

NATIONAL DIOXIN STUDY
PRIORITY POLLUTANT
SAMPLING AT
INDUSTRIAL SITES
REGIONAL SUPPORT

REGION I

FINAL REPORT
OF
FIELD SAMPLING ACTIVITIES

prepared for:
U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I
LEXINGTON, MASSACHUSETTS

FEBRUARY 1985

E.C.JORDAN CO.

CONSULTING ENGINEERS

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Prepared for:

U.S. Environmental Protection Agency
Region I
Lexington, Massachusetts

Prepared by:

E.C. Jordan Co.
Portland, Maine

February 1985

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I. SUMMARY

As part of the national study investigating the presence of dioxin at specific sites, EPA identified nine (9) candidate sites in EPA Region I for collection of soil and sediment samples. Two of these were categorized as Tier 3 (sites where 2,4,5-trichlorophenol was formulated into products), four were categorized as Tier 5 (sites where products derived from 2,4,5-trichlorophenol have been used), and three were categorized as Tier 7 background sites (sites where contamination with dioxin was not suspected).

The nine sites were visited by representatives of EPA and its contractor, E.C. Jordan Co., to verify background information and confirm the suitability of each site for sample collection. Following initial site visits, E.C. Jordan Co., prepared and submitted detailed sampling plans which were used by the sampling team members during the collection of representative soil and sediment samples. Site visit reports, prepared following each episode, were incorporated into the sampling plans. Tier 3 samples were sent to contract laboratory program (CLP) laboratories; all other samples were sent to TROIKA.

In accordance with the requirements of the scope of work, no analytical data results are included in this report.

II. INTRODUCTION

On December 15, 1983, the U.S. Environmental Protection Agency (EPA) issued a national strategy for investigating, identifying, and cleaning up sites contaminated by dioxin. The strategy focused primarily on 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) which is considered the most toxic of the 75 dioxin isomers. As part of the strategy, the Office of Water Regulations and Standards developed a two-year national study plan for investigating and sampling for dioxin at specific processing sites where pesticides possibly contaminated with dioxins were handled or disposed. The plan included additional sampling at sites where possibly contaminated pesticides have been or are being used, and at sites that represent background conditions.

EPA has identified seven classes or "tier levels" based on decreasing potential for 2,3,7,8-TCDD contamination as follows:

Tier 1 - Locations or sites where 2,4,5-trichlorophenol was originally produced, including associated waste disposal areas.

Tier 2 - Sites where 2,4,5-trichlorophenol was used as a precursor to make pesticidal products, including herbicides, germicides, pesticides, and other related extractable organics.

Tier 3 - Sites, and associated waste disposal areas, where 2,4,5-trichlorophenol and its derivatives were formulated into pesticidal products. The pesticidal products of concern include: 2,4,5-trichlorophenoxyacetic acid (2,4,5-T); silvex (2,4,5-TC); erbon; ronnel; hexachlorophene; isobac 20; and 2,4,5-trichlorophenol.

Tier 4 - Combustion sources which either create or fail to destroy dioxins. Sources to be studied are hazardous and municipal waste incinerators, internal combustion engines, and accidental fires involving PCB-transformers.

Tier 5 - Sites, such as right-of-ways and ranchlands, where pesticidal products derived from 2,4,5-trichlorophenol have been and are being used on a commercial basis.

Tier 6 - Certain organic chemical and pesticide manufacturing facilities where improper quality control on certain production processes could have resulted in 2,3,7,8-TCDD contaminated product waste streams.

Tier 7 - Control sites where contamination from 2,3,7,8-TCDD is not suspected.

The dioxin study strategy calls for investigating and taking any necessary response or enforcement actions at all Tier 1 sites and, eventually, at Tier 2 sites as part of the Superfund program. Sites in Tiers 3, 4, 5 and 6 are also being studied through a separate sampling program to determine their probability of contamination. Concurrent with sampling these sites, other areas identified as Tier 7 sites are being sampled to determine if background levels of dioxin exist in the environment and, if so, how widespread they are. EPA's current estimate is that more than 80 percent of the dioxin present in nature occurs at Tier 1 and 2 sites. The remaining 10 to 20 percent is estimated to be distributed between Tier 3,4,5, and 6 sites, with most at the Tier 3 sites.

The initial sampling necessary to evaluate the Tier 3, 4, 5, 6, and 7 sites comprises of the National Dioxin Study.

PURPOSE

The purpose of the National Dioxin Study's sampling program in Region I is to examine the nature of dioxin contamination in the environment and to assess the degree of contamination in Tier 3, 5, and 7 sites. Specifically, the objective of the Tier 3 study is to determine at what percentage of the facilities in this tier have concentrations of dioxin in the soil at levels above one part per billion (ppb). The goal of the Tier 5 study is to evaluate the extent and severity of dioxin contamination in those areas where the herbicides 2,4,5-T and silvex have been used. At Tier 7 sites, the purpose for sampling is to

assess whether background levels of dioxin exist in the environment, as well as to provide a basis for comparison for other tiers.

The purpose of this report is to summarize the sampling program conducted as part of the national study on the Tier 3, 5 and 7 sites in EPA's Region I. No analytical results are included.

SCOPE OF WORK

The sampling program in Region I was comprised of the following five subtasks:

1. Initiate contact with site owners or their representatives to obtain the necessary clearance for gaining site access.
2. Conduct a reconnaissance visit to each site to verify background information and to identify relevant site characteristics.
3. Prepare a sampling plan for each site which details collection procedures and number of samples to be taken.
4. Collect representative samples of soil and/or sediment from identified locations in Tiers 3, 5 and 7.
5. Prepare and submit a report detailing the field sampling activities.

III. SITE SELECTION AND DESCRIPTION

The initial step in the sampling program entailed identifying and selecting sample locations. Representative sites of each tier were selected by EPA from all regions within the United States as part of the National Dioxin Study. Within Region I, nine sample locations were chosen to be sampled as part of the program. Two of the sites were designated as Tier 3 sites, four as Tier 5, and the remaining three as Tier 7, or background sites. Figure 1 depicts the general location of the nine sites and identifies each by name and tier. Site specific location plans are presented at the end of this section beginning on page 12.

The Tier 3 and Tier 5 sites were selected by EPA based on consultation with state regulatory agency personnel from those states within the region. Region I Tier 3 sites were located in New Hampshire and Rhode Island; the Tier 5 sites were located in Maine and Vermont. Tier 7 sites were selected randomly from areas which had previously been identified and sampled as part of the Office of Pesticide's National Soil Monitoring Program (NSMP). In Region I, the Tier 7 sites were part of three standard metropolitan statistical areas (SMSA) located in Hartford, Connecticut; and Fitchburg and Pittsfield, Massachusetts. A brief summary and history of each site is included as part of the next section of this report. Documentation of pesticide usage at each site is included in Appendix A.

TIER 7 SITES

Pittsfield, Massachusetts

Nine individual sites were included within this sampling area. Seven locations were within the city limits of Pittsfield with the remaining two sampling points located in Dalton and Lanesborough, Massachusetts. Figures 2 through 5 depict the locations of the nine sampling sites which ranged from privately-owned landscaped lawns to remote, wooded state forest areas. However, in all cases, the sampling points were vegetated with either grass or weeds. No records or evidence exist that a herbicide was used on these sites in the past.



LEGEND

NAME

TIER NO.

CLARA LAKE (5)

B & A R-O-W(5)

LAKE ABENAKI (5)

CMP R-O-W (5)

CLARA LAKE (5)

J. HUBBARD (3)

FITCHBURG AREA SITES (7)

PITTSFIELD AREA SITES (7)

HARTFORD AREA SITES (7)

CARROLL PRODUCTS (3)

APPROXIMATE SCALE

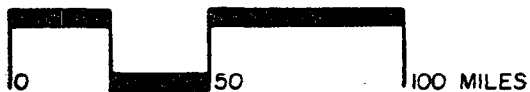


FIGURE 1
GENERAL SITE LOCATIONS
REGION I
NATIONAL DIOXIN STUDY

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Hartford, Connecticut

Eight sites were randomly selected from a network of locations in the Hartford standard metropolitan statistical area. Three of these sites were within the city limits of Hartford, while the remaining five locations were situated within Hartford County, in the towns of Andover, E. Granby, and Windsor, Connecticut. The general locations of these sampling areas are shown on Figures 6 through 11. The individual sites included residential lawns, a church and courthouse lawn, and several rural sites which were, at the time, predominantly wooded. None of these sites showed evidence or are suspected of having been sprayed with any herbicide which might have contained dioxin.

Fitchburg, Massachusetts

Six discrete sample sites were selected in this area. Five of the sites were within the Fitchburg city limits and the remaining one was located in the town of Lunenburg. Figures 12 through 14 show the general location of these six sites. Two of the sample areas were in residential lawns, and the other four were in unimproved, wooded areas. Like the other Tier 7 sites, there was no indication that these areas contained dioxin.

TIER 5 SITES

Lake Abenaki, Vermont

This site was located northeast of the village of Thetford Center, Vermont, as shown on Figure 15. Primary access to the lake is through Camp Farnsworth, a girl scout camp which surrounds the lake and which is located off Route 114. The lake shore, in general, was heavily wooded and stable with no evidence of recent erosion. Even though the lake was quite shallow (maximum depth of approximately 10 feet), it was used extensively by the camp for water recreation (swimming, canoeing, etc.) and by the public for fishing. As a result of its shallowness, the lake has experienced periods of increased vegetative growth. Because of this, approximately 15 acres of the lake (southern third) were sprayed with 2,4-D and silvex in June 1975. According to the caretaker at

the camp, this application appeared to have been effective in controlling vegetative growth in the lake.

Clara Lake, Vermont

The Clara Lake site, as shown on Figure 16, is located north of the village of Whitingham, Vermont. Access to the site is from a gravel road (causeway) which traverses the lake. The lake was partially drained in 1982 and much of the former lake bed has reverted to grass, weeds, and shrubs. The existing pond was about one third the size of the original lake (4 acres versus 13 acres) and quite shallow (4 to 5 feet deep except near an existing dam) at the time of the sampling. The lake was sprayed three times in the early 1970's in an effort to control weed growth. A portion of the spray mix used during this period of time included the herbicide silvex. Even though the lake had been partially drained, it was still being used for water recreation (swimming and fishing). Consequently, EPA personnel decided that this site should continue to be considered a Tier 5 location for this study.

Central Maine Power Co. Right-of-Way, Yarmouth, Maine

Central Maine Power Co. (CMP) maintains a right-of-way for a 115 kv transmission line between its steam electric power generating facility in Yarmouth, Maine, and Mosher substation in Gorham, Maine. In 1978, to control vegetative growth, CMP sprayed selected plants within 75 feet of the tower centerline in the Yarmouth area with Tordon 155, which contains 2,4,5-T. The herbicide was applied only at the base of selected plants. Following site reconnaissance, two areas along the right-of-way in Yarmouth were selected for sampling. The first of these areas was a 150-ft by 800-ft strip located within the right-of-way about 300 feet east of Interstate Highway 95. The second was a 150-ft by 800-ft strip located within the right-of-way between Portland Street and U.S. Route 1. The second area was about 1,000 feet west of the first. Figure 17 shows the location of the site.

Bangor & Aroostook Railroad Right-of-Way, Grindstone, Maine

The Bangor & Aroostook Railroad (B&A) serves northern Maine by providing rail freight service to several small towns and cities as well as to the timber and agricultural related businesses of the region. Most of the B&A track is bordered by forested, uninhabited land. In June 1977, the B&A conducted a spraying program using mixtures containing 2,4,5-T for control of vegetative growth along its right-of-way north of Millinocket, Maine. Following a reconnaissance of the area and consultation with Region I personnel, an 1,800-foot section of right-of-way between Mile Posts 111 and 112 was selected for sampling as part of the National Dioxin Study. The location of this section of right-of-way is shown on Figure 18.

TIER 3 SITES

J. Hubbard, Inc., Nashua, New Hampshire

J. Hubbard, Inc., located in Nashua, New Hampshire (see Figure 19), is operated, in part, as a formulator and distributor of a scented isopropyl rubbing alcohol solution called Dr. Hubbard's Red Cross Nurse. At the time of purchase by current owners in 1975, and for the following two years, hexachlorophene was mixed with the alcohol and scented oil at the J. Hubbard facility, but has not been used since then. Current owners have no knowledge of how long the previous owners used hexachlorophene.

Hexachlorophene was purchased in a dry form and stored on site in small drums. Only one container, which held about 25 pounds of substance, was on site at any given time. Water, oil, and hexachlorophene were mixed together in a bucket sitting in a sink. The blended mixture was then poured into two 275-gallon vats containing alcohol. These vats were moved to the location shown in B-28, Appendix B. They were cleaned once, about two years later; wash water was flushed down the drain to the city sewer. According to J. Hubbard personnel, no leakage has occurred during their ownership. Hexachlorophene use at the site has been estimated between 50 and 100 pounds per year based on J. Hubbard records showing an annual production rate of 2,000 to 4,000 gallons of Red

Cross Nurse and a mixing ratio of 0.024 pounds of hexachlorophene per gallon of alcohol.

Carroll Products, Inc., Wood River Junction, Rhode Island

Carroll Products, Inc., is located on Route 91 in Wood River Junction, Rhode Island (see Figure 20). In 1976, Carroll Products, Inc., purchased for resale 1,800 pounds of purified grade 2,4,5-T from Dow Chemical Company. According to analytical results provided by Dow Chemical Co., the 2,4,5-T contained no more than 0.01 parts per million (ppm) of dioxin. Shipped via common carrier (truck), the chemical, in dry form, was contained in plastic liner bags inside three 55-gallon metal drums (600 pounds each) with clamp type lids. Following receipt by Carroll Products, 1,190 pounds, the entire contents of one drum and most of another, were repackaged for shipment to Polaroid Corporation. The repackaging occurred on the first floor of Building 2 as shown on Figure B-29 of Appendix B. The chemical was scooped from the 55-gallon drums into smaller fiber drums which were picked up by Polaroid personnel on two separate occasions. Carroll Products personnel could not verify which loading dock was used, but assumed it was the main dock in Building 4 (Figure B-29, Appendix B). Following repackaging, all floor sweepings, gloves, bag liners, scoops, protective clothing, etc., were placed in two fiber drums and hauled via a Carroll Products company truck to an incinerator in Saugus, Massachusetts.

In 1976, all floor drains emptied into an on-site lagoon (Figure B-29, Appendix B); however, there were no reported or known spillages during storage or shipment of 2,4,5-T. According to company personnel, the lagoon has not been used since Carroll Products purchased the property in October 1971.

The remaining unopened drum, along with 75 pounds remaining from the shipment to Polaroid Corporation and repackaged in a plastic liner in a 41-gallon fiber drum, were stored on-site on the second floor of Building 2 from 1976 to 1984. In April 1984, Dow Chemical provided two steel drums to overpack the stored drums, and they were shipped to Full Fertilizer Service, Floresville, Texas.

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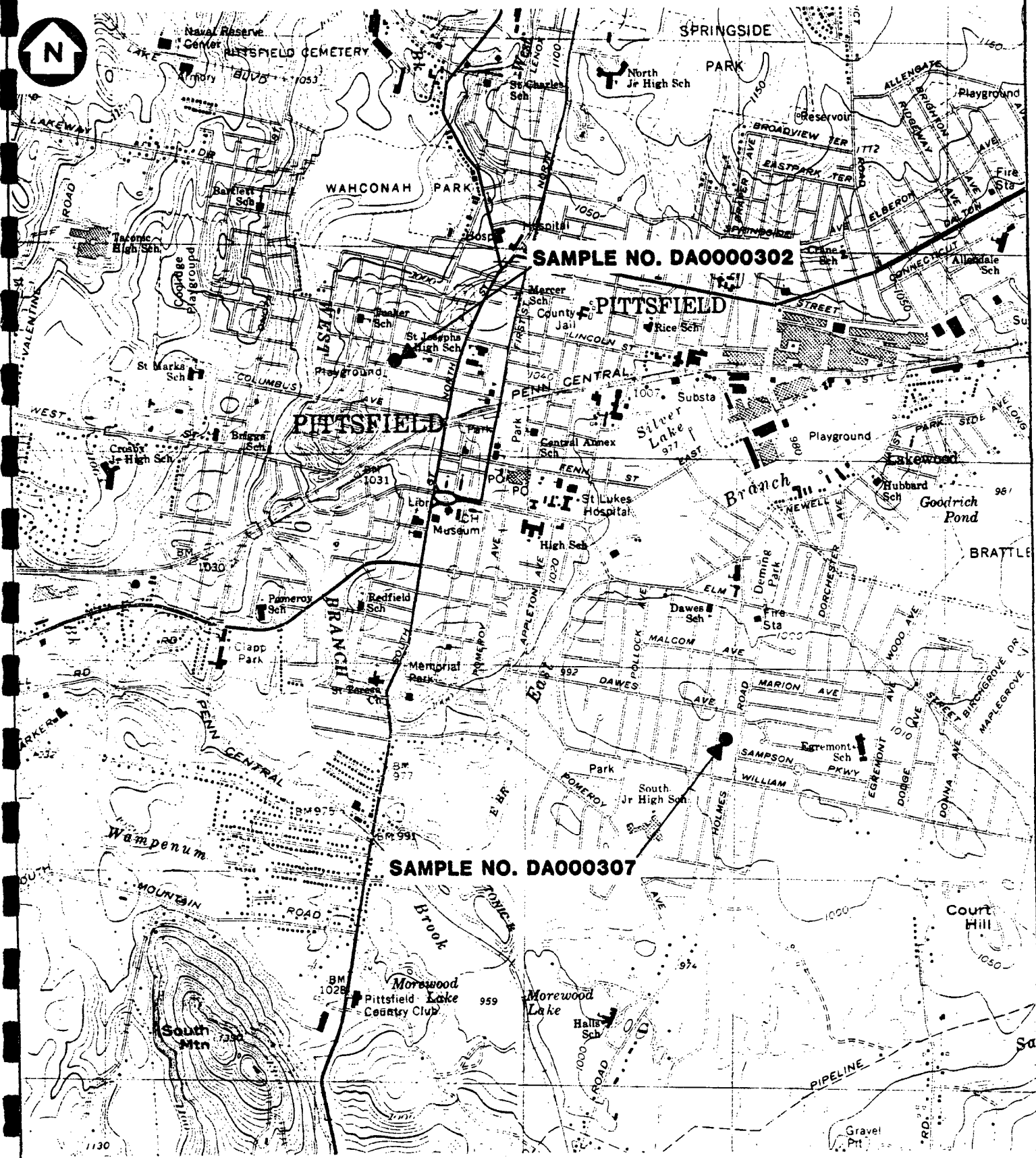
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710 1	<u>United States.</u> #b <u>Environmental Protection Agency.</u> #b <u>Region I.</u> #e sponsor.				

Delete Holdings- Export- Label- Submit- Replace- Report Error- Update Holdings-C Validate-C
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No record of what happened to the remaining 35 pounds of the chemical exists, but company officials believe it became part of the floor sweepings at the time of initial repacking.



- E.C. JORDAN CO.

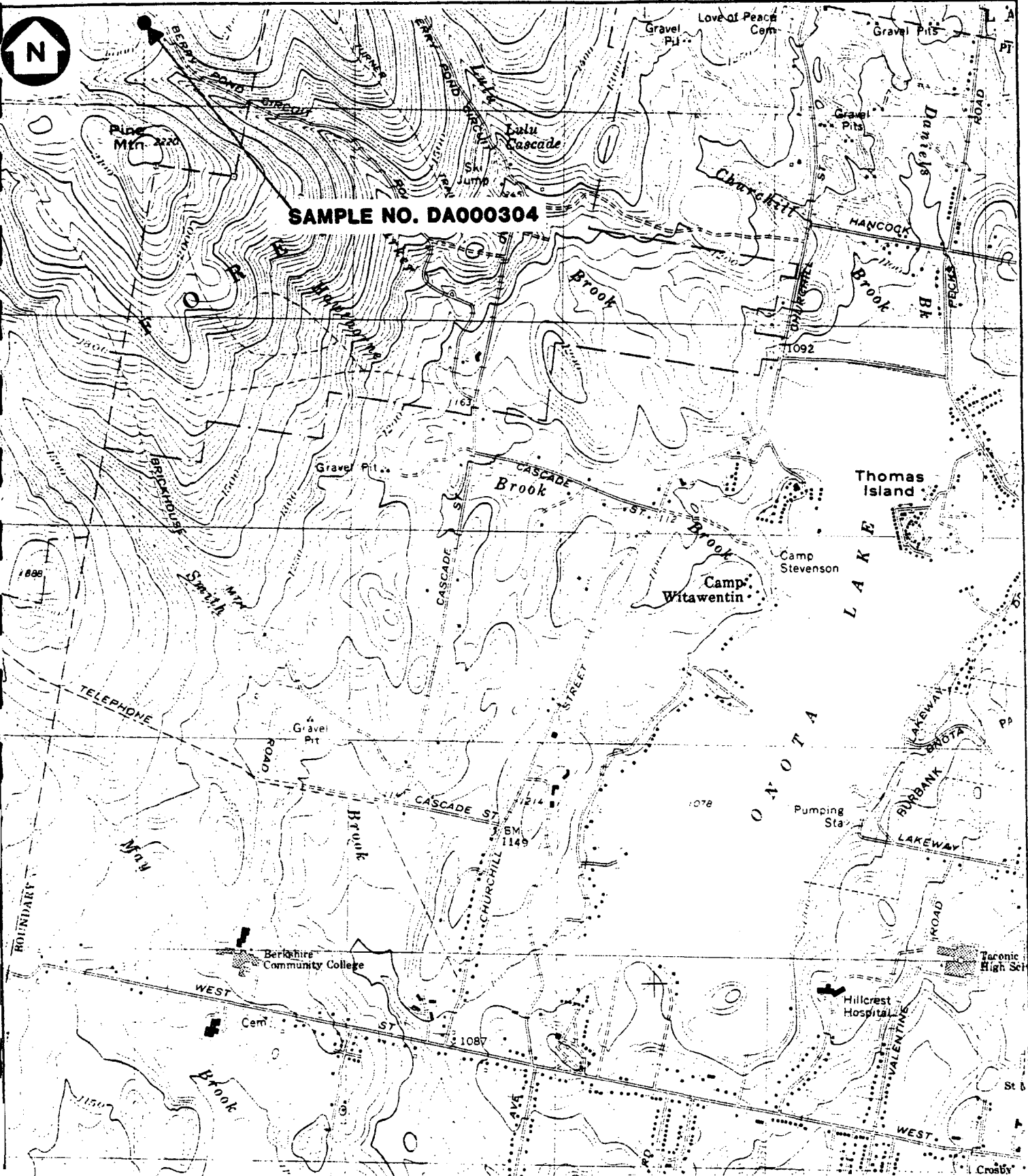


SOURCE: USGS - PITTSFIELD EAST, MA
PITTSFIELD WEST, MA

FIGURE 3
LOCATION PLAN
NATIONAL DIOXIN STUDY
PITTSFIELD AREA SITES
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SAMPLE NO. DA000304



