M-652

Formerly Utilized Sites Remedial Action Program (FUSRAP)

ADMINISTRATIVE RECORD

for the Maywood Site, New Jersey

US Army Corps of Engineers®

AK RIDGE NATIONAL LABORATORY
OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX X
OAK RIDGE, TENNESSEE 37831

October 2, 1986

[redacted]
7 Branca Court
Lodi, New Jersey 07644

Dear [redacted]:

Designation Survey Report

Enclosed is a report summarizing the radiological measurements performed on your property at an earlier date. If you have questions or require additional information about this report, please contact:

Edward G. DeLaney
Division of Facility & Site
Decommissioning Projects
U. S. Department of Energy
Germantown, Maryland 20874
(301) 353-4716

If you have any questions about future work to be performed on your property, please forward these questions to:

S. W. Ahrends
U.S. Department of Energy
Oak Ridge Operations
Post Office Box E
Oak Ridge, Tennessee 37831
(615) 576-0948

Sincerely yours,

Barry A. Berven

Barry A. Berven, Ph.D.
RASA Program Manager, ORNL

BAB:sh

Enclosure

cc: S. W. Ahrends, DOE/OR
R. O. Chester
W. D. Cottrell
R. W. Doane
S. V. Kaye
J. F. Nemec, BNI
A. Wallo, Aerospace

OCT 3

M-652

ORNL/RASA-86/34

HEALTH AND SAFETY RESEARCH DIVISION

Nuclear and Chemical Waste Programs
(Activity No. AH 10 05 00 0; ONLWC01)

RESULTS OF THE RADIOLOGICAL SURVEY AT 7 BRANCA COURT (LJ040), LODI, NEW JERSEY

R. W. Doane

Date of Issue - September 1986

Investigation Team

B. A. Berven - RASA Program Manager
W. D. Cottrell - FUSRAP Project Director
R. W. Doane - Field Survey Supervisor

Survey Team Members

B. S. Ellis
D. W. Greene
C. A. Muhr
E. M. Pilz
W. Winton

Work performed as part of the
RADIOLOGICAL SURVEY ACTIVITIES PROGRAM

Prepared by the
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831
operated by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under Contract No. DE-AC05-840R21400

CONTENTS

LIST OF FIGURES AND TABLES

ACKNOWLEDGMENTS

Research for this project was sponsored by the Division of Remedial Action Projects, U.S. Department of Energy. The author wishes to acknowledge the support of J. E. Baublitz, Deputy Director, Office of Remedial Action and Waste Technology, E. G. DeLaney, Director, Division of Facility & Site Decommissioning Projects, and members of their staff. In addition, the author appreciates the manuscript preparation by S. E. Huckaba, D. A. Roberts, and J. K. Williams, Biology Division.

RESULTS OF THE RADIOLOGICAL SURVEY AT 7 BRANCA COURT, LODI, NEW JERSEY*

INTRODUCTION

A radiological survey of 7 Branca Court, Lodi, New Jersey, was conducted by a survey team from Oak Ridge National Laboratory (ORNL) on October 22, 1985 at the request of the Department of Energy (DOE).

The radiological survey conducted on this property was for the purpose of determining whether the property had any radioactive material onsite in excess of background radiation levels, and, if so, were these radioactive materials in excess of remedial action guidelines established by DOE such that the property could be "designated" for further investigation.

SURVEY METHODS

The radiological survey of the property included: (1) a gamma scan of the entire property outdoors; and (2) sampling of surface (0-15 cm) soil. No indoor survey measurements were performed. These survey methods followed the plan outlined in Reference 1. A comprehensive description of the survey methods and instrumentation has been presented in another report.[2]

SURVEY RESULTS

The normal background radiation levels for the northern New Jersey area are presented in Table 1. These data are provided for comparison with survey results presented in this section. All direct measurement results presented in this report are gross readings at ground surface; background radiation levels have not been subtracted. Similarly, background concentrations have not been subtracted from radionuclide concentrations measured in environmental samples.

---

*The survey was performed by members of the Radiological Survey Activities Group of the Health and Safety Research Division at Oak Ridge National Laboratory under DOE contract DE-AC05-840R21400.

