655SERBSF10,637

655SERBSF10,637

Site Name (Subject):	UNIVERSITY OF NORTH CAROLINA
Site ID (Document ID):	NCD003203213
Document Name (DocType):	Contractor Report (CONTR)
Report Segment:	
Description:	FIT Report: Final Environmental Priorities Initiative PA
Date of Document:	6/27/1989
Date Received:	
Box: *Enter SF and # with no spaces*	SF10,637
Access Level:	PUBLIC
Division:	WASTE MANAGEMENT
Section:	SUPERFUND
Program (Document Group):	SERB (SERB)
Document Category:	FACILITY

Print Report for Record | **Go to New Blank Record** | **Go to New Record - (default to last record values)** | **Delete Record**

R-586-5-9-33

FINAL
ENVIRONMENTAL PRIORITIES INITIATIVE
PRELIMINARY ASSESSMENT OF
UNIVERSITY OF NORTH CAROLINA - CHAPEL HILL
FINLEY GOLF COURSE ROAD EXTENSION
CHAPEL HILL, NORTH CAROLINA
EPA ID #NCD003203213

#2650

RECEIVED
JUL 17 1989
SUPERFUND BRANCH

Prepared Under
TDD No. F4-8812-03
CONTRACT NO. 68-01-7346

Revision 0

FOR THE

WASTE MANAGEMENT DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

JUNE 27, 1989

CERCLA

NUS CORPORATION
SUPERFUND DIVISION

Prepared By	Reviewed By	Approved By
Gerald Milligan Project Manager	Greg Schank Assistant Regional Project Manager	Murray Warner, P.E. Regional Project Manager

TABLE OF CONTENTS

Section No.		Page
1.0	**INTRODUCTION**	**1**
1.1	Objective	1
1.2	Scope of Work	1
2.0	**SITE DESCRIPTION**	**3**
2.1	Site Location	3
2.2	Site Features	3
2.3	Ownership History	7
2.4	Nature of Operations	7
2.5	Permit and Regulatory History	9
3.0	**ENVIRONMENTAL SETTING**	**11**
3.1	Water Supply	11
3.2	Surface Waters	13
3.3	Hydrogeology	13
	3.3.1 Geology	13
	3.3.2 Groundwater	13
3.4	Climate and Meteorology	14
3.5	Land Use	14
3.6	Population Distribution	14
3.7	Critical Habitats/Endangered Species	14
4.0	**VISUAL SITE INSPECTION**	**15**
4.1	Solid Waste Management Units (SWMUs) and Areas of Concern (AOC)	15
4.2	VSI Participants	15
REFERENCES		**37**

APPENDIX A 1-4 Mile Radius Study Area Map
APPENDIX B EPA Potential Hazardous Waste Site Preliminary Assessment Form

Number		Page

TABLES

Table 2-1	Chemicals Present at Chydaru Site	8
Table 4-1	SWMU Identification Summary	17

FIGURES

Figure 2-1	Site Location Map	4
Figure 2-2	Site Location Map	5
Figure 2-3	Site Layout Map	6
Figure 3-1	Surface Water Intake and Well Location Map	12
Figure 4-1	Solid Waste Management Unit/Area of Concern Locations	18
Figure 4-2	Photo Location Map	19

EXECUTIVE SUMMARY

The University of North Carolina-Chapel Hill (Chydaru) site is located on Finley Golf Course Road Extension in Chapel Hill, Orange County, North Carolina. This location has been used to store chemical waste since the early 1970's and was active at the time of this Visual Site Inspection (VSI).

The facility receives NRC-regulated radioactive wastes and RCRA-regulated mixed waste for storage-to-decay. These wastes, generated by laboratory/classroom activities on campus, are give an incoming and an exit date. The length of time that chemical wastes remain at this location depends on the radioactive half-life of the isotope present.

This site is located in the Piedmont Physiographic Province in northern-central North Carolina. The facility lies on a layer of residual soil and weathered rock (regolith) which is underlain by fractured, metamorphosed granite rocks. These units are hydrologically connected. Drinking water targets that may be affected include 6,840 people who use private wells and the Chatham County north well system as a potable source. The nearest private well is three-quarters of a mile to the north of the facility.

The Chydaru site is classified as an interim status storage facility. However, the university submitted a closure plan for the facility in November of 1988 which stated that all mixed waste will be transported to the university's Hazardous Materials Facility prior to November 7, 1991.

The Visual Site Inspection conducted January 23-24, 1989, identified 7 Solid Waste Management Units (SWMUs) and 4 Areas of Concern (AOCs). One SWMU and 1 AOC are recommended for further action on a low-priority basis. In addition, corrective maintenance alleged to have been completed on 3 AOCs (fuel supply tanks) should be verified.

1.0 INTRODUCTION

The NUS Corporation Region 4 Field Investigation Team (FIT) conducted a Preliminary Assessment (PA) and a Visual Site Inspection (VSI) at the University of North Carolina - Chapel Hill site on January 23-24, 1989. The task was performed as part of the Environmental Priorities Initiative (EPI) program as stated in Technical Directive Document (TDD) No. F4-8812-03.

1.1 OBJECTIVE

The major objective of the EPI program is to conduct an onsite and offsite inspection of the assigned facility in order to characterize the Solid Waste Management Units (SWMUs) associated releases and other Areas of Concern (AOC). The inspection is conducted in a two-phase operation: the Preliminary Review which includes the review and evaluation of specific file documents; and the Visual Site Inspection (VSI) which identifies all SWMUs, known releases, and AOCs.

1.2 SCOPE OF WORK

The scope of this investigation included the following activities:

- a file search of State and EPA files in an attempt to obtain and review specific documents (RCRA, CERCLA, AIR, and NPDES) that will help characterize the facility,

- development of a detailed site base map to scale including site features, solid waste management unit locations, areas of concern, and photo-documentation areas,

- evaluation of target populations within a 3-mile radius from the site with regard to groundwater, air, and within a 15-mile stream distance for surface water,

- a private well survey within a 3-mile radius of the University of North Carolina - Chapel Hill (Chydaru) site,

- photo-documentation of all Solid Waste Management Units (SWMUs) and related releases and exposure pathways,

- inspection and photodocumentation of all Areas of Concern (AOC).

2.0 SITE DESCRIPTION

2.1 SITE LOCATION

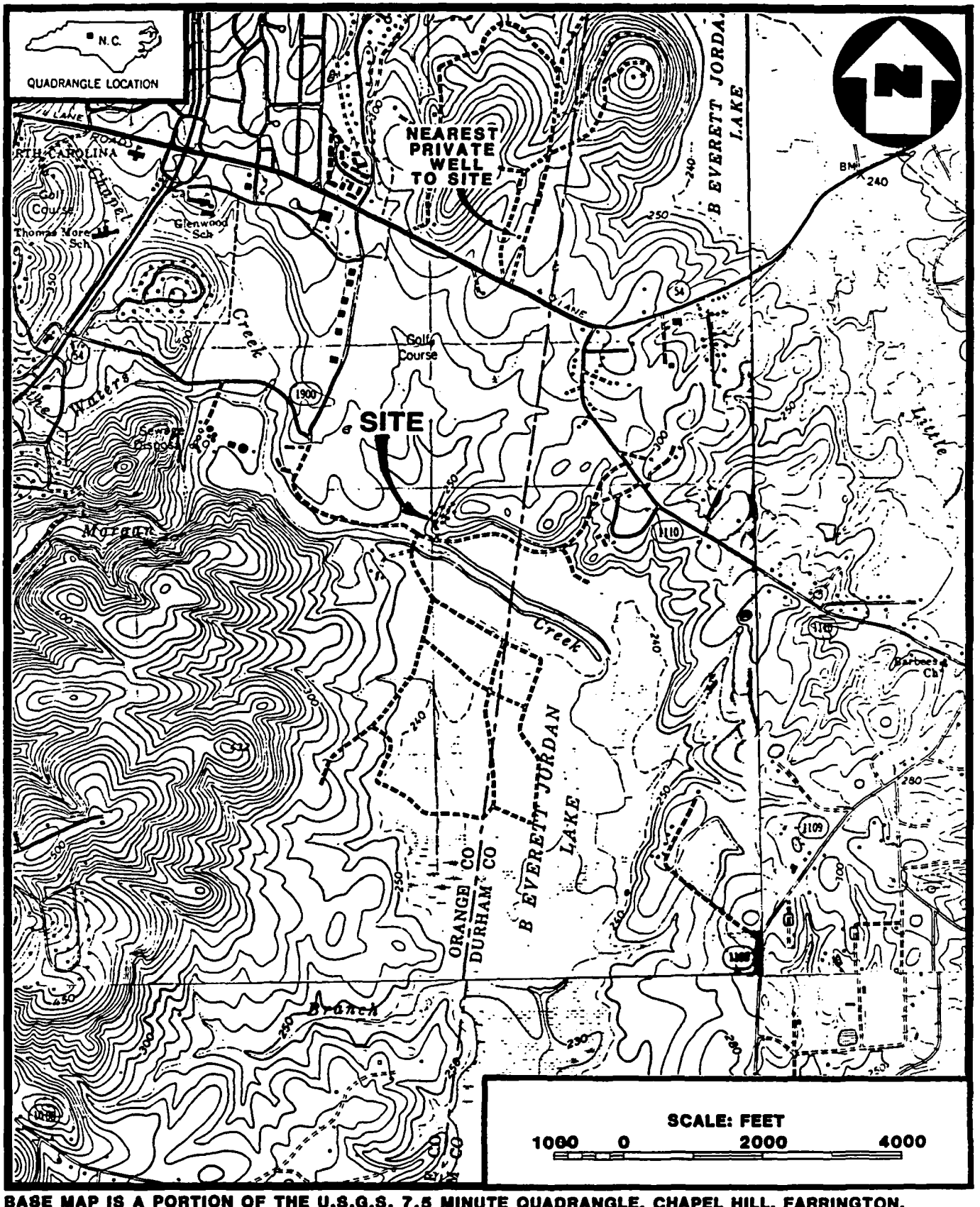
This University of North Carolina - Chapel Hill (Chydaru) facility is located on the Finley Golf Course Road Extension on university property in Chapel Hill, Orange County, North Carolina. On the United States Geological Survey (USGS) Chapel Hill, North Carolina, topographic map the site is specifically located at 35°53'38" north latitude and 79°00'55" east longitude (Figure 2-1). The Visual Site Inspection (VSI) associated with this study revealed that the topography of the site area is better represented by Figure 2-2 (Ref. 1).

2.2 SITE FEATURES

The Chydaru facility sits on approximately 4 acres of rolling, tree-covered terrain (Ref. 1). Features of the site include a circling dirt access road around which the 10 facility buildings are situated (Figures 2-2, 2-3).

The buildings, five of which are metallic structures and five being of wooden design, are primarily used for storage purposes. Buildings 184A, 185, and 192 are maintained under the jurisdiction of the Physical Plant Maintenance Shop, and are currently used for storage of out-of-date hospital records. Buildings 333, and 255H are maintained under the authority of the Environmental Science and Engineering Department. These structures house apparatus that has been used by the department in past science projects. Building 255H is secured by a lock. Buildings 330, 1, 2, 3, and 4 are the responsibility of the University Health and Safety Office. These buildings are used to store mixed wastes, scintillation vials containing radioactive substances, various dry wastes, and animal carcasses. They are secured by locks (Refs. 1, 2).

Accessibility of the site to the general public is facilitated by the dirt-covered (road) extension of Finley Golf Course Road. This road leads to the unrestricted site area. The moderate slope of the intervening terrain and relative remoteness of the area provide only a minimal amount of inaccessibility (Ref. 1).