SOURCE: USGS - PITTSFIELD WEST, MA

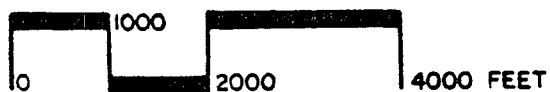
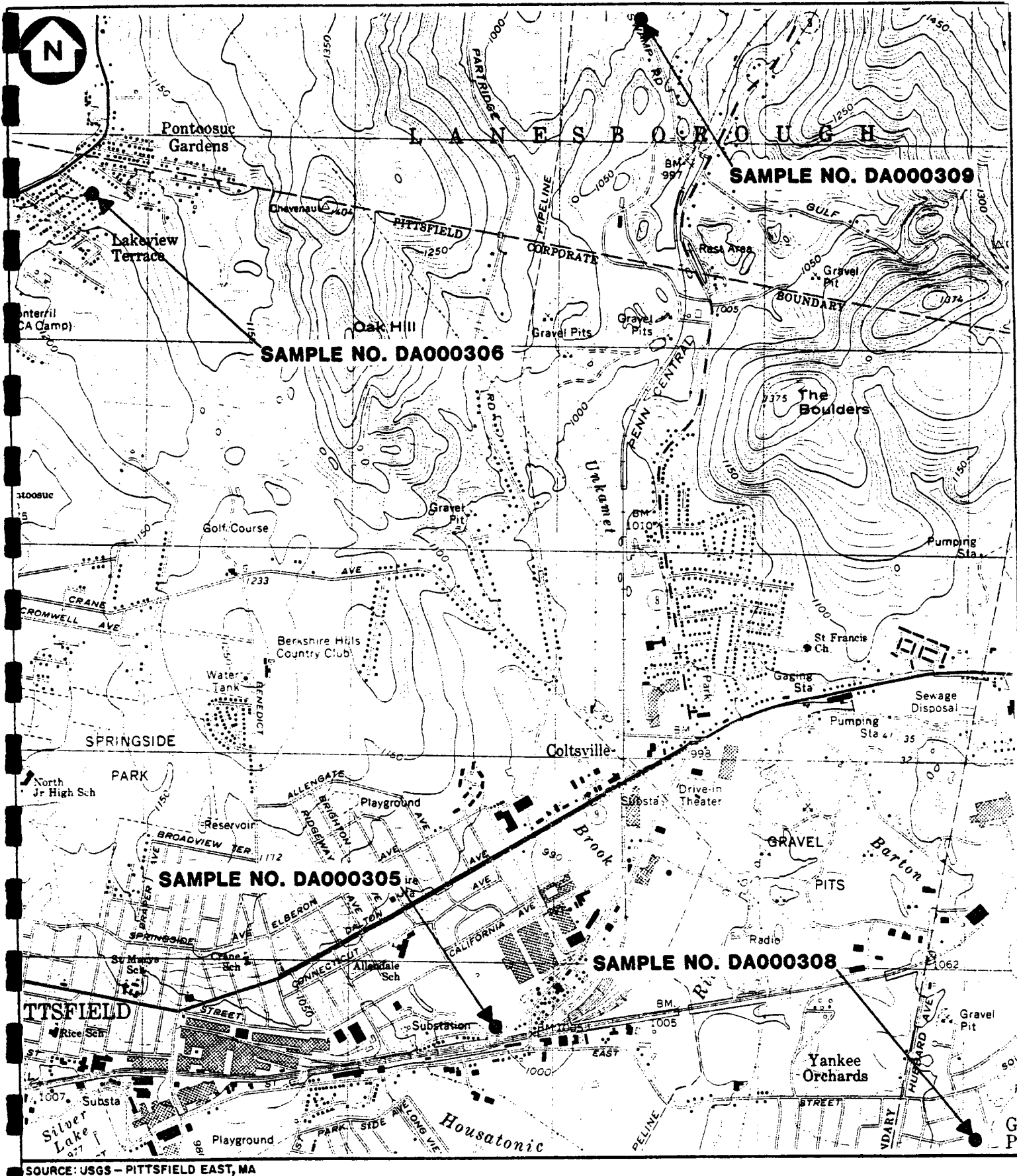
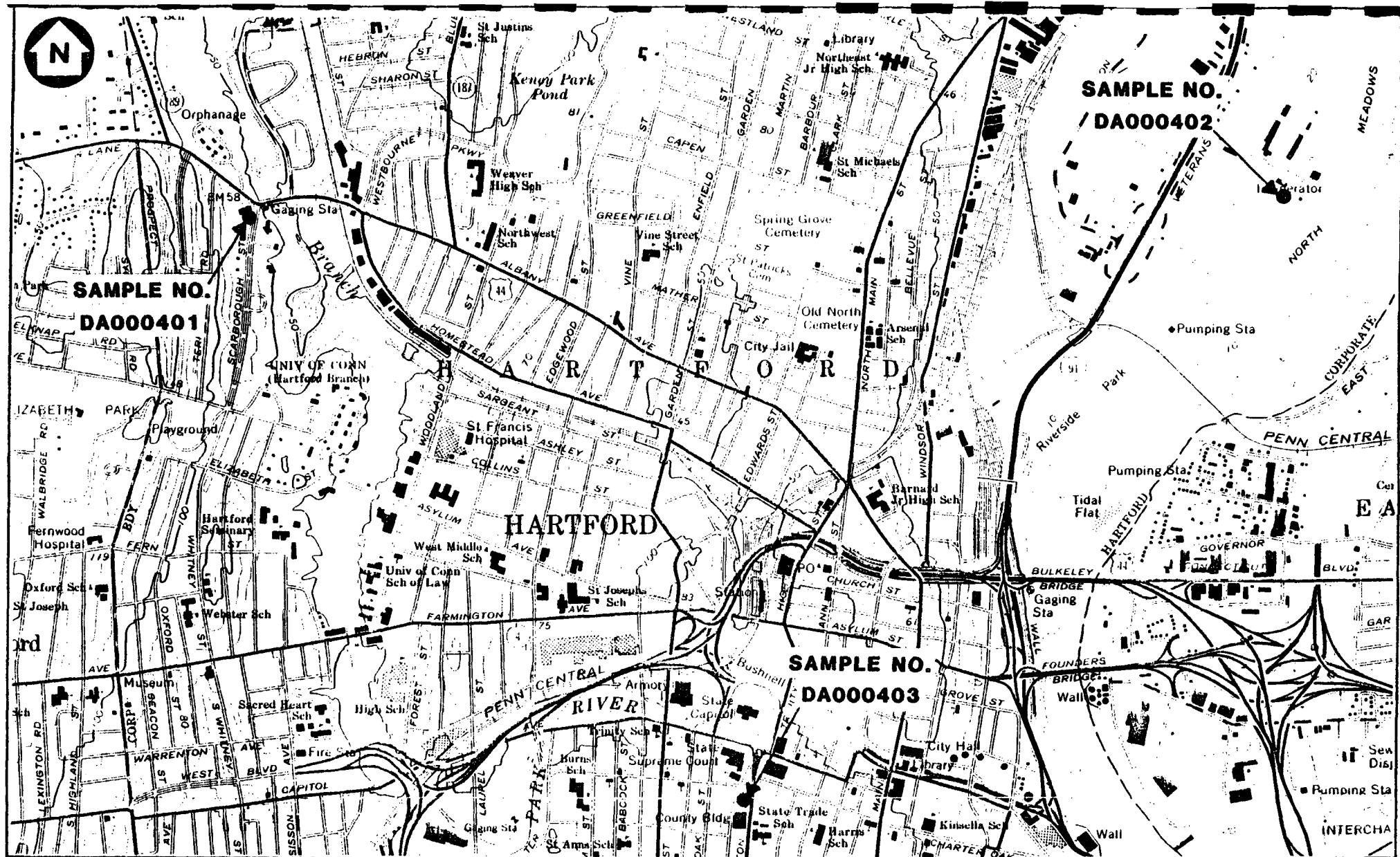


FIGURE 4
LOCATION PLAN
NATIONAL DIOXIN STUDY
PITTSFIELD AREA SITES

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**FIGURE 5
LOCATION PLAN
NATIONAL DIOXIN STUDY
PITTSFIELD AREA SITES**



SOURCE: USGS -

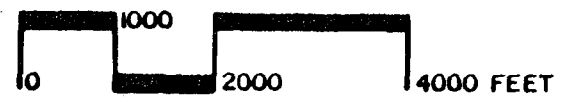
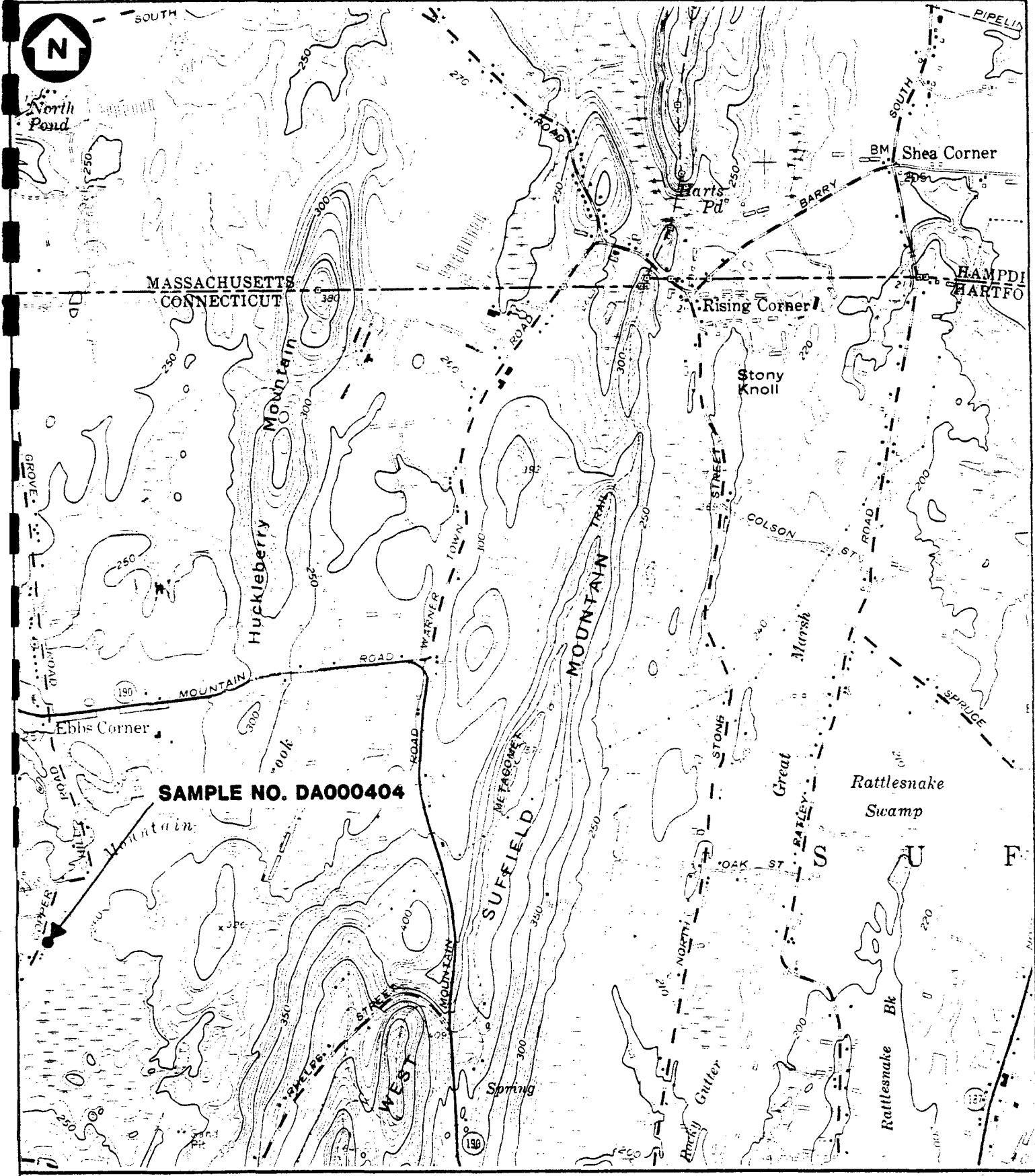


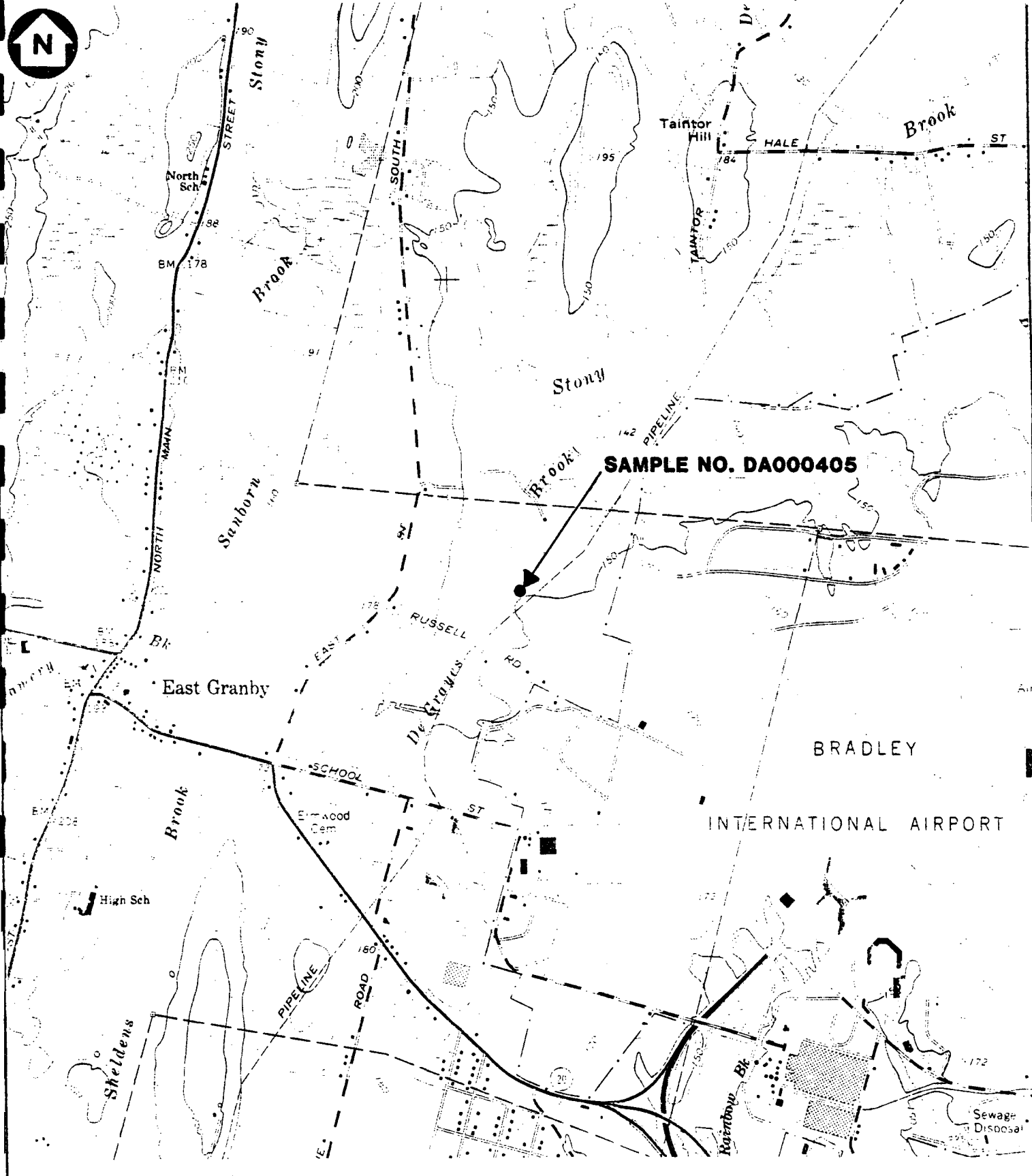
FIGURE 6
NATIONAL DIOXIN STUDY
LOCATION PLAN
HARTFORD AREA SITES
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SOURCE: USGS - WEST SPRINGFIELD, MA

FIGURE 7
LOCATION PLAN
NATIONAL DIOXIN STUDY
HARTFORD AREA SITES

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SOURCE: USGS - WINDSOR LOCKS, CT

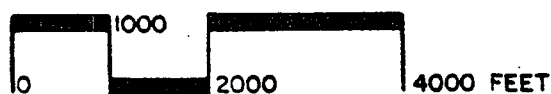
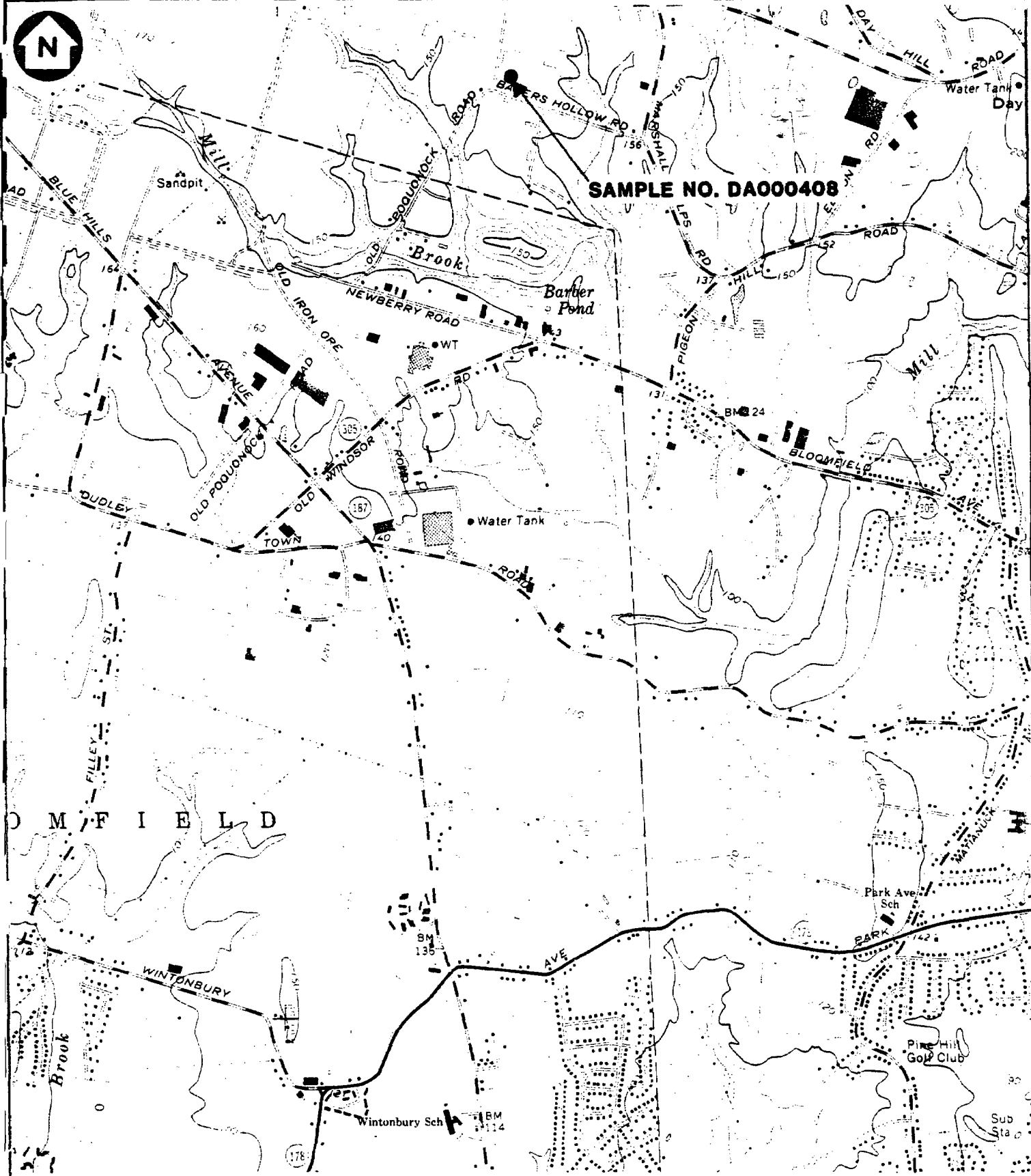


FIGURE 8
LOCATION PLAN
NATIONAL DIOXIN STUDY
HARTFORD AREA SITES

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SOURCE: USGS - HARTFORD NORTH, CT

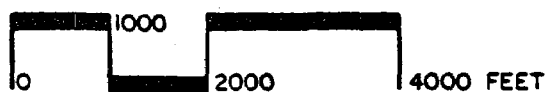
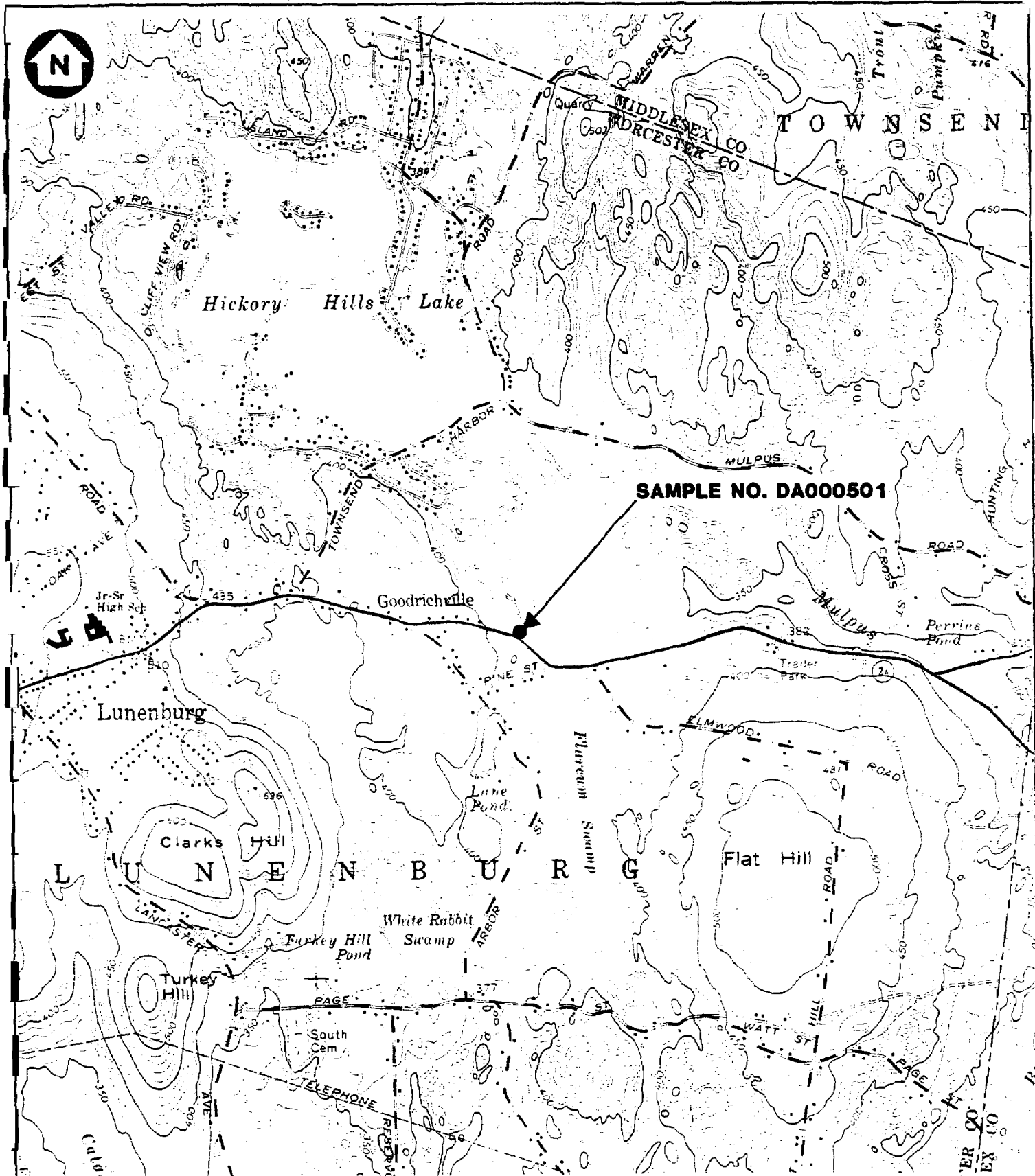


FIGURE 11
LOCATION PLAN
NATIONAL DIOXIN STUDY
HARTFORD AREA SITES

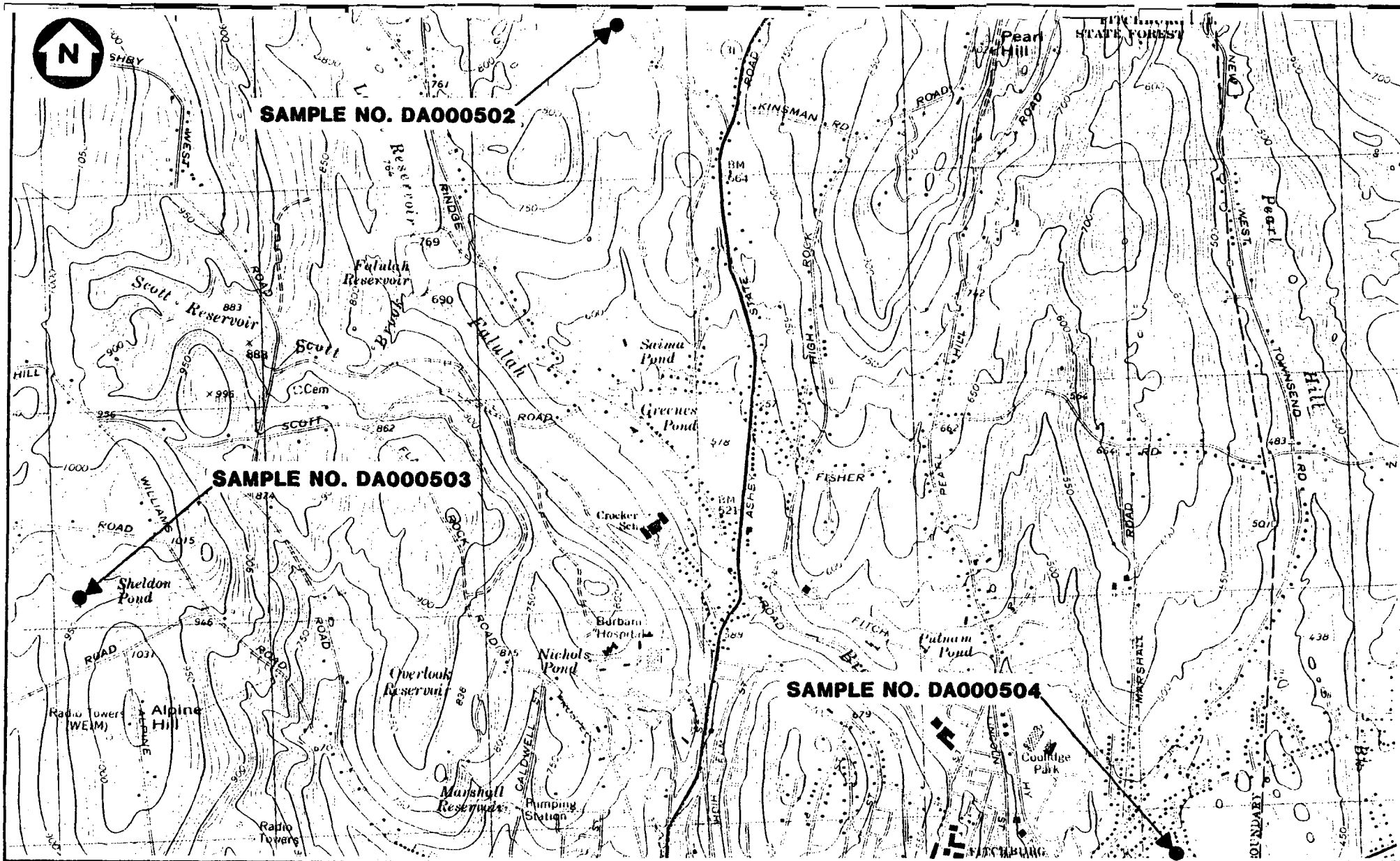
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SOURCE: USGS - SHIRLEY, MA

FIGURE 12
LOCATION PLAN
NATIONAL DIOXIN STUDY
FITCHBURG AREA SITES

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SOURCE: USGS - FITCHBURG, MA

