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Formerly Utilized Sites Remedial Action Program (FUSRAP)

ADMINISTRATIVE RECORD

for
Niagara Falls Storage Site





Science Applications International Corporation
An Employee-Owned Company

April 5, 1995

U.S. Department of Energy
Oak Ridge Field Office
P.O. Box 2001
Oak Ridge, TN 37831-8758

Attention: Mr. Ronald E. Kirk
Site Manager - New York Sites

Subject: Contract DE-AC05-91OR21950
NIAGARA FALLS - DELIVERABLE: FIELD SAMPLING PLAN FOR THE
E' VICINITY PROPERTY OF THE NIAGARA FALLS STORAGE SITE

Dear Mr. Kirk:

Enclosed are two copies of the preliminary draft of the subject report. By copy of this letter, three bound copies and one unbound copy of the report have been provided to BNI for review and records retention purposes. We are requesting comments by April 21, 1995.

If you have any questions or comments, please call me at 481-8552.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

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PRELIMINARY DRAFT

**FIELD SAMPLING PLAN FOR THE
E' VICINITY PROPERTY OF THE
NIAGARA FALLS STORAGE SITE**

NIAGARA FALLS, NEW YORK

MARCH 1995

prepared for

U.S. Department of Energy, Oak Ridge Operations Office, Formerly Utilized Sites Remedial Action Program

prepared by

Science Applications International Corporation ESC-FUSRAP
under Contract No. DE-AC05-91OR21950



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LIST OF ACRONYMS AND ABBREVIATIONS

AEC	Atomic Energy Commission
BGS	below ground surface
BNI	Bechtel National, Inc.
°C	Celsius
COC	contaminants of concern
cpm	counts-per-minute
cm	centimeters
CWM	Chem Waste Management
DOE	Department of Energy
DQO	Data Quality Objective
E'	E-Prime
EPA	Environmental Protection Agency
°F	Fahrenheit
FSP	Field Sampling Plan
ft	foot/feet
FUSRAP	Formerly Utilized Sites Remedial Action Program
ha	hectare
in.	inch
km	kilometer
LOOW	Lake Ontario Ordnance Works
mi	miles
m ³	cubic meters
MED	Manhattan Engineer District
msl	mean sea level
NFSS	Niagara Falls Storage Site
OSHA	Occupational Safety and Health Association
ORAU	Oak Ridge Associated Universities
PCB	polychlorinated biphenyl
QAPjP	Quality Assurance Project Program
QA/QC	Quality Assurance/Quality Control
Ra	Radium
SAIC	Science Applications International Corporation
TCLP	toxicity characteristic leaching procedure
Th	Thorium
TLD	thermoluminescent dosimeter
TNT	trinitrotoluene
U	uranium
U.S.	United States
VP	Vicinity Property
WCS	waste containment structure
yd ³	cubic yards
yr	year

1. INTRODUCTION

In 1974, the Atomic Energy Commission (AEC), a predecessor to the U.S. Department of Energy (DOE), instituted the Formerly Utilized Sites Remedial Action Program (FUSRAP). This Program is now managed by DOE to identify and cleanup or otherwise control sites where residual radioactive contamination (exceeding current guidelines) remains from the early years of the nation's atomic energy program, or from commercial operations causing conditions that Congress has authorized DOE to remedy under FUSRAP. The E-prime (E') vicinity property (VP) of the Niagara Falls Storage Site (NFSS) is one of these sites. The following section provides background information about the west side of VP E' where two above-ground polychlorinated biphenyl (PCB) tanks were located. This section summarizes what is known about the nature and extent of the contamination, identifies the purpose and scope of this investigation, and outlines the data quality objectives (DQO).

1.1 SITE BACKGROUND

The NFSS and VPs were originally a portion of the Lake Ontario Ordnance Works (LOOW), which was developed in the early 1940's to produce trinitrotoluene (TNT). Although materials used in the production of TNT were shipped to the site, TNT production was never initiated. In 1944, the site was assigned to the Manhattan Engineer District (MED), and from 1944 to 1947 portions of the LOOW were used to store uranium-ore processing residues from a nearby ceramics plant (BNI 1992). By 1948, most of the original LOOW was sold to commercial interests by the War Assets Administration. What remained of the LOOW was transferred to the newly formed AEC. The AEC used the LOOW as a storage site for radioactive and nonradioactive waste until 1953 (ORAU 1990). Building 401 was modified to separate nonradioactive isotopes of boron. The site was used for the production of Boron-10 from 1953 to 1959 and between 1965 and 1971.