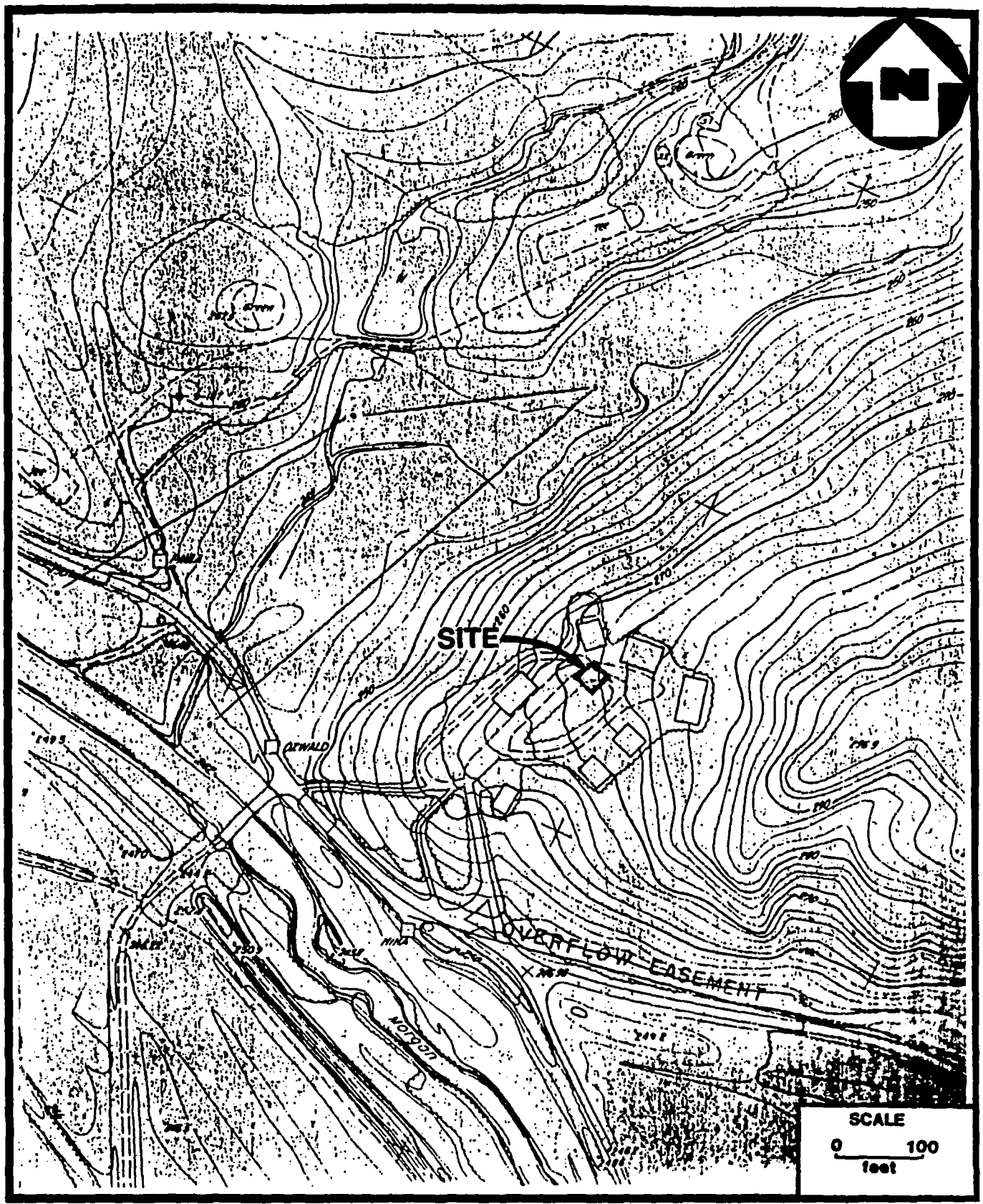
BASE MAP IS A PORTION OF THE U.S.G.S. 7.5 MINUTE QUADRANGLE, CHAPEL HILL, FARRINGTON, GREEN LEVEL AND SOUTHWEST DURHAM 1981.

SITE LOCATION MAP

FIGURE 2-1

UNIVERSITY OF NORTH CAROLINA - CHAPEL HILL
CHYDARU FACILITY
CHAPEL HILL, NORTH CAROLINA

NUS CORPORATION

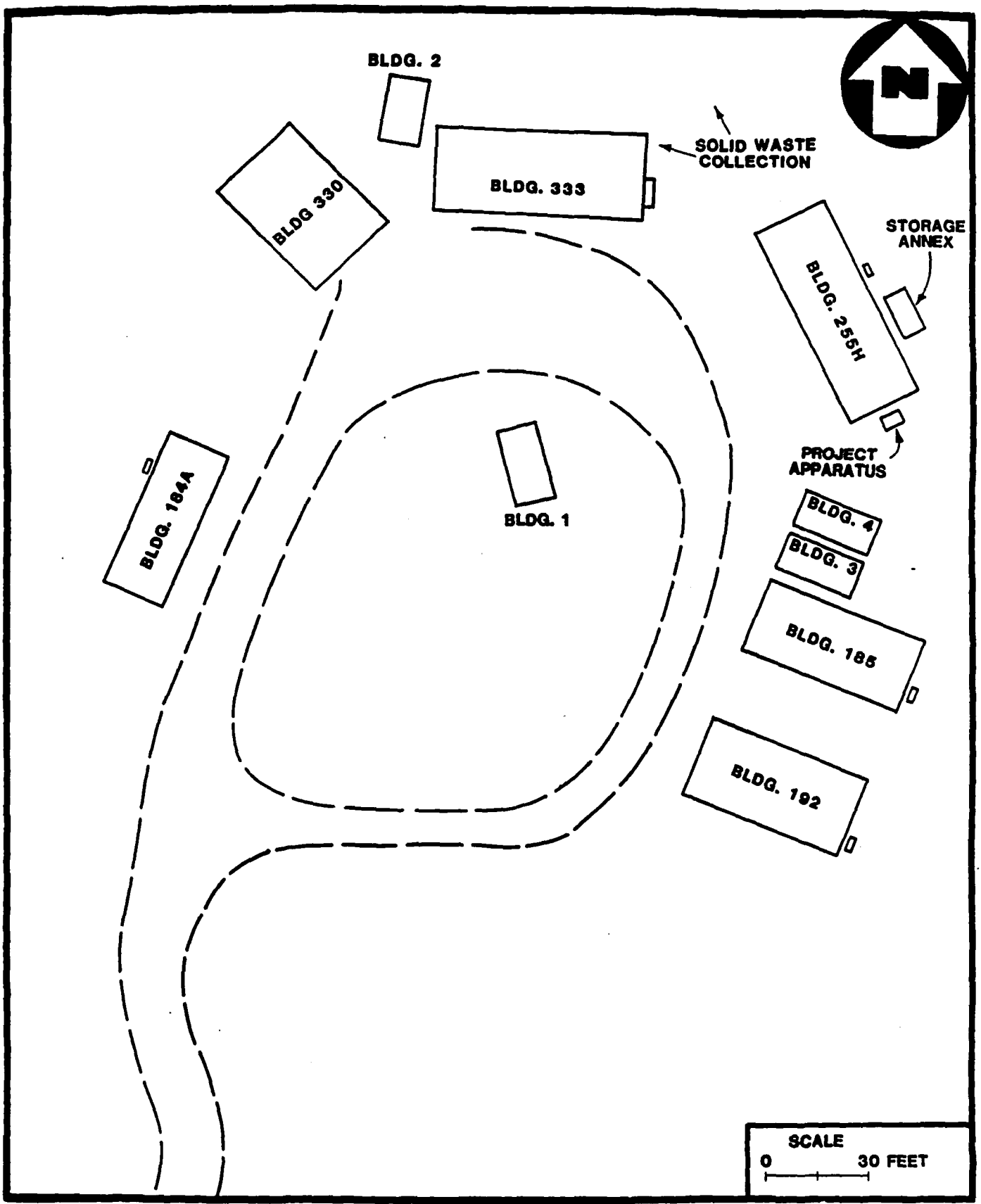


REF. TOPOGRAPHIC MAP WITHIN THE HAZARDOUS WASTE PERMIT APPLICATION (EPA FORM 3510-3) OF UNIVERISITY NORTH CAROLINA – CHAPEL HILL FILED BY JOHN L. TEMPLE, VICE CHANCELLOR OF BUSINESS AND FINANCE, APRIL 21, 1981.

SITE LOCATION MAP
UNIVERSITY OF NORTH CAROLINA - CHAPEL HILL
CHYDARU FACILITY
CHAPEL HILL, NORTH CAROLINA

FIGURE 2-2

NUS CORPORATION



SITE LAYOUT MAP
UNIVERSITY OF NORTH CAROLINA - CHAPEL HILL
CHYDARU FACILITY
CHAPEL HILL, NORTH CAROLINA

FIGURE 2-3

NUS CORPORATION

2.3 OWNERSHIP HISTORY

The property on which the Chydrau facility lies was once owned by Mrs. Mary Mason. It was donated to the University of North Carolina - Chapel Hill on July 20, 1894, at the time of her death and is currently owned by the university (Ref. 23).

2.4 NATURE OF OPERATIONS

The property on which the site now sits was a part of a farm once owned by Mrs. Mary Mason. Following the land's donation to the university, it was used as barracks for the Civilian Conservation Corps in 1930. Later, in the early 1960's, the Institute of Government used the property for housing and rehabilitation of useful offenders. This location also housed the grounds caretaker (Refs. 1, 3, 23). In the early 1970's, the university began using the facility to store chemical wastes that were generated by many of the science laboratory/classrooms on campus. The facility's primary use was, and continues to be, for the storage-for-decay of scintillation vials containing short-lived radionuclides and mixed wastes. The facility also stores contaminated "dry waste" materials and refrigerated animal carcasses (Table 2-1, Ref. 1).

The chemistry and biology departments of the Academic Affairs Division and the Health Affairs Division schools of dentristry, medicine, pharmacy, and public health are the primary campus waste producers among the approximately 1,875 laboratories (Ref. 14).

Shop supervisors, the principal investigator (PI), or another designated person familiar with the material are required to complete a UNC Hazardous Material Transfer Form (#510) or a Radioactive Waste Disposal Form (HSO Form #102) for waste control. These forms are a prerequisite for campus generators wishing to dispose of waste as prescribed by the university's Health and Safety Office. The forms' primary function is to identify and characterize the waste constituents to allow for proper handling (Ref. 14).

The university's Health and Safety Office, formed in 1974, inherited the responsibility for managing the disposition of campus-generated wastes (Ref. 3). Wastes deemed radioactive or mixed wastes are sent to the Chydaru facility and given an incoming date as well as an exit date. The exit date is based on the radioactive half-life of the isotope present (Table 2-1), (Refs. 1, 4). Mixed waste constituents on site may include chemicals that meet the criteria for RCRA hazardous waste designation (Ref. 5). The maximum amount of this regulated material on hand at any time is alleged to not exceed approximately 875 gallons (3,326 kg). Here RCRA designated F003, F005 and D001

TABLE 2-1

CHEMICALS PRESENT AT THE CHYDARU SITE
UNIVERSITY OF NORTH CAROLINA - CHAPEL HILL
CHAPEL HILL, NORTH CAROLINA

Category	Isotope	Half-Life (days)	Radioactivity Type
Radioactive liquid wastes (NON-RCRA)	Iodine 125	59.9	gamma
	Tritium	12.3	beta
	Calcium 45	165	beta/gamma
	Carbon 14	5730	beta
	Phosphorous 32	14.28	beta
	Chromium 51	27.7	gamma
	Chlorine 36	3.01×10^5	beta
	Sulfur 35	87.2	beta
	Sodium 22	2.605	beta/gamma
	Robidium 86	18.63	beta
	Chemical Compound (as scintillation media)	**Chemical Type**	**RCRA Waste Code**
Hazardous Wastes (RCRA)	Toluene	Solvent	F005
	Xylene	Solvent	F003
	Dioxane	Solvent	D001
	undisclosed scintillation media	unknown	unknown

wastes are stored in 30-gallon steel drums believed to contain a maximum of 2.5 gallons (9.5 kg) of substance within 5ml, 7ml, 10ml, and 20ml plastic or glass vials (Ref. 5). University of North Carolina - Chapel Hill officials disclosed that an average of two drums are generated per week, with peak periods being at the end of the spring semester in April, not exceeding 350 drums on hand at any one time (Refs. 1, 5). Upon arrival of the designated exit date, wastes are transported off site to the university's Hazardous Materials Facility (HMF) for staging and disposition by a contractor (Ref. 4).

2.5 PERMIT AND REGULATORY HISTORY

The University of North Carolina - Chapel Hill (Chydaru) site was operated under the authority of the Nuclear Radiation Commission (NRC) and the North Carolina Radiation Protection Section of the Department of Human Resources prior to the promulgation of RCRA regulations in November 1980 (Ref. 12).

