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THE AEROSPACE CORPORATION



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7 December 1983

Mr. Arthur Whitman  
Office of Nuclear Energy, NE-24  
Division of Remedial Action  
U.S. Department of Energy  
Germantown, Maryland 20545

Dear Mr. Whitman:

DRAFT CERTIFICATION PACKAGE: BAYO CANYON SITE  
LOS ALAMOS, NEW MEXICO

Enclosed is a working draft copy of the Certification Docket for the Bayo Canyon Site, Los Alamos, New Mexico, for your review. If you have any questions or changes, please contact me at 488-6353.

Sincerely,

*Mary Alice Jennison*

Mary Alice Jennison  
Environmental Controls and  
Analysis Directorate  
Eastern Technology Division

MAJ:sej

Enclosure

cc: J. Baublitz  
E. DeLaney  
J. Jennings  
(all w/o)

bcc: H. Bauer  
B. Fritz  
F. Hoch  
T. Iura  
R. Johnson  
F. Newman  
A. Wallo  
C. Young  
(all w/o)

CERTIFICATION DOCKET  
FOR THE BAYO CANYON SITE  
LOS ALAMOS, NEW MEXICO

DEPARTMENT OF ENERGY  
OFFICE OF NUCLEAR ENERGY  
OFFICE OF TERMINAL WASTE DISPOSAL AND REMEDIAL ACTION  
DIVISION OF REMEDIAL ACTION PROJECTS

## CONTENTS

	<u>Page</u>
Introduction to the Certification Docket for the Bayo Canyon Site, Los Alamos, New Mexico	1
Description of the Bayo Canyon Site	1
Purpose	1
Property Identification	2
Docket Contents	2
Exhibit I: Summary of Activities at Bayo Canyon Site, Los Alamos, New Mexico	I-1
Exhibit II: Documents supporting the Certification of the Bayo Canyon Site, Los Alamos New Mexico	II-1

INTRODUCTION TO THE CERTIFICATION DOCKET  
FOR THE BAYO CANYON SITE  
LOS ALAMOS, NEW MEXICO

The Department of Energy, Office of Terminal Waste Disposal and Remedial Action, Division of Remedial Action Projects (and/or the predecessor agency, offices, and divisions) has reviewed the past activities of the Manhattan Engineer District and Atomic Energy Commission at the Bayo Canyon site in Los Alamos, New Mexico and completed a radiological survey of the site. The site was determined to contain sub-surface contamination of strontium-90. As a result, the remedial measures implemented included placing monuments to delineate boundaries of the restricted area (the area where levels of strontium-90 were above the radiological standards determined to be appropriate for the project) and restricting use of the site through the inclusion of a restrictive covenant in the property deed. The covenants will limit excavation of the site property until the year 2142 when the strontium-90 contamination has decayed to acceptable radiological levels.

Purpose

This docket references the published reports that contain information supporting the certification of the site's radiological condition and contains certain other unpublished references and correspondence supporting the site's certification.

This certification docket references and contains only the material most pertinent to the certification; a more comprehensive package of records is to be archived by the Department of Energy through the Assistant Secretary for Management and Administration and will be available through either the DOE Records Office or the DOE Historian Office. Copies of the certification docket will be

maintained by the Department at the DOE Public Document Room in Washington, D.C., so that the docket will be accessible to members of the general public.

### Property Identification

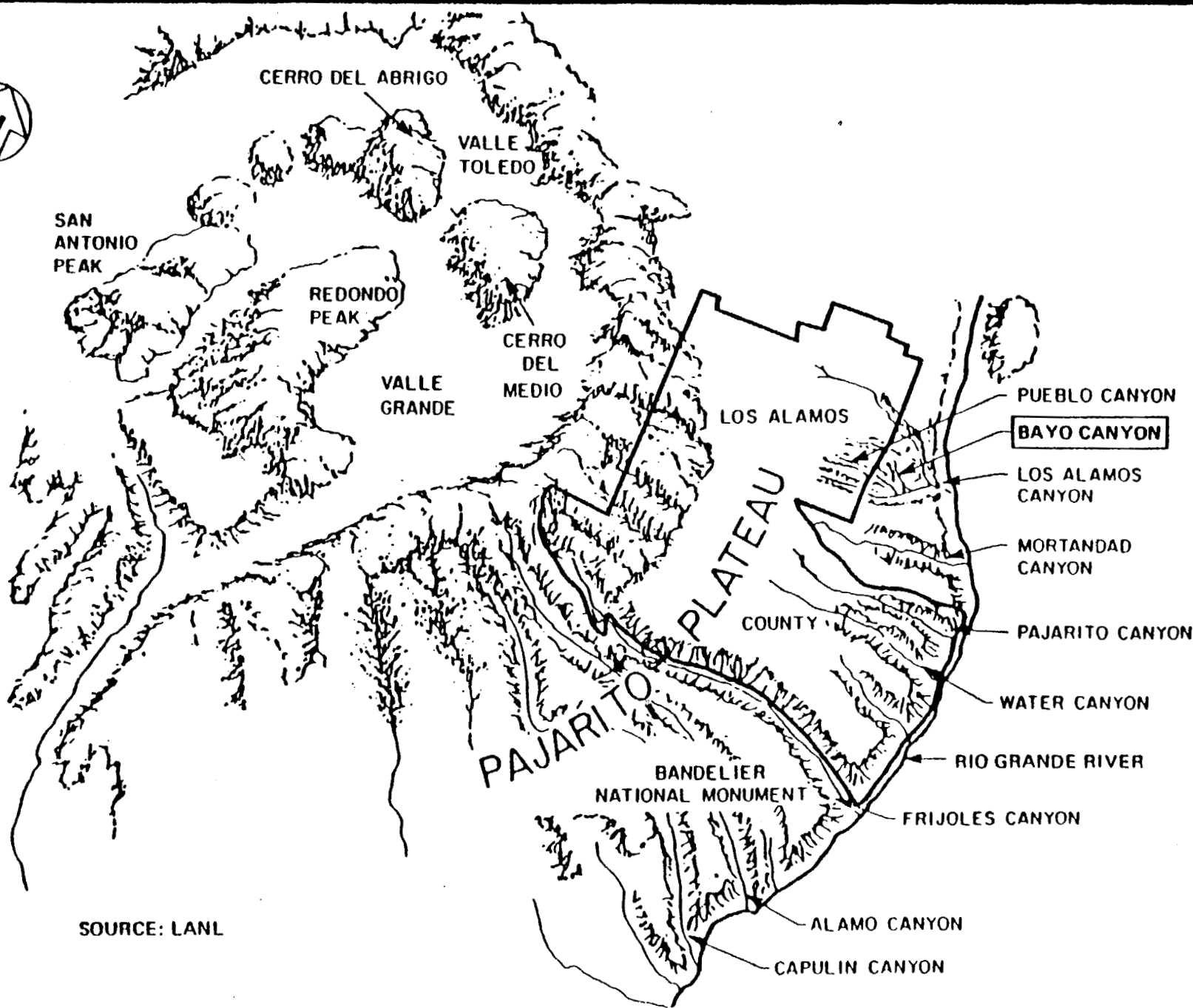
The site is located in the Bayo Canyon, which is bounded by Kwage Mesa on the south and Otowi Mesa on the north, in Los Alamos County, North Central New Mexico, (as shown on the attached map). The site is adjacent to the Township of Los Alamos on the west and is about 100 km north-northeast of Albuquerque and 40 km northwest of Santa Fe. The area of concern presently consists of approximately 1.5 acres which is the area that remained contaminated after the decontaminating and decommissioning of the original 350-acre technical area (TA)-10 site in 1963.

### Docket Contents

A brief summary of the history and activities of the Manhattan Engineer District and Atomic Energy Commission are discussed in Exhibit I of the certification package.

An additional summary of the Bayo Canyon site is located in the report entitled A Background Report for the Formerly Utilized Manhattan Engineer District/Atomic Energy Commission Sites Program, September 1980, U.S. Department of Energy, DOE/EV-D097A.

The Bayo Canyon site was decommissioned in 1963. Subsequent to this, the site area was surveyed using portable radiation survey instruments in 1966, 1967, 1971, 1973, and 1975. Some of these surveys are summarized and identified in the following correspondence:



SOURCE: LANL

Bayo Canyon Location Map

- o Agnew, H.M. (LASL) to H. Jack Blackwell (LAAO), "History of Disposal of Contaminated Real Property," September 30, 1971-- Summary of LASL Health Division concerning all areas of Los Alamos that were involved with radioactive material and subsequently released to the public.
- o Blackwell, H. Jack (LAAO) to H.C. Donnelly (Albuquerque Operations Office), October 19, 1971 "Management of Contaminated Real Property"--Remarks to Mr. Agnew's memorandum dated September 30, 1971.
- o Donnelly, H.C. (Albuquerque Operations Office) to J.A. Erlewine (AEC), October 22, 1971, "Management of Contaminated Real Property"--Encloses the historical data on the property in Los Alamos. Two of these enclosures are referenced above. The other enclosures are not attached.
- o Erlewine, John A. (AEC) to H.C. Donnelly (Albuquerque Operations Office), "Management of Contaminated Real Property," November 3, 1971--Discusses preparation plan for decontamination and disposal of AEC previously released property in Los Alamos.
- o Buckland, Carl (LASL) to Dean D. Meyer (LASL), "Summary of Records Search for Radioactivity Remaining in TA-1, Acid Waste Lines, TA-10, TA-45, and Acid Canyon Below TA-45," February 16, 1973.
- o Voelz, George L. (LASL) to H. Jack Blackwell (LAAO), "Proposed Plan for Environmental Radioactivity Resurvey of Former and Current AEC Land Areas," May 17, 1973--Proposed resurvey with attached maps.
- o Blackwell, H. Jack (LAAO) to H.C. Donnelly (Albuquerque Operations Office), "Management of Contaminated Real Property," June 25, 1973--Discusses LAAO's and LASL's plan to resurvey former AEC lands.
- o Voelz, George L. (LASL) to H. Jack Blackwell (LAAO), "Former AEC Facilities," November 13, 1973--Current conditions of former AEC property in Los Alamos.
- o Blackwell, H. Jack (LAAO) to H.C. Donnelly (Albuquerque Operations Office), "Decontamination and Decommissioning of AEC Facilities," November 23, 1973--Comments and additional information to Mr. Voelz memorandum dated November 13, 1973.
- o Blackwell, H. Jack (LAAO) to G.J. Keto (AEC), "Radiological Survey of Real Property at Los Alamos" June 24, 1974-- Comments on survey of former AEC property in Los Alamos.

- o Voelz, George L. (LASL) to Kenneth R. Braziel (LAAO), "Radiological Condition Surveys of Real Property," August 15, 1974--Update on the condition of former AEC property in Los Alamos.

In 1976 the Bayo Canyon site was identified as a possible candidate for remedial action under the Formerly Utilized Sites Remedial Action Program. During 1976 and 1977 the Los Alamos Scientific Laboratory conducted a radiological survey of the site. The radiological surveys are documented in the following final report:

- o Formerly Utilized MED/AEC Sites Remedial Action Program--Radiological Survey of the Bayo Canyon, Los Alamos, New Mexico, June 1979, U.S. Department of Energy, DOE/EV-0005/15.

The decisions for remedial action are discussed in the following correspondence:

- o Frangos, Thomas G. (DOE) to S. Meyers (DOE), "Notification of Need for Some Remedial Action in Bayo Canyon, Los Alamos, New Mexico," February 7, 1980.
- o Ballard, Jr., W. Wade (DOE) to William E. Mott (DOE), "Remedial Actions at the Bayo Canyon and Acid/Pueblo Canyon, New Mexico Sites," December 18, 1981.
- o Mott, William E. (DOE) to W. Wade Ballard, Jr. (DOE), "Bayo Canyon Area, Los Alamos, New Mexico," January 4, 1982.

The remedial actions conducted by Bechtel, Inc. and Professional Land Surveying is documented in the following correspondence:

- o Keller, E.L. (DOE) to J.E. Baublitz (DOE), "Draft Final Reports for Acid/Pueblo and Bayo Canyon Sites," June 16, 1983--The draft remedial action report for Bayo Canyon is attached.



EXHIBIT I  
SUMMARY OF ACTIVITIES  
AT THE BAYO CANYON SITE  
LOS ALAMOS, NEW MEXICO

Site Function

The Manhattan Engineer District (MED) constructed facilities in a portion of Bayo Canyon during 1943 and 1944. This Bayo Canyon site (or TA-10) was utilized by MED and later the Atomic Energy Commission (AEC) between 1944 and 1961 as a firing site for conventional high explosive experiments in conjunction with research on nuclear development. These experiments were operated by the University of California under contract with AEC.

The radioactive contamination of the site resulted primarily from the experimental explosion shots and from the disposal of radioactive wastes from the radiochemistry operations on the site.

The explosive tests contained natural and depleted uranium (U-238) together with lanthanum (La-150) as a radiation source for blast diagnosis, which contained some contamination of strontium-90 (Sr-90). During the explosive tests natural and depleted uranium, lanthanum-140 and strontium-90 were dispersed into the environment as aerosols and solid debris.

The radiochemistry laboratories prepared the radiation source for blast diagnosis by radiochemically separating the La-140 from a solution containing the radioactive parent Ba-140, the stable daughter Ce-140 and other impurities including Sr-90. The liquid and solid radioactive wastes from these operations were disposed of below the surface in holding tanks, pits, and a leaching field.

## Site Description

The Bayo Canyon site is located in Bayo Canyon, which is bounded by Kwage Mesa on the south and Otowi Mesa on the north, in the Los Alamos County in North Central New Mexico. The site is adjacent to the Township of Los Alamos on the east and is about 100 km north-northeast of Albuquerque and 40 km northwest of Santa Fe.

The original site consisted of 350 acres and contained a radiochemistry laboratory, solid waste disposal facilities, two assembly buildings, an inspection building, a personnel building, control buildings at two detonation control complexes with adjacent firing pads, and contaminated leach pits from the radiochemistry laboratory.

The boundary of the area of concern encompasses 1.5 acres. During decommissioning, all physical facilities were either burned or destroyed. The debris from the buildings, sewer facilities, and surface debris were disposed of in the contaminated waste burial site which is located on the present 1.5 acre area.

## Owner History

The site was owned by the U.S. Government (from 1943 through 1967) as part of the LANL operations. On July 1, 1967, the land was transferred by quit claim deed to Los Alamos County who is now the present owner.

## Radiological History and Status

There were numerous high explosives detonations at this site. Many of the explosive assemblies contained a lanthanum-140 source. The source frequently amounted to several thousand curies. Although lanthanum has a relatively short life, all the sources contained a

small but unavoidable amount of strontium-90 contamination and, therefore, much of the canyon area became contaminated with this beta-emitting material. The source preparation building and several surrounding buildings, much of the plumbing, and waste pits were contaminated with strontium-90. Some of the first structures to be cleared in Bayo Canyon were released on February 8, 1960. On March 13, 1960, seven structures were burned at four different locations in the canyon with the residue removed for burial. The small solid waste disposal pit and a sump for liquid wastes were excavated. Material from the waste disposal pits and underground pipes were removed to the contaminated burial area on Mesita Del Buey (also located on the LASL site). These were dug to a depth of approximately 15 feet at which level the radiation reading was still above background. The holes were filled with clean dirt resulting in the surfaces being left at background radiation levels. All contaminated objects on the surface of the canyon were picked up, and an intensive search was made for material throughout the area. This entire area was inspected and a final report, dated August 19, 1963, stated that the area was free of significant radioactive contamination and did not present a health hazard.

Due to the wide dispersal of debris from the explosive tests and the continuing natural erosion process, there existed the probability that some high-explosive and some potentially radioactive materials remained in the canyon after decommissioning. For this reason, surveys using portable radiation survey instruments were conducted in 1966, 1967, 1971, 1973, and 1975.

In 1976, the site was identified as a location that might require remedial action under the Formerly Utilized Sites Remedial Action Program by the Energy Research and Development Administration (ERDA - predecessor to DOE).

During 1976 and 1977, LASL, under contract with ERDA and subsequently with DOE, conducted a field radiological survey and evaluation of this area. A collection of more than 1200 samples of surface and subsurface soils were obtained from this survey. Results showed that there was strontium-90 contamination at levels higher than could be attributed to worldwide fallout. Subsurface soil samples revealed high gross beta activity with the highest levels being several meters below the surface. Measurements and theoretical evaluations show that no exposures in excess of federal radiation protection standards are being received by the public under present or projected land use. Strontium-90 is the only radionuclide which exceeds the criteria at the site.

In 1980, a supplemental survey was conducted at the site by Ford, Bacon and Davis Utah (FBDU). The results of this survey agreed with the results of the previous survey conducted by LASL. These results concluded that this site contained subsurface contamination of strontium-90 and if disturbed before the Year 2142, when the Sr-90 would decay to acceptable levels, radiological health problems could exist.

Remedial action began on the site on August 2, 1982 and was completed by September 10, 1982. The total cost of the remedial activities came to \$335,600. The boundary zone of the 1.5 acre restricted area was located. The restricted area is the area in which levels of strontium-90 exceeded the 100 pCi/g criterion. This area had been the location of the former radiochemistry laboratory, the former solid waste disposal area, the liquid waste leach pits, and a buffer zone. Six restricted area boundary monuments, with three guard posts each and several warning signs were installed around this restricted area. Restrictive covenants were prepared for the property deeds. This covenant restricts excavation until the Year 2142 when contamination of the strontium-90 has decayed to acceptable levels

(below 100 pCi/g above background).\* During the installment of the monuments and guard posts, Eberline Instrument Corporation checked for contamination in the holes and on the equipment and recorded no readings above normal background.

The site will be inspected on a quarterly basis by Los Alamos County in order to prevent any unauthorized excavation or grading activity while the deed restriction is in effect.

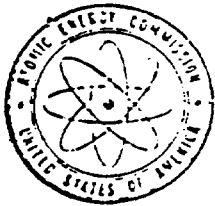
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\*Radiological Guidelines for Application to DOE's Formerly Utilized Sites Remedial Action Program, March 1983, U.S. Department of Energy, ORO-831, p. 4-4.

EXHIBIT II  
DOCUMENTS SUPPORTING THE CERTIFICATION  
OF THE BAYO CANYON SITE,  
LOS ALAMOS, NEW MEXICO

- o Agnew, H.M. (LASL) to H. Jack Blackwell (LAAO), "History of Disposal of Contaminated Real Property," September 30, 1971.
- o Blackwell, H. Jack (LAAO) to H.C. Donnelly (Albuquerque Operations Office), "Management of Contaminated Real Property," October 19, 1971.
- o Donnelly, H.C. (Albuquerque Operations Office) to J.A. Erlewine (AEC), "Management of Contaminated Property," October 22, 1971.
- o Erlewine, J.A. (AEC) to H.C. Donnelly (Albuquerque Operations Office), "Management of Contaminated Real Property," November 3, 1971.
- o Buckland, Carl (LASL) to Dean D. Meyer (LASL), "Summary of Records Search for Radioactivity Remaining in TA-1, Acid Waste Lines, TA-10, TA-45, and Acid Canyon Below TA-45," February 16, 1973.
- o Voelz, George L. (LASL) to H. Jack Blackwell (LAAO), "Proposed Plan for Environmental Radioactivity Resurvey of Former and Current AEC Land Areas," May 17, 1973.
- o Blackwell, H. Jack (LAAO) to H.C. Donnelly (Albuquerque Operations Office), "Management of Contaminated Real Property," June 25, 1973.
- o Voelz, George L. (LASL) to H. Jack Blackwell (LAAO), "Former AEC Facilities," November 13, 1973.
- o Blackwell, H. Jack (LAAO) to H.C. Donnelly (Albuquerque Operations Office), "Decontamination and Decommissioning of AEC Facilities," November 23, 1973.
- o Blackwell, H. Jack (LAAO) to G.J. Keto (AEC), "Radiological Survey of Real Property at Los Alamos," June 24, 1974.
- o Voelz, George L. (LASL) to Kenneth R. Braziel (LAAO), "Radiological Condition Surveys of Real Property," August 15, 1974.
- o Frangos, Thomas G. (DOE) to S. Meyers (DOE), "Notification of Need for Some Remedial Action in Bayo Canyon, Los Alamos, New Mexico," February 7, 1980.

