Los Alamos National Laboratory

ENVIRONMENTAL RESTORATION

Environmental Restoration
University of California
Environmental Restoration, MS M992
Los Alamos, New Mexico 87545
505-667-0808/FAX 505-665-4747

U. S. Department of Energy
Los Alamos Area Office, MS A316
Los Alamos, New Mexico 87544
505-665-7203
FAX 505-665-4504

APR 1996
RECEIVED

Date: March 25, 1996
Refer to: EM/ER:96-153

Mr. Benito Garcia
NMED-HRMB
P.O. Box 26110
Santa Fe, NM 87502

SUBJECT: FINAL VOLUNTARY CORRECTIVE ACTION (VCA) PLAN FOR REMEDIATION ACTIVITIES AT TECHNICAL AREA (TA) 0 FOR POTENTIAL RELEASE SITES (PRSs) 0-030(h,i,j,n,o) and 0-030(d,k,p) TOWN SITE SEPTIC SYSTEMS

Dear Mr. Garcia:

Enclosed please find an informational copy of the final VCA Plan for activities in TA-0 for PRS 0-030(h,i,j,n,o) to be completed in Fiscal Year 1996 and PRS 0-030(d,k,p) to be completed in Fiscal Year 1997.

The Department of Energy (DOE) participated in development and review of this plan. The VCA Checklist and Field Authorization Form have been completed and signed. DOE authorization for field work to proceed has been granted and is included with the enclosed plan.

If you have any questions, please call Garry Allen at 505-667-3394 or Bonnie Koch at 505-667-7202.

Sincerely,

Jorg Jansen, Program Manager
Environmental Restoration

Sincerely,

for Theodore J. Taylor, Program Manager
Los Alamos Area Office

JJ/TT/bp

Enclosure: Final VCA Plan for TA-0 for PRS 0-030(h,i,j,n,o) and 0-030(d,k,p)

6830

Cy (w/enclosure):
B. Driscoll, EPA, R.6, 6PD-N
D. Griswold, ERD, AL, MS A906
J. Harry, EM/ER, MS M992
B. Hoditschek, NMED-HRMB
R. Kern, NMED-HRMB
N. Naraine, EM-453, DOE-HQ
M. Shaner, P&PI, MS J591 (5 copies)
N. Weber, Bureau Chief, NMED-AIP, MS J993
J. White, ESH-19, MS K490
S. Yanicak, NMED-AIP, MS J993
RPF, MS M707

Cy (w/o enclosure):
G. Allen, CST-18, MS E525
T. Baca, EM, MS J591
D. Bradbury, EM/ER, MS M992
T. Glatzmaier, DDEES/ER, MS M992
B. Koch, LAAO, MS A316
D. McInroy, EM/ER, MS M992
G. Rael, ERD, AL, MS A906
T. Taylor, LAAO, MS A316
W. Spurgeon, EM-453, DOE-HQ
J. Vozella, LAAO, MS A316
EM/ER File, MS M992

Voluntary Corrective Action Completion Plan for

Potential Release Sites

0-030 (d,h,i,j,k,n,o,p)

Town Site Septic Tank Systems

Field Unit 1

Environmental Restoration Project

March 1996

A Department of Energy
Environmental Cleanup Program

Los Alamos
NATIONAL LABORATORY

LA-UR-96-936

1071

TABLE OF CONTENTS

SECTION			PAGE
1.0	INTRODUCTION		1
	1.1	Site Type and Description	1
		1.1.1 Operational History	1
		PRS 0-030 (d)	1
		PRS 0-030 (h)	1
		PRS 0-030 (i)	1
		PRS 0-030 (j)	2
		PRS 0-030 (k)	2
		PRS 0-030 (n)	2
		PRS 0-030 (o)	2
		PRS 0-030 (p)	2
		1.1.2 COPCs and Rationale for Proposed Remedial Action	3
2.0	SITE CHARACTERIZATION		4
	2.1	RFI Information/Other Decision Data	4
	2.2	Nature and Extent of Contamination	4
3.0	PROPOSED REMEDY		6
	3.1	Description of the Proposed Remedial Action	6
	3.2	Basis for Cleanup Levels	6
	3.3	Site Restoration	6
4.0	WASTE MANAGEMENT		7
	4.1	Estimated Types and Volumes of Waste	7
	4.2	Method of Management and Disposal	8
5.0	DESCRIPTION OF CONFIRMATORY/VERIFICATION SAMPLING		9
6.0	ESTIMATED TIME TO COMPLETE THE ACTION AND UNCERTAINTIES		10
7.0	ANNEXES		
	7.1	Risk-Based Cleanup Level Assumptions and Calculations	
	7.2	RFI Analytical Results	
	7.3	Site Maps	
	7.4	Implementation SOPs	
	7.5	Quality Assurance Plan	
	7.6	Site-Specific Health and Safety Plan	
	7.7	Waste Management Checklist	
	7.8	VCA Checklist and Field Work Authorization Form	
	7.9	Cost Estimate	

1.0 INTRODUCTION

1.1 Site Type and Description

Potential Release Site (PRS) Group 0-3 consists of 13 septic systems. The septic systems were installed during the early 1940s and most remained in use until the Central Waste Water Treatment Plant was completed in late 1947. The septic tanks in this PRS Group handled sanitary waste from the original town site and from early laboratory operations at Technical Area 1 (TA-1). The eight PRSs that are currently scheduled for precharacterization activities and Voluntary Corrective Action (VCA) are described below. Field activities will be conducted for PRSs 0-030 (d, h, i, j, k, n, o, p) and will be completed in the spring and summer of 1996 as part of the Los Alamos National Laboratory (LANL) Environmental Restoration (ER) Project. PRSs 0-030 (d, h, i, j, k, n, o, p) consist of a total of eight septic systems located within the town site (Figure 1).

The potential for chemical or radiological contamination within these septic systems is low; however, all tanks, associated drainlines, and outfall points will be investigated to determine if contamination is present.

1.1.1 Operational History

PRS 0-030 (d)

The septic tank in PRS 0-030 (d) (Figure 2) is located on Los Alamos County property at the Pine Street cul-de-sac (The Zia Company 1947, 05-0132) and was installed in either 1943 or 1944 (Sullivan and Francis memo, 1995). This septic tank serviced McKee houses, apartments and dormitories west of Canyon Road which are now known as Pinon Street, Opal Street, Nugget Street, and Myrtle Street. It is unlikely that the septic tank contains Resource Conservation and Recovery Act (RCRA) or radioactive contamination because it is believed to have served residential areas only (Sullivan and Francis memo, 1995).

PRS 0-030 (h)

The septic tank in PRS 0-030 (h) (Figure 3) is located on private property north of Canyon Road (Kingsley 1947, 05-0174) at the "new" Catholic Church. The topography suggests that the area serviced by this septic tank was probably bound on the east by a north and south line that coincides with what is now the east wall of the Catholic Parish Hall, the areas between Canyon Road and Trinity Drive, the small housing area that was immediately north of Canyon Road, and bound on the west by what is now Diamond Drive. All of the buildings contained by this outlined area were Fort Leonard Wood housing units, dormitories, and military barracks. It is believed that this septic tank was connected only to residential-type buildings, so it is unlikely that radioactive or RCRA materials could have been discharged into this tank (Sullivan and Francis memo, 1995).

PRS 0-030 (i)

The septic tank in PRS 0-030 (i) (Figure 4) is located on Los Alamos County property south of Trinity Drive and east of 35th Street (The Zia Company 1947, 05-0172 and 05-0171; LANL 1990, 0145). Engineering drawings showing the facilities connected to this septic tank are not available; however, the septic tank probably served the West (WAC) Mess Hall and buildings west of the West Mess Hall along Finch Street and south of Trinity Drive. These buildings were dormitories, barracks, a military post office, an officer's lounge, a post exchange, and Sundt Apartments. If the septic tank had, in fact, serviced the aforementioned buildings, it is unlikely that radioactive or RCRA contaminants were discharged into this septic tank (Sullivan and Francis memo, 1995).

PRS 0-030 (j)

Based on a 1947 Zia Company Post Plan drawing, the septic tank in PRS 0-030 (j) (Figure 5) is located about 600 feet north of East Road and east of the eastern segment of Manhattan Loop, on Los Alamos County property (The Zia Company 1947, 05-0132; Sullivan and Francis memo, 1995). Logically, this septic tank would have serviced the Fort Leonard Wood housing units bound by Manhattan Loop, north of Canyon Road. The septic tank may have served other Fort Leonard Wood housing units and a group of unidentified buildings that were located in the immediate vicinity of Manhattan Loop. If these housing units were, in fact, serviced by this septic tank, it is unlikely that RCRA or radioactive contamination is present (Sullivan and Francis memo, 1995).

PRS 0-030 (k)

The septic tank in PRS 0-030 (k) (Figure 6) is located on private property north of the former Zia Warehouse area, north of East Road, and east of what is now the Dog Obedience Club building (The Zia Company 1947, 05-0132; Sullivan and Francis memo, 1995). The Zia Company Warehouse area and the septic tank in PRS 0-030 (k) are shown on the 1947 Zia Company Post Plan. Although no information exists concerning the dimensions of the septic tank or the buildings it served, it is likely that this septic tank serviced the Zia Company Warehouse complex. The Warehouse Complex contained building materials, electrical supplies, plumbing supplies, nails, cement, and machinery warehouses. The Warehouse Complex also stored sheet lead and small quantities of pesticides and herbicides, resulting in a potential for RCRA contamination in the septic tank. No radioactive materials are believed to have been associated with the Warehouse Complex, so it is unlikely that radiological contamination exists within this septic system (Sullivan and Francis memo, 1995).

PRS 0-030 (n)

The septic tank in PRS 0-030 (n) (Figure 7) is located on Los Alamos county property west of 15th Street between Canyon Road and Pueblo Canyon (The Zia Company 1947, 05-0132). The septic system connected to this tank was not found on available drawings; however, it is not likely to have been connected to any technical buildings or have received radioactive or RCRA materials (Sullivan and Francis memo, 1995).

PRS 0-030 (o)

The septic tank in PRS 0-030 (o) (Figure 8) is located on private property between Canyon Road and Pueblo Canyon according to a map prepared in 1947 (The Zia Company 1947, 05-0132). This septic tank serviced the Sundt Apartments, McKee Housing, a dormitory and a laundry located in the area that is now Sage Loop, Oakwood Loop, and the area east of 15th Street. It is unlikely that this septic tank contains radioactive or RCRA contaminants (Sullivan and Francis memo, 1995).

PRS 0-030 (p)

The septic tank in PRS 0-030 (p) (Figure 9) is located on private property at the eastern end of the Rim Road cul-de-sac (The Zia Company 1947, 05-0132). It is logical that this septic tank serviced the Rim Road and Quartz Street residential area. There were no TA-1 buildings connected to this septic tank, so it would be unlikely for the tank to be contaminated with radioactive or RCRA materials (Sullivan and Francis memo, 1995).

1.1.2 COPCs and Rationale for Proposed Remedial Action

These septic tanks are being investigated in order to determine if they are a potential risk to human health and the environment. To date RFI activities have not been performed at any of these sites. The potential for chemical or radiological contamination within these septic tanks is low; however, these septic tanks contain waste from the original town site and possibly early laboratory operations at TA-1. The Chemicals of Potential Concern (COPC) as identified in the RFI Work Plan for OU 1071 are total uranium (^{234}U, ^{236}U), plutonium (^{238}Pu, $^{239/240}Pu$), ^{241}americium (^{241}Am), volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), Target Analyte List (TAL) metals, and polychlorinated biphenyl's (PCBs)/pesticides.

2.0 SITE CHARACTERIZATION

2.1 RFI Information/Other Decision Data

The phase 1 RFI activities at PRSs 0-030 (d, h, i, j, k, n, o, p) have not been performed. The potential for chemical or radiological contamination within these septic systems is low. However, all tanks, associated drainlines, and outfall points will be investigated to determine if contamination is present because these septic tanks contain waste from the original town site and possibly early laboratory operations at TA-1. Currently, a limited amount of historical information is available for these sites which suggests that the waste discharged to these septic tanks was from residential-type buildings. An exception to this is PRS 0-030 (k) which serviced the former Zia Warehouse Storage area which stored equipment and lead sheeting. If the historical information is correct, then these septic tanks should have an easy remedy because the amount of contamination, if present, associated with these tanks should be minimal. The precharacterization activities will determine whether or not there is any contamination present at these sites and what type of contamination is associated with each septic tank system. Subsequently, a decision will be made for the type of remedial activity adequate for each site.

2.2 Nature and Extent of Contamination

Currently, the nature and extent of contamination is not known for any of these sites. Field work for precharacterization and subsequent VCA activities at PRSs 0-030 (d, h, i, j, k, n, o, p) will be completed in four field tasks: field surveys, surface sampling, subsurface sampling, and corrective actions. Field survey activities at each PRS will consist of non-intrusive activities such as an initial site survey, geophysical surveying, geodetic surveying, and geomorphologic mapping. Surface sediment samples will be collected for each septic system from sediment catchments adjacent to or immediately downslope of drainline outfall points.

Most of the septic tanks were left in place after changing over to using the Central Waste Water Treatment Plan in 1947. This VCA Plan assumes the septic tanks can be located in the field. Accessible septic tank systems will be investigated given constraints of legal access to private property and physical constraints in the field. In general, physical constraints for access include buildings and related structures, retaining walls, concrete driveways and sidewalks, and buried utilities on private property. Also, a location on an active roadway or driveway is not preferred, if at least one-way access cannot be maintained during excavation activities because this is considered a physical constraint. Asphalt is judged to be repairable and is not considered a constraint. It is possible that two of the septic tanks may be inaccessible, PRSs 0-030 (o and p). These septic tanks may be located under a house and a driveway, respectively. Site survey information and historical documentation will confirm the location of these septic tank systems. If these septic tanks, PRSs 0-030 (o and p), are truly inaccessible, a proposal will be made for No Further Action (NFA). Determination of NFA will be based on historical information and results of other septic tank VCA investigations in this plan.

During precharacterization activities, each tank will be partially excavated utilizing a backhoe to uncover the top of the tank and both the inlet and outlet drainlines adjacent to the tank. The intent is to minimize excavation activities until screening and analytical results determine what type of waste is contained within the tank. Samples will be collected from within and around the tank and associated drainlines using a hand auger. Most of the tanks are expected to have been backfilled with fill material when they were initially taken out of service. A minimum of eight samples will be collected from each septic tank system. A minimum of four waste characterization samples will be collected from the tank contents. One soil sample will be collected from beneath the inlet drainline and a second soil sample will be collected beneath the outlet drainline. In

addition, two surface samples will be collected downslope from the outfall area. The total number of samples collected during the precharacterization activities is dependent upon the size of the septic tank, the configuration of the septic tank, and the tank contents.

All samples will be submitted to the Mobile Chemistry Analytical Laboratory (MCAL) and the Mobile Radiological Analytical Laboratory (MRAL) for screening analyses to determine if any contamination is present. The screening analyses will include gross gamma, gross alpha/beta, gamma spectrometry, tritium, VOCs and metals (XRF) screening. Some samples will also be submitted to a fixed lab for analyses, and verification of the screening data from the MCAL and MRAL. Fixed-lab analyses will include total uranium (^{234}U, ^{236}U) by ICP/MS, plutonium (^{238}Pu, $^{239/240}Pu$) by alpha spectrometry, ^{241}americium (^{241}Am) by gamma spectrometry, VOCs by EPA SW 846 Method 8260, SVOCs by EPA SW 846 Method 8270, total TAL metals by EPA SW 846 Method 6010 and 7470 (Hg), and PCBs/pesticides by EPA SW 846 Method 8080. The waste characterization samples from the tank contents will be analyzed for TCLP metals instead of TAL metals. No QA/QC samples will be collected.

The greatest limitation for each of these sites is not knowing whether or not any contamination exists and what the nature and extent of contamination is, if present. Another limitation is septic tank accessibility. A specific remedial action cannot be determined until the nature and extent of contamination is known. The specific remedial action will be determined on a case-by-case basis after reviewing the precharacterization analytical results for each site.

3.0 PROPOSED REMEDY

3.1 Description of the Proposed Remedial Action

Based on the screening and analytical results of the precharacterization investigation, an evaluation will be made to determine which type of remedial action will be utilized for each septic system. Corrective actions for each of the tanks will be determined on a case-by-case basis, depending on the nature and extent of the contamination, if any. If analytical results from inside and outside the tank(s) and from the outfall area indicate that contamination is not present, then the site will be proposed for NFA. The preferred type of remedial action for residential areas is to abandon the tank(s) in place instead of removing the tanks. However, the tank may be removed if it is cheaper than abandonment of the tank in place. VCA activities may include removal of tank contents and abandonment of the tank structure and drainline with no further action, or excavation and removal of the tank contents, septic tank, and drainlines.

In the event that soil contamination is encountered outside the tank, the tank and the contaminated soils will be removed to the extent necessary. All activities will be conducted according to the site-specific plans prepared for all septic tank investigations. These plans include the Spill Prevention Control and Countermeasures Implementation Plan, the site-specific Health and Safety Plan, and the Waste Characterization Strategy form.

If mixed waste is determined to be present in the subsurface, based on precharacterization sampling, the tank, contents, and drainlines will be left in place until arrangements are made to transfer the material to the Envirocare facility in Utah.

3.2 Basis for Cleanup Levels

Cleanup levels will be determined based on the type of contamination and the land-use requirements at each septic system location. Because sampling has not been conducted, the type and extent of any chemical or radiological contamination that may be present is unknown. Following the precharacterization sampling and VCA activities, risk calculations will be performed using these data and an evaluation will be made to determine land-use requirements. It is currently assumed that all PRSs will be returned to their current condition and uses. Actual land-use of each PRS following VCA completion will be determined on a site-by-site basis. Currently PRSs 0-030 (h) and (n) are recreational use areas, 0-030(i) is on DOE property, and the remaining PRSs (d, j, k, o, p) are in residential land-use areas.

3.3 Site Restoration

Following precharacterization and VCA activities, the site will be restored to its pre-investigation condition. Excavations will be backfilled and compacted, the affected areas will be re-landscaped to the extent necessary, and asphalt or concrete will be repaired as needed. Pre-work photographs, field sketches, and video documentation will be prepared to record the conditions of the site prior to beginning work. Every attempt will be made to restore the site to its original condition and to the satisfaction of the property owner(s).

4.0 WASTE MANAGEMENT

4.1 Estimated Types and Volumes of Waste

Waste volumes: Waste generated during precharacterization and VCA activities will include disposable scoops, disposable coveralls, gloves, decontamination fluids (deionized or potable water and Alconox), paper towels, plastic sheeting, and other miscellaneous sampling debris. It is anticipated that one partially-filled 55-gallon solid waste drum will be generated per PRS location.

The intent for decontamination fluids generated during all activities is to discharge the water at each PRS according to the NMED letter dated December 20, 1995. The decontamination fluids to be discharged will be a mixture of deionized or potable water and Alconox, and less than 6 gallons will be discharged daily. The amount of decontamination fluids discharged at each PRS will be documented according to the site-specific Spill Prevention Control and Countermeasures Implementation Plan. However, if field observations or field screening indicate contaminated soils have been encountered at any PRS, the decontamination fluids for this area of the investigation will be segregated until analytical screening data has been reviewed. It is estimated that a total of one liquid drum of decontamination fluids which cannot be discharged will be generated for all PRSs.

A final methanol and deionized water rinse will only be used if necessary as a final step in decontaminating sampling equipment. If the use of methanol is necessary, a liquid waste drum for the mixture of deionized water and methanol (<9 percent) will be generated for all eight septic tanks.

The volumes of waste generated as a result of VCA activities at each of the septic systems will be determined based on the analytical results of the precharacterization activities and the decision on whether or not to abandon the tank(s) in place. The waste volumes will depend on the size of each tank, the type and extent of contamination, the accessibility of the septic system, and whether or not the tank will be removed or abandoned in place. If an assumption is made that all septic tanks had an average volume of 60 cubic yards and approximately 30 cubic yards of solid waste will be removed from each tank, then an estimated total of 240 cubic yards of solid waste may be generated. Additional waste will be generated if the entire septic tank and outfall drainlines are to be removed and this will be determined on a site by site basis.

Waste types: Personal protective equipment (PPE)/disposable sampling equipment, plastic sheeting, and equipment decontamination fluids (potable water, deionized water, Alconox, and possibly methanol and deionized water mixture at a non-hazardous concentration of <9%).

If a septic system is determined to contain chemical or radiological contamination, the tank contents (sludge and backfill material) will be removed and appropriately containerized for disposal, based on the type of contamination (e.g., drums, roll-off bins, burial boxes). If a decision is made to remove the septic system structures, the tank will be demolished to facilitate containerization. In addition, if the outfall drainline will be removed it will be cut into pieces to facilitate containerization. An estimate of the waste types and volumes for one PRS is summarized in Table 4.1. It is anticipated that approximately the same type and amount of waste will be generated for each PRS.

TABLE 4.1. SUMMARY OF WASTE TYPES AND VOLUMES FOR ONE PRS

PRS	Item	Waste Type	Anticipated Volume
0-030	sampling waste/PPE	solid-potentially hazardous	1 ft^3
	soil and concrete	solid-potentially hazardous	4 to 90 yds^3
	decon wash water	liquid-potentially hazardous	20 gal
	decon final rinse with water/methanol	liquid-non-hazardous	10 gal

NOTE: It is anticipated that the same summary of waste for one PRS can be used for all sites.

4.2 Method of Management and Disposal

All waste generated at PRSs 0-030 (d, h, i, j, k, n, o, p) will be managed according to the site-specific Waste Characterization Strategy form. Based on acceptable knowledge, it is anticipated that all PPE and disposable sampling equipment generated will be nonhazardous. Upon generation, the waste will be immediately shipped from each PRS, under manifest, to a temporary storage area at TA-3, SM- 271 until appropriate disposal can be determined and arranged based on analytical results of soil samples collected from each PRS.

Based on the analytical results of the waste characterization samples, the disposition of the contents from each septic system will be determined prior to removal of the material. If the tank contents are determined to contain chemical or radiological contamination, the tank and contents will be appropriately containerized for disposal based on the type of contamination (e.g., drums or roll-off bins). If the tank structure is to be removed it will be demolished in order to facilitate containerization. Upon generation, the waste will be immediately shipped from each PRS, under manifest, to a temporary storage area at TA-3, SM 271 until appropriate disposal can be determined and arranged, based on analytical results.

It is not anticipated that RCRA hazardous waste will be generated during field activities, but if it is, the waste will be appropriately containerized for disposal based on the type of contamination (e.g., drums, roll-off bins, burial boxes). It is possible that RCRA hazardous waste will be encountered at PRS 0-030 (k) because historical documentation indicates this septic system serviced a former Zia Warehouse Storage area which stored lead sheeting and other equipment. The waste will be shipped from each PRS under manifest, to a < 90 day storage area at TA-3, SM 271 until appropriate disposal can be determined and arranged, based on analytical results. A provisional EPA ID Number will be obtained through ESH-19 prior to shipping any hazardous waste from each PRS for storage or final disposition. The RCRA hazardous waste will be managed according to all laboratory procedures for less than 90-day storage areas.

5.0 DESCRIPTION OF CONFIRMATORY/VERIFICATION SAMPLING

Septic system investigations will involve collecting samples from within and around the tank and associated drainlines using a hand auger. Most of the tanks are expected to have been backfilled with fill material when they were initially taken out of service. A minimum of eight samples will be collected from each tank location. Four samples will be collected from the interior of the tank and two around the outside perimeter of the tank adjacent to the tank bottom. Two surface samples will be collected downslope from drainline outfall point. Samples will be collected using the procedures described in LANL-ER-SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, and/or LANL-ER-SOP-06.19, Weighted Bottle Sampler for Liquids and Slurries in Tanks. All material removed during sampling and excavation activities will be continuously monitored for indications of chemical or radiological contamination with field instruments.

The waste characterization samples from the tank contents will be collected adjacent to the inlet and outlet ends of the tank and/or in each distinct chamber of the tank, if so constructed. Two samples will be collected from each borehole in the tank interior, including one from a depth midway between the top of the tank and the tank floor (if the tank was previously backfilled), and one from immediately above the tank floor. Detailed descriptions of the tank contents will be recorded.

A minimum of two soil samples will be collected outside the tank. One borehole will be hand-augered immediately outside both the inlet and outlet ends of the tank and advanced to approximately 1 foot below the tank bottom, where a soil sample will be collected.

The tank contents will be removed whether the tank is to be abandoned in place or removed. The material removed from each tank will be placed in appropriate containers for disposal, based on the type of contamination, if any. The tank interior will be visually inspected for cracks and staining and the tank conditions will be recorded in field notes. If a breach in the tank structure is identified, a soil sample will be collected outside the tank adjacent to the breach.

If soil outside the tank appears contaminated based on visual inspection, or if field screening results suggests the presence of chemical or radiological contamination, samples will be collected and submitted to the MCAL and MRAL for screening analyses. If the screening results indicate that contaminated material is present above screening action levels, then the contaminated soils will be excavated. Additional samples will be collected and submitted for screening analyses to the MCAL and MRAL. If results indicate that all contaminated material has been removed, final confirmation/verification samples will be collected and submitted to the fixed analytical laboratory for analysis.

If a tank is to be abandoned in place, no confirmation samples will be collected directly beneath the septic tank. If a tank is to be removed, then confirmation samples will be collected beneath the tank after removal. Based on analytical data, the drainlines will be investigated, if required, at select intervals by excavation and collection of samples beneath the drainline. It is preferable to abandon the drainlines in place. All waste generated during precharacterization and VCA activities will be managed in accordance with the site-specific Waste Characterization Strategy form.

Samples will be submitted to the MCAL and the MRAL for screening, and to a fixed analytical laboratory for analysis. Analyses will include total uranium (^{234}U, ^{236}U) by ICP/MS, plutonium (^{238}Pu, $^{239/240}Pu$) by alpha spectrometry, ^{241}americium (^{241}Am) by gamma spectrometry, tritium, VOCs by EPA SW 846 Method 8260, SVOCs by EPA SW 846 Method 8270, total TAL metals by EPA SW 846 Method 6010 and 7470 (Hg), and PCBs/pesticides by EPA SW 846 Method 8080.

6.0 ESTIMATED TIME TO COMPLETE THE ACTION AND UNCERTAINTIES

The estimated time to complete the field activities are assumed to be similar for each PRS and whenever possible the field activities will overlap for several PRSs. The estimated time required for each task of the precharacterization and VCA activities are listed below:

TASK	ESTIMATED TIME
Site survey, geomorphologic mapping	5 days
Preliminary excavation activities, collection of precharacterization samples, samples adjacent to the drainlines outside the tank, and surface samples from the outfall area	5 days
Wait for screening results from the MCAL and the MRAL	1 day
Wait for analytical results from a fixed laboratory	7 to 10 working days
Analytical data review and decision for type of remedial activities	2 days
VCA activities	5 days
Wait for screening results from the MCAL and the MRAL, if required	1 day
Wait for additional analytical results for the verification samples, if required	30 days
Analytical data review and decision to close up excavation	2 days
Restore site to its original condition	5 days

The main uncertainty for these VCA activities is not knowing the nature and extent of contamination which will be encountered at each PRS. If overexcavation is required at a site, then a delay might occur in completion of the field activities depending on the type of contamination and the distance it has migrated away from the source.

Based on historical background information and the type of buildings most of these septic tanks serviced, the VCA activities should be reasonably limited to estimates provided in this plan. Efforts will be made to minimize the amount of waste generated and wherever possible the septic tank system(s) will be abandoned in place. Also, wherever possible field activities for several PRSs will overlap to assist with minimizing costs and time. However, it is always possible that the extent of contamination is greater than originally anticipated. If this occurs, then field activities will be stopped and the site will be reevaluated in order to determine the best approach for the site remediation.

7.0 ANNEXES

Annex 7.1 Risk-Based Cleanup Level Assumptions and Calculations

ANNEX 7.1

Risk-Based Cleanup Level Assumptions and Calculations

This section does not apply to this site unless soil contamination is found during septic tank investigation or excavation. It is assumed that no contaminant of concern will be found outside the septic tank system(s).

Annex 7.2 RFI Analytical Results

ANNEX 7.2

RFI Analytical Results

This section does not apply because no RFI field investigations have been completed at any of these sites.

ANNEX 7.3 Site Maps

ANNEX 7.3

Site Maps

The site maps presented in this VCA Plan do not contain any information from previous field investigations because no previous work has been performed.

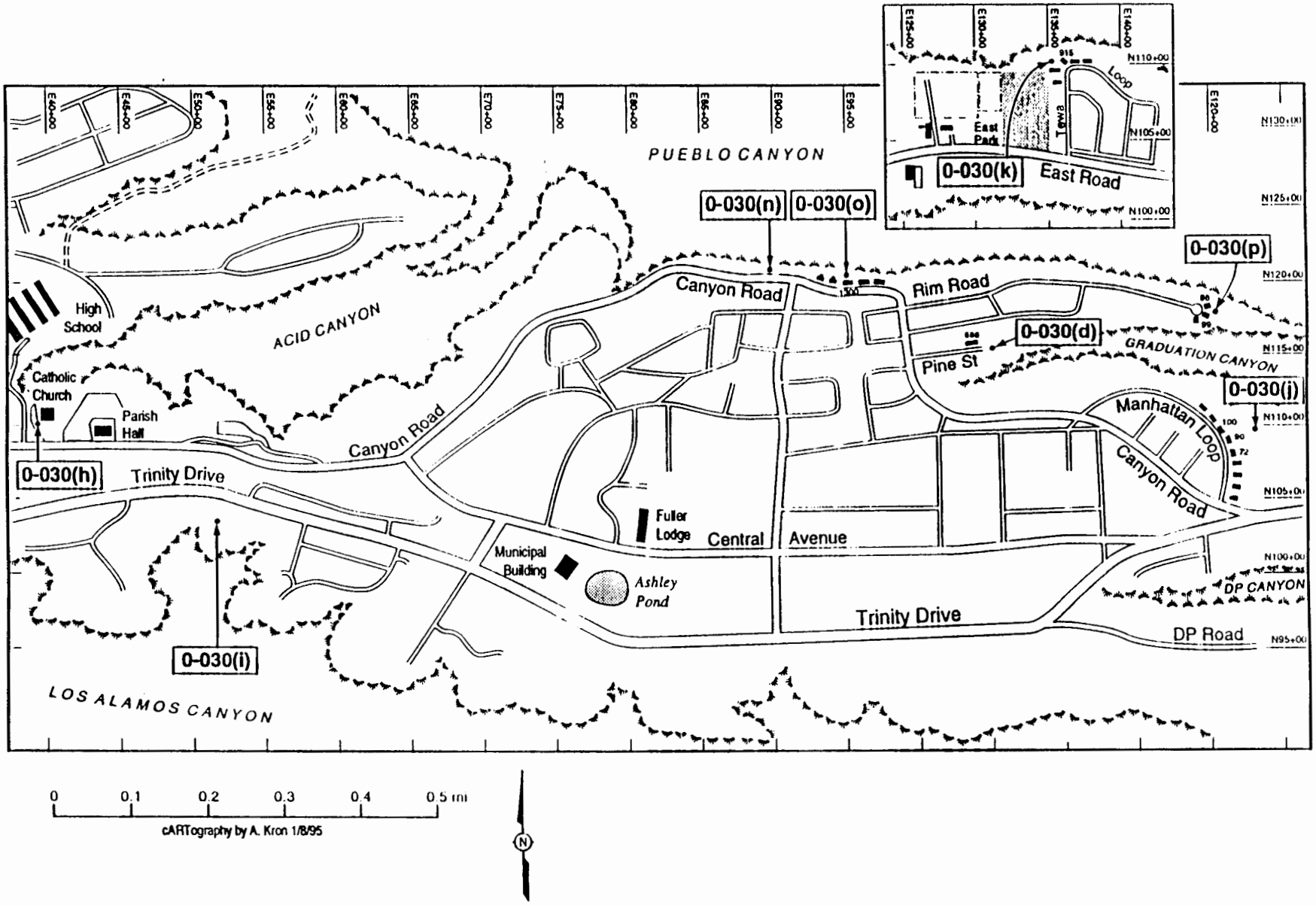


Figure 1. Locations of septic systems in SWMU Group 0-3.

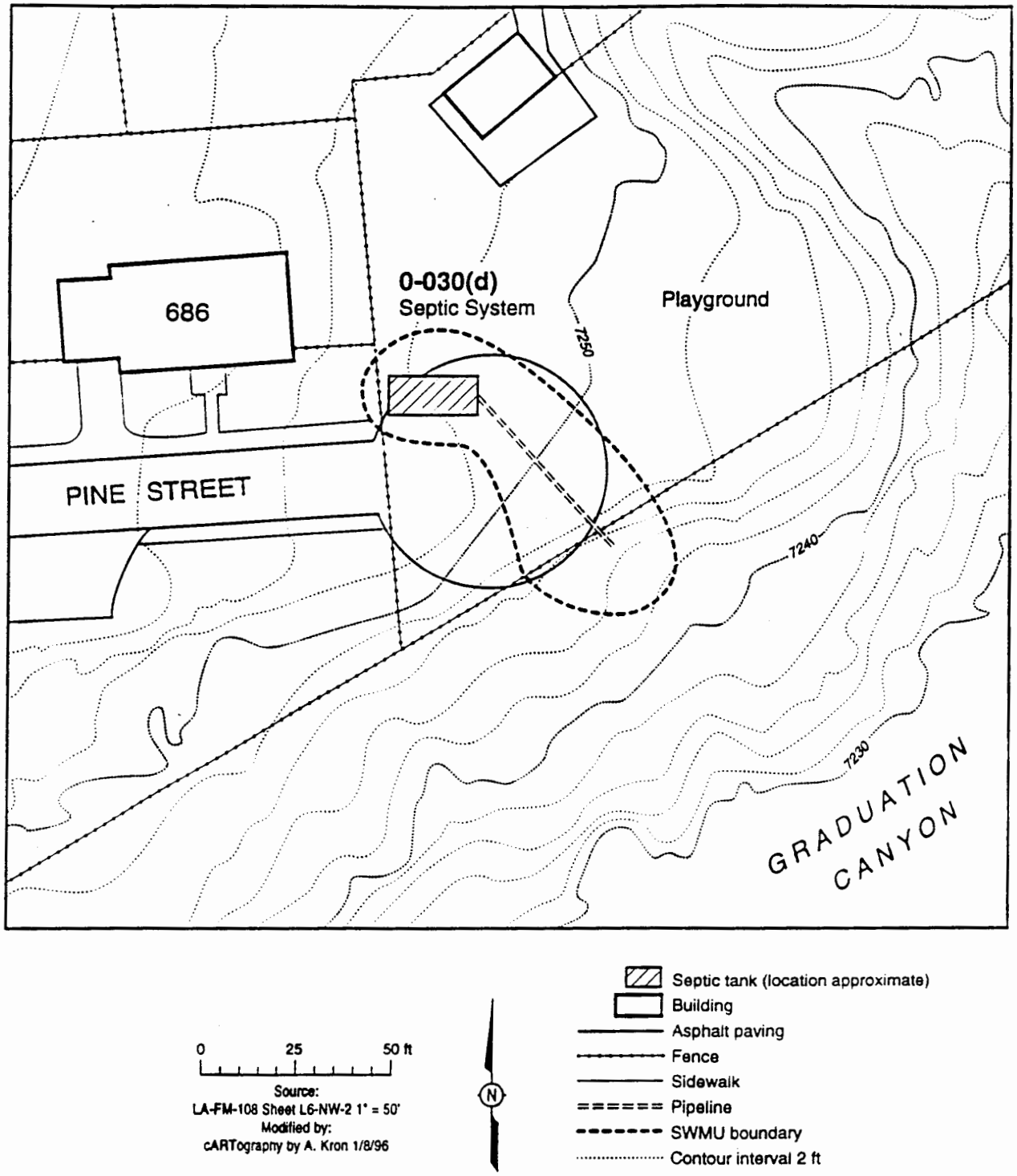


Figure 2. Location of septic system in SWMU 0-30(d).