Waste stored at LOOW was transported from many sources. Historical records indicate that major contributors included: Linde Air Products Division, Mallinckrodt Chemical Plant, Knolls Atomic Power Laboratory, Union Carbide's Electrometallurgical Operation, Middlesex Sampling Plant, Oak Ridge National Laboratory, Eldorado Mining and Refining Company, and Brookhaven National Laboratory. Records indicate that while most of the waste received was radioactive, both nonradioactive and chemical waste were also received.

In the late 1950's a major cleanup of the NFSS occurred. This included removing and consolidating surface debris, and moving this waste to Oak Ridge, Tennessee. Radioactive residues and contaminated soils were left in place (BNI 1992). From 1955 to 1975 more than 526 hectares (ha) (190 acres) were sold to private concerns, leaving the current 77 ha NFSS. As a result of site operations, some areas of the LOOW (not including the NFSS) were contaminated. Contamination also occurred as surface and water transport systems moved contaminants off the NFSS into surrounding properties. These contaminated sites were

Lakes and rivers are the predominant sources of potable water in the area surrounding NFSS; approximately 90 percent of the population in Niagara and Erie Counties use water from these sources. Water from Lake Erie serves 65 percent of the population and water from the upper Niagara River serves another 25 percent (DOE 1986). Counties north of the Niagara escarpment, including Lewiston and Porter Townships, also receive much of their water from these sources.

Groundwater is used as a water supply for approximately 10 percent of the population in Niagara and Erie Counties. Its use is primarily agricultural. The main source of water is the Lockport Dolomite Aquifer, which is absent north of the Niagara escarpment near NFSS. Groundwater wells in the vicinity of NFSS generally have a low yield and supply water of poor quality. The upper groundwater systems in the glacial deposits are sometimes capable of supplying adequate groundwater for domestic use, although these sources may be depleted during dry seasons (DOE 1986).

The climate is classified as humid continental, with a moderating influence by Lake Ontario. The normal temperature range is -3.9 degrees Centigrade (Celsius) (°C) to 24.4 °C (25 degrees Fahrenheit (°F) to 76 °F) with a mean annual temperature of 8.9 °C (48 °F). Mean annual precipitation is 80 centimeters (cm) (32 inches [in.]). Snowfall averages 140 cm/year (yr) (56 in./yr), accounting for about 10 percent to 20 percent of the annual total precipitation (Gale Research Company 1985).

1.3 SUMMARY OF EXISTING SITE CONDITIONS

Vicinity property E' is currently owned by Chem Waste Management (CWM) Chemical Services. The two PCB storage tanks, which were present on the VP during the 1988 remediation effort, have recently been drained and removed from the site (GAI 1994). Currently only the two concrete tank foundations and containment berms remain on the site.