Systematic and Biased Soil Samples

Systematic and biased soil samples were taken from various locations on the property for radionuclide analyses. Locations of the systematic (LJ40S) and biased (LJ40B) samples are shown in Fig. 1, with results of laboratory analyses provided in Table 1. Concentrations of uranium, radium, and thorium were within normal background levels in the systematic samples. However, concentrations of thorium in the biased soil samples exceeded normal background levels for the northern New Jersey area. The range of ^{232}Th was 0.8 pCi/g to 23 pCi/g.

Gamma Radiation Levels

Results of the gamma scan of the surface of the property showed where gamma exposure rates are in excess of natural background radiation levels. Locations and exposure rates are shown in Fig. 2. These results locate where ^{232}Th-bearing material exists. Gamma exposure rates up to 34 $\mu R/h$ exist on the surface of the property.

SUMMARY

Measurements taken at 7 Branca Court indicate that the property contains radioactive contamination primarily from the ^{232}Th decay chain with some contamination from the ^{238}U decay chain. These radionuclide distributions are typical of the type of material processed at the former Maywood Chemical site. The concentration and extent of ^{232}Th on this property is in excess of the relevant DOE criteria.[3] This material was found in the locations shown in Fig. 2. Based on the results of this radiological assessment, it is recommended that this property be "designated" for further characterization.

REFERENCES

1. W. D. Cottrell, ORNL, to A. J. Whitman, DOE/HQ, correspondence, "Radiological Survey of Private Properties in Lodi, New Jersey" (August 15, 1984).

2. Oak Ridge National Laboratory, Procedures Manual for the ORNL Remedial Action Survey and Certification Activities (RASCA) Program, ORNL/TM-8600 (October 1982).

3. U.S. Department of Energy, Guidelines for Residual Radioactivity at Formerly Utilized Sites, Remedial Action Program and Remote Surplus Facilities Management Program Sites (Rev. 1, July 1985).