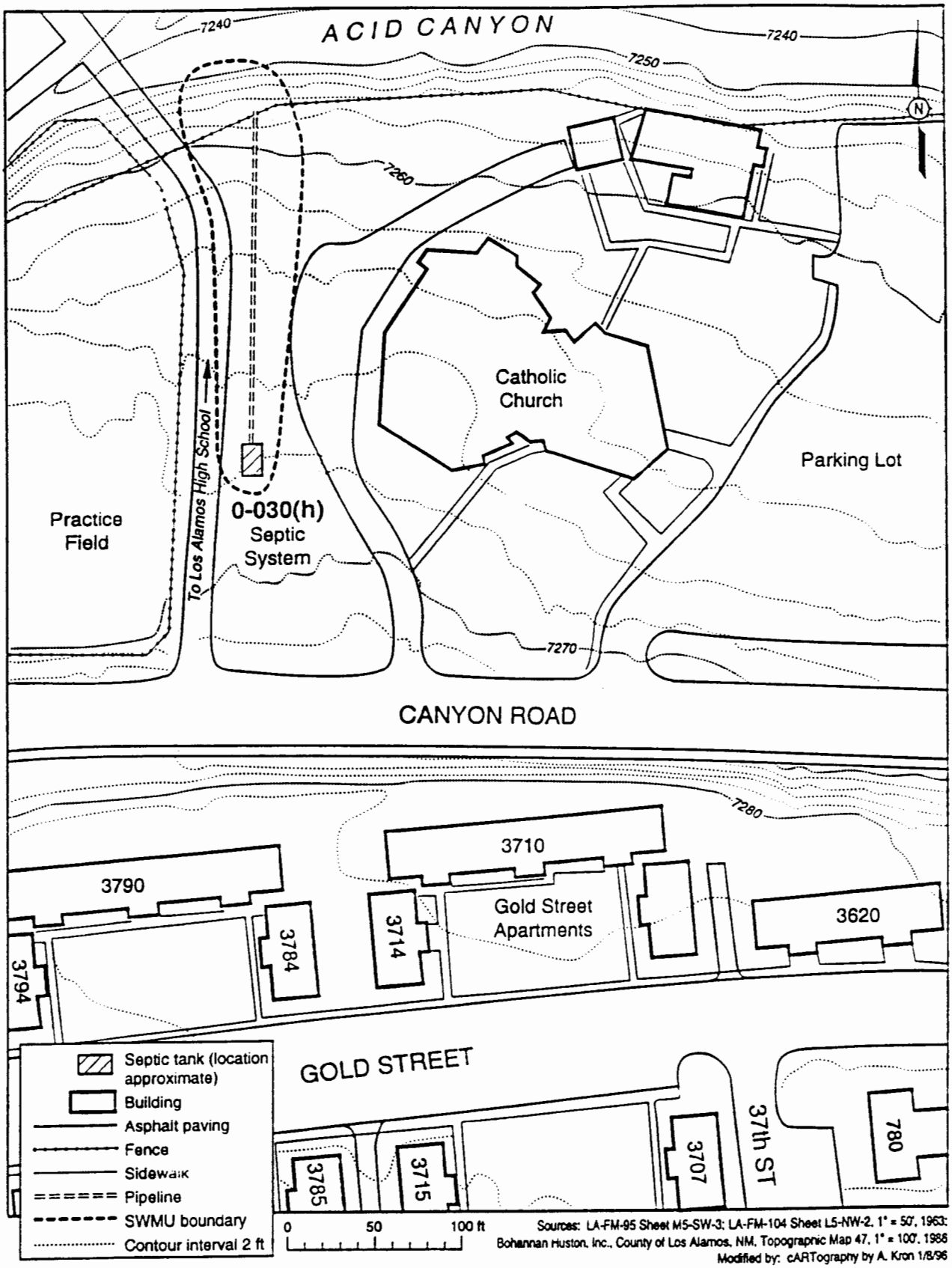


Figure 3. Location of septic system in SWMU 0-30(h).

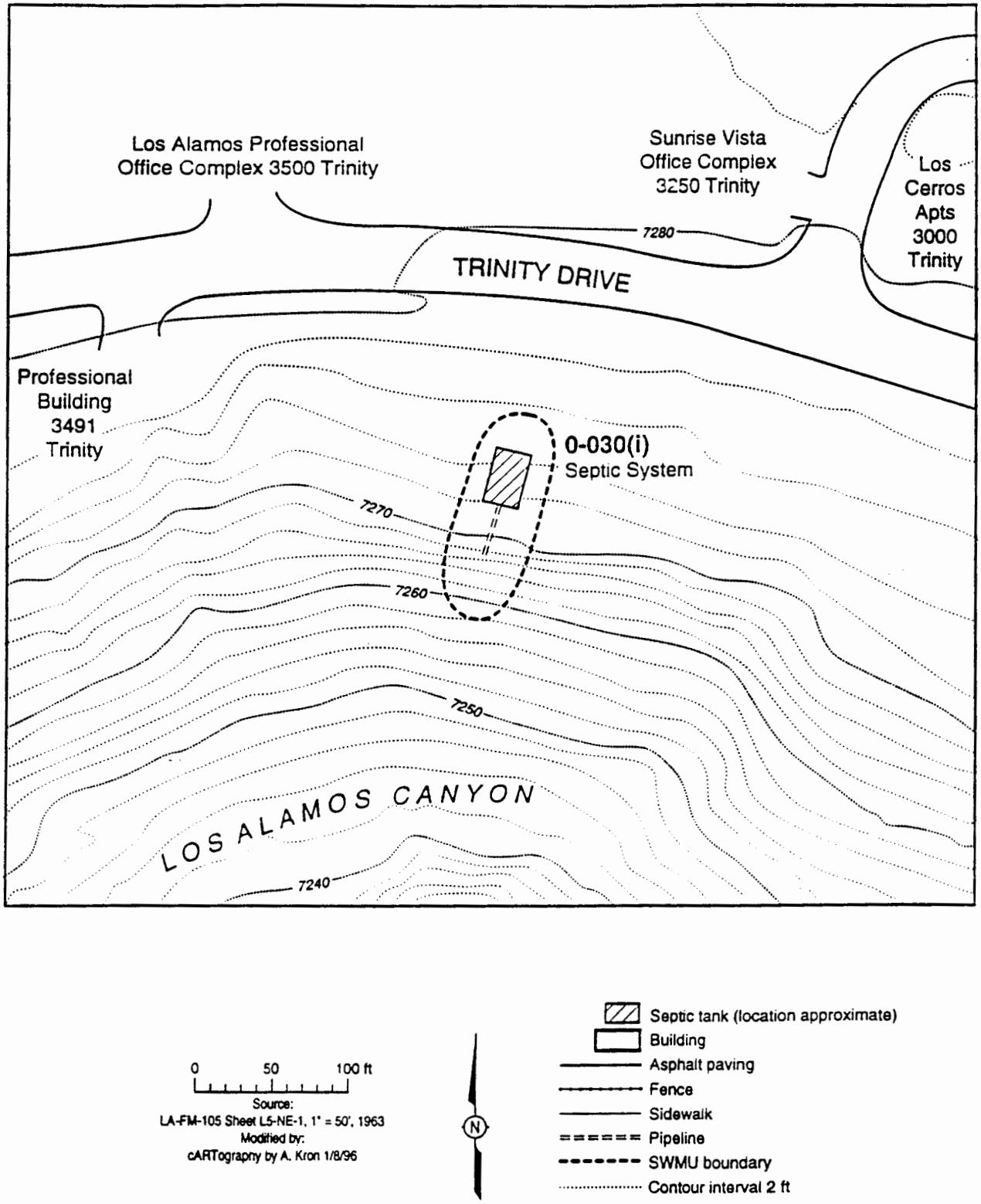


Figure 4. Location of septic system in SWMU 0-30(i).

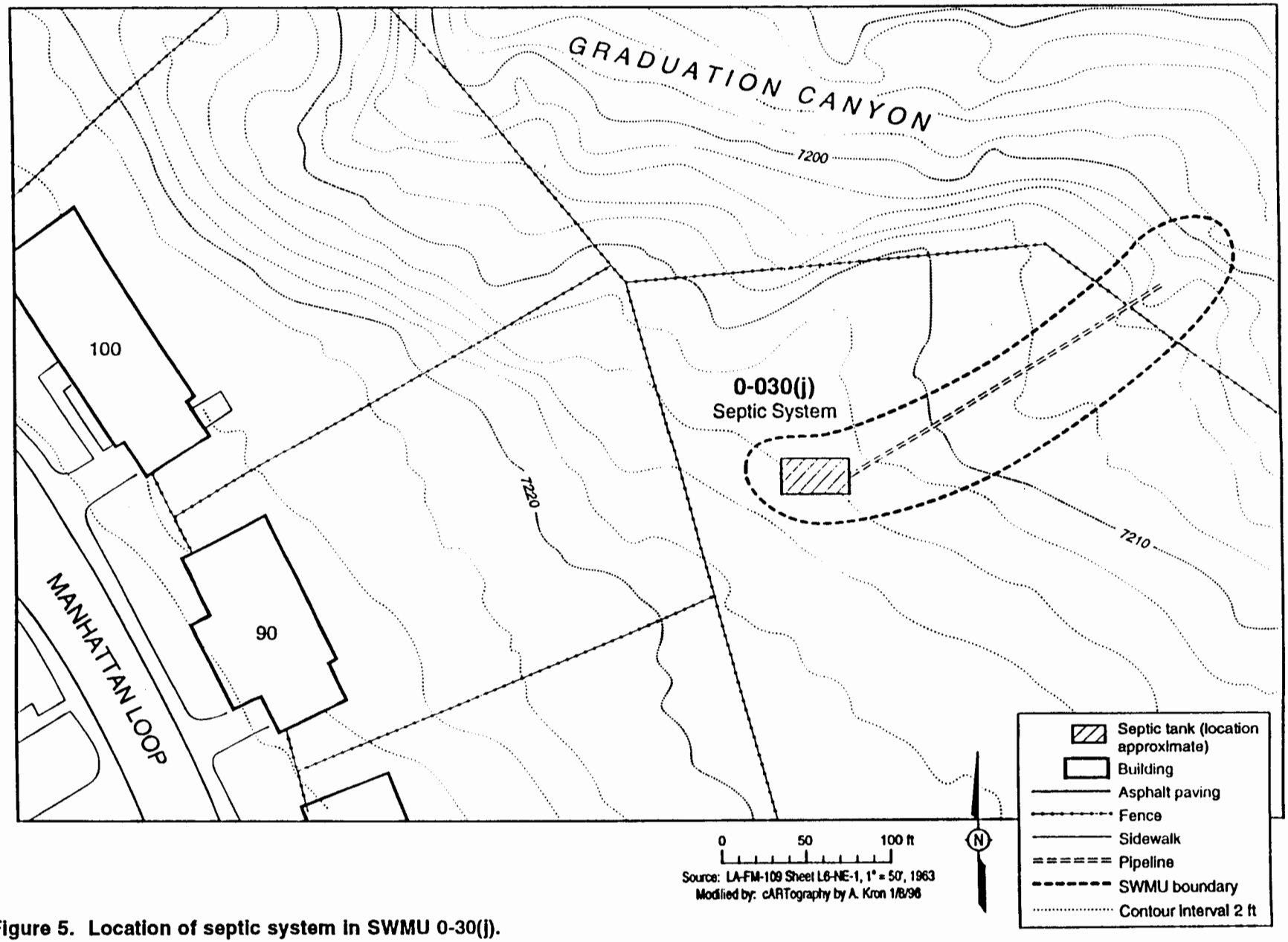
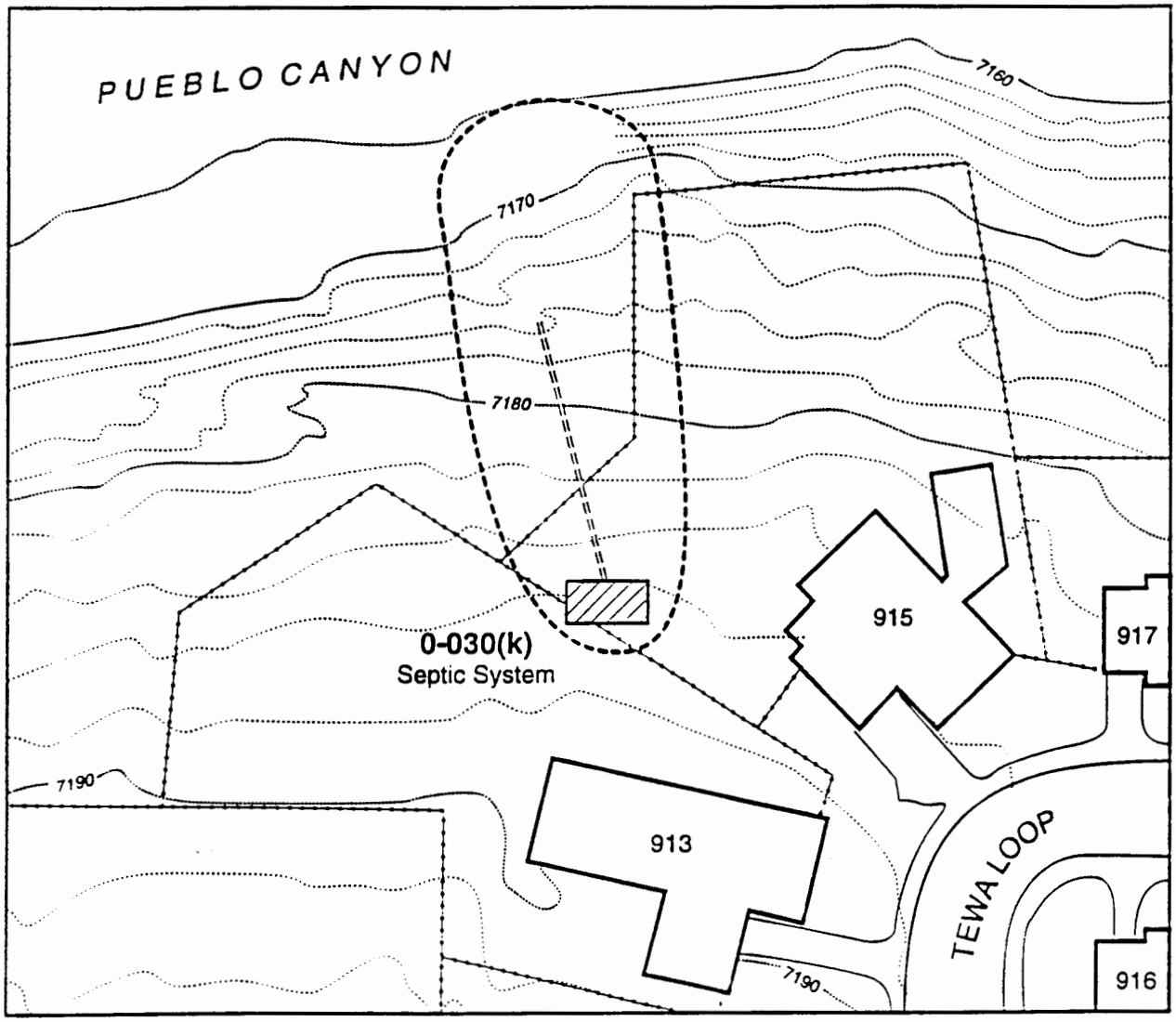


Figure 5. Location of septic system in SWMU 0-30(j).



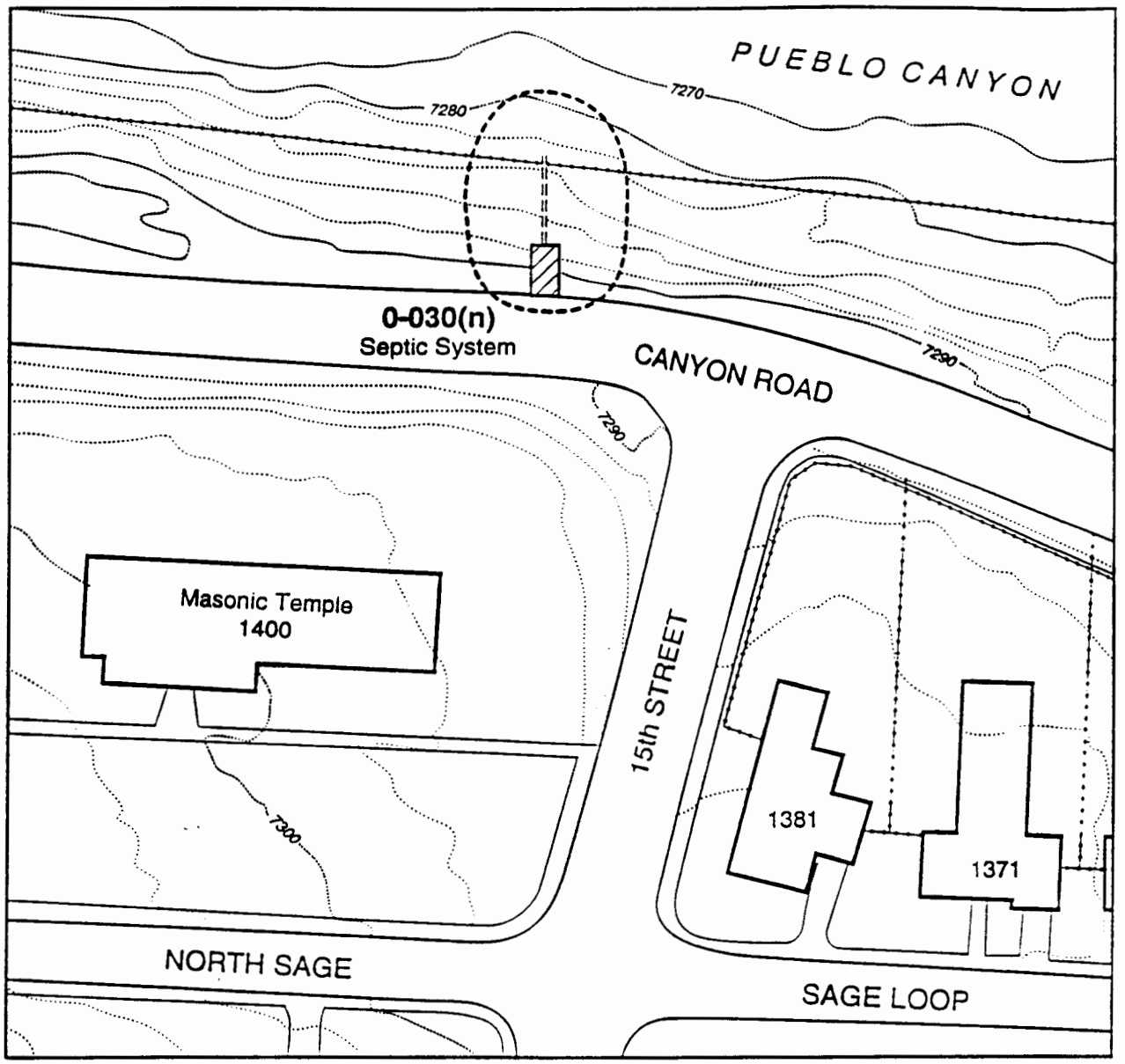
0 50 100 ft

Source:
LA-FM-110 Sheet L6-NE-2, 1' = 50', 1963
Modified by:
cARTography by A. Kron 1/8/96

N

Septic tank (location approximate)
Building
Asphalt paving
Fence
Sidewalk
Pipeline
SWMU boundary
Contour interval 2 ft

Figure 6. Location of septic system in SWMU 0-30(k).



0 50 100 ft

Source:
LA-FM-98 Sheet M6-SW-4, 1" = 50', 1963
Modified by:
cARTography by A. Kron 1/8/96

N

Septic tank (location approximate)
Building
Asphalt paving
Fence
Sidewalk
Pipeline
SWMU boundary
Contour interval 2 ft

Figure 7. Location of septic system in SWMU 0-30(n).

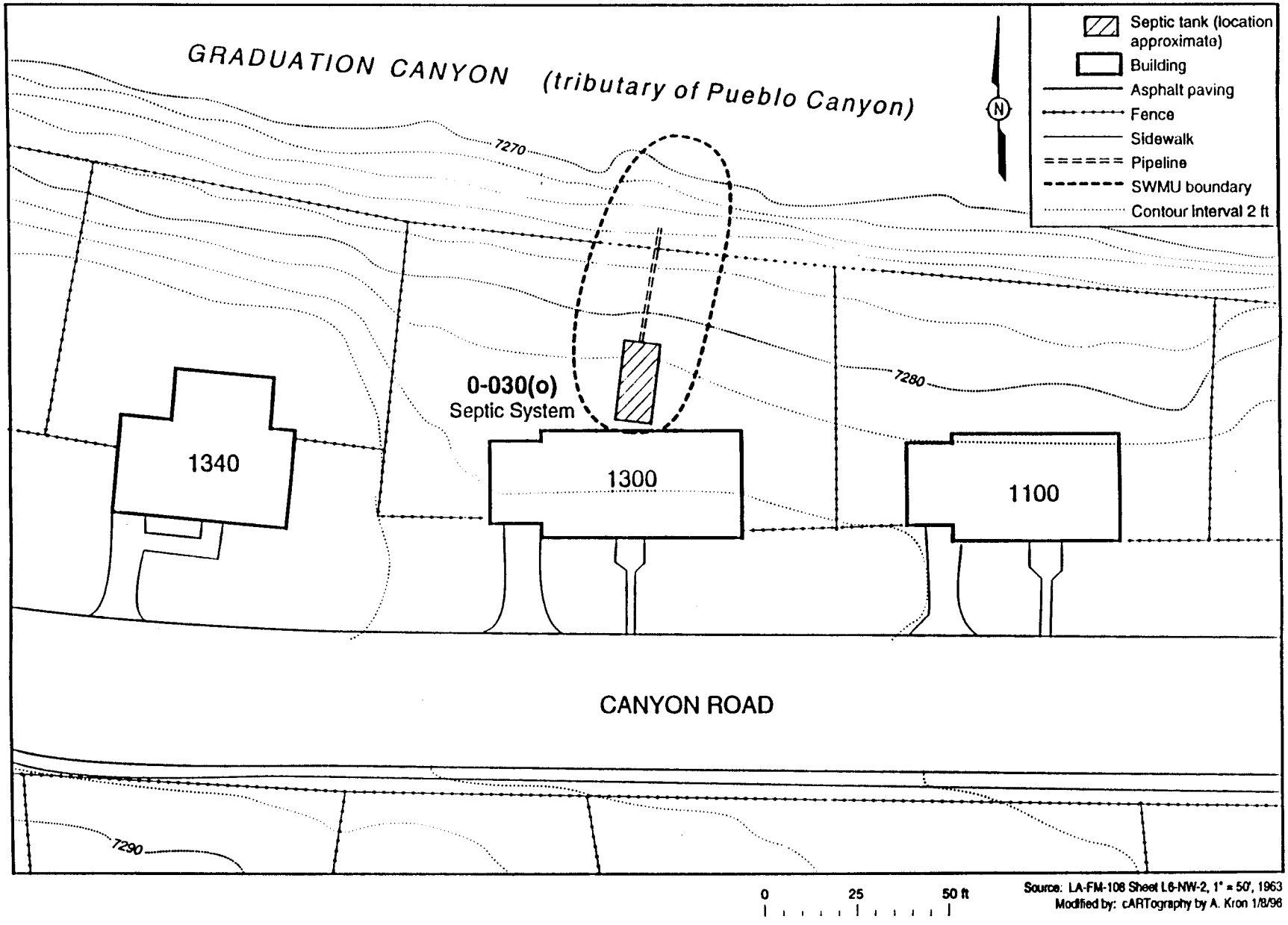


Figure 8. Location of septic system in SWMU 0-30(o).

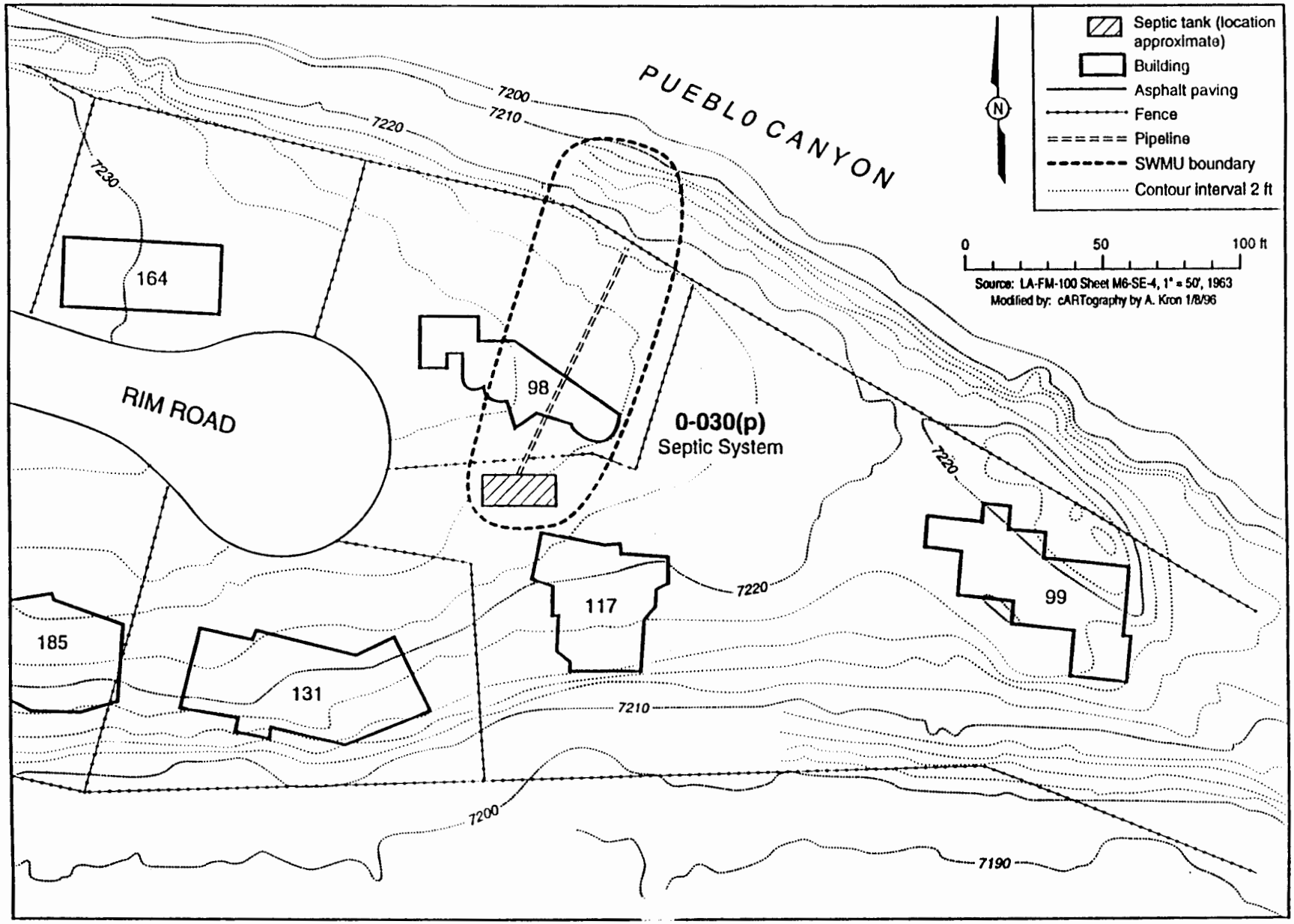


Figure 9. Location of septic system in SWMU 0-30(p).

Annex 7.4 Implementation SOPs

ANNEX 7.4

Implementation SOPs

The SOPs applicable to the precharacterization and VCA activities at PRSs 0-030 (d, h, i, j, k, n, o, p) are listed below:

GENERAL

ER-SOP-01.01	General Instructions for Field Investigations
ER-SOP-01.02	Sample Container and Preservation
ER-SOP-01.03	Handling, Packaging and Shipping of Samples
ER-SOP-01.04	Sample Control and Field Documentation
ER-SOP-01.05	Field Quality Control Samples
ER-SOP-01.06	Management of RFI-Generated Waste
ER-SOP-01.08	Field Decontamination of Drilling and Sampling Equipment

RECONNAISSANCE/FIELD SURVEY

ER-SOP-03.02	General Surface Geophysics
ER-SOP-03.12	Field and Laboratory Notebook Documentation for Environmental Restoration Earth Science Studies

SAMPLING TECHNIQUES

ER-SOP-06.09	Spade and Scoop Method for Collection of Soil Samples
ER-SOP-06.10	Hand Auger and Thin-Wall Tube Sampler
ER-SOP-06.18	Collection of Sand, Packed Powder, or Granule Samples Using the Hand Auger

See Environmental Restoration Standard Operating Procedures, Volumes I and II, November 17, 1993, Los Alamos National Laboratory.

Annex 7.5 Quality Assurance Plan

ANNEX 7.5

Quality Assurance Plan

See Quality Program Plan and Quality Assurance Project Plan for Environmental Restoration, February 1995 revision, Los Alamos National Laboratory.

Annex 7.6 Site-Specific Health and Safety Plan

ANNEX 7.6

Site-Specific Health and Safety Plan

See the site-specific Health and Safety Plan (attached), February 1996, and the Los Alamos Laboratory Environmental Restoration Project Health and Safety Plan, February 11, 1995, Los Alamos National Laboratory.

LANL ER PROJECT
SITE-SPECIFIC HEALTH AND SAFETY PLAN (SSHASP)

Project Title: Field Unit 1, SWMU 0-030(d,h,i,j,k,n,o,p) Septic Tanks

This plan addresses the health and safety criteria to be followed during investigation, remediation or decommissioning activities associated with the Environmental Restoration (ER) Project at the Los Alamos National Laboratory (LANL)

Reviewed and Approved by:

Signature	Name/Title	Company	Date
	Joe Lanik/FH	LANL	2/6/96

Field Unit Health and Safety (HS) Representative

Signature	Name/Title	Company	Date
	Pat LaFrate / HP	LANL ESH-1	2/7/96

Health Physics Operations ESH-1

Signature	Name/Title	Company	Date
	JAYNE BRADLEY / FTM	ERM/GOLDER	2/6/96

FTM/DPL or FTL/JS (optional at discretion of FPL)

Signature	Name/Title	Company	Date
	TERRY RUST / FOM	LANL/ESH-14	2/7/96

Field Project Leader (FPL)

Concurrence by:

Signature	Name/Title	Company	Date

Geophex

Signature	Name/Title	Company	Date
	PARTY CHIEF / SURVEYOR	SURV-TEK	26 FEB 96

Surv-Tek

Signature	Name/Title	Company	Date
	Kevin Hyde / H&S Coordinator	ART	28 Feb 96

Subcontractor Management or HS Representative

Signature	Name/Title	Company	Date

Other

The comments of the above reviewers have been incorporated as stipulated, or resolved with written record and copy to the respective reviewer.

Plan Preparer Name/Signature	Group	Date	Mailstop	Phone
Clint Daymon / Clint Daymon	ERM/Golder	2/6/96	M 327	662-1326

Table of Contents

Section		Page
Table of Contents		i
List of Tables		ii
List of Acronyms and Abbreviations		ii
1.0	Introduction	1-1
2.0	Background Information	2-1
3.0	Organization, Responsibilities, and Authority	3-1
4.0	Hazard Analysis	4-1
4.1	Project Personnel by Task	4-1
4.2	Hazard Substances of Occupational Health Concern	4-3
4.3	Hazard Assessment and Administrative/Engineering Controls	4-4
5.0	Site Controls	5-1
6.0	Exposure Monitoring and Corresponding Actions	6-1
6.1	Direct-Reading Instruments	6-1
6.2	Personal Dosimetry	6-4
6.3	Area Sampling	6-5
7.0	Personal Protective Equipment	7-1
8.0	Decontamination	8-1
9.0	Emergency/Incident Action Plan	9-1
9.1	Adjacent Facilities of Concern	9-1
10.0	Training	10-1
11.0	Medical Surveillance	11-1
12.0	Quality Control and Quality Assurance (QC/QA)	12-1
13.0	Recordkeeping	13-1

Appendices

A	Map(s) of Site Locations, Adjacent Facilities and Site Control Zones/Facilities	A-1
B	Hazardous Substance Hazard Assessment	B-1
C	Chemical, Physical, and Toxicological Properties of Hazardous Chemical Substances	C-1
D	Emergency Contacts and Route(s) to Medical Services	D-1

List of Tables

Table 2-1 Site Description(s) 2-1
Table 2-2 Scope of Work 2-8
Table 3-1 Key Personnel Having HS Responsibility 3-1
Table 4-1 Project Personnel by Task 4-1
Table 4-2 Hazardous Substances of Occupational Health Concern 4-3
Table 4-3 Hazard Assessment and Administrative/Engineering (A&E) Controls 4-4
Table 5 Site Control Measures 5-1
Table 6-1 Direct-Reading Instrument Requirements 6-1
Table 6-2 Personal Dosimetery Requirements 6-4
Table 6-3 Area Sampling Requirements 6-5
Table 7 Personal Protective Equipment 7-1
Table 8 Personnel and Equipment Decontamination 8-1
Table 9 Incident/Emergency Action Requirements 9-1
Table 10 Training Requirements 10-1
Table 11 Medical Surveillance Requirements 11-1
Table 12 Inspection Requirements 12-1
Table 13 Recordkeeping Requirements 13-1

List of Acronyms and Abbreviations

ACGIH ..... American Conference of Governmental Industrial Hygienists
ALARA ..... As Low As Reasonably Achievable
AL ..... Action Level
ANSI ..... American National Standard Institute
APR ..... Air-Purifying Respirator
AR ..... Administrative Requirements
ATM ..... Atmosphere
°C ..... Degrees Centigrade
CFR ..... Code of Federal Regulations
CGI ..... Combustible Gas Indicator
CP ..... Competent Person
CPR ..... Cardiopulmonary Resuscitation
CRZ ..... Contamination Reduction Zone
DAC ..... Derived Air Concentration
dBA ..... Decibels (A-Weighted Scale)
DOE ..... U.S. Department of Energy
DOT ..... U.S. Department of Transportation
DPL ..... Decommissioning Project Leader
EPA ..... U.S. Environmental Protection Agency
ER ..... Environmental Restoration
ESH ..... Environmental, Safety and Health
ESH-1 ..... Health Physics Operations Group
ESH-2 ..... Occupational Medicine Group
ESH-5 ..... Industrial Hygiene and Safety Group
ESH-12 ..... Policy and Program Analysis Group

eV ..... Electron Volts
EZ ..... Exclusion Zone
°F ..... Degrees Fahrenheit
Fibers/cc ..... Fibers Per Cubic Centimeter
FID ..... Flame Ionization Detector
FPL ..... Field Project Leader
FTL ..... Field Team Leader
FTM ..... Field Team Manager
GET ..... General Employee Training
HASP ..... Health and Safety Plan
HAZWOPER ..... Hazardous Waste Operations
HEPA ..... High Efficiency Particulate Air
HPT ..... Health Protection Technician
HS ..... Health and Safety
IARC ..... International Agency for Research on Cancer
IDLH ..... Immediately Dangerous to Life or Health
IHT ..... Industrial Hygiene Technician
IP ..... Ionization Potential
JS ..... Job Superintendent
LAMC ..... Los Alamos Medical Center
LANL ..... Los Alamos National Laboratory
LEL ..... Lower Explosive Limit
LP ..... Laboratory Procedure
$\mu g/M^3$ ..... Micrograms Per Cubic Meter
mg/M^3 ..... Milligrams Per Cubic Meter
mm ..... Millimeters
MSDS ..... Material Safety Data Sheet
MUC ..... Maximum Use Concentration
NIOSH ..... National Institute for Occupational Safety and Health
NRR ..... Noise Reduction Rating
OSHA ..... Occupational Safety and Health Administration
PAH ..... Polycyclic Aromatic Hydrocarbons
PEL ..... Permissible Exposure Limit
PF ..... Protection Factor
PID ..... Photoionization Detector
PNA ..... Polynuclear Aromatics
PPE ..... Personal Protective Equipment
PRS ..... Potential Release Site
RCT ..... Radiological Control Technician
RMMA ..... Radioactive Materials Management Area
RSP ..... Radiological Screening Personnel
RWP ..... Radiological Work Permit
SC ..... Spill Containment

SLM.....Sound Level Meter
SOP.....Standard Operating Procedures
SSHASP.....Site-Specific Health and Safety Plan
SSO.....Site Safety Officer
SUP.....Supervisor
SWMU.....Solid Waste Management Unit
SWP.....Special Work Permit
SZ.....Support Zone
TA.....Technical Area
TLD.....Thermoluminescent Dosimeter
TLV.....Threshold Limit Value
TWA.....8-Hour Time-Weighted Average

1.0 INTRODUCTION

This Site-Specific Health and Safety Plan (SSHASP) has been developed for the Environmental Restoration (ER) Project at the Los Alamos National Laboratory (LANL) to comply with applicable federal and state occupational health and safety (HS) requirements, including those of the U.S. Department of Energy (DOE). The DOE requires LANL to comply with the federal Occupational Safety and Health Administration (OSHA) requirements, although operations at LANL are not subject to the jurisdiction of OSHA. The ER Project has developed a generic Health and Safety Plan, the ER Project HASP, which establishes HS information and requirements applicable to ER field operations projectwide. In addition to the HASP, this SSHASP establishes site-specific HS information and requirements applicable to the scope of work described in Section 2.