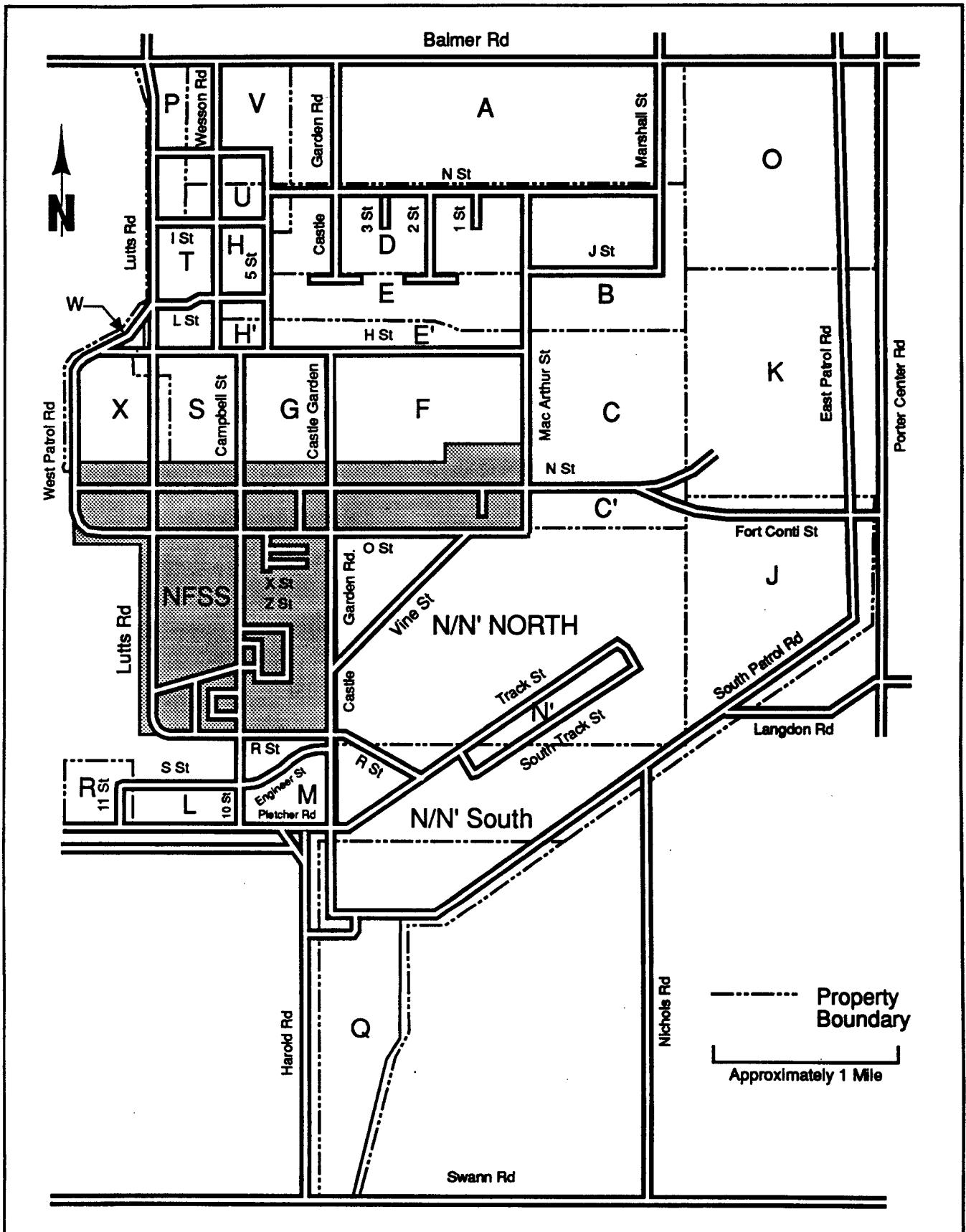
The VP E' may have been used to store radioactive waste while the site was operated as a part of the AEC. This, in addition to the possibility of contaminated material being transported onto the site by surface and water processes, may have led to the contamination of the property. A 1993 walkover gamma-scan placed the background radiation levels at 9,000 counts per minute (cpm). Hot spot activity in the study area ranged from 20,000 cpm to 90,000 cpm (TMA/Eberline 1993) (Figure 1-4).

1.4 CONTAMINANTS OF CONCERN

The results of previous investigations at the NFSS have been compared to applicable standards and background levels to identify contaminants of concern (COC). Based on this comparison and historical information known about the site, uranium (U)-238, radium (Ra)-226, thorium (Th)-230 and Th-232 have been identified as the principle radiological COCs on the

area were selected using the biased method. The majority of these locations were preferentially selected from locations showing elevated gamma readings from historical gamma walkover-surveys. The sampling locations positioned in the center of the tank foundations were also selected using the biased method, since this is the area most likely to be contaminated by PCBs. Since it is unknown whether radiological or PCB contamination exists beneath 5th Street, M Street, or the parking lot, the systematic sampling method was selected. The spacing between systematic sample locations was determined based on the size of the radiological target which has been defined as 16 m (50 ft). The following text focuses on data quality issues.

EPA Summary Level data quality is proposed for all soil analyses (EPA, 1993). The small number of samples required for this study does not justify the cost for an onsite laboratory, and therefore, samples will be shipped overnight to the laboratory. The only analyses to be performed in the field will be the screening of soil samples using field radiological screening instruments, and screening samples for PCBs using an amino assay kit.