In 1980, the Chydaru facility's current EPA Identification Number (NCD003203213) was assigned for the operation of all of the hazardous waste facilities on campus (Ref. 6). The university did not submit a RCRA Hazardous Waste Part A application to the EPA specifically for the Chydaru facility until April of 1981 (Ref. 9). As a result, the facility was assigned its own EPA Identification Number (NCD980515308) in 1982 (Ref. 6).

In 1984, university officials requested that this permit be placed on the inactive list and cancelled under the assertion that the Chydaru facility had not been, nor would ever be used for hazardous wastes (Ref. 8). The underlying premise associated with this request and the initial late filing was the fact that mixed wastes onsite were regulated by the NRC as radioactive substances and not believed to be RCRA defined and regulated hazardous wastes (Ref. 7). The North Carolina Division of Health Services concurred and suggested that the facility be placed on the inactive list in March of 1984 (Ref. 10).

In 1986, radioactive wastes containing EPA hazardous waste constituents that were stored at UNC-Chapel Hill facilities were defined as mixed wastes to be managed under RCRA regulations (Ref. 6). Interim status for the Chydaru facility was reapplied for and granted in July of 1987, but under the same identification number as the noncontinguous Estes Drive site (Refs. 24, 27).

During a September 1987 inspection by the NCDHR, identification numbers were reassigned to noncontinguous sites on the University of North Carolina - Chapel Hill campus. The Chydaru site was

given the identificatrion number that was, formerly, the number assigned to the entire undersity, NCD003203213 (Refs. 6, 11, 27). Inspectors also noted deficiencies in emergency planning and inspection logging procedures (Ref. 29). In August 1988, a RCRA Site Inspection by the EPA cited descrepancies in the Waste Analysis Plan, training records, the manifest system, and indoor housekeeping (Ref. 4).

The facility currently operates as an interim status storage facility (Ref. 24). However, the university submitted a closure plan for this site in November of 1991. According to the plan, all RCRA regulated mixed wastes will be transported to the Hazardous Materials Facility (HMF) prior to November 7, 1988, at which time the Chydaru facility will be used only for the storage of radioactive wastes (Ref. 5).

3.0 ENVIRONMENTAL SETTING

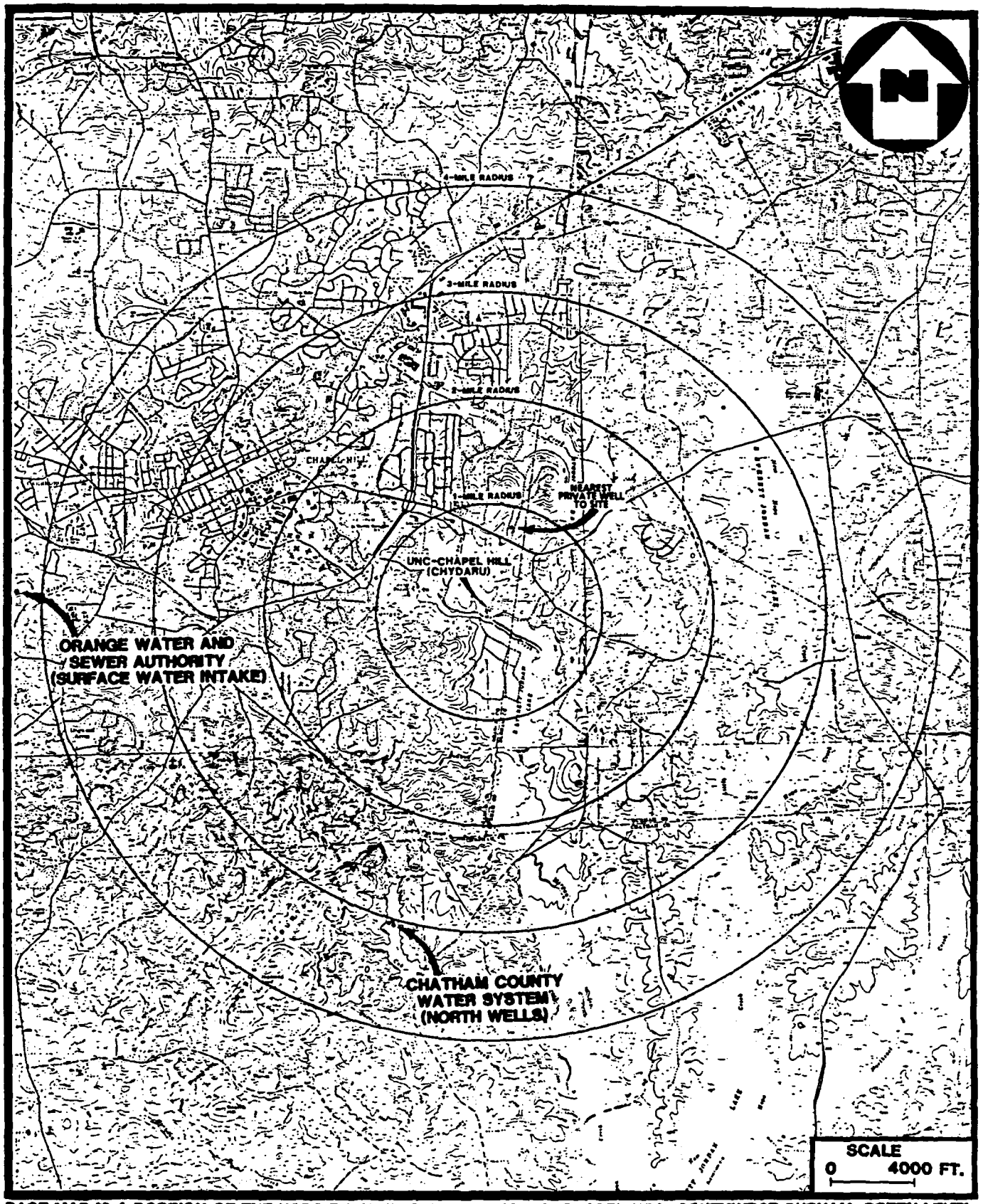
3.1 WATER SUPPLY

Many of the residents within the study area are supplied with potable water from surface water provided by the distribution system of the Orange Water and Sewer Authority (OWASA). Others utilize the area's groundwater via privately owned wells. In addition to these wells, the Chatham County Water System services homes from groundwater wells.

OWASA services approximately 4,267 connections from a connecting chain of surface water sources upgradient from the Chydaru facility. The intake for this water system is approximately 4.3 miles west of the site at University Lake (Figure 3-1) (Refs. 1, 13). This chain begins from Cane Creek Reservoir and travels eastward approximately 7 miles via a raw water main to Stone Quarry Reservoir. Here the water supply travels southeasterly approximately 2.3 miles to University Lake (Refs. 1, 18).

Chatham County authorities note that in two years, the town of Cary, North Carolina, is projected to have a municipal water intake and a 12-million-gallon water tank in operation approximately 9.8 miles downstream of the Chydaru facility on the east bank of B. Everett Jordan Lake (Ref. 15). Officials estimate that this system will service approximately 20,000 connections (76,000 people) in Cary, North Carolina and approximately 9,063 people in the town of Apex, North Carolina (Refs. 26, 28).

Approximately 550 households (2,090 persons) utilize private wells within a 3-mile radius of the site location. The Chatham County Water System services approximately 1,250 connections (approximately 4,750 individuals) from three interconnected wells located 3.1 miles south of the Chydaru facility (Figure 3-1). These wells are screened at depths of 200, 350 and 500 feet bls (Ref. 15). A fourth well was drilled one year ago, but it has never been used. It could be operative within a week if required. The nearest private well is three-quarters of a mile to the north, and upgradient (Figure 3-1). Its depth is undetermined (Ref. 1).



BASE MAP IS A PORTION OF THE USGS 7.5 MINUTE QUADRANGLES, CHAPEL HILL, SOUTHWEST DURHAM, GREEN LEVEL AND FARRINGTON, NORTH CAROLINA, 1961

SURFACE WATER INTAKE AND WELL LOCATIONS
UNIVERSITY OF NORTH CAROLINA - CHAPEL HILL, CHYDARU FACILITY
CHAPEL HILL, NORTH CAROLINA

FIGURE 3-1

NUS CORPORATION

3.2 SURFACE WATER

The closest surface water to the facility is Morgan Creek. The creek is approximately 600 feet south of the site. This surface water flows southeast for 0.5 mile, where it reaches B. Everett Jordan Lake. The lake flows south into Chatham County to expire the 15-mile pathway (Ref. 17). The B. Everett Jordan Lake is used extensively for recreation (boating, fishing, swimming, sailing, etc.). It is estimated that there are 1.5 million visitors to the lake annually. It is not currently a source for drinking water to area residents. Morgan Creek is occasionally used for fishing (Refs. 1, 15, 22).

3.3 HYDROGEOLOGY

The geologic and hydrogeologic conditions in the study area were researched as part of the site investigation. A preliminary literature review was conducted to determine surface and subsurface geologic conditions, soil character, and the mode of groundwater transport and storage.

3.3.1 Geology

The University of Chapel Hill (Chydaru) facility is located in the Piedmont Physiographic Province in northern-central North Carolina. The area is characterized by gently rolling hills with local elevations ranging from 230 to 750 feet above mean sea level (Ref. 18).

Chapel Hill lies in the Carolina Slate Belt west of sediments of the Triassic Basins (Ref. 19). The facility is situated on top of a layer of residual soil and weathered rock called regolith, which is in turn underlain by fractured, metamorphosed granitic rocks. The saturated portion of the regolith and the water within fractures of the granitic rocks are hydrologically connected, and together comprise the aquifer of concern in the Chapel Hill area (Ref. 16, p. 8). Recharge to the crystalline rock aquifer results from the infiltration of rainfall through the unsaturated portion of the regolith to the saturated regolith and the fractures in the crystalline rocks (Ref. 16, p. 8).

3.3.2 Groundwater

Locally, groundwater flow is generally towards the streams and rivers. Wells located on hilltops have well depths approximately 100-125 below land surface (bls), with water levels in these wells generally 100 feet bls. By comparison, wells on hill slopes have well depths of 20 feet bls, with typical yields of 2-10 gallons per minute (gpm). Water levels near streams or rivers are usually several feet from the surface (Ref. 16, pp. 1-11).

The aquifer of concern is an unconfined aquifer system with saturation in the fractures rarely exceeding 400 feet below land surface (bls) (Ref. 16, p. 5). The hydraulic conductivity of the crystalline rock aquifer ranges from 10^{-8} to 10^{-3} meters/sec (Ref. 20, p. 29). Well production is a function of the regolith's thickness, the amount of water stored in the regolith, and the size and frequency of the fractures in the underlying granitic rocks (Ref. 21, pp. 330-332).

3.4 CLIMATE AND METEOROLOGY

The normal daily average temperature ranges from 42°F in January to 79°F in July in the Chapel Hill, North Carolina area (Ref. 17). Net annual precipitation is 4 inches, while the 1-year, 24-hour rainfall is 3 inches (Ref. 17).

3.5 LAND USE

Land use in the immediate 1-mile radius of the site is a spacial mix of commercial and residential establishments. Much of this area is used for the Finley Golf Course. A more dense urban population (Chapel Hill) exists in the northwest quadrant of this study, extending 2 to 4 miles from the site. The southwest quadrant is typified by numerous residential clusters and subdivisions. Northeast of the site at 2 to 4 mile distances, a moderate amount of suburban growth gives way to B. Everett Jordan Lake as the predominant feature as the observation moves southward (Refs. 1, 18).

3.6 POPULATION DISTRIBUTION

According to the Graphic Exposure Modeling System (GEMS), the population is as follows: 0 to 1 mile: 481 people; 1 to 2 miles: 1,761 people; 2 to 3 miles: 5,111 people. The total population within 3 miles is 7,353 (Ref. 22).

3.7 CRITICAL HABITATS/ENDANGERED SPECIES

Neither critical habitats nor endangered species were identified along the surface water pathway.

4.0 VISUAL SITE INSPECTION (VSI)

The Visual Site Inspection (VSI) of the University of North Carolina - Chapel Hill (Chydaru) facility was performed on January 24-25, 1989. The VSI focused on the particular identification of Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) with references to past and present waste handling practices.

Weather conditions were similar on both days of the inspection. Temperature rose from the upper 40's to the lower 50's with fair to partly cloudy skies. There was no wind (Ref. 1).