ER participants are responsible for conducting work in accordance with applicable regulations. The term "ER participants" refers to anyone performing ER work, including LANL, subcontractors to LANL and their lower-tier contractors, consultants, and agents. In some cases in this document, LANL has chosen to invoke OSHA and LANL requirements which ordinarily may not apply to ER field operations (e.g., OSHA's general industry standards in Part 1910 of Title 29 of the Code of Federal Regulations [29 CFR 1910]). These choices were made on a case-by-case basis to maintain consistency with LANL's ALARA policy and to clarify LANL's expectations with regard to interpretable requirements of the multiple agencies governing ER work. Where there is concern that implementation of work orders or HS requirements would conflict with contract terms, or could unreasonably compromise the safety or health of an individual or the environment, such concerns should be brought to the attention of the Contract Administrator and the Field Unit HS Representative immediately. Failure to comply with terms of HS plans may constitute cause to stop activity or for issuance of a stop work order as specified in Section 3.4.2 of the HASP without cost or penalty to LANL.

This SSHASP shall be reviewed and approved in accordance with Section 1.2 of the HASP. Once this SSHASP has been approved, revisions will be tracked using a SSHASP modification form (Appendix B of the HASP) per Section 1.3 of the HASP. Modifications to this SSHASP may result in a change to the terms or scope of a subcontract. Completion of a SSHASP modification form is not the means for modifying the scope or terms of the project contract. To modify a contract, the Subcontractor shall notify the Contract Administrator and Field Unit HS Representative under the changes clause and shall not proceed with the change until a change order has been mutually agreed between the parties, or unless unilateral direction is given by the Contract Administrator.

2.0 BACKGROUND INFORMATION

Project Title:	Field Unit 1, SWMUs 0-030(d,h,i,j,k,n,o,p) Septic Tanks
TA:	0
Objective:	Ensure that the property is suitable for unrestricted use
Classification of Work:	Intrusive and Non-intrusive Activities

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

	SWMU 0-030 (d)	SWMU 0-030 (h)	SWMU 0-030 (i)	SWMU 0-030 (j)	SWMU 0-030 (k)	SWMU 0-030 (n)	SWMU 0-030 (o)	SWMU 0-030 (p)
	[redacted]							
Adjacent Facilities/Structure								
Roads/Highways	X	X	X	X	X	X	X	X
Buildings/Foundation	X			X	X	X	X	X
UST								
Below Ground Utilities (excavation permit review will be completed prior to intrusive work)								
Electric	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Cable	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Gas	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Phone	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Water	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Sewer	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
Other (specify)								
Above Ground Electric:								
<50kV								
>50kV								
>345kV								
Other(specify):								
Topography								
Canyon Bottom								
Canyon Slopes *[enter approx. % grade]*	15 %	5 %	18 %	10 %	13 %	9 %	17 %	3 %
Mesa Top	X	X	X	X	X	X	X	X
Rolling Hills								
Meadow								

DESCRIPTOR								
	SWMU 0-030 (d)	SWMU 0-030 (h)	SWMU 0-030 (i)	SWMU 0-030 (j)	SWMU 0-030 (k)	SWMU 0-030 (n)	SWMU 0-030 (o)	SWMU 0-030 (p)
	Characteristics							
Streams								
Other *[specify]*:								
Pathway of Release	*[for land and water indicate direction, e.g., N, NE, etc.]*							
Land	SE	N	S	NE	N	N	N	NE
Water	SE	N	SW	NE	N	N	N	NE
Air	X	X	X	X	X	X	X	X
Emergency	*[indicate "Y" or "N"]*							
Land	Y	Y	Y	Y	Y	Y	Y	Y
Air	Y	Y	Y	Y	Y	Y	Y	Y
Water	N	N	N	N	N	N	N	N
Onsite Facilities/Operations	*[where applicable indicate spatial dimensions]*							
Research								
Production								
Previous Release/Spill								
UST								
Firing Site								
Plating								
Landfill (municipal)								
Landfill (mixed waste)								
Storage (rad. mat'ls)								
Storage (chem. mat'ls)								
Storage (chem.. waste)								
Storage (rad. waste)								
Storage (mixed waste)								
Storage (petroleum products)								
Septic Tank	X	X	X	X	X	X	X	X
Previous ER Information and/or Data Available								
Knowledge of Process	X	X	X	X	X	X	X	X
Initial Scoping/ Reconnaissance	X	X	X	X	X	X	X	X
Phase I								
Phase II								
Analytical Data (screening)								
Analytical Data (validated)								
Risk Assessment								

DESCRIPTOR								
	SWMU 0-030 (d)	SWMU 0-030 (h)	SWMU 0-030 (i)	SWMU 0-030 (j)	SWMU 0-030 (k)	SWMU 0-030 (n)	SWMU 0-030 (o)	SWMU 0-030 (p)
	Characteristics							
VCA								
Remediation								
Other								
Previous Substances Used, Disposed, Detected, or Suspected								
HIGH EXPLOSIVES (HE)								
Not Applicable	X	X	X	X	X	X	X	X
RADIONUCLIDES	(indicate isotopes)							
Americium (^{241}Am)	X	X	X	X	X	X	X	X
Plutonium (^{238}Pu, $^{239/240}$Pu)	X	X	X	X	X	X	X	X
Polonium (^{210}Po)	X	X	X	X	X	X	X	X
INORGANIC CORROSIVE ACIDS/BASES								
Not Applicable	X	X	X	X	X	X	X	X
HALOGENS								
Not Applicable	X	X	X	X	X	X	X	X
METALS								
Lead	X	X	X	X	X	X	X	X
TAL Metals (Excluding lead)	X	X	X	X	X	X	X	X
MINERALS *(indicate %)*								
Not applicable	X	X	X	X	X	X	X	X
ORGANIC ACIDS								
Not Applicable	X	X	X	X	X	X	X	X
ALCOHOLS								
Not Applicable	X	X	X	X	X	X	X	X
ALDEHYDES								
Not Applicable	X	X	X	X	X	X	X	X
GASES								
Hydrogen Sulfide	X	X	X	X	X	X	X	X
Methane	X	X	X	X	X	X	X	X
HYDROCARBONS (Halogenated)								
Not Applicable	X	X	X	X	X	X	X	X
HYDROCARBONS (Non-halogenated)								
Not Applicable	X	X	X	X	X	X	X	X
HYDROCARBONS (Petro Based)								

DESCRIPTOR								
	SWMU 0-030 (d)	**SWMU 0-030 (h)**	**SWMU 0-030 (i)**	**SWMU 0-030 (j)**	**SWMU 0-030 (k)**	**SWMU 0-030 (n)**	**SWMU 0-030 (o)**	**SWMU 0-030 (p)**
	Characteristics							
Not Applicable	X	X	X	X	X	X	X	X
KETONES								
Not Applicable	X	X	X	X	X	X	X	X
PESTICIDES								
Not Applicable								
Other	X	X	X	X	X	X	X	X
PCBs								
Not Applicable								
Other	X	X	X	X	X	X	X	X
OTHER								
VOLATILES	All eight SWMU's consist of septic tanks and associated piping. No volatiles are expected to be found. As a safety precaution, monitoring will be conducted for VOCs with a PID (580 OVM w/11.7 lamp) during tasks 2-9, and 11.							
SEMI-VOLATILES	All eight SWMU's consist of septic tanks and associated piping. No semi-volatiles are expected to be found. As a safety precaution, monitoring will be conducted for SVOCs with a PID (580 OVM w/11.7 lamp) during tasks 2-9, and 11.							

TABLE 2-2
SCOPE OF WORK

Task ID	Task Description	Site ID(s)	Anticipated Dates/Duration
Task 1 - Field Survey	This task includes surveying to locate subsurface structure(s) (areas surrounding septic tanks, drain lines, leach field and areas with visual evidence that suggests contamination) and the placement of surface and subsurface sampling locations. A) Site Survey i) Records Review: Examination of historic photographs, maps, engineering plans. ii) Site Inspection (Non-intrusive): Locating buried structures in the field. iii) Locating and marking locations of buried structures. B) Geodetic Survey: Non-intrusive surveying services to lay out survey grids for geophysical survey C) Geophysical Survey: Subcontractor use of magnetic, electromagnetic, conductivity, and ground penetrating radar to locate buried structures. D) Geomorphologic Mapping: Locating and mapping outfall areas from the SWMUs septic systems.	0-030 (d,h,i,j,k,n,o,p)	January to February 1996/ 5 weeks
Task 2 - Septic Tank 030 (d)	This task involves the subsurface sampling at septic tank SWMU D-030(d): A) This sub-task will involve the placement of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Mobilization: Establishment of site control boundaries, equipment, and temporary storage area. ii) Heavy Equipment Operation: Mobilizing backhoe and associated heavy equipment to the field site. B) This sub-task will involve sampling of septic tank system, subsurface piping and marking the sampling locations. i) Septic Tank System: a) Interior Tank Sampling: The contents inside the tank (s) will be sampled using a hand-auger, and analyzed for potential contaminants of concern. It is not anticipated that it will be necessary to enter any of the tanks. b) Excavation: Subcontractor will remove surface soil to expose the top of the tank and subsurface piping utilizing a backhoe. May use backhoe to uncover buried structures or assist in locating structures if geophysics does not achieve adequate results. c) Subsurface Sampling: A hand auger will be used to obtain soil samples beneath the tank, beneath the subsurface piping, and in other potentially contaminated areas. d) Equipment and Personnel Decontamination: Use of dry, aqueous, and methanol decontamination procedures to clean potentially/actually contaminated equipment and personnel in the EZ or CRZ. ii) Geodetic Survey: Sample locations will be geodetically surveyed. C) This sub-task will involve the removal of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Demobilization: Removal of site control boundaries, equipment, and supplies. ii) Heavy Equipment Operation: Demobilizing backhoe and associated heavy equipment from the field site.	0-030 (d)	Summer 1996/ 2 to 3 weeks

Task ID	Task Description	Site ID(s)	Anticipated Dates/Duration
Task 3 - Septic Tank 030 (h)	This task involves the subsurface sampling at septic tank SWMU D-030(h): A) This sub-task will involve the placement of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Mobilization: Establishment of site control boundaries, equipment, and temporary storage area. ii) Heavy Equipment Operation: Mobilizing backhoe and associated heavy equipment to the field site. B) This sub-task will involve sampling of septic tank system, subsurface piping and marking the sampling locations. i) Septic Tank System: a) Interior Tank Sampling: The contents inside the tank (s) will be sampled using a hand-auger, and analyzed for potential contaminants of concern. It is not anticipated it will be necessary to enter any of the tanks. b) Excavation: Subcontractor will remove surface soil to expose the top of the tank and subsurface piping utilizing a backhoe. May use backhoe to uncover buried structures or assist in locating structures if geophysics does not achieve adequate results. c) Subsurface Sampling: A hand auger will be used to obtain soil samples beneath the tank, beneath the subsurface piping, and in other potentially contaminated areas. d) Equipment and Personnel Decontamination: Use of dry, aqueous, and methanol decontamination procedures to clean potentially/actually contaminated equipment and personnel in the EZ or CRZ. ii) Geodetic Survey: Sample locations will be geodetically surveyed. C) This sub-task will involve the removal of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Demobilization: Removal of site control boundaries, equipment, and supplies. ii) Heavy Equipment Operation: Demobilizing backhoe and associated heavy equipment from the field site.	0-030 (h)	Spring 1996/ 2 to 3 weeks
Task 4 - Septic Tank 030 (i)	This task involves the subsurface sampling at septic tank SWMU D-030(i): A) This sub-task will involve the placement of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Mobilization: Establishment of site control boundaries, equipment, and temporary storage area. ii) Heavy Equipment Operation: Mobilizing backhoe and associated heavy equipment to the field site. B) This sub-task will involve sampling of septic tank system, subsurface piping and marking the sampling locations. i) Septic Tank System: a) Interior Tank Sampling: The contents inside the tank (s) will be sampled using a hand-auger, and analyzed for potential contaminants of concern. It is not anticipated it will be necessary to enter any of the tanks. b) Excavation: Subcontractor will remove surface soil to expose the top of the tank and subsurface piping utilizing a backhoe. May use backhoe to uncover buried structures or assist in locating structures if geophysics does not achieve adequate results. c) Subsurface Sampling: A hand auger will be used to obtain soil samples beneath the tank, beneath the subsurface piping, and in other potentially contaminated areas. d) Equipment and Personnel Decontamination: Use of dry, aqueous, and methanol decontamination procedures to clean potentially/actually contaminated equipment and personnel in the EZ or CRZ. ii) Geodetic Survey: Sample locations will be geodetically surveyed. C) This sub-task will involve the removal of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Demobilization: Removal of site control boundaries, equipment, and supplies. ii) Heavy Equipment Operation: Demobilizing backhoe and associated heavy equipment from the field site.	0-030 (i)	Spring 1996/ 2 to 3 weeks

Task ID	Task Description	Site ID(s)	Anticipated Dates/Duration
Task 5 - Septic Tank 030 (j)	This task involves the subsurface sampling at septic tank SWMU D-030(j): A) This sub-task will involve the placement of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Mobilization: Establishment of site control boundaries, equipment, and temporary storage area. ii) Heavy Equipment Operation: Mobilizing backhoe and associated heavy equipment to the field site. B) This sub-task will involve sampling of septic tank system, subsurface piping and marking the sampling locations. i) Septic Tank System: a) Interior Tank Sampling: The contents inside the tank (s) will be sampled using a hand-auger, and analyzed for potential contaminants of concern. It is not anticipated that it will be necessary to enter any of the tanks. b) Excavation: Subcontractor will remove surface soil to expose the top of the tank and subsurface piping utilizing a backhoe. May use backhoe to uncover buried structures or assist in locating structures if geophysics does not achieve adequate results. c) Subsurface Sampling: A hand auger will be used to obtain soil samples beneath the tank, beneath the subsurface piping, and in other potentially contaminated areas. d) Equipment and Personnel Decontamination: Use of dry, aqueous, and methanol decontamination procedures to clean potentially/actually contaminated equipment and personnel in the EZ or CRZ. ii) Geodetic Survey: Sample locations will be geodetically surveyed. C) This sub-task will involve the removal of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Demobilization: Removal of site control boundaries, equipment, and supplies. ii) Heavy Equipment Operation: Demobilizing backhoe and associated heavy equipment from the field site.	0-030 (j)	Spring 1996/ 2 to 3 weeks
Task 6 - Septic Tank 030 (k)	This task involves the subsurface sampling at septic tank SWMU D-030(k): A) This sub-task will involve the placement of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Mobilization: Establishment of site control boundaries, equipment, and temporary storage area. ii) Heavy Equipment Operation: Mobilizing backhoe and associated heavy equipment to the field site. B) This sub-task will involve sampling of septic tank system, subsurface piping and marking the sampling locations. i) Septic Tank System: a) Interior Tank Sampling: The contents inside the tank (s) will be sampled using a hand-auger, and analyzed for potential contaminants of concern. It is not anticipated that it will be necessary to enter any of the tanks. b) Excavation: Subcontractor will remove surface soil to expose the top of the tank and subsurface piping utilizing a backhoe. May use backhoe to uncover buried structures or assist in locating structures if geophysics does not achieve adequate results. c) Subsurface Sampling: A hand auger will be used to obtain soil samples beneath the tank, beneath the subsurface piping, and in other potentially contaminated areas. d) Equipment and Personnel Decontamination: Use of dry, aqueous, and methanol decontamination procedures to clean potentially/actually contaminated equipment and personnel in the EZ or CRZ. ii) Geodetic Survey: Sample locations will be geodetically surveyed. C) This sub-task will involve the removal of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Demobilization: Removal of site control boundaries, equipment, and supplies. ii) Heavy Equipment Operation: Demobilizing backhoe and associated heavy equipment from the field site.	0-030 (k)	Summer 1996/ 2 to 3 weeks

Task ID	Task Description	Site ID(s)	Anticipated Dates/Duration
Task 7 - Septic Tank 030 (n)	This task involves the subsurface sampling at septic tank SWMU D-030(n): A) This sub-task will involve the placement of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Mobilization: Establishment of site control boundaries, equipment, and temporary storage area. ii) Heavy Equipment Operation: Mobilizing backhoe and associated heavy equipment to the field site. B) This sub-task will involve sampling of septic tank system, subsurface piping and marking the sampling locations. i) Septic Tank System: a) Interior Tank Sampling: The contents inside the tank (s) will be sampled using a hand-auger, and analyzed for potential contaminants of concern. It is not anticipated that it will be necessary to enter any of the tanks. b) Excavation: Subcontractor will remove surface soil to expose the top of the tank and subsurface piping utilizing a backhoe. May use backhoe to uncover buried structures or assist in locating structures if geophysics does not achieve adequate results. c) Subsurface Sampling: A hand auger will be used to obtain soil samples beneath the tank, beneath the subsurface piping, and in other potentially contaminated areas. d) Equipment and Personnel Decontamination: Use of dry, aqueous, and methanol decontamination procedures to clean potentially/actually contaminated equipment and personnel in the EZ or CRZ. ii) Geodetic Survey: Sample locations will be geodetically surveyed. C) This sub-task will involve the removal of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Demobilization: Removal of site control boundaries, equipment, and supplies. ii) Heavy Equipment Operation: Demobilizing backhoe and associated heavy equipment from the field site.	0-030 (n)	Spring 1996/ 2 to 3 weeks
Task 8 - Septic Tank 030 (o)	This task involves the subsurface sampling at septic tank SWMU D-030(o): A) This sub-task will involve the placement of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Mobilization: Establishment of site control boundaries, equipment, and temporary storage area. ii) Heavy Equipment Operation: Mobilizing backhoe and associated heavy equipment to the field site. B) This sub-task will involve sampling of septic tank system, subsurface piping and marking the sampling locations. i) Septic Tank System: a) Interior Tank Sampling: The contents inside the tank (s) will be sampled using a hand-auger, and analyzed for potential contaminants of concern. It is not anticipated that it will be necessary to enter any of the tanks. b) Excavation: Subcontractor will remove surface soil to expose the top of the tank and subsurface piping utilizing a backhoe. May use backhoe to uncover buried structures or assist in locating structures if geophysics does not achieve adequate results. c) Subsurface Sampling: A hand auger will be used to obtain soil samples beneath the tank, beneath the subsurface piping, and in other potentially contaminated areas. d) Equipment and Personnel Decontamination: Use of dry, aqueous, and methanol decontamination procedures to clean potentially/actually contaminated equipment and personnel in the EZ or CRZ. ii) Geodetic Survey: Sample locations will be geodetically surveyed. C) This sub-task will involve the removal of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Demobilization: Removal of site control boundaries, equipment, and supplies. ii) Heavy Equipment Operation: Demobilizing backhoe and associated heavy equipment from the field site.	0-030 (o)	Spring 1996/ 2 to 3 weeks

Task ID	Task Description	Site ID(s)	Anticipated Dates/Duration
Task 9 - Septic Tank 030 (p)	This task involves the subsurface sampling at septic tank SWMU D-030(p): A) This sub-task will involve the placement of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Mobilization: Establishment of site control boundaries, equipment, and temporary storage area. ii) Heavy Equipment Operation: Mobilizing backhoe and associated heavy equipment to the field site. B) This sub-task will involve sampling of septic tank system, subsurface piping and marking the sampling locations. i) Septic Tank System: a) Interior Tank Sampling: The contents inside the tank (s) will be sampled using a hand-auger, and analyzed for potential contaminants of concern. It is not anticipated that it will be necessary to enter any of the tanks. b) Excavation: Subcontractor will remove surface soil to expose the top of the tank and subsurface piping utilizing a backhoe. May use backhoe to uncover buried structures or assist in locating structures if geophysics does not achieve adequate results. c) Subsurface Sampling: A hand auger will be used to obtain soil samples beneath the tank, beneath the subsurface piping, and in other potentially contaminated areas. d) Equipment and Personnel Decontamination: Use of dry, aqueous, and methanol decontamination procedures to clean potentially/actually contaminated equipment and personnel in the EZ or CRZ. ii) Geodetic Survey: Sample locations will be geodetically surveyed. C) This sub-task will involve the removal of access corridor(s), perimeter security barrier(s), mobile field support office, supplies and sanitation facilities. Associated sub-tasks include: i) Demobilization: Removal of site control boundaries, equipment, and supplies. ii) Heavy Equipment Operation: Demobilizing backhoe and associated heavy equipment from the field site.	0-030 (p)	Summer 1996/ 2 to 3 weeks
Task 10 - On-Site Waste Management	On-site coordination of waste management, including identification, handling, transport, and disposition of non-hazardous, potentially hazardous and hazardous wastes. This task will be accomplished according to the Project-Specific Waste Characterization Strategy Form and may occur simultaneous with Tasks 2 through 9. Associated subtasks include: A) Containing and Labeling Wastes: DOT approved 55 gallon drums will be used for waste storage. Items too large to place in drums will be placed in larger approved containers such as roll-off bins. B) Transporting Waste Containers for Temporary Storage: During field activities, a temporary Waste Management Area will be located in the support zone. The waste containers will be transported off-site to an established temporary storage area and/or a <90 day storage area.	0-030 (d,h,i,j,k,n,o,p)	Spring to summer 1996
Task 11 - On-Going Monitoring	This task will occur concurrently with Tasks 2 through 9. On-going monitoring of surface and subsurface environmental samples. PPE initially will be at Level "D". PPE will be upgraded if conditions warrant. Upgrade of PPE level will depend on field screening of chemical compounds associated with the septic tanks, drain lines, leach fields and outfall areas during tasks 2 through 9. Associated sub-tasks include: A) Sample Monitoring/Screening: Volatile organic compounds will be monitored as necessary using a Photoionization detector (PID). A Combustible Gas/Oxygen meter (CGI) with hydrogen-sulfide indicator will be used as needed for septic tank sampling. Samples will be monitored for radiation using alpha and beta/gamma instruments. B) Exposure Monitoring: Real-time and integrated monitoring equipment will be used as necessary to monitor employee exposures to radiological (^{241}Am, $^{238,239}Pu$, ^{210}Po) and chemical (VOCs, SVOCs, lead, H_2S, CH_4) hazards.	0-030 (d,h,i,j,k,n,o,p)	Spring to summer 1996

Task ID	Task Description	Site ID(s)	Anticipated Dates/Duration
Task 12 - Incident Response	Response to an incident (i.e., rendering first-aid/CPR, hazardous substance release, fire, and spill containment) tasks will be performed as necessary and in accordance with Sections 7, 9 and 10 of the HASP and this SSHASP. This task includes the following subtasks: A) First-aid/CPR B) Fire Fighting C) Incident Response *[in accordance with 29 CFR 1926.65(q)(6)(ii)]* D) Spill Containment *[in accordance with 29 CFR 1926.65(q)(6)(ii)]*	0-030 (d,h,i,j,k,n,o,p)	As Needed.

3.0 ORGANIZATION, RESPONSIBILITIES, and AUTHORITY

Definition of HS roles, responsibilities, authorities, and lines of communication for key personnel identified below are defined in Section 3 of the HASP.

TABLE 3-1

KEY PERSONNEL HAVING HS RESPONSIBILITY

Title	Name	Organization	Phone/Pager
Property Owner Contacts			
SWMU 0-030 (d)	Los Alamos County	Playground at end of Pine St.	N/A
SWMU 0-030 (h)	Immaculate Heart of Mary	3700 Canyon Rd	662-6193
SWMU 0-030 (i)	DOE Land	West Trinity	N/A
SWMU 0-030 (j)	Los Alamos County	East of Manhattan Loop	N/A
SWMU 0-030 (k)	Fredrick & Jeanet Edeskuty	913 Tewa Loop	662-4545
SWMU 0-030 (k)	Carlos Romero	915 Tewa Loop	662-7658
SWMU 0-030 (n)	Los Alamos County	Canyon at 15th St.	N/A
SWMU 0-030 (o)	John & Louis Goldstein	1300 Canyon Rd	662-5066
SWMU 0-030 (p)	Siegfried Hecker	117 Rim Rd	662-9226
SWMU 0-030 (p)	Edward Hammel	99 Rim Rd	662-2147
Field Project Management			
Field Project Leader (FPL)	Garry Allen	LANL-ER	667-3394
Alternate to FPL	Terry Rust	LANL-ER	665-8843 104-8484
Field Team Manager (FTM)	Jayne Bradley	ERM/Golder	662-1335 989-6793
Field Team			
Field Team Leader (FTL)	Andrew Crowder	ERM/Golder	662-1338 820-4413
Site Safety Officer (SSO)/RSP	Scott Wimer	ERM/Golder	662-3700
Alternate Site Safety Officer (SSO)/RSP	Kevin Hyde	ERM/Golder	662-3700
Waste Manager	Jim Santo	ERM/Golder	662-3700
Geophysics	John Clough	Geophex	662-
Surveying	Kent Caldez	Surv-Tek	505-897-3366
Support Personnel			
ERM/Golder H&S Staff	Kevin Hyde	ERM/Golder	662-3700
ESH-1 RCT Support	Marty Peifer	LANL-ESH1	667-0083 104-6649
Field Unit HS Representative	Joe Louck	LANL-ESH5	665-5669 104-6959

LANL PAGER ACCESS # 665-9800 (for pagers that start with 104-xxxx)

4.0 HAZARD ANALYSIS

Provided in this section are the task-specific hazard analysis information and requirements in accordance with Section 4 of the HASP.

4.1 PROJECT PERSONNEL

The personnel identified below by role are expected to perform the task(s) indicated.

TABLE 4-1
PROJECT PERSONNEL BY TASK[1]

PERSONNEL ROLE	TASK(s)											
	1	2	3	4	5	6	7	8	9	10	11	12
FPL [includes alternate]	X	X	X	X	X	X	X	X	X	X	X	X
FTM	X	X	X	X	X	X	X	X	X	X	X	X
FTL	X	X	X	X	X	X	X	X	X	X	X	X
SSO/RSP		X	X	X	X	X	X	X	X	X	X	X
Onsite Waste Manager		X	X	X	X	X	X	X	X	X	X	
Surveyor	X	2B(ii)	3B(ii)	4B(ii)	5B(ii)	6B(ii)	7B(ii)	8B(ii)	9B(ii)			
Geologist		X	X	X	X	X	X	X	X	X	X	
Laborer		X	X	X	X	X	X	X	X	X	X	
Sampler		X	X	X	X	X	X	X	X	X	X	
Heavy Equipment Operator		X	X	X	X	X	X	X	X	X	X	

[1] Not all personnel are required on-site at all times during the give task. SSO required at a minimum when CRZ or EZ is to be entered or when monitoring or SSO specific inspections are required. In addition, site personnel may have multiple roles.

4.2 HAZARDOUS SUBSTANCES OF OCCUPATIONAL HEALTH CONCERN

Not all chemical products used to accomplish a task or contaminants at a particular site may pose an occupational health threat. The hazardous substances of occupational health concern are identified in this section by task and by class of substance, in accordance with Section 4.1 of the HASP. Results of a health hazard assessment of each chemical product and site contaminant identified in Table 2-1 and associated rationales are provided in Appendix B. Substances that have a hazard assessment resulting in either "possibly could occur", "probably will occur", or "likely to occur" and which are expected to result in injury or illness having a hazard severity of "minor", "major", or "catastrophic" are considered to pose an occupational health threat to personnel who may be exposed to these substances, and are included in Table 4-2. The key to the hazard assessment ratings is provided below. The chemical, physical and toxicological properties for each hazardous chemical substance of occupational health concern are provided in Appendix C. For each class of substances included in Table 4-2, the most hazardous substance is identified in Table 4-3 together with corresponding administrative and engineering controls.

Key to hazard assessment ratings:

Hazard Severity	Mishap Probability			
	Likely to Occur	**Probably will Occur**	**Possibly could Occur**	**Unlikely to Occur**
Catastrophic (i.e., death or life-threatening injury/illness from a single encounter)	Imminent	Imminent	Serious	Minor
Major (i.e., significant injury/illness resulting in irreversible harm)	Imminent	Serious	Moderate	Minor
Minor (i.e., injury or illness resulting in reversible harm not likely to threaten mobility, vision)	Serious	Moderate	Minor	Negligible
Negligible	Minor	Minor	Negligible	Negligible

TABLE 4-2
HAZARDOUS SUBSTANCES OF OCCUPATIONAL HEALTH CONCERN

Hazardous Chemical Products to be Used During Field Operations

The chemical products listed below are likely to be used for the tasks indicated, onsite or at satellite locations where field support operations occur. MSDSs for each product shall be kept readily available to users of these products, and shall be shared with other employer's employees onsite who may be affected by the hazardous products in accordance with 29 CFR 1926.65(b)(1)(iv) and (v) and 1926.65(i) and Section 4.2.2.3 of the HASP. It is LANL's policy that whenever feasible a less toxic product should be substituted for a more toxic product, especially for products having a carcinogen constituent.

HAZARDOUS SUBSTANCE	TASK(s)											
	1	2	3	4	5	6	7	8	9	10	11	12
Compressed Gases												
Isobutylene (PID)		Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Pentane (FID or LEL/O_2)		Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Hydrogen Sulfide (H_2S meter)		Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Decontamination Fluids												
Methanol		Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Fuels/Lubricants (Petroleum-Based Hydrocarbons)												
Diesel		Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Gasoline		Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Site Contaminants												
METALS												
Lead		Min	Min	Min	Min	Min	Min	Min	Min	Neg	Min	Min
GASES												
Hydrogen Sulfide		Min	Min	Min	Min	Min	Min	Min	Min	Neg	Min	Min
Methane		Min	Min	Min	Min	Min	Min	Min	Min	Neg	Min	Min
RADIOLOGICAL SUBSTANCES												
Americium (^{241}Am)		Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Plutonium (unspecified)		Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Polonium 210		Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min

4.3 HAZARD ASSESSMENT AND ADMINISTRATIVE / ENGINEERING CONTROLS

Hazards included in this section are those expected to result in one of the hazard assessment ratings defined below and could pose an occupational health threat to workers performing the associated task(s). The hazard assessments and rationales are indicated below with the corresponding administrative and engineering controls for protection from and mitigation of the hazards.

TABLE 4-3

HAZARD ASSESSMENT and

ADMINISTRATIVE and ENGINEERING (A&E) CONTROLS

Hazard	Task(s)	Hazard Assessment	Hazard Assessment Rationale	Administrative & Engineering Controls (Prevention/Mitigation Measures)
SAFETY AND HEALTH CONCERNS				
DRILLING/HEAVY EQUIPMENT OPERATION				
EXCAVATION/ TRENCHING	PERMIT REQUIRED for excavating/trenching > 1 foot; A&E controls shall be implemented in accordance with applicable LANL excavation permit (per LANL AR 1-12) and as specified below; contact Field Unit HS Representative to initiate permit process			
General	2 - 9	Min	Site will be inspected daily and as needed. Excavations will be kept open for a minimum amount of time. Open excavations are to be covered and demarcated during non-work periods.	Inspections by a competent person shall be made prior to start of work, as needed throughout shift and after every rain storm or other hazard increasing occurrence (29 CFR 1926.651) Appropriate engineering controls shall be implemented in accordance with 29 CFR 1926.651 whenever the stability of a structure adjoining an excavation may be endangered Excavated materials (spoils) shall be kept at least 2 ft. away from edge of excavation
Underground utilities - electrical./fire/explosion hazards	2 - 9	TBD	Utilities will be located by excavation permit. Site will be inspected daily and as needed. Excavations will be kept open for a minimum amount of time.	Estimated locations of utilities (i.e., sewer, telephone, gas, electric, water lines, etc.) shall be determined prior to excavating. Notify utility owners of intended work and request they demarcate on ground surface location(s) of underground utilities; have a field team member accompany utility owner rep. to identify intended excavation location(s) and to find out specifics of utility location(s). If utility owner cannot establish exact location of utility installation(s), excavating may proceed with caution provided detection equipment or other acceptable means to locate utility lines(s) are used. As excavating operations approach estimated location of underground utility, exact location of the installation shall be determined by safe and acceptable means (i.e., using hand held excavating equipment). While excavation is open, underground installations shall be protected, supported or shut off as necessary to safeguard site personnel. A temporary barrier around the excavation will be set up to safeguard site personnel, and the public.
Explosive/flammable environment	2 - 9, 12	Min	Ventilation of space will occur (either natural or mechanical, as necessary).	Adequate precaution shall be taken (e.g., ventilation in compliance with 29 CFR 1926.55(b) and 29 CFR 1926.57) to prevent personnel exposure to an atmosphere containing flammable gas ≥10% of the lower explosive limit (LEL).