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Figure 1-2. Niagara Falls Storage Site and Vicinity Properties, Lewiston, New York

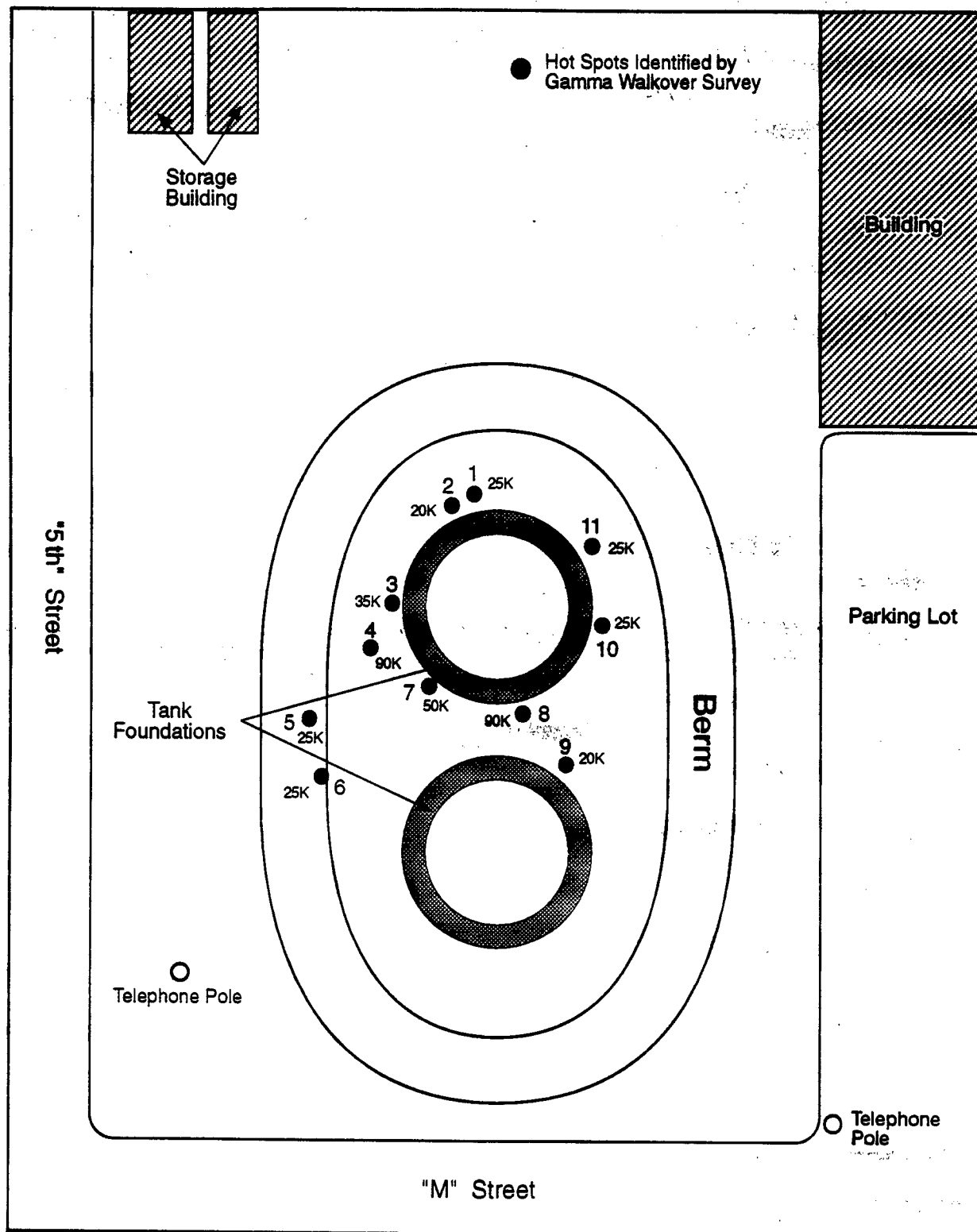


Figure 1-4. Rad Hot Spots Identified by Gamma Walkover Survey

2. FIELD INVESTIGATION APPROACH

It is anticipated that only one stage (Stage 1) of sampling will be required to complete the characterization at the NFSS VP E'. This sampling is outlined in Section 2.1. If the results from this sampling identify the need for additional data this FSP will be amended to include Stage 2.

2.1 STAGE 1

To meet the objectives of this investigation it was determined that only shallow soil sampling is required. No groundwater sampling has been proposed for this investigation since a rigorous groundwater sampling program is currently being performed by CWM Chemical Services. The following section outlines the proposed sampling program.