- o Ballard, Jr. W. Wade (DOE) to William E. Mott (DOE), "Remedial Actions at the Bayo Canyon and Acid/Pueblo Canyon, New Mexico Sites," December 18, 1981.
- o Mott, William E. (DOE) to W. Wade Ballard, Jr. (DOE), "Bayo Canyon Area, Los Alamos, New Mexico," January 4, 1982.
- o Keller, E.L. (DOE) to J.E. Baublitz (DOE), "Draft Final Reports for Acid/Pueblo and Bayo Canyon Sites," June 16, 1983.



UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

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EJC

This information was  
obtained from Blackwell  
in late 1974,  
Hui

NOV 3 1971

H. C. Donnelly, Manager  
Albuquerque Operations Office

MANAGEMENT OF CONTAMINATED REAL PROPERTY

The information provided with your memorandum of October 22, 1971, on the above subject, is particularly useful because Mr. Blackwell has advanced a number of recommendations for improving the condition of property previously decontaminated and released at Los Alamos. The recommended actions to resurvey certain areas and remove sections of contaminated piping as well as contaminated soil where found may alleviate future concern for unrestricted usage of the land which was previously occupied by AEC-owned installations.

As follow-on to the survey requested in my memorandum of July 21, it is requested that you prepare a preliminary plan for accomplishing decontamination and disposal of those facilities described in your August 30, 1971, memorandum as well as the recommended follow-up items covered in the October 22 submission. The plan should provide a schedule of projects considering their relative priority toward an objective of eliminating any possible current hazard, avoiding the possible spread of contamination or exposure to other employees or the public and a general objective of decontamination and removal of excess facilities as part of the general property management of the LASL site. The plan should provide justification for the establishment of relative priorities and for those projects to be undertaken in the near term (FY 73 through FY 75). The reasons for urgency in initiating these projects should be provided. Any additional comments that can be made concerning the scope of each decontamination and decommissioning undertaking and the additional manpower and funding requirements should also be submitted in a preliminary form.

This plan should be submitted to the Division of Waste Management and Transportation where it will be incorporated into the overall planning for decommissioning and decontamination of AEC facilities. Members of the Decontamination and Decommissioning Branch of WMT plan to visit the Los Alamos site on or about the first of December and would like to review progress on this planning assignment at that time.

*John A. Erlewine*  
John A. Erlewine  
Assistant General Manager  
for Operations

*Bob - over commissal*  
*Per over commissal*  
*for your file 7/16*  
*Blackwell*  
111 23



OCT 22 1971

J. A. Erlewine, Asst. General Manager for Operations  
Office of the General Manager, HQ

MANAGEMENT OF CONTAMINATED REAL PROPERTY

Reference is made to your memorandum of July 21, 1971, and my memorandum to you of August 30, 1971, both subject as above.

In accordance with the last paragraph of my memorandum, attached is the historical information supplied by the Los Alamos Scientific Laboratory with comments by the Los Alamos Area Office. We have reviewed the documents transmitted and have no additional comments. We will continue to review data as it is prepared and proposals submitted by the contractor and/or the Los Alamos Area Office pertaining to the areas in question as they are submitted.

Original signed by  
H. C. Donnelly

H. C. Donnelly  
Manager

LER:CEX

Enclosures:

1. Memo, Blackwell/Donnelly,  
dtd 10/19/71 (in trip)
2. Memo, Agnew/Blackwell, 9/30/71, (3 cys)  
w/attachments:  
Memo dtd 8/25/71, Agnew/Blackwell  
Memo dtd 1/13/60, Shipman/Punning  
Memo dtd 7/18/63, Bradbury/Campbell  
Memo dtd 8/27/68, Lemis/Nottrott  
Memo dtd 1/6/66, Shipman/Russo
3. Drawings ENG-R-1915 thru R-1917 and  
R-1984 thru R-1987 (3 cys each)

J. R. Reeder, Dir, OSD, ALO  
w/Encls 1 & 2

*hach*

OCT 19 1971

H. C. Donnelly, Manager  
Albuquerque Operations

MANAGEMENT OF CONTAMINATED REAL PROPERTY

Your memorandum of August 4, 1971, transmitted a copy of a memorandum dated July 21, 1971, from John A. Erlewine, requesting historical data on land and buildings that may have been involved or concerned with radioactive material contamination and subsequently released from AEC control.

By memorandum dated September 30, 1971, H. M. Agnew, Director, Los Alamos Scientific Laboratory, furnished a summary of an investigation by the LASL Health Division concerning all areas of Los Alamos which at one time or another were involved with radioactive material, and which were subsequently released to the public. These areas are identified on several drawings, copies of which are attached along with a copy of Mr. Agnew's memorandum, for your ready reference.

Mr. Agnew's memorandum is straightforward and describes conditions as they are known to exist and generally satisfies Mr. Erlewine's request for historical data to be used by the Division of Contracts, Operational Safety, and Waste and Scrap Management in a review of the AEC policies, procedures, and budgeting for the management of contaminated real property.

The rules and guidelines which were followed in the past in surveying and cleaning-up areas, where radioactive materials were involved, prior to disposal to the public, may no longer be considered adequate in view of the present emphasis on environmental control. The conditions in some areas reflected in Mr. Agnew's report may give rise to questions as to the adequacy of survey and decontamination procedures prior to disposal of some of the property to

OPER. BR. OS&FP SECT DPTY.A.MGR. AREA MGR.

Wingfield:dm  
C. L. ...  
Blackwell

10-15-71

OCT 19 1971

the public. I feel I should comment on these areas of concern and, for ease of reference, have penciled numbers in the margin beside paragraphs in Mr. Agnew's memorandum to which the following comments are keyed:

1. The original technical area (TA-1) has been disposed of by sale and is now occupied by private businesses such as the Los Alamos Inn, three automotive service stations and a restaurant. Part of the area remains undeveloped at the present time. You will note in the memorandum dated January 13, 1960, from T. L. Shipman, Health Division Leader, LASL, to R. E. Dunning, Engineering and Construction, LA&O, mention is made that "it undoubtedly would be possible at many points in this area to find detectable amounts of radioactive materials or chemicals.

I believe we should conduct additional soil sampling in this area (particularly in the undeveloped area) in accordance with present standards and determine whether or not we have a contamination problem.

2. The contaminated sewers were dug up, soil surrounding the pipe monitored and if contaminated, was removed. However, you will note on Drawing ENG-R-1916, a section of pipe was left in place under Central Avenue and under Canyon Road. The ends of the pipes were plugged with concrete. Title to these two streets is now vested in the Incorporated County of Los Alamos. While it is possible that these contaminated pipes may never be disturbed, I believe the possibility exists that they may be disturbed at some later date and therefore, they should be removed and properly disposed of.
3. The TA-10 area was transferred (after clean-up) to the Incorporated County of Los Alamos and at the present time is undeveloped land. Based on the statement in Mr. Agnew's memorandum that "The firing site contributed to surface contamination

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OCT 19 1971

of the canyon area.", I believe we should conduct a soil and vegetation sampling program in accordance with present standards to determine whether or not we have a contamination problem.

I am concerned about the waste disposal pit and a sump for liquid wastes which were excavated to a depth of 15 feet at which level the radiation reading was still above background. I believe we should take another look at this area and if warranted we should either remove the remaining contaminated material or reacquire that portion of the property. A further survey and pick up of metal fragments should also be accomplished.

4. An easement, 100 feet wide, was retained in Pueblo Canyon at the time the property was transferred to the Incorporated County of Los Alamos, to permit monitoring of the stream bed which was known to have spots of detectable contamination. We also have a number of test wells in this area. The need for fencing to prevent access by the public may be required.
5. We will need to take another look at the remaining sections of acid sewer line in the townsite which had been used to transport liquid wastes from TA-1 and TA-3. My concern is that if the major portion of the line was removed prior to the disposal of the property perhaps all of the line should have been removed.
6. The Trailer Parking Area, DP Road, which is a portion of a solid waste disposal pit, mentioned in Mr. Agnew's memorandum is still AEC property under lease to the Incorporated County of Los Alamos. We can exercise the necessary controls over this property and further corrective action is not indicated at this time.

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In conclusion, I propose to ask the LASL to budget for the necessary funds to accomplish the work outlined above. I recognize that until further soil sampling is done in at least two of the areas, I will not know the extent of corrective action (if any) that may be required.

Original Signed by:  
H. Jack Blackwell

H. Jack Blackwell  
Area Manager

LAO:EEW

Enclosures:

1. Memo dtd 9/30/71, Agnew to Blackwell  
with attachments:
  - Memo dtd 1/13/69, Shipman to Dunning
  - Memo dtd 7/18/63, Bradbury to Campbell
  - Memo dtd 8/27/69, Zemis to Nottrott
  - Memo dtd 1/6/66, Shipman to Russo
2. Memo dtd 8/25/71, Agnew to Blackwell
3. Drawings ENG-R-1915, through R-1917 and  
R-1984 through R-1987

DISCONTINUED  
OCT 30 1971  
100-111-102



OFFICE MEMORANDUM

TO : H. Jack Blackwell, Area Manager, LAAO

DATE: September 30, 1971

FROM : H. M. Agnew, Director

SUBJECT: HISTORY OF DISPOSAL OF CONTAMINATED REAL PROPERTY

SYMBOL : DIR

The following is a report on the evaluation of contaminated real property which has been released from AEC control. In your memo of August 11, 1971, entitled Management of Contaminated Real Property, you stated Mr. Erlewine had requested certain information for historical purposes. This memo addresses itself to that request.

The remarks herein represent a summary of an investigation by the LASL Health Division concerning all areas of Los Alamos which at one time or another were involved with radioactive material, and which were subsequently released to the public. These areas are identified on several drawings, copies of which are attached.

① TA-1 was the original technical area where radioactive materials were processed and essentially all radiation producing machines such as the Van de Graaff and cyclotron were located. This area was vacated over a period of years spanning the late 1950's and early 1960's as new facilities south of Los Alamos canyon became available. Each building and its adjacent land were surveyed as they were vacated. If at all contaminated, the building material was removed and placed in contaminated waste burial pits. (See my memo to you dated August 25, 1971, titled "Planned Disposal of Contaminated Real Property"). After the buildings were removed, the surface of land was checked and if contaminated, was removed and back-filled with clean dirt. In this area there was a maze of sanitary sewers, contaminated sewers, water lines, and gas lines. ② The location of the contaminated sewer was known, and starting at each building, the line was dug up, soil surrounding the pipe monitored, and if found contaminated, was removed. With the exception of one section of abandoned pipe, which was later removed along with the acid sewers in the townsite, the entire contaminated line was removed up to Central Avenue. The sanitary sewer was traced and sections removed at each manhole. These sections were monitored and as none were found contaminated, the lines were left in place. All water and gas lines were left underground. A general statement of the condition of this area is given in a memo from Dr. T. L. Shipman to R. E. Dunning, January, 1960 (Xerox copy attached).

H. Jack Blackwell

-2-

DATE: September 30, 1971

3 TA-10 was a technical area which has two types of operations: a chemical separations unit and a firing site. The chemical unit building was removed; the small solid waste disposal pit and a sump for liquid wastes were excavated. These were dug out to a depth of approximately 15 feet at which level the radiation reading was still above background so the holes were filled and the surface area left at background radiation levels. The firing site contributed to surface contamination of the canyon area. All contaminated objects on the surface were picked up and an intensive search was made for material throughout the canyon area. The condition of this area on return to public use is given in a letter from N. E. Bradbury to C. C. Campbell, July, 1963 (Xerox copy attached) and a report, LAMS-2945 entitled, "TA-10, Bayo Canyon Cleanup, May 1963". Subsequent to this effort, inspections of this area have been conducted annually since 1963 with no evidence of radioactive contamination being found.

4 TA-45 was the decontamination plant for contaminated liquid wastes from TA-1 and TA-3. The structures and associated underground pipes were removed and buried. The outflow from the plant had contaminated the cliff face above the canyon floor. This contamination was removed by chipping off the cliff face with jackhammers; the rock removed was hauled to the solid waste disposal area. The stream bed in the canyon was left with spots of detectable contamination = 1000 dis/min - 60 cm<sup>2</sup>. The stream bed which is fed by sewage effluent from the Pueblo Canyon and Bayo Canyon Sewage Treatment Plants, and the land bordering this channel are retained as an easement by the AEC in order to permit monitoring of the channel. This easement has been recorded in the Los Alamos County records.

5 The acid sewers in the townsite had been used to transport liquid wastes from TA-1 and TA-3, and were removed except for certain sections under streets. These sections were capped and plugged at each end with concrete. The areas removed are shown on LASL Drawing ENG-R-1916, attached. On this drawing, it is noted that a section from the manhole ULR-61 to the intersection of Trinity Drive and Diamond Drive was not removed. This section serviced laboratories in HRL-1. The level of radioactivity discharged into this line was very low. When the TA-45 plant was decommissioned, HRL-1 was connected to the County sanitary system. When an addition was built onto the Los Alamos Medical Center, this line was traced and found to be 20 feet under the surface. Since it was not highly contaminated, and the construction work on the addition did not extend down to the sewer, it was decided to leave the sewer in place. This decision is covered in a memo from E. A. Bemis to C. G. Notrott dated August 27, 1969.

6 The Trailer Parking Area, DP Road, is a portion of a solid waste disposal burial pit. The material in the pits had been covered with at



OFFICE MEMORANDUM

TO : Dean D. Meyer, Group Leader, H-1

DATE: February 15, 1973

FROM : Carl Buckland, Leader, General Monitoring Section, H-1

SUBJECT: SUMMARY OF RECORDS SEARCH FOR RADIOACTIVITY REMAINING IN TA-1,  
ACID WASTE LINES, TA-10, TA-45 AND ACID CANYON BELOW TA-45

SYMBOL : H-1

TA-1 Structures and Acid Waste Lines

A 'notice of completion' was signed by C. Stallings on December 1, 1965, witnessed by A. Burch, D. Meyer, C. Princell, C. Blackwell and C. Buckland. This notice completed at least eight years of building removal and clearance in TA-1, starting sometime early in 1957. The files contain numerous status quo memoranda documenting conditions prior to, during, and subsequent to demolition of individual structures. In addition to this, there are letters of final clearance for about five different phases of demolition. Such letters were more comprehensive in nature and usually included several structures. Some of the early letters of clearance, such as a December 6, 1957 memorandum, had certain qualifying remarks that were not cleared or action taken until subsequent correspondence. In other words, the superstructure of many buildings was razed first. Contaminated floors, basements and acid waste lines were not removed in some cases until a year after razing the superstructure. All of the contaminated objects on top or under the surface of the ground were removed from the J-2 building area and the eastern sector of TA-1 located east of a north-south fence line located about 100 feet west of old H-Building by September 9, 1959. During this phase, acid waste lines read as follows:

J-2 line - 8.2 mr/hr. Leaks in the vicinity of Finch Street had occurred. The records show that this is the only place where soil surrounding the pipe was contaminated. Count was minimal. Soil removed to the contaminated dump.

Main acid line - Dirt at hub connection "D" Building to "Boiler House" - 500 c/m alpha.

ML to Q - 3.7 mr/hr

North of Q - 8 mr/hr and 1000 c/m

F-Vault to H-Bldg. manhole - 3.5 mr/hr and 2500 c/m

H- to main line - 2.5 mr/hr

Some sanitary lines - up to 4000 c/m

All of these pipes were removed, in addition to contaminated concrete floors and even the utility tunnel that was removed.

TO: Dean D. Meyer

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..  
C-1-696  
DATE: February 16, 1973

No contamination could be detected in this tunnel, although insulation on the steam pipes leading from the boiler house to Q basement was contaminated from an old radium spill. All of this was removed. The final clearance letter (9/15/69) on this phase read, "I would like to repeat the statement that to the best of our knowledge, no radioactive contamination remains in TA-1 north or south of Trinity, east of the north-south exclusion fence or within the J-2 area". All detectable count was removed as measured with hand alpha and beta-gamma survey instruments. No soil samples exist, with the exception of "D" Building site. I have no records on "D" Building as my section was not involved.

Western area west of the north-south exclusion fence was completed, as mentioned previously, by 12/1/65. Again, the superstructure was removed, followed by cement flooring and walls. Highly contaminated cement in excess of 2500 c/m was transported to the contaminated dump. Cement reading 2500 c/m or less was bulldozed or carried in trucks to a small draw dubbed "Bailey Canyon" (after the bridge was removed). Hundreds of truckloads were dumped into this canyon and then mostly covered with dirt. The majority of the concrete was not contaminated at all or was well below 2500 c/m (all normal and enriched uranium contamination).

On December 10, 1964, Zia commenced removing contaminated acid waste lines west of the north-south exclusion fence from manhole #235. The records show that this manhole and lines extending from it were all removed. A few pipes were found that read up to 15,000 c/m. In the vicinity of manhole #174, many pipes, some of which were contaminated, were all removed. Most of these pipes were not on any map in existence then or now. All of the lines leading to old Sigma Building were removed. By 9/28/65, all of the TA-1 acid waste lines had been removed, including the abandoned line that ran under the concrete slab south of "C" Shop. By 11/23/65, a sanitary sewer leading from "C" Shop to the intersection of Finch and 29th Street was removed since 2000 to 5000 c/m alpha was found in this pipe. Forty more feet of line beyond this point was excavated and monitored and found free from contamination.

In summary, all of the TA-1 acid lines were removed by 1967, with the exception of a plugged strip under Central, Rose and Canyon Road. All of the line from TA-45 back of the Catholic Church property and around south of the high school was removed up to Canyon Road. There is a plugged strip under Canyon and Trinity. All pipe under the Episcopal Church property was removed. John Enders has data on what remains in the vicinity of the hospital and HRL. Pipe down stream in the vicinity of the high school read up to 2500 c/m (dried residue) alpha and .2 m/hr, to give you some idea of the activity in the line under Trinity and Canyon.