TABLE 4-3

HAZARD ASSESSMENT and

ADMINISTRATIVE and ENGINEERING (A&E) CONTROLS (continued)

Hazard	Task(s)	Hazard Assessment	Hazard Assessment Rationale	Administrative & Engineering Controls (Prevention/Mitigation Measures)
Explosive/flammable environment (Cont)				
Oxygen deficiency/ hazardous atmosphere	2 - 9, 12	Min	Ventilation of space will occur (either natural or mechanical).	Where oxygen deficiency or a hazardous atmosphere could reasonably be expected to exist, the atmosphere in excavation/trench shall be tested prior to anyone entering excavation > 4 feet in depth: refer to Section 6.
HEAVY EQUIPMENT OPERATION				
Overhead electrical hazard	2 11	TBD	Administrative and engineering controls will be implemented if overhead lines exist.	During stationery operation, minimum clearance between live lines and any part of equipment or load: 10 ft for lines rated 50 kV; 10 ft + 0.4 in. for each 1 kV over 50 kV, or twice the length of line insulator, whichever is greater. In transit with no load and boom lowered, min. clearance: voltages < 50 kV: 4 ft min voltages 50 kV< x ≤345 kV : 10 ft min voltages 345 kV< x ≤750 kV: 16 ft min
Pinch points in rotating parts	2 - 9, 11	Min	Workers will be kept at a safe distance from moving parts	Heavy equipment shall be inspected for engineering controls in compliance with applicable sections of Subparts O of 29 CFR 1926 and 29 CFR 1910.
Vehicle operation/vehicular traffic accident	All	Mod	Training and proper instruction in use of vehicles will be performed but unknown lies in the operation of vehicles by other drivers. Site personnel to make eye contact with heavy equipment operator when approaching operating heavy equipment	Field team personnel exposed to vehicular traffic shall be provided with, and shall wear, warning vests or other suitable garments marked with or made of reflectorized or high-visibility material. Heavy equipment shall be inspected for engineering controls in compliance with applicable sections of Subparts O of 29 CFR 1926 and 29 CFR 1910.
ELECTRICAL	PERMIT REQUIRED; A&E controls shall be implemented in accordance with applicable requirements of Sections 4.2.2.1 and/or 4.2.2.8 of the HASP and as specified below for lockout/tagout of energized equipment: contact Field Unit HS Representative to initiate permit process. All extension cords shall be GFCI protected, and marked as tested(i.e. date and initial).			
Electrocution working with energized equipment (e.g., generator)	2 - 9, 11	Min	Wires and cords that are energized will be marked	Take preventative measures and identify and correct deficiencies in accordance with Subpart K of 29 CFR 1926 and Sections 4.2.2.1 and/or 4.2.2.8 of the HASP, as applicable.
CHEMICAL HAZARDS				

TABLE 4-3
HAZARD ASSESSMENT and
ADMINISTRATIVE and ENGINEERING (A&E) CONTROLS (continued)

Hazard	Task(s)	Hazard Assessment	Hazard Assessment Rationale	Administrative & Engineering Controls (Prevention/Mitigation Measures)
Chemical splashes - exposure to corrosives and/or substances toxic by skin absorption	2-11	Min	Possible irreversible injury could occur, but is unlikely	PPE (chemical protective clothing and/or eye/face protection) shall be used as specified for the corresponding task(s)/site(s) in section 7 Portable emergency eyewash: Emergency eyewashes must be located within 10 seconds and not more than 100 feet of travel distance of any source of chemical splash that may be corrosive or moderately to severely irritating to body tissue. They must have a capacity to be able to provide continuous flushing for the duration of time necessary to sufficiently flush the most hazardous substance for which the device is being specified. They shall also be inspected and flushed according to manufacturers instructions by the SSO or designee. Refer to ANSI Z358.1-1990 for further information.
Airborne Vapors	2-11	Negligible	Illness is unlikely to occur from exposure to the substances in the soil, as well, exposure above occupational limits is unlikely to occur in the breathing zone.	Compliance with 29 CFR 1926.55(b), 29 CFR 1926.57, and/or other applicable Chemical-specific standard(Table 2 of the HASP)
Flammable Fuel(Gasoline/Diesel)	2-11	Min	High flammability substances could result in minor to major injury/illness	Flammable/Combustible materials shall be stored in accordance with 29 CFR 1926.152 Vehicles/heavy equipment shall not be refueled while the engine is running, or in a spark or flame producing environment
RADIOLOGICAL HAZARDS				
Alpha Radiation	2 - 11	Min	Historic uses	Minimize exposure and maximize distance to source. Use handheld monitoring equipment.
Beta/Gamma Radiation	2 - 11	Min	Historic uses	Minimize exposure and maximize distance to source. Use handheld monitoring equipment.
BIOLOGICAL HAZARDS				
General	All	Min	Hantavirus, spiders, ticks,..., etc.	Refer to Table 1 of the HASP for information concerning various general hazards associated with occupational exposure to toxic and/or hazardous biological agents.
Occupational Exposure to Bloodborne Pathogens	All	Neg	Gloves and protective clothing to be used	Refer to Table 1 and Section 4.2.2.2 of the HASP .
PHYSICAL HAZARDS				
Excessive Noise	2 - 9	Min	Heavy equipment.	Whenever voice(s) must be raised to communicate between two or more persons located <3 feet of each other noise level likely exceeding PEL of 85 dBA; conduct noise monitoring per Section 6; also refer to Section 4.2.2.7 of HASP for additional requirements. Hearing conservation training will be conducted by ERM/Golder health and safety staff during the project kickoff meeting.
MISCELLANEOUS				

TABLE 4-3

HAZARD ASSESSMENT and

ADMINISTRATIVE and ENGINEERING (A&E) CONTROLS (continued)

Hazard	Task(s)	Hazard Assessment	Hazard Assessment Rationale	Administrative & Engineering Controls (Prevention/Mitigation Measures)
Fire/explosion hazards while using compressed gas cylinders for instrument calibration	2 - 9, 11	Min	Use of compressed gases will be done with tanks firmly secure and away from sparks	Handle cylinders with care (Refer to Safe Handling of Compressed Gases in Containers [CGA P-1-1984]).
Sanitation	All	Neg	Toilet will be located on-site if necessary, otherwise facilities at ERM/Golder offices will be utilized.	At least one toilet shall be provided on site for ≤ 20 field team personnel unless transportation is readily available to nearby off-site toilet facilities.
Uneven terrain, slips, trips, falls	All	Min	Areas pointed out during tailgate safety meetings	Use caution and be observant while moving in areas of potential concern; minimize threat of slick surfaces.

5.0 SITE CONTROLS

In accordance with Section 5 of the HASP, the required site control measures are specified below for each task or group of tasks having different requirements. Any exceptions or deviations from requirements of the HASP are noted below. Site map(s) are provided in Appendix A to show where the following site control measures will be located. Since some zone or facility locations may change as site work progresses due to daily variability in site conditions and/or operations (e.g., wind or access), actual locations are to be explained to field team members by the SSO, or the FTL during daily HS tailgate meetings and documented in the logbook kept by the SSO.

TABLE 5
SITE CONTROL MEASURES

CONTROL MEASURES	TASK(S)
	1
Exclusion Zone (EZ)	Not applicable
Contamination Reduction Zone (CRZ)	Not applicable
Support Zone (SZ)	Located on site. No demarcation necessary.
Equipment Staging Area	Located within SZ on site. No demarcation. Postings per Subpart G of 29 CFR 1926.
Equipment Decon Pad/Facility	Not applicable
Temporary Waste Storage Area	Not applicable
Support Trailer(s)	Located at work site in SZ, if needed. No demarcation needed.
Hand Wash Facility	Located on site in SZ.
Toilet Facility	ERM/Golder office facilities will be used. If necessary toilet facilities will be set up on-site in support zone.

TABLE 5 (continued) SITE CONTROL MEASURES	
CONTROL MEASURES	**TASK(S)** **2 Through 12**
Exclusion Zone (EZ)	Located on site. Demarcated by cones and barrier tape. Postings per Subpart G of 29 CFR 1926.
Contamination Reduction Zone (CRZ)	Located on site. Demarcated by cones and barrier tape. Postings per Subpart G of 29 CFR 1926.
Support Zone (SZ)	Located on site. No demarcation necessary.
Equipment Staging Area	Located within SZ on site. No demarcation. Postings per Subpart G of 29 CFR 1926.
Equipment Decon Pad/Facility	Located within CRZ on site. Demarcated by cones and barrier tape. Postings per Subpart G of 29 CFR 1926.
Temporary Waste Storage Area	Located on site in support zone. . Demarcated by cones and barrier tape. Postings per Subpart G of 29 CFR 1926.
Support Trailer(s)	Located at work site in SZ. No demarcation needed.
Hand Wash Facility	Located on site in CRZ.
Toilet Facility	ERM/Golder office facilities will be used. If necessary toilet facilities will be set up on-site in support zone.

6.0 EXPOSURE MONITORING AND CORRESPONDING ACTIONS

In accordance with Section 6 of the HASP, personnel exposure monitoring requirements, action levels, and the corresponding actions to be taken are specified in the tables in this section (Tables 6-1, 6-2, and 6-3) for each task or group of tasks having different requirements.

6.1 DIRECT-READING INSTRUMENTS

Requirements for exposure monitoring using direct-reading instruments and the corresponding action levels and response actions are specified in Table 6-1 for each task or group of tasks having different requirements, action levels or responses. These requirements, levels, and actions are set in accordance with Section 6 of the HASP. Any exceptions or deviations from requirements of the HASP are noted where applicable.

TABLE 6-1
DIRECT-READING INSTRUMENT REQUIREMENTS

Hazardous Condition/ Substance	Task(s)	Instrument	Procedure	Location and Frequency of Monitoring	Action Level(s)	Response Action(s)	Action Level Rationale
				HEALTH PHYSICS			
Radiation Gross α, gross-β/γ (specific radio-isotopes listed in Table 4-2)	2BC, 3BC, 4BC, 5BC, 6BC, 7BC, 8BC, 9BC, 10, 11	β /γ Eberline ESP-1 with HP-260 probe or equiv. α -Ludlum 139 with air proportional probe or equiv. μR meter	Per LANL RadCon Manual and training ESH-1 Procedures Manual	Surface Sampling/Excav a-tions: Excavated soil, ground surface prior to disturbance, and excavated soil/material	Background	Field team member trained in ESH-1 procedures performs surveys (soil, core, personnel, etc.); Intermittent ESH-1 coverage; Large area swipes for α (2000 cm^2) counted using field alpha screening instrument; direct frisk for β/γ.	Standard levels set by ESH-1
				Non-intrusive Activities: Ground surface near source (as applicable based on potential for soil contamination) Personnel: Prior to exiting EZ, CRZ.	> Background α < 500 cpm/probe area β/γ < 5,000 cpm/probe area	Notify ESH-1 of elevated readings; Dedicated field team member trained in ESH-1 procedures performs surveys (soil, core, personnel, etc.); Increased intermittent ESH-1 coverage; α swipes counted using Ludlum 2000 tray counter or equiv.; direct frisk for β/γ.	Standard levels set by ESH-1
				Equipment: Prior to decon and for release	Action Level II: Any smearable contamination on equipment and any detectable activity on personnel above NDA α > 500 cpm/probe area β/γ > 5,000 cpm/probe area Dose >5mR/hr	Work may only proceed according to approved RWP and with full-time onsite ESH-1 technician (or equiv.) in accordance with Sections 3.2.4 and 3.3.4 of the HASP.	Standard levels set by ESH-1

TABLE 6-1 (continued)
DIRECT-READING INSTRUMENT REQUIREMENTS

Hazardous Condition/ Substance	Task(s)	Instrument	Procedure	Location and Frequency of Monitoring	Action Level(s)	Response Action(s)	Action Level Rationale
PHYSICAL CONDITION							
Noise	2 - 11	Sound level meter	Appendix F of the HASP Other	Only monitor non-LANL employees; contact Field Unit HS Rep. if LANL employees need monitoring. Noise measurements required when voice must be raised to communicate between two persons located ≤ 3 feet from each other; monitor hearing zone(s) of employees affected by excessive noise. 1st day of occurrence & whenever operations change warrant monitoring: Sound Level Meter initial measurement and at 30 minute intervals while excessive noise condition persists.	85 dBA (Non-LANL employees only) 80 dBA (Hearing Conservation Program LANL employees only) 84 dBA (Hearing protection required LANL employees only) 90 dBA (Hearing protection required non-LANL employees only)	≥ Action Level: Implement appropriate engineering control(s) per Table 4-3; if unable to lower noise levels below AL, demarcate/post zones of excessive noise and limit access only to employees having sufficient hearing protection training, medical surveillance, and hearing protection per this SSHASP	OSHA 29 CFR 1910.95 for non-LANL employees. Per DOE and LANL requirements for LANL employees.
Heat Stress	All	Reuter-Stokes WBGT Monitor or equivalent	Refer to ACGIH heat stress guidelines (pages 84 - 90; 1994-1995 TLV booklet)	In shaded area at work site	Refer to ACGIH heat stress guidelines (pages 84 - 90; 1994-1995 TLV booklet)	Frequent breaks if temperature are above 85° F. Cooling of skin by water and covering person with shade. Removal of clothes	Refer to ACGIH heat stress guidelines (pages 84 - 90; 1994-1995 TLV booklet)
Cold Stress	All	Thermometer, as needed	Refer to table 1 of the HASP	Monitoring of individuals at work site as necessary	Refer to table 1 of the HASP	Frequent breaks if temperatures are below 30° F. warming of skin by water and covering person with blanket.	Refer to table 1 of the HASP
INDUSTRIAL HYGIENE (CHEMICAL)							
VOCs, SVOCs	2BC, 3BC, 4BC, 5BC, 6BC, 7BC, 8BC, 9BC, 10A, 11	PID (11.7 eV lamp or higher)	Per manufacturer's recommendation and per the LANL ER Project Manual for Site H&S Activities	Surface & Subsurface Soil Sampling - Continuously near point(s) of sampling, periodically in employees' breathing zones, & downwind/ upwind as needed to characterize source/dispersion.	≥ 0.5 ppm above bkgd. for 5 minutes in breathing zone	Allow area(s) of concern to vent naturally or by implementing mechanical means per Table 4-3. If condition continues to exceed action level, limit EZ access to exposure monitoring personnel only.	Refer to Table 2 of the HASP

TABLE 6-1 (continued)
DIRECT-READING INSTRUMENT REQUIREMENTS

Hazardous Condition/ Substance	Task(s)	Instrument	Procedure	Location and Frequency of Monitoring	Action Level(s)	Response Action(s)	Action Level Rationale
Explosion, Oxygen Deficiency, Hydrogen Sulfide	2BC, 3BC, 4BC, 5BC, 6BC, 7BC, 8BC, 9BC, 10A, 11	CGI equipped with hydrogen sulfide sensor (e.g., MSA 361)	Per the LANL ER Project Manual for Site H&S Activities	Excavation/Trenching: Continuously near point(s) of excavation and inside septic tank(s).	Explosivity ≥10% LEL 19.5% > O_2 > 22% in breathing zone (BZ) H_2S ≥ 5 ppm in BZ	Limit access to area(s) and allow for natural ventilation or implement appropriate engineering control(s) per Table 4-3 until action level(s) no longer violated. Use of Level B PPE required for oxygen deficiency or exceedence of H_2S action levels (ALs). (NOTE: H_2S desensitizes nasal receptors and sense of smell becomes unreliable warning indicator)	Explosivity: DOE O_2: Per ANSI Z.88.2-1992 H_2S: 1/2 PEL

6.2 PERSONAL DOSIMETRY

Requirements for personal dosimetry and the corresponding action levels and response actions are specified in Table 6-2 for each task or group of tasks having different requirements, action levels or responses. These requirements, levels, and actions are set in accordance with Section 6 of the HASP and with the chemical-specific standards listed in Table 2 of the HASP. Any exceptions or deviations from requirements of the HASP are noted where applicable.

TABLE 6-2

PERSONAL DOSIMETRY REQUIREMENTS

Hazardous Condition	Task(s)	Procedure	Instrument/ Supplies	Action Levels	Action Level Rationale	Response Actions
PHYSICAL CONDITIONS						
Noise	2 - 10	Appendix F of the HASP per manufacturer's recommendations	Sound level meter	85 dBA Refer to table 6-1	Refer to Table 6-1	Refer to Table 6-1
INDUSTRIAL HYGIENE (CHEMICALS)						
None						

HEALTH PHYSICS (RADIATION) *[Refer to Section 6 of the HASP.]*

Hazardous Substance/ Condition	Task(s)	Action Level(s)	Dosimetry Requirement	Action Level(s) Rationale
External Sources of Radiation Exposure	All	Potential to exceed 100 mREM/year dose limit	Monthly TLD Badge	10 CFR 835
Internal Sources of Radiation Exposure	All	Potential to exceed 100 mREM/year dose limit	Bioassays may be required if conditions warrant and shall be specified by ESH-1/ESH-12 in the RWP.	10 CFR 835

6.3 AREA SAMPLING

Requirements for area sampling and the corresponding action levels and response actions are specified in Table 6-3 for each task or group of tasks having different requirements, action levels or responses. These requirements, levels, and actions are set in accordance with Section 6 of the HASP. Any exceptions or deviations from requirements of the HASP are noted where applicable. Note that the requirements of this table only pertain to occupational exposure monitoring. Environmental sampling requirements, if any, to evaluate spread of contamination to off-site locations should be provided in a site-specific document separate from this SSHASP.

TABLE 6-3

AREA SAMPLING REQUIREMENTS

Hazardous Condition/ Task(s)	Task(s)	Instrument/ Supplies	Location and Duration of Monitoring	Sampling/ Analytical Method	Action Level(s)/ Rationale	Response Action(s)
INDUSTRIAL HYGIENE (CHEMICALS)						
None (this is addressed in table 6-1)						

7.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

In accordance with Section 7 of the HASP, PPE requirements are specified below for each task or group of tasks having different requirements. Only personnel who are trained and qualified to use the equipment in accordance with Section 7 of the HASP and Section 10 of the HASP and SSHASP are allowed to use the equipment specified. Any exceptions or deviations from requirements of these sections are noted below.

TABLE 7
PPE REQUIREMENTS BY TASK

	TASKS												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Specifics**
HEAD	N/A	2A, B(i)(b), C(iii)	3A, B(i)(b), C(iii)	4A, B(i)(b), C(iii)	5A, B(i)(b), C(iii)	6A, B(i)(b), C(iii)	7A, B(i)(b), C(iii)	8A, B(i)(b), C(iii)	9A, B(i)(b), C(iii)	10 AB (if around heavy equip-ment)	11 AB (if around heavy equip-ment)	As needed	Hard hat required within heavy equipment area and/or EZ. Hat suggested during other tasks for sun protection.
EYES	N/A	All	All	All	All	All	All	All	All	All	All	As needed	Safety glasses required at all times while within the EZ.
BODY	N/A	2BC	3BC	4BC	5BC	6BC	7BC	8BC	9BC	ALL	ALL	As needed	Kleenguard/coveralls required at all times while within the EZ.
HANDS													
INNER-GLOVES	N/A	2BC	3BC	4BC	5BC	6BC	7BC	8BC	9BC	10A	All	As needed	Nitrile while in EZ and handling samples.
OUTER-GLOVES	N/A	2A	3A	4A	5A	6A	7A	8A	9A	10B	N/A	As needed	Cotton or Leather. Suggested for activities outside of EZ.
FEET	All	All	All	All	All	All	All	All	All	All	All	As needed	Safety shoes with steel toes.
EARS	N/A	All	All	All	All	All	All	All	All	All	All	As needed	Ear plugs/muffs required in the vicinity of heavy equipment if noise levels exceed 85 dBA. Assume that noise levels around this type of equipment is above 85 dBA until data is obtained.

8.0 DECONTAMINATION

In accordance with Section 8 of the HASP, personnel and/or equipment decontamination requirements are specified below for each task or group of tasks having different requirements. Any exceptions or deviations from Section 8 of the HASP are noted below.

TABLE 8

PERSONNEL AND EQUIPMENT DECONTAMINATION

Personnel and Environmental Monitoring Equipment (EME)

DECON REQUIREMENTS	TASK(s)											
	1	2	3	4	5	6	7	8	9	10	11	12
Option 1 Standard Approach Level D												
Wash Soap	NA	X	X	X	X	X	X	X	X	X	X	X
Wash Solvent	NA	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)
Aqueous Rinse	NA	X	X	X	X	X	X	X	X	X	X	X
Rinse Solvent	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PPE to be Disposed	NA	X	X	X	X	X	X	X	X	X	X	X
PPE to be Laundered (cotton coveralls)	NA	X	X	X	X	X	X	X	X	X	X	X

Sampling and Heavy Equipment

DECON REQUIREMENTS	TASK(s)											
	1	2	3	4	5	6	7	8	9	10	11	12
Sampling Equipment Decon												
Localized at work site in CRZ	NA	X	X	X	X	X	X	X	X	X	X	NA
Wash Soap	NA	X	X	X	X	X	X	X	X	X	X	NA
Wash Solvent	NA	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	NA
Aqueous Rinse	NA	X	X	X	X	X	X	X	X	X	X	NA
Rinse Solvent	NA	X (methanol <10%)	X (methanol <10%)	X (methanol <10%)	X (methanol <10%)	X (methanol <10%)	X (methanol <10%)	X (methanol <10%)	X (methanol <10%)	X (methanol <10%)	X (methanol <10%)	NA
Heavy Equipment Decon												
Localized at work site in CRZ	NA	X	X	X	X	X	X	X	X	X	X	NA
Wash Soap	NA	X	X	X	X	X	X	X	X	X	X	NA
Wash Solvent	NA	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	X (water)	NA
Aqueous Rinse	NA	X	X	X	X	X	X	X	X	X	X	NA
Rinse Solvent	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

9.0 EMERGENCY/INCIDENT ACTION PLAN

Incident/emergency action requirements, equipment, and supplies are specified below for each task or group of tasks having different requirements. Response to an incident or emergency shall occur according to Section 9 of the HASP and this section. Any exceptions or deviations from requirements of the HASP are noted below.

In the event of an incident or emergency, the FTL will function as the site emergency/incident coordinator, as necessary, and will arrange for immediate notification of LANL emergency response personnel to take control of the scene and/or arrange for immediate notification of appropriate authorities. Other key onsite incident/emergency response personnel are identified below. Only personnel who are trained and certified in accordance with Sections 7, 9, and 10 of the HASP and SSHASP are allowed to respond and use the equipment specified. Incident/emergency contacts and telephone numbers and a map indicating the route to the nearest hospital and medical clinic from each investigational site are included in Appendix D. Both these items shall be posted onsite where readily accessible to field team personnel. Site-specific muster areas shall be determined by the SSO prior to the start of field operations each day and shall be communicated to individuals onsite during the HS Tailgate meeting and as other individuals arrive at the site. Location(s) of muster areas may vary from day-to-day depending upon variable site operations and conditions, and shall be documented daily by the SSO or FTL. Contact the ESH-1 Oversight Technician in the event of any incident or emergency.

9.1 ADJACENT FACILITIES OF CONCERN

TABLE 9

INCIDENT/EMERGENCY ACTION REQUIREMENTS

Incident Responders: Response by EM&R of LANL

First-Aid/CPR Provider(s): To be determined[1]

	TASKS											
REQUIREMENTS	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Communications												
Cellular phone	X	X	X	X	X	X	X	X	X	X	X	X
Pager	X	X	X	X	X	X	X	X	X	X	X	X
Air Horn	X	X	X	X	X	X	X	X	X	X	X	X
Description of Air Horn Signals: Two blasts will mean to meet at the muster area. The muster area will be decided when the site is up and running. Three blasts will mean to evacuate the area by the shortest route possible.												
Hand/Body Signals	X	X	X	X	X	X	X	X	X	X	X	X
Description of Hand/Body Signals: Choking (hands on neck)												

1 Designated to be primary first aid/CPR provider

TABLE 9 (continued)
INCIDENT/EMERGENCY ACTION REQUIREMENTS

	TASK(S)											
REQUIREMENTS	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Incident Response Equipment												
Industrial first-aid kit[1]	X	X	X	X	X	X	X	X	X	X	X	X
Bloodborne pathogen and waste disposal kit[2]	X	X	X	X	X	X	X	X	X	X	X	X
Antiseptic	X	X	X	X	X	X	X	X	X	X	X	X
Cold compress	X	X	X	X	X	X	X	X	X	X	X	X
Emergency decon solutions	X	X	X	X	X	X	X	X	X	X	X	X
Portable emergency eyewash[3] (15 min.)	X	X	X	X	X	X	X	X	X	X	X	X
Fire Fighting Equipment												
A:B:C fire extinguisher x 20 lb	X	X	X	X	X	X	X	X	X	X	X	X
Spill Containment Equipment												
Absorbent (Vermiculite)	N/A	X	X	X	X	X	X	X	X	X	X	X
Shovel(s) (1. Steel Spade)	N/A	X	X	X	X	X	X	X	X	X	X	X
Containers for contaminated equipment (55 gallon drum)	N/A	X	X	X	X	X	X	X	X	X	X	X

---

1 The first-aid supplies shall be approved by a consulting physician and be kept in a weatherproof container. The contents are to be checked weekly and resupplied by SSO or designee. Contents shall meet the *American National Standard Minimum Requirements for Industrial Unit-Type First Aid Kits* (ANSI Z308.1-1978).

2 This kit shall be kept in a weatherproof container. Contents are to be checked weekly and resupplied by SSO or designee. Contents shall include at least the following: latex gloves(2 pairs); disposable protective clothing ie. Tyvek Suit; face shield; safety glasses; CPR pocket mask with one-way valve; biohazard disposable bag; decontamination equipment; and shoe covers.

3 Emergency eyewashes and showers must be located within 10 seconds travel time and not more than 100 feet of travel distance of any source of chemical splash that may be corrosive or moderately to severely irritating to body tissue. They must have a capacity to be able to provide continuous flushing for the duration of time necessary to sufficiently flush the most hazardous substance for which the device is being specified. They also shall be inspected and flushed at least weekly by the SSO or designee. Refer to ANSI Z358.1-1990 for further information.

10.0 TRAINING

Training requirements are specified below by job title for each task or group of tasks having different requirements. Personnel shall be trained in accordance with Section 10 of the HASP and as specified below. Any exceptions or deviations from requirements of the HASP are noted below. Personnel performing the roles indicated below shall have completed and have current documentation of the training specified. The SSO, or the FTL or JS, shall verify that personnel have met the training requirements prior to authorizing individuals to enter controlled zones of the work site.

Table 10
Training Requirements

R = Read training; C = Class training; F = Field training; AN = As needed per the HASP; ER = Employer required

Training Requirements	Personnel Role										
	FPL	FTM	FTL	SSO	*RSP	Surveyor	Geologist/ Sampler	Waste Manager	Laborer	Geophysics Personnel	Heavy Equipment Operator
HASP	R	R	R	R	R	R	R	R	R	R	R
SSHASP	R	R	R	R	R	R	R	R	R	R	R
Pre-Job Brief	F or C	F or C	F or C	F or C	F or C	F or C	F or C	F or C	F or C	F or C	F or C
Daily Tailgate	F	F	F	F	F	F	F	F	F	F	F
TA Specific	C	C	C	C	C	C	C	C	C	C	C
GET	C	C	C	C	C	C	C	C	C	C	C
HazCom	R	R	R	R	R	R	R	R	R	R	R
Conduct of Operations	R	R	R	R	R	R	R	R	R	R	R
Occurrence Reporting	R	R	R	R	R	R	R	R	R	R	R
OSHA Rights	R	R	R	R	R	R	R	R	R	R	R
Health Physics Checklist	C	C	C	C	C	C	C	C	C	C	C
Rad Worker II	C	C	C	C	C	C	C	C	C	C	C
40 Hr Worker	C	C	C	C	C	C	C	C	C	C	C
24 Hr Field Training	F	F	F	F	F	F	F	F	F	F	F

* - The RSP shall have a current, approved RSAA on file with ESH-1.

Training Requirements	Personnel Role										
	FPL	FTM	FTL	SSO	*RSP	Surveyor	Geologist/ Sampler	Waste Manager	Laborer	Geophysics Personnel	Heavy Equipment Operator
8 Hr Supervisor		C	C								
8 Hr Refresher	C	C	C	C	C	C	C	C	C	C	C
First Aid			C	C							
CPR			C	C							
First Responder Awareness				C							
PPE (level D)		F	F	F	F	F	F	F	F	F	F
Fire Extinguisher Use		R	R	R	R	R	R	R	R	R	R
Hearing Conservation		R	R	R	R	R	R	R	R	R	R
HMPT Training		C	C	C			C	C			
Stairs ands Ladders				R							
Tools- Hand and Power			R	R	R	R		R	R	R	R
Excavation and Trenching			R	R	R	R			R		R
Excavation and Trenching and Equipment			R	R	R	R			R		R
Confined Space Entry			R	R	R	R			R		
Confined Space Entry Super			R	R							
Electrical Safety Awareness		R	R	R	R	R	R	R	R	R	R
Lockout and Tagout				R	R	R			R		
Crane and Rigging Operator				R						R	R
Crane and Rigging Safety				R						R	R
Hoists				R						R	R
Welding and Cutting				R						R	R
Lead				R							
Bloodborne Pathogens		C	C	C	C	C	C	C	C	C	C

11.0 MEDICAL SURVEILLANCE

The medical surveillance requirements of this section have been established in accordance with Section 11 of the HASP, unless noted otherwise below.

TABLE 11
MEDICAL SURVEILLANCE REQUIREMENTS

Hazard	Task(s)	Action Level	Requirement
Hazardous Waste Operations	All	Potential for exposure to hazardous substances or health hazards ≥ PELs or published exposure limits during HAZWOPER work	29 CFR 1926.65(f)
Bloodborne Pathogens (Or other Potentially Infectious Materials)	All	Any occupational exposure	29 CFR 1910.1030(f)
Hearing Conservation	2 - 11	85 dBA or greater	29 CFR 1910.95(g)

12.0 QUALITY CONTROL AND QUALITY ASSURANCE (QC/QA)

12.1 SITE INSPECTIONS

In accordance with Section 12 of the HASP, the FTL shall see that the following inspections are conducted and documented, and that appropriate actions are taken and documented to rectify identified deficiencies, if any.

TABLE 12
INSPECTION REQUIREMENTS

Inspection	Inspector	Task(s)
Job Site, Material and Equipment (in accordance with 29 CFR 1926.20(b)(2))	SSO	All
General Sanitation (i.e., potable and non-potable water, toilets, washing facilities, eating and drinking areas, vermin control, and/or change rooms; in accordance with 29 CFR 1926.51)	SSO	All
Materials handling, storage, use and disposal (in accordance with 29 CFR 1926.250 and 252)	CP[1]	All
Signs, Signals and Barricades (in accordance with 29 CFR 1926.200)	SSO	All
Motor vehicles and mechanized equip. (in accordance with Subpart O of 29 CFR 1926)	CP[1]	All
Material handling equipment (e.g., rubber-tired scraper, loader and dozers) equipped with rollover protective structures and overhead protection (in accordance with Subpart W of 29 CFR 1926)[2]	CP[1]	10
Excavations/Trenches(per 29 CFR 1926.651(k))	CP[1]	2 through 11
PPE (Section 7 and 29 CFR 1926.95)	User	All
Incident/emergency response equipment (prior to each use and at least monthly)	SSO/User	All
Fire fighting equipment (per 29 CFR 1926.150(a) and (c))	SSO	All
Electrical equipment (per 29 CFR 1926.403(b) and/or 416(f)(8))	CP[1]	As required

[1] Competent person to be provided by contractor that operates equipment.

[2] Inspect for roll over protective structure only during mobilization.

13.0 RECORDKEEPING

In addition to recordkeeping requirements of Section 13 of the HASP, the HS records specified below shall be completed in accordance with Section 13 of the HASP and kept onsite as indicated below.