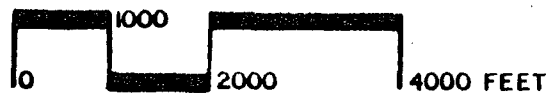
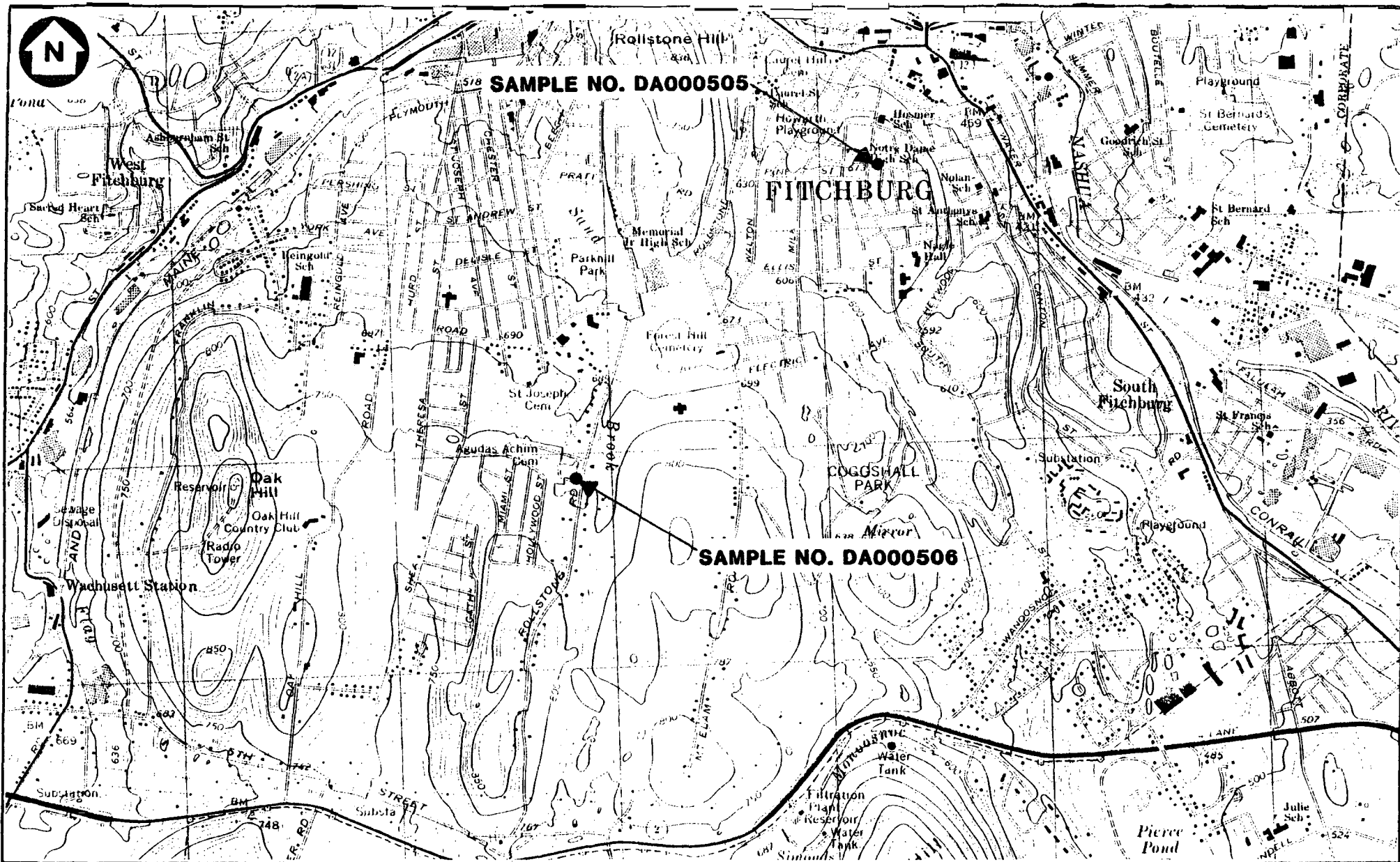


FIGURE 13
NATIONAL DIOXIN STUDY
LOCATION PLAN
FITCHBURG AREA SITES

EC JORDAN CO



SOURCE: USGS - FITCHBURG, MA

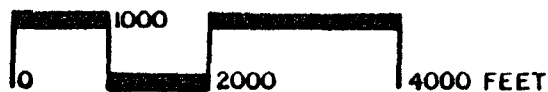
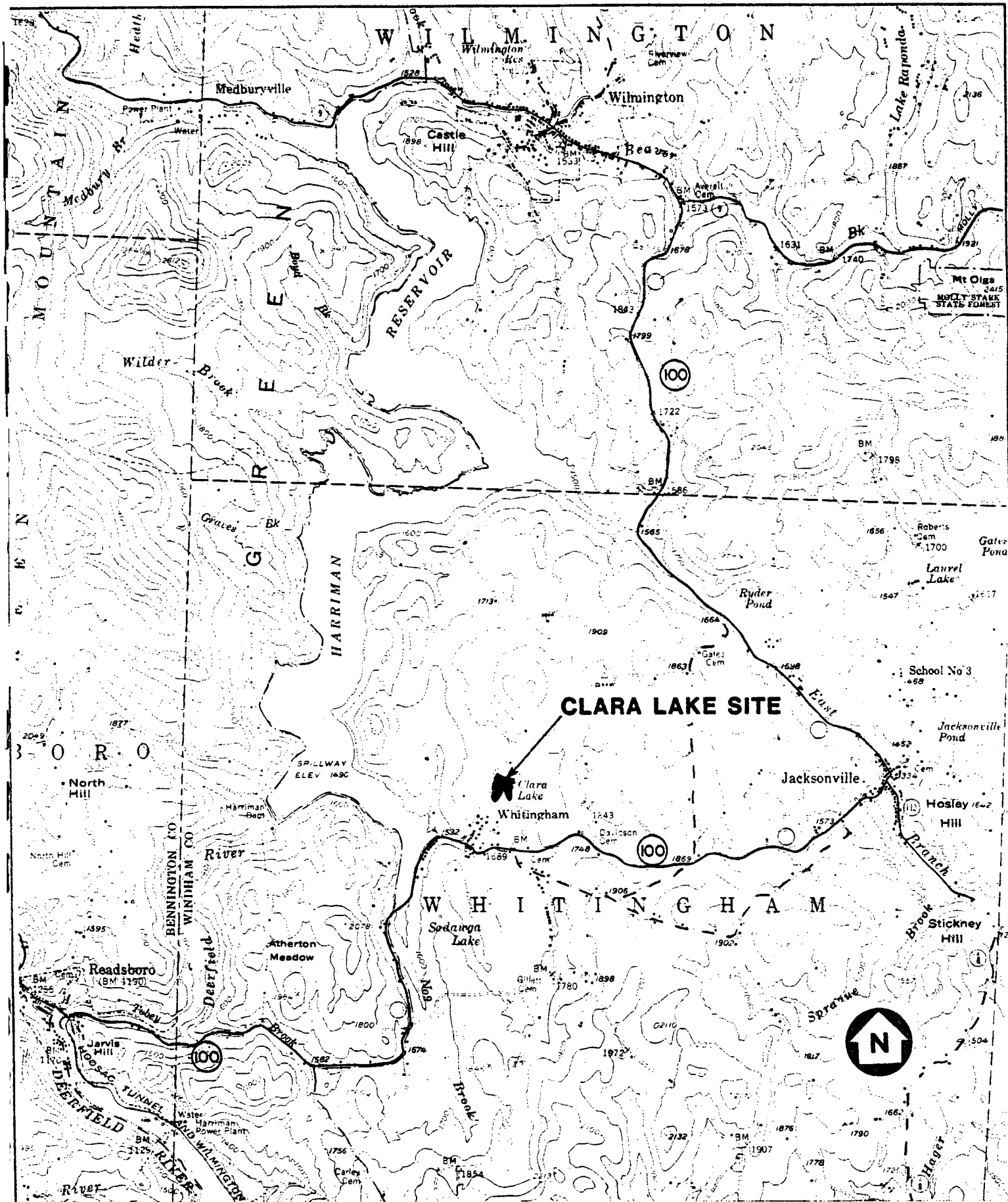


FIGURE 14
NATIONAL DIOXIN STUDY
LOCATION PLAN
FITCHBURG AREA SITES

EC.JORDANCO

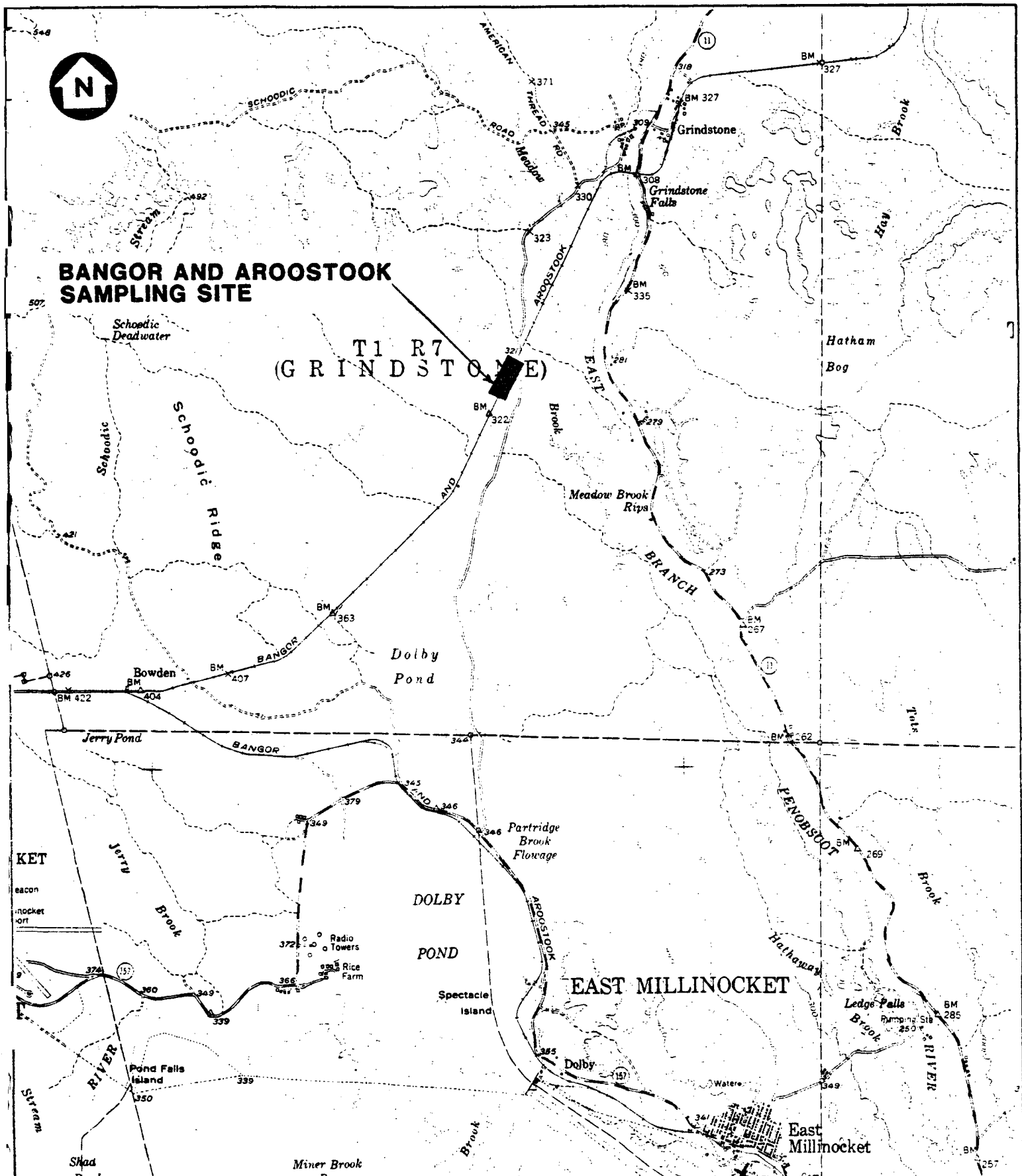


SOURCE: USGS - WILMINGTON, VT

APPROXIMATE SCALE



FIGURE 16
NATIONAL DIOXIN STUDY
LOCATION PLAN
CLARA LAKE
LAKE WHITINGHAM, VT.
EC.JORDAN CO



SOURCE: USGS - MILLINOCKET, ME

APPROXIMATE SCALE

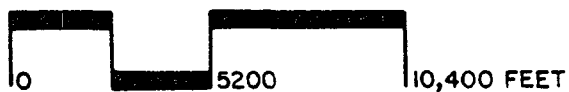
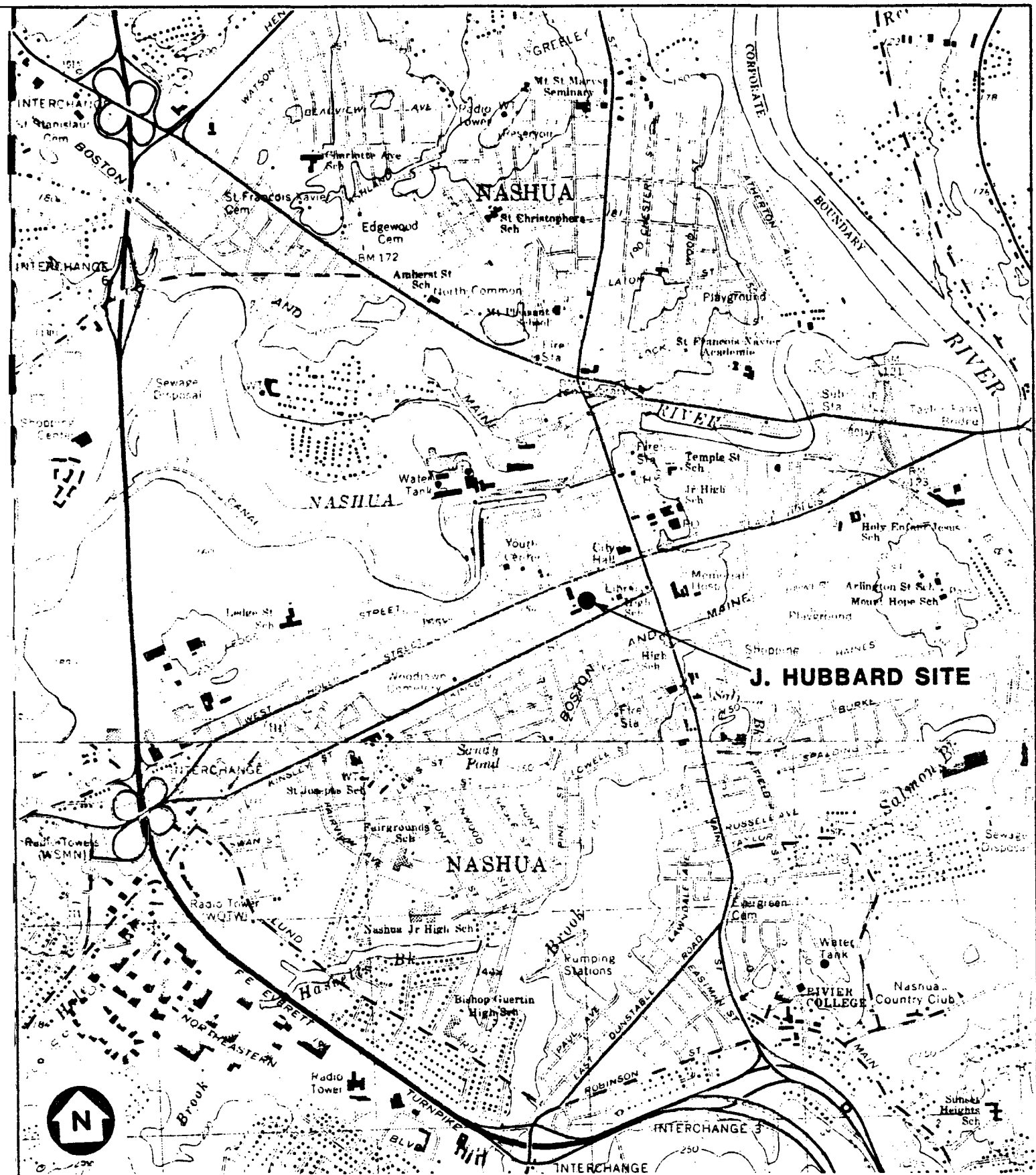


FIGURE 18
NATIONAL DIOXIN STUDY
LOCATION PLAN
BANGOR AND AROOSTOOK
RAILROAD R-O-W
GRINDSTONE(T1 R7), ME.

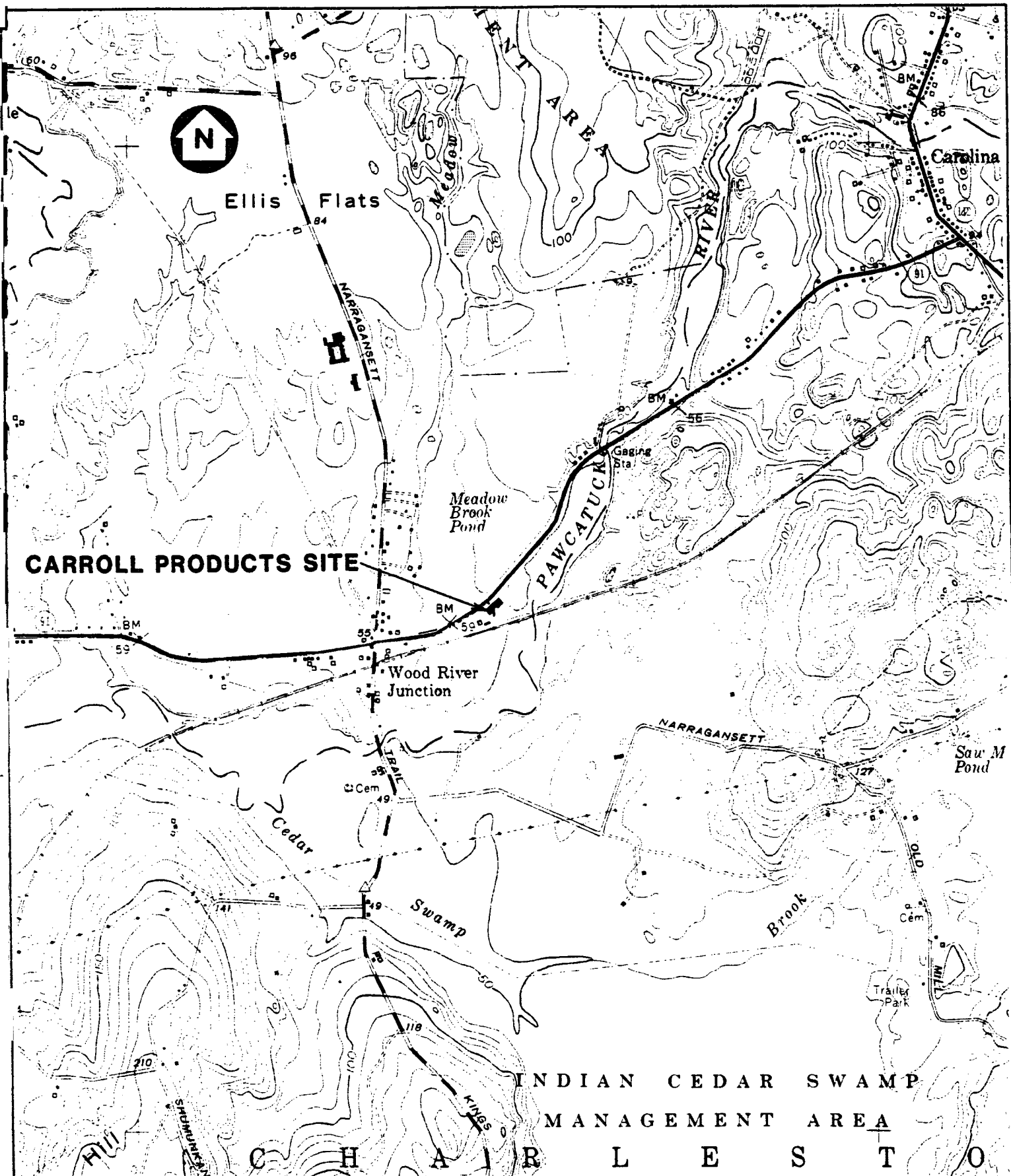
EC.JORDAN CO.



SOURCE: USGS - NASHUA NORTH, NH

FIGURE 19
NATIONAL DIOXIN STUDY
LOCATION PLAN
J. HUBBARD, INC.
NASHUA, N.H.

EC.JORDANCO



SOURCE: USGS - CAROLINA, RI

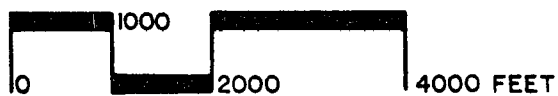


FIGURE 20
NATIONAL DIOXIN STUDY
LOCATION PLAN
CARROLL PRODUCTS
WOOD RIVER JCT., R.I.

EC.JORDAN CO.

IV. SAMPLING PROGRAM

The purpose of the National Dioxin Study sampling program is to collect soil, sediment, fish, and shellfish samples from various sites in Tiers 3, 5, 6, and 7. In a nationwide sampling effort, samples collected in any area or region must be not only representative of the sample site, but also be consistent with and comparable to those collected in all other regions. To ensure this, a standard protocol, Sampling Guidelines Manual for the National Dioxin Study, was developed by EPA. Specific methodologies developed for collecting, handling, and shipping of samples are included in the manual. The sampling program described in this report included only soil and sediment collection and was conducted in conformance with the specified methodologies. The following sections summarize those procedures; any variations which occurred during the sampling episodes are specifically identified.

PRESAMPLING PROCEDURES

Site Contacts

Initially special emphasis was given to contacting the owners and/or representatives of the various sites selected for sampling. Telephone contact was made with those individuals responsible for the Tier 3 and 5 sites to explain the purpose of the program and to obtain permission for gaining access to their property. For the Tier 7 sites, personal contact was made during the initial site visits, since telephone numbers were not available for several of the sampling sites. Furthermore, town officials were notified for the Tier 7 sites and for the two lake sites in Tier 5. In all cases, the individuals contacted were invited to be present, if they desired, during the sampling episodes.

Site Reconnaissance

Once contact had been made with the respective individuals, a site reconnaissance visit was conducted. During the visit, a site history was obtained and the specific site conditions were observed. At that time, the general sampling area was identified, and it was determined whether a random or di-

rected sampling approach would be used. A site visit report was then prepared for each site.

Sampling Plan Preparation

Following the reconnaissance visit, a sampling plan, with a site visit report appended was prepared for each site. The sampling plan included the procedure to be followed in collecting the samples; the number of samples to be collected; the specific identification number of each sample; and the location of each sample point on a site plan.

Selection of Sampling Points

A direct approach was used in selecting the individual sample points for the Tier 3 sites and a random approach was used for the Tier 5 sites. At the direction of EPA, the sample locations for the Tier 7 sites were the same as those used during the initial pesticides study (NSMP). In an effort to obtain statistically valid random samples on Tier 5 sites, the following approach was used:

Determination of the size of the population, from which the random samples of size $n=12$ and $n=24$ were taken, was made to ensure that the sample would provide representative and useful information about the geographic area. If population size were not considered, the samples could possibly have been restricted to a geographic portion of the area which is too small to provide results which reflect true characteristics of the desired region.

Population sizes were determined by specifying an acceptable relative error in the estimates, apart from a 1 in 20 chance. The method makes use of the sample size equation for simple random samples:

$$n = \frac{t^2 (cv)^2}{r^2} / \left[1 + \frac{t^2 (cv)^2}{N r^2} \right]$$

where t = abscissa of the normal curve that cuts off an area α at the tails. For a 1 in 20 chance of having a larger than specified error, $t=2$.

cv = coefficient of variation, a dimensionless measure of variability desired from the sample estimate, i.e., $cv=s/\bar{y}$

r = relative error in the estimated population mean.

N = population size.

n = sample size.

Note that solving the above equation for N yields:

$$N = [nt^2 (cv)^2] / [t^2 (cv)^2 - r^2 n]$$

Tables 1 and 2 show population sizes resulting from fixing the sample sizes at 12 and 24, respectively, and varying the values of r and cv .

TABLE 1
POPULATION SIZES FOR RANDOM SAMPLE OF SIZE 12

		cv				
		0.10	0.15	0.20	0.25	0.30
r	0.025	15	14	13	13	13
	0.05	48	18	15	14	14
	0.10	--	--	48	24	18
	0.15	--	--	--	--	48

TABLE 2
POPULATION SIZES FOR RANDOM SAMPLE OF SIZE 24

		cv				
		0.10	0.15	0.20	0.25	0.30
r	0.025	39	29	27	26	26
	0.05	--	72	39	32	29
	0.10	--	--	--	600	72
	0.15	--	--	--	--	--

Because advance estimates of coefficient of variation and relative error were not available, relatively conservative values were considered when determining the population size. For a sample of size $n=12$, a population of size $N=48$ was used (see Table 1). The interpretation is as follows: from a population of 48 plots, sampling 12 plots will result in an estimate of the mean which is within 10 percent of the true value (apart from a 1 chance in 20), if variability in the data is around 20 percent. If variability is greater (e.g., 30 percent), then the population size of 48 and sample size of 12 will result in an estimate of the mean which is within 15 percent (apart from a 1 chance in 20) of the true mean.

Similarly, for a sample of size 24, a population of size 72 was used (see Table 2). Then for a sample size of 24, the estimate of the mean was within 5 percent of the true value, if variability is only 15 percent (apart from a 1 chance in 20). If greater variation were present, for example, say 30 percent, then the estimate of the mean would be within 10 percent of the true mean, apart from a 1 chance in 20.

SAMPLING EQUIPMENT AND SAMPLE CONTAINER PREPARATION

Soil sampling kits, which contained a tulip bulb planter and a one-quart wide mouth glass jar for each sample, were supplied by Versar, Inc., a subcontractor to EPA. All sample containers and tulip bulb planters were cleaned by Versar,

Inc., prior to shipment to the sampling personnel. According to dioxin protocol, the cleaning procedure for sample containers was as follows:

1. Tap water rinse,
2. Deionized water rinse,
3. Pesticide-grade acetone rinse,
4. Pesticide-grade hexane rinse,
5. Air dried, and
6. Glassware baked at 150°C for at least two hours.

A similar cleaning method was followed for the sediment core sampler and the stainless steel spoons and tongs. However, they were not baked at 150° C. Subsequent to the air drying operations, the tulip bulb planters, spoons, and tongs were all wrapped in aluminum foil for transport to the field.

GENERAL SAMPLING PROTOCOL

Collection of Soil Samples

The procedures followed in obtaining soil and sediment samples are summarized below.

1. For randomly selected samples, the midpoint of each 50-foot by 50-foot randomly selected plot at the site was located using a 100-foot cloth tape.
2. At each sampling location, either directly or randomly selected, any grass covered areas were clipped (if necessary) prior to sampling. All sampling equipment was checked for cleanliness. A soil sample was collected by forcing a tulip bulb planter into the soil to a depth of 4 inches, using a clean planter at each sample location. A sufficient quantity of sample to fill a one-quart wide mouth sample container half full was obtained at each location.
3. The sample from each sample location was placed into a large clean, unused, disposable aluminum foil pan. Stones, roots, twigs, grass,

- and other debris were discarded with a clean pair of tweezers. The "screened" sample was placed into the appropriate sample container.
4. One duplicate sample was obtained for every 12 samples collected.
 5. All necessary field data forms were completed for the sample and identifying labels were attached to the container. Duplicate samples were labeled with an individual sample code, but not identified as a duplicate. All sample transport containers were sealed in the field with a tamper-proof seal. Jar lids were taped securely. A chain-of-custody record was initiated for the sample set. The samples were then packed for shipment, along with the required field blanks and performance evaluation samples.
 6. Once a sample was collected, steps were taken to preserve the chemical and physical integrity of the sample during transport and storage prior to analysis. Soil samples were shipped to the laboratory at ambient temperature and kept away from direct sunlight until they were prepared for laboratory analysis. No other preservation was necessary.
 7. The EPA Sample Control Center was contacted and provided the pertinent information on the samples collected.
 8. The samples were shipped to the designated laboratory. Soil and sediment samples from Tier 3 sites were shipped to a Contract Laboratory Program (CLP) laboratory; samples from the Tier 5 and 7 sites were shipped to EPA's TROIKA laboratories. Samples shipped to the CLP laboratories will be analyzed to 1 part per billion; samples sent to TROIKA will be analyzed to 10 parts per trillion.