TA-10 Bayo Canyon

Some of the first structures to be cleared in Bayo were released on February 8, 1960. On March 13, 1960, seven structures were burned at four different locations in the canyon. Building 6 residue read 1 to 12 mr/hr (burned in place). Building 4 residue read 8 mr/hr (burned about 25 yards north of original location). Recommendation of 3/14/60 stated that residue should be removed for burial. Although I find no subsequent mention of this suggestion, I feel certain that the recommendation was followed in the final clearance of the canyon. (Finally found mention of removal in 8/19/63 correspondence)

The first structure (TA-10-48) to be dismantled in place was started on 3/25/63 and provides our first ghost. TA-10-48 was a burial pit. A high point of radiation was located at 16 feet in depth. At 26 feet, the level dropped to 1.5 mrad/hr at contact with the dirt. A core sample one foot deeper than the 26-foot level read 600 d/m/dry gram of soil (.27 nanocuries/gram). Samples taken at 4 feet read 0 to 40 d/m of <sup>90</sup>Sr/dry gram of soil. No alpha. Pit was refilled with clean dirt at the levels reported here.

Pit 44 was dug to 15 feet and 1.5 mrad/hr. Core samples at 2.5 feet read 4500 d/m <sup>90</sup>Sr/dry gram. Pit was refilled at this point.

Five large pine trees and their roots, reading up to 6 mrad/hr on the ground by the base, were removed from the vicinity of the tank farm. Numerous leach beds and plumbing occupied this tank farm. Complete excavation was apparently impossible or at least impractical. At 20 feet, 1.5 mrad/hr was still found. At this point, the pit was filled with uncontaminated concrete taken from the dismantled firing bunkers.

A specific mention was made concerning a thorough excavation search around Building 1 for hidden pipes. It was also mentioned that the area in the firing pads was dug out to a point that only background radiation could be detected on a GM instrument. Twenty-five Indians were then hired to search for debris in a 2500-foot radius from the firing sites. They picked up 90 truck loads of debris.

The final report, dated 8/19/63, stated that the area was free of significant radioactive contamination and did not present a health hazard.

A typical post-cleanup survey of the site on 7/22/66 turned up the following after weathering:

Lead chunk - 20 mr/hr beta <sup>90</sup>Sr. Lead was subsequently melted. Air activity above the lead during melting read  $1.4 \times 10^{-12}$   $\mu$ Ci/cc. (Limit of  $3 \times 10^{-11}$   $\mu$ Ci/cc soluble for uncontrolled area) Residue left in pan after melting still read 20 mr/hr.

TO: Dean D. Meyer

4  
..  
DATE: February 16, 1973

TA-45 and Acid Canyon

The first survey of acid canyon, for purposes of cleanup, was made on August 31, 1965.

On October 4, 1966, work commenced towards removing TA-45 structures in what was called Phase A of the cleanup. All of the superstructure and concrete foundations were removed by 1/5/67 when operations were terminated due to weather. Excerpts from a 1/11/67 memorandum state that "The entire building and concrete slab (TA-45-1) were removed to the dump, as was the dirt from the end of the building where waste water had drained on the ground for several years". Also, "The surface south and west of the lab. building (TA-45-2) was removed to a depth of one foot and placed in the dump because of earlier spills in this area. The remaining soil shows no detectable radioactive material". Also, "The drain lines within the fenced area were removed and packaged and manholes dug out and removed". Some work of removing the cliff face below TA-45 had started (2000 c/m mentioned). 94 loads of debris from Acid Canyon were placed in pit 4 of area C as fill dirt. Phase A was completed as signified by a letter of completion dated 4/12/67, 10 AM, as initiated by C. Stallings and accepted by B. Wingfield, B. Penland and D. Zarecor.

In letters dated 6/21/67 and 7/11/67, completion of Phase B is reported. This included the removal of all old acid drain pipes, weirs, rocks, tuff and other debris found contaminated in all of Acid and Pueblo Canyon. It was reported that a small amount of contamination (less than 500 c/m alpha) remains in inaccessible places. This is probably an estimate. As I remember, every surface that had accessible detectable alpha count by hand survey instrument was removed.

  
Carl Buckland

CR:ed

Xc: Leo Chelius  
File

OFFICE MEMORANDUM

TO : H. Jack Blackwell, Area Manager, LAAO

DATE: May 17, 1973

FROM : *George L. Vocic*  
George L. Vocic, M.D., Health Division Leader

SUBJECT : PROPOSED PLAN FOR ENVIRONMENTAL RADIOACTIVITY  
RESURVEY OF FORMER AND CURRENT AEC LAND AREAS

SYMBOL : H8M-73-83

This AEC-requested resurvey will be directed by Group H-8 with coordinated assistance from Eng-3, H-1, H-3, H-5, H-7, ISD and AEC/LAAO. The land areas to be resurveyed are noted and discussed in the appended communication references. Initiation of the proposed survey is contingent upon approval of the plan presented herein and upon AEC/LAAO securing permission to enter the old TA-1 land areas which are privately owned.

The land areas to be surveyed are identified as follows:

1. TA-1, including those locations not in the TA-1 bounds indicated on engineering drawings but associated with TA-1 and having some radiocontamination potential.
2. Acid-Pueblo Canyon including the dismantled TA-45 site.
3. Bayo Canyon including the dismantled TA-10 site.

The above areas together with the locations of sections of the old acid sewer line which were left in place in the community are shown on the attached series of maps prepared by Eng-3 (ENG-R-3547 through 3555).

The proposed survey plan will parallel that described in "Los Alamos Land Areas Environmental Radiation Survey 1972," LA-5097-MS. The proposed survey steps are outlined as follows:

1. A records search from which a land use history will be compiled identifying potential environmental contaminants, pertinent environmental measurement data, and subsequent activities which may have affected the areas involved.
2. Determine the measurement and sampling points and mark and record appropriate engineering survey data.
3. In situ field radiation measurements with the following instruments at each point.

*Operations by*  
 ACTION/RECORD COPY *2) Vocic*  
 INFORMATION COPY *1) H. J. Blackwell*  
*4/5/73* *2) Counsel*

TO: H. Jack Blackwell

2

DATE: May 17, 1973

- a. Gross gamma rate ( $\mu\text{R}/\text{h}$ ) measurements using the Ludlum Model 12S instrument.
  - b. LAFPHA/FIDLER instrument measurements to detect Pu and Am radiocontamination.
  - c. Uranium-235 contamination measurements using an Eberline SPA-3 detector and an Eberline PRM-5-3 Pulse Rate Meter.
4. A soil sample will be collected at each point in the following manner where the land surface has remained unaltered except for the forces of nature (wind, rain, etc.). A 7.6 cm diameter by 5.0 cm deep soil core sample at the center and corners of a 10 meter square (or an approximation to a square adjusted in the field to accommodate terrain features) will be composited to form a single soil sample representing the point.

A portion of the old D Building area has reportedly been covered with several feet of fill soil. Therefore some deep coring (1.5 - 3.0 m depth) will be required to examine the extent of potential Pu soil contamination. Similar soil sampling technique will be required where the original soil surface has been covered or disturbed at the areas to be surveyed.

5. A vegetation sample corresponding to each soil sample and consisting of a few hundred grams of available native grass species will be taken.

The number of measurement and sample points planned for each land area are tabulated below:

<u>Land Area</u>	<u>Number of measurement and sampling points</u>
TA-1	50
Pueblo	20
Bayo	20

The soil and vegetation samples will be analyzed in the environmental analytical chemistry laboratories. The samples will be analyzed sequentially so that in those locations where activity determinations are low a smaller number of analyses will be required. The following concentration determinations will be made on each sample. A portion of each sample analyzed will be placed in a sample library to allow repeat assays and other secondary measurements.

TO: H. Jack Blackwell

-3-

DATE: May 17, 1973

1. Pu
2. U
3. Gross beta
4. Gross gamma

Specific nuclide measurements will follow the gross beta and gamma determinations where the gross activity level is significantly different than background samples. Where an area or building may have handled a particular material, such as Am and Cm at TA-1, ML Building, the samples collected will receive special analysis for those materials.

The survey will also include a field search for evidence of any possible environmental nonradioactive contaminants, i. e., explosives, chemicals, etc.

Findings from the records search, field measurements and observations, and analytical laboratory determinations will be formally summarized and reported.

This proposed survey plan is submitted for your review and approval. To allow the survey to proceed during an optimum weather season, your review and permission-to-enter assistance will be required by June 1, 1973.

Reference memoranda regarding the required environmental radioactivity resurvey.

1. TWX dated November 6, 1970, from John A. Erlewine to Managers of Field Offices.
2. Memorandum dated July 21, 1971, from John A. Erlewine to Managers of Field Offices.
3. Memorandum dated August 11, 1971, from H. Jack Blackwell to Harold M. Agnew.
4. Memorandum dated September 30, 1971, from H. M. Agnew to H. Jack Blackwell.
5. Memorandum dated October 19, 1971, from H. Jack Blackwell to H. C. Donnelly.

TO: H. Jack Blackwell

4

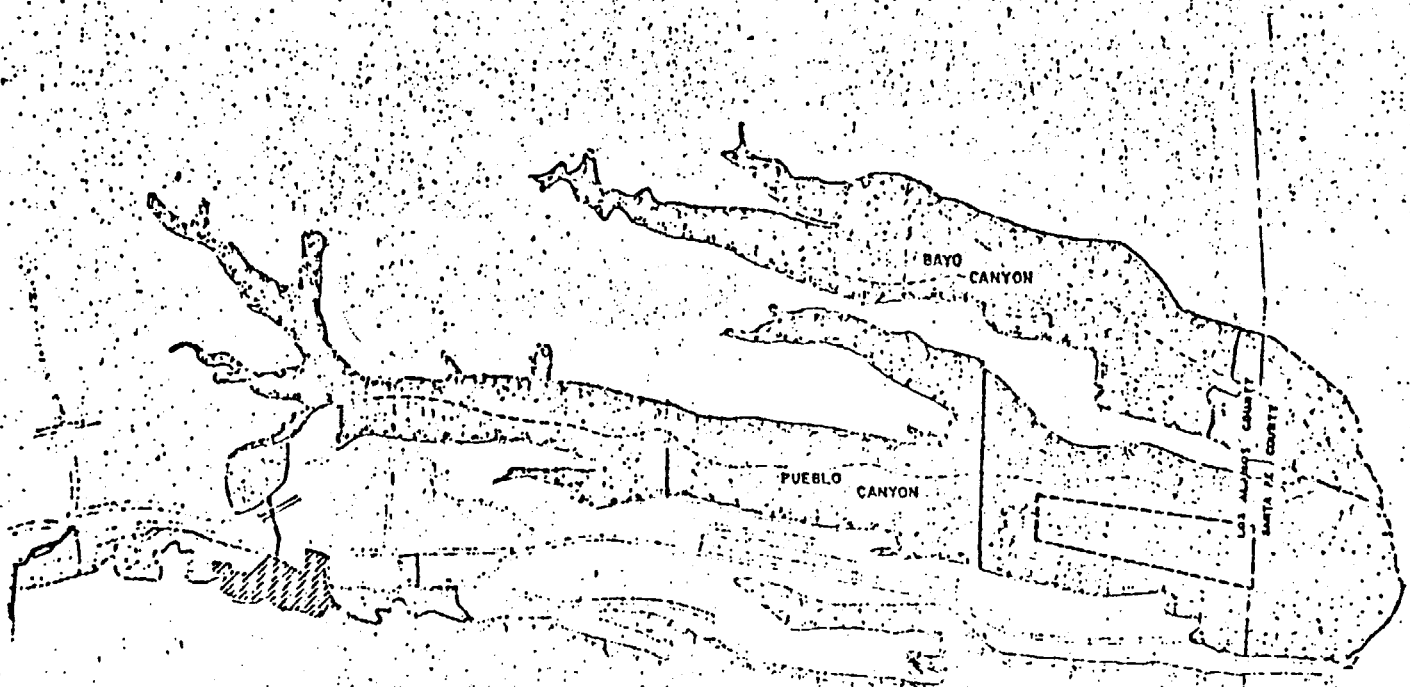
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



6. Memorandum dated November 3, 1971, from John A. Erlewine to H. C. Donnelly.
7. Memorandum dated November 17, 1971, from H. Jack Blackwell to Harold M. Agnew.
8. Memorandum dated January 23, 1973, from H. Jack Blackwell to Harold M. Agnew.

GWV/LJJ:mar

Attachments as Cited.



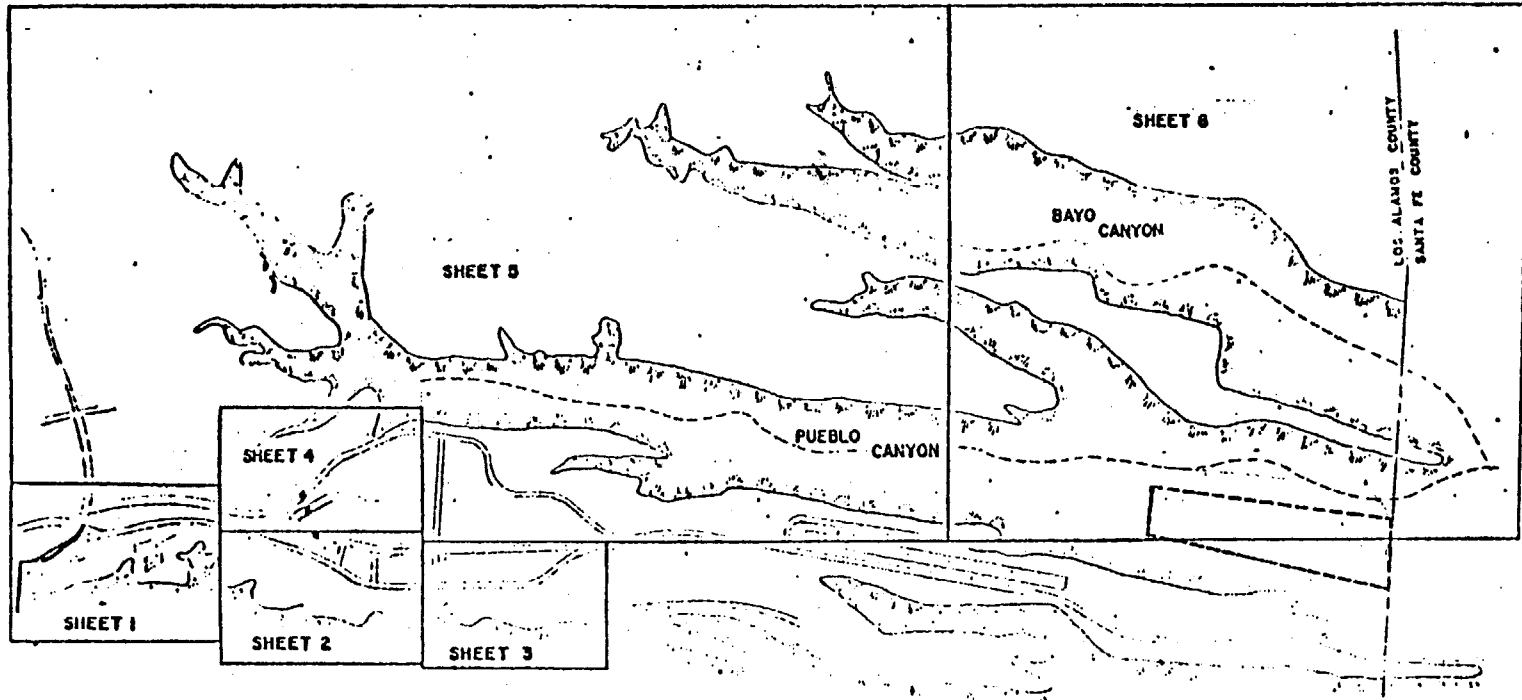


-  AREA TO BE SURVEYED
-  TA-1
-  EXISTING ACID SEWER LINE
-  APEA C-PREVIOUSLY SURVEYED

THIS SET OF DRAWINGS COMBINES OF D-6-R-3247 AND D-6-R-3248

REVIEWER: *SC*  
 DATE: 3/1/83

Los Alamos National Laboratory Environmental Sciences Department	ENVIRONMENTAL SURVEY OF FORMER AND CURRENT AEC LAND AREAS
	PROJECT NO. 2-100-100-000 DRAWING NO. 2-100-100-000-000 SHEET NO. 9 OF 9 ENGR-R 3247

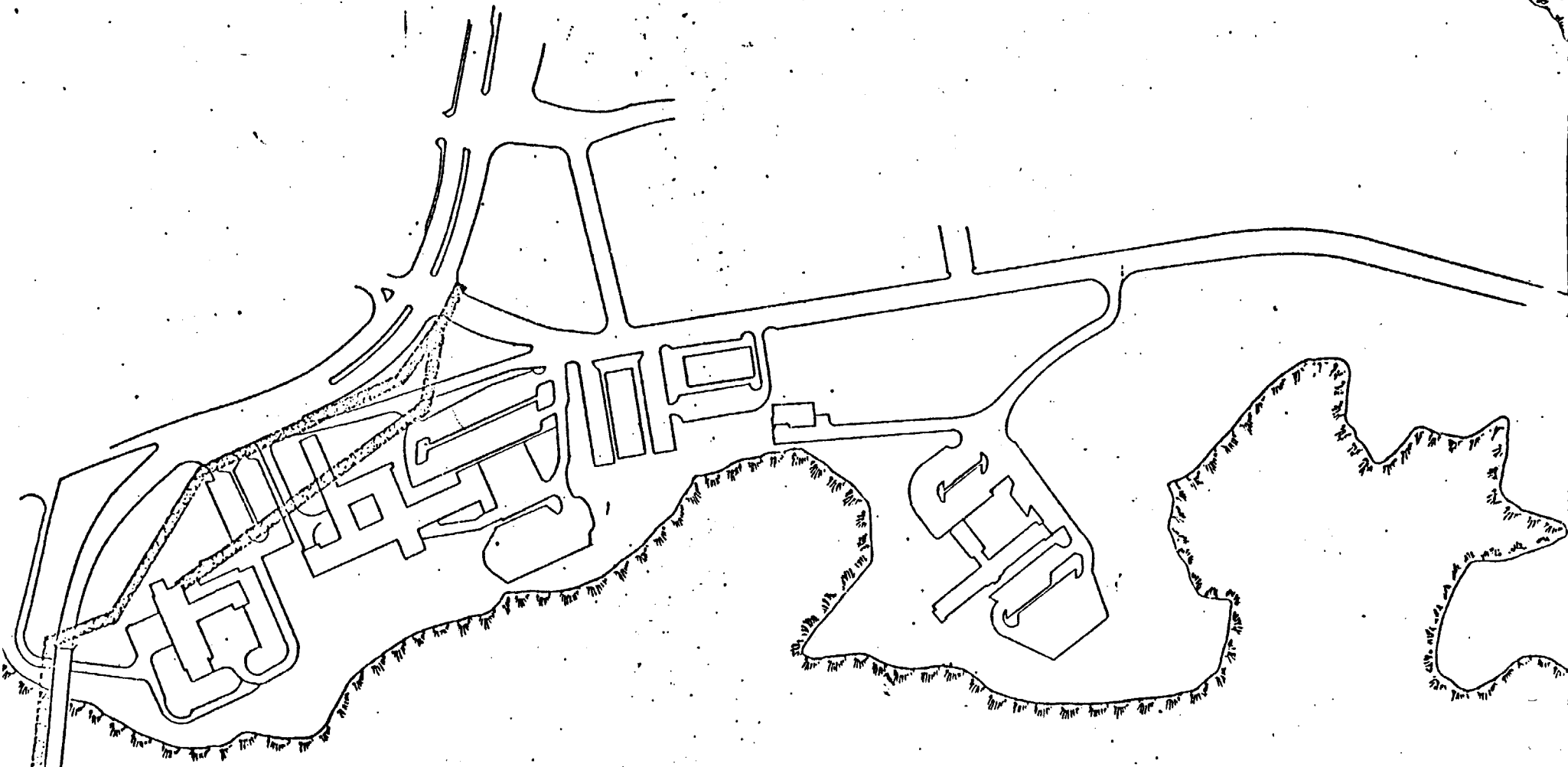


— EXISTING ACID SEWER LINE  
 - - - - - AREA C - PREVIOUSLY SURVEYED

THIS SET OF DWGS CONSISTS OF D66-R-304F THRU D66-R-308

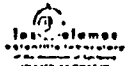
REVIEWER *J. P. [Signature]*  
 CLASS *J.* DATE *2/1/72*