TABLE 13

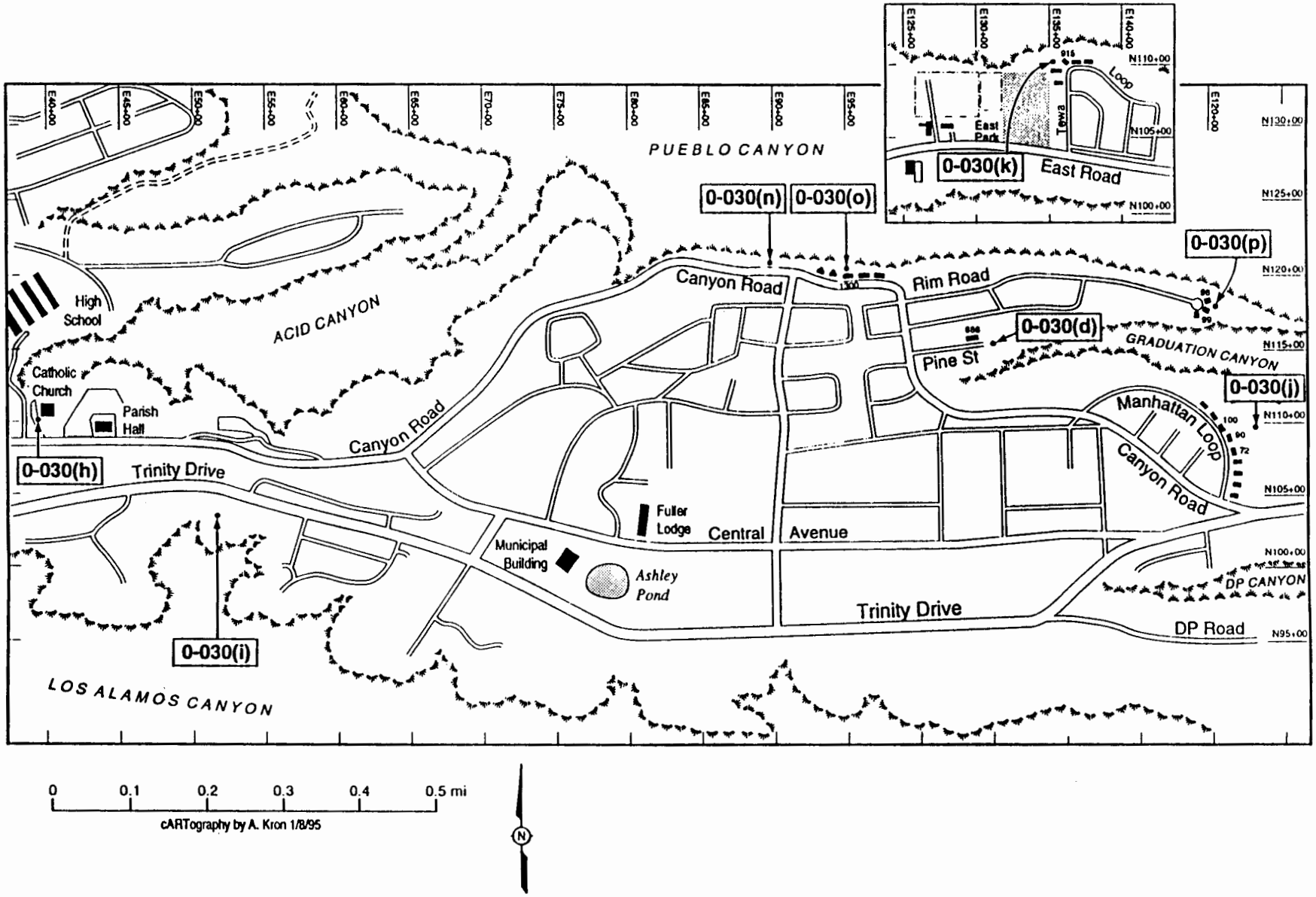
RECORDKEEPING REQUIREMENTS

Record/Form	Requirement Reference	Keep Onsite
ER Project HASP	HASP Section 1	X
This SSHASP	HASP Section 1	X
Completed SSHASP Modification Forms	HASP Section 1	X
SSOs Daily Logbook	HASP Section 13.1	X
Documentation of Training Requirements	HASP Section 10	X
Documentation of Medical Surveillance	HASP Section 11	X
Exposure Monitoring Records	Section 6 of the HASP and Applicable Methods in Appendix F of the HASP	X
HS Inspection Records	HASP Section 12.1	X

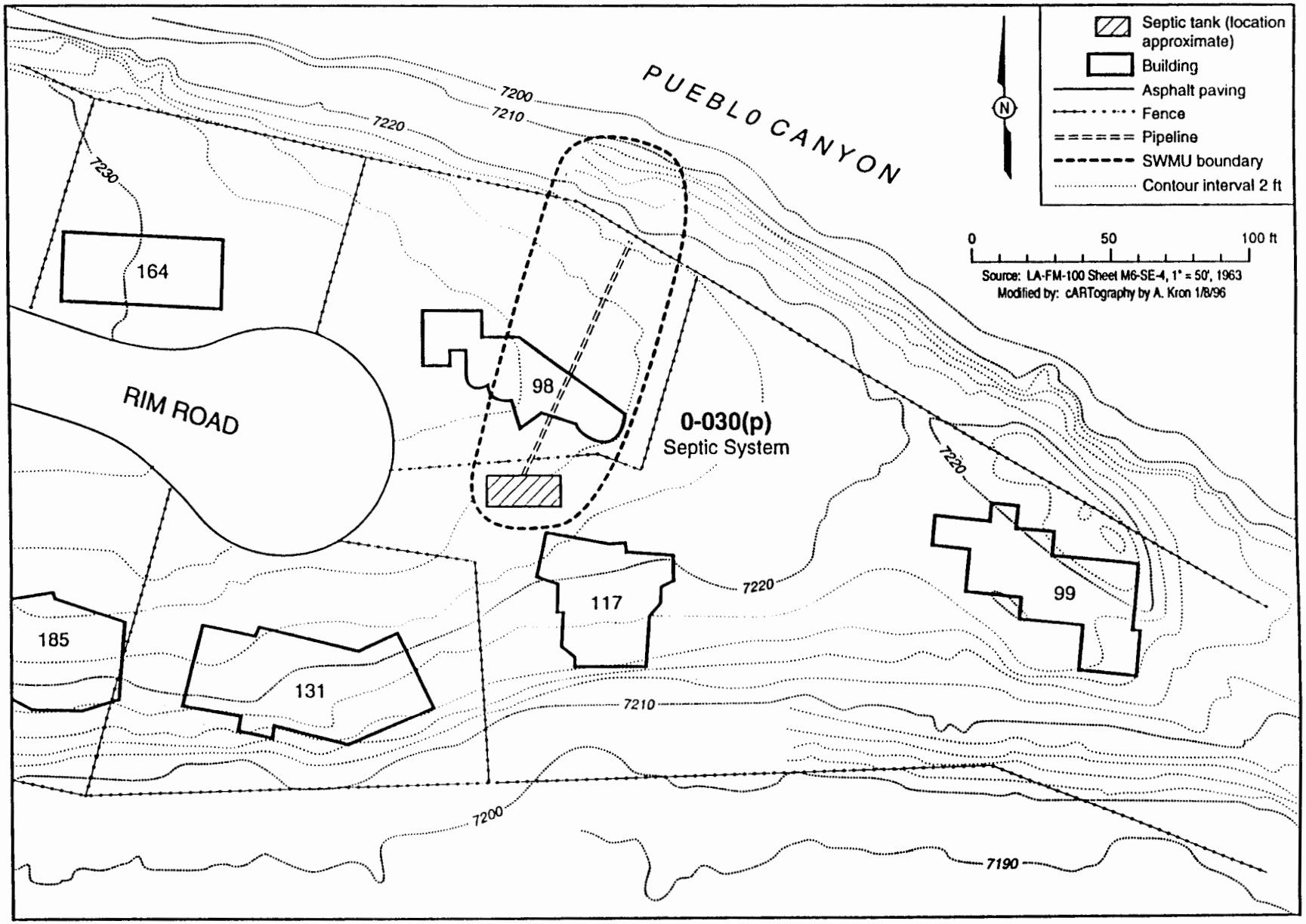
Note: All pertinent H & S records will be forwarded to the Field Unit H & S Representative on a regular basis. All pertinent HP records and documentation to be forwarded to ESH-1 Oversight RCT on a regular basis.

APPENDIX A

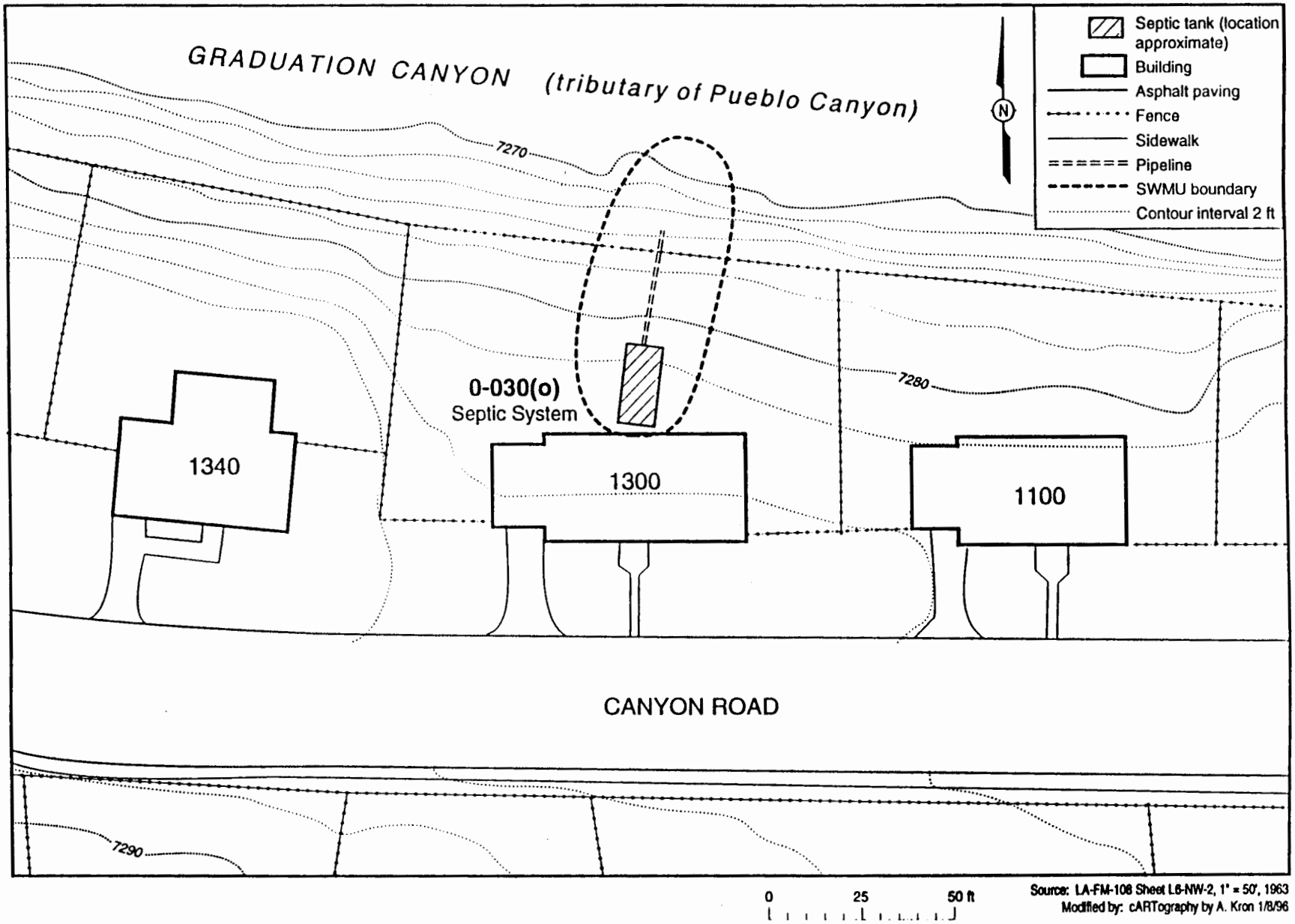
MAP(S) OF SITE LOCATIONS AND ADJACENT FACILITIES



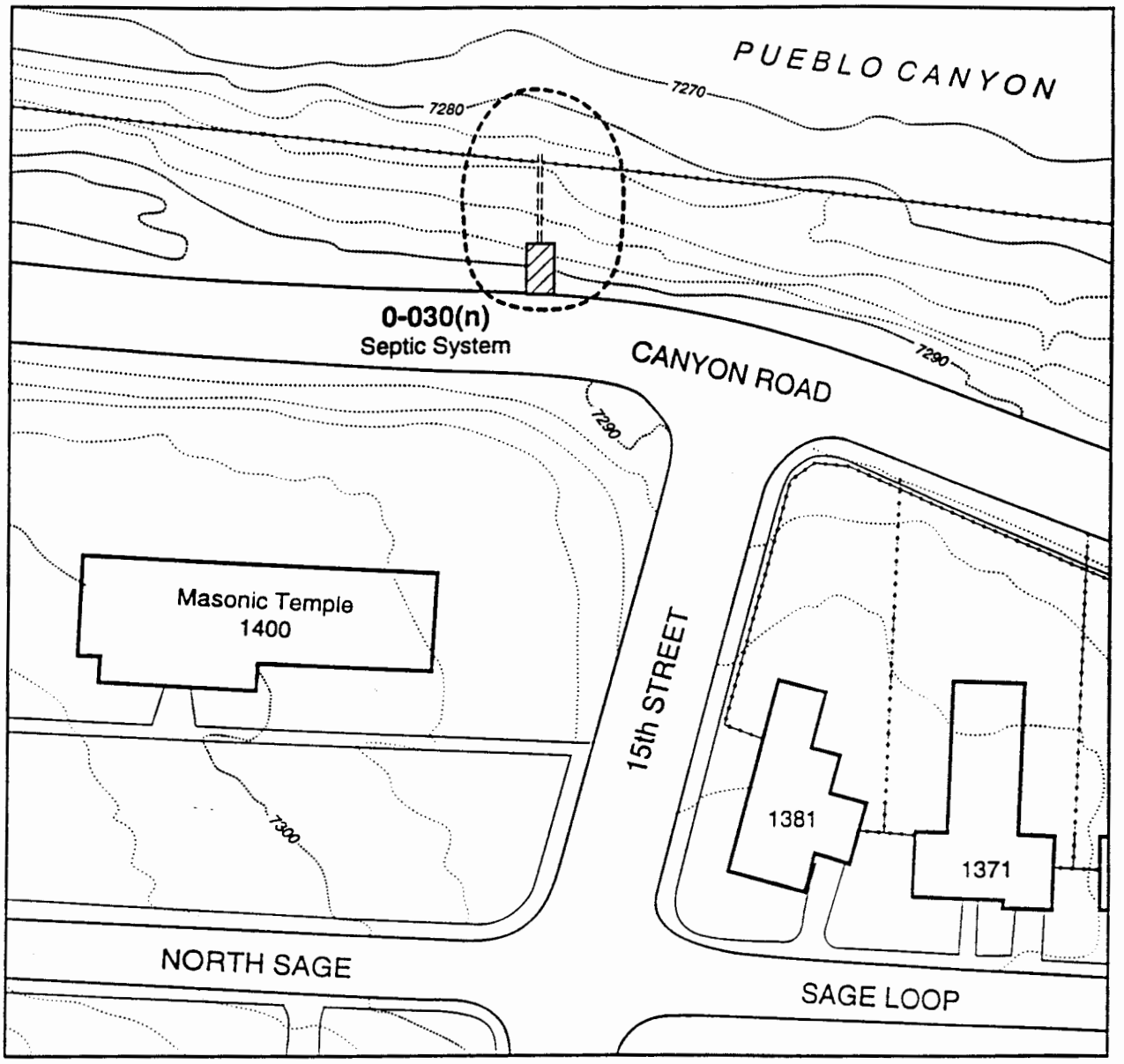
Locations of septic tank systems in SWMU Group 0-3.



Location map for SWMU 0-030(p).



Location map for SWMU 0-030(o).



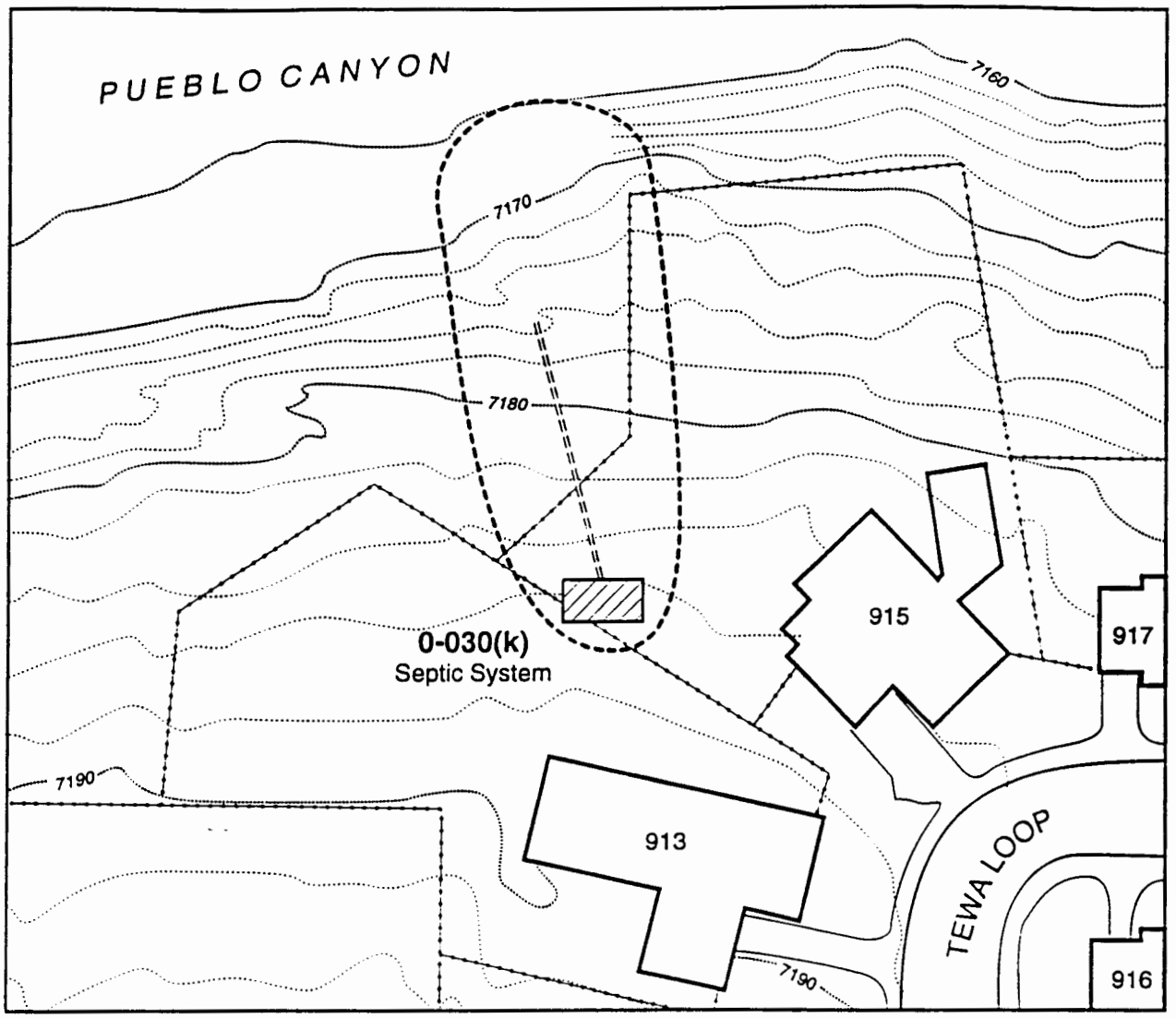
0 50 100 ft

Source:
LA-FM-98 Sheet M6-SW-4, 1" = 50', 1963
Modified by:
cARTography by A. Kron 1/8/96

N

Septic tank (location approximate)
Building
Asphalt paving
Fence
Sidewalk
Pipeline
SWMU boundary
Contour interval 2 ft

Location map for SWMU 0-030(n).



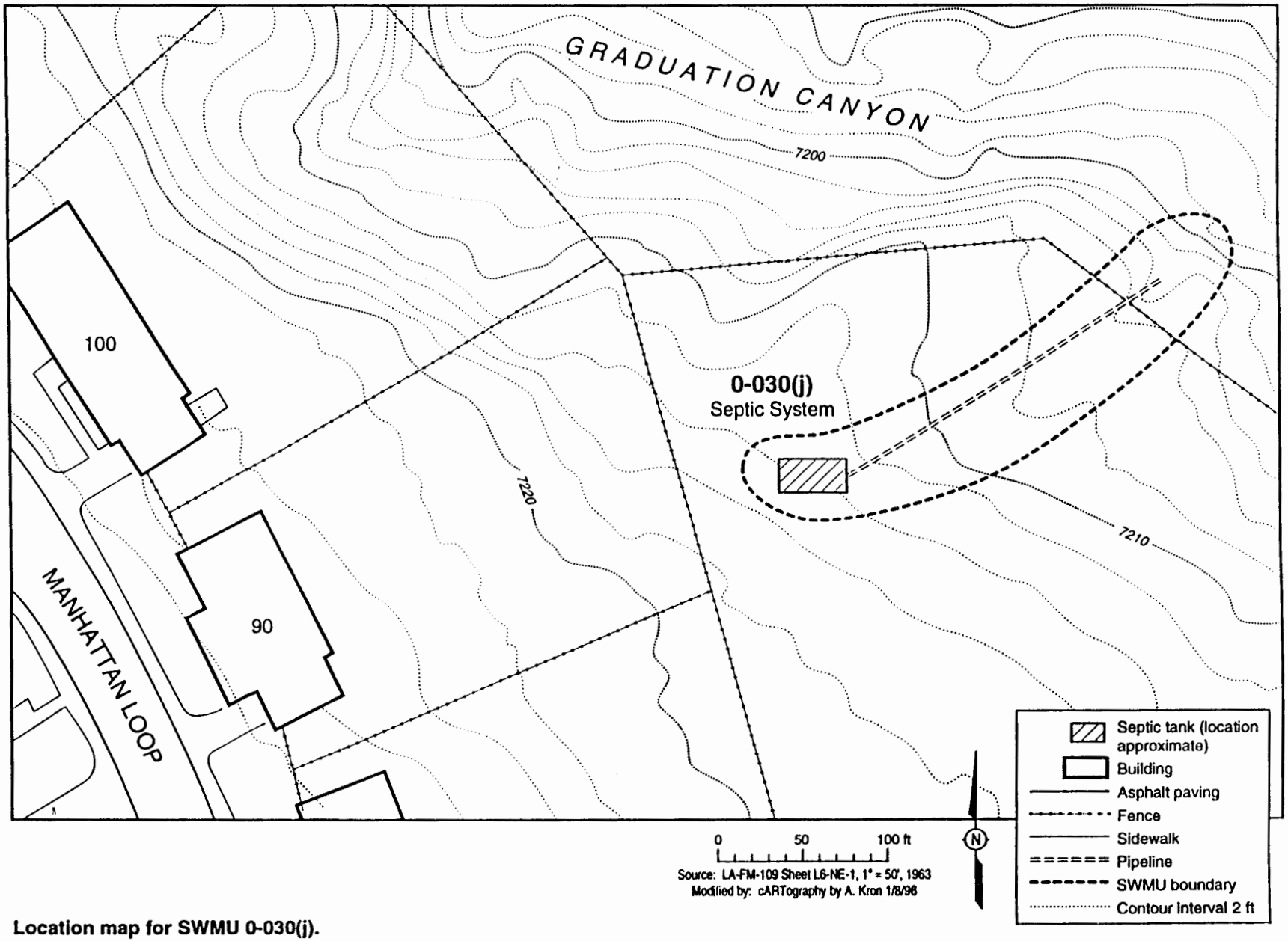
0 50 100 ft

Source:
LA-FM-110 Sheet L6-NE-2, 1' = 50', 1963
Modified by:
cARTography by A. Kron 1/8/96

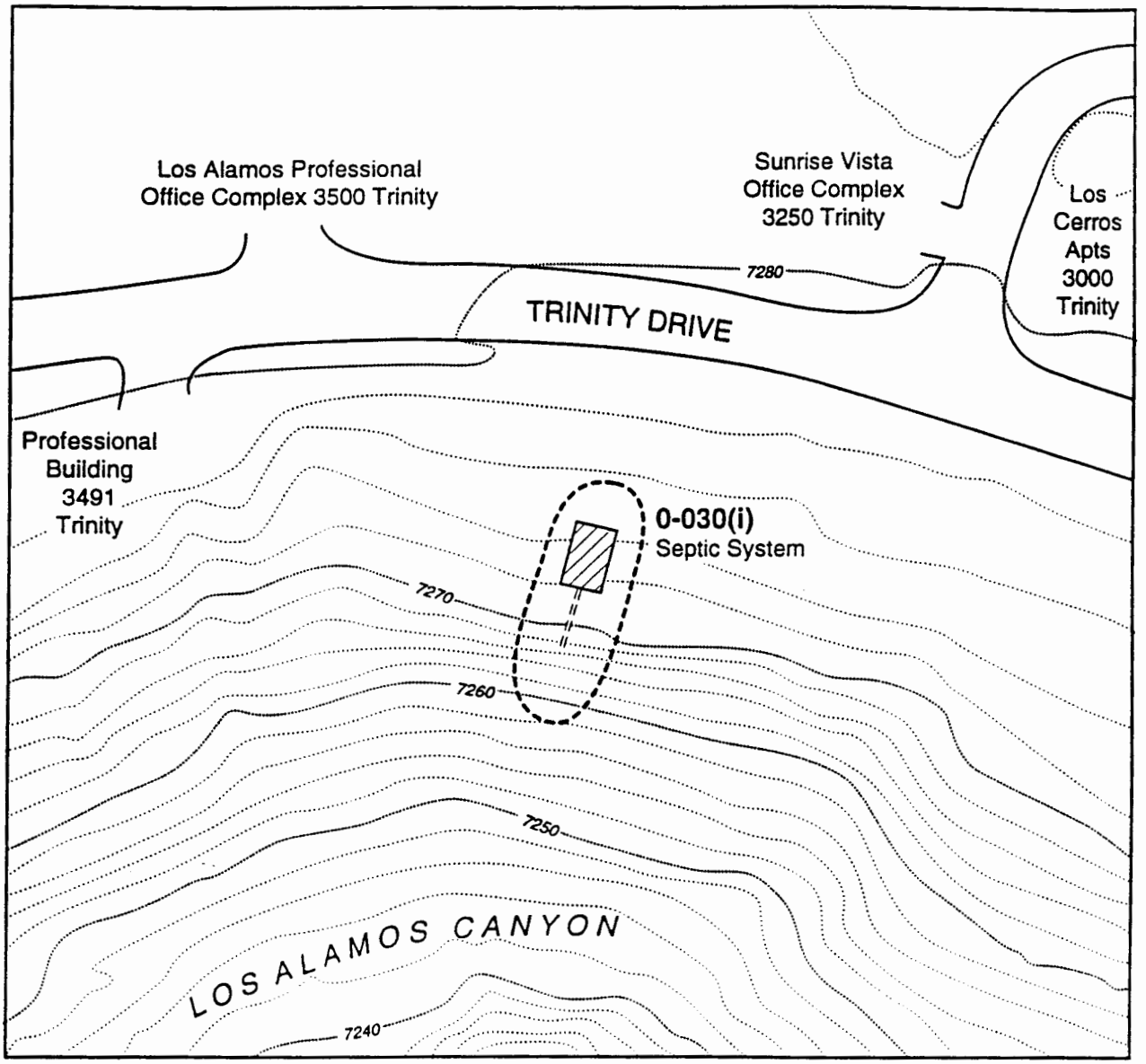
N

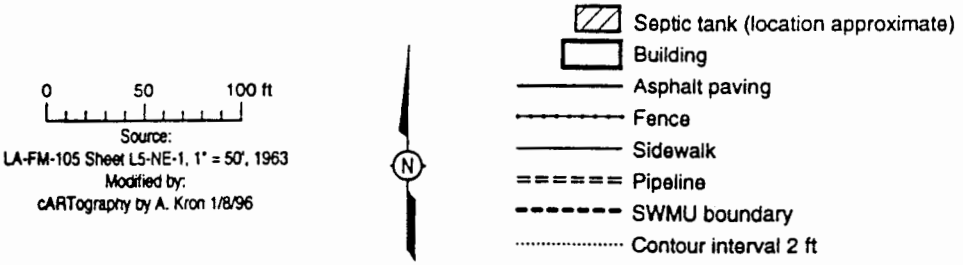
Septic tank (location approximate)
Building
Asphalt paving
Fence
Sidewalk
Pipeline
SWMU boundary
Contour interval 2 ft

Location map for SWMU 0-030(k).

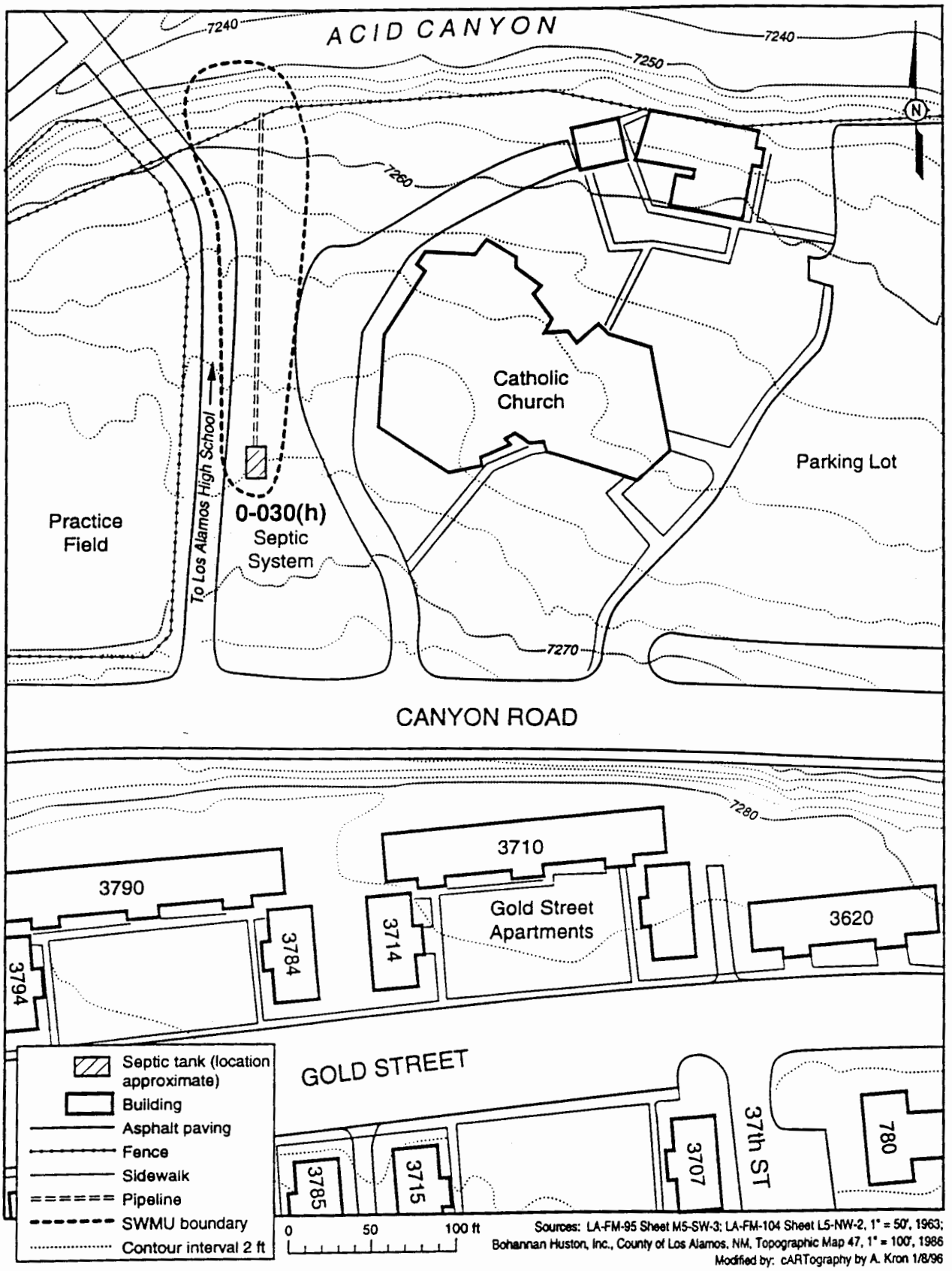


Location map for SWMU 0-030(j).

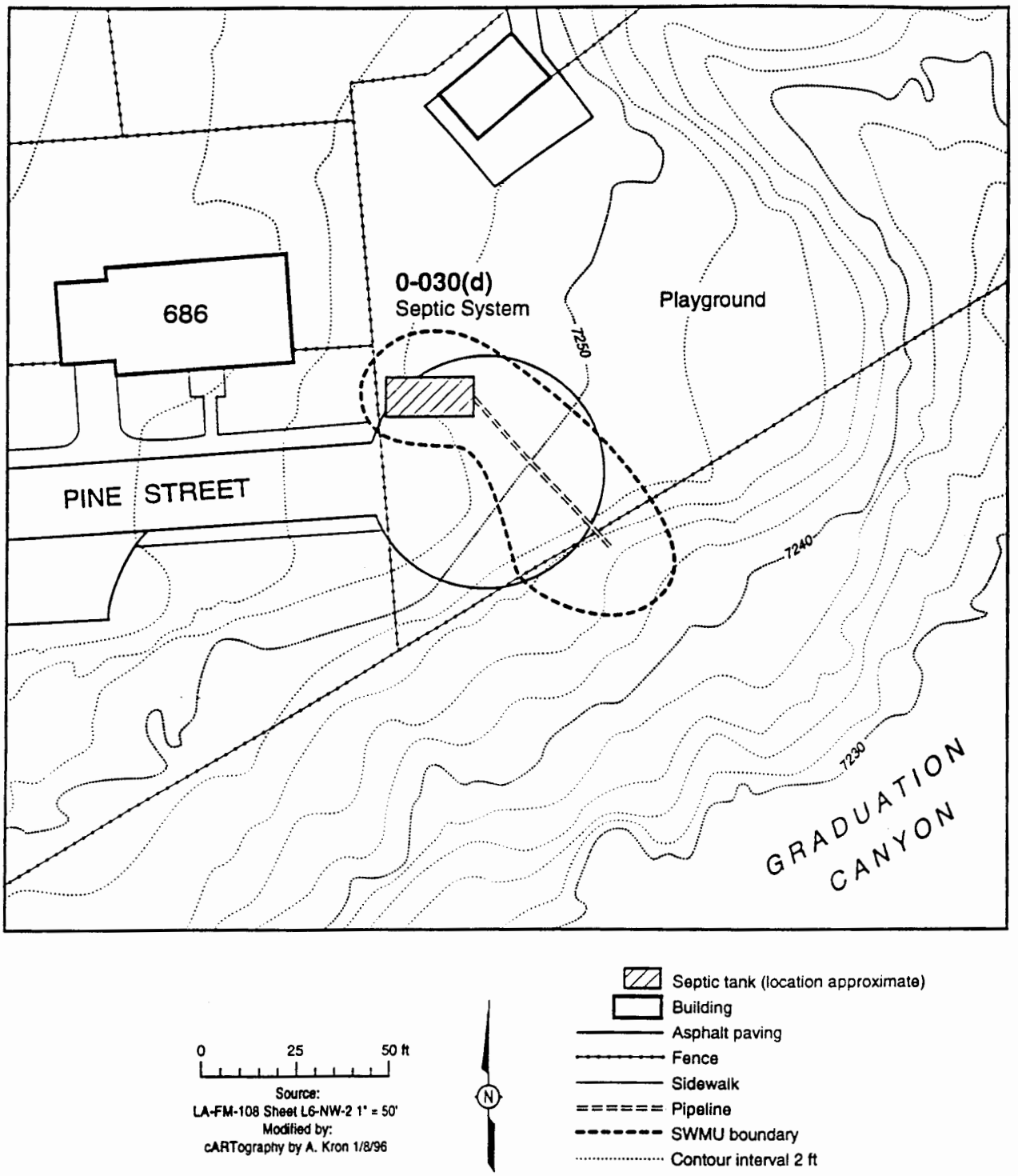




Location map for SWMU 0-030(i).



Location map for SWMU 0-030(h).



Location map for SWMU 0-030(d).

APPENDIX B

HAZARDOUS SUBSTANCE HAZARD ASSESSMENT

APPENDIX B
HAZARDOUS SUBSTANCE - HAZARD ASSESSMENT

This table includes a health hazard assessment, and associated rationales, of each chemical product and site contaminant listed in Table 2-1. This hazard assessment was completed in accordance with Section 4.1 of the HASP.

TASKS(S): All

Substance/ Synonym	Maximum Data[1]		Hazard Assessment Rating/Rationale
	Value	Location	
RADIOLOGICAL SUBSTANCES			
Process Knowledge			
Americium (^{241}Am)			Minimum - Included because of possible historic uses in area
Isotopic Plutonium (Pu^{238}, Pu^{239}, Pu^{240})			Minimum - Included because of possible historic uses in area
Polonium (Po^{210})			Minimum - Included because of possible historic uses in area
Soil Sample Results			
NA			
Soil Gas Vapor Results			
NA			
Air Monitoring or Sampling Results			
NA			
Water Sample Results			
NA			

[1] Reference resources where data reported, and either here or in the "location" column include a brief description of the sample location (e.g., borehole number, depth, etc.).

TASKS(S): All

Substance/ Synonym	Maximum Data[1]		Hazard Assessment Rating/Rationale
	Value	Location	
CHEMICAL SUBSTANCES			
Process Knowledge			
Hydrogen Sulfide			Minimum - Slight potential for gas to be present in septic tank(s)
Methane			Minimum - Slight potential for gas to be present in septic tank(s)
Lead			Minimum - Slight potential for lead to be present in septic tank(s)
Other Metals[2]			Negligible - Most tanks contained only domestic waste as suggested by location and surrounding buildings. In tanks where metals may be present, exposure potential is very low and mostly through skin contact.
Volatiles			Negligible - Most tanks contained only domestic waste as suggested by location and surrounding buildings. In tanks where volatiles may be present, exposure potential is very low and mostly through skin contact.
Semi-Volatiles			Negligible - Most tanks contained only domestic waste as suggested by location and surrounding buildings.. In tanks where semi-volatiles may be present, exposure potential is very low and mostly through skin contact.
PCBs			Negligible - Most tanks contained only domestic waste as suggested by location and surrounding buildings.. In tanks where PCBs may be present, exposure potential is very low.
Pesticides			Negligible - Most tanks contained only domestic waste as suggested by location and surrounding buildings. In tanks where pesticides may be present, exposure potential is very low.