Collection of Sediment Samples

1. The midpoint of each 50-foot by 50-foot randomly selected grid at the site was located, using an electronic distance meter (EDM).
2. All sampling equipment was checked for cleanliness. The gravity core sampler was washed with lake water and wiped with a clean cloth between use at each sample point. The sediment sample was collected by dropping the corer from a near surface position into the lake bottom. A minimum of 500 grams of sediment (enough to fill the

one-quart wide mouth containers half full) was obtained at each sample location.

3. The sediment sample was discharged from the corer into a large clean, unused, disposable aluminum foil pan. Following settling of the sediment, the water was poured off the sample and any stones or other foreign materials were removed using a clean stainless steel spoon. The remaining sediment was then placed into the appropriate sample containers.

The subsequent steps were the same as those for collecting soil samples, which are itemized in Nos. 4 through 8, in the previous section.

SYNOPSIS OF SAMPLING EPISODES

The sample collection episodes were conducted during September 1984 at all sites. Table 3 shows the latitude and longitude coordinates for each site and also indicates the number of samples collected per site.

A total of 116 soil samples and 31 sediment samples was collected in Region I as part of this program. Each sample location is shown in Appendix B. A brief summary of each episode is presented below. Any variances from the general sampling protocol or any deviations from the sampling plans have been incorporated into these summaries.

Pittsfield, Massachusetts Area

One soil sample from each of nine sites was collected during the sampling episode in this area. Figures B-1 through B-9 in Appendix B show each sample location. During the reconnaissance visit, the previous pesticide sample locations (NSMP) were identified at all sites except those located in the State Forest, and were used as sample points for this episode. The sample location in the State Forest could not be accurately determined; therefore, a

TABLE 3
SAMPLING SITE LOCATIONS

Tier	Site Name	Location	Site Coordinates Lat. Long.	No. Sampling Points	No. Duplicate Samples	Total No. of Samples	Episode Case No.	Type of Sample	Sample No.(s)	Potential Dioxin Source
7	Sewage Treatment Plant	Pittsfield, MA	42°23'22" 73°14'54"	1	0	1	2261	Soil	DA000301	Background
	198 Union St.	Pittsfield, MA	42°27'14" 73°15'22"	1	0	1	2261	Soil	DA000302	Background
	Sykes Mountain Rd.	Pittsfield, MA	42°24'05" 73°11'50"	1	0	1	2261	Soil	DA000303	Background
	Berry Pond Circuit Rd.	Pittsfield, MA	42°29'28" 73°19'13"	1	0	1	2261	Soil	DA000304	Background
	255-257 Merrill Rd.	Pittsfield, MA	42°27'23" 73°13'03"	1	0	1	2261	Soil	DA000305	Background
	53 Yarmouth St.	Pittsfield, MA	42°29'32" 73°14'21"	1	0	1	2261	Soil	DA000306	Background
	44 Dexter Ave.	Pittsfield, MA	42°26'17" 73°14'20"	1	0	1	2261	Soil	DA000307	Background
	57 Winter St.	Dalton, MA	42°27'06" 73°11'27"	1	0	1	2261	Soil	DA000308	Background
	Swamp Rd.	Lanesborough, MA	42°29'29" 73°12'27"	1	0	1	2261	Soil	DA000309	Background
7	205 Scarborough St.	Hartford, CN	41°47'05" 72°42'30"	1	0	1	2262	Soil	DA000401	Background
	Jennings Rd.	Hartford, CN	41°47'09" 72°39'13"	1	0	1	2262	Soil	DA000402	Background
	Washington St.	Hartford, CN	41°45'39" 72°40'59"	1	0	1	2262	Soil	DA000403	Background
	Copper Hill Rd.	Hartford, CN	42°01'07" 72°44'53"	1	0	1	2262	Soil	DA000404	Background
	Russell Rd.	E. Granby, CN	41°56'40" 72°42'13"	1	0	1	2262	Soil	DA000405	Background
	Longhill Rd.	Andover, CN	41°45'50" 72°22'38"	1	0	1	2262	Soil	DA000406	Background
	Hayden Station Rd.	Windsor, CN	41°53'27" 72°37'50"	1	0	1	2262	Soil	DA000407	Background
	Old Poquonock Rd.	Windsor, CN	41°53'17" 72°41'42"	1	0	1	2262	Soil	DA000408	Background
7	Route 2A	Lunenburg, MA	42°35'50" 71°41'55"	1	0	1	2263	Soil	DA000501	Background
	Billings/Richardson Rds.	Fitchburg, MA	42°37'28" 71°48'29"	1	0	1	2263	Soil	DA000502	Background
	112 Sheldon Rd.	Fitchburg, MA	42°36'10" 71°50'20"	1	0	1	2263	Soil	DA000503	Background
	Klondike Ave.	Fitchburg, MA	42°35'25" 71°46'40"	1	0	1	2263	Soil	DA000504	Background
	South St.	Fitchburg, MA	42°34'40" 71°48'00"	1	0	1	2263	Soil	DA000505	Background
	29 Vine St.	Fitchburg, MA	42°33'50" 71°49'08"	1	0	1	2263	Soil	DA000506	Background
5	Lake Abenaki	Thetford, VT	43°50'00" 72°14'11"	21	2	23	2270	Sediment	DA000901-DA000923	Silvex
5	Clara Lake	Whitingham, VT	42°47'52" 72°52'40"	21	2	23	2271	8 Sediment 15 Soil	DA001001-Da001023	Silvex
5	CMP R-O-W	Yarmouth, ME	43°47'08" 70°11'46"	21	2	23	2331	Soil	DA001101-DA001123	2,4,5-T
5	B&A R-O-W	Grindstone, ME	45°42'39" 68°36'43"	21	2	23	2332	Soil	DA001201-DA001223	2,4,5-T
3	J. Hubbard	Nashua, NH	42°45'16" 71°28'05"	8	1	9	3331	Soil	DA001301-DA001309	Hexachlorophene
3	Carroll Products	Wood River Jct., RI	41°26'21" 71°41'27"	21	2	23	3332	Soil	DA001401-Da001423	2,4,5-T

sampling point located at the Berry Pond Circuit Road was selected (see Figure B-4). No variance from the general sampling protocol was required during this sampling episode.

Hartford, Connecticut Area

Eight soil samples were collected from this area during the sampling episode. During the reconnaissance visit, the previous pesticide sampling (NSMP) locations were identified as shown in Figures B-10 through B-17 for sampling during this effort. Since no extenuating field circumstances were encountered, the general sampling protocol was followed on these sites.

Fitchburg, Massachusetts Area

Six soil samples were collected from points in this area sampled during the former pesticide study (NSMP). The locations were identified as shown in Figures B-18 through B-23 during the reconnaissance visit. No variance from the general sampling protocol occurred.

Lake Abenaki

Field locations of specific sampling points at this site were determined by using an electronic distance meter (EDM) placed on the shore as shown in Figure B-24. Using a two-way radio, the EDM operator directed the sampling crew to each of 21 sample points. The 23 sediment samples (including two duplicate samples) were collected according to the required sampling protocol.

Clara Lake

Because the water level in Clara Lake had been lowered in 1982, both sediment and soil (former lake bottom) samples were collected on this site. The number of each type of sample was based on the proportion of existing lake area to former lake area. As a result, eight sediment and 15 soil samples, as shown in Figure B-25 were collected. The collection of these samples was in conformance with the required sampling protocol outlined above.

Central Maine Power Co. Right-of-Way

The 23 soil samples on this site were collected following the steps outlined in the general sampling protocol. The location of four sample points (Samples DA001107, DA001108, DA001115, DA001117 shown in Figure B-26 of Appendix B) had to be altered due to specific site conditions. The sampling location of Sample DA001107 was moved 10 feet north from the center of the grid due to a bedrock outcrop in the area. Sample DA001108 was collected in a suspected spray location which was 6 feet north and 2 feet west of the center of the grid. The location of Samples DA001115 and DA001117 were changed since the center of their respective grids fell within a maintenance roadway on the site.

Bangor and Aroostook Railroad Right-of-Way

Twenty-three soil samples were also collected at this site. The locations of two sampling points were moved beyond the railroad ballast to native soil. Samples DA001203 and DA001211 were collected 13 feet from the center of the track rather than six feet as intended prior to sampling. The revised locations for these two samples are shown in Figure B-27. The remaining 21 samples were all collected within the ballast or subgrade. Due to the large number of stones in this area, samples were collected from the upper 4 inches of material by using large stainless steel spoons rather than the tulop bulb planters. No other modifications to the sampling procedures were necessary at this site.

J. Hubbard, Inc.

Nine soil samples as shown in Figure B-28 were collected at this site following sampling protocol. Fewer samples were collected at J. Hubbard than the other sites in this program due to the limited open soil areas available for sampling. The limited size of the alcohol operation conducted on this site was also a determining factor in reducing the number of samples. Sampling crew members and EPA personnel agreed that samples should be collected from areas which were potentially impacted due to spills or disposal operations.

Carroll Products, Inc.

Twenty-three samples were collected at this site. Eighteen soil samples were collected following the guidelines of the general sampling protocol. Five soil samples were obtained in the area designated as the former wet lagoon using a modified procedure. The sample locations are shown in Figure B-29. The lagoon area functioned as a disposal area from 1976 until 1983. The amount of sediment collected in that area between 1976 (when the 2,4,5-T was repackaged at the site) and now cannot be accurately predicted. Therefore, soil (dried lagoon bottom materials) was collected from two depths; 0 to 4 inches and 4 to 8 inches. A clean tulip bulb planter was used in collecting each sample.

CHAIN-OF-CUSTODY PROCEDURES

To ensure the integrity of the samples, once they were collected, an accurate written record of possession, a chain-of custody, was maintained. The chain-of-custody traces possession of the sample from the moment of its collection until its analysis. Three types of chain-of-custody documents were used during this program: sample labels, chain-of-custody records, and custody seals.

A sample label was completed and securely attached to each sampling container. The information recorded on the label included:

- o Sample Number - The unique identification number used to document that sample.
- o Episode Number - The unique number assigned by SCC to that sampling event.
- o Date - A six-digit number indicating the month, day and year of collection.
- o Preservation - Type used, if any.
- o Analytical Parameters - Listed as dioxin.

After attaching sample labels to and packaging each container, samples were shipped with an accompanying Chain-of-Custody Record in accordance with Agency enforcement requirements. For Agency purposes, a sample is considered to be in

an individual's custody if the following criteria are met: if it is in your possession or it is in your view after being in your possession; or if it was in your possession and then locked up or transferred to a designated secure area. The sampler is responsible for the care and custody of the samples collected until they are shipped.

A separate Chain-of-Custody Record (Figure 21) signed and dated by the sampler accompanied each sample shipment to the laboratory. The custody record was enclosed in plastic (with the Dioxin Shipment Record) and taped to the underside of the cooler lid. Shipping coolers were secured and sealed with a custody seal for shipment to the laboratory. Custody seals were placed across the cooler opening so that the cooler could not be opened without breaking the seal. At the laboratory, the representative accepting the incoming sample shipment signed and dated the Chain-of-Custody Record to acknowledge receipt of the samples, completing the sample transfer process. From that point on, the laboratory maintained its own internal records.

CHAIN OF CUSTODY RECORD

[illegible]

FIGURE 21

- E.C.JORDANCO

APPENDIX A

SITE DOCUMENTATION

LAKE ABENAKI
SITE DOCUMENTATION

PERMIT FOR APPLICATION OF CHEMICALS
INFORMATION RETURN FORM

In order for the Department of Water Resources to maintain records of the amount of chemicals placed in the waters of the State, the applicant must fill out the following form and return it to the Department.

Name of Applicant Swift Water Girl Scout Council
Address of Applicator 147 White wood Rd, Westwood, Mass, 02090
Body of Water Receiving Chemical Lake Abenakie Thetford, VT.

Please fill out:

Name of Chemical Applied 24D + Silver
Amount of Chemical Applied 15 Gals 24-D + 5 Gals Silver

Check one:



Chemical was applied on the following

date June 12, 1975



Chemical was not applied.

WR-51-2

PERMIT

PERMIT NO. AN 18 75

PERMIT TO APPLY CHEMICALS FOR THE CONTROL OF AQUATIC NUISANCES IN WATERS OF THE STATE

Permission is granted Swift Water Girl Scout Council, Inc. (its) agent, or agents, to apply the listed chemicals to the waters Lake Abenaki, located in Orange county, Thetford town, in conformance with all statements, agreements and restrictions imposed, made, or accepted by the applicant and/or applicator, in the application signed by Jennifer Plourde and _____, respective addresses P.O. Box 632, Clarmont, and _____, N.H.

This permit is issued subject to the following conditions:

1. Chemical will be employed on or about (date, year) June, 1975
2. Chemical used (name of chemical) Silvex
3. Number of pounds _____ or volume of chemicals _____ to be used. Percent or weight of active ingredient _____
4. Area to be treated 15 ~~600,000~~ acres and average depth _____ feet.
5. Use of the treated waters and those waters affected by the treatment will be prohibited during the chemical treatment and for _____ thereafter.

Additional Restrictions

This permit shall be invalid and the application of chemicals will be held a violation, if the applicant fails to comply with the permit terms, or fails to notify the permit issuing official and the following offices at least (7) days before the time of the chemical treatment.

FOR THE BOARD, DEPARTMENT OF WATER RESOURCES

Dated June 17, 1975

Name James W. Munn

Title Aquatic Biologist

Permit No. _____

APPLICATION FOR PERMIT TO APPLY CHEMICALS
FOR THE CONTROL OF AQUATIC NUISANCES
IN THE WATERS OF THE STATE OF VERMONT.

INSTRUCTIONS

Permit for application of chemicals to water for control of aquatic nuisances must be obtained from the Board of the Department of Water Resources except:

--When treatment of water supply waters is to be made by a duly constituted water supply agency, or,

--Those private waters which do not combine or effect a junction with natural surface waters.

Application should be completed accurately and submitted to the Department of Water Resources at least 30 days prior to proposed date of application of chemicals.

The Department of Water Resources has personnel available to assist in filling out an application.

To: Vermont Water Resources Board
State House, Montpelier, Vermont

DATE: May 28, 1975

Application is hereby made under the provisions of Title 10, Section 910 of the Vermont Statutes Annotated and the policies issued pursuant thereto for approval to apply chemicals for the control of aquatic nuisances.

Applicant Left Water Girl Scout Council, Inc. Date May 28, 1975

Check one or more
Owner(s) ☒ Riparian Owner(s) _____
Abutter(s) _____

Official Address
125 Merrill St.
Manchester, N.H. 03103

Name of waters
Lake Abenaki

Location (city, town, village)
Thetford
County Orange

Describe specific location of waters and parts thereof to be treated (attach sketch)
Area south of main dock area, approximately 15 acres

Is there a regular flowing outlet?	Can applicant control levels in body of water?	If yes, how?
Yes <input checked="" type="checkbox"/> No _____	Yes <input checked="" type="checkbox"/> No _____	<u>Boards over dam</u>

Proposed dates of treatment	Reason for treatment
<u>Between June 9, and June 11.</u>	<u>Control of nuisance aquatic vegetation</u>
<u>Retreatment as required</u>	

Number of acres desired to be treated	Are waters wholly contained on applicant's property?
<u>15</u>	Yes <input checked="" type="checkbox"/> No _____

Type of nuisance to be controlled: scum
emergent or submergent weeds, algae, blooms,
etc. Potamogeton species, Nymphaea odorata, nuphar,
and Typha

Chemical to be used:

Silvex

Name and Address of Applicator

Northeast Weed Control, Co., Inc.
147 Whitewood Rd.
Westwood, Mass. 02090

Check uses of body of water to be treated
Boating XX, bathing XX, private water
supply XX, livestock watering _____,
other _____.

In waters which may be affected by
the treatment, name all known fish

Bass, Perch

Are these waters stocked with trout by
the State? Yes _____ No ✓

Don't know _____

Are other riparian owners, both in the vicinity of the treated area and along
the outlet stream who may be required to restrict their water usages as a
result of the treatment, familiar with your plans? Yes X No _____, agreed
to restrictions? Yes X No _____.

IF REQUIRED:

Will the riparian owners be alerted in advance of the treat-
ment? Yes X No _____ Are you prepared to adequately
post the shore line of the area to be treated with suitable
warning signs? Yes X No _____ Will you submit water
for chemical analyses, both before and after treatment?
Yes X No _____.

The applicant and applicator guarantee that they will employ chemicals in con-
formance with all the conditions of the permit. In addition, the applicant
and applicator agree to accept the following conditions as a prerequisite to
the issuance of a permit; That the issuance of the permit is based on the
assumed accuracy of all statements presented by the applicant. Damage resulting
from the inaccuracy of any computations, improper application of the chemical,
or legal responsibility for the representations made in obtaining approvals or
releases, or failure to obtain approvals or releases from the riparian owners
likely to be affected is the joint and several responsibility of the applicant
and applicator. Applicant and applicator in consideration of the issuance of
the permit hereby applied for, hereby guarantee to hold the State harmless
from all suits, claims or causes of action arising out of the use of chemicals
pursuant to or occasioned by such permit.

Signature (Applicator)

David A. Coughlin

David A. Coughlin

Title

Applicator

Mailing Address

15 Beaver Pond Road
Proctor, Vt. 05765

Signature (Applicant)

Jennifer Plourde

Jennifer Plourde

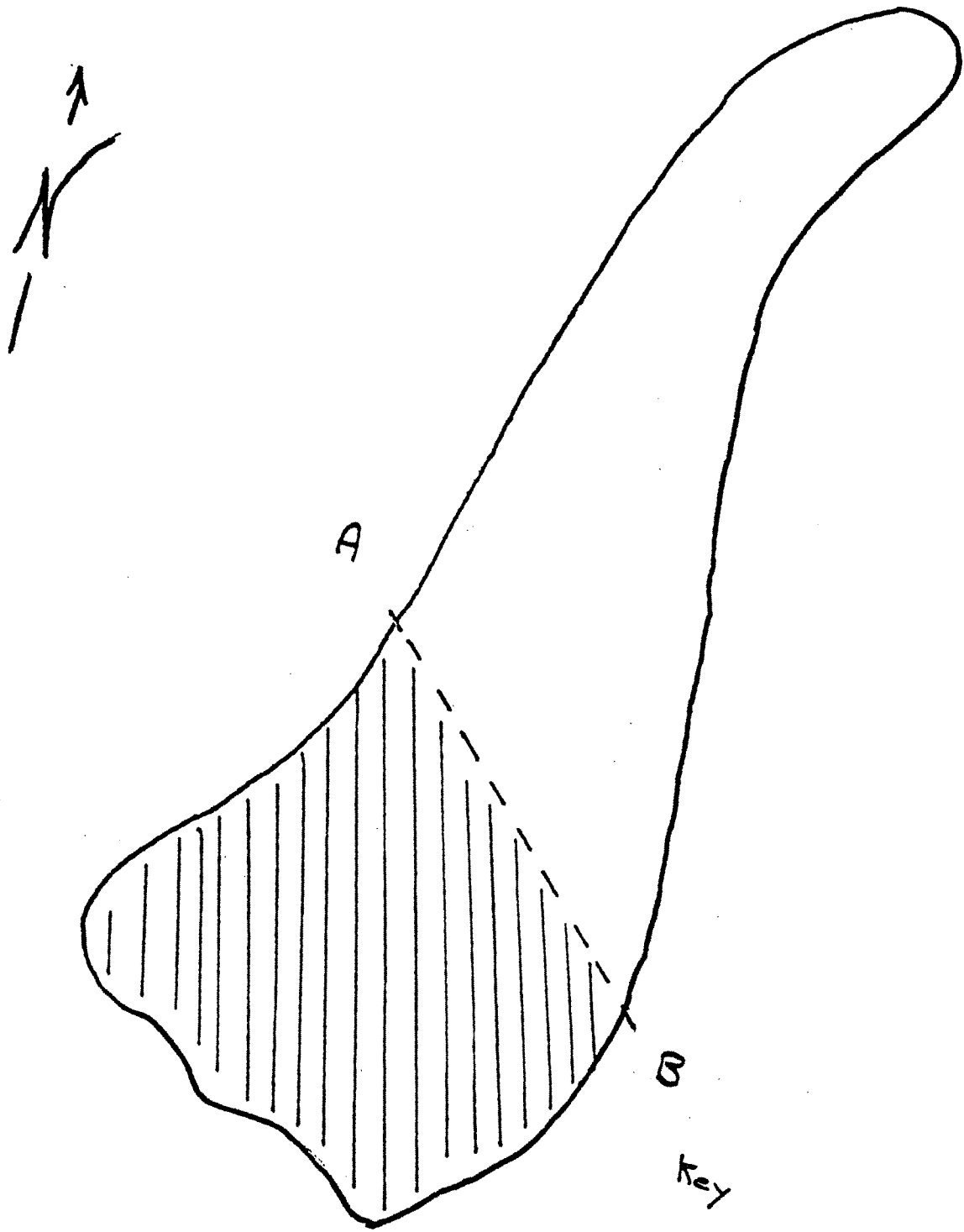
Title


Director, Camp Farnsworth

Mailing Address

P.O. Box 632
Clarmont, N. H.

Lake Abenaki
Thetford, Vt.



Key
Treatment area = 

PROJECT DETAILS

- (1) Name of Applicant *Swift Center Hill Scout Council, et.*
- (2) Location of Body of Water *Thetford*
- (3) Name of Body of Water *Lake Albemarle*
- (4) Number of Surface Acres to be Treated *15*
- (5) Volume of Water to be Treated
- (6) Aquatic Vegetation Present *Potamogeton Species, Nymphaea Odor
Nuphar and Typha*
- (7) Name of Chemical to be Used *Silvex*
- (8) Application Date *June, 1975*
- (9) Number of Pounds of Active Ingredient
- (10) Total Number Pounds of Chemical
- (11) Application Method

FOR DEPARTMENT USE ONLY

(12) Chemical Data

pH	_____	Color	_____
Total Alkalinity	_____	Turbidity	_____
Total Acidity	_____		
Hardness	_____		

- (13) Name of Applicator
- (14) Proposed Date of Treatment
- (15) Recommendations *- No retreatment
2.m.*
- (16) Permit Number
- (17) Control Obtained

WR-50

Department Routing:

1. Department of Agriculture
Remarks:

RECEIVED
JAN 5 8 27 AM '75
DEPT. OF AGRICULTURE

☒ APPROVED ☐ DISAPPROVED

J. L. Scott, Director of Division of Plant Industry
(Signature & Title)
Sent to Control

2. Department of Forests & Parks
Remarks:

retreatment should not be
necessary if applied correctly

☒ APPROVED ☐ DISAPPROVED

H. B. Taylor, Chief
(Signature & Title)
Forest Reserve Section

3. Department of Fish and Game
Remarks:

☒ APPROVED ☐ DISAPPROVED

W. L. ...
(Signature & Title)
Dir. Habitat of Control

CLARA LAKE
SITE DOCUMENTATION

PERMIT

PERMIT NO. AN 2 72

PERMIT TO APPLY CHEMICALS FOR THE CONTROL OF AQUATIC NUISANCES IN WATERS OF THE STATE

Permission is granted JOSEPH O. PROCTER (its) agent, or agents, to apply the listed chemicals to the waters Lake Clara, located in Windham county, Whitingham town, in conformance with all statements, agreements and restrictions imposed, made, or accepted by the applicant and/or applicator, in the application signed by Joseph O. Procter and _____, respective addresses 1053 Brush Hill Road and _____, Milton, MA

This permit is issued subject to the following conditions:

1. Chemical will be employed on or about (date, year) Summer 1972.
2. Chemical used (Name of chemical) Aquathol Plus.
3. Number of pounds 1.0 ppm or volume of chemicals _____ to be used. Percent or weight of active ingredient _____.
4. Area to be treated 18 (~~100~~ acres) and average depth _____ feet.
5. Use of the treated waters and those waters affected by the treatment will be prohibited during the chemical treatment and for _____ thereafter.

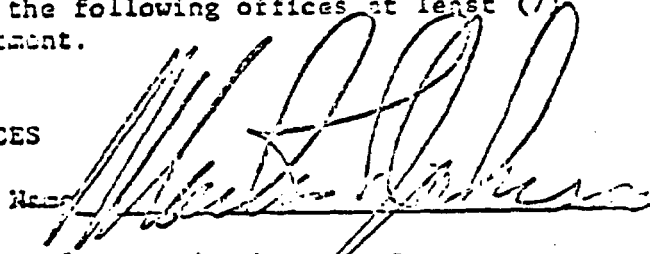
Additional Restrictions

Aquathol Plus contains Endothall (22.1%) which is a Class A pesticide and requires a licensed applicator.

This permit shall be invalid and the application of chemicals will be held a violation, if the applicant fails to comply with the permit terms, or fails to notify the permit issuing official and the following offices at least (7) days before the time of the chemical treatment.

FOR THE BOARD, DEPARTMENT OF WATER RESOURCES

Dated October 7, 1971



Title Commissioner of Water Resources

AGENCY OF ENVIRONMENTAL CONSERVATION
VT. DEPARTMENT OF WATER RESOURCES
MONTPELIER, VERMONT 05602

PERMIT

PERMIT NO. AN 20 73

PERMIT TO APPLY CHEMICALS FOR THE CONTROL OF AQUATIC NUISANCES IN WATERS OF THE STATE

Permission is granted Allied Biological Control Corporation(s) agent, or agents, to apply the listed chemicals to the waters Lake Clara, located in Windham county, Whitingham town, in conformance with all statements, agreements and restrictions imposed, made, or accepted by the applicant and/or applicator, in the application signed by Jason Cortell, Cons. Biologist, respective addresses Allied Biological Control Corporation, Wellesley Hills, Mass. 02181.

This permit is issued subject to the following conditions:

1. Chemical will be employed on or about (date, year) July 11, 1973.
2. Chemical used (name of chemical) Silvex.
3. Number of pounds 5 gallons or volume of chemicals to be used. Percent or weight of active ingredient .
4. Area to be treated (Spot treatment) (sq. ft. acres) and average depth feet. Follow-up of 1972 application.
5. Use of the treated waters and those waters affected by the treatment will be prohibited during the chemical treatment and for thereafter.

Additional Restrictions

This permit shall be invalid and the application of chemicals will be held a violation, if the applicant fails to comply with the permit terms, or fails to notify the permit issuing official and the following offices at least (7) days before the time of the chemical treatment.