2.1.1 Shallow Soil Sampling

In order to meet the objectives of this sampling program, shallow soil samples are proposed to be collected from 13 locations within the bermed PCB containment area, three locations along 5th Street, two locations along M Street, and two locations in the parking lot (see Figure 2-1). Eleven of the 13 sampling locations proposed within the bermed PCB storage tank pit are positioned over radiological hotspots identified by a gamma walkover survey performed by TMA/Eberline in November 1993 (TMA/Eberline 1993). The remaining two sampling locations within the bermed area were positioned in the center of the tank foundations, since this is the location where soil is most likely to be contaminated with PCBs. The samples proposed to be collected beneath the asphalt and road gravel that comprise 5th Street, M Street, and the parking lot west of the berm, are to determine the activity level and PCB content of the soils beneath these surfaces.

All of the shallow soil samples will be collected from 0.0 ft to 2.0 ft BGS by hand driving a 2-ft long by 2-in diameter stainless-steel sample tube into the ground using a slide hammer. The core barrel of the sampler will be lined with four 0.5-ft long and 2-in. diameter stainless-steel sample sleeves. For those samples being collected through asphalt and road gravel, an asphalt coring tool will be used to cut through the asphalt surface. A hand auger, spoon, or other stainless steel device will then be used to remove the road gravel to a level where the underlying soil is exposed. At this point the hole is ready for sampling. The 0.0 ft to 2.0 ft sampling interval is measured from the top surface of the soil.

As the sampler is beaten into the ground, the blow counts for each 0.5-ft advancement will be recorded in a sample logbook. Once the 2-ft sampling depth has been reached, the corebarrel will be removed from the hole, and the sample sleeves retrieved from the sampler. When the sample sleeves are removed, it is important to keep track of which end of the sleeves represent the top and bottom of the sampling interval. Each of the individual sample sleeves will