[2] Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Mercury, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc

TASKS(S): All			
Substance/ Synonym	**Maximum Data[1]**		**Hazard Assessment Rating/Rationale**
	Value	**Location**	
Soil Sample Results			
NA			
Soil Gas Vapor Results			
NA			
Air Monitoring or Sampling Results			
NA			
Water Sample Results			
NA			

APPENDIX C

CHEMICAL, PHYSICAL, AND TOXICOLOGICAL PROPERTIES OF HAZARDOUS CHEMICAL SUBSTANCES

APPENDIX C

PHYSICAL, CHEMICAL, AND TOXICOLOGICAL PROPERTIES OF HAZARDOUS CHEMICAL SUBSTANCES

Substance/ Synonym(s)	Exposure Limit [1,2] / IDLH[1] (ppm)			Physical Characteristics [1]	Route(s) of Entry [1, 3]	Signs/Symptoms of Toxicity [1, 3]	Carcino-genicity [1, 3]	Flash Point [1, 3]	Vapor Press./ Density [1]	IP [1, 4]	SC[5]
	PEL or REL	TLV	IDLH								
CALIBRATION AND WELDING GASES For purposes of LANL ER work, examples of calibration gases are heptane, hexane, hydrogen, isobutylene, oxygen and pentane. Common welding gases include acetylene, oxygen and propane. For the most part, these gases are flammable and pressurized and could become a mini-torpedo if not handled carefully. The primary routes of exposure into the body are inhalation and skin contact/absorption. Symptoms of exposure include light headedness, nausea, headache, numb extremities, dermatitis, loss of appetite, frostbite (propane), chemical pneumonia, and giddiness.											
Pentane	120	600	15,000	Colorless liquid with a gasoline like odor. (Note: a gas above 97 °F maybe utilized as a fuel.)	Inhalation, Skin contact	Drowsiness, irritated eyes, nose, dertimitis, chemical pneumonia	NA	-57 °F	400 mm	10.34 eV	27
Isobutylene	Not Applicable (NA)	Simple Asphyxiant	NA	Colorless, odorless gas	Inhalation	Dizziness, disorientation, excitation	NA	NA	> 1 atm	9.44 eV	22

1 *NIOSH Pocket Guide to Chemical Hazards*, U.S. Department of Health and Human Services, 1994.
2 *1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*, American Conference of Governmental Industrial Hygienists, 1994.
3 *Hazardous Chemicals Desk Reference,* 3rd edition, Richard J. Lewis, Sr., Von Nostrand Reinhold, 1993.
4 HNu Photoionization Detector Guidance Information
5 Spill containment guide (page) number, *1993 Emergency Response Guidebook*, U.S. Department of Transportation, Research and Special Programs Administration, Office of Hazardous Materials Training and Initiatives (DHM-50), 1993.

Substance/ Synonym(s)	Exposure Limit [1,2] / IDLH[1] (ppm)			Physical Characteristics [1]	Route(s) of Entry [1, 3]	Signs/Symptoms of Toxicity [1, 3]	Carcino-genicity [1, 3]	Flash Point [1, 3]	Vapor Press./ Density [1]	IP [1, 4]	SC[5]
	PEL or REL	TLV	IDLH								
CORROSIVES For purposes of LANL ER work, corrosives generally include acids, bases/caustics and inorganic metallic or halogen salts. Common acids include: acetic, citric, hydrochloric, nitric, perchloric, phosphoric, picric, sulfuric, and trichloroacetic (TCA). Common caustics include: ammonia, ammonium hydroxide, potassium hydroxide, sodium hydroxide and sodium hypo chlorite. Inorganic metallic salts include compounds such as chromates and permanganates. Inorganic halogen salts include compounds such as sodium chloride and potassium bromide which can be corrosive to metals and finishes but are not significantly harmful to bodily tissues when good hygiene practices are implemented. Primary routes of entry into the body are skin contact, inhalation and ingestion. Contact with corrosives can result in severe irreversible damage to skin, eyes and respiratory system. Symptoms of exposure include tissue burns; eyes, nose and throat irritation/inflammation; and/or excessive fluid in respiratory system.											
None											
HYDROCARBONS (Halogenated) Examples of halogenated hydrocarbons associated with LANL ER work are 1,2-Dichloroethylene, 1,1,1-Trichloroethane (methyl chloroform), Trichloroethylene, Trichloro-trifluoro ethane(Freon-113), and Vinyl Chloride. Generally, these compounds are moderately to highly volatile and are non combustible. The primary routes of exposure into the body are inhalation, ingestion and/or skin contact. Symptoms of exposure include skin, eyes, and upper respiratory irritation, liver, kidney, cardiac, motor activity, and gastrointestinal changes, anesthesia, irritability, and central nervous system depression.											
None											
HYDROCARBONS (Non-Halogenated) Examples of non-halogenated hydrocarbons associated with LANL ER work are acetone and methyl ethyl ketone (MEK). The primary routes of exposure into the body are inhalation, ingestion and skin absorption. Symptoms of exposure include eyes, nose and throat irritant, headache, dizziness and dermatitis.											
None											
SEPTIC TANK GASES Examples of septic tank gases are hydrogen cyanide, hydrogen sulfide and methane. These gases are flammable and extremely volatile. The primary routes of exposure into the body are inhalation, ingestion and skin absorption. Symptoms of exposure include skin, eyes and respiratory system damage.											
Methane	Asphyxiant/flammable			Colorless gas	Inhalation	Simple asphyxiant, very dangerous fire and explosion hazard	NA	368.6°F	0.554	12.98 eV	compressed 17
Hydrogen Sulfide (Also used as calibration gas)	10	10	300	Colorless gas with a strong odor of rotten eggs. (Note sense of smell becomes rapidly fatigued and can **NOT** be relied upon to warn of the continuous presence of H_2S	Inhalation	Severe irritant to the eyes and mucous membranes; asphyxiant; chronic pulmonary edema; nervous system depression or paralysis; coma	NA	NA (gas)	20 atm	10.46 eV	13

Substance/ Synonym(s)	Exposure Limit [1,2] / IDLH[1] (ppm)			Physical Characteristics [1]	Route(s) of Entry [1, 3]	Signs/Symptoms of Toxicity [1, 3]	Carcino-genicity [1, 3]	Flash Point [1, 3]	Vapor Press./ Density [1]	IP [1, 4]	SC[5]
	PEL or REL	TLV	IDLH								
METALS Metals associated with LANL ER work typically include, though are not limited to lead, beryllium, barium, cadmium, chromium, copper, and mercury. Most metals pose a health hazard in their solid form, especially as dusts, with the exception of mercury vapor. The primary routes of exposure into the body include inhalation, ingestion, and skin contact. Symptoms of exposure include eye, skin and, upper respiratory system irritation; headache, insomnia, metallic taste in mouth, abdominal pain and tremors. Cancers of the lungs and bones are associated with metal intoxication.											
Lead	0.05 mg/m^3	0.05 mg/m^3	700 mg/m^3	A heavy, ductile, soft, gray solid	Inhalation Skin absorption (organic forms only) Ingestion	Loss of appetite, anemia, malaise, insomnia, headache, irritability, muscle and joint pains, tremors, faccid paralysis, hallucinations, muscle weakness	dependent upon compound	NA	11.34 g/cm^3	NA	53
MINERALS For purposes of LANL ER work, examples of minerals include asbestos and silica. Most minerals pose a health hazard in their solid form, especially as dusts. The primary routes of exposure into the body are inhalation and ingestion. Symptoms of exposure include impaired pulmonary function, cough wheeze, pneumoconiosis (amorphous silica), and interstitial fibrosis, dyspnea, finger clubbing (asbestos).											
None											
PETROLEUM-BASED HYDROCARBONS Examples of petroleum-based hydrocarbons associated with LANL ER work are Benzene, Toluene and Xylenes. which are found in most oils, lubricants, fuels and gasoline. Petroleum-based hydrocarbons material generally contain metal contaminants also. The primary routes of exposure into the body are inhalation and skin absorption/contact. Symptoms of exposure include eyes, skin and upper respiratory system irritation, giddiness, headache, confusion, nausea, staggered gait, and fatigue.											
Gasoline	300	300	Potential carcinogen	Solvent odor	Inhalation Ingestion Skin contact	Eyes, skin and mucous membrane irritant; pneumonitis; pulmonary edema; central nervous system depression	Suspected Human Carcinogen (IARC)	-45 °F	7-14 mm @ 100 °F	NA	27
Diesel	400	NA	Potential carcinogen	Oily Smell	Inhalation Ingestion Skin contact	Eyes, skin and mucous membrane irritant	Suspected Human Carcinogen (IARC)	120-190 °F	> 1 atm	NA	27

POLYCHLORINATED BIPHENYLS (PCBs)
PCB's are a series of technical mixtures consisting of many isomers and compounds that vary from mobile oily liquids to white crystalline solids and hard noncrystalline resins (e.g., PCB [42 % chlorine] and PCB [54 % chlorine]). The greater the chlorine content, the more toxic the PCB is likely to be. It is important to remember that there are other isomers of PCB's based on the chlorine content. However, for occupational exposure concerns other isomers are suspected carcinogens and have a NIOSH Recommended Exposure Limit (REL) of 0.001 mg/m^3. Also, toxicity is increased if exposure to carbon tetrachloride occurs at the same time.
The primary routes of exposure into the body are inhalation, ingestion, and skin absorbtion or contact. Symptoms of exposure include chloracne, upper respiratory system irritation, nausea and vomiting, headache, dizziness, depression, and nervousness.

Substance/ Synonym(s)	Exposure Limit [1,2] / IDLH[1] (ppm)			Physical Characteristics [1]	Route(s) of Entry [1, 3]	Signs/Symptoms of Toxicity [1, 3]	Carcino-genicity [1, 3]	Flash Point [1, 3]	Vapor Press./ Density [1]	IP [1, 4]	SC[5]
	PEL or REL	TLV	IDLH								
None											
ALCOHOLS											
Methanol	200 ppm	200 ppm	6000 ppm	Colorless liquid with a characteristic pungent odor.	Inhalation Ingestion Skin or eye contact Skin absorbtion	Irritated eyes, skin, upper respiratory system; headache, drowsiness, dizziness, vertigo,light-headed, nausea, vomiting,visual disturbance, blindness; dermatitis	NA	52 °F	96 mm	10.84 eV (Note: not a contaminant on-site, but a solvent used in decon)	28

APPENDIX D

EMERGENCY CONTACTS
AND
ROUTE(S) TO MEDICAL SERVICES

EMERGENCY CONTACTS AND PHONE NUMBERS

Septic Tanks

MEDICAL EMERGENCY/FIRE:

Los Alamos Fire Dept. **667-7080**

HAZARDOUS RELEASE/SPILL:

LANL HAZMAT Team (EM&R) **667-6211**

LANL Occupational Medicine Clinic (ESH-2) **667-7848**
Los Alamos Medical Center Hospital **662-2455**
Security OS/Pro Force **667-6534**
Los Alamos Police **662-8222**
Los Alamos County Utilities Dept.(Overhead electrical) **662-8130**
LANL Health and Safety ESH-5 ..... **665-7221**
LANL Radiation ESH-1 ..... **667-7137**
FPL: Garry Allen **667-3394**
Alternate FPL: Terry Rust **665-8843, 104-8484**
FTM: Jayne Bradley **662-1335**
FTL: Andrew Crowder **662-1338**
Field Unit HS Rep.: Joe Louck **665-5669, 104-6959**
Field Unit RCT: Marty Peifer **667-0083, 104-6649**
LANL Pager Access **665-9800**

Management Contacts:

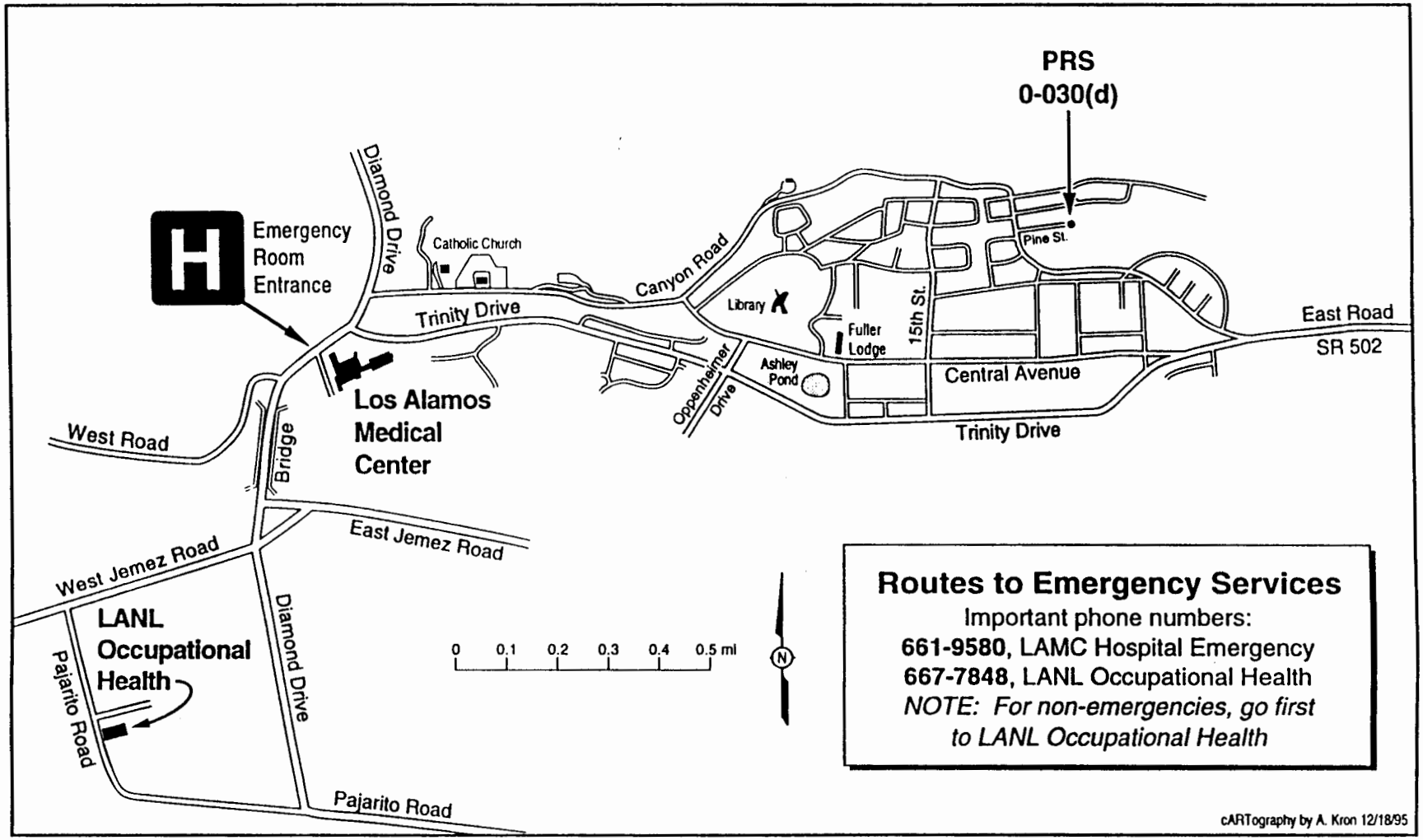
ERM/Golder Contacts: **Al Funk 662-3700, John Williams 662-3700**

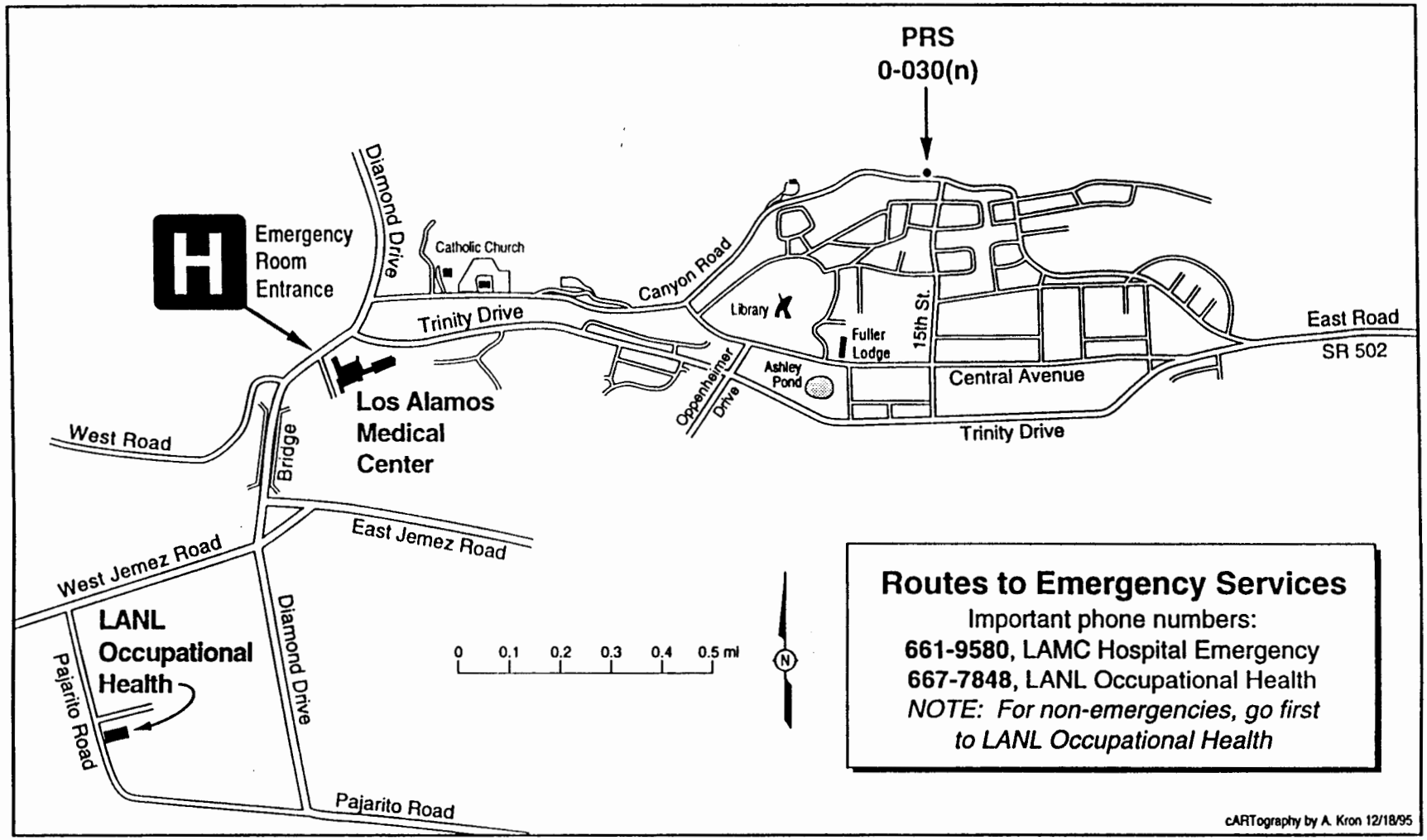
Construction Project Coordinator: **TBD**

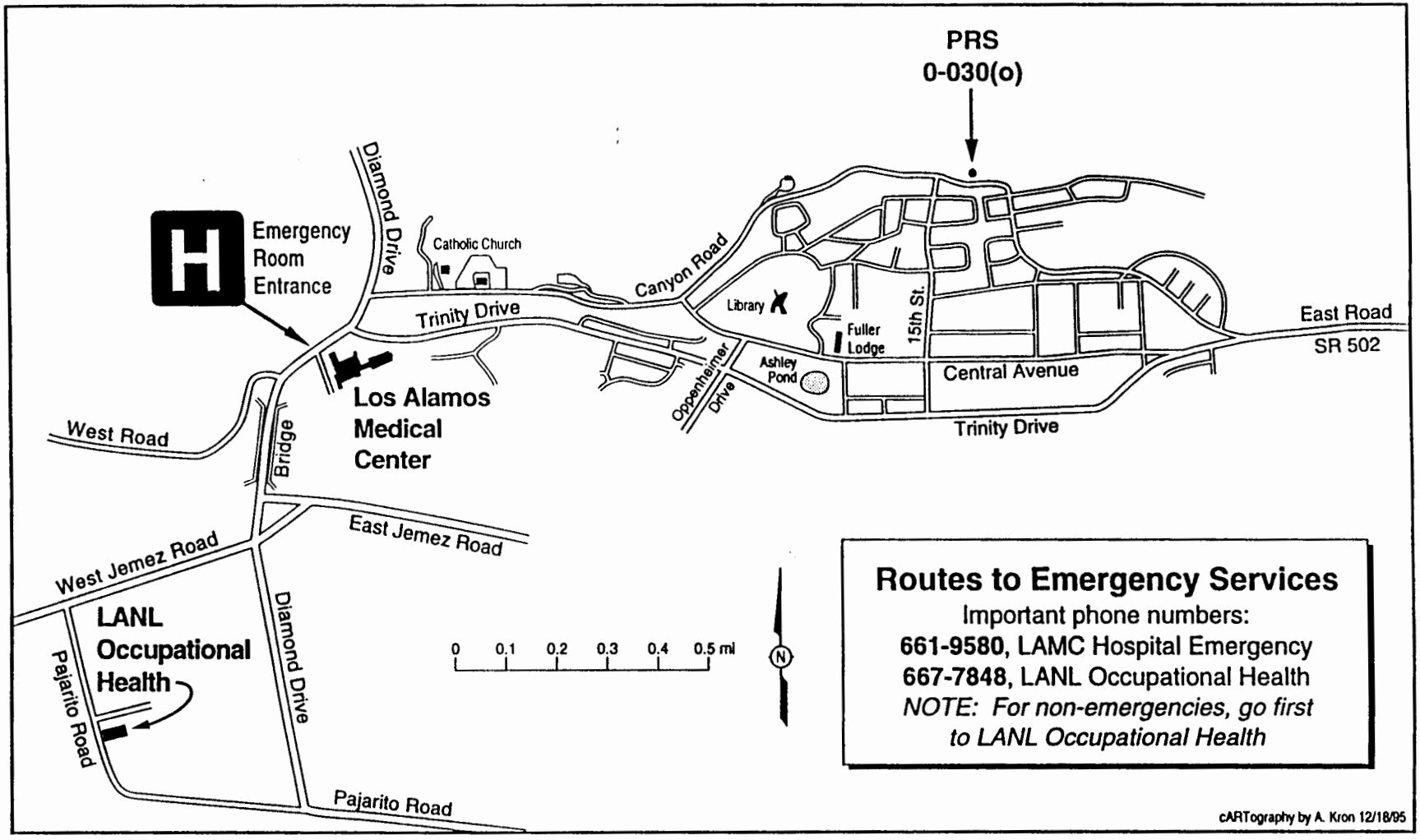
EMERGENCY REPORTING INFORMATION:

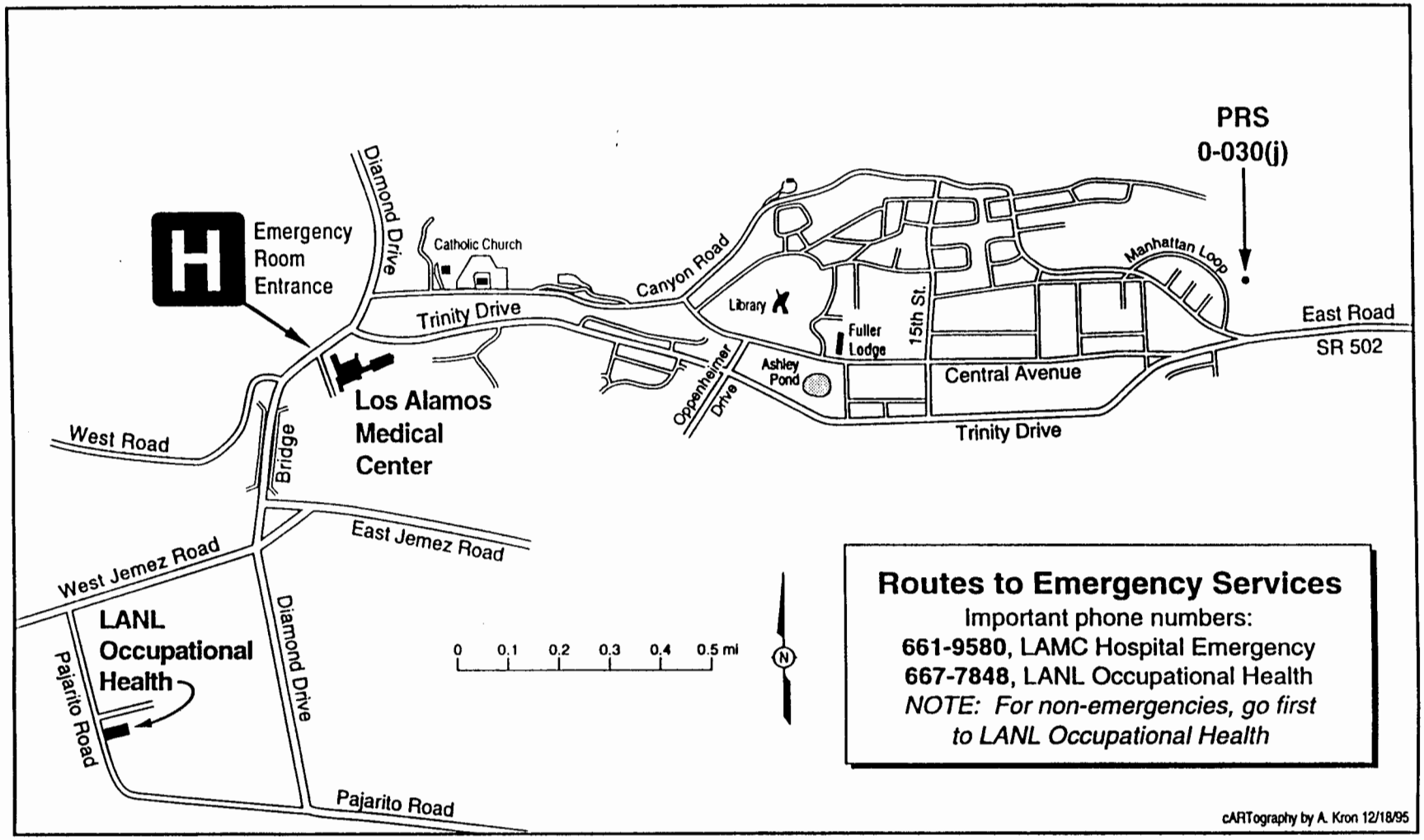
When calling for emergency services, have the following information available to report:

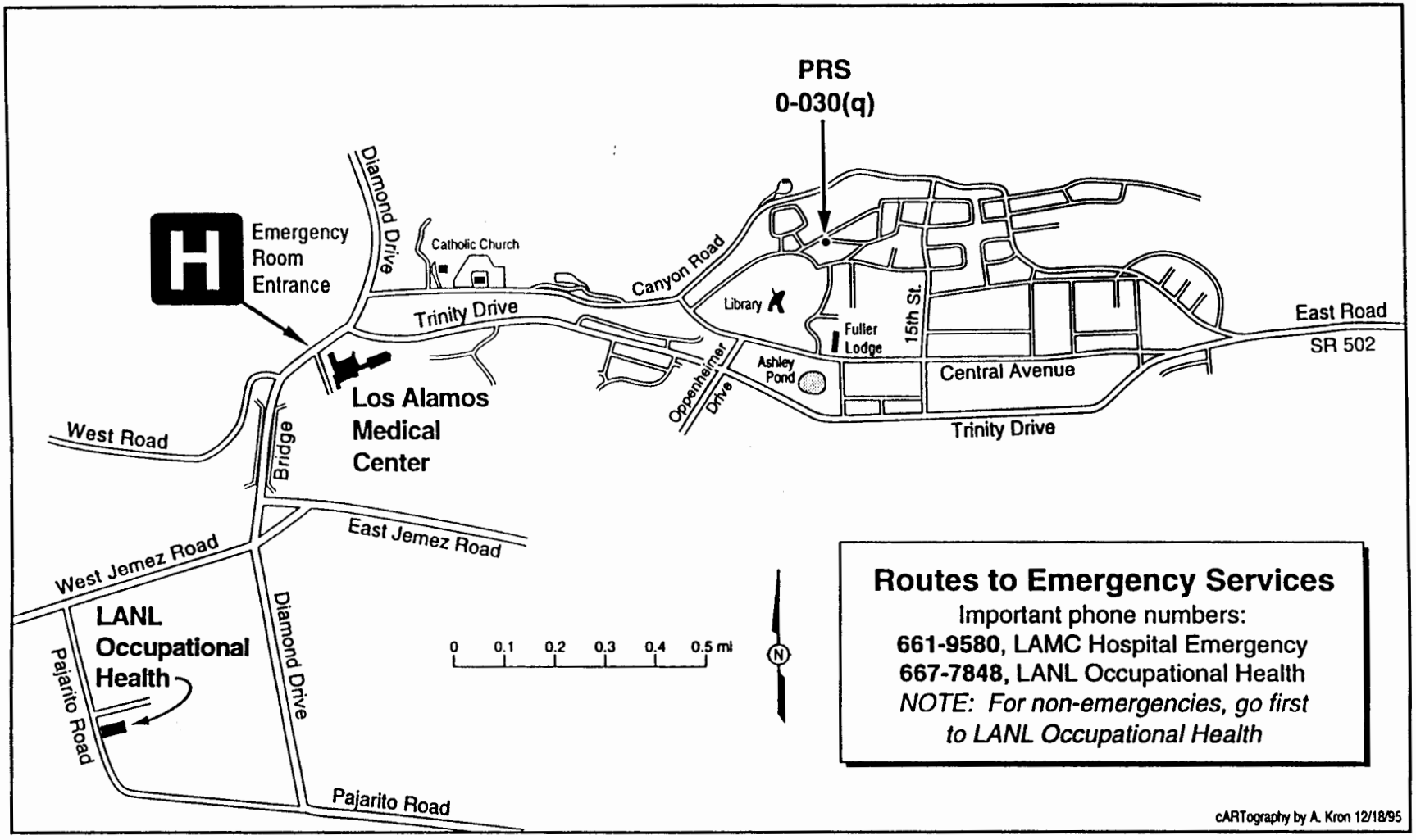
- Site name/location/phone #
- Caller ID
- Nature of emergency
- Number of personnel involved
- Name and condition of affected employees
- Actions taken and assistance required

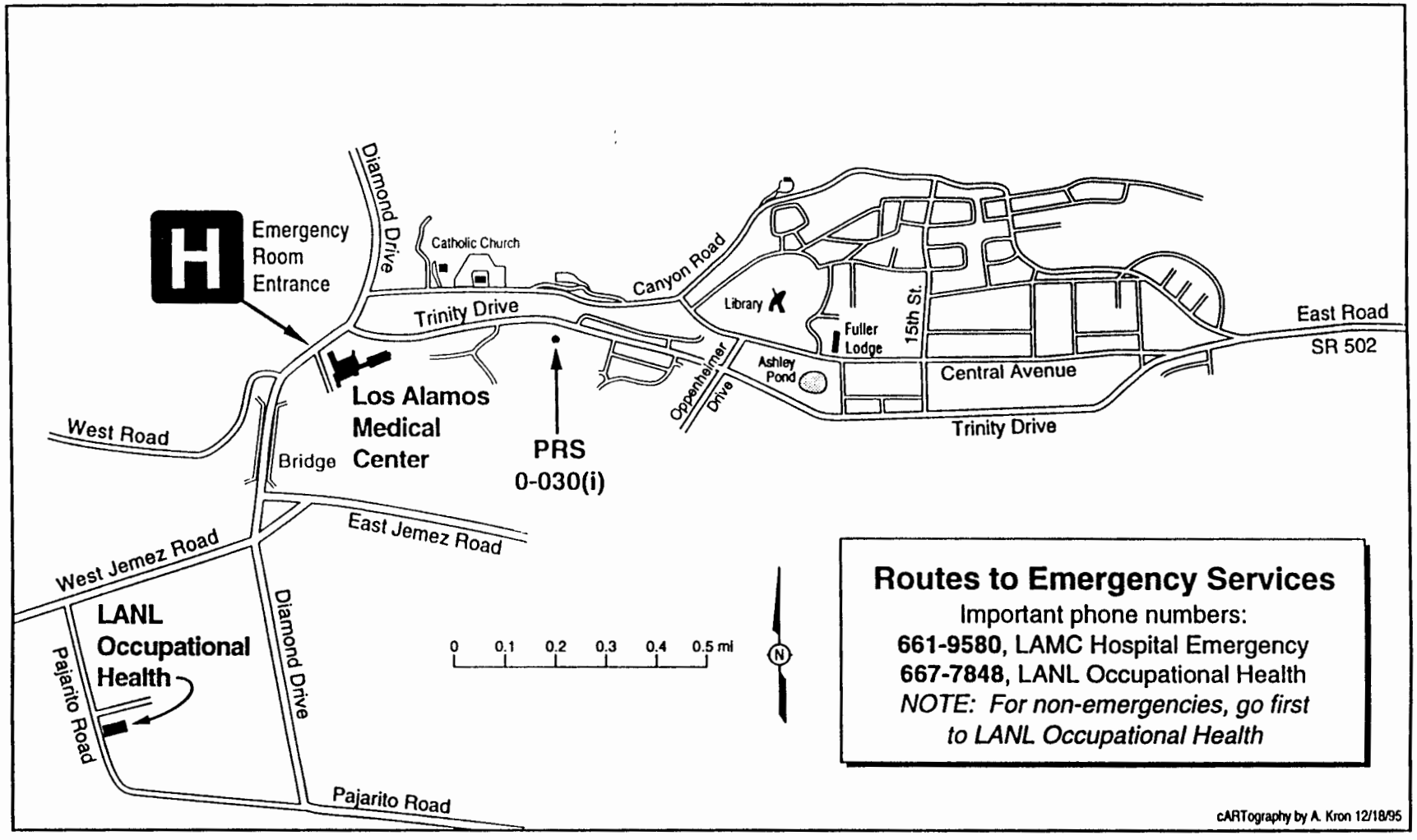

PRS
0-030(d)
Emergency
Room
Entrance
Diamond Drive
Catholic Church
Canyon Road
Trinity Drive
Library
Fuller
Lodge
15th St.
Pine St.
East Road
SR 502
Ashley
Pond
Oppenheimer
Drive
Central Avenue
Trinity Drive
Los Alamos
Medical
Center
West Road
Bridge
East Jemez Road
West Jemez Road
LANL
Occupational
Health
Pajarito Road
Diamond Drive
Pajarito Road
0 0.1 0.2 0.3 0.4 0.5 mi
N
Routes to Emergency Services
Important phone numbers:
661-9580, LAMC Hospital Emergency
667-7848, LANL Occupational Health
NOTE: For non-emergencies, go first
to LANL Occupational Health
cARTography by A. Kron 12/18/95