4.1 SOLID WASTE MANAGEMENT UNITS (SWMUs) AND AREA OF CONCERN (AOC)

Seven SWMUs have been identified at the University of North Carolina - Chapel Hill's Chydaru facility during the VSI. Each unit is a storage facility housing discarded materials. The four AOCs identified are fuel storage tanks containing a useable energy source and their immediate release areas (Ref. 1).

During the VSI, personnel officials of the University of North Carolina - Chapel Hill, a USEPA representative, and two representatives of the North Carolina Department of Human Resources accompanied the NUS Field Investigation Team members (Ref. 1).

All SWMUs and AOCs are identified in Table 4-1 and their locations are shown on Figure, 4-1. Further discussion of these areas is provided in this section. Photographs were taken of all identified SWMUs and AOCs. These locations are identified on Figure 4-2 and in the photograph documentation pages following this section.

4.2 VSI PARTICIPANTS

The following participants were present during the VSI:

Gerald Milligan	Patricia Anderson
NUS Corporation	Environmental Protection Agency
Environmental Scientist	Hydrogeologist

Lewis McAdams
NUS Corporation
Environmental Scientist

Daniel Bius
N.C. Dept. of Human Resources
Environmental Supervisor

Donald Willhoit
UNC - Chapel Hill
Director of the Health and Safety Office

Linda Mann
N.C. Dept. of Human Resources
Environmental Engineer

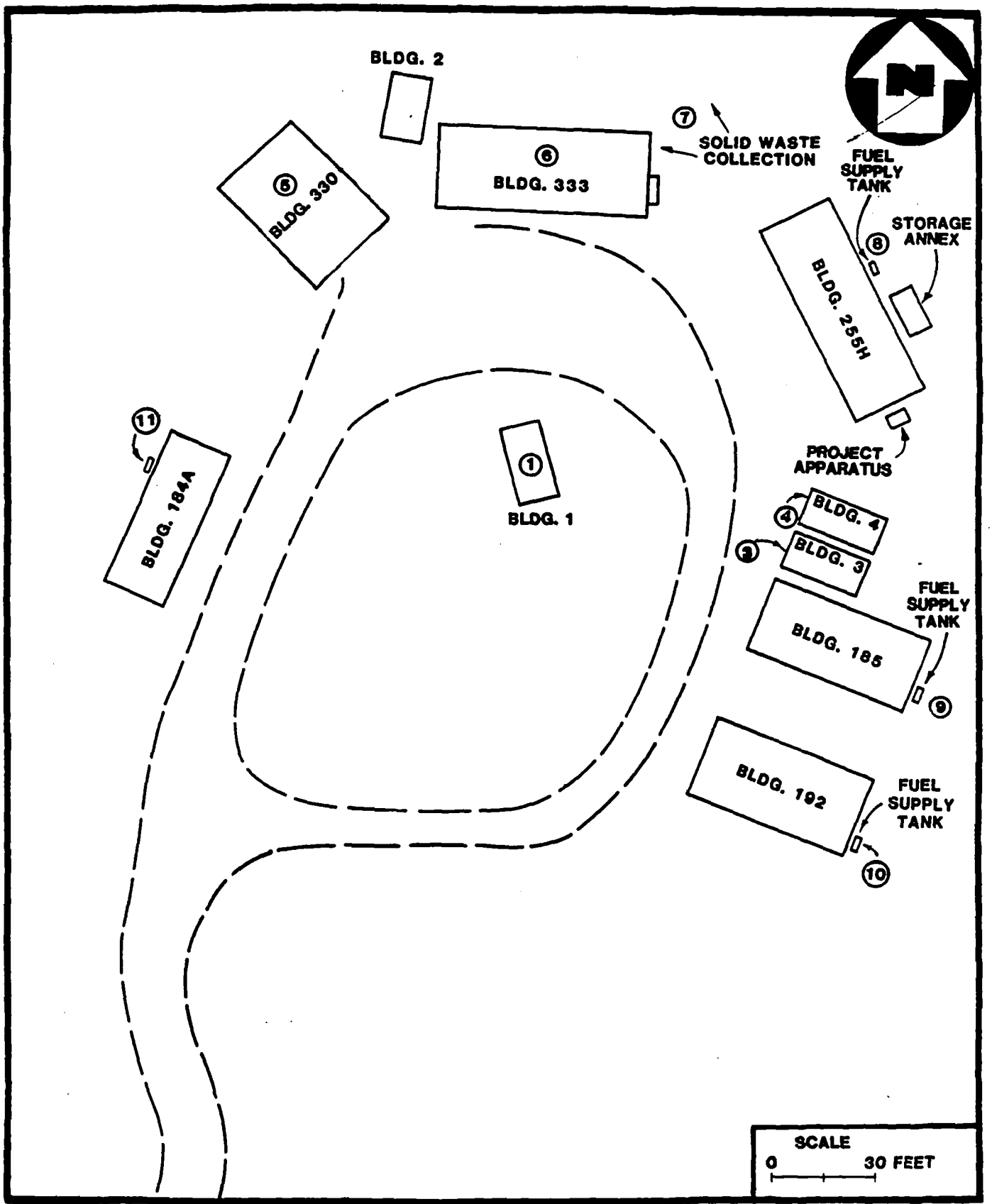
Kathleen Brown
N.C. Dept. of Human Resources
Environmental Engineer

Jerry Shirley
UNC - Chapel Hill
Industrial Hygienist

TABLE 4-1

SWMU IDENTIFICATION SUMMARY

SWMU Number	Name of Unit	Years of Oper.	Waste Managed	Evidence of Release	Recommendation		
					No Further Action	Further Assessment	Sampling
1	Building No. 1	9	radioactive wastes	none	X		No
2	Building No. 2	7	radioactive wastes	none	X		No
3	Building No. 3	5	radioactive wastes	none	X		No
4	Building No. 4	3	radioactive wastes	none	X		No
5	Building No. 330	17	mixed waste (liquid)	none	X		No
6	Building No. 333	17	burned tobacco, limestone, sodium chloride	none	X		No
7	Solid Waste Collection	Unknown	heating fuel/oil	none		X	No
8 (AOC)	Fuel Supply Tank/Spill Area	23	heating fuel/oil	saturated soil		X	No
9 (AOC)	Fuel Supply Tank/Spill Area	31	heating fuel/oil	saturated soil	X		No
10 (AOC)	Fuel Supply Tank/Spill Area	31	heating fuel/oil	saturated soil	X		No
11 (AOC)	Fuel Supply Tank	31	heating fuel/oil	none	X		No



SOLID WASTE MANAGEMENT UNIT/AREA OF CONCERN LOCATIONS
UNIVERSITY OF NORTH CAROLINA - CHAPEL HILL
CHYDARU FACILITY
CHAPEL HILL, NORTH CAROLINA

FIGURE 4-1

NUS CORPORATION

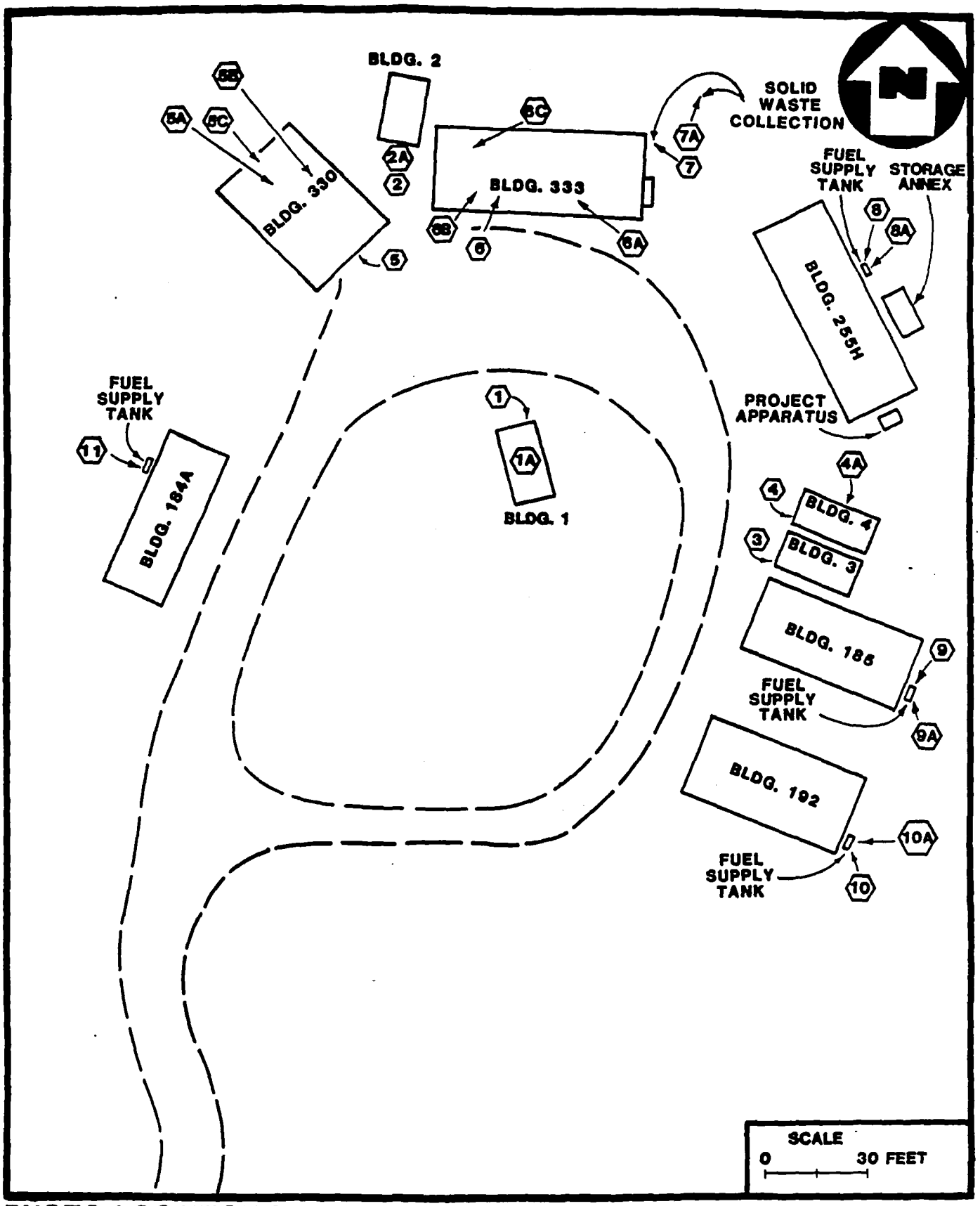


PHOTO LOCATION MAP
UNIVERSITY OF NORTH CAROLINA - CHAPEL HILL
CHYDARU FACILITY
CHAPEL HILL, NORTH CAROLINA

FIGURE 4-2

NUS CORPORATION

SWMU NUMBER: 1

SWMU NAME: Building Number 1

SWMU DESCRIPTION: This unit is a prefabricated metallic building used for storage-for-decay of wastes. It is a 12' x 28' structure that rests upon concrete blocks. The unit has one doorway, no windows, no drainage and no ventilation (Ref. 1).

DATE OF START-UP: According to university officials, this unit was first used during 1980 (Ref. 1).

DATE OF CLOSURE: This building was active at the time of the inspection. Closure is scheduled for no later than November 7, 1992 (Refs. 1, 5).

WASTES MANAGED: The wastes managed included used gloves, insulin tubes, wipes, and aprons that had been used in various laboratory operations on campus. A plastic bag containing vials, associated with mixed wastes, and gloves lay atop a storage box. All wastes were referred to as "dry wastes" by university officials and are believed to have been exposed to Iodine-125, other radioactive wastes, and mixed waste sources. There was no visible identification of the specific hazardous chemicals present. Only radioactive constituents were identified by exterior markings. Refer to Table 2-1 for a list of radioactive substances. University officials state that although a small amount of material in this unit may have been exposed to hazardous waste compounds prior to arriving here, this is not a RCRA regulated unit. Which hazardous wastes may be present was not disclosed. They state that a Part A application for this facility in April of 1981 included Building Number 1 only as a protective measure since they were not certain what was considered to be hazardous wastes at the time (Refs. 6, 31). The quantity of wastes on hand was unknown at the time of the inspection (Ref. 1).

