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# TA 16
# SWMU Reports

6397

# *TA-16, S-Site*

TA-16 contains many of LANL's HE facilities, LANL's state-of-the-art tritium facility, and substantial administrative support buildings. HE activities that take place at TA-16 are fabricating and testing HE, plastics, and adhesives and conducting research in process development for manufacturing items that use these and other materials. Tritium activities include repackaging tritium, chemical purification of tritium by removing helium-3 and other contaminants, mixing tritium with other gases, analyzing gas mixtures, repackaging tritium to user-specified pressures, reclaiming tritium, and conducting applied research and development for boost systems.

MDA-P has been remediated, is now being evaluated, and will eventually be closed. Additional storage structures have been installed. New office buildings are under construction, and the main steam plant has closed and been replaced by smaller local plants.

The Cerro Grande fire swept across TA-16 and destroyed four of the five historical V-Site structures. It burned MDA R, igniting a tree root and cabling insulation that smoldered underground for several days until excavated and extinguished. In addition, it created post-fire flood concerns in Los Alamos Canyon, requiring the activities at TA-41 to be moved to TA-16.

An environmental assessment is currently in progress to address new activities proposed for TA-16. The environmental assessment addresses increasing administrative support and laboratory activities by modifying Building 202 to accept laboratory activities previously performed at TA-41; removing Building 195, a gas station; constructing a machining fabrication facility; and modifying Building 193, an office and laundry facility, to handle plastics.

The HE research, development, and testing capabilities provided at TA-16 include large-scale HE processing; manufacturing HE powders; casting, machining, and pressing HE components; inspection and radiography of HE components to guarantee integrity and ensure quality control for design intent; assembling test devices; and performing chemical analysis of HE. Capability also exists for storing special nuclear material and for storing, treating, and disposing of HE.

**TA-16 — HE-processing area**

**TA-16 — S-Site**

# *SWMU 16-001(a)-99 — Aboveground storage tanks - outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-456, 16-541 | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-001(a)-99 consists of former SWMUs 16-001(a), 16-001(b), and 16-001(c), which are associated with the TA-16 steam plant (Building 16-540). The steam plant served the S-Site explosives-development mission. The former SWMUs consist of two tanks and two dry wells that received effluent from the steam plant. Effluent included cooling water for boilers and flow from floor and roof drains. The dry wells discharged to NPDES-permitted Outfall 02A007, which was removed from the LANL NPDES permit effective May 15, 1998. Suspect contaminants at this consolidated SWMU are chromates. Chromates typically were used as algaecides to prevent fouling the boilers. According to a LANL engineer cited in the OU 1082 work plan, chromates were not used as descalers at this steam plant. Chromates remain as suspect contaminants because steam plant operations in the 1950s and 1960s were not documented thoroughly. Solvents and oils may have been discharged through floor drains.

Former SWMU 16-001(a) was a blowdown tank (structure 16-456), which served the steam plant boilers. Structure 16-456 was located about 40 ft from the northeast corner of the steam plant. It was a 2000-gal.-capacity, 7-ft-long steel tube with an inside diameter of 6 ft and was half-buried in the ground. The tank received hot water blowdown from the steam boilers and was designed to cool the water before it discharged to an outfall; a release stack allowed superheated water to vent to the atmosphere. The tank was replaced in 1988.

Former SWMU 16-001(b) consists of two connected dry wells, which are 4 ft in diameter. One is 6 ft deep and the other is 7.5 ft deep. Both are made of concrete and are covered with a manhole cover. The wells are located about 50 ft downslope and northeast of structure 16-456. The dry wells are designed to allow effluent to seep into the ground. A pipe equipped with a splash deflector enters each well near its bottom. The primary well has an outflow pipe leading to the secondary well. The dry wells previously received overflow from structure 16-456, but were bypassed after 1988 because their capacity was inadequate. The dry wells discharged to NPDES-permitted Outfall 02A007. The dry well system was refurbished after 1988 with new blowdown and settling tanks.

Former SWMU 16-001(c) is a tank (structure 16-541), which received steam plant blowdown. It was installed in 1962 and operated until 1968, when blowdown was diverted to another tank (structure 16-456). Structure 16-541 remained in place on level ground just south of structure 16-456 at the time the OU 1082 work plan was written. It was covered with a concrete pad and equipped with a wire-mesh vent. A standpipe vent is located about 8 ft east of the tank. About 100 ft further downslope is a ditch that, according to the OU 1082 work plan, may have received outfall from the tank.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Before the outfall was permitted (NPDES Outfall 02A007), effluent was analyzed for iron and copper, which suggests that compounds containing those elements may have been used as descalers. The OU 1082 work plan proposed sampling to determine if contamination is present in and around the blowdown tanks and dry wells.

## ER Project Sampling Summary

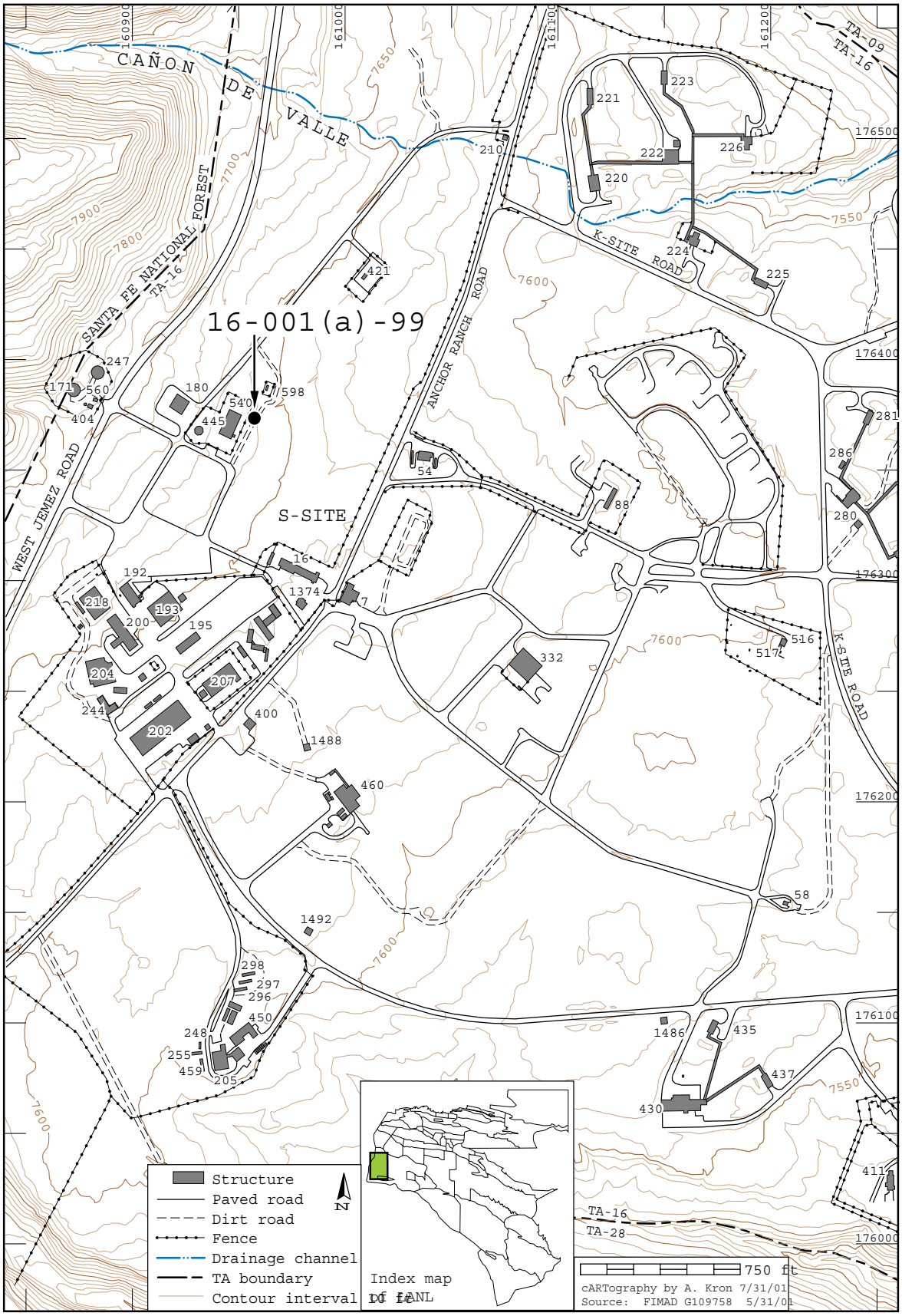
No analytical samples were collected at this site.

## References

RFI Work Plan for Operable Unit 1082 LA-UR Number: 93-1196

**View of SWMU 16-001(a)-99**

**View of SWMU 16-001(a)-99**


16-001(a)-99
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-001(d) — Subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-001(d) is a dry well that served a building (Building 16-208). SWMU 16-001(d) had not been located at the time the OU 1082 work plan was written. According to an engineering drawing, the dry well was 3 ft in diameter and 9 ft deep, and was connected to Building 16-208 with a 4-in. pipe. The dry well was located northeast of Building 16-208. Building 16-208 was a 10-ft-long x 30-ft-wide metal structure on a concrete foundation that was built in 1952 to house 55-gal. drums on racks along the long walls. The building was in use as a chemical storage facility at the time the OU 1082 work plan was written and was still in use for that purpose in 2001. The outlet to the dry well was plugged at an unknown time before the OU 1082 work plan was written. Suspect contaminants at SWMU 16-001(d) include organic solvents, corrosives, and toxic liquids. No record of a spill in the building has been found.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed sampling to determine if contamination is present in and around the dry well.

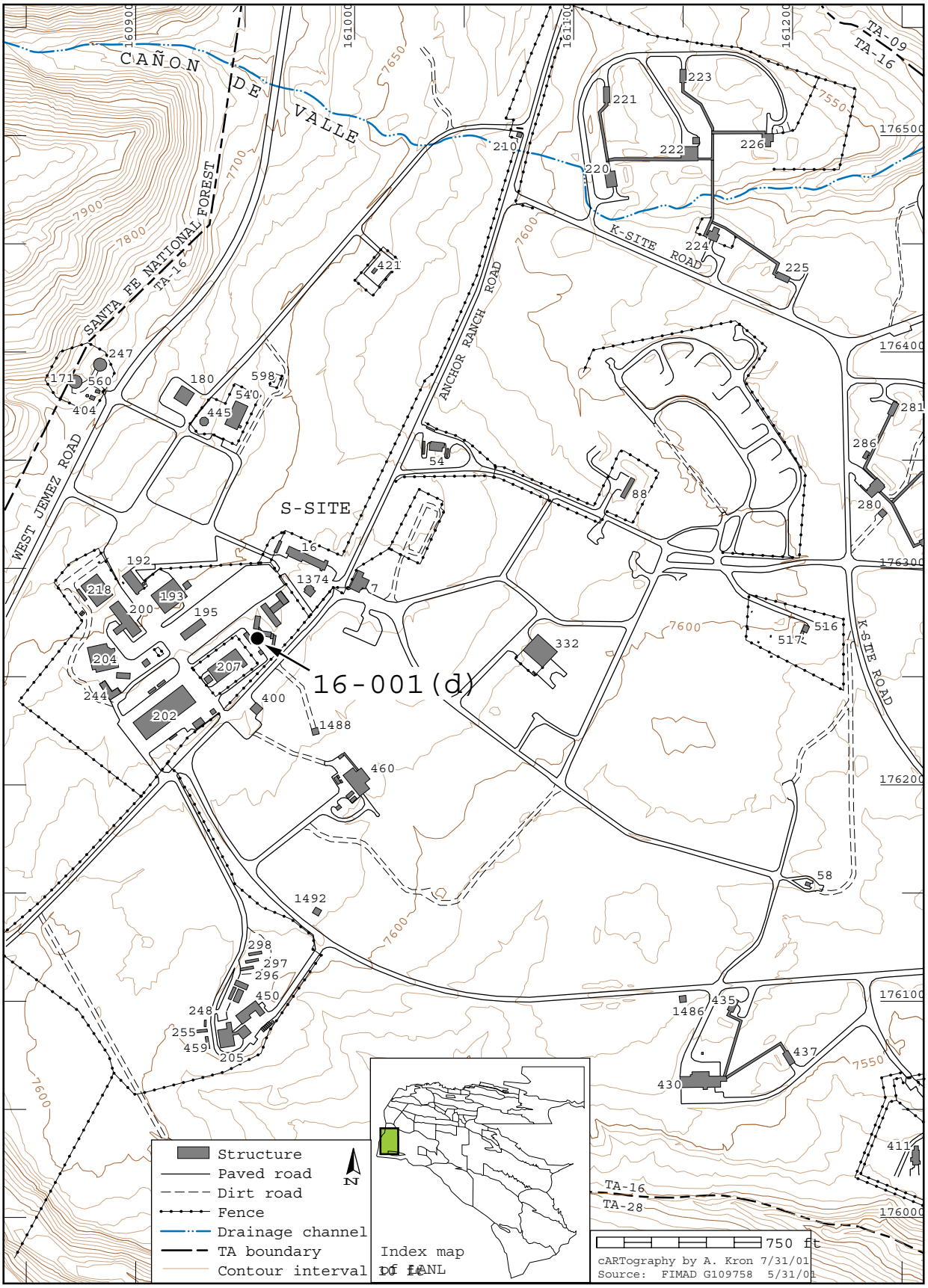
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196


**No photo; subsurface unit**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-001(d)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-003(a) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-mid 1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-003(a) is an inactive HE sump and outfall associated with an assembly building (Building 16-410). Building 16-410 is a test device assembly building where explosive charges and other components are assembled into finished test devices. Building 16-410 also is used to disassemble devices that have undergone nondestructive tests. The sump was installed in the early 1950s and modified in 1966 to improve its effectiveness and to reduce HE handling. It was a rectangular tank with a removable 0.25-in. aluminum lid. Its outside dimensions are 12 ft long, 4 ft wide, and 5 ft high. The walls and bottom are 8-in.-thick steel-reinforced concrete. The sump operated to remove suspended solids from process water before it was discharged to the outfall. HE fines (scrap) were collected in a cloth filter bag secured inside a metal filter basket. The baskets and filter bags periodically were collected and cleaned at the basket-washing facility (structure 16-390), which is located at the burning ground. HE fines that were too small to be collected in the filter bags settled to the bottom of the sump. To assist separation of the suspended solids, the water flowed under an aluminum baffle and over a concrete weir before it discharged to the outfall. HE in the bottom of the sump periodically was removed and burned. The inactive outfall was NPDES-permitted Outfall 05A053 and was removed from the LANL NPDES permit effective January 14, 1998.

Waste at SWMU 16-003(a) consisted of washdown water. According to the OU 1082 work plan, small amounts of potentially hazardous effluent may have been discharged to the environment. The outfall received effluent from the HE sump and floor, roof, and equipment drains. Effluent flowed into a common drainline that discharged to the outfall, which discharged to Water Canyon. Suspect contaminants are explosives, natural and depleted uranium, ethylene glycol, metals, and other solvents.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed including this SWMU in a generic TA-16 sump sampling plan. Sampling was completed in 1995. In July 2000, this site was seeded and mulched, and straw wattles were installed as a BMP to minimize any potential contaminant migration from the site.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 20 | 10 | 1 |
| SVOCs | 20 | N/A | 5 |
| VOCs | 2 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

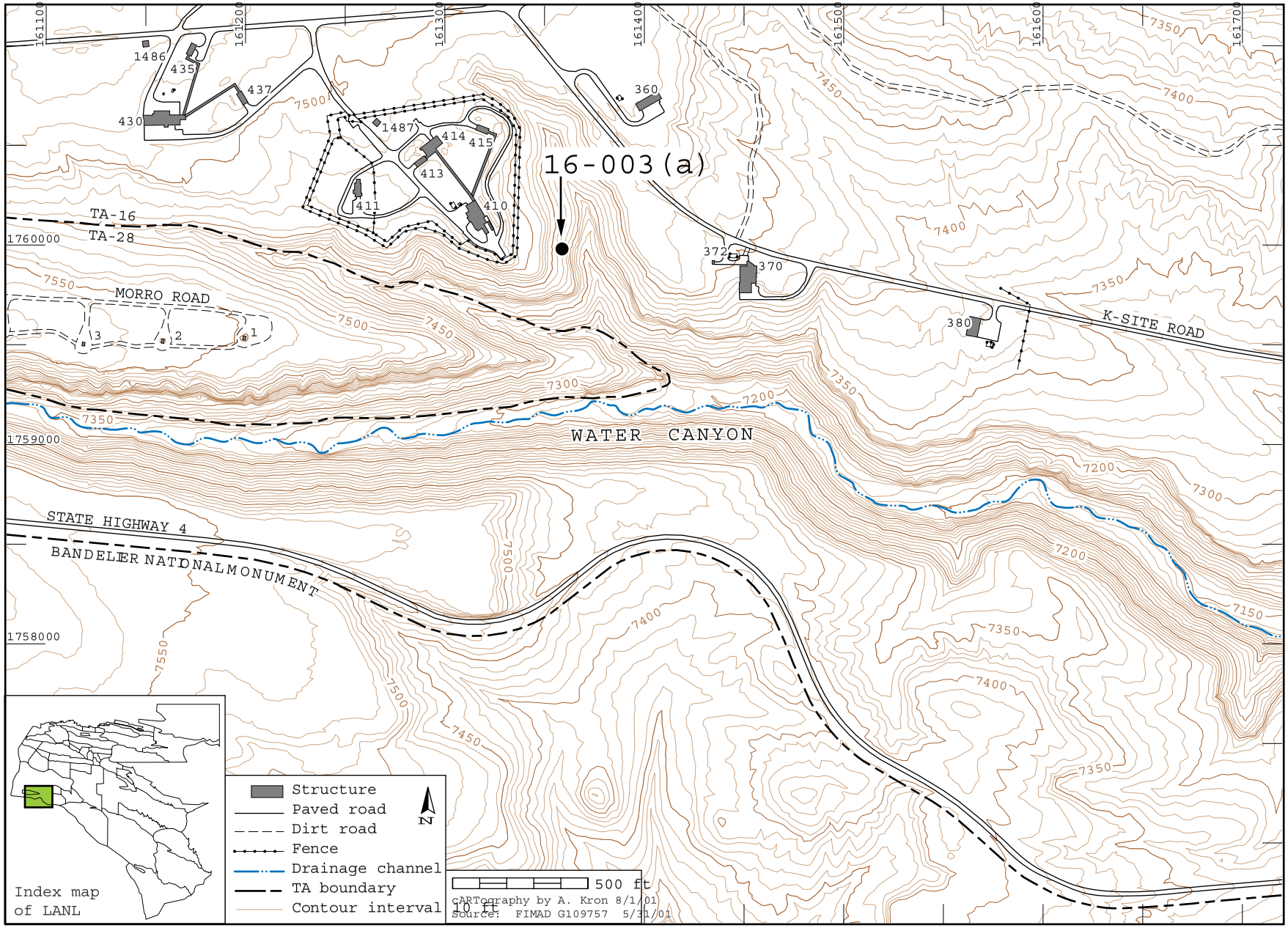
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 2.99 mg/kg | 0.39 mg/kg |
| SVOCs | Benzo(a)anthracene | 1 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 1.3 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 1.9 mg/kg | 0.62 mg/kg |
| | Dibenz(a,h)anthracene | 0.17 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 0.87 mg/kg | 0.62 mg/kg |

## References

**Outfall [SWMU 16-003(a)]**

**Outfall [SWMU 16-003(a)]**

**Best management practice [SWMU 16-003(a)]**


16-003(a)
TA-16
TA-28
MORRO ROAD
K-SITE ROAD
WATER CANYON
STATE HIGHWAY 4
BANDELER NATIONAL MONUMENT
1486
435
437
430
1487
414
415
413
411
410
360
372
370
380
1
2
3
161100
161200
161300
161400
161500
161600
161700
1760000
1759000
1758000
7350
7400
7450
7500
7550
7300
7200
7150
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
500 ft
Index map of LANL
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

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# *SWMU 16-003(b) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-Present |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-003(b) is an inactive HE sump and an inactive outfall associated with the truck-washing building (Building 16-400). The sump was installed in the early 1950s and modified in 1966 to improve its effectiveness and to reduce HE handling. It is a rectangular tank with a removable 0.25-in. aluminum lid. Outside dimensions were 12 ft long, 4 ft wide, and 5 ft high. The walls and bottom were 8-in.-thick, steel-reinforced concrete. The sump received HE-bearing water from the truck-washing activities. The sump operated to remove suspended solids from wash water before it was discharged to the outfall. The sump is currently plugged. HE fines (scrap) were collected in a cloth filter bag secured inside a metal filter basket. The baskets and filter bags periodically were collected and cleaned at the basket-washing facility (structure 16-390), which was located at the burning ground. HE fines that were too small to be collected in the filter bags settled to the bottom of the sump. To assist separation of the suspended solids, the water flowed under an aluminum baffle and over a concrete weir before it discharged to the outfall. HE in the bottom of the sump periodically was removed and burned. The inactive outfall was NPDES-permitted Outfall 05A063 and was removed from the LANL NPDES permit effective December 5, 1995. The outfall received effluent from the HE sump and a steam-pit drain. Effluent flowed to a common drainline that discharged to the outfall, which discharged to a level meadow. Building 16-400 is a truck-washing facility, although it has been used for cleaning other HE-contaminated materials, such as drainpipe, that was excavated from World War II HE sumps. Most of the trucks were used to transport boxed HE and process equipment. Suspect contaminants are HE and solvents.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed including this SWMU in a generic TA-16 sump sampling plan. Sampling was completed in 1995.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 9 | N/A | 3 |
| Inorganic chemicals | 22 | 17 | 1 |
| SVOCs | 19 | N/A | 6 |
| VOCs | 1 | N/A | 0 |

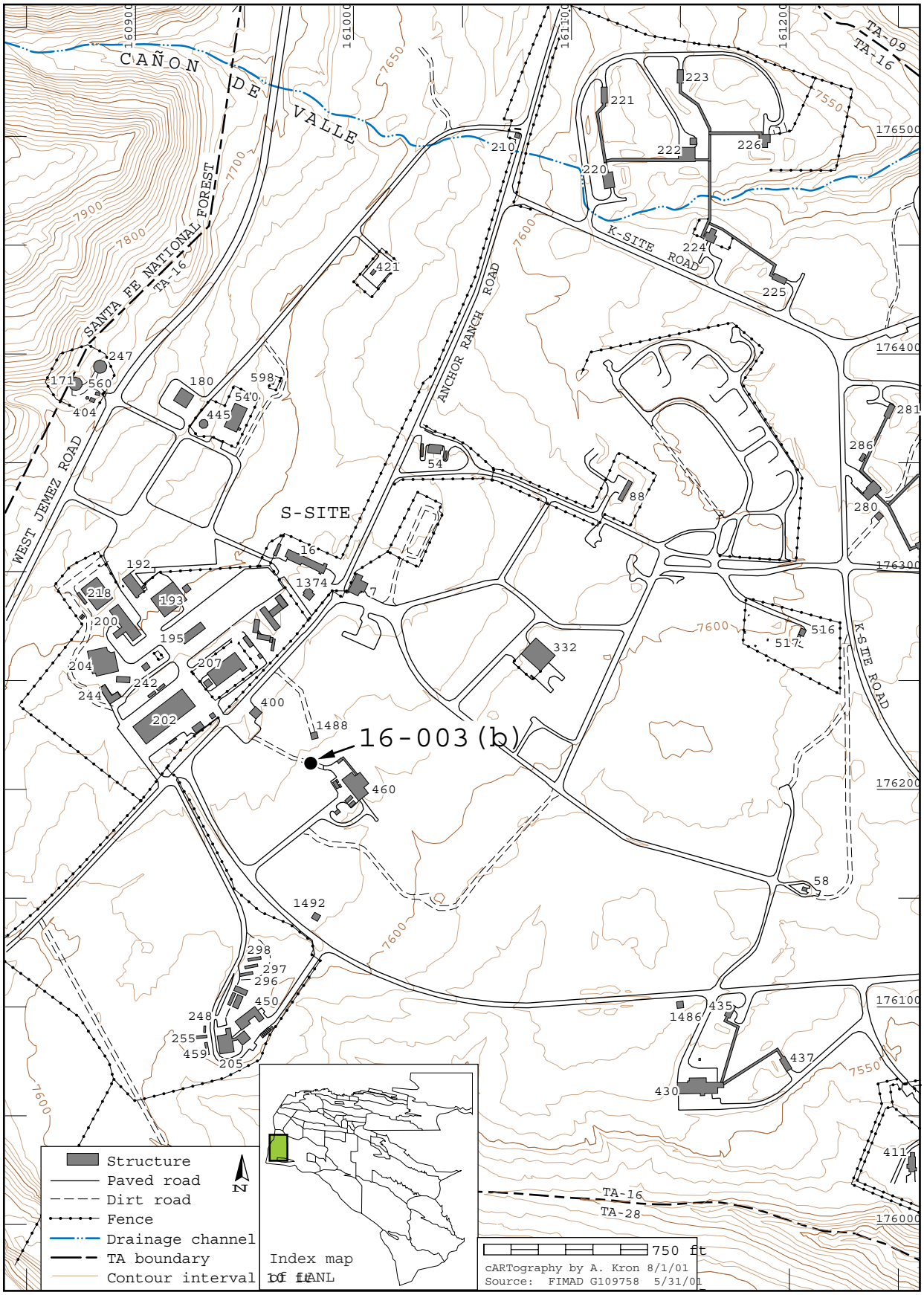
The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 1.07 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 1.46 mg/kg | N/A |
| | Nitroguanidine | 3.78 mg/kg | N/A |
| Inorganic chemicals | Arsenic | 2.7 mg/kg | 0.39 mg/kg |
| SVOCs | Acenaphthylene | 0.06 mg/kg | N/A |
| | Benzo(a)anthracene | 4.8 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 4.8 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 6.1 mg/kg | 0.62 mg/kg |
| | Dibenz(a,h)anthracene | 0.78 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 3.1 mg/kg | 0.62 mg/kg |

## References

RFI Work Plan for Operable Unit 1082 LA-UR Number: 93-1196

**Cover over sump [SWMU 16-003(b)]**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-003(b)
7900
7800
7700
7650
7600
7550
176500
176400
176300
176200
176100
176000
161090
161100
161110
161200
247
171
560
404
180
598
540
445
421
210
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225
54
88
281
286
280
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1374
7
192
218
193
200
195
204
242
244
207
202
400
1488
460
332
516
517
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-003(c)-99 — Outfall/effluent discharge - physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-mid 1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-003(c)-99 consists of former SWMUs 16-003(c) and 16-026(v). This consolidated SWMU contains one inactive HE sump [former SWMU 16-003(c)] and its associated drainline and outfall [former SWMU 16-026(v)] from a decommissioned analytical chemistry laboratory (Building 16-460). Wastes consisted primarily of fine grains of HE from analytical chemistry experiments. Historically, small quantities of HE were used in the building and small quantities of solvents and other chemicals were discharged to the sump. The outfall was NPDES-permitted Outfall 05A072, and it received effluent from the sump and building floor drains, bench-sink cup drains, steam-cup drains, sink drains, and a drinking fountain. The outfall was removed from the LANL NPDES permit effective September 19, 1997. Building 16-460 currently is used to support bioremediation studies in nearby greenhouses. Potential contaminants at this consolidated SWMU are HE, inorganic chemicals, and laboratory chemicals such as solvents.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted an RFI at former SWMU 16-026(v) in 1995 to determine if a release had occurred from the outfall and if so, if the release had caused contamination above action levels. Two boreholes were drilled near the outfall: one at the outfall and one at the next downstream sediment trap. In addition, the ER Project sampled 14 other downstream locations. Samples were field-screened for HE, radiation, and organic chemicals. Samples were analyzed for organics, HE, inorganics, and uranium. Elevated PAH levels were found and attributed to continuing releases from nearby parking lots and roof drains. Elevated chromium in one sample was believed to be the result of naturally high values of chromium in the geologic subunit of the Bandelier Tuff that underlies former SWMU 16-026(v). The RFI report recommended NFA at this SWMU. In 1998, a straw bale barrier was installed as a BMP to minimize erosion at the site.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 3 | N/A | 1 |
| Inorganic chemicals | 21 | 14 | 2 |
| SVOCs | 20 | N/A | 5 |
| VOCs | 2 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | TATB | 11.1 mg/kg | N/A |
| Inorganic chemicals | Arsenic | 3.63 mg/kg | 0.39 mg/kg |
| | Iron | 36,100 mg/kg | 23,000 mg/kg |
| SVOCs | Benzo(a)anthracene | 4.9 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 3.9 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 6.5 mg/kg | 0.62 mg/kg |
| | Dibenz(a,h)anthracene | 0.44 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 1.6 mg/kg | 0.62 mg/kg |

## References

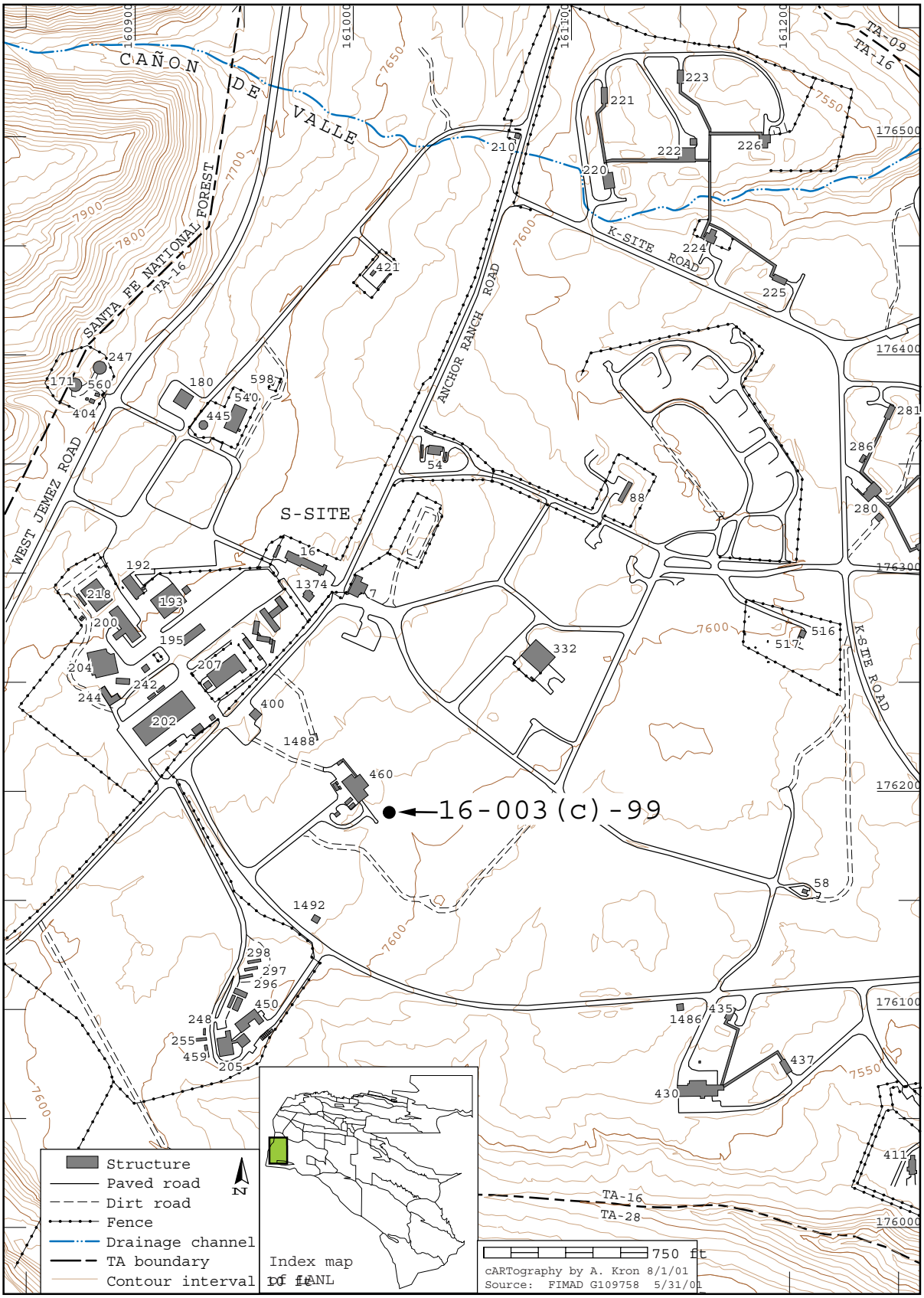

RFI Report for TAs -11, -13, -16: PRSs 11-012(a,b), 13-003(a), 16-006(c,d), 16-010(a), 16-021(a), 16-026(c,d,v), 16-028(a), 16-030(g) — LA-UR Number: 97-3072

RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**Outfall [former SWMU 16-026(v)]**

**Outfall [former SWMU 16-026(v)]**

**Sump [former SWMU 16-003(c)]**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-003(c)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-003(d)-99 — Physical/chemical treatment units - subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-mid 1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-003(d)-99 consists of former SWMUs 16-001(e), 16-003(d), 16-003(e), 16-003(f), and 16-003(g), which includes seven inactive HE sumps and the associated inactive dry well located along the 300-Line. The 300-Line consists of process Buildings 16-300, -302, -304, and -306. The 300-Line was built in late 1951 for casting HE. Buildings were converted to other uses when casting explosives were replaced by plastic-bonded explosives. The 300-Line sumps discharged to a single NPDES-permitted outfall (Outfall 05A058), which was removed from the LANL NPDES permit effective July 31, 1996. Solvents historically were disposed of in the sumps, but currently are containerized and disposed of off the site. Suspect contaminants are HE and solvents.

Former SWMU 16-001(e) is an active dry well located about 100 ft east of Building 16-306 at the head of a small tributary of Water Canyon. The dry well is adjacent to the outfall of the Building 16-300 process line. The dry well was built in the early 1980s but did not function properly because it drained to impermeable tuff. By the time the OU 1082 work plan was written, the dry well had been filled with soil and overgrown with vegetation. Suspect contaminants at former SWMU 16-001(e) are HE and solvents.

Former SWMU 16-003(d) consists of two inactive HE sumps that served Building 16-300. Building 16-300 is a mock (inert) explosives preparation facility where wash-down water was drained to the sumps. Raw materials including penterythritol, barium nitrate, cyanuric acid, and nitrocellulose are blended into plastic-bonded molding powders. At the time the OU 1082 work plan was written, no HE operations took place in Building 16-300.

Former SWMU 16-003(e) consists of two inactive HE sumps that served Building 16-302. Building 16-302 was a casting facility where explosives were melted in steam-heated kettles and poured into molds. Castings later were machined to their final shapes. Molds, kettles, and other equipment were cleaned using steam and high-temperature wash water that drained into the sumps. Small-to-moderate amounts of castable explosives and solvents historically were discharged to the environment. Building 16-302 currently is used as a non-HE operations facility.

Former SWMU 16-003(f) consists of two inactive HE sumps that served Building 16-304. No HE was being used when the OU 1082 work plan was written and the work plan stated that the probability of HE in the sumps was low. Building 16-304 is a plastics and plastic component development and production facility. Polycarbonate components are fabricated using injection-molding machines. Other components are made using hydraulic presses. Large high-temperature ovens are used to dry-mold powders and to cure thermoset plastics. Solvents have been used at Building 16-304. By the time the OU 1082 work plan was written, solvents were containerized and sent off-site for disposal. In June 2000, the area occupied by former SWMU 16-003(f) was seeded and mulched, and straw wattles were installed as a BMP to minimize any potential contaminant migration from the site.

Former SWMU 16-003(g) consists of two inactive HE sumps that served Building 16-306. Building 16-306 is a plastic component development and production facility. Operations include molding polysiloxane foam and polyurethane components, intrusion molding, and epoxy and laminate work. Ovens are used to cure thermoset plastics. Solvents historically used at Building 16-306 include acetone, chlorothene, Freon-PCA solvent, and methylene chloride. Solvents historically were discharged to the sumps but current practice is to containerize them and dispose of them off-site.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed including the SWMUs in this consolidated unit in a generic TA-16 sump sampling plan. Sampling was completed in 1995.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric

deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 8 | N/A | 4 |
| Inorganic chemicals | 23 | 18 | 3 |
| SVOCs | 25 | N/A | 7 |
| VOCs | 6 | N/A | 0 |

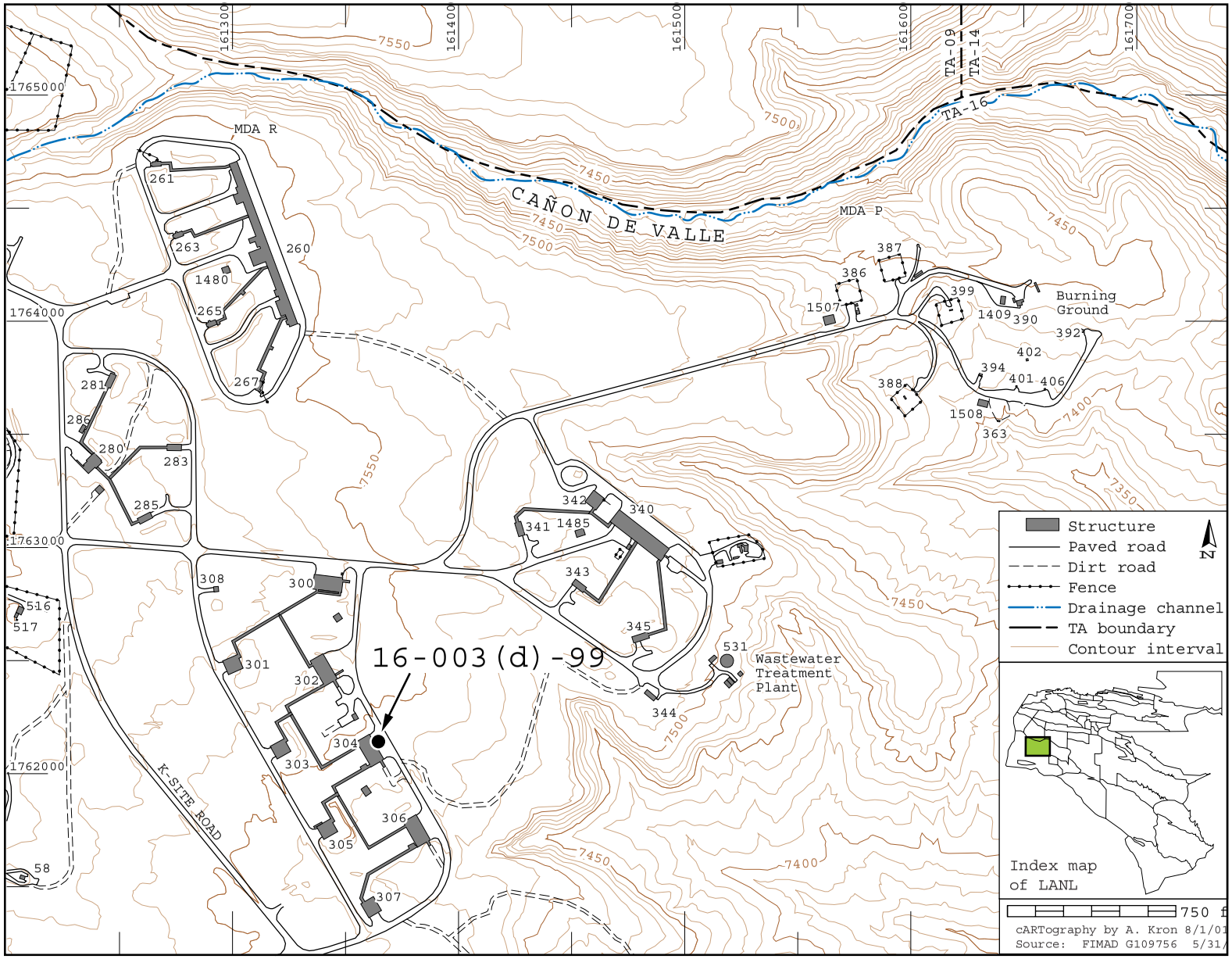
The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.09 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 1.53 mg/kg | N/A |
| | RDX | 24.5 mg/kg | 4.4 mg/kg |
| | Trinitrotoluene[2,4,6-] | 90.1 mg/kg | 31 mg/kg |
| Inorganic chemicals | Arsenic | 9.6 mg/kg | 0.39 mg/kg |
| | Iron | 39,500 mg/kg | 23,000 mg/kg |
| | Mercury | 233 mg/kg | 23 mg/kg |
| SVOCs | Acenaphthylene | 0.09 mg/kg | N/A |
| | Benzo(a)anthracene | 31 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 31 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 22 mg/kg | 0.62 mg/kg |
| | Benzo(k)fluoranthene | 29 mg/kg | 6.2 mg/kg |
| | Dibenz(a,h)anthracene | 0.17 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 19 mg/kg | 0.62 mg/kg |

## References

**View of SWMU 16-003(d)-99, looking south**

**View of SWMU 16-003(d)-99, north side of Building 16-300**




Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval

N

Index map of LANL

750 f

cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *SWMU 16-003(h)-99 — Outfall/effluent discharge - physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-mid 1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-003(h)-99 consists of former SWMU 16-003(h) and former AOC 16-030(d). This consolidated SWMU contains an inactive HE sump [former SWMU 16-003(h)], drainline and outfall [former AOC 16-030(d)] associated with an inspection building (Building 16-280), which was a physical inspection and metrology laboratory for HE and other weapons components. The outfall was former NPDES-permitted Outfall 05A061. It was removed from the LANL NPDES permit effective July 31, 1996. Building 16-280 is also a staging facility for assembling test device components. Solvents and HE historically may have been discharged to the sump but at the time the OU 1082 work plan was written, solvents were containerized for off-site disposal. No other effluent sources were discharged to the outfall.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed including the former SWMUs in this consolidated SWMU in a generic TA-16 sump sampling plan. Sampling was completed in 1995.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

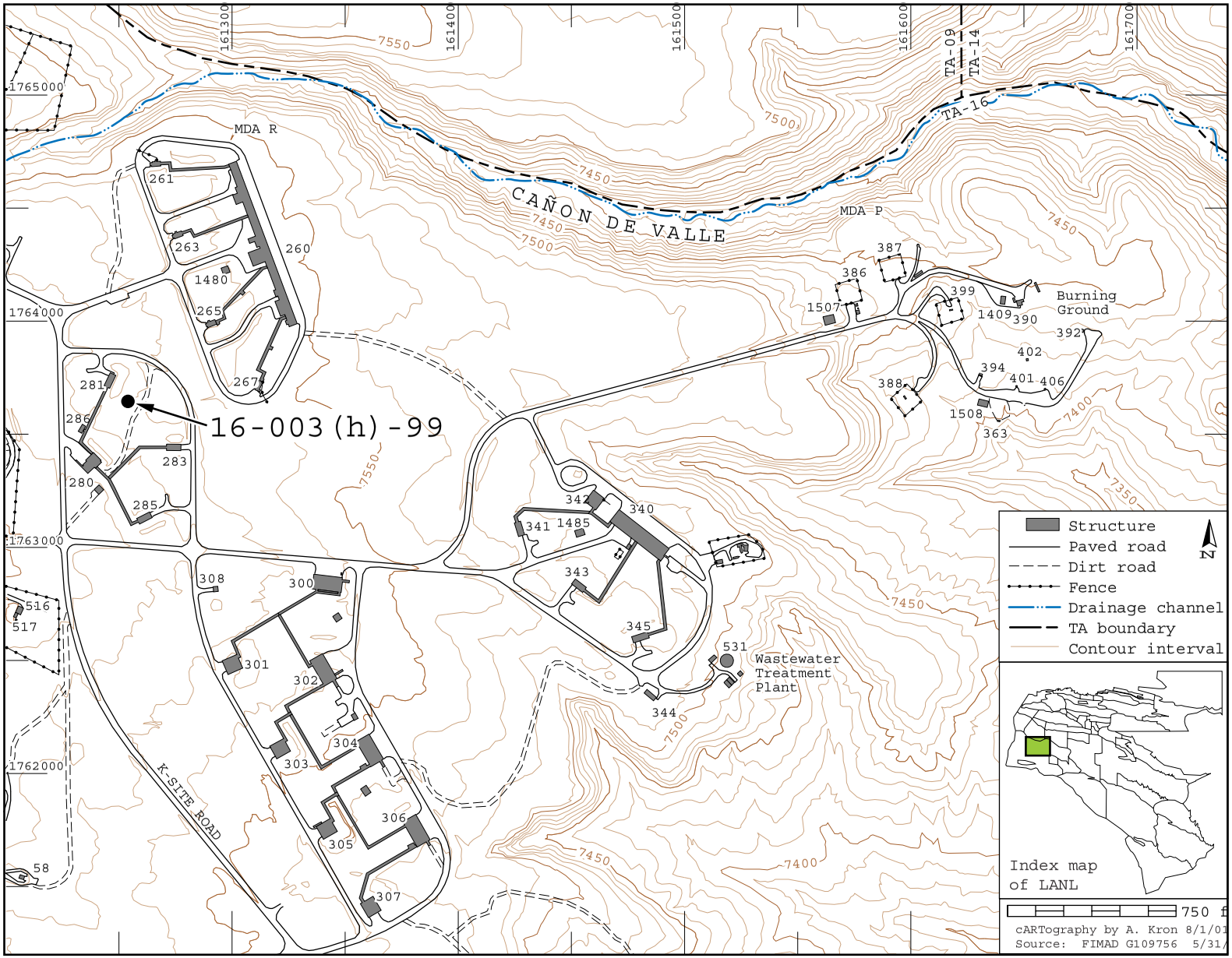
| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 6 | N/A | 1 |
| Inorganic chemicals | 19 | 9 | 2 |
| SVOCs | 19 | N/A | 9 |
| VOCs | 2 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-4,6-dinitrotoluene[2-] | 0.103 mg/kg | N/A |
| Inorganic chemicals | Arsenic | 4.87 mg/kg | 0.39 mg/kg |
| | Chromium (total) | 277 mg/kg | 210 mg/kg |
| SVOCs | Benzo(a)anthracene | 640 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 690 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 940 mg/kg | 0.62 mg/kg |
| | Benzo(k)fluoranthene | 350 mg/kg | 6.2 mg/kg |
| | Chrysene | 930 mg/kg | 61 mg/kg |
| | Dibenz(a,h)anthracene | 91 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 340 mg/kg | 0.62 mg/kg |
| | Methylnaphthalene[2-] | 100 mg/kg | 55 mg/kg |
| | Naphthalene | 300 mg/kg | 53 mg/kg |

**View of former AOC-16-030(d)**

**View of former SWMU-16-003(h)**


16-003(h)-99
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
161300
161400
161500
161600
161700
1765000
1764000
1763000
1762000
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
283
280
285
308
300
301
302
303
304
305
306
307
516
517
58
342
340
341
1485
343
345
531
344
386
387
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-003(i) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-mid 1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-003(i) is an inactive HE sump and outfall associated with structure 16-265, an HE assembly/rest house. The sump received effluent from a sink and a drinking fountain. It discharged to a NPDES-permitted outfall (Outfall 05A057), which was removed from the LANL NPDES permit sometime before 1994. Suspect contaminants in the sump are 1,1,1-trichloroethane, chloromaleic anhydride, and HE.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed including this SWMU in a generic TA-16 sump sampling plan. Sampling was completed in 1995.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 19 | 12 | 1 |
| SVOCs | 10 | N/A | 1 |
| VOCs | 0 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

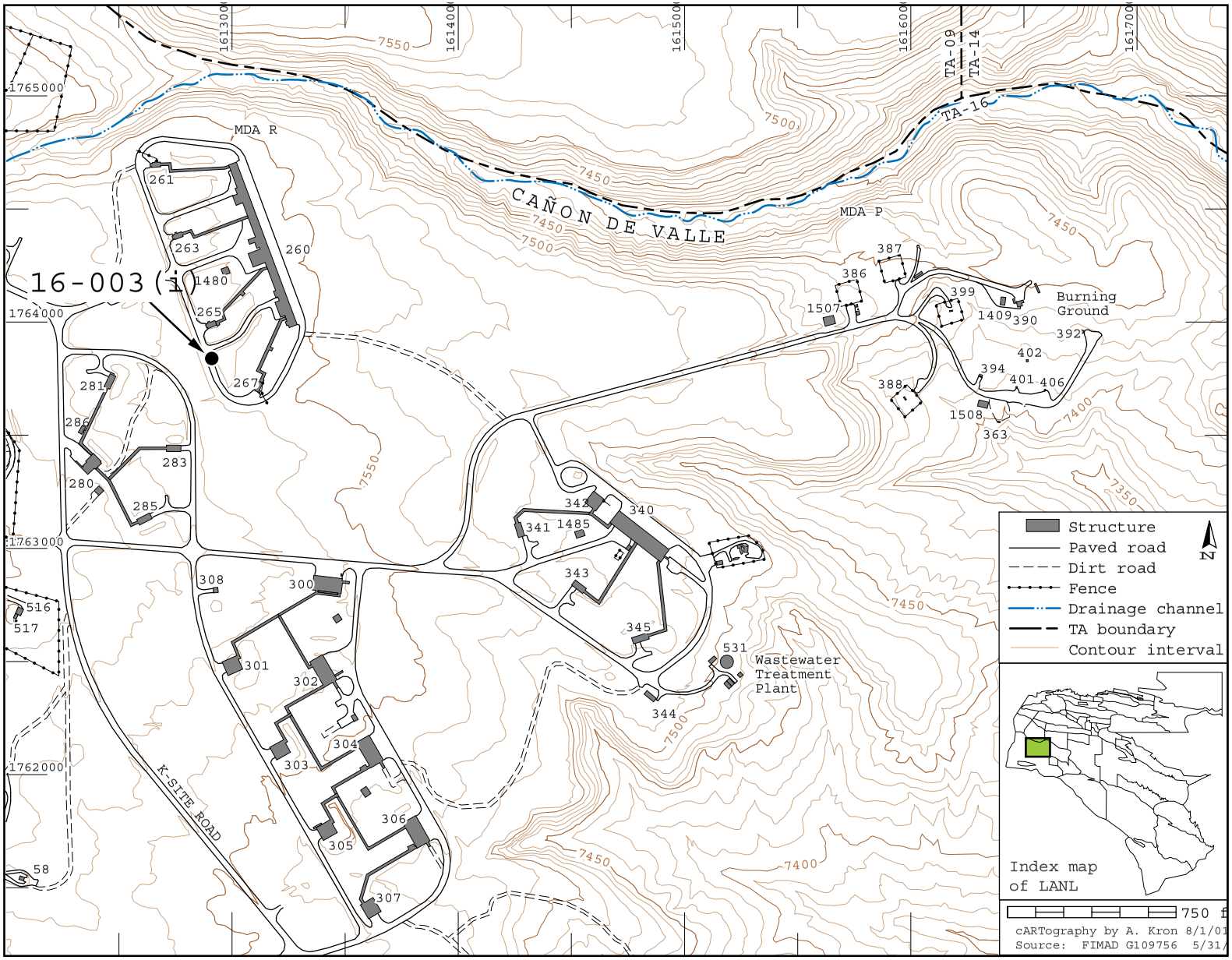
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 3.7 mg/kg | 0.39 mg/kg |
| SVOCs | Benzo(a)pyrene | 0.095 mg/kg | 0.062 mg/kg |

## References

RFI Work Plan for Operable Unit 1082 LA-UR Number: 93-1196

**View of SWMU 16-003(i)**

**View of SWMU 16-003(i)**


16-003(i)
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300N
161400N
161500N
161600N
161700N
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
283
280
285
308
300
301
302
304
303
306
305
307
516
517
58
343
341
1485
340
342
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-003(j) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-mid 1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-003(j) is an inactive HE sump associated with a rest house (structure 16-267). The sump received effluent from a janitorial sink and discharged to a NPDES-permitted outfall (Outfall EPA 05A149), which was removed from the LANL NPDES permit sometime prior to 1994. The suspect contaminant for this SWMU is HE.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed including this SWMU in a generic TA-16 sump sampling plan. Sampling was completed in 1995.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 20 | 8 | 1 |
| SVOCs | 7 | N/A | 1 |
| VOCs | 0 | N/A | 0 |

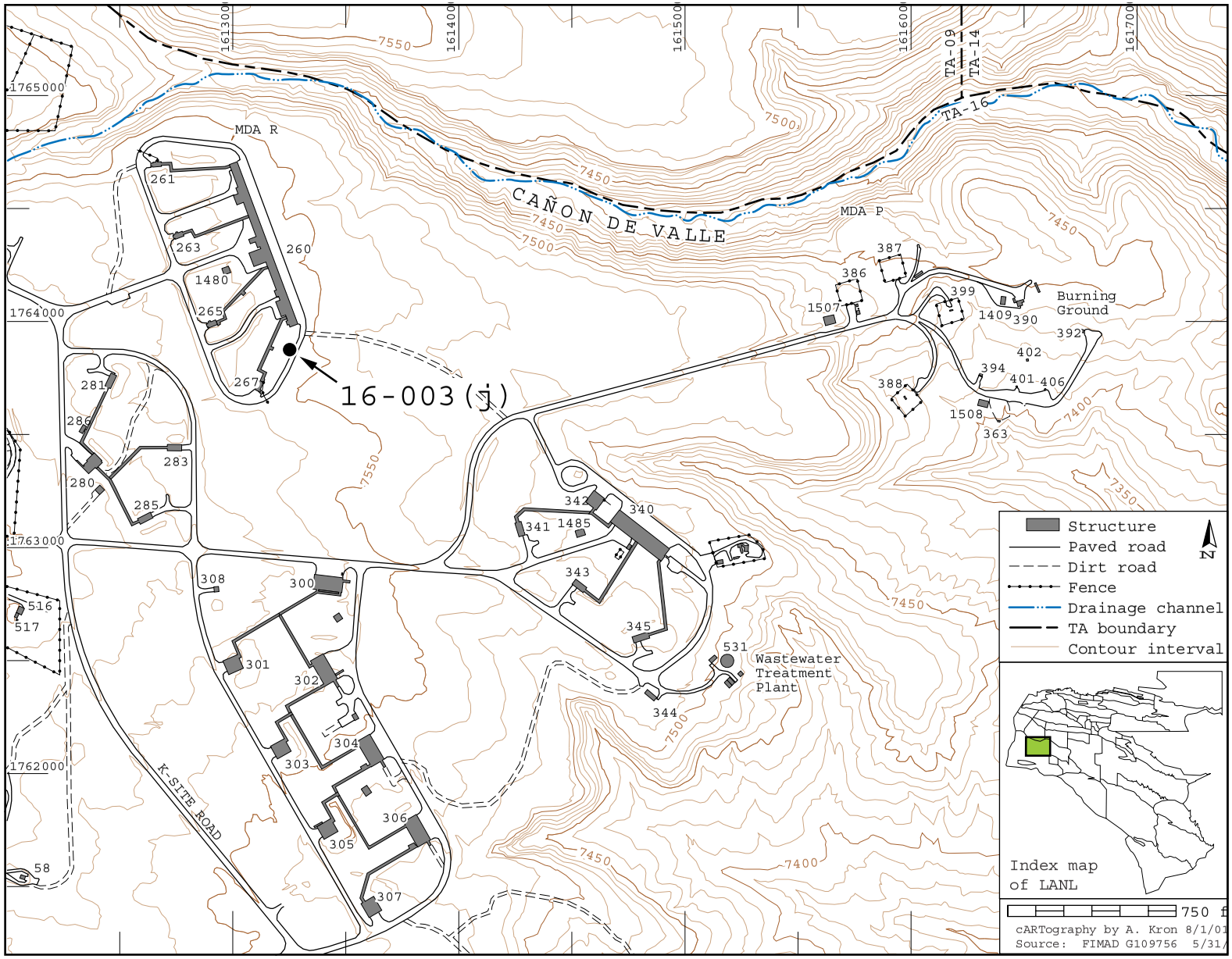
The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 12.3 mg/kg | 0.39 mg/kg |
| SVOCs | Benzo(a)pyrene | 0.084 mg/kg | 0.062 mg/kg |

## References

RFI Work Plan for Operable Unit 1082 LA-UR Number: 93-1196

**View of sump [SWMU 16-003(j)]**


16-003(j)
CAÑON DE VALLE
MDA R
MDA P
TA-16
TA-09
TA-14
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
283
280
285
308
300
301
302
304
303
306
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307
516
517
58
342
340
341
1485
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
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cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-003(l)-99 — Outfall/effluent discharge - physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-Present |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-003(l)-99 consists of former SWMUs 16-003(l) and 16-030(h). This consolidated SWMU contains three active HE sumps [former SWMU 16-003(l)] associated with drainlines and three inactive outfalls [former SWMU 16-030(h)] from an HE pressing facility (structure 16-430) where plastic-bonded explosive and mock HE powders were pressed to shape. The three sumps received effluent from five pressing bays. Waste primarily consisted of small quantities of HE powder and solvents. Most solvents and HE collected in the sumps were removed and burned. Each outfall received effluent from the sumps. The effluent from each outfall flowed to a common drainage ditch and discharged to a single drainage channel. The outfall was NPDES-permitted Outfall 05A071, which was removed from the LANL NPDES permit effective March 10, 1998. The 1990 SWMU report stated that known releases of acetone and methyl ethyl ketone occurred, but documentation of the releases was not found.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed including this SWMU in a generic TA-16 sump sampling plan. Sampling was competed in 1995. In 1996, a sediment trap was installed at former SWMU 16-030(h) as a BMP. As part of the post-Cerro Grande fire recovery, former SWMU 16-030(h) was seeded and mulched, and straw wattles were installed to further minimize erosion at the site.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 6 | N/A | 4 |
| Inorganic chemicals | 24 | 18 | 5 |
| SVOCs | 28 | N/A | 6 |
| VOCs | 3 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

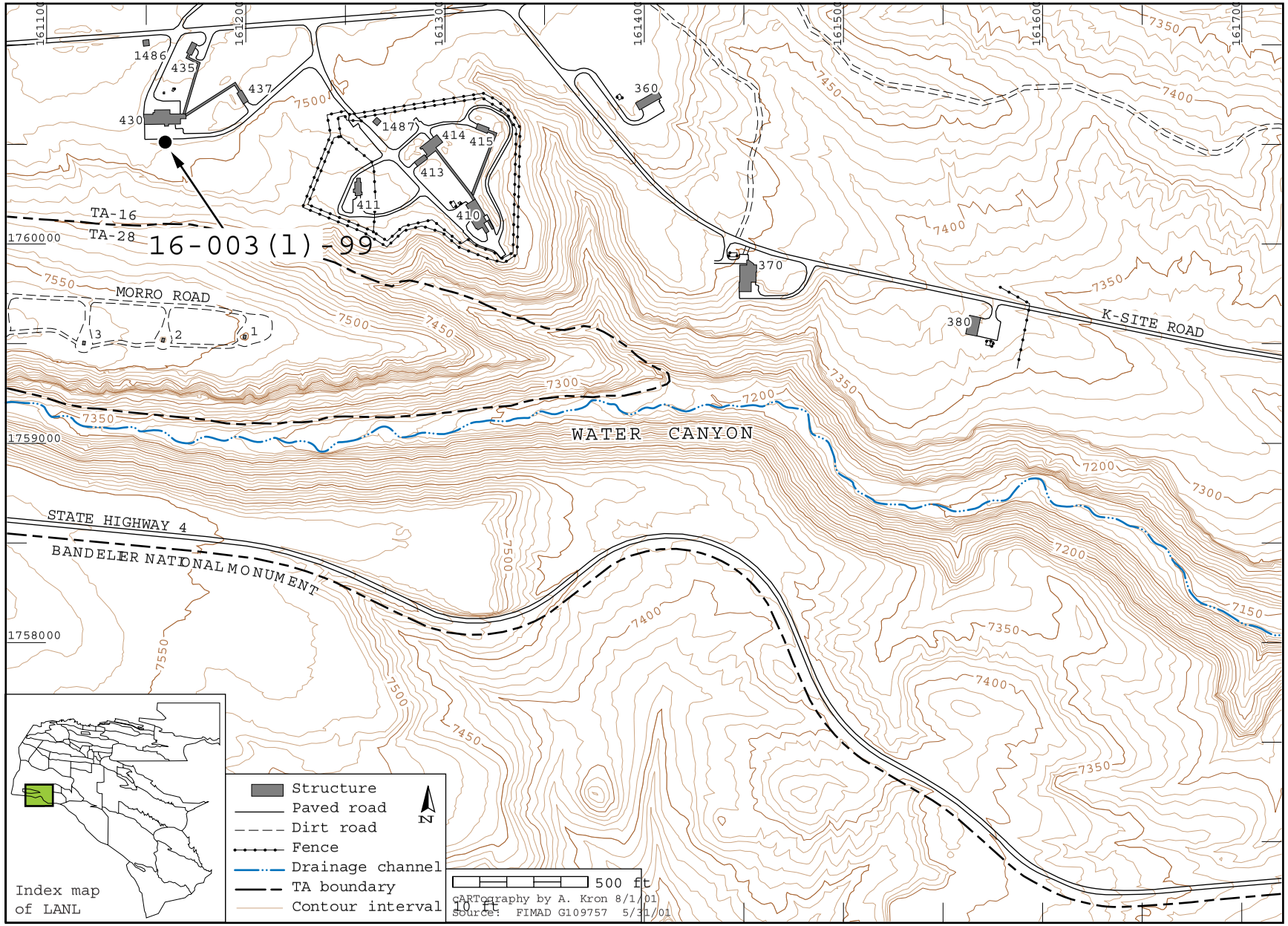
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 26.4 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 16.7 mg/kg | N/A |
| | Dinitrobenzene[1,3-] | 11.1 mg/kg | 6.1 mg/kg |
| | HMX | 9300 mg/kg | 3100 mg/kg |
| Inorganic chemicals | Arsenic | 18.3 mg/kg | 0.39 mg/kg |
| | Barium | 7870 mg/kg | 5200 mg/kg |
| | Copper | 3810 mg/kg | 2800 mg/kg |
| | Cyanide (total) | 1.61 mg/kg | N/A |
| | Iron | 105,000 mg/kg | 23,000 mg/kg |
| SVOCs | Acenaphthylene | 0.33 mg/kg | N/A |
| | Benzo(a)anthracene | 5.9 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 6.7 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 11 mg/kg | 0.62 mg/kg |
| | Dibenz(a,h)anthracene | 0.83 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 3.7 mg/kg | 0.62 mg/kg |

## References

RFI Work Plan for Operable Unit 1082 LA-UR Number: 93-1196

**Best management practice [former SWMU 16-030(h)], outfall**

**View of former SWMU 16-003(l), sump**


16-003(1)-99
TA-16
TA-28
MORRO ROAD
K-SITE ROAD
WATER CANYON
STATE HIGHWAY 4
BANDELER NATIONAL MONUMENT
1486
435
437
430
1487
414
415
413
411
410
360
370
380
1
2
3
1760000
1759000
1758000
7550
7500
7450
7400
7350
7300
7200
7150
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
500 ft
0 ft
Index map of LANL
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

# *SWMU 16-003(m)-99 – Physical/chemical treatment units -subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-Present |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-003(m)-99 consists of former SWMUs 16-003(m) and 16-006(d), and former AOC 16-030(g), all of which were associated with the HE inspection building (Building 16-380). This consolidated SWMU contains one inactive HE sump [former SWMU 16-003(m)], a septic system [former SWMU 16-006(d)], and an outfall [former AOC 16-030(g)]. Building 16-380 is a former inspection site for raw HE powder brought to TA-16 and currently is used to store ammunition for LANL security forces. Former SWMU 16-003(m) received wash-down water from cleaning activities. Former SWMU 16-006(d) is an active septic system that includes a 540-gal., reinforced concrete septic tank, drainlines, distribution box, and tile drainfield that serves Building 16-380. Five floor drains, two water closets, and one deep sink discharged to the septic tank. Suspect contaminants are HE, inorganic chemicals, and organic chemicals. Former AOC 16-030(g) received effluent from the sump, two roof drains, the steam-heating system, and a drop inlet from a parking lot. The outfall was NPDES-permitted Outfall 05A052, and discharged to Water Canyon. When the RFI report was written, the outfall received only parking lot runoff and was in the process of being removed from the LANL NPDES permit. The sump and the steam-heating system discharges have been plugged. Suspect contaminants at former AOC 16-030(g) are HE and metals.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted RFIs at former SWMU 16-006(d) and former AOC 16-030(g) in 1995. The RFIs were conducted to determine if a release had occurred from each of the former units and if so, whether the release caused contamination. At former SWMU 16-006(d), six samples were collected from three locations. Samples were field-screened for HE, radioactivity, organic chemicals, and inorganic chemicals, and analyzed for organic chemicals, radiation, inorganic chemicals, and HE. No elevated chemical concentrations were found, and the RFI report recommended NFA at former SWMU 16-006(d). At former AOC 16-030(g), two boreholes were drilled: one at the outfall and one at the next downstream sediment trap. In addition, sample locations were screened for HE at 10-ft intervals downgradient. At the first negative HE screening location, 3 surface soil samples were collected at 20-ft intervals. Two additional surface samples were taken further downgradient. In all, 7 locations were sampled and 12 samples were collected. All samples were field-screened for organic chemicals, radiation, and HE. All field-screening results were negative. The samples showed elevated lead and PAH levels, but the levels were determined not to represent a human health risk. Erosion controls were installed at this site as a BMP. The RFI report recommended NFA at former AOC 16-030(g).

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 9 | N/A | 3 |
| Inorganic chemicals | 20 | 5 | 2 |
| Radionuclides | 6 | 6 | 0 |
| SVOCs | 19 | N/A | 5 |
| VOCs | 1 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.218 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 0.109 mg/kg | N/A |
| | TATB | 3.34 mg/kg | N/A |
| Inorganic chemicals | Arsenic | 3.33 mg/kg | 0.39 mg/kg |
| | Lead | 434 mg/kg | 400 mg/kg |
| SVOCs | Benzo(a)anthracene | 3.3 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 3.2 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 4.8 mg/kg | 0.62 mg/kg |
| | Dibenz(a,h)anthracene | 0.41 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 1.4 mg/kg | 0.62 mg/kg |

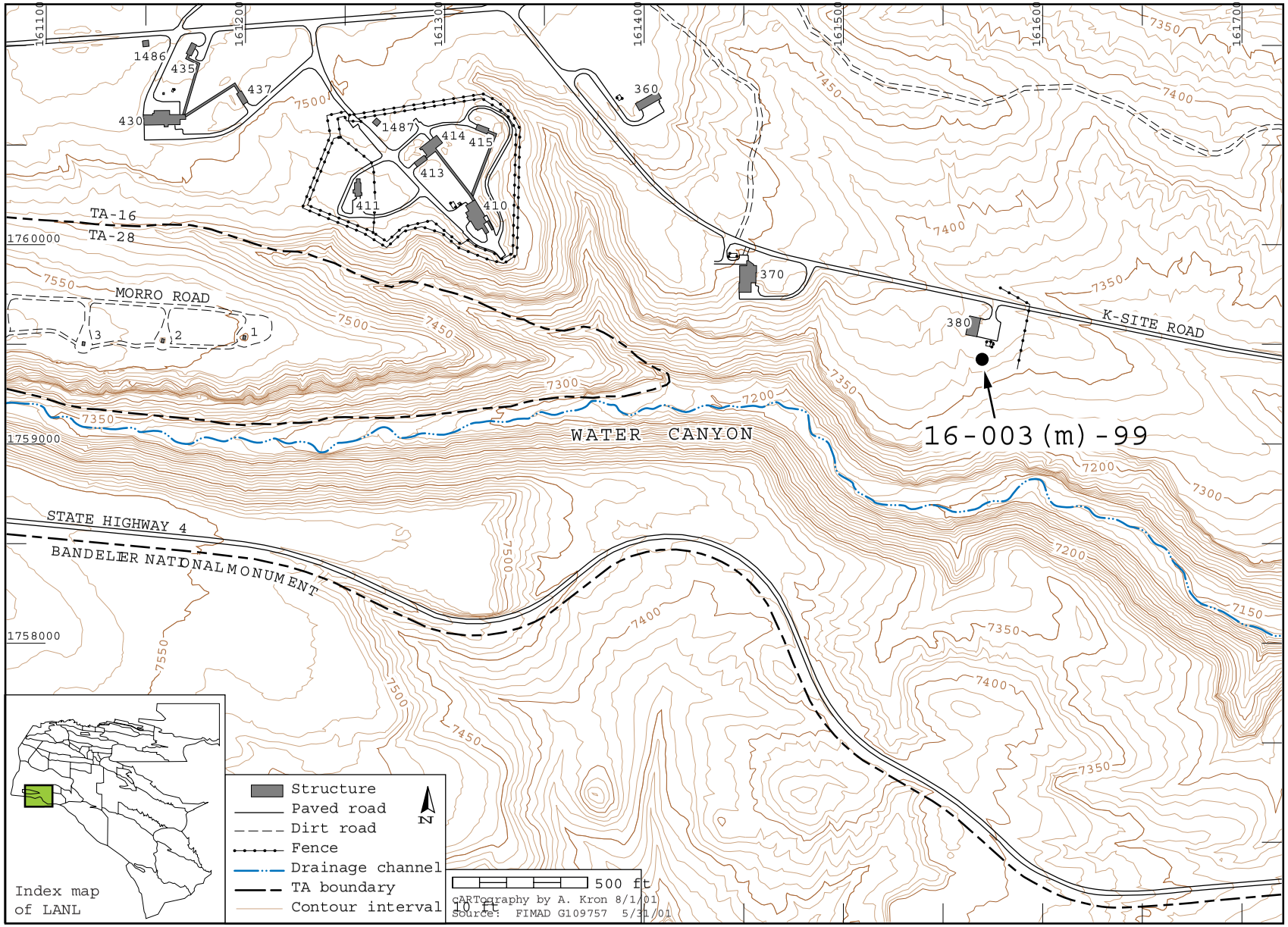
## References


RFI Report for TAs -11, -13, -16: PRSs 11-012(a,b), 13-003(a), 16-006(c,d), 16-010(a), 16-021(a), 16-026(c,d,v), 16-028(a), 16-030(g) — LA-UR Number: 97-3072

RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of former AOC 16-030(g), outfall**

**View of the location of former SWMU 16-003(m), sump**


16-003(m)-99
WATER CANYON
K-SITE ROAD
MORRO ROAD
TA-16
TA-28
STATE HIGHWAY 4
BANDELIER NATIONAL MONUMENT
1486
435
437
430
1487
414
415
413
411
410
360
370
380
1
2
3
161100
161200
161300
161400
161500
161600
161700
1760000
1759000
1758000
7350
7400
7450
7500
7550
7300
7200
7150
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
500 ft
10 ft
Index map
of LANL
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

# *SWMU 16-003(n)-99 — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | Early 1950s-mid 1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-003(n)-99 consists of former SWMUs 16-003(n) and 16-029(i). Former SWMU 16-003(n) is an inactive HE sump that was associated with Building 16-342. Former SWMU 16-029(i) was recommended for NFA in Addendum 2 of the OU 1082 work plan and in the rewritten Chapter 6 of the OU 1082 work plan because it is a duplicate of former SWMU 16-003(n).
Building 16-342 was an HE process building on the 340-Line at TA-16 that was used to mix and blend constituents of plastic-bonded explosive formulations. The sump was a rectangular tank with a removable 0.25-in. aluminum lid. Outside dimensions are 12 ft long, 4 ft wide, and 5 ft high. The walls and bottom are 8-in.-thick, steel-reinforced concrete. The sump operated to remove suspended solids from process water before it was discharged to a now inactive outfall. HE fines (scrap) were collected in a cloth filter bag secured inside a metal filter basket. The baskets and filter bags periodically were collected and cleaned at the basket-washing facility. HE fines that were too small to be collected in the filter bags settled to the bottom of the sump. To help separate the suspended solids, the water flowed under an aluminum baffle and over a concrete weir before it discharged to the outfall. HE in the bottom of the sump periodically was removed and burned. Water was filtered and tested before it discharged to the outfall, which discharged to former NPDES-permitted Outfall 05A062, which discharged to Cañon de Valle. The outfall was removed from LANL's NPDES permit effective July 31, 1996. Solvents were containerized for disposal, but historically the solvents were discharged to the sump. Natural uranium was used at Building 16-342. The sump received process and wash-down water following cleaning activities. Former SWMU 16-029(i) is a duplicate of former SWMU 16-003(n). Suspect contaminants at former SWMU 16-003(n) are HE, organic chemicals, inorganic chemicals, and radionuclides.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed including former SWMU 16-003(n) in a generic TA-16 sump sampling plan. Sampling was completed in 1995. As part of the post-Cerro Grande fire recovery, seed, mulch, a straw bale barrier, and straw wattles were installed as a BMP at former SWMU 16-003(n) to minimize any potential contaminant migration from this site.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 8 | N/A | 3 |
| Inorganic chemicals | 21 | 11 | 2 |
| SVOCs | 22 | N/A | 1 |
| VOCs | 2 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.446 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 0.714 mg/kg | N/A |
| | RDX | 4.44 mg/kg | 4.4 mg/kg |
| Inorganic chemicals | Arsenic | 12.8 mg/kg | 0.39 mg/kg |
| | Barium | 5910 mg/kg | 5200 mg/kg |
| SVOCs | Benzo(a)pyrene | 0.43 mg/kg | 0.062 mg/kg |

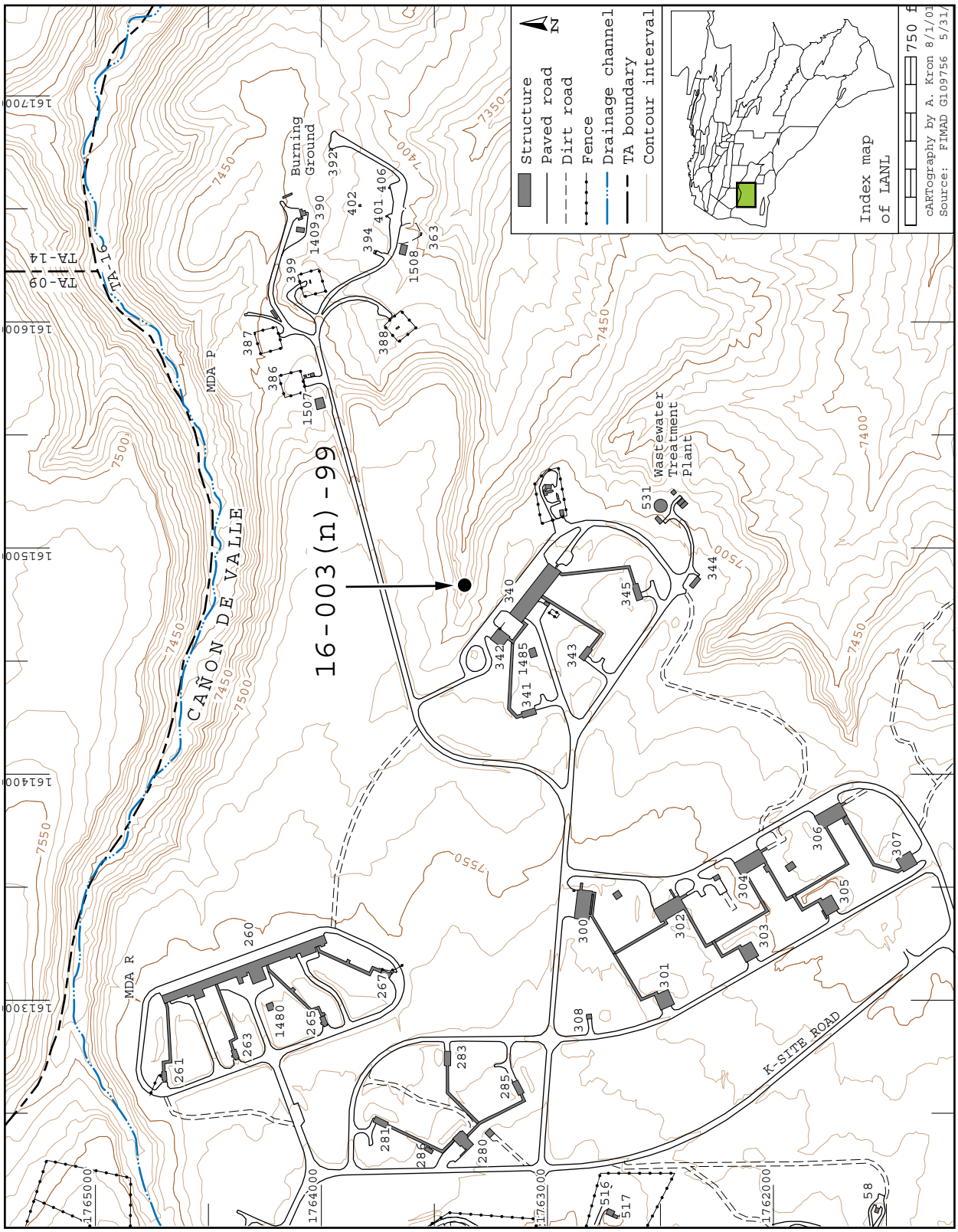
## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU 16-003(n), outfall**

**View of SWMU 16-003(n), sump**


16-003(n)-99
CAÑON DE VALLE
MDA P
MDA R
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
N
7550
7500
7450
7400
7350
1617000
1616000
1615000
1614000
1613000
1765000
1764000
1763000
1762000
260
261
263
1480
265
267
280
281
283
285
286
300
301
302
303
304
305
306
307
308
340
341
342
343
344
345
1485
531
516
517
58
386
387
388
399
1409
390
392
402
394
401
406
1508
363
1507

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# *SWMU 16-003(o) — Physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-mid 1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-003(o) consists of six inactive HE sumps and the outfall associated with the explosives synthesis building (Building 16-340). The sumps historically discharged to former NPDES-permitted Outfall 05A054. The outfall was removed from the LANL NPDES permit effective July 20, 1998. Building 16-340 was used in producing plastic-bonded explosives. VOCs are used in plastic explosive preparation. Most VOCs are distilled during processing. The remaining solvents historically were discharged with the wastewater to the sumps. A solvent distillation unit, the “fish ladder,” was installed in the late 1980s to trap and volatilize residual solvents. The OU 1082 work plan reported that Building 16-340 was the largest solvent user at TA-16. The building is slated for decommissioning.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The RFI work plan proposed including this SWMU in a generic TA-16 sump sampling plan. Sampling was completed in 1995 and confirmed the presence of contamination. Seed, mulch, and a straw-bale barrier were installed in 2000 as a BMP to minimize contaminant migration and erosion at this site.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 8 | N/A | 2 |
| Inorganic chemicals | 22 | 20 | 2 |
| SVOCs | 22 | N/A | 7 |
| VOCs | 1 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

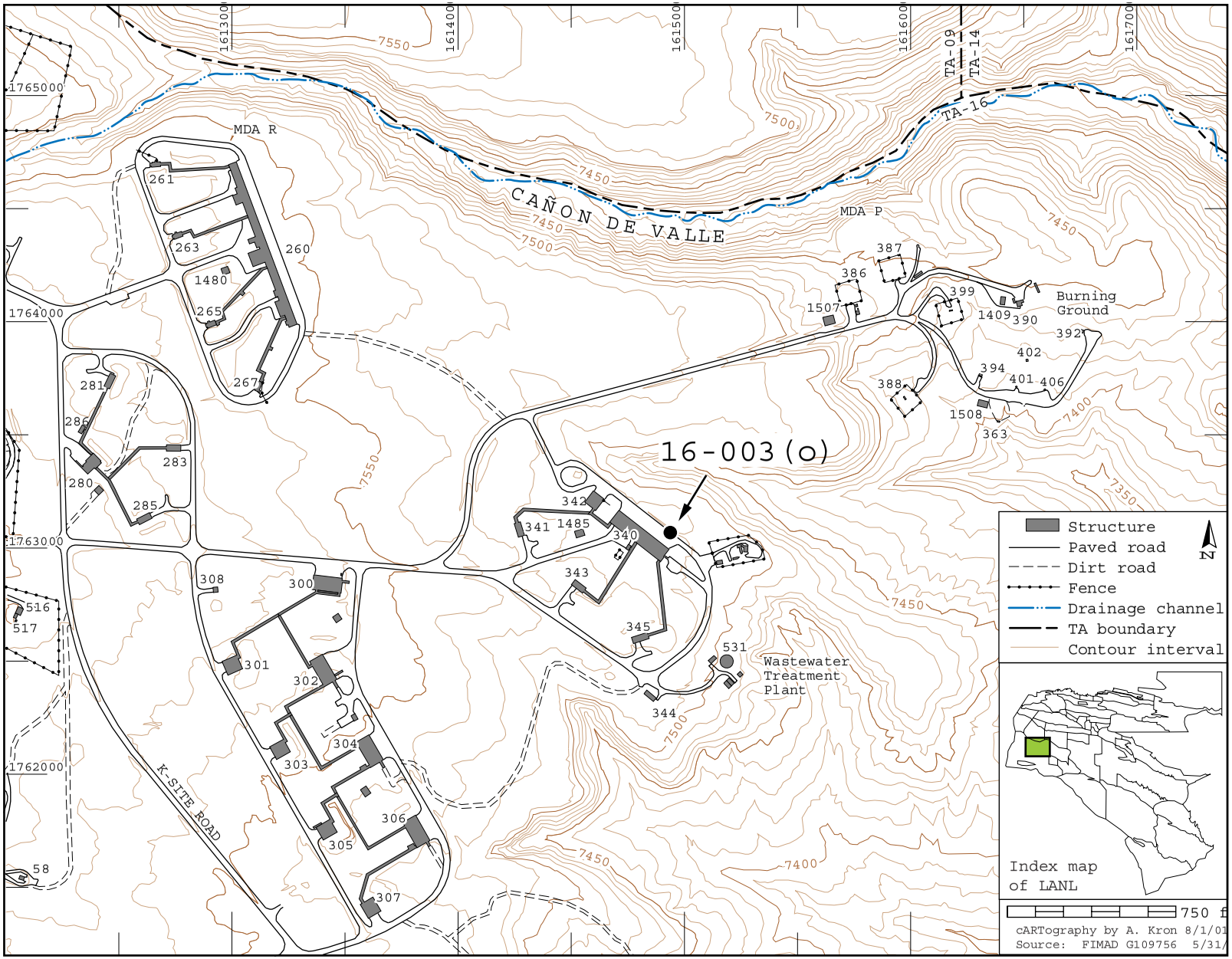
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 1.07 mg/kg | N/A |
| | RDX | 40.7 mg/kg | 4.4 mg/kg |
| Inorganic chemicals | Arsenic | 68.3 mg/kg | 0.39 mg/kg |
| | Iron | 44,400 mg/kg | 23,000 mg/kg |
| SVOCs | Benzo(a)anthracene | 26 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 26 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 38 mg/kg | 0.62 mg/kg |
| | Benzo(k)fluoranthene | 13 mg/kg | 6.2 mg/kg |
| | Bis(2-ethylhexyl)phthalate | 150 mg/kg | 35 mg/kg |
| | Dibenz(a,h)anthracene | 2.9 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 10 mg/kg | 0.62 mg/kg |

## References

RFI Work Plan for Operable Unit 1082 LA-UR Number: 93-1196

**View of SWMU 16-003(o)**

**View of SWMU 16-003(o)**


16-003(o)
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
161300
161400
161500
161600
161700
1765000
1764000
1763000
1762000
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
283
280
285
308
300
301
302
304
303
306
305
307
516
517
58
342
341
1485
340
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *SWMU 16-004(a)-99 — Wastewater treatment plant/waste lines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1953-1992 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-004(a)-99 consists of former SWMUs 16-004(a), 16-004(b), 16-004(c), 16-004(d), 16-004(e), and 16-004(f). These former SWMUs were components of the inactive TA-16 sanitary WWTP, which received wastewater only from the TA-16 sanitary sewer system. The WWTP was built in 1953 during the expansion of TA-16 and was disconnected when the LANL SWCS became operational in 1992. The WWTP was designed for gravity flow. The WWTP had an NPDES-permitted outfall (Outfall SSS03S). As part of its NPDES permit, the outfall for the WWTP was monitored for inorganic chemicals, organic chemicals, and pesticides. Effluent was monitored bimonthly for radionuclides and standard parameters for wastewater systems, e.g., biological oxygen demand, chemical oxygen demand, total dissolved solids, and anions. Suspect contaminants at this consolidated SWMU are HE, solvents, inorganic chemicals, and radionuclides.

Former SWMU 16-004(a) is a concrete Imhoff tank that measures 18 ft x 35 ft x 22 ft deep, with nine interconnected compartments that served as settling boxes. Effluent from the boxes flowed over a weir into a dosing siphon. The tank had an emergency overflow pipe that discharged onto a slope northeast of the tank.

Former SWMU 16-004(b) is a trickling filter that received effluent from the dosing siphon. The trickling filter is about 56 ft in diameter, with a rotating arm that distributed water from the Imhoff tank over a pebble bed. The trickling filter's capacity was 100,000 gal. per day.

Former SWMU 16-004(c) is the final tank that received discharge water from the trickling filter. Former SWMU 16-004(c) is a 20-square-ft concrete box located about 45 ft east of the trickling filter. Trickling-filter discharge entered an insert at the bottom of the final tank. Water spilled over the insert to a surrounding trough and flowed to an outlet at the southeast corner of the clarifier. The clarifier was rated at 117,600 gal. per day. Discharge from the clarifier flowed through a metering concrete outfall box and to Outfall SSS03S, and then to a tributary of Water Canyon.

Former SWMUs 16-004(d) and 16-004(f) are two sludge-drying beds. Sludge periodically was siphoned from the bottom of the Imhoff tank and sent to the drying beds. The beds are adjacent concrete rectangles about 15 ft x 30 ft x 1 ft deep, located about 100 ft below the Imhoff tank. Each bed has an inlet valve at the west end of the bed. Sludge from the drying beds was monitored quarterly for radioactivity and tritium before it was removed and disposed of at MDA G. Permanent seeding, mulching, and straw wattles were installed at this former SWMU in 2000 to minimize erosion at the site, as part of the post-Cerro Grande fire recovery.

Former SWMU 16-004(e) is a 5-square-ft-screen that filtered out large solids. The screen was made of round, 1-in.-diameter bars and was discarded at the northwest corner of the WWTP site. The screen was replaced by a comminutor that was housed in a lidded concrete box about 5 ft x 10 ft x 3 ft high.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The OU 1082 work plan proposed sampling the former SWMUs in this consolidated SWMU.

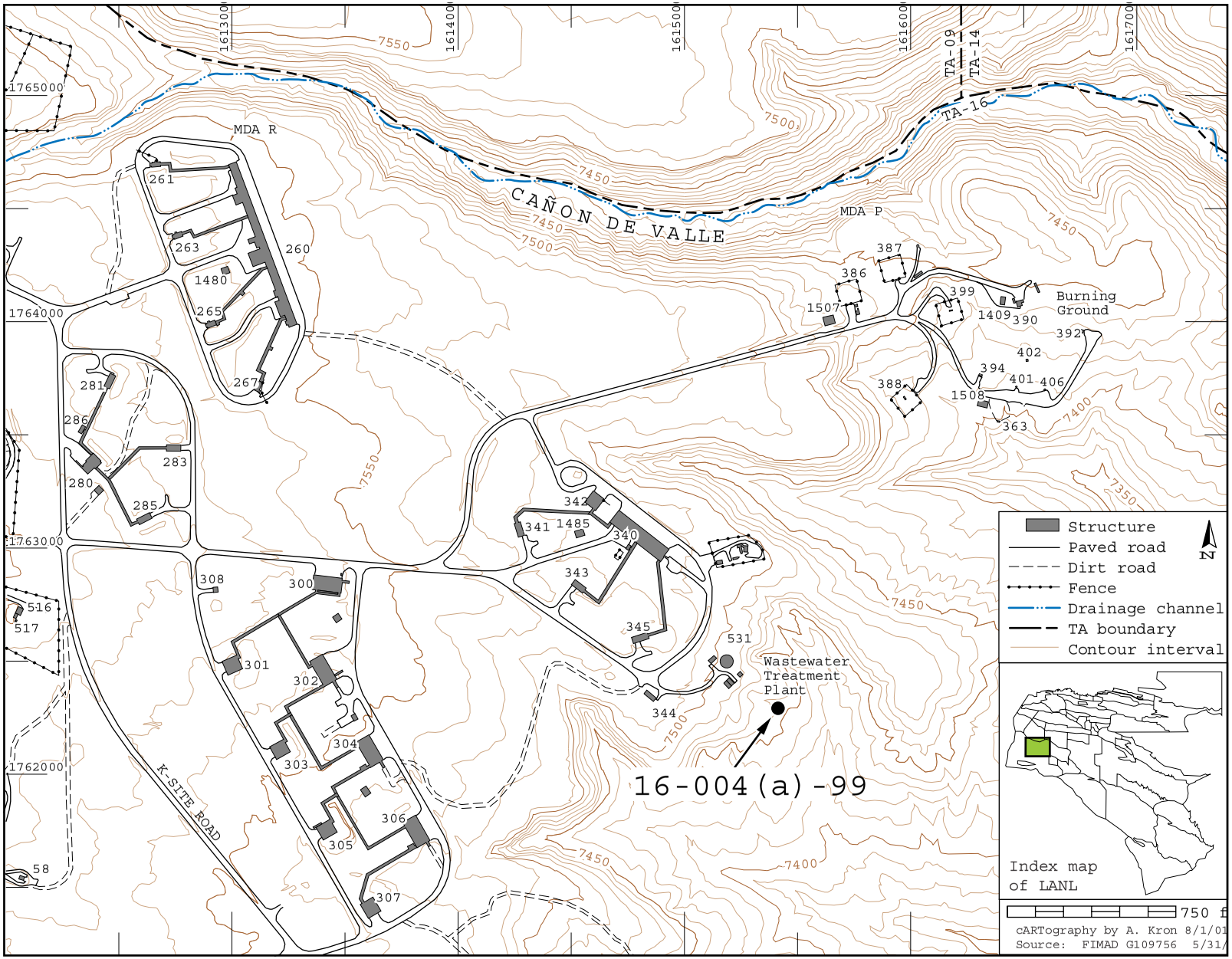
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

RFI Work Plan for Operable Unit 1082 LA-UR Number: 93-1196

**View of SWMU 16-004(a)-99, looking east**


CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
16-004(a)-99
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
283
280
285
308
300
301
302
303
304
305
306
307
516
517
58
342
341
1485
340
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-026(d2) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(d2) is an outfall (and associated drainline) that served a single floor drain located in the utility room of an HE rest house (structure 16-435). From the early 1950s to the present, this rest house has functioned as a temporary storage area for packaged raw explosives being delivered to HE-processing buildings, for finished HE products ready for transport, or for scrap explosives being removed for disposal. The rest house contains an attached 4-ft x 8-ft utility room equipped with one steam pump and one small compressor used to heat and ventilate the building. The utility room has a single floor drain, which, until 1992, discharged low volumes of steam condensate through a 4-in. VCP to an outfall located approximately 90 ft from the rest house.

Since 1992, the practice at TA-16 has been to collect steam condensate in a 2.5- or 5-gal. bucket placed at the end of the condensate pipe and to allow the condensate to evaporate from the bucket. Before 1992, the outfall received only steam condensate from the heating and ventilating equipment located in the utility room of the rest house (structure 16-435). The steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. The current practice (starting in January 1997) is not to use additives of any kind in the steam used to heat the TA-16 buildings. There is no access to the utility room from the area of structure 16-435 used for storing HE components, because each utility room can be accessed only from outside the structure. The floor of the utility room shows rust and mineral stains as typically result from the evaporation of condensed water. From the normal operation and maintenance of the compressor, small amounts of lubricating oil have been known to leak, and some oil staining is visible on the utility room floor. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less. Employee interviews indicate that since at least 1981, there have been no releases to the environment involving a utility room drain from a rest house.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

This SWMU was recommended for NFA in the RFI work plan, and there has been no additional investigation at this site.

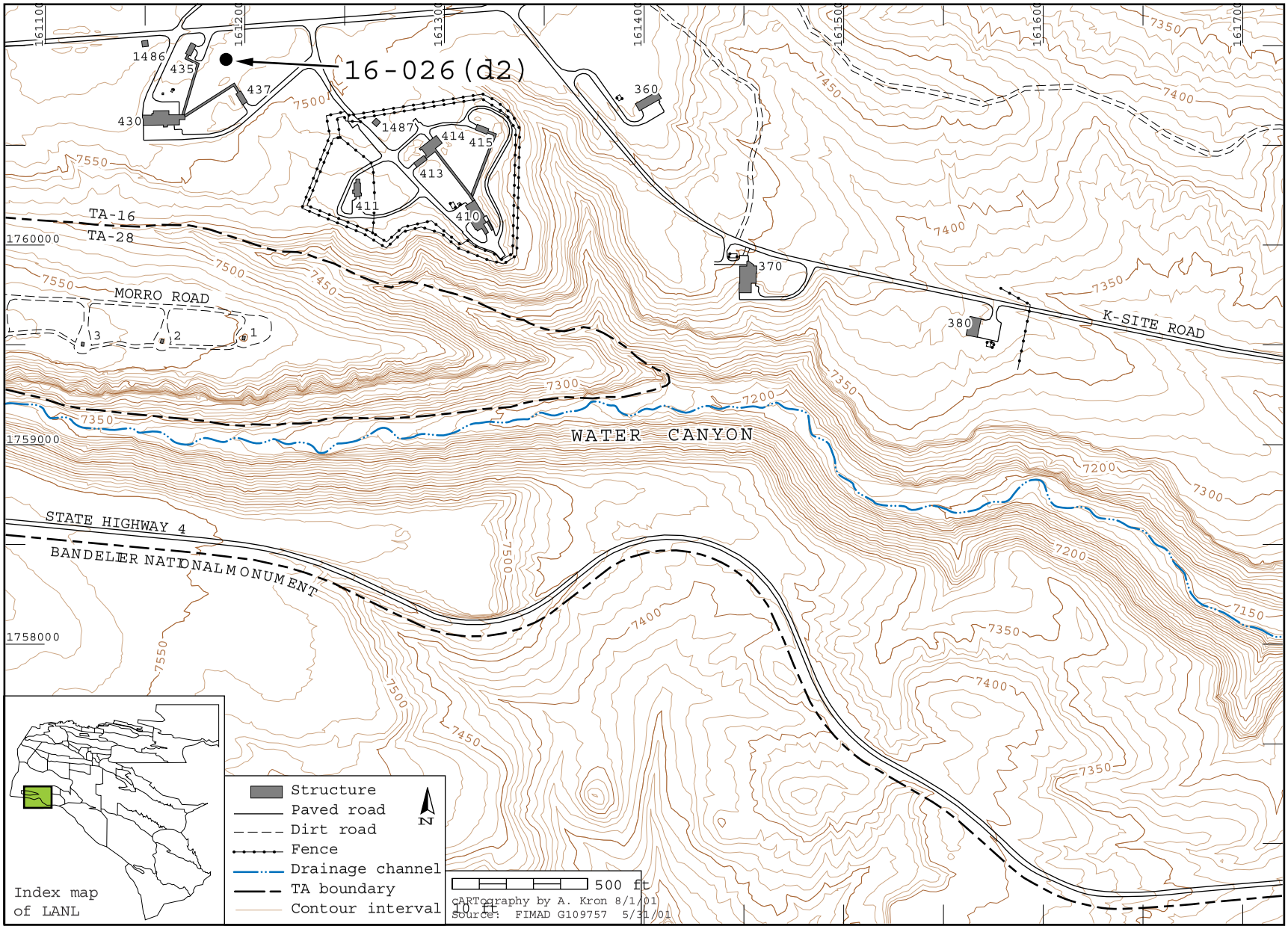
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(d2), drain**


16-026(d2)
1486
435
437
430
1487
414
415
413
411
410
360
370
380
TA-16
TA-28
MORRO ROAD
K-SITE ROAD
WATER CANYON
STATE HIGHWAY 4
BANDELIER NATIONAL MONUMENT
1760000
1759000
1758000
7550
7500
7450
7400
7350
7300
7200
7150
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
500 ft
Index map of LANL
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

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# *SWMU 16-026(e2) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-1992 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(e2) is an outfall (and associated drainline) that served a single floor drain located in the utility room of an HE rest house (structure 16-415). From the early 1950s to the present, this rest house has functioned as a temporary storage area for packaged raw explosives being delivered to HE-processing buildings, for finished HE products ready for transport, or for scrap explosives being removed for disposal. The rest house contains an attached 4-ft x 8-ft utility room equipped with one steam pump and one small compressor, which are used to heat and ventilate the building. The utility room has a single floor drain, which, until 1992, discharged low volumes of steam condensate through a 4-in. VCP to an outfall located approximately 90 ft from the rest house.

Since 1992, the practice at TA-16 has been to collect steam condensate in a 2.5- or 5-gal. bucket placed at the end of the condensate pipe and to allow the condensate to evaporate from the bucket. Before 1992, the outfall received only steam condensate from the heating and ventilating equipment located in the utility room of the rest house (structure 16-415). The steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. The current practice (starting in January 1997) is not to use additives of any kind in the steam used to heat the TA-16 buildings. There is no access to the utility room from the area of structure 16-415 used for storing HE components, because each utility room can be accessed only from outside the structure. The floor of the utility room shows rust and mineral stains as typically result from the evaporation of condensed water. From the normal operation and maintenance of the compressor, small amounts of lubricating oil have been known to leak, and some oil staining is visible on the utility room floor. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less. Employee interviews indicate that since at least 1981, there have been no releases to the environment involving a utility room drain from a rest house.

The mechanical heating and ventilating equipment (condensate pump and compressor) has been removed from the utility room of structure 16-415 and replaced by an electric heating and ventilating unit. The utility room floor drain of this rest house is plugged and no longer used.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

This SWMU was recommended for NFA in the RFI work plan, and there has been no additional investigation at this site.

## ER Project Sampling Summary

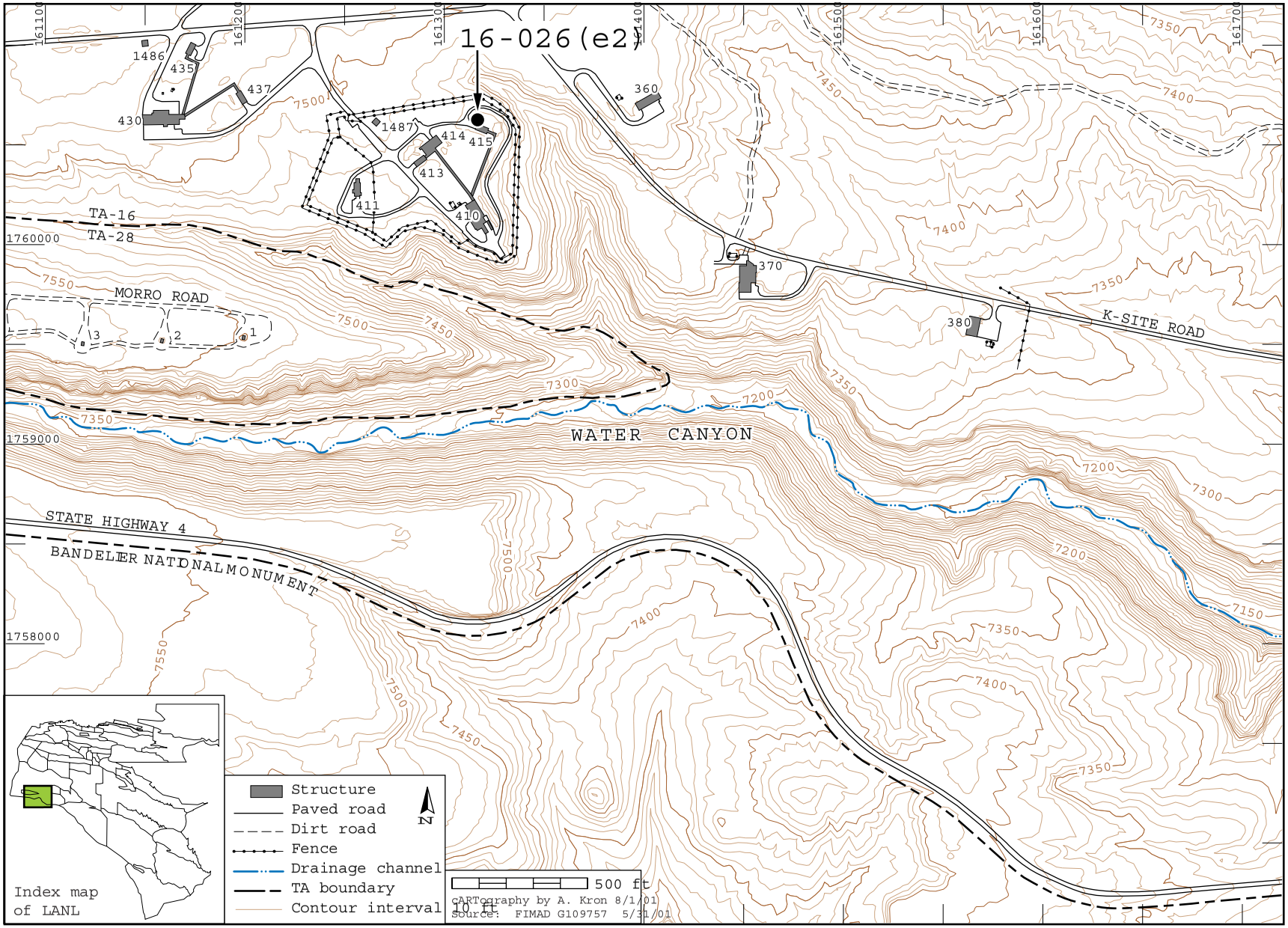
No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(e2), outfall**

**View of SWMU 16-026(e2), drain**


16-026(e2)
TA-16
TA-28
MORRO ROAD
K-SITE ROAD
WATER CANYON
STATE HIGHWAY 4
BANDELIER NATIONAL MONUMENT
1760000
1759000
1758000
161100
161200
161300
161400
161500
161600
161700
1486
435
437
430
1487
414
415
413
411
410
360
370
380
1
2
3
7550
7500
7450
7400
7350
7300
7200
7150
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
500 ft
Index map of LANL
CARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

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# *SWMU 16-026(f) – Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1953-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(f) is soil associated with two outfalls from an HE-processing building (Building 16-308). Building 16-308 was built in 1953 and initially was used as a drying building for nitrocellulose explosives. After the 1960s, the building was used to store detonators and squibs (HE initiators). Building 16-308 has a utility basement that houses compressors and condensate pumps. Activities in the basement have no direct link to other building activities. There are no floor drains on the first floor. The first floor and the basement are not connected to each other and have separate entrances. The basement is accessible only by ladder. The only water lines into the building are for the sprinkler system. The outfall on the northeast corner of the building drains rainwater from the roof, and the 4-in. VCP daylights about 20 ft northeast of the building. The outfall on the southeast corner of the building receives effluent from two basement floor drains that carry condensate from steam lines and pumps. A shallow trench that extends southeast from Building 16-308 is believed to be this outfall's drainage.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The rewritten Chapter 6 of the OU 1082 work plan recommended NFA for SWMU 16-026(f) because no hazardous waste and/or hazardous constituents are present at the site now, nor has the site ever been used to manage hazardous waste and/or constituents.

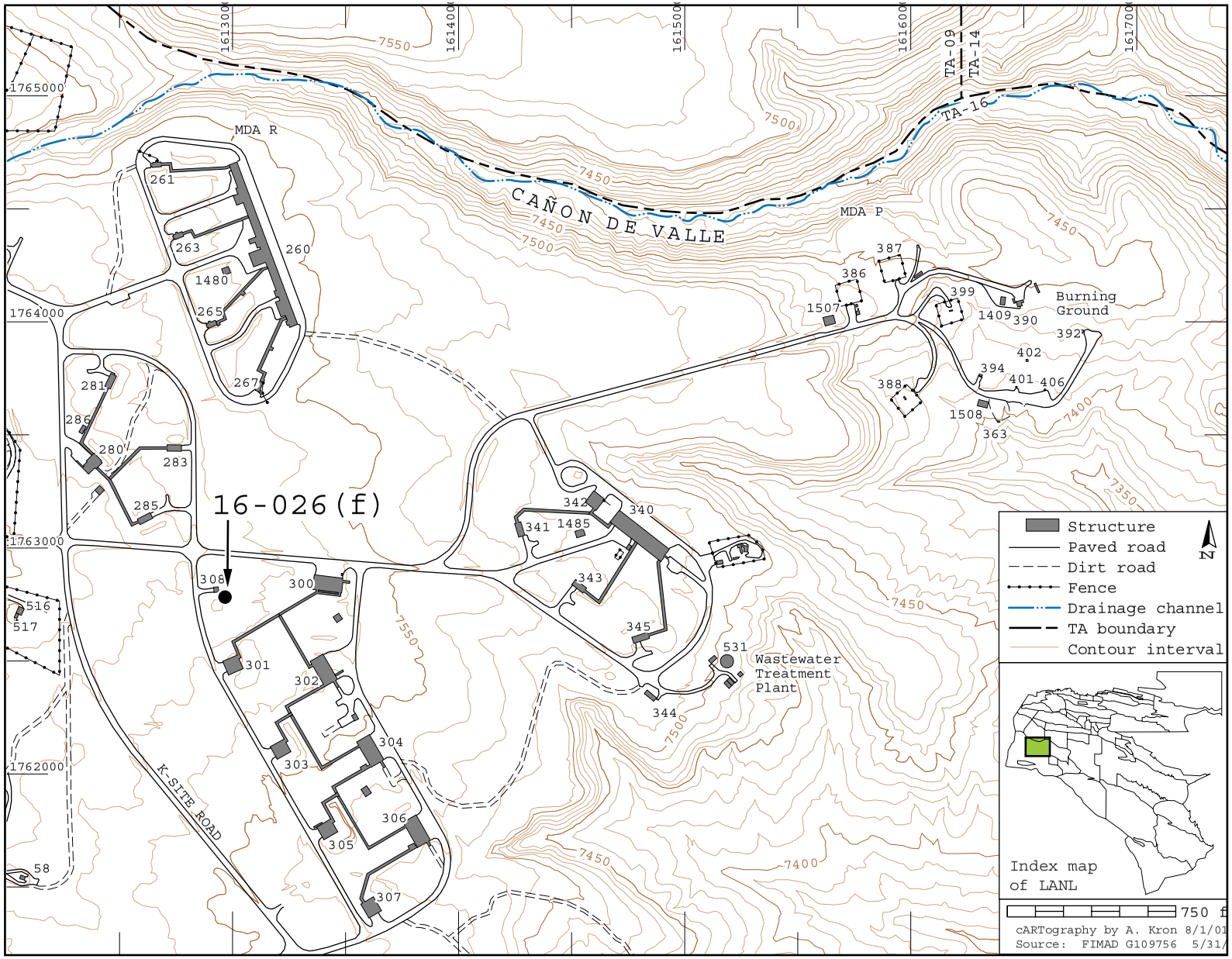
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Proposal for 5 No Further Actions | LA-UR Number: 02-5883 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(f)**


16-026(f)
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
161300
161400
161500
161600
161700
1765000
1764000
1763000
1762000
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
283
285
308
300
301
302
303
304
305
306
307
516
517
58
342
340
341
1485
343
345
344
531
1507
386
387
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *SWMU 16-026(f2) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1940s-1992 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(f2) is an outfall (and associated drainline) that served a single floor drain located in the utility room of an HE rest house (structure 16-413). From the late 1940s/early 1950s to the present, this rest house has functioned as a temporary storage area for packaged raw explosives being delivered to HE-processing buildings, for finished HE products ready for transport, or for scrap explosives being removed for disposal. The rest house contains an attached 4-ft x 8-ft utility room equipped with one steam pump and one small compressor, which are used to heat and ventilate the building. The utility room has a single floor drain, which, until 1992, discharged low volumes of steam condensate through a 4-in. VCP to an outfall located approximately 90 ft from the rest house.

Since 1992, the practice at TA-16 has been to collect steam condensate in a 2.5- or 5-gal. bucket placed at the end of the condensate pipe and to allow the condensate to evaporate from the bucket. Before 1992, the outfall received only steam condensate from the heating and ventilating equipment located in the utility room of structure 16-413. The steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. The current practice (starting in January 1997) is not to use additives of any kind in the steam used to heat the TA-16 buildings. There is no access to the utility room from the area of structure 16-413 used for storing HE components, because each utility room can be accessed only from outside the structure. The floor of the utility room shows rust and mineral stains as typically result from the evaporation of condensed water. From the normal operation and maintenance of the compressor, small amounts of lubricating oil have been known to leak, and some oil staining is visible on the utility room floor. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less. Employee interviews indicate that since at least 1981, there have been no releases to the environment involving a utility room drain from a rest house.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

This SWMU was recommended for NFA in the RFI work plan, and there has been no additional investigation at this site.

## ER Project Sampling Summary

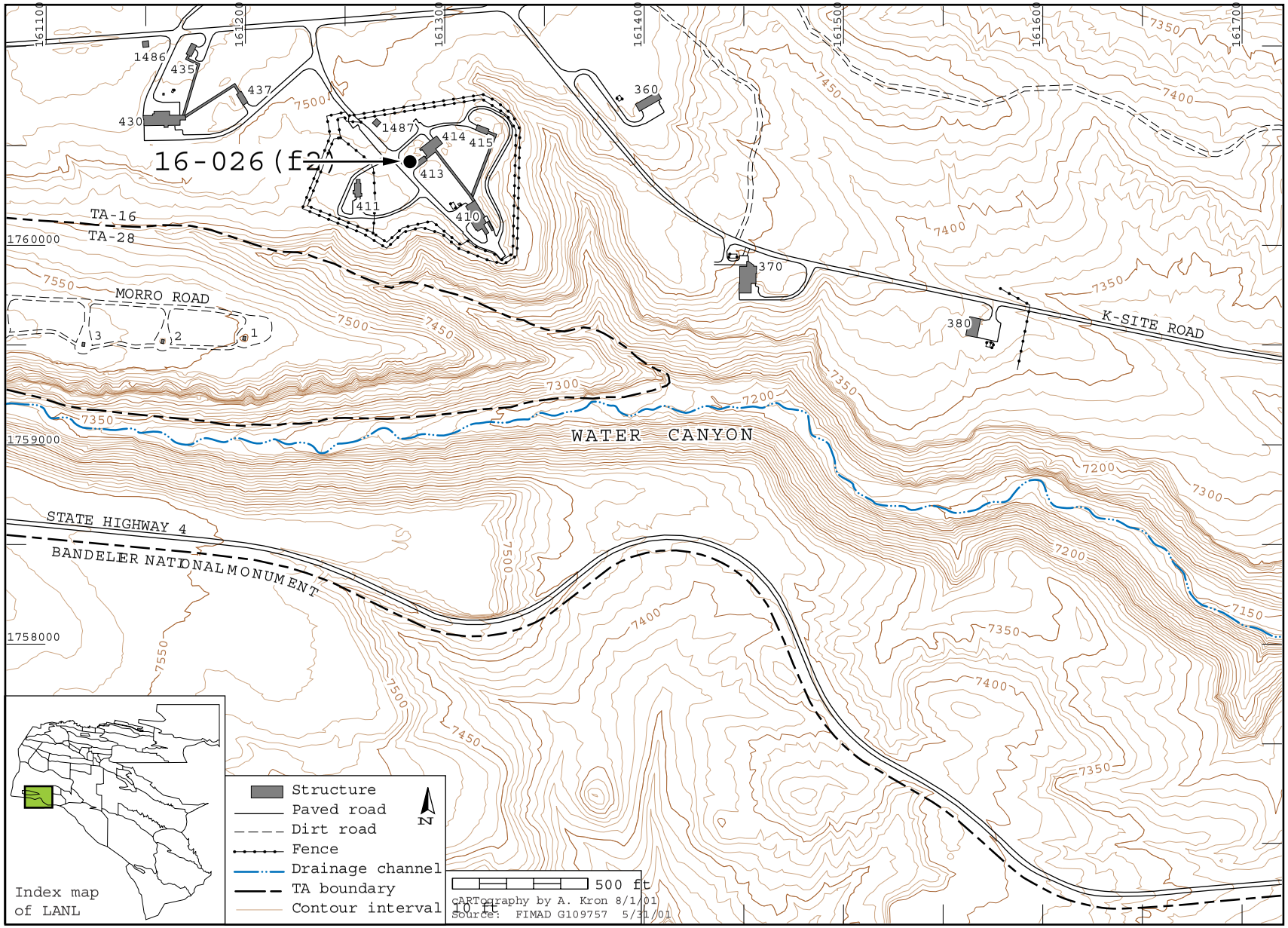
No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(f2), outfall**

**View of SWMU 16-026(f2), drain**


16-026(f2)
TA-16
TA-28
MORRO ROAD
K-SITE ROAD
WATER CANYON
STATE HIGHWAY 4
BANDELIER NATIONAL MONUMENT
1486
435
437
430
1487
414
415
413
411
410
360
370
380
1
2
3
7500
7550
7450
7400
7350
7300
7200
7150
1760000
1759000
1758000
161100
161200
161300
161400
161500
161600
161700
Index map of LANL
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
500 ft
10 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

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# *SWMU 16-026(g) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(g) is soil associated with an outfall from an inspection building (Building 16-280). Building 16-280 was built in 1951 and is an HE physical inspection building. HE and natural and depleted uranium components are handled and inspected on the first floor of this facility. The outfall received effluent from four equipment drains and five floor drains in the basement. The drains are plugged. The basement has always been used as a utility room for pumps and compressors, and the first floor and the basement are not connected to each other and have separate entrances. No hazardous materials are stored in the basement. There is no record of oil spills from the basement drain. The 6-in. VCP outfall daylights 300 ft northeast of Building 16-280.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The rewritten Chapter 6 of the OU 1082 work plan recommended NFA at SWMU 16-026(g) because no hazardous waste and/or hazardous constituents are currently present, nor have they historically been present at the site of the SWMU.