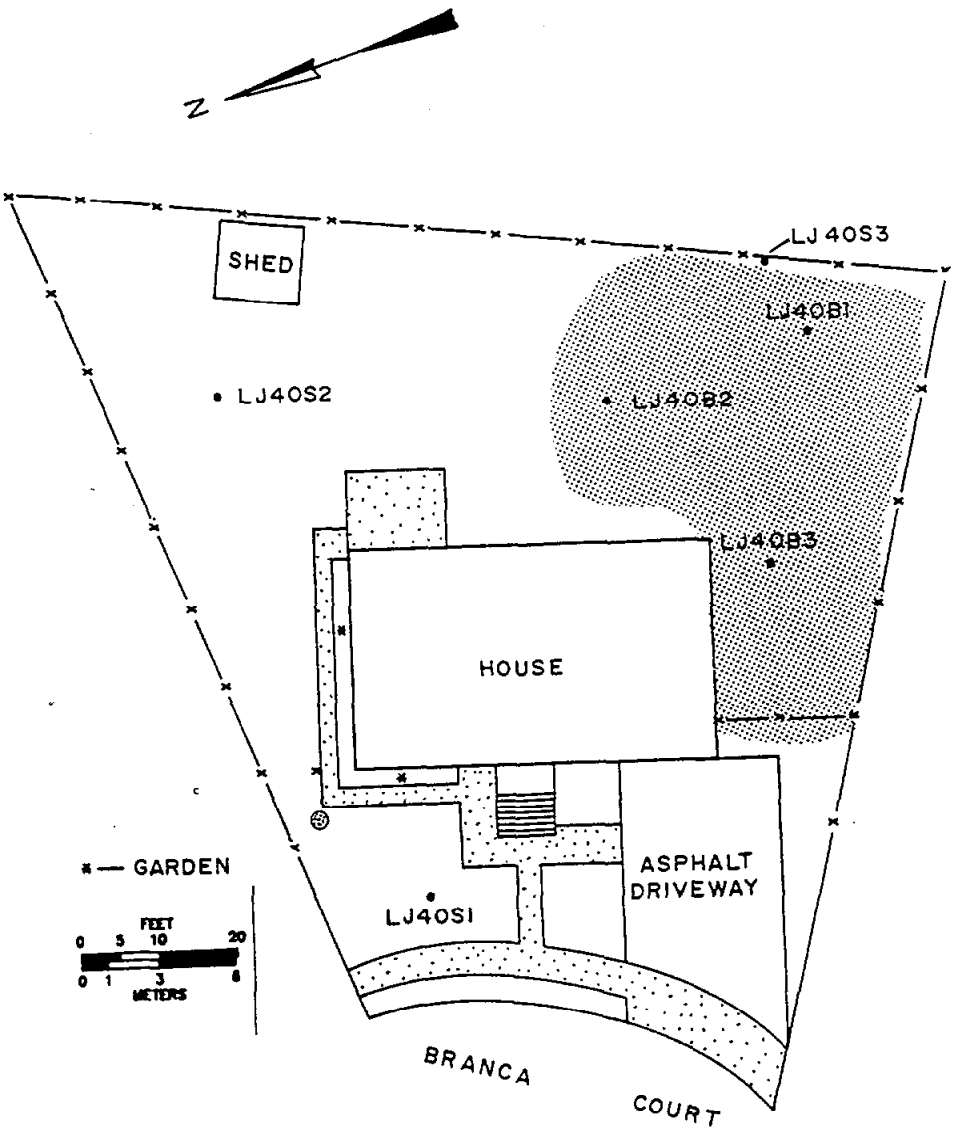

Fig. 1. Diagram showing locations of soil samples taken at 7 Branca Court, Lodi, New Jersey.