FOR THE BOARD, DEPARTMENT OF WATER RESOURCES

Dated July 10, 1973

Name J. P. Cortell

Title Acting Commissioner of
Water Resources

WR-51

CENTRAL MAINE POWER CO.

SITE DOCUMENTATION



Central Maine Power Company

GENERAL OFFICE, EDISON DRIVE, AUGUSTA, MAINE 04336
(TWX NUMBER, CMP-AGUA 710-226-0195)

(207) 623-3521

June 25, 1984

Mr. David Courtemanch
State Environmental Protection Agency
State House
Augusta, Maine 04333

Dear Mr. Courtemanch:

SPRAYING COMPLETED ON SECTION 164 & 165 IN YARMOUTH + RT 95

<u>Poles</u>	<u>Date</u>	<u>Application</u>	<u>Chemical</u>	<u>Gallons Used</u>
2-6	11/6/78	Stump Spray	Tordon 101R	3
6-9	11/7/78	Stump Spray	Tordon 101R	4
9-14	11/8/78	Stump Spray	Tordon 101R	8
18-26	11/2/78	Basal Spray	*Tordon 155	200
26-29	11/1/78	Basal Spray	*Tordon 155	150
29-31	10/31/78	Basal Spray	*Tordon 155	200
31-35	10/30/78	Basal Spray	*Tordon 155	250

*Mixture for Tordon 155 = 5 qts. Tordon 155 to 100 gals.
kerosene.

Very truly yours,

L.J. Krieger, Jr.
Brush Control Coordinator

LJK/ed

BANGOR AND AROOSTOOK RAILROAD

SITE DOCUMENTATION

STATE OF MAINE

Inter-Departmental Memorandum Date August 14, 1984

To Robert L. Denny, Director

Dept. Board of Pesticides Control, AFRR

From M. Dawn Charest, Secretary

Dept. " " " "

Subject 1975-1983 Spray Reports re Maine Railroad's R-O-W Spraying

The following chemicals (herbicides) were used by Railroad Weed Control, Inc. during the spray seasons June through September 1975-1983 at various locations in Maine for brush/weed control for Maine railroads:

<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Amdon 101	Amdon 101	atratol 80W	ametryn
atratol 80W	atratol 80W	atrazine	atratol 80W
atrazine	atrazine	Banvel 720	atrazine
Banvel 720	Banvel 720	Dicamba	Banvel 720
Dicamba	Dicamba	Lo-Drift	Dicamba
MSMA	picloram	MSMA	Evik 80W
Picloram	Princep	Princep	Princep 80W
Princep	Simazine	Simazine	Simazine
Simazine	2,4 D	2,4 D	2,4 D Amine
Tordon 101		*2,4,5 - T (See attached)	
2,4 D			

<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>
accutrol	atratol 80W	atratol 80W	atratol 90%
atrazine	Banvel 720 (also 4WS)	atrazine	Banvel 720
Banvel 720	Dicamba	Banvel 720	Diquat
Dicamba	diuron (Karmex) 80W	dalapon (Dowpon M)	Ontrack 8E
Evik 80W	Evik 80W	Dicamba	Princep
Lo-Drift	Lo-Drift	Diquat	Weedar 64
Princep	Princep	DMA 4	X-77
Simazine	Spike 80W (tebuthiuron)	Evik 80W	
2,4 D	Surflan 75W (oryzalin)	glyphosate (Roundup)	
	2,4 D Amine	Lo-Drift	
	Weedar 64 (2,4 D)	Ontrack 8E (metolachlor)	
		Princep 80W	
		Simazine	
		Triclopyr (Garlon 3A)	
		X 77 (surfactant)	

<u>1983</u>
atratol 90%
atrazine
Banvel 720
Bromacil
Dicamba
Diquat dibromide
Diuron
Garlon
glyphosate (Roundup)
Ontrack 8E (metolachlor)
Princep 90%
Simazine
2,4 D Amine
Weedar 64

REPORT OF PESTICIDE APPLICATION

TO: BOARD OF PESTICIDES CONTROL, STATE OFFICE BLDG., ROOM 601, AUGUSTA, MAINE 04330

Application Date(s) *June, 1977* Town _____ Company *B & A RR*

Operator's Name *William J. Staples* Contracting Party *Railroad Weed Control*

Exact Location *See attached*

Size of area (Acres, road mileage, No. of shade trees, etc.) *Sprayed 16' pattern, 8' each side center of track*

Pesticide* *Atrazine, Simazine, 240, Dicamba* Dilution applied *40 gal/acre* Dosage applied *6#*

Atritol 80w, 3# Princep 80w, 1/2 gal Banvel 320, 2oz. to drift per acre

Method of application *Hyprail Truck with boom* Target organism *Weeds & Grass*

Disposition of unused material, empty containers, etc. *Remained on truck*

Difficulties encountered (equipment trouble, spillage, spray stream problem, leaks, weather) *None*

Treated 1075 acres applying 5160# actual atrazine, 2580# actual simazine, 537.5 gal Banvel 320 or 537.5# 240, 537.5# (2,4,5-T), 537.5# Dicamba

* Give common name of the actual chemical(s) and not some trade or manufacturer's name for it.

SUMMARY OF DAILY APPLICATION

Chemical Rates Per Acre: 64 3 34 1.300

Note: Insert Name of chemical in column heading

PRINTED IN U.S.A.

J. HUBBARD, INC.

SITE DOCUMENTATION

FORM 1479-A (REV. DEC. 1970)		DEPARTMENT OF THE TREASURY - INTERNAL REVENUE SERVICE Formula for Article Made with Specially Denatured Alcohol or Rum (See Instructions on back)																									
1. NAME (Also state former name, if changed recently) J. Hubbard Company, Inc.		2. DATE 6-26-73																									
3. ADDRESS (Number and Street, City, State, and ZIP Code) 94 Ash St., Nashua, N.H. 03060		4. INDUSTRIAL USE PERMIT NUMBER																									
5. TYPE OF OPERATION (Check applicable boxes) <input type="checkbox"/> MANUFACTURER <input type="checkbox"/> DISTRIBUTOR <input type="checkbox"/> BOTTLER		6. IS SPECIALLY DENATURED ALCOHOL OR RUM TO BE RECOVERED FROM THE MANUFACTURING PROCESS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO																									
7. NAME OF ARTICLE, OR USE OF ALCOHOL OR RUM IF AN ARTICLE IS NOT TO BE MANUFACTURED Jr. Hubbard's Surface Sanitizer and Air Deodorizer		8. CODE NUMBER 410																									
9. SPECIALLY DENATURED ALCOHOL OR RUM FORMULA USED (Specify denaturants in these formulas where selection is permitted; e.g., S.D.A. 38B) 41-B (XXXXXXXXXXXXXXXXXXXXXXX)		10. PROOF 190																									
11. FORMULA NOTE: Formula must total one gallon or multiple thereof and quantity of each ingredient in one gallon of the finished product should be stated, as in the following type of formula: Any action taken on this formula is in conjunction with the sample bearing same laboratory number as is stamped hereon, and the finished product manufactured under this formula must be in all respects exactly like the sample submitted for approval.		APPROVED AS CONFORMING TO 12. COMMERCIAL LABELING 26-CFR PART 201 Submit original, revised or additional labels for approval. ACTION (This space reserved)																									
11a. FORMULA IS <input checked="" type="checkbox"/> NEW <input type="checkbox"/> REVISED <input type="checkbox"/> RESUBMITTED		ATTACH LABELS ALONG DOTTED LINE																									
11b. STATE FORMULA (Describe process when required by regulations)																											
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>fl.oz.</th> <th>% Vol.</th> <th>% Wt.</th> </tr> </thead> <tbody> <tr> <td>SDA Alcohol</td> <td>100</td> <td>78.0</td> <td>69.30</td> </tr> <tr> <td>Water</td> <td>26</td> <td>20.3</td> <td>23.85</td> </tr> <tr> <td>Oils</td> <td>2</td> <td>1.7</td> <td>1.55</td> </tr> <tr> <td>Hexachlorophene</td> <td>(.024#/gal.)</td> <td></td> <td>0.30</td> </tr> <tr> <td>Totals</td> <td>128 gallon</td> <td>100%</td> <td>100%</td> </tr> </tbody> </table>					fl.oz.	% Vol.	% Wt.	SDA Alcohol	100	78.0	69.30	Water	26	20.3	23.85	Oils	2	1.7	1.55	Hexachlorophene	(.024#/gal.)		0.30	Totals	128 gallon	100%	100%
	fl.oz.			% Vol.	% Wt.																						
SDA Alcohol	100	78.0	69.30																								
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Hexachlorophene	(.024#/gal.)		0.30																								
Totals	128 gallon	100%	100%																								
EPA Reg. No. 10831-1 Mixture of oils Lavender Lavandin Pine Siberian Fir Origanum Thymol oil Rosemary Eucalyptus Terpinyl acetate																											
13. SIZES OF COMMERCIAL PACKAGES 3 oz., 3 oz., 15 oz., 32 oz., 64 oz., 5 gallon		14. SIGNATURE OF APPLICANT OR AUTHORIZED AGENT J. Hubbard Company, Inc. <i>Robert M. McLaughlin</i>																									
DO NOT WRITE BELOW THIS LINE																											
LABORATORY NUMBER SAMPLE 48635		ACTION <div style="border: 1px solid black; padding: 5px; display: inline-block;"> APPROVED </div> <i>R. P. G. L.</i> FOR THE DIRECTOR, Chemist																									
LABORATORY NUMBER OIL																											
ANALYST Diana Borabaugh																											
DATE 6-26-73																											

ATTACHMENT 1

Questionnaire # _____

1. Person to be contacted for information pertaining to this questionnaire:

<u>Name</u>	<u>Title</u>	<u>Telephone</u> (include area code)
<u>Donald Torres</u>	<u>President</u>	<u>603-882-3231</u>

2. Plant Name: J. Hubbard, Inc.

3. Plant Address: 94 Ash Street
Street
Nashua, New Hampshire 03061

City State Zip

Latitude/Longitude of Plant: 40 x 60
(If unknown, a full description of location for the purpose of plotting on U.S.G.S. maps.)

4. Company Name: J. Hubbard, Inc.

5. Company Address: 94 Ash Street
Street

Nashua New Hampshire 03061
City State Zip

6. If this plant was acquired or leased from another owner, identify date and lessor or former owner below.

Name J. Hubbard Company
Month May Year 1975

7. Is your company currently, or ever been, involved in formulating (blending), repackaging, or otherwise handling prior to distribution any pesticides containing the following compounds?

a) 2,4,5-T, salts & esters	Yes _____	No _____
b) silvex, salts & esters	Yes _____	No _____
c) erbon, salts & esters	Yes _____	No _____
d) ronnel, salts & esters	Yes _____	No _____
e) hexachlorophene, salts & esters	Yes <u>X</u>	No _____
f) isobac 20, salts & esters	Yes _____	No _____
g) 2,4,5-TCP, salts & esters	Yes _____	No _____

Note: Actual chemical names for these seven compounds are listed in Table 1.

IF "NO" FOR 7a THRU 7g, CHECK THE ITEM BELOW WHICH BEST DESCRIBES YOUR FACILITY, AND STOP HERE. DETACH AND RETURN PAGE 1 ONLY.

- 1) _____ Sales Office
2) _____ Warehouse
3) X Other (Identify) Formulating- Blending

IF "YES" TO ANY OF 7a THRU 7g PROCEED to the NEXT QUESTION.

NOTE: For Questions 8 through 17, add additional pages if necessary.

8a. Provide year(s) for these activities. (If plant was previously owned by another company include these years if known.)

	1	2	3
Compound*	Formulating (Blending)	Repackaging	Other
a. 2,4,5-T			
b. silvex			
c. erbon			
d. ronnel			
e. hexachlorophene	1975-1979		
f. isobac 20			
g. 2,4,5-TCP			

*Include salts & esters.

8b. Provide total quantities (in pounds) for any of the seven compounds (listed below) used in the activities identified above in 8a.

	1	2	3
Compound*	Formulating (Blending)	Repackaging	Other
a. 2,4,5-T			
b. silvex			
c. erbon			
d. ronnel			
e. hexachlorophene	50 lbs		
f. isobac 20			
g. 2,4,5-TCP			

*Include salts & esters.

9. Check the items that best describe the formulating (blending) operations at the plant at the end of 1982. If none, indicate by NA, where appropriate.

Compound*	In Operation	Temporarily or Seasonally Inactive	Permanently Ceased (Month/Year)
a. 2,4,5-T			
b. silvex			
c. erbon			
d. ronnel			
e. hexachlorophene			August 1979
f. isobac 20			
g. 2,4,5-TCP			

*Include salts & esters.

10. Plant age: 57 years

11. a. Does this plant generate waste (excluding sanitary waste)?
Yes _____ No x

IF NO, PLEASE STOP HERE AND RETURN PAGES 1 & 2 ONLY

CARROLL PRODUCTS, INC.

SITE DOCUMENTATION

LAWRENCE W. BIERLEIN, P.C.

LAW OFFICES
CANAL SQUARE
1054 THIRTY-FIRST STREET, N.W.
WASHINGTON, D.C. 20007

(202) 342-5250

May 1, 1984

CABLE: OBJECTIVE
TELEX: 89 2320 (WU)
440297 (ITT)

Mr. William J. Walsh
U.S. Environmental Protection Agency
60 Westview Street
Lexington, MA 02173

Dear Mr. Walsh:

Attached is the Carroll Products, Inc., response to your letter and the enclosed questionnaire of April 17.

As indicated in my enclosed letter of November 22, 1983, to Barbara McAllister, the company was not engaged in formulating or otherwise producing 2,4,5-TCP. The company bought the purified grade product from Dow and repackaged it into smaller units on two occasions in 1976.

Your questions 11-16 pertain to wastes, and these have been answered from the perspective of this limited 2,4,5-TCP operation.

Please let me know if you have any questions on the enclosure.

Sincerely,


Lawrence W. Bierlein

Enc.

ATTACHMENT 1

Questionnaire # _____

1. Person to be contacted for information pertaining to this questionnaire:

<u>Name</u>	<u>Title</u>	<u>Telephone</u> (include area code)
<u>Arthur Schwartz</u>	<u>Dir. of Chemical Operations</u>	<u>(401) 364-7731</u>

2. Plant Name: Carroll Products, Inc.

3. Plant Address: P. O. Box 66
Street
Route 91

Wood River Junction, RI 02894
City State Zip

Latitude/Longitude of Plant: _____
 (If unknown, a full description of location for the purpose of plotting on U.S.G.S. maps.)

4. Company Name: Carroll Products, Inc.

5. Company Address: Route 91
Street

Wood River Junction, RI 02894
City State Zip

6. If this plant was acquired or leased from another owner, identify date and lessor or former owner below.

Name Sun Chemical Corp., Fifth Avenue, New York, NY
 Month October Year 1971

7. Is your company currently, or ever been, involved in formulating (blending), repackaging, or otherwise handling prior to distribution any pesticides containing the following compounds?

a) 2,4,5-T, salts & esters	Yes _____	No _____
b) silvex, salts & esters	Yes _____	No _____
c) erbon, salts & esters	Yes _____	No _____
d) ronnel, salts & esters	Yes _____	No _____
e) hexachlorophene, salts & esters	Yes _____	No _____
f) isobac 20, salts & esters	Yes _____	No _____
g) 2,4,5-TCP, salts & esters	Yes <u>X</u>	No _____

Note: Actual chemical names for these seven compounds are listed in Table 1.

IF "NO" FOR 7a THRU 7g, CHECK THE ITEM BELOW WHICH BEST DESCRIBES YOUR FACILITY, AND STOP HERE. DETACH AND RETURN PAGE 1 ONLY.

1) _____ Sales Office
 2) _____ Warehouse
 3) _____ Other (Identify) _____

IF "YES" TO ANY OF 7a THRU 7g PROCEED to the NEXT QUESTION.

NOTE: For Questions 8 through 17, add additional pages if necessary.

8a. Provide year(s) for these activities. (If plant was previously owned by another company include these years if known.)

Compound*	1	2	3
	Formulating (Blending)	Repackaging	Other
a. 2,4,5-T			
b. silvex			
c. erbon			
d. ronnel			
e. hexachlorophene			
f. isobac 20			
g. 2,4,5-TCP		1976	

*Include salts & esters.

8b. Provide total quantities (in pounds) for any of the seven compounds (listed below) used in the activities identified above in 8a.

Compound*	1	2	3
	Formulating (Blending)	Repackaging	Other
a. 2,4,5-T			
b. silvex			
c. erbon			
d. ronnel			
e. hexachlorophene			
f. isobac 20			
g. 2,4,5-TCP		1090	

*Include salts & esters.

9. Check the items that best describe the formulating (blending) operations at the plant at the end of 1982. If none, indicate by NA, where appropriate.

Compound*	In Operation	Temporarily or	
		Seasonally Inactive	Permanently Ceased (Month/Year)
a. 2,4,5-T			
b. silvex			
c. erbon			
d. ronnel			
e. hexachlorophene			
f. isobac 20			
g. 2,4,5-TCP	N/A	N/A	1976*

*Include salts & esters.

*Facility was engaged in repackaging only.

10. Plant age: +35 years

*11. a. Does this plant generate waste (excluding sanitary waste)?

Yes X No

*See Cover Letter.

IF NO, PLEASE STOP HERE AND RETURN PAGES 1 & 2 ONLY

- 12b. Provide type of waste disposed, the amount disposed of per year, the waste hauler (when appropriate)* and the disposal location.

Type of Waste Disposed

(1) direct discharger: Yes _____ No _____

Name of Receiving Water _____

(2) indirect discharger -
publicly owned treatment works (POTW) _____ Yes _____ No

(a) Municipal Authority Name: _____

Address: _____

POTW Name: _____

Address: _____

(3) discharge to a privately owned treatment works _____ Yes _____ No

Name: _____

Address: _____

(4) Contract Hauled _____ Yes _____ No

Waste Hauler Name: _____

Address: _____

Disposal Location: _____

(5) Land Disposal: Yes _____ No _____

Disposal Location: _____

12c. Does this plant have a National Pollutant Discharge Elimination System (NPDES) permit? Yes _____ No _____

If YES, list the permit number and expiration date, and check the item that characterizes the wastewater discharge covered by the permit.

<u>Permit #</u>	<u>Expiration Date</u>	<u>Wastewater Discharge</u>
_____	_____	_____ Formulating Process*
		_____ Non-Formulating Process
		_____ Non-process wastewater

*See Page 2 for definition of process wastewater.

12d. If the NPDES permit has expired and has not been renewed, provide the NPDES number for your last permit and the plant's current NPDES application number, and check the items that characterized the wastewater discharge.

<u>Permit #</u>	<u>Expiration Date</u>	<u>Wastewater Discharge</u>
_____	_____	_____ Formulating Process*
		_____ Non-Formulating Process
		_____ Non-process wastewater
<u>NPDES application #</u>		

*See Page 2 for definition of process wastewater

- * 13. Does this facility generate solid waste which requires disposal?
Yes ☒ No ☐

*See Cover Letter.

If YES, complete rest of 13.

Provide type of solid waste disposal, the amount disposed of per year, the waste hauler (when appropriate)* & disposal location.

a) Contract Hauled:

1. Waste Hauler Name: Carroll Products, Inc.

Address: Route 91, Wood River Junction, RI 02894

2. Disposal Location: Saugus, MA

b) Land Disposal:

Disposal Location: _____

c) Incinerator:

X

1. Incineration Location: Refuse Energy Systems Co.

100 Salem Turnpike

Saugus, MA

2. Disposal Location of _____

Incineration Ash: Unknown

Amount of Waste Disposed

[illegible]

LAWRENCE W. BIERLEIN, P.C.

LAW OFFICES
CANAL SQUARE
1034 THIRTY-FIRST STREET, N.W.
WASHINGTON, D.C. 20007

(202) 342-5230

November 22, 1983

CABLE: OBJECTIVE
TELEX: 89 3320 (WU)
640297 (ITT)

Ms. Barbara McAllister
Environmental Protection Specialist
Compliance Section, Waste Management Div.
U.S. Environmental Protection Agency
John F. Kennedy Federal Building, Room 1903
Boston, MA 02203

Dear Ms. McAllister:

This is in response to the October 13 letter to Carroll Products from Merrill S. Hohman, having to do with 2,4,5-TCP. Your questions from Attachment I are answered in order:

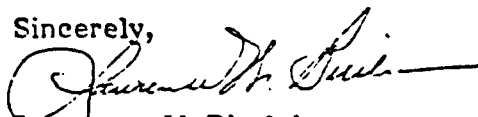
1. Mitchell Manufacturing Division of Carroll Products never manufactured this product. They purchased purified grade 2,4,5-Trichlorophenol from the Dow Chemical Company, repackaged it, and sold it on two occasions in 1976.
2. Mitchell Manufacturing bought purified grade, not technical grade, 2,4,5-TCP from Dow Chemical of Midland Michigan and sold it on only two occasions to Polaroid Corporation, 119 Windsor Street, Cambridge, MA 02139. No analyses were performed by this company.
3. None was manufactured.
4. There was no manufacturing done. Wastes were floor sweepings, gloves, aprons and similar handling equipment used in the repackaging of the material.
5. The wastes described above were not mixed with other materials.
6. The accumulated wastes were taken by the company on their own vehicle to Refuse Energy Systems Co., 100 Salem Turnpike, Saugus, MA 01906, for incineration.
7. A total of 230 pounds of wastes were sent for incineration in one trip, on 4/22/76. No wastes are in storage.

8. No tests were done.

9. We have no other data relating to 2,3,7,8-TCDD.

Please let me know if you have any further questions on this matter.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lawrence W. Bierlein", followed by a horizontal line.

Lawrence W. Bierlein
Counsel to Carroll Products, Inc.