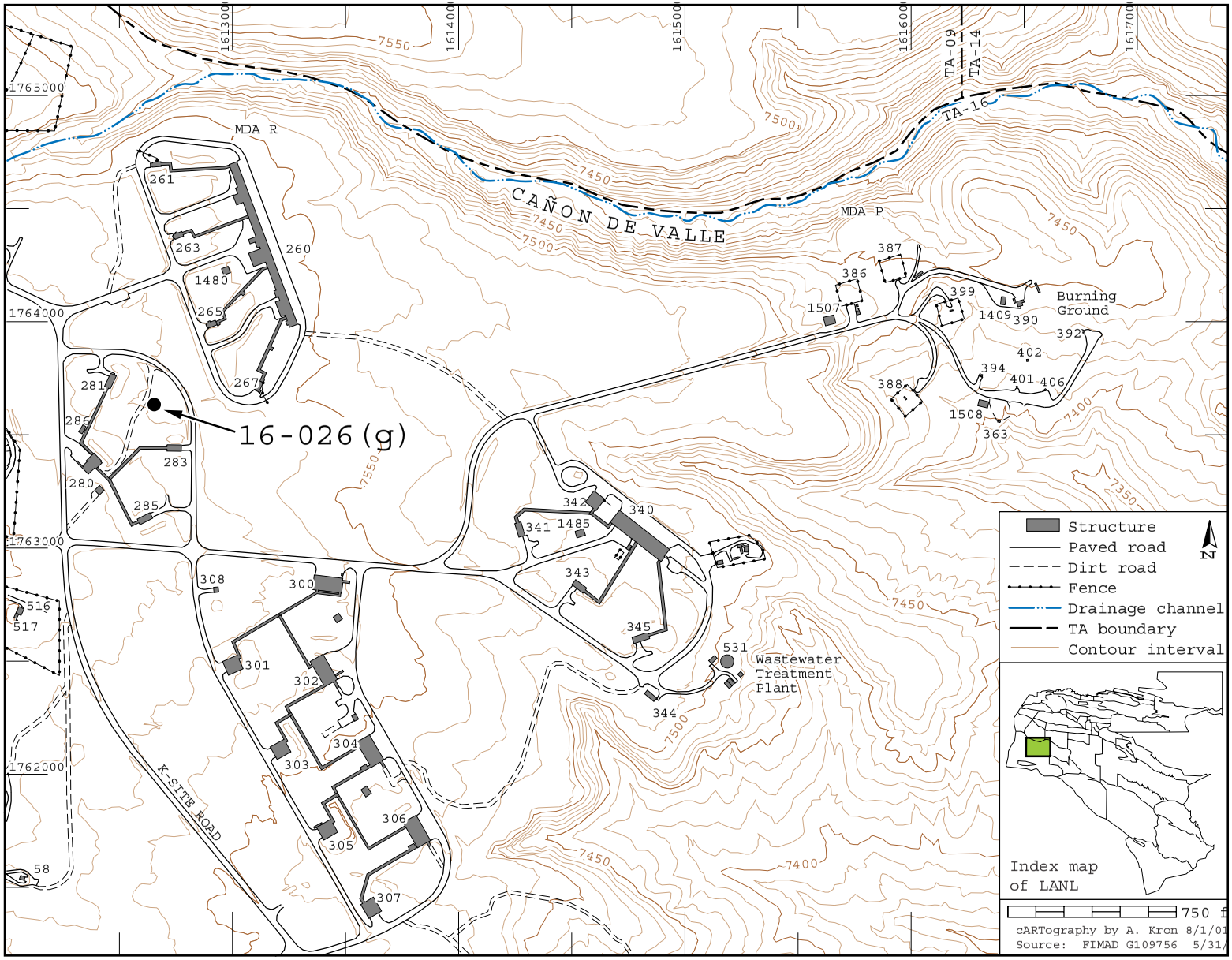
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-026(g), outfall, looking west**




Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval

N

Index map of LANL

750 f

cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *SWMU 16-026(g2) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-1992 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(g2) is an outfall (and associated drainline) that served a single floor drain located in the utility room of an HE rest house (structure 16-285). From the early 1950s to the present, this rest house has functioned as a temporary storage area for packaged raw explosives being delivered to HE-processing buildings, for finished HE products ready for transport, or for scrap explosives being removed for disposal. The rest house contains an attached 4-ft x 8-ft utility room equipped with one steam pump and one small compressor, which are used to heat and ventilate the building. The utility room has a single floor drain, which, until 1992, discharged low volumes of steam condensate through a 4-in. VCP to an outfall located approximately 30 ft from the rest house.

Since 1992, the practice at TA-16 has been to collect steam condensate in a 2.5- or 5-gal. bucket placed at the end of the condensate pipe and to allow the condensate to evaporate from the bucket. Before 1992, the outfall received only steam condensate from the heating and ventilating equipment located in the utility room of structure 16-285. The steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. The current practice (starting in January 1997) is not to use additives of any kind in the steam used to heat the TA-16 buildings. There is no access to the utility room from the area of structure 16-285 used for storing HE components, because each utility room can be accessed only from outside the structure. The floor of the utility room shows rust and mineral stains as typically result from the evaporation of condensed water. From the normal operation and maintenance of the compressor, small amounts of lubricating oil have been known to leak, and some oil staining is visible on the utility room floor. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less. Employee interviews indicate that since at least 1981, there have been no releases to the environment involving a utility room drain from a rest house.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

This SWMU was recommended for NFA in the RFI work plan, and there has been no additional investigation at this site.

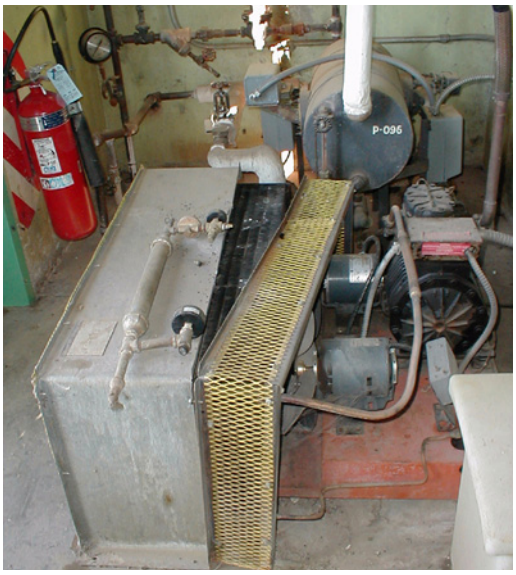
## ER Project Sampling Summary

No analytical samples were collected at this site.

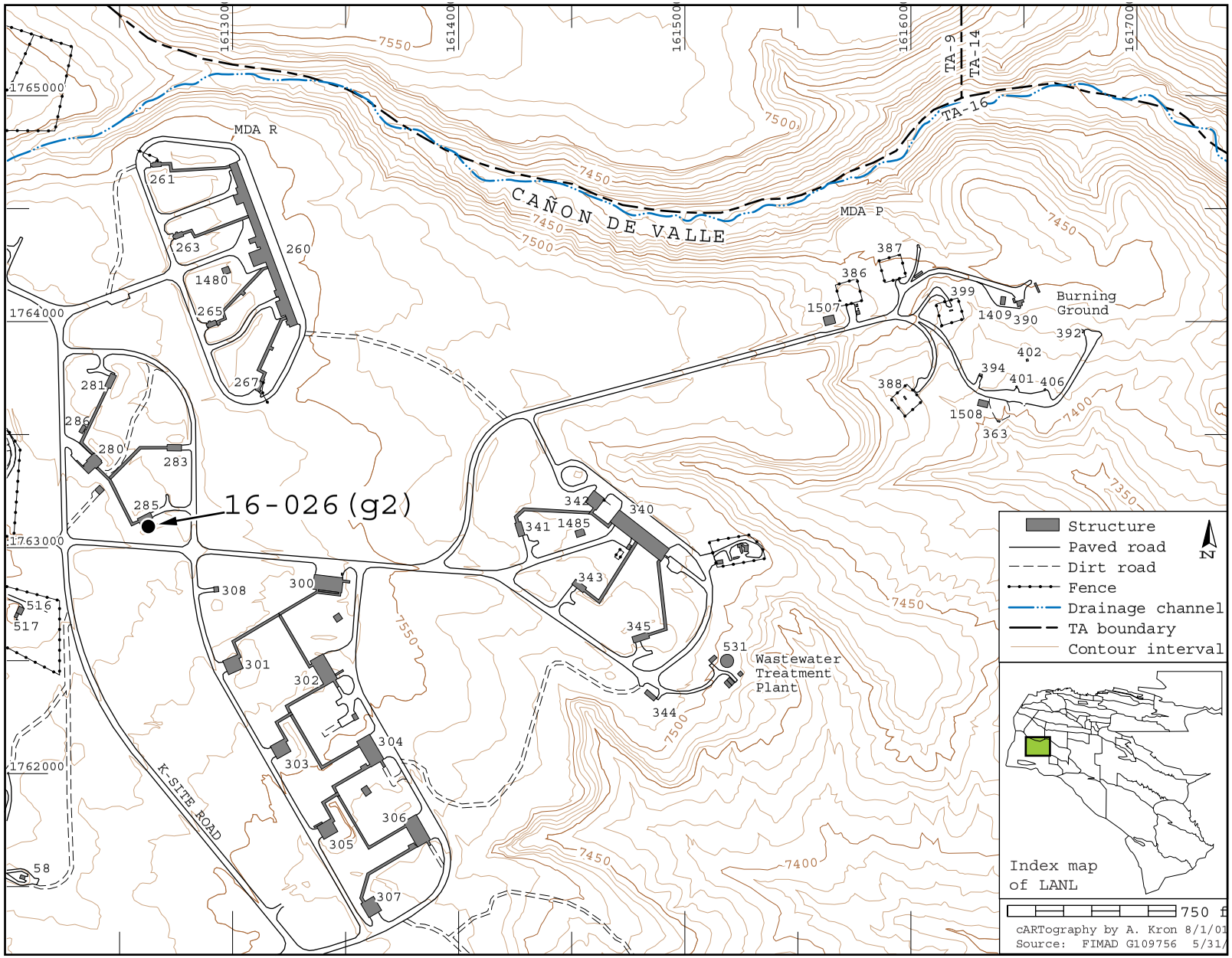
## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(g2) outfall**




**View of SWMU 16-026(g2) inside Building 16-285**


16-026(g2)
CAÑON DE VALLE
MDA R
MDA P
TA-9
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
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1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-026(h) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-1992 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(h) is an outfall (and associated drainline) that served a single floor drain located in the utility room of an HE rest house (structure 16-281). From the early 1950s to the present, this rest house has functioned as a temporary storage area for packaged raw explosives being delivered to HE-processing buildings, for finished HE products ready for transport, or for scrap explosives being removed for disposal. The rest house contains an attached 4-ft x 8-ft utility room equipped with one steam pump and one small compressor, which are used to heat and ventilate the building. The utility room has a single floor drain, which, until 1992, discharged low volumes of steam condensate through a 4-in. VCP to an outfall located approximately 45 ft from the rest house.

Since 1992, the practice at TA-16 has been to collect steam condensate in a 2.5- or 5-gal. bucket placed at the end of the condensate pipe and to allow the condensate to evaporate from the bucket. Before 1992, the outfall received only steam condensate from the heating and ventilating equipment located in the utility room of structure 16-281. The steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. The current practice (starting in January 1997) is not to use additives of any kind in the steam used to heat the TA-16 buildings. There is no access to the utility room from the area of structure 16-281 used for storing HE components, because each utility room can be accessed only from outside the structure. The floor of the utility room shows rust and mineral stains as typically result from the evaporation of condensed water. From the normal operation and maintenance of the compressor, small amounts of lubricating oil have been known to leak, and some oil staining is visible on the utility room floor. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less. Employee interviews indicate that since at least 1981, there have been no releases to the environment involving a utility room drain from a rest house.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

This SWMU was recommended for NFA in the RFI work plan, and there has been no additional investigation at this site.

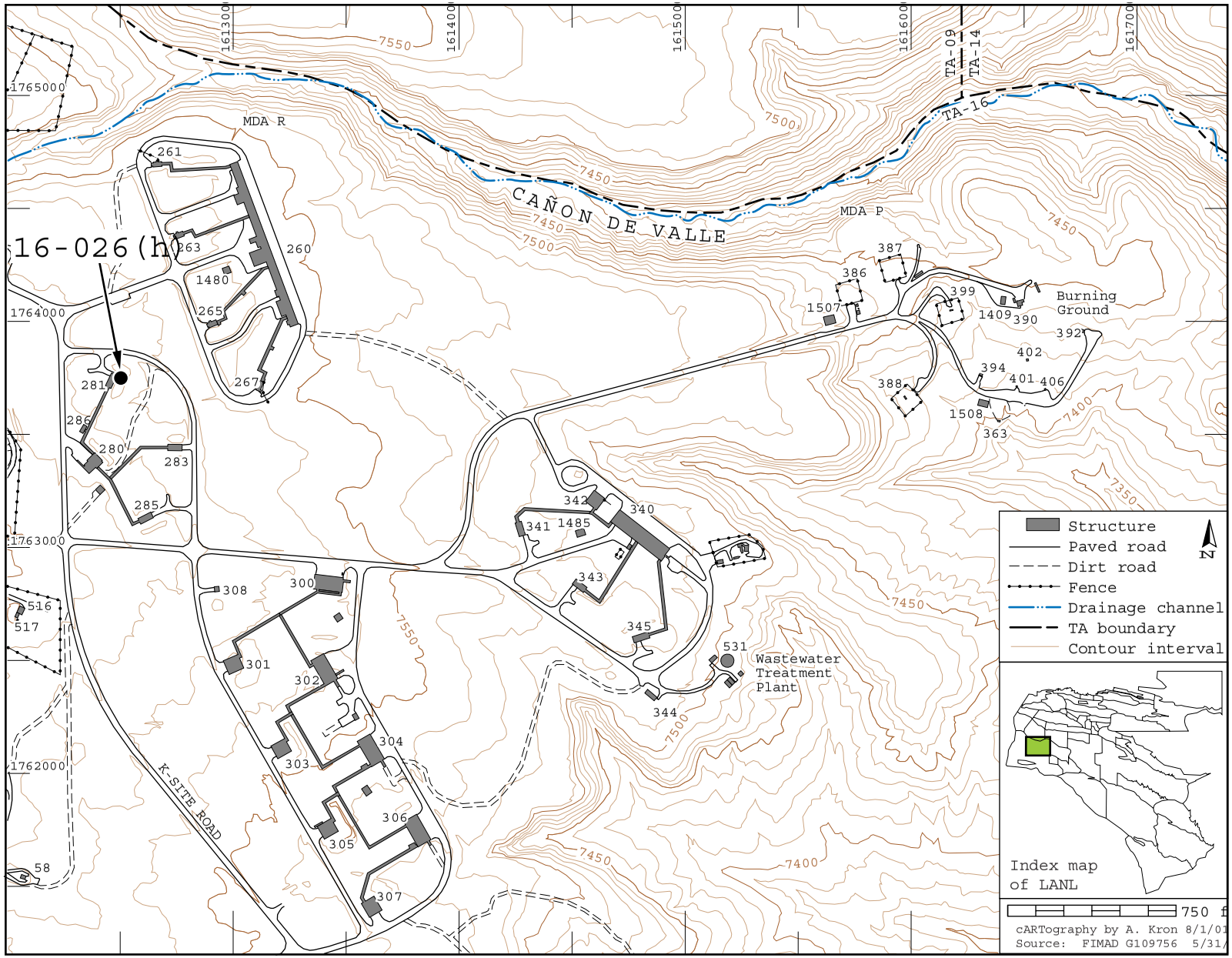
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(h)**


16-026(h)
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
283
285
516
517
58
308
300
301
302
303
304
305
306
307
342
341
1485
340
343
345
344
531
387
386
1507
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388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-026(i) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-1991 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-026(i) is soil contamination associated with an outfall from an x-ray building (Building 16-224) located on the north side of S-Site. The radiography area of S-Site was built in 1952 and consists of seven buildings: three rest houses, three x-ray buildings, and a centrally located photo processing building. The buildings are connected by enclosed walkways. Building 16-224 is 58 ft x 44 ft x 10 ft high. The rest houses store finished, packaged HE components before and after they are radiographed. The components are transported between the rest houses and the x-ray buildings on the enclosed walkways. When components arrive at the x-ray buildings, they are removed from their packaging, x-rayed, and repackaged. The floor drains that discharged to this SWMU are located in the northeast and northwest corners of Building 16-224. The drainline daylights northeast of Building 16-224. Site workers stated that HE dust and small chips would break off during the x-ray process and could enter the floor drains. Because this SWMU is associated with floor drains in the x-ray building, HE contamination could be present at the outfall. Small HE chips have historically been observed in the drains. The drains were plugged in 1991. The outfall is characterized by low flow onto a shallow, grassy slope.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed sampling at SWMU 16-026(i) to detect barium and HE.

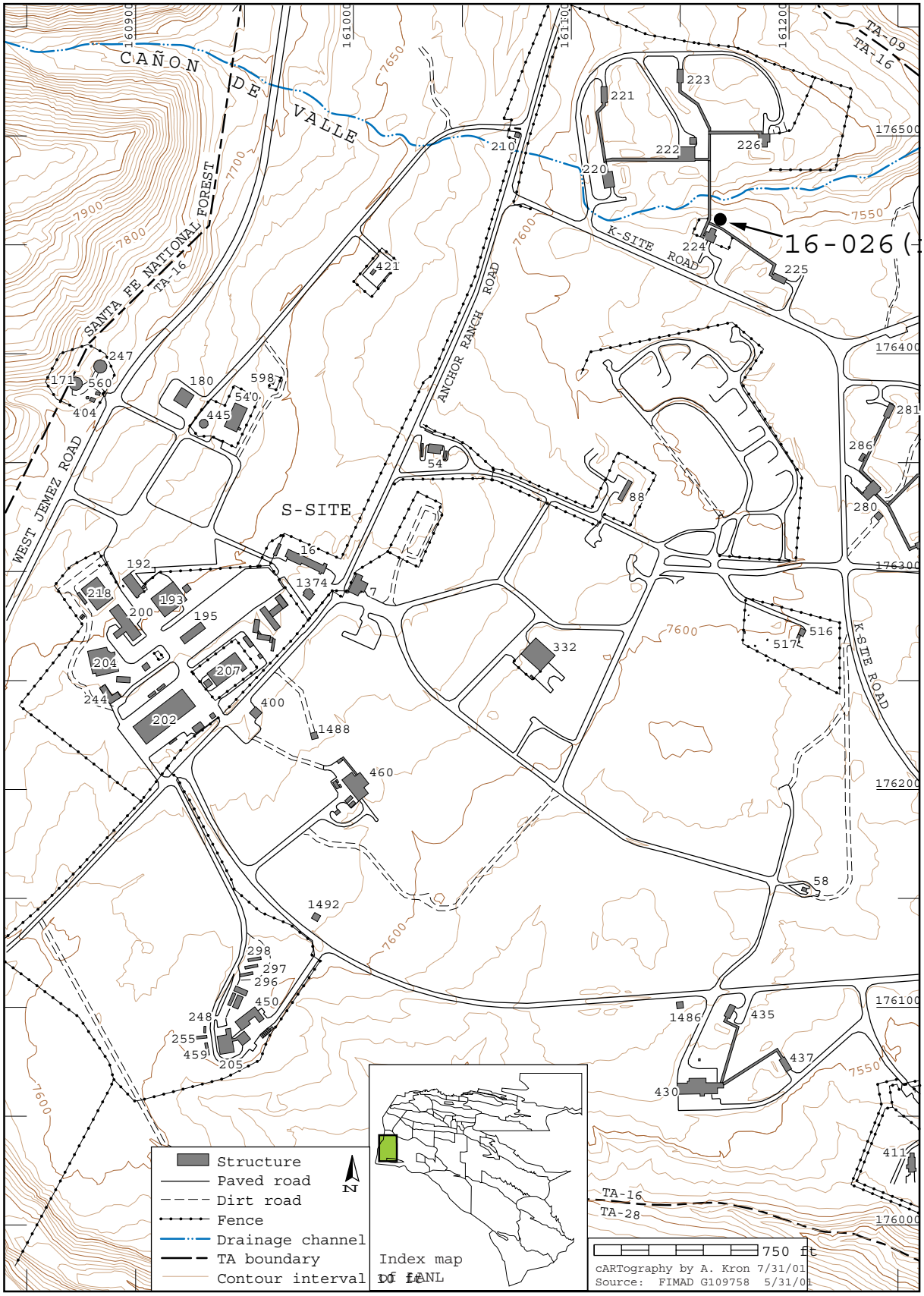
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-026(i), outfall**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-026
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-026(j) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-1991 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-026(j) is soil contamination associated with an outfall from an inactive x-ray building (Building 16-226) located on the north side of S-Site. The radiography area of S-Site was built in 1952 and consists of seven buildings: three rest houses, three x-ray buildings, and a centrally located photo processing building. The buildings are connected by enclosed walkways. Building 16-226 is 58 ft x 44 ft x 10 ft high. The rest houses store finished, packaged HE components before and after they are radiographed. The components are transported between the rest houses and the x-ray buildings on the enclosed walkways. When components arrive at the x-ray buildings, they are removed from their packaging, x-rayed, and repackaged. The floor drains that discharged to SWMU 16-026(j) are located in the southeast and southwest corners of Building 16-226. The corner floor drains join and form one 6-in. VCP line out of the building, draining into a grassy, gradually sloping area. Although during several site visits the location of the drain outfall from Building 16-226 could not be located, an engineering drawing shows the drain flowing southeast. Site workers stated that HE dust and small chips would break off during the x-ray process and could enter the floor drains. Because this SWMU is associated with floor drains in the x-ray building, HE contamination could be present at the outfall. Small HE chips historically have been observed in the drains. The drains were plugged in 1991.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed sampling at SWMU 16-026(j) to detect barium and HE.

## ER Project Sampling Summary

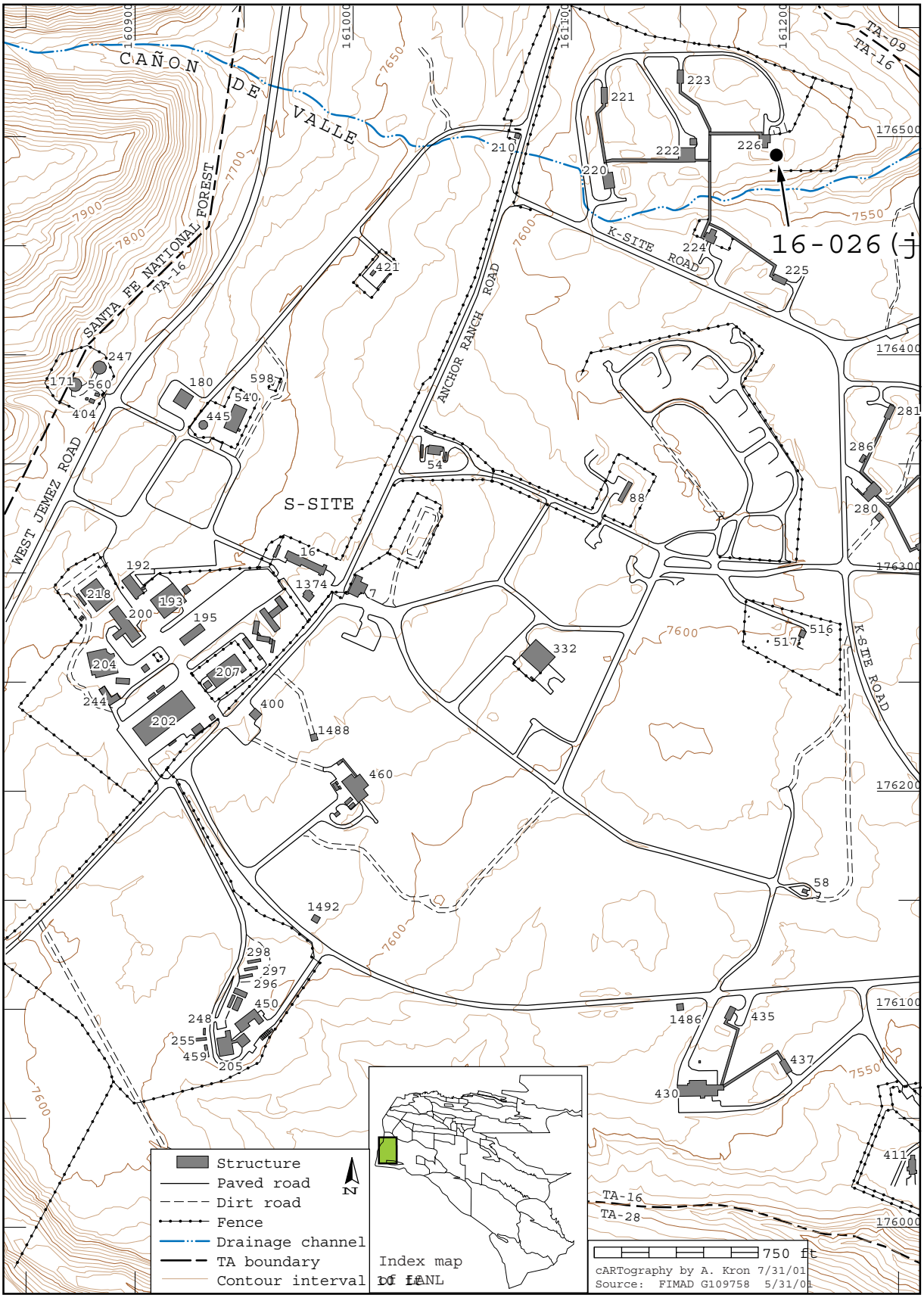
No analytical samples were collected at this site.

## References

RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-026(j), looking south**

**View of SWMU 16-026(j)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-026(j
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-026(j2) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-1998 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(j2) is the outfall from an HE sump [SWMU 16-029(f)] associated with a rest house (structure 16-345). The rest house is located on the 340 Line. The line was built in 1951 and 1952 and was used to prepare plastic-bonded explosive powders. In the 1980s to 1990s, solvents were containerized to prevent their reaching the sumps. Structure 16-345 serves as an HE storage facility for Building 16-340. It has a single sump and associated drainlines. The sump received wash-down water generated during cleaning activities. HE is the only known material that was stored in the building. The outfall is located southeast of structure 16-345 and received effluent from the sump, but the exact discharge point is unknown. Rest house 16-345 is currently inactive.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

This site was sampled in 1995. Six samples were collected from five locations and submitted to an analytical laboratory for inorganic and organic chemicals, and HE analyses. Sampling results indicate that organic chemicals were detected and inorganic chemicals were present at levels exceeding SALs. In 1997, an additional eight samples were collected from two locations and submitted to an analytical laboratory for similar analyses. The additional sampling conducted in 1997 did not provide a bounding on the contamination.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 18 | 7 | 2 |
| SVOCs | 19 | N/A | 6 |
| VOCs | 2 | N/A | 0 |

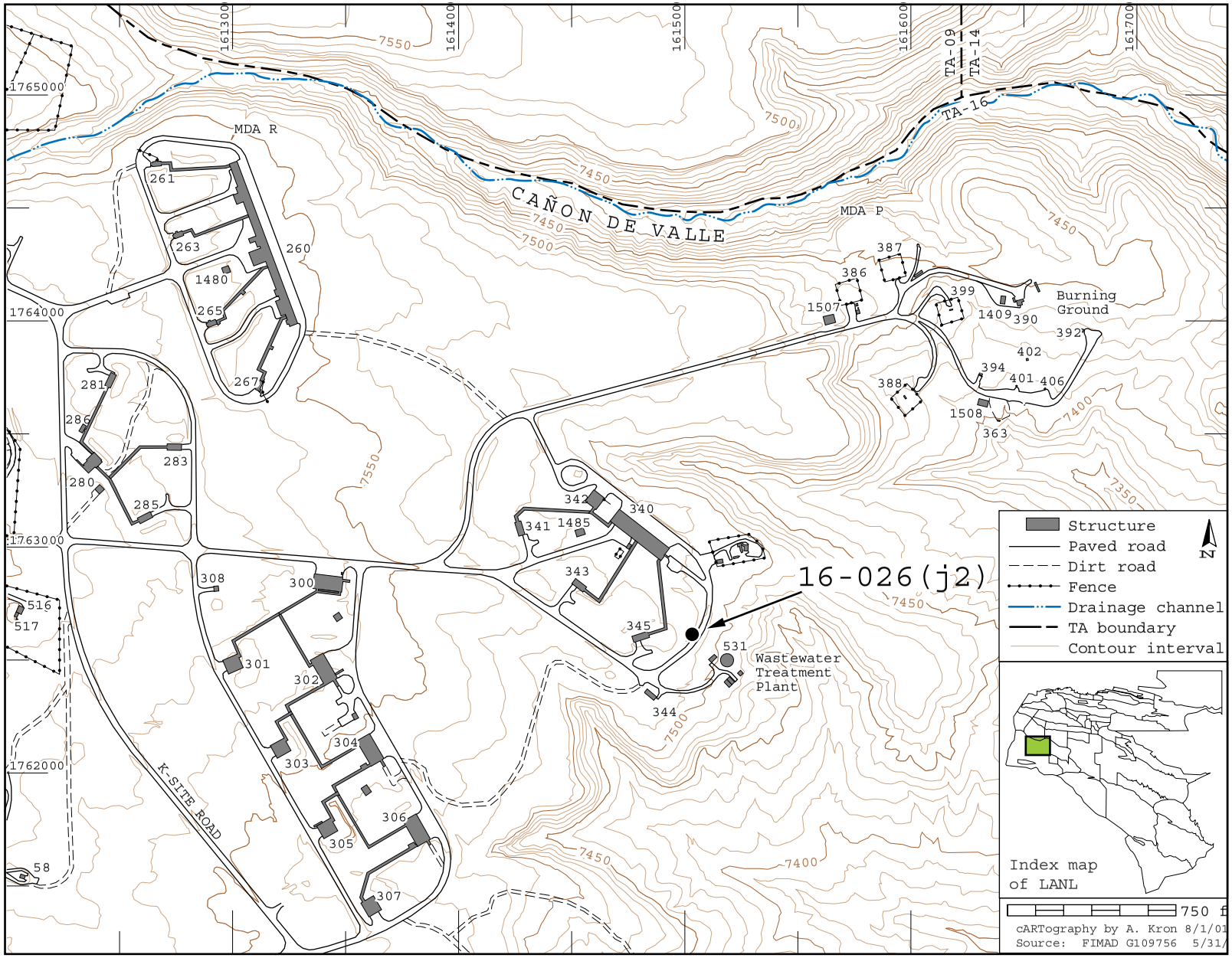
The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 2.2 mg/kg | 0.39 mg/kg |
| | Chromium (total) | 260 mg/kg | 210 mg/kg |
| SVOCs | Acenaphthylene | 0.05 mg/kg | N/A |
| | Benzo(a)anthracene | 3.3 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 4.1 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 4.9 mg/kg | 0.62 mg/kg |
| | Dibenz(a,h)anthracene | 0.61 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 2.5 mg/kg | 0.62 mg/kg |

## References

RFI Work Plan for Operable Unit 1082 LA-UR Number: 93-1196

**View of SWMU 16-026(j2)**


16-026(j2)
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-026(k) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1940s-1992 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(k) is an outfall (and associated drainline) that served a single floor drain located in the utility room of an HE rest house (Building 16-221). From the late 1940s/early 1950s to the present, this rest house has functioned as a temporary storage area for packaged raw explosives being delivered to HE-processing buildings, for finished HE products ready for transport, or for scrap explosives being removed for disposal. The rest house contains an attached 4-ft x 8-ft utility room equipped with one steam pump and one small compressor, which are used to heat and ventilate the building. The utility room has a single floor drain, which, until 1992, discharged low volumes of steam condensate through a 4-in. VCP to an outfall located approximately 45 ft from the rest house.

Since 1992, the practice at TA-16 has been to collect steam condensate in a 2.5- or 5-gal. bucket placed at the end of the condensate pipe and to allow the condensate to evaporate from the bucket. Before 1992, the outfall received only steam condensate from the heating and ventilating equipment located in the utility room of structure 16-221. The steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. The current practice (starting in January 1997) is not to use additives of any kind in the steam used to heat the TA-16 buildings. There is no access to the utility room from the area of structure 16-221 used for storing HE components, because each utility room can be accessed only from outside of the structure. The floor of the utility room shows rust and mineral stains as typically result from the evaporation of condensed water. From the normal operation and maintenance of the compressor, small amounts of lubricating oil have been known to leak, and some oil staining is visible on the utility room floor. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less. Employee interviews indicate that since at least 1981, there have been no releases to the environment involving a utility room drain from a rest house.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

NOTE: Structure 16-221 is no longer used, and steam is no longer pumped to its utility room. This rest house is slated for D&D. This SWMU was recommended for NFA in the RFI work plan, and there has been no additional investigation at this site.

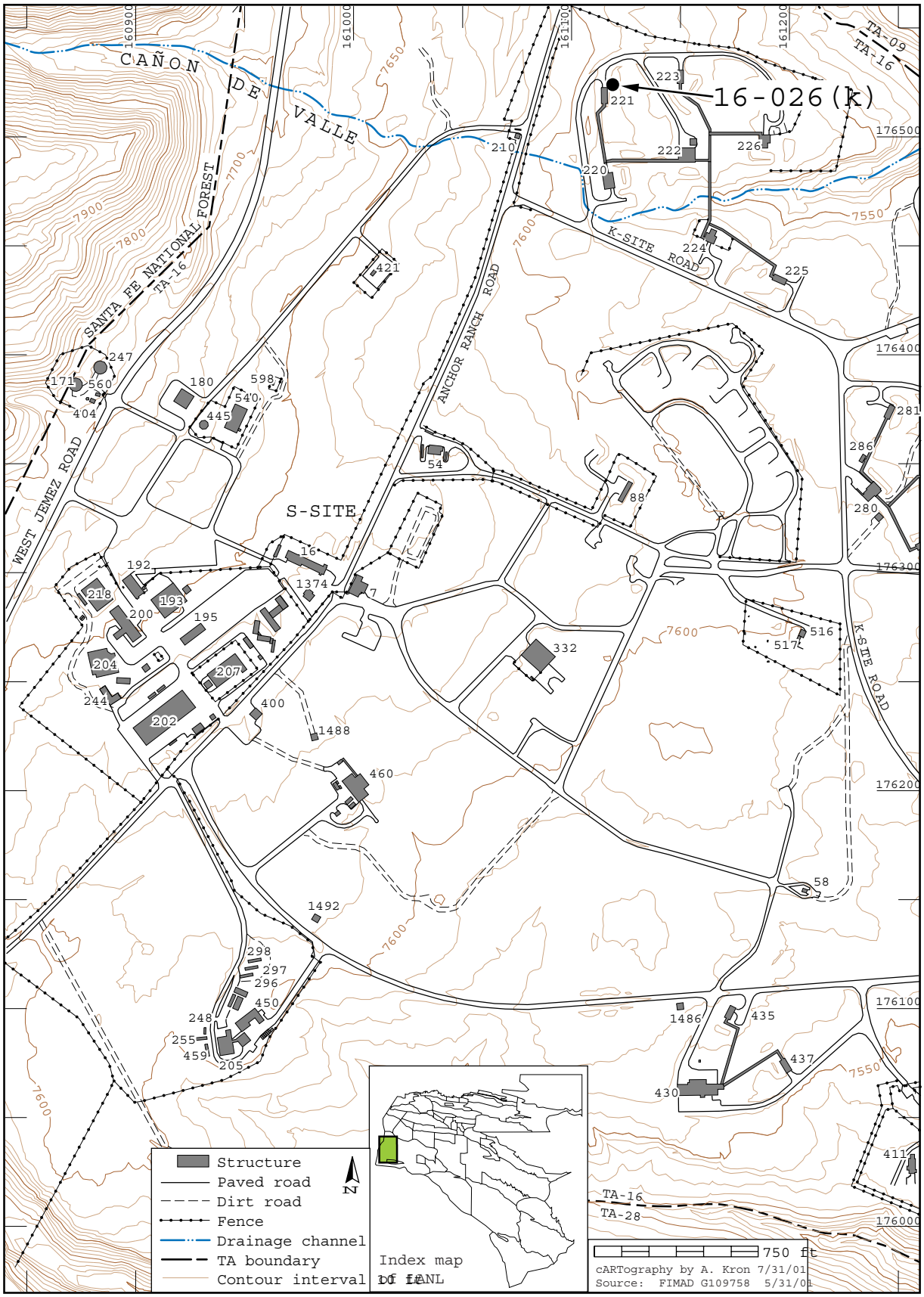
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(k)**


16-026(k)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
S-SITE
K-SITE ROAD
ANCHOR RANCH ROAD
WEST JEMEZ ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-026(l)-00 — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-026(l)-00 consists of former SWMUs 16-026(l) and 16-028(c). The former SWMUs are drainlines and outfalls from drains throughout an x-ray building (Building 16-220). The outfalls discharged from similar processes in Building 16-220 to an area where the outfalls overlap; suspect contaminants are commingled here. Building 16-220 (41 ft x 68 ft x 20 ft high) was the low-energy x-ray facility for HE components, located on the north side of S-Site. The radiography area of S-Site was built in 1952 and consists of seven buildings: three rest houses, three x-ray buildings, and a centrally located photo processing building. The buildings are connected by enclosed walkways. The rest houses store finished, packaged HE components before and after they are radiographed. The components are transported between the rest houses and the x-ray buildings on the enclosed walkways. When components arrive at the x-ray buildings, they are removed from their packaging, x-rayed, and repackaged. Former SWMU 16-026(l) is potentially contaminated soil associated with outfalls from Building 16-220. The area where the outfall daylights could not be located, even after several site visits. Former SWMU 16-028(c) is a former NPDES-permitted outfall (Outfall 04A070, removed from LANL's NPDES permit effective September 19, 1997) and drainlines that received discharges from eight floor drains in Building 16-220. The effluent contained noncontact cooling water, chiller condensate, and periodic discharge from an HE vacuum pump and floor washings. The 6-in. VCP daylights in a rocky ditch near the building. The ditch flows to a relatively flat, grassy field. The floor drains at Building 16-220 were plugged in 1991.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The rewritten Chapter 6 for the OU 1082 work plan recommended NFA for former SWMU 16-026(l) because it could not be located during site visits. Addendum 2 of the OU 1082 work plan proposed sampling at former SWMU 16-028(c) to detect barium and HE.

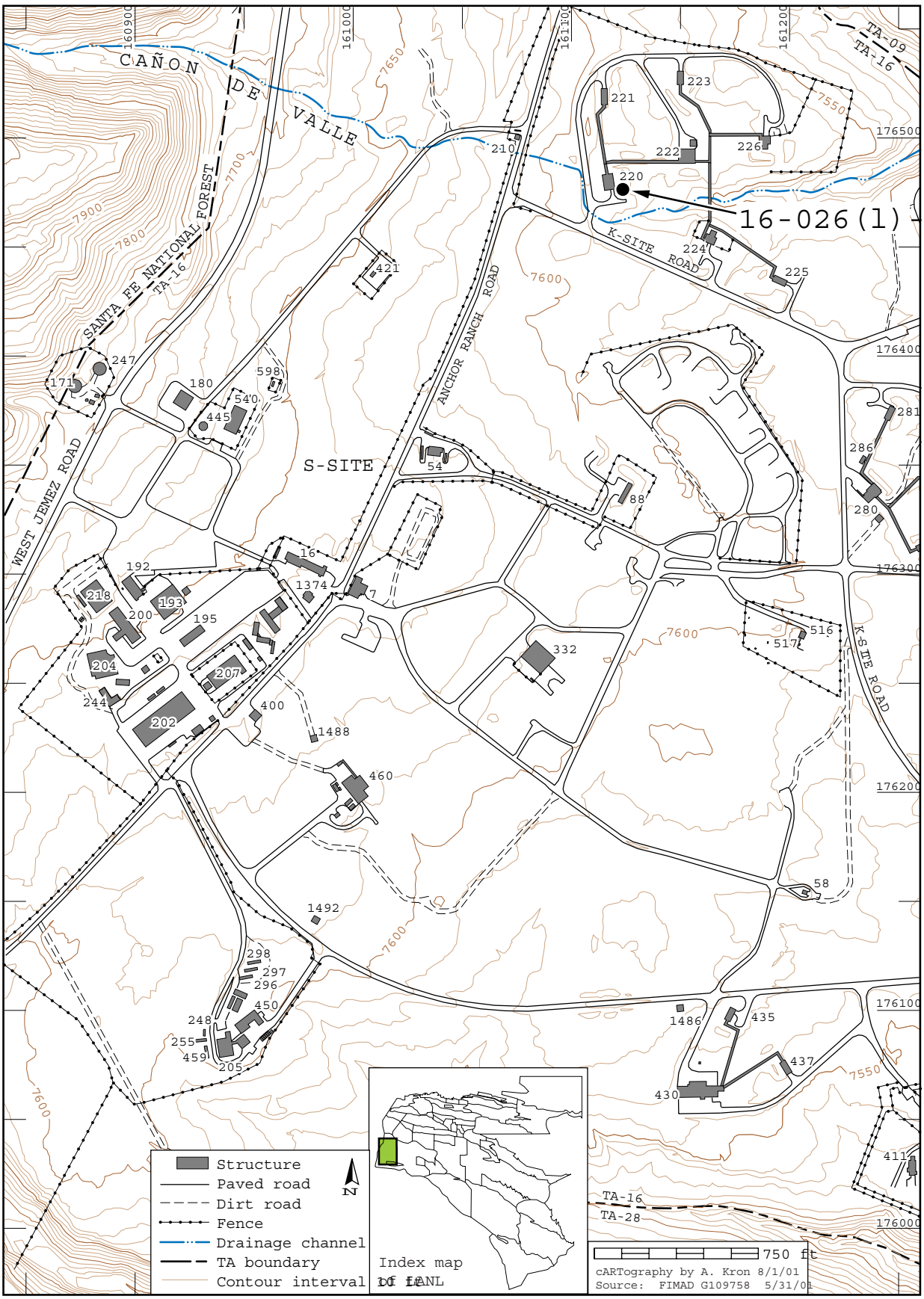
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038


**No photo; subsurface unit**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
16-026(1)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-026(q)-99 — Container storage - facility/equipment - operational release - outfall/effluent discharge - subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1970 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-026(q)-99 consists of former SWMUs 16-005(d), 16-017(h)-99, 16-017(x)-99, 16-025(k), 16-025(l), 16-026(q), 16-029(f2), 16-029(r), 16-031(d), 16-032(c), and 16-034(a), and AOCs C-16-006 and C-16-065. The consolidated SWMU consists of potentially contaminated surface and subsurface soil in the footprints of former HE-processing buildings and associated structures in the 20s Line of HE-processing buildings at S-Site. All the former structures are related to and located along or near the 20s Line of HE-processing buildings. The 20s Line contained several HE production facilities in a single line of buildings that were connected by enclosed walkways. Most buildings in the 20s Line were burned in 1968. The residual debris from burning and the subsurface structures were cleaned up in 1969.

Former SWMU 16-005(d) is the footprint of a former septic tank (structure 16-177) and its 6-in. drainline that served lavatories in the southwest wing of former Building 16-27. Primary drainage in the area where the tank was located was to a tributary of Water Canyon, about 0.25 mi south.

Former SWMU 16-017(h)-99 is the footprint of a former HE-casting building (Building 16-27). Operations were conducted at the building from 1945 to 1970. The building was removed in 1995. It was a 150-ft x 50-ft building of wooden-frame construction with a concrete foundation, concrete floor, and a basement that housed vacuum pumps and other equipment. The building consisted of a 39-ft x 89-ft central casting room and several smaller rooms that were used as laboratories and offices. An associated equipment room south of the main building also was considered part of Building 16-27. Former Building 16-27 was the main production casting facility at TA-16 until approximately 1953. Full-scale lenses for nuclear devices were cast in the building. After casting operations were moved into the 300 Line in the early 1950s, Building 16-27 was used as a warehouse. The building was removed during 1998 D&D activities .

Former SWMU 16-017(x)-99 is a former storage magazine at S-Site (structure 16-79). This site is 1 of the 23 structures originally designated as SWMU 16-017, but later redesignated by adding an alpha identifier for each structure.

Former SWMU 16-025(k) is the footprint of a former HE powder inspection building (Building 16-25). The former building was made of wooden-frame construction and measured 20 ft long x 30 ft wide x 15 ft high and had a concrete foundation and floor, plus an addition that was 6 ft x 10 ft x 15 ft high. Building 16-25 was built in 1944 and had no sump. Activities in the building consisted of spreading HE powder on tables to remove foreign objects to prepare the HE for casting. The building was closed in 1959 and was shown to be contaminated with HE before it was burned in 1968. Suspect contaminants at this former SWMU were inorganic chemicals, organic chemicals, and HE.

Former SWMU 16-025(l) is the footprint of a former HE-casting building (Building 16-26) that was built in 1944. The building was 40 ft x 45 ft x 18 ft high. The building had a basement (12 ft x 40 ft) that served as a utility room. A wood ceiling in the basement formed the floor beneath the casting kettles and provided access to the kettles. The basement had a 4-ft-deep sump. The portion of the main floor that was not above the basement was a concrete slab slightly elevated above ground level. The floor had a lead-lined trough that led to a sump, former SWMU 16-032(c). After former Building 16-27 was constructed in 1945, Building 16-26 was used for inspecting raw HE. Building 16-26 was burned in 1968. Industrial sumps and drainlines were disposed of at TA-54; noncombustible material was flashed and disposed of at MDA P (SWMU 16-018).

Former SWMU 16-026(q) consists of footprints of nine removed sumps and associated drains and outfalls for former Building 16-27. Drainlines flowed eastward in rock-lined ditches to a ditch that flowed south along the road and into the main drainage for S-Site. The sumps and drainlines were removed in 1968 and disposed of at MDA L.

Former SWMU 16-029(f2) is the footprint of the decommissioned sump, drainline, and outfall from former Building 16-24. Effluent exited from the southwest corner of Building 16-24, flowed into a sump located about 15 ft northwest of the building's west corner, and drained into a rock-lined ditch that flowed into the main drainage for S-Site. The sump and drainline were removed in 1968 and disposed of at TA-54, and noncombustible debris was disposed of at MDA P.

Former SWMU 16-029(r) is the footprint of the drainage system for the former drainline that served former Building 16-25. A drainage ditch is evident at the location of the former drainline and was determined to be contaminated with HE in 1970. A drainline is believed

to have exited Building 16-25 from its southeast corner and to have emptied into a pond located southeast of former Building 16-26, an HE-casting building [former SWMU 16-025(l)]. A drainage ditch heads east from the historical location of the pond and turns south to the sumps at former Building 16-55.

Former SWMU 16-031(d) is the location of a decommissioned cooling tower (former structure 16-28). The tower stored water used in cooling jackets for the casting operations in former Building 16-27. The tower was built concurrently with Building 16-27 in 1945 and was located about 70 ft south of Building 16-27. The tower was of wooden-frame construction and measured 28 ft square x 46 ft high. It was demolished in 1968. There is no record of a sump or chromate use.

Former SWMU 16-032(c) is the footprint of former sumps, drainlines, and outfalls that served Building 16-26. The building was renovated in 1945, and an HE sump was added. This sump discharged to a secondary sump that discharged to a drainline and the outfall. The rock-lined ditch that served as the outfall is still present. The outfall drained into the main drainage for S-Site. Building 16-26 was destroyed in 1968, and the drains and sumps were removed and disposed of at TA-54; noncombustible debris was disposed of at MDA P.

Former SWMU 16-034(a) is the building footprint for the former analytical laboratory for the 20s Line (Building 16-24). The building was constructed in 1946, measured 20 ft long x 36 ft wide x 11 ft high, and had a concrete floor. Activities in the building were to determine properties of production castings, which included HE density, composition, and particle size. The building had lead-lined ducts and a lead-lined trough in the floor. The trough surrounded a hood in the northwest corner of the building. Building 16-24 was destroyed by burning in 1968.

Former AOC C-16-006 was described in the 1990 SWMU report as the former location of an equipment building (Building 16-148) constructed in 1950 and removed in 1968. The designation of Building 16-148 was used for two different buildings at different times. One of the two buildings designated as Building 16-148 was a small (6 ft x 6 ft) solvent storage building located west of former Building 16-24, an analytical laboratory. The other building designated as Building 16-148 was a 6-ft x 12-ft x 6-ft equipment storage room adjacent to the passage to Building 16-24. AOC C-16-006 is the unit associated with potential contamination from the solvent storage building. The equipment storage room has been assigned to SWMU 16-032(b).

Former AOC C-16-065 was a 14-ft x 9-ft x 5-ft-high concrete platform (structure 16-185) that was used to store containers of HE-contaminated waste from nearby HE-processing buildings. AOC C-16-065 was built in 1948 and removed from service in 1960. According to the VCM report (see below), the platform probably was removed in 1968 concurrently with the D&D of nearby buildings. The former AOC was located about 50 ft east of former Building 16-27. Suspect contaminants at former AOC C-16-065 were HE and inorganic chemicals.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted a VCM at former SWMU 16-005(d) in 1997 and 1998 to characterize the SWMU and to implement an accelerated cleanup in conjunction with D&D activities at the former SWMU. The septic tank had been removed prior to D&D, and D&D activities were limited to removal of the drainline. After the drainline was removed, the ER Project field-screened 27 samples from 8 locations, with preferential samples taken from locations beneath noted joints or breaks in the drainline. Samples were screened for HE, radioactivity, inorganic chemicals, and organic chemicals. Based on screening results that indicated the potential presence of HE and silver, eight samples were submitted for laboratory analysis of HE, inorganic chemicals, organic chemicals, and uranium. Elevated levels of amino-2,6-dinitrotoluene[4-], amino-4,6-dinitrotoluene[2-], HMX, RDX, and trinitrotoluene[2,4,6-] were detected. After analytical results were received, two additional samples were collected upgradient from the tank and from the tank discharge to bound the detected contamination. Contaminated soil within the boundary was removed. Following cleanup, confirmation sampling and analyses were conducted. Elevated levels of both organic chemicals and inorganic chemicals were detected in the confirmation samples; the nature and extent of this contamination has been determined. Both the human health and ecological screening assessment support NFA at this former SWMU.

The OU 1082 work plan proposed SWMU 16-017, which included the storage magazine redesignated as SWMU 16-017(x)-99, for deferral until D&D.

The ER Project conducted an RFI at former SWMU 16-025(k) in 1997 to determine if contaminants were present in soils at levels of concern. A total of 12 screening samples were taken from 6 locations in the building's footprint. Samples were screened for HE and radioactivity. Three samples that screened positive for HE were submitted for laboratory analysis. The samples were analyzed for inorganic chemicals, organic chemicals, and HE. Slightly elevated levels of lead, copper, and zinc were found but were determined not to present a human health risk. The RFI report recommended former SWMU 16-025(k) for a human health NFA because contaminants were not present at the site at levels that present a potential risk to human health.

Addendum 1 of the OU 1082 work plan proposed sampling at former SWMUs 16-026(q), 16-029(f2), 16-029(l), and 16-029(r) to detect residual subsurface HE contamination.

The ER Project conducted a VCM at former SWMU 16-031(d) in 1997. Five screening samples were collected and screened for HE and inorganic chemicals. One sample was submitted for laboratory analysis for inorganic chemicals. Copper was detected at a slightly elevated concentration. The VCM report recommended NFA at former SWMU 16-031(d) because contaminants at this site posed no unacceptable potential risk to human health.

Addendum 1 of the OU 1082 work plan proposed surface and subsurface sampling at former SWMU 16-032(c) to detect residual HE contamination.

Addendum 1 of the OU 1082 work plan proposed sampling to detect surface HE contamination at former SWMU 16-034(a).

Addendum 1 of the OU 1082 work plan proposed sampling at AOC C-16-006 to detect residual subsurface solvents.

The ER Project conducted a VCM at former AOC C-16-065 in May 1997. Five samples were collected from the footprint of the former container storage platform. Samples were field-screened for HE and BTEX; no HE was detected, and one sample screened positive for BTEX. One sample was submitted for laboratory analysis. The sample was analyzed for inorganic chemicals, organic chemicals, and HE, and the analysis detected several PAHs. There was no indication that PAHs were used at this site, and the VCM report recommended NFA for former AOC C-16-065 because contaminants at this site posed no unacceptable potential risk to human health.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 7 | N/A | 3 |
| Inorganic chemicals | 25 | 20 | 1 |
| PCBs | 1 | N/A | 0 |
| SVOCs | 17 | N/A | 3 |
| VOCs | 5 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 1.22 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 1.62 mg/kg | N/A |
| | RDX | 20.8 mg/kg | 4.4 mg/kg |
| Inorganic chemicals | Arsenic | 11 mg/kg | 0.39 mg/kg |
| SVOCs | Benzo(a)pyrene | 0.38 mg/kg | 0.062 mg/kg |
| | Dibenz(a,h)anthracene | 0.15 mg/kg | 0.062 mg/kg |
| | Nitroaniline[4-] | 0.8 mg/kg | N/A |

## References

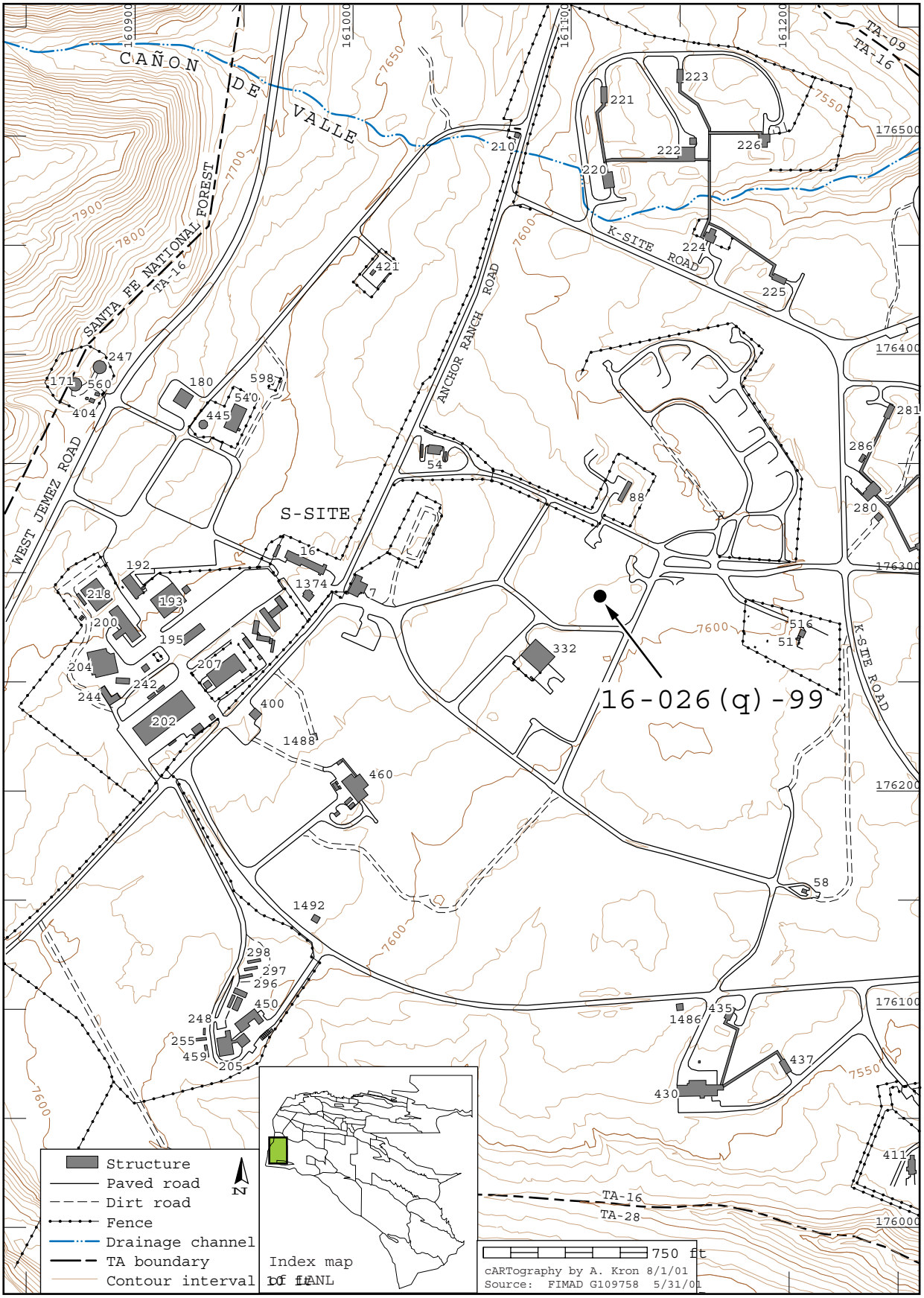

Voluntary Corrective Measures Completion Report for Potential Release Sites 16-006(g), 16-005(d), 16-034(p) Drum Storage Aggregate - [16-029(g2) and C-16-074] V-Site — LA-UR Number: 99-3001

Addendum to the Voluntary Corrective Measures Plan for Potential Release Sites 16-005(d), 16-006(g,h), 16-017[Bldg. 27], 16-026(q), 16-029(g2,w,x), 16-031(c), C-16-074 (V-Site) — LA-UR Number: 98-2780

RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

**View of SWMU 16-026(q)-99**

**View of SWMU 16-026(q)-99**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-026(q)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-026(r) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(r) is potential soil contamination from oil overflow lines associated with the oil-water separator at fire station Number 5 (Building 16-180) at TA-16. The fire station was built in 1952. The oil-water separator is located in the middle of the south wall of Building 16-180 and received discharge from six floor drains. The oil-water separator remains in place but is no longer used. It is a 3-cubic-foot cement pit below floor level in a wastewater line that receives only oily wastewater. The pit removed oil from the water to protect the sewer system from being overloaded with large volumes of oil. Oil was separated from water: the oil layer, which floated to the top of the pit, flowed to an oil overflow drainline, a 2-in. cast-iron pipe, located at the top of the pit. The water sank to the bottom of the pit and flowed out of a drain at the pit bottom. Currently, rags are used to mop up oil stains, and the interceptor drain is inactive. The oil overflow line is believed to daylight approximately 70 ft south of the building, but the pipe is not visible. No oil stains were visible where the pipe is believed to daylight. The water in the bottom of the oil-water separator drained into a field approximately 200 ft south of Building 16-180.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Addendum 2 of the OU 1082 work plan proposed sampling at the outfall for SWMU 16-026(r) to detect organic chemicals.

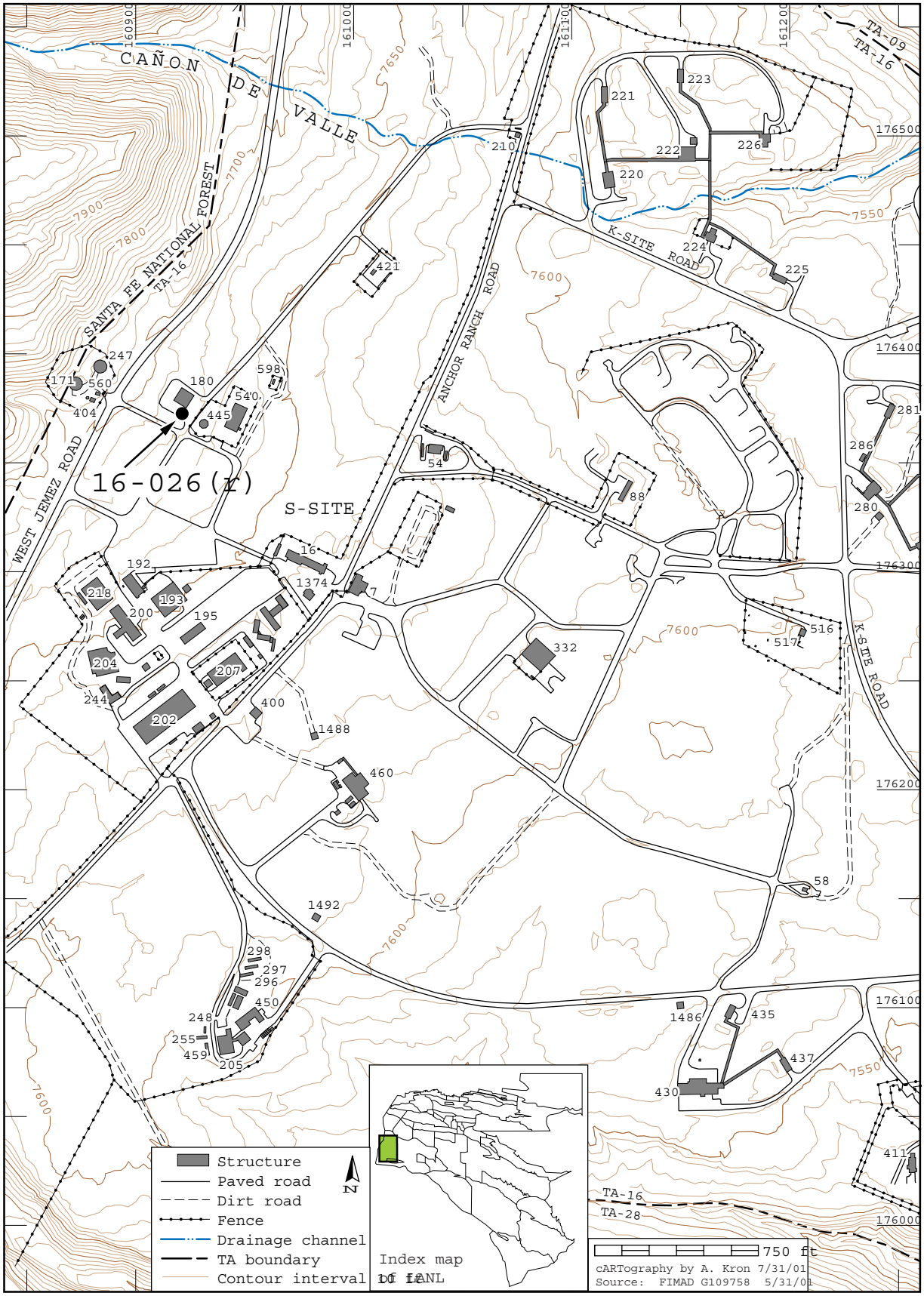
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

| | |
|---|---|
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(r)**




Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft

N

Index map of LANL

750 ft

cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-026(s) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1956 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(s) is potential surface soil contamination from the inactive outfall at a former instrument shop (Building 16-5). The outfall originated from the east corner of the former building and drained about 100 ft to the southeast. The end of the outfall shows two 4-in. VCPs emptying into the drainage; the source of one of the pipes is unknown. Building 16-5 was removed in 1956. Oils and solvents were used in the instrument shop, which operated from 1945-1956. Suspect contaminants are organic chemicals.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 1 of the OU 1082 work plan proposed sampling to detect residual oil and solvents.

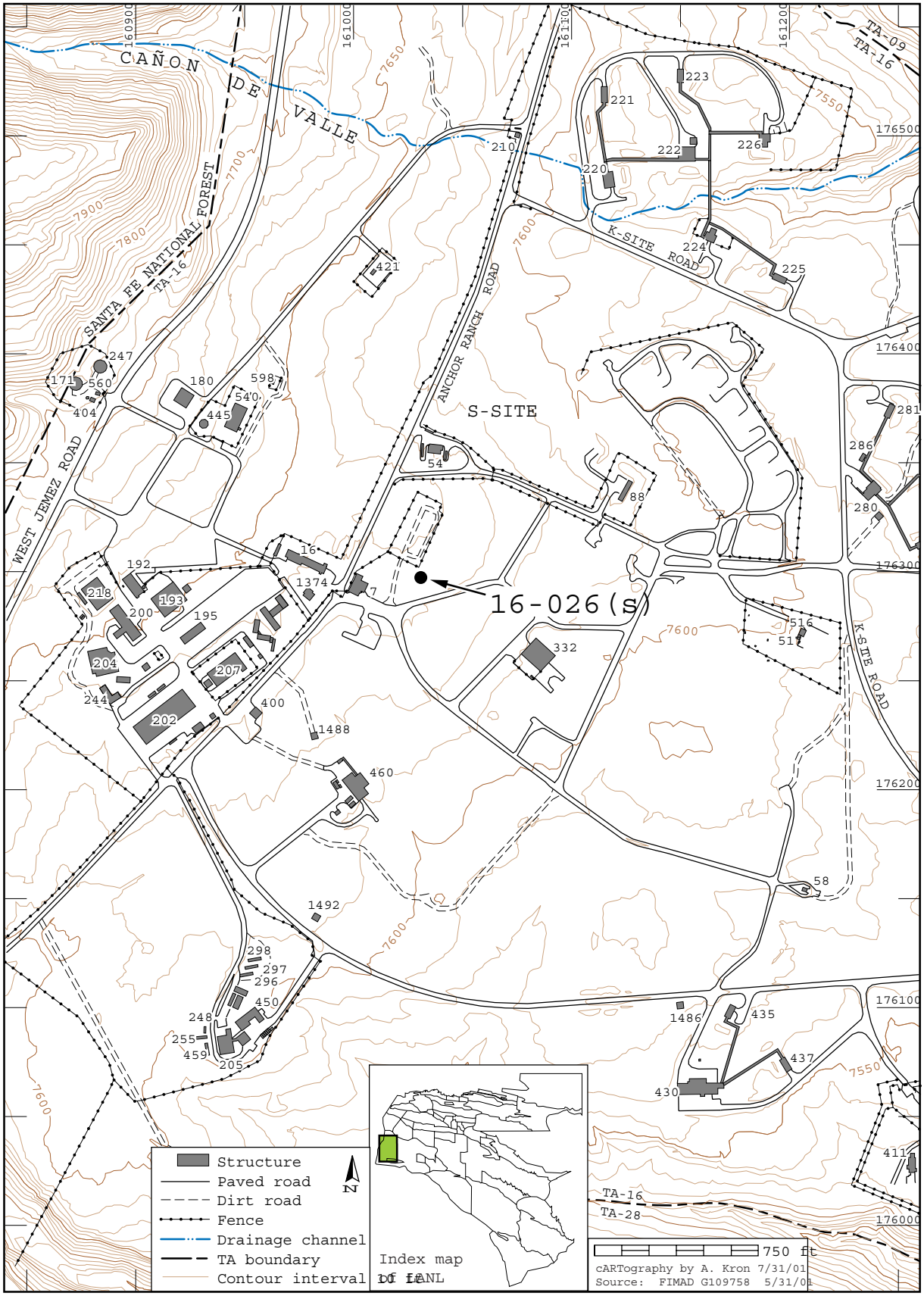
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-026(s)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-026(s)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-026(t) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(t) is an active storm drainline and associated outfall from the roof drains of Building 16-207, a warehouse. The 1990 SWMU report describes SWMU 16-026(t) as an inactive outfall from a drainline located on the eastern side of Building 16-207. Engineering drawings and site visits (conducted as recently as the summer of 2000) demonstrate that the outfall is periodically active, intermittently discharging rainwater collected from the roof of the building.

Building 16-207 is located outside of the fenced TA-16 HE-processing area. The SWMU 16-026(t) storm drainline periodically collects rainwater from the building roof only. Rainwater from 10 roof drains is channeled from the roof to a line that runs through the interior of the building and connects to a drainline beneath the concrete floor of Building 16-207. The drainline exits the building at the northwest and the northeast corners of the building as 6-in. pipes that connect to an 8-in. storm drainline that runs southeast (underground) to its point of discharge (at daylight) approximately 80 ft southeast of the building. The point of discharge is through an 8-in. VCP. Within the building, the drainline is an entirely closed system suspended from the ceiling.

Building 16-207 was constructed from November 5, 1951, through November 10, 1952, and became operational in early 1953. Building 16-207 functioned as a warehouse from the time of its construction in 1951 until 1992. During that period, the building stored a variety of items, including small amounts of depleted uranium (stored in a locked, controlled area of the building). From 1992 to the present, Building 16-207 has been occupied by the Environmental Testing Team of the Engineering Sciences and Applications Division Measurement Technology Group. The ESA-MT, ET laboratory housed in Building 16-207 conducts mechanical test simulations (i.e., noninvasive and nondestructive) on weapons components. Testing includes static testing, such as static loads, pressure, and material characterization tests.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

This SWMU was recommended for NFA in the RFI work plan, and there has been no additional investigation at this site.

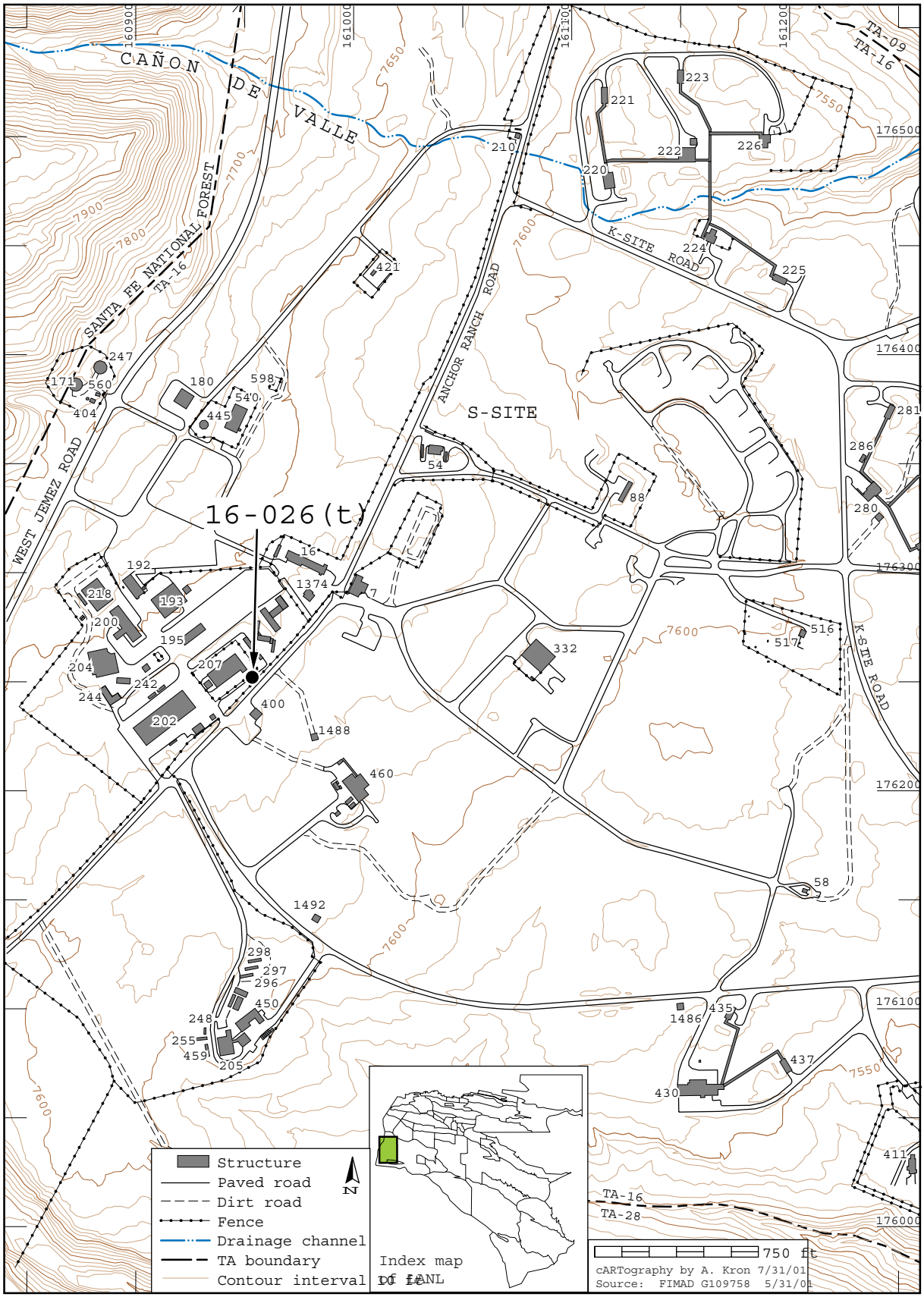
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(t), outfall**


16-026(t)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-026(u) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(u) is potential soil contamination from overflow lines at the oil-water separator in the tire and grease room at the TA-16 service station (Building 16-195). Building 16-195 was built in 1952. In addition to receiving wash-down water from the oil and grease room, the oil-water separator received floor washings from the wash area, the ambulance room, and the grease and repair room. The oil-water separator remains in place but is no longer used. It is a 3-cubic-foot cement pit below floor level in a wastewater line that receives only oily wastewater. The pit removed oil from the water to protect the sewer system from being overloaded with large volumes of oil. Oil was separated from water, and the oil layer, which floated to the top of the pit, flowed to an oil overflow drainline, a 2-in. cast-iron pipe, located at the top of the pit. The water sank to the bottom of the pit and flowed out of a drain at the pit bottom. The overflow drainline runs about 90 ft southeast of Building 16-195. Although the pipe is not visible, a magnetic survey of the area confirmed the location of the pipe.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed sampling at the outfall for SWMU 16-026(u) to detect organic chemicals.

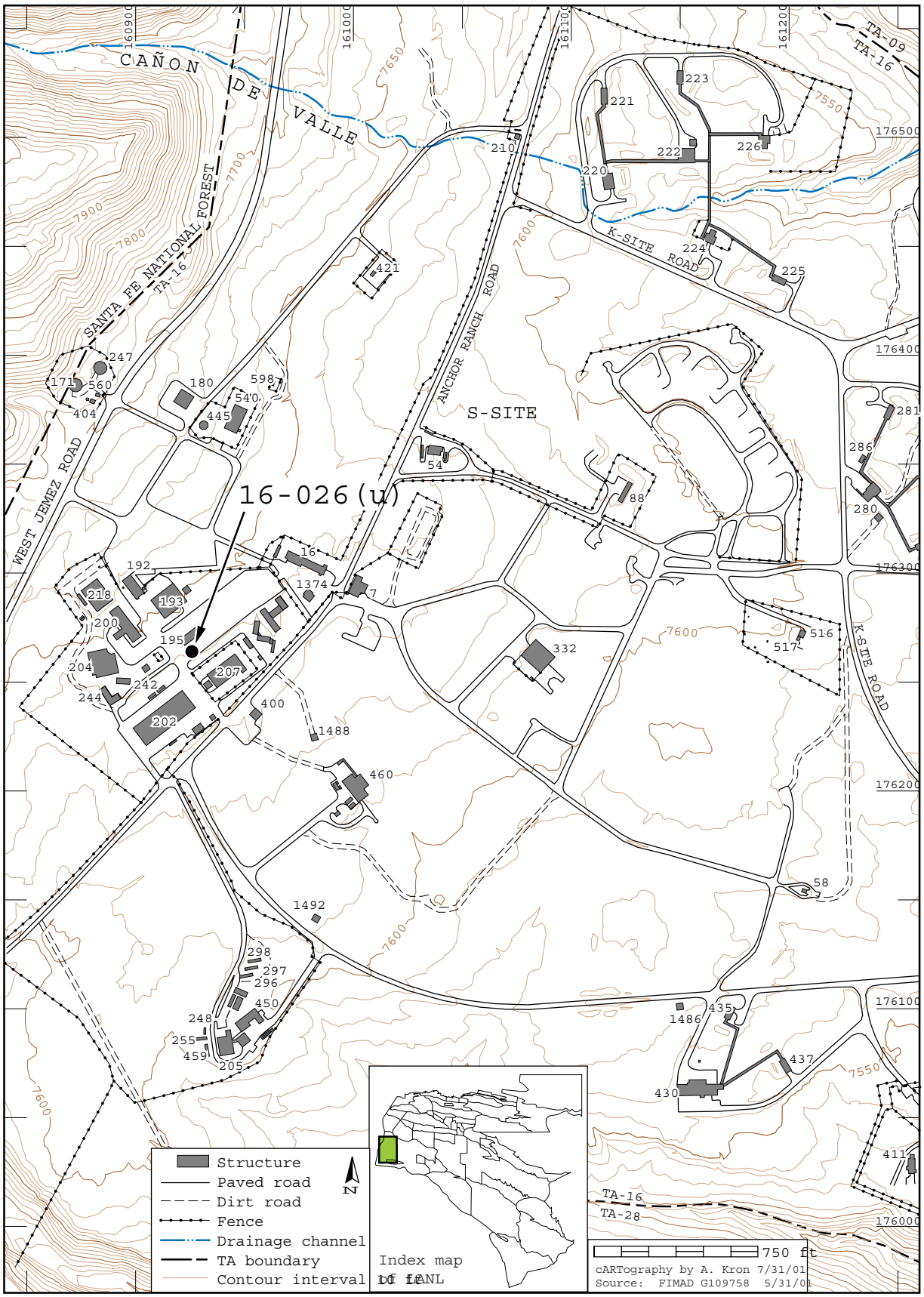
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038


**No photo; subsurface unit**


16-026(u)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-026(x) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1940s-1992 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(x) is an outfall (and associated drainline) that serves a single floor drain located in the utility room of an HE rest house (Building 16-437). From the late 1940s/early 1950s to the present, this rest house has functioned as a temporary storage area for packaged raw explosives being delivered to HE-processing buildings, for finished HE products ready for transport, or for scrap explosives being removed for disposal. The rest house contains an attached 4-ft x 8-ft utility room equipped with one steam pump and one small compressor, which are used to heat and ventilate the building. The utility room has a single floor drain, which until 1992, discharged low volumes of steam condensate through a 4-in. VCP to an outfall located approximately 90 ft from the resthouse.

Since 1992, the practice at TA-16 has been to collect steam condensate in a 2.5- or 5-gal. bucket placed at the end of the condensate pipe and to allow the condensate to evaporate from the bucket. Before 1992, the outfall received only steam condensate from the heating and ventilating equipment located in the utility room of Building 16-437. The steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. The current practice (starting in January 1997) is not to use additives of any kind in the steam used to heat the TA-16 buildings. There is no access to the utility room from the area of Building 16-437 used for storing HE components, because each utility room can be accessed only from outside the structure. The floor of the utility room shows rust and mineral stains as typically result from the evaporation of condensed water. From the normal operation and maintenance of the compressor, small amounts of lubricating oil have been known to leak, and some oil staining is visible on the utility room floor. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less. Employee interviews indicate that since at least 1981, there have been no releases to the environment involving a utility room drain from a rest house.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

This SWMU was recommended for NFA in the RFI work plan, and there has been no additional investigation at this site.

## ER Project Sampling Summary

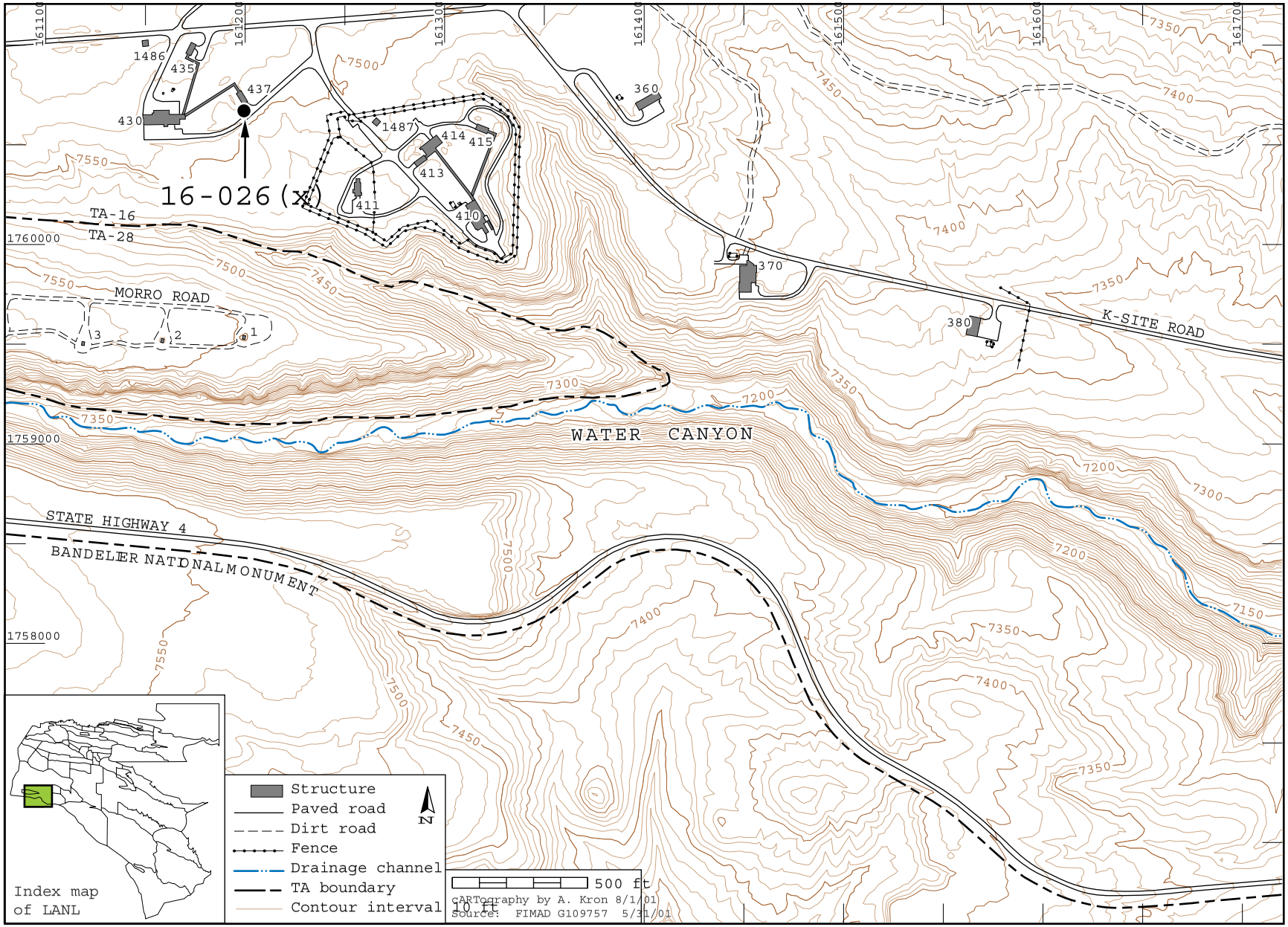
No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(x), outfall**

**View of SWMU 16-026(x), drain**


16-026(x)
TA-16
TA-28
MORRO ROAD
WATER CANYON
K-SITE ROAD
STATE HIGHWAY 4
BANDELIER NATIONAL MONUMENT
1486
435
437
430
1487
414
415
413
411
410
360
370
380
1
2
3
7550
7500
7450
7400
7350
7300
7200
7150
1760000
1759000
1758000
161100
161200
161300
161400
161500
161600
161700
Index map of LANL
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
500 ft
0 1 2
CARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

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# *SWMU 16-026(y) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(y) is soil associated with an outfall on the east side of a rest house (Building 16-411). Building 16-411 was built in 1951 and is used as an assembly building for finished HE components. Components to be assembled arrived at the building in finished condition. The outfall has several sources. A utility room with pumps and compressors has a floor drain that receives condensate and discharges to the outfall. The pumps and compressors contain less than one gallon of oil. Within the building, an eyewash station, drinking fountain, and sink drain contribute effluent to the line. Externally, two roof drains and a steam pit connect to the outfall. The 4Hin. VCP daylights 2 ft south of a double security fence, about 100 ft south of Building 16-411. The effluent drains down a steep canyon edge into Water Canyon. Effluent volume averages 600 gal./month, 500 gal. from precipitation.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The rewritten Chapter 6 of the OU 1082 work plan recommended SWMU 16-026(y) for NFA because no hazardous waste and/or constituents are present nor has the SWMU ever been used to manage, generate, treat, store, or dispose of hazardous waste.

## ER Project Sampling Summary

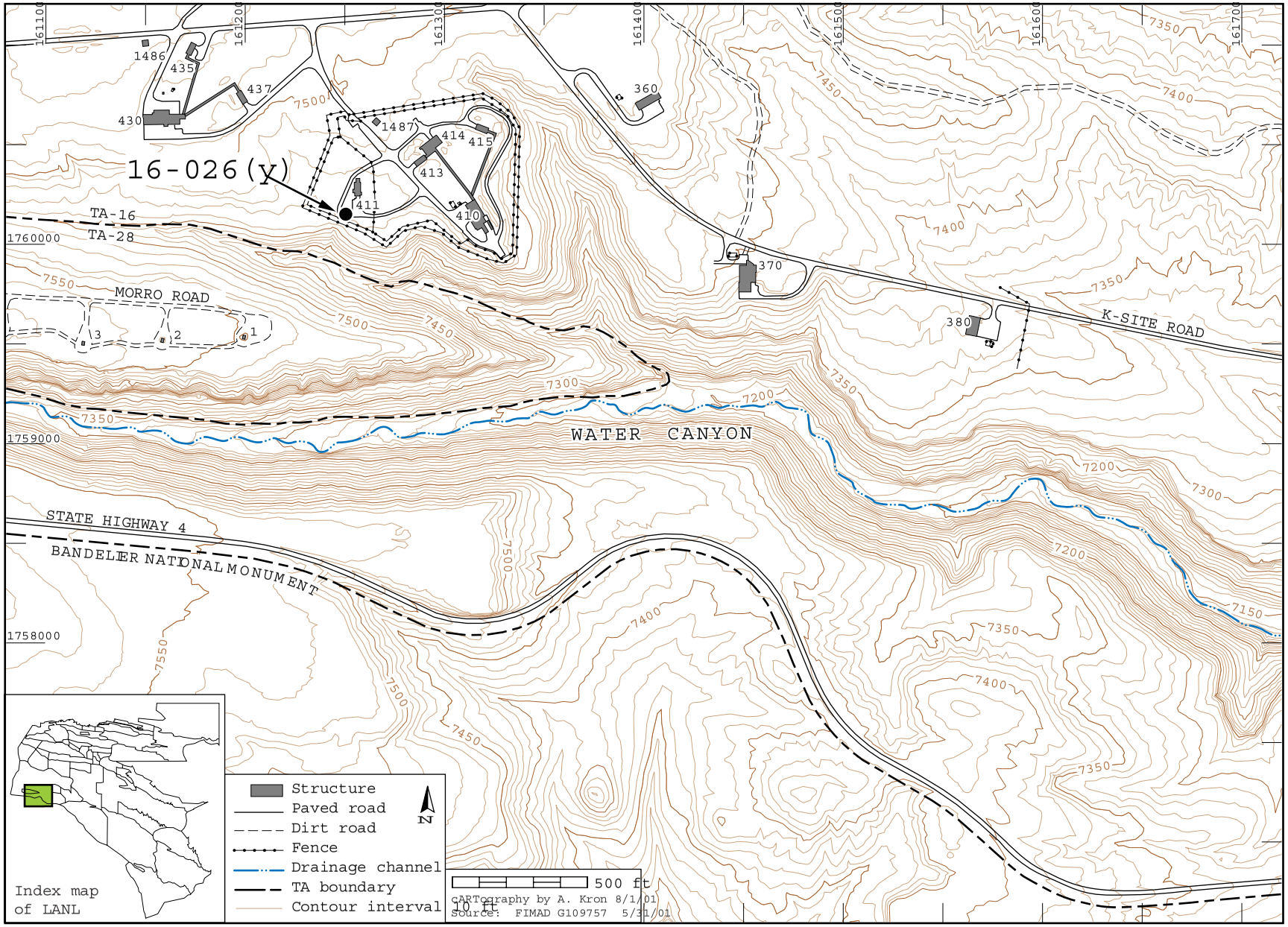
No analytical samples were collected at this site.

## References

RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-026(y), outfall**

**View of SWMU 16-026(y), drain**


16-026(y)
TA-16
TA-28
MORRO ROAD
WATER CANYON
K-SITE ROAD
STATE HIGHWAY 4
BANDELIER NATIONAL MONUMENT
1486
435
437
430
1487
414
415
413
411
410
360
370
380
1
2
3
7500
7550
7450
7400
7350
7300
7200
7150
1760000
1759000
1758000
161100
161200
161300
161400
161500
161600
161700
Index map of LANL
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
500 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

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# *SWMU 16-026(z) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1953-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(z) is soil associated with an outfall from a plastics component development facility (Building 16-306) that has operated since 1953. The outfall flows from a roof-drain downspout near the southeast side of Building 16-306. The outfall leads into a paved drainage ditch that carries rainwater to a culvert and eventually into Water Canyon.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The rewritten of Chapter 6 of the OU 1082 work plan recommended SWMU 16-026(z) for NFA because no hazardous waste and/or constituents are present at the site. In addition, the roof drains were never used to manage, generate, treat, store, or dispose of hazardous waste.

## ER Project Sampling Summary

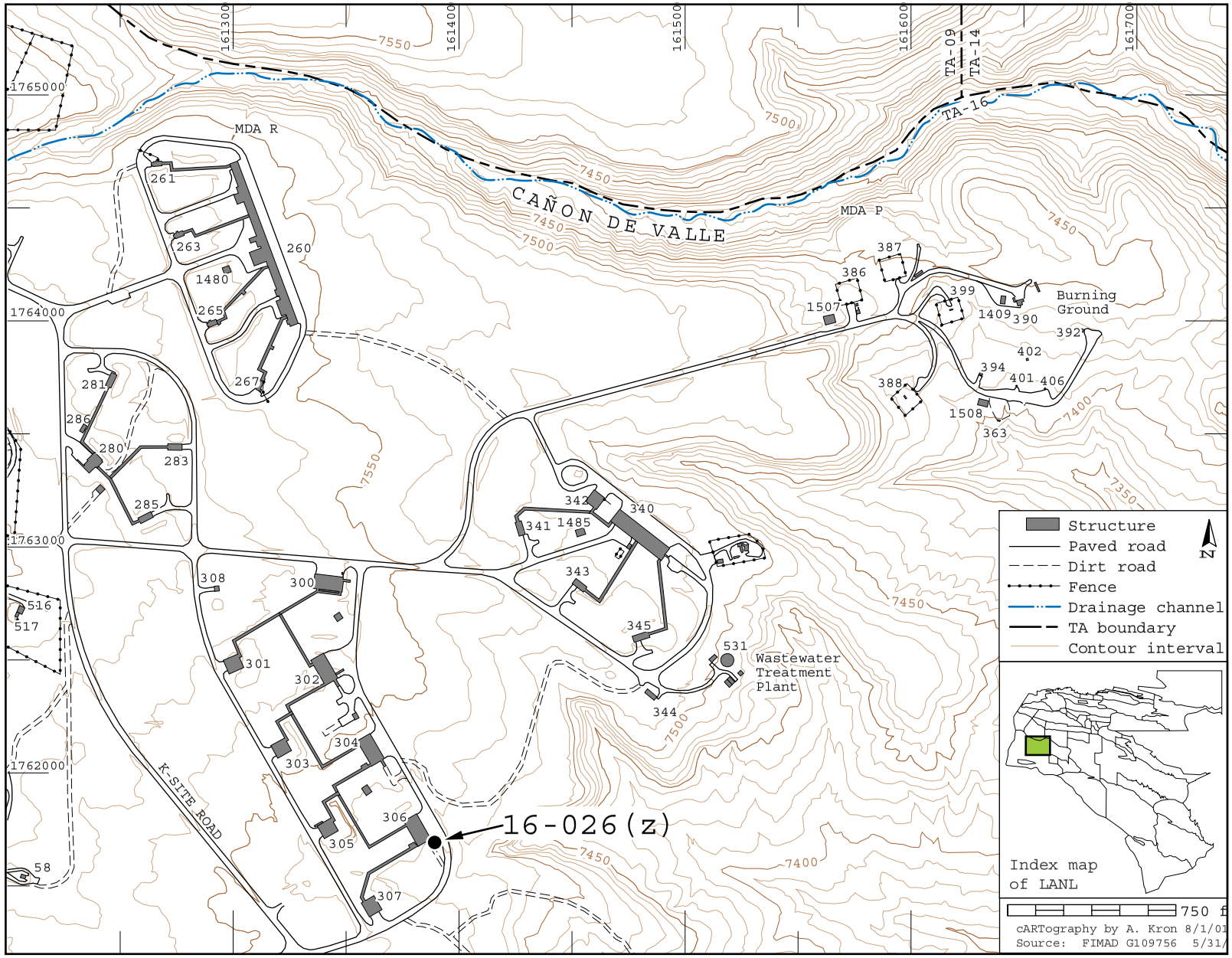
No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-026(z), outfall**

**View of SWMU 16-026(z), outfall**


16-026(z)
CAÑON DE VALLE
TA-16
TA-09
TA-14
MDA R
MDA P
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-028(a) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-Present |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-028(a) is the south drainage channel from the burning ground at TA-16. The channel runs between a water treatment shed (Building 16-363) and the liquid impoundment, SWMU 16-008(b), which has undergone RCRA closure. Suspect contaminants in the drainage were HE, inorganic chemicals, and laboratory chemicals such as solvents. Soil samples were collected for analysis from the south drainage in 1987 to detect soluble barium, inorganic chemicals, and organic chemicals. Elevated levels of barium and cadmium were detected. In 1992, a metals scoping study was performed in the burning ground drainages. Elevated barium levels were detected.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted an RFI at SWMU 16-028(a) in 1995 and resampled some locations in 1997. In 1995, 10 surface soil samples from 10 sediment-trap locations were screened for inorganic chemicals, HE, and radiation. Five of the samples were submitted for laboratory analysis and were analyzed for organic chemicals, inorganic chemicals, HE, and uranium. Elevated levels of barium, lead, zinc, benzo(a)pyrene, and HE (RDX) were detected. In 1997, four subsurface soil samples were taken from four of the ten 1995 locations to vertically bound contamination that was detected in the 1995 sampling. The four samples were submitted for laboratory analysis and were analyzed for organic chemicals, inorganic chemicals, HE, and uranium. Elevated levels of arsenic, barium, copper, nickel, silver, total uranium, and zinc were detected. The drainage receives run-on from an upgradient asphalt-paved road, suggesting that the PAHs are derived from a continuing source. The RFI report stated that contaminant concentration drops off quickly downgradient from the source, and that contamination was bounded in the downgradient and vertical directions. Because contaminants were found to pose no unacceptable potential risk to human health, the RFI report recommended SWMU 16-028(a) for NFA. In 1997, straw bale barriers were installed at this site to minimize contaminant migration from the site. In 2000, additional BMPs were installed in the form of straw wattles and permanent seeding.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 6 | N/A | 3 |
| Inorganic chemicals | 19 | 7 | 1 |
| SVOCs | 9 | N/A | 1 |
| VOCs | 1 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.25 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 0.17 mg/kg | N/A |
| | RDX | 5.33 mg/kg | 4.4 mg/kg |
| Inorganic chemicals | Arsenic | 2.4 mg/kg | 0.39 mg/kg |
| SVOCs | Benzo(a)pyrene | 0.09 mg/kg | 0.062 mg/kg |

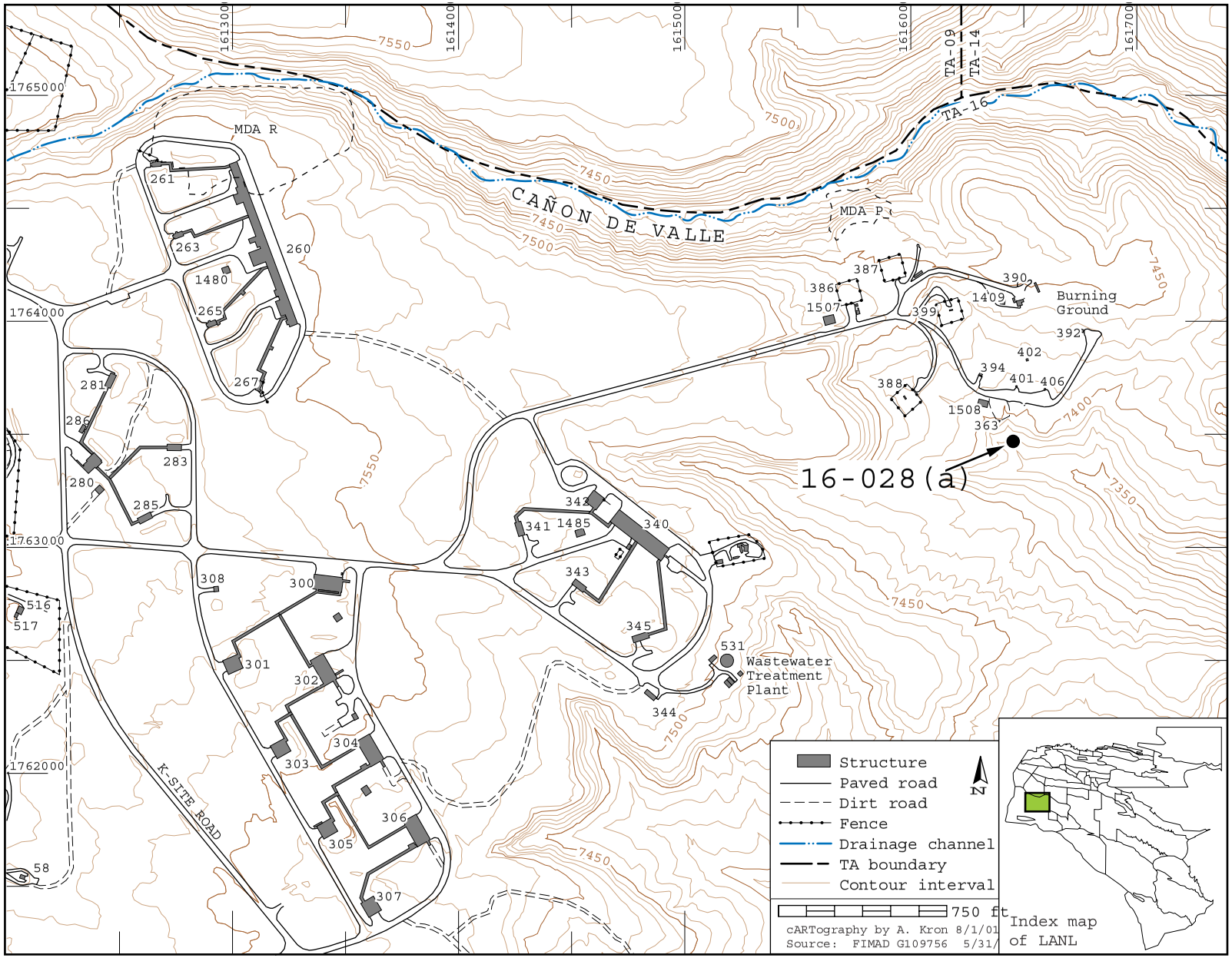
## References


RFI Report for TAs -11, -13, -16: PRSs 11-012(a,b), 13-003(a), 16-006(c,d), 16-010(a), 16-021(a), 16-026(c,d,v), 16-028(a), 16-030(g) — LA-UR Number: 97-3072

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**Best management practice**

**Best management practice**




Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval

750 ft

cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

Index map of LANL

# *SWMU 16-028(b) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1953-1998 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-028(b) is potentially contaminated soil from formerly permitted NPDES Outfall 004A092 at a metal-forming building (Building 16-370). Building 16-370 was built in 1953 as a barium nitrate grinding facility. In the late 1950s, it was converted to a metal-forming shop for steel and aluminum and continues to operate in that capacity. The outfall was eliminated from LANL's NPDES permit effective January 14, 1998. The outfall flowed to Water Canyon from the west side of Building 16-370 through a 6-in. VCP that daylights about 50 ft south of the building. The outfall received effluent from 29 floor drains in the building and an eyewash, a drinking fountain, and a sink. At the time Addendum 2 of the OU 1082 work plan was written, many of the drains were in the process of being plugged. Effluent volumes historically were as much as 4000 gal. per day. Suspect contaminants in the outfall drainage are metal chips, oils, solvents, and barium.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Addendum 2 of the OU 1082 work plan proposed sampling at SWMU 16-028(b) to detect organic chemicals and metals. In 1998, an investigative sample was collected from this site and submitted for to a off-site laboratory for HE and inorganic and organic chemical analyses. In 2000, as part of the post Cerro Grande fire recovery, debris removal, mulching, and permanent seeding were conducted at this site as a BMP. Straw wattles were also installed to stabilize the site and to prevent any potential contaminant migration.

## ER Project Sampling Summary

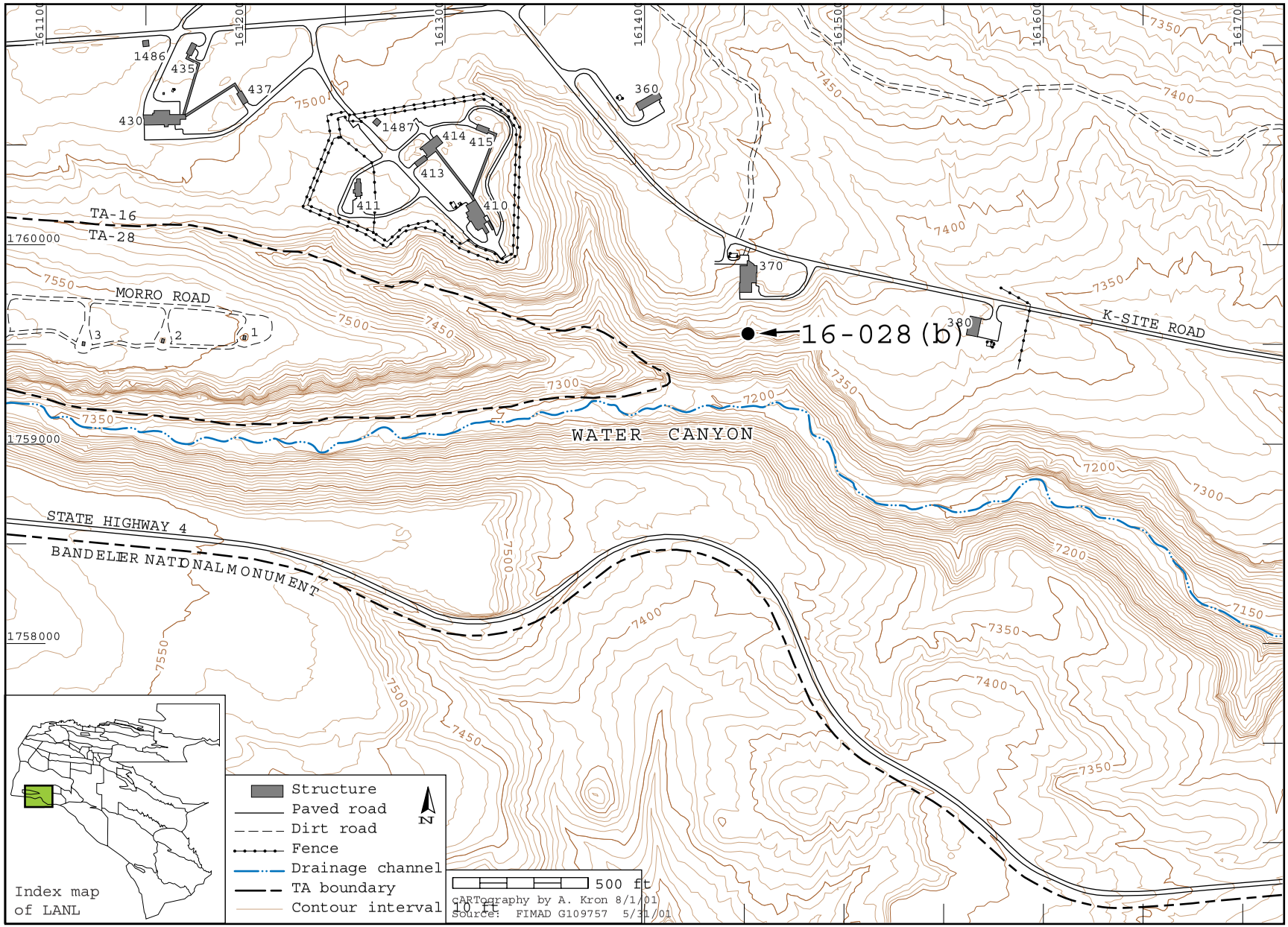
The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 4 | N/A | 0 |
| Inorganic chemicals | 21 | 9 | 1 |
| SVOCs | 12 | N/A | 6 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 6.4 mg/kg | 0.39 mg/kg |
| SVOCs | Benzo(a)anthracene | 67 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 71 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 75 mg/kg | 0.62 mg/kg |
| | Benzo(k)fluoranthene | 58 mg/kg | 6.2 mg/kg |
| | Chrysene | 120 mg/kg | 61 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 44 mg/kg | 0.62 mg/kg |

**Best management practice**


16-028(b)
WATER CANYON
K-SITE ROAD
MORRO ROAD
TA-16
TA-28
STATE HIGHWAY 4
BANDELIER NATIONAL MONUMENT
1486
435
437
430
1487
414
415
413
411
410
360
370
380
1
2
3
7550
7500
7450
7400
7350
7300
7200
7150
1760000
1759000
1758000
161100
161200
161300
161400
161500
161600
161700
Index map of LANL
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
500 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

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# *SWMU 16-029(b2)-99 — Facility/equipment - outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1940s-1960s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-53 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-029(b2)-99 consists of former SWMU 16-029(b2) and former AOC C-16-005. The former units are potentially contaminated surface and subsurface soil in the footprints of former HE-processing buildings, former materials storage buildings, sumps, drainlines, and outfall systems associated with the GMX-2 HE-processing buildings. All the former structures are related to and located along or near the GMX-2 HE-processing buildings. Most structures in this consolidated SWMU were constructed in the 1940s primarily for experimental HE research and development activities. No production-scale HE volumes were processed in this area. The GMX-2 area ceased to be used as an active site in the early 1950s. Most of the structures in the GMX-2 area were intentionally destroyed by burning in 1960. Residual debris from burning and the remaining subsurface structures were cleaned up in 1966.

Former AOC-16-005 is the footprint of a decommissioned HE-processing facility (Building 16-53). The former building housed a hydraulic press for HE processing. HE machining and casting may also have been carried out in this building. Additionally, the building may have been used as an optical equipment storage facility. It was built in 1945 and was 39 ft long x 16 ft wide x 14 ft high and had an addition that was 6 ft long x 17 ft wide x 8 ft high. Building 16-53 was of wood-frame construction with a concrete foundation and floor. It was surrounded on three sides by an earthen barricade. Suspect contaminants were metals, organic chemicals, and HE.

Former SWMU 16-029(b2) is the footprint of two sumps and associated drainlines and outfalls that served Building 16-53. The primary sump was on the south side of the building's southern barricade, and a secondary sump was located 100 ft southwest of the building. A drainline exited the secondary sump to the south, eventually flowing into the main drainage ditch for the GMX-2 area.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Addendum 1 of the OU 1082 work plan proposed sampling at former SWMU 16-029(b2) to detect surface and subsurface residual HE contamination.

The ER Project conducted an RFI at former AOC C-16-005 in August 1997. Twelve surface and near-surface samples from six locations were screened for HE and radioactivity. Two samples were submitted to a laboratory for analysis of inorganic chemicals, organic chemicals, and HE. Elevated mercury levels were detected in the laboratory samples but were determined not to present an unacceptable human health risk. The RFI report recommended NFA at AOC C-16-005 because contamination is not present at levels that pose an unacceptable potential risk to human health.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 19 | 1 | 1 |
| SVOCs | 0 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

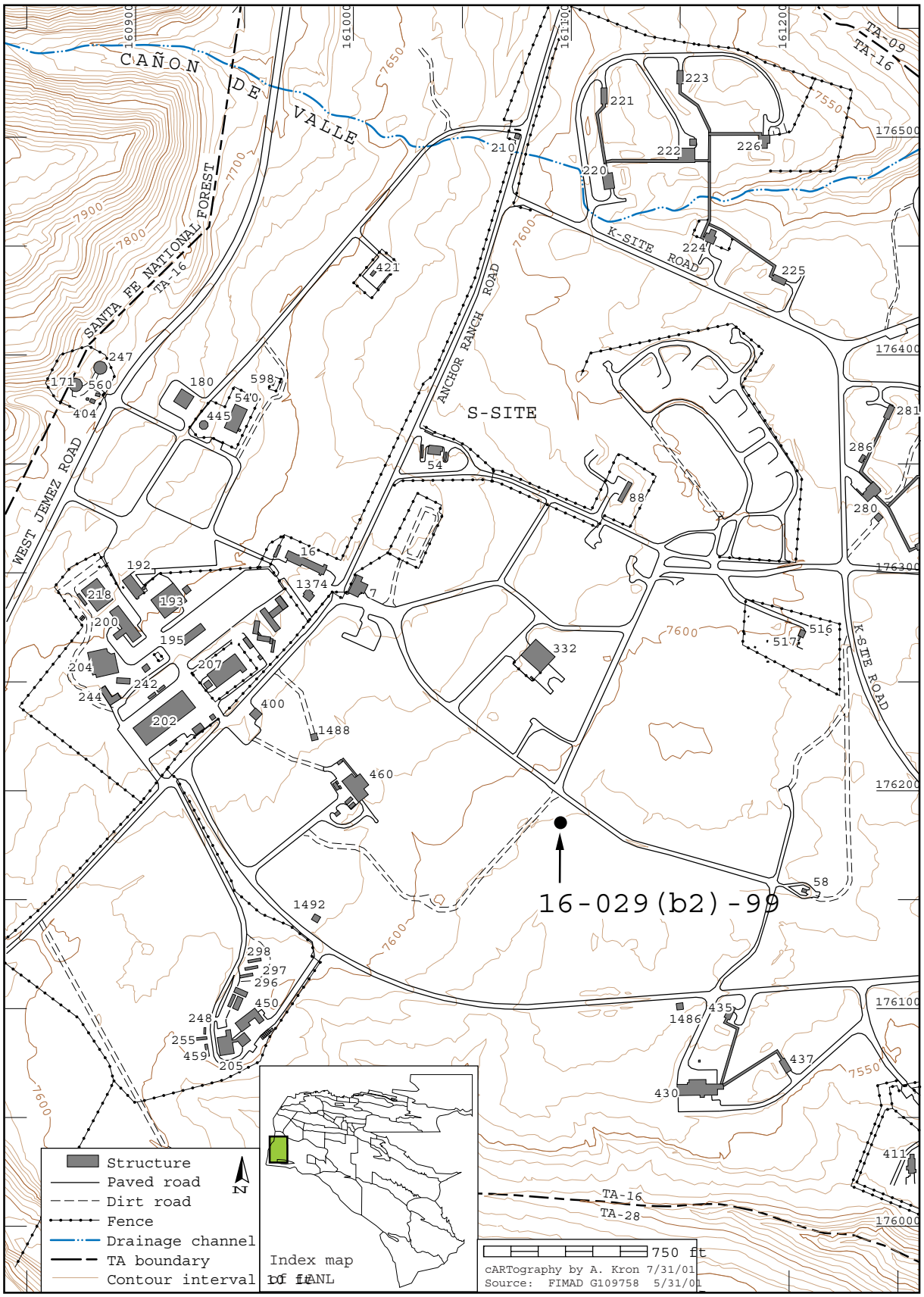
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 3.1 mg/kg | 0.39 mg/kg |

## References


RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-029(b2)-99, looking east**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-029(b2)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-029(c2)-99 — Facility/equipment - outfall/effluent discharge - subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-36, 16-37, 16-179 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-029(c2)-99 consists of former SWMUs 16-005(e), 16-025(z), and 16-029(c2), and AOC 16-015(c). The consolidated SWMU is the location of footprints of former HE-processing buildings, former materials storage buildings, sumps, drainlines, and outfall systems associated with the GMX-2 HE process lines at S-Site. GMX-2 structures were located in the south-central and eastern part of S-Site. Structures at GMX-2 were used primarily for experimental HE research and development. No production-scale HE operations were conducted in the GMX-2 area. The GMX-2 area operated from 1944 to the early 1950s. Most structures in the area were destroyed by burning in February 1960. Residual debris from burning and the remaining subsurface structures were cleaned up in 1966. All the former structures in the consolidated SWMU are related to and located along or near the GMX-2 HE process lines.

Former SWMU 16-005(e) is the location of the former septic system (structure 16-179) that served the lavatories and darkrooms in the former explosives-testing facility (Building 16-37). It was located about 110 ft northwest of Building 16-37 and was connected to it by a 6-in. VCP.

Former SWMU 16-025(z) is the former location of Building 16-37 and its associated sumps and drainlines. Initially, Building 16-37 was designated as an explosives-testing facility. Small castings were made during the spring of 1945, at which time the building was turned over to Section X-3B to investigate problems associated with cavitation in the inner charges for the implosion device. Casting operations to address this problem were conducted at this time. The building was equipped with an elaborate plumbing system designed to facilitate HE development and vacuum-overcasting operations. Vacuum overcasting was a method of cooling HE castings designed to minimize bubbles by putting a vacuum on the casting riser during charge cooling. The former building's dimensions were 20 ft x 75 ft x 13 ft high. It was of wood-frame construction with concrete floors. Before its removal in 1960, Building 16-37 was shown to be contaminated with HE. A memo also indicated that it was contaminated with carbon-14.