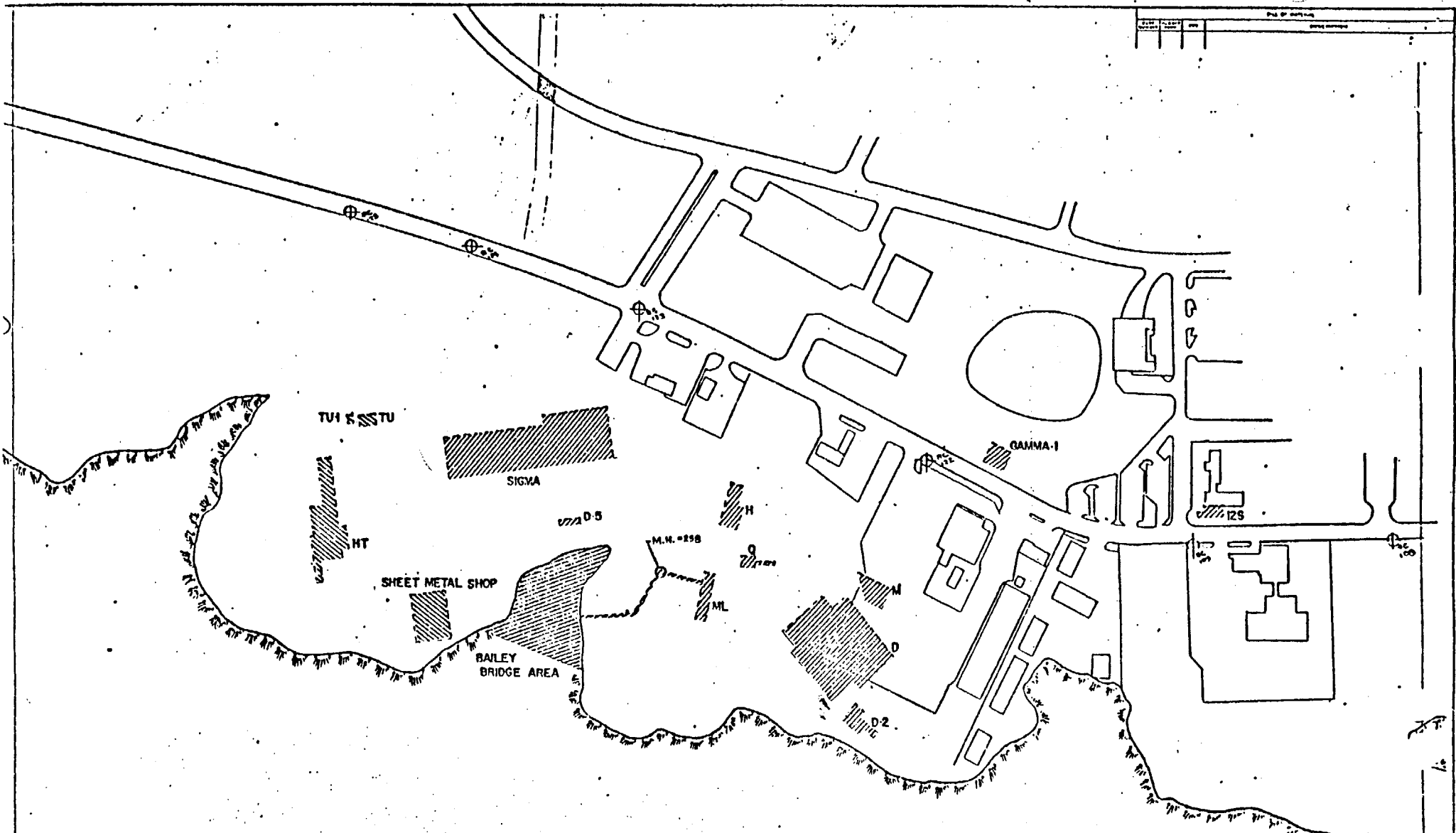
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	<p>DATE: 2/1/72          DRAWN BY: [Signature]          CHECKED BY: [Signature]</p>
<p>1-1000 9 ENG-R-304B</p>	





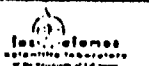
 EXISTING ACID SEWER LINE

THIS SET OF DRAWINGS CONSISTS OF ENG-R-3547 THRU ENG-R-3553

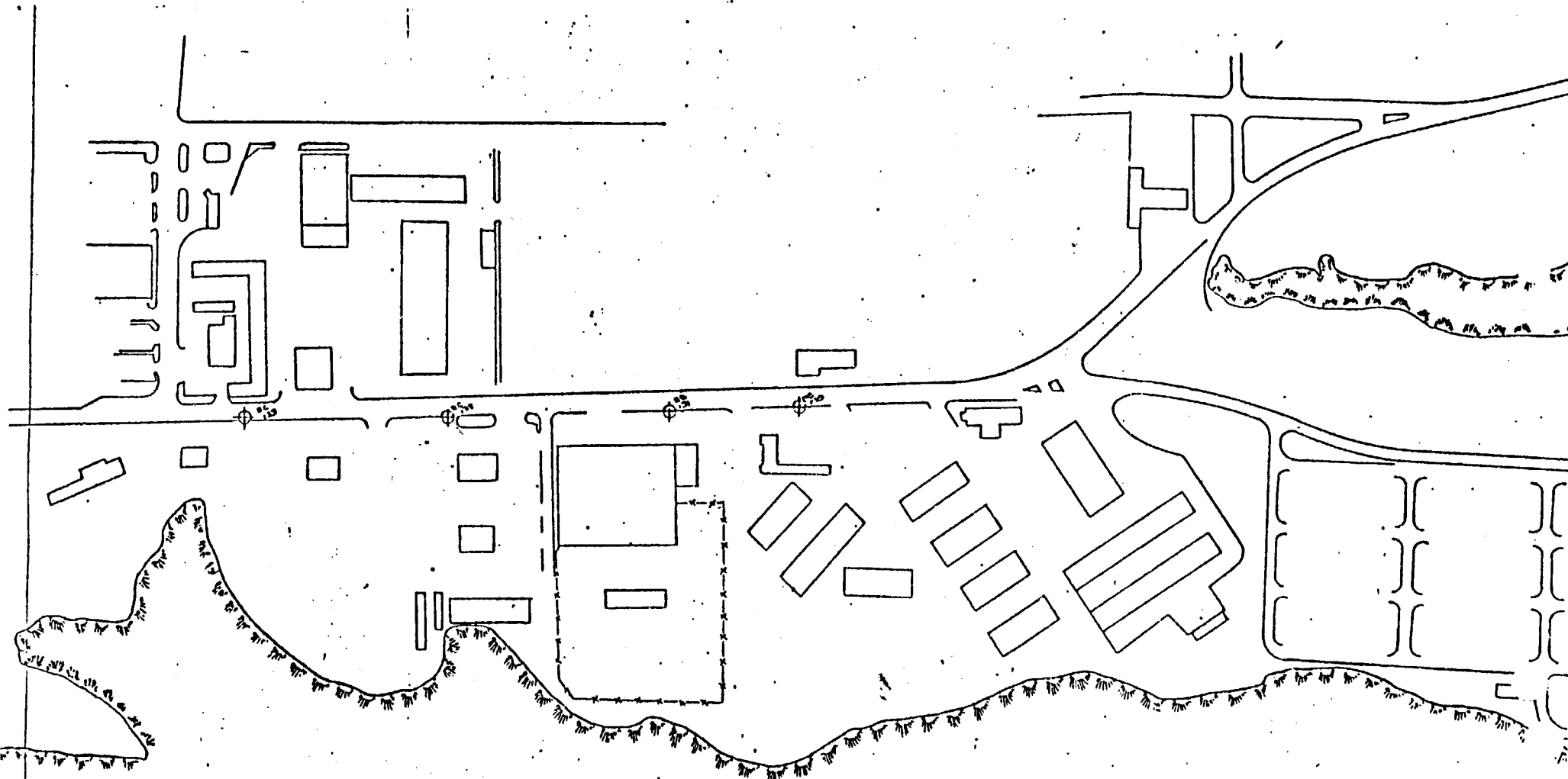
 <b>Test-Science</b> Analytical Laboratory <small>of the University of California</small>		<b>ENVIRONMENTAL SURVEY          OF FORMER AND CURRENT          AEC LAND AREAS</b>	
PROJECT NO. CLIENT DATE	DRAWN BY CHECKED BY DATE	SCALE SHEET NO.	TOTAL SHEETS
REVIEWER <i>J. P. [Signature]</i>	DATE 1/13/13	100	9
CLASS V		ENG-R-3549 D 1	



 FORMER TA-I BUILDINGS  
 EXISTING ACID SEWER LINE

THIS SET OF DWGS CONSISTS OF ENG-R-3547 THRU ENG-R-3555	
	
<b>ENVIRONMENTAL SURVEY OF FORMER AND CURRENT AEC LAND AREAS</b>	
PROJECT NO. DRAWING NO. DATE DRAWN BY CHECKED BY APPROVED BY	REVISED BY DATE SCALE SHEET NO. 9 OF 10
REVIEWER: <i>SE Perry</i>	CLASS: <i>V</i> DATE: <i>7/1/73</i>

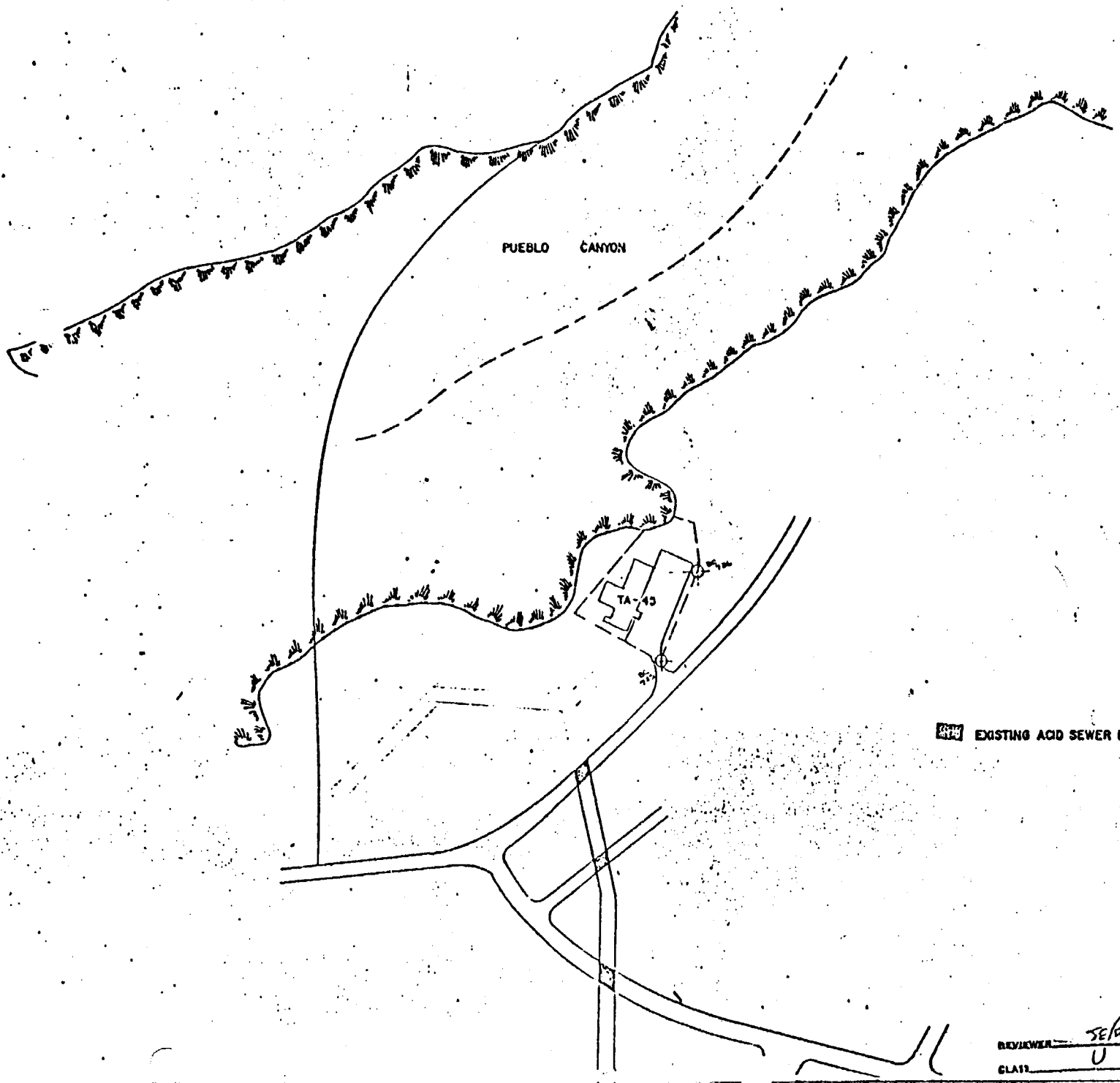
NO.	DATE	BY	REVISION



THIS SET OF DWGS CONSISTS OF ENG-R-3547 THRU ENG-R-3553

		ENVIRONMENTAL SURVEY OF FORMER AND CURRENT AEC LAND AREAS	
REVIEWER <i>F. Lucas</i>	CLASS U	DATE 3/10/70	NO. 9 ENG-R-3551


DATE	BY	NO.	REV.

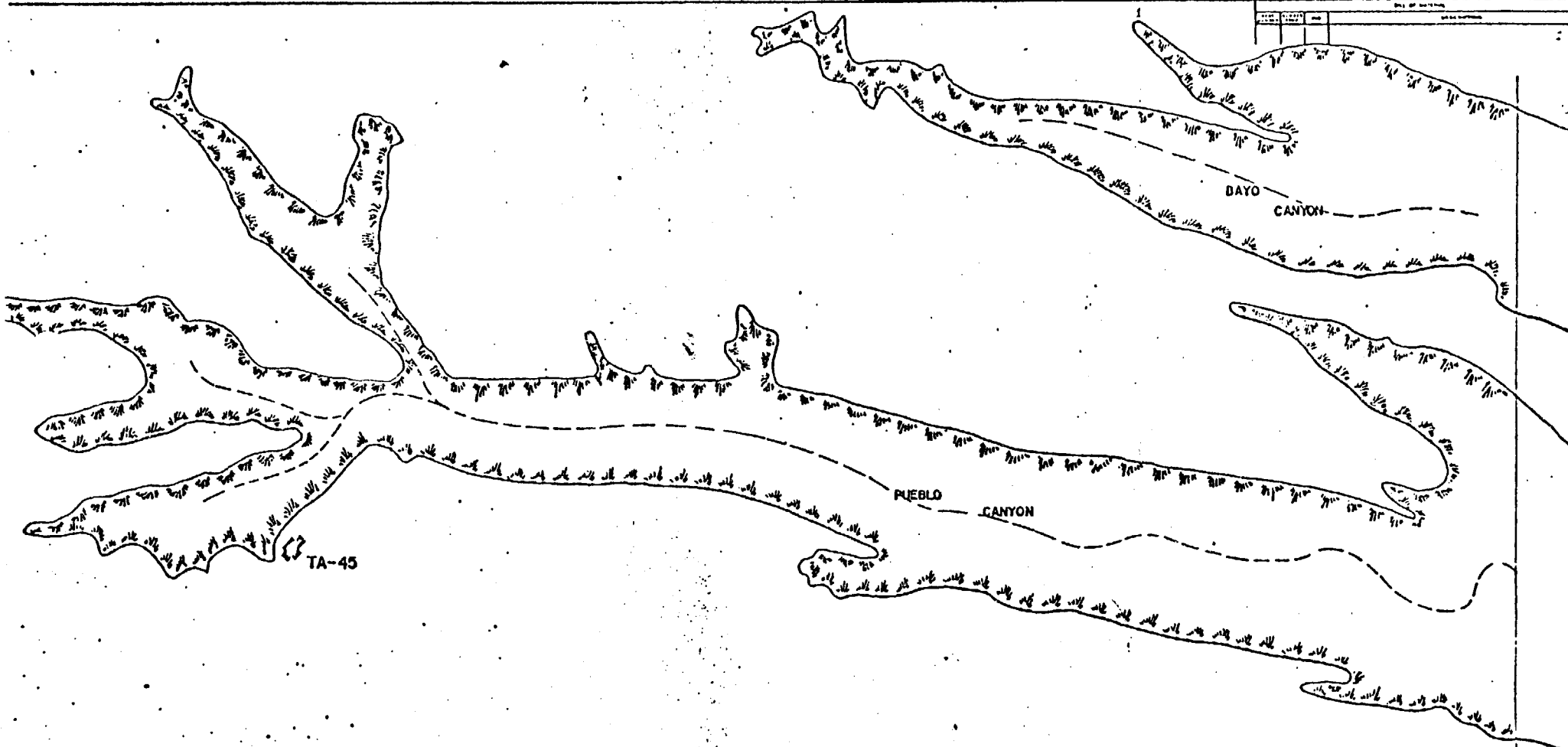


 EXISTING ACID SEWER LINE

THIS SET OF PLEES CONSISTS OF ENG-A-2047 THRU D-9-A-2048

REVIEWER SE/ham  
 CLASS U DATE 2/1/83

 <b>J&amp;S Associates</b> Consulting Engineers 1000 West 10th Street Denver, Colorado 80202		<b>ENVIRONMENTAL SUR-          OF FORMER AND CURRE          AEC LAND AREAS</b>	
NO.	DATE	BY	REV.
00	9	ENG-R-2002	