APPENDIX B

SAMPLE LOCATION PLANS

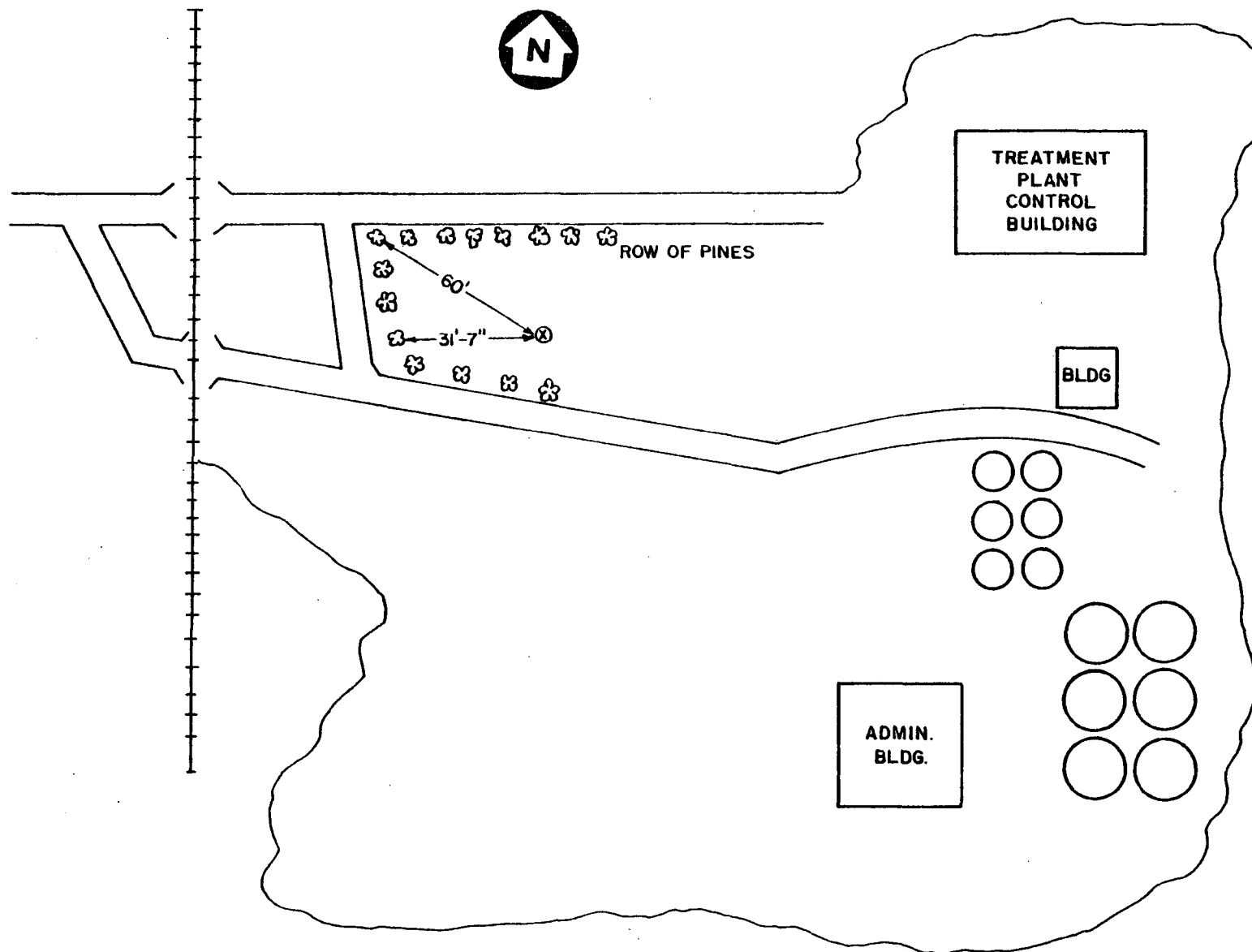


FIGURE B-1
SAMPLE DA000301 LOCATION
SEWAGE TREATMENT PLANT
PITTSFIELD, MA
NATIONAL DIOXIN STUDY
ECJORDANCO

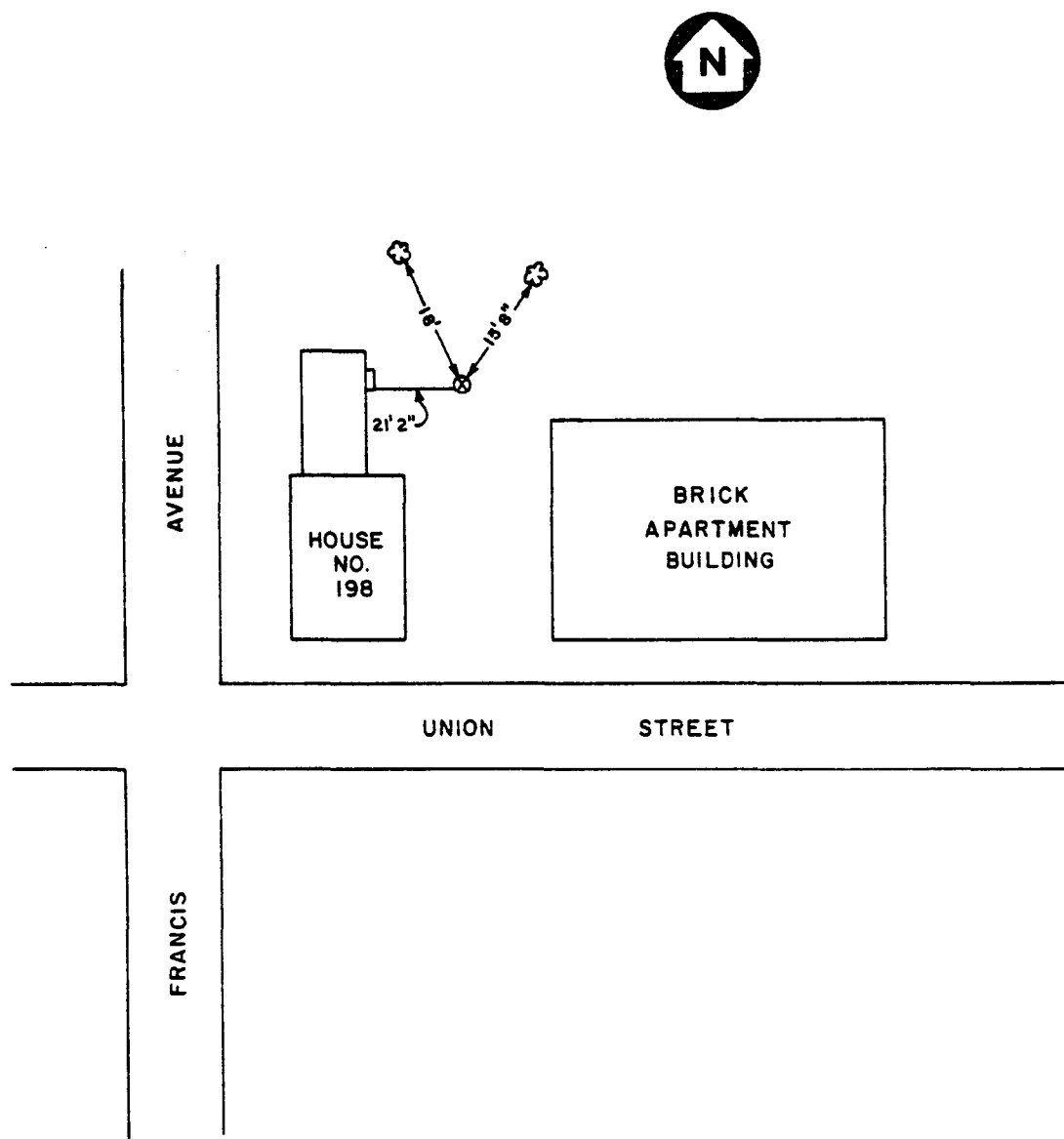


FIGURE B-2
SAMPLE DA000302 LOCATION
198 UNION ST.
PITTSFIELD, MA
NATIONAL DIOXIN STUDY
ECJORDANCO

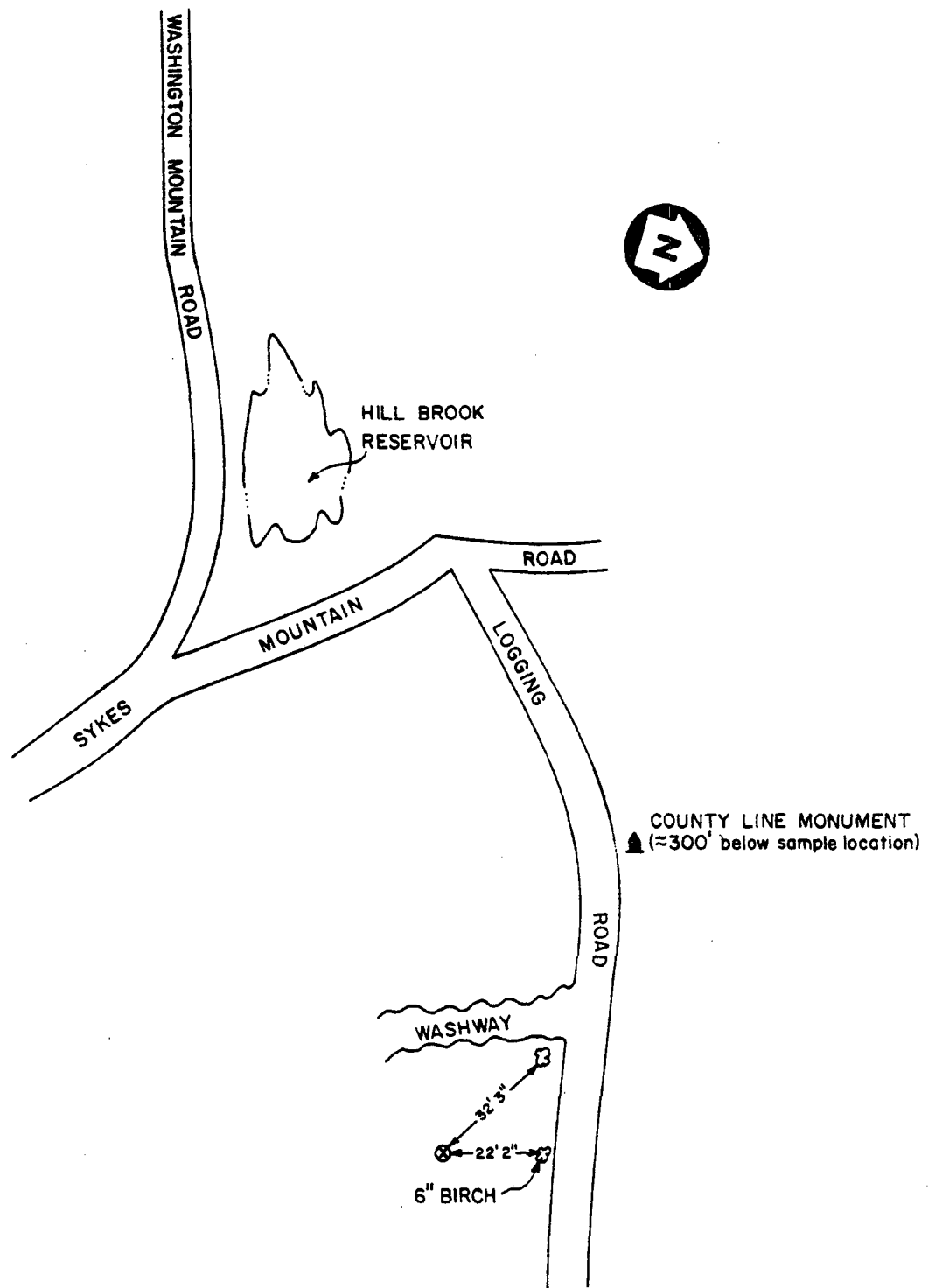
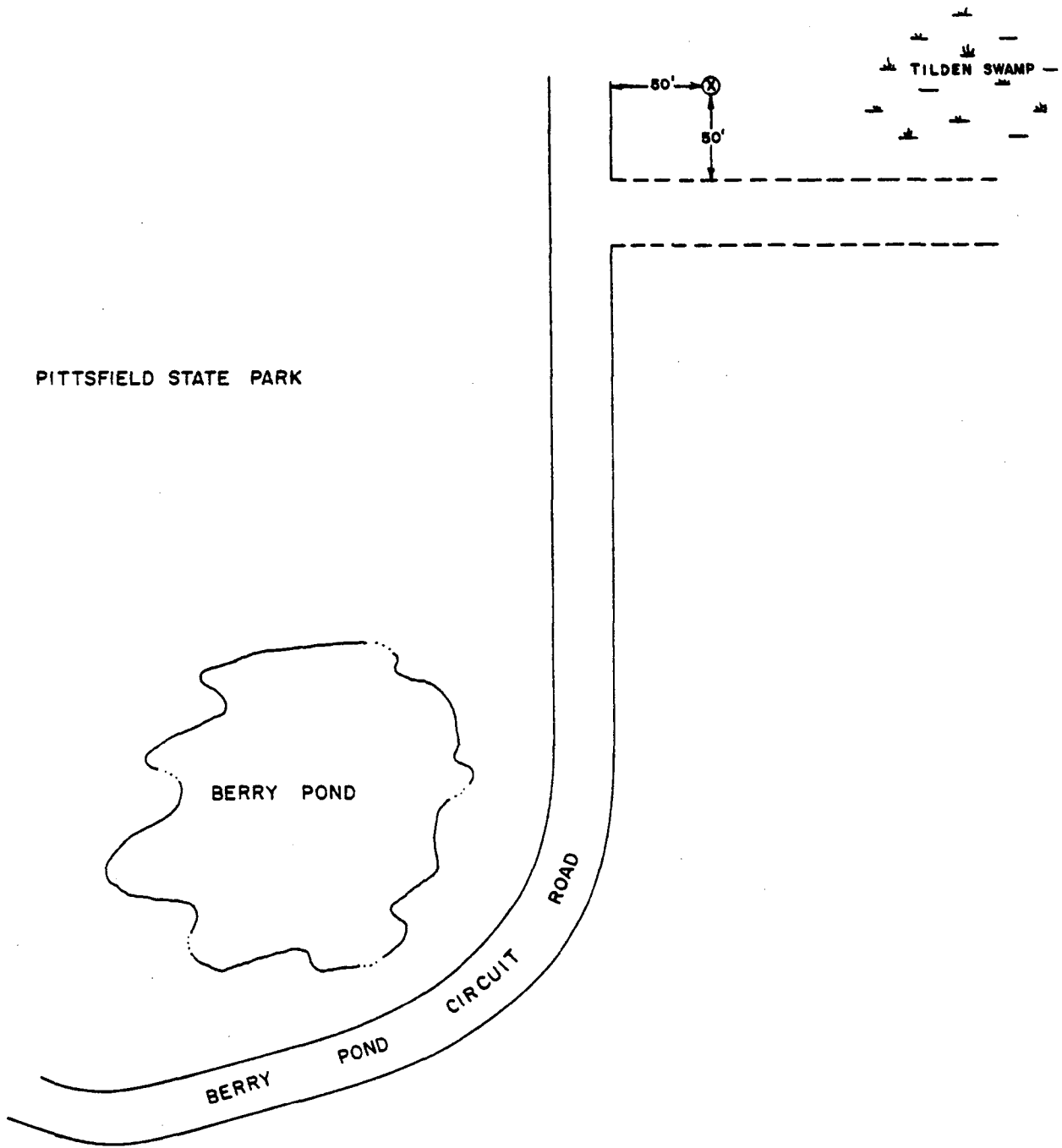


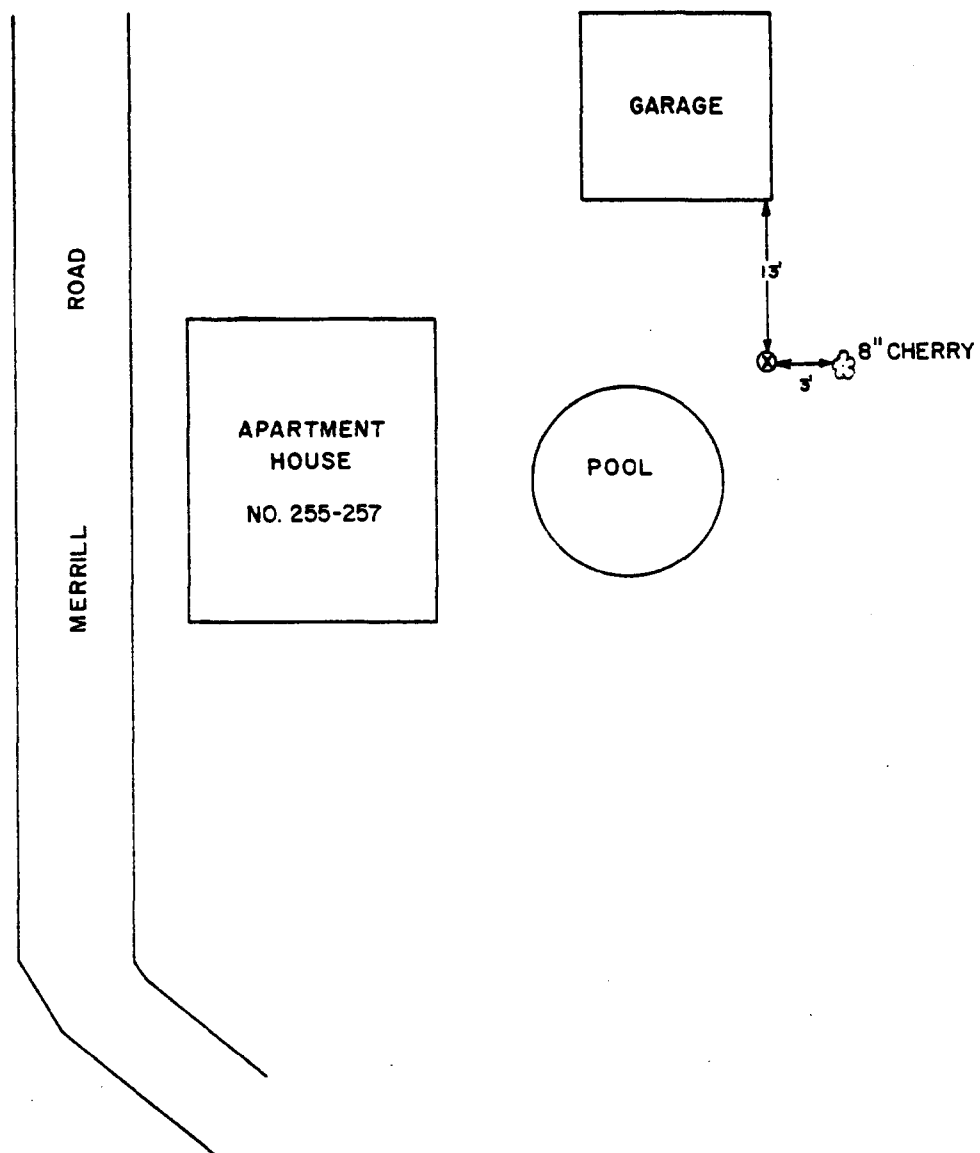
FIGURE B-3
SAMPLE DA000303 LOCATION
SYKES MOUNTAIN RD.
PITTSFIELD, MA
NATIONAL DIOXIN STUDY

EC.JORDANCO



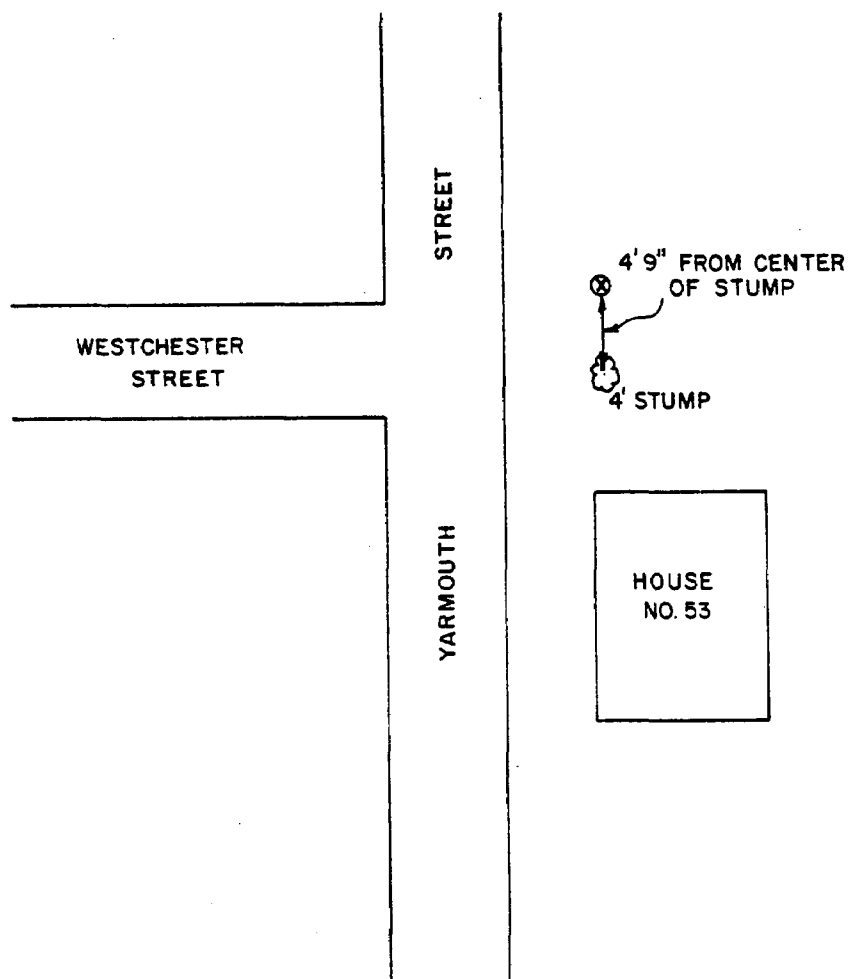
NOT TO SCALE

FIGURE B-4
SAMPLE DA000304 LOCATION
BERRY POND CIRCUIT RD.
PITTSFIELD, MA
NATIONAL DIOXIN STUDY
EC.JORDANCO



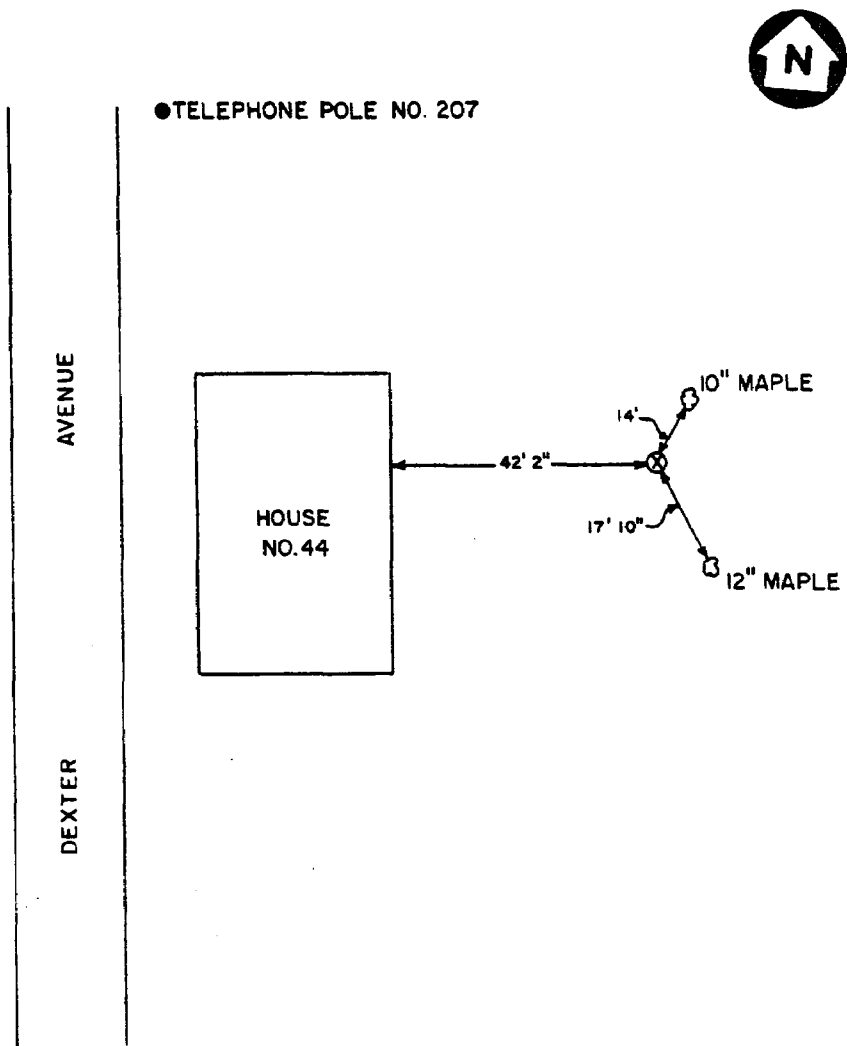
NOT TO SCALE

FIGURE B-5
SAMPLE DA000305 LOCATION
255-257 MERRILL RD.
PITTSFIELD, MA
NATIONAL DIOXIN STUDY
ECJORDANCO



NOT TO SCALE

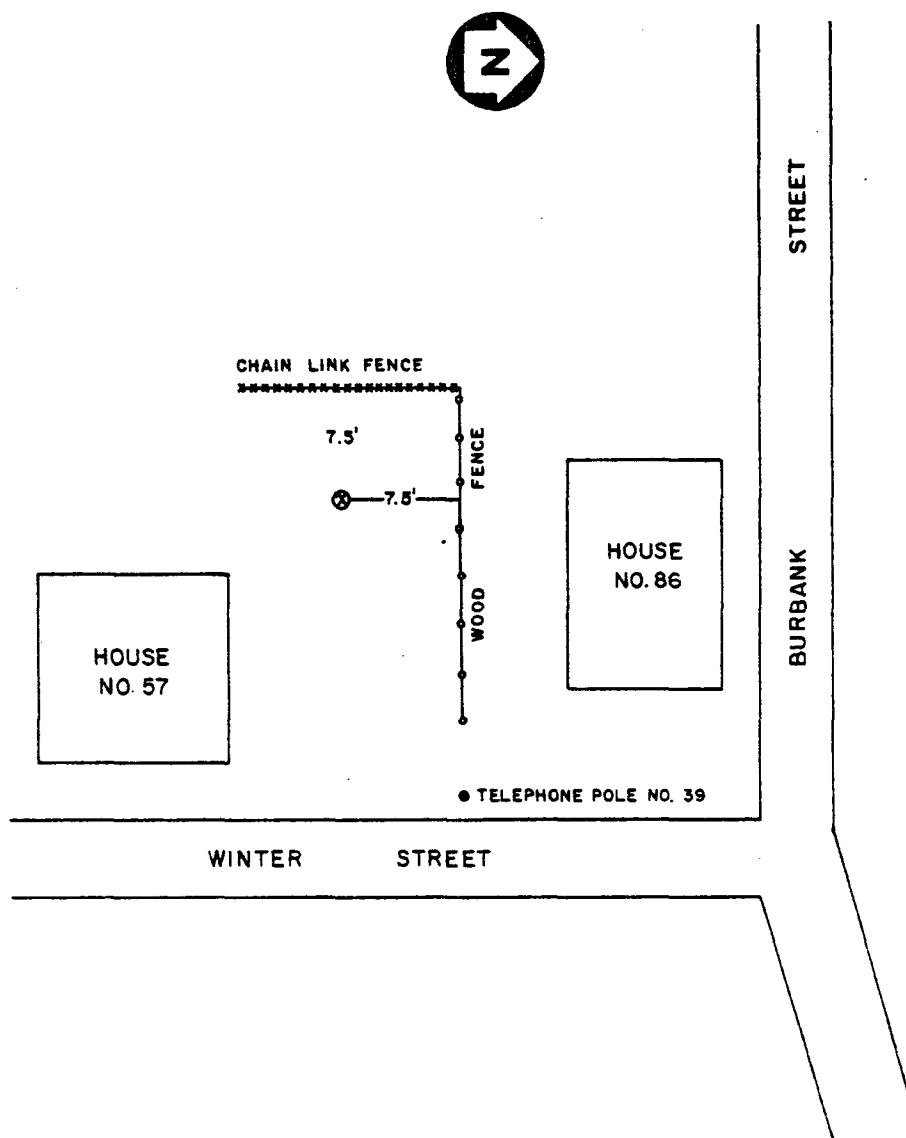
FIGURE B-6
SAMPLE DA000306 LOCATION
53 YARMOUTH ST.
PITTSFIELD, MA
NATIONAL DIOXIN STUDY
EC.JORDANCO



NOT TO SCALE

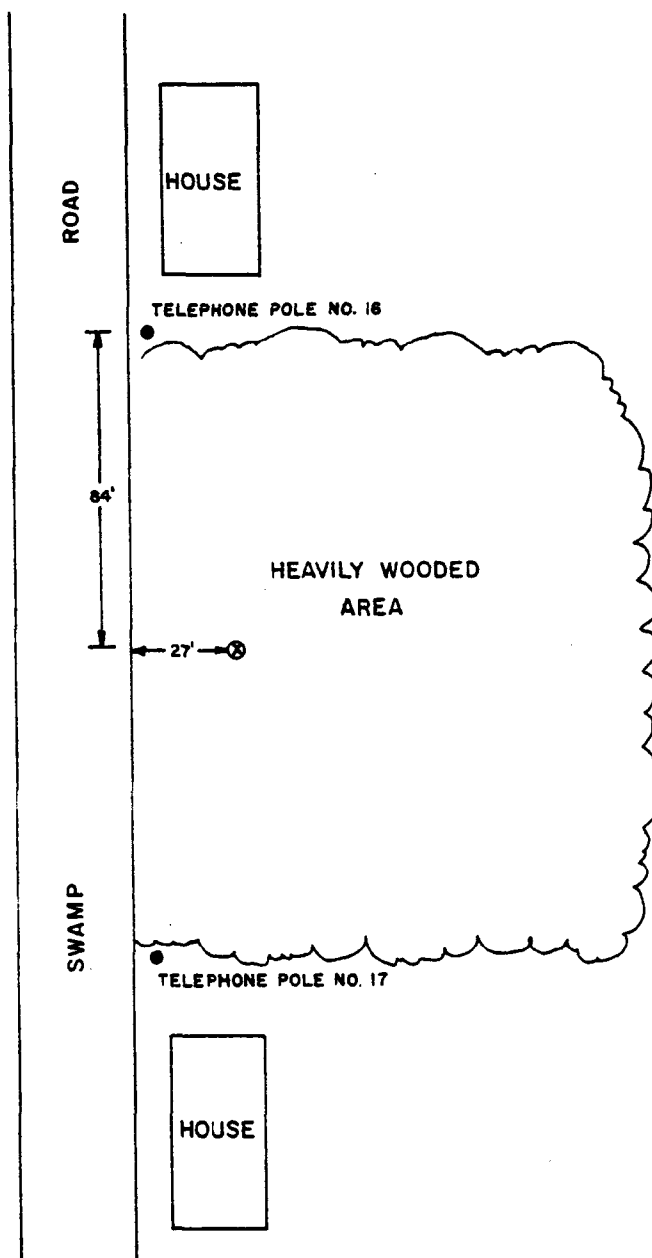
FIGURE B-7
SAMPLE DA000307 LOCATION
44 DEXTER AVE.
PITTSFIELD, MA
NATIONAL DIOXIN STUDY