Former SWMU 16-029(c2) is the former location of three sumps, drainlines, and outfalls that served former Building 16-37. The drainlines and sumps were on the east side of the building. The plumbing system included an acid waste line, a propane tank and line, and a lavatory. Little information exists about use of the acid waste line. An older primary sump was located on the southeast corner of the building, and a newer primary sump was on the building's northeast corner. Both primary sumps drained southeast into a secondary sump that was located 75 ft from the building; this secondary sump drained another 250 ft to the southeast.

Former AOC 16-015(c) is the former location of a decommissioned HE steam-cleaning building (Building 16-36). The building was 8 ft square x 10 ft high. Building 16-36 was located 10 ft southeast of Building 16-37. It was of wood-frame construction on a concrete foundation. Effluent drained to the primary sump located on the southeast corner of Building 16-37. Before its removal in 1960, Building 16-36 was determined to be contaminated with HE.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 1 of the OU 1082 work plan proposed sampling at former AOC 16-015(c) and SWMU 16-025(z) to detect surface HE contamination. At former SWMU 16-005(e), the work plan proposed sampling to detect subsurface HE contamination, and at former SWMU 16-029(c2), the work plan proposed sampling to detect surface and subsurface HE contamination.

RFI sampling for AOC 16-015(c) was completed in 1997; minimal contamination was found.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 1 | N/A | 0 |
| Inorganic chemicals | 19 | 3 | 1 |
| SVOCs | 1 | N/A | 0 |

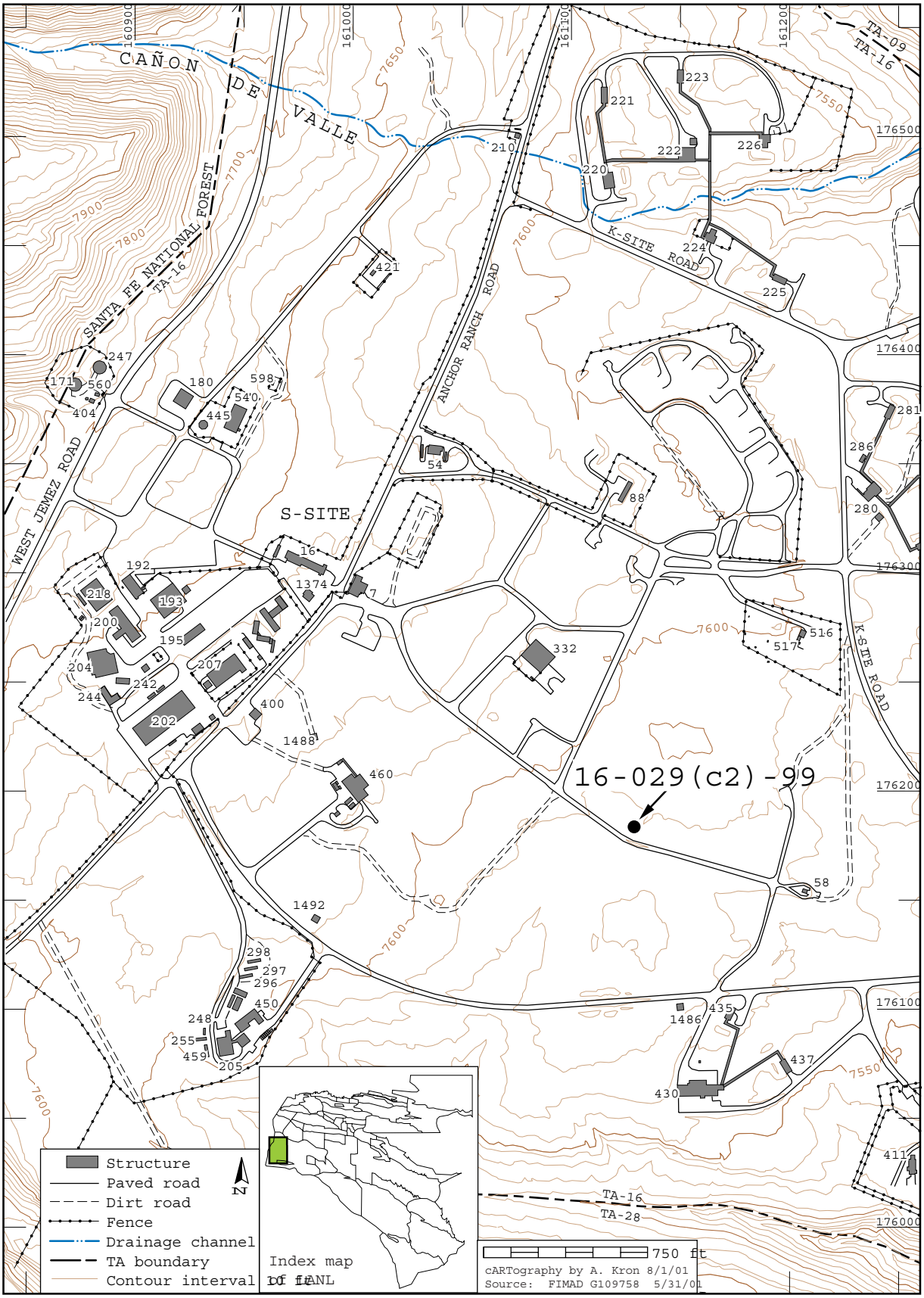
The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 3.1 mg/kg | 0.39 mg/kg |

## References

RFI Work Plan for Operable Unit 1082, Addendum 1 LA-UR Number: 94-1580

**View of SWMU 16-029(c2)-99, looking east**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-16
TA-28
16-029(c2)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-029(e)-99 — Outfall/effluent discharge - physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-Unknown |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-029(e)-99 consists of former SWMUs 16-026(h2) and 16-029(e). The former SWMUs are an inactive outfall and HE sump, respectively, associated with a rest house (structure 16-360). The outfall was permitted under NPDES as Outfall 05A159. The outfall was removed from LANL's NPDES permit effective August 16, 1995. The sump was installed in the early 1950s and modified in 1966 to improve its effectiveness and to reduce HE handling. It is a rectangular tank with a removable 0.25-in.-thick aluminum lid. The sump is 12 ft long x 4 ft wide x 5 ft high (outside dimensions), and the walls and bottom are 8-in.-thick steel-reinforced concrete. The sump operated to remove suspended solids from process water before discharge to the outfall. HE fines (scrap) were collected in a cloth filter bag secured inside a metal filter basket. The baskets and filter bags were periodically collected and cleaned at the basket-washing facility (structure 16-390) located at the burning ground [SWMU 16-010(h)-99]. HE fines that were too small to be collected in the filter bags settled to the bottom of the sump. To help separate the suspended solids, the water flowed under an aluminum baffle and over a concrete weir before it discharged to the outfall. HE in the bottom of the sump was periodically removed and burned. Water was filtered and tested before it was discharged to the outfall. According to the OU 1082 work plan, the sump most likely received wash water from historical cleaning activities.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The former SWMUs in this consolidated SWMU were proposed in the OU 1082 work plan to be included in a generic TA-16 sump sampling plan. Sampling was completed in 1995. Low levels of contamination were found. In 1998, straw bale barriers were installed at former SWMU 16-026(h2) to minimize potential contaminant migration from the site. In 2000, additional BMPs were installed in the form of permanent seeding, mulching, and straw wattles.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 9 | N/A | 2 |
| Inorganic chemicals | 19 | 12 | 2 |
| SVOCs | 25 | N/A | 8 |
| VOCs | 2 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

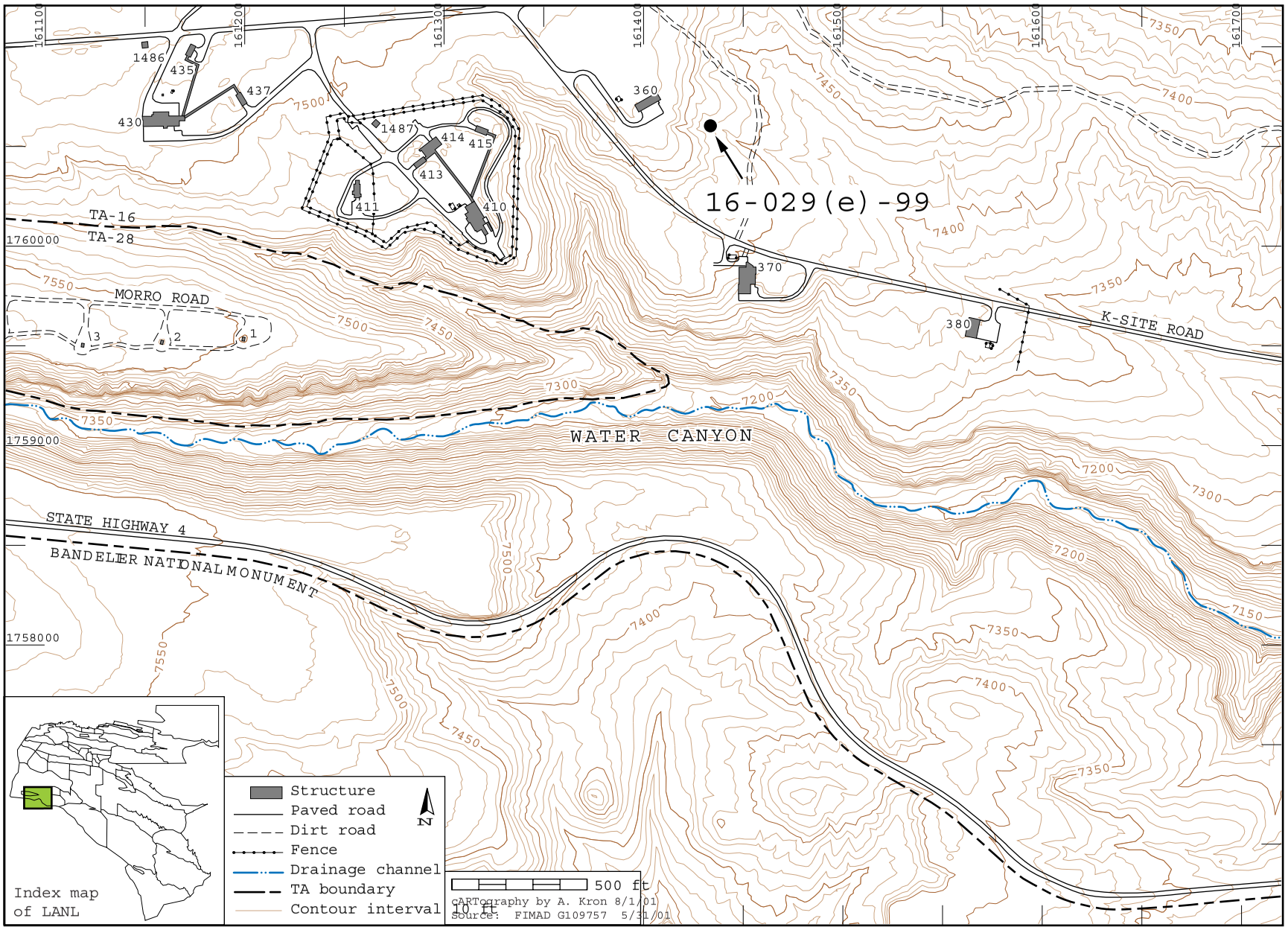
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.31 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 0.1 mg/kg | N/A |
| Inorganic chemicals | Arsenic | 4.1 mg/kg | 0.39 mg/kg |
| | Iron | 40,000 mg/kg | 23,000 mg/kg |
| SVOCs | Acenaphthylene | 0.75 mg/kg | N/A |
| | Benzo(a)anthracene | 75 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 68 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 120 mg/kg | 0.62 mg/kg |
| | Benzo(k)fluoranthene | 31 mg/kg | 6.2 mg/kg |
| | Chrysene | 110 mg/kg | 61 mg/kg |
| | Dibenz(a,h)anthracene | 8.7 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 35 mg/kg | 0.62 mg/kg |

## References

RFI Work Plan for Operable Unit 1082 LA-UR Number: 93-1196

**View of former SWMU 16-026(h2), outfall**

**View of former SWMU 16-029(e), sump**


16-029(e)-99
WATER CANYON
K-SITE ROAD
MORRO ROAD
TA-16
TA-28
STATE HIGHWAY 4
BANDELER NATIONAL MONUMENT
1486
435
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7500
7450
7400
7350
7300
7200
7150
1760000
1759000
1758000
161100
161200
161300
161400
161500
161600
161700
Index map of LANL
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
500 ft
10 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

# *SWMU 16-029(f) — Physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-mid 1990s |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-029(f) is an inactive HE sump associated with a rest house (structure 16-345). Structure 16-345 serves as an HE storage facility for Building 16-340. It has a single sump and associated drainlines. The sump was installed in the early 1950s and modified in 1966 to improve its effectiveness and to reduce HE handling. It is a rectangular tank with a removable 0.25-in.-thick aluminum lid. The sump is 12 ft long x 4 ft wide x 5 ft high (outside dimensions), and the walls and bottom are 8-in.-thick steel-reinforced concrete. The sump operated to remove suspended solids from process water before discharge to the outfall. HE fines (scrap) were collected in a cloth filter bag secured inside a metal filter basket. The baskets and filter bags were periodically collected and cleaned at the basket-washing facility (Building 16-390) located at the burning ground [SWMU 16-010(h)-99]. HE fines that were too small to be collected in the filter bags settled to the bottom of the sump. To help separate the suspended solids, the water flowed under an aluminum baffle and over a concrete weir before it discharged to the outfall, SWMU 16-026(j2). HE in the bottom of the sump was periodically removed and burned. Water was filtered and tested before it was discharged to the outfall. The sump has received wash-down water generated during cleaning activities. HE was stored in containers in the rest house and is the only known material stored in the rest house.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The OU 1082 work plan proposed including SWMU 16-029(f) in a generic TA-16 sump sampling plan. The drainage [SWMU 16-026(j2)] associated with the sump [16-029(f)] was sampled in 1995. Minimal levels of contamination were found.

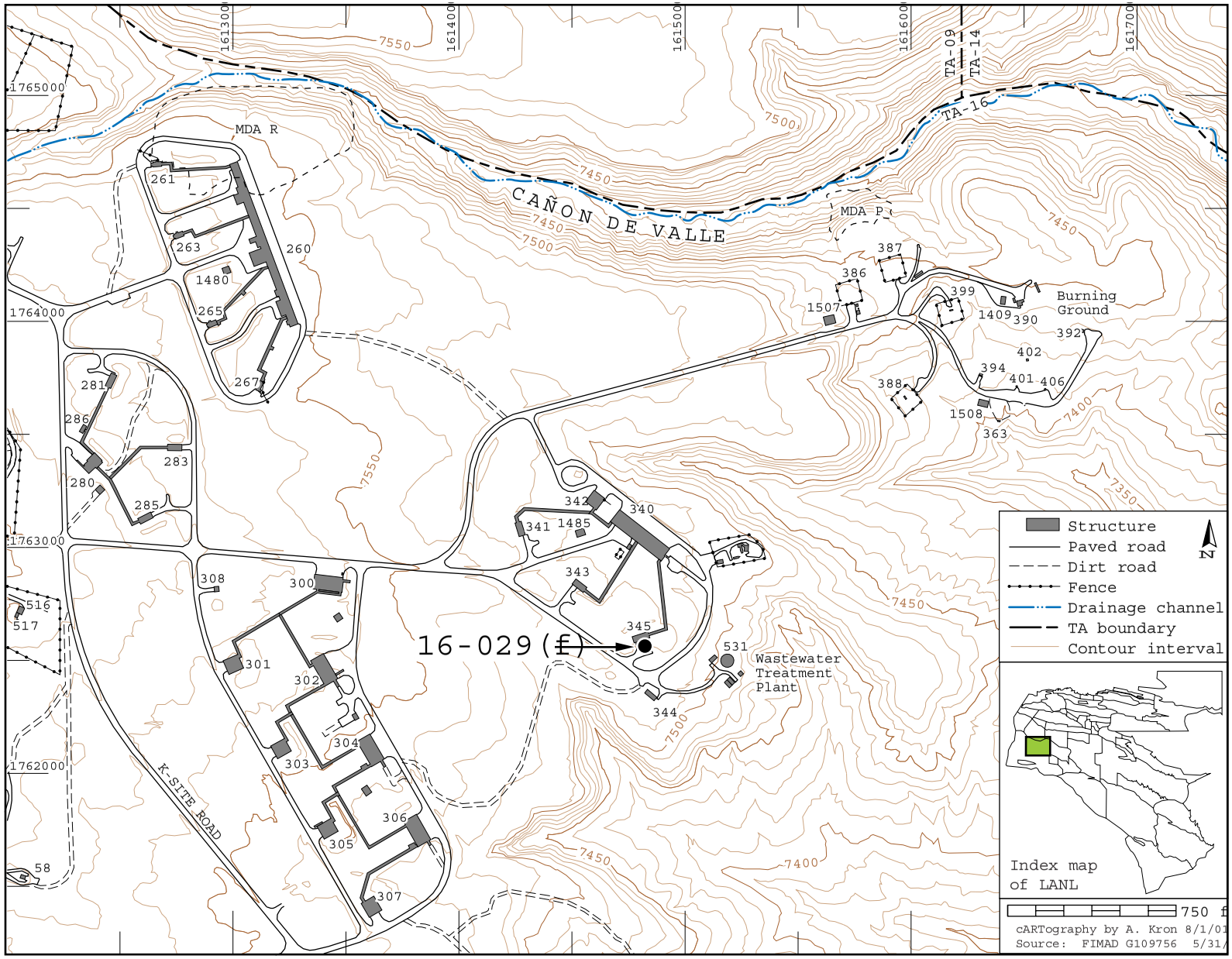
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU16-029(f)**




Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval

N

Index map of LANL

750 f

cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *SWMU 16-029(g)-99 — Outfall/effluent discharge - physical/chemical treatment units - soil contamination*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1953-mid 1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-029(g)-99 consists of former SWMUs 16-021(a), 16-028(e), and 16-029(g). The consolidated SWMU includes the former location of an HE sump [former SWMU 16-029(g)], drainline, and outfall [former SWMU 16-021(a)] associated with a materials-testing laboratory (Building 16-450). Building 16-450 was constructed in 1953 to house electroplating operations, although those plans were later revised. The building may have been used as a chemical engineering laboratory and a paint shop, and more recently the building functioned as a materials-testing laboratory. The sump received wash-down water from floor trenches and discharged to NPDES-permitted Outfall 04A091, which was removed from LANL's NPDES permit effective September 19, 1997. The outfall discharged to Water Canyon. Discharges may have included metals, cyanide, acids, paints, solvents, and oils. The sump was removed by another LANL group in 1997. Suspect contaminants at the outfall were identified as HE, inorganic chemicals, and organic chemicals. Former SWMU 16-028(e) is potentially contaminated soil associated with the outfall.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted an RFI at former SWMU 16-021(a) in 1997 to confirm the location of the outfall and to determine if a release had occurred from the drainline, resulting in contamination. The location of the outfall was confirmed by the presence of broken pieces of VCP. Two sample holes were dug: one at the mouth of the outfall and one 5 ft downgradient from the outfall. Two samples were taken from each hole. In all, five laboratory samples (including a collocated QA/QC sample) were collected from the two locations. Samples were field-screened for organic chemicals, and all samples screened positive. Samples sent to the fixed laboratory were analyzed for organic and inorganic chemicals. Low concentrations of benzoic acid, p-isopropyltoluene, and trichloroethene were detected. Also, arsenic, copper, mercury, and zinc were detected. Because of the very low levels of compounds found during analysis, the RFI report recommended former SWMU 16-021(a) for NFA.

The ER Project performed an institutional interim measure at former SWMU 16-029(g) in 1997. In association with construction required for a project located at a process building (Building 16-450) a LANL group, ESA-TSE, removed the sump that was former SWMU 16-029(g), and the ER Project sampled the soil around and below the sump. In 2000, the site was permanently seeded and mulched, and straw wattles were installed as a BMP.

Former SWMU 16-028(e)was recommended for NFA in Addendum 2 of the OU 1082 work plan because it was addressed under former SWMU 16-029(g) in the 1993 OU 1082 work plan.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 9 | N/A | 3 |
| Inorganic chemicals | 20 | 14 | 2 |
| Radionuclides | 3 | 0 | 0 |
| SVOCs | 21 | N/A | 6 |
| VOCs | 5 | N/A | 1 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 1.71 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 0.178 mg/kg | N/A |
| | PETN | 113 mg/kg | N/A |
| Inorganic chemicals | Arsenic | 8 mg/kg | 0.39 mg/kg |
| | Chromium | 516 mg/kg | 210 mg/kg |
| SVOCs | Acenaphthylene | 0.06 mg/kg | N/A |
| | Benzo(a)anthracene | 5.1 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 5.9 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 7.4 mg/kg | 0.62 mg/kg |
| | Dibenz(a,h)anthracene | 0.8 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 2.6 mg/kg | 0.62 mg/kg |
| | Trichloropropane[1,2,3-] | 0.03 mg/kg | 0.0014 mg/kg |

## References

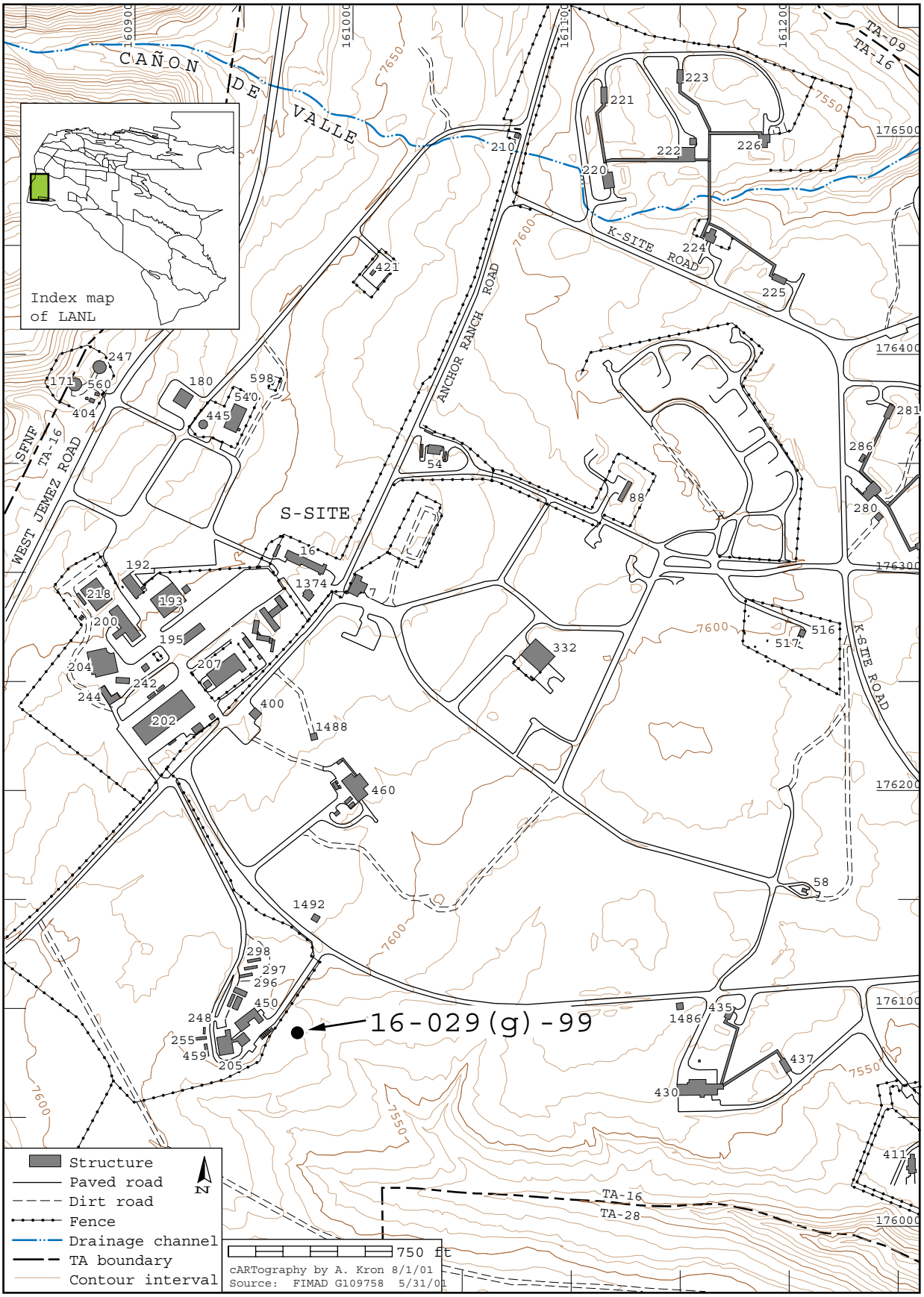

RFI Report for TAs -11, -13, -16: PRSs 11-012(a,b), 13-003(a), 16-006(c,d), 16-010(a), 16-021(a), 16-026(c,d,v), 16-028(a), 16-030(g) — LA-UR Number: 97-3072

Notification of Institutional Interim Measure at TA-16-450, PRS 16-029(g) (letter includes modification to 1993, OU 1082 Work Plan — LA-UR Number: N/A

RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU 16-029(g)-99, looking east**


CAÑON DE VALLE
Index map of LANL
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
WEST JEMEZ ROAD
SFNF
TA-16
TA-09
TA-28
16-029(g)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-029(h)-99 — Outfall/effluent discharge - physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-029(h)-99 consists of former SWMU 16-029(h) and former AOC 16-003(p). Former AOC 16-003(p) is an inactive HE sump, and former SWMU 16-029(h) is the associated drainline and outfall from Building 16-478. The sump measures 15 ft long x 5 ft wide x 4 ft deep. Building 16-478 is U-shaped and consists of a 15-ft x 17-ft x 10-ft machining room, a 12-ft-long x 16-ft-wide x 8-ft-high utility room, and a 34-ft-long x 13-ft-wide x 6.5-ft-high control room. The building was constructed in 1944, with additions in 1949. The sump and outfall are plugged. The outfall flowed into Cañon de Valle. Building 16-478 is a battleship bunker on the eastern end of TA-16 in an area formerly known as P-Site. P-Site was built to study implosions using x-rays and later was used to study initiators. Because of its remote location, P-Site also was used to machine experimental explosives. After a 1959 HE machining accident at Building 16-260 [consolidated SWMU 16-021(c)-99], Building 16-478 was used for remote HE-machining tests, specifically high-speed machining tests on experimental HE compounds for characterization purposes. The laminates were machined at Building 16-478 because their toxicity, radioactivity, and pyrophoric nature required a remote location. Such tests were performed approximately 15 times per year in the 1970s and 1980s. The sump is perpendicular to the south wall of the building. Two drainlines may be present. One drainline exits the southeast corner of the sump and was plugged in July 1987. It runs 80 ft east of the sump, where the 6-in. VCP daylights on the canyon rim. The other drain was reportedly a French drain that may have existed until the late 1960s. The drainline was believed to be an 8-in. cast-iron soil pipe connected to an 8-in. VCP. The drain was believed to extend about 125 ft to the south of Building 16-478 and to intersect an off-site drainage channel. Suspect contaminants at both former SWMUs are HE and uranium chips. When Addendum 2 of the OU 1082 work plan was written, Building 16-478 was used rarely and was scheduled for decommissioning. The building had been deactivated by turning off water and power to the structure. A limited sampling program conducted from 1970 to 1986 indicated potential HE contamination at the outfall.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed investigating the former SWMU and AOC in this consolidated unit to locate each drainline, determine its terminus, and sample the lines and termini. In addition, the work plan proposed sampling to determine the potential extent of contamination from historical releases.

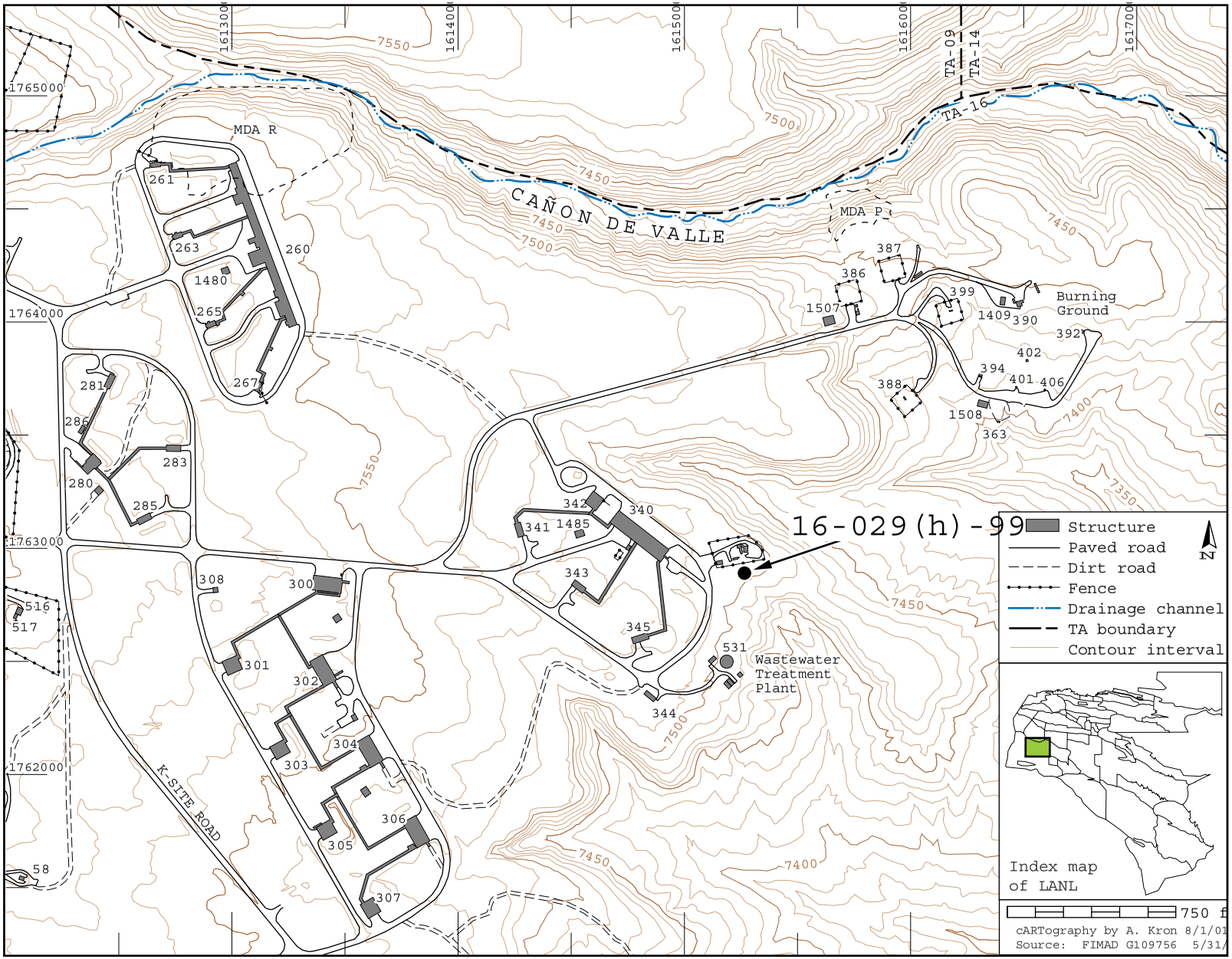
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-029(h)-99, looking east**


16-029(h)-99
CAÑON DE VALLE
MDA R
MDA P
TA-16
TA-09
TA-14
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
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283
280
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58
308
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302
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306
305
307
342
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1485
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531
387
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1507
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388
1508
363

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# *SWMU 16-029(h2)-99 — Facility/equipment - outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1948-late 1950s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-029(h2)-99 consists of potential soil contamination at former SWMUs 16-025(d), 16-025(g), 16-025(h), 16-025(i), 16-025(j), and 16-029(h2), 16-029(m), 16-029(n), 16-029(o), and 16-029(p). The consolidated SWMU includes the footprints of former HE-machining buildings (Buildings 16-95, -96, -97, and –98), including their sumps and drainlines, at the GMX-3 area. Operations within the GMX-3 area were devoted to developing techniques to produce HE lenses, the explosives components of a nuclear weapon, with high chemical purity and with accurate shapes. The HE-machining buildings in this consolidated SWMU are respectively known as "West," "North," "East," and "South," and they were located east of the 30s Line. They were of wood-frame construction on a concrete slab. Each building was 20 ft x 12 ft with a 20-ft x 6-ft porch and was equipped with garbage cans to collect HE pieces for disposal at the burning ground. Former SWMU 16-025(d) is former Building 16-94, the footprint of the decommissioned equipment control building, which sat in the center of the west-north-east-south configuration. Wooden-walled earthen barricades separated the other buildings from Building 16-94. The buildings were all built in 1948 and closed in 1959. Intentional burning in 1960 destroyed the buildings. Explosive residues were removed to TA-54, and noncombustibles were disposed of at MDA P (SWMU 16-018). The sumps and drainlines were removed in 1967.

Former SWMU 16-025(d) is the footprint of a decommissioned equipment control building (former Building 16-94). The 30-ft-square building with a 10-ft-square extension was almost identical in structure and removed at the same time as the other structures in this consolidated SWMU. The former building had no sump or plumbing.

Former SWMU 16-025(g) is the footprint of an HE-machining building (former Building 16-95). It was the western building in the consolidated SWMU configuration.

Former SWMU 16-025(h) is the footprint of an HE-machining building (former Building 16-96). Building 16-96 was the northern building in the consolidated SWMU configuration. The building was used for HE machining until Building 16-260, another machining building, was completed in the early 1950s.

Former SWMU 16-025(i) is the footprint of an HE-machining building (former Building 16-97), the eastern building in the consolidated SWMU configuration.

Former SWMU 16-025(j) is the footprint of an HE-machining building (former Building 16-98). Building 16-98 was the southern building in the consolidated SWMU configuration and stored containers for disposal of pieces of HE at the burning ground. The building was decommissioned as a machining building and converted to a coffee and smoking room.

Former SWMU 16-029(m) is the footprint of the sump, drainline, and outfall that served Building 16-95. Former SWMU 16-029(n) is the footprint of the sump, drainline, and outfall that served Building 16-96. Former SWMU 16-029(o) is the footprint of the sump, drainline, and outfall that served Building 16-97. Former SWMU 16-029(p) is the footprint of the sump, drainline, and outfall that served Building 16-98. Former SWMU 16-029(h2) is the footprint of the drainage system that connected many of the drainlines described above. A drainline flowed from the Building 16-98 sump to the sump for Building 16-97, then to the sump for Building 16-96, and finally to a manhole (structure 16-801). A second drainline exited the sump for Building 16-95 and flowed into the manhole (structure 16-801) and trended north beneath the 90s Line. The drainlines eventually discharged north of the site. Suspect contaminants are HE, inorganic chemicals, and organic chemicals.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted an RFI at former SWMU 16-025(d) in 1997. Eight surface and near-surface soil samples were screened for HE and radiation from four locations in the building footprint. One sample screened positive for HE, and all samples contained only background radiation activity. The sample with the highest concentration of HE was submitted for laboratory analysis of inorganic chemicals, organic chemicals, and HE. No elevated contaminant concentrations were detected. The RFI report recommended NFA at former SWMU 16-025(d) because contamination is not present at levels that present an unacceptable potential risk to human health.

The ER Project conducted an RFI at former SWMU 16-025(g) in 1997. Twelve surface and near-surface soil samples were screened for HE and radioactivity from six locations in and adjacent to the building footprint. One sample screened positive for HE, and all

samples contained only background radiation activity. Three samples, including the sample that screened positive for HE, were submitted for laboratory analysis of inorganic chemicals, organic chemicals, and HE. Copper was detected at slightly above BV. The RFI report recommended NFA at former SWMU 16-025(g) because contamination is not present at levels that present an unacceptable potential risk to human health.

The ER Project conducted an RFI at former SWMU 16-025(h) in 1997. Eleven surface and near-surface soil samples were screened from six locations in and adjacent to the building footprint. One sample screened positive for HE, and all samples contained only background radiation activity. Three samples, including the sample that screened positive for HE, were submitted for laboratory analysis of inorganic chemicals, organic chemicals, and HE. Lead and zinc were detected above BVs. Ten PAH compounds were detected in two samples; however, the levels were less than PRGs for industrial soils. Knowledge of operations suggests that PAHs were not used in processes at Building 16-96. The PAHs that were detected are frequently associated with asphalt and industrial operations; field notes from the RFI indicate that buried asphalt was present at this site and may have been in the collected samples. The RFI report recommended NFA at former SWMU 16-025(h) because contamination is not present at levels that present an unacceptable potential risk to human health.

Addendum 1 of the OU 1082 work plan proposed sampling at former SWMU 16-025(i) to detect surface HE contamination.

The ER Project conducted an RFI at former SWMU 16-025(j) in 1997. Ten surface and near-surface soil samples were screened for HE and radiation from five locations in the building footprint. All samples screened negative for HE and contained background radioactivity. Three samples were submitted for laboratory analysis of inorganic chemicals, organic chemicals, and HE. Lead and zinc were detected above background values. The RFI report recommended NFA at former SWMU 16-025(j) because contamination is not present at levels that present an unacceptable potential risk to human health.

Addendum 1 of the OU 1082 work plan and the VCM plan proposed sampling the sumps and the soils within the boundary of former SWMU 16-029(h2) to locate residual HE in the subsurface soil.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 6 | N/A | 4 |
| Inorganic chemicals | 22 | 15 | 1 |
| SVOCs | 12 | N/A | 1 |
| VOCs | 1 | N/A | 0 |

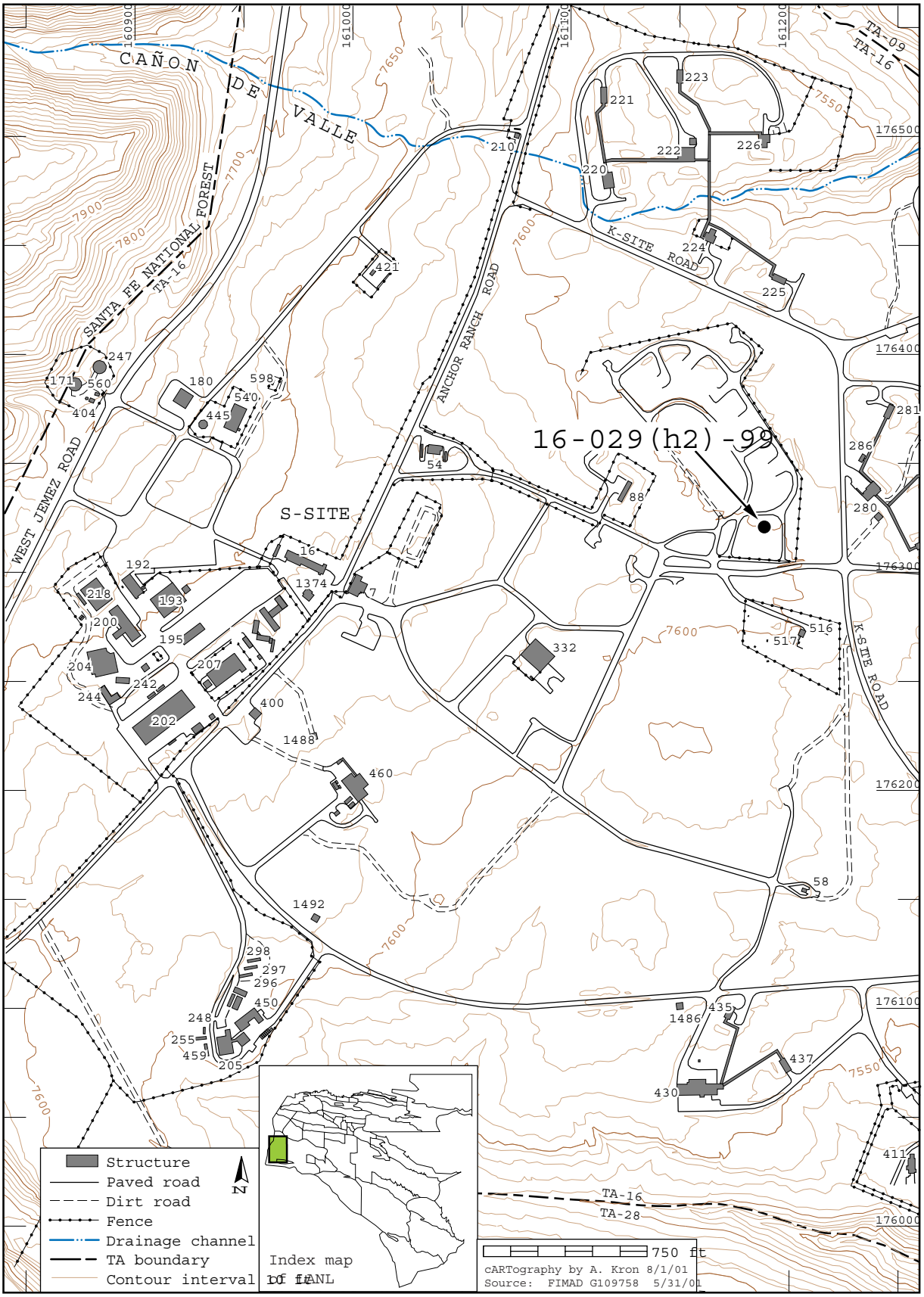
The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.58 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 1.3 mg/kg | N/A |
| | RDX | 1200 mg/kg | 4.4 mg/kg |
| | Trinitrotoluene[2,4,6-] | 650 mg/kg | 31 mg/kg |
| Inorganic chemicals | Arsenic | 5.1 mg/kg | 0.39 mg/kg |
| SVOCs | Benzo(a)pyrene | 0.08 mg/kg | 0.062 mg/kg |

## References

RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 LA-UR Number: 97-3770

**View of SWMU 16-029(h2)-99, looking east**


16-029(h2)-99
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
S-SITE
K-SITE ROAD
ANCHOR RANCH ROAD
WEST JEMEZ ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval of 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-029(j)-99 — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-029(j)-99 consists of former SWMUs 16-026(k2) and 16-029(j). The former SWMUs are areas of potentially contaminated soil associated with outfalls from inactive sumps and drainlines that serviced Bay 25 at Building 16-260, an HE-machining building located in the northeast quadrant of historical S-Site. S-Site was used for HE processing from 1944 to the early 1950s. In a 1971 sampling effort, barium contamination was found 200 ft northeast of Building 16-260. Suspect contaminants at these former SWMUs are HE, organic chemicals, and inorganic chemicals.

Former SWMU 16-026(k2) was an outfall that received wash-down water contaminated with HE from a floor drain and associated drainline in the hallway between the machining room in Bay 25 and the control room for Bay 25 in the southern portion of Building 16-260. The floor drain is located directly below a water hose that is used to wash down the bays. No other drains are located near bays in Building 16-260. The drain has not been plugged. The drainline, made of 4-in. VCP, daylights in a drainage ditch about 15 ft south of Building 16-260. The drainage ditch is connected by two culverts to the drainage ditches on the north side of a walkway (structure 16-271) and to the drainage ditch on the east side of the road. The ditches drain rainwater away from Building 16-260, but the drainage ditch is heavily silted and the corrugated metal culvert is barely visible.

Former SWMU 16-029(j) was an outfall that received wash-down water from cleaning activities in the control cubicle of machining Bay 25. The wash-down water was discharged from a concrete sump that was added to Building 16-260 in 1961. The sump measured 4 cubic feet and contained a 1-cubic-foot filter basket for collecting HE. The drain from the sump is a 2-in. cast-iron pipe. The drainline extends about 10 ft south from Building 16-260 and daylights into a grassy ditch 15 ft south of Building 16-260, the same ditch into which the drainline from former SWMU 16-026(k2) discharges. Use of the sump was discontinued in 1970. Although the drainline is not plugged, the cubicle is no longer used for HE patching operations.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

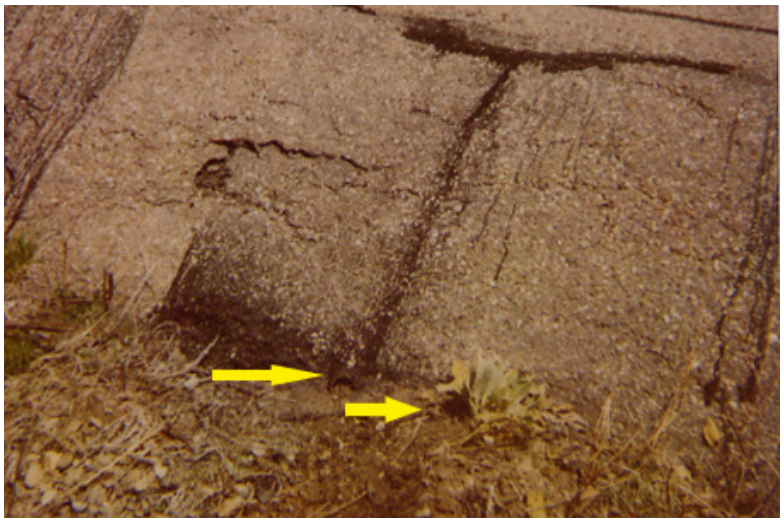
Addendum 2 of the OU 1082 work plan proposed sampling at these former SWMUs to detect potential HE contamination.

## ER Project Sampling Summary

No analytical samples were collected at this site.

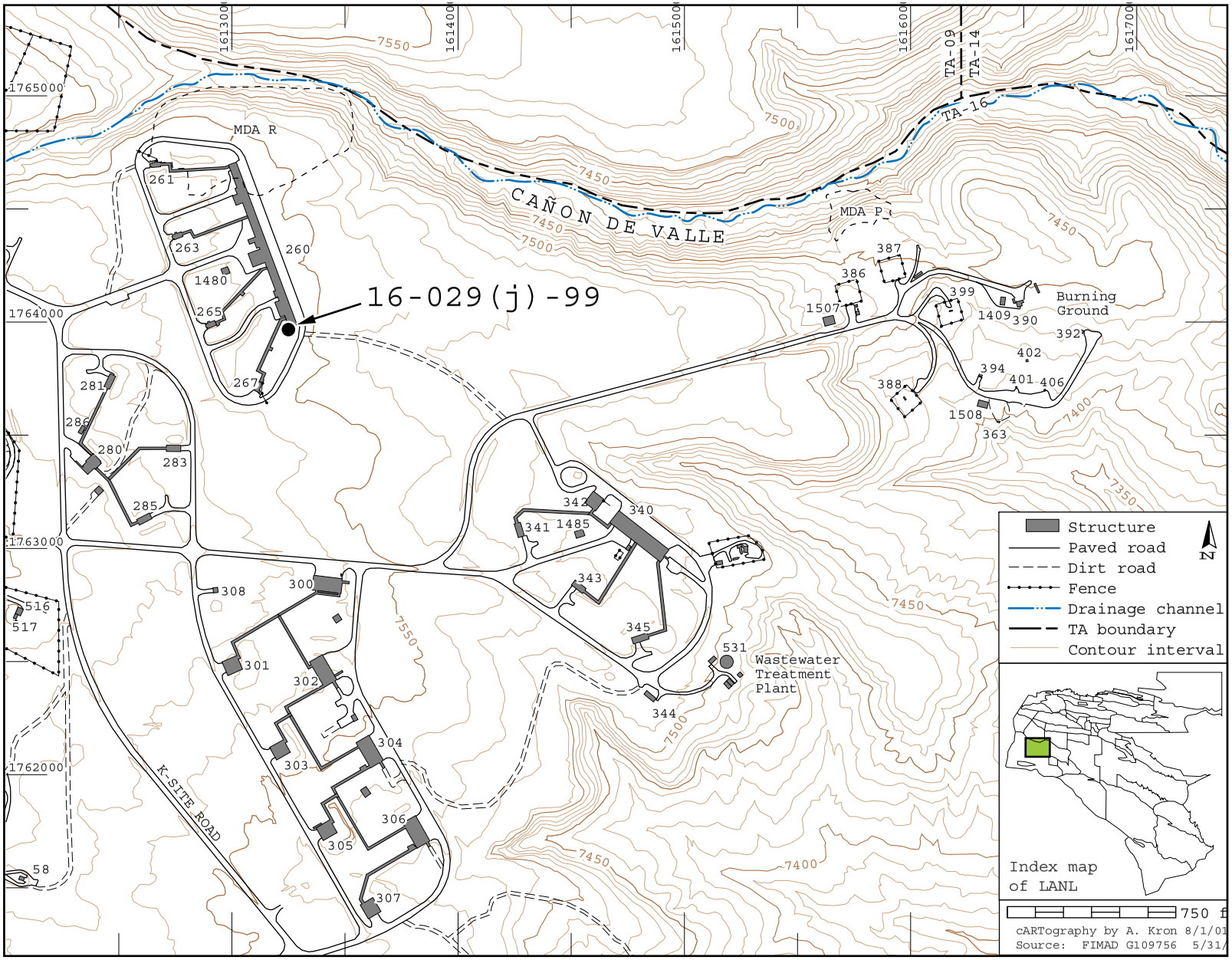
## References

RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038



**View of SWMU 16-029(j)-99, outfalls [former SWMUs 16-026(k2) and 16-029(j)]**

**View of former SWMU 16-029(j), sump**


16-029(j)-99
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-029(q)-99 — Container storage - outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1991 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-029(q)-99 consists of former SWMUs 16-017(f)-99, 16-029(q), and AOC C-16-064. The consolidated unit was part of the 90s Line. Operations in the buildings at this site initially were part of HE-processing operations in the post-World War II era S-Site complex that involved large quantities of HE.

Former SWMU 16-017(f)-99 is a former HE-machining building (Building 16-99). The 892-sq-ft building was made of wood on a concrete slab and was surrounded on three sides by an earthen berm that was packed against steel pilings. The building was completed in 1948, and riser-cutting activities were at maximum levels until mid-1951 when the modern HE-machining building (Building 16-260) was finished. Sometime during the late 1950s or early 1960s, Building 16-99 was converted to a storage facility. The building was taken out of service by 1991 and removed in 1996.

Former SWMU 16-029(q) consists of the location of an HE sump, drainlines, and an outfall associated with former Building 16-99. The sump was approximately 15 ft long x 5 ft wide x 5 ft deep. The drainlines were buried VCP leading from the sumps to the road, to depressions next to the road where the pipes daylighted, and to an open-air drainage channel. In the mid- to late 1960s, the sump was filled with gravel. Building 16-99, the sump, drainlines, and berms around Building 16-99 were removed during D&D operations in 1996.

Former AOC C-16-064 is the former location of a drum storage platform 50 ft southwest of a former HE-machining building (Building 16-99). The platform (structure 16-183) was built in April 1945. It was an 8-ft-square wooden structure elevated a few feet above ground surface on steel legs. The platform was used to store containers of HE scrap from the riser-cutting in Building 16-99. Structure 16-183 was decommissioned and flashed at the burning ground in 1968.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

In April 1996, following removal of surface and subsurface structures and contaminated soils within 2 ft of the sumps and drainlines by D&D (using the HE spot test to guide soil removal), the ER Project field-screened 35 samples within the building and drainage area footprint associated with former SWMU 16-029(q). Six samples were lateral bounding and six were vertical bounding. All samples were field-screened for HE, inorganic chemicals, organic chemicals, and radionuclides. Seven samples were submitted for laboratory analysis. HE and lead were detected at elevated levels, and the ER Project conducted a VCA to excavate contaminated soil. After the soil was excavated, eight confirmation samples were collected. Samples were analyzed for HE and organic chemicals. One sample was also tested for chromium(VI). Confirmation sampling results indicated that the VCA was successful. After the confirmation sampling analysis results were received, trenches from the excavated drainlines and sumps and the cleanup sites were backfilled with clean soil, compacted, and contoured to blend with the surrounding topography. The area was reseeded with native grasses. The VCA report proposed NFA for former SWMU 16-029(q) because the site has been remediated in accordance with applicable state and federal regulations.

The ER Project conducted a VCA at former AOC C-16-064 in August 1996. Eight field-screening samples were taken and screened for RDX/TNT, HE, organic chemicals, and radionuclides. Because elevated levels of HE were detected, two samples were taken for laboratory analysis. Those samples were analyzed for inorganic chemicals, organic chemicals, and HE. RDX was found at elevated levels, and the contaminated soil was excavated. Two confirmation samples were taken following the VCA. Samples were analyzed for inorganic chemicals, organic chemicals, and HE. Analysis indicated that the VCA was successful. The former AOC was backfilled with clean soil, compacted, and contoured to blend with surrounding topography. The area was reseeded with native grasses. The VCA report proposed NFA for former AOC C-16-064 because the site has been remediated in accordance with applicable state and federal regulations.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric

deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 6 | N/A | 3 |
| Inorganic chemicals | 23 | 16 | 2 |
| SVOCs | 2 | N/A | 0 |
| VOCs | 10 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.58 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 0.67 mg/kg | N/A |
| | RDX | 164 mg/kg | 4.4 mg/kg |
| Inorganic chemicals | Arsenic | 8.7 mg/kg | 0.39 mg/kg |
| | Iron | 24,100 mg/kg | 23,000 mg/kg |

## References

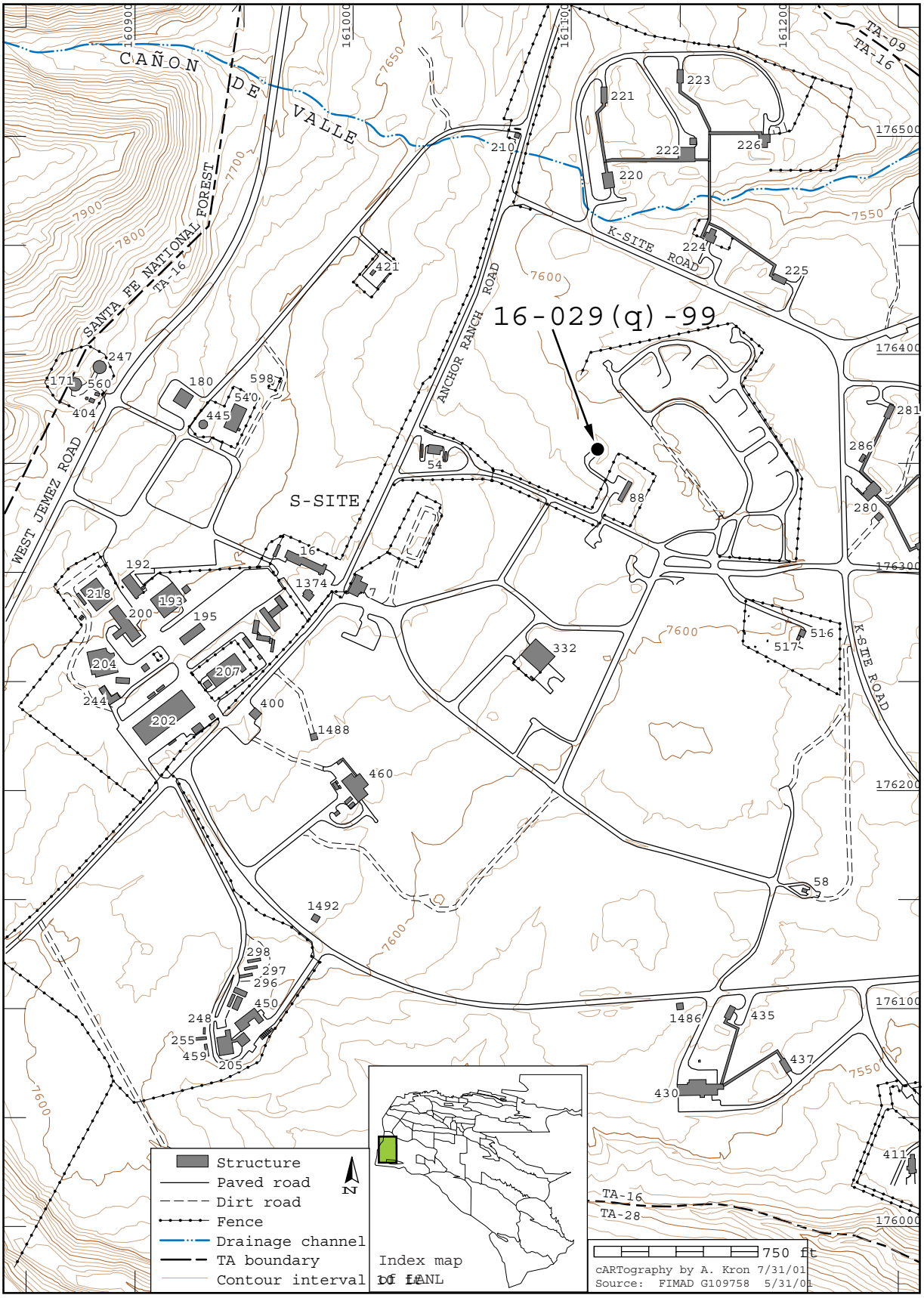

Voluntary Corrective Action Report for PRSs at TA-16, 90s-Line: PRSs 16-026(m,n,o,p), 16-029(k,l,q,s,t,u), C-16-064, C-16-067 — LA-UR Number: 96-3285

Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 — LA-UR Number: 97-640

Voluntary Corrective Action Plan for SWMUs 16-026(m,n,o,p), 16-029(k,l,q,s,t,u) — LA-UR Number: 96-623

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-029(q)-99**


16-029(q)-99
CAÑON DE VALLE
S-SITE
K-SITE ROAD
ANCHOR RANCH ROAD
WEST JEMEZ ROAD
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
7900
7800
7700
7650
7600
7550
176500
176400
176300
176200
176100
176000
161000
161100
161200
160900
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-029(v)-99 — Facility/equipment - outfall/effluent discharge - soil contamination*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | 16-49, 16-50, 16-51, 16-52 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-029(v)-99 consists of former SWMUs 16-025(a2), 16-025(b2), 16-029(d2), 16-029(e2), 16-029(v), and 16-034(o) and former AOC 16-015(d). The consolidated SWMU encompasses building footprints of former HE-processing buildings, sumps, and drainlines associated with the GMX-2 HE-processing buildings. The former structures are related to and located along or in close proximity to the GMX-2 HE-processing buildings. The structures in this consolidated SWMU were constructed in 1944 primarily for experimental HE research and development activities. No production-scale HE volumes were processed in this area. The GMX-2 area ceased to be used as an active site in the early 1950s. The structures were determined to be contaminated with HE before burning in 1960. Residual debris from burning and the remaining subsurface structures were cleaned up in 1966. Suspect contaminants at this consolidated SWMU are HE, inorganic chemicals, and organic chemicals.

Former SWMU 16-034(o) is an area of potentially contaminated soil associated with the former location of an experimental laboratory used to determine the properties of HE (Building 16-49). The building was L-shaped, and the dimensions of the two wings of the building were 30 ft x 33 ft x 12 ft high and 40 ft x 20 ft x 12 ft high. It was of wooden-frame construction with a concrete floor. A wide range of solvents was used in the experiments. The facility was cleaned each day, and wash-down water, including solvents and HE, was discharged to the sump.

Former SWMU 16-029(v) is an area of potentially contaminated soil associated with the former location of the sump, drainline, and outfall that served former Building 16-49. Lead-lined troughs were located along laboratory benches that drained into the sump. The sump was located southeast of the building, and the drainline ran along the south and east sides of the building to the sump. The sump discharged to the main GMX-2 drainage, which was located east of the southern GMX-2 area. A second drainline, with no sump, exited the building from the northeast corner. According to Addendum 1 of the OU 1082 work plan, the second drainline may have served a lavatory.

Former SWMU 16-025(a2) is an area of potentially contaminated soil associated with the former location of an experimental HE-casting building (Building 16-50). The building had two rooms that were separated by an earthen bunker; each room was 21 ft x 13 ft x 9 ft high. Building 16-50 was of wooden-frame construction with a concrete floor and had an earthen barricade on the west, north, and south sides.

Former SWMU 16-029(d2) is an area of potentially contaminated soil associated with the former location of two HE sumps, drainlines, and outfalls that served former Building 16-50. The sumps were located approximately 75 ft southeast of the building. The facility was routinely cleaned using high-pressure steam cleaning. Wash water was discharged to the sumps. Drainlines from the sump discharged to the main drainage that was east of the GMX-2 area.

Former AOC 16-015(d) is an area of potentially contaminated soil associated with the former location of a 7-cubic-foot decommissioned HE steam-cleaning building (Building 16-51) that was located about 100 ft east of Building 16-49. It was made of wooden-frame construction on a concrete foundation.

Former SWMU 16-025(b2) is an area of potentially contaminated soil associated with the former location of an experimental casting facility (Building 16-52). The building had three sections that measured 15 ft square x 9 ft high, 11 ft x 15 ft x 9 ft high, and 23 ft x 15 ft x 9 ft high. The building was made of wooden-frame construction with a concrete floor and had a reinforced concrete divider in its southern portion. The southern portion of the building was separated from the rest of the structure by an earthen barricade. The entire building had an earthen barricade on the west, north, and south sides.

Former SWMU 16-029(e2) is an area of potentially contaminated soil associated with the former location of three sumps, drainlines, and outfalls that served former Building 16-52. The sumps were located about 75 ft southeast of the building. Drainlines from the sumps discharged to the main drainage east of the GMX-2 area.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Addendum 1 of the OU 1082 work plan proposed sampling at former SWMU 16-025(a) and former SWMU 16-029(d2) to detect surface and subsurface HE contamination, respectively.

The ER Project conducted an RFI at former SWMU 16-025(a2) in 1997. Minimal contamination was found.

Addendum 1 of the OU 1082 work plan proposed sampling at former SWMU 16-025(b2) and former SWMU 16-029(e2) to detect surface and subsurface HE contamination, respectively. The ER Project conducted an RFI at former SWMU 16-025(b2) in 1997. Twelve surface and near-surface samples were screened for HE and radiation from the door locations, building center, and quadrants of the former building. Two samples were submitted for laboratory analysis based on positive HE screening results. The samples were analyzed for inorganic chemicals, organic chemicals, and HE. No elevated chemical concentrations were found, and the RFI report recommended NFA at former SWMU 16-025(b2) because contamination is not present at this site at levels that present a potential human health risk.

The work plan proposed sampling at former SWMU 16-034(o) and former SWMU 16-029(v) to detect surface and subsurface HE contamination, respectively.

Addendum 1 of the OU 1082 work plan proposed sampling at former AOC 16-015(d) to detect surface HE contamination. The ER Project conducted an RFI at former AOC 16-015(d) in 1997. Minimal contamination was found.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 2 | N/A | 1 |
| Inorganic chemicals | 20 | 7 | 1 |
| SVOCs | 10 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

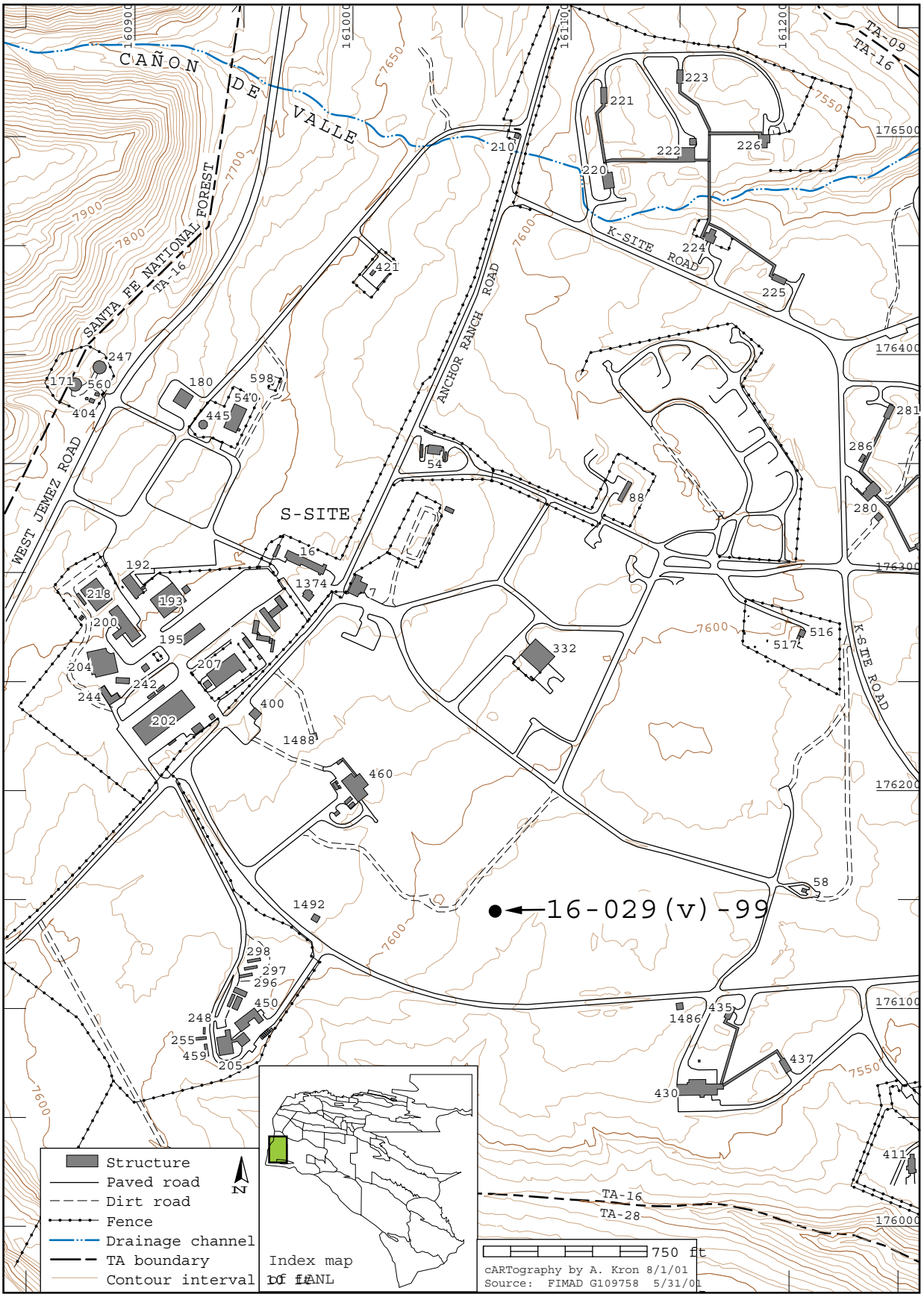
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | RDX | 5.79 mg/kg | 4.4 mg/kg |
| Inorganic chemicals | Arsenic | 3.4 mg/kg | 0.39 mg/kg |

## References


RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-029(v)-99, looking east**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-029(v)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-029(x)-99 — Facility/equipment - outfall/effluent discharge - subsurface liquid disposal - wastewater treatment plant/waste lines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1980 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-029(x)-99 consists of former SWMUs 16-006(g), 16-017(v)-99, 16-025(x), 16-029(w), 16-029(x), and 16-031(c). The consolidated SWMU is associated with former Building 16-515, an HE-processing building at V-Site (originally TA-25), and former SWMUs associated with a former electroplating laboratory (Building 16-100). The Building 16-100 sump drained to the sump system for Building 16-515, which was located at V-Site; hence the Building 16-100 sump is considered with the V-Site SWMUs. V-Site was built in 1944 to conduct tests involving handling, loading, shake-testing, and cold-testing mock-ups of the atomic bomb. V-Site was altered in 1945 to allow process work on explosive charges. TA-25 was absorbed into TA-16 at an unknown date. All active work at V-Site ceased by 1980. Structures at V-Site include an assembly bay, laboratory buildings, an equipment building, and a warehouse. All but two buildings at V-Site, Building 16-516, a high-bay assembly building, and Building 16-517, an equipment building (see consolidated SWMU 16-013-99), were destroyed in the May 2000 Cerro Grande fire. All former SWMUs in this consolidated unit were exposed to surface fires.

Former SWMU 16-017(v)-99 is potentially contaminated soil in the footprint of a former HE-processing building (Building 16-515) built in 1944 as part of TA-25. It was built as a warehouse but also housed a shop and a small office. The former building was remodeled in 1945 into a laboratory, inspection room, and repair area for HE parts. The laboratory had an x-ray machine and a darkroom. Parts of the walls near the x-ray machine were lead covered. The inspection and repair room floors were fitted on three sides with lead-lined troughs leading outside to the trough under the porch. The troughs were used to capture HE-bearing wastes from the casting room. Lead lining was used in the early days of TA-16 because lead does not react with TNT, the principal cast explosive used. HE residues within the building were washed out, and the wash water was directed into the troughs. The floor had a one-percent slope that drained effluent toward the troughs. Lead was removed from the troughs in 1950. HE casting occurred in the eastern end of the former building during the 1950s and 1960s. In 1963, the laboratory area was remodeled to include a temperature-cycling chamber. The building later was used as a warehouse. Suspect contaminants are photo-processing chemicals, metals associated with plating operations and other World War II-era V-Site operations, organic chemicals, HE, and uranium-238.

Former SWMU 16-006(g) is a decommissioned septic tank (structure 16-527) and its associated drainline and potentially contaminated subsurface soil. The tank was 6 ft long x 10 ft wide x 4.5 ft deep, had a capacity of 1500 gal., and was made of reinforced concrete with a wooden cover. The 4-in. drainline and the tank received effluent from the sinks and toilets in the southeast corner of former Building 16-515. The drainline discharged at a manhole (structure 16-795) to an outfall line that is described in the text of former SWMU 16-029(x). The septic tank, drainline, and the manhole (structure 16-795) were removed from service in 1970. The septic tank and drainline underwent D&D in 1997 and 1998.

Former SWMU 16-025(x) is potentially contaminated soil in the former location of an electroplating laboratory (Building 16-100), a 25-ft-long x 33-ft-wide wooden-frame building. Building 16-100 was relocated from TA-03 (where it was designated as structure 03-3) to TA-16 in 1949. It was set on concrete piers and had a utility room and a workroom. The building was located about 400 ft southwest of V-Site. In this building, HE charges were directly electroplated. Building 16-100 underwent D&D and was burned in 1960. Suspect contaminants were HE, inorganic chemicals, and organic chemicals.

Former SWMU 16-029(w) is potentially contaminated soil associated with the former HE sump, drainline, and outfall in Building 16-100, a former electroplating laboratory. The HE sump was 6 ft long x 14 ft wide and was located on the east side of the laboratory. The sump drained via a 4-in. pipe to a manhole (structure 16-796) and then to the V-Site outfall through former SWMU 16-029(x). The sump and drainline were removed in 1960.

Former SWMU 16-029(x) is potentially contaminated soil associated with the inactive HE sump and drainage system from former Buildings 16-515 and 16-100. Effluent flowed from two work areas into a trough to the drainline and on to the sump, which was located west of Building 16-515. Drainlines from the darkroom and utility room also discharged to the sump. The sump measured 4 ft long x 11 ft wide x 4 ft deep and had three chambers. The first chamber was fitted with a wire catch basket. Outflow from the final chamber discharged through a standpipe inlet 2 ft above the bottom of the sump, and then to a 6-in. VCP. During operations, the sump was routinely emptied, and the HE residues were burned at the TA-16 burning grounds. Drains from the darkroom and utility room in Building 16-515 entered the system within 50 ft of the sump. From the sump, a 6-in. VCP led through seven manholes (structures 16-793, 16-794, 16-795, 16-796, 16-797, 16-798, and 16-799). The drainline daylighted about 800 ft southeast of V-Site. Branch lines from a septic tank (structure 16-527) [former SWMU 16-006(g)] and Building 16-100 [former SWMU 16-025(x)] entered the system at structure 16-795, a manhole. The entire system drained into a low, level swale, then into a drainage ditch beside K-Site

Road. The sump and drainage system, including manholes, was scheduled to be demolished in 1970, but the demolition was never performed. Past employees reported that the boracitol casting, which was performed in former Building 16-515, caused dead trees in the outfall area of the drain system. A 1970 survey for hazardous material in the drainline found no toxic substances or radioactive contamination, but did find HE contamination. Suspect contaminants are photo-processing chemicals, metals associated with plating operations and other World War II-era V-Site operations, organic chemicals, HE, and uranium-238.

Former SWMU 16-031(c) is listed in the 1990 SWMU report as a drainline that received both sanitary and industrial waste from a former HE-processing building (Building 16-515). Engineering drawings indicate that all effluent from this structure entered the drain system described for former SWMU 16-029(x) above.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Concurrently with the D&D of the former structures in 1997 and 1998, an ER Project field team conducted a VCM at the site of former SWMU 16-006(g) and former SWMU 16-029(x). The objective of the VCM was to implement an accelerated cleanup in conjunction with D&D of the septic tank and drainline. The cleanup strategy for the site included sampling in appropriate locations to detect the presence of any contamination, to remove contamination if present at levels greater than PRGs, and to bound the spatial extent of contamination by determining decreasing trends in remaining contaminant concentrations. ER Project personnel documented the D&D activities and noted locations of cracks and broken joints along the drainline. These locations were flagged and sampled by the ER Project immediately following D&D in 1997, 1998, and 1999. Nine samples were taken from locations based on noted joints or breaks in the drainline. Samples were screened for HE, radioactivity, inorganic chemicals, and organic chemicals. Elevated levels of HE, silver, barium, chromium, and copper were detected. Radioactivity levels were less than two times background levels. Organic chemicals were not detected. On the basis of screening results, three samples were submitted for laboratory analysis for HE, boron, inorganic chemicals, organic chemicals, and uranium (analyses for boron were run because of the potential use of boracitol, a boron-containing explosive, at former Building 16-515). No inorganic chemicals were carried forward to the screening assessments because none was above LANL BVs and/or they were in the range of LANL BVs. Uranium results were higher than LANL's site-wide uranium BV but were below the proposed TA-16 local BV. Upon receipt of analytical results, two additional bounding samples were collected in March 1999 from beneath the former septic tank location and from 5 ft down drainage from that location to define a decreasing trend in contaminant concentration of uranium, HE, and organic chemicals. Samples were sent for laboratory analysis of uranium, HE, boron, and organic chemicals. Organic chemicals that were carried forward to the screening assessments include methylene chloride, HMX, RDX, tetrachloroethene, trichloroethene, and acetone. In the human health screening assessment, contaminants above BVs or EQLs were compared with EPA Region 9 PRGs for industrial workers. All potential contaminants were below PRGs; therefore, a human health risk assessment was not performed. An ecological screening assessment was conducted in which constituents whose maximum concentrations exceeded BVs or were detected below EQLs in samples collected at less than 5-ft depth were identified as potential contaminants. The potential contaminants were compared with a set of ESLs for nine ecological receptors at V-Site. All potential contaminants were eliminated as chemicals of potential ecological concern because a likely receptor exposure pathway could not be identified. On the basis of the human health and ecological screening assessments, the VCM report recommended NFA at SWMU 16-006(g). Low levels of organic contaminants remaining in the soil were bounded; that is, sampling data indicate that maximum concentrations at the source of contamination were removed and remaining contaminant concentrations diminish with distance from the removed source. Addendum 1 of the OU 1082 work plan proposed subsurface sampling at former SWMU 16-029(x) at the sump and at two of the seven manholes to detect suspect contaminants. Data collected for this former SWMU during the V-Site D&D and VCM (1997 to 1998) showed that the cleanup achieved the V-Site cleanup levels but did not achieve full nature and extent of contamination characterization, and did not pass the ecological screening assessment for all constituents; hence, this former SWMU was not included in the VCM report.

The ER Project conducted a VCM at former SWMU 16-025(x) in May 1997. Eight samples were collected and screened for HE and inorganic chemicals. RDX, barium, copper, and lead were detected in the screening samples. On the basis of screening results, three samples were submitted for laboratory analysis for inorganic chemicals, radionuclides, HE, and organic chemicals. Elevated concentrations of uranium, lead, and the PAHs anthracene, dibenzofuran, 2-methyl-naphthalene, fluorene, naphthalene, and phenanthrene were detected. None of the detected chemicals was present at a level that posed a human health risk, and the VCM report recommended former SWMU 16-025(x) for NFA.

Addendum 1 of the OU 1082 work plan proposed subsurface sampling at former SWMU 16-029(w) to detect residual metals and cyanide.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 5 | N/A | 4 |
| Inorganic chemicals | 25 | 22 | 1 |
| Pesticide/PCBs | 3 | N/A | 0 |
| SVOCs | 8 | N/A | 0 |
| VOCs | 9 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.81 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 1.9 mg/kg | N/A |
| | RDX | 5.3 mg/kg | 4.4 mg/kg |
| | Trinitrotoluene[2,4,6-] | 54 mg/kg | 31 mg/kg |
| Inorganic chemicals | Arsenic | 11 mg/kg | 0.39 mg/kg |

## References


Voluntary Corrective Measures Completion Report for Potential Release Sites 16-006(g), 16-005(d), 16-034(p) Drum Storage Aggregate - [16-029(g2) and C-16-074] V-Site — LA-UR Number: 99-3001

Addendum to the Voluntary Corrective Measures Plan for Potential Release Sites 16-005(d), 16-006(g,h), 16-017[Bldg. 27], 16-026(q), 16-029(g2,w,x), 16-031(c), C-16-074 (V-Site) — LA-UR Number: 98-2780

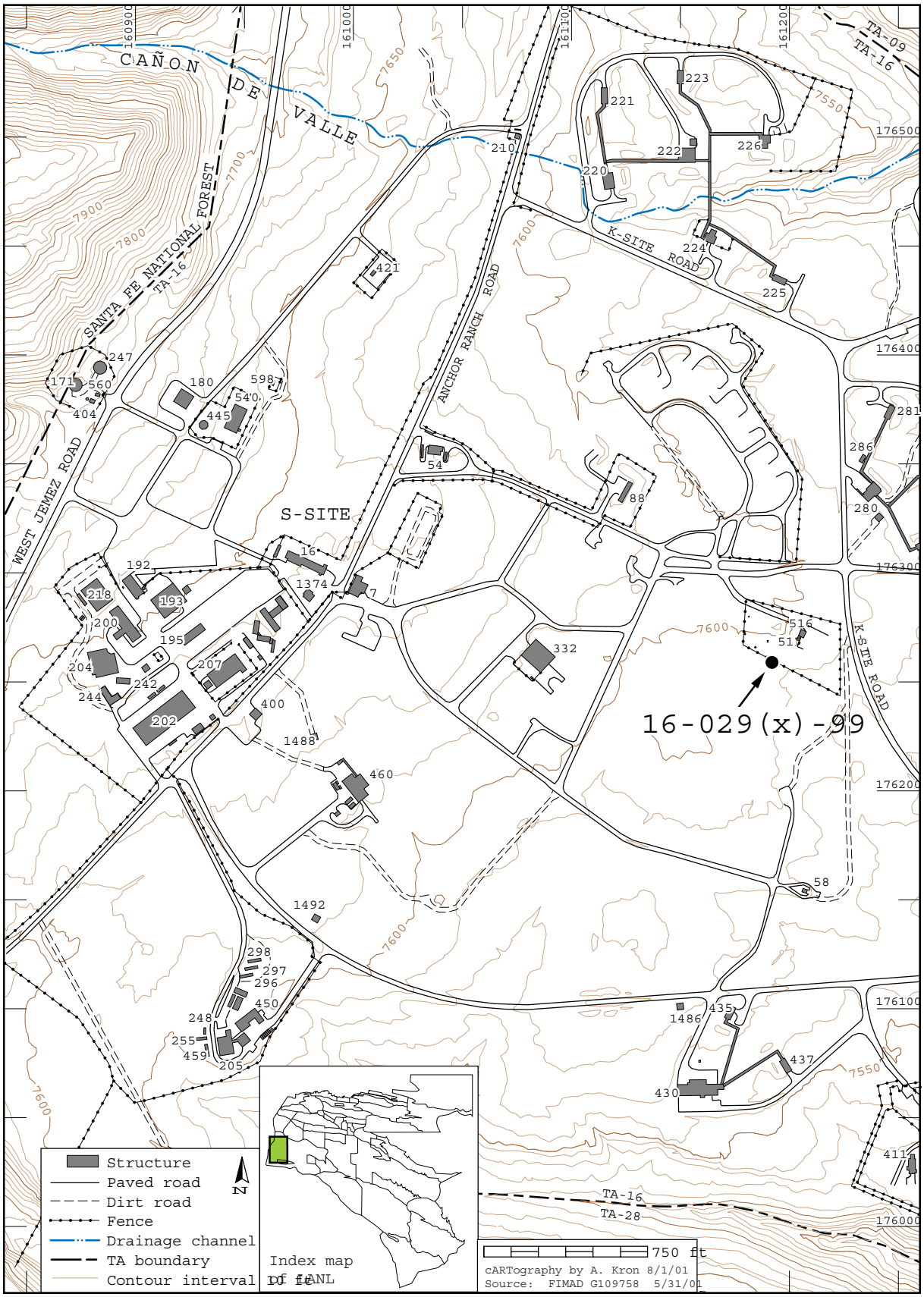
Voluntary Corrective Measures (VCM) Report for TA-16: PRSs 16-013, 16-025(x), 16-031(d), C-16-065, C-16-068 — LA-UR Number: 97-3677

Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 — LA-UR Number: 97-640

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-029(x)-99, looking southeast**

**View of SWMU 16-029(x)-99, looking southeast**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-029(x)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-029(y)-99 — Facility/equipment - outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950s |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-38 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-029(y)-99 consists of former SWMUs 16-025(t) and 16-029(y). The consolidated SWMU encompasses the building footprint of a former HE-processing building (Building 16-38), sumps, and drainlines associated with the GMX-2 HE-processing buildings. The former structures are related to and located along or in close proximity to the GMX-2 HE-processing buildings. The structures in GMX-2 were primarily built in the 1940s for experimental HE research and development activities. No production-scale HE volumes were processed in this area. The GMX-2 area ceased to be used as an active site in the early 1950s. Most of the structures in the GMX-2 area were intentionally destroyed by burning in 1960. Residual debris from burning and the remaining subsurface structures were cleaned up in 1966.

Former SWMU 16-025(t) is an area of potentially contaminated soil associated with the former location of a decommissioned HE milling, machining, and experimental casting facility (Building 16-38). It was reported that uncommon types of HE, including plumbatol and boracitol, were processed in this building. The rectangular building, built in 1944, was divided into four sections. Dimensions of the four sections were 30 ft x 32 ft x 12 ft high, 10 ft x 24 ft x 9 ft high, 10 ft x 15 ft x 10 ft high, and 10 ft x 15 ft x 12 ft high. A concrete two-bay partition was located in the south corner of the building. The building was of wooden-frame construction with a concrete foundation and a concrete floor. In a survey done in the 1950s, the building was determined to be contaminated with HE. It was destroyed by intentional burning in 1960.

Former SWMU 16-029(y) is an area of potentially contaminated soil associated with the former location of three sumps, drainlines, and outfalls that served former Building 16-38. Two outlets fed two sumps located on the southeast side of the building. The sumps fed a third sump that was located about 50 ft southeast of former Building 16-38. A drainline from this sump led southeast and daylighted beyond the road to former Building 16-57. According to a former site worker cited in Addendum 1 of the OU 1082 work plan, the sump had a French drain system downstream from the HE sump. More than 700 lb of HE were removed from the sump when it was decommissioned in the 1960s.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 1 of the OU 1082 work plan proposed sampling at former SWMU 16-029(y) to detect residual subsurface HE contamination. Addendum 1 of the OU 1082 work plan proposed sampling at former SWMU 16-025(t) to detect surface HE contamination.

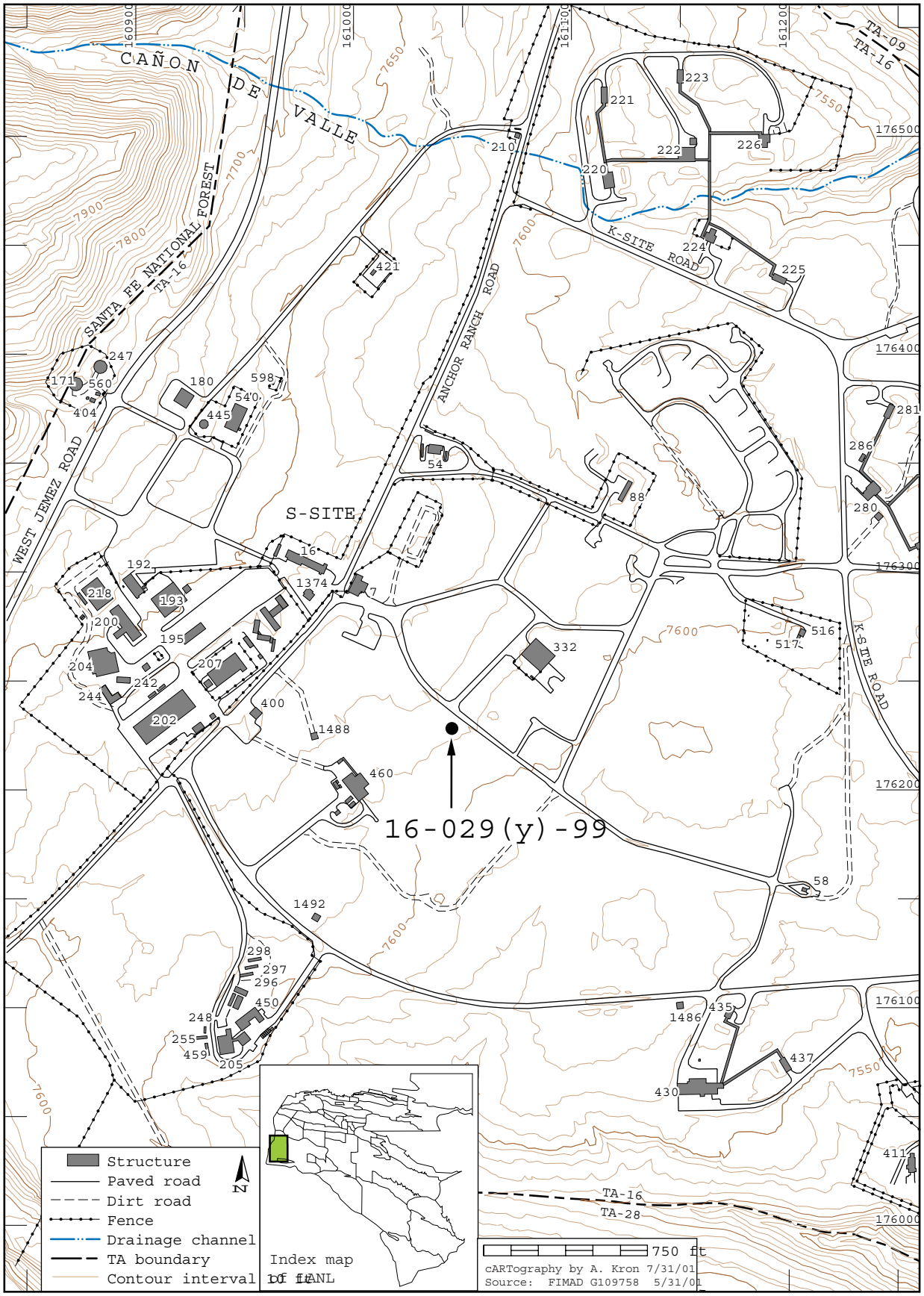
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-029(y)-99, looking northwest**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-029(y)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-029(z)-99 —Facility/equipment - incinerators/Thermal treatment units - outfall/effluent discharge - physical/chemical treatment units - subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1960s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-029(z)-99 consists of former SWMUs 16-005(c), 16-025(p), 16-025(q), 16-025(r), 16-025(s), 16-025(u), 16-025(v), 16-026(w), 16-029(z), 16-032(a), 16-034(l), 16-034(p) and AOCs 16-011 and 16-023(b). The consolidated SWMU encompasses the footprints of some of the former 40s Line HE-processing buildings and their associated sumps, septic tank, drainlines, and outfall systems; two former trash incinerators; one former equipment building; and a former radium source building. All of the former structures are related to and located along or in close proximity to the 40s Line of HE-processing buildings at GMX-3. Operations at GMX-3 were devoted to developing techniques to produce HE lenses, the explosives component of a nuclear weapon, with high chemical purity and with accurate shapes. The 40s Line contained several HE production facilities in a single line of buildings that were connected by enclosed walkways. The GMX-3 area is located in the central portion of the current S-Site complex. The structure footprints in this consolidated SWMU are bounded on the north by the 90s Line [consolidated SWMU 16-008(a)-99], on the east by a northeast-southwest road east of Building 16-27, on the west by the administration area, and on the south by the east-west road separating the GMX-2 and GMX-3 areas. All of the buildings in this consolidated SWMU had floor troughs that discharged to sumps and, except for Building 16-46, these fed a common outfall. Primary drainage in this region is eastward to a north-south ditch that empties into Water Canyon about 0.25 mi south of S-Site. In 1960, most of the 40s Line buildings were decommissioned, destroyed by intentional burning, and removed to the MDA P landfill. Sumps and drainlines were removed, and associated HE-contaminated soil was cleaned up to a residual level of 3 percent HE. All of the decommissioned structures in the 40s Line were surveyed for radiation, HE, and toxic chemicals before being burned. The survey results were negative unless otherwise noted below. Decommissioning of the buildings may have resulted in a layer of soil overlaying contaminated structure footprints.

Former SWMU 16-005(c) is a decommissioned 8-ft x 6-ft x 4-ft-deep septic tank (structure 16-176) and its drainlines that served lavatories in former Building 16-41 [see former SWMU 16-034(p) described below]. Building 16-41 contained an office and two lavatories but was physically separated from the HE-processing buildings of the 40s Line that it served. The tank was made of reinforced concrete and had a wooden cover. The tank discharged to a 4-in. VCP line leading to a leach field.

Former AOC 16-011 is a former incinerator (structure 16-412). The incinerator was placed over the utility basement at former Building former 16-41 in 1960 when the aboveground structure was removed, and the incinerator began operations in 1962. The utility basement is former SWMU 16-034(p), described below. The site at former AOC 16-011 included a steel incinerator cage, metal debris, ash, and soil. Paper and cloth suspected of being HE contaminated were burned in the incinerator. Suspect contaminants were HE, PAHs, inorganic chemicals, and ash debris.

Former AOC 16-023(b) is potentially contaminated soil associated with a decommissioned incinerator (structure 16-403). The incinerator burned paper and cloth that may have been HE contaminated. The incinerator was built in 1961 and was located in the partially enclosed portion of the F-shaped concrete blast shield that was originally part of former Building 16-43. The incinerator was used for approximately one year, at which time another incinerator (structure 16-412, former SWMU 16-011) was built as its replacement. The old incinerator (structure 16-403) was removed in 1966 or 1967. Suspect contaminants are PAHs, HE, and radionuclides.

Former SWMU 16-025(p) is potentially contaminated surface and subsurface soil associated with a HE-processing building (former Building 16-44). Building 16-44 was used to physically inspect completed charges and sift raw HE materials, removing metallic contaminants. It measured 20 ft x 60 ft and had a wooden floor. The floor was built on pillars and had troughs along the longer walls, which discharged to a sump [former SWMU 16-029(z) described below]. The sumps discharged to a common outfall. Building 16-44 was designated as HE contaminated in a 1959 survey.

Former SWMU 16-025(q) is potentially contaminated surface and subsurface soil associated with a former HE-processing building (Building 16-45). Building 16-45 was used for x-ray examination of HE lenses. It was a 20-ft x 60-ft wooden building with wooden floors on pillars. Building 16-45 had floor troughs along the longer walls, and those troughs discharged to a sump [former SWMU 16-029(z) described below]. The sump discharged to a common outfall. Building 16-45 was designated as HE contaminated in a 1959 survey.

Former SWMU 16-025(r) is potentially contaminated surface and subsurface soil associated with the footprints of a former rest house (structure 16-46) and the associated sump. Structure 16-46 was used to temporarily store HE products awaiting radiography in Building 16-45. Structure 16-46 was a 20-ft x 60-ft wooden rest house with wooden floors on pillars and had floor troughs along the longer walls, which discharged to a sump. The rest house was offset from the rest of the 40s Line and had an outfall that is included within the boundary of former SWMU 16-025(n), which is included in consolidated SWMU 16-034(b)-99.

Former SWMU 16-025(s) is potentially contaminated surface soil associated with a former radium source building (Building 16-48). The building measured 20 ft square x 14 ft high and was of wooden-frame construction with concrete floors. The source pit was in the floor. The building was found to be contaminated with HE and uranium-238 in the late 1950s.

Former SWMU 16-025(u) is potentially contaminated soil associated with the footprint of an HE-processing building (former Building 16-42). Building 16-42 housed HE casting operations and had a partial basement for utility service. In 1949, a control room was added on the east side and a new casting kettle was added on the west side. Building 16-42 had a concrete floor on pillars and measured 40 ft x 90 ft. The building had a lead-lined trough across three sides of the structure. The troughs discharged to a sump, which discharged to a common outfall. Building 16-42 was designated as HE contaminated in a 1959 survey.

Former SWMU 16-025(v) is potentially contaminated soil associated with an HE-processing building (former Building 16-43). The building housed experimental HE casting and/or machining operations. The building was 20 ft x 60 ft with a wooden floor that was built on pillars. The building had a cement partition in its north corner that was used as a blast shield for the building's machine tools. The building had a lead-lined trough across three sides of the structure. The troughs discharged to a sump, which discharged to a common outfall. Building 16-43 was designated as HE contaminated in a 1959 survey.

Former SWMU 16-026(w) consists of a drainline and outfall from the darkroom at former Building 16-45, a photo-processing laboratory. The drainline exited the building from its eastern wall. The location of the discharge point is uncertain. Building 16-45 was designated as HE contaminated in a 1959 survey.

Former SWMU 16-029(z) is potentially contaminated soil associated with the decommissioned sumps and drainlines exiting to the decommissioned secondary sumps that were located in former HE-Processing Buildings 16-42, 16-43, 16-44, and 16-45. This represents the principal HE drainage system for the 40s Line. [The secondary sumps are addressed under former SWMU 16-032(a) in this consolidated SWMU.] Suspect contaminants are HE, inorganic chemicals, and organic chemicals.

Former SWMU 16-032(a) is potentially contaminated soil associated with the secondary sumps for former Buildings 16-42, 16-43, 16-44, and 16-45 and the common drainline linking them. The sumps are located about 60 ft from the building footprints.

Former SWMU 16-034(l) is the footprint of former equipment and control building (Building 16-47). Building 16-47 was built in 1945 of wooden-frame construction with a concrete foundation and floor. It was 11 ft square x 8.5 ft high and was located about 10 ft south of former Building 16-46. The structure may have stored HE or HE-contaminated materials.

Former SWMU 16-034(p) was the foundation of former Building 16-41, a building that measured 17 ft x 30 ft x 14 ft high. Building 16-41 provided lavatories and office space on its ground floor. Utilities in the basement served other buildings in the area. Building 16-41 also served as a laboratory and may have been used to store compressors. In 1962, the building was removed, and a trash incinerator (former AOC 16-011 described above in this consolidated SWMU) was built in the basement. Former SWMU 16-034(p) includes the former basement foundation and associated soil. The incinerator was removed during a 1995 VCA.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Addendum 1 of the OU 1082 work plan proposed subsurface sampling at former SWMUs 16-005(c), 16-025(r), 16-025(u), and 16-025(v) to determine if HE contamination is present in the surface soils.

The ER Project conducted a VCA at former AOC 16-011 in 1995 to dismantle and dispose of the metal incinerator cage and remaining ash and soil debris. Two samples were collected from each of five locations at various depths in the incinerator pit. Samples were screened for HE and radioactivity; the screens were negative. Samples were analyzed for inorganic and organic chemicals. Lead was detected above regulatory action levels in the incinerator contents, which were disposed of off-site as D008 hazardous waste. Confirmation samples were not collected because all the soil, ash, and metal debris were removed, and the basement floor was intact. The VCA report requested DOE concurrence for NFA at former AOC 16-011.

Addendum 1 of the OU 1082 work plan proposed sampling to detect surface HE contamination within the building footprint of former SWMU 16-025(p) and the RFI sampling was completed in 1997. Minimal contamination was found.

Addendum 1 of the OU 1082 work plan proposed sampling to detect surface HE contamination within the building footprint, and RFI sampling at former SWMU 16-025(q) was completed in 1997. Minimal contamination was found.

The OU 1082 work plan proposed surface soil screening to detect HE and sampling to detect residual radionuclides. RFI sampling at former SWMU 16-025(s) was completed in 1997. Minimal contamination was found.

Addendum 1 of the OU 1082 work plan proposed sampling to detect residual silver in the subsurface in the outfall and drainage associated with former SWMU 16-026(w).

Addendum 1 of the OU 1082 work plan proposed sampling the primary sumps and adjacent drainlines to detect residual subsurface HE within the boundary of former SWMU 16-029(z).

Addendum 1 of the OU 1082 work plan proposed sampling the secondary sumps and adjacent drainlines to detect residual subsurface HE contamination at former SWMU 16-032(a).

The ER Project conducted an RFI at former SWMU 16-034(l) in 1997 to determine if contaminants were present in soils at levels of concern. Eight surface and near-surface soil samples from quadrants of the former building were collected and screened for HE and beta/gamma radioactivity. All samples screened positive for HE and showed only background radioactivity levels. The sample that contained the highest concentrations of TNT and RDX per the D-Tech kit was submitted for laboratory analysis of inorganic chemicals, organic chemicals, and HE. No contamination was detected above SALs. The RFI report recommended NFA at former SWMU 16-034(l) because contamination is not present at levels that present a potential human health risk.

The ER Project conducted a VCM at former SWMU 16-034(p) in 1998 and 1999 to investigate the former SWMU and to implement an accelerated cleanup in conjunction with D&D activities. Suspect contaminants were organic chemicals, inorganic chemicals (specifically barium and silver), and HE. D&D activities were conducted by ER Project personnel and consisted of removing and disposing of the concrete foundation of the former structure. Because of the anticipated difficulty of removing the foundation footings, which appeared to have been poured into trenches within the tuff, the field team determined that the footings would remain in place. Reinforcing metal and other metal items encountered during removal were placed in a roll-off container for recycling. Approximately 20 cubic yards of asphalt paving were removed. The asphalt was screened for HE and radioactivity, and three asphalt samples were submitted for waste characterization analysis. An exploratory trench was dug perpendicular to the foundation to investigate the extent of fill material. The team determined that the fill material had been used as part of the construction of the basement structure. A total of 22 samples were collected from 15 locations in a grid system from beneath the foundation of the former building and incinerator and along the entire extent of the building footprint. The samples underwent in situ and XRF screening. Thirteen of the samples were further screened for HE. Ten samples were further screened for PAHs. A total of 17 laboratory samples (excluding waste characterization samples) were collected and submitted for off-site laboratory analysis. Fourteen of the samples were selected from the screening samples based on screening results. Three of the laboratory samples were collected as vertical and lateral bounding samples on the basis of analytical results from the initial 13 laboratory samples. The samples were analyzed for HE, inorganic chemicals, organic chemicals, cyanide, and radionuclides. Samples collected in fill material immediately below the incinerator floor contained inorganic chemicals slightly above BVs: arsenic, cobalt, copper, lead, silver, zinc, calcium, barium, cadmium, manganese, mercury, selenium. Of the inorganic chemicals detected above BVs, calcium is not a hazardous constituent. The two bounding samples, which were collected below and beside the original sampling locations, did not contain inorganic chemicals above BVs; thus, all detected inorganic contaminants were bounded. HE and HE-degradation products were not detected in any samples. One organic chemical, pyrene, was detected but subsequent sampling at that location did not detect the presence of pyrene, thereby effectively bounding the pyrene contamination. No other organic chemicals were detected at former SWMU 16-034(p). In the human health screening assessment, contaminants above BVs or EQLs were compared with EPA Region 9 PRGs for industrial workers. It was determined that all contaminants were below the PRGs except for aluminum and arsenic. The original excavation for the basement floor was filled with select backfill to the ground surface, and the surface was revegetated. Exposure to a human receptor at this depth (10.3 ft to 10.8 ft) is improbable; therefore, a human health risk assessment was not performed. None of the potential contaminants were retained as potential ecological contaminants because no complete exposure pathway exists for the ecological receptors at former SWMU 16-034(p). Thus, the VCM report recommended NFA at former SWMU 16-034(p).

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 25 | 15 | 3 |
| Radionuclides | 1 | 0 | 0 |
| SVOCs | 11 | N/A | 4 |
| VOCs | 0 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 13.2 mg/kg | 0.39 mg/kg |
| | Cyanide (total) | 0.6 mg/kg | N/A |
| | Lead | 493 mg/kg | 400 mg/kg |
| SVOCs | Acenaphthylene | 0.12 mg/kg | N/A |
| | Benzo(a)anthracene | 0.84 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 0.76 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 1 mg/kg | 0.62 mg/kg |

## References


Voluntary Corrective Measures Completion Report for Potential Release Sites 16-006(g), 16-005(d), 16-034(p) Drum Storage Aggregate - [16-029(g2) and C-16-074] V-Site — LA-UR Number: 99-3001

RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

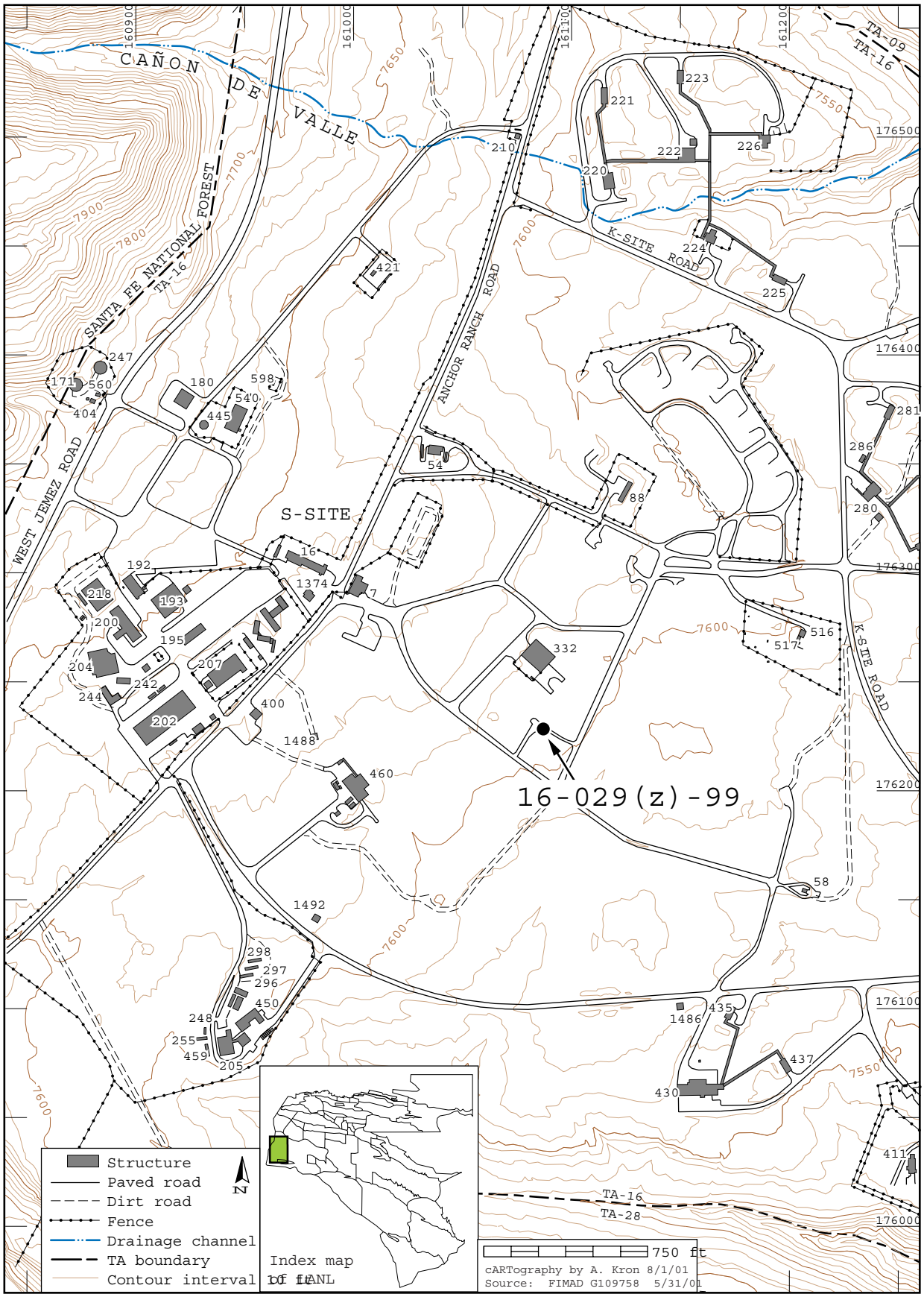
Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 — LA-UR Number: 97-640

Final Voluntary Correction Action Report for Non-HSWA: PRS 16-011 — LA-UR Number: 96-188

Voluntary Corrective Action Plans for PRSs, Group 4: Sites under Field Unit 3 at TA-16, S-Site: 16-011, 16-016(b,f); and Sites under Field Unit 3 at TA-33, HP Site: 33-016 — LA-UR Number: N/A

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-029(z)-99, looking east**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-029(z)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-030(a) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-030(a) is potentially contaminated soil associated with the outfall from a chemical storage building (Building 16-344). Building 16-344 was built in 1951 and is located in the southeast corner of P-Site. P-Site (historic TA-13) was decommissioned and incorporated into TA-16 in the 1950s. P-Site was constructed in 1944 to conduct flash x-ray studies of the implosion of HE test devices. Building 16-344 has three 5-ft-long x 2-ft-wide cement drain troughs that project through the south wall to a grassy, semicircular bermed area about 45 ft in diameter. The building consists of two rooms with floors that are sloped toward the troughs to direct floor drainage. The east room has container rack storage for solvents. The west room stores containerized inorganic chemicals, plastics, and inert materials such as barium nitrate. Secondary containment was installed in 1991 to block the cement troughs and to restrict chemical spills. Suspect contaminants at the outfall are inorganic and organic chemicals.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Addendum 2 of the OU 1082 work plan proposed sampling at the outfall for inorganic and organic chemicals.

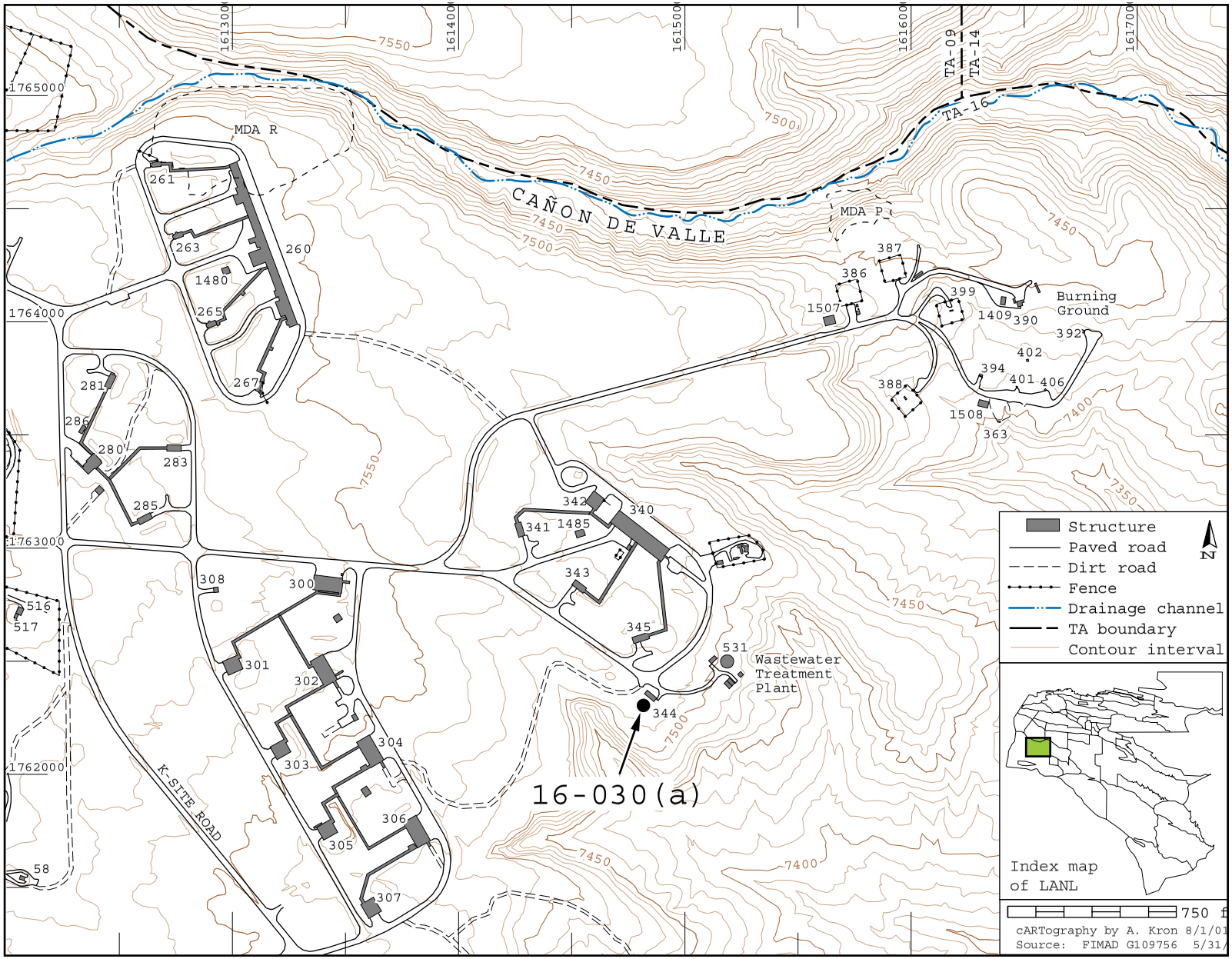
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-030(a)**


CAÑON DE VALLE
MDA R
MDA P
TA-16
TA-09
TA-14
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
16-030(a)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *SWMU 16-030(b) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1940s-1992 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-030(b) is an outfall and associated drainline that serves a single floor drain located in the utility room of an HE rest house (structure 16-343). From the late 1940s/early 1950s to the present, this rest house has functioned as a temporary storage area for packaged raw explosives being delivered to HE-processing buildings, for finished HE products ready for transport, or for scrap explosives being removed for disposal. The rest house contains an attached 4-ft by 8-ft utility room equipped with one steam pump and one small compressor, which are used to heat and ventilate the structure. The utility room has a single floor drain, which, until 1992, discharged low volumes of steam condensate through a 4-in. VCP to an outfall located approximately 90 ft from the rest house. Structure 16-343 is no longer used, and steam is no longer pumped to its utility room. This rest house is slated for D&D.

Since 1992, the practice at TA-16 has been to collect steam condensate in a 2.5- or 5-gal. bucket placed at the end of the condensate pipe and to allow the condensate to evaporate from the bucket. Before 1992, the outfall received only steam condensate from the heating and ventilating equipment located in the utility room of structure 16-343. The steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. The current practice (starting in January 1997) is not to use additives of any kind in the steam that heats the TA-16 buildings. There is no access to the utility room from the area of structure 16-343 used for storing HE components, because each utility room can be accessed only from outside of the structure. The floor of the utility room shows rust and mineral stains as typically result from the evaporation of condensed water. From the normal operation and maintenance of the compressor, small amounts of lubricating oil have been known to leak, and some oil staining is visible on the utility room floor. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less. Employee interviews indicate that since at least 1981, there have been no releases to the environment involving a utility room drain from a rest house.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

This SWMU was recommended for NFA in the RFI work plan, and there has been no additional investigation at this site.