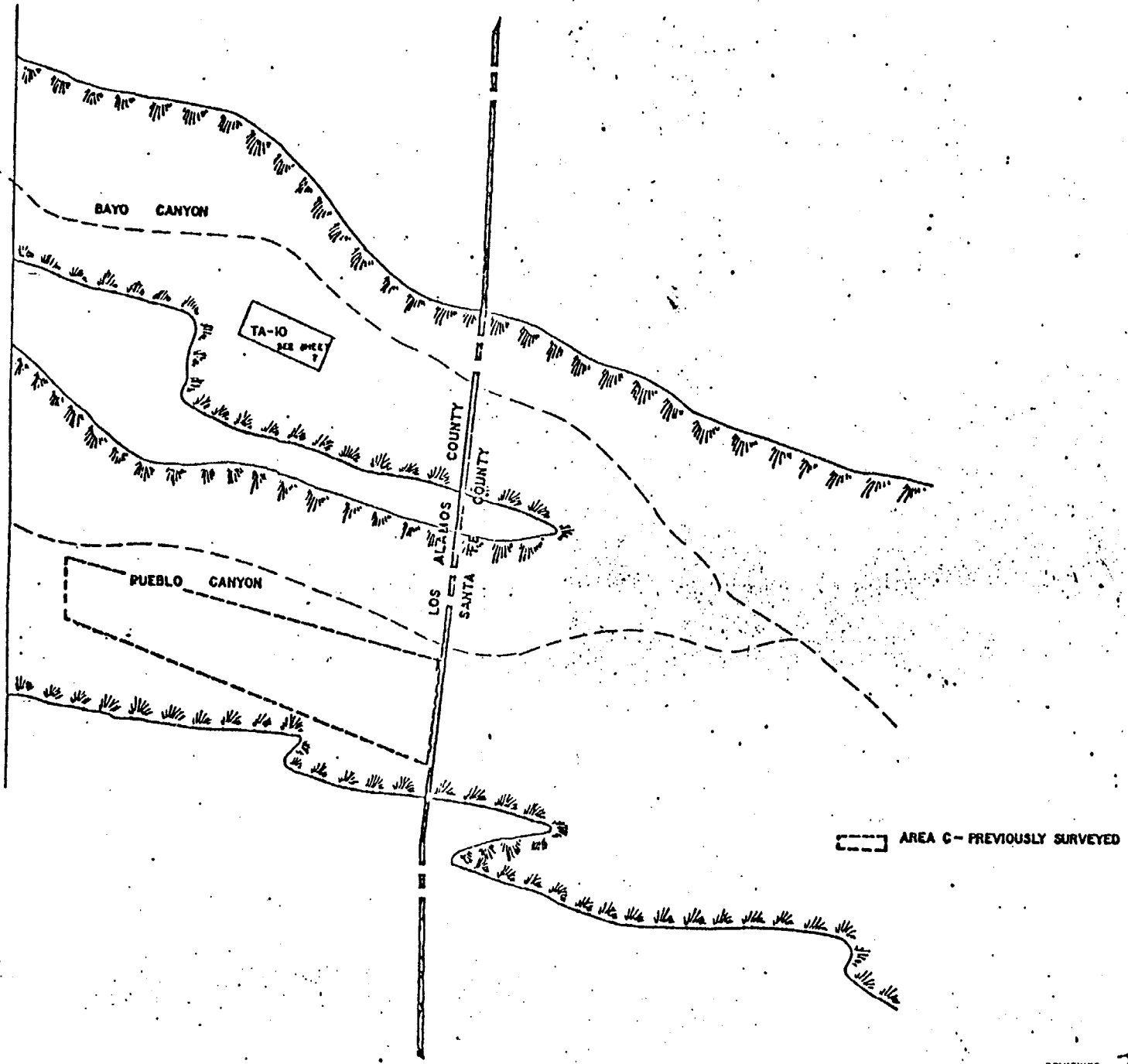


NO.	DATE	BY	REVISION

THIS SET OF DWGS CONSISTS OF ENG-A-3047 THRU ENG-A-3053

REVIEWER *J. R. [Signature]*  
 CLASS \_\_\_\_\_ DATE *2/2/73*

<p>California Department of Water Resources          WATER RESOURCES DIVISION</p>		<p>ENVIRONMENTAL SURVEY          OF FORMER AND CURRENT          AEC LAND AREAS</p>
<p>PROJECT NO. <i>11/52-11/52-623</i></p>	<p>DATE <i>2/2/73</i></p>	
<p>ENGINEER <i>[Signature]</i></p>		<p>ENG-R-3053 D</p>



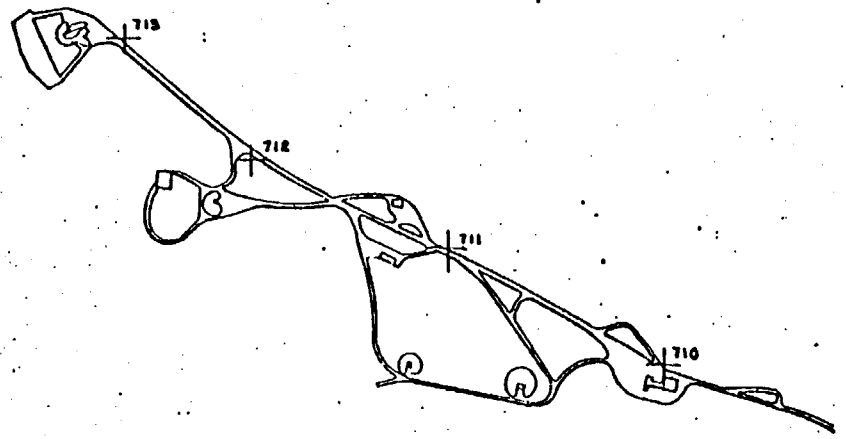
THIS SET OF PAGES CONSISTS OF ENG-R-3047 THRU ENG-R-3055

--- AREA C - PREVIOUSLY SURVEYED

		<b>ENVIRONMENTAL SUR OF FORMER AND CURF AEC LAND AREAS</b>	
PROJECT NO.	DATE	BY	REVISION

REVIEWER *Te Rued*  
 CLASS *U* DATE *9/12*





TA-10

THIS SET OF DRAWINGS CONSISTS OF ENG-A-3047 THRU ENG-A-3050

REVIEWER *[Signature]*  
 CLASS 1 DATE 2/19/73

<p>Los Alamos Scientific Laboratory      U.S. DEPARTMENT OF ENERGY</p>		<p>ENVIRONMENTAL          OF FORMER AND          AEC LAND AREA</p>
<p>PROJECT NO. <u>12-2-2</u></p>	<p>DATE <u>2/19/73</u></p>	<p>CLASS <u>9</u> ENG-R-3</p>

UNITED STATES  
ATOMIC ENERGY COMMISSION  
LOS ALAMOS, NEW MEXICO 87544

JUN 25 1973

H. C. Donnelly, Manager  
Albuquerque Operations

MANAGEMENT OF CONTAMINATED REAL PROPERTY

My memorandum to you dated October 19, 1971, subject as above, advanced a number of recommendations for a resurvey of certain real property previously decontaminated and released at the Los Alamos Area Office. The recommended actions to resurvey certain areas and remove sections of contaminated piping as well as contaminated soil where found may alleviate future concern for unrestricted usage of the land which was previously occupied by AEC-owned installations.

The Los Alamos Area Office and LASL have developed the following plan for an environmental radioactivity resurvey of former AEC land areas.

The land areas to be surveyed are identified as follows:

1. TA-1, including those locations not in the TA-1 bounds indicated on engineering drawings but associated with TA-1 and having some radiocontamination potential.
2. Acid-Pueblo Canyon including the dismantled TA-45 site.
3. Bayo Canyon including the dismantled TA-10 site.

The above areas together with the locations of sections of the old acid sewer line which were left in place in the community are shown on the attached series of maps prepared by Eng-3 (ENG-R-3547 through 3555).

The proposed survey plan will parallel that described in "Los Alamos Land Areas Environmental Radiation Survey 1972," LA-5097-MS. The proposed survey steps are outlined as follows:

1. A records search from which a land use history will be compiled identifying potential environmental contaminants, pertinent environmental measurement data, and subsequent activities which may have affected the areas involved.

2. Determine the measurement and sampling points and mark and record appropriate engineering survey data.
3. In situ field radiation measurements with the following instruments at each point.
  - a. Gross gamma rate ( $\mu\text{R}/\text{h}$ ) measurements using the Ludlum Model 12S instrument.
  - b. LAFPHA/FIDLER instrument measurements to detect Pu and Am radiocontamination.
  - c. Uranium-235 contamination measurements using an Eberline SPA-3 detector and an Eberline PRM-5-3 Pulse Rate Meter.
4. A soil sample will be collected at each point in the following manner where the land surface has remained unaltered except for the forces of nature (wind, rain, etc.). A 7.6 cm diameter by 5.0 cm deep soil core sample at the center and corners of a 10 meter square (or an approximation to a square adjusted in the field to accommodate terrain features) will be composited to form a single soil sample representing the point.
 

A portion of the old D Building area has reportedly been covered with several feet of fill soil. Therefore some deep coring (1.5 - 3.0 m depth) will be required to examine the extent of potential Pu soil contamination. Similar soil sampling technique will be required where the original soil surface has been covered or disturbed at the areas to be surveyed.
5. A vegetation sample corresponding to each soil sample and consisting of a few hundred grams of available native grass species will be taken.

The number of measurement and sample points planned for each land area are tabulated below:

<u>Land Area</u>	<u>Number of measurement and sampling points</u>
TA-1	50
Pueblo	20
Bayo	20

The soil and vegetation samples will be analyzed in the environmental analytical chemistry laboratories. The samples will be analyzed sequentially so that in those locations where activity determinations are low a smaller number of analyses will be required. The following concentration determinations will be made on each sample. A portion of each sample analyzed will be placed in a sample library to allow repeat assays and other secondary measurements.

1. Pu
2. U
3. Gross beta
4. Gross gamma

Specific nuclide measurements will follow the gross beta and gamma determinations where the gross activity level is significantly different than background samples. Where an area or building may have handled a particular material, such as Am and Cm at TA-1, MIL Building, the samples collected will receive special analysis for those materials.

The survey will also include a field search for evidence of any possible environmental nonradioactive contaminants, i. e., explosives, chemicals, etc.

Findings from the records search, field measurements and observations, and analytical laboratory determinations will be formally summarized and reported.

This proposed survey plan is submitted for your review and approval. To allow the survey to proceed during an optimum weather season, prompt review and approval of the plan will be appreciated.

Original Signed by:  
H. Jack Blackwell  
H. Jack Blackwell  
Area Manager

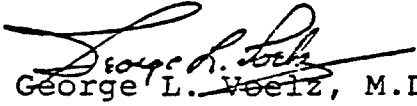
LAO:EEW

Enclosures:  
Maps

## OFFICE MEMORANDUM

TO : H. Jack Blackwell, Manager, AEC-LAAO

DATE: November 13, 1973

FROM :  George L. Veelz, M.D., Health Division Leader

SUBJECT : FORMER AEC FACILITIES

SYMBOL : H

The following material is in reply to the teletype from H. C. Donnelly, dated October 31, 1973, concerning real property which has been released from AEC control following cleanup efforts. Real property is considered to be land and buildings. Answers to the questions are keyed to the numbers on the teletype.

1. This list identifies the real properties at Los Alamos where cleanup has been done and the property released for conditional or unconditional use.

a. TA-1, the original Manhattan District Laboratory Site.

b. TA-10, the Bayo Canyon Site used for Ra-La shots during and immediately following the war.

c. TA-45, the old liquid waste treatment facility and its discharge area into Acid Canyon which in turn drains into Pueblo Canyon.

d. The contaminated waste line from TA-1 and TA-3 to TA-45.

2. Brief summary of cleanup actions and present conditions of the area.

A description of the cleanup actions at each site and the criteria used is given in the attached letter from H. M. Agnew to H. Jack Blackwell dated September 30, 1971. In addition, a recent search of the records indicates that the clean concrete from building foundations was dumped into a gully leading into Los Alamos Canyon and was covered with clean dirt. For this purpose, "clean" was defined as less than 2500 counts per minute on a portable alpha survey meter and some small fraction of this material was contaminated below this level with normal and enriched uranium. In addition, a series of soil samples from under the D Building, following removal of about one foot of earth, indicated plutonium values ranging from 100-500 dis/min per gram. This site was covered with several feet of clean dirt. Specific comments on the other points follow.

ACTION/RECORD COPY *Operations Div.*

INFORMATION COPY *(1) Manager*

TO: H. Jack Blackwell

-2-

DATE: November 13, 1973

B. Current Conditions

TA-1 Resurveys of this area have not been done. A plan has been submitted to the AEC and approved and we are awaiting receipt of permission to enter the privately owned lands.

TA-45, Acid Canyon The outfall from the waste treatment plant was discharged into Acid Canyon which, in turn discharges into Pueblo Canyon. Plutonium was discharged to the area in liquid effluents during the years 1944-1964. Plutonium concentrations in filtered surface waters in Acid Canyon and the adjacent portions of Pueblo Canyon generally average about 20 pCi/liter. A limited number of samples of the alluvium taken in 1970 indicate plutonium concentrations of 27 pCi/g in lower Acid Canyon, 4.6 pCi/g in Pueblo Canyon one mile below the Acid Canyon outlet and 1.1 pCi/g two miles below Acid Canyon. A resurvey of the area has recently been done with the sample analyses and analysis of the data incomplete at this date. These results will be forwarded to you as soon as they are available.

TA-10, Bayo Canyon This area has been resurveyed this fall with no positive indications on the portable survey instruments. Sample analyses are, again, not complete. It may be noted that the chief concern in the cleanup operations in this area was with explosives, although the surveys include a search for long-lived radioactive materials used here, such as impurities ( $^{90}\text{Sr}$ ) in the radio-lanthanum and uranium.

Acid Waste Line The sections of the line under the roads and near the Hospital remain in place.

C. Who property transferred to.

This question will be answered by LAAO.

D. Organizations knowledgeable about cleanup and disposal.

The Health Division at LASL provided monitoring services and health physics advice as well as advice and monitoring on explosives, where pertinent. The Engineering Department planned and coordinated the actual operations. Transfer of title for the areas was carried out by the AEC-LAAO.

TO: H. Jack Blackwell

-3-

DATE: November 13, 1973

#### E. Available references

In addition to the attached letter summarizing the cleanup and conditions, further information can be found in:

W. C. Courtright, "TA-10 Bayo Canyon Cleanup," LAMS-2945, May 1963.

W. D. Purtyman, "Plutonium in Stream Channel Alluvium in the Los Alamos Area, New Mexico," LA-4561, February 1971.

T. E. Hakonson, "Ecological Investigation of Radioactive Materials in Waste Discharge Areas at Los Alamos," LA-5282-MS, May 1973.

Information on the general radiological conditions at Los Alamos can be found in our continuing series of environmental reports.

#### F. Adequacy of Cleanup

Since there are no formal standards having to do with such contamination, only an opinion can be stated on this question. In reviewing the records and with the information now available on contamination levels, we would feel that areas such as TA-1 or the Acid Canyon site would probably not be disposed of to the public under today's conditions of environmental concern. In our opinion, the plutonium measurements available do not indicate the presence of a health hazard since they are within a proposed, conservative standard which we have recently derived and which will be published in the near future. The levels are, however, higher than the standard proposed by the State of Colorado.

Until formal standards are available, actions to be taken depend strongly on value judgements as to potential public reaction, health risk, ease of accomplishing anything useful, environmental impact resulting from additional clean-up actions, costs, and similar factors. We would have recommended immediate and decisive action if there were any indication of a true health hazard. Now it appears that additional actions are elective decisions based on subjective reasoning rather than definitive data. The following recommendations are made on that basis.

Acid Waste Line The Laboratory cannot take action on removal of these sections on community property since this would entail excavation on property which is not under AEC control. We have made some preliminary engineering cost estimates for removal of these sections for your use in considering the problem. These are:

TO: H. Jack Blackwell

-4-

DATE: November 13, 1973

1. Remove 3 in. acid sewer line from manhole ULR 33 in Los Alamos Canyon to northwest of Los Alamos Medical Center along Diamond Drive. \$22,000
2. Remove 6 in. acid sewer line from HRL to near old manhole ULR 35 (removed) at Trinity and Diamond. Estimate includes tunneling under Medical Center addition. \$59,000
3. Remove two sections of 4 in. acid sewer line; one under Trinity along Diamond Drive, one under Canyon Road north of Episcopal Church. \$16,000
4. Remove three sections of 8 in. acid sewer, one under Central Avenue, one under Rose Street, one under Canyon Road in the vicinity of the United Church. \$8000

We would suggest that, if you do consider removing these sections, the work be coordinated with the county plans for major repairs to the areas. We would also believe that the section of the line near the hospital (Item 2 above) could be left in place because of the depth of burial and the low contamination levels of the effluents to which this section was exposed.

Acid-Pueblo Canyons The Acid-Pueblo Canyon system is of considerable interest to the Laboratory as an ecological study area because of the type and age of the contamination present. We believe that results from a continued study of the area will be extremely useful in assessing the environmental behavior of plutonium. For this reason we would recommend that arrangements be made to keep this area undisturbed either by cleanup activities or by the public. To this end, we are considering the possibility of arranging a lease for the area to permit the needed continuing investigation.

Other Areas In the current situation it would seem that plans or proposals for further action, if required, be deferred for TA-1 and Bayo Canyon locations until the prospective surveys are completed and additional data are available.

GLV:JWH/mjt

Encl. as stated

cc: R. E. Schreiber  
L. P. Reinig  
H. S. Jordan  
J. E. Dummer  
L. J. Johnson  
ISD-5



NOV 23 1973

H. C. Donnelly, Manager  
Albuquerque Operations

DECONTAMINATION AND DECOMMISSIONING OF AEC FACILITIES  
(YOUR TWX DATED 10/31/73)

Enclosed is a copy of a self-explanatory memorandum dated November 13, 1973 (with enclosure) from George L. Voelz, M.D., Health Division Leader, LASL, which provides additional information on contaminated ex-AEC owned facilities that have been turned over to other uses and for which we are no longer responsible.

This memorandum will elaborate upon certain comments made by Dr. Voelz and will furnish additional information in response to the October 31, 1973, TWX. Answers to the questions are keyed to the numbers on the TWX and Dr. Voelz' letter.

- 1.a. TA-1, the original Manhattan District Laboratory Site sold, for unconditional use, to private individuals and firms.
- b. TA-10, Bayo Canyon Site, transferred to Incorporated County of Los Alamos for unconditional use.
- c. TA-45, the former Liquid Waste Treatment Site, transferred to Incorporated County of Los Alamos for unconditional use. Acid Canyon and Pueblo Canyon transferred to Incorporated County of Los Alamos subject to recognition of an easement, generally 100 ft. wide along the canyon beds, reserved unto the AEC.
- d. Contaminated Waste Lines (Acid Waste Lines) from TA-3 and TA-1. The properties were transferred for unconditional use.

5 22 44.13

2. In addition to the attached letter from H. M. Agnew to H. Jack Blackwell, dated September 30, 1971, see also the attached memorandum dated October 19, 1971, from H. Jack Blackwell to H. C. Donnelly, which discusses the Agnew memorandum.
- B. Current Conditions. The owners of the property in the TA-1 area have been identified and we will seek permission to resurvey the area and collect soil and vegetation samples.
- C. The following is a list of present owners of the propertie

(1) TA-1

Tract F, Lot #2, Investment Properties, Inc.  
Albuquerque, New Mexico

Tract F, Lot #1, Walter L. Wyman  
San Diego, California

Tract LL, Lot #2, Humble Oil Co.  
Los Alamos, New Mexico

Tract LL, Lot #3A, Gateway Investment Co.  
Los Alamos, New Mexico

Tract LL, Lot #3, Richard Speers Dept. Store  
Los Alamos, New Mexico

Tract LL, Lot #1, Gulf Oil Co.  
Los Alamos, New Mexico

Tract MM, Aries Co.  
Girard, Ohio

Tract RR, Lot A, Tres Perkins, Inc.  
Los Alamos, New Mexico

Tract RR, Lot B, Bonnie Jeanne Corp.  
Los Alamos, New Mexico

Tract NN, Los Alamos County

Tract KK, Los Alamos County

Tract II, Los Alamos County

(2) TA-10

Bayo Canyon Site was transferred to the Incorporated County of Los Alamos by Quitclaim Deed on July 1, 1967, for unconditional use.