RELEASE CONTROLS: All potentially hazardous wastes appear to be contained within plastic bags placed inside of cardboard paper boxes that were taped and designated as radioactive by exterior markings. A plastic bag containing vials, gloves, and other solids was the exception. The metallic building protected the contents from direct exposure to outdoor elements. The building was securely locked (Ref. 1).

Wastes are given incoming and exit dates at Building Number 1 that are based on the half-life of the most radioactive isotope present. The radioactive wastes present are to be identified by HSO Form #102 submitted by shop supervisors, the principal investigator, or another responsible person (Refs. 1, 4, 14). From the Chydaru facility, wastes are transported offsite to the unversity's Hazardous Materials Facility (HMF) for staging and final disposition. Wastes are manifested to a contracted disposal facility from the HMF (Ref. 4).

RELEASE HISTORY: There is no documented evidence among EPA/state of North Carolina file material suggesting that a release to the environment has occurred. Neither university officials or employees disclosed information of this nature.

INTERIM RECOMMENDATIONS: This unit poses no apparent threat to the environment. No further action is recommended.

PHOTOGRAPH NO. 1, 1A

SWMU NUMBER: 2

SWMU NAME: Building Number 2

SWMU DESCRIPTION: This unit is a prefabricated metallic building known to be used for storage-for-decay of materials. The building is approximately 12' x 22' structure that rests upon concrete blocks. The unit has one doorway, but no windows, no drainage, and no ventilation (Ref. 1).

DATE OF START-UP: University officials stated that this unit began operation in approximately 1982 (Ref. 1).

DATE OF CLOSURE: It was active at the time of this inspection.

WASTES MANAGED: The waste managed includes pipettes, aprons, vials and possibly other materials that have allegedly been exposed to radioactive chemicals during various laboratory operations on campus. Materials exposed to Iodine-125 are known to be stored here. The quantity on hand was unknown. There was no visible identification of mixed waste. Refer to Table 2-1 for a list of possible radioactive substances. The total quantities were unknown. A rusty, empty 1-gallon can was noted underneath the building. It's former contents were unknown. There were no signs of abnormal stress to the environment (Ref. 1).

RELEASE CONTROLS: All potentially hazardous materials appeared to be contained within plastic bags inside of cardboard paper boxes, that were taped and designated as radioactive by exterior markings. The metallic building protected the contents from direct exposure of the stored contents to outdoor elements. The building was securely locked (Ref. 1).

RELEASE HISTORY: There is no documented evidence in the EPA or state of North Carolina file material to suggest that a release to the environment has taken place from this unit. University of North Carolina - Chapel Hill officials were not aware of a release incident associated with the unit.

INTERIM RECOMMENDATION: This unit poses no apparent threat to the environment. No further action is recommended.

PHOTOGRAPH NO. 2, 2A

SWMU NUMBER: 3

SWMU NAME: Building Number 3

SWMU DESCRIPTION: A prefabricated metallic building used for storage-for-decay of materials. The building is approximately a 12' x 22' structure that rests upon concrete blocks. The unit has one doorway, but no windows, no drainage or ventilation (Ref. 1).

DATE OF START-UP: University officials stated that this unit began storage functions in 1984 (Ref. 1).

DATE OF CLOSURE: The building was still active at the time of the inspection (Ref. 1).

WASTES MANAGED: The wastes managed included pipettes, empty vials, stoppers and other materials that have been exposed to radioactive waste during various laboratory operations on campus. The total quantities stored were unknown (Ref. 1). Refer to Table 2-1 for a list of possible radioactive substances.

RELEASE CONTROLS: All potentially hazardous materials appeared to be contained within plastic bags inside of cardboard paper boxes that were taped and designated as radioactive by exterior markings. The metallic building protected the contents from direct exposure to the outdoor elements. The building was securely locked at the time of this inspection (Ref. 1).

RELEASE HISTORY: There is no documented evidence in the State of North Carolina or EPA file material to suggest that a release to the environment has taken place from this unit. University officials were unaware of a release incident from this unit.

INTERIM RECOMMENDATION: This unit poses no apparent threat to the environment. No further action is recommended.

PHOTOGRAPH NO. 3, 3A

SWMU NUMBER: 4

SWMU NAME: Building Number 4

SWMU DESCRIPTION: A prefabricated metallic building is used for storage-for-decay of materials. The building is approximately a 12' x 22' structure that rests upon concrete blocks. The unit has one doorway, but no windows, no drainage or ventilation (Ref. 1).

DATE OF START-UP: According to university officials, this building was first utilized for storage during 1986 (Ref. 1).

DATE OF CLOSURE: The unit was still active at the time of this inspection.

WASTES MANAGED: The wastes managed included pipettes, empty vials, rubber stoppers and other materials that have been exposed to radioactive chemicals used in various chemical laboratory operations on campus (refer to Table 2-1). University officials state that materials were not exposed to mixed wastes. Markings on the exterior of the boxes identified Phosphorus-32 as one of the radioactive chemicals present. Quantities stored were not known (Ref. 1).

RELEASE CONTROLS: All potentially hazardous materials appeared to be contained within plastic bags inside cardboard paper boxes that were taped and designated as radioactive by exterior markings. The metallic building protected the contents from direct exposure to the outdoor elements (Ref. 1).

RELEASE HISTORY: There is no documented evidence in the state of North Carolina or EPA file material stating that a release to the environment has occurred. University officials were not aware of a release incident from this unit.

INTERIM RECOMMENDATION: There is no apparent threat to the environment from this unit. No further action is recommended.

PHOTOGRAPH NO. 4, 4A

SWMU NUMBER: 5

SWMU NAME: Building Number 330

SWMU DESCRIPTION: This unit is a prefabricated metallic building used for the storage of materials and animal carcasses. The building is a 30' x 40' structure that contains a refrigeration unit. There is a walk-through door entrance and a roll-up garage type entry. It has a concrete foundation and is ventilated on the sides. There are no windows (Ref. 1).

DATE OF START-UP: University officials stated that this unit first began such use in the early 1970's (Ref. 1).

DATE OF CLOSURE: The mixed waste regulated by the RCRA regulations will no longer be stored at this location as of November 7, 1992. A closure plan has been submitted (Ref. 5).

WASTES MANAGED: The wastes managed include liquid mixed waste compounds that have been used in various laboratory operations on campus. Although radioactive in nature, these wastes are subject to RCRA guidelines due to the presence of EPA-defined hazardous constituents. The mixed wastes include an array of radioactive wastes combined with such compounds as toluene, xylene, dioxane and other undetermined scintillation medium. Animal carcasses are kept in a refrigerated unit. Liquid waste volume reaches an approximate maximum of 350 (30-gallon) barrels at peak periods with each containing a maximum of 9.5 kg (7.329 lbs) of waste material according to university officials. Approximately two drums per week are generated, according to officials (Ref. 1). See Table 2-1 for compounds present.

Drums of wastes are given incoming and exit dates at building 330 that are based on the half-life of the most radioactive isotope present. The wastes present are identified by HSO Form #102 and Form #510 submitted by shop supervisors, the principal investigator, or another responsible person (Refs. 1, 4, 14). From the Chydaru facility, wastes are transported off site to the university's Hazardous Materials Facility (HMF) for staging and final

disposition. Wastes are manifested to a contracted disposal facility from the HMF (Ref. 4).

RELEASE CONTROLS: Wastes are contained within 30-gallon drums in 5 ml, 7ml, and 10ml glass and plastic vials. The metallic building, with its concrete floor, protects contents from exposure to outdoor elements. The building was securely locked (Ref. 1).

RELEASE HISTORY: University officials disclosed information stating that, as recently as 1987, various materials believed to be radioactive, which were destined for storage in this building, were later found at Orange County Landfill. Mr. D. Willhoit believes that most, but perhaps not all, of these drummed wastes have been recovered (Ref. 1).

Neither state of North Carolina or EPA file material refers to a release to the environment from this unit. There was no visual evidence of a release to the soil in the vicinity of this building (Ref. 1).

INTERIM RECOMMENDATION: There is no apparent threat to the environment from this unit. No further action is recommended.

PHOTOGRAPH NO. 5, 5A, 5B, 5C

SWMU NUMBER: 6

SWMU NAME: Building Number 333

SWMU DESCRIPTION: This unit is a permanent, wooden, open-faced, shed-type building. This structure is a 33' x 23' unit that houses Environmental Sciences and Engineering research project apparatus. A kiln, motor, units, ducts, metal piping, and a collection/separator unit are among the items stored (Ref. 1) (See Figure 2-2).

DATE OF START-UP: University officials stated that this unit was first used in the early 1970's (Ref. 1).

DATE OF CLOSURE: The apparatus in this building have not been used for the last three years, it was disclosed. However, depending on projects to come, it may be used again (Ref. 1).

WASTES MANAGED: The apparatus stored at this location was used in the burning of tobacco according to university officials. University officials stated that in addition to tobacco, the project used crushed limestone, sodium chloride and Arizona road dusts to get the desired conditions (Ref. 1).

Flue dust was noticed inside an oven-like kiln. University officials believed that this was from the burning of tobacco. This material was apparently placed into fiber drums. Four medium-sized drums (each approximately 30 gallons) and two smaller-sized drums (each approximately 20 gallons) were noted (Ref. 1).

RELEASE CONTROLS: The by-products of the science project were contained within drums and in the kiln. Exposure of the wastes in this open-faced building to outdoor elements was not observed. There was no visual evidence of a release to the open-ground floor of this unit (Ref. 1).

RELEASE HISTORY: Neither state of North Carolina nor EPA file material makes note of a release to the environment from this building. Visual observation did not indicate

that there was a mishandling of waste from this unit. University officials stated that no releases from the unit were ever observed.

INTERIM RECOMMENDATION: This unit poses no apparent threat to the environment. No further action is recommended.

PHOTOGRAPH NO. 6, 6A, 6B, 6C

SWMU NUMBER: 7

SWMU NAME: Solid Wastes Collection

SWMU DESCRIPTION: Various apparatus presumably used in conjunction with the Environmental Sciences project of Building 333 are located in this collection area.

DATE OF START-UP: University officials had no knowledge as to when this solid waste management unit began (Ref. 1).

DATE OF CLOSURE: This collection is believed to have not been added to since 1985-86. It is not known whether or not the materials of this unit will be reused (Ref. 1).

WASTES MANAGED: The wastes include air condition units, metal cylinders, metal sheets and dust collector/separators. The air condition units may still contain freon, however, there was no evidence of leakage to the ground (Ref. 1).

RELEASE CONTROLS: The above mentioned units of the outdoor collection area are all directly exposed to outdoor elements. There were no containment structures to retain any possible spilled materials in the area.

RELEASE HISTORY: Neither state of North Carolina or EPA file material suggests that a release to the environment has taken place from this SWMU. University officials were not aware of any incidents involving a release (Ref. 1).

INTERIM RECOMMENDATION: Although there were no apparent releases to the soil from this waste unit, construction of a containment structure for prolonged storage is recommended.

PHOTOGRAPH NO. 7, 7A

AOC NUMBER: 8

AOC NAME: Fuel Supply Tank and Spill Area

AOC DESCRIPTION: The tank is a fuel/oil storage unit made of cast iron with an intake coupler to receive fuel, and a drain plug and gravity flow copper line to dispense fuel. It sits above the ground on concrete blocks and holds approximately 100 gallons of fuel. The fuel is used to heat Building 255H. It is the release of this fuel/oil to the soil near this tank that fosters waste management concerns. A 16-square-foot area was saturated with fuel at an approximate depth of 2 to 3 feet below surface level. The spillage was covered by leaves.

DATE OF START-UP: This building and the fuel supply unit were first used around 1966 according to university sources. The point in time when fuel was first released to the soil is unknown (Ref. 1).

DATE OF CLOSURE: The unit is available for use, but could be considered on standby because of the unoccupied building it supports.

WASTES MANAGED: Heating fuel/oil is the waste managed. It appeared somewhat less viscous than automotive oil.

RELEASE CONTROLS: A 3-inch coupling assembly atop this unit facilitates the transfer of fuel (intake) and a 1-inch drain plug provides a manual dispensing outlet. A gravity flow copper line with a manual shut-off valve leads to an interior heating unit. The tank has a welded body. The intake assembly has a security lock. There is no retainment feature associated with this tank in the event of a fuel spill incident (Ref. 1). Corrective action at tank release points such as the intake plug and the copper line connection point is said to have taken place since this inspection, according to university officials (Refs. 1, 3). NCDHR representatives could not verify that corrective action had taken place (Ref. 24).