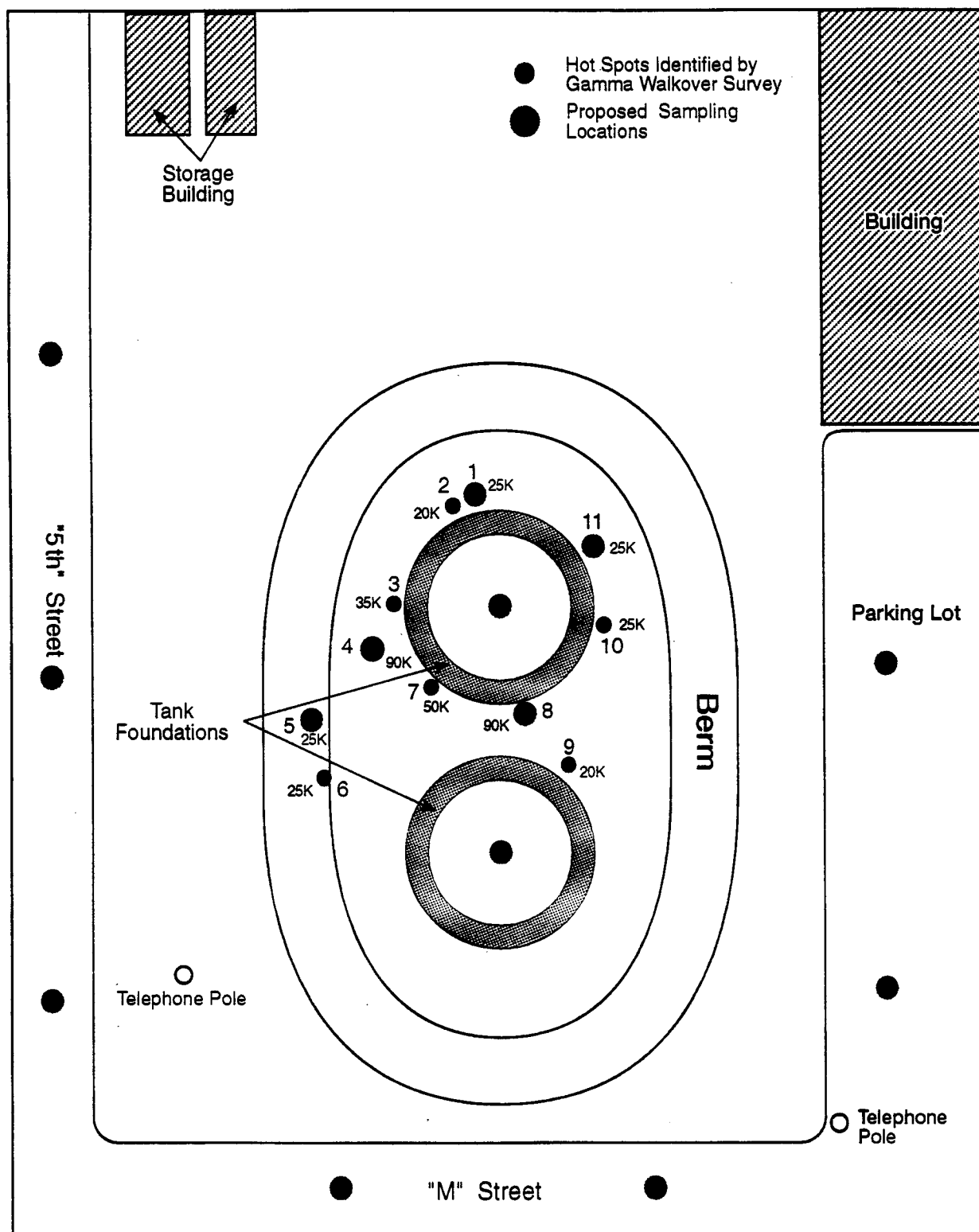


Figure 2-1. Proposed Shallow Soil Sampling Locations

Table 2-2. Preservatives, Containers, and Holding Times for Laboratory Samples

Analyte/Test	Container	Quantity	Preservative	Holding Time
PCBs	Amber glass wide-mouth jar	1/250-ml	4 °C	14 days to extraction, 40 days to analysis
Radionuclides:				
U-238	Polypropylene wide-mouth jar*	1/500-ml	4 °C	6 months
Ra-226	Polypropylene wide-mouth jar	1/500-ml	4 °C	6 months
Th-230	Polypropylene wide-mouth jar	1/500-ml	4 °C	6 months
Th-232	Polypropylene wide-mouth jar	1/500-ml	4 °C	6 months
TCLP (total):				
volatiles			4 °C	
metals	Glass wide-mouth	1/125-ml	4 °C	14 days
BNAE	Glass, amber	1/250-ml	4 °C	180 days
PCBs/Pesticides	Glass, amber	1/250-ml	4 °C	7/40
*U-238, Ra-226, Th-230, and Th-232 analyses can all be run on soil from one 500-ml bottle. No need to collect four separate sample bottles.				

3. ANALYTICAL PROCEDURES

A summary of the analytical techniques and laboratory methods to be performed on soil samples is presented in Tables 2-1 and 2-2. These analytical procedures meet the minimum detect limit requirements needed to address the DQOs outlined in Section 1.6.

See Section 6.0 for issues related to quality assurance/quality control (QA/QC).

3.1 SAMPLE HANDLING, PACKAGING, AND SHIPPING

Sample collection, handling, and chain-of-custody will be conducted according to FUSRAP procedures consistent with *A Compendium of Superfund Field Operations Methods* (EPA 1987). The samples will be packed in vermiculite or bubble wrap to minimize the potential for breaking and will be shipped to the laboratory for analysis. Samples will be packed in Blue Ice[®] (when appropriate), and shipped by overnight mail to an analytical laboratory within 24 hours of the time they are collected (FUSRAP 1994).

4. FIELD NOTEBOOKS AND DOCUMENTATION

All sampling personnel will keep indelible black ink records of field activities in bound field notebooks and on appropriate bound forms on a daily basis. Samplers will record weather conditions, sampling locations and depths, types of samples collected, analyses required, date and time of sampling, chain-of-custody identification numbers and procedures, field measurements, and names of sampling personnel.

All field documentation, analytical data, and reports generated from this data will be assigned a document control number and submitted to the Project Document Control Center as a permanent record. See *Design Basis for Environmental Technology* (FUSRAP 1994) for further details on documentation requirements.

5. DECONTAMINATION

Decontamination will be conducted as necessary to ensure that personnel and equipment leaving a controlled area meet DOE guidelines for release. Before beginning field sampling activities, all drilling and sampling equipment will be decontaminated using the following methods.