## (3) TA-45

TA-45, the former Liquid Waste Treatment Site (located in Tract L, Eastern Area No. 3) was transferred to the Incorporated County of Los Alamos on July 1, 1967, for unconditional use.

## ✓ (4) Acid Canyon and Pueblo Canyon

Acid Canyon (located in Tract L and Parcel I, Eastern Area No. 3) and Pueblo Canyon (located in Parcel I, Eastern Area No. 3 and Pueblo Canyon Parcel, Eastern Los Alamos County Tracts and Parcels) are drainages from the TA-45 Site. These were transferred to the Incorporated County of Los Alamos by Quitclaim Deed on July 1, 1967, subject to the recognition of an easement, generally 100 ft. wide, along the canyon bottoms. This easement and right-of-access was to permit the construction and operation of test wells and to permit the collection of earth and water samples.

## (5) Contaminated Waste Lines (Acid Waste Lines)

Small sections of acid waste lines from TA-1 and TA-3 to TA-45 were left in place under and across Central Ave., Canyon Road, Diamond Drive and along and within the Diamond Drive right-of-way. This property was unconditionally transferred to the Incorporated County of Los Alamos on July 1, 1967. There is also a small section of acid line under and across the Hospital property owned by Lutheran Hospitals and Homes Society, Inc.

D. No comment

E. In addition to available references listed in Dr. Voelz' memorandum, please add the following:

- 44-53 5 30 66-113
- (1) T. L. Shipman to R. E. Dunning, dated Jan. 13, 1960, subject: TA-1.
- 2000002

- (2) N. E. Bradbury to C. C. Campbell, dated July 18, 1963.
- (3) Edwin Bemis to Carl G. Nottrott, dated August 27, 1969, Buried Acid Sewer Line under New Addition to Hospital.
- (4) John A. Erlewine to H. C. Donnelly, dated Nov. 3, 1971, Management of Contaminated Real Property.
- (5) H. Jack Blackwell to Harold M. Agnew, dated November 17, 1971, Management of Contaminated Property.
- (6) George L. Voelz, M.D., to H. Jack Blackwell, dated May 17, 1973, Proposed Plan for Environmental Radioactivity Resurvey of Former and Current AEC Land Areas.
- (7) H. Jack Blackwell to H. C. Donnelly, dated June 25, 1973, Management of Contaminated Real Property.
- (8) J. F. Burke to H. Jack Blackwell, dated July 12, 1973, Management of Contaminated Real Property.
- (9) E. E. Wingfield to George L. Voelz, M.D., dated August 14, 1973, Proposed Plan for Environmental Resurvey of Former and Current AEC Land Areas.

F. With respect to the adequacy of cleanup, we have no problem with the LASL's opinions. It is quite evident that formal standards must be made available so that prudent decisions can be made regarding cleanup. Since the LASL has stated that there is no indication of a true health hazard, we concur in their recommendations and feel that actions regarding the Acid Waste Lines, the Acid - Pueblo Canyons, the TA-1, and the Bayo Canyon, can be held in abeyance, for the time being, until formal standards are available, or until meaningful contamination data from monitoring surveys are available.

In connection with the removal of the acid waste lines, we will work with the County and schedule removal of the lines at the time of major street repairs. One such repair is presently planned.

You will note that Dr. Voelz has indicated the possibility of arranging a lease with the County for the Acid - Pueblo Canyon area.

At the time of transfer of the property to the County, we reserved an easement generally 100 feet wide along the canyon beds to construct, operate, maintain and remove test wells, as well as construction of any fences, buildings, structures, etc., that may be necessary to carry out test well operations and soil and vegetation sampling programs. This easement may suffice for the LASL's program for continued ecological study of the area.

Original Signed by:  
H. Jack Blackwell

H. Jack Blackwell  
Area Manager

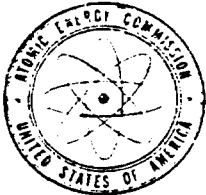
LAO:EEW

Enclosures:  
As stated

NOV 23 1975

1:40

H. J. BLACKWELL



UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

June 24, 1974

G. J. Keto  
Assistant for Economic  
and Community Affairs

RADIOLOGICAL SURVEY OF REAL PROPERTY AT LOS ALAMOS

In connection with the currently underway and partially completed disposal of some 5,000 acres of Government real property at Los Alamos, it was necessary to conduct radiological surveys of the property prior to release to General Services Administration (GSA). The surveys were completed and both the Field and Headquarters agreed that the results did not indicate any hazard which would preclude unrestricted use of the land by private owners or the general public. In 1971 when the scope and methods for conducting the surveys were being worked out, the Los Alamos Area Office (LAO) recommended that similar surveys be conducted on Government property previously decontaminated and released to private and County ownership at Los Alamos and that appropriate action be taken to decontaminate such property in accordance with the results of the surveys and modern concepts of allowable contamination. The recommendation was accepted by Headquarters and arrangements were made in the Field to accomplish it. Accomplishment was deferred until after completion of the survey of the property being released for disposal. LAO then made arrangements with the County and all private landowners for the surveys and issued a news release after coordination with Headquarters. ✓

LAO advises that as of this date the Los Alamos Scientific Laboratory (LASL) has collected all soil and vegetation samples scheduled, except two soil samples, on the land previously transferred to private or County ownership. These two samples are to be taken by core drilling at the former "D Building" location in the old Technical Area which is on or near the present Los Alamos Inn parking lot. Gross alpha and gross gamma examination of all samples taken to date has been completed but chemical process examination has not been done.

There are some preliminary findings available. At the site of former "Q Building" which was located in the old Technical Area, now undeveloped privately owned property, alpha radiation at a few times normal background level has been noted. At the site of former "J Building" located in the old Technical Area, now at the eastern end of a new apartment building complex, cesium at a little above background levels has been found at a point where an acid sewer line had been removed. Cesium at slightly above background levels has also been detected at the site of the former "Bailey Bridge" at a small feeder canyon in the old Technical Area which is partly on now undeveloped privately owned property on the rim of the Los Alamos canyon and partly on AEC property.

On County property in Bayo Canyon, which runs roughly east to west between two mesas occupied by private housing, there was formerly located a "chemical shack" where chemical processing sinks were drained into a pit. Prior to transfer of the property to the County, this pit was excavated to a depth of over 15 feet to remove contamination. However, strontium 90 at about 100 times normal background has now been found at the pit location. This is the most significant finding of the current survey to date. TA-4

There are portions of an acid sewer line abandoned in place under Los Alamos Medical Center property and under the County's Trinity and Canyon Drives. Based on the history of its use, it is assumed that contamination exists in the portions of the line still in place. Plans for its eventual removal will be made at the time all results of the surveys are available and recommendations are being considered for whatever decontamination actions may be necessary at any of the locations surveyed.

✓ Pueblo Canyon runs roughly west to east and parallel with the previously mentioned Bayo Canyon. It joins Bayo Canyon just east of the Los Alamos County line on the Otowi Section of land which is public domain property under the administrative control of the AEC. Pueblo Canyon is the location of the tract of land declared excess to GSA and on which Mr. Roger Bartlett was the high bidder. He did not go through with the purchase of the land because of his stated concern with the reported above background levels of plutonium in the stream bed which traversed the tract of land on which he bid. Mr. Bartlett was also concerned with even higher levels of plutonium reported in the stream bed both above and below the tract of land on which he bid. The canyon bottom land above the particular tract was transferred to, and belongs to Los Alamos County. The land immediately below the tract is under control of the Commission. What measures, if any, may be required in connection with plutonium levels in Pueblo Canyon have not been determined.

The purpose of the above information is to give an indication of the status of action on the radiological surveys of previously transferred real property at Los Alamos. A complete report should be available within the next few months.

H. J. Blackwell  
Special Assistant to the  
Assistant for Economic  
and Community Affairs

UNIVERSITY OF CALIFORNIA  
LOS ALAMOS SCIENTIFIC LABORATORY  
(CONTRACT W-7405-ENG-36)  
P. O. Box 1663  
Los Alamos, New Mexico 87544

IN REPLY  
REFER TO: H

August 15, 1974

Mr. Kenneth R. Braziel, Area Manager  
Los Alamos Area Office  
U. S. Atomic Energy Commission  
Los Alamos, NM 87544

Re: RADIOLOGICAL CONDITION SURVEYS OF REAL PROPERTY

Dear Mr. Braziel:

This is in response to the letter from H. C. Donnelly requesting additional information on previously excised AEC real property where radioactive materials were used. As agreed with W. Crismon of your office, we include in the following answers to questions 1 and 2 in Mr. Erlewine's letter and are sending the reply to you so that the answers to questions 3 and 4 concerning the identity of the property and the present owners can be attached.

We believe that the properties identified in the memorandum from G. Voelz to H. Jack Blackwell, dated November 13, 1973, are still the ones of concern. A copy of this memo is enclosed. There have been an additional 5500 acres of land released since this time but these were not used for radioactive material handling and a complete report, (LA-5097-MS), of the results of the survey for radiological contamination was sent to Operational Safety. The previous memo also provided our recommendations as to possible actions on these properties. The current review has indicated no reason to change these.

Answers to the questions in Mr. Erlewine's letter of June 4, 1974 follow:

1. A search of the Health Physics' records for information on these properties was made in February 1973. A summary of the findings at that time is given in the enclosure. At this time a record was made of the location of each item in storage (some in dead storage in Denver) and these documents can be recovered within several weeks.



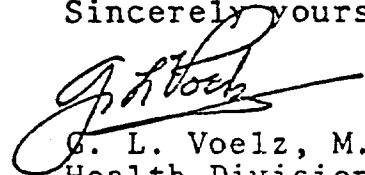
August 15, 1974

2. Little additional information on the radiological condition of these properties is, as yet, available. A resurvey plan was submitted to the AEC on May 17, 1973 and approval was received in August 1973 to proceed, conditional upon the AEC first obtaining permission of the current owners of the property. This permission has been received and the resurvey is in progress with, however, only preliminary, unreduced data available at this time. The major holdup is in obtaining the necessary analyses of the samples. These data will be documented and a report submitted as early as possible.

The Engineering Department has re-estimated the cost of removing the remaining sections of the old acid waste line under the town at \$155,000. This includes the removal of a) about 2250 feet of 3-in. sewer line running from Building 700 to northwest of the Medical Center; b) about 850 feet of 6-in. line from HRL Building to an old manhole on Trinity Drive. This line runs under the present west wing of the Medical Center and will require tunneling; c) about 175 feet of 4-in. line in three sections: under Trinity Drive, along Diamond Drive, and across Canyon Road; and d) about 165 feet of 8-in. line under Central Avenue, Rose Street, and Canyon Road.

Some additional data in the Acid Pueblo Canyon system have been obtained during the ecological studies now in progress. These data are included in the annual Environmental Surveillance Reports routinely sent to Operational Safety. The latest, and most complete discussion is in LA-5586, pp. 29-33.

Sincerely yours,



G. L. Voelz, M.D.  
Health Division Leader

GLV:JWH:ed  
Attach.

cc: R. E. Schreiber, DD  
L. P. Reinig, Eng-DO  
J. E. Dummer, H-1  
L. J. Johnson, H-8

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2.22.1  
1.18

FEB 7 1980

EV-13

Notification of Need for Some Form of Remedial Action in Bayo Canyon,  
Los Alamos, New Mexico

S. Meyers, NE-90

EV/ECT has determined that portions of Bayo Canyon are contaminated with radioactive residue as a result of activities conducted for the Manhattan Engineer District and Atomic Energy Commission. We consider this site to be low priority as potential exposure rates to the general public are relatively low under the present use. Enclosed in support of these findings are:

- The radiological survey report for Bayo Canyon, and
- The Bayo Canyon Site Summary.

The Office of General Counsel has made a preliminary finding that DOE has authority to conduct remedial action at this site.

Please keep us informed of the status of this project in order that EV may fulfill our overview requirements.

/s/  
Thomas G. Frangos, Director  
Office of Environmental  
Compliance and Overview

2 Enclosures

bcc: Aerospace  
A. Whitman, EV-131  
EV-10  
SMILLER, GC

EV-131  
AWhitman  
2/4/80

EV-13  
WEMott  
2/3/80

EV-10  
Frangos  
2/7/80  
CF

GC  
Miller concurred  
by phone 2/7  
can

U.S. DEPARTMENT OF ENERGY  
**memorandum**

DATE: 10 1981

NE-30.1

SUBJECT: Remedial Actions at the Bayo Canyon and Acid/Pueblo Canyon, New Mexico Sites

TO: W. E. Mott, EP-32

We are planning to complete the engineering design and environmental analysis for these two sites in FY 1982. It is expected that the remedial actions will be relatively small in scope and can be completed during October, 1982. We request that your office complete the radiological survey evaluation work for these two sites as soon as possible, but no later than January, 1982. Your memorandum dated September 9, said that you were reevaluating the Bayo Canyon site and it might not need remedial action, even though you have designated it previously. Furthermore, it is cost effective to work on both of these New Mexico sites at the same time. We must proceed with utilization of the Bechtel engineering staff now on board in response to your previous designation. Therefore, we need your decisions on these sites immediately.

*W. W. Ballard Jr.*  
W. W. Ballard, Jr.  
Acting Director  
Remedial Action Program  
Nuclear Waste Management  
and Fuel Cycle Programs  
Office of Nuclear Energy

cc: D. E. Patterson, EP-32

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~~60002~~

*mathis/colic*  
*1/11/82*

NM.1

JAN 4 1982

EP-32

Bayo Canyon Area, Los Alamos, New Mexico

W. Wade Ballard, Jr., NE-30.1

This is in response to your December 18, 1981, memorandum. The Office of Operational Safety decision that Bayo Canyon should be considered for remedial action has not changed. Also, we still consider this site to have a low priority because the present and potential uses indicate that increments of radiation exposure due to residual contamination attributable to Bayo test operations would be small in comparison to either radiation protection guidelines or natural background. The type of remedial action to be considered should range from no action or merely restricting use of the property, to stabilization and/or removal of contaminated material. The decision on which remedial action alternative to choose should consider a cost-benefit analysis.

Please provide us with two copies of all final and draft reports on Bayo Canyon so that we can perform our independent review function.

Original signed by:

William E. Mott  
Office of Operational  
Safety (EP-32)

bcc:  
Aerospace  
D. Patterson, EP-32  
A. Whitman, EP-32

*3/1*  
EP-32:GPTuri:d1m:353-2766:12/31/81:EP-32-81-431:DF-60

CONCURRENC
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Transmittal  
Report  
Remittal Action

Department of Energy  
Oak Ridge Operations  
P.O. Box E  
Oak Ridge, Tennessee 37830

JUN 16 1983

J. E. Baublitz, DRAP, NE-24, DOE-HQ, GTN  
S. Stief, Safety and Environmental Control

DRAFT FINAL REPORTS FOR ACID/PUEBLO AND BAYO CANYON SITES -

Attached are copies of the draft final reports for the Acid/Pueblo and Bayo Canyon sites for your review. Any comments on the reports should be submitted to this office by ~~July 1, 1983~~ - July 17, 1983

*Lowell J. Campbell*  
for E. L. Keller, Director  
Technical Services Division

CE-53:KFH

Attachment:  
As stated

cc w/o attach:  
J. T. Milloway  
R. L. Rudolph, BNI

REPORT ON REMEDIAL  
ACTION AT THE  
BAYO CANYON SITE  
LOS ALAMOS, NEW MEXICO  
MAY, 1983

Under Contract Number DE-AC05-81OR20722 between the United States Department of Energy, Oak Ridge Operations Office and Bechtel National, Inc.

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## TABLE OF CONTENTS

	<u>PAGE</u>
1.0 INTRODUCTION	1
1.1 Foreword	1
1.2 Cost Summary	1
2.0 HISTORY	3
2.1 Owners	3
2.2 Site Description	3
2.3 Radiological History and Status	3
3.0 WORK PROGRAM DEVELOPMENT	7
3.1 Organization	7
3.1.1 DOE-Bechtel, Oak Ridge	7
3.1.2 Site Organization	7
3.1.3 LANL	7
3.1.4 DOE-Los Alamos	9
3.2 Work Description	9
3.3 Site Characterization	9
3.4 Engineering	9
3.4.1 Basis for Work Performed	9
3.4.2 Definition of Design Basis	9
3.5 Procurement	10
3.6 Schedule	10
3.7 Quality Assurance	10
3.8 Construction Safety Program	11
3.9 Radiological Protection Program	11
4.0 PERFORMANCE BY SUBCONTRACTORS	12
4.1 Survey Services	12
4.1.1 Staffing and Manpower	12
4.1.2 Chronology of Work	12
4.1.3 Procedures and Equipment	12
4.1.4 Cleanup	12
4.1.5 Cost	12
5.0 RADIOLOGICAL SUPPORT	14
6.0 CONTINUING ACTION	15
6.1 Description of Perpetual Monitoring	15



## APPENDICES

A.	References	16
B.	Photographs	17
C.	Tabulation of Bids	19
D.	Description of Restricted Area	20

## FIGURES

1	Bayo Canyon Site	4
2	Bayo Canyon Location Map	5
3	Management Organization	8
4	Location of Survey Monuments	13

## TABLES

1.1	Cost Summary	2
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## 1.0 INTRODUCTION

### 1.1 Foreword

This report is a summary of the activities performed under the U. S. Department of Energy (DOE), Formerly Utilized Sites Remedial Action Program (FUSRAP) at the Bayo Canyon Site (TA-10) in Los Alamos County, New Mexico. The site was determined by the DOE to require remedial action under FUSRAP because radioactive contamination levels at the site exceed acceptable levels for unrestricted use.

The action taken consisted of installing survey monuments on the boundary of the contaminated area and placing restrictions on the property deed to limit excavation on the site until the year 2142.

A Purchase Contract was executed between Bechtel National, Inc. (BNI) and Professional Land Surveying for installation of the survey monuments and the preparation of draft deed restrictions in accordance with New Mexico practices and laws. (Remedial action at Bayo Canyon was conducted simultaneously with remedial action at Acid/Pueblo Canyon, another nearby FUSRAP site. For cost-effectiveness, surveying services for the two sites were placed in one subcontract.)

The work was begun on August 2, 1982, and was essentially completed by September 10, 1982.

This report describes the placement of survey monuments and the drawings and draft deed restrictions that were submitted to Los Alamos County. At the time this report was published, discussions were being held between DOE and Los Alamos County concerning the deed restrictions and surveillance responsibilities.

### 1.2 Cost Summary

The total cost of remedial action at the Bayo Canyon site was \$335,600. A breakdown of the cost is given in Table 1.1.