RELEASE HISTORY: The occurrence of an overflow from the intake assembly was disclosed by university officials. It is believed to have happened during refilling operations. The date of this incident is unknown. No other specific incidents

of a release are known. State of North Carolina and EPA file data does not mention that a release has occurred from this unit. No such incident was reported or investigated (Ref. 1).

INTERIM RECOMMENDATION: Corrective action initiated by the university should be verified. The spill area should be addressed on a low priority basis.

PHOTOGRAPH NO. 8, 8A

AOC NUMBER: 9

AOC NAME: Fuel Supply Tank and Spill Area

AOC DESCRIPTION: The tank is a fuel/oil storage unit made of cast iron with an intake coupler to receive fuel and a copper gravity flow line with a manual shut-off valve. This line leads to a heating unit inside of Building 185. The tank is approximately 100 gallons in capacity and rests above the ground on concrete blocks. This unit is identified as an area of waste management concern due to the release of fuel/oil over two areas of approximately 4 square feet and 12 square feet at an approximate depth of 2 feet below surface level. The spillage was covered by leaves.

DATE OF START-UP: University officials estimate that this building and the fuel system began being used in the late 1950's. When fuel was first released to the soil is unknown (Ref. 1).

DATE OF CLOSURE: The unit was available for use at the time of this inspection, but could be considered on standby because of the unoccupied building it supports.

WASTES MANAGED: Heating fuel/oil is the waste of concern. It appeared somewhat less viscous than automotive oil.

RELEASE CONTROLS: A coupling assembly atop the unit facilitates the transfer of fuel (intake). A gravity flow copperline with a manual shut-off valve leads to an interior heating unit. The tank is welded seam construction and appears to be in sound condition. The intake coupling is secured by a lock. There is no retainment feature associated with this tank in the event of a spill incident. One release to the soil appeared to come from the intake coupler, probably from an overfill. The other release to the soil appeared to come from the copper dispensing line at a connecting point (Ref. 1). Corrective action is said to have taken place since this inspection, according to university officials. They contend that this tank has since been removed from this location and that the saturated soil has been excavated and replaced. They further state that the excavated soil now lays atop plastic to allow evaporation to take

place (Ref. 3). NCDHR representatives could not verfiy that corrective action had taken place (Ref. 24).

RELEASE HISTORY: University officials knew of no past release incidents in association with this unit. Neither state of North Carolina or EPA file material makes mention of a release from this unit. However, as previously mentioned, visual observation noted that a release to the soil had occurred from the storage tank unit. No such incident was reported or investigated (Ref. 1).

INTERIM RECOMMENDATION: The corrective action initiated by university officials should be verified on a low priority basis.

PHOTOGRAPH NO. 9, 9A

AOC NUMBER: 10

AOC NAME: Fuel Supply Tank and Spill Area

AOC DESCRIPTION: The tank is a fuel/oil storage unit made of cast iron with an intake coupler to receive fuel and a copper gravity flow line with a manual shut-off valve to dispense fuel. It is an approximately 100-gallon unit that rests above the ground on concrete blocks. Fuel within the tank is used to heat Building 192. This unit is identified as an area of waste management concern because of a release of approximately 4 square feet or fuel/oil to the surface area under the tank at an approximate depth of 1.5 feet below surface level. The spillage was covered by leaves. This condition appeared to hamper minor vegetative growth in the immediate area (Ref. 1).

DATE OF START-UP: University officials state that this building and the fuel system began operation in the late 1950's. The point in time when fuel was first released to the soil is unknown (Ref. 1).

DATE OF CLOSURE: The unit was available for use at the time of this inspection, but could be considered on standby because of the unoccupied building it supports.

WASTES MANAGED: Heating fuel/oil is the waste of concern. It is somewhat less viscous than automotive oil.

RELEASE CONTROLS: A gravity flow copper line with a manual shut-off valve leads to an interior heating unit to facilitate fuel transfer. The intake coupler allows a direct connection from a supply unit. It is secured by a lock. There is no retainment feature associated with this tank in the event of a spill incident. The tank is welded seam construction and appears to be in sound condition (Ref. 1).. Corrective action is said to have taken place since this inspection, according to university officials. They contend that this tank has since been removed from this location and that the saturated soil has been excavated and replaced. They further state that the excavated soil now lays atop plastic to allow evaporation to take place (Ref. 3). NCDHR representatives could not verify that corrective action had taken place (Ref. 24).

RELEASE HISTORY: Neither state of North Carolina or EPA file material reveals information regarding a release to the environment. University officials knew of no such release incidents in association with this unit. As previously noted, evidence of a release was observed during this inspection. No such incidents were reported or investigated.

INTERIM RECOMMENDATION: The corrective action initiated by the university should be verified.

PHOTOGRAPH NO. 10, 10A

AOC NUMBER: 11

AOC NAME: Fuel Supply Tank

AOC DESCRIPTION: The tank is a fuel/oil storage unit made of cast iron type with an intake coupler to receive fuel and a copper dispensing line with a manual shut-off valve. This line leads to a heating unit inside of Building 184. The tank is approximately 100 gallons in capacity and rests above the ground on concrete blocks. This unit is identified as an area of waste management concern because of the identification of a release from other alike units and the potential for that to occur here. No spillage was noted at this location, however.

DATE OF START-UP: University officials estimate that this building and the fuel system began operation in the late 1950's (Ref. 1).

DATE OF CLOSURE: The unit was available for use at the time of this inspection, but could be considered on standby because of the unoccupied building it supports.

WASTES MANAGED: Heating fuel/oil is the potential waste of concern. It is somewhat less viscous than automotive oil.

RELEASE CONTROLS: A gravity flow copper line with a manual shut-off valve leads to an interior heating unit to facilitate fuel transfer. The intake coupler allows a direct connection from a supply unit. It is secured by a lock. The tank is of welded seam construction and appears to be in sound condition. Visual observation did not identify a release to the environment from this unit (Ref. 1).

RELEASE HISTORY: Neither state of North Carolina nor EPA file material discloses information regarding a release to the environment from this unit. University officials knew of no such release incidents in association with this tank. As previously noted, there was no visual evidence of waste substances.

INTERIM RECOMMENDATION: This unit poses no apparent threat to the environment. No further action is required.

PHOTOGRAPH NO. 11

REFERENCES

1. NUS Corporation Field Logbook No. F4-1208 for University of North Carolina, Chapel Hill, North Carolina, TDD No. F4-8812-04. Documentation of facility reconnaissance, January 23-25, 1989.

2. Donald G. Willhoit, Director, Health and Safety Office, University of North Carolina, Chapel Hill, North Carolina, letter to William Meyer, Head, Solid and Hazardous Waste Management Board, May 27, 1987. Subject: Cover letter for a Notification of Hazardous Waste Activity.

3. Jerry Shirley, University of North Carolina, Chapel Hill, North Carolina, Industrial Hygienist. Telephone conversation with Gerald Milligan, NUS Corporation, March 8, 1989. Subject: Chadyru property history.

4. David Langston, Environmental Engineer, USEPA, RCRA Site Inspection report for University of North Carolina, Chapel Hill, North Carolina, August 31, 1988.

5. Closure Plan and Cover Letter, for University of North Carolina, Chapel Hill, North Carolina, NCD00320321. Filed by Donald G. Willhoit, Director of University of North Carolina, Chapel Hill, North Carolina. Health and Safety Office, November 7, 1984.

6. Donald Willhoit, Director, Health and Safety Office, University of North Carolina, Chapel Hill, North Carolina. Telephone conversation with Gerald Milligan, NUS Corporation, January 5, 1989. Subject: Chydaru facility history.

7. Donald Willhoit, Director, Health and Safety Office, University of North Carolina, Chapel Hill, North Carolina. Part A application (NCD003203213) with cover letter to William Meyer, Head, Solid and Hazazrdous Waste Management Board, July 9, 1987.

8. Donald Willhoit, Director, Health and Safety Office, University of North Carolina, Chapel Hill, North Carolina. Letter to William Meyer, Environmental Engineer, Environmental Health Section, March 26, 1984. Subject: Status of University Hazardous Wastes Permits.

9. Donald Willhoit, Director, Health and Safety Office, University of North Carolina, Chapel Hill, North Carolina,. Cover letter of Part A application to Rita D. Ford, USEPA, April 17, 1981.

10. Frank E. Moore, Geologist, Solid and Hazardous Waste Management Branch, Division of Health Services, letter to Walton Jones, USEPA, March 28, 1984.

11. Donald Willhoit, Director, Health and Safety Office, University of North Carolina, Chapel Hill, North Carolina letter to Jim Edwards, NCDHR with cover letter to Gerald Milligan, NUS Corporation, January 5, 1989. Subject: Respective EPA identification numbers.

12. Cecil Brown, Director of Radioactive Materials Branch, North Carolina Department of Human Resources, telephone conversation with Gerald Milligan, NUS Corporation, February 10, 1989. Subject: Radioactive materials compliance.

13. Orange Water and Sewer Authority, Chapel Hill, North Carolina Meter Reading schedules and general information. January, 1988.

14. Donald Willhoit, Director, Health and Safety Office, University of North Carolina, Chapel Hill, North Carolina. Part B application (NCD982093783), Section B-1, October 1988.

15. Marion Hoffman, Chatham County manager, Chatham County Water System. telephone conversation with Gerald Milligan, NUS Corporation, March 10, 1989. Subject: Chatham County north wells.

16. Harry E. LeGrand, "Groundwater of the Piedmont and Blue Ridge Provinces in the Southeastern States," Circular 538, (Washington, D.C., GPO; United States Geological Survey, 1967), pp. 1-11.

17. U.S. Department of Commerce, Climatic Atlas of the United States, (Washington, D.C.: GPO, June 1968), Reprint: 1983, National Oceanic and Atmospheric Administration.

18. U.S. Geological Survey, 7.5 minute series Topographic Quadrangle Maps of North Carolina: Southwest Durham 1973 (Photorevised 1981), Chapel Hill 1978 (Photorevised 1981), Green Level 1973 (Photorevised 1981), Farrington 1978 (Photorevised 1981), scale 1:24,000.

19. North Carolina Geological Survey, Geologic Map of North Carolina, 1985, scale 1:500,000.

20. R. Allen Freeze and John A. Cherry, "Groundwater", (Englewood Cliffs, N.J.: Prentice-hall, 1979), p. 29.

21. U.S. Geological Survey, 1984. Hydrologic Events Selected Water-Quality Trends and Groundwater Resources. National Water Summary 1984, Water-Supply Paper 2275, pp. 330-332.

22. Roger Jones, Fisheries Biologist, North Carolina Wildlife Resource Commission. Telephone conversation with Gerald Milligan, NUS Corporation, March 14, 1989. Subject: Recreational use of surface water.

23. Grace Wagoner, University Property Officer, University of North Carolina, Chapel Hill, North Carolina. Telephone conversation with Gerald Milligan, NUS Corporation, March 15, 1989. Subject: University property ownership.

24. Kathleen Brown, Environmental Engineer, North Carolina Department of Human Resources, telephone conversation with Gerald Milligan, NUS Corporation, March 16, 1989. Subject: Site RCRA Status.

25. USEPA, Graphical Exposure Modeling System (GEMS) Database, compiled from the United States Bureau of Census (1980).

26. William Coleman, Assistant Town Manager of Cary, North Carolina, telephone conversation with Gerald Milligan, NUS Corporation, March 21, 1989. Subject: Proposed water service.

27. Jim Edwards, Compliance Officer, North Carolina Department of Human Resources, telephone conversation with Gerald Milligan, NUS Corporation, March 21, 1989. Subject: Site Interim Status Identification Number.

28. Steve Stewart, Town Manager of Apex, North Carolina, telephone conversation with Gerald Milligan, NUS Corporation, March 21, 1989. Subject: Proposed water service.

29. Larry Perry, North Carolina Department of Human Resources, RCRA Inspection Report for University of North Carolina, Chapel Hill, North Carolina, September 17, 1987.

30. John Temple, Vice Chancellor for Business and Finance, University of North Carolina, Chapel Hill, North Carolina. Part A application (NCD003203213), May 21, 1981.

31. Donald Willhoit, Director, Health and Safety Office, University of North Carolina, Chapel Hill, North Carolina. Telephone conversation with with Gerald Milligan, NUS Corporation, March 27, 1989. Subject: Chydaru site status.