## ER Project Sampling Summary

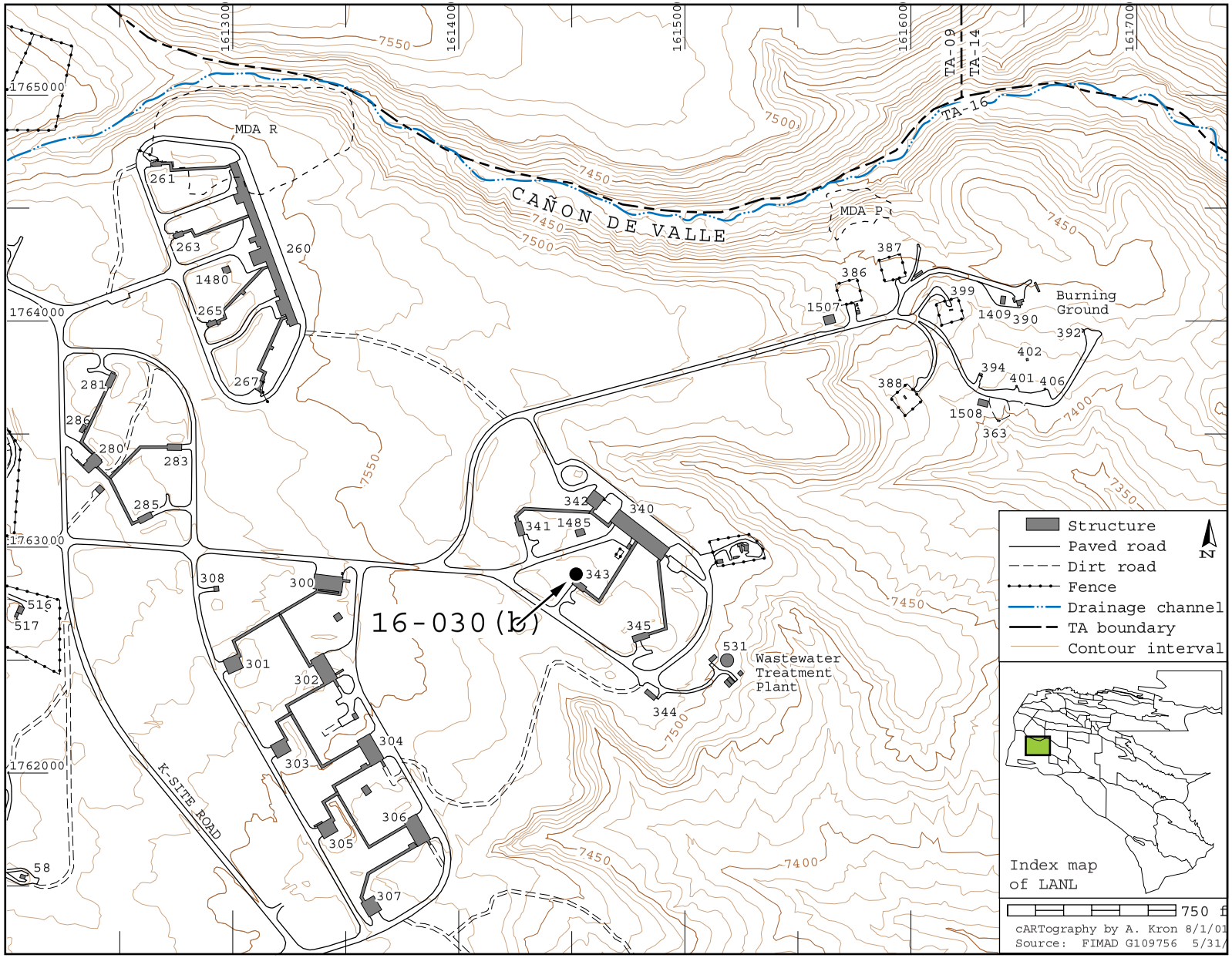
No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-030(b)**

**View of SWMU 16-030(b)**


CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
16-030(k)
161300
161400
161500
161600
161700
1765000
1764000
1763000
1762000
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
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58
308
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301
302
303
304
305
306
307
342
341
1485
340
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-030(c) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1953-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-030(c) is potentially contaminated soil associated with an outfall from an x-ray film-processing laboratory (Building 16-222) located in the center of the radiography area at TA-16. Building 16-222 was built in 1953. The only outfall that could be located in the vicinity of Building 16-222 originates from a roof drain downspout on the northwest side of the building, and four roof drains discharge to the downspout. The outfall associated with the x-ray film laboratory could not be located during a site visit.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The rewrite of Chapter 6 of the RFI work plan for OU 1082 recommended NFA at SWMU 16-030(c) because the outfall could not be located.

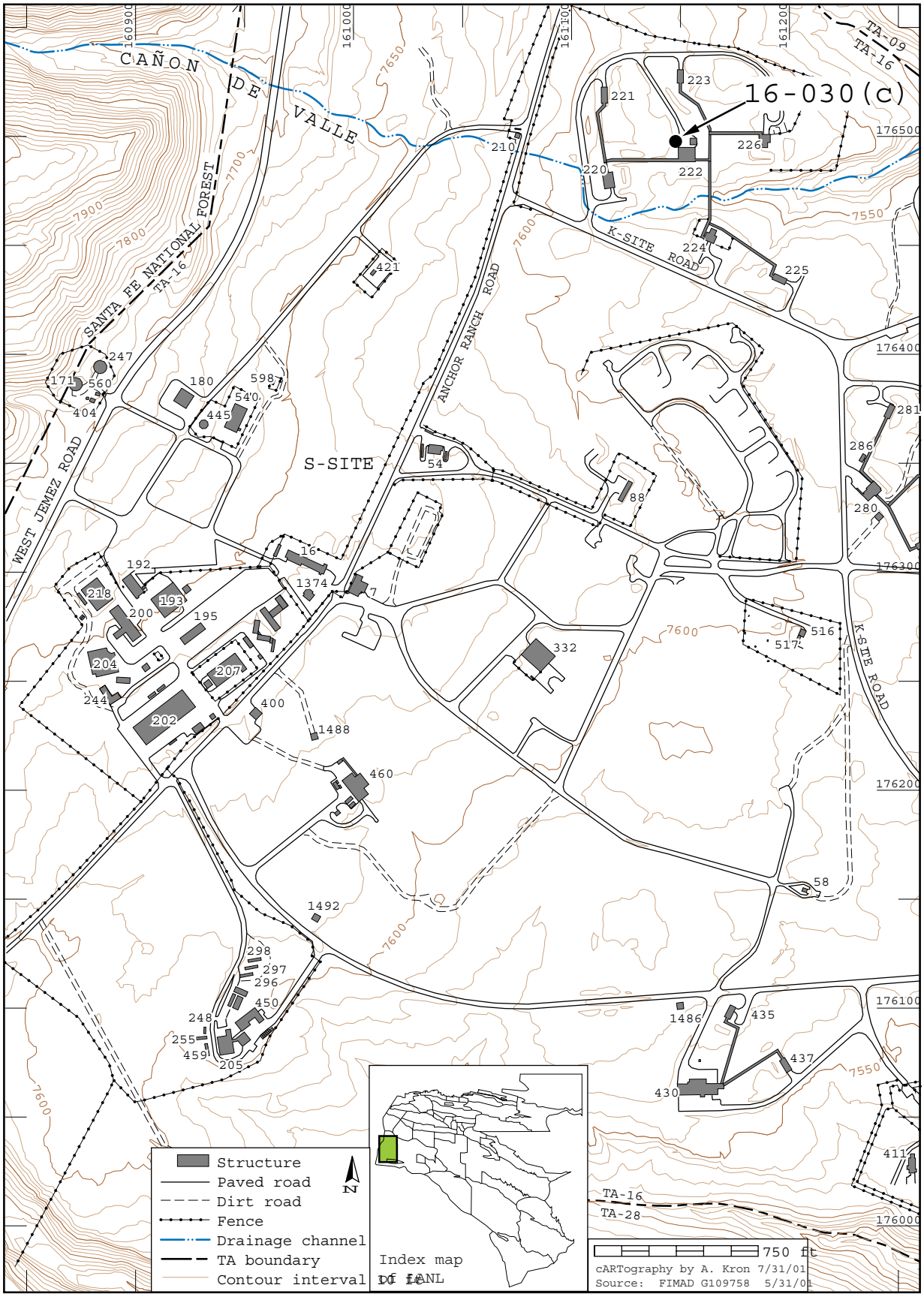
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |
| Los Alamos National Laboratory Proposal for 5 No Further Actions | LA-UR Number: 02-5883 |


**No photo; location unknown**


16-030(c)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
WEST JEMEZ ROAD
7900
7800
7700
7650
7600
7550
160900
161000
161100
161200
176500
176400
176300
176200
176100
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171
560
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225
281
286
280
54
88
16
1374
7
192
218
193
200
195
204
207
244
202
400
1488
460
332
516
517
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-030(e) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1940s-1992 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-030(e) is an outfall (and associated drainline) that serves a single floor drain located in the utility room of an HE rest house (structure 16-225). From the late 1940s/early 1950s to the present, this rest house has functioned as a temporary storage area for packaged raw explosives being delivered to HE-processing buildings, for finished HE products ready for transport, or for scrap explosives being removed for disposal. The rest house contains an attached 4-ft by 8-ft utility room equipped with one steam pump and one small compressor, which are used to heat and ventilate the structure. The utility room has a single floor drain, which, until 1992, discharged low volumes of steam condensate through a 4-in. VCP to an outfall located approximately 90 ft from the rest house.

Since 1992, the practice at TA-16 has been to collect steam condensate in a 2.5- or 5-gal. bucket placed at the end of the condensate pipe and to allow the condensate to evaporate from the bucket. Before 1992, the outfall received only steam condensate from the heating and ventilating equipment located in the utility room of structure 16-225. The steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. The current practice (starting in January 1997) is not to use additives of any kind in the steam used to heat the TA-16 buildings. There is no access to the utility room from the area of structure 16-225 used for storing HE components, because each utility room can be accessed only from outside of the structure. The floor of the utility room shows rust and mineral stains as typically result from the evaporation of condensed water. From the normal operation and maintenance of the compressor, small amounts of lubricating oil have been known to leak, and some oil staining is visible on the utility room floor. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less. Employee interviews indicate that since at least 1981, there have been no releases to the environment involving a utility room drain from a rest house.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

SWMU 16-030(e) was proposed for NFA in 2001 because no solid or hazardous waste or constituents were ever managed in the utility room of this building.

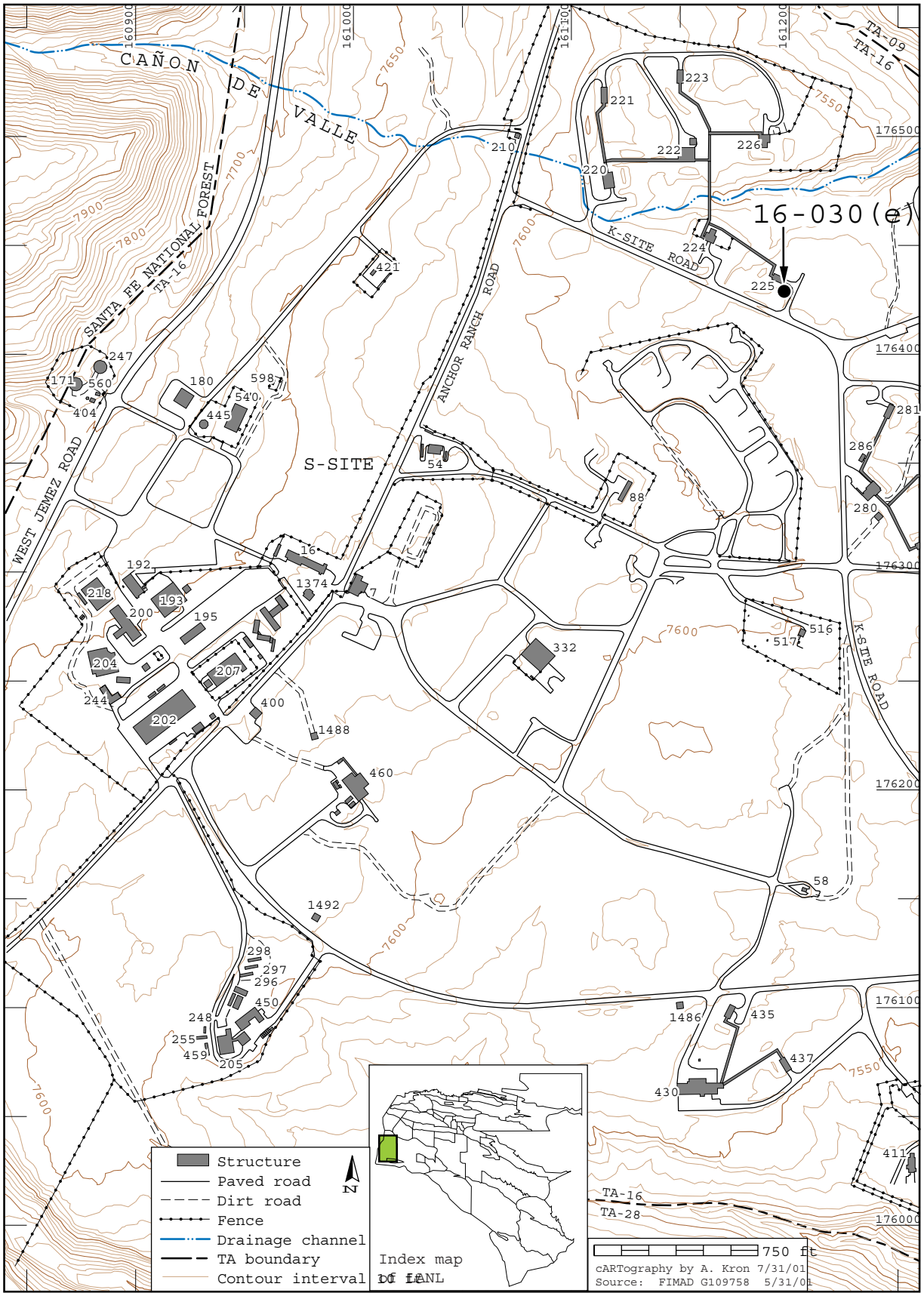
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-030(e)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
16-030(e)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-030(f) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1940s-1992 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-030(f) is an outfall (and associated drainline) that serves a single floor drain located in the utility room of an HE rest house (structure 16-223). From the late 1940s/early 1950s to 1992, this rest house has functioned as a temporary storage area for packaged raw explosives being delivered to process buildings, for finished HE products ready for transport, or for scrap explosives being removed for disposal. The rest house contains an attached 4-ft by 8-ft utility room equipped with one steam pump and one small compressor, which are used to heat and ventilate the structure. The utility room has a single floor drain, which, until 1992, discharged low volumes of steam condensate through a 4-in. VCP to an outfall located approximately 90 ft from the rest house.

Before 1992, the outfall received only steam condensate from the heating and ventilating equipment located in the utility room of structure 16-223. The steam condensate was composed of condensed water containing amine, an ammonia derivative commonly added to water to control pH and to prevent corrosion and mineral buildup within piping. The current practice (starting in January 1997) is not to use additives of any kind in the steam used to heat the buildings at TA-16. There is no access to the utility room from the area of structure 16-223 used for storing HE components, because each utility room can be accessed only from outside of the structure. The floor of the utility room shows rust and mineral stains as typically result from the evaporation of condensed water. From the normal operation and maintenance of the compressor, small amounts of lubricating oil have been known to leak, and some oil staining is visible on the utility room floor. The total capacity of lubricating oil (20-weight) for the compressor is approximately 0.5 quart or less. Employee interviews indicate that since at least 1981, there have been no releases to the environment involving a utility room drain from a rest house. Since 1992, structure 16-223 has no longer been used, and steam is no longer pumped to its utility room. This rest house is slated for D&D.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

This SWMU was recommended for NFA in the RFI work plan, and there has been no additional investigation at this site.

## ER Project Sampling Summary

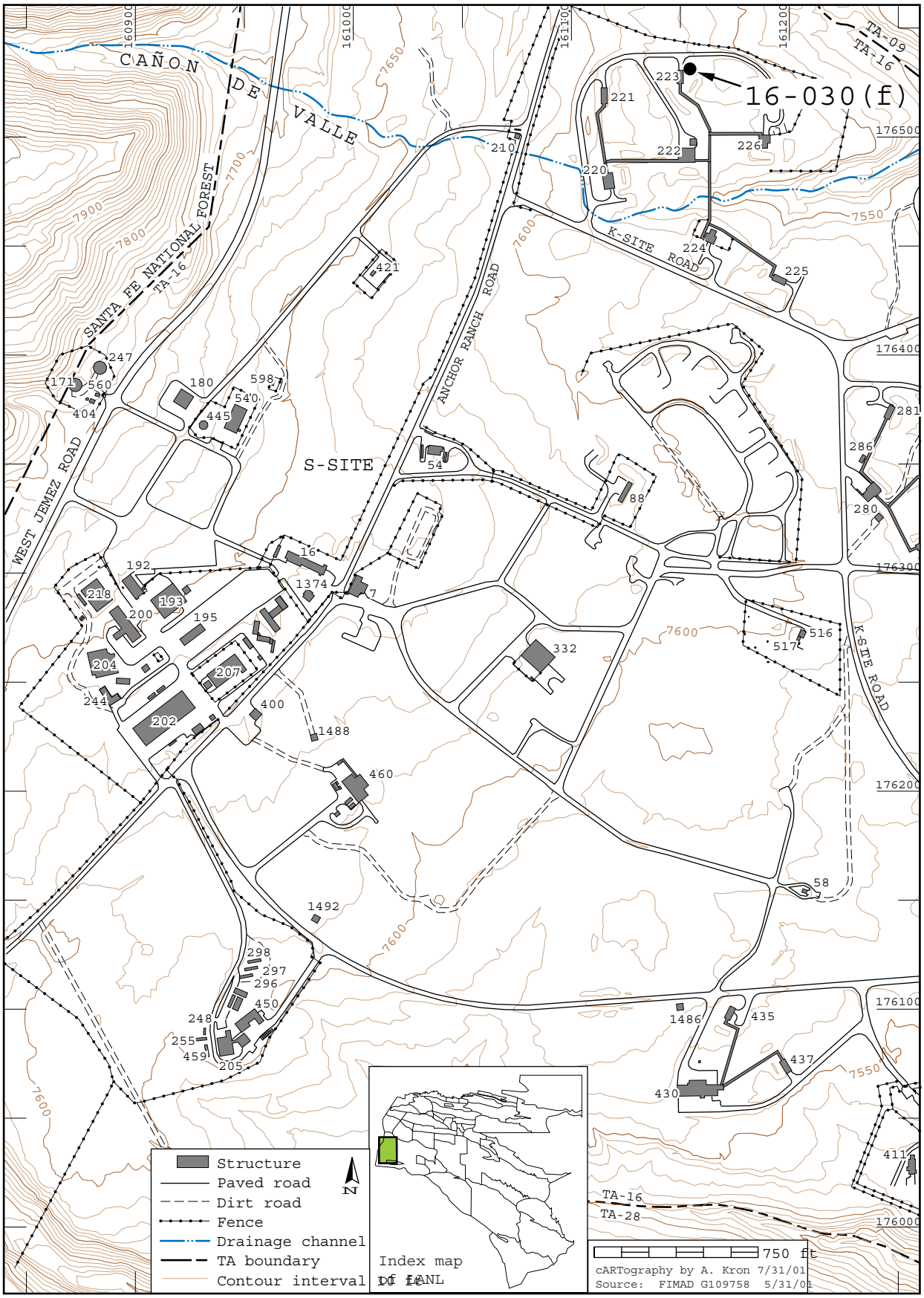
No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-030(f), looking south**

**View of SWMU 16-030(f), drain**


16-030(f)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
S-SITE
K-SITE ROAD
ANCHOR RANCH ROAD
WEST JEMEZ ROAD
7900
7800
7700
7650
7600
7550
161000
161100
161200
176500
176400
176300
176200
176100
176000
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-031(a) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1953-Unknown |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-031(a) is potentially contaminated soil below the outfall associated with a decommissioned cooling tower (structure 16-372), which served Building 16-370, a barium nitrate grinding facility and metal-forming shop [consolidated SWMU 16-006(c)-00]. The cooling tower, built in 1953, was made of wood and was located about 125 ft west of Building 16-370 on K-Site Road. The decommissioning date is not known; the cooling tower burned during the Cerro Grande fire in 2000. Chilled water from the cooling tower cycled through pumps and machinery located on the ground floor of Building 16-370. The 6-in. VCP originates from a drain inside the southeast corner of former structure 16-372 and runs approximately 150 ft south to the edge of Water Canyon where it daylights. Suspect contaminants are chromates, given the age and nature of the unit (e.g., cooling tower), although no documentation exists stating that chromates were used.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed sampling sediment traps between the outfall and the canyon wall to detect chromium contamination at SWMU 16-031(a). One sample was collected at this site in 1998 and submitted to the analytical laboratory for analysis of HE, organic and inorganic chemicals.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 22 | 6 | 1 |
| SVOCs | 8 | N/A | 3 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

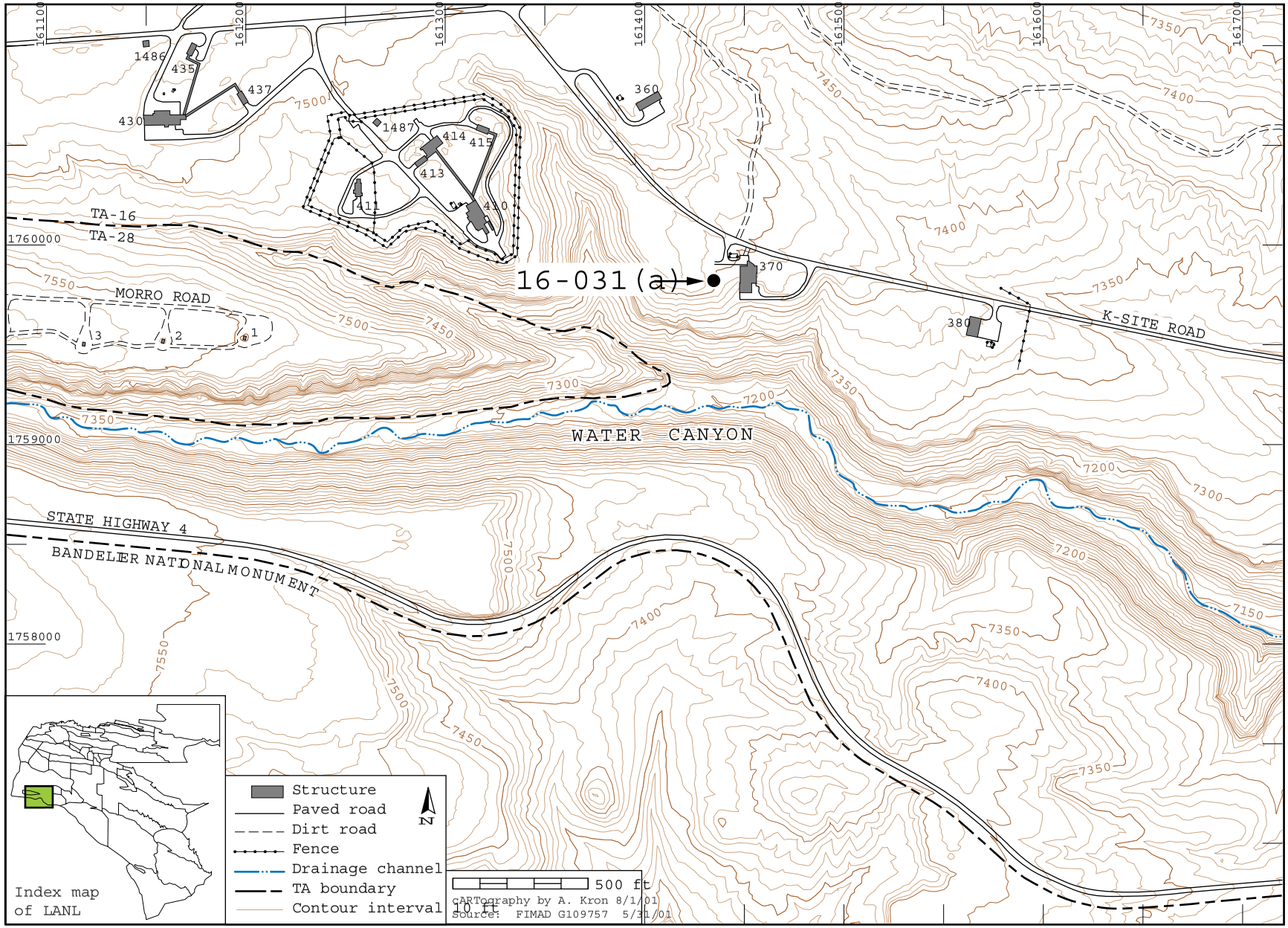
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 4.9 mg/kg | 0.39 mg/kg |
| SVOCs | Benzo(a)anthracene | 0.88 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 0.75 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 0.82 mg/kg | 0.62 mg/kg |

## References

RFI Work Plan for Operable Unit 1082, Addendum 2 LA-UR Number: 95-1038

**View of SWMU 16-031(a), outfall**

**View of SWMU 16-031(a), drainage**


16-031(a)
TA-16
TA-28
MORRO ROAD
K-SITE ROAD
WATER CANYON
STATE HIGHWAY 4
BANDELIER NATIONAL MONUMENT
1486
435
437
430
1487
414
415
413
411
410
360
370
380
1
2
3
7350
7400
7450
7500
7550
7300
7200
7150
161100
161200
161300
161400
161500
161600
161700
1760000
1759000
1758000
Index map of LANL
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
500 ft
10 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

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# *SWMU 16-031(b) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-1957 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-031(b) is potentially contaminated soil associated with the drain from a cooling tower (structure 16-262), which served an HE-machining building (Building 16-260). The cooling tower, built in 1946 at Building 16-42 and relocated to Building 16-260 in 1951, was located about 50 ft north of a walkway (structure 16-269) and 12 ft west of Building 16-260. It was made of wood and sat on a 3-ft-high concrete base. It was removed in 1957. The cooling tower's purpose is not known. Remains of the tower include a pile of rubble and two 2-in. cast-iron pipes that discharge into a drainage ditch. Suspect contaminants are chromates, given the age and nature of the unit (e.g., cooling tower), although no documentation exists stating that chromates were used.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed sampling to detect chromate contamination at the outfall drainage.

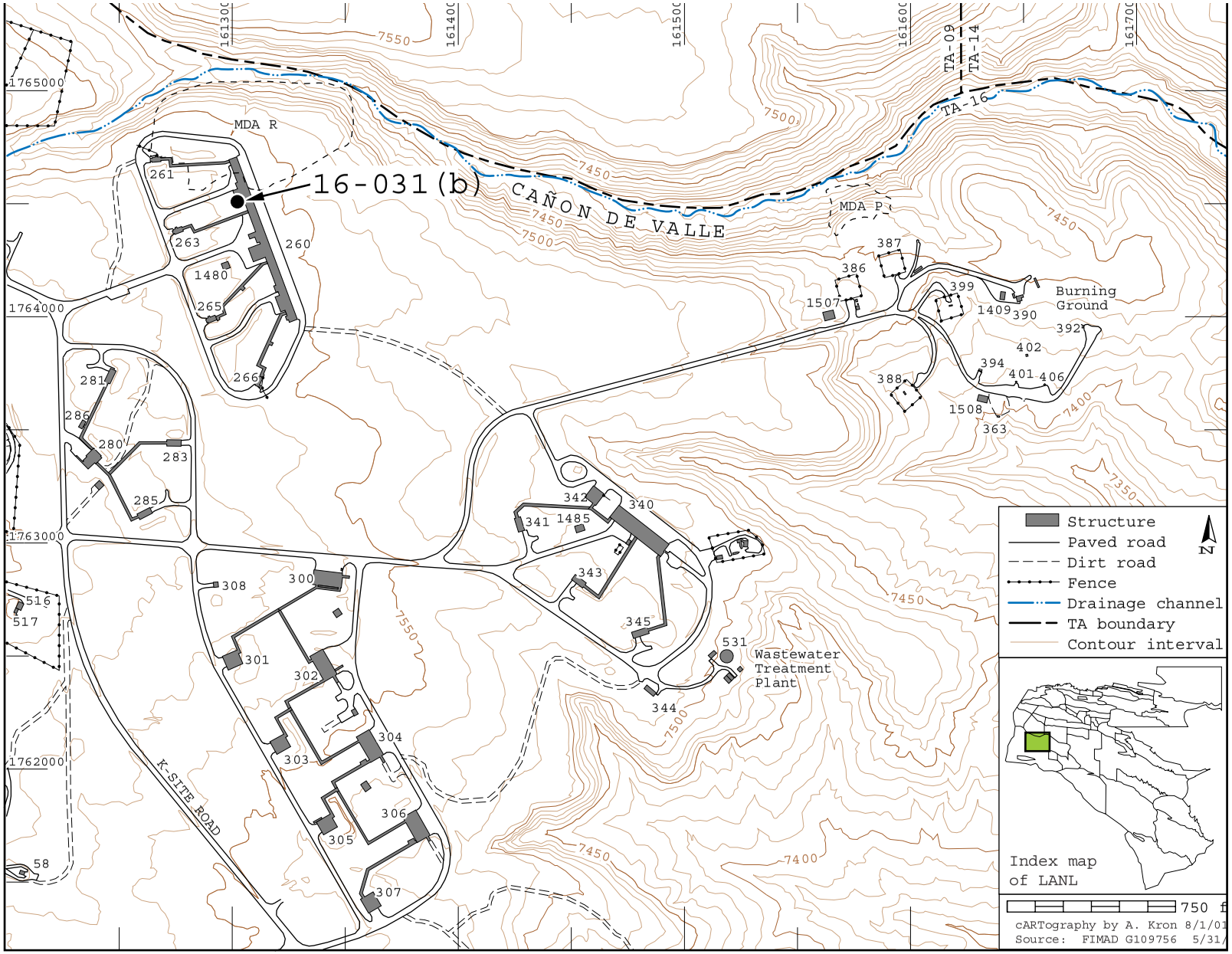
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-031(b)**


16-031(b)
CAÑON DE VALLE
MDA R
MDA P
TA-16
TA-09
TA-14
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
16130
16140
16150
16160
16170
7550
7500
7450
7400
7350
261
263
260
1480
265
266
281
286
280
283
285
516
517
58
308
300
301
302
303
304
305
306
307
342
340
341
1485
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *SWMU 16-031(e) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-031(e) is potential soil contamination associated with an outfall at the chlorination station for TA-16 (structure 16-560). It was built in 1952 in Water Canyon and was subsequently moved to its current site on West Jemez Road near the entrance to TA-16. The chlorination station is 11 ft long x 17 ft wide x 9 ft high. A concrete trench and floor drain on the structure's southwest corner discharges to the outfall. The trench is designed to drain leakage from water inlet and outlet lines. The chlorinator adds chlorine to the water as a gas, making any releases to the environment airborne. Water that might leak into the trench would be chlorinated drinking water or pump condensate. The outfall also receives drainage from a beam scale sump used to measure the amount of chlorine gas added to the water. The cast-iron drainline daylights approximately 40 ft southeast in the drainage ditch along West Jemez Road. No known historical releases are associated with structure 16-560.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The rewrite of Chapter 6 of the RFI work plan for OU 1082 recommended NFA at SWMU 16-031(e) because no hazardous waste and/or constituents are present at this site now, nor has the site ever been used to manage, generate, treat, store, or dispose of hazardous waste and/or constituents.

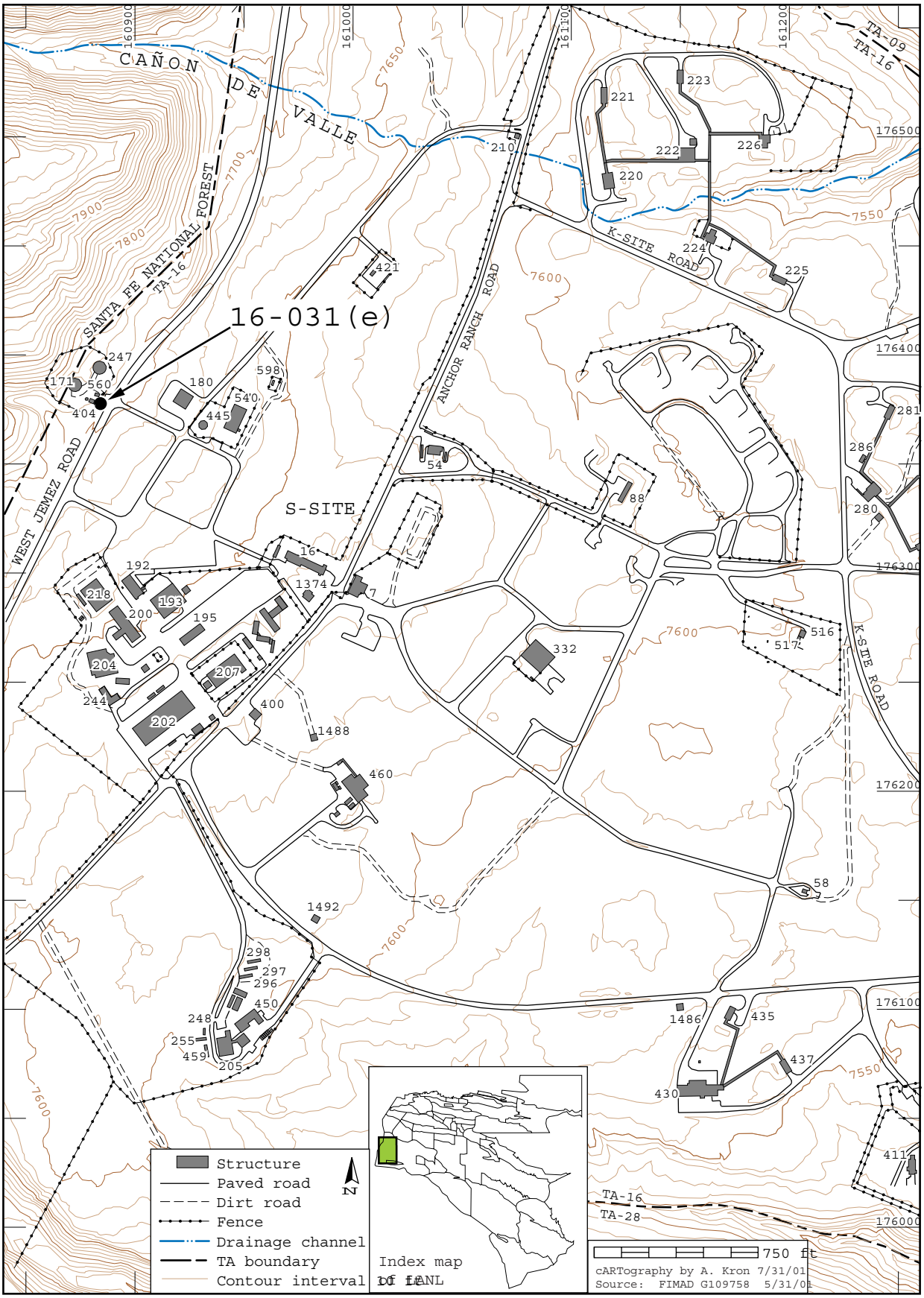
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-031(e)**


16-031(e)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
7900
7800
7700
7650
7600
7550
161000
161100
161200
176500
176400
176300
176200
176100
176000
247
171
560
404
180
598
54'0
445
421
210
221
223
222
226
220
224
225
281
286
280
54
88
16
1374
7
192
218
193
200
195
204
207
244
202
400
1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-031(f) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1953 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-031(f) is soil associated with an outfall from a decommissioned chlorination station (Building 16-21). Former building 16-21 was a wooden building built in 1944. It was 18 ft square and 10 ft high and was located in the old administration area of S-Site, approximately 30 ft southeast of the old cafeteria, Building 16-16. Building 16-21 was stripped of usable equipment in 1953 when the new chlorination station [Building 16-560, SWMU 16-031(e)] came online. Building 16-21 was removed in 1992 to make room for a telephone equipment building (Building 16-1374). The outfall received effluent from a line draining from the southeast corner of Building 16-21. Previously, the 4-in. VCP daylighted 26 ft southwest of former Building 16-21. There is now a parking lot covering the area of the former outfall.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The rewrite of Chapter 6 of RFI work plan for OU 1082 recommended NFA at SWMU 16-031(f) because no hazardous waste and/or constituents are present at this site now, nor was the site ever used to manage, generate, treat, store, or dispose of hazardous waste and/or constituents.

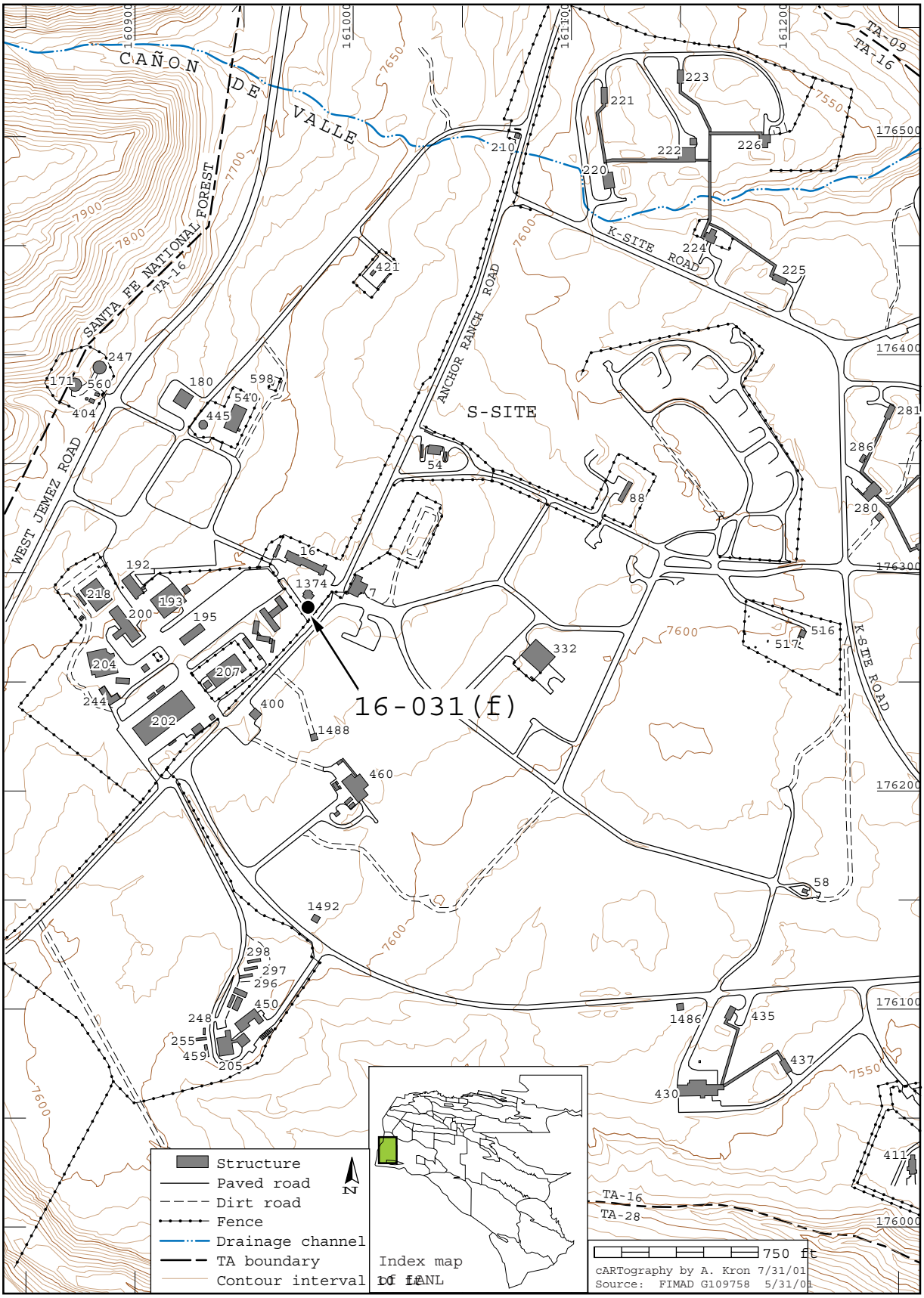
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038


**No photo; subsurface unit**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-031(f)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-031(h) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-031(h) is soil associated with an outfall from a utility room in Building 16-478, a machine shop. The utility room was added to the building in 1950 when the building was modified to be used to test the effects of machining on HE products. The outfall receives effluent from a floor drain and sink in the utility room. Effluent from the floor drain includes wash-down water and discharge from a water-sealed/water-cooled vacuum pump. The drain, which consists of a 4-in. VCP, daylights approximately 30 ft from the building. Interviews with past site workers indicate that the utility room is not contaminated with HE because it was located adjacent to the control room, which employees were careful not to contaminate. In addition, the hot water boiler that was installed in 1949 was natural gas powered, with an automatic pilot and push-button electric ignition. The open flame associated with the natural gas system supports this presumption. The vacuum system was used to hold HE pieces for machining. HE dust and chip production during machining was minimized by using liberal amounts of water, which drained into a sump. A water filter is incorporated into the vacuum line to prevent HE from traveling down the line.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The rewrite of Chapter 6 of the RFI work plan for OU 1082 recommended NFA at SWMU 16-031(h) because no hazardous waste and/or constituents are present at the site now, nor has the site been used to manage, generate, treat, store, or dispose of hazardous waste and/or constituents.

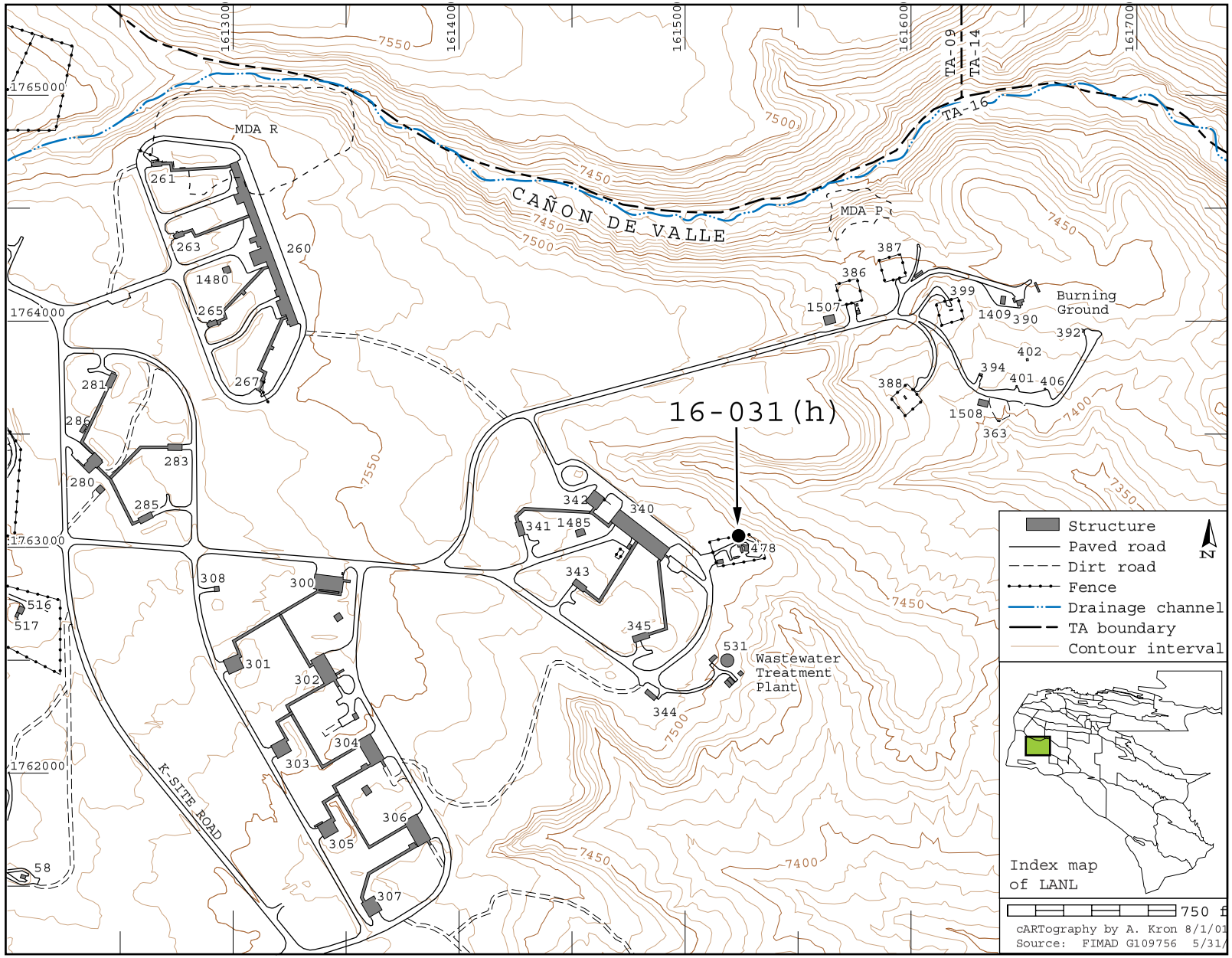
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-031(h)**


16-031(h)
CAÑON DE VALLE
TA-16
TA-09
TA-14
MDA R
MDA P
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
283
280
285
308
300
301
302
303
304
305
306
307
516
517
58
342
340
341
1485
343
345
344
531
1478
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *AOC 16-033(a) — Underground storage tanks*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown-1987 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | Unknown | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-033(a) is a 1000-gal. underground diesel fuel tank that was located east of Building 16-16 in the old S-Site administration area. The tank was rectangular and attached to a larger cylindrical tank. According to the 1990 SWMU report, this tank had a documented release. Before the tank was removed in 1987, it was surveyed for gross alpha, -beta, and -gamma and tritium; no activity was detected. During removal, about 15 cubic yards of contaminated soil were excavated and taken to TA-54 for land farming. The excavation was backfilled with clean soil.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed NFA at AOC 16-033(a) because historical information does not suggest that it presents an unacceptable human health or environmental risk. In addition, hazardous waste was never managed in the tank. Closure of USTs before 1988 consisted of removing obviously contaminated soil and collecting samples for analysis of lead, benzene, toluene, and xylene, with TCLP analysis, before regrading the excavation.

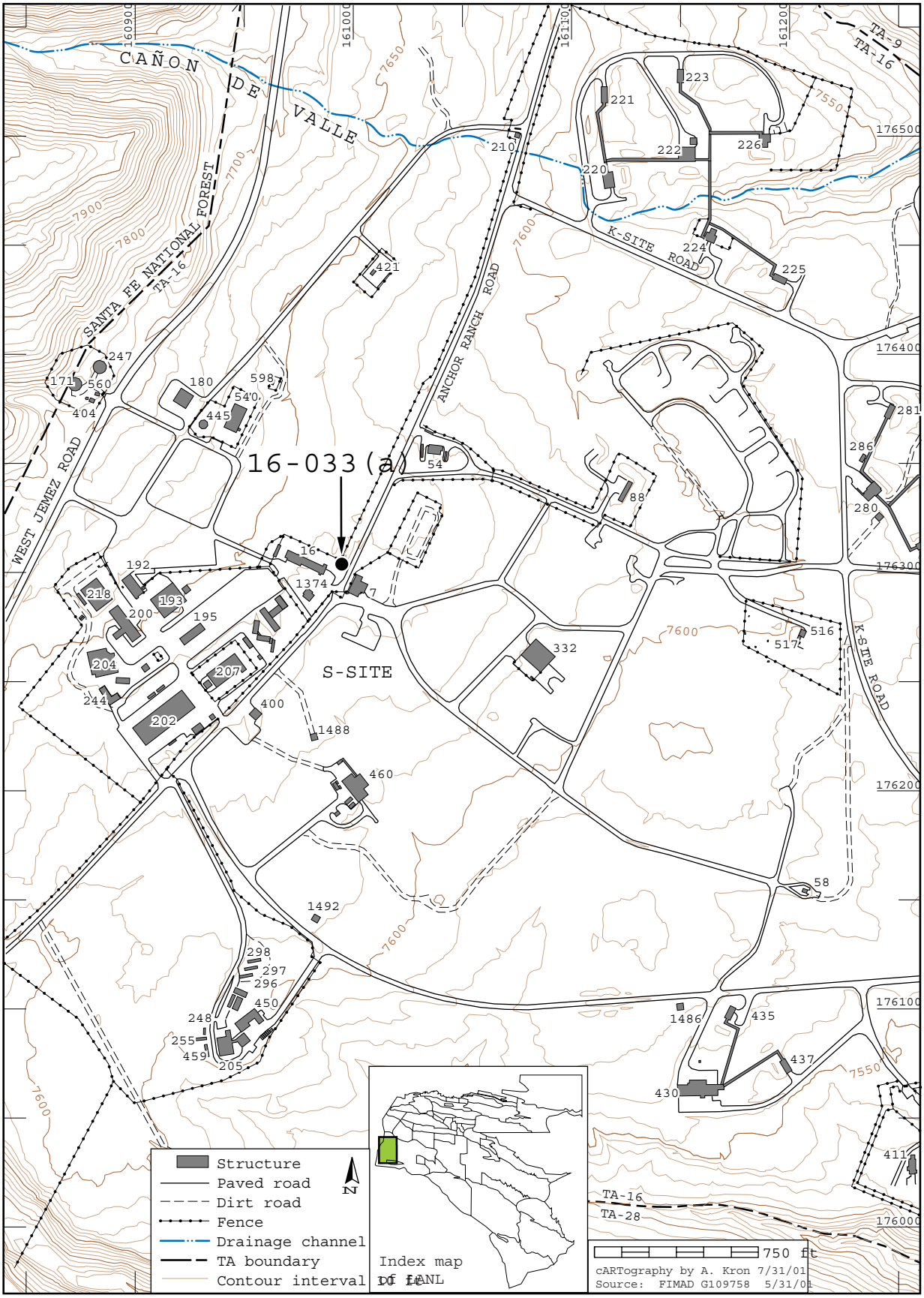
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038


**No photo; subsurface unit**


16-033(a)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-9
TA-28
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC 16-033(b) — Underground storage tanks*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-1987 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-196 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-033(b) was a 4000-gal. underground leaded-gasoline tank (structure 16-196) once located next to structure 16-197, a tank on the east side of the TA-16 service station (Building 16-195). Before removal of structure 16-196 in 1987, attempts were made to remove soil contaminated by structure 16-196, but further excavation was impeded by the adjacent tank (structure 16-197) and by the service station.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed NFA at AOC 16-033(b) because historical information does not suggest that it presents an unacceptable potential risk to human health or the environment. In addition, hazardous waste was never managed in the tank. Closure of USTs before 1988 consisted of removing obviously contaminated soil and collecting samples for analysis of lead, benzene, toluene, and xylene, with TCLP analysis, before regrading the excavation.

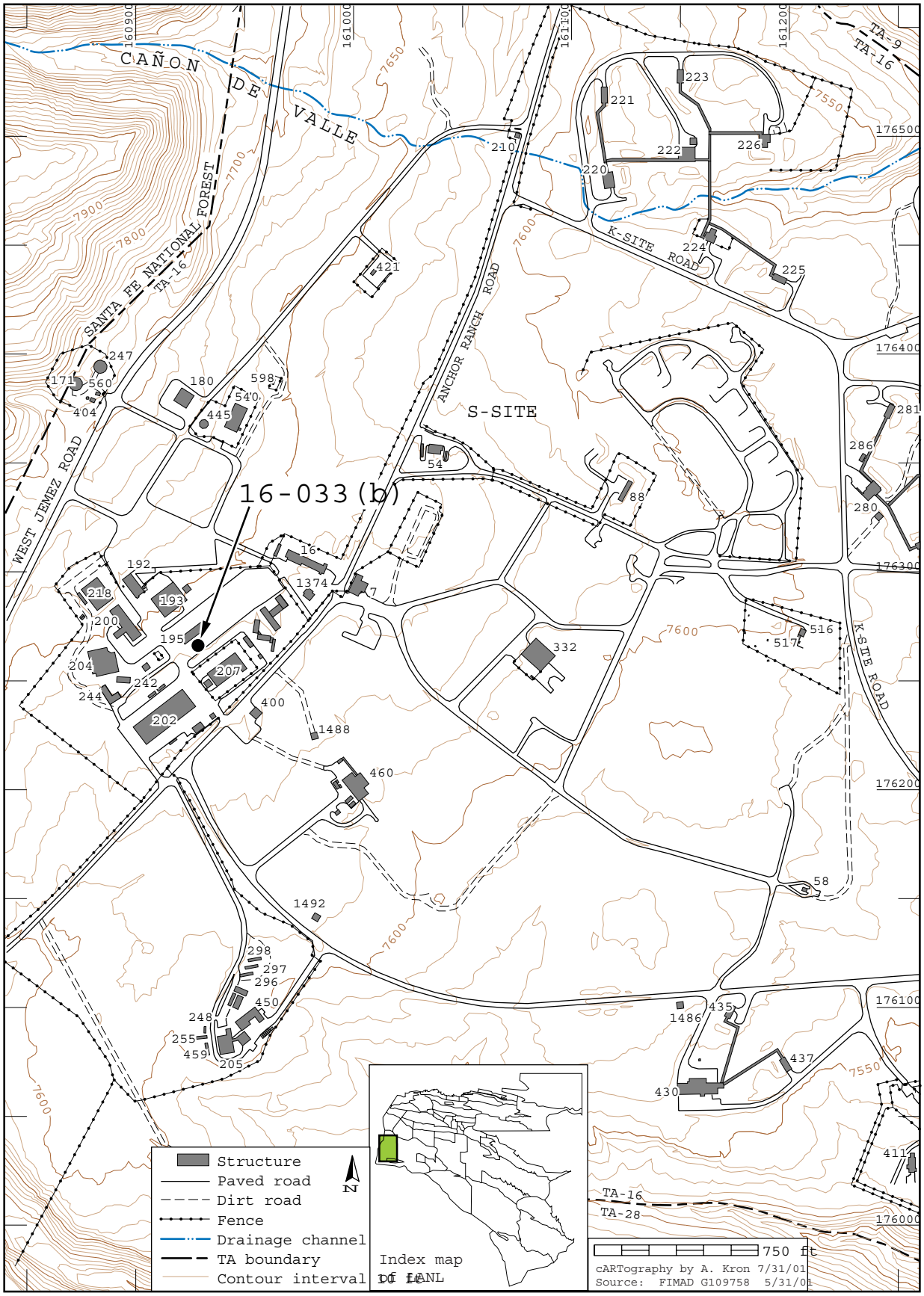
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038


**No photo; subsurface unit**


16-033(b)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-9
TA-28
160900
161000
161100
161200
176500
176400
176300
176200
176100
176000
7650
7700
7900
7800
7600
7550
247
171
560
404
180
598
540
445
421
210
221
223
222
226
220
224
225
281
286
280
54
88
16
1374
7
192
218
193
200
195
204
207
242
244
202
400
1488
460
332
516
517
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC 16-033(e) — Underground storage tanks*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | Unknown | **Other Remedial Action Conducted?** | No |

## Unit Description

AOC 16-033(e) consists of two underground fuel tanks, associated fuel lines, and pump base located northwest of former Building 16-10. Building 16-10 was a former warehouse at TA-16 [see consolidated PRS 16-017(i)-99]. The warehouse operated from 1945 to 1998. There is no existing information about the installation, construction, capacity, or removal of the two underground fuel tanks. Despite the preliminary surveys conducted at this site, these tanks have not been accurately located. Suspect contaminants at AOC 16-033(e) are benzene, toluene, ethylbenzene, xylene, and possibly lead.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed performing geophysical surveys to determine if the tanks remain at the site. If they were removed, the work plan stated that they would be recommended for NFA. If they remain in place, the tanks and associated lines will be removed under LANL's UST program.

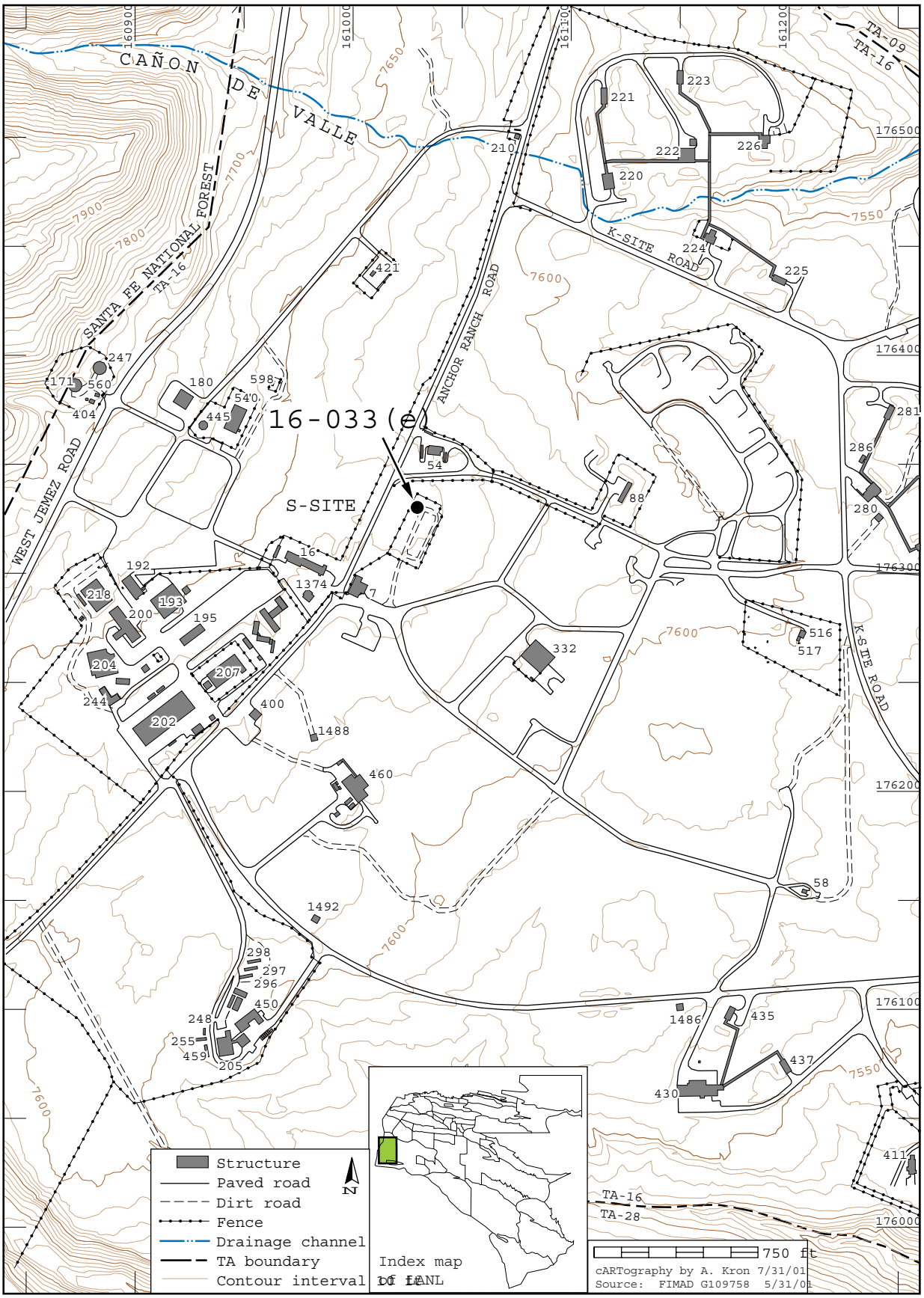
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038


**No photo; subsurface unit**


16-033(e)
S-SITE
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
7650
7700
7900
7800
7600
7550
176500
176400
176300
176200
176100
176000
160900
161000
161100
161200
247
171
560
404
180
598
540
445
421
210
221
223
222
226
220
224
225
54
88
281
286
280
16
1374
7
192
218
193
200
195
204
207
244
202
400
1488
460
332
516
517
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map
of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC 16-033(k) — Underground storage tanks*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | Unknown | **Other Remedial Action Conducted?** | No |

## Unit Description

AOC 16-033(k) is an inactive 200-gal. underground gasoline storage tank located immediately south of a hutment (structure 16-500). The tank is made of steel, was installed in 1952, and served an emergency generator system. It is not known when the tank was removed from service.

## ER Project Activities

*This site is a newly-identified AOC and there have been no RFI activities conducted at the site.*

When NMED was notified about the existence of this tank, which was discovered during construction activities in 1996, the ER Project proposed the tank be pumped of its contents, investigated, and remediated in accordance with regulatory requirements.

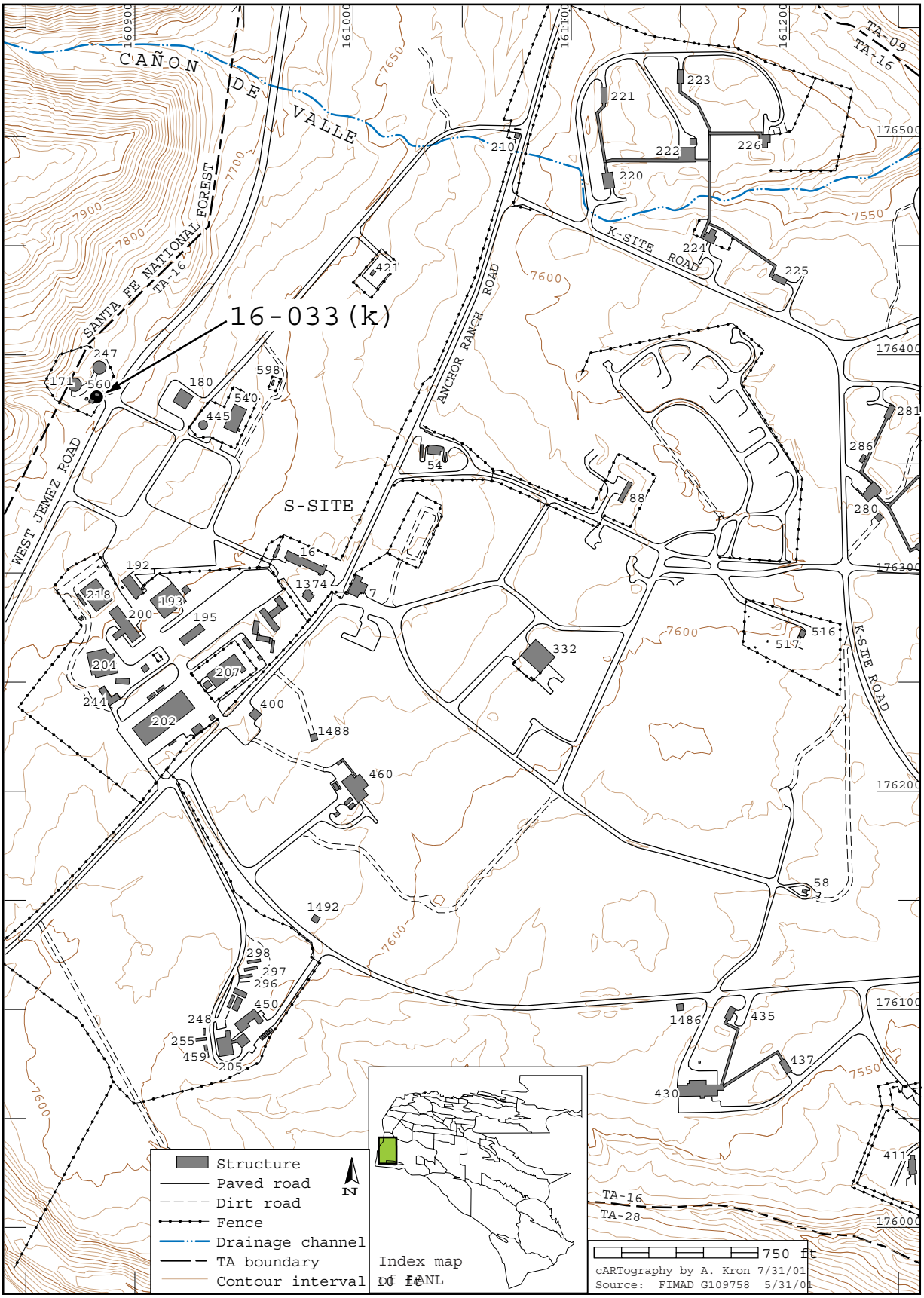
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

None.

**No photo; subsurface unit**


16-033(k)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
S-SITE
K-SITE ROAD
ANCHOR RANCH ROAD
WEST JEMEZ ROAD
161000
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161200
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176300
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1492
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205
1486
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430
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Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-034(b)-99 — Facility/equipment - physical/chemical treatment units - septic tank - soil contamination*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-034(b)-99 consists of former SWMUs 16-005(j), 16-005(m), 16-025(m), 16-025(n), 16-025(o), 16-034(b), 16-034(c), 16-034(d), 16-034(e), and 16-034(f). The consolidated SWMU encompasses an area that was the former location of the T-Site (TA-24) HE-related magazines, hutments, warehouses, shops, laboratories, and septic system. T-Site is located in the northwest part of TA-16, northwest of the S-Site explosives manufacturing complex. TA-24 was used primarily for radiography of HE charges. Construction of T-Site structures began in 1944 and continued until the fall of 1950, when activities were transferred to the newly constructed GT-Site located at the old Anchor East site (TA-9). Intentional burning in 1960 destroyed most of the structures, and residual debris and subsurface structures were removed in 1966. All structures were surveyed for radiation, HE, and toxic chemicals before being burned. Unless otherwise noted, the survey results were negative. HE was reported to have been removed to better than 3 percent wt, and radionuclides were cleaned up to background levels. No structures remain on the site, and it has been overgrown with trees.

Former SWMU 16-005(j) is potentially contaminated subsurface soil associated with the footprint of a former septic tank (structure 16-504) that served the lavatories and darkrooms in Building 16-490. It was located about 75 ft east of the building and was connected by a 4-in. VCP.

Former SWMU 16-005(m) is potentially contaminated subsurface soil adjacent to a decommissioned concrete HE sump, (former structure 16-507). The sump was located north of former Building 16-490 and received effluent from the large room in the central section of the building. The sump drained east of Building 16-490 through a 6-in. VCP and was shown to be contaminated with HE before its removal in 1960.

Former SWMU 16-025(m) is potentially contaminated surface soil associated with a former x-ray and gamma-ray facility (Building 16-495) built in 1947. It was a wooden-frame structure with a concrete floor. Building 16-495 was a source building that contained either radium-226 or cobalt-60 gamma sources. The former building had no plumbing or sumps. Before being burned, it was determined that the building was contaminated with HE and uranium-238. Suspect contaminants were inorganic chemicals, organic chemicals, HE, and radionuclides.

Former SWMU 16-025(n) is potentially contaminated surface soil associated with a decommissioned source hutment (structure 16-499) that was built in 1945. It was made of wooden-frame construction with a concrete floor and measured 16 ft square x 9 ft high. The concrete floor had a pit in its center that was 2 ft long x 4 ft wide x 2.5 ft deep. The structure had no sumps or plumbing. Radium-226 was used in the hutment to produce gamma rays that could be used to examine the dense baratol charges and uranium-238 parts that were used in the implosion device. By 1950, the hutment contained a cobalt-60 source. Before being burned in 1960, a shelf in structure 16-499 was found to be contaminated with alpha activity. The structure was also found to be contaminated with HE before it was burned. Suspect contaminants were inorganic chemicals, organic chemicals, HE, and radionuclides.

Former SWMU 16-025(o) is potentially contaminated surface soil associated with a decommissioned source hutment (structure 16-500) that was identical to former structure 16-499. Structure 16-500 was built in 1947. It was made of wooden-frame construction with a concrete floor and was 16 ft square x 9 ft high. The concrete floor had a pit in its center that was 2 ft long x 4 ft wide x 2.5 ft deep. The former structure had no sumps or plumbing. HE and radioactive contamination was found in structure 16-500 before it was burned, and the concrete floor was sent to the landfill at TA-54. Suspect contaminants were inorganic chemicals, organic chemicals, HE, and radionuclides.

Former SWMU 16-034(b) is potentially contaminated surface soil associated with the footprint of a decommissioned primary laboratory and office building (Building 16-490). Former Building 16-490 was a wooden-frame L-shaped building with a transecting internal radiation/explosion barrier. Two drainage troughs exited from the south side of the building. The building housed x-ray radiography of HE, photo processing, electron microscopy, and storage. The building was found to be contaminated with HE before it was burned in 1960.

Former SWMU 16-034(c) is potentially contaminated surface soil associated with the footprint of a decommissioned warehouse hut (structure 16-491) that was built in 1945. The hut, a 6-ft-wide x 24 ft-long x 9-ft-high wooden-frame structure with a wooden floor, was used to store equipment during World War II. By 1950, structure 16-491 was the site of x-ray exposure experiments on rabbits and rats. The structure had no sumps or plumbing. Before being burned in 1960, structure 16-491 was determined to be contaminated with HE. Suspect contaminants were inorganic chemicals, organic chemicals, and HE.

Former SWMU 16-034(d) is potentially contaminated surface soil associated with the footprint of a decommissioned wooden-frame machine shop (Building 16-492) that was built in 1945. It measured 16 ft square x 9 ft high and had a wooden floor. The building had no sumps or plumbing, and operations there ceased in December 1959. The shop was shown to be HE contaminated before being burned in 1960. Suspect contaminants were inorganic chemicals, organic chemicals, and HE.

Former SWMU 16-034(e) is potentially contaminated surface soil associated with the footprint of a former storage building (Building 16-496). The building was a 16-ft x 32-ft x 9-ft wooden-frame building with a wooden floor. The building was shown to be contaminated with HE during the pre-burning inspection in 1959. Suspect contaminants were inorganic chemicals, organic chemicals, and HE.

Former SWMU 16-034(f) is the footprint of a decommissioned laboratory (Building 16-498) that was built in 1945. It measured 16 ft x 42 ft x 9 ft high and was of wooden-frame construction with wooden floors. Initially, the laboratory was used for storage and as an eating area. By 1950, it was used by draftsmen in the western end, by site photographers in its center, and for plutonium autoradiography experiments in its eastern end. Small-scale photo processing was conducted in the building in addition to plutonium autoradiography experiments. Former Building 16-498 had no sumps, and it was not in use after December 1959. It was found to be contaminated with HE during the survey that preceded demolition by burning in 1960. Suspect contaminants were inorganic chemicals, organic chemicals, HE, and radionuclides.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Addendum 1 of the OU 1082 work plan proposed subsurface sampling at former SWMU 16-005(j) to detect the presence of silver associated with the septic system.

Addendum 1 of the OU 1082 work plan also proposed subsurface sampling at former SWMU 16-005(m) to detect HE.

The ER Project conducted an RFI at former SWMU 16-025(m) in 1997 to determine if contaminants were present in soils at levels of concern. Ten surface and near-surface soil samples were collected from five locations in and adjacent to the building footprint and were screened for HE and radioactivity. HE spot test results indicated that the samples were negative for HE, and radiation screening results indicated the samples contained only background levels of radioactivity. D-Tech kit results indicated that one sample screened positive for HE. That sample and another from the center of the building footprint were submitted for laboratory analysis for inorganic chemicals, organic chemicals, isotopic uranium, radium-226, strontium-90, cobalt-60, radionuclides by gamma spectroscopy, and HE. No contamination above SALs was detected, and the RFI report recommended NFA at former SWMU 16-025(m) because contamination is not present at levels that present a potential unacceptable risk to human health.

The ER Project conducted an RFI at former SWMU 16-025(n) in 1997 to determine if contaminants were present in soils at levels of concern. Ten surface and near-surface soil samples were collected from five locations and were field-screened for HE and radioactivity. HE spot test kit results indicated that all samples screened negative for HE, and radiation screening results indicated all samples had only background levels of radioactivity. D-Tech kit results indicated that all samples were positive for HE. Two samples, one of which had the highest HE concentrations and one of which was selected at random, were submitted for laboratory analysis for inorganic chemicals, organic chemicals, isotopic uranium, radium-226, strontium-90, cobalt-60, radionuclides by gamma spectroscopy, and HE. No contamination above SALs was detected, and the RFI report recommended NFA at former SWMU 16-025(n) because contamination is not present at levels that present a potential unacceptable risk to human health.

The ER Project conducted an RFI at former SWMU 16-025(o) in 1997 to determine if contaminants were present in soils at levels of concern. Ten surface and near-surface soil samples were collected from five locations in and adjacent to the structure's footprint and were field-screened for HE and radioactivity. HE-spot test results indicated that all samples screened negative for HE, and radiation screening results indicated that all samples had only background levels of radioactivity. D-Tech kit results indicated that three samples screened positive for HE. Two samples, one of which had the highest HE concentrations and one of which was selected at random, were submitted for laboratory analysis of inorganic chemicals, organic chemicals, isotopic uranium, radium-226, strontium-90, cobalt-60, radionuclides by gamma spectroscopy, and HE. No contamination above SALs was detected, and the RFI report recommended NFA at former SWMU 16-025(o) because contamination is not present at levels that present a potential unacceptable risk to human health.

The OU 1082 work plan addendum proposed surface-soil sampling at former SWMU 16-034(b) to detect residual HE on or near the disturbed surface of the former SWMU.

The ER Project conducted an RFI at former SWMU 16-034(c) in 1997 to determine if contaminants were present in soils at levels of concern. Five surface and near-surface soil samples were collected from five locations in the building footprint and were field-screened for HE and radioactivity. HE spot test kit results indicated that all samples screened negative for HE, and radiation screening results indicated that all samples contained only background levels of radioactivity. D-Tech kit results indicated that two samples screened positive for HE. Those two samples were submitted for laboratory analysis of inorganic chemicals, organic chemicals, and HE. Analyses were not run for radionuclides at former SWMU 16-034(c) because historical evidence indicated that radioactive material was not stored or used in the warehouse hut. Additionally, field screening did not indicate the presence of radioactive constituents. No contamination was detected above SALs. The RFI report recommended NFA at former SWMU 16-034(c) because contamination is not present at levels that present a potential unacceptable risk to human health.

The ER Project conducted an RFI at former SWMU 16-034(d) in 1997 to determine if contaminants were present in soils at levels of concern. Five surface and near-surface soil samples were collected from five locations in and adjacent to the building footprint and were field-screened for HE and radioactivity. HE spot test kit results indicated that all samples screened negative for HE, and radiation screening results indicated that all samples contained only background levels of radioactivity. D-Tech kit results indicated that four samples screened positive for HE. Two samples that screened positive for HE were submitted for laboratory analysis of inorganic chemicals, organic chemicals, and HE. Analyses were not run for radionuclides because historical evidence indicated that radioactive material was not stored or used in the machine shop. Additionally, field screening did not indicate the presence of radioactive constituents. No contamination was detected above SALs. The RFI report recommended NFA at former SWMU 16-034(d) because contamination is not present at levels that present a potential unacceptable risk to human health.

The ER Project conducted an RFI at former SWMU 16-034(e) in 1997 to determine if contaminants were present in soils at levels of concern. Five surface and near-surface soil samples were collected from five locations in the building footprint and were field-screened for HE and radioactivity. HE spot test kit results indicated that all samples screened negative for HE; radiation screening results indicated that all samples contained only background levels of radioactivity. D-Tech kit results indicated that three samples screened positive for HE. The sample with the highest HE concentrations and a randomly selected sample that also screened positive for HE were submitted for laboratory analysis of inorganic chemicals, organic chemicals, total uranium, and HE. No contamination was detected above SALs. The RFI report recommended NFA at former SWMU 16-034(e) because contamination is not present at levels that present a potential unacceptable risk to human health.

The ER Project conducted an RFI at former SWMU 16-034(f) in 1997 to determine if contaminants were present in soils at levels of concern. Five surface and near-surface soil samples were collected from five locations in the building footprint and were field-screened for HE and radioactivity. HE spot test kit results indicated that all samples screened negative for HE, and radiation screening results indicated that all samples contained only background levels of radioactivity. D-Tech kit results indicated that three samples screened positive for HE. The two samples with the highest HE concentrations were submitted for laboratory analysis for inorganic chemicals, organic chemicals, isotopic uranium, isotopic plutonium, cyanide, and HE. No contamination was detected above SALs. The RFI report recommended NFA at former SWMU 16-034(f) because contamination is not present at levels that present a potential unacceptable risk to human health.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 20 | 9 | 1 |
| Radionuclides | 5 | 1 | 0 |
| SVOCs | 4 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

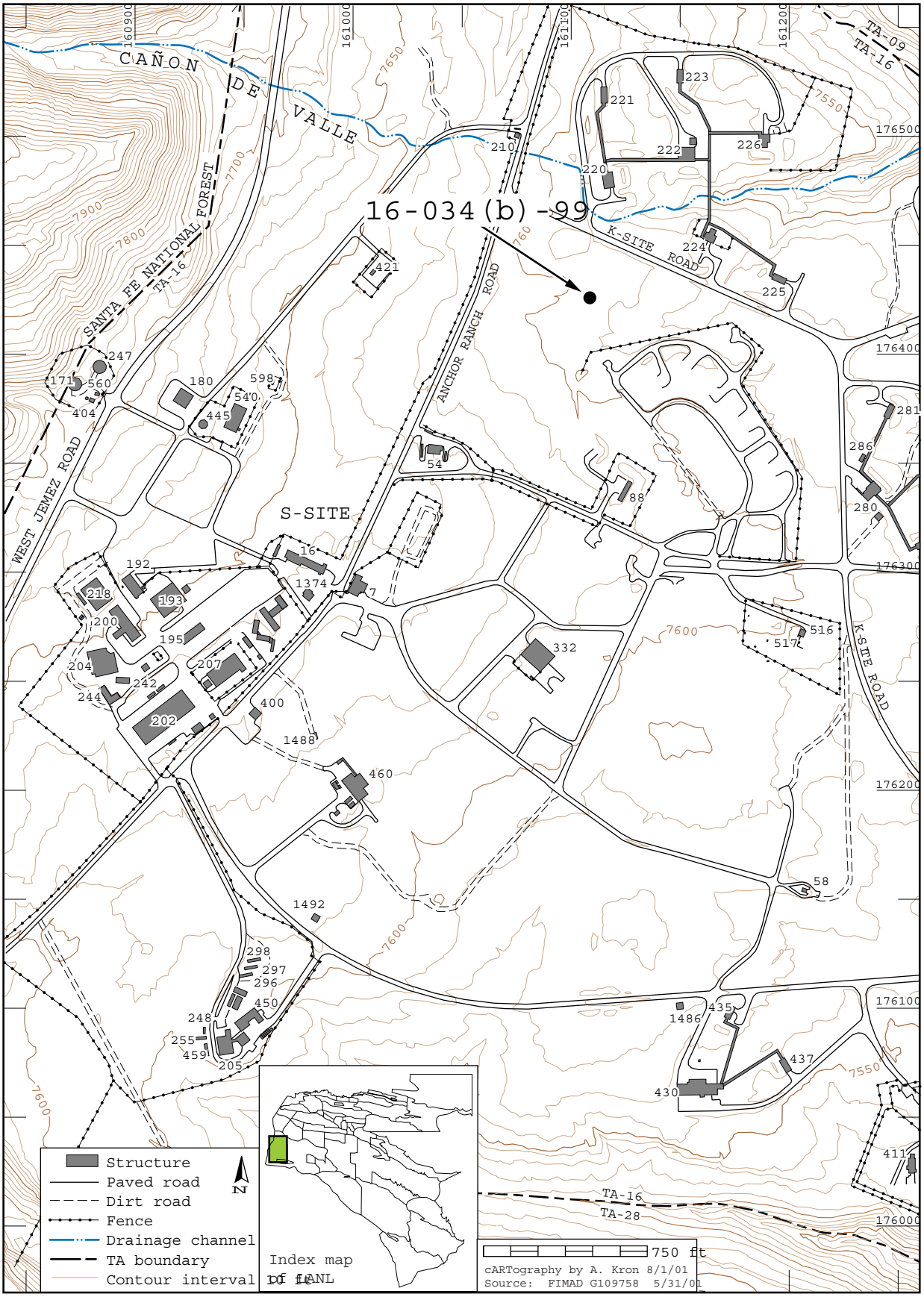
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 5.2 mg/kg | 0.39 mg/kg |

## References


RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-034(b)-99, looking west**


16-034(b)-99
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-034(h) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1955 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-137 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-034(h) is potentially contaminated soil associated with the footprint of a former plumbing and electrical shop (Building 16-137). Building 16-137 was part of a Zia Company satellite maintenance area used for upkeep on S-Site buildings. The maintenance area was built in 1944 and 1945 and was removed by 1955. It was located west of West Road, which was the only entry to S-Site before 1951 and formed the boundary of the HE exclusion zone. The maintenance area included the fire station. Suspect contaminants are HE.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed sampling at SWMU 16-034(h) to detect residual organic chemicals on the disturbed surface of the site.

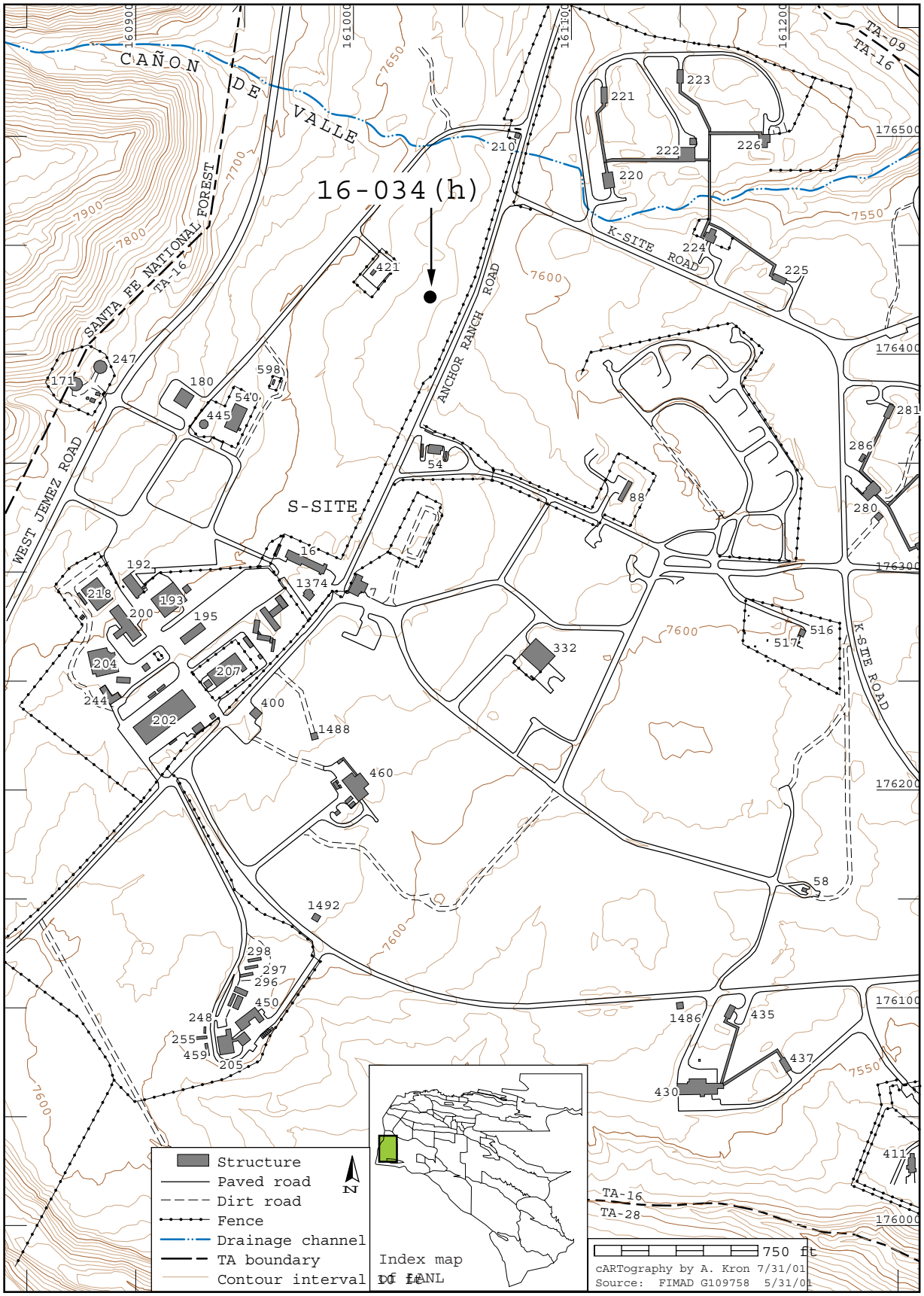
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-034(h)**


16-034(h)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
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517
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1492
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1486
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437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-034(i) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1955 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-141 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-034(i) is soil contamination in the footprint of a portable wooden structure (structure 16-141) that was 16 ft square and 9 ft high and was used for storage at the Zia satellite maintenance station at S-Site. Structure 16-141 was part of a Zia Company satellite maintenance area used for upkeep on S-Site buildings. The maintenance area was built in 1944 and 1945 and was removed by 1955. It was located west of West Road, which was the only entry to S-Site before 1951 and formed the boundary of the HE exclusion zone. Structure 16-141 was subsequently relocated to TA-35 for use as a construction shack.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The rewrite of Chapter 2 of the OU 1082 RFI work plan recommended NFA at SWMU 16-034(i) because no hazardous waste and/or constituents are present at the site now, nor was the site ever used to manage, generate, treat, store, or dispose of hazardous waste and/or constituents. Information from past site workers familiar with the Zia satellite maintenance area indicates that there is no HE contamination at the site. Structure 16-141 was considered clean enough to be relocated to another TA.

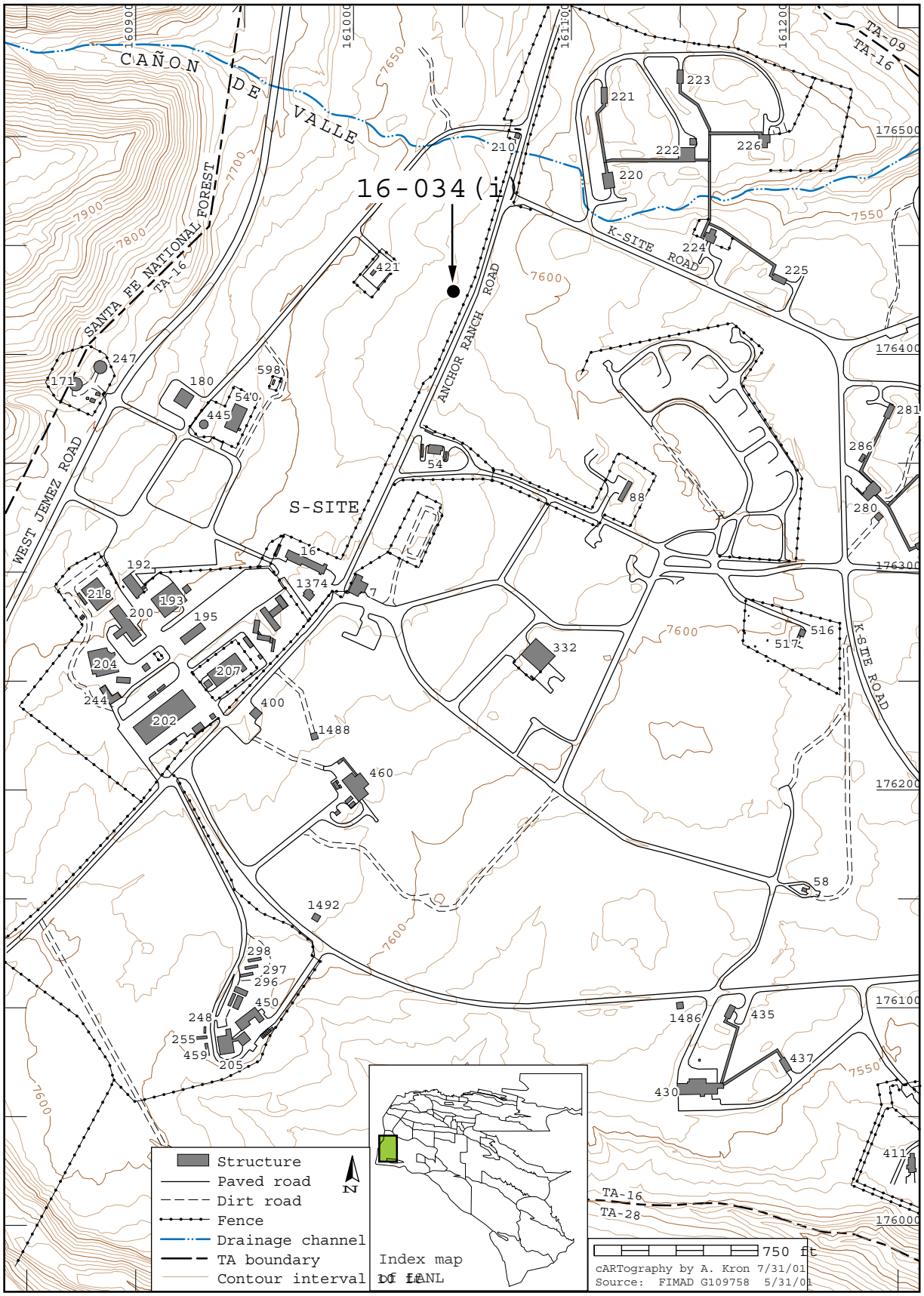
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-034(i)**


16-034(i)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
7900
7800
7700
7650
7600
7550
160900
161000
161100
161200
176500
176400
176300
176200
176100
176000
221
223
222
226
220
210
224
225
421
247
171
180
598
540
445
54
88
281
286
280
16
192
1374
7
218
193
200
195
204
207
244
202
400
1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-034(j) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950-1955 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-190 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-034(j) is potentially contaminated soil associated with a decommissioned container storage rack (structure 16-190) in the Zia Company satellite maintenance area at S-Site. Former structure 16-190 was located north of a wooden storage building (former Building 16-139). The rack held fifteen 55-gal. containers that provided lubricants and solvents by gravity feed. It is possible that other chemicals were stored on the rack. The rack was in place by 1950 and was removed by 1955. The maintenance area was located west of West Road, which was the only entry to S-Site before 1951 and formed the boundary of the HE exclusion zone.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed sampling at SWMU 16-034(j) to detect residual organic chemicals on the disturbed surface of the site.

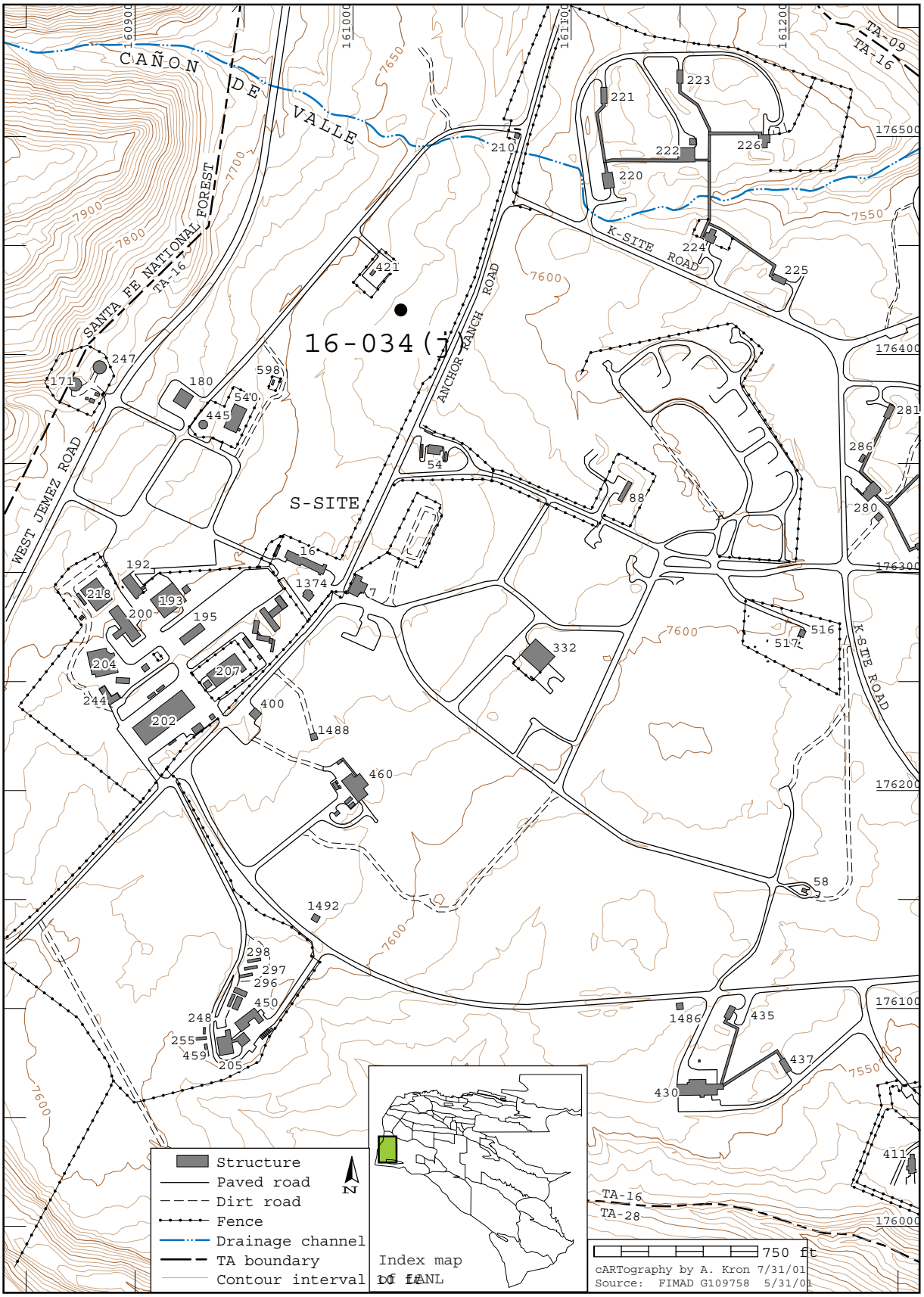
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

| | |
|---|---|
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-034(j)**


16-034(j)
S-SITE
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
7900
7800
7700
7650
7600
7550
160900
161000
161100
161200
176500
176400
176300
176200
176100
176000
221
223
222
226
220
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224
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421
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171
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207
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202
400
1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
750 ft
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-034(k) — Soil contamination*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1955 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-140 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-034(k) is soil contamination in the footprint of a portable wooden structure (structure 16-140) that was 16 ft square x 9 ft high and was used for storage at the Zia satellite maintenance station at S-Site. It is not known what was stored in the former structure, and its exact location has not been determined. Structure 16-140 was part of a Zia Company satellite maintenance area used for upkeep on S-Site buildings. The maintenance area was built in 1944 and 1945 and was removed by 1955. It was located west of West Road, which was the only entry to S-Site before 1951 and formed the boundary of the HE exclusion zone.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The rewrite of Chapter 2 of the OU 1082 RFI work plan recommended NFA at SWMU 16-034(k) because no hazardous waste and/or constituents are present at the site now, nor was the site ever used to manage, generate, treat, store, or dispose of hazardous waste and/or constituents. Information from past site workers familiar with the Zia satellite maintenance area indicates that there is no HE contamination at the site.

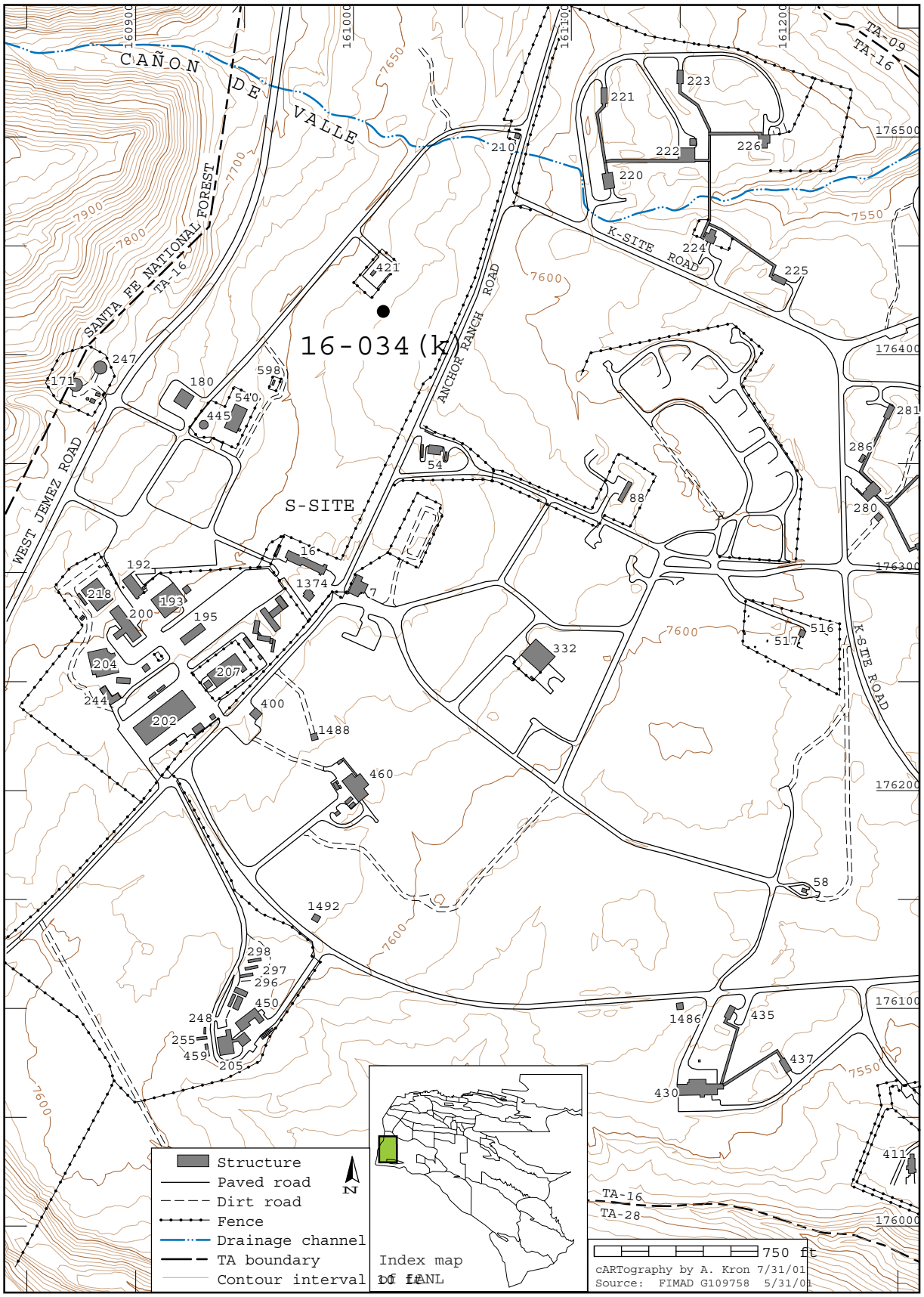
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-034(k)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-16
16-034(k)
S-SITE
TA-16
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-034(m) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1959 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-86 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-034(m) is the footprint of a former laboratory building (Building 16-86). The SWMU is located in the historic GMX-2 area at S-Site. GMX-2 structures were located in the south-central and eastern part of S-Site and were used primarily for experimental HE research and development. No production-scale HE operations were conducted in the GMX-2 area. The GMX-2 area operated from 1944 to the early 1950s. Building 16-86 was constructed in 1945; it had wooden floors, had no plumbing fixtures or sumps, and contained temperature-controlled curing ovens. The former building also may have been used as a magazine. Building 16-86, used until 1959, was listed as being HE contaminated before its destruction by burning in 1960. Suspect contaminants were inorganic chemicals, organic chemicals, and HE.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted an RFI at SWMU 16-034(m) in 1997 to determine if contaminants were present in soil at levels of concern. Five surface and near-surface soil samples from five locations in the building footprint were screened for HE and radiation. One sample screened positive for HE; all samples had only background radioactivity. Two samples, one of which had screened positive for HE, were submitted for laboratory analysis for organic chemicals, inorganic chemicals, and HE. Slightly elevated levels of copper, lead, silver, zinc, benzoic acid, and phenol were detected. No HE was detected in the laboratory sample despite the positive reading in the field. The kit that was used for field screening HE has been shown to provide false positives due to interference with humic materials. The RFI report recommended NFA at SWMU 16-034(m) because contamination is not present at levels that present a potential unacceptable risk to human health.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 18 | 5 | 1 |
| SVOCs | 2 | N/A | 0 |

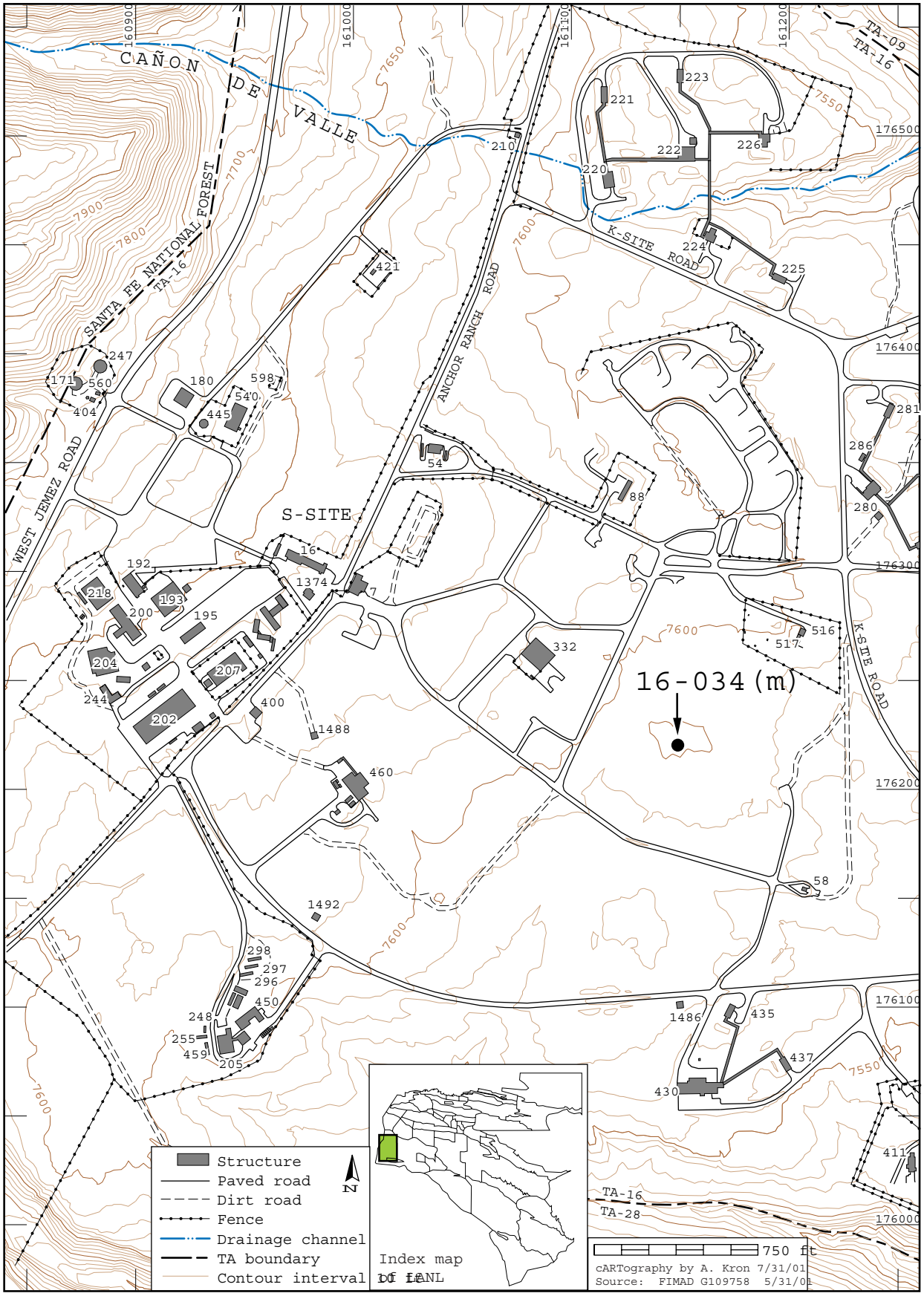
The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 2.3 mg/kg | 0.39 mg/kg |

## References

| | |
|---|---|
| RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 | LA-UR Number: 97-3770 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-034(m)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-034(m)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-034(n) — Soil contamination*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1959 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-83 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-034(n) is the footprint of a laboratory building (Building 16-83). The SWMU is located in the historic GMX-2 area at S-Site. Structures at GMX-2 were located in the south-central and eastern part of S-Site and were used primarily for experimental HE research and development. No production-scale HE operations were conducted in the GMX-2 area. The GMX-2 area operated from 1944 to the early 1950s. Building 16-83 was constructed in 1945; it had wooden floors, had no plumbing fixtures or sumps, and contained temperature-controlled curing ovens. The former building also may have been used as a magazine. Building 16-83, removed from service in 1959, was listed as being HE contaminated before its destruction by burning in 1960. Residual debris from burning was cleaned up in 1966. Suspect contaminants were inorganic chemicals, organic chemicals, and HE.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 1 of the OU 1082 work plan proposed sampling at SWMU 16-034(n) to detect surface HE contamination in the building footprint.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 18 | 3 | 2 |
| SVOCs | 0 | N/A | 0 |

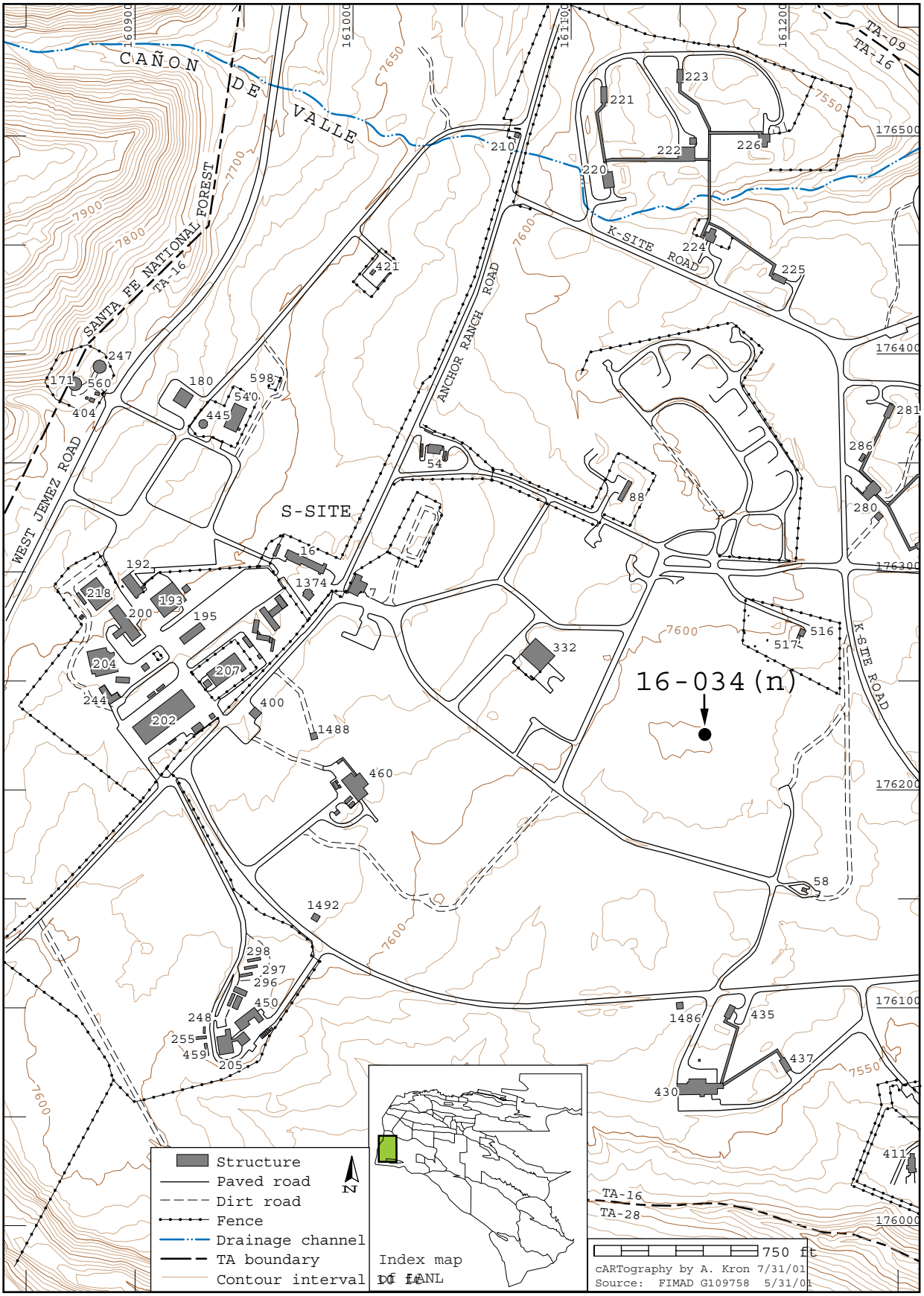
The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 3.7 mg/kg | 0.39 mg/kg |
| | Mercury | 35 mg/kg | 23 mg/kg |

## References

RFI Work Plan for Operable Unit 1082, Addendum 1 LA-UR Number: 94-1580

**View of SWMU 16-034(n)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-034(n)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *AOC C-16-002 — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-1957 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | None | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC C-16-002 is potentially contaminated soil in the footprint of a decommissioned cooling tower (structure 16-262) that served an HE machining building (Building 16-260). The former cooling tower, built in 1946 at Building 16-42 and relocated to Building 16-260 in 1951, was located about 50 ft north of a walkway (structure 16-269) and 12 ft west of Building 16-260. It was made of wood and sat on a 3-ft-high concrete base. It was removed in 1957. The cooling tower's purpose is not known. Remains of the tower include a pile of rubble and two 2-in. cast-iron pipes that discharge into a drainage ditch. Suspect contaminants are chromates, given the age and nature of the unit (e.g., cooling tower), although no documentation exists stating that chromates were used.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed sampling to detect chromate contamination at the outfall drainage [see SWMU 16H031(b)]; samples from the drainage will be representative of contamination, if any, at AOC C-16-002.

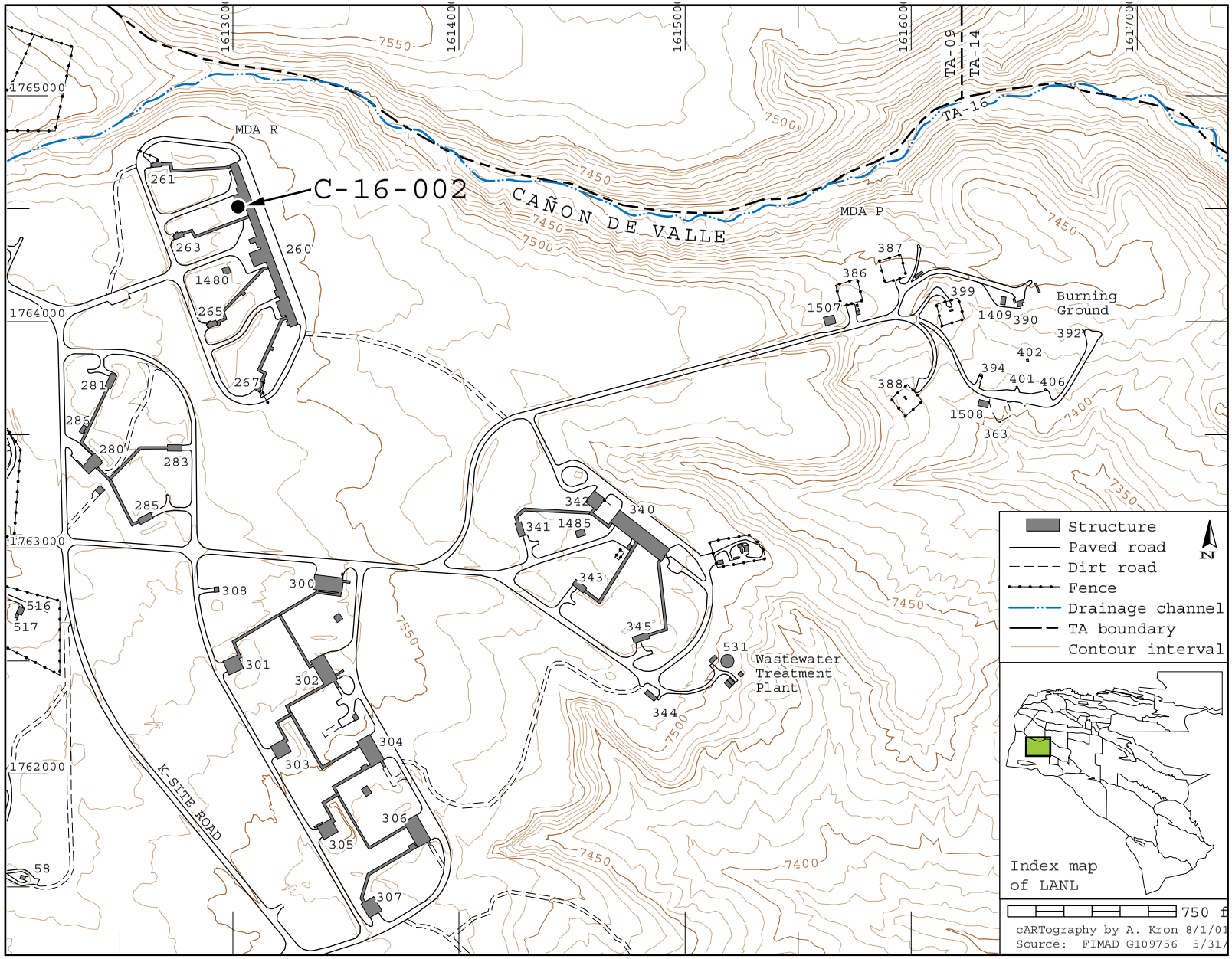
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of AOC C-16-002**


C-16-002
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
161300
161400
161500
161600
161700
1765000
1764000
1763000
1762000
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
283
285
308
300
301
302
303
304
305
306
307
516
517
58
342
341
1485
340
343
345
531
344
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *AOC C-16-011 — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1955 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-132 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC C-16-011 is potentially contaminated soil associated with the footprint of a former paint shop (Building 16-132). Building 16-132 was part of a Zia Company satellite maintenance area used for upkeep on S-Site buildings. The structural composition of Building 16-132 is not known. The maintenance area was built in 1944 and 1945 and was removed by 1955. It was located west of West Road, which was the only entry to S-Site before 1951 and formed the boundary of the HE exclusion zone. The maintenance area included the fire station. Suspect contaminants are HE.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed sampling at AOC C-16-011 to detect residual organic chemicals on the disturbed surface of the site.