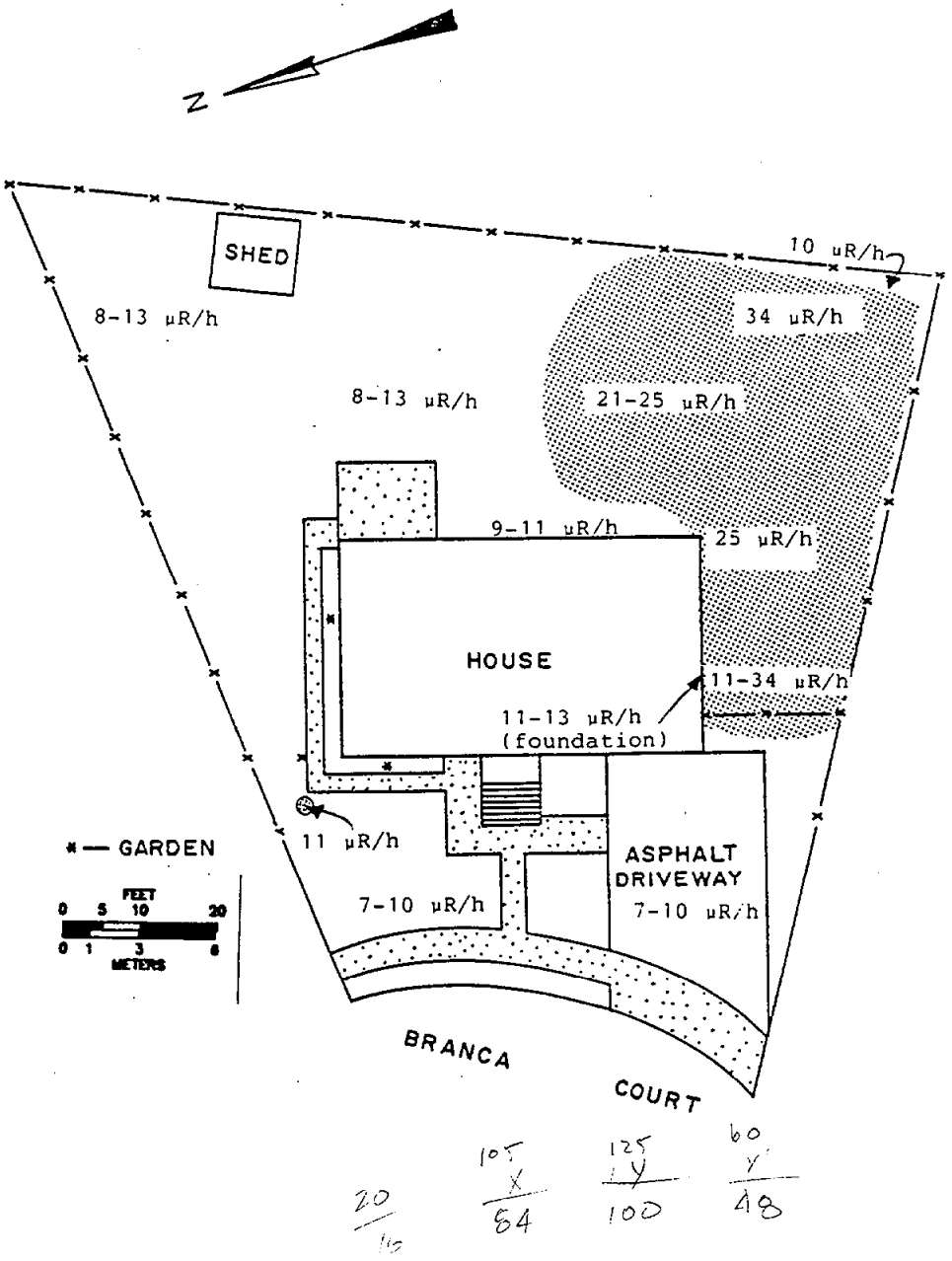

Fig. 2. Gamma radiation levels measured at 7 Branca Court, Lodi, New Jersey.

Table 1. Background radiation levels for the northern New Jersey area.

Type of radiation measurement or sample	Radiation level or radionuclide concentration
Gamma exposure rate at 1 m above floor or ground surface (μR/h)	8[a]
Concentration of radionuclides in soil (pCi/g)	
^{232}Th	0.9[b]
^{238}U	0.9[b]
^{226}Ra	0.9[b]

[a]Reference 4.
[b]Reference 5.

Table 2. Concentrations of radionuclides in soil at 7 Branca Court, Lodi, New Jersey.

Sample[a]	Depth (cm)	Radionuclide concentration (pCi/g)		
		^{226}Ra[b]	^{232}Th[b]	^{238}U[c]
		Systematic samples		
LJ40S1	0-15	0.63 ± 0.07	0.87 ± 0.4	0.71
LJ40S2	0-15	0.66 ± 0.1	0.90 ± 0.5	0.74
LJ40S3	0-15	0.70 ± 0.1	1.1 ± 0.3	0.84
		Biased samples[d]		
LJ40B1A	0-15	3.2 ± 1	23 ± 0.3	8.9
LJ40B1B	15-30	1.6 ± 0.1	8.0 ± 0.6	3.4
LJ40B1C	30-45	0.58 ± 0.09	0.8 ± 0.4	0.66
LJ40B2A	0-15	1.6 ± 0.2	8.9 ± 3	3.6
LJ40B2B	15-30	0.85 ± 0.06	1.5 ± 0.4	0.92
LJ40B3A	0-15	2.2 ± 0.3	13 ± 2	4.9
LJ40B3B	15-30	1.0 ± 0.1	2.8 ± 0.87	1.8

[a]Locations of soil samples are shown on Fig. 1.

[b]Indicated counting error is at the 95% confidence level (± 2 σ).

[c] Total analytical error of measurement results is less than ± 5% (95% confidence level).

[d]Biased samples are taken from areas shown to have elevated gamma exposure rates.

INTERNAL DISTRIBUTION

1-3. B. A. Berven
4. R. O. Chester
5. W. D. Cottrell
6-10. R. W. Doane
11. S. V. Kaye
12. P. T. Owen
13. T. H. Row
14. IR&A Publications Office
15. Laboratory Records - RC

EXTERNAL DISTRIBUTION

16-18. S. W. Ahrends, U.S. Department of Energy, P. O. Box E, Oak Ridge, TN 37831

19. J. D. Berger, Oak Ridge Associated Universities, P. O. Box 117, Oak Ridge, TN 37831

20-22. Edward G. DeLaney, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874

23-25. J. F. Nemec, Bechtel National, Inc., 800 Oak Ridge Turnpike, Oak Ridge, TN 37831

26. J. W. Wagoner, U.S. Department of Energy, 19901 Germantown Road, Germantown, MD 20874

27. Office of Assistant Manager, Energy Research and Development, Oak Ridge Operations Office, Oak Ridge, TN 37831

28-29. Office of Scientific and Technical Information, DOE, Oak Ridge, TN 37831