TABLE 1.1

Cost Summary for Remedial Action  
at Bayo Canyon

<u>Item</u>	<u>Amount (\$)</u>
Construction (Includes Professional Land Surveying - \$11,300	19,800
Engineering	183,000
Radiological Support	67,800
Management (including construction management)	65,000
TOTAL	<hr/> \$335,600

## 2.0 HISTORY

### 2.1 Owners

From 1943 through 1967, the site was owned by the U. S. Government as part of the Los Alamos National Laboratory (LANL) operations. LANL is a prime contractor to the U.S. Department of Energy. In July 1967, the site was transferred to the present owner, Los Alamos County, by quit-claim deed.

### 2.2 Site Description

The site is located in Bayo Canyon, in north-central New Mexico, Los Alamos County, adjacent to and east of the town of Los Alamos (see Figure 1). The site is accessible via New Mexico State Highway 4, and a dirt road leading west to the Pueblo Canyon that continues to Bayo Canyon.

The boundary of the site has been designated to encompass approximately 1.5 acres and encloses the subsurface radiological contamination that remained after decontamination and decommissioning of the original 350-acre TA-10 site in 1963.

### 2.3 Radiological History and Status

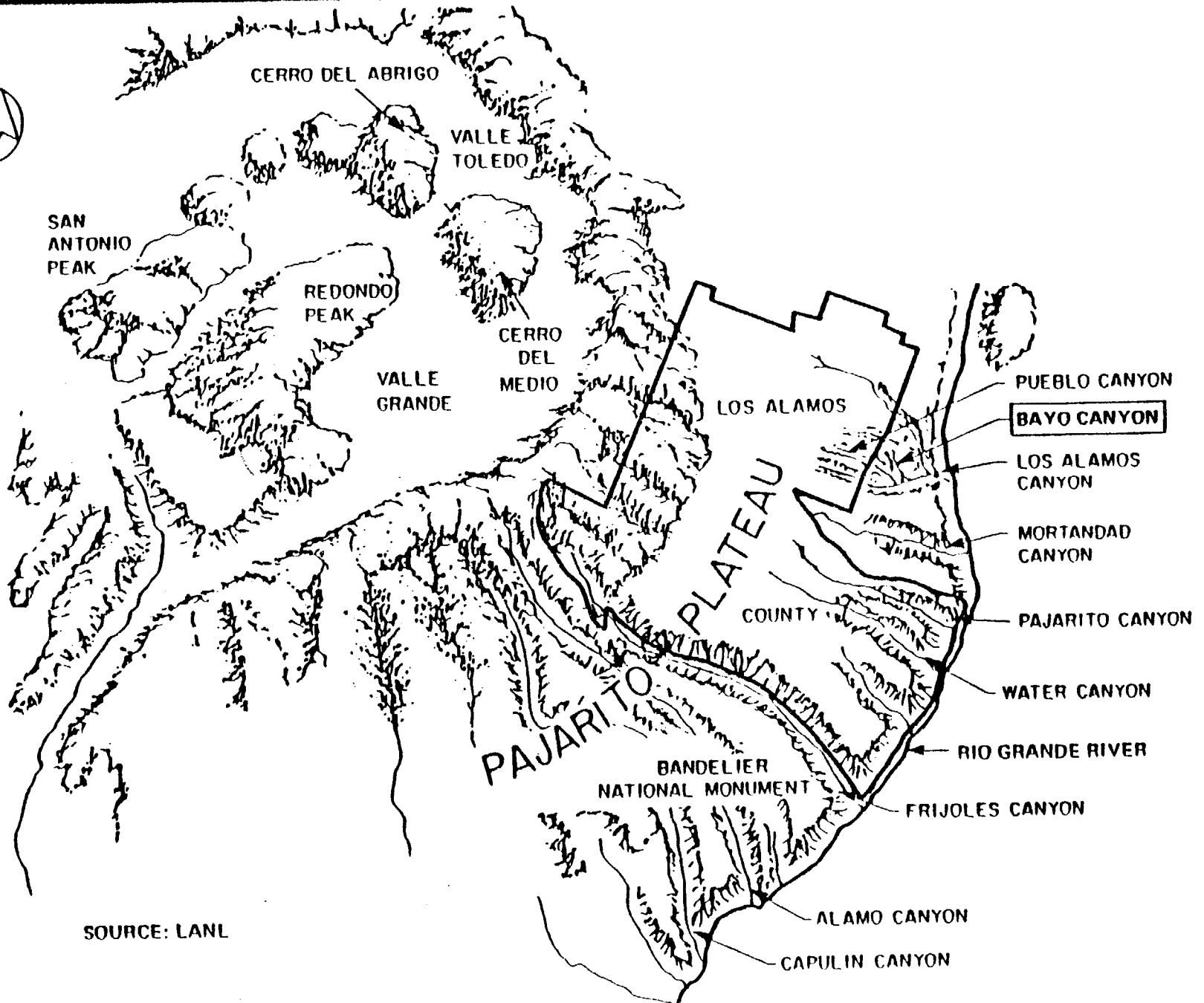
Between 1944 and 1961, experiments with high explosives were conducted in the Bayo Canyon area by the Manhattan Engineer District (MED) and the Atomic Energy Commission (AEC). These tests included natural and depleted uranium (U-238) and lanthanum (La-140), which was used as a tracer. Strontium-90 (Sr-90) was also present as a contaminant of the lanthanum. During this time, natural uranium, depleted uranium and strontium were dispersed into the surface environment of the Bayo Canyon area. In addition, strontium was deposited in waste-handling facilities, and some migrated into the subsurface soil.

Facilities of the site included a radiochemistry laboratory, solid waste disposal facilities, two assembly buildings, an inspection building, a personnel building, control buildings at two detonation control complexes with adjacent firing pads, and contaminated leach pits from the radiochemistry laboratory.

In 1960 decommissioning of the site began. All known surface contaminated material was disposed of at the radioactive waste burial site at the Los Alamos National Laboratory.

At the completion of decommissioning, the site was considered to meet the standards for unrestricted use in effect at the time. It was also recognized that some subsurface radioactive material probably remained in the canyon. For additional information on site history and past radiological surveys, see Reference 3 (Appendix A).

FIGURE 1  
BAYO CANYON LOCATION MAP



SOURCE: LANL

Figure 2 Bayo Canyon Location Map

In 1976, the Energy Research and Development Administration (predecessor to DOE) identified the Bayo Canyon Site as a Manhattan Engineering District/Atomic Energy Commission (MED/AEC) site that might require remedial action. LANL personnel began a resurvey in 1976 for possible residual contamination. The radiological survey results, along with the supplemental survey by Ford, Bacon and Davis, Utah (FBDU) in 1980 (see Appendix A), indicated that the site contained subsurface Sr-90 contamination that could present a radiological health problem if disturbed before the year 2142, when the Sr-90 would decay to acceptable levels. The site was therefore designated to receive consideration for remedial action.

Current use of the Bayo Canyon Site and the surrounding area is exclusively recreational. Projected future use includes possible residential development.

### 3.0 WORK PROGRAM DEVELOPMENT

#### 3.1 Organization

This section presents the parties involved in the remedial action at the Bayo Canyon Site and shows how they worked together to accomplish the remedial action work. The involved parties include the U. S. Department of Energy, Oak Ridge and Los Alamos Area Operations Offices; Bechtel National, Inc., Oak Ridge Office; Professional Land Surveying, Santa Fe, New Mexico; Eberline Instrument Corporation, Albuquerque, New Mexico; and Argonne National Laboratory, Argonne, IL.

##### 3.1.1 DOE-Bechtel, Oak Ridge

The work performed at the Bayo Canyon Site in 1982 was administered by DOE, Oak Ridge Operations (ORO), Technical Services Division, under the auspices of the Office of Terminal Waste Disposal and Remedial Action, Division of Remedial Action Projects, through the Formerly Utilized Sites Remedial Action Program (FUSRAP). DOE-Los Alamos Area Office and Los Alamos National Laboratory (LANL) representatives assisted in remedial action coordinating and scheduling. Bechtel National, Inc. (BNI), Nuclear Fuel Operations (NFO) Division, Oak Ridge Office, implemented the remedial action effort as FUSRAP Program Management Contractor (PMC) for DOE. Argonne National Laboratory provided NEPA process support to ORO.

Eberline Instrument Corporation (EIC) of Albuquerque, New Mexico, was selected with Bechtel to form the FUSRAP project management team. Eberline conducts radiological surveys and personnel monitoring of FUSRAP sites.

Applicable management arrangements are shown in Figure 3.

##### 3.1.2 Site Organization

The site organization consisted of a BNI Site Superintendent who directed activities of the subcontractor site representatives from Professional Land Surveying (civil survey), and EIC (radiological control and health physics services) to ensure that the specified remedial action was carried out in an efficient and timely manner. The BNI Site Superintendent also coordinated with the field representatives of the Oak Ridge and Los Alamos offices of DOE, and with representatives from LANL.

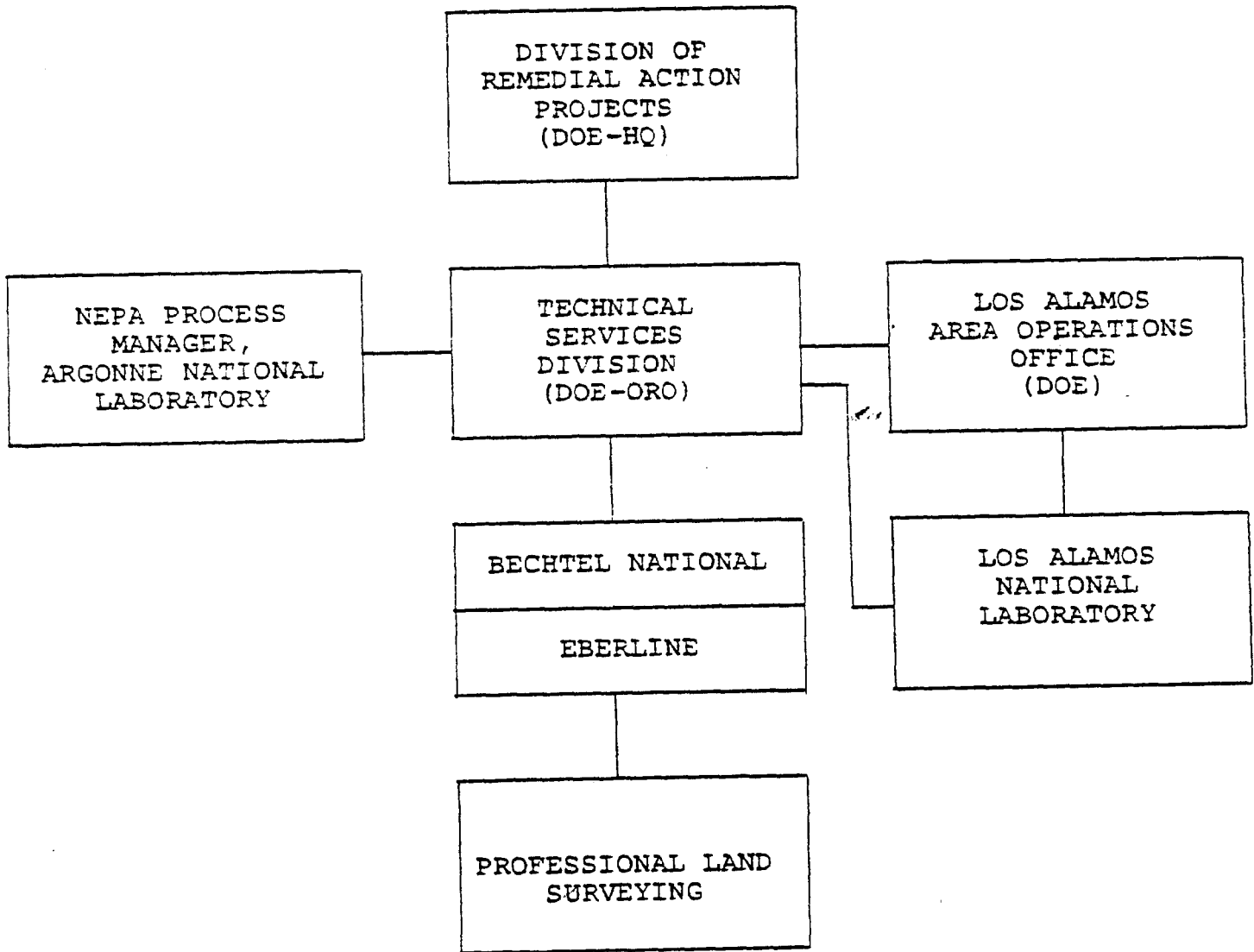
##### 3.1.3 Los Alamos National Laboratory

LANL was involved with the field work through its Environmental Surveillance Group (H-8). LANL performs radiological monitoring/surveillance activities in the area as part of its routine environmental monitoring/ surveillance program.



FIGURE 3

Management Organization for Remedial Action  
At Bayo Canyon Site



### 3.1.4 DOE-Los Alamos Area Office

The DOE-Los Alamos Area Office provided to the Oak Ridge Operations Office and BNI the assistance necessary to allow the remedial action to be performed in a timely and expeditious manner. The assistance took many forms, one of which was the handling of initial contacts with LANL and local officials. DOE-Los Alamos also provided an interface for local officials and media during the preparation for, and conduct of, the remedial activities.

### 3.2 Work Description

The work at the Bayo Canyon site consisted of locating the boundary of a restricted area that includes the contaminated area, installing survey monuments, guard posts, and warning signs and preparing draft restrictive covenants for the property deeds. Restrictive covenants are needed to limit excavation until contamination has decayed to acceptable levels.

### 3.3 Site Characterization

Radioactive contamination of the site was characterized by LANL in 1979. See Reference 3, Appendix A. This characterization was used by Bechtel to define the restricted area.

### 3.4 Engineering

#### 3.4.1 Basis for Work Performed

The basis for remedial work at the Bayo Canyon Site was a radiological survey conducted by LANL<sup>(3)</sup>. During this survey no surface contamination exceeding the guideline criteria was found.

At three different locations between eight and 40 feet below surface, levels of strontium-90 were detected which exceeded the criterion of 100 pCi/g<sup>(5)</sup>. Sr-90 is the only radionuclide which exceeds criteria at the Bayo Canyon Site. These locations were in an area of approximately 1.5 acres which contained the former radiochemistry laboratory, the former solid waste disposal area, the liquid waste leach pits, and a buffer zone.

#### 3.4.2 Definition of Design Engineering

The remedial action for the Bayo Canyon site was to establish permanent monuments around the 1.5 acre restricted area and place a restrictive covenant on the deed to prevent excavation of the land until radioactivity on the site has decayed to below guideline levels. This time period is estimated to be about 160 years.

Engineering prepared one drawing showing the location of the contaminated area, one specification for surveying, and other subcontract documents for survey services at the Bayo Canyon site.

The scope of work for the surveying services at Bayo Canyon involved the following major elements:

- o Furnish and install six monuments with three guard posts each at locations shown on the drawing.
- o Perform a closure survey with tie-in to the New Mexico State Plane System or Los Alamos geodetic survey control point.
- o Provide a restrictive covenant, prepared by an attorney licensed in the State of New Mexico, which limits excavation within the restricted area until the year 2142.

The design was started in the beginning of May, 1982, and the subcontract package was issued for bids on June 17, 1982.

### 3.5 Procurement

Bids were solicited from firms local to Los Alamos for civil surveying services at the Acid/Pueblo Canyon site and the Bayo Canyon site. The low bidder was Professional Land Surveying of Santa Fe, New Mexico, with a bid of \$11,360.00. The subcontract was awarded to this firm on July 28, 1982. See Appendix C for a tabulation of bids.

### 3.6 Schedule

The schedule for performing remedial action at the Bayo Canyon site called for work to start July 28, 1982 and be completed by September 10, 1982.

The actual dates of field work were from August 2, 1982 through August 13, 1982. Office work was essentially completed by September 10, 1982.

### 3.7 Quality Assurance

The standard BNI Nuclear Fuel Operations' Quality Assurance Program as amended for the FUSRAP Project was used for the work performed at the Bayo Canyon site. A complete description of the Quality Assurance Program is contained in the Project Quality Assurance Manual and the Field Construction Manual.

Project audits were not conducted at the site based on the results of the Quality Assurance Assessments made for the site and on a cost/benefit evaluation of the site. An audit was performed at the Project Document Control center of the availability and retrievability of site records. The audit verified compliance with the Project Quality Assurance Program.

### 3.8 Construction Safety Program

The construction safety program for remedial action activities at the Bayo Canyon site was the BNI FUSRAP Project Safety Program. The program was enforced, no safety problems were encountered, and there were no accidents or injuries through the duration of the work.

### 3.9 Radiological Protection Program

Radiological protection during the remedial action was performed in accordance with the FUSRAP Radiological Protection Program, which is on file at the Bechtel Oak Ridge Office. A description of radiological protection activities at the Bayo Canyon site is contained in Section 5.0.

## 4.0 PERFORMANCE BY SUBCONTRACTOR

### 4.1 Survey Services

The survey services were provided by Professional Land Surveying of Santa Fe, N. M. under Purchase Contract 14501-01/04-PC-19.

#### 4.1.1 Organization

The field organization of the subcontractor consisted of a Party Chief/Instrument man, and two rodmen/chainmen.

#### 4.1.2 Chronology of Work

Work started on August 2, 1982 with the locating of the LANL reference monument. On August 3, 1982, the New Mexico state monuments were located and the locations of the monuments to be installed were set. While checking surveyed locations for the monuments, it was discovered that the restricted area was intersected by the Los Alamos-Santa Fe County line. This discovery required a Field Change Order to be written specifying two draft restrictive covenants (one for each county) instead of one. On August 5, 1982, locations of the monuments to be set were checked, and holes for concrete were augered to the approximate depth required. The holes for the guard posts were also drilled. On August 9, 1982, reference points were set for checking monuments to the New Mexico grid. On August 10, 1982, pipes for monuments and guard posts were placed and holes cleaned to appropriate depth. On August 13, 1982, monuments and guard posts were poured with concrete, monument caps were set and checked and signs were installed. See Figure 3 for location of monuments.

#### 4.1.3 Procedures and Equipment

The procedures used were those called for in the specifications and accepted practices in the industry. The main piece of equipment used was a Kern - Electronic Theodolite.

#### 4.1.4 Cleanup

No cleanup was needed as no contamination was found on equipment at the times of release from the site.

#### 4.1.5 Cost

The work at the site was paid for on a lump sum basis, which included an adjustment because of a change in legal requirements. This resulted from the discovery that the restricted area lay in two counties. The total cost of the survey work at Bayo Canyon was \$11,300.00. (This amount is included in the "Construction" item in Table 1.1.)