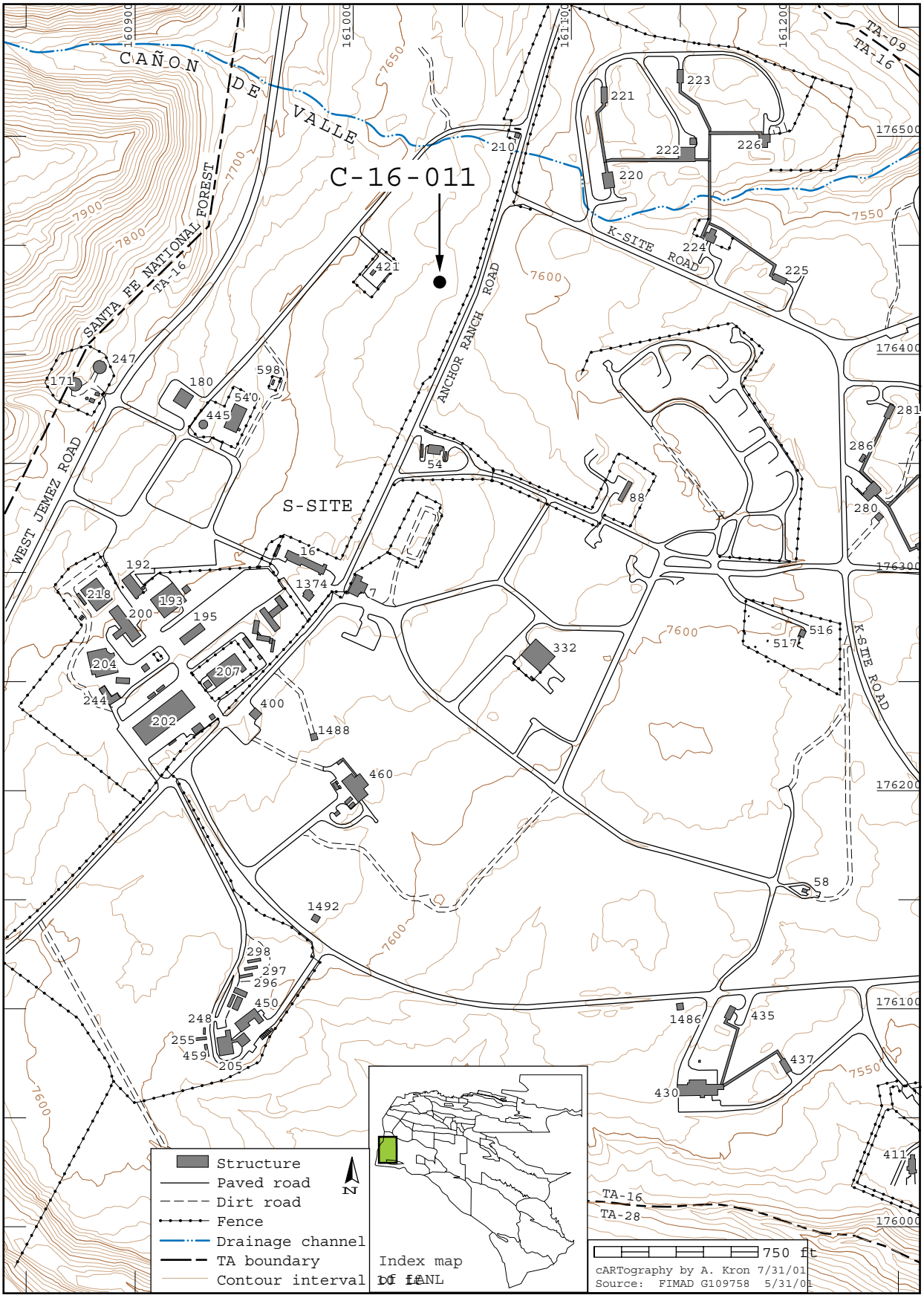
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of AOC C-16-011**


C-16-011
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
161000
161100
161200
176500
176400
176300
176200
176100
176000
7650
7700
7900
7800
7600
7550
247
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1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC C-16-028 — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1956 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-5 | **Other Remedial Action Conducted?** | No |

## Unit Description

AOC C-16-028 is the historic location of an instrument shop, Building 16-5. The shop was built in 1945 and removed in 1956. It was made of wooden-frame construction and was used to repair instruments such as gauges. Building 16-5 also has an inactive outfall, SWMU 16-026(s). Building 16-5 was located in the old TA-16 administration area. The administration area of S-Site was used primarily for activities that did not involve HE processing. Suspect contaminants are inorganic and organic chemicals.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 1 of the OU 1082 work plan proposed sampling at the inactive outfall [SWMU 16-026(s)] to detect residual oil and solvents. Outfall sampling results would be used to determine the types of contaminants, if any, that may be associated with AOC CH16-028.

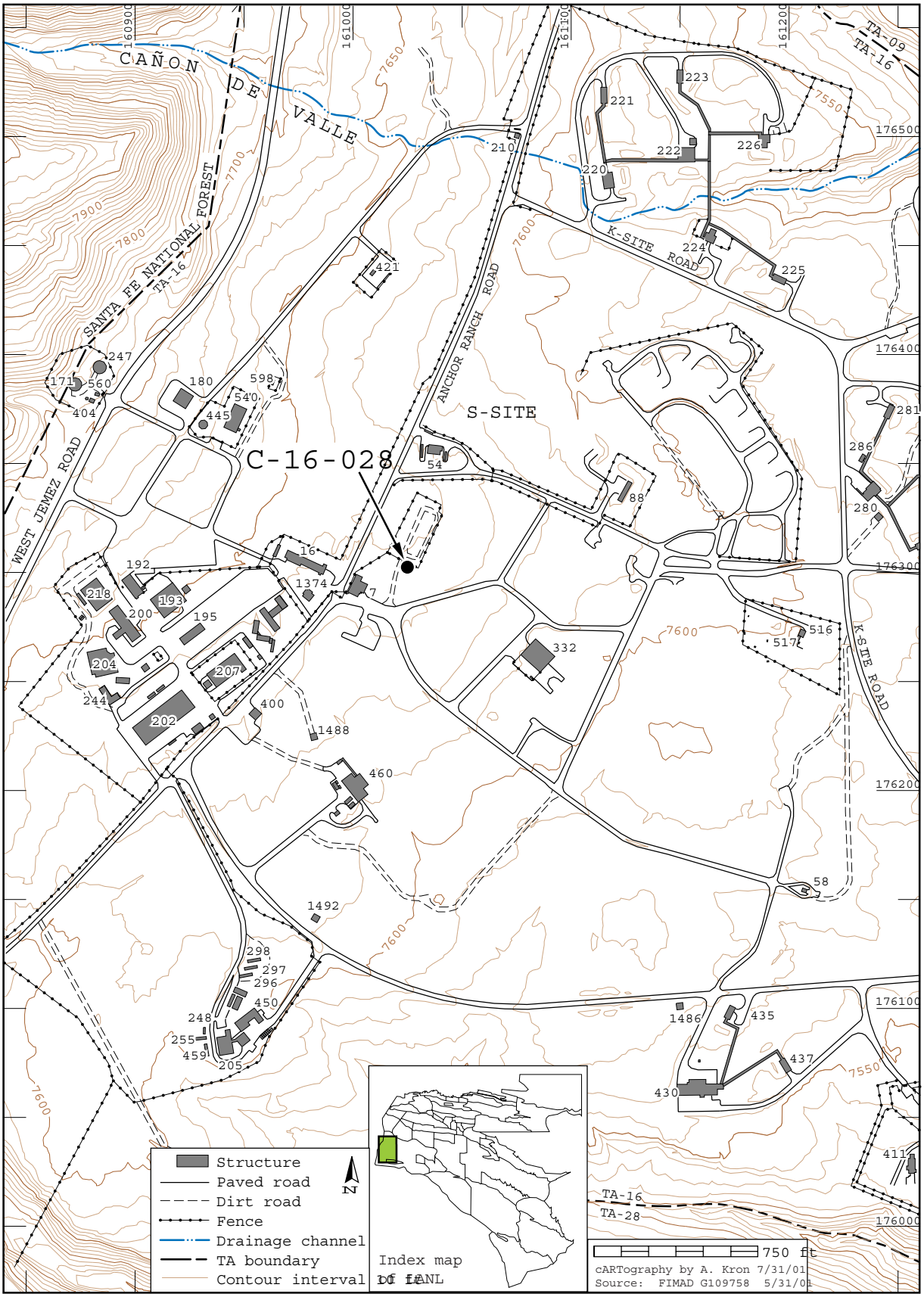
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of AOC C-16-028, looking east**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
C-16-028
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC C-16-030 — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1948-1956 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-181 | **Other Remedial Action Conducted?** | No |

## Unit Description

AOC C-16-030 is potentially contaminated surface soil associated with decommissioned tank housing (structure 16-181). The concrete tank housing was buried 1.5 ft in the soil. The building was constructed in 1948 and removed in 1956. It was located about 20 ft from a former diesel unit building [Building 16-182 (AOC C-16-031)] and about 40 ft northeast of a historic steam plant and machine shop (Building 16-7) in the old TA-16 administration area. The administration area of S-Site was used primarily for activities that did not involve HE processing. Addendum 1 of the RFI work plan stated that it is likely that the former tank housing was used to store fuel for the Building 16-182 diesel unit.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 1 of the OU 1082 work plan proposed sampling at AOC C-16-030 to detect residual gasoline, oil, or diesel that may have spilled in the vicinity of the tank housing.

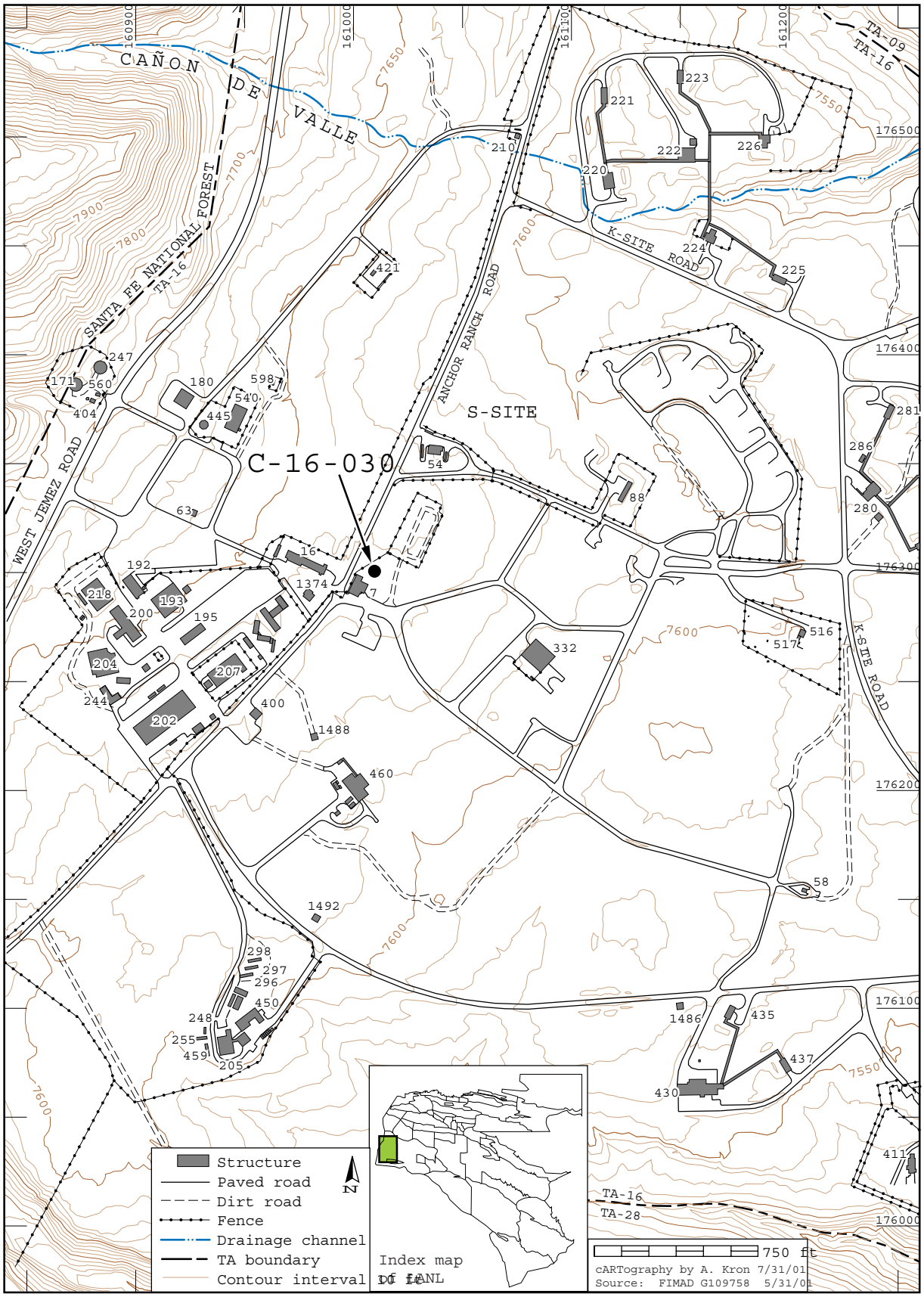
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of AOC C-16-030, looking east**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
C-16-030
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC C-16-031 — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1956 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-182 | **Other Remedial Action Conducted?** | No |

## Unit Description

AOC C-16-031 is potentially contaminated surface soil associated with a decommissioned diesel unit building (Building 16-182). The former diesel unit building was of wooden construction. The building was constructed in 1944 and removed in 1956. It was located about 20 ft from former structure 16-181 (AOC C-16-030) and about 40 ft northeast of historic Building 16-7, a steam plant and machine shop in the old TA-16 administration area. The administration area of S-Site was used primarily for activities that did not involve HE processing.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 1 of the OU 1082 work plan proposed sampling at AOC C-16-031 to detect residual gasoline, oil, or diesel that may have spilled in the vicinity of the diesel unit building.

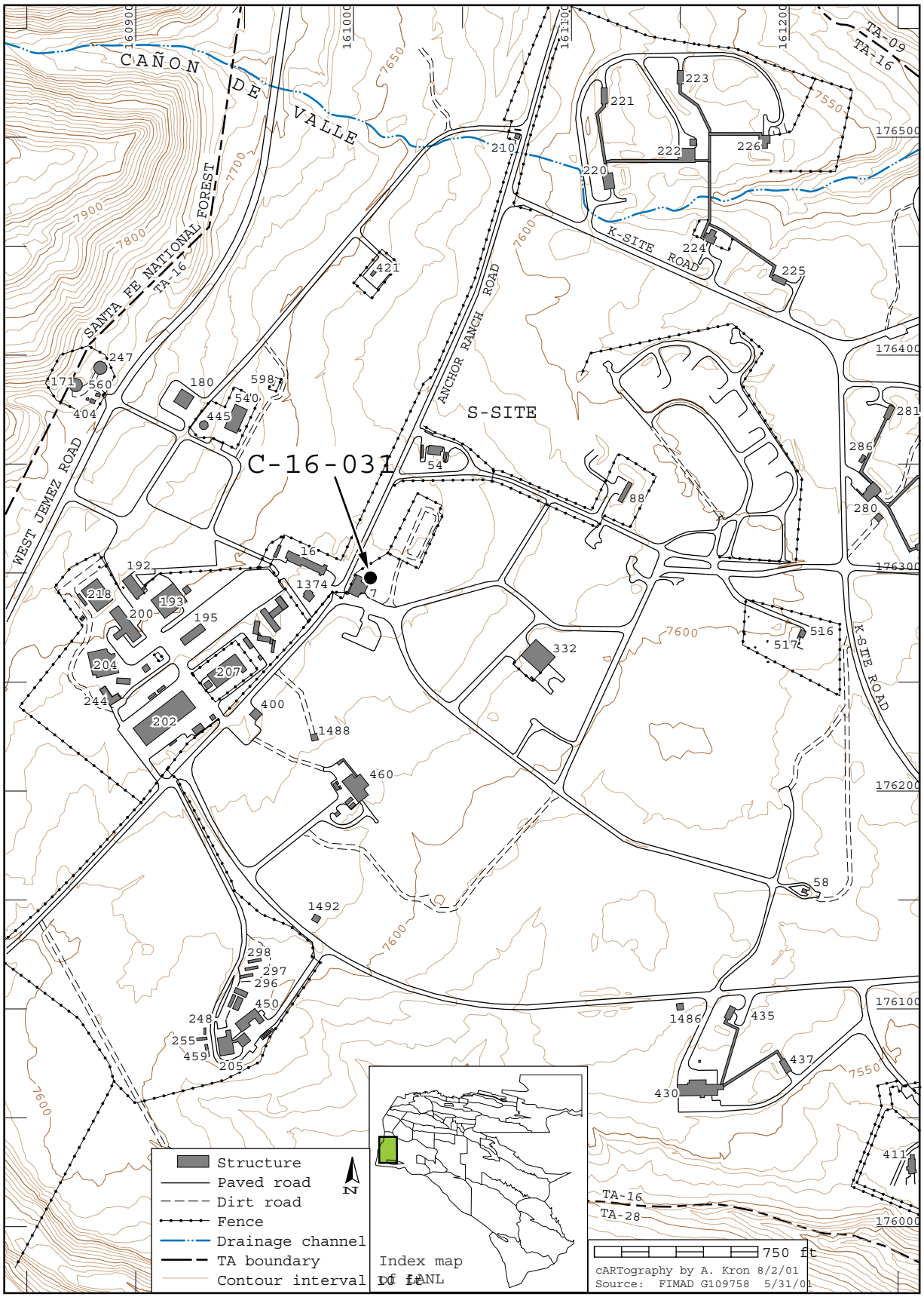
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

| | |
|---|---|
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of AOC C-16-031**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
C-16-031
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/2/01
Source: FIMAD G109758 5/31/01

# *AOC C-16-060 — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1949 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-479 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC C-16-060 is potentially contaminated soil associated with a former storage structure (structure 16-479) that was 16 ft square x 8 ft high with a wooden floor. The structure was used at P-Site from 1944 to 1949. P-Site was constructed in 1944 to conduct flash x-ray studies of the implosion of HE test devices. It consisted of an office and shop building, laboratory and test buildings, an experimental chamber, a magazine, and a storage building. By the 1950s most of the buildings had been removed. Remaining buildings were incorporated into the S-Site complex. Structure 16-479 was located about 50 ft south of structure 16-480 [AOC 16-025(d2)] and may have been used to store materials used in the structure 16-480 mockup chamber. Structure 16-479 was moved to TA-33 for further use in August 1949.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed sampling in the footprint of Building 16-479 to detect residual radionuclides on the disturbed surface.

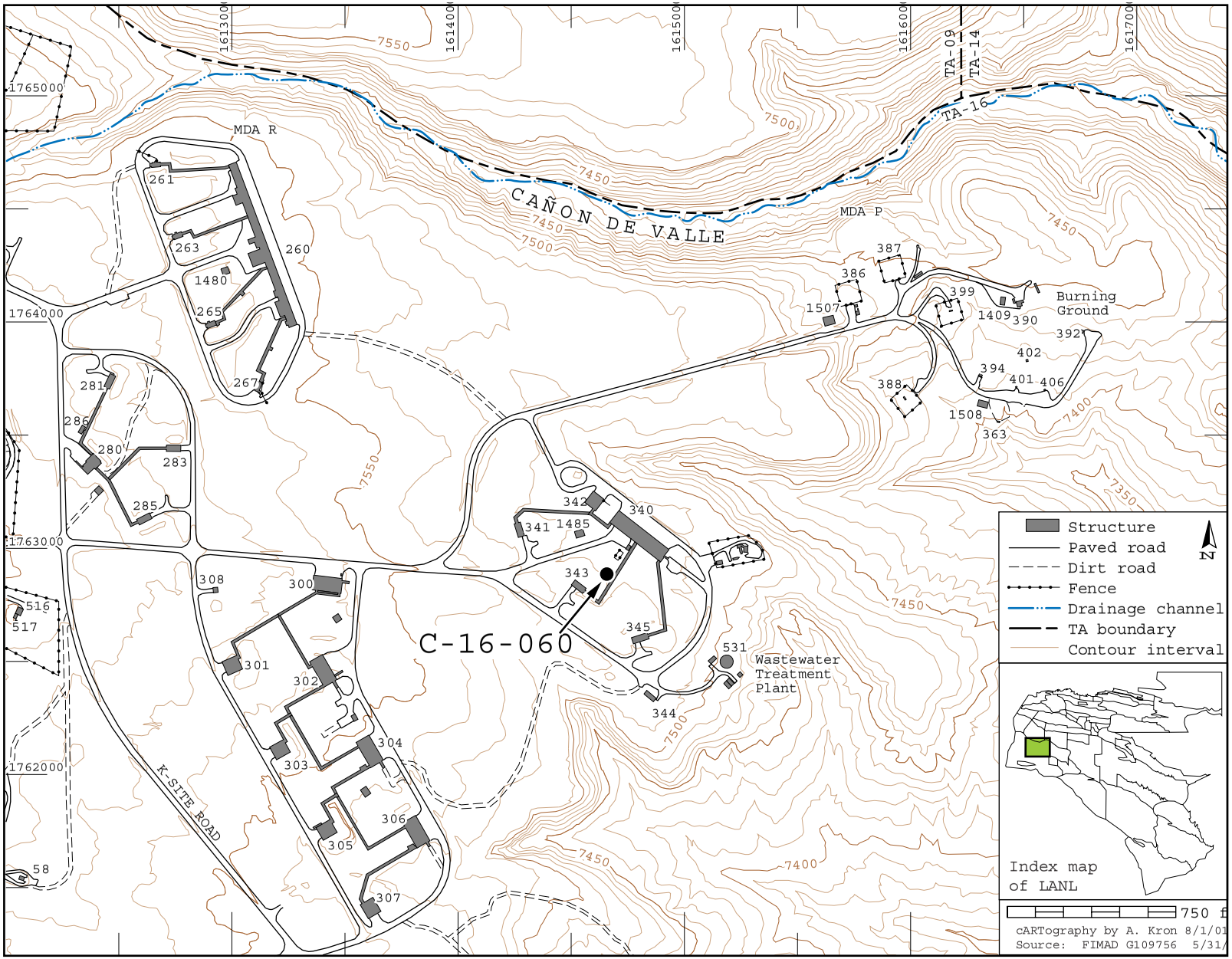
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of AOC C-16-060**


C-16-060
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
283
285
516
517
58
308
300
301
302
303
304
305
306
307
342
340
341
1485
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *AOC C-16-069 — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-87 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC C-16-069 is potentially contaminated media associated with a standard 8-ft x 13-ft x 7-ft Signal Corps trailer (structure 16-87) that was used as a machine shop for metallic parts in the historic GMX-2 area. The structures in GMX-2 were built primarily in the 1940s for experimental HE research and development activities. No production-scale HE volumes were processed in this area. The GMX-2 area ceased to be used as an active site in the early 1950s. Most of the structures in the GMX-2 area were intentionally destroyed by burning in 1960. Residual debris from burning and the remaining subsurface structures were cleaned up in 1966. Structure 16-87 was surveyed for hazardous materials, including HE, in the late 1950s; none was found. The trailer was returned to the AEC in 1957.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 1 of the OU work plan proposed sampling in the footprint of structure 16-87 to detect residual petroleum hydrocarbons. One sample was collected form this site in 1997 and submitted to an offsite laboratory. The sample was analyzed for HE and organic chemicals. No HE constituents were detected and pyrene was the only organic chemical detected.

## ER Project Sampling Summary

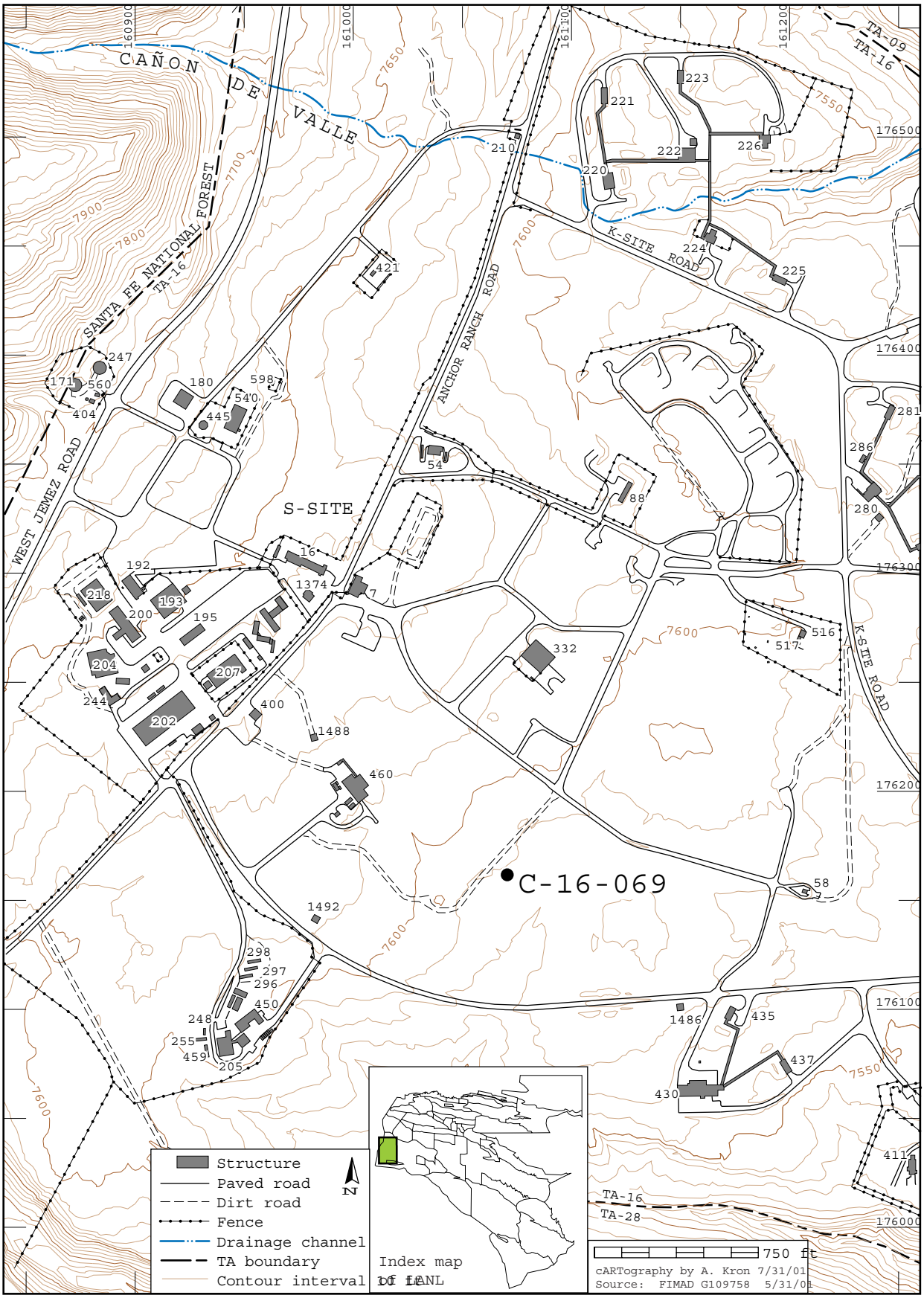
The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| Hes | 0 | N/A | 0 |
| SVOCs | 1 | N/A | 0 |

## References

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of AOC C-16-069, looking southwest**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
C-16-069
TA-09
TA-28
7900
7800
7700
7650
7600
7550
160900
161000
161100
161200
176500
176400
176300
176200
176100
176000
247
171
560
404
180
598
540
445
421
210
223
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222
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220
224
225
54
88
281
286
280
16
192
1374
7
218
193
200
195
204
207
244
202
400
1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *AOC C-16-073 — Underground storage tanks*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

AOC C-16-073 is an underground gasoline storage tank believed to be located 6 ft from the southwest wall of an administrative building (Building 16-200) located outside the TA-16 HE exclusion zone. The tank has no structure number. The tank served an emergency generator located inside the basement equipment room of Building 16-200; it is assumed that the tank was installed in 1952 when Building 16-200 was built. The emergency generator power source was subsequently changed to natural gas, and it is likely that the tank was decommissioned when the conversion occurred. The tank was monitored for radioactivity in 1967 and none was detected. Preliminary survey results have not succeeded in locating this tank.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 2 of the OU 1082 work plan proposed performing geophysical surveys to determine if the tank remains at the site. If it was removed, the work plan stated that it would be recommended for NFA. If it remains in place, the tank and associated lines will be removed under LANL's UST program.

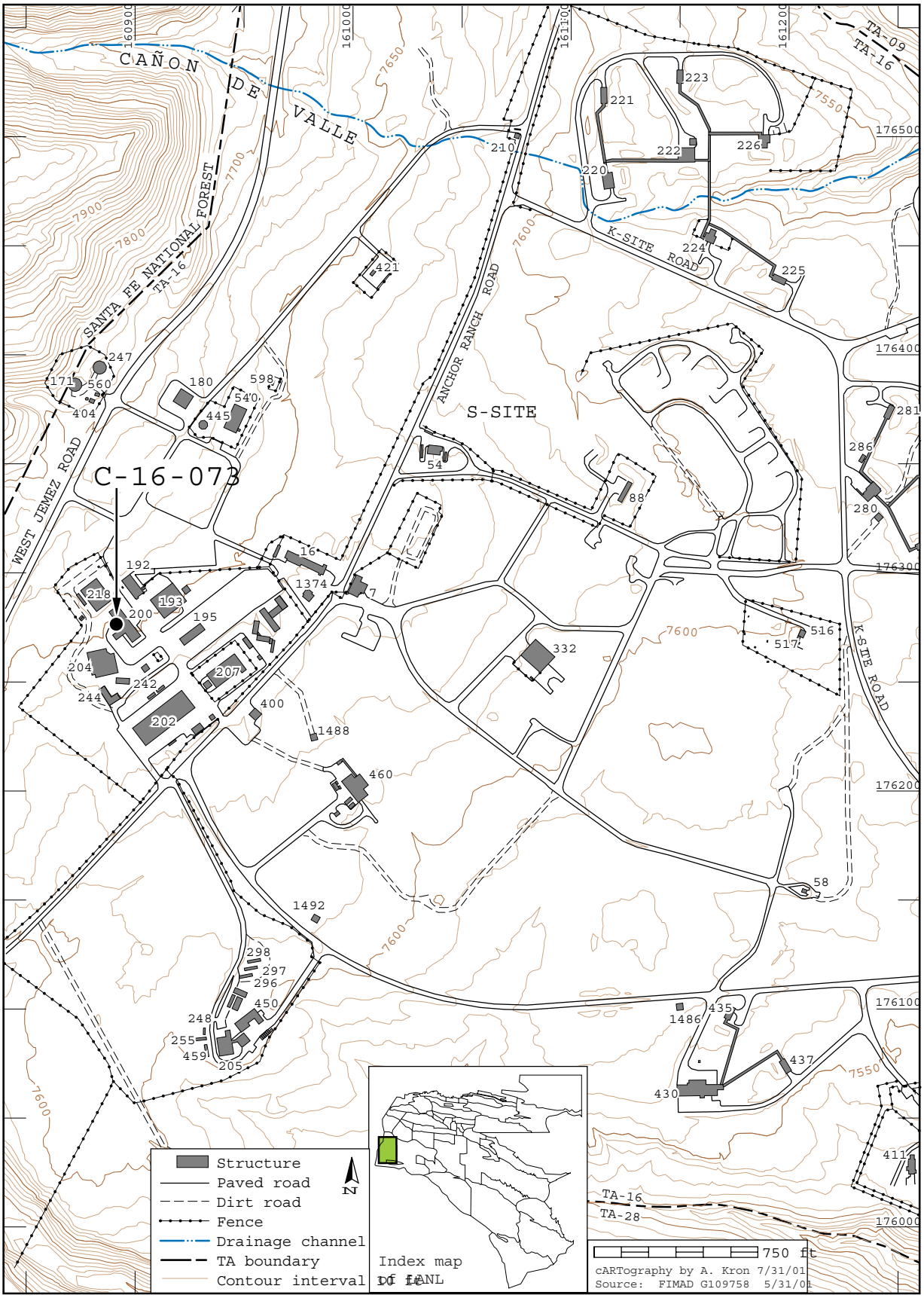
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038


**No photo; subsurface unit**




Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft

N

Index map of LANL

750 ft

cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC C-16-075 — Spill/nonintentional release*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

AOC C-16-075 is a newly identified spill location near an HE synthesis building (Building 16-340). This AOC was identified on January 30, 1997, during the excavation of a 15-ft x 15-ft x 2-ft concrete pad adjacent to the covered walkway of Building 16-340. Organic vapors (fuel-oil odor) were detected during the excavation. The soil was sampled for VOCs. Hydrocarbons were detected in the samples collected, consistent with a kerosene or light diesel oil. The only AOCs in the immediate area are AOCs 13-003(a) and 13-003(b), an inactive septic system that once served P-Site; however, no drainlines were discovered during the excavation and there was no obvious connection to AOCs 13-003(a) or 13-003(b). This area is considered to be the site of a one-time spill. The excavation was backfilled with the original soil.

## ER Project Activities

There have been no ER activities.

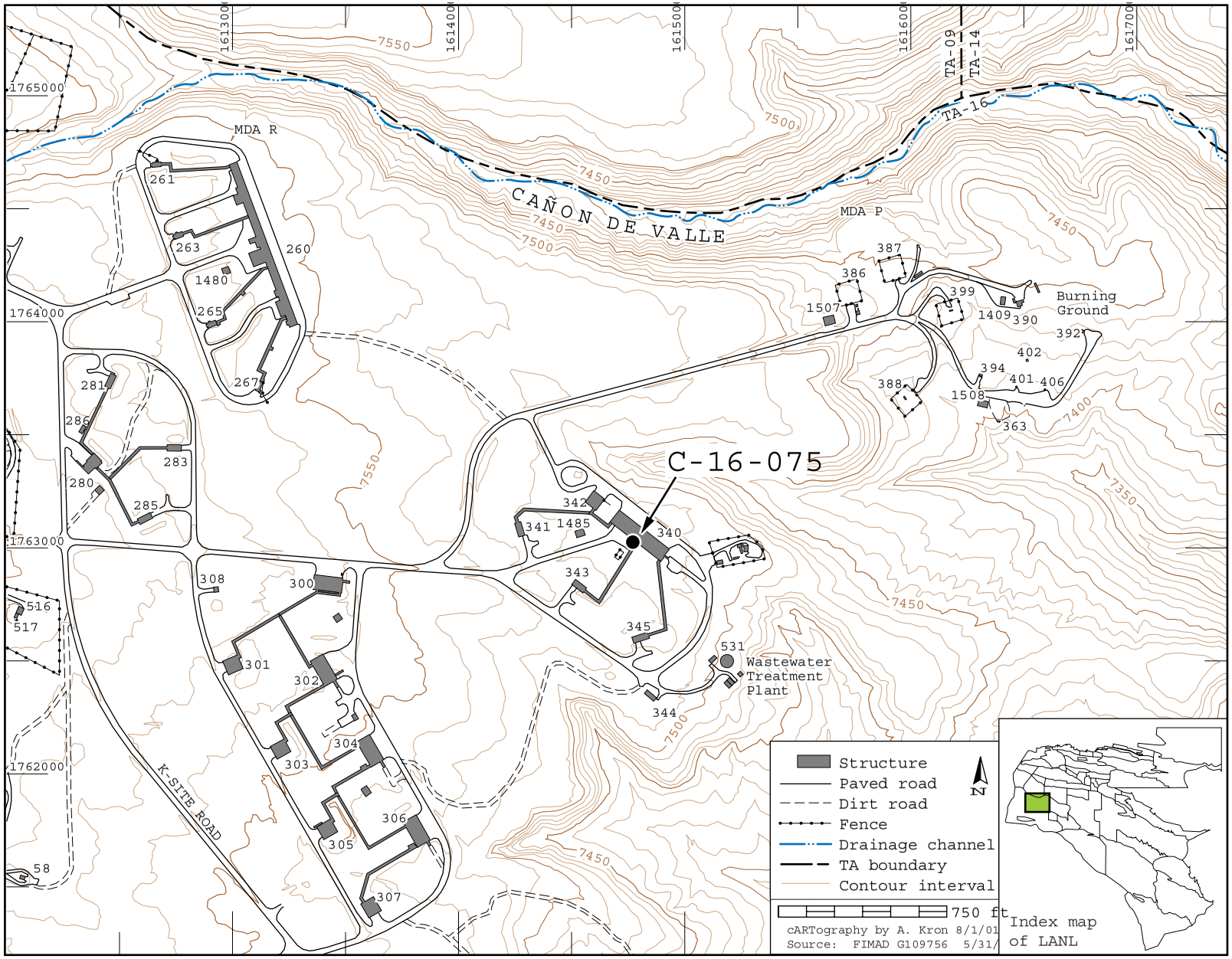
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

None.

**View of AOC C-16-075, spill location**


C-16-075
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
283
280
285
516
517
58
308
300
301
302
304
303
306
305
307
342
341
1485
340
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
750 ft
N
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
Index map of LANL

# *SWMU 16-005(a) — Subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1952 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-161 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-005(a) is potentially contaminated subsurface soil at the site of a decommissioned septic tank (structure 16-161) and its associated drainfield, which were located in the southwest region of TA-16 and drained to the south. The tank served Buildings 16-1, -2, -7, -10, -16, -22, and -525. The septic system was installed in 1945; its use was discontinued in 1952; and it was removed in 1967. Buildings 16-1 and -2 are decommissioned office buildings. Building 16-7 was a steam plant and machine shop, but the building was used for storage at the time the Addendum 1 to the OU 1082 work plan was written. The steam plant part of the building was removed in 1956. The machine shop repaired equipment from TA-16 and machines were decontaminated before they were sent to the shop. Building 16-10 was a storage building for casting molds and was no longer in use when the OU 1082 work plan addendum was written. Building 16-16 was a cafeteria that was decommissioned in 1992; it currently is used for offices. Building 16-22 was an office building that was removed in 1961. Building 16-525 was a women's change house and laundry facility that was built in 1951 and demolished in 1989. The septic system served the toilets, a floor drain in the equipment room, and two roof drains for Building 16-525. All other wastewater from Building 16-525 went to the grease trap [structure 16-1137, SWMU 16-005(l)]. Most of the 6-in. VCP that was connected to structure 16-161 is active and is tied in with an intersecting line that carries sanitary waste from other buildings at the site to the TA-16 WWTP. The line was plugged at a point just beyond the new connection at a manhole (structure 16-776). The section of line that connected Buildings 16-1, -2, -10, -16, -22, and -525 to the main line is inactive. Suspect contaminants are HE and organic and inorganic chemicals.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The OU 1082 work plan addendum proposed RFI sampling at SWMU 16-005(a) to locate the most likely regions of potential contamination, beginning with field-screening for HE.

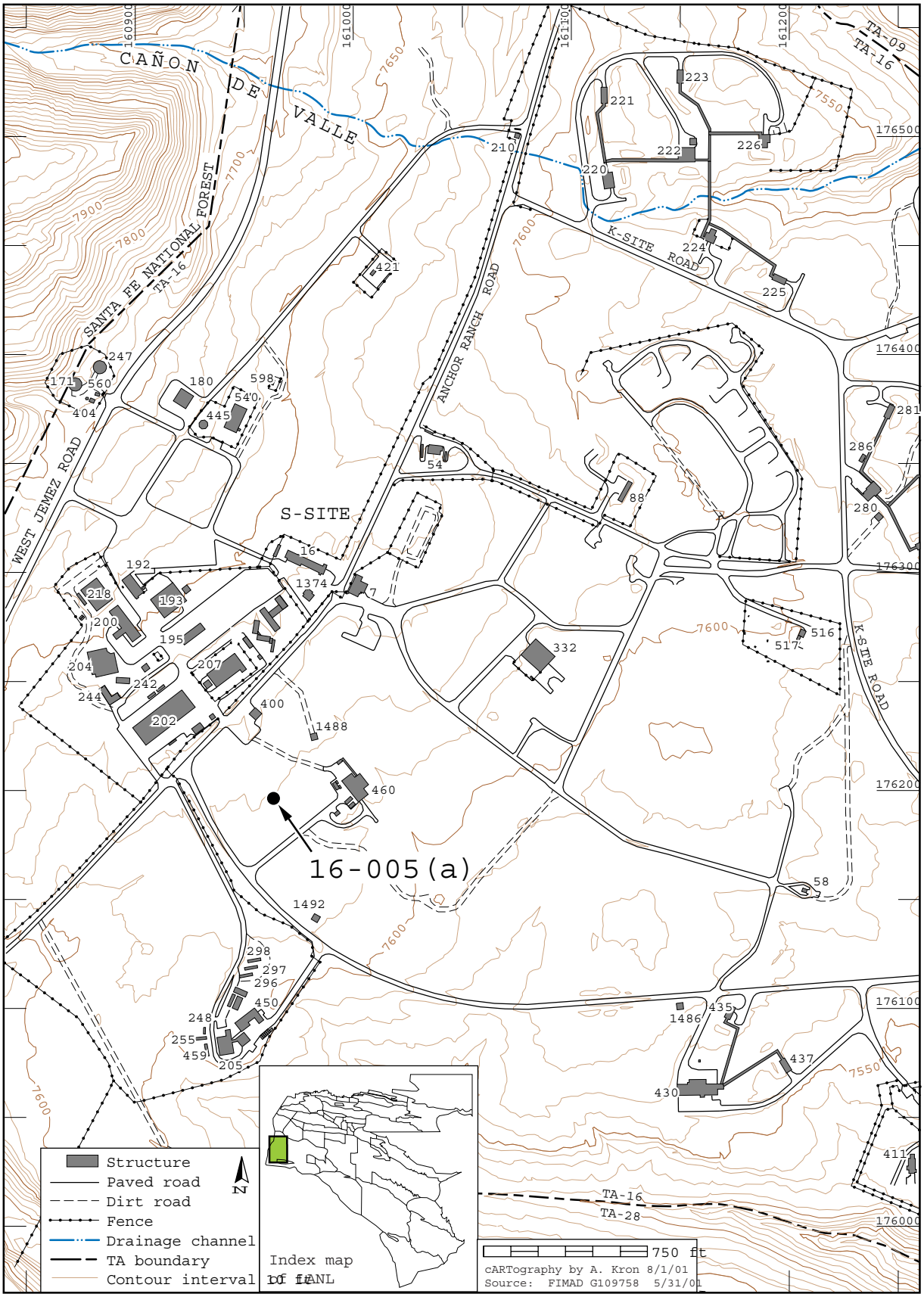
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580


**No photo; subsurface unit**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-005(a)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-005(h) — Septic tank*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-1952 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-431 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-005(h) is the location of potentially contaminated subsurface soil at the site of a decommissioned septic tank (structure 16-431). Structure 16-431 served an HE processing building (Building 16-430), where plastic-bonded explosives and mock HE powders were pressed into shape. The tank was built in 1951 and was located about 200 ft from the southwest corner of Building 16-430. The tank's use was discontinued in January 1952 and was removed in 1968. Since Building 16-430 was completed in July 1951 and sanitary sewer lines, leading to the TA-16 waste water treatment plant, were not connected to the building until January 1952, it is possible that the tank was used during the first six months that Building 16-430 operated. Structure 16-431 had an associated outfall, SWMU 16-003(l)-99. Suspect contaminants for the outfall are organic chemicals and HE; Addendum 1 for the OU 1082 work plan lists the same suspect contaminants for SWMU 16-005(h), based on suspect outfall contaminants.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The OU 1082 work plan addendum proposed RFI sampling at SWMU 16-005(h) to locate the most likely regions of potential contamination, beginning with field-screening for HE.

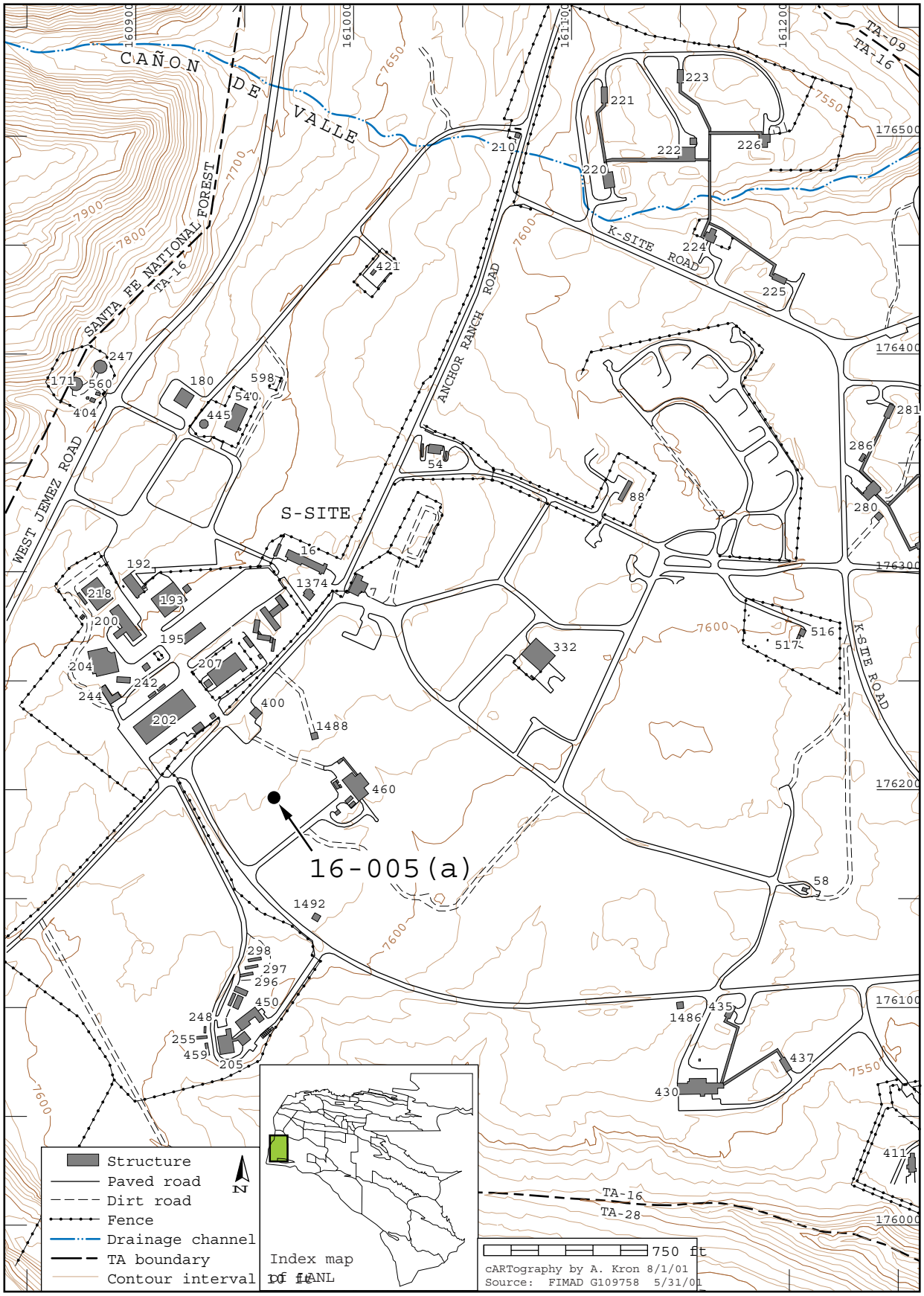
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580


**No photo; subsurface unit**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-005(a)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-005(k) — Septic tank*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1945 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-1132 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-005(k) is the location of potentially contaminated subsurface soil adjacent the site of a decommissioned septic tank (structure 16-1132). The tank was installed in January 1944 and served the administration building (Building 16-1) and a steam plant and machine shop building (Building 16-7). The tank was removed in 1956 and was found to be free of contamination upon removal. The tank was the original septic system for Buildings 16-1 and 16-7. Sewer lines from the buildings joined at a manhole (structure 16-784) and led to the septic tank. The tank discharged to a drainfield 140 ft to the west. When the sewer system for the septic tank (structure 16-161) was built in 1945, the tank was connected to a manhole (structure 16-784). The VCP from the manhole to structure 16-1132 then was decommissioned.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The OU 1082 work plan addendum proposed sampling at SWMU 16-005(k) to locate the most likely regions of potential contamination, beginning with field-screening for HE.

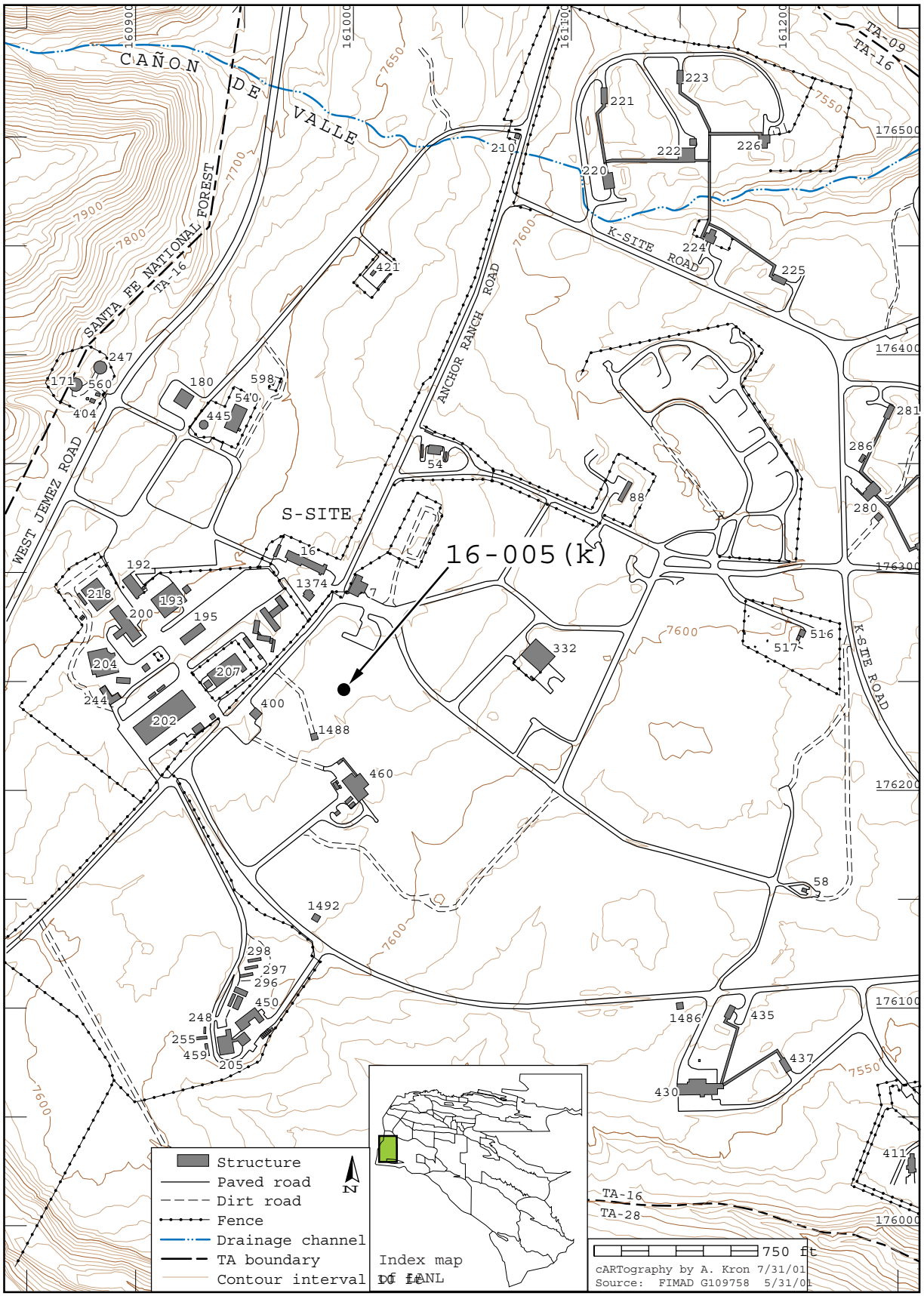
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580


**No photo; subsurface unit**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-005(k)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-005(l) — Physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-1137 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-005(l) is the location of potentially contaminated subsurface soil adjacent to a decommissioned manhole/grease trap (structure 16-1137). Structure 16-1137 served Building 16-525, the women's change house. The grease trap was located about 98 ft south of Building 16-525, next to an existing steam manhole (structure 16-1082). Structure 16-1137 was 6.5 ft in diameter x 4 ft deep. It was a cylinder made of reinforced concrete and had a steel cover that resembled a manhole. The grease trap was partially buried 5.5 ft into the ground and the top protruded about 1 ft above the ground surface. Structure 16-1137 discharged to an outfall ditch through 4-in. VCP that was buried about 3 ft belowground. Structure 16-1137 was removed but the removal date is unknown. Building 16-525 originally was a women's change house with laundry facilities. It was built in 1951 and demolished in 1989. Wastewater from the showers, sinks, and all but one floor drain and two roof drains discharged to structure 16-1137; the floor drain and roof drains discharged to SWMU 16-005(a). Wash water from the laundry room also drained to the grease trap.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The OU 1082 work plan addendum proposed RFI sampling at SWMU 16-005(l) to locate the most likely regions of potential contamination, beginning with field-screening for HE.

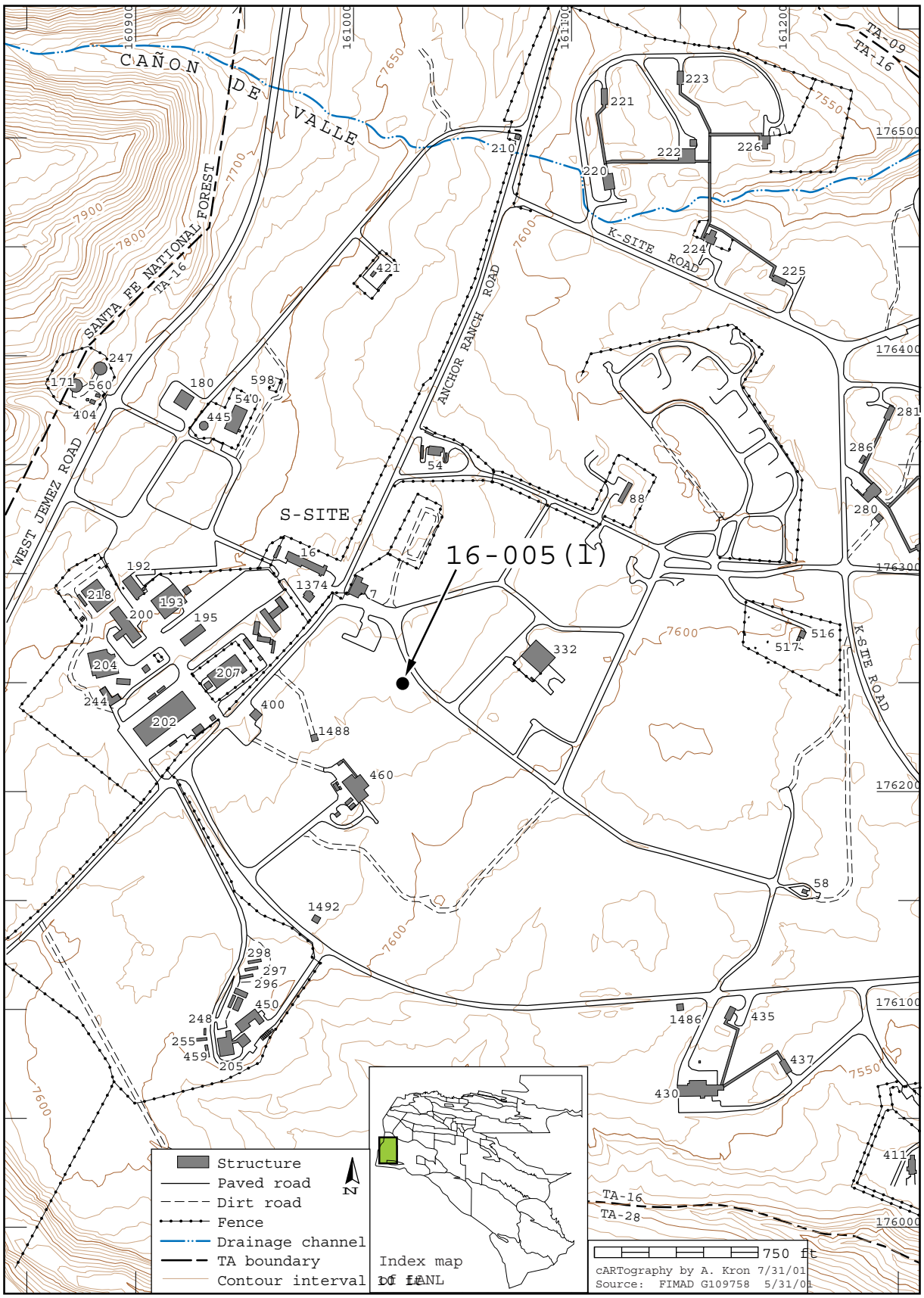
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580


**No photo; subsurface unit**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-16
TA-28
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
K-SITE ROAD
S-SITE
16-005(I)
7900
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160900
161000
161100
161200
176500
176400
176300
176200
176100
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1374
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204
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244
202
400
1488
460
332
516
517
58
1492
298
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435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-005(n) — Septic tank*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1949-1971 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-173 | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-005(n) is a septic tank (structure 16-173) associated with a latrine (structure 16-162) that was put in service in 1949. The latrine was removed in 1971. The latrine and septic tank were north of the 90s Line HE machining buildings. The septic tank was abandoned in place in 1971. A contamination survey conducted in 1971 found that gross alpha and gross beta activity in the tank's water were below detection limits that were in place at the time of the survey. The OU 1082 work plan recommended NFA for this SWMU because documentation indicated that the septic tank received only sanitary waste from a latrine located several hundred feet from the nearest process building and there was no potential for release to the environment.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

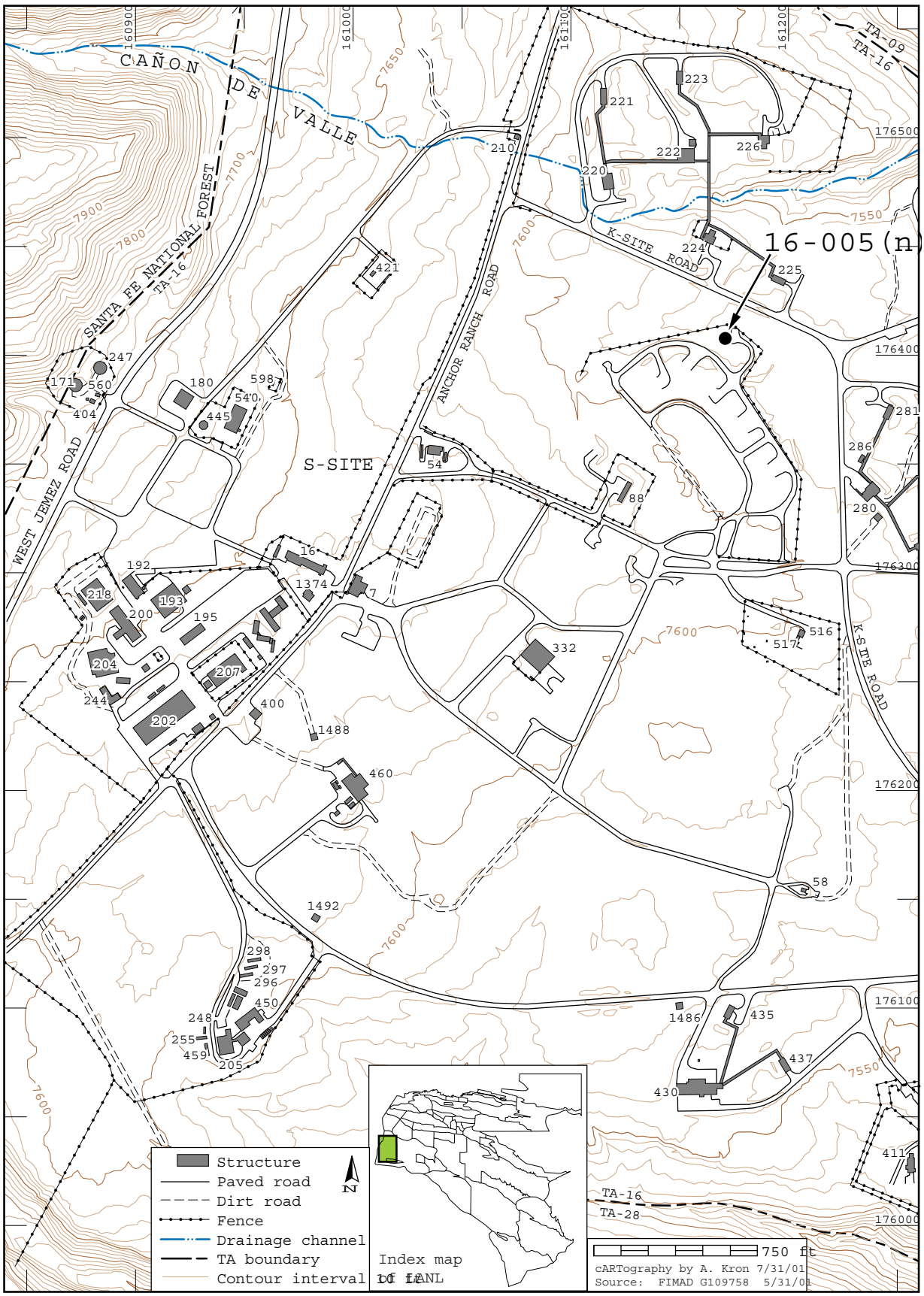
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196


**No photo; subsurface unit**


16-005(n)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
S-SITE
K-SITE ROAD
ANCHOR RANCH ROAD
WEST JEMEZ ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-006(a) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1964-1988 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-175 | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-006(a) was a septic tank (structure 16-175). It was a 500-gal. capacity, 10-ft x 5-ft, reinforced-concrete tank and a 4-in.-diameter VCP that ran from the instrumentation/test building (Building 16-54) to the tank. The tank was installed in 1964 and was replaced in 1988. The drainline's use was discontinued and left in place. Building 16-54 was initially a barium nitrate grinding facility. The building was used as an environmental testing laboratory from the late 1950s to 1988. The laboratory had physical testing machines that included a vibration table and shock-testing and drop-impact machines. Building 16-54 currently is used as an office building. An environmental survey of the septic tank conducted in November 1988 detected organic chemicals. Suspect contaminants are barium and organic chemicals.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed sampling the tank prior to decontamination and decommissioning.

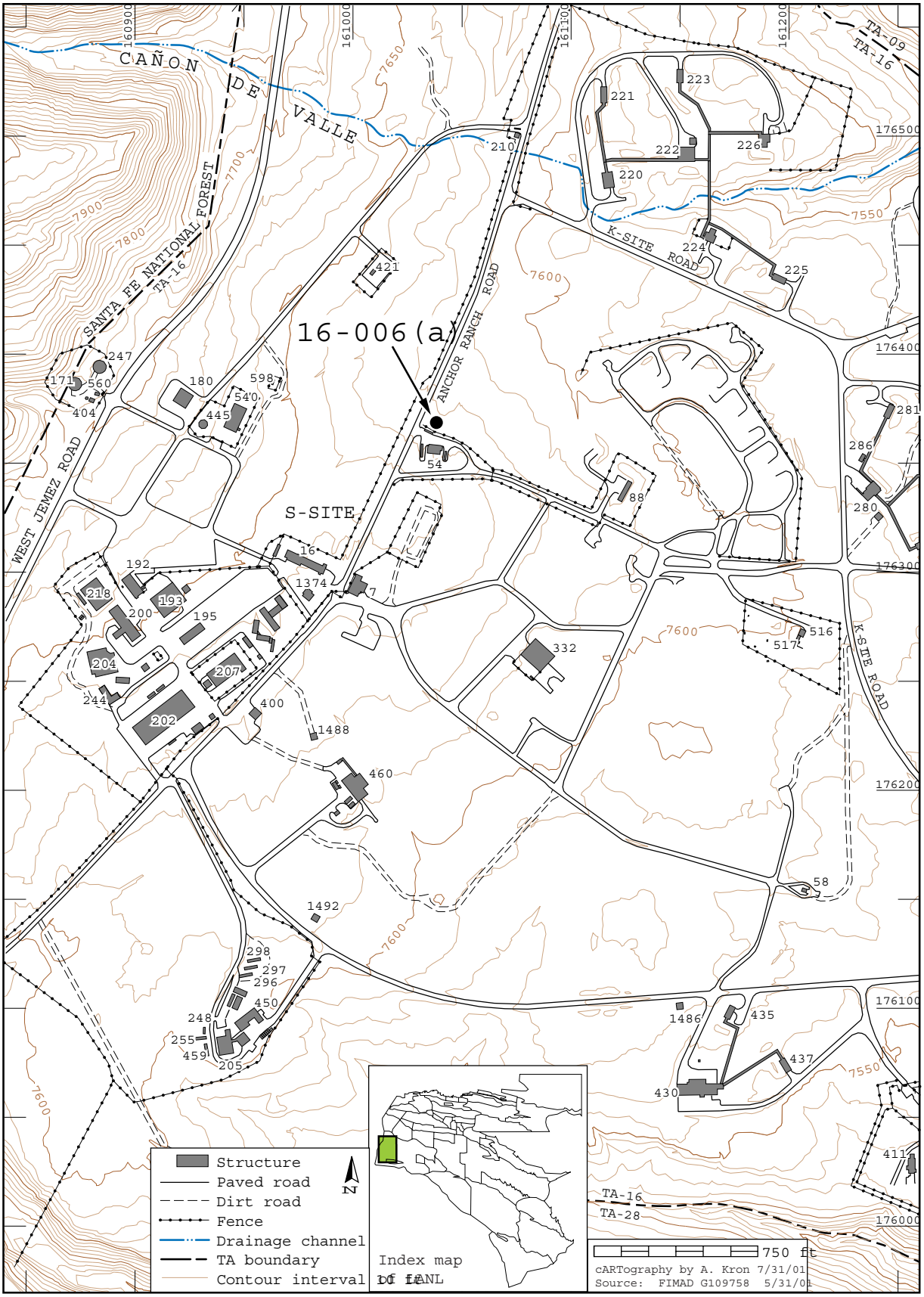
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196


**No photo; subsurface unit**


16-006(a)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-006(c)-00 — Outfall/effluent discharge - subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1953-Unknown |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-371 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-006(c)-00 consists of former SWMUs 16-006(c) and 16-026(a). Former SWMU 16-006(c) is a septic system that served the metal forming building (Building 16-370). The building was built in 1953 and housed barium nitrate and metal-forming operations. Former SWMU 16-026(a) is potentially contaminated soil associated with outfalls and drainlines from Building 16-370. The outfall areas from these two SWMUs overlap, and suspect contaminants are commingled. Suspect contaminants are HE, inorganic chemicals, uranium, and organic chemicals.

Former SWMU 16-006(c) is a 1200-gal. reinforced-concrete septic tank (structure 16-371), and its associated drainlines, drainfield, and outfall. The septic system was installed in 1953. The tank serves six floor drains, three water closets, and two lavatories on the third floor of Building 16-370. The units are connected to a common line that empties to a manhole (structure 16-831), which drains to the septic tank. At the time of the ER Project RFI at this former SWMU, the tank was used as a holding tank for water from floor drains and third-floor restrooms, and the drainline to the outfall was plugged at the tank. The tank was pumped regularly when Building 16-370 was operational, but at the time of the RFI the building was inactive.

Former SWMU 16-026(a) is potentially contaminated soil associated with two outfalls and associated drainlines from Building 16-370. One outfall received discharge from a roof drain on the east side of Building 16-370 and the other received discharge from a steam pit condensate drain from the south side of the building. Effluent from the outfalls drained into Water Canyon. The steam pit drain joins NPDES-permitted Outfall 04A092, SWMU 16-028(b). The outfall was deleted from the LANL NPDES permit effective January 14, 1998. Addendum 2 of the OU 1082 work plan proposed NFA at former SWMU 16-026(a) because no process-related hazardous constituents have been introduced into the roof drains or the steam pit drains.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted an RFI at former SWMU 16-006(c) in 1995 to determine if a release had occurred and if so, if the release resulted in contamination. Samples were field-screened for HE, radioactivity, and organic chemicals; in addition, nine samples were collected from six locations and submitted for laboratory analysis. One supplemental sample was collected in September 1996 because the 1995 data did not bound the downgradient extent of contamination from the outfall. Elevated levels of barium and benzo(a)pyrene were found in the samples, but were thought to pose no unacceptable human health risks. The RFI report recommended NFA for former SWMU 16-006(c).

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 22 | 14 | 3 |
| Radionuclides | 1 | 0 | 0 |
| SVOCs | 19 | N/A | 1 |
| VOCs | 4 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 2.3 mg/kg | 0.39 mg/kg |
| | Barium | 6540 mg/kg | 5200 mg/kg |
| | Cyanide (total) | 0.25 mg/kg | N/A |
| SVOCs | Benzo(a)pyrene | 0.19 mg/kg | 0.062 mg/kg |

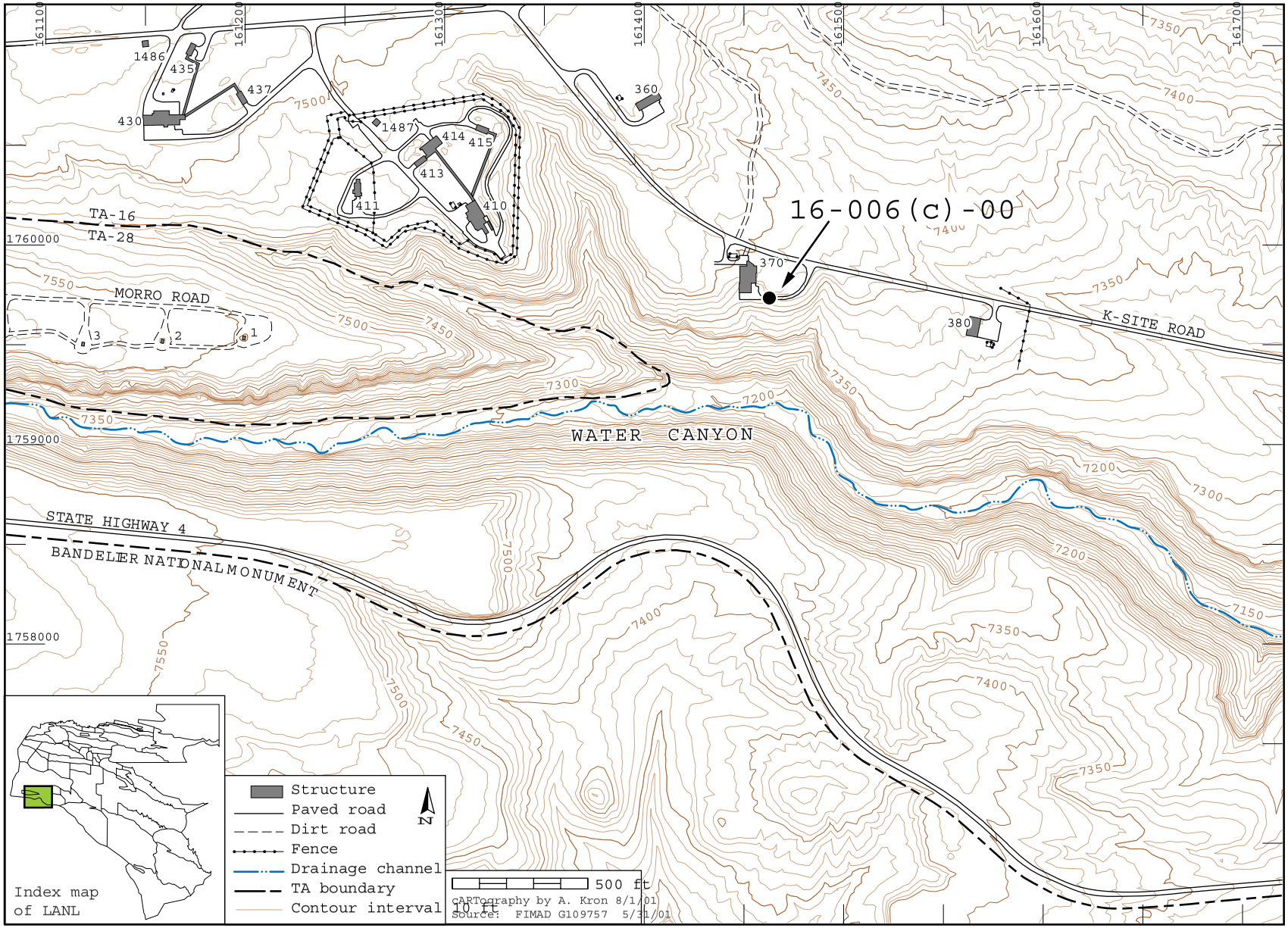
## References


RFI Report for TAs -11, -13, -16: PRSs 11-012(a,b), 13-003(a), 16-006(c,d), 16-010(a), 16-021(a), 16-026(c,d,v), 16-028(a), 16-030(g) — LA-UR Number: 97-3072

RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of former SWMU 16-006(c)**


16-006(c)-00
WATER CANYON
MORRO ROAD
K-SITE ROAD
STATE HIGHWAY 4
BANDELER NATIONAL MONUMENT
TA-16
TA-28
1760000
1759000
1758000
16110
16120
16130
16140
16150
16160
16170
1486
435
437
430
1487
414
415
413
411
410
360
370
380
3
2
1
7350
7400
7450
7500
7550
7300
7200
7150
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
500 ft
100 ft
Index map of LANL
CARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

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# SWMU 16-007(a)-99 — Facility/equipment - storage areas/waste piles/ magazines - surface impoundment

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-31, 16-32, 16-33, 16-34 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-007(a)-99 consists of former SWMUs 16-007(a), 16-024(e), 16-025(e), 16-025(f), and former AOC 16-024(d). These are settling ponds and three machining buildings (including their associated sumps and drainlines) located in the GMX-3 (HE and implosion systems) 30s-Line area in the central portion of S-Site. This consolidated SWMU encompasses an area that was the location of three identical HE machining buildings (Buildings 16-31, -32-, and -33), sumps and drainlines that discharged to a series of four waste ponds, and a former magazine. The buildings were part of a row of structures referred to as the 30s Line that also included magazines, radiographic facilities, and utility buildings. The area is bounded on the north by structures 16-89, -90, -91, -92, and -93; on the east by a road; on the west by the administration area east of Anchor Ranch Road; and on the south by the road. S-Site was used for HE processing from 1944 to the early 1950s. Operations at GMX-3 were devoted to developing techniques to produce HE lenses, the explosives component of a nuclear weapon, with high chemical purity and accurate shape. HE was subjected to disruptive processes like casting and machining. Casting operations consisted of melting powdered HE and pouring the melts into shaped molds. Cooling protocols were controlled carefully during the casting stage to ensure perfect shape. To control cooling, casting buildings generally were equipped with piping arrays that provided water and steam at various temperatures and pressures to cooling jackets that surrounded the castings. HE vapor was produced while the cast HE was melted and the vapor tended to coat the interiors of the casting buildings. The widely dispersed HE was removed daily using high-pressure mixtures of steam and hot water. Wash water drained through troughs in the floors into sumps, or it leaked out through cracks in building floors and walls. After casting, risers (ridged imperfections in the cast) were sawed off and the HE charges were machined under a stream of water. Fine HE powder in machining buildings, from riser sawing and machining, also was washed into sumps and may have collected or passed through cracks in the building's floors. HE normally was held in magazines and rest houses between operations, where occasional spillage occurred. Buildings associated with those operations were hosed down periodically to remove HE contamination; wash water was discharged to sumps and drainage systems. Most buildings were decommissioned, destroyed by intentional burning, and removed to MDA P. All decommissioned buildings were surveyed for radiation, HE, and toxic chemicals before they were burned. Results of those surveys were negative unless otherwise indicated in this unit description. Sumps and drainlines were removed and associated HE-contaminated soil was cleaned to a residual level of 3% HE.

Former SWMU 16-007(a) consists of four backfilled ponds about 100 ft southwest of the process building (Building 16-90). The ponds were aligned in a row and each was flat-bottomed and about 100 ft square. The ponds were 8 ft to 10 ft deep and separated by berms 4 ft to 6 ft high. The ponds received effluent from drains in historical machining buildings (Buildings 16-31, -32, and -33), which were decommissioned and burned in January and February 1960. The ponds are believed to have received HE-contaminated liquids containing barium and organic chemicals. Natural uranium also may have been discharged to the ponds. No documentation indicates a release occurred from the ponds. The locations of the historical ponds are level with the mesa and covered with grasses. In 1967, the ponds were excavated as part of the S-Site demolition and restoration. In 1988, subsurface soil samples were collected from the bottoms of each of the ponds. Samples were analyzed for HE, inorganic and organic chemicals, and radionuclides. Elevated levels of inorganic chemicals were detected. No samples were taken from beneath the pond floors.

Former SWMUs 16-024(e), 16-025(e), and 16-025(f) were three identical HE-machining buildings (Buildings 16-31, -32, and -33). Each building consisted of two 13-square-ft chambers for machining and an 8-square-ft control room. Pipes connected the control room to the machining chambers. The buildings were made of wood and had concrete slab floors with fill dirt around and between them. Each building was almost entirely buried and had a door to the control room that was exposed on the southwest side. Doors to the machining chambers were located in blowout walls on the northeast side. An air conditioning system was mounted atop each mound that surrounded each machining building. Originally, each machining chamber had a lead-lined trough for washing out HE. The lead-lined troughs were replaced with concrete troughs with spark-proof mastic covering in August 1945. In the 1950s, the buildings were converted to other purposes. A sump that received effluent from the troughs of two machining chambers was located between each building and the road northeast of the 30s-Line. Each sump had a drainline that passed beneath the adjacent road, under an earthen barricade, and into the settling ponds [former SWMU 16-007(a)]. These sumps and drains are treated as part of this consolidated SWMU. The buildings were listed as having HE contamination in 1959. Suspect contaminants are HE and inorganic chemicals.

Former AOC 16-024(d) is the footprint of a historical HE magazine (structure 16-34). Structure 16-34 was 12 ft wide x 17.5 ft long x 8 ft high. It was a wood-frame structure with a concrete floor and was bermed on three sides and on top. The magazine was located within the 30s-Line. Raw or finished HE products and machined products for physical and x-ray examination were stored at structure 16-34. The magazine was built in 1945 and had no plumbing. Structure 16-34 collapsed by 1960 and was demolished at a

later unknown date. Suspect contaminants were inorganic and organic chemicals and HE. No previous investigations were conducted at this site.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed sampling to determine the nature and extent of contamination, if any, at former SWMU 16-007(a).

The ER Project conducted an RFI at former AOC 16-024(d) in 1997 to determine if elevated contaminant concentrations were present in soils. Ten field-screening samples were taken from five locations in and adjacent to the building footprint. Samples were field-screened for HE and radionuclides. Samples were negative for radionuclides and one sample was positive for HE. The positive sample was submitted for laboratory analysis and analyzed for organic and inorganic chemicals and HE. No elevated chemical concentrations were detected, and the RFI report recommended NFA at former AOC 16-024(d) because no hazardous chemicals were present.

Addendum 1 of the OU 1082 work plan proposed subsurface sampling at former SWMUs 16-024(e), 16-025(e), and 16-025(f) to locate residual HE. Because of the small size of the buildings and the large amounts of soil contained in the barricades around them, Addendum 1 of the OU 1082 work plan stated that it was likely that contamination in the building footprints was diluted when the barricades were bulldozed.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 22 | 13 | 1 |
| Radionuclides | 0 | 0 | 0 |
| SVOCs | 1 | N/A | 0 |
| VOCs | 2 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 3.8 mg/kg | 0.39 mg/kg |

## References

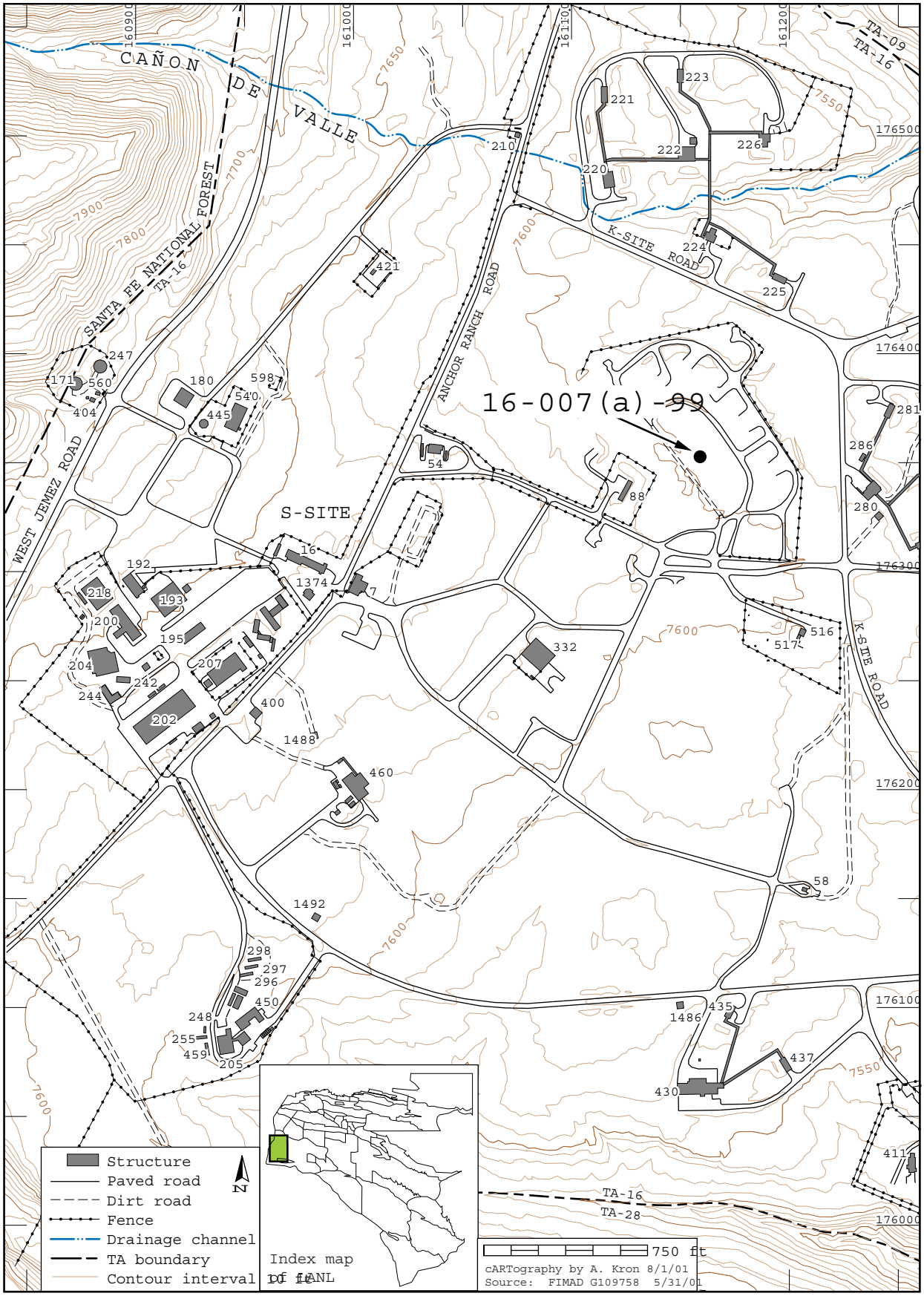

RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU 16-007(a)-99**

**View of SWMU 16-007(a)-99, looking east**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-007(a)-99
7900
7800
7700
7650
7600
7550
16090
16100
16110
16120
176500
176400
176300
176200
176100
176000
247
171
560
404
180
598
540
445
421
210
220
221
222
223
224
225
226
54
88
281
286
280
16
1374
7
192
218
193
200
195
204
242
244
207
202
400
1488
460
332
516
517
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-008(a)-99 — Container storage - outfall/effluent discharge - physical/chemical treatment units - surface impoundment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950-1991 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-008(a)-99 consists of former SWMUs 16-008(a), 16-017(a)-99, 16-017(b)-99, 16-017(c)-99, 16-017(d)-99, 16-017(e)-99, 16-026(m), 16-026(n), 16-026(o), 16-026(p), 16-029(k), 16-029(l), 16-029(s), 16-029(t), 16-029(u), and former AOC C-16-067. This consolidated SWMU is the location of the footprints of former HE-processing buildings, former materials storage buildings, and sumps, drainlines, and outfall systems (drainages) associated with the 90s Line of HE-processing buildings in the historic GMX-3 area. GMX-3 developed and used production techniques for shaped HE charges. The process involved large quantities of HE. Most structures in this consolidated SWMU were built in 1950 for machining HE. Shortly after the buildings were constructed, LANL began using HE pressing techniques rather than casting, which reduced the volume of HE removed by machining. As a result, HE machining in the 90s Line was at a smaller, more experimental level. After 1970, all of the buildings were used for storage until they were removed from service (by 1991). The structures were removed during D&D activities in 1996.

Descriptions of the former SWMUs and the one AOC are grouped by system below (e.g., building, sump, and drainline/outfall for each associated building). Each building was equipped with two sumps that received effluent from drain troughs in the concrete slab floors. Initially, the sumps contained filter baskets, but the sumps subsequently were converted to conventional concrete sumps that were cleaned by vacuum-removal of wastewater. All the sumps were removed from service in 1970. In addition to effluent from the building sumps, drainage from driveways, roof drains, and building washdown discharged to the drainlines and outfalls described below. Each outfall/drainage consists of a buried VCP from the sumps, drainage channel along the road where the pipes daylight, buried VCP beneath the road, and an open-air drainage channel. Effluent discharged into a drainage that emptied into Cañon de Valle 600 ft north of the 90s Line or to the 90s Line pond.

The DOE sampled potentially contaminated sites at the 90s Line during the late 1980s. Samples were taken from the outfall area draining the processing building (Building 16-93), former SWMU 16-029(k). Samples were analyzed for HE, cyanide, metals, and organic chemicals. Elevated levels of barium, cadmium, lead, zinc, and cyanide were found; none was above SALs. HE was not detected in the samples. No previous analyses were conducted for samples within the boundaries of the other former SWMUs and AOC in this consolidated unit. Historical samples from the pond [former SWMU 16-008(a), into which the drainlines from Buildings 16-89, 16-90, and 16-91 discharged] may be representative of contaminants from those buildings. Pond sampling (soil) data indicate that nickel and cadmium were above BVs but below SALs. Acetone, which has no BV, was also detected but was below its SAL. Within the pond, barium in water and HE in soils exceeded SALs.

Former SWMU 16-017(e)-99 is a former HE machining building (Building 16-89), a 1684-square-foot wood building on a concrete slab. It was surrounded on three sides by an earthen berm that was packed against steel pilings. The building subsequently was converted to a storage facility that operated from 1950 to 1970. Former SWMU 16-029(u) consists of two former sumps in Building 16-89. Each sump is about 15 ft long x 5 ft wide x 5 ft deep. In the mid- to late-1960s, the HE sumps were filled with gravel. Former SWMU 16-026(p) consists of the drainlines and outfall from the sumps for Building 16-89.

Former SWMU 16-017(d)-99 is a former HE machining building (Building 16-90), a 2165-square-foot wood building on a concrete slab. It was surrounded on three sides by an earthen berm that was packed against steel pilings. Building 16-90 was completed in 1950 and machining activities were at maximum levels until mid-1951, when the modern HE machining building (Building 16-260), was finished. The building subsequently was converted to a storage facility during the late 1950s or early 1960s. It operated from 1950 to 1980. Former SWMU 16-029(t) consists of two former sumps for Building 16-90. The sumps are 15 ft long x 5 ft wide x 5 ft deep. In the mid- to late-1960s, the HE sumps were filled with gravel. Former SWMU 16-026(o) consists of the drainlines and outfalls from the sumps for Building 16-90.

Former SWMU 16-017(c)-99 is a former HE machining building (Building 16-91), a 1332-square-foot wood building on a concrete slab. It was surrounded on three sides by an earthen berm that was packed against steel pilings. The building was converted in the late 1950s or early 1960s for cleaning and refurbishing HE-contaminated equipment. It operated from 1950 to 1980. Former SWMU 16-029(s) consists of two former sumps for Building 16-91. Each was about 15 ft long x 5 ft wide x 5 ft deep. The HE sumps were filled with gravel in the mid- to late-1960s. Former SWMU 16-026(n) is the drainline and outfall from the sumps for Building 16-91.

Former SWMU 16-017(a)-99 is the footprint of an HE machining building (Building 16-92), a 1332-square-foot wood building on a concrete slab. It was surrounded on three sides by an earthen berm that was packed against steel pilings and operated from 1950 to 1955. The building subsequently was converted for cleaning and refurbishing HE-contaminated equipment. By 1970, it was devoted entirely to storage. Former SWMU 16-029(l) is potentially contaminated soil associated with two former sumps in Building 16-92.

Each sump is about 15 ft long x 5 ft wide x 5 ft deep. In the mid- to late-1960s, the HE sumps were filled with gravel. Former SWMU 16-026(m) is potentially contaminated soil associated with the drainline and outfall from the sumps in Building 16-92. Operations at Building 16-92 may have resulted in uranium contamination from the handling of disassembled items containing uranium.

Former AOC C-16-067 was a drum storage platform (structure 16-191), adjacent to the HE machining building (Building 16-90). It was made of wood and sat on steel legs a few feet off the ground. The platform was 8 ft long x 8 ft wide x 4.5 ft high. The platform was constructed in 1950 along with the 90s Line and was used to store oils, solvents, and possibly HE in containers that had spigots. The drainline for Building 16-90 extended through the boundary of AOC C-16-067. The platform was decommissioned in 1970.

Former SWMU 16-017(b)-99 is the footprint of an HE machining building (Building 16-93), a 1627-square-foot wood building on a concrete slab. It was surrounded by an earthen berm on three sides; the berm was packed against steel pilings. The building subsequently was converted to an electroplating facility, then to a storage facility. It began operating in 1950. By the 1970s, Building 16-93 was devoted to storage. Former SWMU 16-029(k) consists of two former sumps, a drainline, and an outfall from Building 16-93. In the mid- to late-1960s, the HE sumps were filled with gravel. Surface soil data from samples taken in the vicinity of the plating outfall drainage in the late 1980s showed barium, cadmium, lead, zinc, and cyanide above BVs but below SALs. Soil samples were analyzed for HE, inorganic chemicals, and organic chemicals. No HEs were detected in the samples.

Former SWMU 16-008(a) is a 200-ft-diameter, inactive, unlined settling pond that received liquid waste from the HE sumps at three processing buildings (Buildings 16-89, 16-90, and 16-91). Buildings 16-92 and 16-93 did not empty into former SWMU 16-008(a). The pond may have been 10 ft to 15 ft deep. An engineering drawing shows that this site was once an HE-burning area. The pond may have received HE, barium, uranium, and organic chemicals. No documentation has been found that the pond was cleaned. The area currently contains runoff and occasionally dries up in the summer. Samples taken from the pond in the 1980s indicate that barium, nickel, and cadmium were above BVs but below SALs. Acetone, which has no BV, was also detected but was below its SAL. Within the pond, barium in water and HE in soils exceeded SALs.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed sampling at SWMU 16-008(a) to determine the depth of the pond floor and sediment layering, and to detect HE, inorganic chemicals, organic chemicals, and radionuclides.

The ER Project conducted a VCA in 1996 at the former SWMUs and AOC in this consolidated unit, with the exception of former SWMU 16-008(a), in conjunction with D&D activities. VCAs were conducted following D&D removal of all surface and subsurface structures and contaminated soil within two feet of sumps and drainlines.

The ER Project conducted a VCA at former SWMUs 16-026(m) and 16-029(l) in 1996, following D&D removal of all surface and subsurface structures. Following removal of the structures, 20 quantitative field-screening samples were taken. Four samples were lateral-bounding. Samples were screened for RDX and TNT, inorganic chemicals, organic chemicals, and radionuclides. Twenty locations were above BVs for barium, one was above BVs for zinc, five were above BVs for nickel, six were above BVs for copper, and six were above SAL for uranium. The soil containing the highest level of each potential contaminant above BVs was submitted for laboratory analysis of HE, total uranium, inorganic chemicals, and organic chemicals. No analyte was detected above SAL. The VCA report recommended NFA at former SWMUs 16-026(m) and 16-029(l) because available data indicate that potential contaminants are not present.

In 1996, a VCA was performed at former SWMUs 16-026(n) and 16-029(s). The ER Project took 41 field-screening samples. Sixteen were lateral bounding, quantitative field screening samples, two were vertical-delineation samples, and four were vertical-bounding samples. Samples were screened for HE, inorganic chemicals, organic chemicals, and radionuclides. Thirty-one screening locations were above BVs for barium and seven were above BVs for silver. The soil that contained the highest level of each potential contaminant above BVs was submitted for laboratory analysis. Six potential contaminant and bounding laboratory samples were taken and analyzed for inorganic chemicals, organic chemicals, and HE. Cadmium and barium were detected above BVs but below SALs. RDX was above SAL and TNB was above PRGs. PAHs were detected in the analysis but were attributed to non-point source runoff from surrounding parking lots and roads. Contamination was bounded at all locations except one during COPC sampling. Because there are no multiple constituent problems at former SWMUs 16-029(s) and 16-026(n), the VCA report stated that the one location where TNB was above PRG would be below PRG based on a hazard index of 1. All other locations were below PRGs. After verification sampling results were received, trenches from the excavated drainlines and sumps and the cleanup sites were backfilled with clean soil, compacted, and contoured to blend with the surrounding topography. The area was seeded with native grasses. The VCA report recommended NFA at former SWMUs 16-029(s) and 16-026(n) because the SWMU was remediated in accordance with current applicable state or federal regulations, and available data indicate that potential contaminants are either not present or are present in concentrations that pose no unacceptable risk to human health under present and projected future land use.

In a 1996 VCA performed by the ER Project at former SWMUs 16-026(o) and 16-029(t), 41 field-screening samples were taken. Eighteen were lateral-bounding, quantitative field-screening samples and seven were vertical-bounding samples. Samples were screened for HE, inorganic chemicals, organic chemicals, and radionuclides. Thirty screening locations were above BVs for barium,

four were above BVs for zinc, one was above BVs for silver, and two were above BVs for thorium. The soil that contained the highest level of each COPC above BVs was submitted for laboratory analysis. Seven potential contaminant and bounding laboratory samples were taken and analyzed for inorganic chemicals, organic chemicals, and HE. TNT and RDX were detected above PRGs; TNB was detected above SAL. Bounding samples were below SAL and PRGs except at three locations where the soil was later excavated. The vertical extent of contamination was defined by bounding samples at locations that were remediated. After verification sample results were received, trenches from the excavated drainlines and sumps and the remediated sites were backfilled with clean soil, compacted, and contoured to blend with the surrounding topography. The area was seeded with native grasses. Contaminated soils were removed and soil remaining at the site was below PRGs. The VCA report recommended NFA at former SWMUs 16-026(o) and 16-029(t) because the PRS was remediated in accordance with current applicable state or federal regulations, and available data indicate that potential contaminants either are not present or are present in concentrations that pose no unacceptable risk under present and projected future land use.

In 1996, the ER Project conducted a VCA at former SWMUs 16-026(p) and 16-029(u); 28 field-screening samples were taken. Ten of the samples were lateral-bounding, quantitative field-screening samples and two were vertical-bounding samples. Samples were screened for HE, inorganic chemicals, organic chemicals, and radionuclides. Eighteen of the samples were submitted for laboratory analysis for organic chemicals, inorganic chemicals, and HE. TNT, RDX, and beryllium were present at levels above SALs and industrial cleanup levels. Contaminated soils were cleaned up to below PRGs and the VCA report recommended NFA at former SWMUs 16-026(p) and 16-029(u) because the SWMUs were remediated in accordance with current applicable state or federal regulations. Available data indicate that potential contaminants either are not present or are present in concentrations that pose no unacceptable risk to human health under present and projected future land use.

The ER Project conducted a VCA at former SWMU 16-029(k) in 1996. Thirty-one field-screening samples were taken. Eight samples were lateral-bounding, quantitative field-screening samples and two were vertical-bounding samples. Samples were screened for HE, inorganic chemicals, organic chemicals, and radionuclides. COPC and bounding laboratory-analysis samples were biased to locations with positive field readings and to areas where visual examination suggested leakage of process water. Twenty-nine locations were above BVs for barium, two locations were above SAL for chromium, one location was above BVs for nickel, one location was above BVs for silver, one location was above BVs for lead, and one location was above SAL for uranium. One location that was above PRGs for RDX based on screening was excavated. Bounding samples were taken at locations where soil cleanup occurred. The soil containing the highest level above BVs for each COPC based on the screening was submitted for laboratory analysis. Five COPC and bounding laboratory samples were taken and analyzed for HE, inorganic chemicals, and organic chemicals. One sample also was tested for chromium(VI) because of a high-chromium screening value. Two samples were above BV for barium, one sample was above BV for chromium, and one sample was above SAL for chromium(VI) and chromium. Copper and lead were above BVs in one sample, two samples were above BV for nickel, and two samples were above BVs for zinc. No HEs were detected above SAL, and all detected organics were below SALs. Bounding samples were below SALs for all analytes. The VCA report recommended NFA at former SWMU 16-029(k) because the SWMU was characterized and remediated in accordance with applicable state and federal regulations and the available data indicate that potential contaminants either are not present or are present in concentrations that pose no unacceptable risk to human health under current and projected future land use.

In 1996, the ER Project conducted a VCA at former AOC C-16-067. Sixteen samples were taken and field-screened for HE, inorganic chemicals, organic chemicals, and radionuclides. COPC and bounding laboratory-analysis samples were biased to areas where visual examination suggested leakage of process water. One location had 500 ppm to 1000 ppm of diesel fuel. Two samples were sent for laboratory analysis of inorganic chemicals, organic chemicals, and HE. HE was detected above SAL and all soil at this former AOC was excavated. After cleanup, confirmation samples showed all soils below PRGs. The VCA report recommended NFA at former AOC C-16-067 because it was characterized and remediated in accordance with current applicable state and federal regulations, and available data indicate that potential contaminants either are not present or are present in concentrations that pose no unacceptable risk to human health under the projected future land use.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 9 | N/A | 5 |
| Inorganic chemicals | 26 | 23 | 6 |
| SVOCs | 21 | N/A | 1 |
| VOCs | 13 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.92 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 1.19 mg/kg | N/A |
| | Nitrotoluene[2-] | 0.159 mg/kg | N/A |
| | RDX | 186 mg/kg | 4.4 mg/kg |
| | Trinitrotoluene[2,4,6-] | 121 mg/kg | 31 mg/kg |
| Inorganic chemicals | Arsenic | 4.7 mg/kg | 0.39 mg/kg |
| | Chromium (total) | 226 mg/kg | 210 mg/kg |
| | Chromium hexavalent ion | 67.7 mg/kg | 23 mg/kg |
| | Cyanide (total) | 1.6 mg/kg | N/A |
| | Iron | 27,100 mg/kg | 23,000 mg/kg |
| | Nickel | 3280 mg/kg | 1500 mg/kg |
| SVOCs | Benzo(a)pyrene | 0.21 mg/kg | 0.062 mg/kg |

## References


Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 — LA-UR Number: 97-640

Voluntary Corrective Action Report for PRSs at TA-16, 90s-Line: PRSs 16-026(m,n,o,p), 16-029(k,l,q,s,t,u), C-16-064, C-16-067 — LA-UR Number: 96-3285

Voluntary Corrective Action Plan for SWMUs 16-026(m,n,o,p), 16-029(k,l,q,s,t,u) — LA-UR Number: 96-623

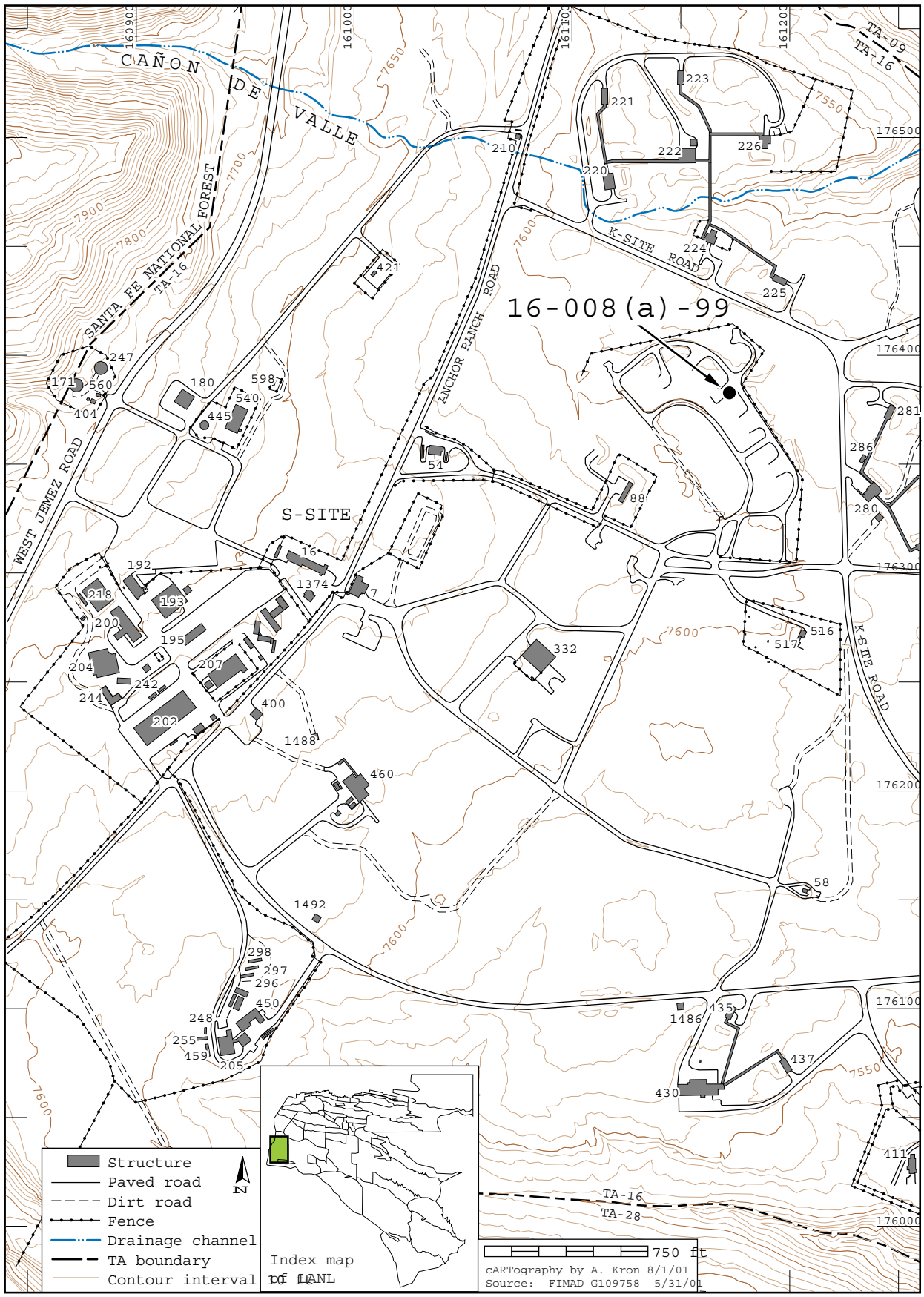
RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU 16-008(a)-99, looking east**

**View of SWMU 16-008(a)-99, looking northeast**

**View of SWMU 16-008(a)-99, looking west**


16-008(a)-99
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-009(a) — Open burning/open detonation*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1940s-1960s |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-009(a) was a burn area that was located in a level field near the western end of TA-16. The burn area was about 254 ft northwest of the World War II barium nitrate grinding facility (structure 16-54). The burn area was established in 1945 as a trash-burning site. It was not located in the old HE exclusion area and while it operated, a dedicated HE burn area existed at the MDA R burning ground. Aerial photos indicate that the burn area for SWMU 16-009(a) occupied about 100 square ft; a 6-ft-high berm surrounded the area on three sides. The east side of the burn area had an opening wide enough to allow truck access to the enclosed area. The burn area was used from the late 1940s to the 1960s. The site was decommissioned and the berm was leveled; it currently is an open vegetated field. Uranium was detected using hand-held instruments at this SWMU during an excavation in the late 1990s. Suspect contaminants at SWMU 16-009(a) are inorganic chemicals, uranium, and organic chemicals.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The OU 1082 work plan proposed sampling to determine the presence or absence of suspected contaminants.

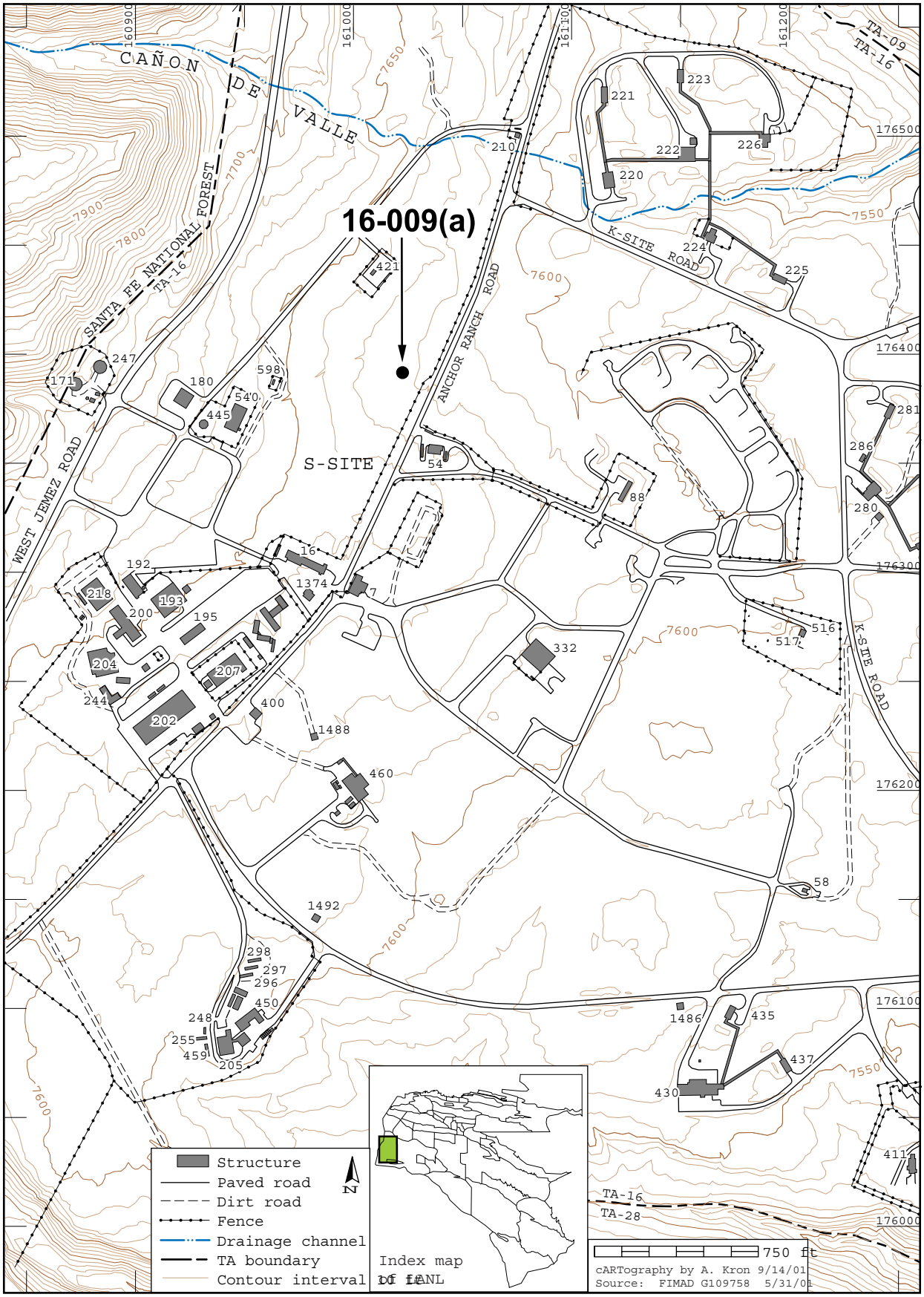
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU 16-009(a)**


16-009(a)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-16
TA-16
TA-28
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
K-SITE ROAD
WEST JEMEZ ROAD
7650
7700
7900
7800
7600
7550
7600
7600
7550
7600
161000
161100
161200
176500
176400
176300
176200
176100
176000
221
223
222
226
220
210
224
225
421
247
171
180
598
540
445
54
88
281
286
280
16
192
1374
7
218
193
200
195
204
207
244
202
400
1488
460
332
516
517
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
750 ft
cARTography by A. Kron 9/14/01
Source: FIMAD G109758 5/31/01
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL

# *SWMU 16-010(b) — Open burning/open detonation*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-1990s |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | 16-387 | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-010(b) was a flash pad identified as structure 16-387. It operated as a hazardous waste treatment unit under RCRA interim status and is undergoing RCRA closure. The pad was built in 1951 and was used to flash-burn HE-contaminated material. The burn area was enclosed within a 100-ft x 100-ft fenced area, and was made of a layer of sand several inches thick over a soil base.

## ER Project Activities

*RFI and closure activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project requested a Class I permit modification to remove this SWMU from Module VIII of LANL's Hazardous Waste Facility Permit because it is a hazardous waste treatment unit that is undergoing closure in accordance with state and federal regulations.

Closure activities and verification sampling for this site were completed in 2000 and 2001, in concert with the MDA P closure. Final closure approval is pending.

## ER Project Sampling Summary

Results from analytical samples collected at this site are reported with the MDA P closure report.

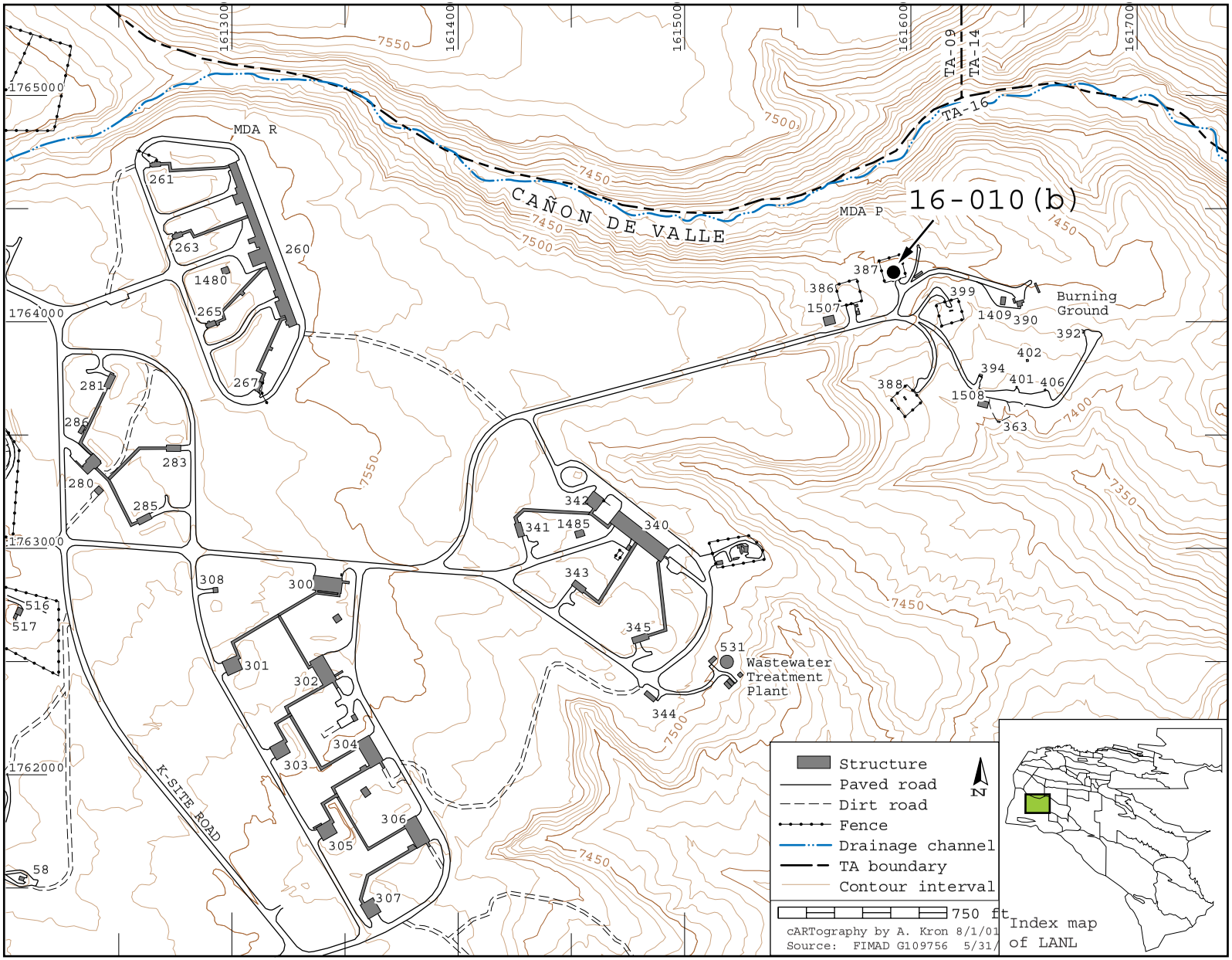
## References


| | |
|---|---|
| Sampling and Analysis Plan for Material Disposal Area P | LA-UR Number: 99-3630 |
| Closure Plan for the TA-16-387 Flash Pad | LA-UR Number: 99-4010 |
| RFI Work Plan for Operable Unit 1082 | LA-UR Number: 93-1196 |
| MDA P Area Closure Certification Report | LA-UR Number: 02-7819 |

**View of SWMU 16-010(b)**

**View of SWMU 16-010(b)**

**View of 16-010(b) after closure activities**


16-010(b)
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
Index map of LANL
N
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
283
285
308
300
301
302
303
304
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306
307
516
517
58
342
341
1485
340
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363

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# *SWMU 16-010(c) — Open burning/open detonation*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-388 | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-010(c) is a former burn table that was converted to a flash pad/burn tray (structure 16-388). The burn table was used to treat HE scrap. The 100-ft x 100-ft enclosed area consisted of a concrete pad that was used to unload explosives and a 16-ft x 4-ft metal tray that was approximately 2 ft above the ground surface. Scrap HE was placed on the tray and burned.