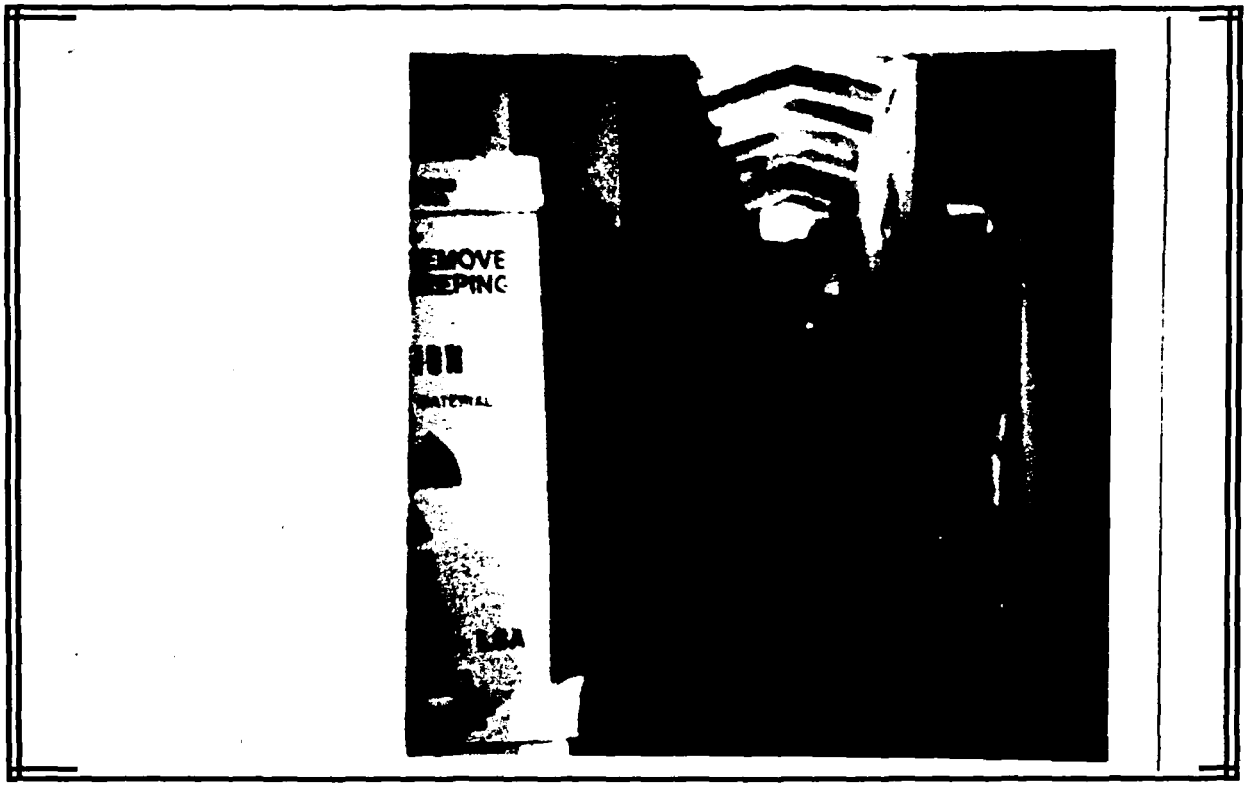
PHOTOGRAPH No.1 This is a 12' x 28' prefabricated metallic storage unit that is identified as Building Number 1. The unit has one doorway, no windows, no drainage, and no obvious ventilation.

PHOTOGRAPH No.1A A view of the interior of Building Number 1. This NRC regulated unit is used to store various "dry wastes" that are believed to have been exposed to mixed waste sources. Only radioactive chemicals were identified.

PHOTOGRAPH No. 2 This is a prefabricated metallic storage unit approximately 12' x 22' in size. This unit is known as Building Number 2. It has one doorway, but no windows, no drainage, and no obvious ventilation.

PHOTOGRAPH No. 2A A view of the interior of Building Number 2. This NRC regulated unit is used to store materials believed to have been exposed to radioactive chemicals. Materials exposed to I-125 are known to be stored here. Bags of fill material were also here.

PHOTOGRAPH No. 3 This is a prefabricated metallic storage unit approximately 12' x 22' in size. This unit is known as Building Number 3. It has one doorway, but no windows, no drainage and no obvious ventilation. It sits among other storage units.



PHOTOGRAPH No. 3A: A view of the interior of Building Number 3. This NCR regulated unit is used to store materials believed to have been exposed to radioactive chemicals. Materials exposed to P-32 are known to be stored here.

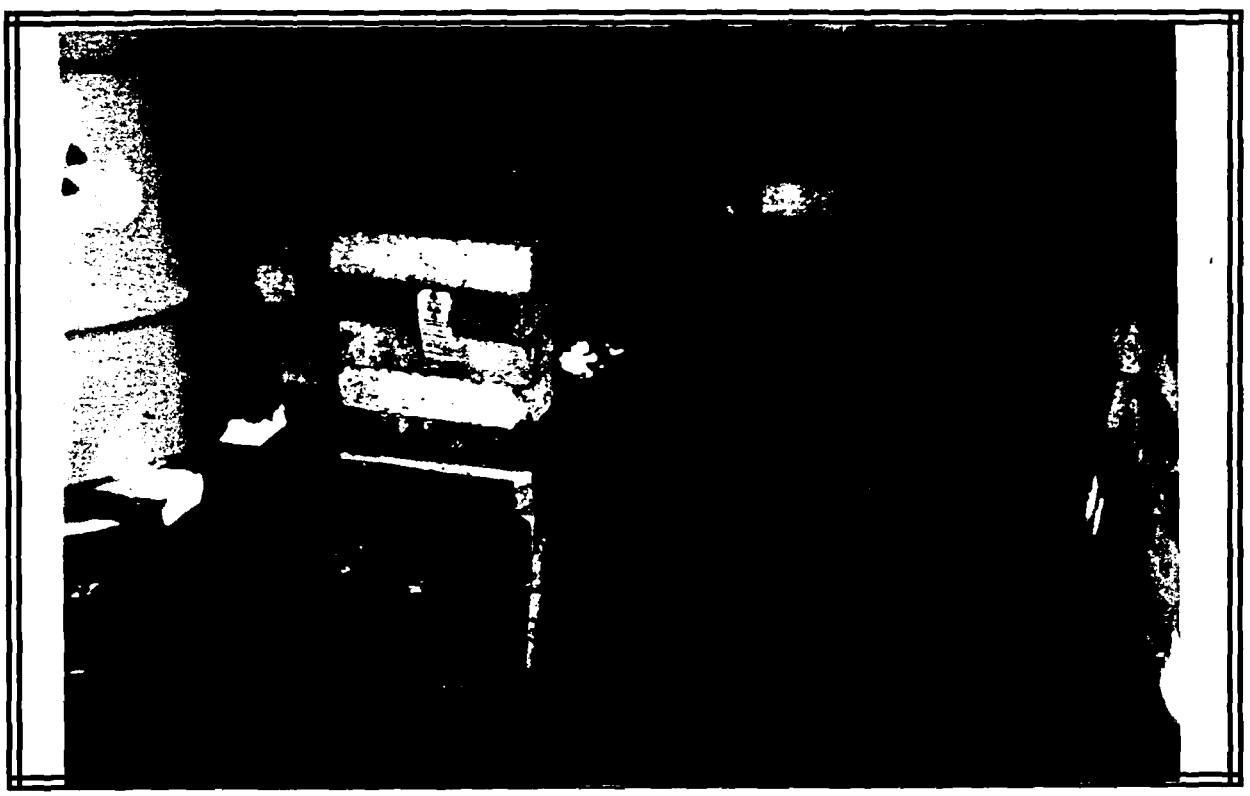
PHOTOGRAPH No.4 This is a prefabricated metallic storage unit approximately 12' x 22' in size. This unit is known as Building Number 4. It has one doorway, but no windows, no drainage, and no obvious ventilation. It sits adjacent to another storage unit.

PHOTOGRAPH No.4A A view of the interior of Building Number 4. This NRC regulated unit is used to store materials believed to have been exposed to radioactive chemicals. Materials exposed to P-32 are known to be stored here.

PHOTOGRAPH No.5 This is a view of a prefabricated metallic storage unit approximately 30' x 40' in size. This unit is known as Building Number 330. It has a walk-through door, and a roll-up garage-type entry. There is a concrete foundation and ventilation on the sides. There are no windows. Waste within are RCRA regulated.

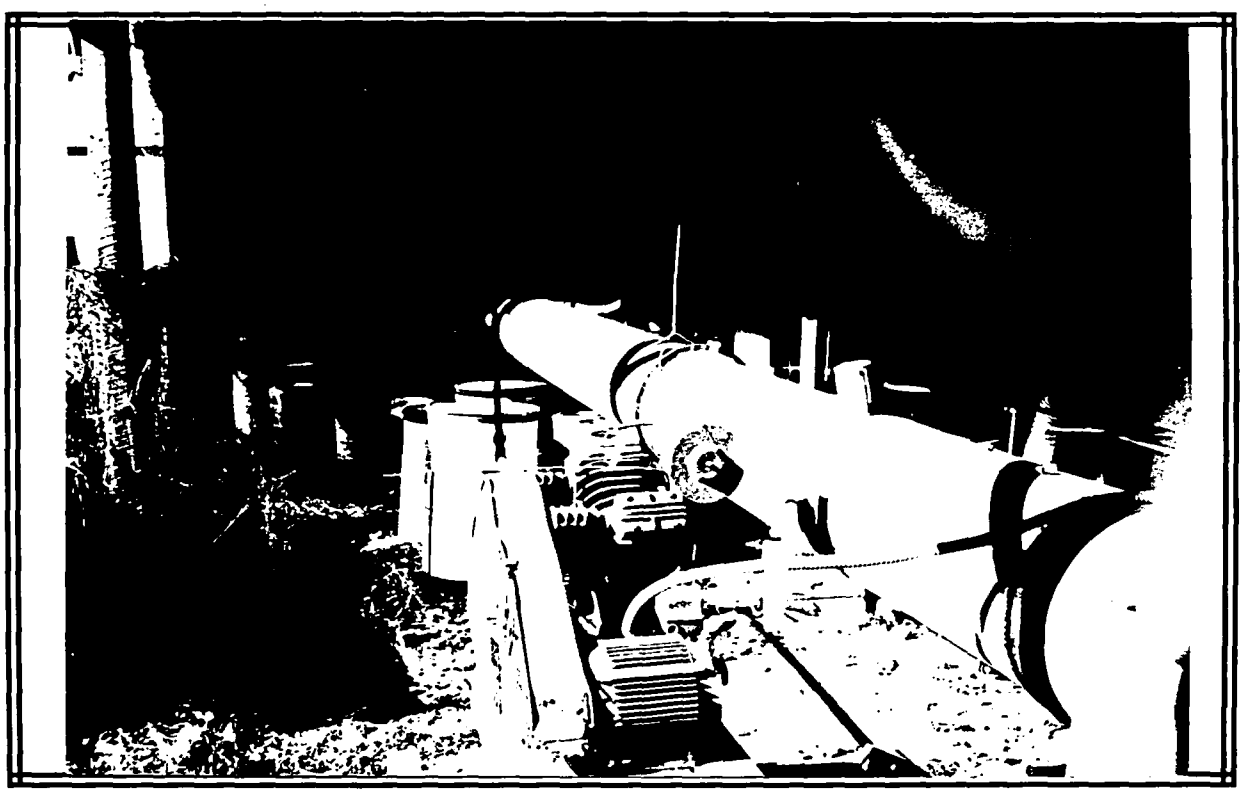
PHOTOGRAPH No.5A An interior view of Building 330 citing spaced drums of mixed wastes and a refrigeration unit to the right that is used for decayed animal carcasses.

PHOTOGRAPH No.5B An interior view of Building 330 citing closed drums, and maintenance items near the refrigeration unit.