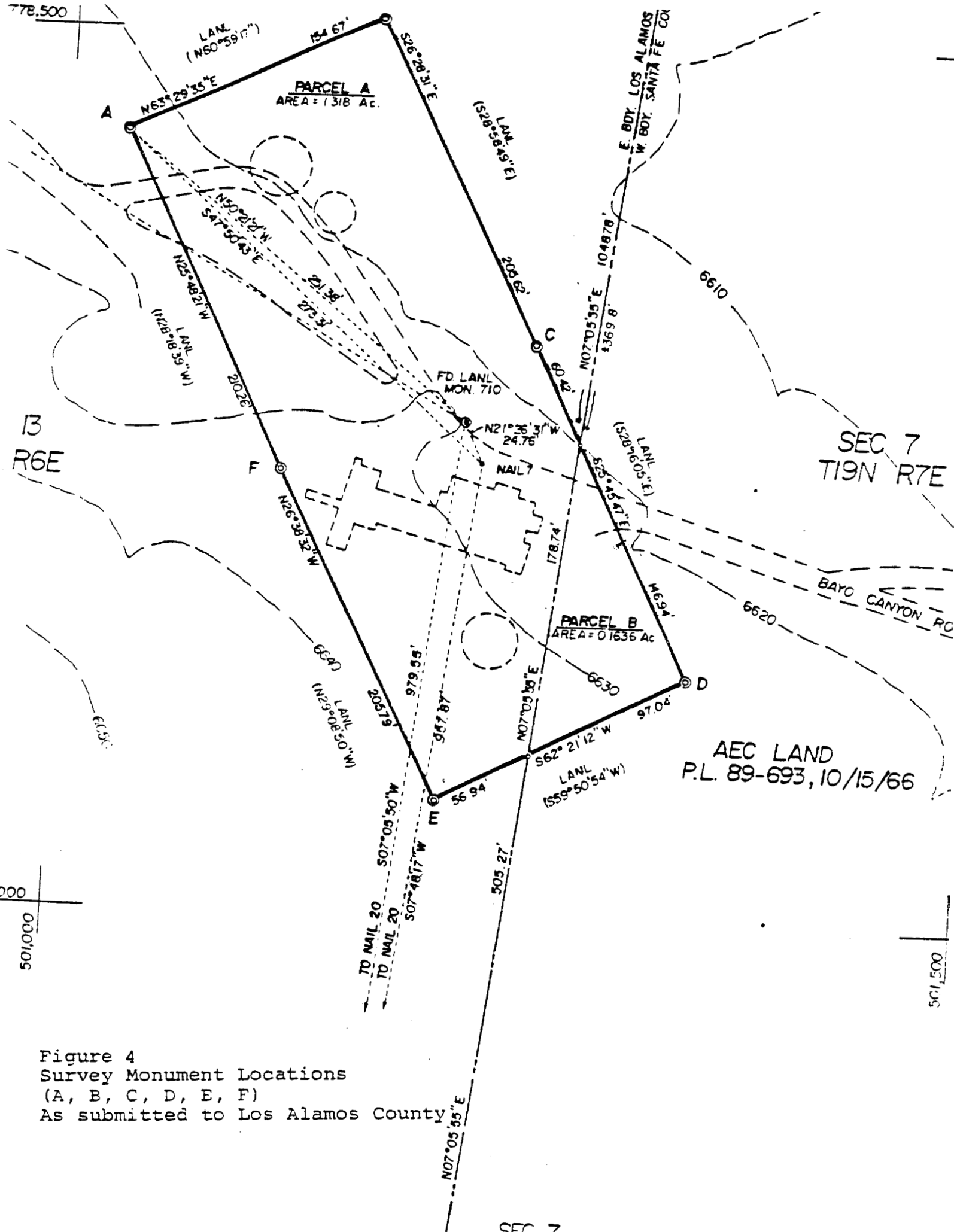


Figure 4  
 Survey Monument Locations  
 (A, B, C, D, E, F)  
 As submitted to Los Alamos County

## 5.0 RADIOLOGICAL SUPPORT

From August 2, 1982, through August 13, 1982, remedial action took place at Bayo Canyon. During this time period, six (6) restricted area boundary monuments, with guard posts, were erected.

Three surveyors participated in the remedial action. Each was assigned a thermoluminescent dosimeter (TLD) radiation monitoring badge. Badges were issued prior to the beginning of work and collected upon termination of the job. Results showed that no workers were exposed to gamma radiation levels distinguishable from natural background. All TLD exposures are on file at BNI's project office located in Oak Ridge, Tennessee.

During the placement of the monuments and guard posts, EIC checked holes and equipment for contamination. Monitoring consisted of intermittent radiological surveys using a pancake geometry Geiger Mueller probe (Eberline Model HP-210) connected to a rate meter/scaler (Eberline Model PRS-1). As anticipated, no readings above normal background were recorded.

## 6.0 CONTINUING ACTION

### 6.1 Description of Perpetual Monitoring

A restrictive covenant (Exhibit F) was drafted and submitted to Los Alamos County. The draft covenant restricts/prohibits any excavation or grading within the restricted area until the year 2142. Los Alamos County will inspect the site at least quarterly to make sure there is no unauthorized excavation or grading activity while the deed restriction is in force. At the time this report was published, discussions were being held between DOE and Los Alamos County concerning the deed restrictions and surveillance requirements.



## Appendix A:

### References

- 1) Purchase Contract 14501-01/04-PC-19.  
Provide surveying services at the Bayo Canyon Site and the Acid/Pueblo Site, Los Alamos, New Mexico; Bechtel National, Inc. and Professional Land Surveying.
- 2) "Preliminary Evaluation of Radioactivity Remedial Action Alternatives, Bayo Canyon Site, Los Alamos, New Mexico, Summary Report"; Bechtel National, Inc., Oak Ridge, TN., July 1982
- 3) DOE/EV-0005/15; "Radiological Survey of the Bayo Canyon, Los Alamos, New Mexico;" June, 1979; Los Alamos Scientific Laboratory.
- 4) FBDU 409-317; "Engineering Evaluation of the Bayo Canyon Site;" Sept., 1981; Ford, Bacon & Davis Utah.
- 5) Letter, E. L. Keller to R. L. Rudolph, March 17, 1982, "Criteria for Remedial Action at Acid/Pueblo and Bayo Canyons; Request for Cost/Benefit Analysis of Remedial Action Options of the Canyons."

APPENDIX B - BAYO CANYON PHOTOGRAPHS



04-2-6-8/5/82

Augering hole for monument B, on Bayo Canyon site. Holes and equipment were checked for contamination by Eberline at the completion of each hole. Following this, concrete was placed and marker caps set.



04-2-22-8/13/82

This sign, installed at edge of the restricted area, was located between monuments A and F by the subcontractor, Professional Land Surveyors.



04-2-23-8/13/82

Detail of the monument and monument cap plate for monument C. Six such marker plates were set and tied in to identify the limit of the contaminated area.



04-2-24-8/13/82

Monument C showing guard posts set to prevent inadvertent movement of the marker monuments.

Appendix C  
Tabulation of Bids

Civil Survey Services  
Acid/Pueblo and Bayo\*

Item No.	Description	Bidder #1	Bidder #2	Bidder #3
1.1	Survey and install monuments (Lump Sum)	\$10,000.00	\$12,000.00	\$12,450.00
2.1	3-Man Survey Crew (8 Hrs.)	640.00	600.00	560.00
2.2	2-MAN Survey Crew (8-Hrs.)	480.00	400.00	520.00
2.3	Office Work (8 Hrs.)	240.00	280.00	240.00
2.4	Travel Reimbursement (Man/Day)	40.00 Per	N/A	N/A
	Mileage	N/A	N/A	0.40
	Portal to Portal Pay	Yes	No	No
TOTAL AMOUNT FOR AWARD PURPOSE		11,360.00	13,280.00	13,770.00

\* As described in Section 1.0, a joint bid was issued for surveying services at Acid/Pueblo and Bayo Canyons.

Appendix D  
Description of Restricted Area

The material presented in this exhibit is as submitted by Professional Land Surveying to Bechtel National, Inc. Bechtel National, Inc. has passed this material on to DOE-ORO for use in formalizing the restrictive covenants in consultation with Los Alamos County.

SURVEYOR'S CERTIFICATE

I, GARY DAWSON, HEREBY CERTIFY THAT THIS PLAT IS A TRUE REPRESENTATION OF AN ACTUAL SURVEY COMPLETED BY ME ON SEPTEMBER 7, 1982; AND THAT THE SURVEY WAS MADE AND THE PLAT PREPARED IN THE FURTHERANCE OF THE PERFORMANCE OF BECHTEL NATIONAL, INC.'S CONTRACT NO. DE-AC05-810-R20722-FUSRAP WITH THE UNITED STATES DEPARTMENT OF ENERGY AND ARE TRUE AND CORRECT WITHIN THE ACCURACIES REQUIRED FOR 3rd ORDER, CLASS II SURVEYS, TO THE BEST OF MY KNOWLEDGE AND BELIEF.

\_\_\_\_\_  
GARY DAWSON, NMPLS #7014

STATE OF NEW MEXICO )  
                                  : ss.  
COUNTY OF SANTA FE )

The foregoing surveyor's certificate was acknowledged before me on September 7, 1982 by Gary Dawson, a professional land surveyor registered (licensed) in New Mexico.

\_\_\_\_\_  
Notary Public

My Commission Expires:  
  
\_\_\_\_\_

This certification has been executed (dates corrected) and incorporated on the drawing titled "Bayo Canyon Restricted Area Survey, Los Alamos National Laboratory" by Professional Land Surveying dated September 7, 1982.

Exhibit A of Letter from Roger L. Copple to Professional Land Surveying dated September 10, 1982

Professional Land Surveying

LEGAL DESCRIPTION OF PARCEL A

All that part of Sec. 13, T19N, R6E of N.M.P.M., County of Los Alamos N.M. which part may be described as follows:

Commencing at a point on the East boundary of said Section 13, also being the said county line, which point lies N7°05'55"E, 505.27 feet more or less, from the S.W. corner of Section 7, T19N, R7E;

Thence S62°21'12"W, 56.94 feet to a brass cap "E" set in concrete;

Thence N26°38'32"W, 205.79 feet to a brass cap "F" set in concrete;

Thence N25°48'21"W, 210.26 feet to a brass cap "A" set in concrete;

Thence N63°29'35"E, 154.67 feet to a brass cap "B" set in concrete;

Thence S26°28'31"E, 205.62 feet to a brass cap "C" set in concrete;

Thence S25°45'47"E, 60.42 feet a point on the East boundary of said Section 13;

Thence S07°05'55"W, 178.74 feet along the East boundary of said Section 13 to the point of commencement, containing 1.318 acres more or less as shown as "Parcel A" on "Survey Plat of Parcels A&B, within Section 13, T19N, R6E and Section 7, T19N, R7E, Los Alamos County and Santa Fe County N.M.", prepared by "Professional Land Surveying", dated Sept. 82.

The forgoing description is to be read in conjunction with all pertinent data shown on said "Survey Plat" and is not a contradiction thereof.

See Figure No. 4 of this Report

Professional

land

Surveying

LEGAL DESCRIPTION OF PARCEL B

All that part of AEC Land P.L. 89-693, 10/15/66, Sec 7, T19N, R7E of N.M.P.M., County of Santa Fe N.M., which said part may be described as follows:

Commencing at a point on the West boundary of said Section 7, also being the said county line, which point lies N7°05'55"E, 505.27 feet, more or less, from the S.W. corner of said Section 7;

Thence N7°05'55"E, 178.74 feet;

Thence S25°45'47"E, 146.94 feet to a brass cap "D" set in concrete;

Thence S62°21'12"W 97.04 feet to the point of commencement, containing 0.1636 acres more or less and as shown as "Parcel B" on "Survey Plat of Parcels A&B, within Section 13 T19N, R6E & Section 7, T19N, R7E, Los Alamos County and Santa Fe County, N.M." prepared by "Professional Land Surveying", dated Sept. 82.

The foregoing description is to be read in conjunction with all pertinent data shown on said "Survey Plat" and is not a contradiction thereof.

See Figure No. 4 of this Report



Reply: NE-24

Subject: Recommendation for Certification of Current Restricted Use  
and Termination of the Bayo Canyon Site, Los Alamos, New  
Mexico

To: E.F. Coffman, Director  
Office of Terminal Waste Disposal and Remedial Action

I am attaching for your signature the Statement of Conditional Certification and the Federal Register Notice of Certification of the Bayo Canyon site, Los Alamos, New Mexico.

The Manhattan Engineer District (MED) constructed facilities in a portion of the Bayo Canyon during 1943 and 1944. The Bayo Canyon site was utilized by the Manhattan Engineer District and later the Atomic Energy Commission between 1944 and 1961 as a firing site for conventional high explosives in conjunction with research on nuclear development.

Radiological surveys conducted in 1976 and 1977 by Los Alamos Scientific Laboratory detected levels of strontium-90 above the 100 pCi/g criterion.

On August 2, 1982, remedial action was initiated on the site. Monuments were constructed to delineate the boundary of the 1.5 acre area that showed levels of strontium-90 above the 100 pCi/g criterion.

Based on the review of the final remedial action and radiological survey and considering appropriate guidelines, the Department of Energy has determined that the Bayo Canyon site in Los Alamos, New Mexico, is radiologically acceptable for restricted use and is terminated from the Formerly Utilized Sites Remedial Action Program. I have provided the attached docket to effect this certification, under the conditions of the restrictive covenant included in the property deed that restricts/prohibits any excavation or grading within the restricted area until the Year 2142.

Following your concurrence in this conditional certification, this office will notify interested state and local agencies, the public, local land records offices, and the specific property owners of the certification actions by correspondence and local newspaper announcements, as appropriate. The documents transmitted with the Statement of Conditional Certification and the Federal Register Notice will be compiled in final docket form by the Division of Remedial Action Projects for retention in accordance with DOE Order 1324.2 (Disposal Schedule 25).

J.E. Baublitz, Director  
Division of Remedial Action Projects

STATEMENT OF CONDITIONAL CERTIFICATION:  
THE BAYO CANYON SITE,  
LOS ALAMOS, NEW MEXICO

The Office of Terminal Waste Disposal and Remedial Action has reviewed and analyzed the radiological data obtained following remedial action on the Bayo Canyon site in Los Alamos, New Mexico. Based on this review, the Department of Energy certifies that the condition of the Bayo Canyon site is radiologically acceptable for restricted use and is terminated from the Formerly Utilized Sites Remedial Action Program with the conditions of the restrictive covenant included in the property deed. This covenant restricts/prohibits any excavation or grading within the restricted area until the Year 2142 when the strontium-90 contamination level has decayed to acceptable levels (below 100 pCi/g above background).

By: \_\_\_\_\_

Date: \_\_\_\_\_

F.E. Coffman, Director  
Office of Terminal Waste  
Disposal and Remedial Action

DEPARTMENT OF ENERGY  
OFFICE OF NUCLEAR ENERGY  
CERTIFICATION OF THE RADIOLOGICAL CONDITION  
OF THE BAYO CANYON SITE  
LOS ALAMOS, NEW MEXICO

AGENCY: Office of Terminal Waste Disposal and Remedial Action  
Department of Energy

ACTION: Notice of Conditional Certification

SUMMARY: The Department of Energy has completed radiological surveys and has taken remedial action to restrict access to the 1.5 acre area located at the Bayo Canyon site, Los Alamos, New Mexico, that exceeded the 100 pCi/g criterion for strontium-90, as a result of the high explosive detonations conducted by the Manhattan Engineer District and the Atomic Energy Commission. The Department, through the Office of Terminal Waste Disposal and Remedial Action has issued the following statement:

STATEMENT OF CONDITIONAL CERTIFICATION  
BAYO CANYON SITE,  
LOS ALAMOS, NEW MEXICO

The Office of Terminal Waste Disposal and Remedial Action has reviewed the final remedial action and radiological survey report of the Bayo Canyon site. Based on this review, the Department of Energy has certified that the condition of the site is radiologically acceptable for the current restricted use under the controls provided by the restrictive covenants included in the property deeds, that will limit excavation until the Year 2142 when the strontium-90 buried on the site will have decayed to below the 100 pCi/g concentration level determined to be acceptable for unrestricted use and has certified this site is terminated from the Formerly Utilized Sites Remedial Action Program.

For further information contact:

J.E. Baublitz, Director  
Division of Remedial Action Projects  
Office of Terminal Waste Disposal  
and Remedial Action (NE-24)  
U.S. Department of Energy  
Washington, D.C. 20545  
(301) 353-5272

SUPPLEMENTARY INFORMATION: The Department of Energy has established a program to characterize and, where necessary, correct the radiological conditions at sites formerly used by the Army Corps of Engineers' Manhattan Engineer District and the Atomic Energy Commission during the early years of nuclear research, development, and production. The ultimate objective of the program is to ensure that these formerly utilized sites, and any associated properties in their vicinity, are within the radiological guidelines established to protect the general public. The Bayo Canyon site in Los Alamos, New Mexico, is one of the formerly utilized sites.

The Manhattan Engineer District (MED) constructed facilities in a portion of the Bayo Canyon during 1943 and 1944. The Bayo Canyon site was utilized by the Manhattan Engineer District and later the Atomic Energy Commission between 1944 and 1961 as a firing site for conventional high explosive experiments in conjunction with research on nuclear development. These experiments were operated by the University of California under contract with the Atomic Energy Commission.

In August 1963, the site area was inspected after an intensive clean-up search and the area was reported as free of significant radioactive contamination. On July 1, 1967, the land was transferred by quit claim deed to Los Alamos County.

During the following years, radiological surveys were conducted in this area. In 1976, the site was identified as a location that might require remedial action under the Formerly Utilized Sites Remedial Action Program.

In 1976 and 1977, the Los Alamos Scientific Laboratory conducted a field radiological survey and evaluation of the area. The results showed elevated levels of strontium-90 existed.

On August 2, 1982, remedial action was initiated on the site. Boundaries with monuments were set up to encompass the 1.5 acre restricted area that showed levels of strontium-90 above the 100 pCi/g criterion.

Based on the review of the final remedial action and radiological survey, the Department of Energy has determined that the Bayo Canyon site in Los Alamos, New Mexico, is radiologically acceptable for restricted use and is terminated from the Formerly Utilized Sites Remedial Action Program. This termination is made assuming a restrictive covenant be included in the property deed that restricts/prohibits any excavation or grading within the restricted area until the Year 2142 by which time the strontium-90 buried on the site will have decayed to below the 100 pCi/g concentration level determined to be acceptable for unrestricted use.

These findings are supported by the Department of Energy "Certification Docket for the Bayo Canyon Site, Los Alamos, New Mexico." The docket will be available for review between 8:00 a.m. and 4:00 p.m., Monday through Friday (except Federal holidays), in the Department of Energy Public Document Room located in Room 1E-190 of the Forrestal Building, 1000 Independence Avenue, S.W., Washington, D.C.

Dated: \_\_\_\_\_

\_\_\_\_\_  
F.E. Coffman, Director  
Office of Terminal Waste  
Disposal and Remedial Action

EXHIBIT III  
LIST OF RELEVANT DOCUMENTS NOT  
INCLUDED IN THIS PACKAGE BY COPY

- o A Background Report for the Formerly Utilized MED/Atomic Energy Commission Sites Program, September 1980, U.S. Department of Energy, DOE/EV-D097A.
- o Formerly Utilized MED/AEC Sites Remedial Action Program-- Radiological Survey of the Bayo Canyon Los Alamos, New Mexico, June 1979, U.S. Department of Energy, DOE/EV-0005/15.
- o Radiological Guidelines for Application to DOE's Formerly Utilized Sites Remedial Action Program, March 1983, U.S. Department of Energy, ORO-831.