The current flash pad consists of a 22-ft x 22-ft concrete pad set on a secondary containment area and surrounded on three sides by a concrete wall. Prior to treatment, the HE-contaminated wastes are placed on steel pallets or steel trays. Propane burners are used as heat sources to treat the wastes at the flash pad, which can be covered with a movable steel roof when not in use.

The current burn tray consists of a stainless-steel kettle that is 30 in. in diameter and 24 in. high. Propane burners are used to treat HE-contaminated liquid wastes at the burn tray. The entire assembly, which can be covered with a retractable cover, is provided with secondary containment.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project requested a Class I permit modification for this SWMU because it is an active hazardous waste treatment unit and is managed in accordance with state and federal regulations.

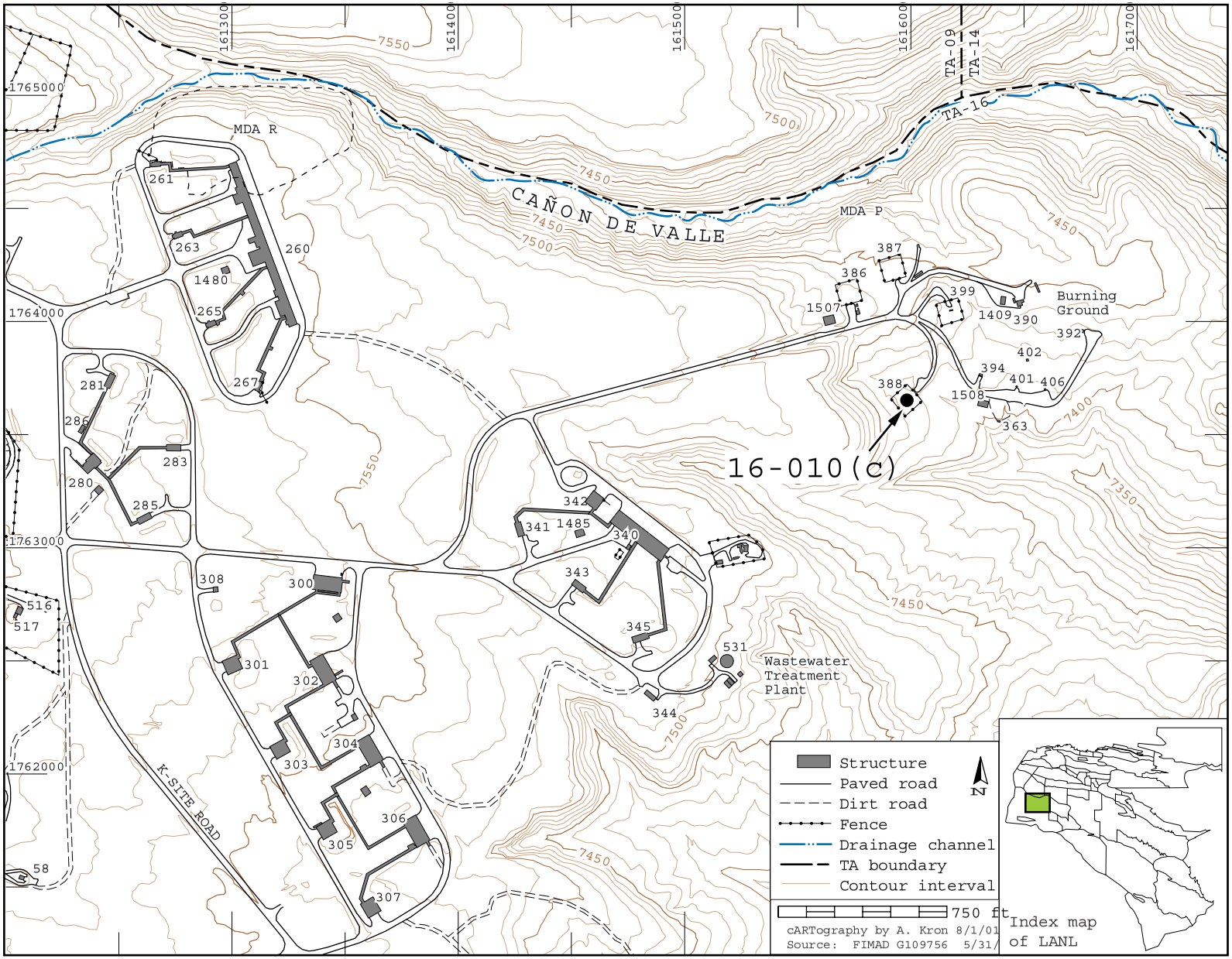
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

| | |
|---|---|
| RFI Work Plan for Operable Unit 1082 | LA-UR Number: 93-1196 |

**View of SWMU 16-010(c)**


16-010(c)
CAÑON DE VALLE
MDA R
MDA P
TA-16
TA-09
TA-14
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
283
285
308
300
301
302
303
304
305
306
307
516
517
58
342
341
1485
340
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
750 ft
N
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
Index map of LANL

# *SWMU 16-010(d) — Open burning/open detonation*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950s-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | 16-399 | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-010(d) is a former burn slab that was converted to a burn tray (structure 16-399). The burn table is used to treat HE scrap. The 100-sq-ft enclosed area consists of a concrete pad that is used to unload explosives and a 16-ft x 4-ft metal tray on the burn table that is approximately 2 ft above the ground surface. HE is placed on the tray and burned. A metal-covered rain guard can be rolled back to expose the tray.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project requested a Class I permit modification for this SWMU because it is an active hazardous waste management unit and is managed in accordance with state and federal regulations. In 1998, BMPs were installed at this site in the form of run-on diversion, repaving, and installation of an earthen berm and a roof covering.

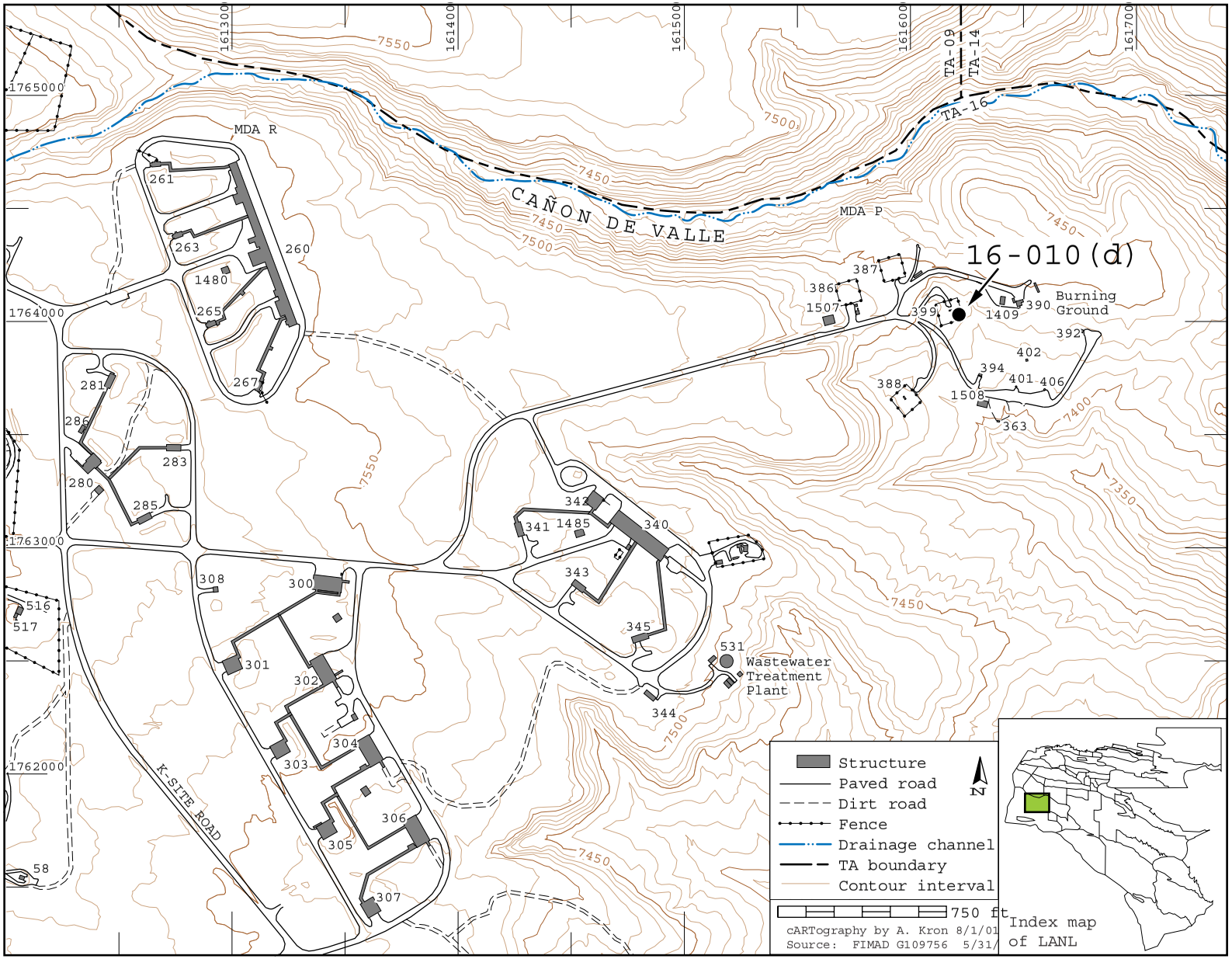
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU 16-010(d)**


16-010(d)
CAÑON DE VALLE
MDA R
MDA P
TA-16
TA-09
TA-14
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
283
280
285
308
300
301
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304
305
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307
516
517
58
342
341
1485
340
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
750 ft
N
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
Index map of LANL

# *SWMU 16-010(e) — Physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1961-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-401 | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-010(e) is a steel filter vessel (structure 16-401) that was built in 1961 to replace a filter bed. The filter vessel is 8 ft, 9 in. in diameter and 4 ft high. It is equipped with a jib crane-operated conical steel cover. About half of the vessel is above grade. The structure is conical with a surface layer of sand over layers of fine and coarse gravel. The vessel is used to filter HE/water sludge from HE sumps. The sludge, which is trucked in from sitewide HE sumps, is pumped into the structure and dried by blowing hot air across filtered residue. The residue is burned in the vessel and any residual ash and the top layer of sand are removed, characterized, and disposed of. A drainage system previously transferred the filtered water from the filter vessel to a filter/treatment unit [structure 16-363, SWMU 16-010(g)]. The filtered water is now transferred to the HEWTF's sump tank via an underground pipe.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

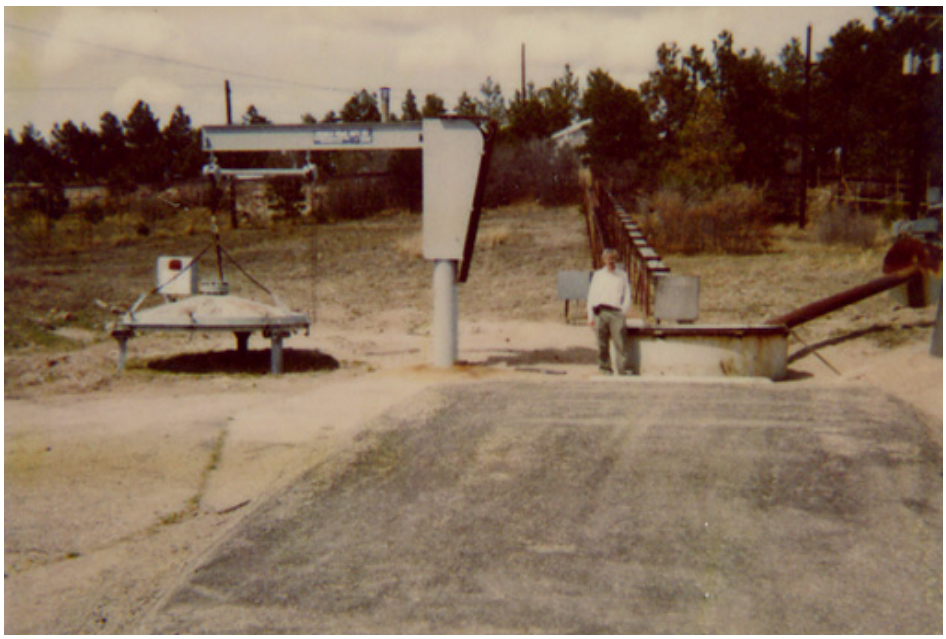
The ER Project requested a Class I permit modification to remove this SWMU from Module VIII of LANL's Hazardous Waste Facility Permit because it is an active hazardous waste treatment unit and is managed in accordance with state and federal regulations. This unit is also included in the NPDES permit for the HEWTF.

## ER Project Sampling Summary

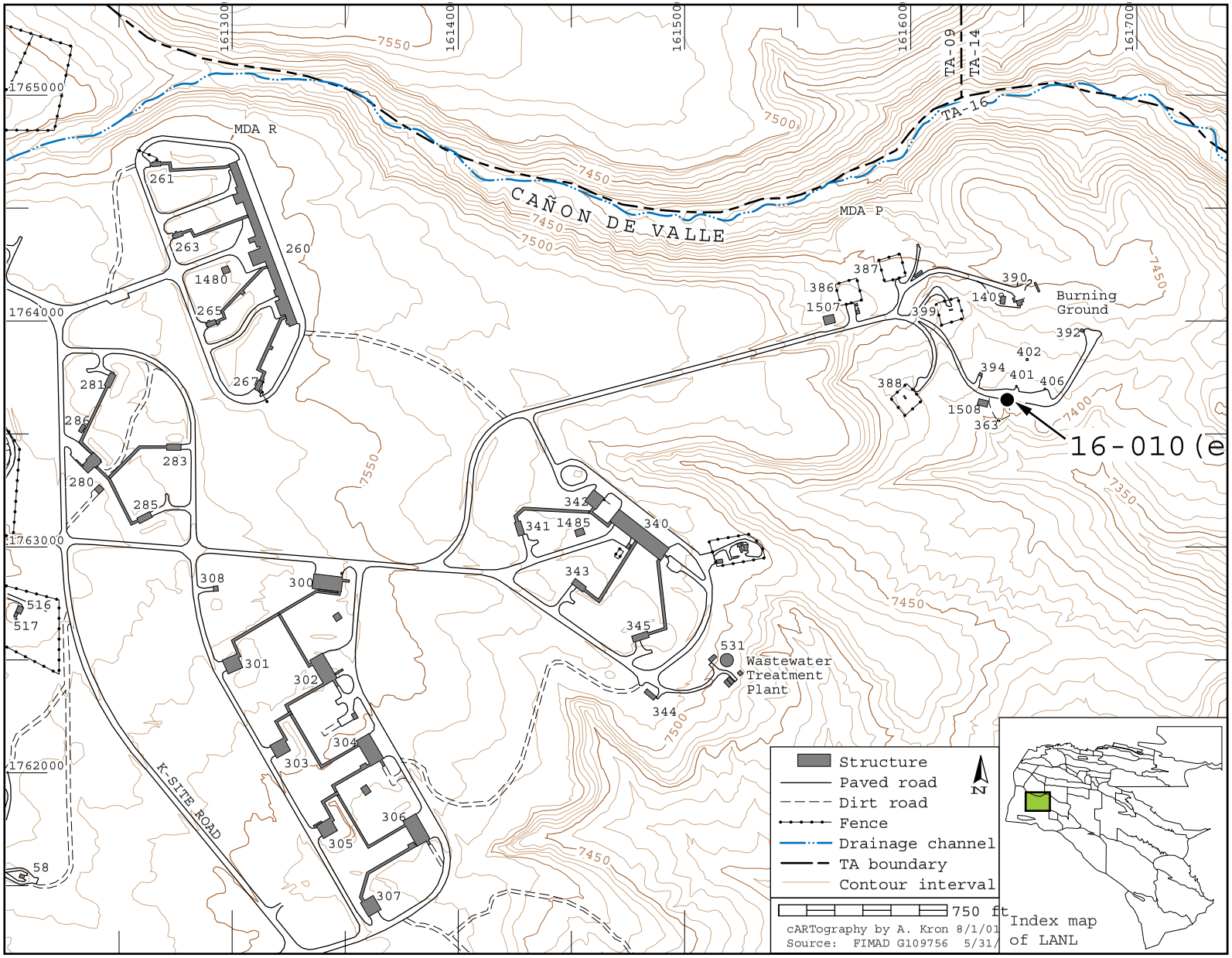
No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU 16-010(e)**


CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
16-010 (e
Wastewater Treatment Plant
K-SITE ROAD
161300
161400
161500
161600
161700
1765000
1764000
1763000
1762000
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
283
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300
301
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303
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305
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516
517
58
342
341
1485
340
343
345
344
531
387
386
1507
390
1409
399
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
Index map of LANL

# *SWMU 16-010(f) — Physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1965-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-406 | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-010(f) is a steel filter vessel (structure 16-406). This vessel replaced filter bed 16-393 in 1965. The filter vessel is 8 ft, 4 in. in diameter and 4 ft high. It is equipped with a jib crane-operated conical steel cover. About half of the vessel is above grade. The structure is conical, with a surface layer of sand over layers of fine and coarse gravel. The vessel is used to filter HE/water sludge from HE sumps. The sludge, which is trucked in from sitewide HE sumps, is pumped into the structure and dried by blowing hot air across filtered residue. The residue is burned in the vessel and any residual ash and top layer of sand are removed, characterized, and disposed of.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project requested a Class I permit modification for this SWMU because it is an active hazardous waste treatment unit and is managed in accordance with state and federal regulations. This unit is also included in the HEWTF's NPDES permit.

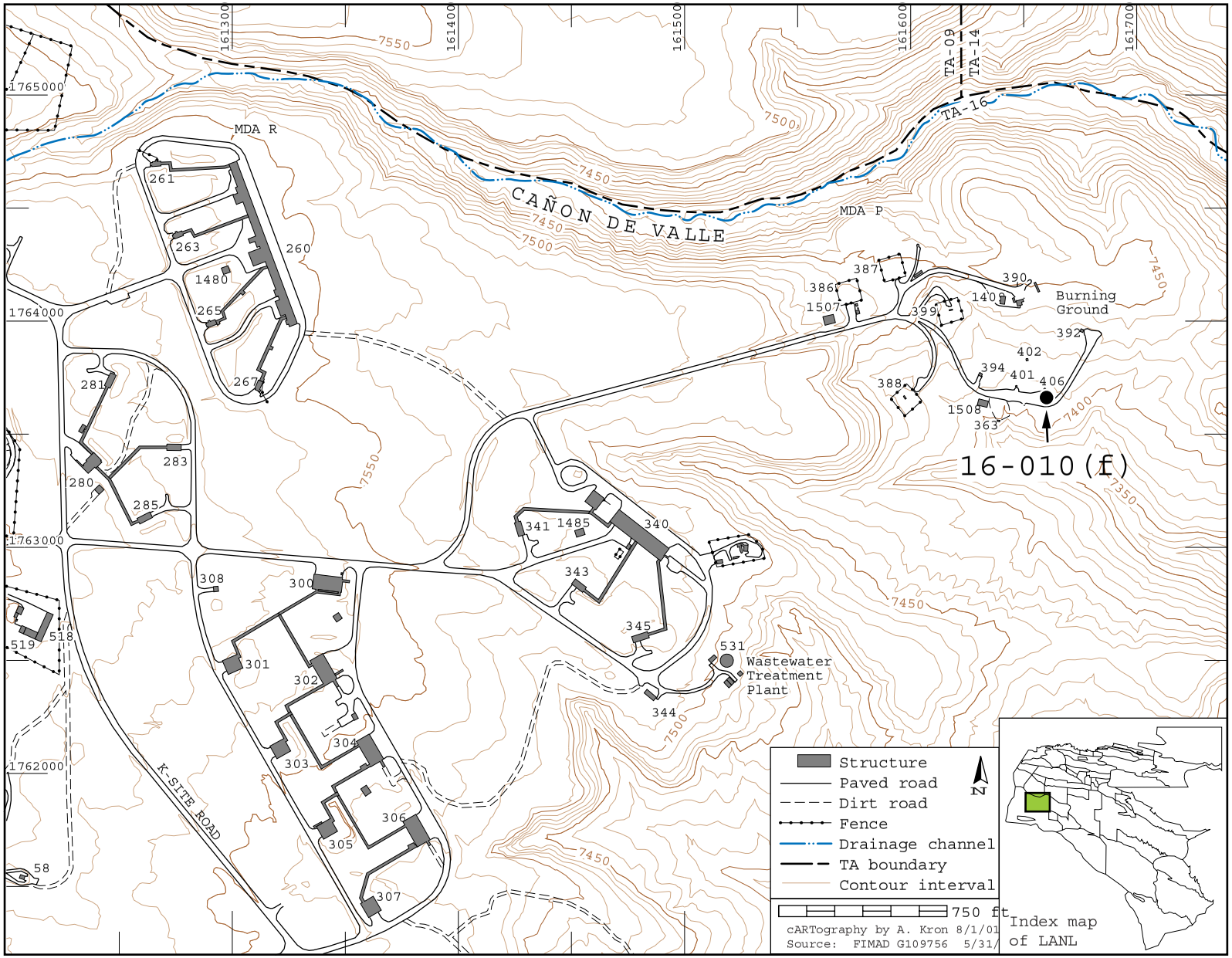
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU 16-010(f)**


16-010(f)
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
161300
161400
161500
161600
161700
1765000
1764000
1763000
1762000
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
283
280
285
308
300
301
302
303
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519
518
58
341
1485
340
343
345
344
531
387
386
1507
399
1408
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
Index map of LANL

# *SWMU 16-010(h)-99 — Open burning/open detonation - physical/ chemical treatment units - wastewater treatment plant/waste lines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-1990 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-010(h)-99 consists of former SWMUs 16-005(g), 16-010(h), 16-010(i), 16-010(j), 16-010(k), 16-010(l), 16-010(m), and 16-010(n). The former SWMUs do not include the active hazardous waste management units that are part of the TA-16 burning ground operation. The burning ground is located in the northeast corner of TA-16. The burning ground was constructed in 1951 for HE treatment. Treated material was placed in the MDA P landfill until 1984; after 1984, the treated material was taken to TA-54 for disposal.

Former SWMU 16-005(g) is the historical location of a filter bed (structure 16-393), which was decommissioned and disposed of at TA-54. The unit was built to receive HE residue wash water from the basket-wash facility [former SWMU 16-010(h)]. Structure 16-406, HE filter vessel [SWMU 16-010(f), which was not included in this consolidated unit] was built on top of the location of former structure 16-393. Former SWMU 16-005(g) was proposed for NFA in the OU 1082 work plan because it is located beneath a RCRA interim status unit, SWMU 16-010(f).

Former SWMU 16-010(h), the decommissioned basket-wash facility (Building 16-390), operated from 1951 to 1966 and was used to clean filters from sitewide HE sumps and to divert residual filtered wash water to troughs (former SWMUs 16-010(k-n), then to filter beds [former SWMUs 16-010(e,i, and j) and SWMU 16-005(g)]. The basket-wash facility and troughs have not been used as intended since 1966. The basket-wash facility currently is used for storage.

Former SWMU 16-010(i) is structure 16-392, an inactive burn pad that formerly was a filter bed that received wash water from the basket-wash facility. The wash water was received through a trough (structure 16-1136). Filtered wash water from the basket-wash facility collected within perforated piping along the bottom of the filter bed and drained via gravity through a pipe to an adjacent outfall southeast of the filter bed. The filter bed was modified to a burn pad to burn suspected uranium-contaminated objects. The trough was dismantled when the filter bed was modified.

Former SWMU 16-010(j) was a filter bed (structure 16-394) that was used from 1951 to 1966. It received wash water from the basket-wash facility. The filter bed was converted to a burn tray in 1990 and operated as a hazardous waste treatment unit under RCRA interim status. The burn tray was used to burn HE-contaminated oils, solvents, and water mixed with oils and solvents. Once materials were poured onto the tray, wood that was stacked beneath the tray was ignited remotely. Residues from burning were managed in accordance with state and federal regulations.

Former SWMU 16-010(k) is a steel trough with a V-shaped cross section that carried wash water from the basket-wash facility to a filter bed [SWMU 16-010(e)]. The trough was built in 1951. It is open at the top, elevated 3 ft off the ground on a steel framework, and is about 370 ft long. The filter bed was replaced with a filter vessel (structure 16-401).

Former SWMU 16-010(l) is a trough (structure 16-1134) similar in construction to former SWMU 16-010(k). It carried wash water from the basket-wash facility to a filter bed [structure 16-394, former SWMU 16-010(j)] that was converted to a burn tray.

Former SWMU 16-010(m) is a trough (structure 16-1135) that carried wash water from the basket-wash facility to a filter bed (structure 16-393). In 1965, a filter vessel [structure 16-406, SWMU 16-010(f)] replaced structure 16-393.

Former SWMU 16-010(n) is a trough (structure 16-1136) that carried wash water from the basket-wash facility to a filter bed (structure 16-392). The trough was dismantled in 1988. This is the only trough through which materials that were potentially contaminated with uranium were transported.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project submitted a RCRA closure plan for the burn tray [SWMU 16-010(j)] after burn operations were relocated to another hazardous waste treatment unit [structure 16-388, SWMU 16-010(c)].

In 1995, the former SWMUs were sampled for HE, inorganic and organic chemicals, and in some cases, uranium. This sampling confirmed the presence of contamination.

Consolidated SWMU 16-010(h)-99 will be further investigated, characterized, assessed, and potentially remediated as part of future corrective action activities at the TA-16 burning ground.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 12 | N/A | 6 |
| Inorganic chemicals | 24 | 13 | 2 |
| SVOCs | 8 | N/A | 1 |
| VOCs | 5 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 15.2 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 21.7 mg/kg | N/A |
| | HMX | 18,700 mg/kg | 3100 mg/kg |
| | Nitrotoluene[2-] | 3.03 mg/kg | N/A |
| | RDX | 10,700 mg/kg | 4.4 mg/kg |
| | Trinitrotoluene[2,4,6-] | 2060 mg/kg | 31 mg/kg |
| Inorganic chemicals | Arsenic | 7.3 mg/kg | 0.39 mg/kg |
| | Lead | 800 mg/kg | 400 mg/kg |
| SVOCs | Nitrosodimethylamine[N-] | 0.33 mg/kg | 0.0095 mg/kg |

## References


Closure Plan for the TA-16-394 Burn Tray — LA-UR Number: 99-6216

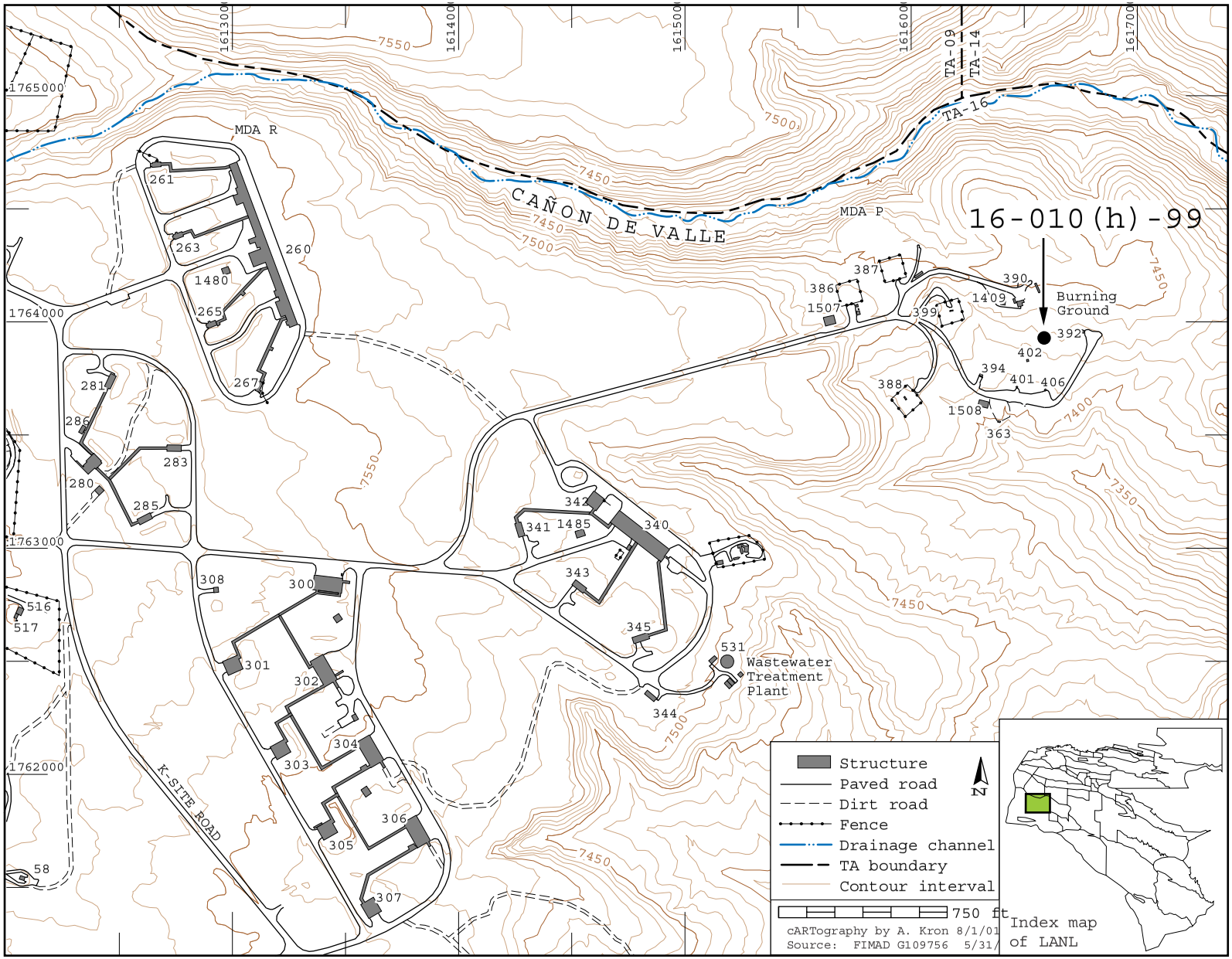
RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

Closure Plan for the TA-16-394 Burn Tray, Rev. 1 — LA-UR Number: N/A

**View of SWMU 16-010(h)-99, looking northeast**

**View of SWMU 16-010(h)-99, looking northeast**

**View of SWMU 16-010(h)-99, looking southwest**


16-010(h)-99
Burning Ground
CAÑON DE VALLE
MDA R
MDA P
TA-16
TA-09
TA-14
K-SITE ROAD
Wastewater Treatment Plant
1765000
1764000
1763000
1762000
161300N
161400N
161500N
161600N
161700N
7550
7500
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7400
7350
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263
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388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
750 ft
N
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
Index map of LANL

# *SWMU 16-013-99 — Container storage - facility/equipment - soil contamination - storage areas/waste piles/ magazines - sumps*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-013-99 consists of former SWMUs 16-006(h), 16-013, 16-017(q)-99, 16-017(r)-99, 16-017(s)-99, 16-017(t)-99, 16-017(u)-99, and 16-029(g2), and AOCs C-16-074 and C-16-068. This consolidated SWMU encompasses the former location of the V-Site courtyard, which was the location of miscellaneous activities that supported HE testing and processing. In 1945, the entire V-Site area was incorporated into TA-16. The buildings and courtyard have been used for programmatic activities and storage since then. All but two buildings (the high bay assembly building [Building 16-516] and an equipment building [Building 16-517]) were destroyed in the May 2000 Cerro Grande fire. All former SWMUs in this consolidated unit were exposed to surface fires. V-Site and all its associated structures are considered a historical site. The entire site is inactive and any additional work will be deferred until the site's future as a historical site is determined.

Former SWMU 16-006(h) is the former steam-heating distribution pump pit (structure 16-526) located against the berm retaining wall near an equipment building (Building 16-517). The pit was constructed in 1945 and housed a condensate pump. Condensate from radiators in the area was routed to the pump pit to be returned to the source boiler. The system served former Buildings 16-515, 16-519, and 16-520, and Building 16-516, which still is in use. Some pipes in the pit may have been insulated with asbestos.

Former SWMU 16-013 is a former storage area located in the V-Site courtyard, where containers of unusable material and other items were stored. The area was once part of V-Site, constructed in 1944 for testing components of implosion devices. Suspect contaminants at former SWMU 16-013 were uranium, inorganic chemicals, and organic chemicals.

Former SWMU 16-017(q)-99 is a former storage magazine associated with V-Site. Former SWMUs 16-017(r)-99 and 16-017(s)-99 are the former sites of the varnishing and assembly operations (former Buildings 16-519 and 16-520). Both buildings later were used for storage. Former SWMU 16-017(t)-99 (Building 16-516) initially housed a laboratory and later was used for equipment storage. Former SWMU 16-017(u)-99 (Building 16-516) was an HE-processing building and the site of testing activities for the Trinity device.

Former SWMU 16-029(g2) was a below-grade concrete pit (structure 16-523) that was built in 1944 and taken out of service in 1945. The pit was backfilled with soil to ground level and covered with a concrete slab. The 11-ft x 16-ft x 4-ft-deep pit held a remotely controlled shaker table used in vibration tests on a Fat Man device prototype, which had an HE component. Former AOC C-16-074 sits directly atop former SWMU 16-029(g2). It is the location of a decommissioned drum storage area east of Building 16-517. Drums containing residual HE-contaminated hydraulic oil were stored on an asphalt pad. The pad was built on the surface above the concrete vault that held the shaker table after the former SWMU was backfilled. Suspect contaminants were HE, uranium, inorganic chemicals, and organic chemicals.

Former AOC-16-068 is an area of potential soil contamination associated with former Building 16-522, which was built in 1944 and removed in 1945. The building has not been located on LANL engineering drawings or on aerial photographs; it is believed to be the unidentified building foundation west of former Building 16-519. Suspect contaminants were HE, uranium, inorganic chemicals, and organic chemicals.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs, FVs, and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Addendum 1 of the OU 1082 work plan stated that action on former SWMU 16-006(h) would be deferred until D&D.

The ER Project conducted a VCM at former SWMUs 16-013 and 16-029(g2) and former AOCs C-16-068 and C-16-074 in 1997 and 1998. At former SWMU 16-013, samples were collected to determine if contamination existed in the former waste storage area. Five surface-soil samples were collected from the drainage north of the V-Site courtyard. Samples were field-screened for HE and inorganic chemicals. Two samples were submitted for laboratory analysis based on field-screening results and analyzed for radiation, HE, inorganic chemicals, and organic chemicals. No elevated contaminant concentrations were found, and the VCM report recommended former SWMU 16-013 for NFA because contaminants at that site pose no unacceptable risk to human health. Former

SWMU 16-029(g2) and former AOC C-16-074 were also sampled in the VCM to determine the nature and extent of detected contamination and to bound the extent of contamination, if any. Fifteen samples were screened from eight boreholes across and downgradient from the former SWMUs to check for vertical and lateral contaminant distribution. The samples were field-screened for HE and inorganic chemicals. HE screening results showed no indication of the presence of HE. Screening results for metals were close to BVs. Five of the samples were sent to an off-site laboratory for analysis for inorganic chemicals, HE, organic chemicals, and uranium. Upon evaluation of laboratory analysis results, an additional deeper sample was collected to bound the extent of contamination and was sent to an off-site laboratory for analysis for a limited suite of inorganic chemicals. Elevated levels of acetone, barium, chromium, copper, and nickel were detected at the downgradient sample location. A human health screening assessment did not identify potential contaminants because maximum concentrations either were below BVs for inorganic chemicals or below PRGs. None of the contaminants was retained in the ecological screening assessment due to incomplete exposure pathways for ecological receptors. The VCM report recommended NFA for former SWMU 16-029(g2) and former AOC C-16-074.

The OU 1082 work plan proposed the following SWMUs for deferral until D&D: 16-017(q)-99, 16-017(r)-99, 16-017(s)-99, 16-017(t)-99, and 16-017(u)-99.

At former AOC C-16-068, four samples were collected from the former location of Building 16-522, where a concrete, soil-filled foundation remains. Samples were collected from within the building foundation and were field-screened for HE. One sample was submitted for laboratory analysis based on screening results. Samples were analyzed for radioactivity, HE, inorganic chemicals, and organic chemicals. Elevated levels of benzo(a)pyrene were detected in the sample, and the VCM report stated that it could not be attributed to the former AOC because there was no indication that PAHs were used at the site. The VCM report proposed NFA for former AOC C-16-068.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 1 | N/A | 1 |
| Inorganic chemicals | 25 | 18 | 4 |
| PCBs | 0 | N/A | 0 |
| SVOCs | 13 | N/A | 3 |
| VOCs | 1 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

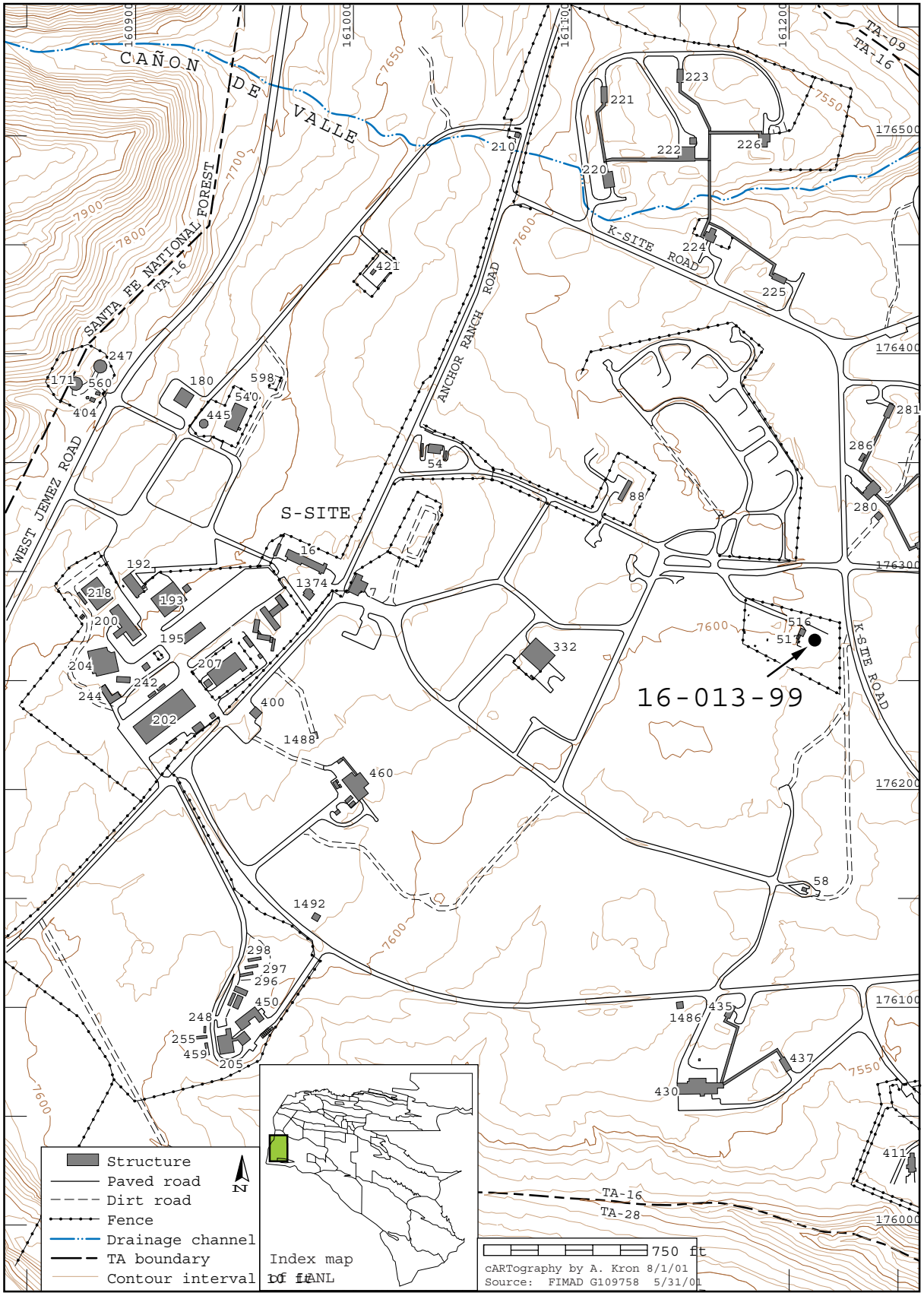
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.5 mg/kg | N/A |
| Inorganic chemicals | Arsenic | 16 mg/kg | 0.39 mg/kg |
| | Iron | 150,000 mg/kg | 23,000 mg/kg |
| | Lead | 3400 mg/kg | 400 mg/kg |
| | Uranium | 250 mg/kg | 230 mg/kg |
| SVOCs | Acenaphthylene | 0.094 mg/kg | N/A |
| | Benzo(a)pyrene | 0.27 mg/kg | 0.062 mg/kg |
| | Bis(2-ethylhexyl)phthalate | 320 mg/kg | 35 mg/kg |

## References

Voluntary Corrective Measures Completion Report for Potential Release Sites 16-006(g), 16-005(d), 16-034(p) Drum Storage Aggregate - [16-029(g2) and C-16-074] V-Site LA-UR Number: 99-3001

| | |
|---|---|
| Addendum to the Voluntary Corrective Measures Plan for Potential Release Sites 16-005(d), 16-006(g,h), 16-017[Bldg. 27], 16-026(q), 16-029(g2,w,x), 16-031(c), C-16-074 (V-Site) | LA-UR Number: 98-2780 |
| Voluntary Corrective Measures (VCM) Report for TA-16: PRSs 16-013, 16-025(x), 16-031(d), C-16-065, C-16-068 | LA-UR Number: 97-3677 |
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| Voluntary Corrective Action Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |
| RFI Work Plan for Operable Unit 1082 | LA-UR Number: 93-1196 |

**View of SWMU 16-013-99, looking southeast**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-013-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-015(a) — Subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1956 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-15 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-015(a) is the location of potentially contaminated surface and subsurface soils associated with a decommissioned men's locker room and laundry facility (Building 16-15), and its associated drainline. Building 16-15 was located in the southern part of the TA-16 administration area. The administration area of S-Site was used primarily for activities that did not involve HE processing. It was built in 1945 using wood-frame construction. The building was removed in April 1956. A washer in the building's equipment room discharged to a sump that led to a 6-in., cast-iron drainline. It is not known if the outfall was exposed on the surface. Building 16-15 was assessed for safety in 1956 prior to demolition. At that time, it was presumed that HE could be present in the drainline. The drainline was plugged and left in the ground. Suspect contaminants at this SWMU are HE and inorganic chemicals.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The Addendum 1 of the OU 1082 work plan proposed surface and subsurface sampling at this SWMU.

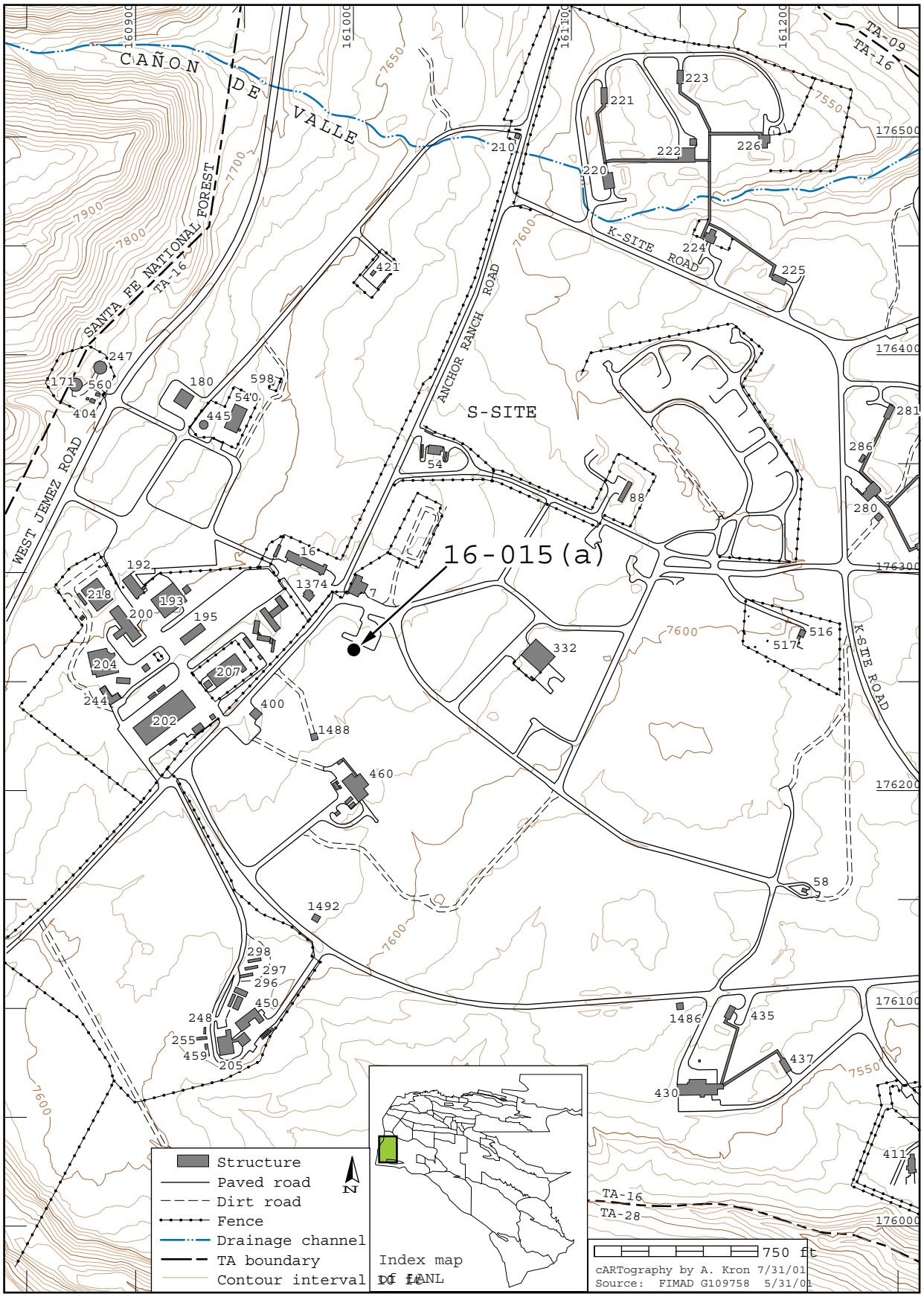
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

| | |
|---|---|
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-015(a)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-015(a)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-015(b) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1960 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-18 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-015(b) is the former location of a decommissioned steam-washing house (Building 16-18). The SWMU consists of potentially contaminated surface and subsurface soils in the area of Building 16-18 and its associated drainfield. Building 16-18 was located in the southern part of the TA-16 administration area. The administration area of S-Site was used primarily for activities that did not involve HE processing. It was built in 1945 using wood-frame construction with a concrete foundation. The building was burned in place in 1960. Building 16-18 originally was used to steam-clean machinery. Later, it was used to store containers of motor oil. An outfall was associated with a drain from the north side of the building. A concrete trough extended from the building about 23 ft to the northeast. From there, an underground drainline ran east for 188 ft. The drainline was removed in July 1966. Suspect contaminants at SWMU 16-015(b) are HE, organic chemicals, and inorganic chemicals.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

Addendum 1 of the OU 1082 work plan proposed surface and subsurface sampling at SWMU 16-015(b).

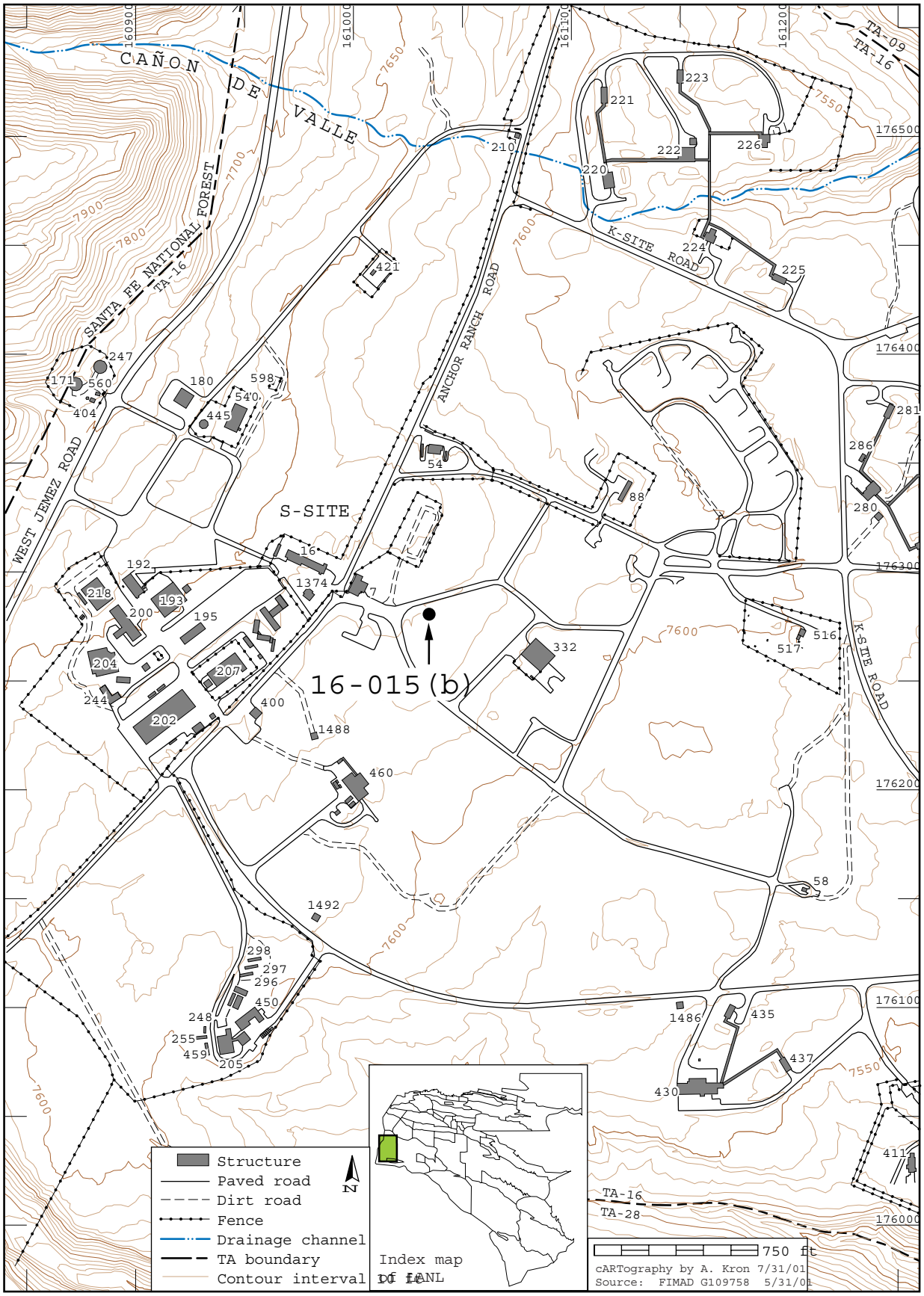
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-015(b)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-015(b)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-016(a) — Landfill*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1940s |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-016(a) is the location of a historical landfill located northeast of an S-Site bunker (structure 16-76). S-Site was used during World War II for the production of HE for weapons and nonweapons research and development. Operations included casting, pressing, and machining HE; assembling explosive test devices; fabricating plastic components; developing new materials; and nondestructive testing of these materials. Material storage, division, and group administration offices and machine shop facilities also were located at S-Site. In 1965, a memo reported that an unspecified amount of metal had been buried at SWMU 16-016(a) during World War II. The debris subsequently was located using a magnetometer and was excavated and removed to MDA P. Suspect contaminants are HE and inorganic chemicals.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The OU 1082 work plan proposed sampling at SWMU 16-016(a) to determine if contamination is present in the surface or subsurface soils.

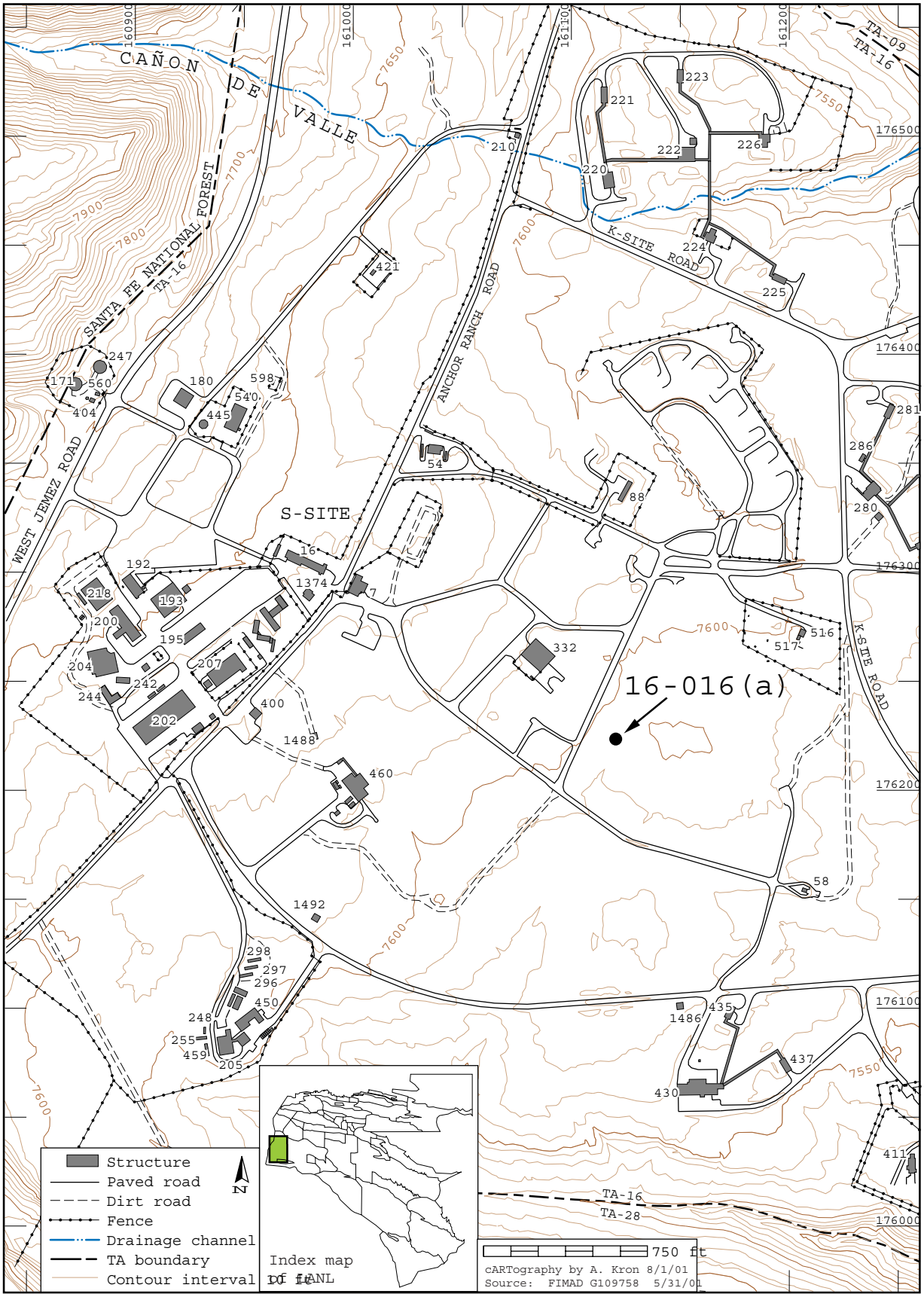
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196


**No photo; subsurface unit**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
16-016(a)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-016(b) — Surface disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1948-1958 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-016(b) is the site of a former surface disposal area at TA-16. The area consisted of several mounds of soil containing asphalt, concrete, and other construction debris located about 500 ft north of the TA-16 steam plant (structure 16-540). The debris was believed to have been deposited at the site between 1948 and 1958. The site was outside the HE corridor at TA-16.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted a VCA in 1995 that removed the debris and followed with confirmatory samples. Cleanup involved excavating the soil mounds and associated debris; 20 soil samples were field-screened for HE. Material also was screened for radionuclides before it was removed from the site. No radionuclides were found during screening. Three confirmatory samples were collected after all soil and debris were removed. Samples were analyzed for HE and inorganic chemicals. No contaminants were found in the soil. The soil mounds and associated debris were taken to the TA-16 gravel pits and staged until sample results indicated that the soil was free of contamination. Once they were determined to be clean, the soil and debris were used as construction fill at the gravel pits. The site was restored by regrading and allowing native grasses to revegetate the area. No erosion control was necessary because the site is relatively level.

The VCA report recommended NFA for SWMU 16-016(b).

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 1 | N/A | 0 |
| Inorganic chemicals | 21 | 1 | 1 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 2.29 mg/kg | 0.39 mg/kg |

## References


Final Voluntary Corrective Action Report for HSWA: PRS 16-016(b) — LA-UR Number: 96-189

Voluntary Corrective Action Plans for PRSs, Group 4: Sites under Field Unit 3 at TA-16, S-Site: 16-011, 16-016(b,f); and Sites under Field Unit 3 at TA-33, HP Site: 33-016 — LA-UR Number: N/A

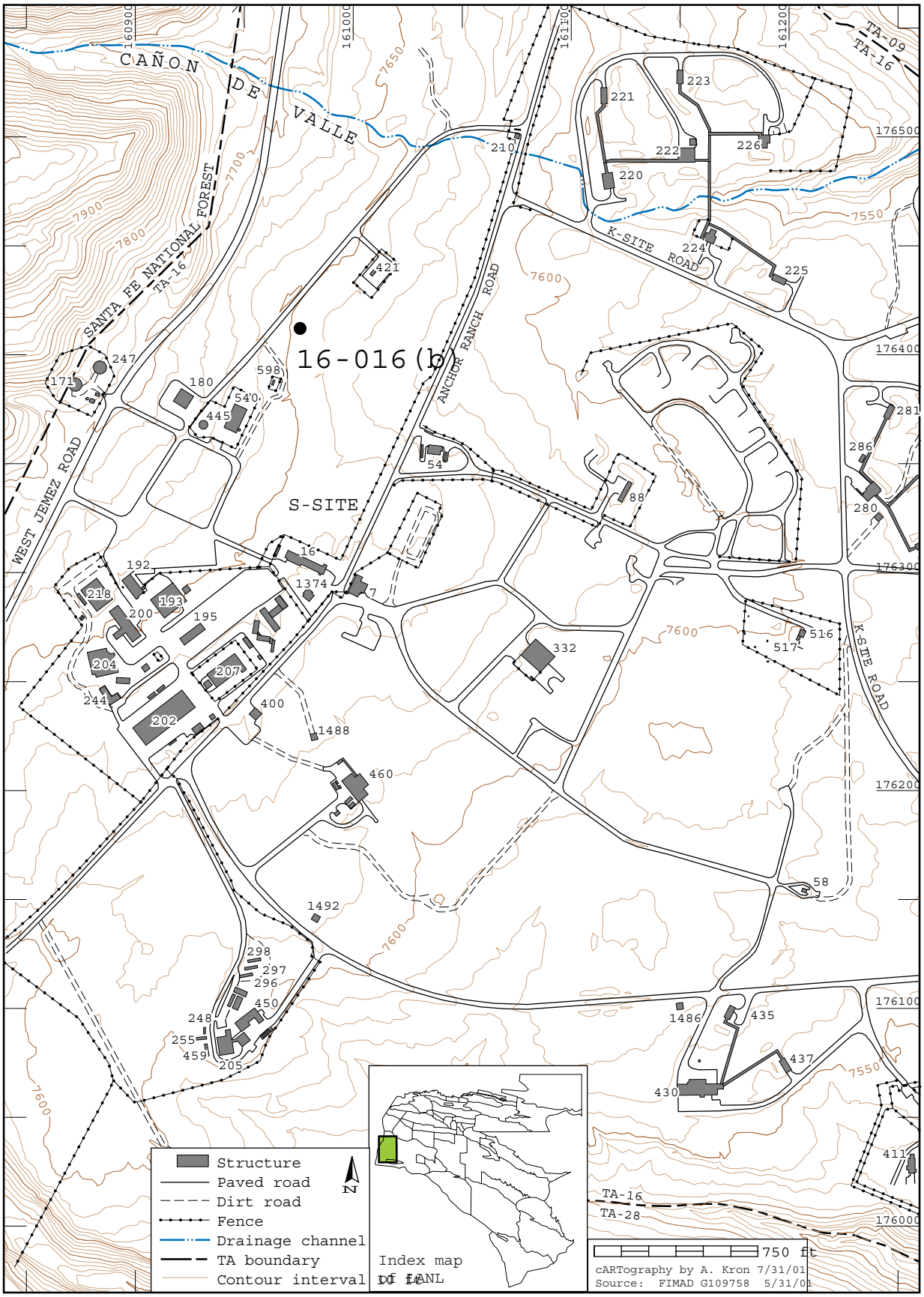
Voluntary Corrective Action Completion Plan for PRS 16-016(b) Former Surface Disposal Area — LA-UR Number: N/A

RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**Surface disposal area before remediation [SWMU 16-016(b)]**

**Surface disposal area debris being removed [SWMU 16-016(b)]**

**Surface disposal area after remediation [SWMU 16-016(b)]**


16-016(b)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
7900
7800
7700
7650
7600
7550
7500
161000
161100
161200
176500
176400
176300
176200
176100
176000
221
223
222
226
220
210
224
225
421
247
171
180
598
540
445
54
88
281
286
280
16
192
1374
7
218
193
200
195
204
207
244
202
400
1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-016(c)-99 — Storage areas/waste piles/magazines - subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951–2002 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | Various | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-016(c)-99 consists of former SWMUs 16-006(e), 16-010(a), and 16-016(c). The former SWMUs are part of the TA-16 burning ground operations. These SWMUs are located adjacent to MDA P (SWMU 16-018).

Former SWMU 16-006(e) was an approximately 100-gal., steel septic tank that was part of a septic system constructed in 1963. The system included a drainfield, outfall, and associated piping that served a control shelter (structure 16-389) for a burning site. The water closet, lavatory, and floor drain in the control shelter discharged to the septic tank. Structure 16-389 (control shelter) generally was occupied only during burning ground operations, which occurred one to two days a week from the 1950s to 1984. In 1987, LANL obtained a sanitary waste permit for the septic tank from Los Alamos County. The overflow outlet from the tank was sealed in 1988 and the contents subsequently were routinely pumped and disposed of through LANL's SWSC centralized sanitary treatment plant.

Former SWMU 16-010(a) is a former HE flash pad (structure 16-386) that now is used for materials storage. This structure also was designated as a barium nitrate storage site. The flash pad was built in 1951 and is located approximately 150 ft west of another flash pad [structure 16-387, SWMU 16-010(b)] not included in this consolidated SWMU. The flash pad is a rectangular, fenced, level area of bare soil within a 100-ft x 100-ft fenced area. The northeastern corner of the area enclosed by the fence was used in the 1950s and 1960s as a storage site for a pile of barium nitrate [SWMU 16-016(c)].

Former SWMU 16-016(c) is a historical barium nitrate storage area/pile located next to and partially overlapping an inactive flash pad [structure 16-386, former SWMU 16-010(a)]. The footprint of the barium nitrate pile is about 0.85 acre. The site is on a steep, north-facing slope at the head of a small drainage channel into Cañon de Valle. The pile was removed in the early 1970s.

The tank [former SWMU 16-006(e)] was sampled in September 1995 as part of a survey for radioactivity in LANL septic tanks. No elevated radioactivity was found in the tank. The ER Project drilled two boreholes at the proximal and distal ends of the septic system in September 1995. The locations were field-screened for HE; two locations had elevated HE. Four samples were submitted for laboratory analysis based on field-screening results. Samples were analyzed for HE, organic chemicals, and inorganic chemicals. No elevated concentrations were found by the laboratory analyses. The septic tank contents were sampled in April 1998 and the results confirmed that the wastewater would meet SWSC's WAC.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted an RFI at SWMU 16-010(a) in 1995. Thirty samples from thirty locations were field-screened for HE and inorganic chemicals. Samples were collected from areas with the highest barium concentrations and were submitted for laboratory analysis. Barium concentrations were highest in surface samples collected near the former location of the barium nitrate storage pile [former SWMU 16-016(c)]. The RFI recommended NFA at former SWMU 16-010(a) by attributing the barium contamination to former SWMU 16-016(c).

Initial sampling was conducted at former SWMU 16-016(c) in March 1995. A field-randomized, 20-ft grid was used to collect barium, HE, and radiation field-screening data. The grid extended over the area of former SWMU 16-010(a). Using the grid, surface-soil samples from the five highest barium readings were submitted for laboratory analysis. The drainage channel was field-screened for barium, HE, and radiation at groups of 3 points every 30 ft downgradient for a distance of 210 ft. A total of 18 samples were collected from the grid and drainage transect for laboratory analysis. Analysis showed several inorganic chemicals, particularly barium and lead, at elevated concentrations. Results also showed PAHs and HE. Total uranium was elevated. In 1998, BMPs were installed at former SWMU 16-016(c) in the form of run-on diversion, a vegetative buffer strip, regrading, and straw-bale barriers to minimize contaminant migration from the site.

The ER Project submitted a SAP for this consolidated SWMU in 1999 to evaluate residual contamination. A VCA plan was submitted for the consolidated SWMU as an attachment to the SAP. The VCA plan documented how former SWMUs 16-010(a) and 16-016(c) would be cleaned up. The project proposed field-screening to locate lead, barium, and HE contamination. Field-screening results would be used to direct removal of contaminated soils. Proposed sampling is designed to confirm that former SWMU 16-006(e) received only sanitary waste, therefore supporting a recommendation to remove former SWMU 16-006(e) from Module VIII of LANL's Hazardous Waste Facility Permit. Cleanup levels at consolidated SWMU 16-016(c)-99 would be confirmed by laboratory sample analysis.

The remediation of SWMU 16-016(c)-99 was performed as part of the consolidated closure of MDA P (SWMU 16-018) and the 387 Flash Pad [16-010(b)], and occurred primarily from August 2000 to March 2001.

Excavation within the footprint of the barium nitrate pile [SWMU 16-016(c)] included both remote and conventional means. Because part of the boundary of the barium nitrate pile extended down the western margin of MDA P, contaminated materials in this area were excavated during the excavation of MDA P. Soils within the 386 Flash Pad [SWMU 16-010(a)] areas were excavated and staged with soils from adjacent areas of the MDA P excavation. Field-screening for barium was used to identify the extent of the excavation. Surface soils and some bedrock materials were removed from within the flash pad area. Discontinuous areas downgradient of the flash pad were removed. Barium was not found to have penetrated the bedrock. Some residual bedrock contamination was identified in the drainage along the western margin of MDA P, but it was below the operational PRG of 2000 mg/kg. The remaining areas of exposed soil within the 386 Flash Pad fence were screened for barium concentration. After excavation, a layer of soil and gravel was placed in the excavation within the current fence. Gravel was placed on the north side of the current fence as an erosion control measure.

The septic tank [SWMU 16-016(e)] and waste line were remediated in two stages, in March 2001 and March 2002. In March 2001, the waste line (4-in. diameter VCP) was located and excavated from the tank to its endpoint. The pipe was empty and the connection with the tank had been severed. Field-screening of the pipe interior indicated that no HE or barium contamination was present. The distal 10 ft of the waste line was crushed pipe with no defined outfall. The metal top and riser of the tank were excavated to expose the tank itself. A representative of the NMED Field Operations Division inspected the tank and the tank was backfilled with clean soil to grade and left in place. The pipe inlet was plugged with a PVC pipefitting and the water was turned off inside the building restroom to decommission the source. Soil surrounding the tank and the edges and interior portions of the tank were field-screened for HE and barium and found to be below operational PRGs for both. In March 2002, the tank and pipe were excavated, sampled, and removed completely.

## ER Project Sampling Summary

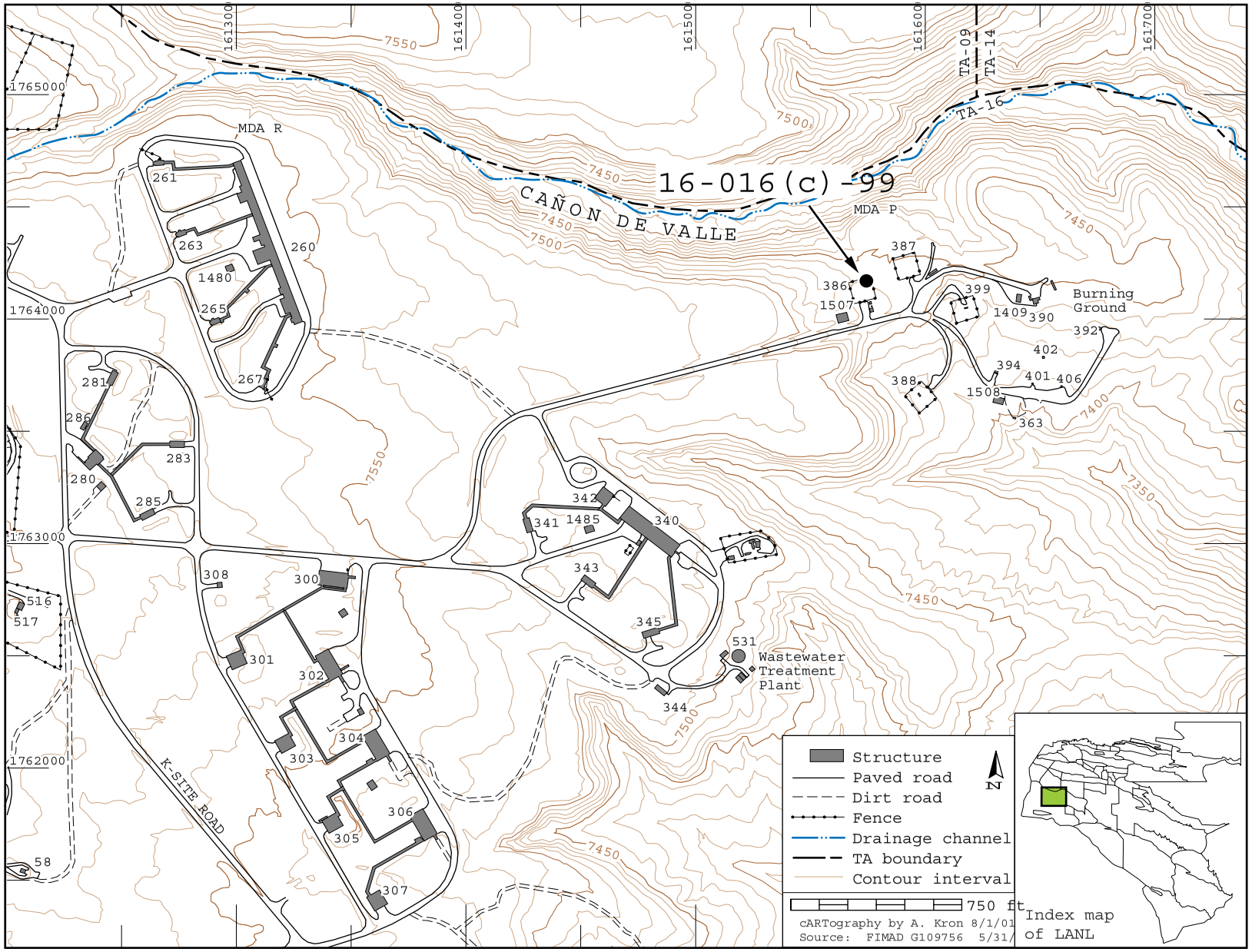
Results from analytical samples collected at this site are reported with SWMU 16-018 (MDA P).

## References


| | |
|---|---|
| Material Disposal Area P Area Closure Certification Report | LA-UR Number: 02-7819 |
| Sampling and Analysis Plan for Material Disposal Area P | LA-UR Number: 99-3630 |
| Voluntary Corrective Action Plan for Remediation of Consolidated PRS 16-016(c)-99 | LA-UR Number: 99-3630 |
| RFI Report for TAs -11, -13, -16: PRSs 11-012(a,b), 13-003(a), 16-006(c,d), 16-010(a), 16-021(a), 16-026(c,d,v), 16-028(a), 16-030(g) | LA-UR Number: 97-3072 |
| RFI Work Plan for Operable Unit 1082 | LA-UR Number: 93-1196 |

**View of SWMU 16-016(c)-99, looking south**

**View of SWMU 16-016(c)-99, looking north**


16-016(c)-99
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
Index map of LANL
N

# *SWMU 16-016(d) — Surface disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown-1995 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-016(d) is a small debris disposal area at a darkroom building (Building 16-222). Items observed in the debris disposal area included a partially full can used to mix cement, segments of corrugated metal pipe, cable, and rebar. Debris appeared to consist of construction-related materials. The debris pile was field-screened for HE and radioactivity and removed to the TA-16 burning ground in March 1995 by the operating group.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

SWMU 16-016(d) was recommended for NFA in the rewritten Chapter 6 of the OU 1082 RFI work plan because it never was used to manage hazardous waste and/or constituents.

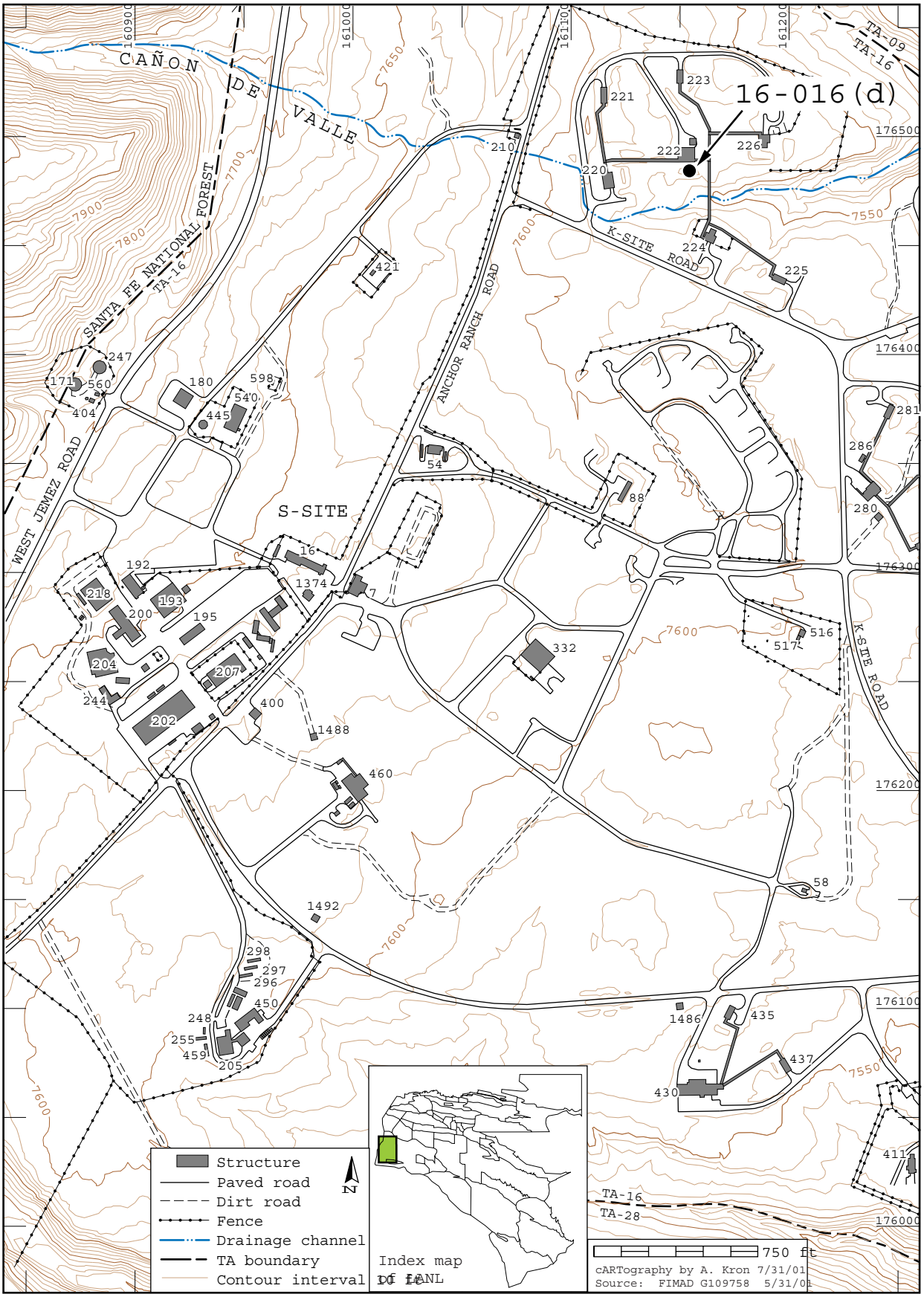
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-016(d), looking northeast**


16-016(d)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-16
TA-28
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
7900
7800
7700
7650
7600
7550
161000
161100
161200
160900
176500
176400
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176200
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176000
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180
598
540
445
54
88
281
286
280
16
192
1374
7
218
193
200
195
204
207
244
202
400
1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-016(e) — Surface disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-016(e) is a white fibrous mass located among graded soil and tuff 150 ft southeast of the painting and boxing building (Building 16-360).

## ER Project Activities

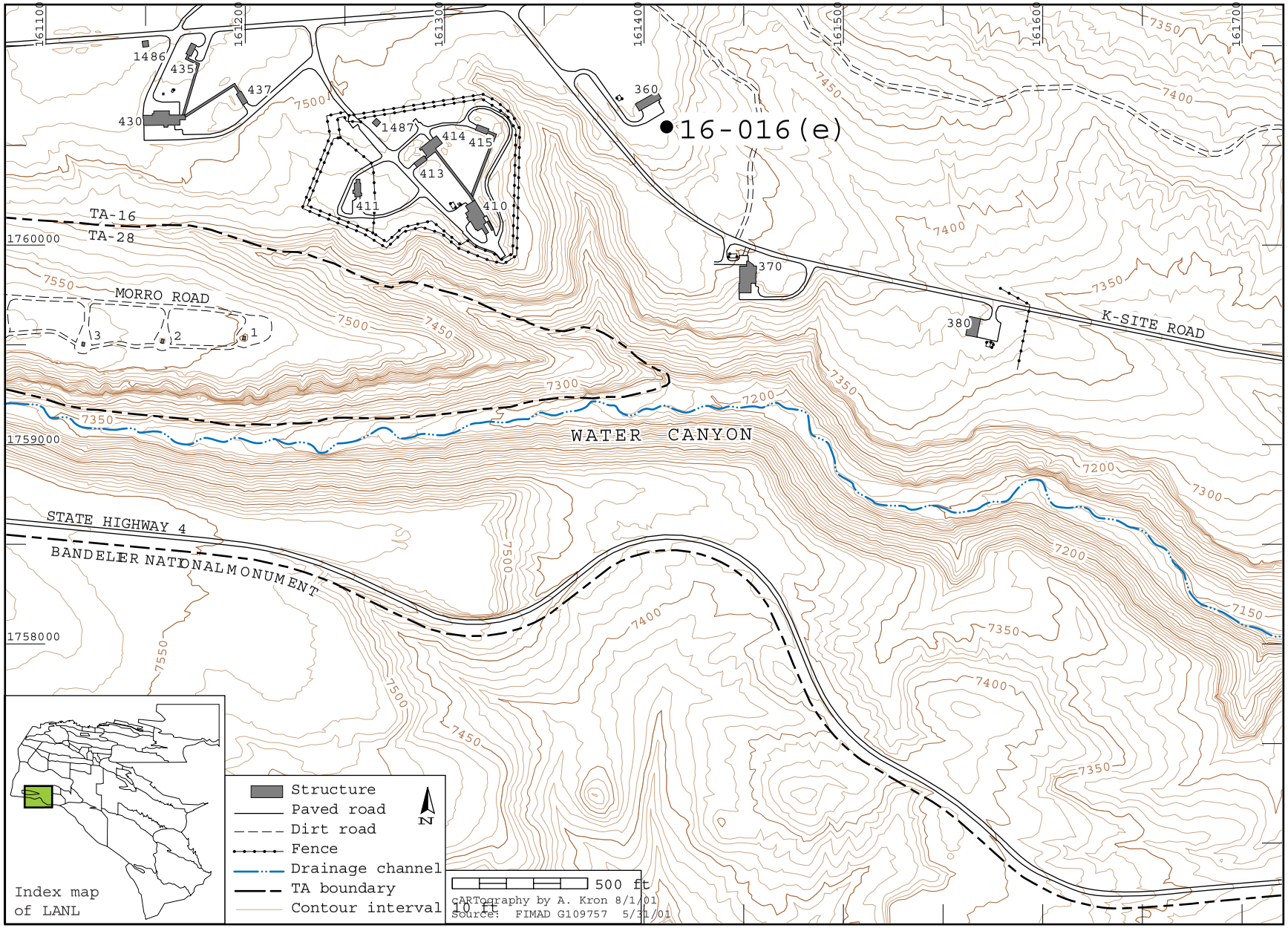
*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

In 1994, a sample was collected from the white fibrous mass and analyzed by x-ray diffraction. Sampling results indicated that this fibrous mass was fiberglass, not asbestos, as suggested in the 1990 SWMU report. SWMU 16-016(e) was recommended for NFA in the rewritten Chapter 6 of the OU 1082 RFI work plan because it never was used to manage hazardous waste and/or constituents.

## References


| | |
|---|---|
| Material Disposal Area P Area Closure Certification Report | LA-UR Number: 02-7819 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-016(e)**


16-016(e)
WATER CANYON
K-SITE ROAD
MORRO ROAD
TA-16
TA-28
STATE HIGHWAY 4
BANDELER NATIONAL MONUMENT
1486
435
437
430
1487
414
415
413
411
410
360
370
380
1
2
3
16110
16120
16130
16140
16150
16160
16170
1760000
1759000
1758000
7550
7500
7450
7400
7350
7300
7200
7150
Index map of LANL
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
500 ft
10 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

# *AOC 16-016(f) — Surface disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1960-1995 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

AOC 16-016(f) is the site of a former surface disposal area that was located on a hillside southeast of a packaging facility (Building 16-360). The site contained a small amount of friable asbestos and construction debris. The construction material had been present at this site since about 1960. Other debris associated with this AOC included black cellular foam glass (used as roof insulation), rusted cans, and broken drainage tile. Asbestos was the only suspect contaminant at this site.

## ER Project Activities

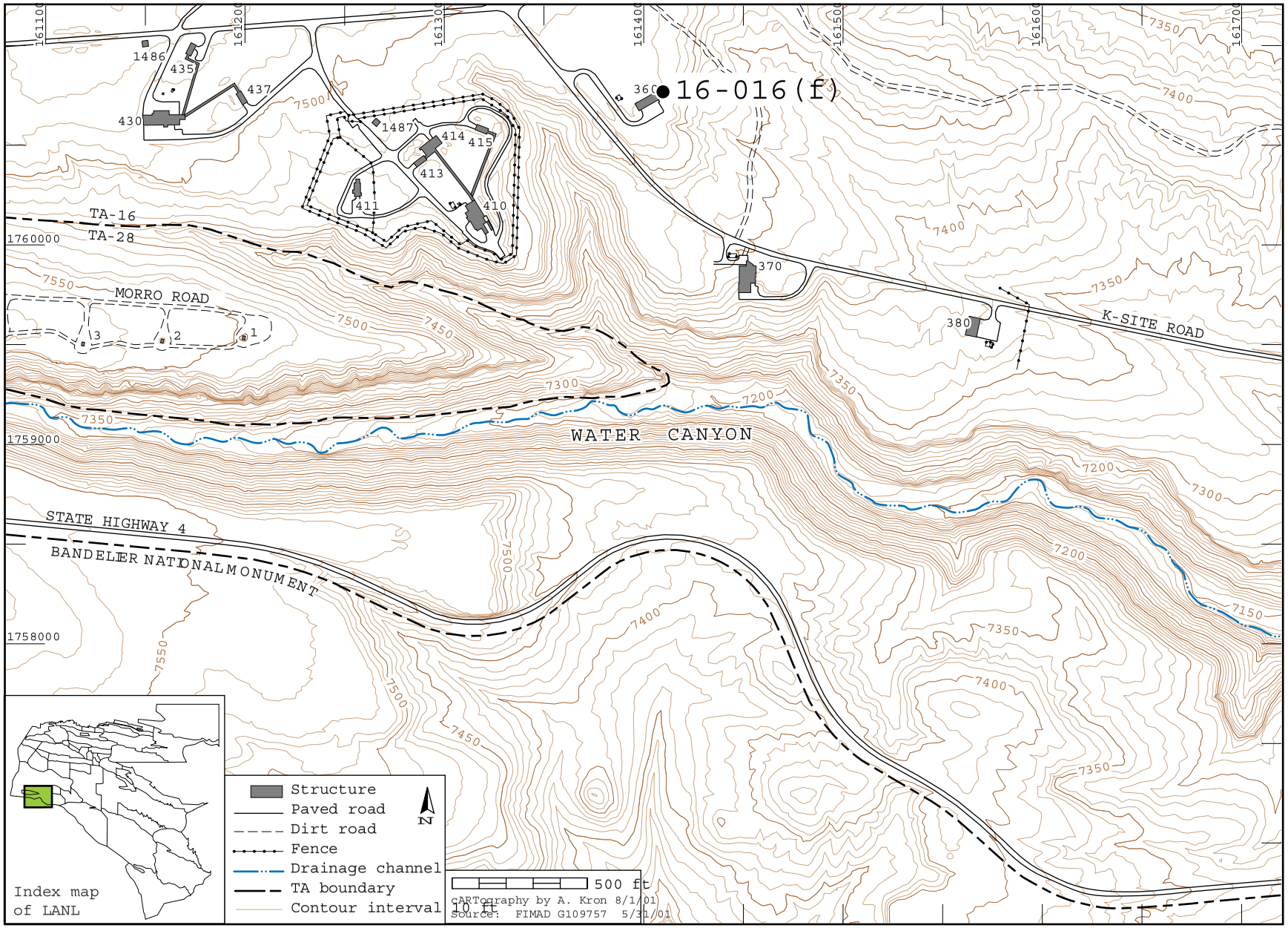
*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project conducted a VCA at this AOC in 1995, which included sampling the asbestos and removing it and the surrounding soil. Once the asbestos and surrounding soil were removed, the remainder of the disposal area was excavated. The debris was field-screened for HE and radioactivity before it was removed from the site for disposal at the Los Alamos county landfill. Field-screening results were negative. Confirmatory samples were not collected because there is no analytical method for asbestos in soil other than visual inspection. Friable asbestos was handled in accordance with LANL's asbestos abatement program. Site restoration and erosion controls were implemented. The site was regraded but was not reseeded because it is bare tuff.

## References


| | |
|---|---|
| Voluntary Corrective Action Completion Report PRS 16-016(f) Former Surface Disposal Area Non-HSWA | LA-UR Number: 96-190 |
| Voluntary Corrective Action Plans for PRSs, Group 4: Sites under Field Unit 3 at TA-16, S-Site: 16-011, 16-016(b,f); and Sites under Field Unit 3 at TA-33, HP Site: 33-016 | LA-UR Number: N/A |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of AOC 16-016(f), looking north**


16-016(f)
TA-16
TA-28
MORRO ROAD
K-SITE ROAD
WATER CANYON
STATE HIGHWAY 4
BANDELIER NATIONAL MONUMENT
1760000
1759000
1758000
161100
161200
161300
161400
161500
161600
161700
1486
435
437
430
1487
414
415
413
411
410
360
370
380
1
2
3
7550
7500
7450
7400
7350
7300
7200
7150
Index map of LANL
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
500 ft
10 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

# *SWMU 16-016(g) — Surface disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-016(g) is a debris area associated with a preparation building (Building 16-370). The debris includes cans and pipes that are distributed over a 20-ft-diameter area located in a drainage ditch about 60 ft south of the building. The debris appears to be construction-related. Building 16-370 is a metal-machining facility that formerly was a barium nitrate grinding facility.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

The ER Project screened three soil samples for inorganic chemicals from below the confluence of SWMU 16-028(b), which is the outfall area for Building 16-370, and the SWMU 16-016(g) drainage ditch. Elevated barium levels were detected, and SWMU 16-028(b) is being investigated further.

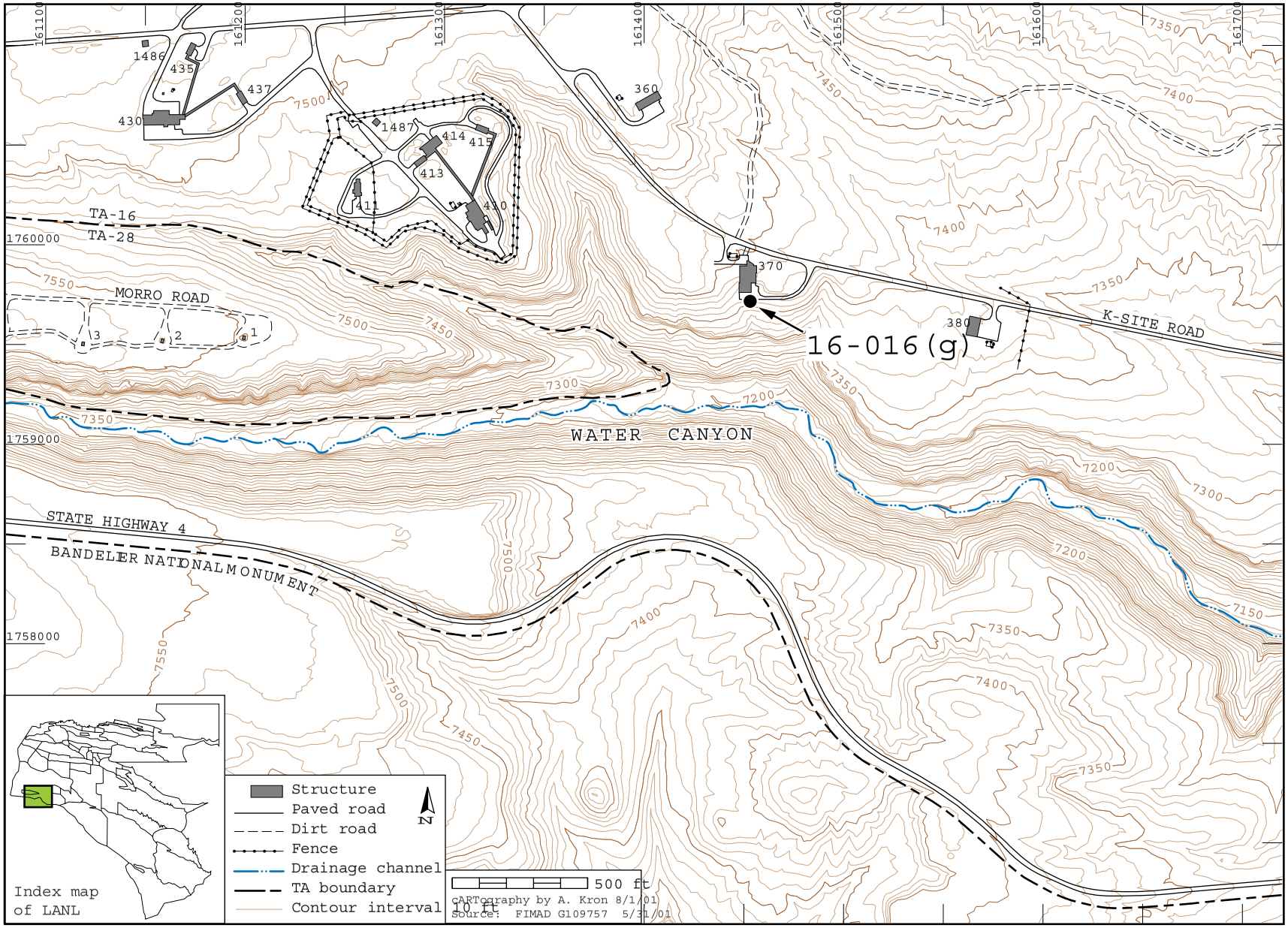
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-016(g)**


16-016(g)
K-SITE ROAD
WATER CANYON
TA-16
TA-28
MORRO ROAD
STATE HIGHWAY 4
BANDELER NATIONAL MONUMENT
1760000
1759000
1758000
161100
161200
161300
161400
161500
161600
161700
1486
435
437
430
1487
414
415
413
411
410
360
370
380
7550
7500
7450
7400
7350
7300
7200
7150
Index map of LANL
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
500 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

# *SWMU 16-017(g)-99 — Former HE structure*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950-1951 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-80 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-017(g)-99 is a former storage magazine (12 ft x 24 ft x 7 ft) at TA-16. Former SWMU 16-017 consisted of a group of 23 intact structures associated with S-Site. The former storage magazine (structure number 16-80) was built before 1950 and its use was discontinued in 1951.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

During the AUA conducted in 1999, former SWMU 16-017 was split into 23 separate SWMUs to facilitate tracking. Each former structure in the series was given an alpha-identifier at that time. The OU 1082 work plan proposed deferring further action on these structures until D&D.

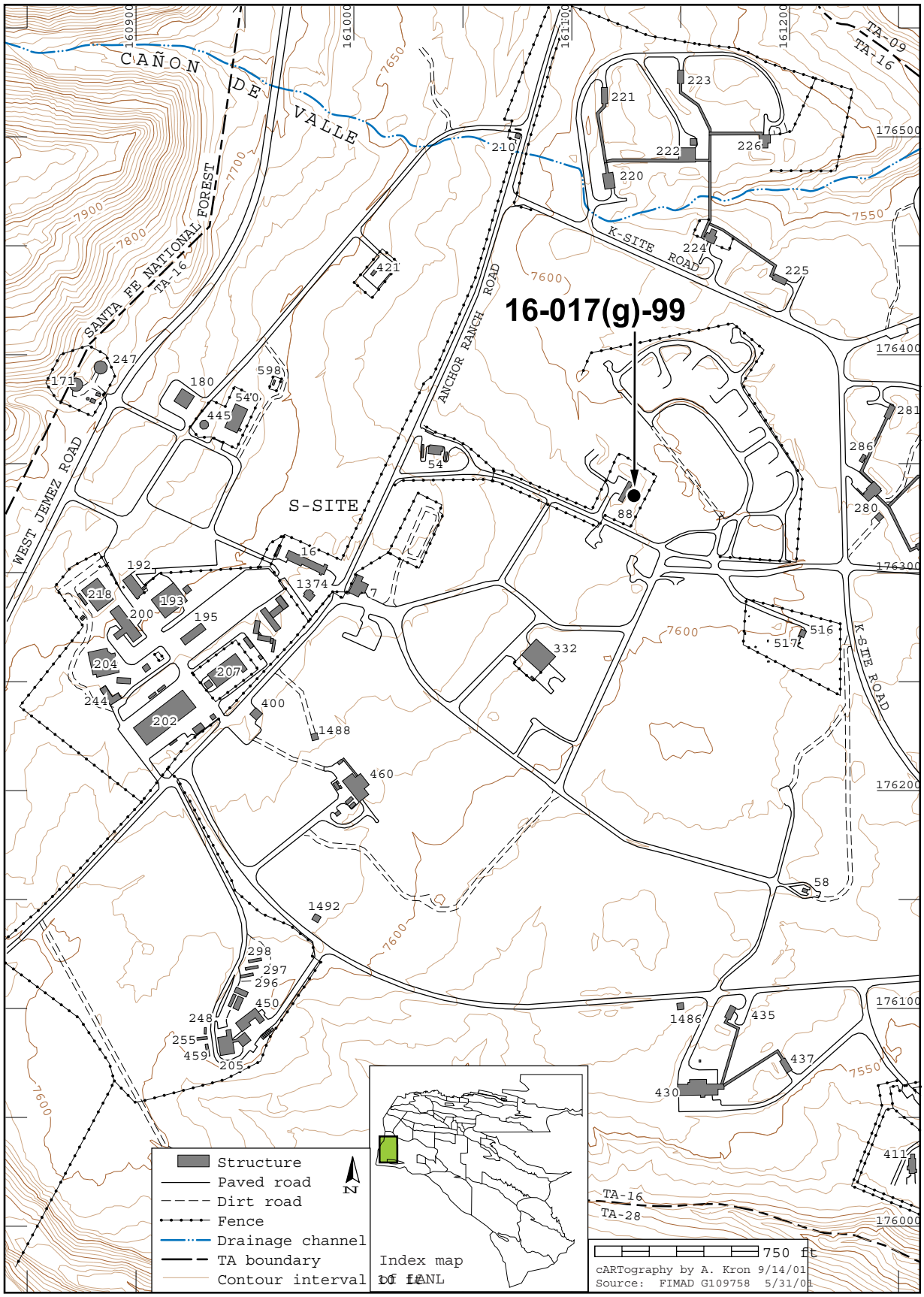
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-017(g)-99, looking north**


16-017(g)-99
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 9/14/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-017(i)-99 — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1998 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-10 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-017(i)-99 is of one of the buildings associated with former SWMU 16-017 and former AOCs C-16-025 and C-16-026. During the AUA conducted in 1999, former SWMU 16-017 was split into 23 separate SWMUs to facilitate tracking. Each former structure in the series was given an alpha-identifier at that time.

SWMU 16-017(i)-99 is the location of a 200 ft x 40 ft x 20 ft former warehouse at TA-16 (Building 16-10). HE casting molds were washed out on the north end of Building 16-10. The warehouse operated from 1945 to 1998. D&D of Building 16-10 occurred in 1998.

Former AOC C-16-025 was a cabinet shop (Building 16-8) that was built in 1945 and removed in March 1956. It was of wood-frame construction and was located west of Building 16-10 and south of Building 16-9. The cabinet shop was used as a carpentry shop.

Former AOC C-16-026 was a plumbing shop (Building 16-17) that was built in 1945 and removed in March 1956. It was of wood-frame construction and was located south of Building 16-10. Addendum 1 of the OU 1082 work plan stated that there were indications that HE was handled in Building 16-17; however, a private contractor was allowed to remove the building in 1956. Rigorously enforced site policy required that all HE-contaminated buildings were destroyed by burning. Therefore, because moving this building was allowed, HE contamination would not have been present.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

Addendum 1 of the OU 1082 work plan recommended NFA for the former AOCs in this consolidated unit because there was no indication that hazardous materials were used at those locations.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 17 | 4 | 1 |
| SVOCs | 0 | N/A | 0 |
| VOCs | 0 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

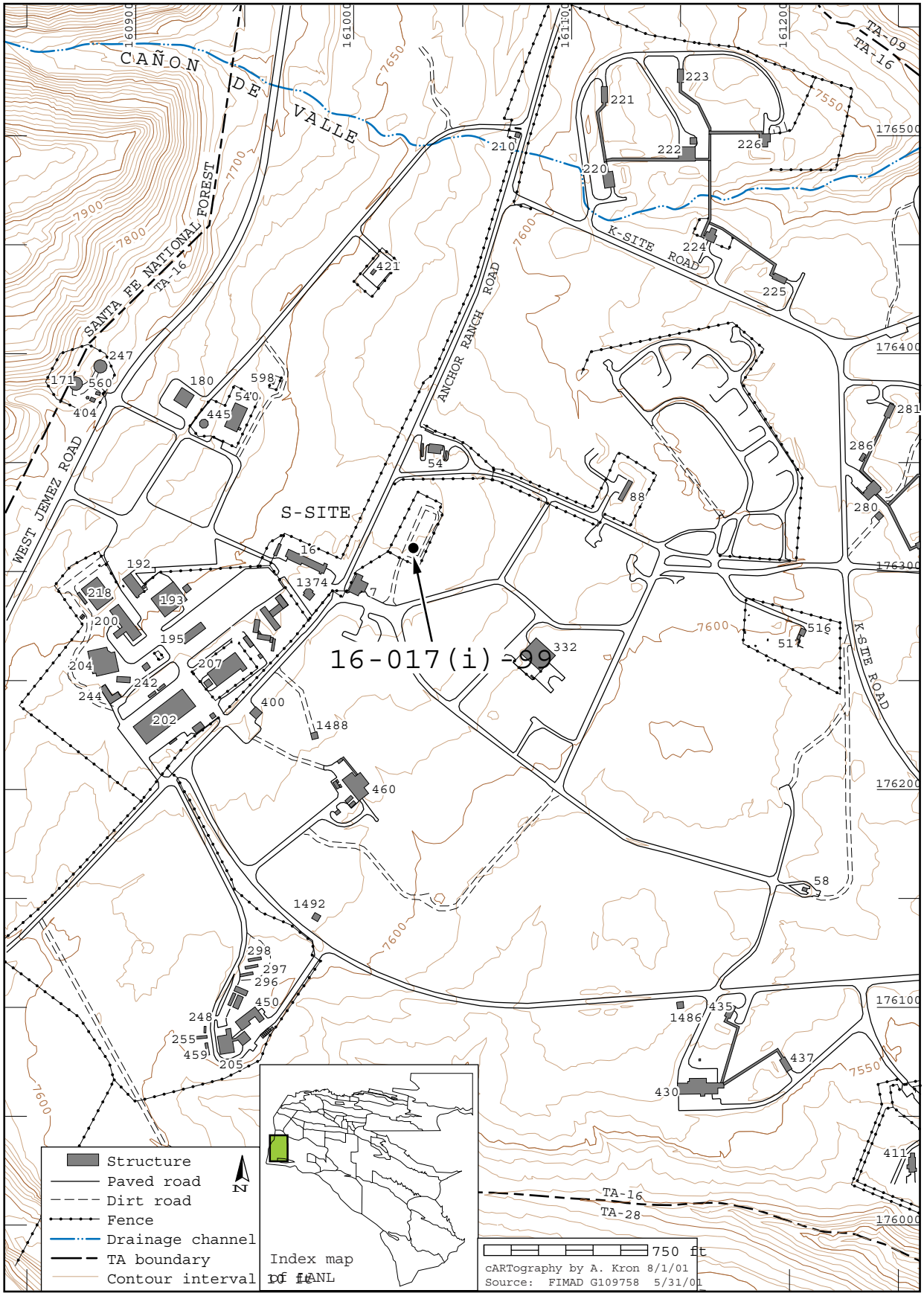
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 5.5 mg/kg | 0.39 mg/kg |

## References

| | |
|---|---|
| Decommissioning Completion Report for High-Explosive Facilities at Technical Area -16 (Buildings 27, 10, 13, and 63) | LA-UR Number: N/A |
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-017(i)-99, looking northeast**

**View of SWMU 16-017(i)-99, looking east**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-16
TA-16
TA-28
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
K-SITE ROAD
S-SITE
16-017(i)-99
7900
7800
7700
7650
7600
7550
7600
7600
7600
7550
161090
161100
161100
161200
176500
176400
176300
176200
176100
176000
247
171
560
404
180
598
540
445
421
210
223
221
222
226
220
224
225
281
286
280
54
88
16
1374
7
192
218
193
200
195
204
242
244
207
202
400
1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-017(j)-99 — Former structure - storage magazine*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown-1951 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-63 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-017(j)-99 is a 24 ft x 26 ft x 9 ft former storage magazine at TA-16 (structure 16-63), which was built before 1950 and was was no longer in use in 1951.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

During the 1999 AUA, former SWMU 16-017 was split into 23 separate SWMUs to facilitate tracking. Each former structure in the series was given an alpha-identifier at that time. Structure 16-63 underwent D&D in the late 1990s.

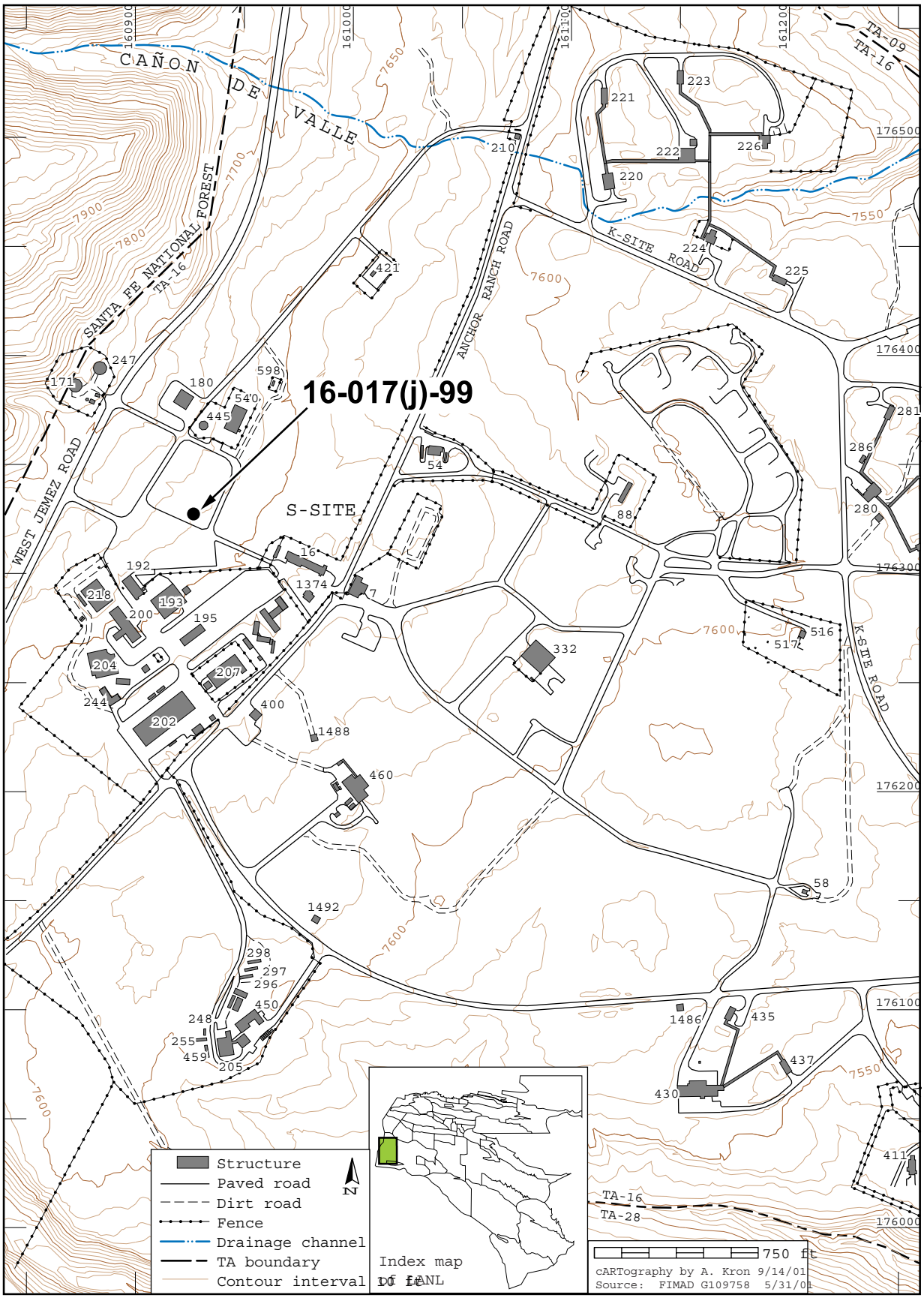
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Decommissioning Completion Report for High-Explosive Facilities at Technical Area -16 (Buildings 27, 10, 13, and 63) | LA-UR Number: N/A |
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-017(j)-99, looking northeast**


16-017(j)-99
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
Index map of LANL
750 ft
cARTography by A. Kron 9/14/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-017(k)-99 — Former structure - storage magazine*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-78 | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-017(k)-99 is a 12 ft x 24 ft x 7 ft former storage magazine (structure 16-78). Former PRS 16-017 consisted of a group of 23 intact structures associated with S-Site.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

During the 1999 AUA, former SWMU 16-017 was split into 23 separate SWMUs to facilitate tracking. Each former structure in the series was given an alpha-identifier at that time. Structure 16-78 underwent D&D in 1995.

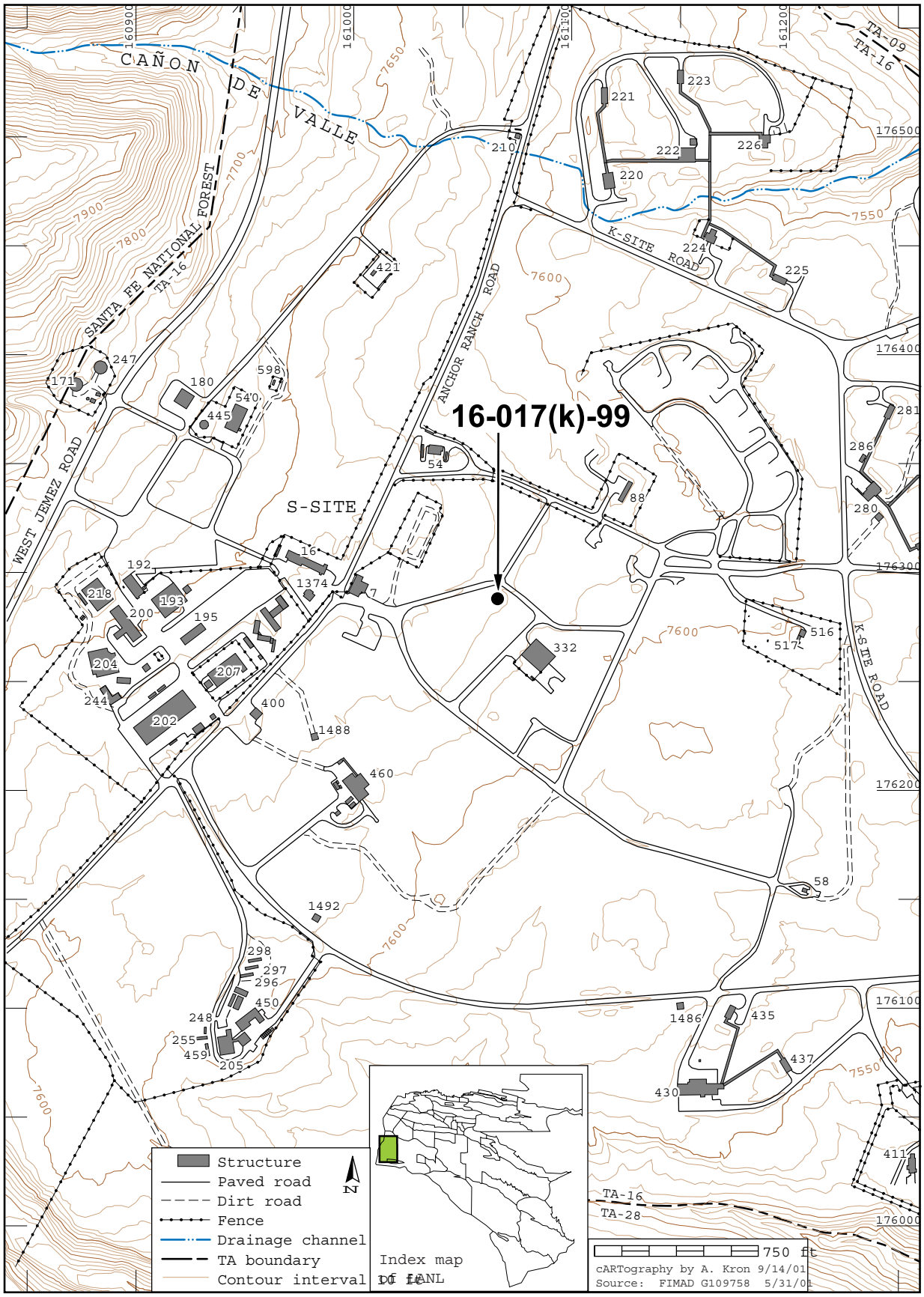
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

| | |
|---|---|
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-017(k)-99**


16-017(k)-99
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 9/14/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-017(l)-99 — Former structure - storage magazine*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-77 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-017(l)-99 is a 12 ft x 24 ft x 7 ft former storage magazine (structure 16-77). Former SWMU 16-017 consisted of a group of 23 intact structures associated with S-Site. Structure 16-77 has been removed.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

During the 1999 AUA, former SWMU 16-017 was split into 23 separate SWMUs to help facilitate tracking. Each former structure in the series was given an alpha-identifier at that time. Structure 16-77 underwent D&D in 1995.