EC.JORDAN CO



NOT TO SCALE

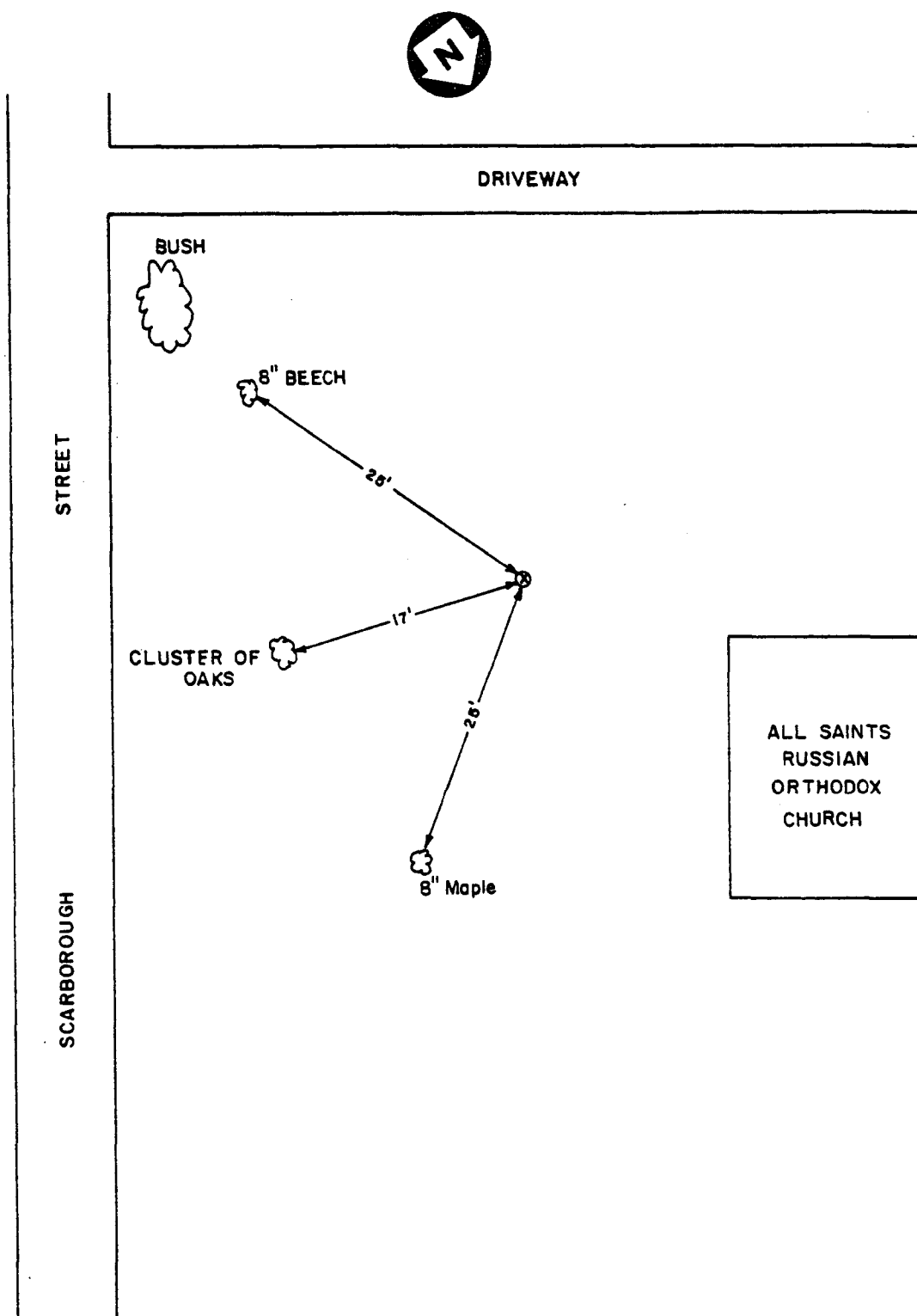
FIGURE B-8
SAMPLE DA000308 LOCATION
57 WINTER ST.
DALTON, MA
NATIONAL DIOXIN STUDY
EC.JORDANCO



NOT TO SCALE

FIGURE B-9
SAMPLE DA000309 LOCATION
SWAMP RD.
LANESBOROUGH, MA
NATIONAL DIOXIN STUDY

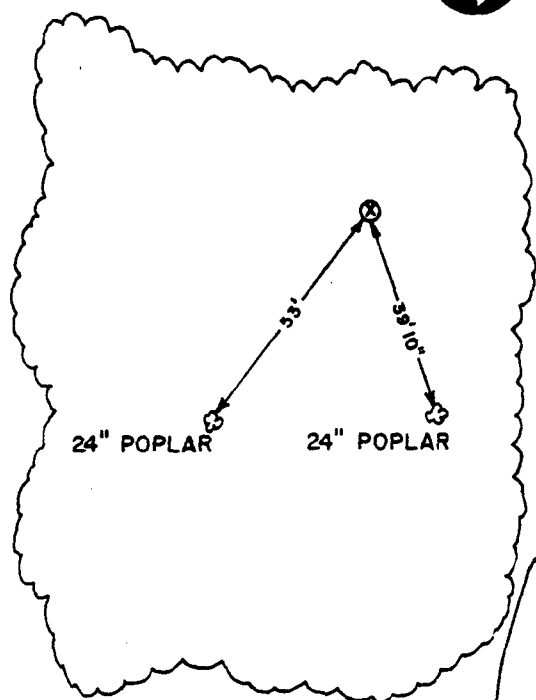
EC.JORDAN CO



NOT TO SCALE

FIGURE B-10
SAMPLE DA000401 LOCATION
205 SCARBOROUGH ST.
HARTFORD, CT
NATIONAL DIOXIN STUDY

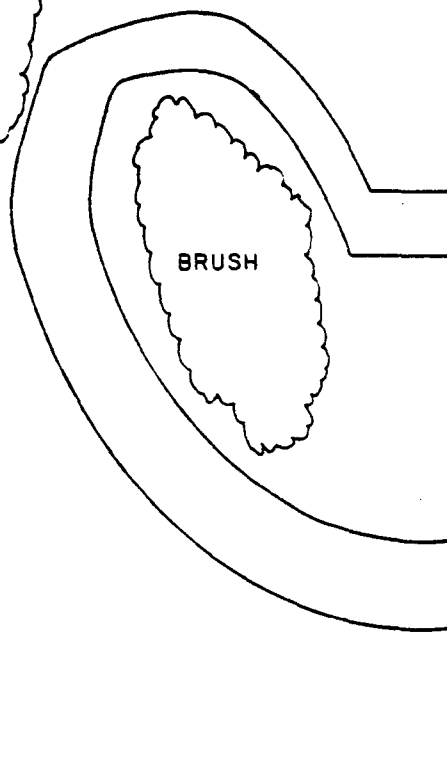
EC.JORDANCO



PUBLIC
WORKS
DEPT.

ROAD

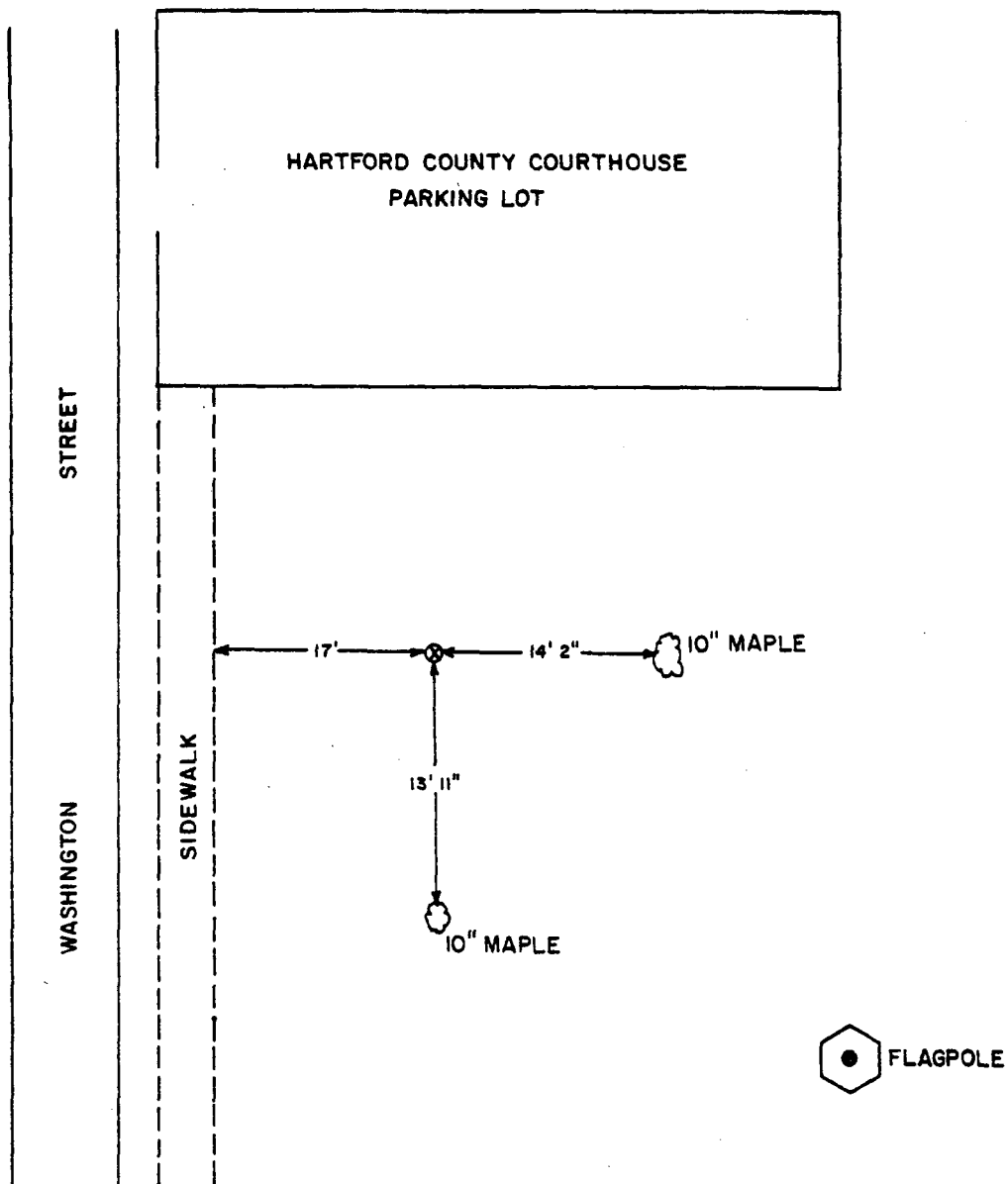
HARTFORD
POLICE
DEPT.



JENNINGS

NOT TO SCALE

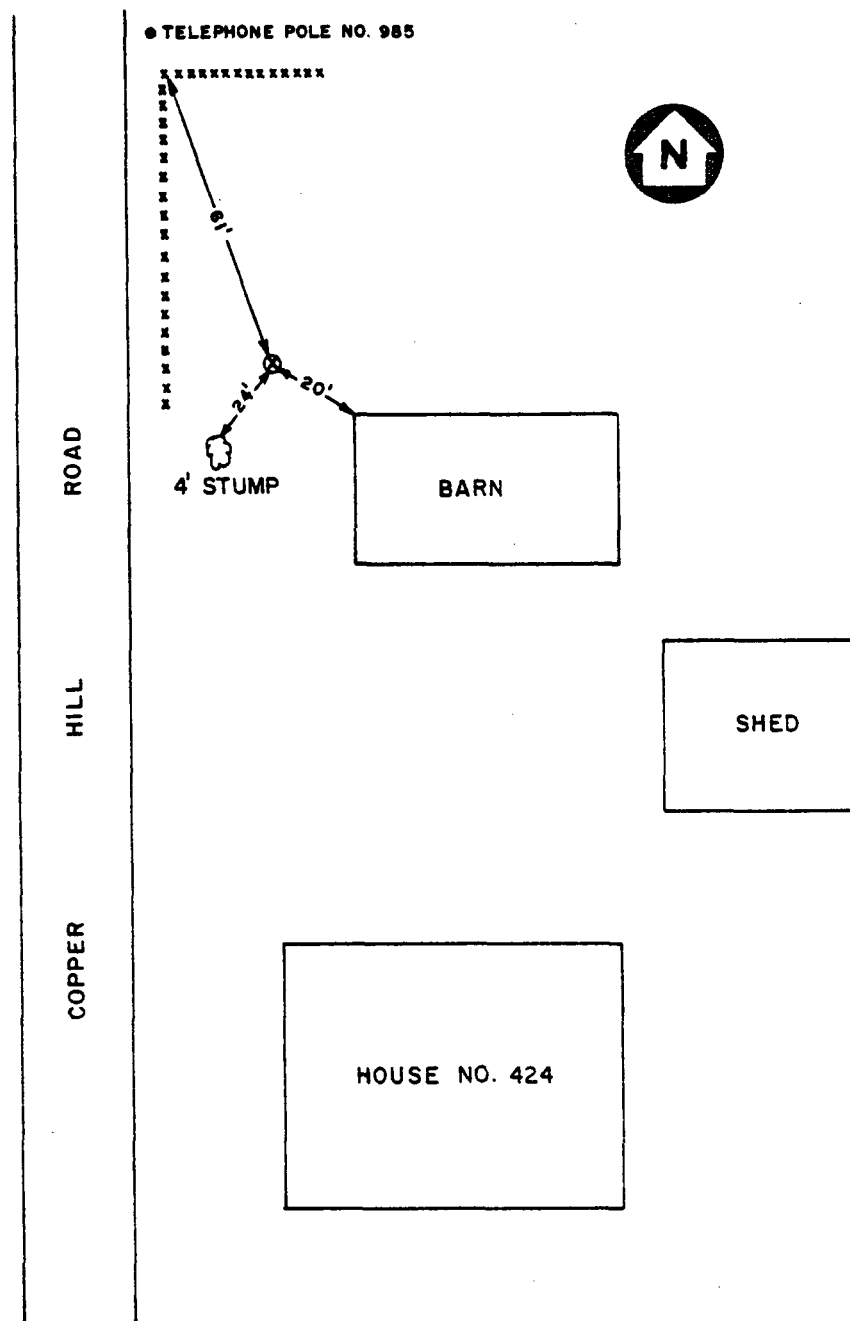
FIGURE B-11
SAMPLE DA000402 LOCATION
JENNINGS RD.
HARTFORD, CT
NATIONAL DIOXIN STUDY
EC.JORDANCO



NOT TO SCALE

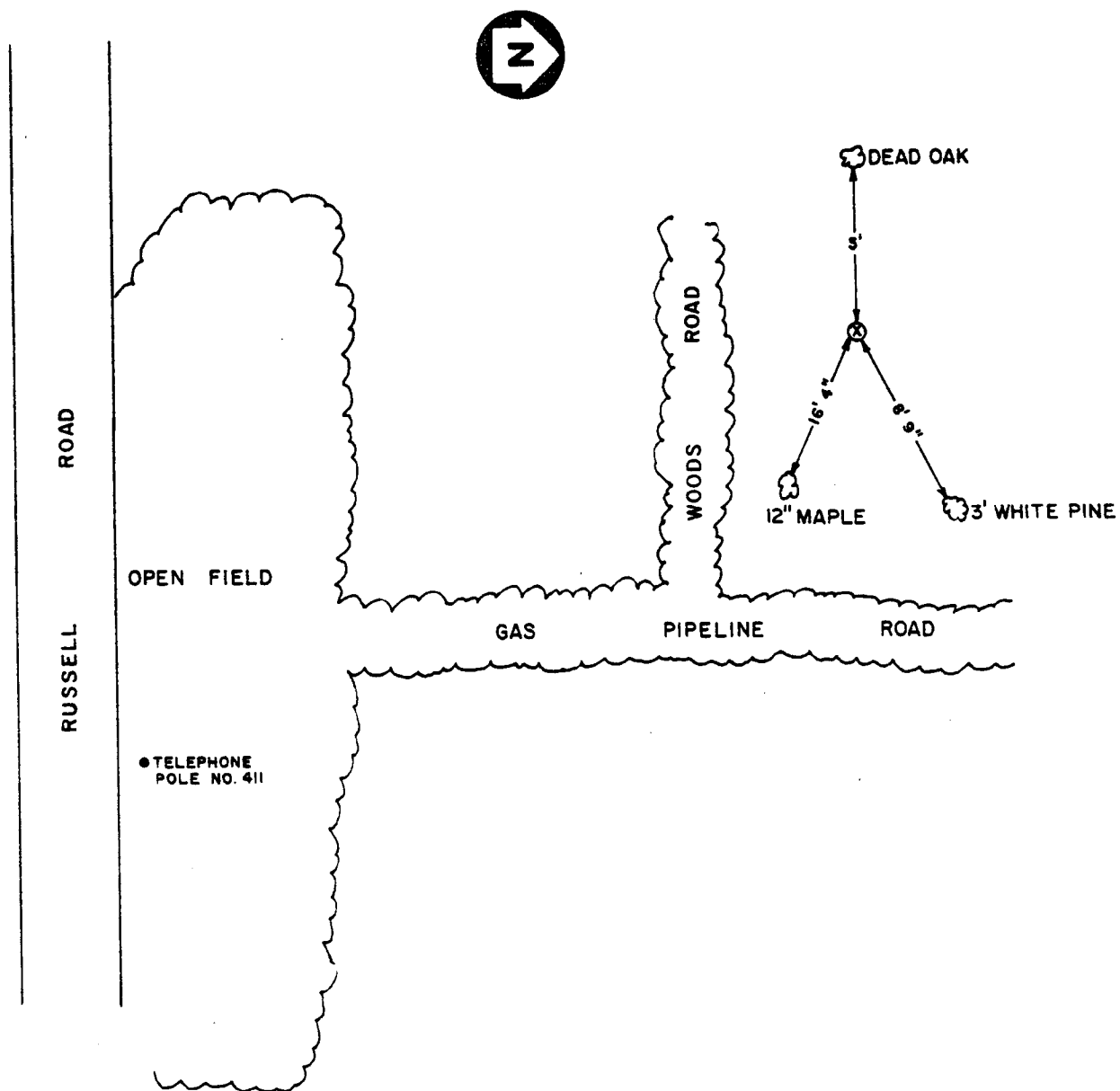
FIGURE B-12
SAMPLE DA000403 LOCATION
WASHINGTON ST.
HARTFORD, CT
NATIONAL DIOXIN STUDY

ECJORDANCO



NOT TO SCALE

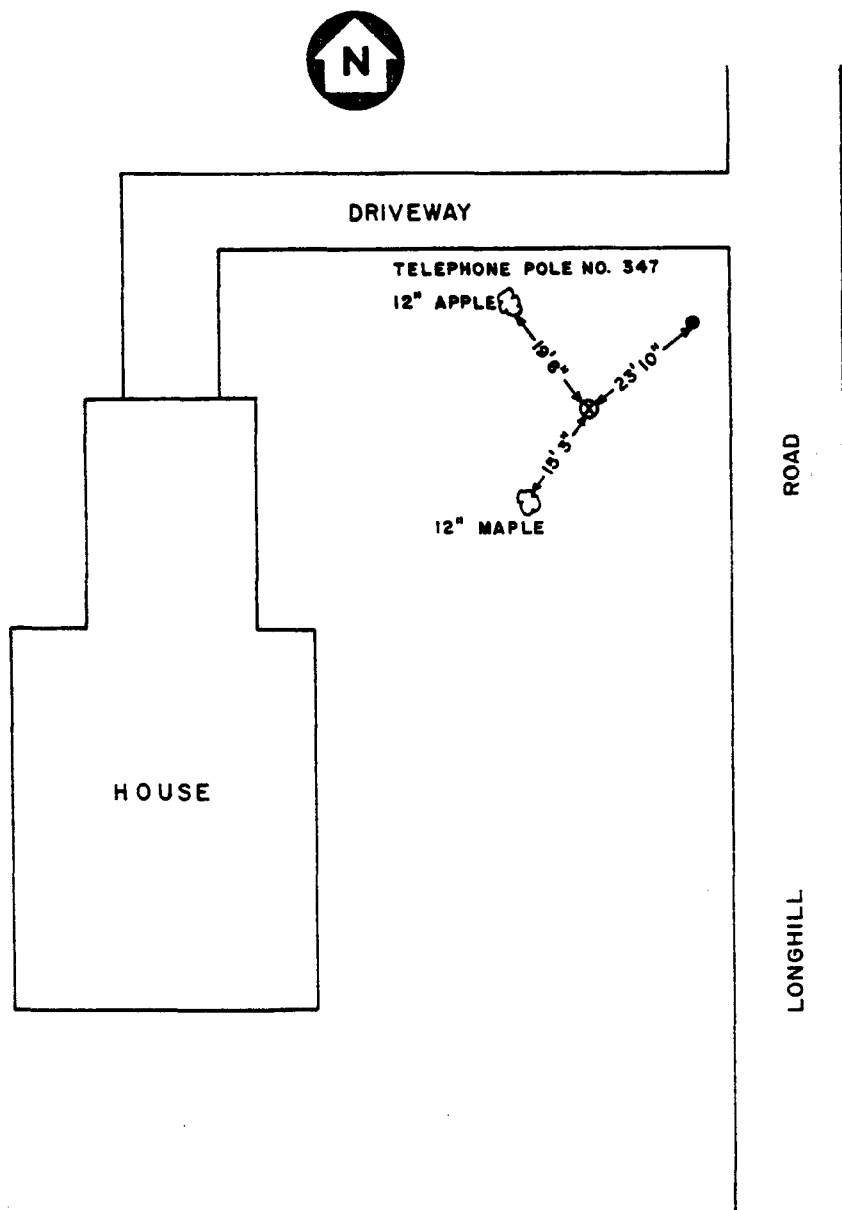
FIGURE B-13
SAMPLE DA000404 LOCATION
COPPER HILL RD.
HARTFORD, CT
NATIONAL DIOXIN STUDY
ECJORDANCO



NOT TO SCALE

FIGURE B-14
SAMPLE DA000405 LOCATION
RUSSELL RD.
EAST GRANBY, CT
NATIONAL DIOXIN STUDY

ECJORDANCO



NOT TO SCALE

FIGURE B-15
SAMPLE DA000406 LOCATION
LONGHILL RD.
ANDOVER, CT
NATIONAL DIOXIN STUDY
ECJORDANCO



TELEPHONE POLE NO. 1879

2' BIRCH



9' 9"



29' 2"



10' 2"



2' MAPLE



ROAD

STATION

HAYDEN

BRICK
HOUSE

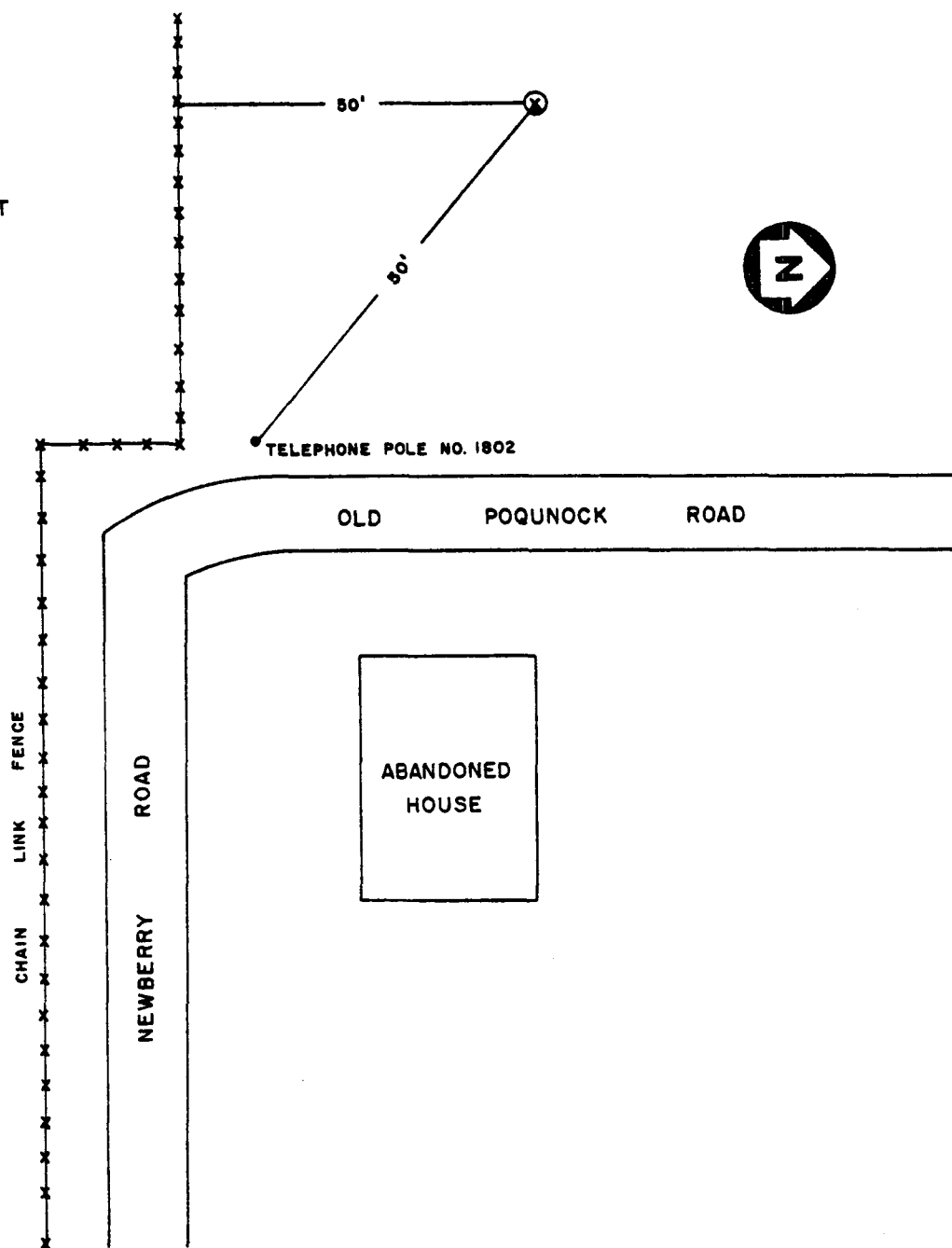
● TELEPHONE POLE NO. 3626

WHITE
WOOD
HOUSE

NOT TO SCALE

FIGURE B-16
SAMPLE DA000407 LOCATION
HAYDEN STATION RD.
WINDSOR, CT
NATIONAL DIOXIN STUDY
EC.JORDANCO

KAMAN
AIRCRAFT



NOT TO SCALE

FIGURE B-17
SAMPLE DA000408 LOCATION
OLD POQUOCK RD.
WINDSOR, CT
NATIONAL DIOXIN STUDY
EC.JORDANCO

TELEPHONE POLE NO. 177

ROUTE 2A (TO LUNENBURG)