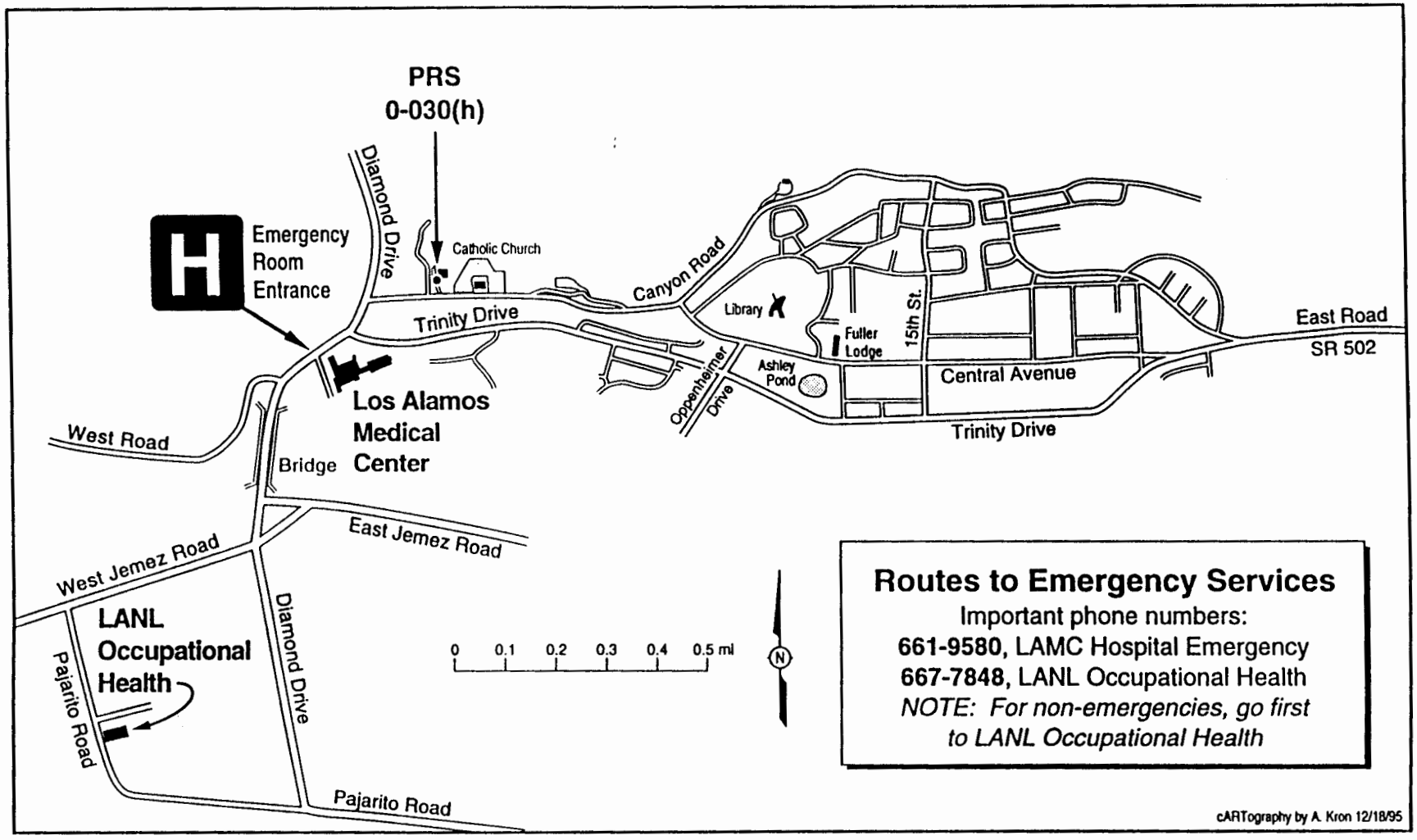

PRS
0-030(n)
Emergency
Room
Entrance
Diamond Drive
Catholic Church
Canyon Road
Trinity Drive
Library
Fuller
Lodge
15th St.
East Road
SR 502
Ashley
Pond
Central Avenue
Oppenheimer
Drive
Trinity Drive
Los Alamos
Medical
Center
West Road
Bridge
East Jemez Road
West Jemez Road
LANL
Occupational
Health
Pajarito Road
Diamond Drive
0 0.1 0.2 0.3 0.4 0.5 mi
N
Pajarito Road
Routes to Emergency Services
Important phone numbers:
661-9580, LAMC Hospital Emergency
667-7848, LANL Occupational Health
NOTE: For non-emergencies, go first
to LANL Occupational Health
cARTography by A. Kron 12/18/95

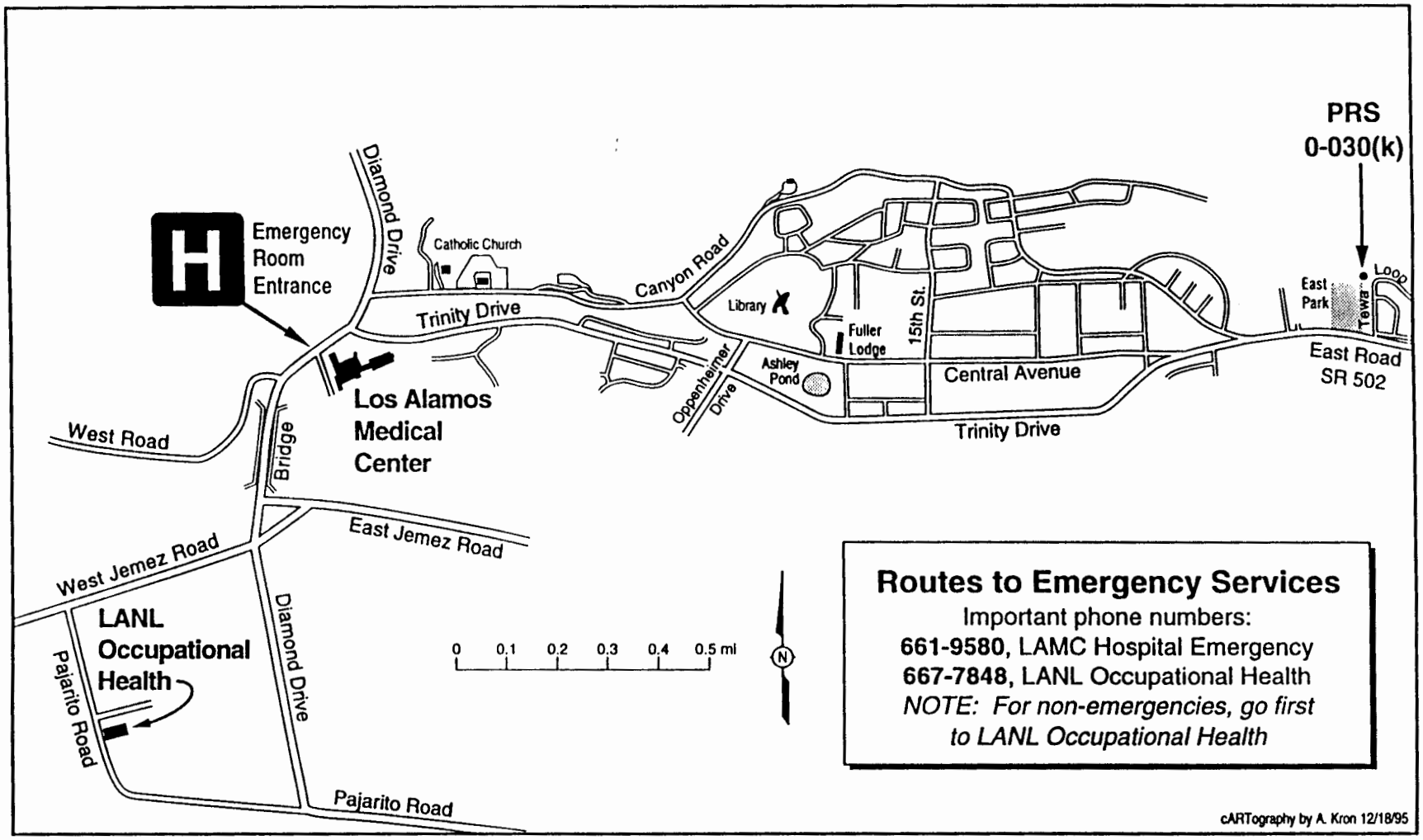

PRS
0-030(o)
Emergency
Room
Entrance
Diamond Drive
Catholic Church
Canyon Road
Trinity Drive
Library
Fuller
Lodge
15th St.
East Road
SR 502
Ashley
Pond
Central Avenue
Oppenheimer
Drive
Trinity Drive
Los Alamos
Medical
Center
West Road
Bridge
East Jemez Road
West Jemez Road
LANL
Occupational
Health
Pajarito Road
Diamond Drive
Pajarito Road
0 0.1 0.2 0.3 0.4 0.5 mi
N
Routes to Emergency Services
Important phone numbers:
661-9580, LAMC Hospital Emergency
667-7848, LANL Occupational Health
NOTE: For non-emergencies, go first
to LANL Occupational Health
cARTography by A. Kron 12/18/95


PRS
0-030(j)
Emergency
Room
Entrance
Diamond Drive
Catholic Church
Canyon Road
Trinity Drive
Library
Fuller
Lodge
15th St.
Manhattan Loop
East Road
SR 502
Ashley
Pond
Oppenheimer
Drive
Central Avenue
Trinity Drive
Los Alamos
Medical
Center
West Road
Bridge
East Jemez Road
West Jemez Road
LANL
Occupational
Health
Pajarito Road
Diamond Drive
Pajarito Road
0 0.1 0.2 0.3 0.4 0.5 mi
N
Routes to Emergency Services
Important phone numbers:
661-9580, LAMC Hospital Emergency
667-7848, LANL Occupational Health
NOTE: For non-emergencies, go first
to LANL Occupational Health
cARTography by A. Kron 12/18/95


PRS
0-030(q)
Emergency
Room
Entrance
Diamond Drive
Catholic Church
Canyon Road
Trinity Drive
Library
Fuller
Lodge
15th St.
East Road
SR 502
Ashley
Pond
Central Avenue
Oppenheimer
Drive
Trinity Drive
Los Alamos
Medical
Center
West Road
Bridge
East Jemez Road
West Jemez Road
LANL
Occupational
Health
Pajarito Road
Diamond Drive
0 0.1 0.2 0.3 0.4 0.5 mi
N
Pajarito Road
Routes to Emergency Services
Important phone numbers:
661-9580, LAMC Hospital Emergency
667-7848, LANL Occupational Health
NOTE: For non-emergencies, go first
to LANL Occupational Health
cARTography by A. Kron 12/18/95


Emergency Room Entrance
Diamond Drive
Catholic Church
Canyon Road
Trinity Drive
Library
Fuller Lodge
15th St.
East Road
SR 502
Ashley Pond
Central Avenue
Oppenheimer Drive
Trinity Drive
Los Alamos Medical Center
West Road
Bridge
PRS 0-030(i)
East Jemez Road
West Jemez Road
LANL Occupational Health
Pajarito Road
Diamond Drive
0 0.1 0.2 0.3 0.4 0.5 mi
N
Pajarito Road
Routes to Emergency Services
Important phone numbers:
661-9580, LAMC Hospital Emergency
667-7848, LANL Occupational Health
NOTE: For non-emergencies, go first to LANL Occupational Health
cARTography by A. Kron 12/18/95


PRS
0-030(h)
Emergency
Room
Entrance
Diamond Drive
Catholic Church
Trinity Drive
Canyon Road
Library
Fuller
Lodge
15th St.
East Road
SR 502
Ashley
Pond
Central Avenue
Oppenheimer
Drive
Trinity Drive
Los Alamos
Medical
Center
West Road
Bridge
East Jemez Road
West Jemez Road
LANL
Occupational
Health
Pajarito Road
Diamond Drive
Pajarito Road
0 0.1 0.2 0.3 0.4 0.5 mi
N
Routes to Emergency Services
Important phone numbers:
661-9580, LAMC Hospital Emergency
667-7848, LANL Occupational Health
NOTE: For non-emergencies, go first
to LANL Occupational Health
cARTography by A. Kron 12/18/95


PRS
0-030(k)
Emergency
Room
Entrance
Diamond Drive
Catholic Church
Canyon Road
Trinity Drive
Library
Fuller
Lodge
15th St.
Ashley
Pond
Oppenheimer
Drive
Central Avenue
Trinity Drive
East
Park
Tewa
Loop
East Road
SR 502
Los Alamos
Medical
Center
West Road
Bridge
East Jemez Road
West Jemez Road
LANL
Occupational
Health
Pajarito Road
Diamond Drive
Pajarito Road
0 0.1 0.2 0.3 0.4 0.5 mi
N
Routes to Emergency Services
Important phone numbers:
661-9580, LAMC Hospital Emergency
667-7848, LANL Occupational Health
NOTE: For non-emergencies, go first
to LANL Occupational Health
cARTography by A. Kron 12/18/95

Site Health and Safety Plan Acknowledgment

I have read, understand, and agree to follow the provisions detailed in this health and safety plan for Field Unit 1,.

I understand that my failure to comply with these provisions may lead to disciplinary actions and/or my dismissal from the site.

Printed Name	Organization	Employee #	Signature	Date

SSHASP MODIFICATION FORM

Project Title: SWMU 00-030(d,h,i,j,k,n,o,p) VCA

TA(s): 0 SSHASP No.: 101 Modification No.: 01

Modifications of the SSHASP shall be made per Section 1.3 of the HASP.
Attach to this page the SSHASP modifications.

Comments of the following reviewers have been incorporated as stipulated, or resolved with written record and copy to the respective reviewer.

	(Print Name)	(Title)	(Signature)	(Date)
Prepared by	Jim Santo	Field Team Member	[signature]	2/28/96

Review and Approval by:

	(Print Name)	(Title)	(Signature)	(Date)
Field Unit HS Representative	Joe Lack	ESH-5/ESH	[signature]	3/6/96
FTM/DPL or FTL/JS (optional at discretion of FPL)	Jayne Bradley	FTM	[signature]	2/29/96
Technical Area Representative				
FPL	Terry Rust	FOM	[signature]	3/8/96

Concurrence by:

	(Print Name)	(Title/Company)	(Signature)	(Date)
Subcontractor Representative (Management or HS Rep.)	Kevin Hyde	H&S Coordinator/IAGI	[signature]	2/28/96
Subcontractor Representative (Management or HS Rep.)				
Subcontractor Representative (Management or HS Rep.)				
Other				

SSHASP No. 101, MODIFICATION-01
SWMU 00-030(d,h,i,j,k,n,o,p) VCA

Table 3-1 will be modified so that Eddie Hull will be the geophysics field team member; and Geophex phone number will be listed as 661-6140.

Table 7, PPE Requirements by task, will be modified so that personnel from Geophex performing the geophysical survey, as identified in task 1 of table 2-2, will not be required to wear steel toed protective foot gear.

Annex 7.7 Waste Management Checklist

ANNEX 7.7

Waste Management Checklist

See the attached site-specific Waste Characterization Strategy form, February 16, 1996.

WASTE CHARACTERIZATION STRATEGY FORM

Field Unit/TA	PRS/SWMU Number	Title
Field Unit 1, TA-00	SWMUs 0-030 (d, h, i, j, k, n, o, p)	Townsite Septic Tanks

Name: Jayne Bradley, ERM/Golder	**Date:** 14 February 1996
FPL: Garry Allen	**WMC:** Larry Maassen
Type of Activity: Site Characterization and Voluntary Corrective Action	

Site Description:
Solid Waste Management Unit (SWMU) Group 0-3 consists of 13 septic systems. The septic systems were installed during the early 1940s and most remained in use until the Central Waste Water Treatment Plant was completed in late 1947. The septic tanks in this SWMU Group handled sanitary waste from the original townsite and from early laboratory operations at Tech Area 1 (TA-1). The SWMUs that are currently scheduled for field investigation and Voluntary Corrective Action (VCA) are described below. Field activities will be conducted for SWMUs 0-030 (d, h, i, j, k, n, o, p) and will be completed in March 1996 as part of the Los Alamos National Laboratory (LANL) Environmental Restoration (ER) Project. SWMUs 0-030 (d, h, i, j, k, n, o, p) consist of a total of eight septic tanks located within the townsite (Figure 1).

The potential for chemical or radiological contamination within these septic systems is low; however, all tanks, associated drainlines, and outfall points will be investigated to determine if contamination is present.

SWMU 0-030 (d)
The septic tank in SWMU 0-030 (d) (Figure 2) is located on Los Alamos County property at the Pine Street cul-de-sac (The Zia Company 1947, 05-0132) and was installed in 1943 or 1944 (Sullivan and Francis memo, 1995). This septic tank serviced McKee houses, apartments and dormitories west of Canyon Road which are now known as Pinon Street, Opal Street, Nugget Street, and Myrtle Street. It is unlikely that the septic tank contains Resource Conservation and Recovery Act (RCRA) or radioactive contamination because it is believed to have served residential areas only (Sullivan and Francis memo, 1995).

SWMU 0-030 (h)
The septic tank in SWMU 0-030 (h) (Figure 3) is located on private property north of Canyon Road (Kingsley 1947, 05-0174) at the "new" Catholic Church. The topography suggests that the area serviced by this septic tank was probably bound on the east by a north and south line that coincides with what is now the east wall of the Catholic Parish Hall, the areas between Canyon Road and Trinity Drive, the small housing area that was immediately north of Canyon Road, and bound on the west by what is now Diamond Drive. All of the buildings contained by this outlined area were Fort Leonard Wood housing units, dormitories, or military barracks. It is believed that this septic tank was connected only to residential-type buildings, so it is unlikely that radioactive or RCRA hazardous constituents could have been discharged into this tank (Sullivan and Francis memo, 1995).

SWMU 0-030 (i)
The septic tank in SWMU 0-030 (i) (Figure 4) is located on Los Alamos County property south of Trinity Drive and east of 35th Street (The Zia Company 1947, 05-0172 and 05-0171; LANL 1990, 0145). Engineering drawings showing the facilities connected to this septic tank are not available; however, the septic tank probably served the West (WAC) Mess Hall and buildings west of the West Mess Hall along Finch Street and south of Trinity Drive. These buildings were dormitories, barracks, a military post office, an officer's lounge, a post exchange, and Sundt Apartments. If the septic tank had, in fact, serviced the aforementioned buildings, it is unlikely that radioactive or RCRA contaminants were discharged into this septic tank (Sullivan and Francis memo, 1995).

SWMU 0-030 (j)
Based on a 1947 Zia Company Post Plan drawing, the septic tank in SWMU 0-030 (j) (Figure 5) is located about 600 feet north of East Road and east of the eastern segment of Manhattan Loop, on Los Alamos County property (The Zia Company 1947, 05-0132; Sullivan and Francis memo, 1995). Logically, this septic tank would have serviced the Fort Leonard Wood housing units bound by Manhattan Loop, north of

Canyon Road. The septic tank may have served other Fort Leonard Wood housing units and a group of unidentified buildings that were located in the immediate vicinity of Manhattan Loop. If these housing units were, in fact, serviced by this septic tank, it is unlikely that RCRA or radioactive contamination is present (Sullivan and Francis memo, 1995).

SWMU 0-030 (k)
The septic tank in SWMU 0-030 (k) (Figure 6) is located on private property north of the old Zia Warehouse area, north of East Road, and east of what is now the Dog Obedience Club building (The Zia Company 1947, 05-0132; Sullivan and Francis memo, 1995). The Zia Company Warehouse area and the septic tank in SWMU 0-030 (k) are shown on the 1947 Zia Company Post Plan. Although no information exists concerning the dimensions of the septic tank or the buildings it served, it is likely that this septic tank serviced the Zia Company Warehouse complex. The Warehouse Complex contained building materials, electrical supplies, plumbing supplies, nails, cement, and machinery warehouses. The Warehouse Complex also stored sheet lead and small quantities of pesticides and herbicides, resulting in a potential for RCRA contamination in the septic tank. No radioactive materials are believed to have been associated with the Warehouse Complex, so it is unlikely that radiological contamination exists within this septic system (Sullivan and Francis memo, 1995).

SWMU 0-030 (n)
The septic tank in SWMU 0-030 (n) (Figure 7) is located on Los Alamos county property west of 15th Street between Canyon Road and Pueblo Canyon (The Zia Company 1947, 05-0132). The septic system connected to this tank was not found on available drawings; however, it is not likely to have been connected to any technical buildings or have received radioactive or RCRA materials (Sullivan and Francis memo, 1995).

SWMU 0-030 (o)
The septic tank in SWMU 0-030 (o) (Figure 8) is located on private property between Canyon Road and Pueblo Canyon according to a map prepared in 1947 (The Zia Company 1947, 05-0132). This septic tank serviced the Sundt Apartments, McKee Housing, a dormitory and a laundry located in the area that is now Sage Loop, Oakwood Loop, and the area east of 15th Street. It is unlikely that this septic tank contains radioactive or RCRA contaminants (Sullivan and Francis memo, 1995).

SWMU 0-030 (p)
The septic tank in SWMU 0-030 (p) (Figure 9) is located on private property at the eastern end of the Rim Road cul-de-sac (The Zia Company 1947, 05-0132). It is logical that this septic tank serviced the Rim Road and Quartz Street residential area. There were no TA-1 buildings connected to this septic tank, so it would be unlikely for the tank to be contaminated with radioactive or RCRA materials (Sullivan and Francis memo, 1995).

Description of Field Operations:

The field work for initial investigation and subsequent VCA activities at SWMUs 0-030 (d, h, i, j, k, n, o, p) will be completed in four field tasks: field surveys, surface sampling, subsurface sampling (includes sampling tank contents), and corrective actions. The tasks that will result in the generation of waste to be characterized and managed appropriately include surface sampling, subsurface sampling, and corrective actions. Wastes will be managed in accordance with applicable ER Project Standard Operating Procedures (SOPs), and applicable federal, state, and local regulations.

Field Surveys
Initial field investigation activities will consist of field surveys including a site survey, geophysical survey and geomorphologic mapping. Site surveys will be conducted to verify the locations of the septic tanks, drainlines, and outfall points. The locations will be determined by examining historic aerial photographs, by

reviewing records including maps and engineering plans, and by conducting visual site inspections. If the site surveys do not reveal the location of all buried structures in sufficient detail, geophysical surveys will be conducted to more precisely locate the septic tanks and trace drainlines to their outfall locations. A magnetic survey and an electromagnetic conductivity survey will be conducted to further define buried features. In addition, first-order stream channels that originate at or transect the outfall points for each septic tank will be located and mapped to determine sites for sampling channel sediments. This activity will locate all sediment catchments adjacent to, or as close as possible to, the outfall points.

Surface Sampling

Surface sediment samples for each outfall will be collected using the procedures described in LANL-ER-SOP-06.14, Sediment Material Collection. Samples of channel sediments will be collected from sediment catchments adjacent to or immediately downslope of septic drain outfall points as identified during the geomorphologic mapping of the drainage channels. Two sediment samples will be collected as close as possible to the outfall points from sediment catchments in first or higher-order drainage channels that have developed downslope of the septic drain outfalls. If no distinct channels are discernible adjacent to the outfall points, two samples will be collected from likely sediment catchment areas adjacent to the outfall points. A total of 16 samples (2 samples per site) will be taken from sediment catchment areas and analyzed for total uranium (^{234}U, ^{236}U) by inductively coupled plasma/mass spectrometry (ICP/MS), plutonium (^{238}Pu, $^{239/240}Pu$) by alpha spectroscopy, ^{241}americium (^{241}Am) by gamma spectroscopy, tritium, volatile organic compounds (VOCs) by EPA SW 846 Method 8260, semivolatile organic compounds (SVOCs) by EPA SW 846 Method 8270, total Target Analyte List (TAL) metals by EPA SW 846 Method 6010 and 7470 (Hg), polychlorinated biphenyls (PCBs)/pesticides by EPA SW 846 Method 8080.

Subsurface Sampling

Septic system investigations will involve collecting samples from within and around the tank and associated drainlines using a hand auger. Most of the tanks are expected to have been backfilled with fill material when they were initially taken out of service. A minimum of six soil samples will be collected from each tank location. Four samples will be collected from the interior of the tank and two around the outside perimeter of the tank adjacent to the tank bottom. Additional samples will be collected from beneath the drainline at regular intervals between the tank and the outfall point.

Prior to collection of samples, the septic tanks will be located and sufficiently excavated to expose the top of the tank and the inlet and outlet drainlines to determine the configuration of the septic system. The excavation will be continuously monitored with field-screening instruments and inspected for staining and breaches in the septic system to determine if releases from the tank may have occurred. Subsurface samples will be collected using the procedures described in LANL-ER-SOP-06.10, Hand Auger and Thin-Wall Tube Sampler, and/or LANL-ER-SOP-06.19, Weighted Bottle Sampler for Liquids and Slurries in Tanks.

The interior samples will be collected adjacent to the inlet and outlet ends of the tank and/or in each distinct chamber of the tank, if so constructed. Two samples will be collected from each borehole in the tank interior, including one from a depth midway between the top of the tank and the tank floor (if the tank was previously backfilled), and one from immediately above the tank floor. All materials encountered within and around the tank will be continuously monitored for organic vapors and radiological constituents. Detailed descriptions of the tank contents and the condition of the tank structure will be recorded.

A minimum of two soil samples will also be collected outside the tank. One borehole will be hand-augered immediately outside the inlet and outlet ends of the tank and advanced to a depth 1 foot below the tank bottom, where a soil sample will be collected. Soil that appears contaminated based on visual inspection or if field screening indicates the presence of chemical or radiological contamination, additional samples will be collected. All materials removed from the borehole will be continuously monitored for organic vapors and gross alpha, beta and gamma radiation.

The samples will be submitted to the Mobile Chemistry Analytical Laboratory (MCAL) and the Mobile Radiological Analytical Laboratory (MRAL) for screening and to a fixed analytical laboratory for analysis. Analyses will include total uranium (^{234}U, ^{236}U) by ICP/MS, plutonium (^{238}Pu, $^{239/240}Pu$) by alpha spectrometry, ^{241}americium (^{241}Am) by gamma spectrometry, tritium, VOCs by EPA SW 846 Method 8260, SVOCs by EPA SW 846 Method 8270, and PCBs/pesticides by EPA SW 846 Method 8080. The samples collected from inside the tank for waste characterization purposes will be analyzed for TCLP metals and the soil samples collected from around the tank and beneath the drain lines will be analyzed for total TAL metals by EPA SW 846 Method 6010 and 7470 (Hg).

Voluntary Corrective Actions

Based on the results of the field investigation, an evaluation will be made to determine what corrective action will be required for each of the septic systems. VCAs for each of the tanks will be determined on a case-by-case basis, depending on the nature and extent of the contamination, if any. VCA activities may include removal of tank contents and abandonment of the tank structure and drainline with no further action, or excavation and removal of the septic tank, contents, and associated outfall drainlines. In the event that soil contamination is encountered outside the tank, the tank and the contaminated soils will be removed to the extent necessary. If mixed waste is determined to be present in the subsurface, based on initial sampling, the tank, contents, and drainline will be left in place until arrangements can be made to ship the waste from the SWMU to a temporary storage area and final disposition location..

Investigation or Remediation Waste Description and Volume Estimate:

Waste volumes: Waste generated during sampling and VCA activities will include scoops, disposable coveralls, nitrile gloves, decon fluids (deionized or potable water and Alconox), paper towels, plastic sheeting and other miscellaneous sampling debris. It is anticipated that one 55-gallon solid waste drum will be generated per septic tank. Waste will be consolidated appropriately to minimize the volume of drums generated, if possible (e.g., gloves from the different SWMUs may be segregated in labeled and sealed plastic bags within the same drum), to reduce the number of drums required to contain the waste. An estimated minimum number of eight solid waste drums will be generated during all field activities.

The intent for decon fluids generated during all activities is to discharge the water at each SWMU according the NMED letter dated December 20, 1995. The decon fluids to be discharged will be a mixture of deionized or potable water and Alconox and less than 6 gallons will be discharged daily. However, if field observations or field screening indicate contaminated soils have been encountered at any SWMU, the decon fluids for this area of the investigation will be segregated until analytical screening data has been reviewed. If the decon water can be discharged on each SWMU, it is estimated that one liquid drum may be generated during all field activities.

A final methanol and deionized water rinse will only be used if necessary as a final step in decontaminating sampling equipment. If the use of methanol is necessary, a liquid waste drum for the mixture of deionized water and methanol (<9 percent) will be generated for all eight septic tanks.

The volumes of waste generated as a result of VCA activities at each of the septic systems will be determined based on the analytical results of the initial investigation activities and the decision on whether or not to abandon the tank(s) in place. The waste volumes will depend on the size of each tank, the type and extent of contamination, the accessibility of the septic system, and whether or not the tank will be removed or abandoned in place. The tanks are expected to range in volume from 4 to 90 cubic yards. Any residual sludge and backfill material which may have been placed in each tank when the tanks were decommissioned during 1947 will be removed from each tank and segregated. In order to minimize the amount of waste, the backfill material will be placed back in the tank or the excavation if analytical results

indicate the material does not present a threat to human health or the environment. If an assumption is made that all septic tanks had an average volume of 60 cubic yards and approximately 30 cubic yards of solid waste will be removed from each tank, then an estimated total of 240 cubic yards of solid waste may be generated. Additional waste will be generated if the entire septic tank and outfall drainlines are to be removed and this will be determined on a site to site basis.

Waste Types: Personal protective equipment (PPE)/disposable sampling equipment, plastic sheeting, and equipment decontamination fluids (potable water, deionized water, detergent, and possibly methanol and deionized water mixture at a non-hazardous concentration of <9%).

If a septic system is determined to contain chemical or radiological contamination, the tank contents (sludge and backfill material) will be removed and appropriately containerized for disposal, based on the type of contamination (e.g., drums, roll-off bins, burial boxes). If a decision is made to remove the septic system structures, the tank will be demolished to facilitate containerization. Prior to any demolition and removal activities, the site-specific health and safety plan will be modified to include these activities. In addition, if the outfall drainline will be removed it will be cut into pieces to facilitate containerization.

Waste Packing: Closed-top and open-top, Department of Transportation approved, 55-gallon drums will be used to containerize liquid and solid wastes, respectively. Roll-off bins may be used for VCAs that require larger volumes of excavated materials. Burial boxes may be used to contain excavated material if chemical or radiological contamination is encountered. Prior to using burial boxes or roll-off bins, site logistics will be reviewed to determine whether or not these containers can be easily moved around onsite and if the appropriate equipment (forklift) is readily available to move the containers.

Characterization Strategy:
Archival information and acceptable knowledge suggests that all of these septic tanks, with the exception of SWMU 0-030(k), served residential-type buildings which suggests that nonhazardous waste will probably be encountered. Based on acceptable knowledge of all these SWMUs, high explosive compounds and asbestos are not expected to be encountered at these sites and are not considered to be a waste concern.

Preliminary characterization samples will be collected from the tank contents prior to any excavation activities. During the initial sampling phase, the profile of the tank contents will be described and field screened for radiological contamination and VOCs with hand held instruments. If distinct layering is encountered in the tank, a sample will be collected from each different layer to determine whether or not any chemical or radiological contaminants are present. If the analytical results indicate any layer is nonhazardous, then an attempt will be made during excavation activities to segregate this material from the material which contains chemical or radiological contaminants.

In order to minimize waste, a dry decontamination step will be implemented to remove excess soil from scoops, bowls, and other sampling equipment. In addition, walking through or kneeling in potentially contaminated soil during sampling will be discouraged.

Samples from within and around the septic systems will be submitted to the MCAL and the MRAL for screening and to a fixed analytical laboratory for analysis. Analyses will include total uranium (^{234}U, ^{236}U) by ICP/MS, plutonium (^{238}Pu, $^{239/240}Pu$) by alpha spectrometry, ^{241}americium (^{241}Am) by gamma spectrometry, tritium, VOCs by EPA SW 846 Method 8260, SVOCs by EPA SW 846 Method 8270, total TAL metals by EPA SW 846 Method 6010 and 7470 (Hg), and PCBs/pesticides by EPA SW 846 Method 8080.

Temporary Storage Area

Based on acceptable knowledge, it is anticipated that all PPE and disposable sampling equipment generated will be nonhazardous. Upon generation, the waste will be immediately shipped from the SWMU under manifest, to a temporary storage area at TA-3, SM 271 until appropriate disposal can be determined and arranged, based on analytical results.

Based on the analytical results of the initial investigation, the disposition of the contents from each septic system will be determined prior to removal of the material. If the tank contents are determined to contain chemical or radiological contamination, the tank and contents will be appropriately containerized for disposal based on the type of contamination (e.g., drums or roll-off bins). If the tank structure is to be removed it will be demolished in order to facilitate containerization. Upon generation, the waste will be immediately shipped from the SWMU under manifest, to a temporary storage area at TA-3, SM 271 until appropriate disposal can be determined and arranged, based on analytical results.

<90 Day Storage Area

It is not anticipated that RCRA hazardous waste will be generated during field activities, but if it is the waste will be appropriately containerized for disposal based on the type of contamination (e.g., drums or roll-off bins). The waste will be shipped from the SWMU under manifest, to a < 90 day storage area at TA-3, SM 271 until appropriate disposal can be determined and arranged, based on analytical results. A provisional EPA ID Number will be obtained through ESH-19 prior to shipping any hazardous waste from the SWMU to LANL property for storage or final disposition. The RCRA hazardous waste will be managed according to all state and federal regulations.

Analyte Suite:

Analyte	Direct Sampling of Waste	Acceptable Knowledge		
		Existing Information		Data from Site Char.
		Present	Absent	
Volatile Compounds				X
Semi-Volatile Compounds				X
Organochlorine Pesticides & PCBs				X
Inorganic Compounds				X
High Explosive Compounds			X[1]	
Gross Alpha				X
Gross Beta				X
Gross Gamma				X
Asbestos			X[1]	
Tritium				X
TCLP: Metals				X
Organics				X[2]
Pesticides, Herbicides, Fungicides				X[2]

1. Acceptable Knowledge indicates that these constituents are absent from the waste streams.
2. Analyses for volatile organics, and semi-volatile organics will be performed instead of TCLP.