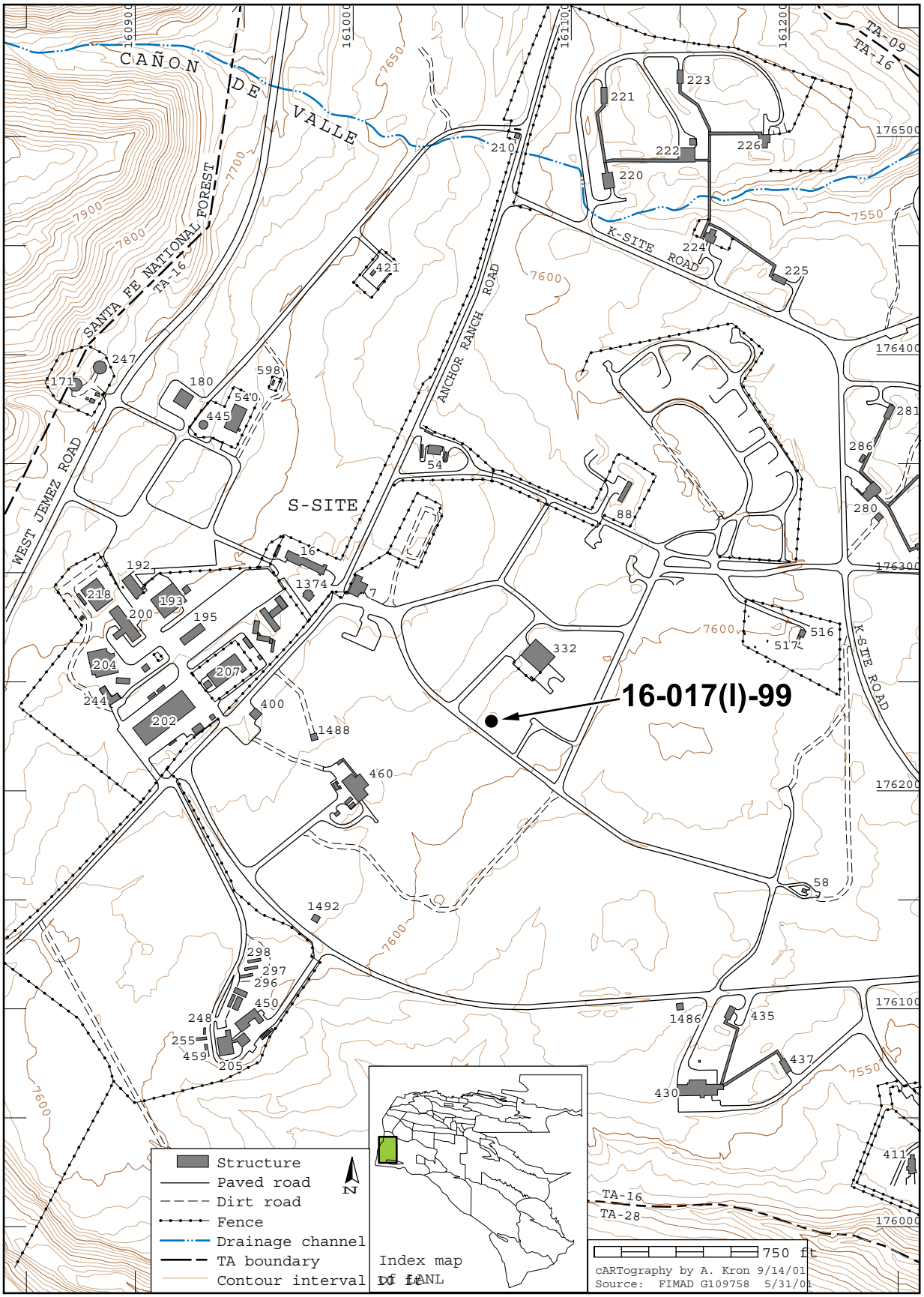
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-017(l)-99**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-16
TA-28
16-017(I)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
Index map of LANL
750 ft
cARTography by A. Kron 9/14/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-017(m)-99 — Former structure - storage magazine*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-76 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-017(m)-99 is a 12 ft x 24 ft x 7 ft former storage magazine (structure 16-76). Former SWMU 16-017 consisted of a group of 23 intact structures associated with S-Site. Structure 16-76 underwent D&D in 1995.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

During the 1999 AUA, former SWMU 16-017 was split into 23 separate SWMUs to facilitate tracking. Each former structure in the series was given an alpha-identifier at that time.

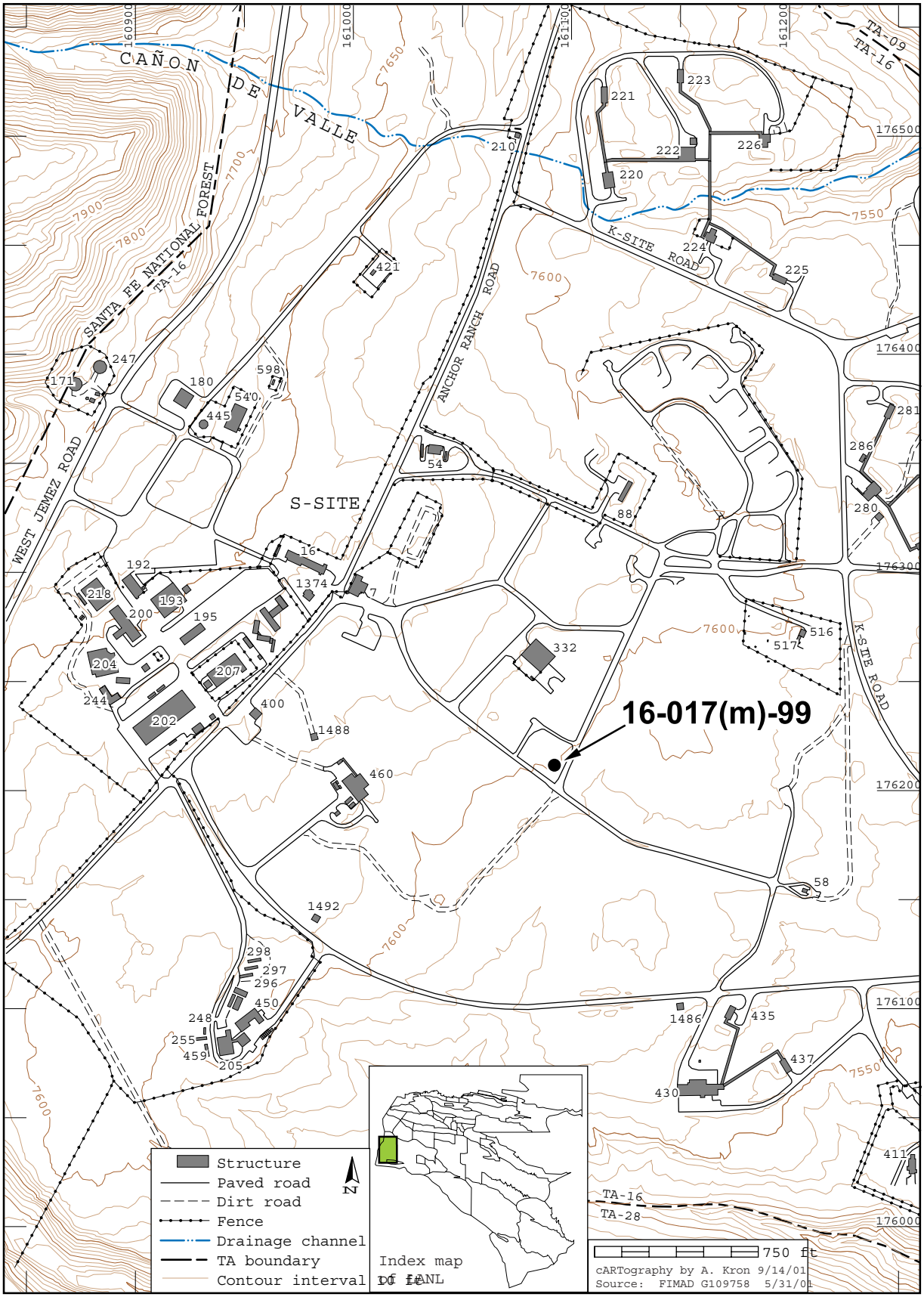
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-017(m)-99**


16-017(m)-99
CAÑON DE VALLE
S-SITE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
7900
7800
7700
7650
7600
7550
160900
161000
161100
161200
176500
176400
176300
176200
176100
176000
221
223
222
226
220
210
224
225
421
247
171
180
598
540
445
54
88
281
286
280
16
192
1374
7
218
193
200
195
204
207
244
202
400
1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
750 ft
cARTography by A. Kron 9/14/01
Source: FIMAD G109758 5/31/01
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map
of LANL

# *SWMU 16-017(n)-99 — Former structure - storage magazine*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-75 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-017(n)-99 is a 12 ft x 24 ft x 7 ft former storage magazine (structure 16-75). Former SWMU 16-017 consisted of a group of 23 intact structures associated with S-Site.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

During the 1999 AUA, former SWMU 16-017 was split into 23 separate SWMUs to facilitate tracking. Each former structure in the series was given an alpha-identifier at that time. Structure 16-75 underwent D&D in 1995.

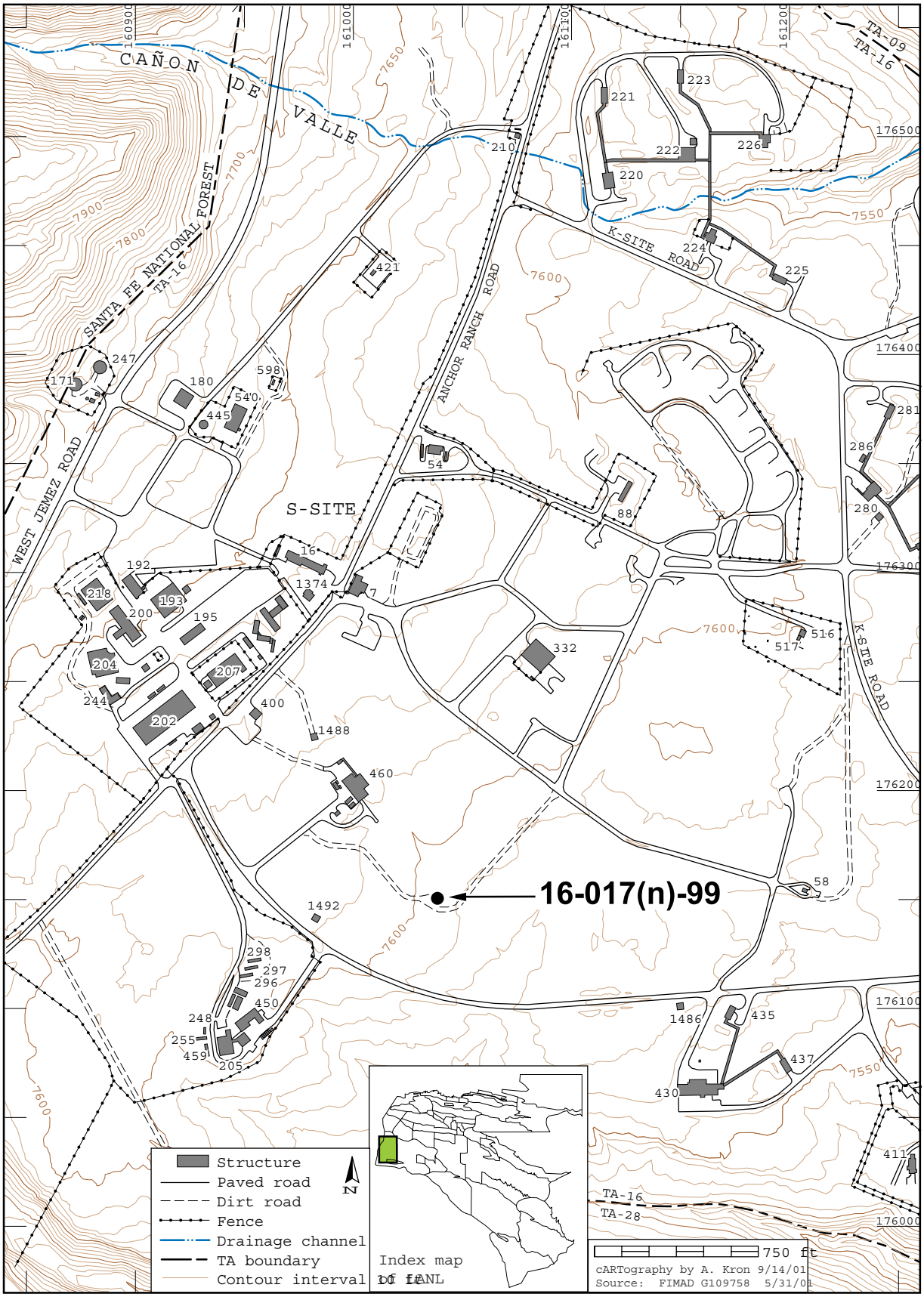
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-017(n)-99, looking west**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
16-017(n)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 9/14/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-017(o)-99 — Former structure - storage magazine*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-59 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-017(o)-99 is a 20-ft x 60-ft x 8.5-ft former storage magazine (structure 16-59). Former SWMU 16-017 consists of a group of 23 intact structures associated with S-Site.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

During the 1999 AUA, former SWMU 16-017 was split into 23 separate SWMUs to facilitate tracking. Each former structure in the series was given an alpha-identifier at that time. Structure 16-59 underwent D&D in 1995.

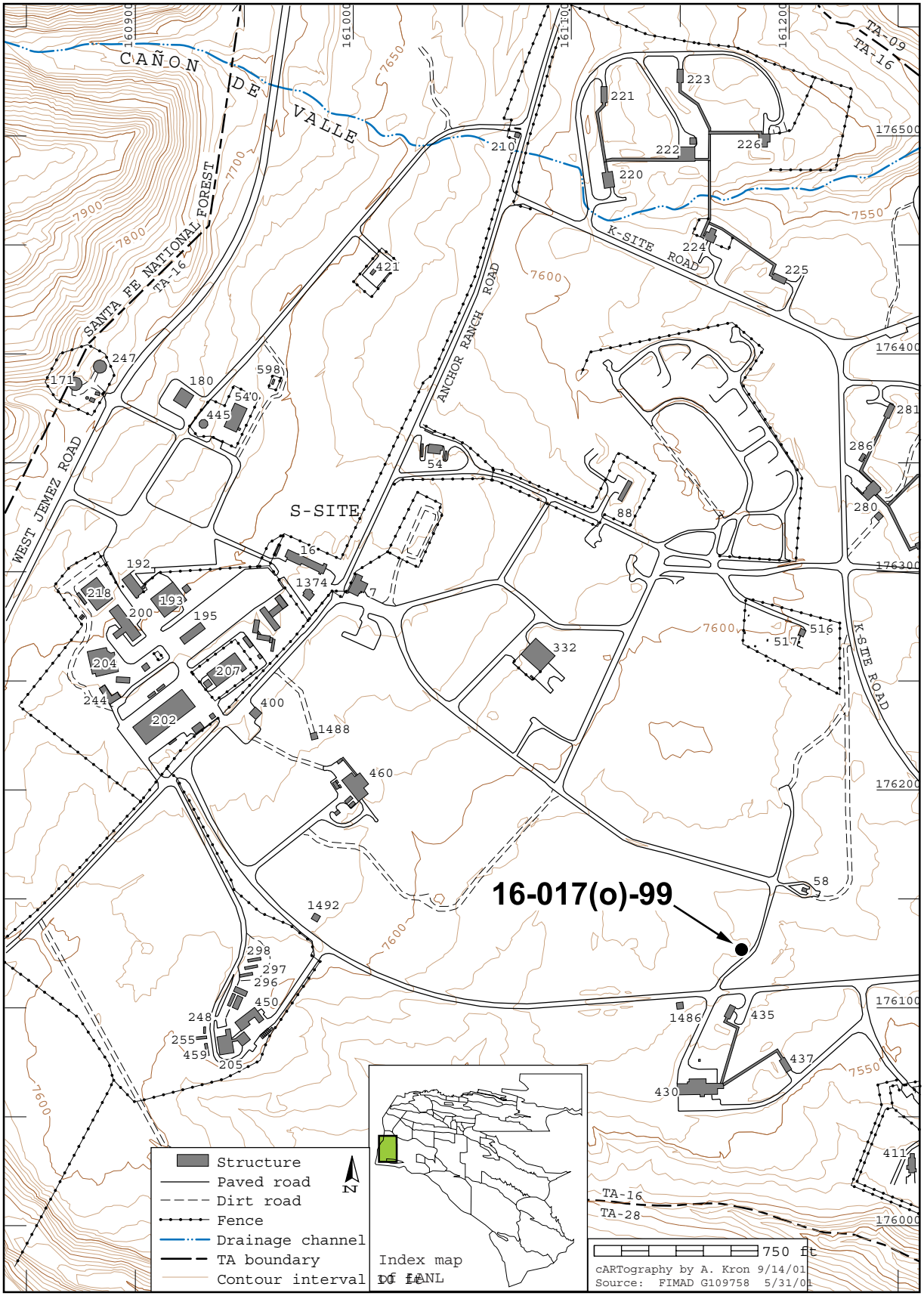
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-017(o)-99, looking west**


16-017(o)-99
CAÑON DE VALLE
S-SITE
K-SITE ROAD
ANCHOR RANCH ROAD
WEST JEMEZ ROAD
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 9/14/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-017(p)-99 — Former structure - storage magazine*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1946-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-61 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-017(p)-99 is a 20-ft x 60-ft x 8.5-ft former storage magazine (structure 16-61). Former SWMU 16-017 consists of a group of 23 intact structures associated with S-Site.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

During the 1999 AUA, former SWMU 16-017 was split into 23 separate SWMUs to facilitate tracking. Each former structure in the series was given an alpha-identifier at that time. Structure 16-61 underwent D&D in 1995.

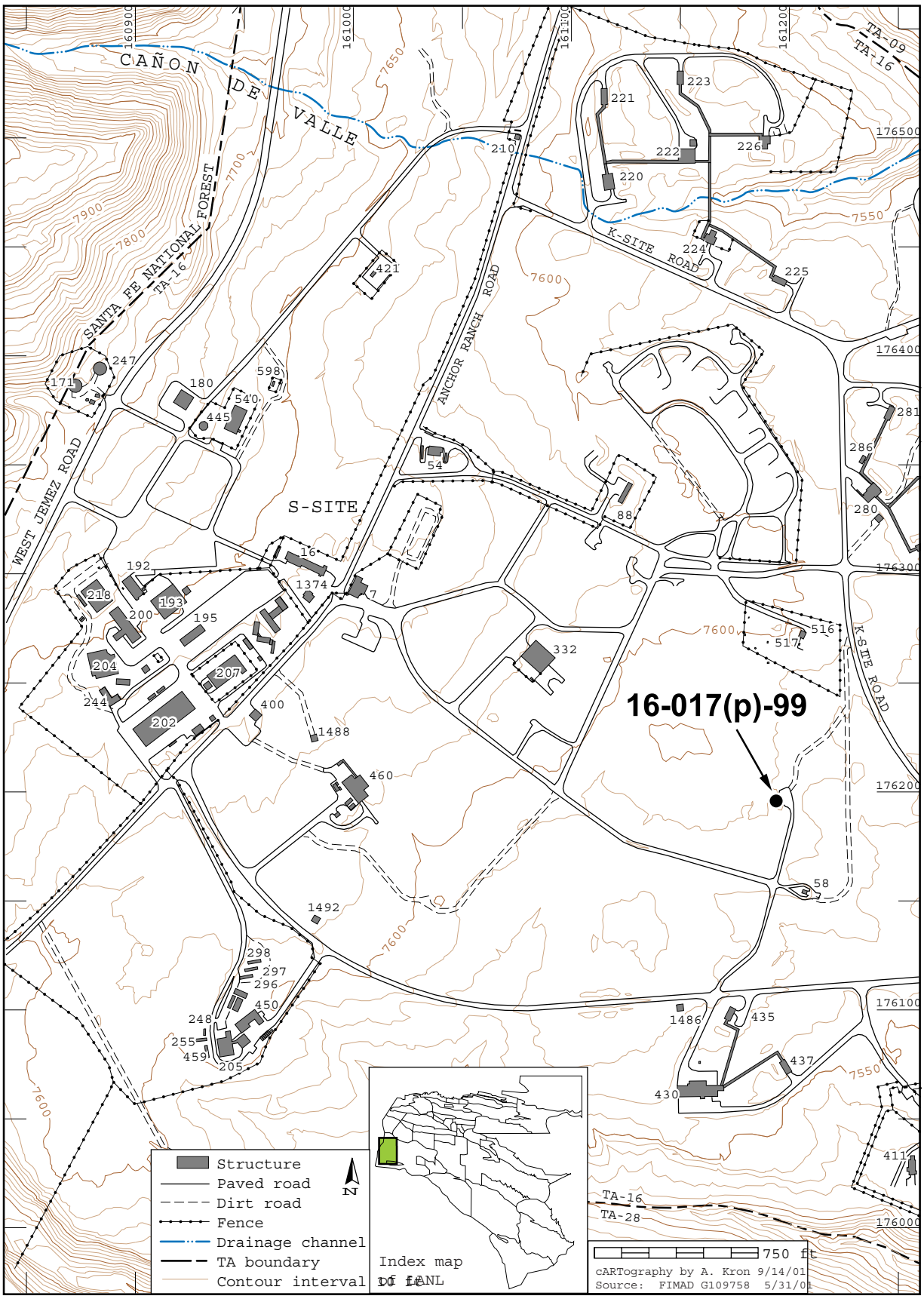
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

| | |
|---|---|
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-017(p)-99, looking west**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-28
16-017(p)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 9/14/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-017(w)-99 — Former structure - storage magazine*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-73 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-017(w)-99 was a 10.5-ft x 12.5-ft x 6-ft former storage magazine (structure 16-73). Former SWMU 16-017 consists of a group of 23 intact structures associated with S-Site.

## ER Project Activities

*RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.*

During the 1999 AUA, former SWMU 16-017 was split into 23 separate SWMUs to facilitate tracking. Each former structure in the series was given an alpha-identifier at that time. Structure 16-73 underwent D&D in 1995.

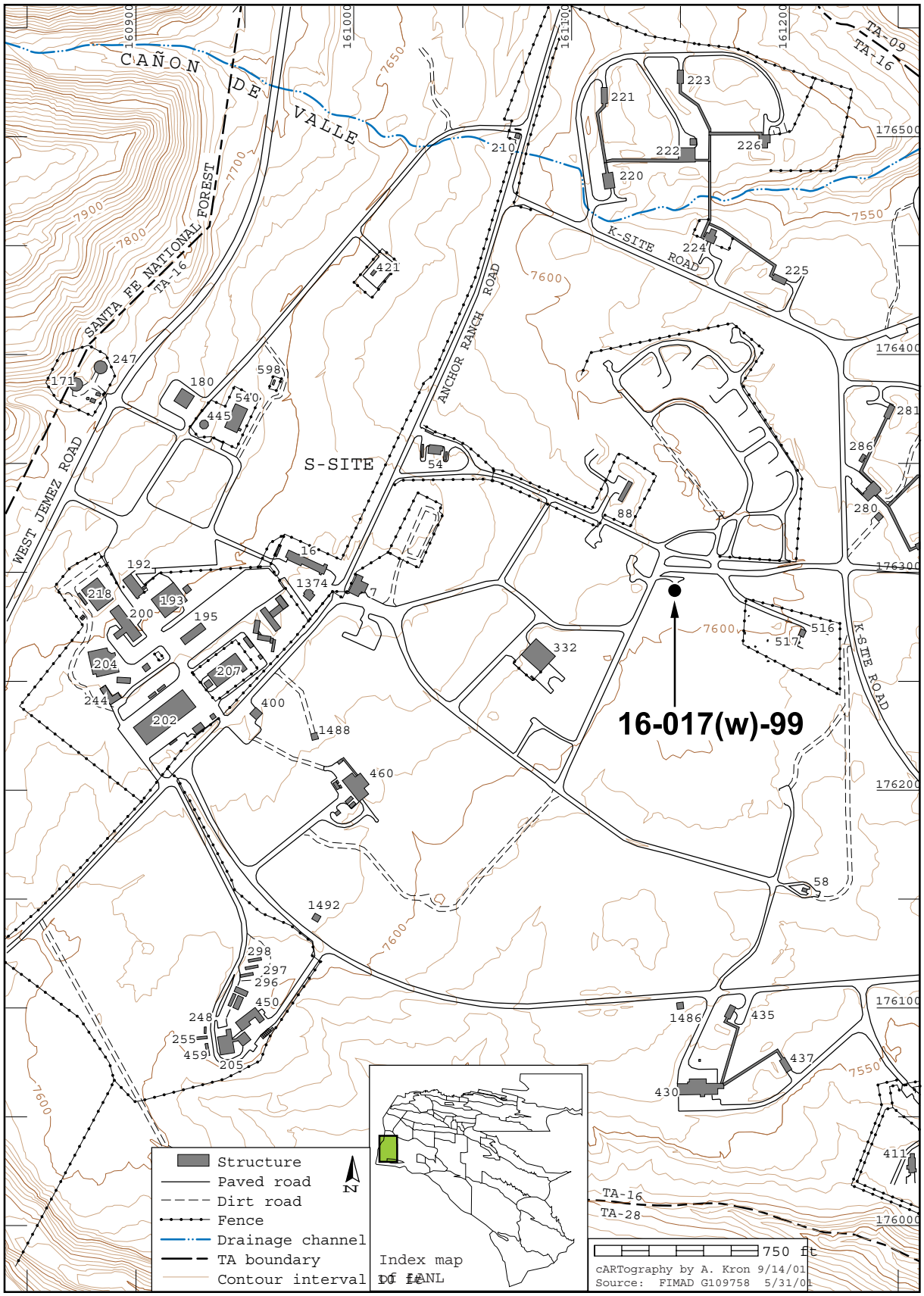
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

| | |
|---|---|
| Voluntary Corrective Measures Plan for PRSs at TA-16: 16-005(d), 16-006(g,h), 16-013, 16-017, 16-025(x), 16-026(q), 16-029(g2,h2,w,x), 16-031(c,d), 16-034(p), C-16-065, C-16-068, C-16-074 | LA-UR Number: 97-640 |
| RFI Work Plan for Operable Unit 1082, Addendum 1 | LA-UR Number: 94-1580 |

**View of SWMU 16-017(w)-99, looking east**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
16-017(w)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 9/14/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-018 — Material disposal area (MDA)*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950-1984 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-018 (known as MDA P) is located north of the TA-16 burning ground near the south rim of Cañon de Valle. The site operated from 1950 until 1984 as a disposal site for debris that resulted from burning HE and HE-contaminated material at TA-16. Concrete and construction debris was deposited directly on the slopes leading down the canyon. Other materials were burned at one of the nearby open-burn units and the resulting debris or residue was pushed over the mesa rim. The western area of MDA P primarily received construction debris from the demolition of World War II buildings; the eastern area received debris and residue from the open-burn units. The contaminants of primary concern at MDA P included detonable HE, HE residues in soil, barium, and asbestos. MDA P also contained low levels of uranium and metals such as lead and cadmium.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The ER Project submitted a closure plan to NMED in 1995. The plan was approved in 1997 and Phase I work began on removing the waste from MDA P. The discovery of detonable HE in the MDA P landfill required the use of a remote excavator. Remote landfill excavation began in February 1999 and was completed on May 3, 2000, just before the Cerro Grande fire. Nonremote excavation of contaminated soil beneath the landfill resumed after fire recovery and was completed in March 2001. Waste disposal was completed in June 2001. Phase II confirmatory sampling and geophysical measurements began in June 2001. During the Phase II sampling, additional contamination was found and additional excavation of localized contamination was completed.

Nearly 55,000 cubic yards of soil, rock, and metal and concrete debris were excavated from MDA P. Of this quantity, 21,506 cubic yards of soil were disposed as hazardous waste. The remainder of this quantity consisted of industrial waste soils, concrete and metal debris that was recycled or managed as industrial waste, and rock that was decontaminated and then used as riprap within TA-16. Other excavated waste included 3947 lb of asbestos-containing material; 888 containers of unknown content; 95 miscellaneous metal objects; 3240 lb of low-level radioactive waste; 5389 lb of mixed waste; and various smaller quantities of HE, HE-contaminated debris, and residuals from treating HE.

Scrap metal and concrete were shipped to recycling facilities. Contaminated soils and industrial wastes were shipped to off-site solid waste landfills. Solid, nonhazardous wastes were disposed of at MDA J.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| Dioxin/Furans | 0 | N/A | 0 |
| HEs | 12 | N/A | 3 |
| Herbicides | 0 | N/A | 0 |
| Inorganic chemicals | 20 | 20 | 2 |
| Pesticide/PCBs | 2 | 0 | 0 |
| Radionuclides | 4 | 1 | 0 |
| SVOCs | 4 | N/A | 0 |
| VOCs | 4 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 0.908 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 1.1 mg/kg | N/A |
| | RDX | 37 mg/kg | 4.4 mg/kg |
| Inorganic chemicals | Arsenic | 7.2 mg/kg | 0.39 mg/kg |
| | Barium | 6,980 mg/kg | 5,200 mg/kg |

## References


Material Disposal Area P Area Closure Certification Report — LA-UR Number: 02-7819

Sampling and Analysis Plan for Material Disposal Area P — LA-UR Number: 99-3630

DOE/LANL Closure Plan for TA 16, MDA P — LA-UR Number: 96-1092

RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

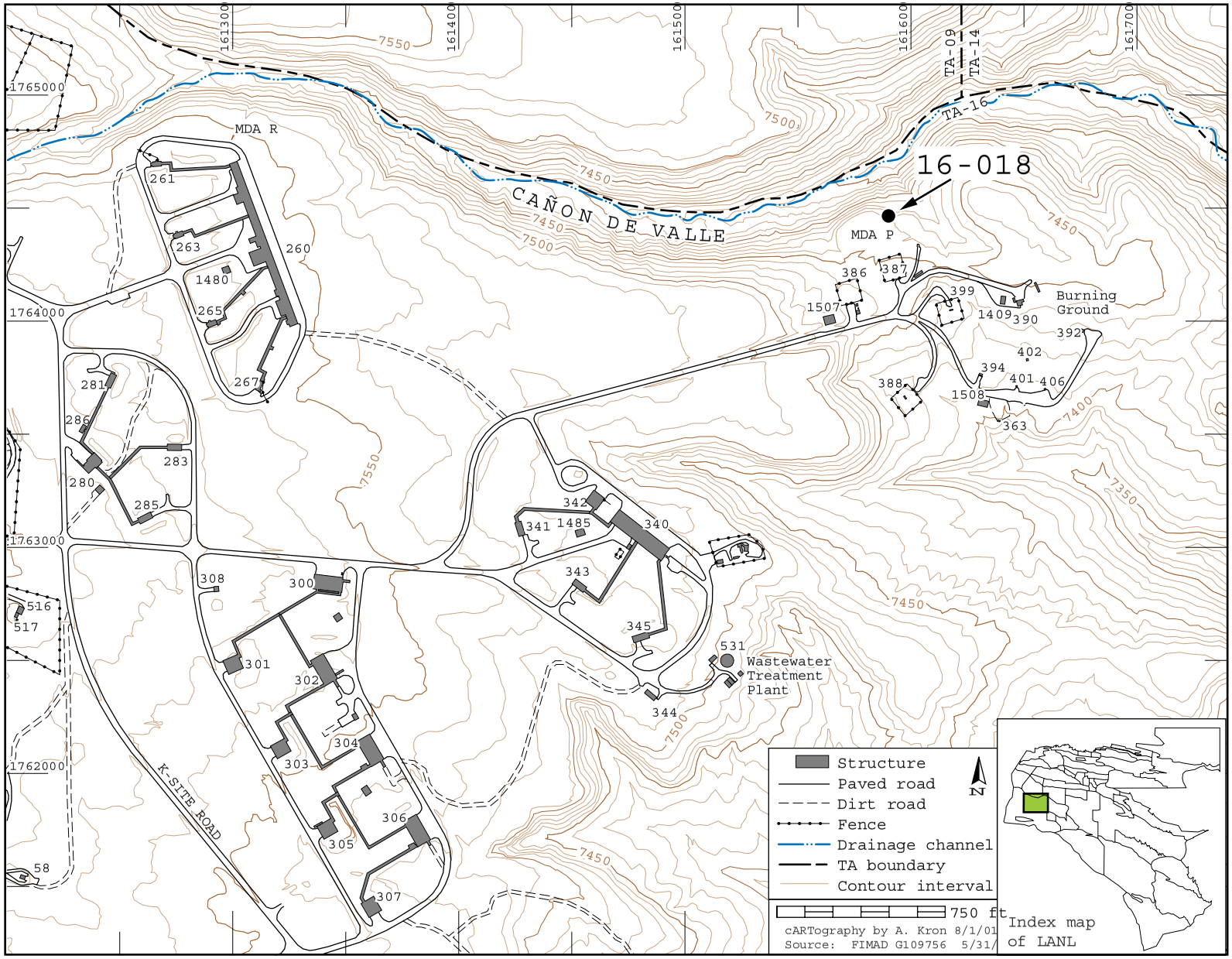
Preparing staging areas (SWMU 16-018)

MDA P excavator (SWMU 16-018)

Recycle metal (SWMU 16-018)

After remediation (SWMU 16-018)

After remediation (SWMU 16-018)


16-018
MDA P
MDA R
CAÑON DE VALLE
TA-16
TA-09
TA-14
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
161300
161400
161500
161600
161700
1765000
1764000
1763000
1762000
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
283
285
308
300
301
302
303
304
305
306
307
516
517
58
342
341
1485
340
343
345
344
531
386
387
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
750 ft
N
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/
Index map of LANL

# *SWMU 16-019 — Material disposal area (MDA)*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1952 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-019 is known as MDA R. MDA R consists of the original World War II S-Site burning ground and associated waste-disposal site. Located north of Building 16-260 and south of Cañon de Valle, MDA R was built in the mid-1940s and was used as a burning ground for waste explosives until the early 1950s. Total area of the site is estimated to be 2.27 acres. MDA R consisted of three U-shaped, 75-square-ft bermed pits. A road encircled the pits and the area was fenced. Before the pits were constructed, HE was burned in an open field. During construction of the 260 Line, the berms and surface soil at MDA R were graded northward into Cañon de Valle. The ER Project visited the site in 1992 and observed debris that had been pushed northward over the edge of the MDA R burning ground toward the canyon floor. Debris was held back by a natural barrier of wood and trees that was created by clearing the area for Building 16-260, which was built in 1951. No information is available about D&D activities at MDA R. The area was covered with grasses and pine trees before the spring 2000 Cerro Grande fire. Suspect contaminants were barium, HE, lead, asbestos, and low levels of other inorganic chemicals.

## ER Project Activities

*Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The Cerro Grande fire burned over MDA R and continued to burn underground for several weeks. SWMU 16-019 underwent an accelerated action as part of the emergency response efforts associated with the fire, including fire-suppression activities and stabilization. Fire suppression involved excavating and staging about 800 cubic yards of clean soil and 1500 cubic yards of contaminated soil and debris. Stabilization efforts consisted of implementing stormwater BMPs, including constructing a run-on diversion channel and installing erosion-control materials. In September 2000, the ER Project sampled SWMU 16-019 to determine the nature and extent of potential contamination at MDA R after the area had been excavated.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 5 | N/A | 3 |
| Inorganic chemicals | 23 | 20 | 3 |
| SVOCs | 7 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 2.7 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 0.69 mg/kg | N/A |
| | RDX | 120 mg/kg | 4.4 mg/kg |
| Inorganic chemicals | Arsenic | 7.1 mg/kg | 0.39 mg/kg |
| | Barium | 84,000 mg/kg | 5200 mg/kg |
| | Iron | 25,000 mg/kg | 23,000 mg/kg |

## References


Project Completion Report for the Accelerated Action at TA-16, MDA R — LA-UR Number: 01-522

DRAFT Surface Sampling at Canon de Valle, TA-16 — LA-UR Number: N/A

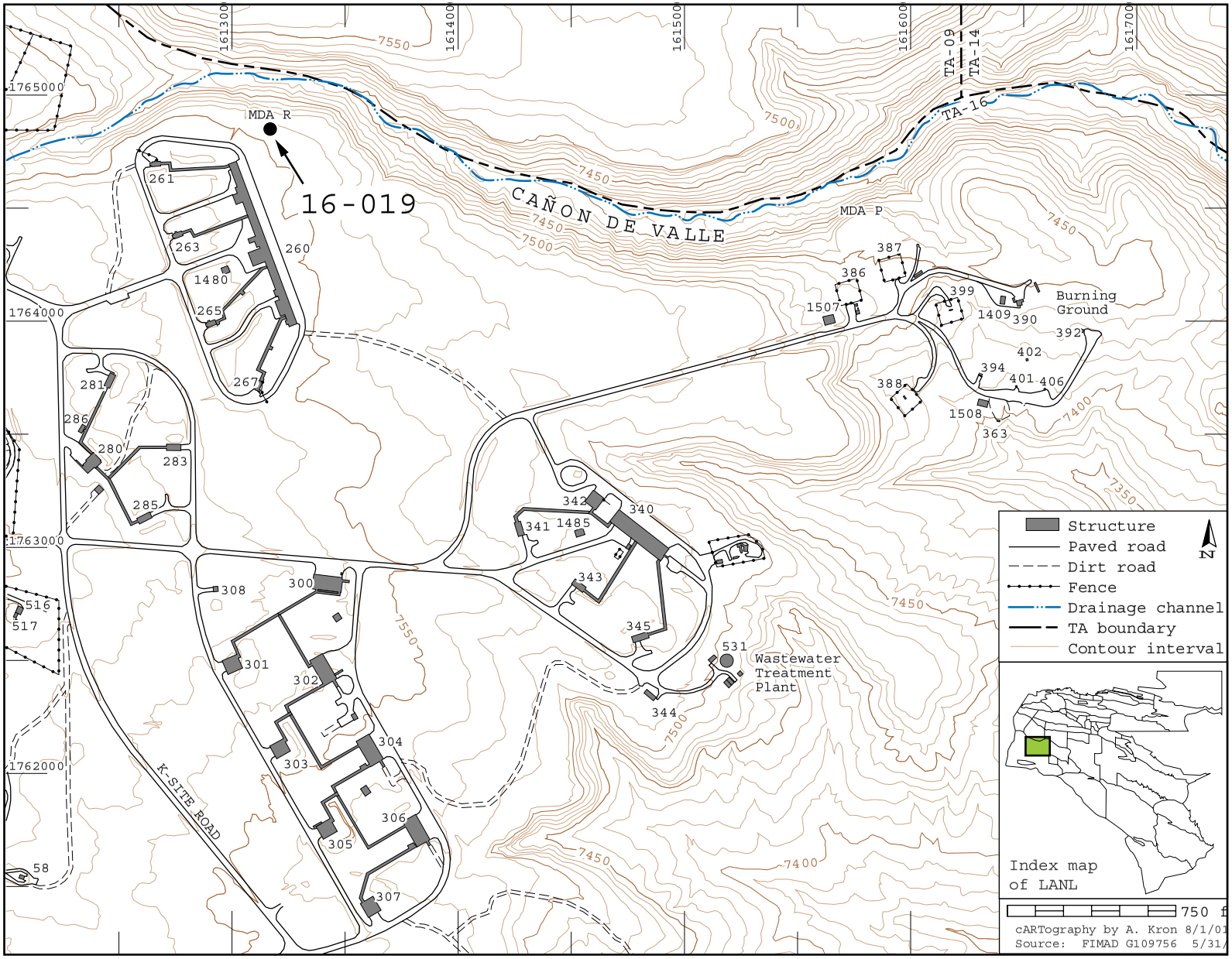
RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU 16-019**

**After Cerro Grande fire (SWMU 16-019)**

**Exposed debris; after Cerro Grande fire (SWMU 16-019)**

**Wattles on remediated slope; after Cerro Grande fire (SWMU 16-019)**


16-019
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
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Source: FIMAD G109756 5/31/

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# *SWMU 16-020 — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown-1995 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-020, known as the “silver outfall,” is a former operational release area where untreated, spent photo-fixing bath solutions were released to the soils and stream sediments. Chemicals in the untreated spent photo-fixing bath solutions included silver thiosulfate, sodium thiosulfate, sulfuric acid, boric acid, and cyanide. These chemicals were process wastes from the x-ray film photo-processing laboratory in Building 16-222, built in 1952. This spent solution was discharged on the south side of the building where it flowed approximately 295 ft in a gently sloping, small stream channel down to the confluence with the main channel of Cañon de Valle. The facility discharged significant quantities of silver (more than 12 g/L) for a period of 20 yr. In 1979, the facility began to recover the silver, and around this time, the outfall became NPDES-permitted Outfall EPA 06A073. In 1995, the building became inactive and all photo-processing equipment was moved to Building 16-260. At that time, discharges from the facility ceased. On January 14, 1998, the outfall was removed from LANL's NPDES permit.

## ER Project Activities

*Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.*

The “silver outfall” was sampled in 1995 for HE and inorganic and organic chemicals. Several analytes, including silver, chromium, and PAHs were present at levels above SALs. After the Cerro Grande fire, in the summer of 2000, more than 200 cubic yards of contaminated soil were removed from the site to minimize the potential for flood-induced contaminant mobilization. Following this IA, the site was stabilized with BMPs such as check dams, straw wattles, and rock pavements. Verification samples were collected following the IA; moderate levels of contamination remained.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 4 | N/A | 2 |
| Inorganic chemicals | 22 | 13 | 3 |
| SVOCs | 25 | N/A | 8 |
| VOCs | 7 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-4,6-dinitrotoluene[2-] | 0.05 mg/kg | N/A |
| | Nitrotoluene[2-] | 0.11 mg/kg | N/A |
| Inorganic chemicals | Arsenic | 19.3 mg/kg | 0.39 mg/kg |
| | Chromium (total) | 1190 mg/kg | 210 mg/kg |
| | Silver | 720 mg/kg | 380 mg/kg |
| SVOCs | Acenaphthylene | 0.064 mg/kg | N/A |
| | Benzo(a)anthracene | 420 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 460 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 580 mg/kg | 0.62 mg/kg |
| | Benzo(k)fluoranthene | 140 mg/kg | 6.2 mg/kg |
| | Chrysene | 610 mg/kg | 61 mg/kg |
| | Dibenz(a,h)anthracene | 68 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 270 mg/kg | 0.62 mg/kg |

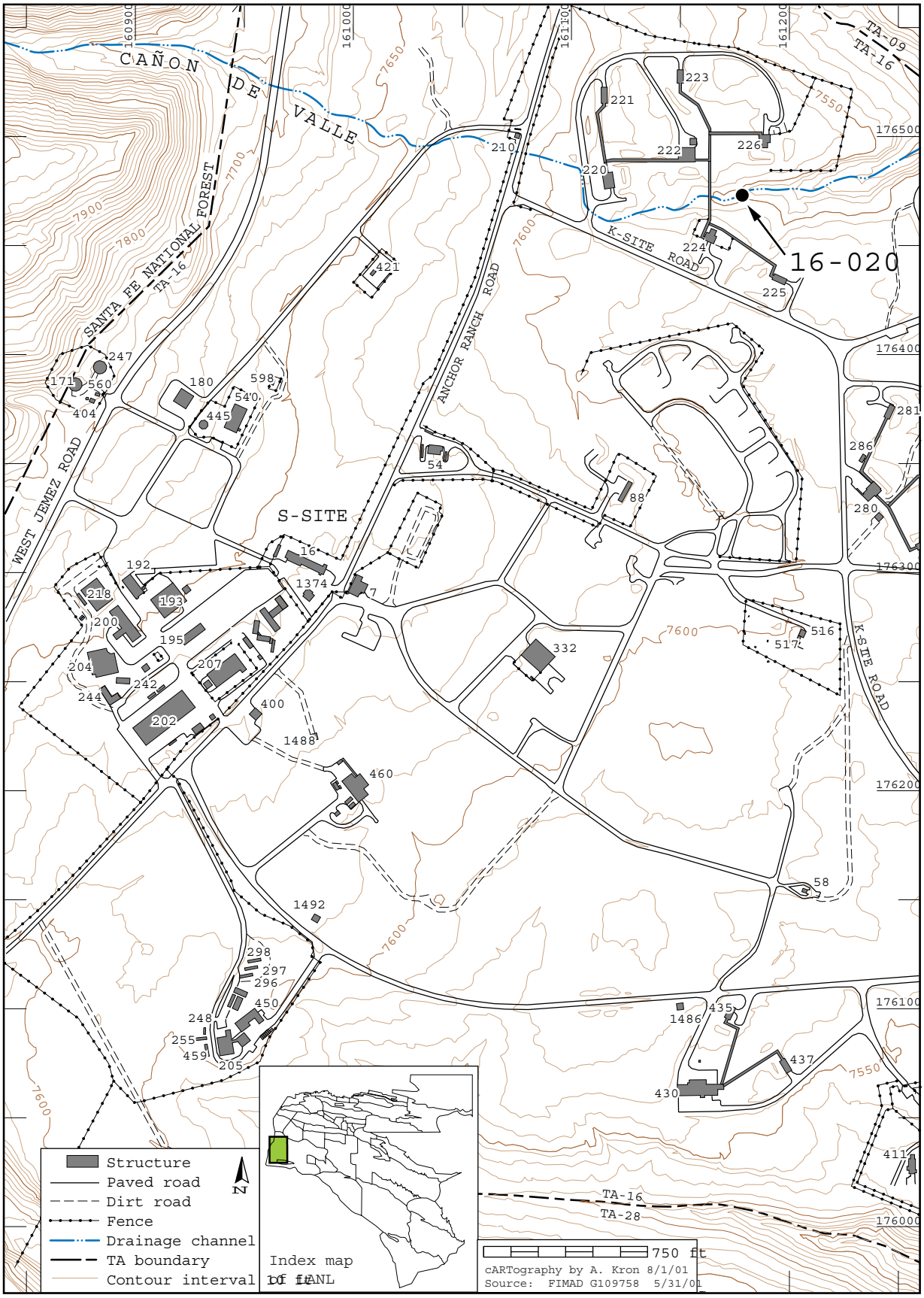
## References


Expedited Cleanup Plan for Solid Waste Management Unit 16-020, Photo Processing Outfall — LA-UR Number: 96-622

RFI Work Plan for Operable Unit 1082 — LA-UR Number: 93-1196

**View of SWMU 16-020**

**View of SWMU 16-020**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-020
TA-09
TA-28
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202
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1488
460
332
516
517
58
1492
298
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248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-021(c)-99 — Physical/chemical treatment units - subsurface liquid disposal*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1951-Present |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-021(c)-99 consists of former SWMUs 16-003(k) and 16-021(c). The consolidated SWMU contains 13 active HE sumps and drainlines and the associated inactive outfall, which was NPDES-permitted EPA 05A056. The outfall became inactive in November 1996 and was removed from the LANL NPDES permit effective January 14, 1998. The sumps, drainlines, and outfall served an HE machining facility that was built in 1951 (Building 16-260). In 1999, former SWMUs 16-003(k) and 16-021(c) were consolidated into SWMU 16-021(c)-99. The sumps are still active.

Former SWMU 16-003(k) consists of 13 active HE sumps and former drainlines that serve Building 16-260. The sumps are currently plugged so that they do not discharge to the environment. One sump measures 90 in. x 36 in. x 31 in. The other 12 measure 176 in. x 36 in. x 31 in. Machine turnings are routed to the sumps as waste. In 1966, the 10-ft-wide loading dock on the rear of Building 16-260 was removed and new sumps with watertight aluminum liners were installed adjacent to the northeast wall of the building. HE-contaminated soil under the old sumps was removed and replaced with clean compacted earth. The sumps were connected by VCP to a 4-ft-deep concrete trough that paralleled Building 16-260. The feeder trough discharged into a second concrete trough that discharged into an outfall and drainage [former SWMU 16-021(c)]. Two of the sumps (serving machining bays 22, 23, 24, and 25) receive barium precipitation treatment waste. After pH adjustment, barium is precipitated as insoluble barium sulfate by adding sodium sulfate to the sump solution. Barium residues are removed to the TA-16 burning ground when the sumps are serviced. Waste primarily consists of HE. HE charges with uranium attached periodically have been machined at the facility. Special precautions are taken to prevent uranium from entering the wastewater system. Currently, the sumps are pumped and the water is treated at the TA-16 HE wastewater treatment facility.

Former SWMU 16-021(c) is an inactive outfall, a former pond, and a drainage channel associated with the 13 sumps that service Building 16-260. Historically, discharge from the sumps was routed to the outfall. At one point, discharge reportedly was as high as several million gallons per year. Currently, the former pond contains no water, although soil and sediment are wet sporadically. The drainage channel from the outfall flows about 600 ft to the bottom of Cañon de Valle. This channel contains a ponding area (about 50 ft long x 20 ft wide) immediately below the outfall. The drainage then flows about 600 ft north to the bottom of Cañon de Valle, traveling over a 15-ft cliff at a distance of about 400 ft from the outfall. Stormwater from the road on the northeast side of Building 16-260 also flowed into the pond. Stormwater flow is now diverted around the pond by a series of BMPs.

Sediment surveys conducted from 1970 to 1985 and again in 1991 indicated the presence of HE and barium in the outfall and drainage from the surface to the soil/tuff interface.

## ER Project Activities

Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

The ER Project conducted a Phase I RFI in 1995 that focused on surface materials in the drainage. The objective of sampling at former SWMU 16-003(k) was to determine whether a release had occurred beneath the HE sumps and troughs that presented a human health and/or environmental risk. Only a subset of sampling was completed at former SWMU 16-003(k) due to hazards associated with drilling in HE-contaminated areas. The objective of the sampling at former SWMU 16-021(c) was to determine the lateral and vertical extent of contamination. Surface and near-surface soil samples were analyzed for HE, inorganic chemicals, organic chemicals, and uranium. RDX, HMX, TNT, DNT, TNB, anthracene, bis(2-ethylhexyl)phthalate, and barium were detected above SALs. Non-RFI surface and groundwater sampling revealed that HE constituents and barium were present at levels greater than MCLs in springs and surface waters potentially associated with former SWMU 16-021(c). Together, the data analysis led to the decision that a CMS and CMI were required at former SWMU 16-021(c). The RFI report recommended a VCA at former SWMU 16-003(k) in conjunction with the CMS/CMI at former SWMU 16-021(c). The RFI report also recommended accelerated Phase II sampling at former SWMU 16-021(c) to prepare for a CMS.

The administrative boundary for the CMS runs along State Highway 501, which coincides with the Pajarito fault to the west and follows the basin divides between Water Canyon and Cañon de Valle to the south, as far as Martin Spring Canyon and Pajarito Canyon, and Cañon de Valle to the north. The areal extent of the study includes all surface and subsurface terrain within the boundary except individual SWMUs and associated downgradient areas to the edge of Cañon de Valle and Fish Ladder Seep and its sub-basin. The primary objective of the CMS is to select the remedial technologies that will be used to achieve media cleanup

standards in the components of the site conceptual model. The objectives of the investigation to support the CMS are to define the extent of contamination and to characterize the behavior of active transport pathways for the site conceptual model components.

The ER Project and LANL's ESH-18 coordinated an IA in 1995 using BMPs to stabilize the soil associated with former SWMU 16-021(c) and to prevent further contaminant release. The IA consisted of three measures. First, diverting stormwater runoff reduced the volume of surface flow to the drainage channel. Sandbags were placed to divert runoff from the area into adjacent drainages. Second, the existing settling pond was covered to reduce the potential for mobilization of pond sediments. Third, installing eight straw-bale dams enhanced the capacity for sediment deposition within the drainage.

Phase II RFI surface sampling, conducted by the ER Project in 1996-1997, showed that surface contamination does not extend laterally beyond the drainage. During the Phase II RFI, 209 screening samples and 57 analytical laboratory samples were collected. Samples were screened for HE and analyzed for HE, inorganic chemicals, and organic chemicals. Monitoring wells were installed in four boreholes that were determined the most likely to produce water. The Phase II investigation also included extensive sampling of TA-16 springs and the Cañon de Valle alluvial system. Data collection is ongoing. Human health and ecological screening assessments listed barium, bis(2-ethylhexyl)phthalate, HMX, RDX, and TNT as the contaminants of greatest potential concern at the consolidated SWMU, although cadmium, chromium, copper, lead, nickel, vanadium, and zinc are consistently observed above background levels in the drainage. Anthracene also was detected in several samples. A potassium bromide tracer that was deployed in April 1997 was detected in two locations at TA-16 in August 1997, suggesting that Outfall 260 is hydrogeologically connected to Cañon de Valle springs. The connection suggests that contamination found in the outfall area is a source of contamination in Cañon de Valle springs, seeps, surface water, and alluvium. Investigation results demonstrated the need for corrective action at consolidated SWMU 16-021(c)-99.

Additional BMPs were instituted at consolidated SWMU 16-021(c)-99 in 1998 to minimize run-on over the former pond. The BMPs consisted of three controls: a concrete curb along the east end of the asphalt behind Building 16-260 to prevent run-off from flowing freely onto the SWMU boundaries; HDPE sheeting to seal the steel plates covering the troughs associated with former SWMU 16-003(k); and a 4-in. PVC diversion pipe was installed from the outfall to the drainage's confluence with Cañon de Valle. All BMPs are inspected quarterly and are maintained.

The ER Project performed a major IM cleanup at SWMU 16-021(c)-99 in 2000 and 2001, removing approximately 1500 cubic yards of contaminated material from the site. HE and barium-contaminated soil were removed from the highly contaminated "pond" and outfall areas. The highly contaminated soil in the pond area was blended and excavated robotically, for safety reasons. Excavated soil was screened to remove rock that was decontaminated and later used in site restoration. The outfall was reinforced with rocks, covered with jute matting, and reseeded. The excavated soil was staged in piles (nonhazardous) or rolloffs (hazardous) before shipment to off-site permitted landfills for treatment and disposal. After soil was removed, verification samples were collected. Sample results indicated that the IM removed most of the HE. The residual contamination remaining at the outfall source area will be addressed in the Phase III report for SWMU 16-021(c)-99 and through the ongoing CMS process.

A hydrogeological study is being conducted as part of the CMS at consolidated SWMU 16-021(c)-99. Activities include collecting samples from three springs and one seep. Two of the springs (SWSC and Burning Ground) are located in Cañon de Valle and one spring is in Martin Canyon. The seep is located in Cañon de Valle and is sampled biweekly. Five alluvial wells are sampled quarterly and tested biweekly for water-quality parameters (pH, conductivity, and temperature). A sixth alluvial well is part of a "well pair" and only one of the two wells is sampled. Three alluvial wells that will be located in Martin Springs Canyon will be included in the quarterly sampling. The ER Project outlines CMS activities at Outfall 260 for NMED by submitting monthly CMS progress reports.

Two deep boreholes (greater than 1500 vertical ft) were drilled in 2000 and 2001, to the east and southeast of SWMU 16-021(c)-99. These boreholes will help evaluate whether groundwater contamination is migrating from TA-16. Multiscreen Westbay sampling ports were installed in the completed wells, CdV-R-15-3 and CdV-R-37-2. Sampling data collected from these wells have not indicated significant HE contamination. Quarterly sampling of these wells is ongoing.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 13 | N/A | 6 |
| Inorganic chemicals | 28 | 28 | 6 |
| PCBs | 2 | N/A | 0 |
| Radionuclides | 1 | 1 | 0 |

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| SVOCs | 26 | N/A | 2 |
| VOCs | 20 | N/A | 1 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 69 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 82.7 mg/kg | N/A |
| | Dinitrobenzene[1,3-] | 29 mg/kg | 6.1 mg/kg |
| | HMX | 137,000 mg/kg | 3100 mg/kg |
| | RDX | 118,000 mg/kg | 4.4 mg/kg |
| | Trinitrotoluene[2,4,6-] | 102,000 mg/kg | 31 mg/kg |
| Inorganic chemicals | Arsenic | 11 mg/kg | 0.39 mg/kg |
| | Barium | 40,300 mg/kg | 5200 mg/kg |
| | Bromide | 2.39 mg/kg | N/A |
| | Cyanide (total) | 1.9 mg/kg | N/A |
| | Iron | 25,000 mg/kg | 23,000 mg/kg |
| | Thallium | 7.1 mg/kg | 6.1 mg/kg |
| SVOCs | Benzo(a)pyrene | 0.39 mg/kg | 0.062 mg/kg |
| | Bis(2-ethylhexyl)phthalate | 4600 mg/kg | 35 mg/kg |
| | Xylene[1,3-]+Xylene[1,4-] | 0.01 mg/kg | N/A |

## References


Monthly Progress Report, Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c), November 2002 — LA-UR Number: 02-7671

Addendum to the CMS Plan for PRS 16-021(c), Revision 1 — LA-UR Number: 02-7366

Monthly Progress Report, Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c), October 2002 — LA-UR Number: 02-7095

September 2002 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) — LA-UR Number: 02-6574

Monthly Progress Report for Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c), August 2002 — LA-UR Number: 02-5634

Monthly Progress Report or Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c), July 2002 — LA-UR Number: 02-5154

Interim Measures Report for Potential Release Site 16-021(c)-99 — LA-UR Number: 02-4229

Monthly Progress Report for Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c), June 2002 — LA-UR Number: 02-4121

May 2002 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) — LA-UR Number: 02-3453

Monthly Progress Report for Potential Release Site (PRS) 16-021(c), April 2002 — LA-UR Number: 02-2758

Monthly Progress Report for Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c), March 2002 — LA-UR Number: 02-2061

| | |
|---|---|
| February 2002 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 02-1245 |
| January 2002 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 02-0652 |
| December 2001 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 02-0243 |
| November 2001 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 01-6824 |
| Monthly Progress Report, Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c), October 2001 | LA-UR Number: 01-6327 |
| October 2001 Corrective Measures Study (CMS) Progress Report for Potential Release | LA-UR Number: N/A |
| Monthly Progress Report, Corrective Measures Study (CMS) for Potential Release, September 2001 Site (PRS) 16-021(c) | LA-UR Number: 01-5693 |
| August 2001 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: N/A |
| July 2001 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 01-4583 |
| June 2001 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 01-3675 |
| May 2001 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 01-3178 |
| April 2001 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 01-2457 |
| March 2001 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 01-1962 |
| February 2001 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 01-1357 |
| January 2001 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 01-944 |
| Modifications to Potential Release Site (PRS) 16-021(c)-99 Sampling Activities | LA-UR Number: N/A |
| December 2000 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 01-256 |
| November 2000 Monthly Progress Report for Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 00-5928 |
| October 2000 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 00-3741 |
| September 2000 Corrective Measures Study (CMS) Progress Report for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 00-4970 |
| September 2000 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 00-4970 |
| August 2000 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 00-3741 |
| July 2000 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 00-3818 |
| June 2000 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: N/A |

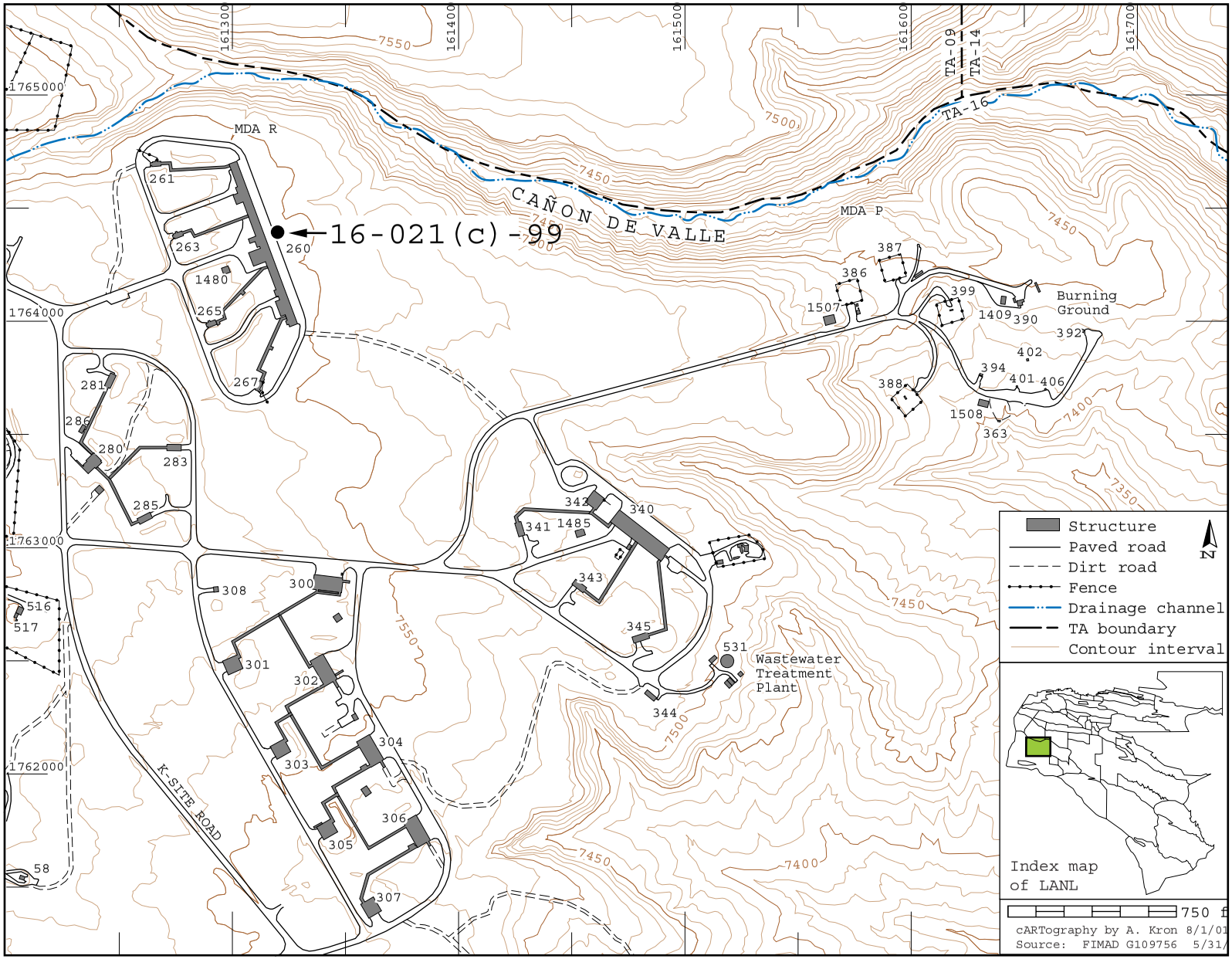
| | |
|---|---|
| April 2000 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 00-2606 |
| May 2000 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 00-2607 |
| March 2000 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 00-1884 |
| February 2000 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: 00-1281 |
| January 2000 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: N/A |
| Interim Measures Plan for Consolidated Potential Release Site 16-021(c)-99 | LA-UR Number: 99-6767 |
| December 1999 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: N/A |
| November 1999 Monthly Progress Report for the corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: N/A |
| October 1999 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: N/A |
| September 1999 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: N/A |
| August 1999 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: N/A |
| July 1999 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: N/A |
| June 1999 Monthly Progress Report for the Corrective Measures Study (CMS) for Potential Release Site (PRS) 16-021(c) | LA-UR Number: N/A |
| Corrective Measures Study Plan for Potential Release Site 16-021(c) - Addendum | LA-UR Number: 98-3918 |
| RFI Report for PRS 16-021(c), Volume 2 | LA-UR Number: 98-4101 |
| RFI Report for PRS 16-021(c), Volume 3 | LA-UR Number: 98-4101 |
| RFI Report for TA -16: PRS 16-021(c) 260 Outfall - Phase II, Volume I | LA-UR Number: 98-4101 |
| Progress Report for PRS 16-021(c) CMS [October, November, and December 1998] | LA-UR Number: N/A |
| CMS Plan for TA-16, PRS 16-021(c) | LA-UR Number: 98-3918 |
| Modifications to drilling plan for PRS 16-021(c) | LA-UR Number: N/A |
| RFI Report for TA-16: PRSs 16-021(c) and 16-003(k) | LA-UR Number: 96-3191 |
| Interim Action Report for Solid Waste Management Unit 16-021(c) | LA-UR Number: 96-0419 |
| Interim Action Plan for TA-16: PRS 16-021(c) | LA-UR Number: N/A |
| OU 1082 Field Implementation Plan for Sampling at SWMU 16-021(c) | LA-UR Number: N/A |
| RFI Work Plan for Operable Unit 1082 | LA-UR Number: 93-1196 |

**View of SWMU 16-021(c)-99**

**During interim action**

**Outfall after interim action**

**Moving rock and using hay bales and jute mat to prevent further migration of contaminants in drainage**


16-021(c)-99
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
283
285
516
517
58
308
300
301
302
303
304
305
306
307
342
341
1485
340
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *AOC 16-022(b) — Underground storage tanks*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | Unknown |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-197 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-022(b) is a historical 4000-gal. UST (structure 16-197) that held unleaded gasoline. During 1987, the tank tested tight, but when the tank was removed in 1990, 15 gal. to 20 gal. of residual fuel were released when scale was dislodged from the bottom of the tank. The contaminated soil was removed immediately and cleaned up in compliance with the New Mexico UST regulations in effect at the time. A 10,000-gal. tank (structure 16-1465) was installed after structure 16-197 was removed.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

In 1994, structure 16-1465 was discovered to have leaked that year. The site where the leak occurred, which includes the former location of structure 16-197, has been sampled and remediated; investigations continued as Addendum 2 to the OU 1082 work plan was written. Addendum 2 of the OU 1082 work plan stated that the investigation of structure 16-1465 would address potential contamination from structure 16-197. When the extent of contamination from structure 16-1465 is determined, further action will be taken in accordance with New Mexico UST regulations.

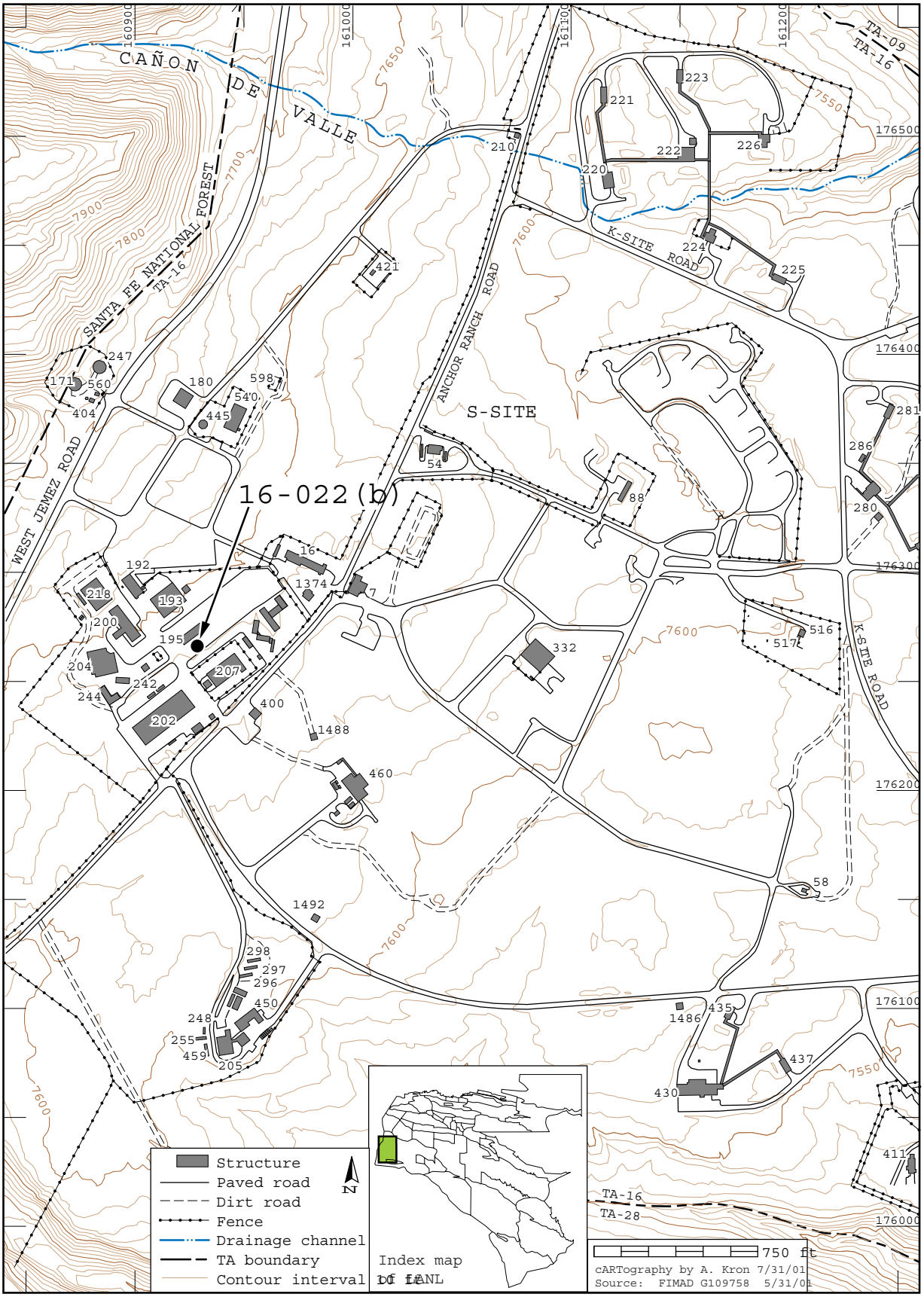
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038


**No photo; subsurface unit**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-16
TA-16
TA-28
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
K-SITE ROAD
S-SITE
16-022(b)
7900
7800
7700
7650
7600
7550
160900
161000
161100
161200
176500
176400
176300
176200
176100
176000
247
171
560
404
180
598
540
445
421
210
223
221
222
226
220
224
225
281
286
280
54
88
16
1374
7
192
218
193
200
195
204
242
244
207
202
400
1488
460
332
516
517
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC 16-024(a) — Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1951 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-488 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(a) is the location of a decommissioned and removed HE magazine (Building 16-488) on the south side of S-Site in a region that originally was called P-Site. P-Site (the historical TA-13) was built in 1944 to support the research and development of HE for the Manhattan Project. It was designed as a site for counter x-ray diagnostics of HE lens configurations. Activities supporting the operation included operation of counter x-ray equipment, HE assembly, and research on the magnetic-method program. P-Site was converted to initiator testing in 1945. Initiator assemblies consisted of HE, beryllium, polonium (an alpha-emitter), and other inorganic chemicals. Alpha-contaminated buildings were decontaminated in 1946 and 1947 and certified free of alpha contamination in 1948. The buildings in the western half of P-Site were demolished in the early 1950s to make way for construction of the grinding building (Building 16-340) and associated structures. P-Site was incorporated into S-Site in 1957. Former Building 16-488 was built in 1944 to store HE in support of x-ray diagnostics work on HE lenses. The building's construction and dimensions are unknown; its approximate location was identified from aerial photographs and evidence of the building's gravel driveway. Building 16-488 was decommissioned and removed in 1951; the method of decommissioning is unknown.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 2 of the OU 1082 work plan proposed sampling in the footprint of AOC 16-024(a) to detect residual HE in the disturbed soils.

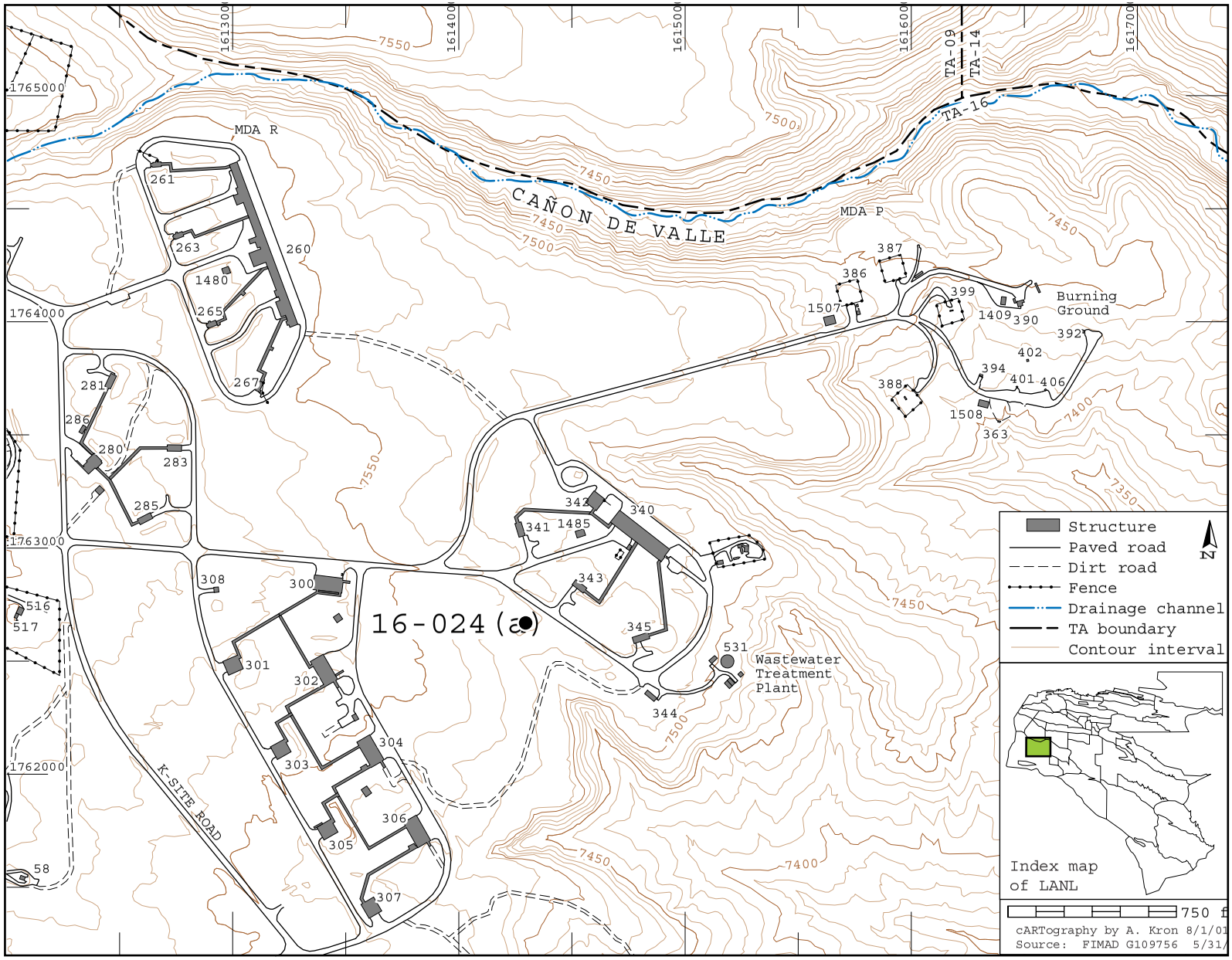
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of AOC 16-024(a)**


CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
16-024 (a)
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
283
285
516
517
58
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305
306
307
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341
1485
340
343
345
344
531
387
386
1507
399
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392
402
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406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
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Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *AOC 16-024(b) — Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1946-1960 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-74 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(b) is the location of potentially contaminated surface soil associated with a former HE magazine (former structure 16-74), which was located in the historical GMX-3 area. Operations at GMX-3 were devoted to developing techniques to produce HE lenses, the explosives component of a nuclear weapon, with high chemical purity and accurate shapes. HE was subjected to disruptive processes like casting and machining. HE normally was held in magazines and rest houses between operations. Spillage occasionally occurred in the magazines and rest houses. Structure 16-74 was made of wood and had a concrete floor. It was 9 ft wide x 11 ft long x 7 ft high, bermed on three sides and on top, and had no plumbing. It was located north of the casting rest house (structure 16-88). Structure 16-74 was built in 1946 to store HE in transit to the machining buildings (Buildings 16-31, -32, and -33). Structure 16-74 had no sumps or drainlines that would provide a pathway to the environment; it was burned in 1960. The suspect contaminant at this site is HE.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 1 of the OU 1082 work plan proposed sampling at AOC 16-024(b) to detect residual HE and HE byproducts on the disturbed surface area of AOC 16-024(b).

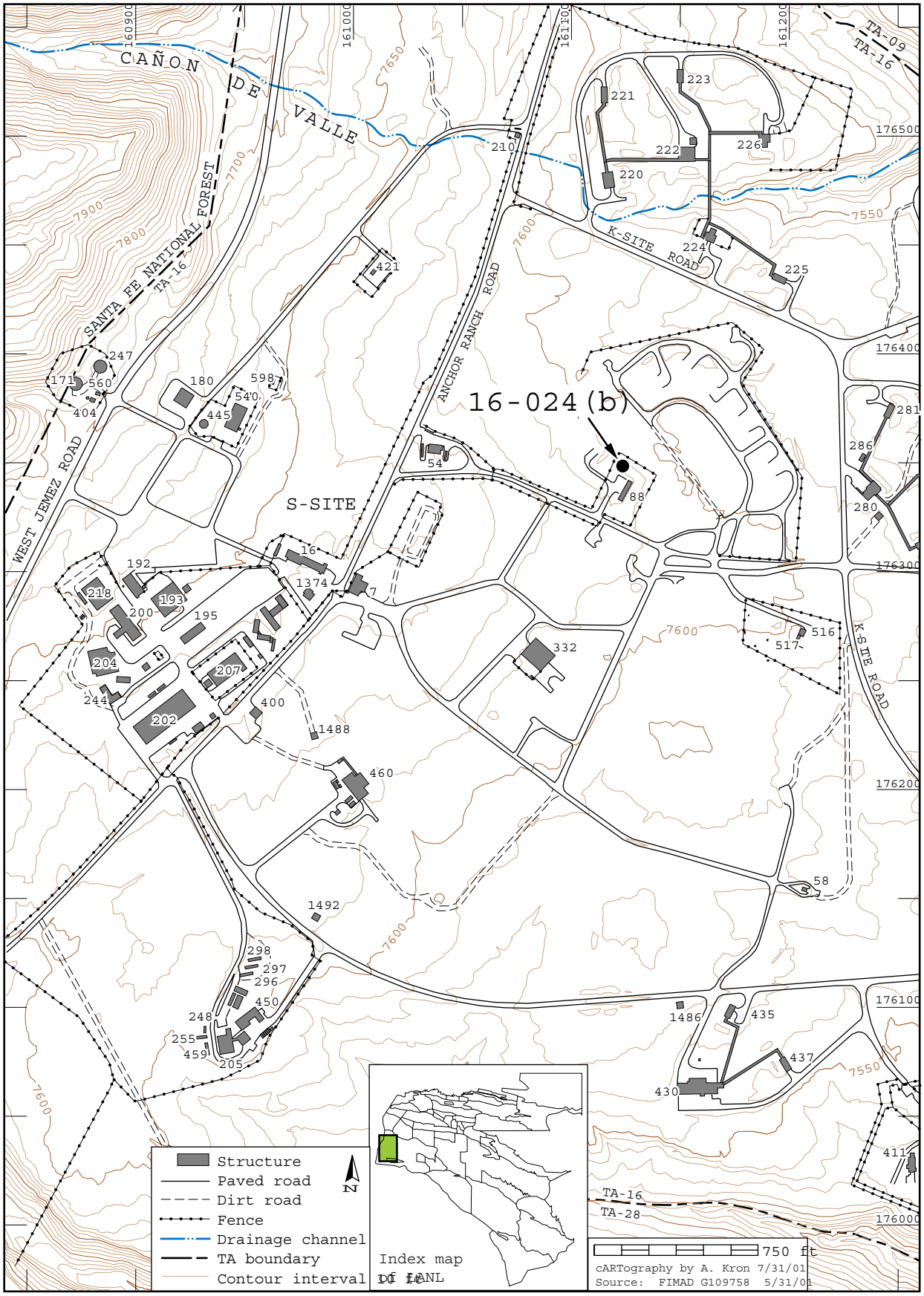
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of AOC 16-024(b)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-024(b)
TA-09
TA-28
160900
161000
161100
161200
176500
176400
176300
176200
176100
176000
7650
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7900
7800
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400
1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC 16-024(h) – Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-497 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(h) is the location of potentially contaminated surface soil within the footprint of a decommissioned HE magazine (former structure 16-497). Structure 16-497 was located at T-Site (the historical TA-24). T-Site was located northwest of the S-Site explosives manufacturing complex and currently is devoid of structures. T-Site was used primarily for radiographic operations. T-Site operated from 1944 to 1950, when site activities were transferred to GT-Site (TA-08). Most structures at T-Site were destroyed by burning in February 1960. Residual debris from burning and the remaining subsurface structures were cleaned up in 1966. All structures at T-Site were free of residual radioactivity in 1966 when they were resurveyed after they were burned. Structure 16-497 was made of wood-frame construction with earthen barricades on three sides and on top; it was 15 ft x 40 ft x 9 ft, with a concrete foundation and floor. Structure 16-497 had no sumps or drains to the external environment. A radioactive lanthanum source broke open at structure 16-497 and contaminated the building with strontium-90. The building also was found to be contaminated with HE during a building survey in 1959.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 1 of the OU 1082 work plan proposed sampling to detect residual strontium-90, HE, and HE byproducts on the disturbed surface soils of AOC 16-024(h). This site was sampled in 1997.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 18 | 0 | 1 |
| Radionuclides | 1 | 1 | 0 |
| SVOCs | 0 | N/A | 0 |

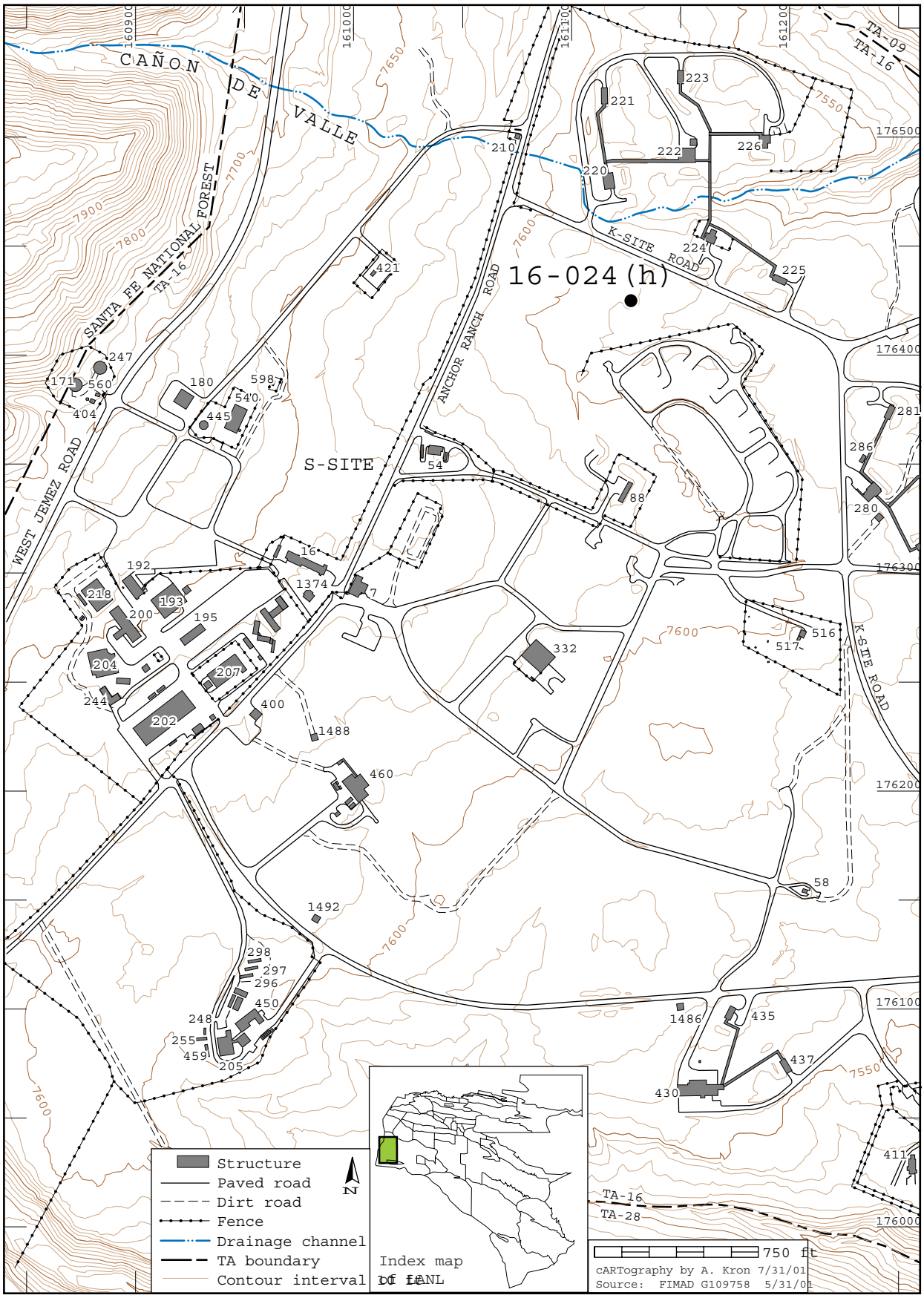
The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 2.3 mg/kg | 0.39 mg/kg |

## References

RFI Work Plan for Operable Unit 1082, Addendum 1 LA-UR Number: 95-1580

**View of AOC 16-024(h)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-16
16-024(h)
K-SITE ROAD
ANCHOR RANCH ROAD
S-SITE
WEST JEMEZ ROAD
K-SITE ROAD
TA-16
TA-28
7900
7800
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161200
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176400
176300
176200
176100
176000
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598
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517
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435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *AOC 16-024(i) — Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1946 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-64 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(i) is the former location of a historical magazine (structure 16-64) that was built in 1944 outside the HE exclusion zone at S-Site. The magazine had a concrete floor with soil piled against three sides of the building, but not over the top. Structure 16-64 was retired from use as a magazine after 1946, when S-Site was expanded to handle larger quantities of HE and larger receiving magazines were built to handle the larger HE quantities. Because it was not contaminated, carpenters and plumbers used the magazine to store their equipment. Structure 16-64 was removed in 1961. The area that the magazine occupied is outside the current HE exclusion zone at TA-16. The public can access the former location of structure 16-64, which is about 80 ft north of the S-Site main gate and under the asphalt driveway that serves the gate and the parking lot.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 2 of the OU 1082 work plan proposed sampling in the footprint of structure 16-64 to detect residual HE contamination on the disturbed ground surface. Samples would be cored through the asphalt parking lot on top of AOC 16-024(i).

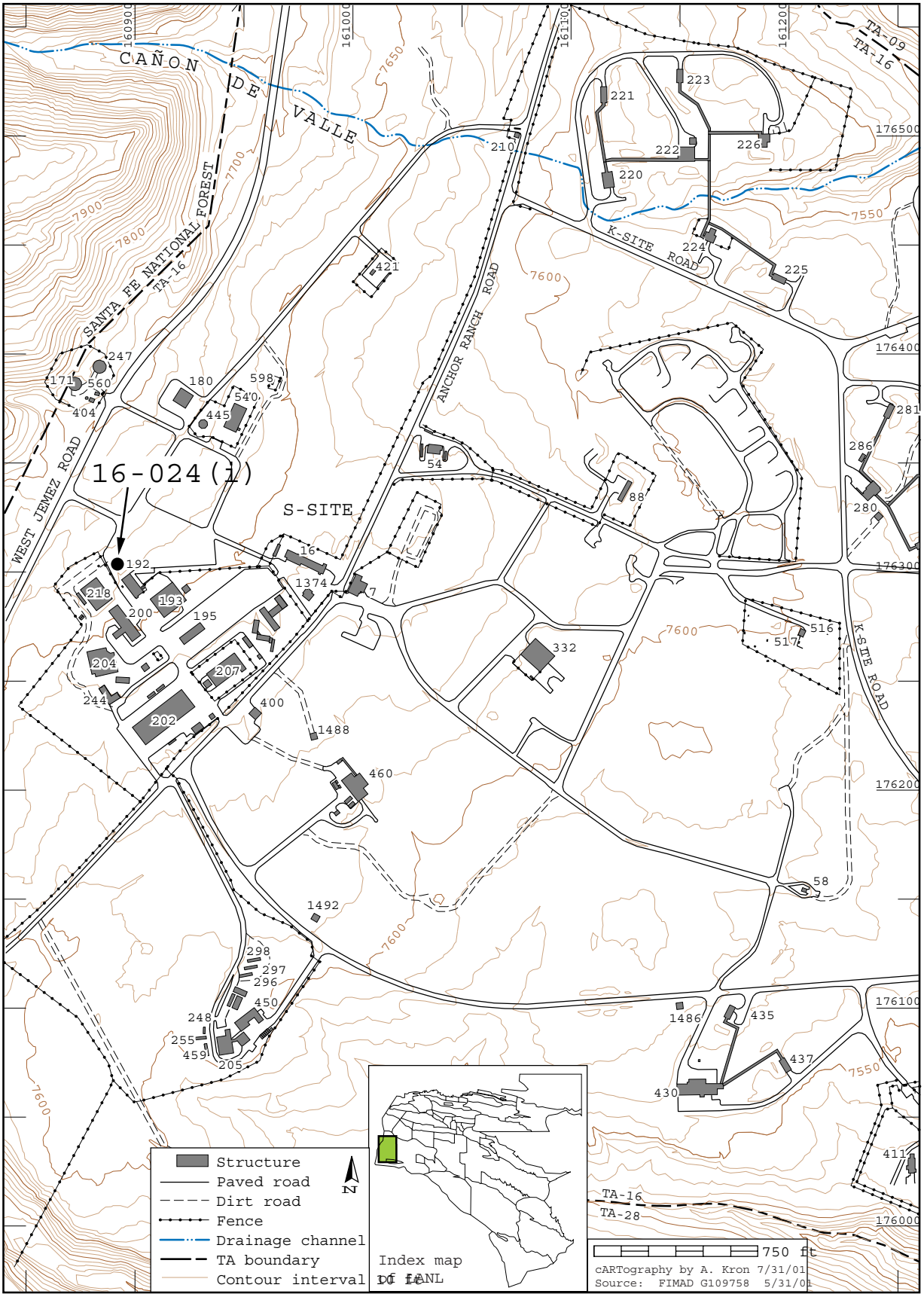
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of AOC 16-024(i), looking south**


16-024(i)
S-SITE
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC 16-024(j) – Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1946 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-65 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(j) is the former location of a historical magazine (structure 16-65) that was built in 1944 outside the HE exclusion zone at S-Site. The magazine had a concrete floor with soil piled against three sides of the building, but not over the top. Structure 16-65 was retired from use as a magazine after 1946, when S-Site was expanded to handle larger quantities of HE and larger receiving magazines were built to handle the larger HE quantities. Because it was not contaminated, carpenters and plumbers used the magazine to store their equipment. Structure 16-65 was removed in 1951. The area that the magazine occupied is outside the current HE exclusion zone at TA-16. An administration building (Building 16-204) covers a portion of the former site of structure 16-65.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 2 of the OU 1082 work plan proposed sampling in the footprint of structure 16-65 to detect residual HE contamination on the disturbed ground surface.

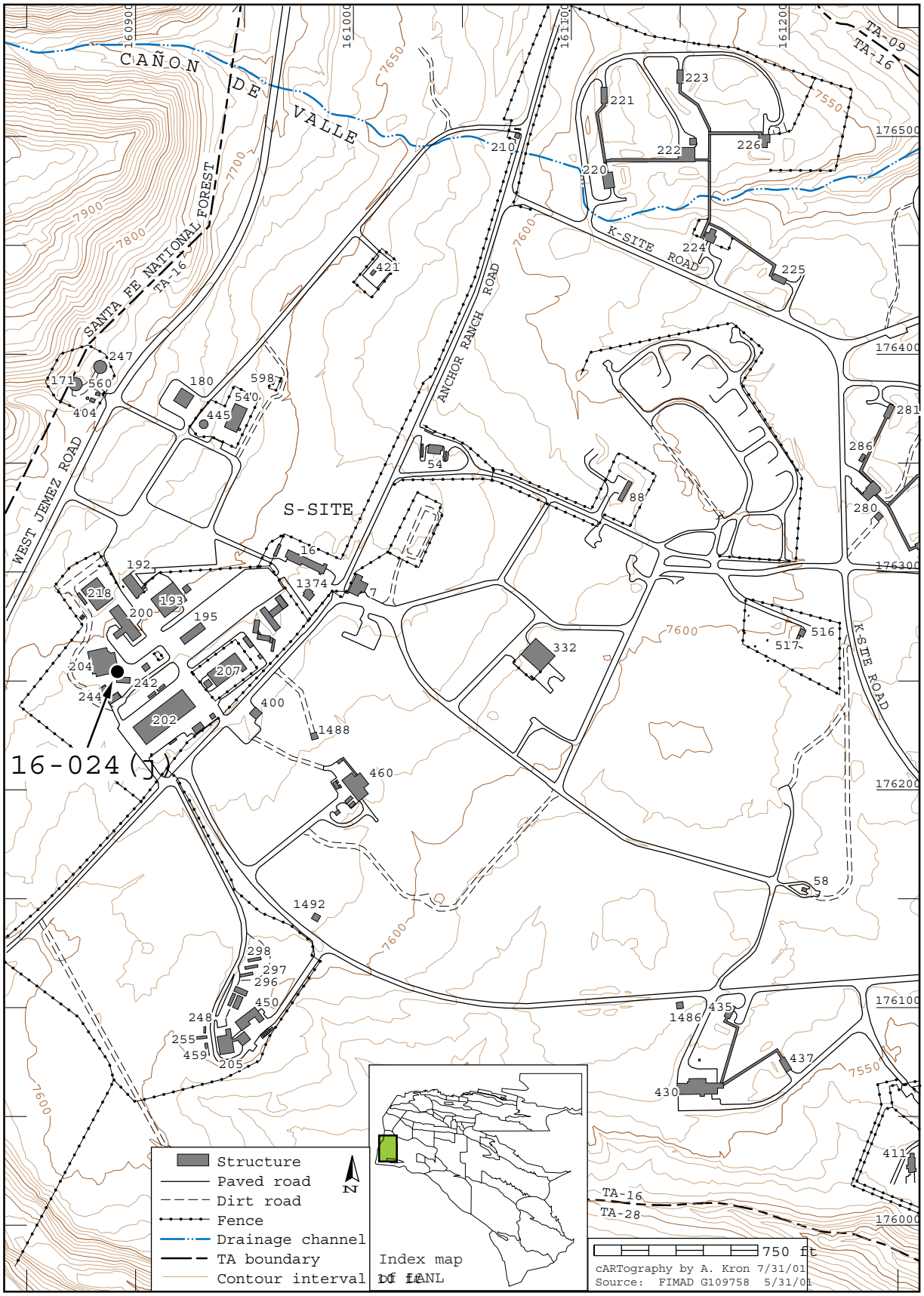
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of AOC 16-024(j), looking southwest**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-024(j)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC 16-024(k) – Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1946-1959 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-57 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(k) is the site of a former HE magazine (structure 16-57) in the western part of the former GMX-2 area. The magazine was 6 ft square x 7 ft high and was of wood-frame construction with a wooden floor. Earthen barricades surrounded the magazine on three sides and the top. It was on level ground south of a steam-cleaning facility (structure 16-38). HE magazines were used to store packaged HE and finished HE products before and after processing. No HE processing was done in the magazines. Little is known about this magazine; however, magazine operations may have resulted in HE spills. Structure 16-57 had no sumps or plumbing. Structure 16-57 was built in May 1946 and use was discontinued in 1959. Before it was burned in 1960, the building was found to be contaminated with HE.

## ER Project Activities

Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

The ER Project conducted an RFI at AOC 16-024(k) in 1997 to determine if contaminants were present at elevated levels in soils. Four surface and near-surface samples were collected from four locations in the building footprint. Samples were field-screened for HE and beta/gamma radioactivity. Samples showed background radioactivity levels. One sample that screened positive for HE was submitted for laboratory analysis for inorganic chemicals, organic chemicals, and HE. Sample analysis data showed that no contaminants were present at AOC 16-024(k) at levels above SALs in use at that time. The RFI report recommended NFA at AOC 16-024(k) because contaminants at this site posed no unacceptable risk to human health.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 17 | 0 | 1 |
| SVOCs | 0 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

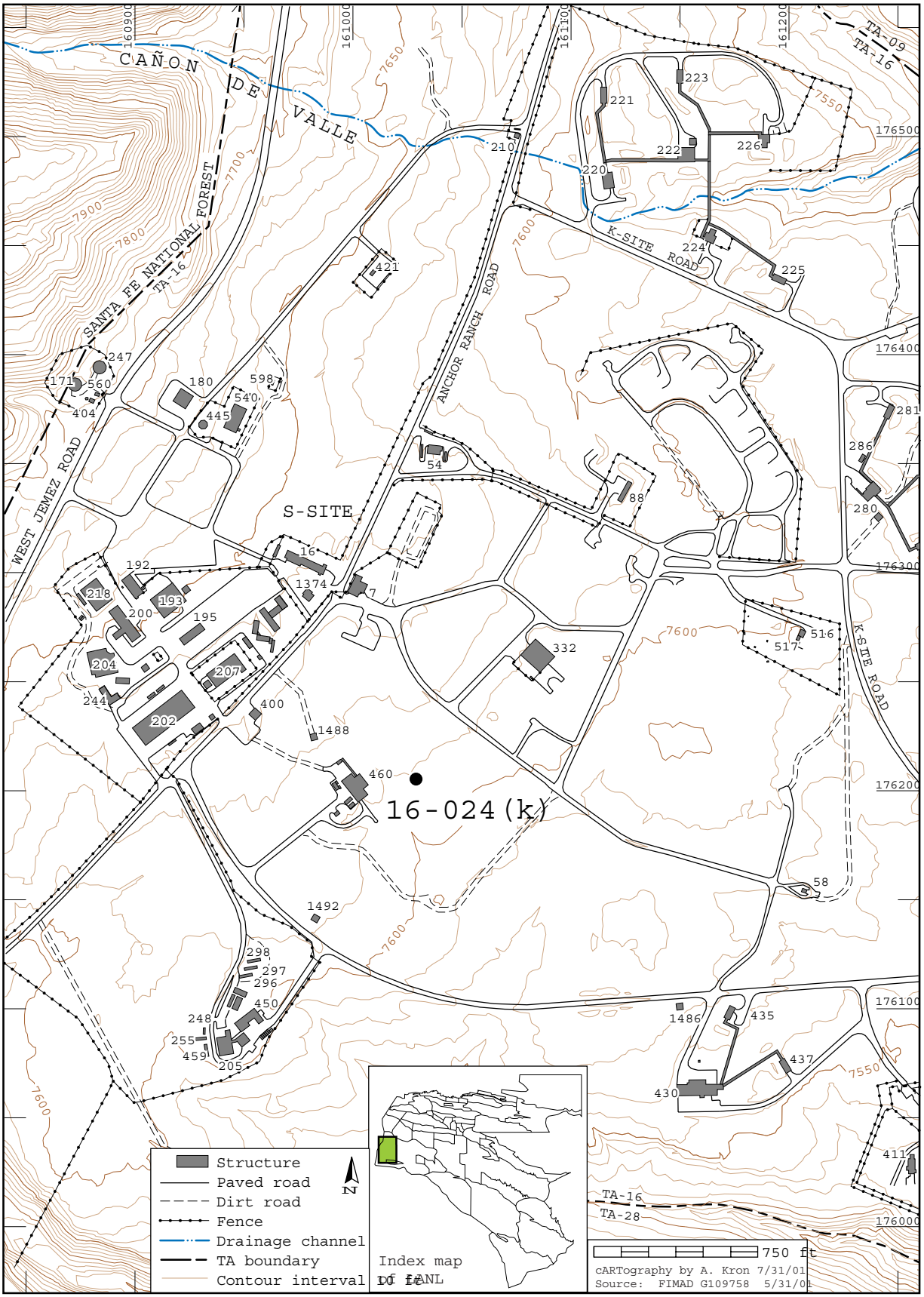
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 2.9 mg/kg | 0.39 mg/kg |

## References


RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of AOC 16-024(k)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-024(k)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *AOC 16-024(l) – Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950s |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-72 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(l) is the former location of a decommissioned HE magazine (structure 16-72) in the GMX-2 area at S-Site. GMX-2 structures were located in the south-central and eastern part of World War II-era S-Site. Structures at GMX-2 were used primarily for experimental HE research and development. HE magazines such as AOC 16-024(l) were used to store HE between processing operations. No production-scale HE operations were conducted in the GMX-2 area, which operated from 1944 to the early 1950s. Most structures in the area were burned in February 1960. Residual debris from burning and the remaining subsurface structures were cleaned up in 1966. Structure 16-72 was 6 ft square x 7 ft high and of wood-frame construction with earth barricades on three sides and on top. Structure 16-72 had no sumps or drains to the external environment. Before it was burned in 1960, structure 16-72 was determined to be contaminated with HE.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

The addendum 1 to the OU 1082 work plan proposed sampling at AOC 16-024(l) to detect residual HE and other constituents on the disturbed surface of this AOC.

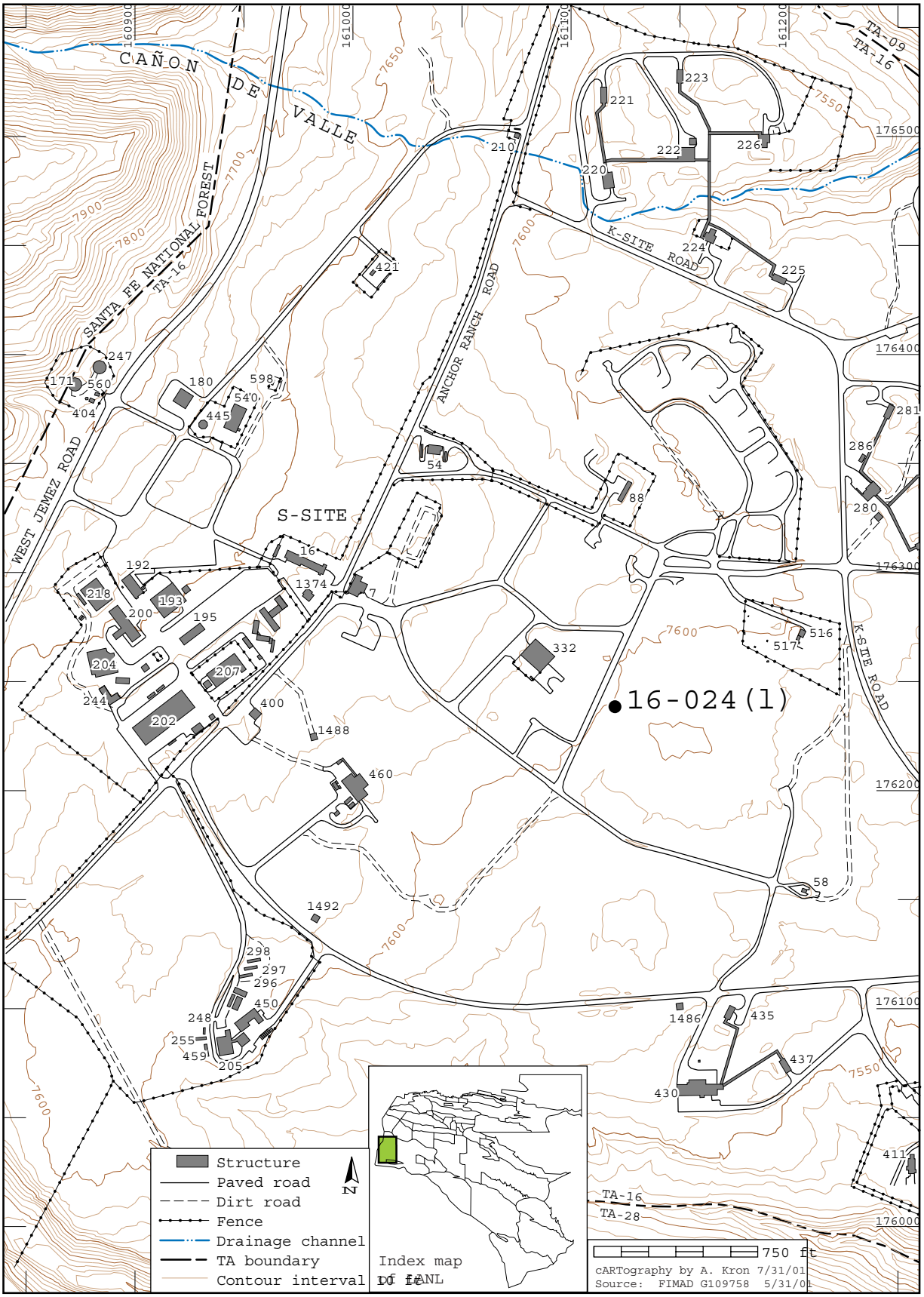
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of AOC 16-024(l)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
16-024(l)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC 16-024(m) – Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1940s-1959 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-66 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(m) is the footprint of a former HE magazine (structure 16-66). The magazine was a 6-ft x 6-ft x 7-ft high wood-frame building with a wooden floor and earthen barricades on three sides and on top. It was located on level ground northeast of a steam-cleaning building (Building 16-37). HE magazines were used to store packaged HE and finished HE products before and after processing. No HE processing was conducted in magazines. Little is known about this specific magazine; however, magazine operations may have resulted in HE spills. The magazine had no sumps or plumbing. It was built in the mid-1940s and use was discontinued in 1959. Before it was burned in 1960, it was determined that the magazine was contaminated with HE. Historical evidence indicates that radioactive materials were not stored or used in this HE magazine.

## ER Project Activities

Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

The ER Project conducted an RFI at AOC 16-024(m) in 1997 to determine if contaminants were present at elevated levels in soils. Four field-screening samples were collected from four locations in and downgradient from the building footprint. Samples were field-screened for HE and beta/gamma radioactivity. Samples were negative for radioactivity. One sample that screened positive for HE was submitted to a fixed laboratory and analyzed for inorganic chemicals, organic chemicals, and HE. HE was not detected in the laboratory sample despite the positive field reading. The kit that was used for field-screening HE has been shown to provide false positives due to interference with humic materials. Sample analysis data showed that contaminants at AOC 16-024(m) posed no unacceptable risk to human health. The RFI report recommended NFA at AOC 16-024(m).

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 18 | 1 | 1 |
| SVOCs | 2 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

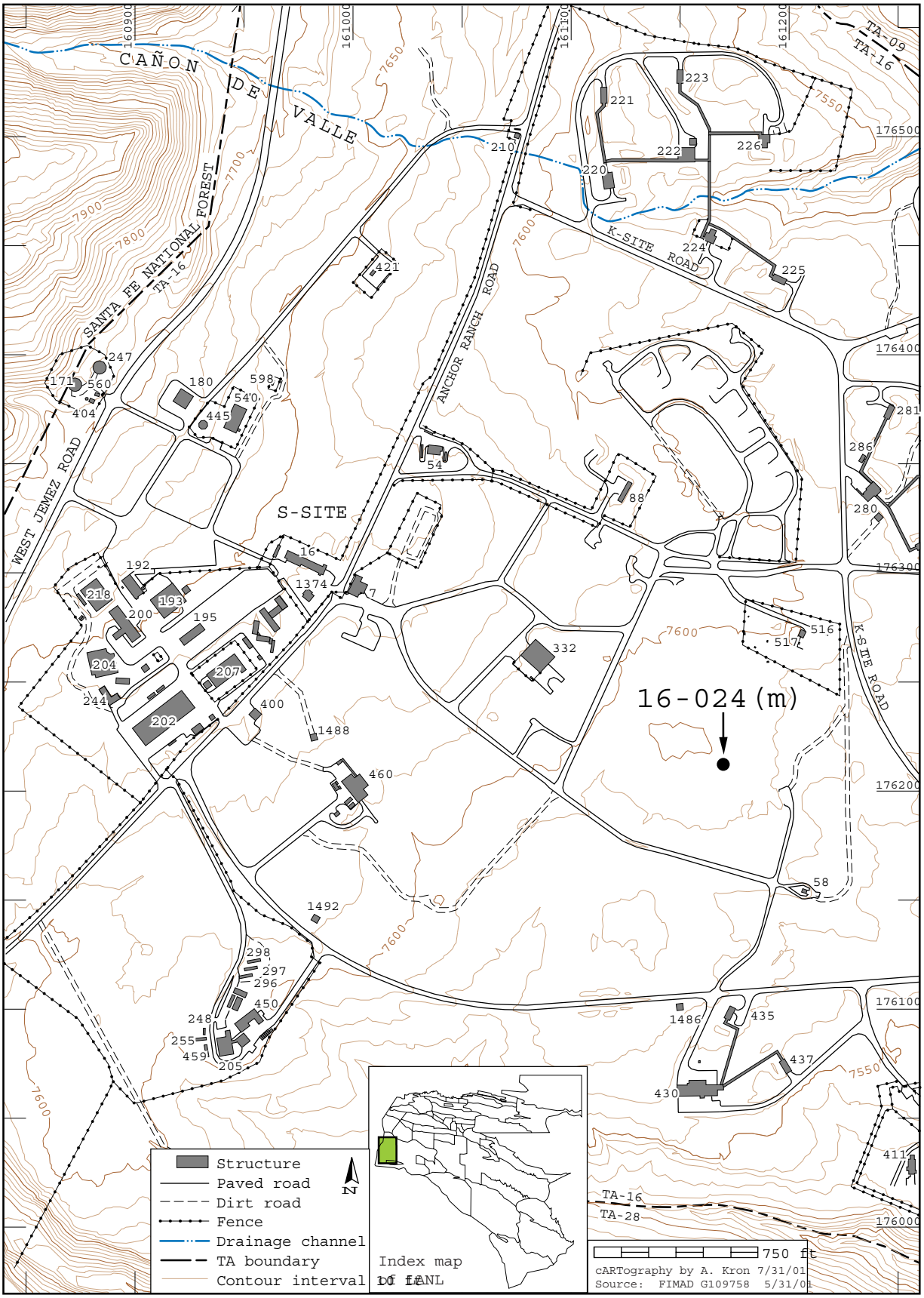
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 4.1 mg/kg | 0.39 mg/kg |

## References


RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of AOC 16-024(m)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-024 (m)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *AOC 16-024(n) — Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950s |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-84 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(n) is the location of a decommissioned HE magazine (structure 16-84) in the GMX-2 area at S-Site. GMX-2 structures were located in the south-central and eastern part of World War II-era S-Site. Structures at GMX-2 primarily were used for experimental HE research and development. HE magazines such as AOC 16-024(n) were used to store HE between processing operations. No production-scale HE operations were conducted in the GMX-2 area, which operated from 1944 to the early 1950s. Most structures in the area were burned in February 1960. Residual debris from burning and the remaining subsurface structures were cleaned up in 1966. Structure 16-84 was 16 ft square x 9 ft high and of wood-frame construction with earthen barricades on three sides and on top. Structure 16-84 had no sumps or drains to the external environment. Before it was burned in 1960, it was determined that structure 16-84 was contaminated with HE.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 2 to the OU 1082 work plan proposed sampling at AOC 16-024(n) to detect residual HE and other constituents on the disturbed surface of this AOC.

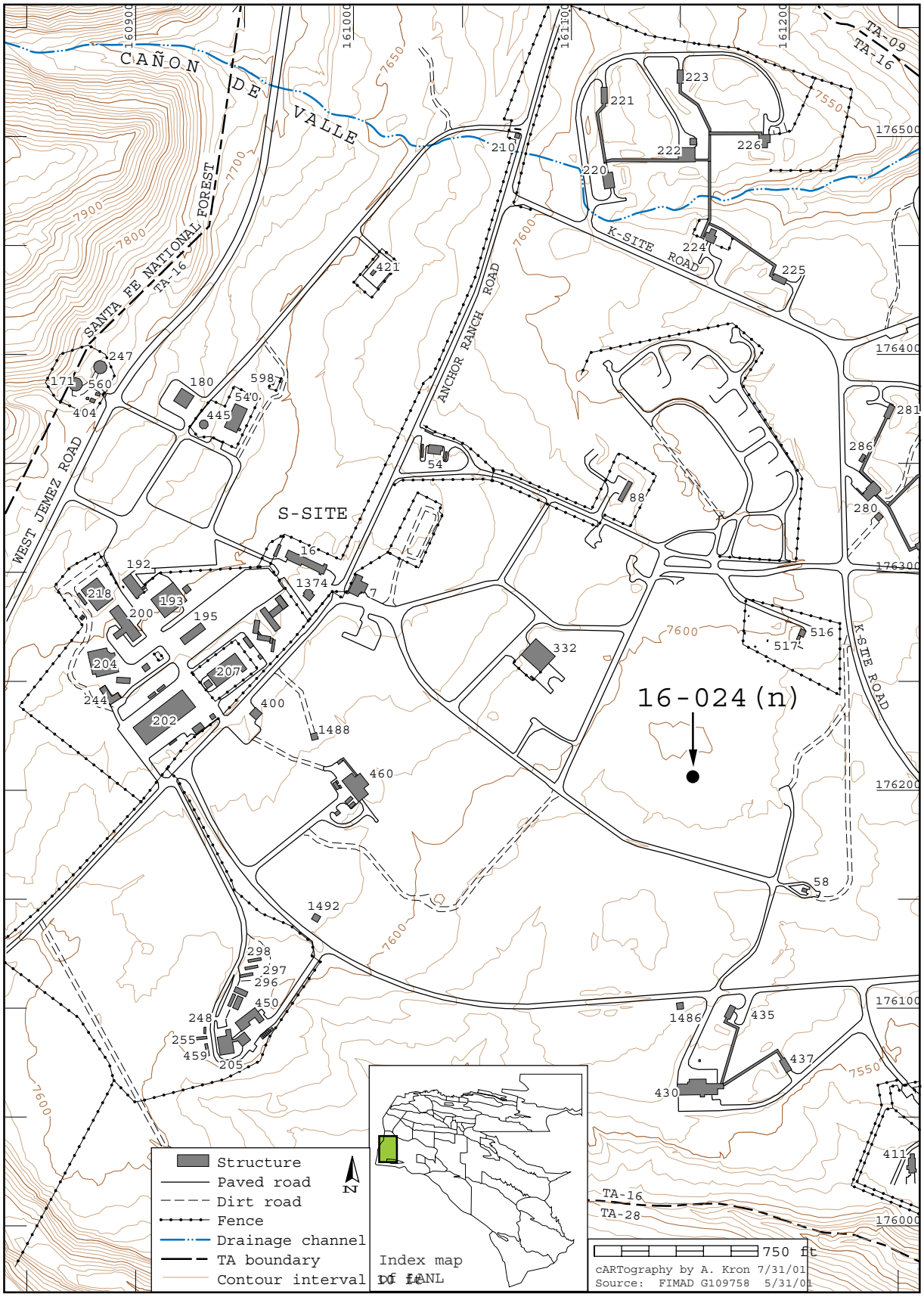
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of AOC 16-024(n)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-024(n)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC 16-024(o) – Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1946-1959 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-67 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(o) is the site of a former HE magazine (structure 16-67) in the western part of the former GMX-2 area. The magazine was 6 ft square x 7 ft high and was of wood-frame construction with a wood floor. Earth barricades surrounded the magazine on three sides and on the top. It was on level ground south of a steam-cleaning facility (structure 16-37). HE magazines were used to store packaged HE and finished HE products before and after processing. HE processing was not done in magazines. Little is known about this specific magazine; however, magazine operations may have resulted in HE spills. Structure 16-67 had no sumps or plumbing; it was built in May 1946 and use was discontinued after 1959. Before it was burned in 1960, the structure was found to be contaminated with HE.