25' 10"
(FROM GUARDRAIL)

22"
WHITE
PINE

7' 4"

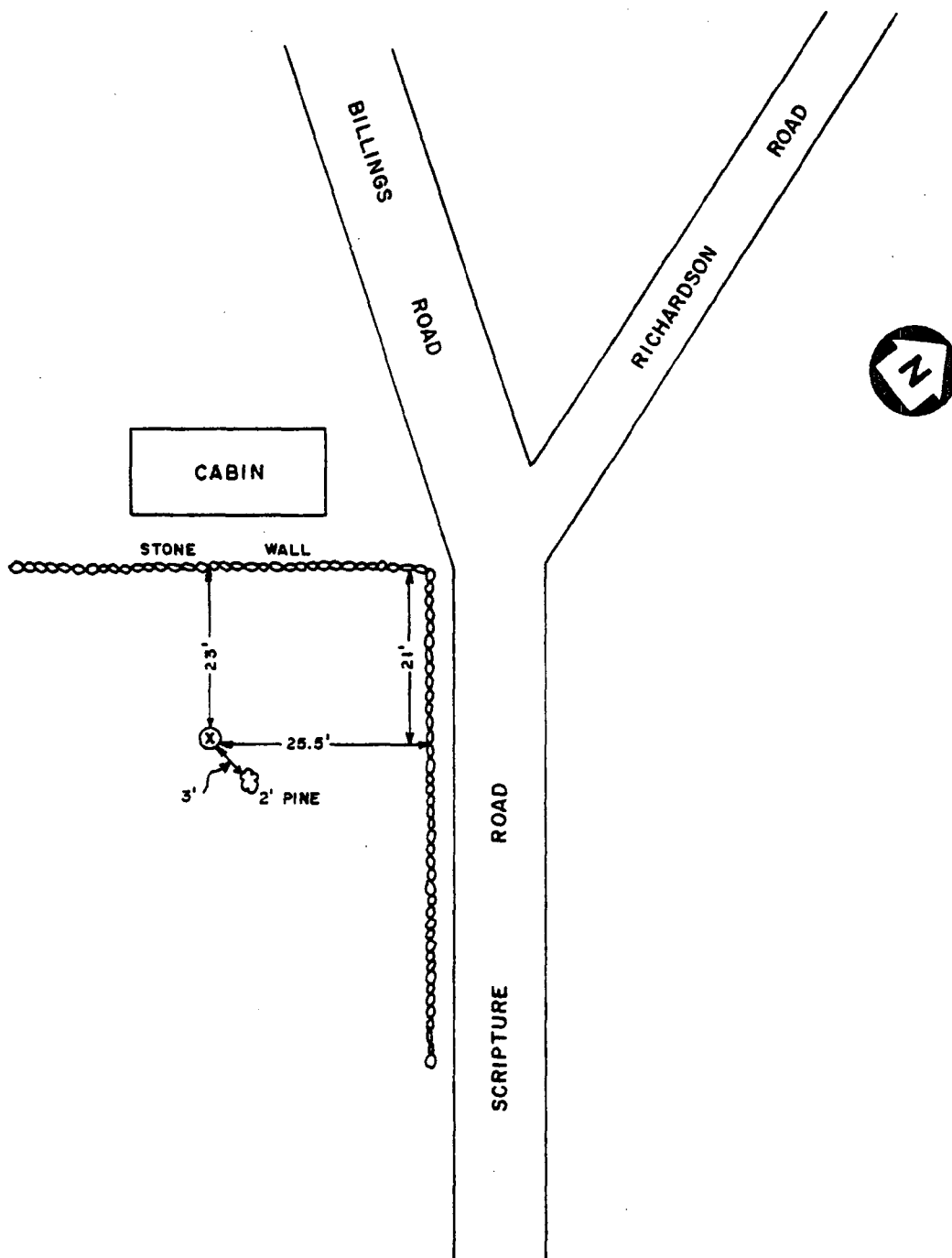
DIRT
ROAD



NOT TO SCALE

FIGURE B-18
SAMPLE DA000501 LOCATION
ROUTE 2A
LUNENBURG, MA
NATIONAL DIOXIN STUDY

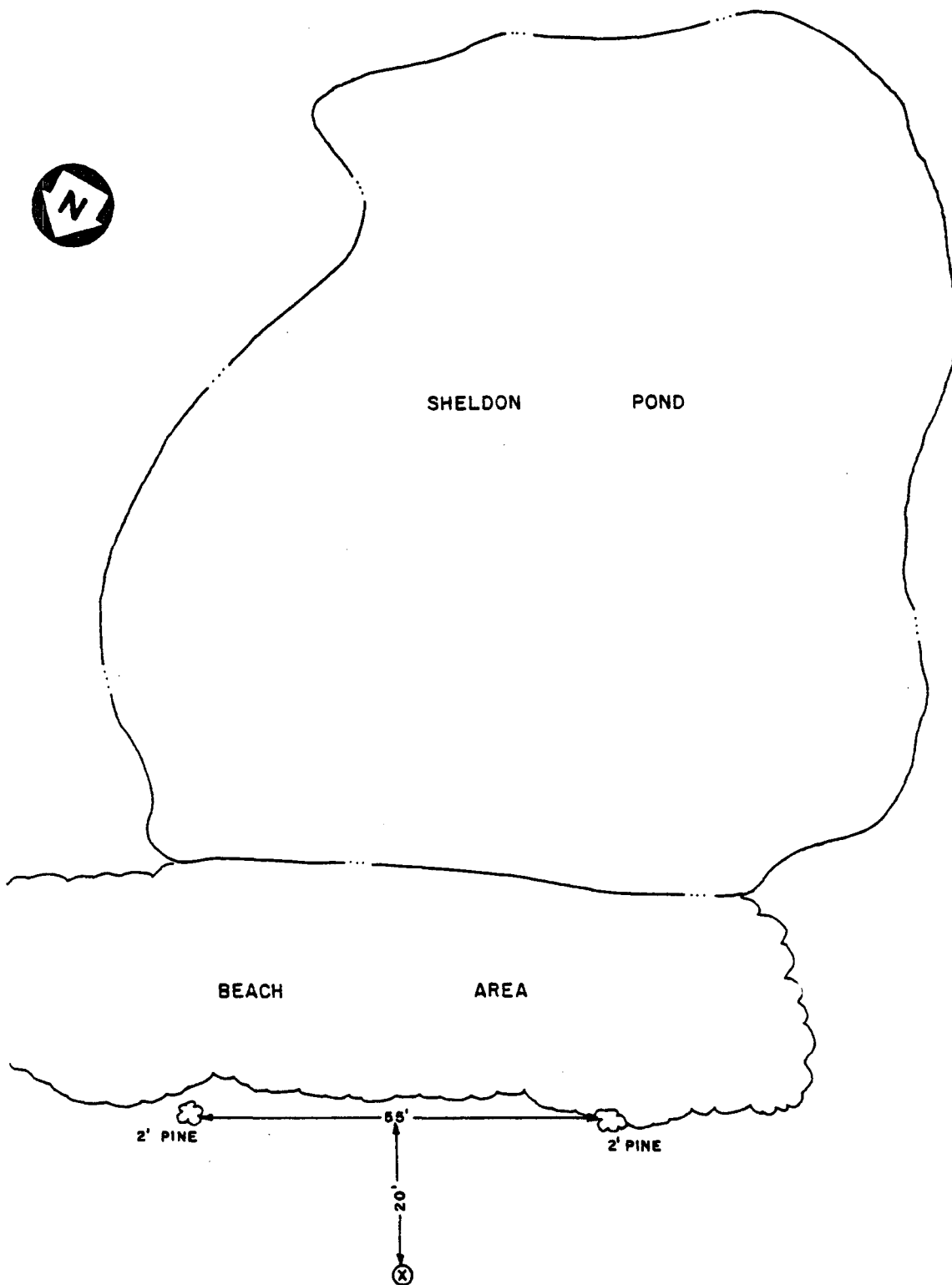
EC.JORDANCO



NOT TO SCALE

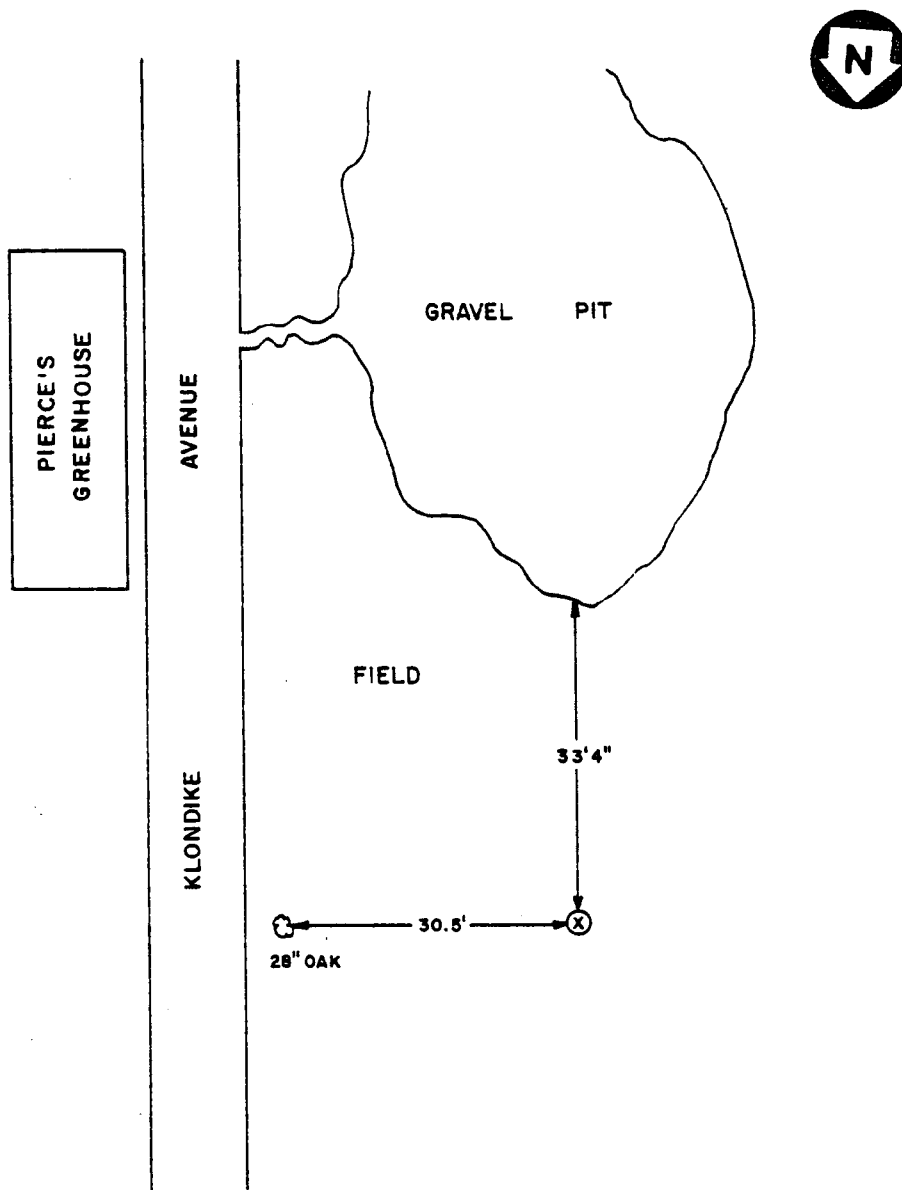
FIGURE B-19
 SAMPLE DA000502 LOCATION
 BILLINGS/RICHARDSON RDS.
 FITCHBURG, MA
 NATIONAL DIOXIN STUDY

EC.JORDANCO



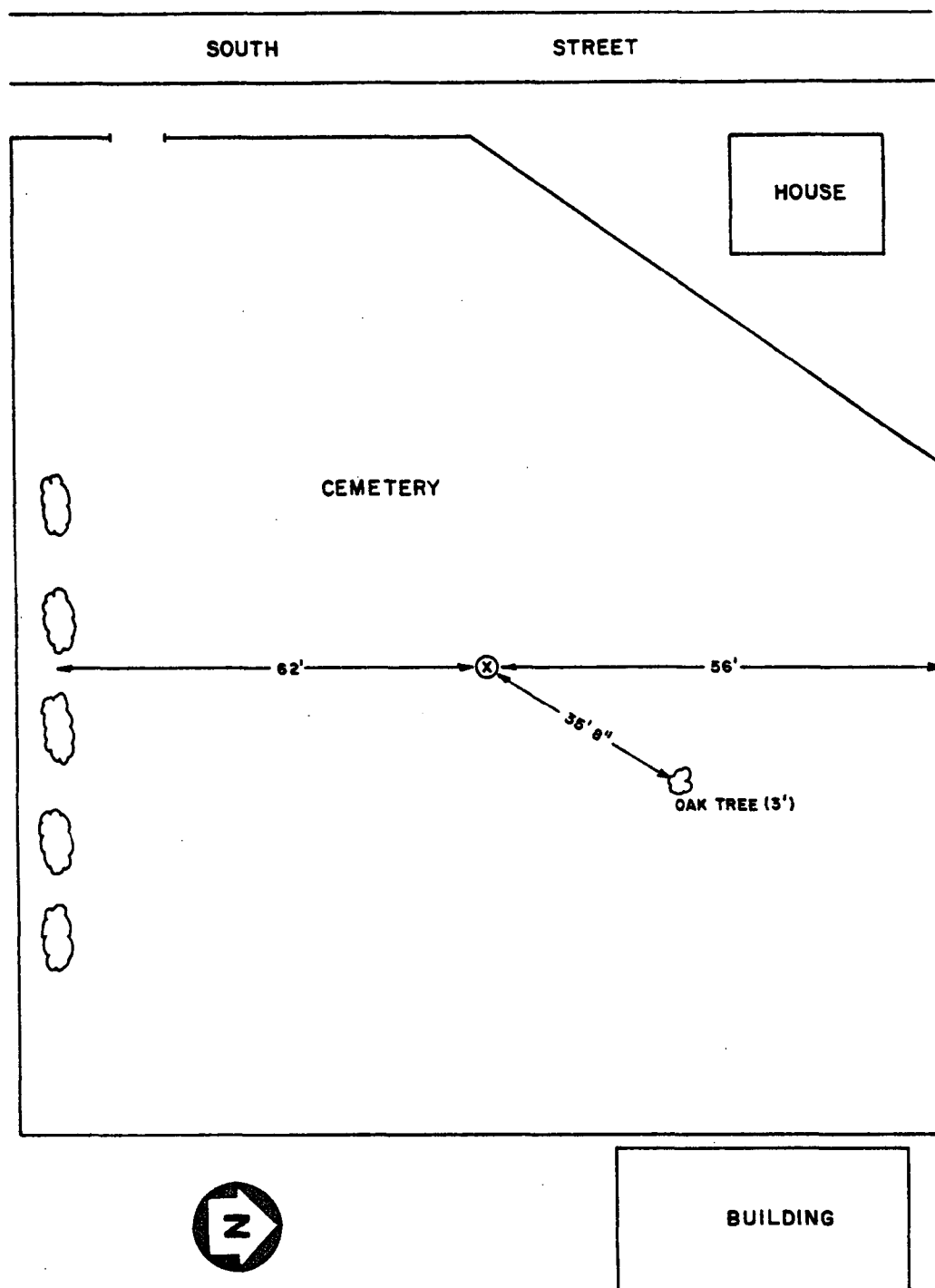
NOT TO SCALE

FIGURE B-20
SAMPLE DA000503 LOCATION
112 SHELDON RD.
FITCHBURG, MA
NATIONAL DIOXIN STUDY
ECJORDANCO



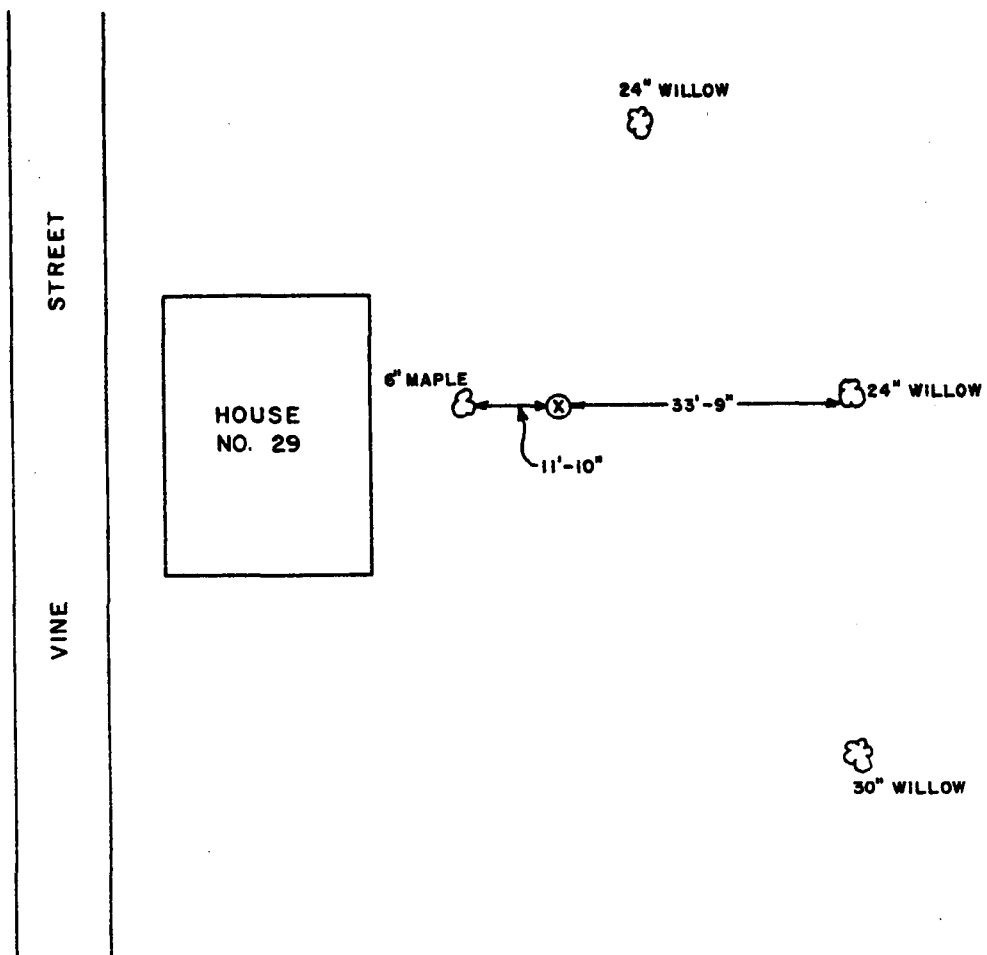
NOT TO SCALE

FIGURE B-21
SAMPLE DA000504 LOCATION
KLONDIKE AVE.
FITCHBURG, MA
NATIONAL DIOXIN STUDY
ECJORDANCO



NOT TO SCALE

FIGURE B-22
SAMPLE DA000505 LOCATION
SOUTH ST.
FITCHBURG, MA
NATIONAL DIOXIN STUDY
EC.JORDANCO



NOT TO SCALE

FIGURE B-23
SAMPLE DA000506 LOCATION
29 VINE ST.
FITCHBURG, MA
NATIONAL DIOXIN STUDY
EC.JORDANCO

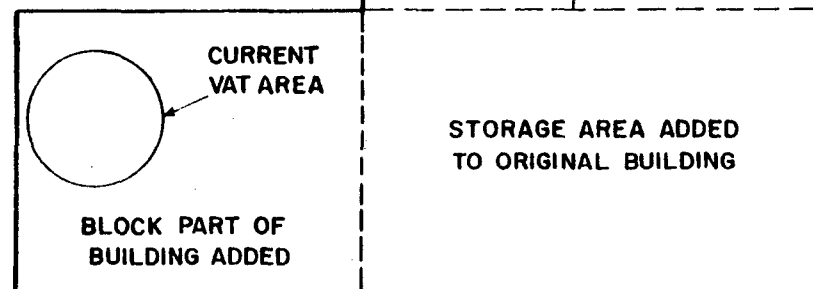
PAGE NOT

AVAILABLE

DIGITALLY



08●



NOTE: SEE FOLLOWING PAGE FOR SAMPLE
LOCATION DETAILS

ASH STREET

TO KINSLEY ST. →

STONE WALL

STONE STEPS

02●

STONE STEPS

ORIGINAL
VAT AREAWOOD
FLOOR

WOODEN STAIRS

03,09●

LOADING DOCK

04●

05●

06●

07●

SINK

CONCRETE FLOOR

01●

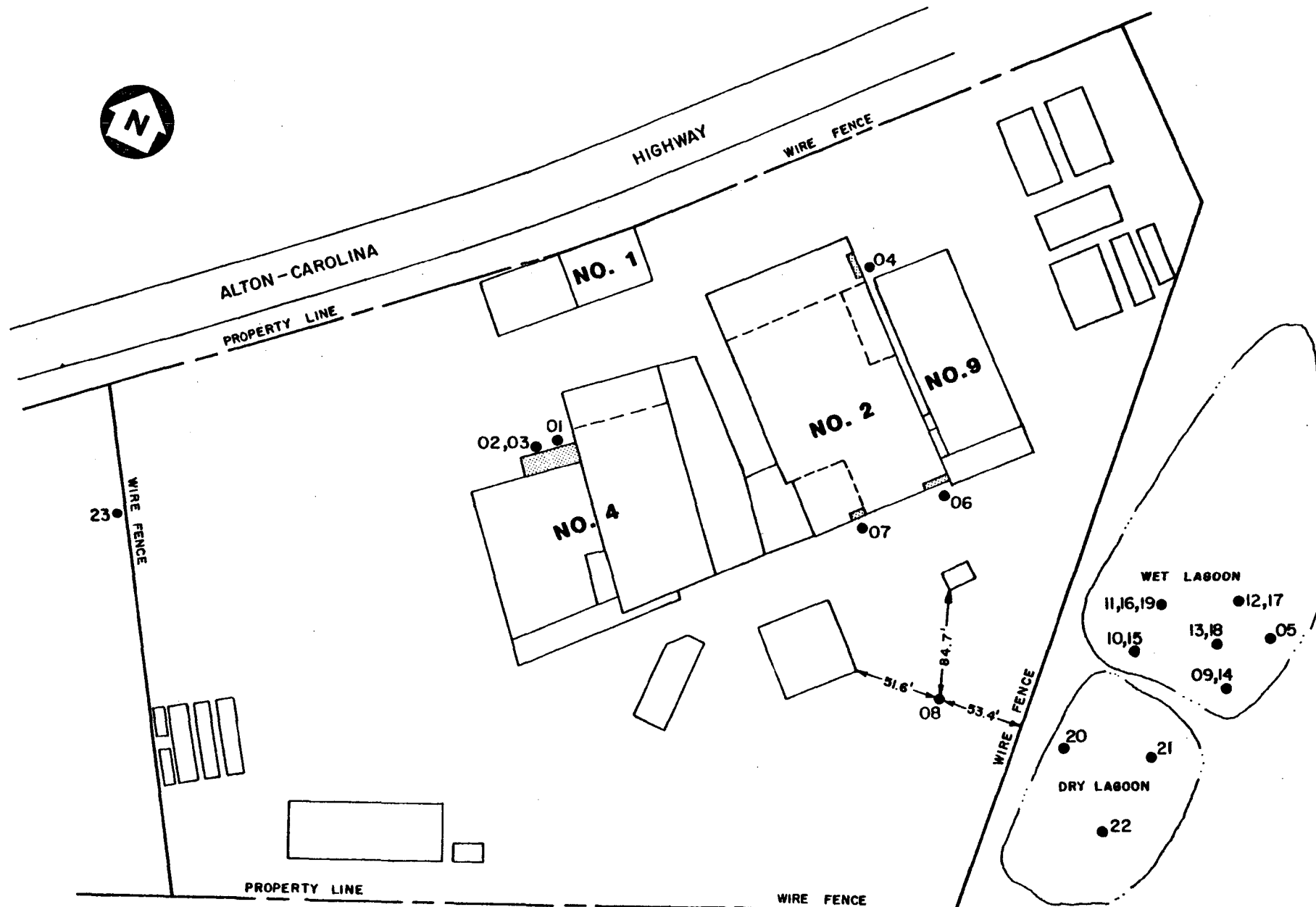
CURRENT
VAT AREASTORAGE AREA ADDED
TO ORIGINAL BUILDING

FIGURE B-28
SAMPLES DA001301-DA001309
NATIONAL DIOXIN STUDY
SAMPLE LOCATION PLAN
J. HUBBARD, INC.
NASHUA, N.H.

EC.JORDANCO

J. HUBBARD, INC.
SAMPLE LOCATION DESCRIPTIONS

<u>SAMPLE NO.</u>	<u>LOCATION</u>
DA001301	2 feet from building foundation 33.5 feet from east (Ash Street) corner of building
DA001302	5.7 feet from stone wall 2.7 feet from northeast steps 3.7 feet from southeast steps
DA001303	2.5 feet from building foundation 1.4 feet from cement at bottom of steps
DA001304	1.0 foot from building foundation 20.2 feet from block building
DA001305	1.5 feet from dock 14.7 feet from block building
DA001306	1.0 foot from dock 9.2 feet from block building
DA001307	4.0 feet from block building foundation 15.3 feet from corner where block building, storage area, and original building meet
DA001308	2.5 feet from block building foundation 13.3 feet from west corner of block building
DA001309	2.5 feet from building foundation 1.4 feet from cement at bottom of steps

 **LOADING DOCK**

NOTE: SEE FOLLOWING PAGE FOR SAMPLE
LOCATION DETAILS.

FIGURE B-29

SAMPLES DA001401-DA001423

NATIONAL DIOXIN STUDY

SAMPLE LOCATION PLAN

CARROLL PRODUCTS
WOOD RIVER JCT., R.I.

- E.C.JORDAN CO.

NO

SCALE

CARROLL PRODUCTS
SAMPLE LOCATION DESCRIPTIONS

<u>SAMPLE NO.</u>	<u>LOCATION</u>
DA001401	0.8 foot in front of loading dock 4.5 feet from east end of dock 29.6 feet from west end of dock
DA001402, 03	0.8 foot in front of loading dock 16.4 feet from east end of dock 17 feet from west end of dock
DA001404	1.6 feet in front of loading dock 13.3 feet from north corner of Building 2
DA001405	Located approximately as shown in old well lagoon area
DA001406	2.7 feet in front of loading dock 6.5 feet from east end of dock
DA001407	2.6 feet in front of loading dock 6.4 feet from east end of dock
DA001408-23	Locations approximately as shown on preceeding page