Field Unit/TA	PRS/SWMU Number	Title
Field Unit 1, TA-00	SWMUs 0-030 (d, h, i, j, k, n, o, p)	Townsite Septic Tanks

Signatures:

Prepared By — Date: 2-16-96

Waste Management Representative — Date: 2/20/96

Garry Allen or Field Unit #1 Designee — Date: 2/28/96

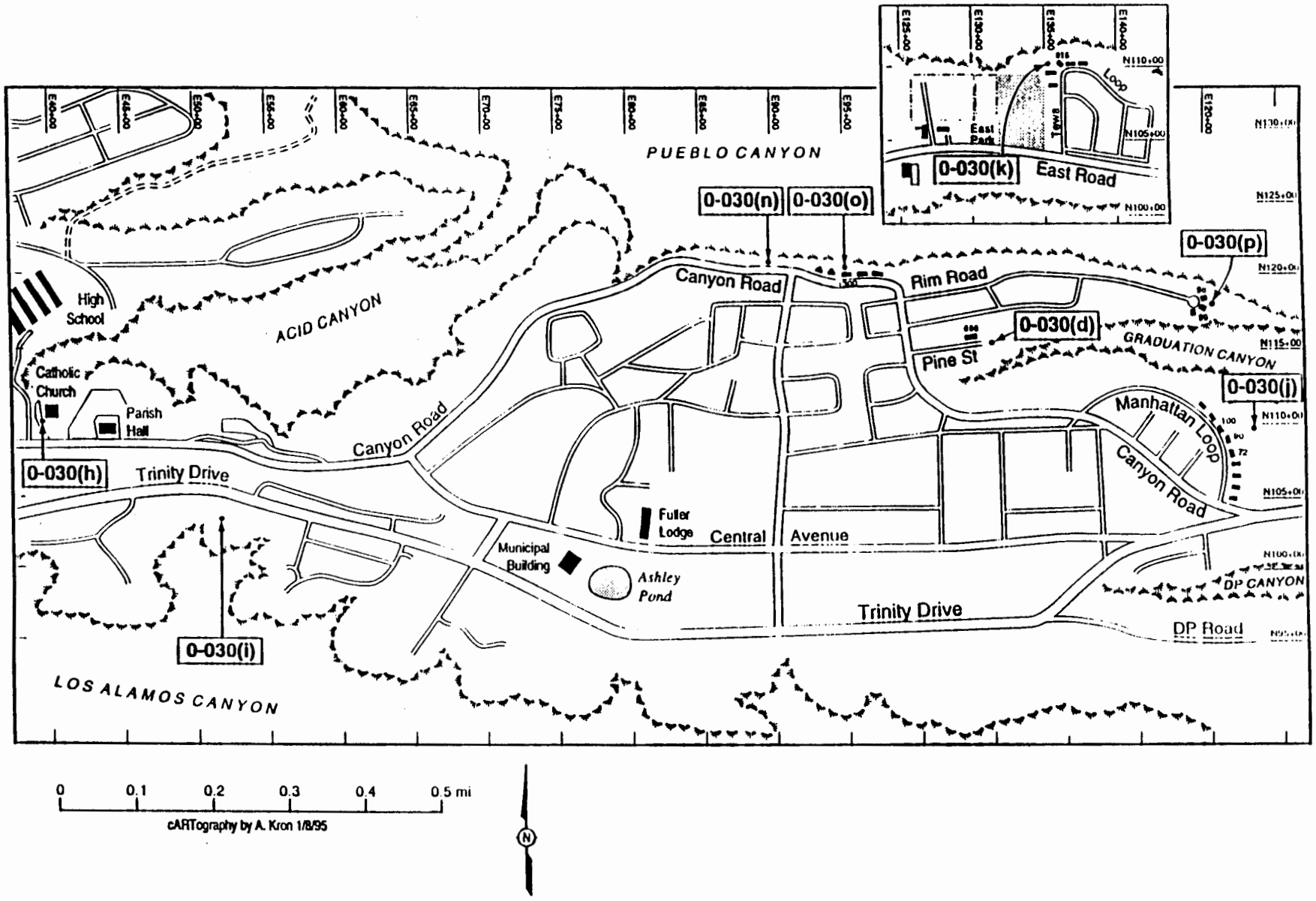


Figure 1. Locations of septic tank systems in SWMU Group 0-3.

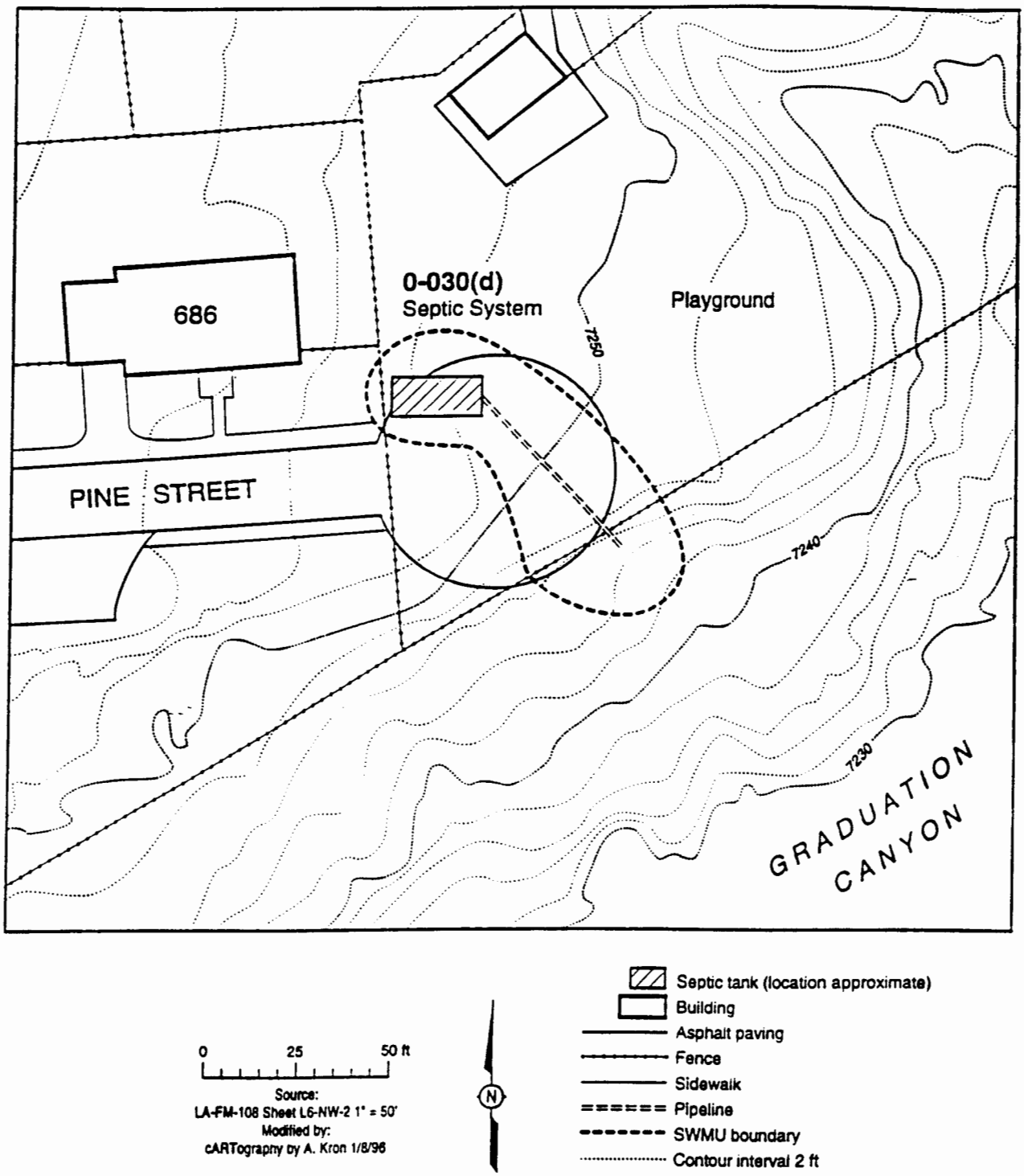


Figure 2. Location map for SWMU 0-030(d).

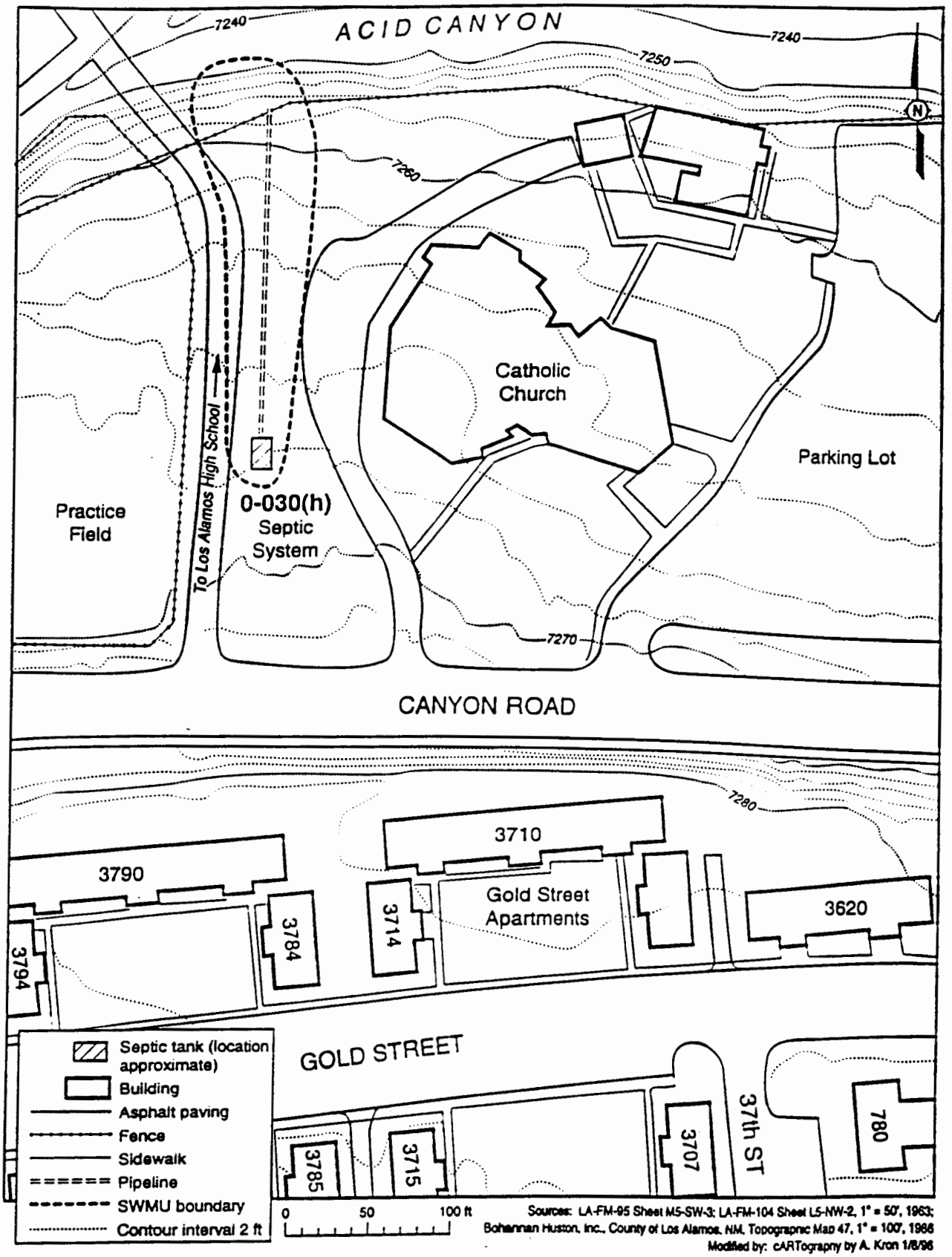


Figure 3. Location map for SWMU 0-030(h).

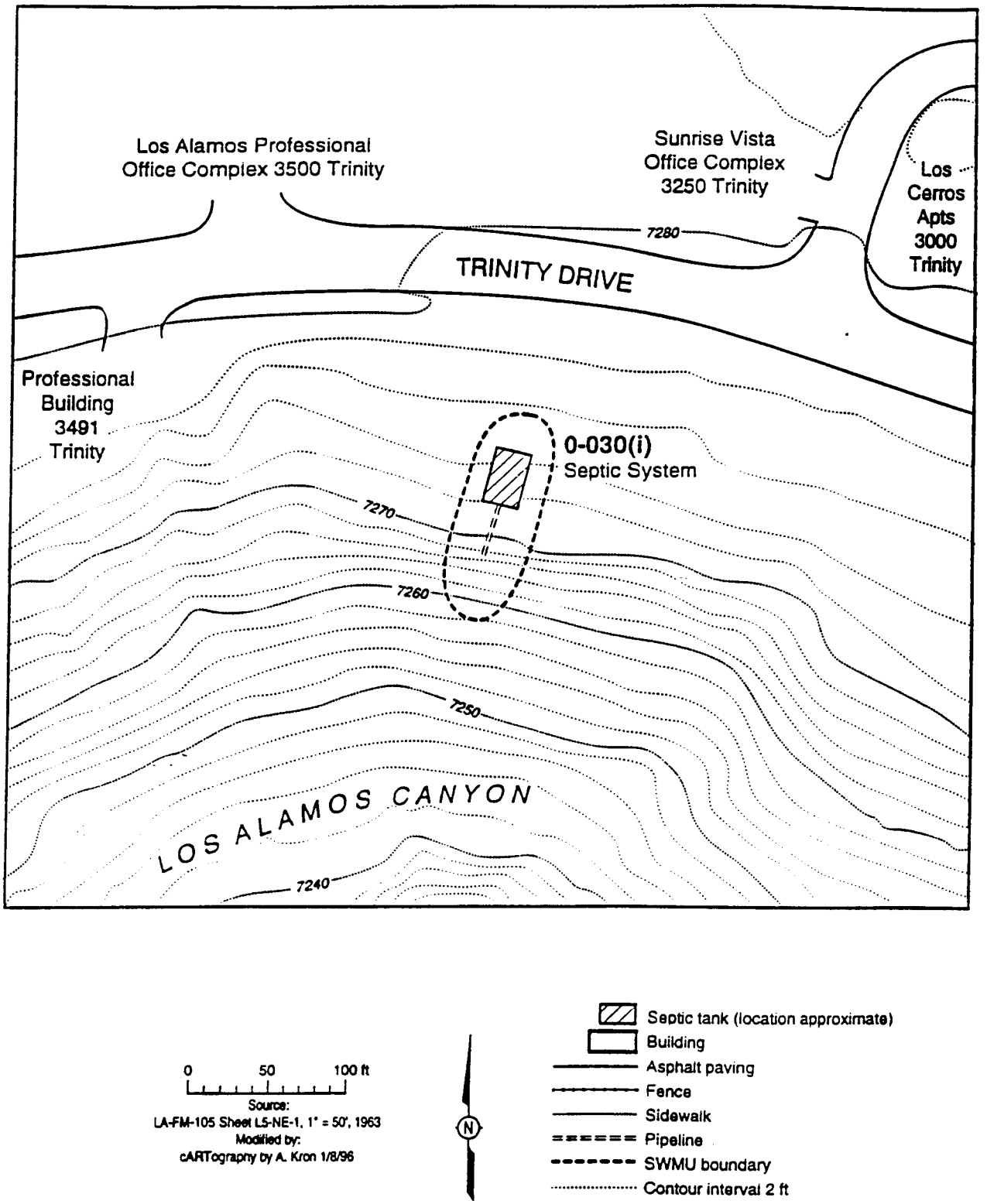


Figure 4. Location map for SWMU 0-030(I).

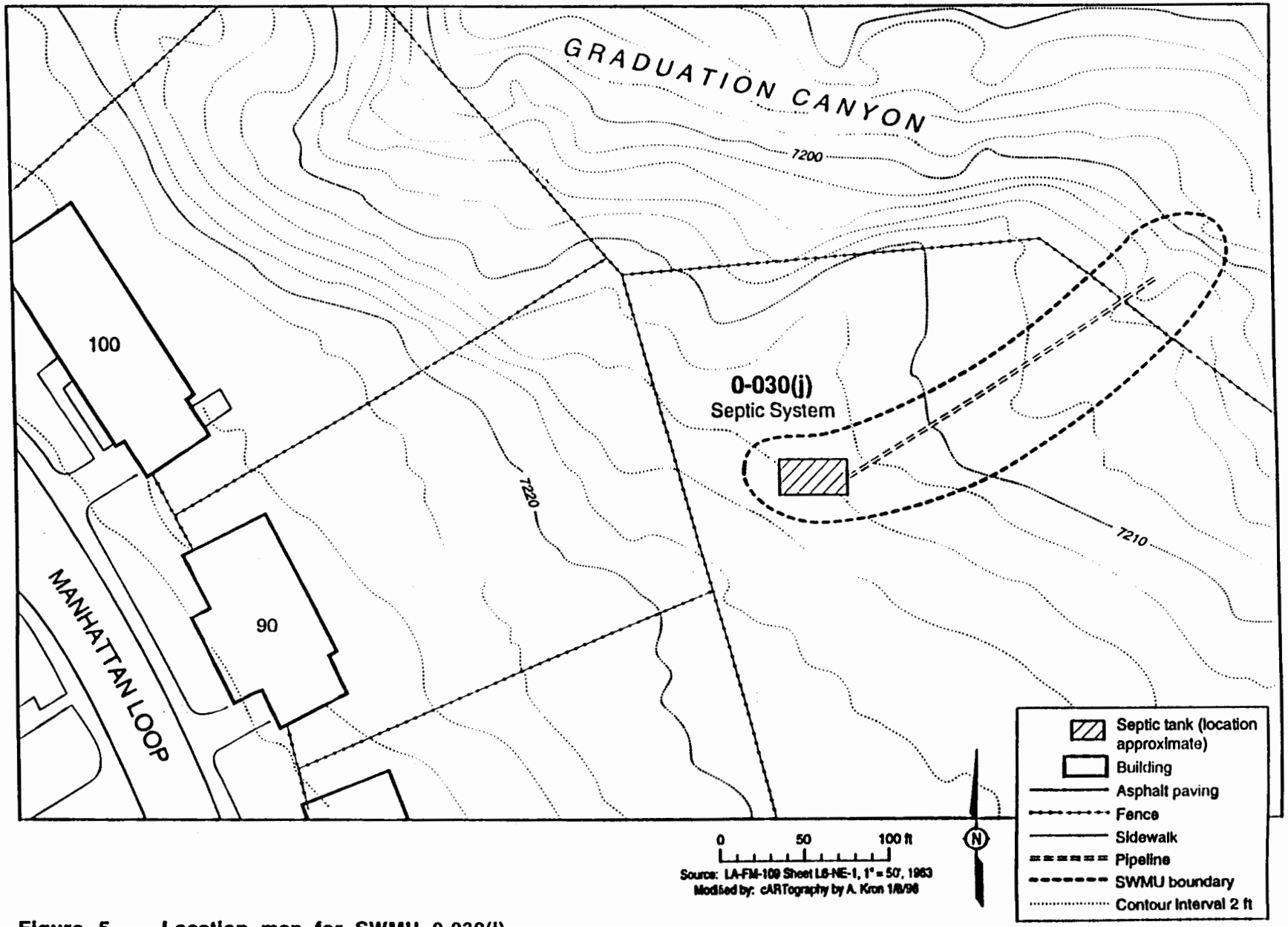
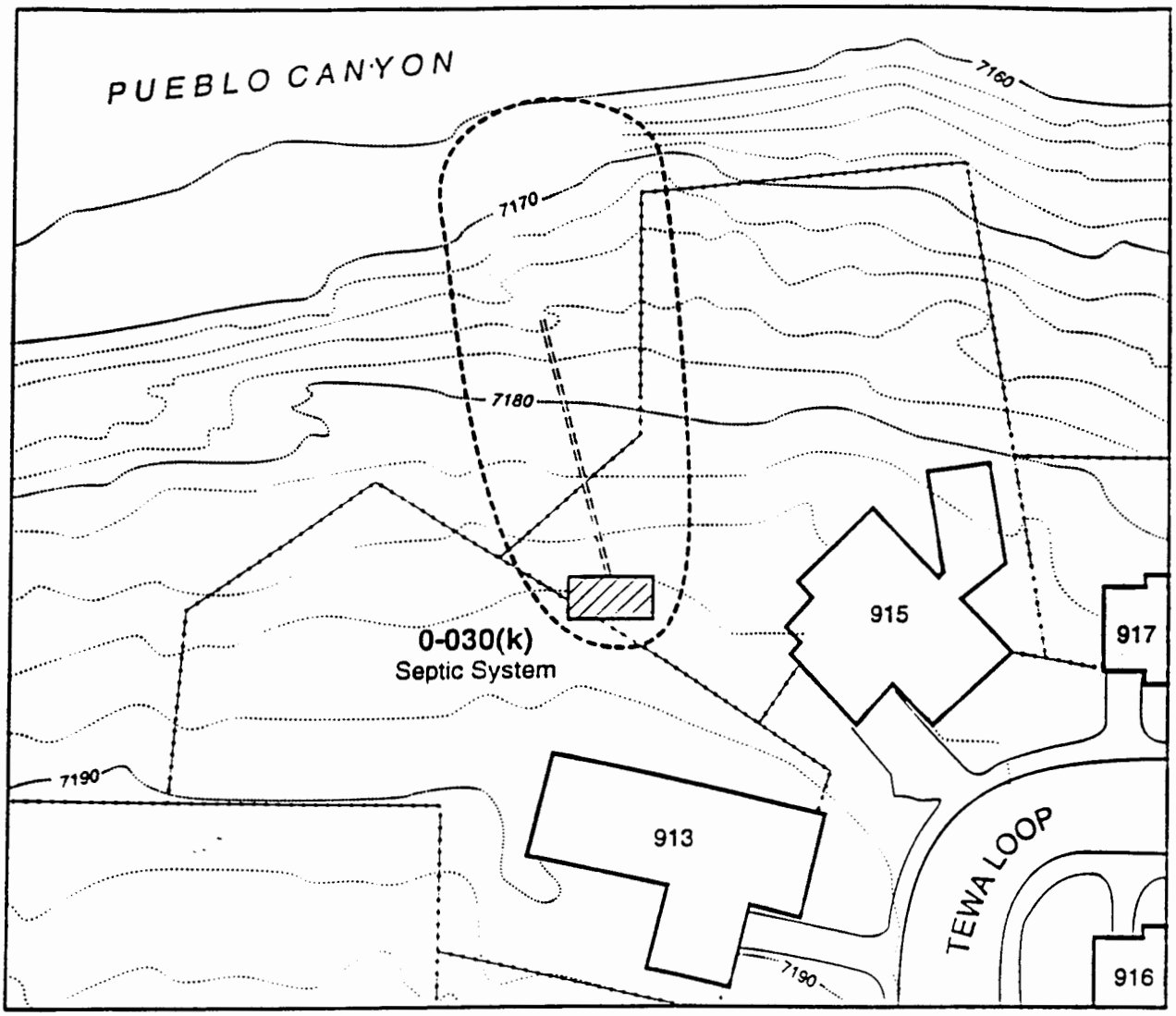


Figure 5. Location map for SWMU 0-030(j).



0 50 100 ft

Source:
LA-FM-110 Sheet L6-NE-2, 1" = 50', 1963
Modified by:
cARTography by A. Kron 1/8/96

N

Septic tank (location approximate)
Building
Asphalt paving
Fence
Sidewalk
Pipeline
SWMU boundary
Contour interval 2 ft

Figure 6. Location map for SWMU 0-030(k).

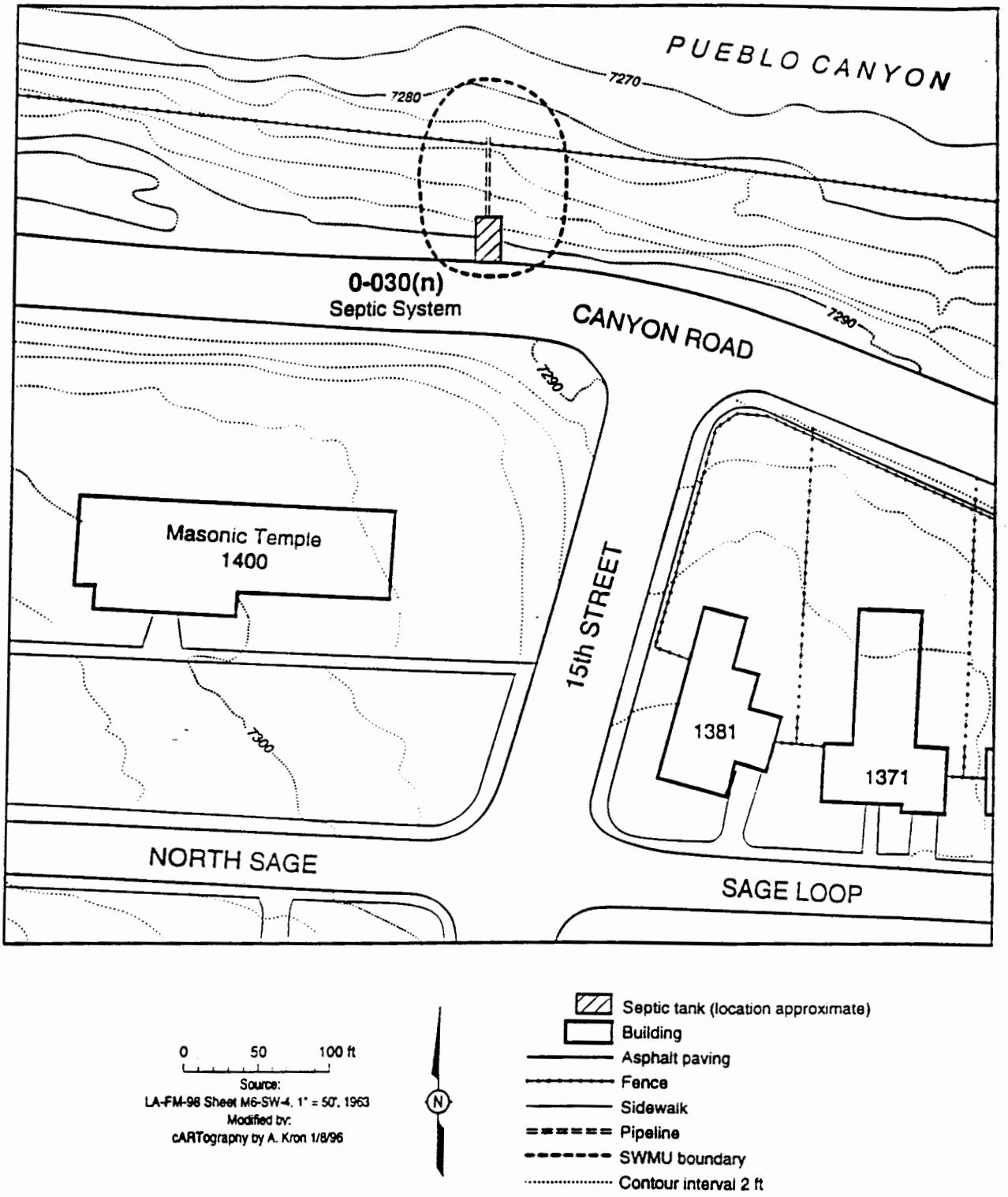


Figure 7. Location map for SWMU 0-030(n).

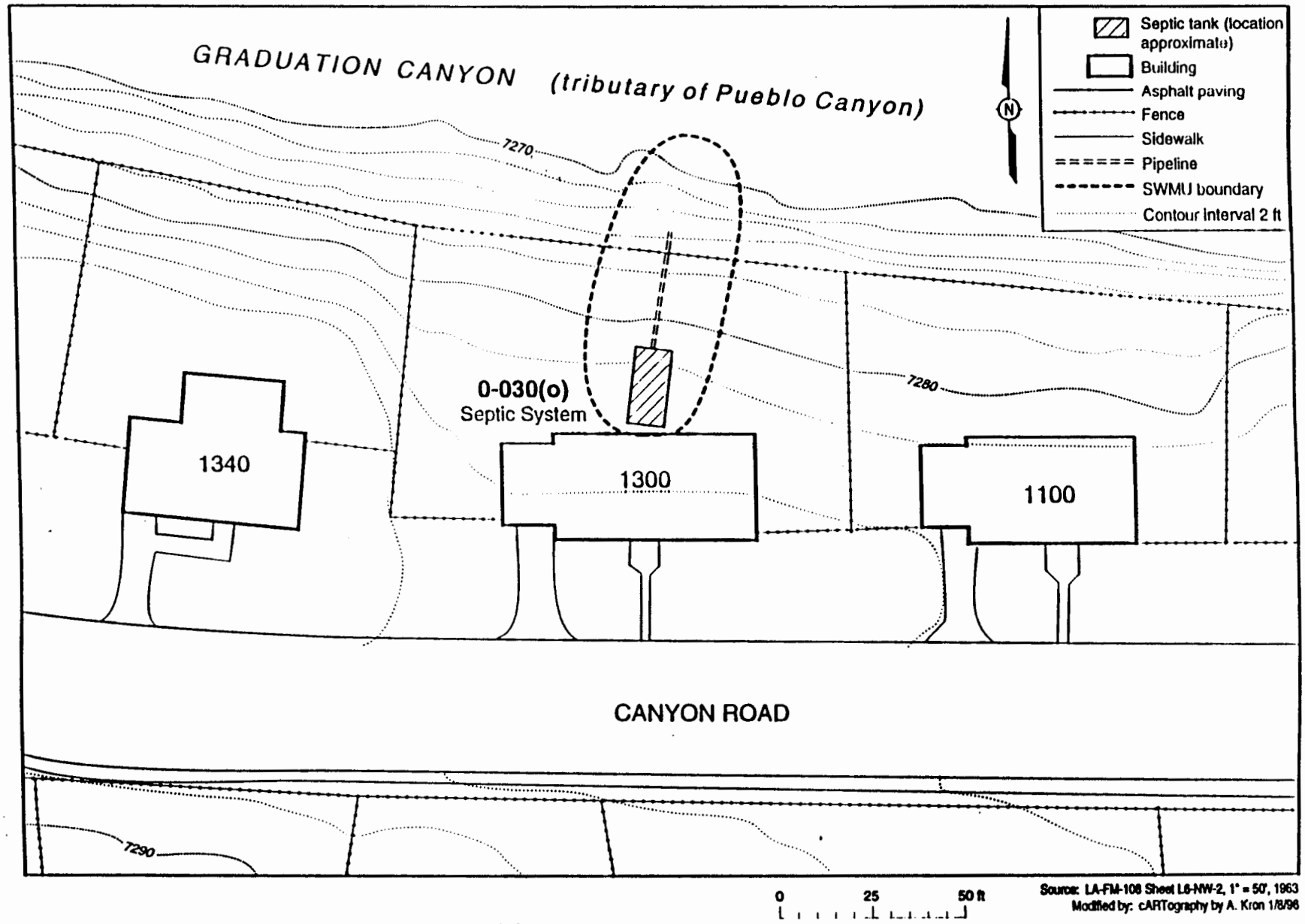


Figure 8. Location map for SWMU 0-030(o).

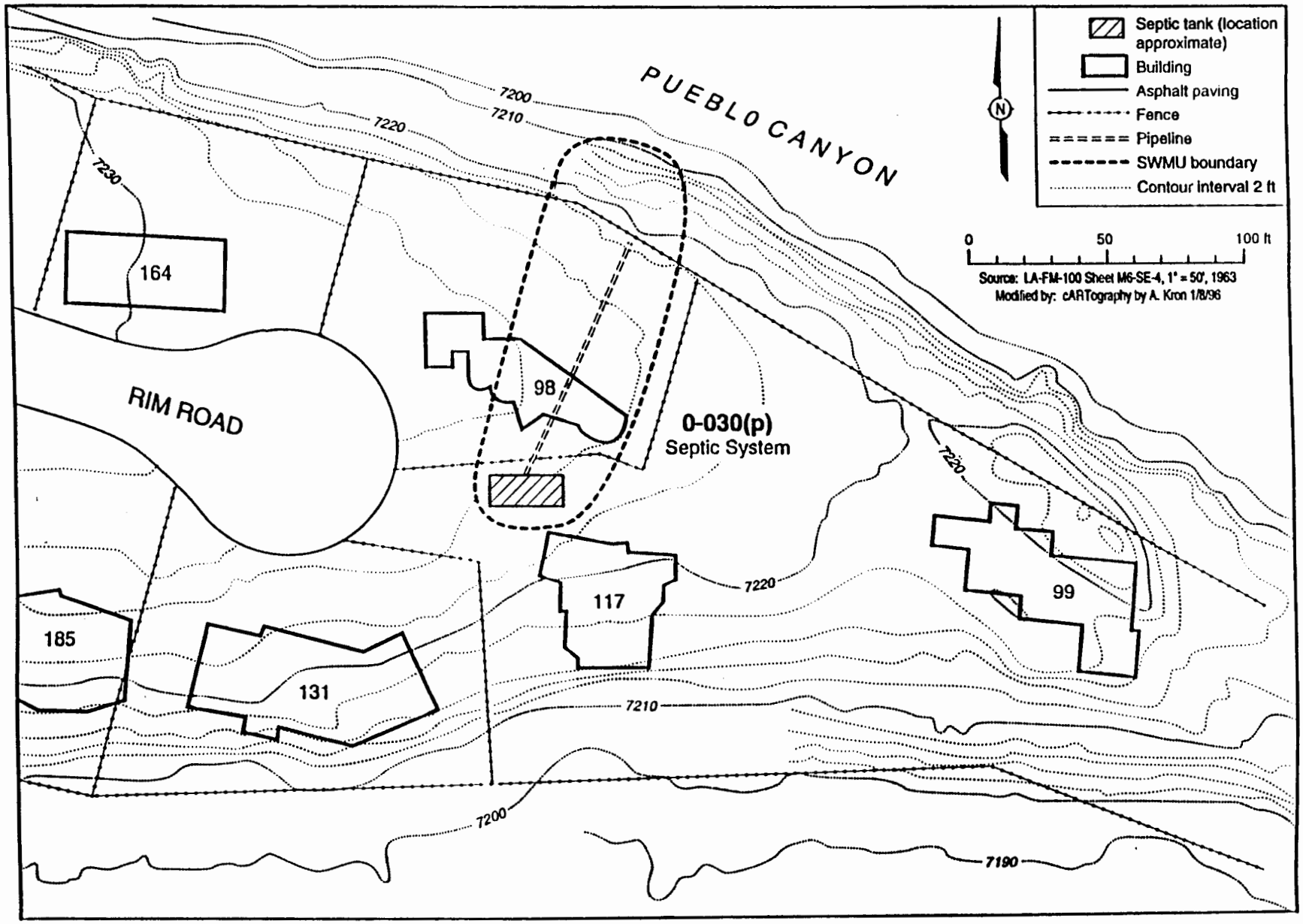


Figure 9. Location map for SWMU 0-030(p).

Annex 7.8 VCA Checklist and Fieldwork Authorization Form

Voluntary Corrective Action (VCA)
Checklist and Fieldwork Authorization Form

PRS No. 0-030(d,h,i,j,k, n,o,p) **HSWA or AOC**

✓ COPC(s) defined.

✓ Nature and extent defined or field screening method available to guide where not defined.

✓ Remedy is obvious.

✓ Time for removal is less than 6 months.

____ Remedy is final.

✓ Land use assumptions straightforward.

____ Treatment, Storage, Disposal Facilities are available for waste type and volume.

✓ Cleanup cost is reasonable for the planned action, and meets accelerated decision logic criterion for decision to proceed with VCA.

Explain criteria not checked above. Initial charaterization of these sites will be done as a part of this VCA. Based on historical knowledge the remedy is expected to be final and all waste is expected to be readily disposed of.

Through reviewing the above criteria associated with this site, I believe that a VCA is the appropriate Accelerated Cleanup approach.

FPL GR Allen Date 26 March 96

FPC [illegible] Date 26 March 96

The undersigned have reviewed the final plan and believe that it fully satisfies the appropriate Accelerated Cleanup approach.

FPL GR Allen Date 26 March 96

FPC [illegible] Date 26 March 96

Through reviewing the VCA Plan, for site(s) 0-030(d,h,i,j,k, n,o,p), and believing that the above criteria have been met, I authorize the fieldwork to proceed.

DOE ER Program Manager [illegible] Date 26/May/96

EM/ER:96-134

Annex 7.9 VCA Cost Estimate

7.9 VCA Cost Estimate

(Assumption: All septic tank systems have the same scope of work. Therefore, the cost should be approximately the same for each site.)

Pre-Field Activities

Field Preparation/Readiness Review	Subtotal	$ 20,000

Field Activities

Field Team (FOM, FTM, FTL, SSO, Sampler/Waste Manager, etc.)	$ 30,000
Geodetic Surveys/"mark out" surveys	$ 5,000
Excavation, tank abandonment/removal, waste transportation, etc.	$ 30,000
Waste Disposal	$ 13,000
Site Restoration	$ 5,000
Subtotal	$ 83,000

Analytical Costs

Rad Van (assume shared cost)	$ 5,000
Chem Van (assume shared cost)	$ 5,000
Verification Sampling	$ 15,000
Waste Characterization Samples	$ 10,000
Subtotal	$ 35,000

Post Field Activities

Acceptance Inspection	$ 1,000
Final Report	$ 25,000
Subtotal	$ 26,000

Total Estimated Cost	**$ 164,000**