## ER Project Activities

Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

The ER Project conducted an RFI at AOC 16-024(o) in 1997 to determine if contaminants were present at elevated levels in soils. Four surface and near-surface samples were collected from four locations in and downgradient from the building footprint. Samples were field-screened for HE and beta/gamma radioactivity. Samples showed background radioactivity levels. One sample screened positive for HE and was submitted for laboratory analysis for inorganic chemicals, organic chemicals, and HE. Sample analysis showed that no contaminants were present at AOC 16-024(o) at levels above SALs in use at that time. The RFI report recommended NFA at AOC 16-024(o) because contaminants at this site posed no unacceptable risk to human health.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 16 | 1 | 1 |
| SVOCs | 0 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

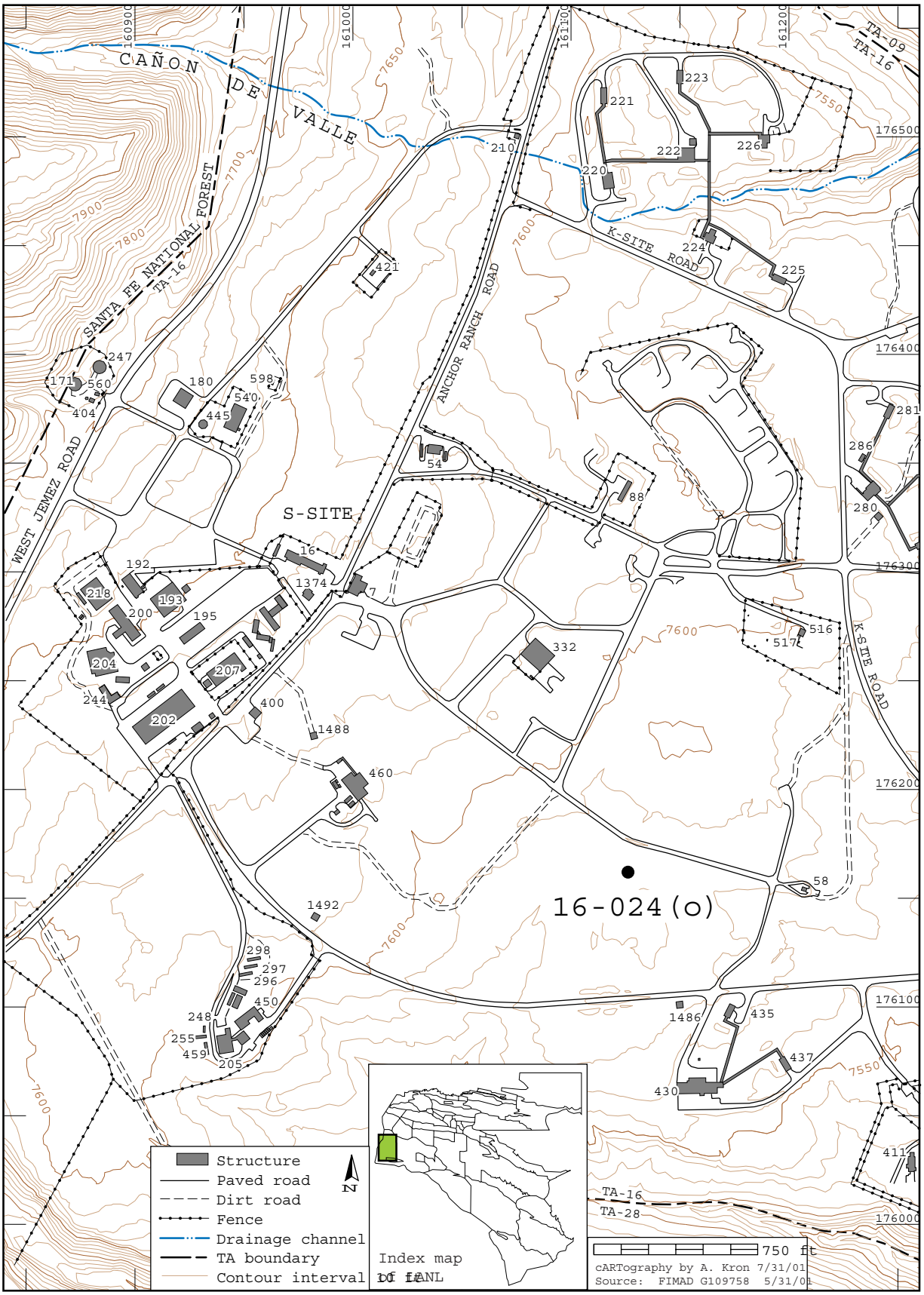
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 2.8 mg/kg | 0.39 mg/kg |

## References


RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of AOC 16-024(o)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-024(o)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *AOC 16-024(q) – Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1946-1959 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-71 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(q) is the site of a former HE magazine (structure 16-71) in the western part of the former GMX-2 area. The magazine was 6 ft square x 7 ft high and of wood-frame construction with a wood floor. Earth barricades surrounded the magazine on three sides and on top. It was on level ground south of a steam-cleaning facility (structure 16-37). HE magazines were used to store packaged HE and finished HE products before and after processing. No HE processing was conducted in the magazines. Little is known about this specific magazine; however, magazine operations may have resulted in HE spills. Structure 16-71 had no sumps or plumbing; it was built in May 1946 and use was discontinued in 1959. Before it was burned in 1960, the structure was found to be contaminated with HE.

## ER Project Activities

Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

The ER Project conducted an RFI at AOC 16-024(q) in 1997 to determine if contaminants were present at elevated levels in soils. Four surface and near-surface samples were collected from four locations in and downgradient from the building footprint. Samples were field-screened for HE and beta/gamma radioactivity. Samples showed no detectable HE and background radioactivity levels. One sample downgradient from the former location of the magazine door was submitted for laboratory analysis for inorganic chemicals, organic chemicals, and HE. Sample analysis showed that no contaminants at AOC 16-024(q) were above SALs. The RFI report recommended NFA at AOC 16-024(q) because contaminants at that site posed no unacceptable risk to human health.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 19 | 5 | 1 |
| SVOCs | 1 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

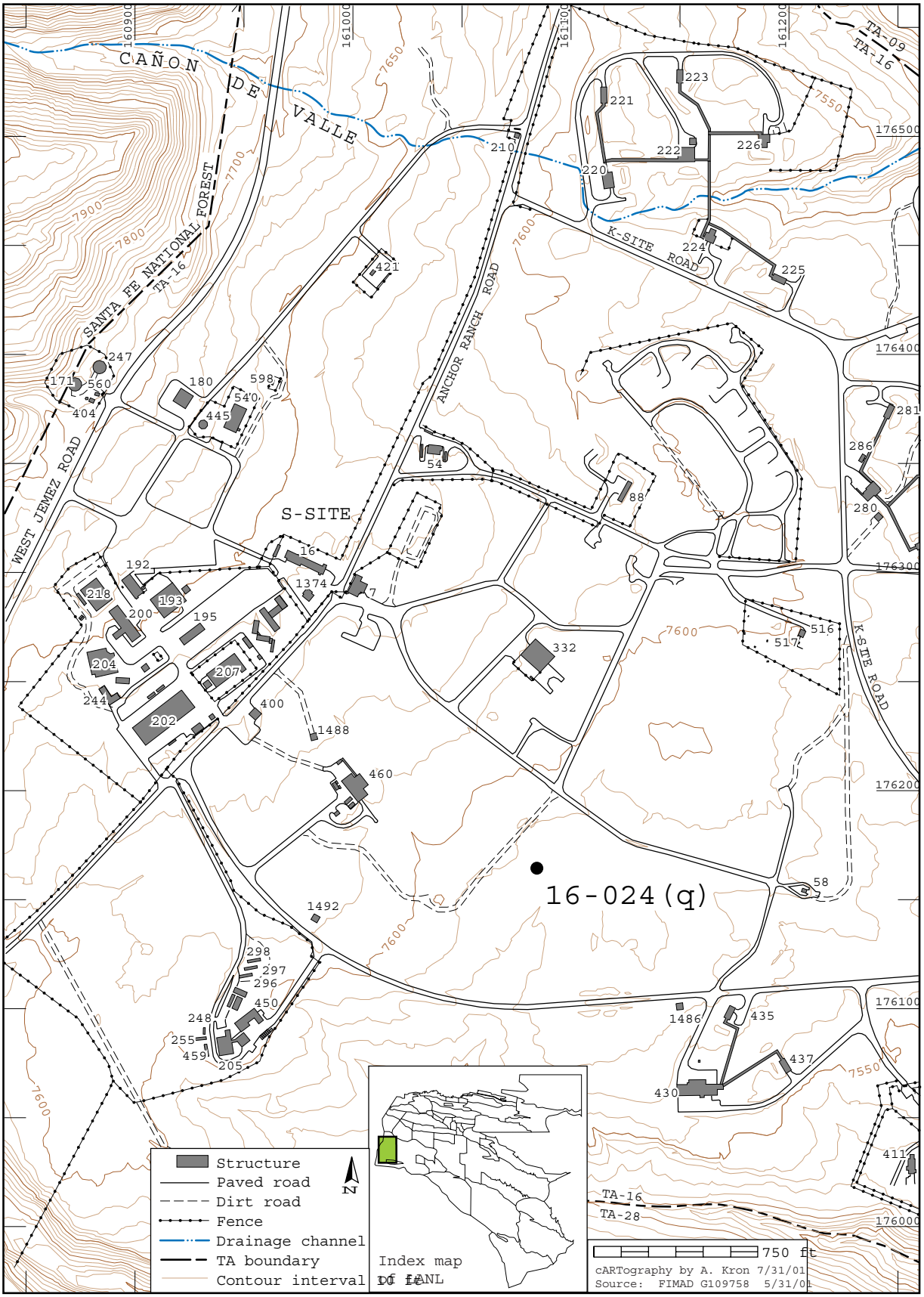
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 3.8 mg/kg | 0.39 mg/kg |

## References


RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of AOC 16-024(q)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-024(q)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *AOC 16-024(s) – Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1950s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-60 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(s) is the site of a former HE magazine (structure 16-60) in the western part of the former GMX-2 area. The magazine was 20 ft x 60 ft x 8.5 ft high with a concrete floor. Soil was piled against three sides of the building, which was on level ground at the south periphery of GMX-2. HE magazines were used to store packaged HE and finished HE products before and after processing. No HE processing was conducted in the magazines. Structure 16-60 had no sumps or plumbing; it was built in 1945 and removed in late 1950 due to its proximity to the Building 16-435 construction site.

## ER Project Activities

Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

The ER Project conducted an RFI at AOC 16-024(s) in 1997 to determine if contaminants were present at elevated levels in soils. Eight surface and near-surface samples were collected from five locations in and adjacent to the building footprint. Samples were field-screened for HE and beta/gamma radiation. Samples showed background radioactivity levels. Two samples screened positive for HE. One of those samples was submitted for laboratory analysis for inorganic chemicals, organic chemicals, and HE. Another sample was taken from a deeper interval at the same location to confirm that HE was not found at that depth. That sample also was submitted for laboratory analysis. Sample analysis showed that no contaminants were present at AOC 16-024(s) at levels above SALs. The RFI report recommended NFA at AOC 16-024(s) because contaminants at this site posed no unacceptable risk to human health.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 17 | 3 | 1 |
| SVOCs | 0 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

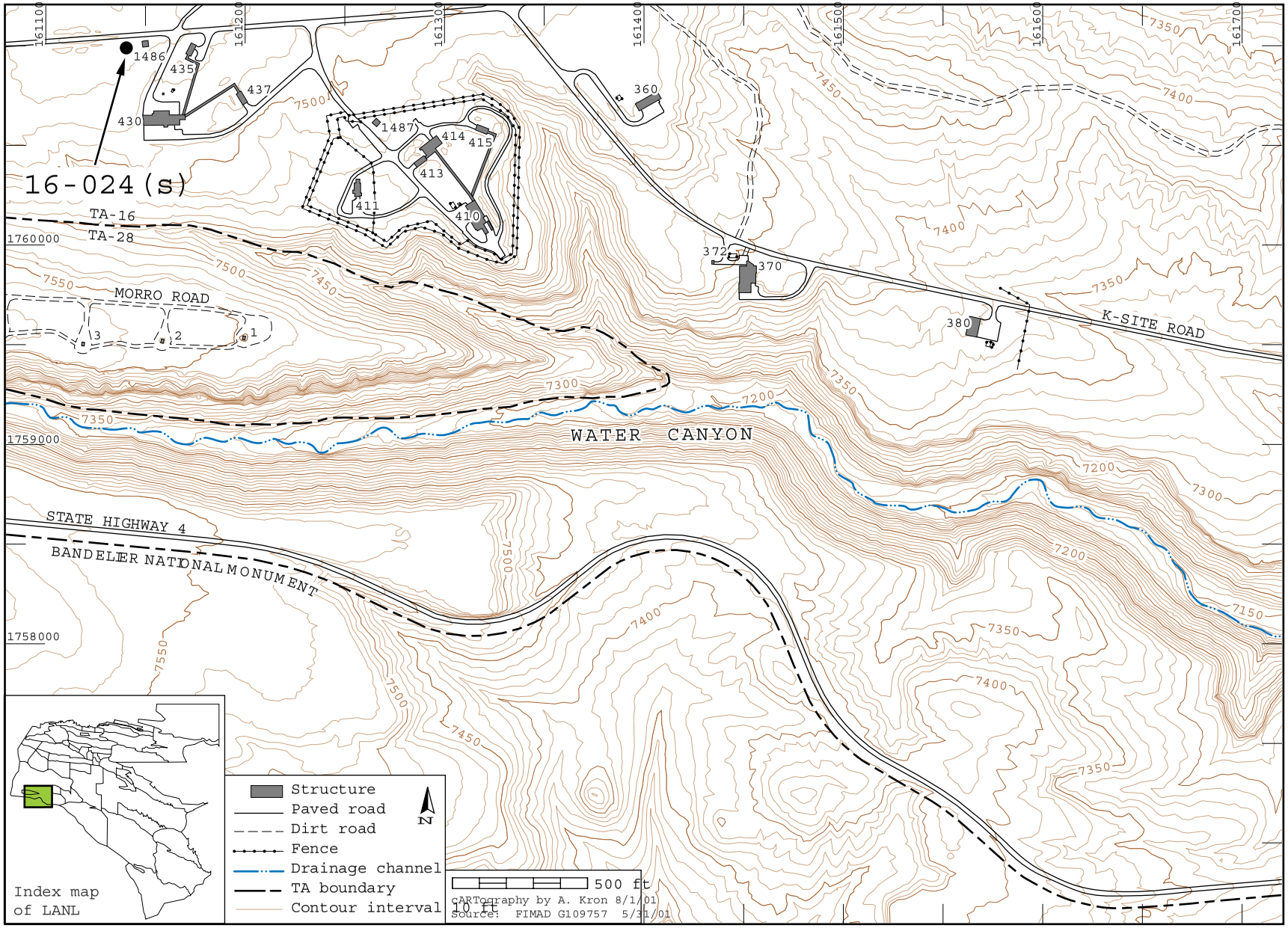
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 3.7 mg/kg | 0.39 mg/kg |

## References


RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of AOC 16-024(s)**


16-024(s)
TA-16
TA-28
MORRO ROAD
K-SITE ROAD
WATER CANYON
STATE HIGHWAY 4
BANDELIER NATIONAL MONUMENT
1486
435
437
430
1487
414
415
413
411
410
360
372
370
380
1
2
3
161100
161200
161300
161400
161500
161600
161700
1760000
1759000
1758000
7350
7400
7450
7500
7550
7300
7200
7150
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
500 ft
Index map of LANL
CARTography by A. Kron 8/1/01
Source: FIMAD G109757 5/31/01

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# *AOC 16-024(t) — Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-1966 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-464 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(t) is potentially contaminated soil in the location of a decommissioned HE magazine (structure 16-464). Structure 16-464 was used to store HE that was brought to Building 16-460, a decommissioned analytical chemistry laboratory [see consolidated AOC 16-003(c)-99] for analysis. Structure 16-464 was built in late 1952 and used heavily until it was removed in 1966. The building's construction configuration is unknown due to a lack of engineering drawings for this magazine. Structure 16-464 likely had no sumps or drains to the external environment. The method of removal and subsequent cleanup of structure 16-464 is unknown.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 2 of the OU 1082 work plan proposed sampling in the footprint of structure 16-464 to detect residual HE and other potential contaminants on the surface of this AOC.

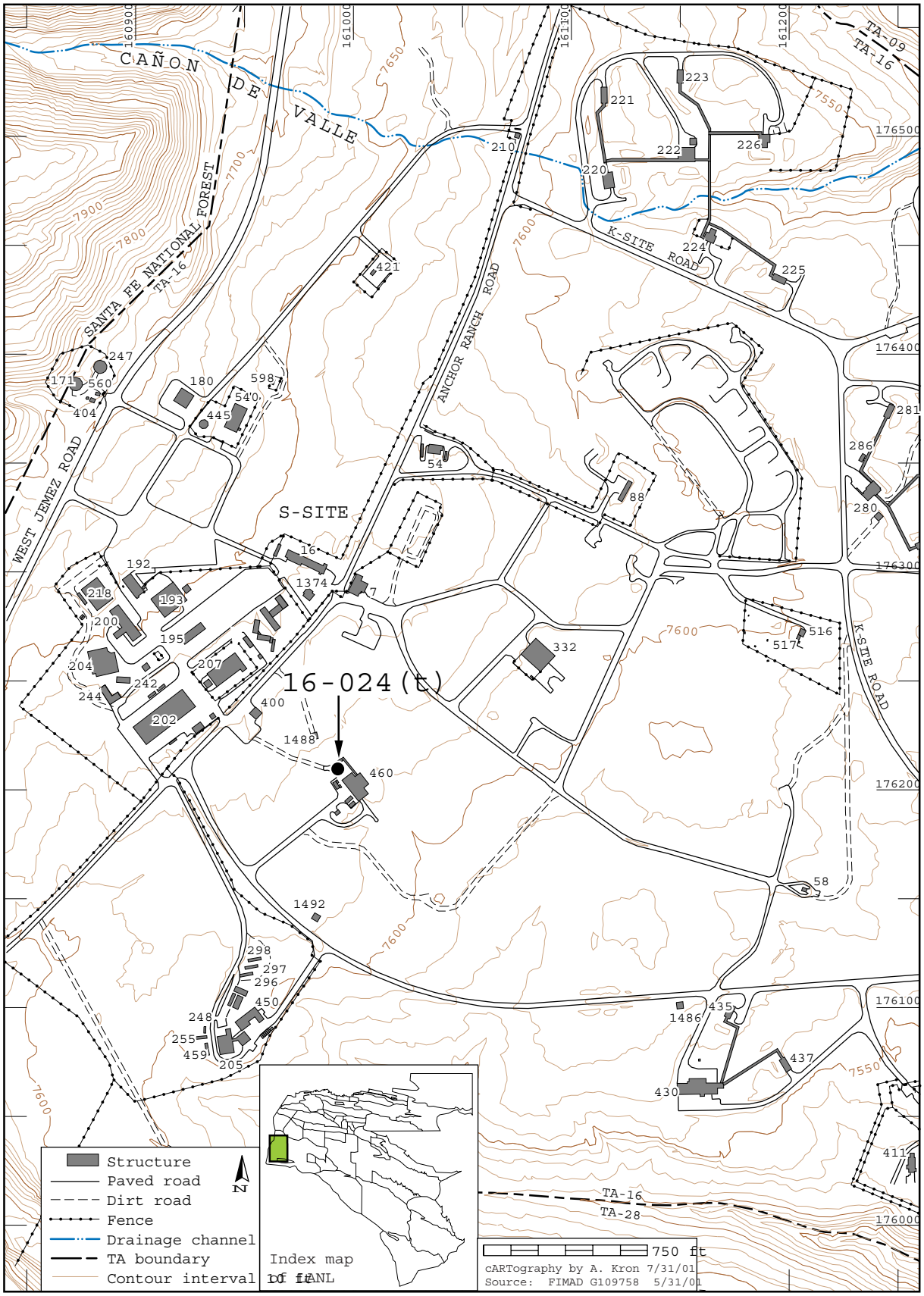
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of AOC 16-024(t), looking west**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
16-024(t)
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *AOC 16-024(u) — Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-481 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(u) is the location of a decommissioned and removed magazine (structure 16-481) located on the south side of S-Site in an area that originally was called P-Site. P-Site (the historical TA-13) was built in 1944 to support the research and development of HE for the Manhattan Project. It was designed as a site for counter x-ray diagnostics of HE lens configurations. Activities supporting the operation included operation of counter x-ray equipment, HE assembly, and research in the magnetic-method program. P-Site was converted to initiator testing in 1945. Initiator assemblies consisted of HE, beryllium, polonium (an alpha-emitter), and other inorganic chemicals. Alpha-contaminated buildings were decontaminated in 1946 and 1947 and certified free of alpha contamination in 1948. The buildings in the western half of P-Site were demolished in the early 1950s to make way for construction of the grinding building (Building 16-340) and associated structures. P-Site was incorporated into S-Site in 1957. Structure 16-481 was built in 1944 to store HE in support of x-ray diagnostics work on HE lenses. The building's method of construction is unknown. Its approximate location was identified from aerial photographs and evidence of the former building's gravel driveway. Structure 16-481 was retired from use in November 1950; it was decommissioned and removed in 1951. The method of decommissioning is unknown.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 2 of the OU 1082 work plan proposed sampling in the footprint of AOC 16-024(u) to detect residual HE in the disturbed soils.

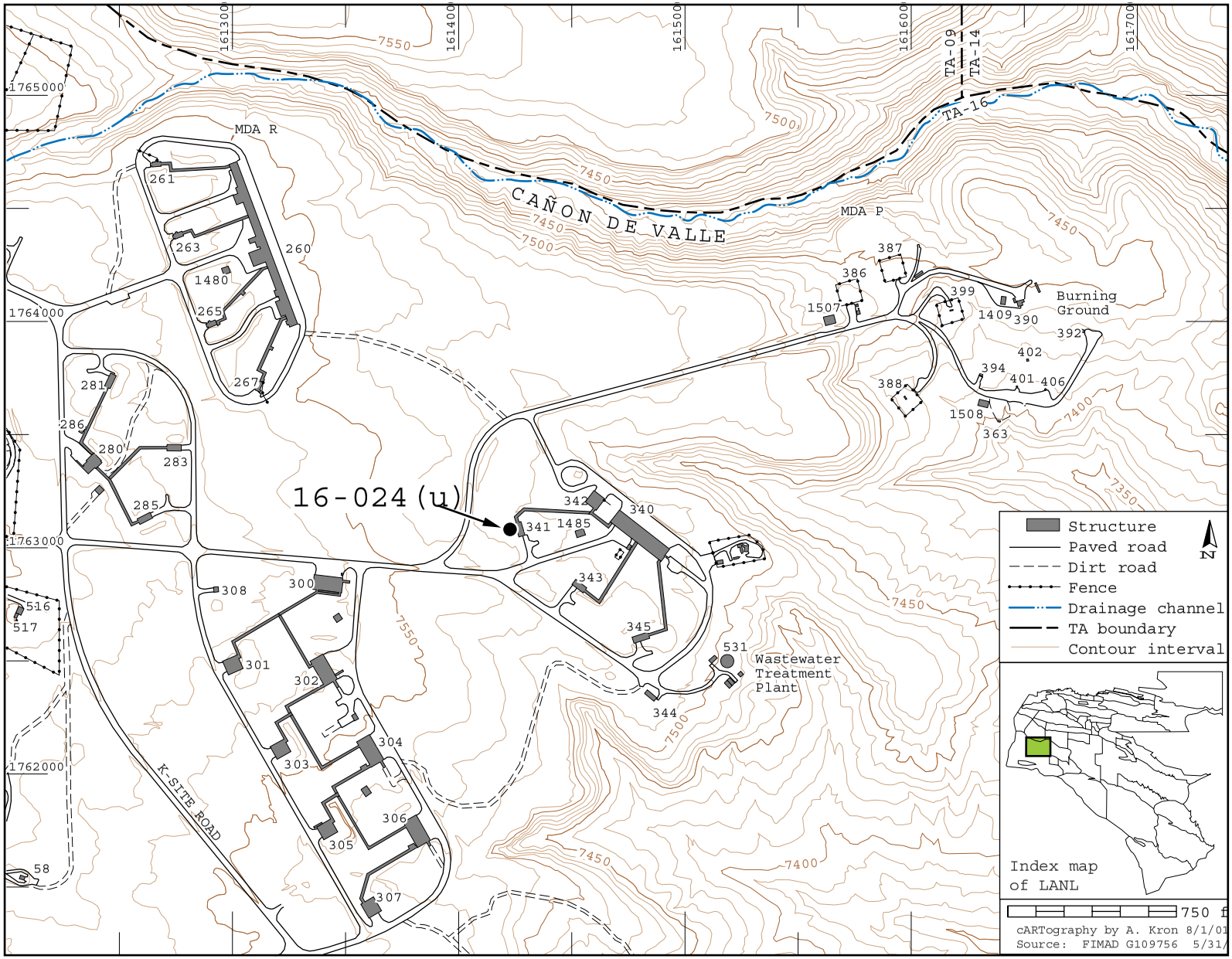
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References

RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of AOC 16-024(u)**




Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval

Index map of LANL

750 f

cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *AOC 16-024(v) – Storage areas/waste piles/magazines*

| | | | |
|---|---|---|---|
| **Administrative Authority** | DOE | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1946 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-62 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

AOC 16-024(v) is the former location of a magazine (structure 16-62) that was built in 1944 outside the HE exclusion zone at S-Site. The magazine had a concrete floor with soil piled against three sides of the building, but not over the top. Structure 16-62 was retired from use as a magazine after 1946, when S-Site was expanded to handle larger quantities of HE and as a result, larger receiving magazines were built. Because it was not contaminated, carpenters and plumbers used the magazine to store their equipment. Structure 16-62 was removed in 1968. The area that the magazine occupied is outside the current HE exclusion zone at TA-16. The public can access the area once occupied by structure 16-62, which is about 100 ft east of a steam plant (Building 16-540) in a grassy field that slopes east.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 2 of the OU 1082 work plan proposed sampling in the footprint of structure 16-62 to detect residual HE contamination on the disturbed ground surface.

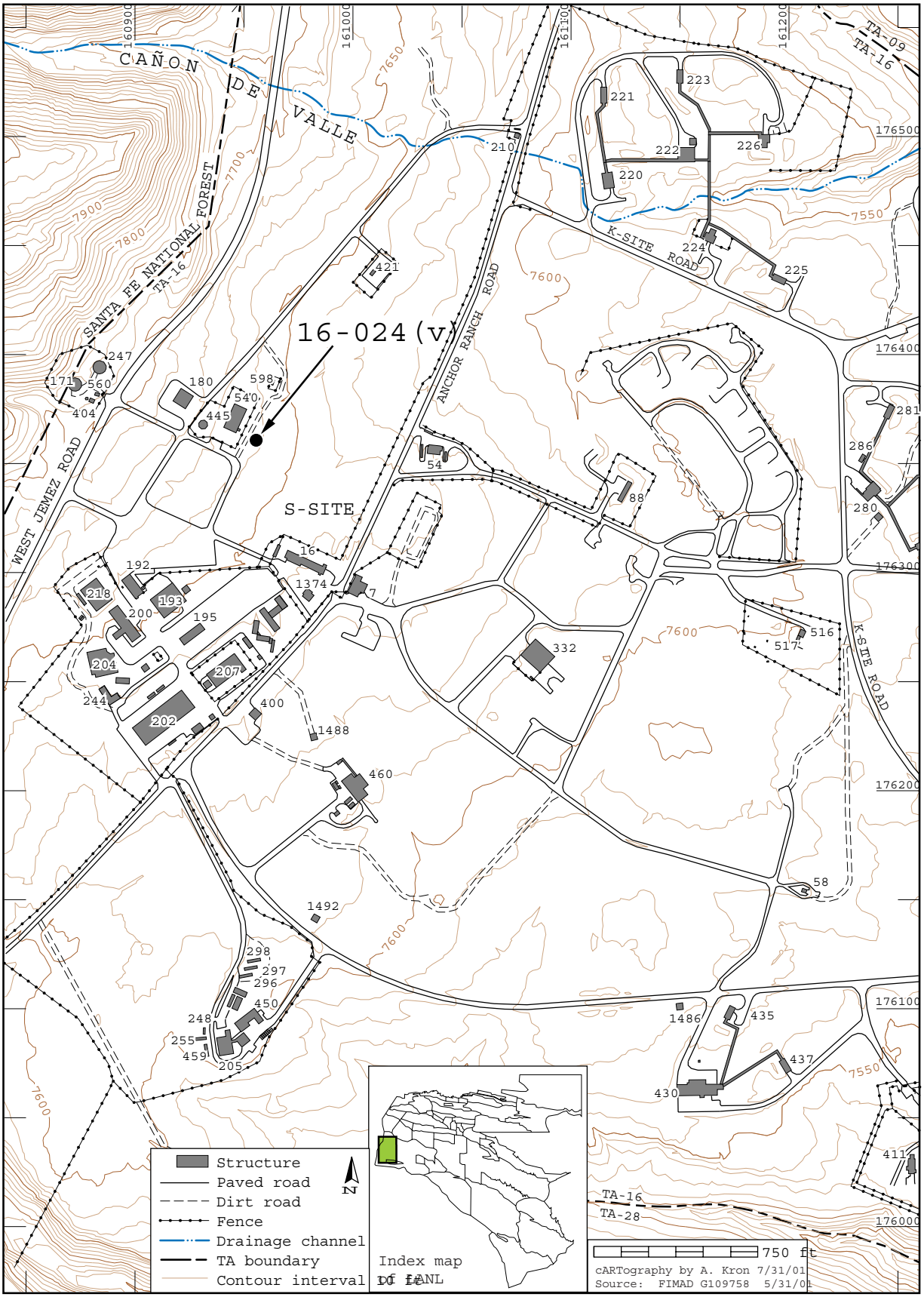
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of AOC 16-024(v)**


16-024(v)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-28
7900
7800
7700
7650
7600
7550
161000
161100
161200
176500
176400
176300
176200
176100
176000
247
171
560
404
180
598
540
445
421
210
221
223
222
226
220
224
225
54
88
281
286
280
16
192
1374
7
218
193
200
195
204
207
244
202
400
1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-025(a) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1950s |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-39 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-025(a) is the location of potentially contaminated surface soil associated with a former radiography building (Building 16-39) south of T-Site in the former GMX-3 area. T-Site was formerly part of TA-24. Operations at GMX-3 were devoted to developing techniques to produce HE lenses, the explosives component of a nuclear weapon with high chemical purity and accurate shapes. Building 16-39 was built in early 1945 west of the 30s Line machining buildings [see consolidated SWMU 16-007(a)-99)]. It was 16 ft sq x 9 ft high and had no sumps or drains to the external environment. Building 16-39 was a radiography building where source radiography and x-ray radiography were used to determine the quality of HE lenses during the 1940s. It is unclear from historical documents whether Building 16-39 was used for radiography or for storage of sources or both. Most GMX-3 buildings, including Building 16-39, were decommissioned, destroyed by intentional burning, and removed to MDA P (SWMU 16-018) during the early 1960s. All decommissioned buildings were surveyed for radiation, HE, and toxic chemicals before they were burned. Surveys in the 1950s showed Building 16-39 was contaminated with HE, cobalt-60, radium-226, and uranium-238. The building was burned in 1960. In 1966, the debris of Building 16-39 was checked for radioactivity before cleanup. No radioactivity was found.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 1 of the OU 1082 work plan proposed sampling at SWMU 16-025(a) to detect residual radionuclides and other potential contaminants on the disturbed surfaces of SWMU 16-025(a).

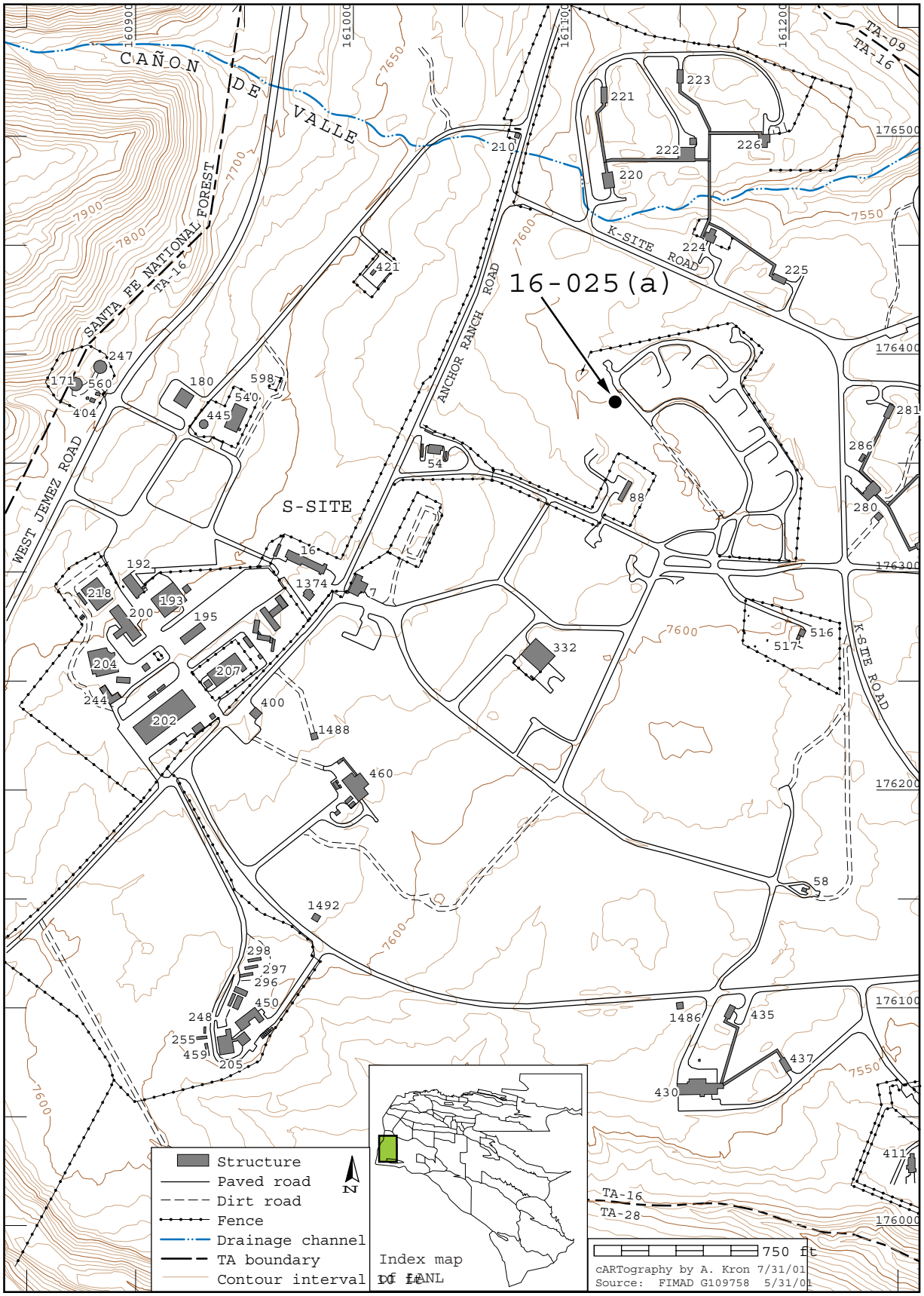
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-025(a), looking south**


16-025(a)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-025(b) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1950-1960 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-40 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-025(b) is the location of potentially contaminated surface soil associated with a radiography building (former Building 16-40) at T-Site in the former GMX-3 area. Operations at GMX-3 were devoted to developing techniques to produce HE lenses, the explosives component of a nuclear weapon with high chemical purity and accurate shapes. HE was subjected to disruptive processes like casting and machining. Building 16-40 was constructed west of Building 16-39 [SWMU 16-025(a)] in 1950 to provide gamma radiography within the GMX-3 area. It was about 20 ft square with earthen barricades on two sides. Building 16-40 contained a lead-lined pit in the floor for radioactive sources and had no sumps or drains to the external environment. Surveys in the 1950s showed Building 16-40 was contaminated with HE, cobalt-60, radium-226, and uranium-238. A survey in 1957 showed Building 16-40 was contaminated with cobalt-60 at a spot on the floor and on a source plug. The Zia Company was directed to remove the radioactively contaminated materials. Most GMX-3 buildings, including Building 16-40, were decommissioned, destroyed by intentional burning, and removed to MDA P (SWMU 16-018) in the early 1960s. All decommissioned buildings were surveyed for radiation, HE, and toxic chemicals before they were burned. In 1966 the debris of Building 16-40 was checked for radioactivity before cleanup. No radioactivity was found.

## ER Project Activities

Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

Addendum 1 of the OU 1082 work plan proposed sampling at SWMU 16-025(b) to detect residual radionuclides and other potential contaminants on the disturbed surfaces of SWMU 16-025(b). This site was sampled in 1997.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 17 | 0 | 1 |
| Radionuclides | 3 | 0 | 0 |
| SVOCs | 2 | N/A | 0 |

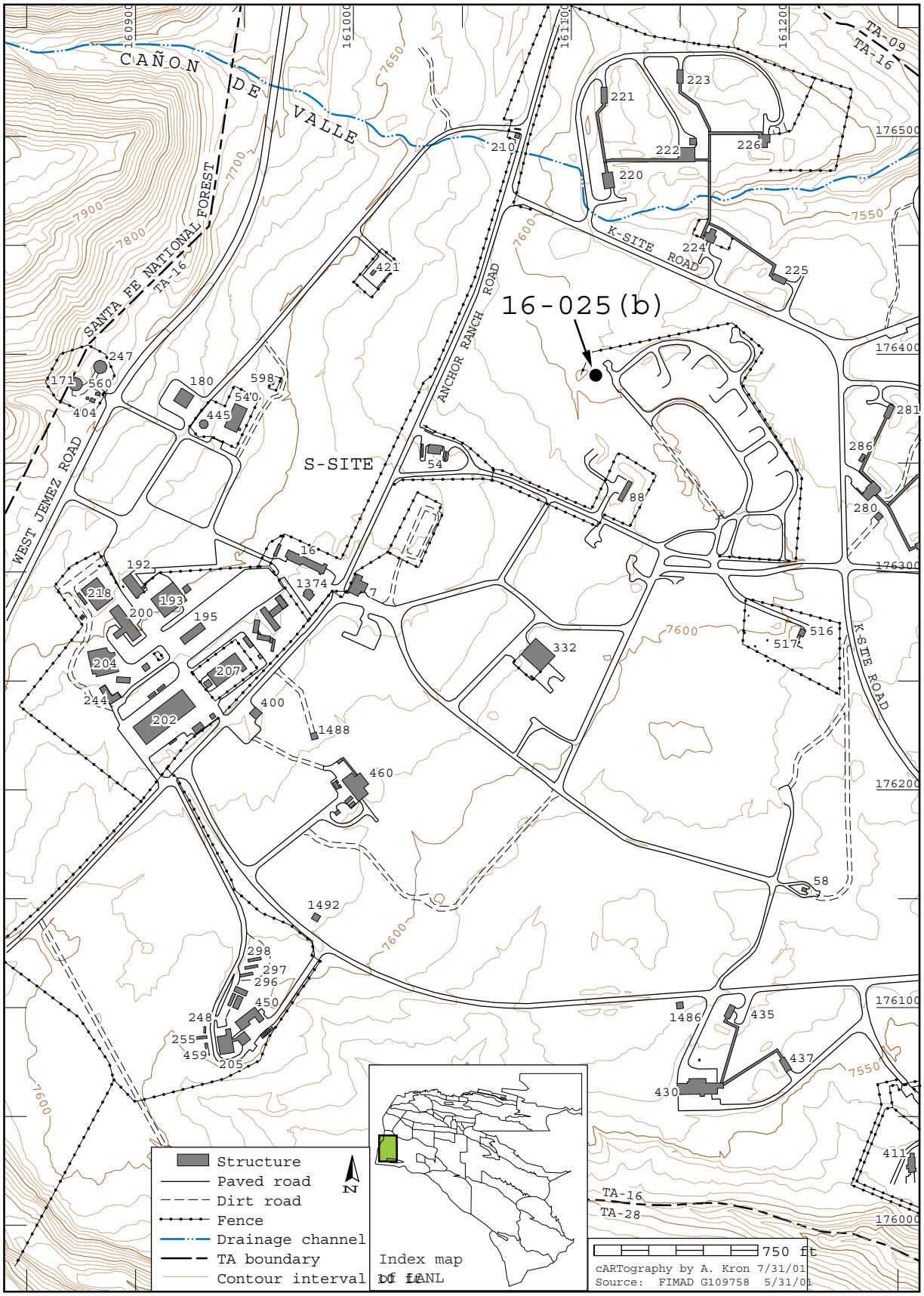
The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 3 mg/kg | 0.39 mg/kg |

## References

RFI Work Plan for Operable Unit 1082, Addendum 1 LA-UR Number: 94-1580

**View of SWMU 16-025(b)**


16-025(b)
CAÑON DE VALLE
S-SITE
K-SITE ROAD
ANCHOR RANCH ROAD
WEST JEMEZ ROAD
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-025(c2) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950s |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-56 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-025(c2) is contaminated soil associated with the former location of a physical testing laboratory (structure 16-56) in the GMX-2 area at S-Site. GMX-2 structures were located in the south-central and eastern part of the World War II-era S-Site. Structures at GMX-2 were used primarily for experimental HE research and development; activities in this structure included mechanical testing of HE charges. No production-scale HE operations were conducted in the GMX-2 area, which operated from 1944 to the early 1950s. Structure 16-56 was 16 ft sq x 9 ft high. It was of wood-frame construction with earthen barricades on three sides. The building contained a soapstone sink that drained into the southernmost sump associated with Building 16-52 [SWMU 16-029(v)-99]. Before it was burned in 1960, it was determined that structure 16-56 was contaminated with HE. Most structures in the GMX-2 area were destroyed by burning in February 1960. Residual debris from the burning and the remaining subsurface structures were cleaned up in 1966.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 1 of the OU 1082 work plan proposed sampling at SWMU 16-025(c2) to detect surface contamination of HE and other potential contaminants.

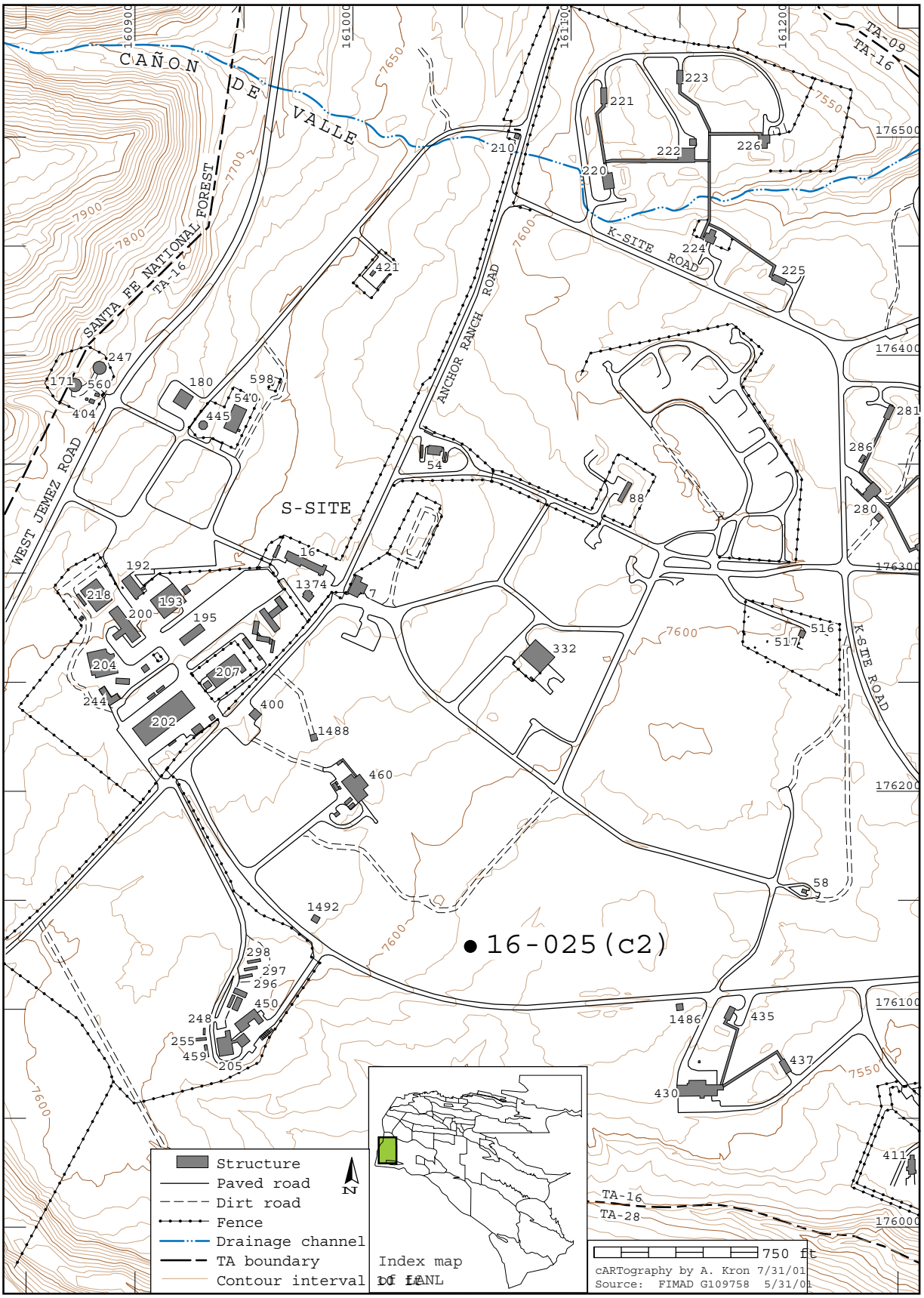
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-025(c2)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
16-025(c2)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-025(d2) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1947-1951 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-480 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-025(d2) is potentially contaminated surface soil at the former location of a decommissioned mockup chamber (structure 16-480). It was an octagonal structure 16 ft in diameter that was located southwest of the entrance to a current plastic-bonded explosive fabrication facility (Building 16-340) that is in a sloped, grassy area between a walkway (structure 16-352) and the western access road to Building 16-340. Structure 16-480 was a temporary mockup chamber that was built in 1947 and removed in 1951. The mockup building simulated a chamber that would be used for explosive (probably initiator) experiments at other sites. It was built of logs on a concrete slab. Detonation never occurred in structure 16-480. No direct documentation about the use of structure 16-480 exists, but such a structure is referred to in a memo referenced in Addendum 2 of the OU 1082 work plan. In addition to radioactive components, equipment used at structure 16-480 is suspected to have contained mercury.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 2 of the OU 1082 work plan proposed sampling in the footprint of structure 16-480 to detect residual radionuclides and other potential contaminants on the disturbed surface of SWMU 16-025(d2).

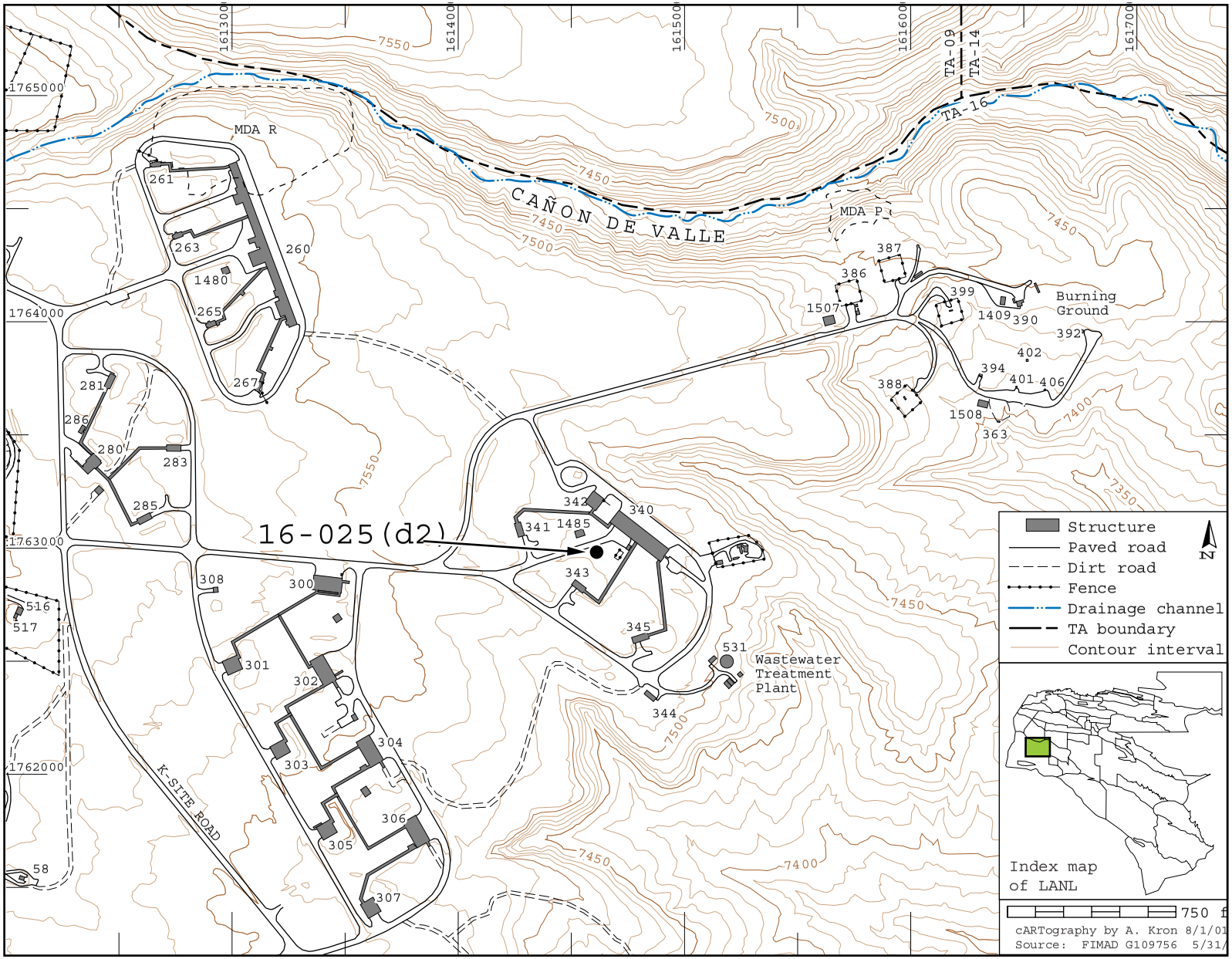
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-025(d2)**


16-025(d2)
CAÑON DE VALLE
MDA R
MDA P
TA-09
TA-14
TA-16
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
1765000
1764000
1763000
1762000
161300
161400
161500
161600
161700
7550
7500
7450
7400
7350
261
263
260
1480
265
267
281
286
280
283
285
516
517
58
308
300
301
302
303
304
305
306
307
342
341
1485
340
343
345
344
531
387
386
1507
399
1409
390
392
402
394
401
406
388
1508
363
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

# *SWMU 16-025(e2) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1949 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-106 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-025(e2) is an area of potential soil contamination from a former storage magazine (structure 16-106, formerly A-1) that was located at S-Site. The 6-ft x 6-ft x 7-ft-high wood-frame structure was built in May 1944 and removed in August 1949. The building had no drains to the external environment and it was used primarily to store non-HE materials such as aluminum powder, lead oxide, and barium nitrate. It also was used to store packaged HE. Upon arrival at S-Site, raw HE (in packaged form) was placed in this building while awaiting transfer to one of S-Site's HE-processing buildings for machining and shaping. Once processed, finished HE forms were placed in this building while awaiting transfer to an off-site location. No open packages or loose HE was stored in the magazine and no HE machining or shaping was ever conducted in this building. Archival evidence indicates that contaminants were never released. In August 1949, this magazine was removed in preparation for the construction of State Highway 501 (West Jemez Road). Removal was accomplished through explosive demolition or burning, both common practices for decommissioning and decontaminating buildings at S-Site during the late 1940s through the mid- to late 1960s. The former location of this structure currently lies beneath State Highway 501 and/or beneath disturbed soils adjacent to the road. Highway construction activities severely disturbed surrounding soils and completely obliterated the surface footprints of this former building. In addition, during road construction activities, several feet of excavated soils, base course, and asphalt were placed over the former structure's location.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

The RFI work plan recommended NFA for SWMU 16-025(e2). Consequently, there has been no additional investigation at this site.

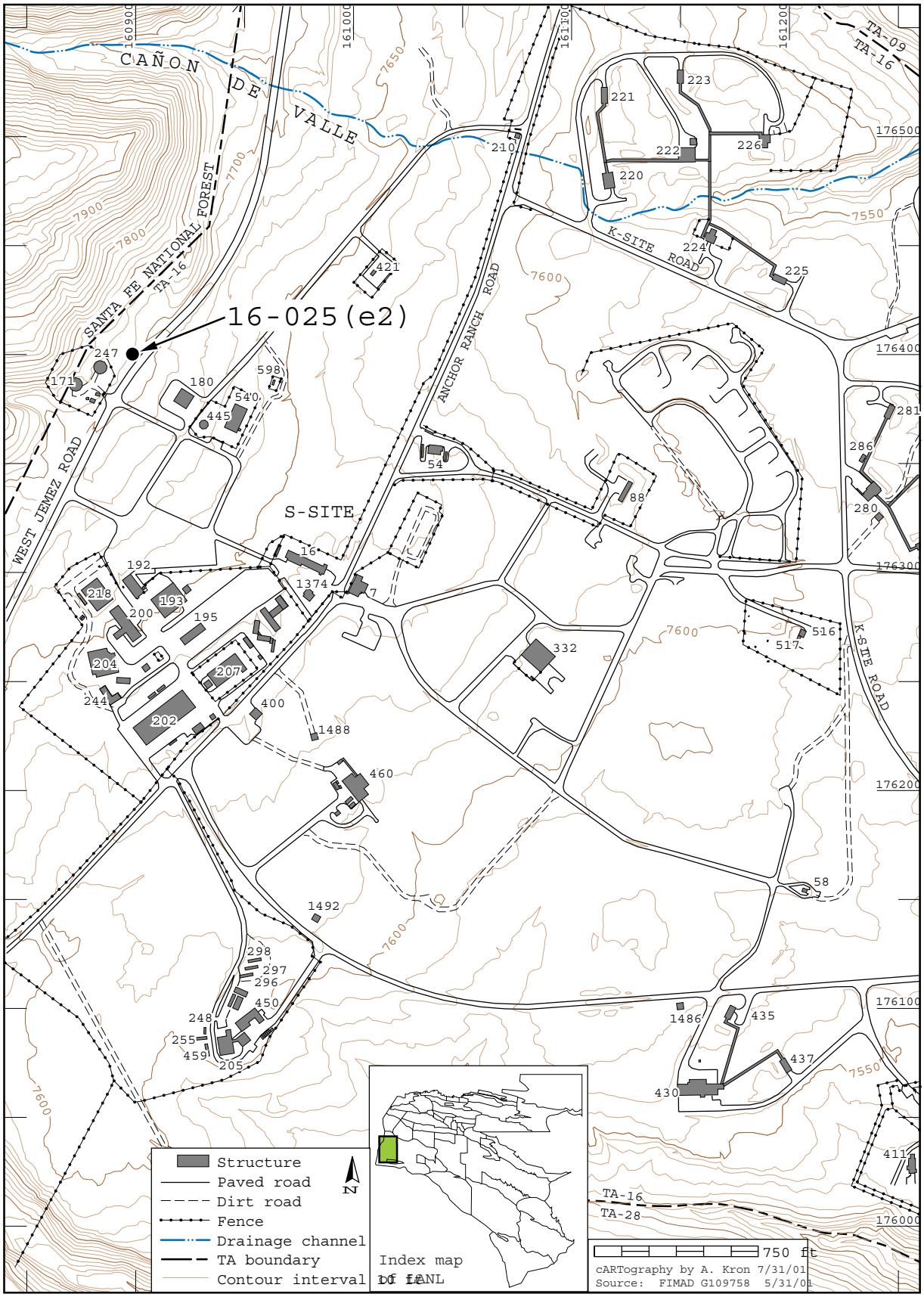
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-025(e2), looking west**


16-025(e2)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
TA-09
TA-16
TA-16
TA-28
S-SITE
K-SITE ROAD
K-SITE ROAD
ANCHOR RANCH ROAD
WEST JEMEZ ROAD
160900
161000
161100
161200
176500
176400
176300
176200
176100
176000
7650
7700
7900
7800
7600
7550
247
171
180
598
540
445
421
210
221
223
222
226
220
224
225
54
88
281
286
280
16
1374
7
192
218
193
200
195
204
207
244
202
400
1488
460
332
516
517
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map
of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-025(f2) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1949 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-107 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-025(f2) is an area of potential soil contamination from a former storage magazine (structure 16-107, formerly A-2) that was located at S-Site. The 6-ft x 6-ft x 7-ft-high storage magazine was of wood-frame construction, built in May 1944, and removed in August 1949. The structure had no drains to the external environment; it primarily was used to store non-HE materials such as aluminum powder, lead oxide, and barium nitrate. It also was used to store packaged HE. Upon arrival at S-Site, raw HE (in packaged form) was placed in this structure while awaiting transfer to one of S-Site's HE-processing buildings for machining and shaping. Once processed, finished HE forms were placed in this building while awaiting transfer to an off-site location. No open packages or loose HE was stored in the magazine and no HE machining or shaping was ever conducted in this structure. Archival evidence indicates that contaminants were never released. In August 1949, this magazine was removed in preparation for the construction of State Road 501 (West Jemez Road). Building removal most likely was accomplished through explosive demolition or burning, both common practices for decommissioning and decontaminating buildings at S-Site during the late 1940s through the mid- to late 1960s. The former location of this building currently lies beneath State Highway 501 and/or beneath disturbed soils adjacent to the road. Highway construction activities severely disturbed surrounding soils and completely obliterated the surface footprints of this former structure. In addition, during road construction activities, several feet of excavated soils, base course, and asphalt were placed over the former structure's location.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

The RFI work plan recommended NFA for SWMU 16-025(f2). Consequently, there has been no additional investigation at this site.

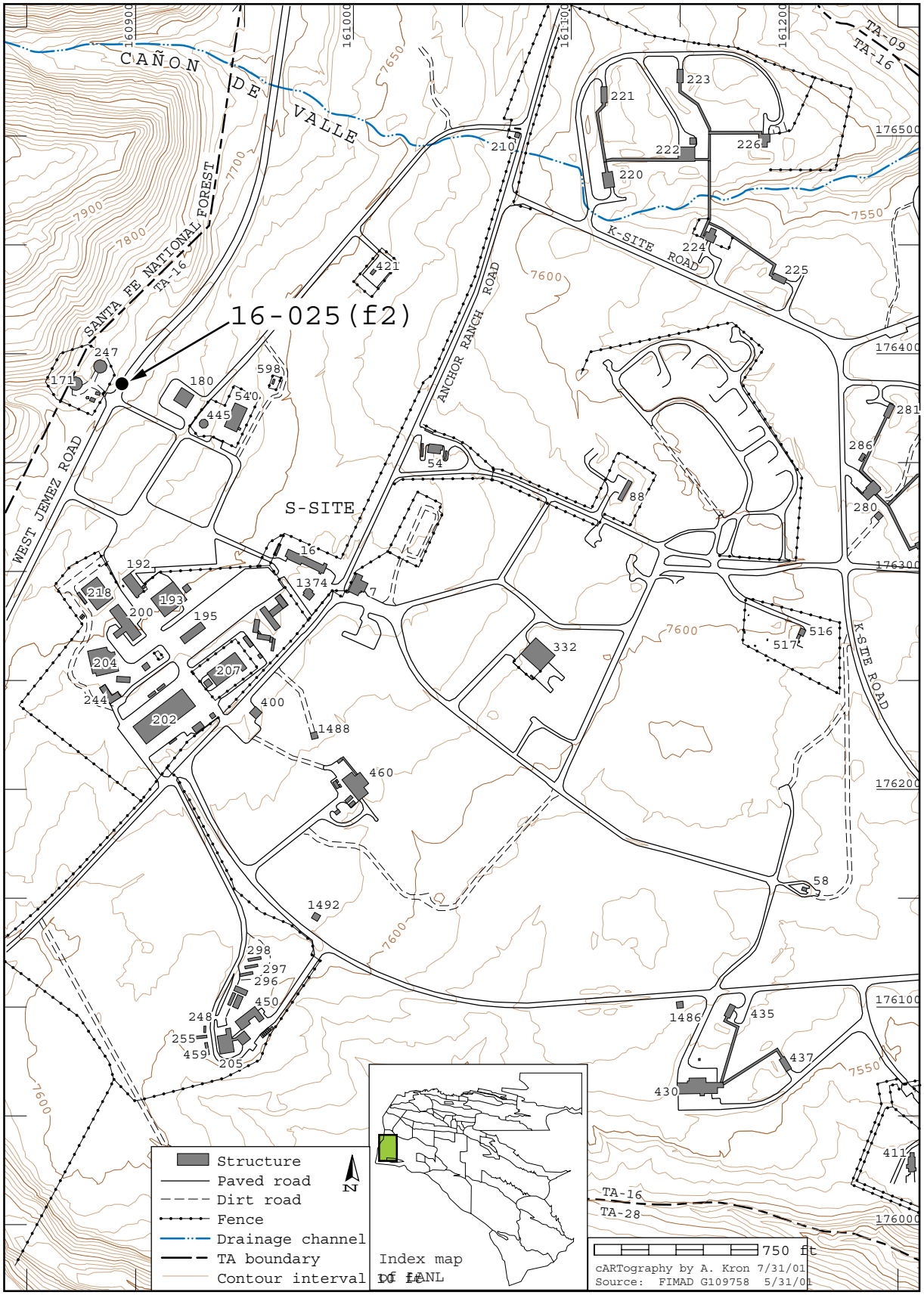
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-025(f2), looking west**


16-025(f2)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-28
247
171
180
598
540
445
421
210
221
223
222
226
220
224
225
54
88
281
286
280
16
192
218
193
200
195
1374
7
204
207
244
202
400
1488
460
332
516
517
58
1492
298
297
296
450
248
255
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7900
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7600
7550
160900
161000
161100
161200
176500
176400
176300
176200
176100
176000
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map
of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-025(h2) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1949 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-109 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-025(h2) is an area of potential soil contamination from a former storage magazine (structure 16-109, formerly A-4) that was located at S-Site. The 6-ft x 6-ft x 7-ft-high structure was of wood-frame construction, built in May 1944, and removed in November 1950; it was used primarily to store non-HE materials such as aluminum powder, lead oxide, and barium nitrate. It also was used to store packaged HE. Upon arrival at S-Site, raw HE (in packaged form) was placed in this structure while awaiting transfer to one of S-Site's HE-processing buildings for machining and shaping. Once processed, finished HE forms were placed in this building while awaiting transfer to an off-site location. No open packages or loose HE was stored in the magazine and no machining or shaping of HE was ever conducted in this building. Archival evidence indicates that contaminants were never released. In August 1949, this magazine was removed in preparation for the construction of State Highway 501 (West Jemez Road). Removal was accomplished through explosive demolition or burning, both common practices for decommissioning and decontaminating buildings at S-Site during the late 1940s through the mid- to late 1960s. The former location of this building currently lies beneath State Highway 501 and/or beneath disturbed soils adjacent to the road. Road construction activities severely disturbed surrounding soils and completely obliterated the surface footprints of this former structure. In addition, during road construction activities, several feet of excavated soils, base course, and asphalt were placed over the former location of the structure.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

The RFI work plan recommended SWMU 16-025(h2) for NFA; consequently, there has been no additional investigation at this site.

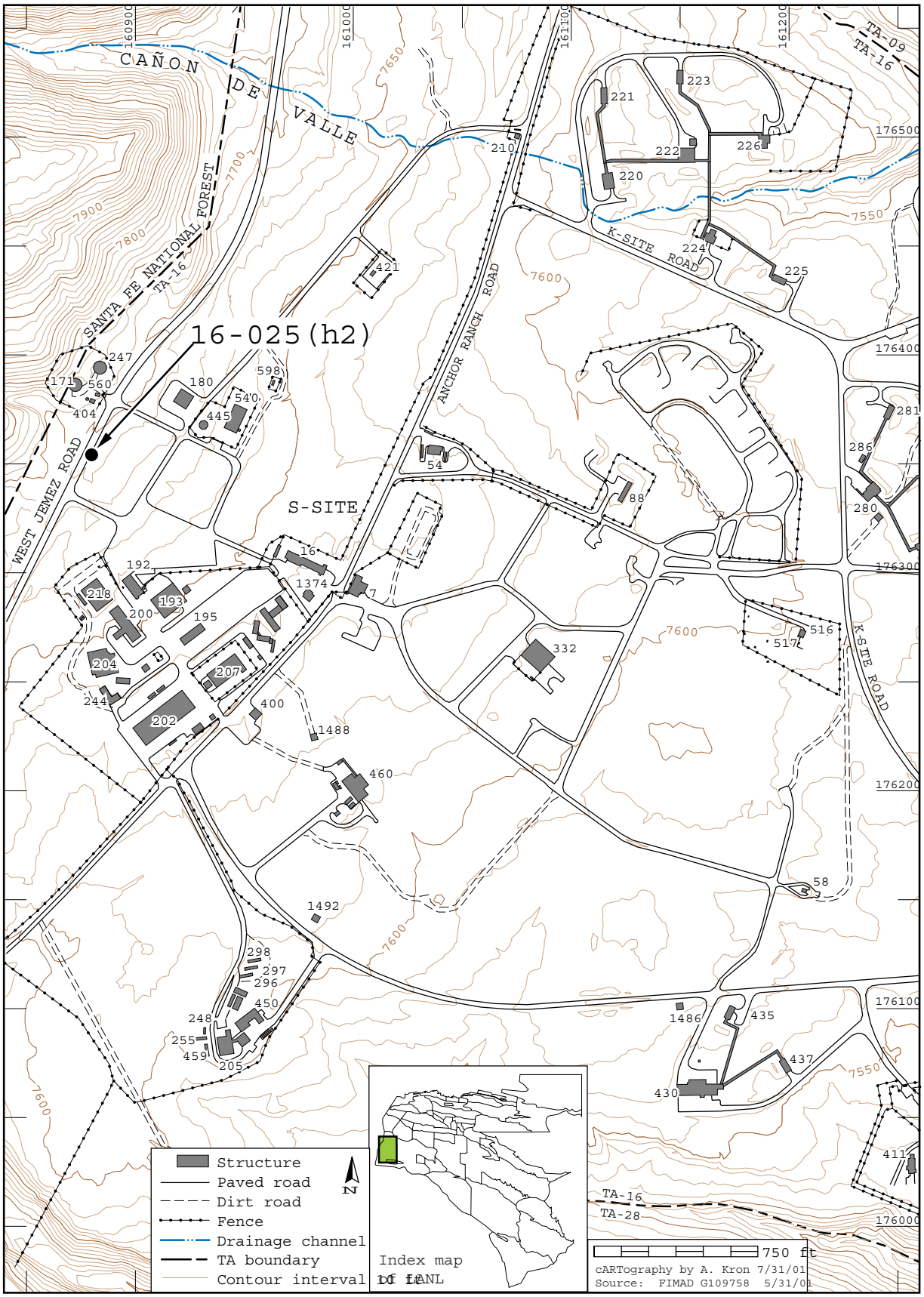
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-025(h2), looking north**


16-025(h2)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
S-SITE
ANCHOR RANCH ROAD
K-SITE ROAD
TA-09
TA-16
TA-28
7900
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7650
7600
7550
161000
161100
161200
176500
176400
176300
176200
176100
176000
247
171
560
404
180
598
540
445
421
210
221
223
222
226
220
224
225
54
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281
286
280
16
192
1374
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218
193
200
195
204
207
244
202
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1488
332
516
517
460
58
1492
298
297
296
450
248
255
459
205
1486
435
437
430
411
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-025(w) — Facility/equipment*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1944-1950s |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-81 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-025(w) is soil contamination associated with a nitrocellulose drying facility (structure 16-81) at the GMX-2 area. GMX-2 structures were located in the south-central and eastern part of World War II-era S-Site. Structures at GMX-2 were used primarily for experimental HE research and development. No production-scale HE operations were conducted in the GMX-2 area, which operated from 1944 to the early 1950s. Structure 16-81 was 8.5 ft square x 8 ft high and was located southeast of a former processing building (Building 16-45). Structure 16-81 consisted of a primary building and a smaller fan room connected to the main structure by a 17-ft-long air duct. Structure 16-81 had no sumps or external drains to the environment. Nitrocellulose was shipped in alcohol to avoid spontaneous combustion, but the alcohol evaporated before its use in HE castings. Other solvents may have been used in the building. Before it was burned in 1960, it was determined that structure 16-81 was contaminated with HE. Residual debris from burning and the remaining subsurface structures were cleaned up in 1966.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

An addendum to the OU 1082 work plan proposed sampling at SWMU 16-025(w) to detect residual organic compounds and other potential contaminants in the subsurface soil.

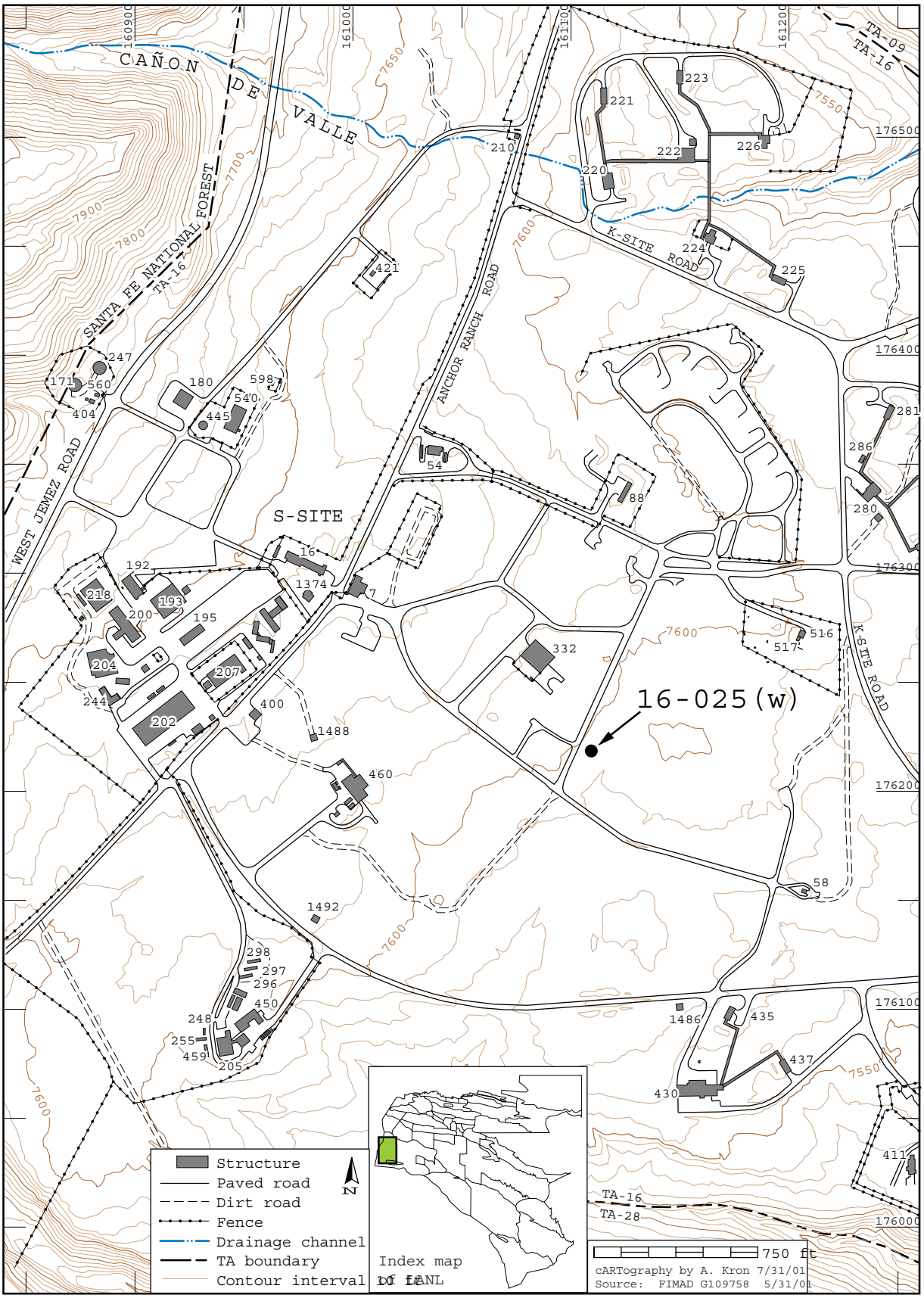
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU16-025(w)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-16
TA-28
16-025(w)
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

# *SWMU 16-025(y)-99 — Facility/equipment - outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1945-1959 |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | No |
| **Structure Number** | 16-55 | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-025(y)-99 consists of former SWMUs 16-025(y) and 16-029(a2). Former SWMU 16-025(y) is the footprint of the former barium nitrate grinding facility (structure 16-55) in the GMX-2 area. Former SWMU 16-029(a2) is potential contamination from sumps and drainlines at structure 16-55.

Building 16-55 was located south of a former processing building (Building 16-45). Building 16-55 consisted of three structures: a processing building that was connected to an equipment room and a storage room. The building was of wood-frame construction with a concrete floor. Building 16-55 was the first barium nitrate grinding facility constructed at S-Site, in March 1945. It was used for that purpose until structure 16-54 was built later in 1945. After 1945, Building 16-55 was used for several purposes, including lead storage. The building was considered a storage building when it was surveyed in 1959. Use of Building 16-55 was discontinued in December 1959 and it was burned in February 1960. Before it was burned, the building was determined to be contaminated with HE. Suspect contaminants were inorganic chemicals, organic chemicals, and HE.

Former SWMU 16-029(a2) is potentially contaminated surface and subsurface soil associated with structure 16-55 and its associated drainline and sumps. The sumps were located east of structure 16-55 and discharged to a drainline that flowed into the main S-Site drainage. The sump drained to a secondary sump and then to an outfall.

## ER Project Activities

Information presented in this section was derived from previously published documents. Any discussion of BVs and SALs is taken from the referenced documents and reflects the values in use at the time the documents were written. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

The ER Project conducted an RFI at former SWMU 16-025(y) in summer 1997 to determine if contaminants were present in soils at unacceptable levels. Biased sampling was designed to detect barium and HE in the surface and near-surface soil in the building footprint. Ten samples were field-screened from five locations in and adjacent to the building footprint. Samples were screened for HE, barium, and radionuclides. HE screening samples were positive. Screening sample results for barium were less than two times BV for all samples. Four of the screened samples were submitted for laboratory analysis. Samples submitted to the analytical laboratory were analyzed for inorganic chemicals, organic chemicals, and HE. Slightly elevated levels of barium and mercury were detected. The RFI report recommended NFA at former SWMU 16-025(y) because contamination at the site posed no unacceptable risk to human health.

Addendum 1 to the OU 1082 work plan proposed sampling at former SWMU 16-029(a2) to detect surface HE contamination.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 0 | N/A | 0 |
| Inorganic chemicals | 18 | 1 | 1 |
| SVOCs | 0 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

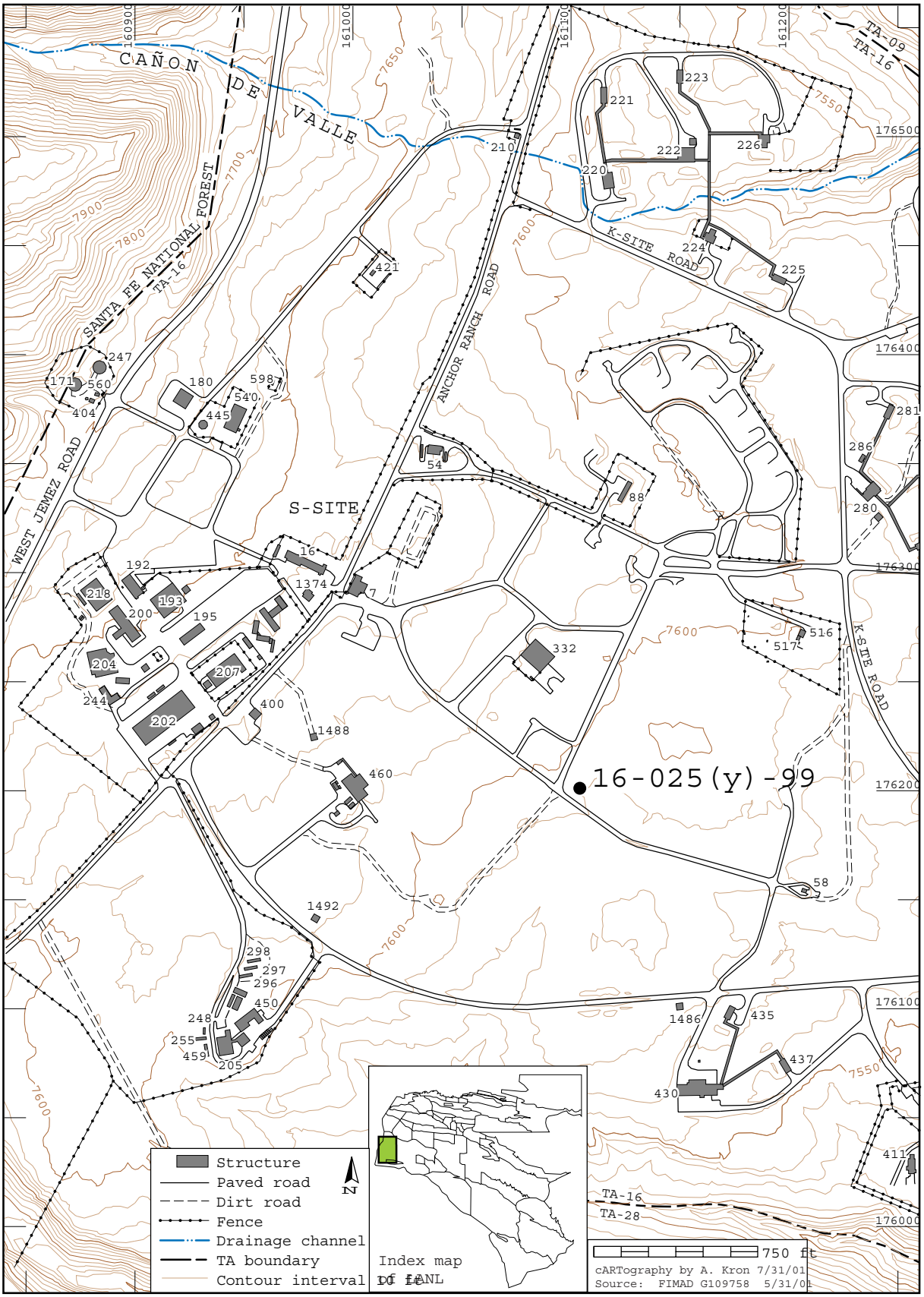
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| Inorganic chemicals | Arsenic | 3.9 mg/kg | 0.39 mg/kg |

## References


RFI Report for TA-16: PRSs 16-024(c,d,f,g,k,m,o,p,q,r,s), 16-025(b2,d,g,h,j k,m,n,o,y), 16-034(c,d,e,f,l,m), C-16-005, C-16-017 — LA-UR Number: 97-3770

RFI Work Plan for Operable Unit 1082, Addendum 1 — LA-UR Number: 94-1580

**View of SWMU 16-025(y)-99, looking east**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-025(y)-99
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-026(a2) — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1953-Present |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

SWMU 16-026(a2) is an active storm drainline and associated outfall from the roof drains of an administration building (Building 16-200) that is outside the fenced TA-16 HE-processing area. The outfall is active periodically, intermittently discharging rainwater collected from the roof of the building. Building 16-200 was constructed from July 2, 1951, through December 22, 1952, and became operational in early 1953. It was constructed to house administrative offices only and has been used as an administrative office building from the time of its construction. The 1990 SWMU report describes SWMU 16-026(a2) as an inactive outfall with an unknown waste stream from a drainline located on the southeast side of Building 16-200. As-built engineering drawings show that this drainline and associated outfall were built exclusively to collect and disperse stormwater from the roof of Building 16-200. The engineering drawings show that all roof drains tie into the building's storm drainline and that all floor drains tie into the building's sanitary sewer line. Engineering drawings show that the rainwater is channeled through a line that runs beneath most of the length of the concrete basement floor of Building 16-200, initiating as a 4-in.-diameter pipe at the north end of the building. The 4-in. pipe connects to a 6-in. pipe at a juncture near the basement stairwell. The 6-in. line exits at the south end of the building where it connects to an 8-in. line that runs southeast (underground) to a point of discharge (at daylight) approximately 175 ft southeast of the building. The point of discharge is through a 12-in. corrugated culvert.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

The RFI work plan recommended NFA for SWMU 16-026(a2); consequently, there has been no additional investigation at this site.

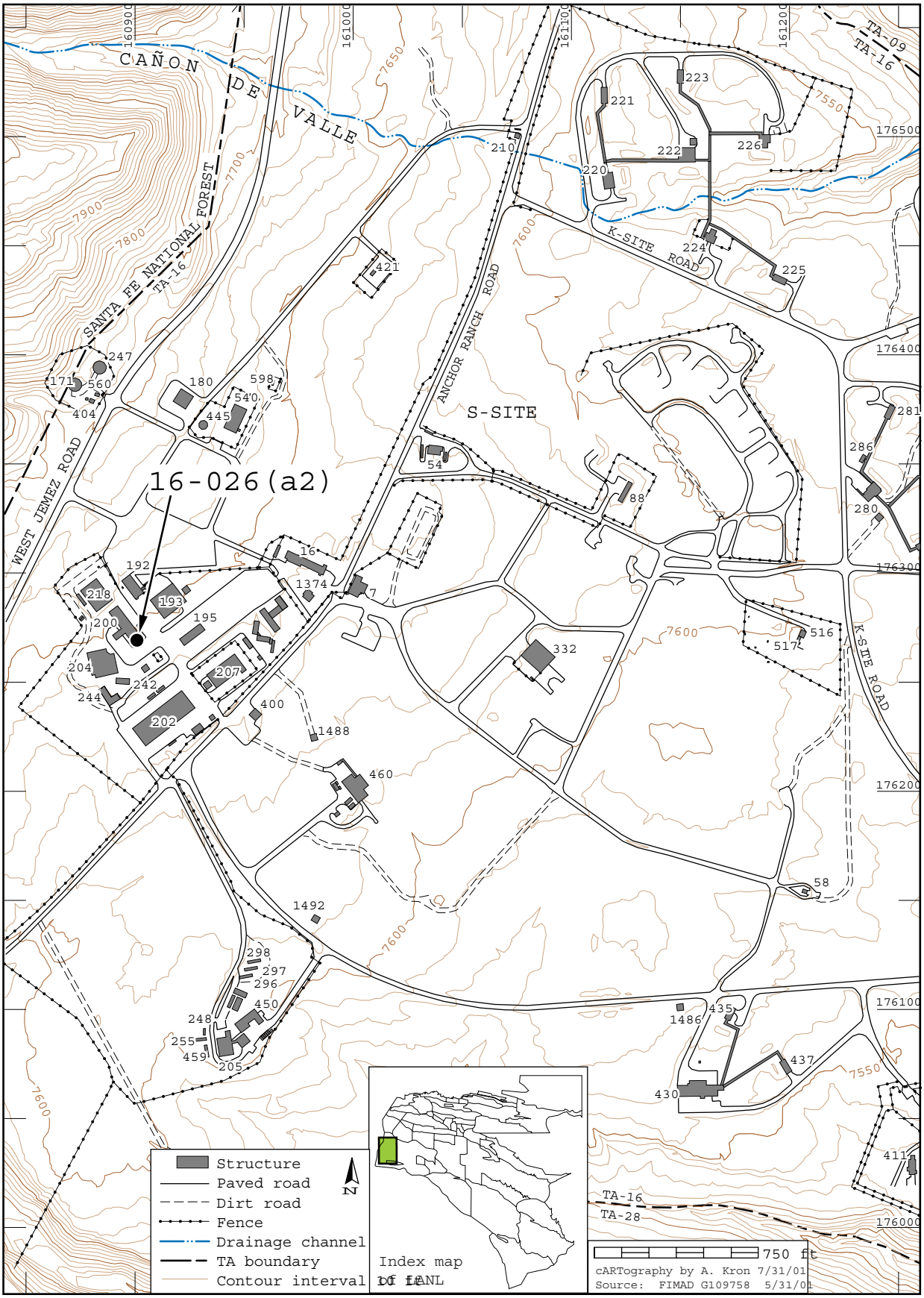
## ER Project Sampling Summary

No analytical samples were collected at this site.

## References


| | |
|---|---|
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume I | LA-UR Number: 01-2793 |
| Los Alamos National Laboratory Permit Modification Request, for 25 PRSs Proposed for No Further Action, June 2001, Volume II | LA-UR Number: 01-2793 |
| RFI Work Plan for Operable Unit 1082, Addendum 2 | LA-UR Number: 95-1038 |

**View of SWMU 16-026(a2), looking northwest**


16-026(a2)
CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-28
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 50 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-026(b)-99 — Outfall/effluent discharge - physical/chemical treatment units*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1953-mid 1990s |
| **Has ER Sampled the Site?** | Yes | **ER Remedial Action Conducted?** | Yes |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | No |

## Unit Description

Consolidated SWMU 16-026(b)-99 consists of former SWMUs 16-026(b), 16-026(c), 16-026(d), 16-026(e), 16-029(a), 16-029(b), 16-029(c), and 16-029(d). The consolidated SWMU contains inactive HE sumps, drainlines, and outfalls associated with inactive rest houses on the west side of the 300 Line. The line was built in 1951 and 1952 for casting HE. The buildings were converted to other uses when cast explosives were replaced by plastic-bonded explosives (except for Building 16-302, which remained a casting facility). The rest houses are located south of the processing buildings, and each rest house has a pair of HE sumps. Effluent from each sump drained into the gutter along the road in front of the rest houses. According to the OU 1082 work plan, none of the sump outfalls required EPA permits, and all the sumps have been plugged. None of the buildings currently is used to store explosives. The sumps are rectangular concrete tanks with removable 0.25-in. aluminum lids. Outside dimensions are about 12 ft long x 4 ft wide x 5 ft high. Initially, HE fines were collected in a cloth filter bag secured inside a metal filter basket. The baskets and filter bags periodically were collected and cleaned at the basket-washing facility (Building 16-390). HE fines too small to be collected by the filter bags settled to the bottom of the sump. To help separate the suspended solids, the water flowed under an aluminum baffle and over a concrete weir before it discharged to an outfall. HE in the bottom of the sump periodically was removed and burned. The sumps were modified in 1966 to improve their effectiveness and to reduce HE handling. Watertight aluminum tanks were installed in the sumps, eliminating the filter baskets and cloth bags. Each tank has two baffle and weir separation stages on the long axis of the sump. Waste products in the sumps periodically were removed and burned in the sand beds at the TA-16 burning ground.

Soil and sediment studies of HE in the S-Site drainage system were conducted from 1970 to 1985, and in the water from HE sumps and outfalls in 1988. For samples related to the former SWMUs in this consolidated unit, samples taken from a rest house (structure 16-307) [former SWMUs 16-026(b) and 16-029(a)] showed residual explosives at 13 percent by weight in 1975. Concentrations had dissipated to 0.4% by 1984. Inorganic chemical concentrations were above BVs in water and soils associated with the sump drainages from the 300 Line. A 1989 DOE investigation of the 300 Line outfalls showed low levels of cesium-137 and uranium-235. Organic chemicals were present in several drainages below SALs and were present above SALs in sump water.

Former SWMUs 16-026(b) and 16-029(a) are the outfall and sumps, respectively, associated with an inactive rest house (structure 16-307). Structure 16-307 served Building 16-306 [consolidated SWMU 16-003(d)-99], the plastics-production facility. The rest house was used to store molds and other materials used in the plastics-development facilities. The building previously housed a solvent disassembly tank used for removing HE from test devices. According to the OU 1082 work plan, test devices were the principal cause of HE contamination in the outfall drainage channel.

Former SWMUs 16-026(c) and 16-029(b) are the outfall and sumps, respectively, that served an inactive rest house (structure 16-305). Structure 16-305 served the plastics-development and production facility [Buildings 16-304 and 16-306 [consolidated SWMU 16-003(d)-99)]. The rest house was used to store raw materials used in the plastics-fabrication process, finished plastic products, and for filament winding of developmental components. Suspect contaminants were HE, inorganic chemicals, and organic chemicals associated with plastics manufacturing. One soil sample was taken from the outfall at structure 16-305 in 1970. Analytical results showed no TNT, RDX, or HMX, although some unknown HE decomposition products may have been present at low levels.

Former SWMUs 16-026(d) and 16-029(c) are the outfall and sumps, respectively, that served an inactive rest house (structure 16-303). Structure 16-303 was built in 1953 and served Building 16-302 [consolidated SWMU 16-003(d)-99], an HE casting facility. The rest house stored raw materials used in the casting process and HE castings produced in the casting building. Suspect contaminants were HE, inorganic chemicals, and organic chemicals. Two samples were taken at the former SWMU 16-026(d) outfall in 1970. Samples showed elevated levels of HMX and/or RDX and TNT.

Former SWMUs 16-026(e) and 16-029(d) are the outfall and sumps, respectively, that served an inactive rest house (structure 16-301). Structure 16-301 served Building 16-300 [consolidated SWMU 16-003(d)-99], the mock HE-processing facility. The rest house was used to store raw materials that were used to prepare mock HE.

## ER Project Activities

Information presented in this section was derived from previously published documents. RFI activities conducted at this site are described in detail in the documents listed in the reference section below.

The ER Project conducted RFIs at these former SWMUs in 1995 to determine if releases had occurred from the drain outfalls and if the releases caused contamination. Only SWMUs 16-026(c) and 16-026(d) were proposed for NFA. At former SWMU 16-026(c), the

ER Project sampled 14 locations: all locations were field-screened for HE, radiation, and organic chemicals. All samples were negative. Boreholes were drilled at the outfall and at the next downstream sediment trap. Three samples were collected from each borehole. In addition, five surface samples were collected. Eleven samples were submitted for fixed-laboratory analysis for organic chemicals, inorganic chemicals, and HE. Elevated PAH levels were found in the laboratory samples. The locations where PAHs were detected also receive stormwater runoff from asphalt-paved areas. The RFI report attributed the presence of PAHs to general industrial activities and recommended former SWMU 16-026(c) for NFA because contaminants at that site pose no unacceptable risk to human health. At former SWMU 16-026(d), 18 locations were field-screened for HE, inorganic chemicals, and organic chemicals. All samples screened negative. Boreholes were drilled at the outfall and about 25 ft downstream at the next sediment trap. Eleven samples were collected from six of the screened locations (including boreholes) and submitted for fixed-laboratory analysis. Samples were analyzed for inorganic chemicals, organic chemicals, and HE. Several inorganic chemicals (arsenic, barium, chromium, lead, vanadium, and zinc) were detected at elevated levels. One organic chemical, benzo(a)pyrene (a PAH), was detected at elevated levels, and its presence was attributed to runoff from an asphalt-paved roadway. The RFI report attributed the presence of benzo(a)pyrene to general industrial activities. Elevated levels of RDX were present in one sample. The RFI report recommended NFA at former SWMU 16-026(d) because contaminants at that site posed no unacceptable risk to human health under an industrial-use scenario. The other former SWMUs in the consolidated unit will be investigated in future field campaigns.

## ER Project Sampling Summary

The following table shows the number of analytes that exceeded BVs, FVs, and SALs that were in use in calendar year 2002. These data reflect site conditions before any remedial activities may have occurred, as discussed in the ER Project activities section above. BVs are naturally occurring concentrations of inorganic chemicals and radionuclides in soil, sediment, or tuff before any influence from LANL operations. FVs are concentrations of radionuclides in soil, sediment, or tuff that resulted from global atmospheric deposition unrelated to LANL releases. SALs are concentrations of chemicals or radionuclides based on a residential exposure, below which there is no potential unacceptable risk to human health.

| Analytical Suite Sampled | No. of Chemicals Detected | No. of Chemicals >CY2002 BV/FV (If Applicable) | No. of Chemicals >CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | 9 | N/A | 5 |
| Inorganic chemicals | 21 | 12 | 4 |
| SVOCs | 24 | N/A | 7 |
| VOCs | 1 | N/A | 0 |

The following table provides the maximum concentrations of analytes that exceeded CY2002 SALs.

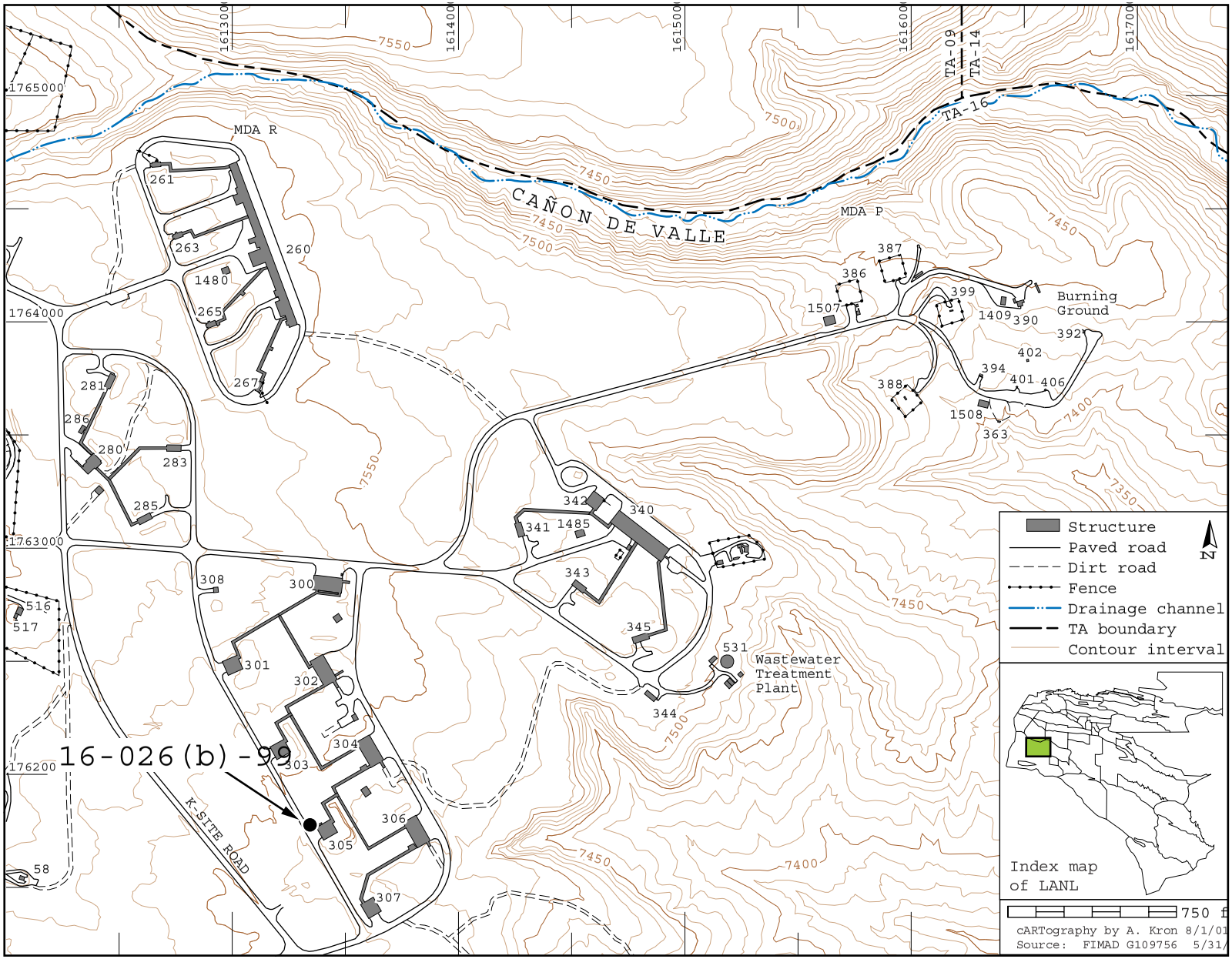
| Analytical Suite | Analyte | Maximum Concentration | CY2002 SAL (Residential) |
|---|---|---|---|
| HEs | Amino-2,6-dinitrotoluene[4-] | 1.68 mg/kg | N/A |
| | Amino-4,6-dinitrotoluene[2-] | 22.4 mg/kg | N/A |
| | HMX | 3910 mg/kg | 3100 mg/kg |
| | RDX | 202 mg/kg | 4.4 mg/kg |
| | Trinitrotoluene[2,4,6-] | 318 mg/kg | 31 mg/kg |
| Inorganic chemicals | Arsenic | 3.7 mg/kg | 0.39 mg/kg |
| | Chromium (total) | 439 mg/kg | 210 mg/kg |
| | Copper | 11,000 mg/kg | 2800 mg/kg |
| | Nickel | 2100 mg/kg | 1500 mg/kg |
| SVOCs | Benzo(a)anthracene | 15 mg/kg | 0.62 mg/kg |
| | Benzo(a)pyrene | 26 mg/kg | 0.062 mg/kg |
| | Benzo(b)fluoranthene | 38 mg/kg | 0.62 mg/kg |
| | Benzo(k)fluoranthene | 17 mg/kg | 6.2 mg/kg |
| | Dibenz(a,h)anthracene | 4.6 mg/kg | 0.062 mg/kg |
| | Indeno(1,2,3-cd)pyrene | 18 mg/kg | 0.62 mg/kg |
| | Nitroaniline[4-] | 0.68 mg/kg | N/A |

## References


| | |
|---|---|
| RFI Report for TAs -11, -13, -16: PRSs 11-012(a,b), 13-003(a), 16-006(c,d), 16-010(a), 16-021(a), 16-026(c,d,v), 16-028(a), 16-030(g) | LA-UR Number: 97-3072 |
| RFI Work Plan for Operable Unit 1082 | LA-UR Number: 93-1196 |

**View of SWMU 16-026(b)-99, looking north**

**View of SWMU 16-026(b)-99, looking southeast**


16-026(b)-99
CAÑON DE VALLE
MDA R
MDA P
TA-16
TA-09
TA-14
Burning Ground
Wastewater Treatment Plant
K-SITE ROAD
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval
N
Index map of LANL
750 f
cARTography by A. Kron 8/1/01
Source: FIMAD G109756 5/31/

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# *SWMU 16-026(b2)-00 — Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | N/A |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-1993 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

Consolidated SWMU 16-026(b2)-00 consists of former SWMUs 16-026(b2) and 16-028(d). SWMU 16-026(b2) is the site of potential soil contamination from an overflow drain and associated drainline and outfall from a former oil/water separator in a decommissioned machine shop (a shops building, Building 16-202). SWMU 16-028(d) is potentially contaminated soil from a former NPDES-permitted outfall and drainlines that received discharges from drains throughout Building 16-202. The outfall areas for the former SWMUs overlap. Suspect contaminants are organic chemicals and inorganic chemicals.

Former SWMU 16-026(b2) is located in the current S-Site administration area. It was built in 1952 when Building 16-202 was built. The oil/water separator remains in place but has been decommissioned. The decommissioning date is unknown, but by 1977, the room that contained the oil/water separator was no longer used. The oil/water separator is a cement pit that is below floor level with a volume of 3 cubic ft. The pit is in a wastewater line that receives only oily water. It was designed to receive up to 100 gal./minute of oily water. The oil/water separator removed oil from water to protect the sewer system from being overloaded with large volumes of oil. The oil floated to the top of the pit to allow water to flow out a drain to the bottom of the pit into the sewer system. The oil layer flowed into an overflow drain. The overflow lines are 2-in. cast-iron pipes that ordinarily drained onto the ground. A wood plank now covers the oil/water separator and the room is used as an office. The oil overflow line runs about 135 ft southeast from Building 16-202 and daylights near the bottom of a drainage ditch that runs along a road.

Former SWMU 16-028(d) served Building 16-202 from 1952 to 1993. The building was used as a secure machine shop and provided electrical, mechanical, pipefitting, milling, and other machining services. The building currently is used for office space. The outfall, included on LANL's NPDES permit as Outfall 04A083, received noncontact cooling water and wash water from two floor drains, effluent from two non-HE sumps, discharge from two sink drains, and rainwater from 16 roof drains. It was removed from the LANL NPDES permit effective September 19, 1997. The drainline is 8-in. VCP that daylights 80 ft southeast of Building 16-202.

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

Addendum 2 of the OU 1082 work plan proposed sampling at these former SWMUs to detect contamination from organic chemicals.

## ER Project Sampling Summary

No analytical samples were collected at this site.

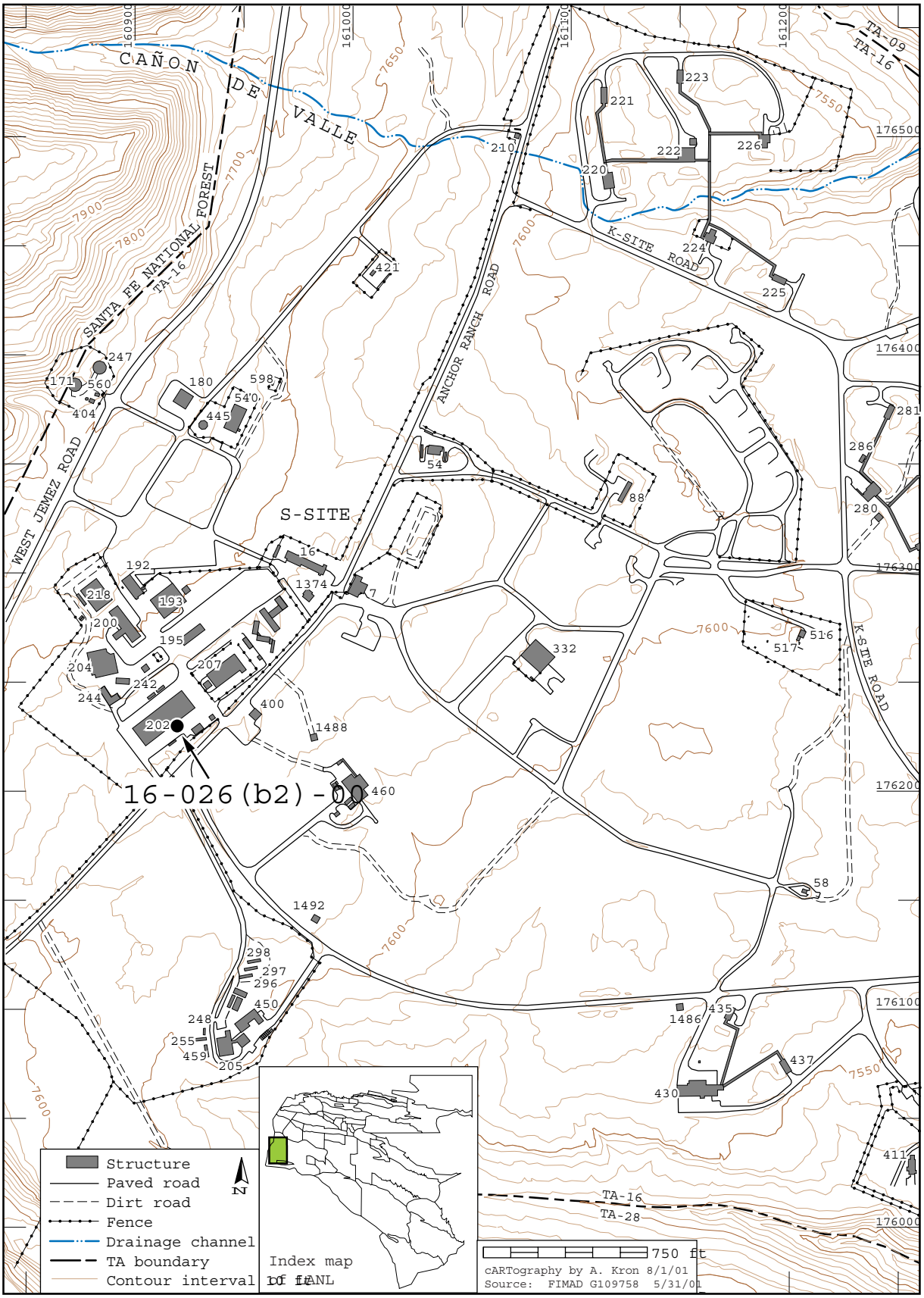
## References

RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**Sump [former SWMU 16-028(d)]**

**Potential soil contamination [former SWMU 16-026(b2)]**

**Outfall [former SWMU 16-028(d)]**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-28
16-026(b2)-00
Structure
Paved road
Dirt road
Fence
Drainage channel
TA boundary
Contour interval 10 ft
N
Index map of LANL
750 ft
cARTography by A. Kron 8/1/01
Source: FIMAD G109758 5/31/01

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# *SWMU 16-026(c2) – Outfall/effluent discharge*

| | | | |
|---|---|---|---|
| **Administrative Authority** | NMED | **Former Operable Unit** | OU 1082 |
| **Technical Area** | TA-16 | **Dates of Operation** | 1952-1991 |
| **Has ER Sampled the Site?** | No | **ER Remedial Action Conducted?** | No |
| **Structure Number** | N/A | **Other Remedial Action Conducted?** | Yes |

## Unit Description

SWMU 16-026(c2) is the outfall from a chemical storage building (Building 16-462) located in the southwest quadrant of TA-16. Building 16-462 was built in 1952 to store chemicals that were used in an analytical and process-control laboratory (Building 16-460). Building 16-462 is a single-story building with two rooms. One room contains an inventory of solvents and oils; the other stores organic and inorganic compounds. The rooms have troughs in the floor that drain to separate drainlines outside the building. The drainlines that comprise SWMU 16-026(c2) are 6-in. VCP. They exit from the southeast side of the building and travel southeast for about 32 ft before they daylight next to one another in a grassy area that slopes to the southeast. Engineering drawings show a square collection pit where the lines daylight. On a site visit, the pit was observed but was filled with sediment. Effluent flows southeast to a drainage ditch. The ditch leads to a corrugated metal culvert that drains northeast. Drains at Building 16-462 were plugged in 1991. Historical spill records at Building 16-462 are unknown. Archival information from the 1970s states that effluent from Building 16-462 is "effectively negligible."

## ER Project Activities

RFI activities conducted at this site are described in detail in the documents listed in the reference section below. No additional RFI activities have been conducted at this site.

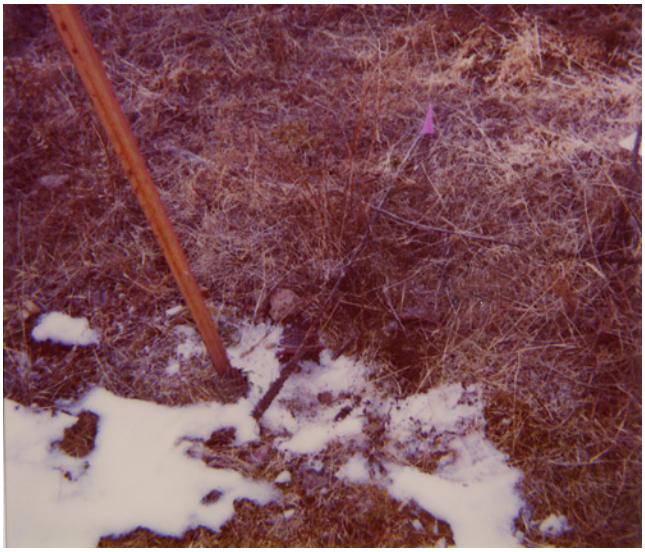
Addendum 2 of the OU work plan proposed sampling at SWMU 16-026(c2) to detect organic chemicals.

## ER Project Sampling Summary

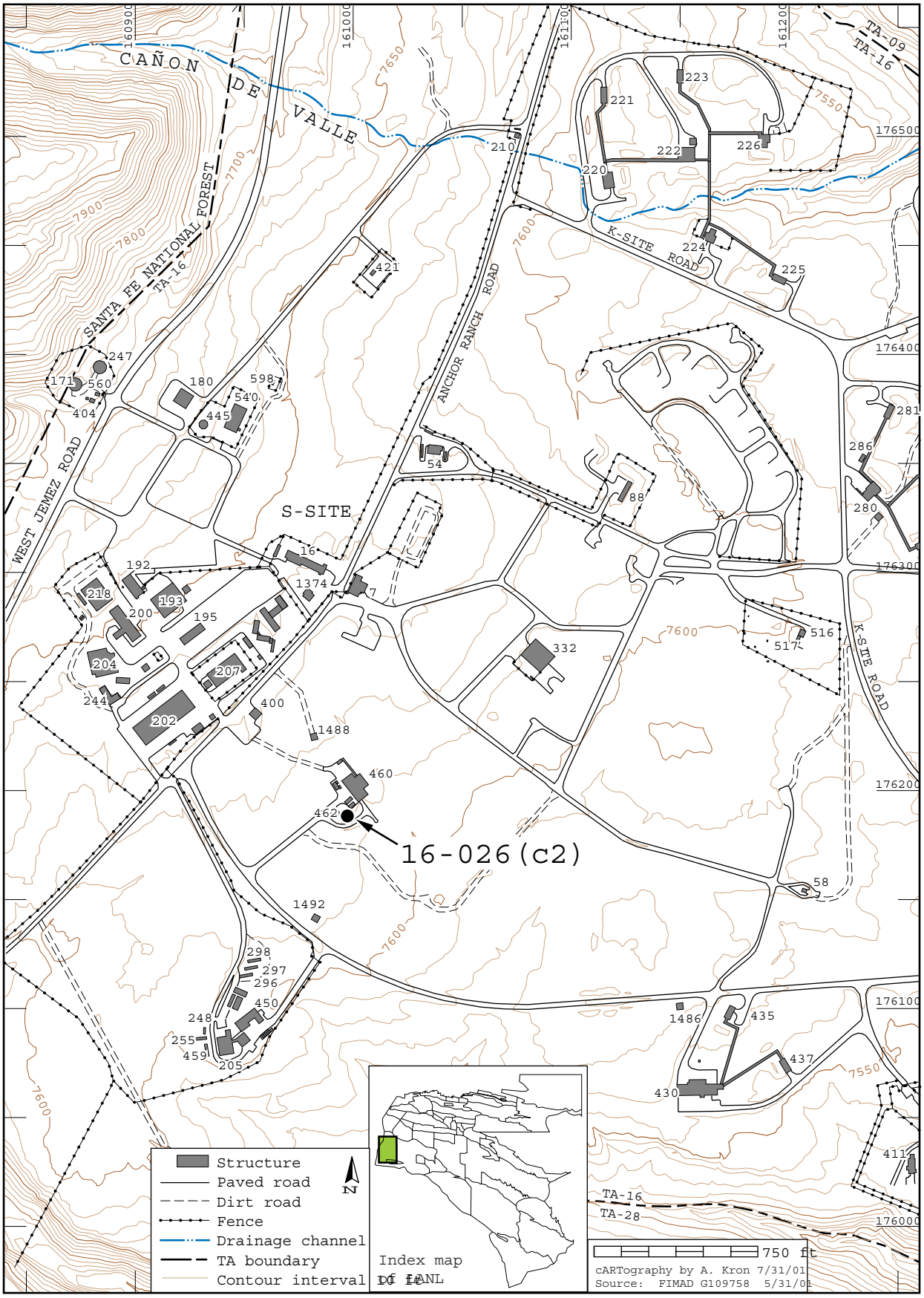
No analytical samples were collected at this site.

## References


RFI Work Plan for Operable Unit 1082, Addendum 2 — LA-UR Number: 95-1038

**View of SWMU 16-026(c2)**


CAÑON DE VALLE
SANTA FE NATIONAL FOREST
TA-16
WEST JEMEZ ROAD
ANCHOR RANCH ROAD
K-SITE ROAD
S-SITE
TA-09
TA-16
TA-16
TA-28
16-026(c2)
Structure
Paved road
Dirt road
Fence
Drainage channel
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Contour interval 10 ft
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Index map of LANL
750 ft
cARTography by A. Kron 7/31/01
Source: FIMAD G109758 5/31/01