Large Equipment Decontamination

- 1) Remove soil adhering to augers, drill rod, and other equipment by scraping, brushing, or wiping;
- 2) thoroughly pressure wash equipment with potable water and a nonphosphatic laboratory grade detergent (i.e. Liquinox) using a steam cleaner;
- 3) thoroughly rinse equipment with potable water using a steam cleaner;
- 4) air dry; and
- 5) wrap equipment in plastic sheeting to keep it clean before use.

Sampling Equipment Decontamination

Radiological Decontamination Procedure:

- 1) Remove soil adhering to equipment by scraping, brushing, or wiping;
- 2) thoroughly wash equipment with potable water and a nonphosphatic laboratory grade detergent (i.e. Liquinox);
- 3) thoroughly rinse equipment with potable water;
- 4) rinse thoroughly with distilled/deionized water;
- 5) air dry; and
- 6) wrap equipment in aluminum foil to keep equipment clean prior to use.

6. QUALITY ASSURANCE

The FUSRAP document, *Design Basis for Environmental Technology*, will be used as the Quality Assurance Project Program (QAPjP) to guide the Niagara Falls sampling effort outlined in this FSP. The FSP and QAPjP together meet the minimum requirements of a Sampling and Analysis Plan as outlined in the EPA guidance document, *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (EPA 1987). As required by this guidance manual, the QAPjP describes the QA/QC protocols necessary to achieve the DQOs dictated by the intended use of the data.

7. HANDLING OF INVESTIGATION DERIVED WASTE

All waste soil generated by field operations that are suspected of being contaminated based on field screening and historical data will be handled in accordance with BNI waste disposal procedures (BNI 1993). Any drummed waste material shall at a minimum be labeled by noting: the date when the waste was generated, general contents in the drum, and location from where the waste was derived.

8. HEALTH AND SAFETY

All field operations will be performed under the guidance and direction of the onsite Health and Safety Officer, who will implement the requirements outlined in the site-specific Health and Safety Plan.

Prior to commencing field operations, a site-specific Health and Safety Plan must be available for workers to review. All personnel to implement the field investigation must at a minimum have 40 Occupational Safety and Health Act (OSHA) training hrs and have 8 current hrs of refresher training, be involved in a medical monitoring program that meets the minimum requirements of 29 CFR 1910.120, and be issued a thermoluminescent dosimeter (TLD) when working in a radiological environment. Other general worker health and safety requirements include wearing safety glasses, hard hats, and steel toed boots at all times when present in the work area.

9. REFERENCES

BNI (Bechtel National, Inc.) 1984. *Geological Report for the Niagara Falls Storage Site*, DOE/OR/20722-8, Oak Ridge, Tennessee, June.

BNI 1992. *Certification Docket for the Remedial Action Performed at the Niagara Falls Storage Site Vicinity Properties in Lewiston, New York, From 1983 Through 1986*, CCN 092430, Oak Ridge, Tennessee, July.

BNI 1993. *Waste Management Plan for FUSRAP*, Oak Ridge, Tennessee, June.

DOE (Department of Energy) 1986. *Final Environmental Impact Statement: Long-Term Management of the Existing Radioactive Waste and Residues at Niagara Falls Storage Site*, DOE/EIS-0109F, Washington, D.C., April.

EPA (Environmental Protection Agency) 1987. *A Compendium of Superfund Field Operations Methods*, EPA/540/P-87/001a, Washington, D.C., July.

EPA 1993. *Guidance for Planning for Data Collection in Support of Environmental Decision Making Using the Data Quality Objectives Process*, EPA QA/G-4, Washington, D.C. March.

FUSRAP 1994. *Design Basis for Environmental Technology*, (14501-191-DB-01), CNN 124607, Oak Ridge, Tennessee, July.

Gale Research Company (1985). *Climate of the States*, 3rd ed., Volume 1, Detroit, Michigan.

GAI (Golder Associates, Inc.) 1994. *Phase I Record Documentation and Certification Tanks T-64 and T-65 Closure Model City TSDR Facility*, 933-9075, Model City, New York, March.

ORAU (Oak Ridge Associated Universities) 1990. *Verification of 1985 and 1986 Remedial Actions Niagara Falls Storage Site Vicinity Properties Lewiston, New York, Oak Ridge, Tennessee*. July.

TMA/Eberline 1993. *Walkover Gamma Scan PCB Tanks - Area E*, BNI No. D-16321, November.