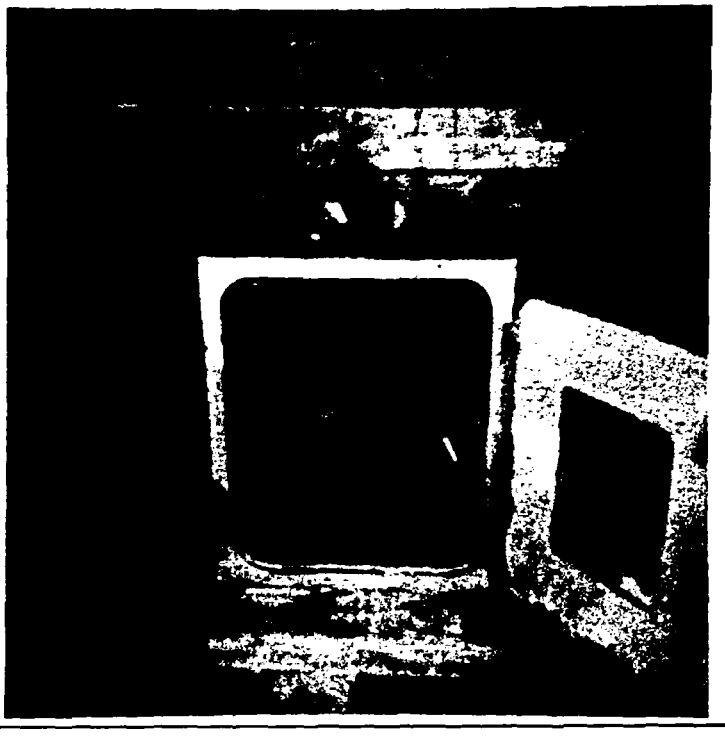
PHOTOGRAPH No.5C An interior view of Building 330 citing the area of the highest radioactivity reading. The contents of these containers were unspecified.

PHOTOGRAPH No.6 This is a view of both Building Number 330 (left) and Building Number 333 (right). The latter is approximately 33' x 23' unit of wood design.



PHOTOGRAPH No.6A A view of the project apparatus components within Building Number 333. No releases to the soil were cited during the visual observation of this unit. Note drums alleged to contain burned tobacco substance from the kiln.

PHOTOGRAPH No.6B A view of fiber drums in the foreground and the kiln apparatus in the background.



PHOTOGRAPH No.6C A view of the kiln alleged to contain burned tobacco. No odors were noted. No release to the soil was observed.

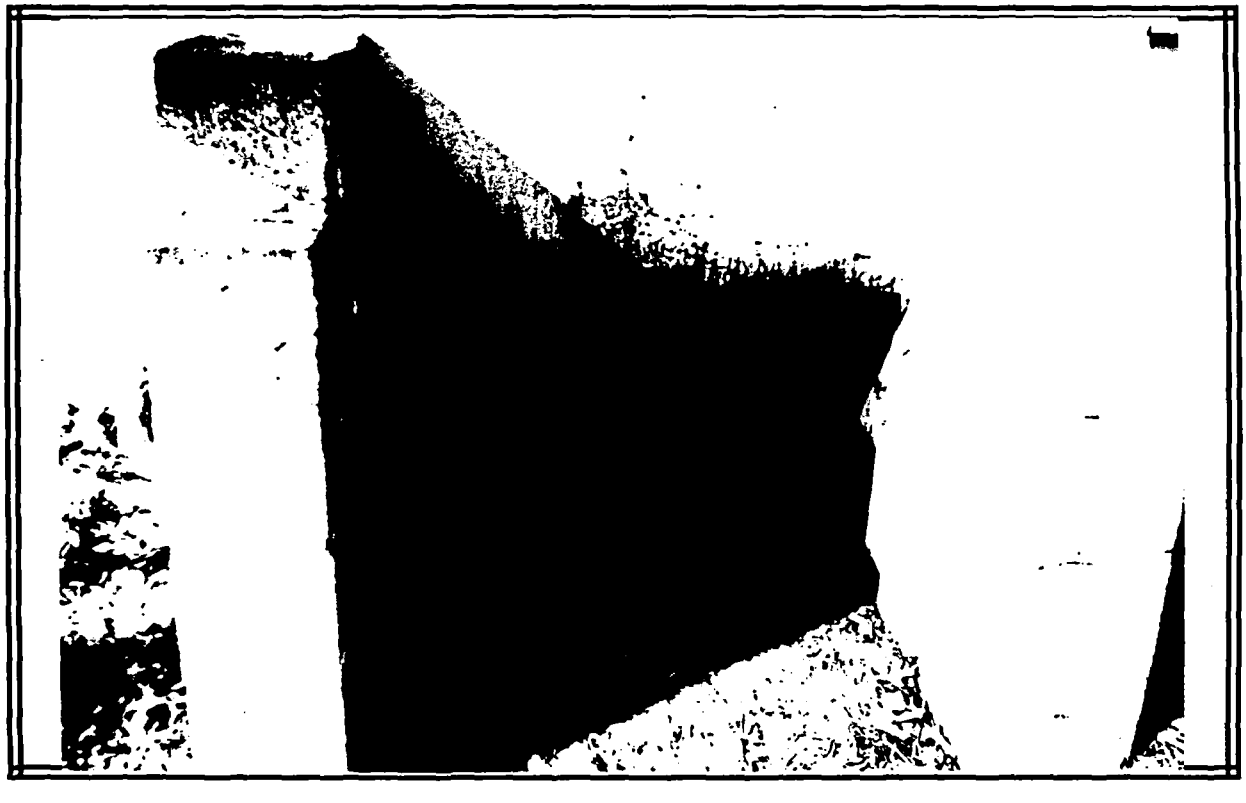
PHOTOGRAPH No.7 An outdoor solid waste collection adjacent to Building Number 333. This is one of two portions of the collection. Note air conditioning units, metal sheets, and cylinders. No releases were noted.

PHOTOGRAPH No.7A The second of two parts of a solid waste collection of apparatus from the project in Building Number 333. This waste collection includes separators and cylinders. No releases to the environment were observed.

PHOTOGRAPH No.8 *This is an outdoor fuel storage tank containing heating oil/fuel for Building* Number 255H. Visual observation noted that this fuel had leaked to the area soil from the top intake coupling.

PHOTOGRAPH No.8A This view of the same tank is to show the extent of fuel spillage around the tank (approximately 16 sq. ft.). This tank holds approximately 100 gallons.

PHOTOGRAPH No.9 This view of the fuel/oil storage tank outside of Building Number 185 may show oil sheen that was present among leaves and the subsequent ground below them. This tank holds approximately 100 gallons.



PHOTOGRAPH No.9A Signs that an overflow has occurred were visible. An area beneath the tank also showed signs that a release to the soil had occurred.

PHOTOGRAPH No.10 An area of approximately 4 sq. ft. beneath this tank was saturated with fuel/oil. The tank holds approximately 100 gallons such fuel/oil.

PHOTOGRAPH No.10A This view of the same tank more clearly identifies a release to the soil in the area of this tank.

PHOTOGRAPH No.11 This fuel/oil storage tank behind Building Number 184 is similar in size and style to the other tanks at the facility. Although the status of the other tanks implies that a similar release may occur, there was no release to the soil from this unit.

APPENDIX A

APPENDIX B

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	NCD003203213

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
University of North Carolina-Chapel Hill	Finley Golf Course Extension Rd.

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Chapel Hill	NC	27514	Orange		

09 COORDINATES LATITUDE	LONGITUDE
35° 53' 38".0	79° 00' 55".0

10 DIRECTIONS TO SITE (Starting from nearest public road)

Raleigh Rd. eastward from City Center to Finley Golf Course Rd., turn Southward, then veer to the east (left) after proceeding approximately 3200 ft. to dirt road extension to first turn-in on the left.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residence)
University of North Carolina	212 Finley Road

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Chapel Hill	NC	27514	(919) 962-5507

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residence)
University of North Carolina/Health & Safety Office	212 Finley Road

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
Chapel Hill	NC	27514	(919) 962-5507

13 TYPE OF OWNERSHIP (Check one)

☐ A. PRIVATE ☐ B. FEDERAL: _____ (Agency name) ☒ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☒ YES ☐ NO DATE 08 / 31 / 88 (MONTH DAY YEAR)

BY (Check all that apply)

☒ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR

☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: _____ (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)	03 YEARS OF OPERATION
☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN	early 1970's (BEGINNING YEAR) | still active (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

mixed wastes- radioactive wastes with toluene, xylene, dioxane. I-125, tritium, calcium 45, carbon 14, phosphorus 32, Cr 51, chlorine 36, sulfur 35, sodium 22, rubidium 86

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

The extent of hazard to the enviroment is minimal. Wastes are contained and transported in a proper manner.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☒ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Kathleen Brown	NCDHR	(919) 733-2178

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Gerald Milligan		NUS Corporation	(404) 938-7710	03 / 15 / 89 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
NC	NCD003203213

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [ ] B. POWDER, FINES
- [ ] C. SLUDGE
- [ ] D. OTHER _____ (Specify)
- [ ] E. SLURRY
- [X] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS 3.67
- CUBIC YARDS _____
- NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [X] B. CORROSIVE
- [X] C. RADIOACTIVE
- [ ] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [X] G. FLAMMABLE
- [X] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS	3,325	Kg	alleged maximum quantity at any
PSD	PESTICIDES			given time; mixed waste
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently used CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
sol	xylene		vials in drums; boxes,		
			plastics bags	unkn	
sol	toluene		vials in drums; boxes,		
			plastic bags	unkn	
sol	undisclosed scintilation		vials in drums; boxes,		
	media		plastic bags	unkn	

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

1. NUS Field Log Book (F4-1208)
2. EPA File Material
3. State of North Carolina File Material

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	NCD003203213

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE Jan 25-26, 89) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 6,840
04 NARRATIVE DESCRIPTION

The remote possibility of contamination to groundwater exists from the areas of concern. Visual observation cited waste estimated at no greater depths than 2 to 3 ft. bls.

01 ☐ B SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE Jan 25-26 89) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0
04 NARRATIVE DESCRIPTION

The possibility of surface water contamination is remote, at best. There was no evidence to suggest that a release had occurred. Current containment appeared adequate.

01 ☐ C CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE Jan 25-26, 89) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0
04 NARRATIVE DESCRIPTION

There is no evidence to indicate that a release to the air existed; monitoring instruments read zero. Prolonged exposure to workers and handlers should be avoided due to the presence of radioactive substances.

01 ☐ D FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE Jan 25-26 89) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

Containment methodology practiced at the facility provided adequate assurance against fire or explosives during normal operations.

01 ☐ E DIRECT CONTACT — 02 ☐ OBSERVED (DATE Jan 25-26, 89) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: Approx. 10
04 NARRATIVE DESCRIPTION

Prolonged exposure of workers and handlers to radioactive substances should be of concern.

01 ☐ F CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE Jan 25-26 89) ☒ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: .0023 (Acres)
04 NARRATIVE DESCRIPTION

A release to the soil from in the areas of concern appeared to be at no greater than 2-3 ft. bls.

01 ☐ G DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: Jan 25-26, 89) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED:
04 NARRATIVE DESCRIPTION

The possibility exists that drinking water could be contaminated. However, visual observation provided no evidence to support a release to the drinking water in the area.

01 ☐ H WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE Jan 25-26, 89) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: approx. 10
04 NARRATIVE DESCRIPTION

Concern of exposure to workers to radioactive substances is valid. Handlers must avoid prolonged exposure.

01 ☐ I POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: Jan 25-26 89) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: approx. 10
04 NARRATIVE DESCRIPTION

NCDHR Radiation Protection Section deemed the facility to be in satisfactory status. There was also no evidence of danger via exposure with the exception of the need to avoid prolonged exposure by handlers.

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
NC	NCD003203213

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: Jan 25&26) 89 ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

There was damage observed.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: Jan 25&26) 89 ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

There was no damage observed.

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: Jan 25&26) 89 ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

There was no danger observed to the area food chain.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills runoff standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: Jan 25&26) 89 ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 0 — 04 NARRATIVE DESCRIPTION

There was no unstable containment noted.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: Jan 25&26) 89 ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No offsite damage observed.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: Jan 25&26) 89 ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

No danger to sewers, drains, etc. observed.

01 ☒ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: Jan 25&26 89 ☒ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION

Concern to the possibility that unauthorized dumping occured by mistake. Radioactive drums were disclosed at the Orange County Landfill. Many, but possibly not all, were recovered according to UNC officials.

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

None noted.

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The threats to the environment is minimal to zero.

V. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

1. NUS Field Logbook F4-1208 - UNC Chapel Hill (chydaru)
2. State of North Carolina / EPA File Material

EPA FORM 2070-12 (7-81)