Rockwell International
Energy Systems Group

SUPPORTING DOCUMENT

GO NO.	S/A NO.	PAGE 1 OF	TOTAL PAGES	REV LTR/CHG NO SEE SUMMARY OF CHG	NUMBER
07704	44650	10	10	NC	N704TI990038

PROGRAM TITLE

Decontamination and Disposition of Facilities

DOCUMENT TITLE

Radiological Survey Results - Release to Unrestricted Use, SRE, Building 143

DOCUMENT TYPE	KEY NOUNS
Technical Information	Decontamination

ORIGINAL ISSUE DATE	REL. DATE
	5-31-83

PREPARED BY/DATE — DEPT — MAIL ADDR

J. H. Wallace — 779 — T034

IR&D PROGRAM? YES ☐ NO ☒
IF YES, ENTER TPA NO.

APPROVALS — DATE

R. J. Tuttle — 5/2/83
B. F. Ureda — 5/4/83
C. C. Conners — 5/5/83
J. M. Marzek
W. P. McCurnin — 5/11/83 for WLMcC
M. E. Remley — 18 May 83

DISTRIBUTION

*	NAME	MAIL ADDR
*	C. C. Conners	NB02
*	J. M. Harris	T055
*	W. R. McCurnin	T020
*	M. E. Remley	NB13
*	R. J. Tuttle	NB13
*	B. F. Ureda	NB02
*	J. H. Wallace	T034

0054Y/reg

* COMPLETE DOCUMENT
NO ASTERISK, TITLE PAGE/SUMMARY OF CHANGE PAGE ONLY

ABSTRACT

The results of the radiological survey for Building 143 of the SRE facility are described. All survey results are below the applicable limits, showing that this area may be released for unrestricted use.

RESERVED FOR PRO

CONTENTS

TABLES

FIGURES

I. INTRODUCTION

This document covers the final release survey of Building 143, the major reactor building of the SRE facility. This survey covers the following areas:

1) Below grade – Hot cell working area
2) High bay – Floor, walls, ceiling
3) Overhead bridge cranes (65 ton and 5 ton)
4) R/A exhaust systems
5) Mezzanine offices
6) Main floor offices
7) Main floor support areas.

The ground level layout of the operating facility is shown in Figure 1. The mezzanine, consisting solely of offices, and the basement, comprising the hot cell operating area, are shown in Figure 2.

Radiological surveys were performed in conformance with N704TP990008, "Radiological Survey Plan Support of D/D Operations at T-143 (SRE)", R. K. Owens.

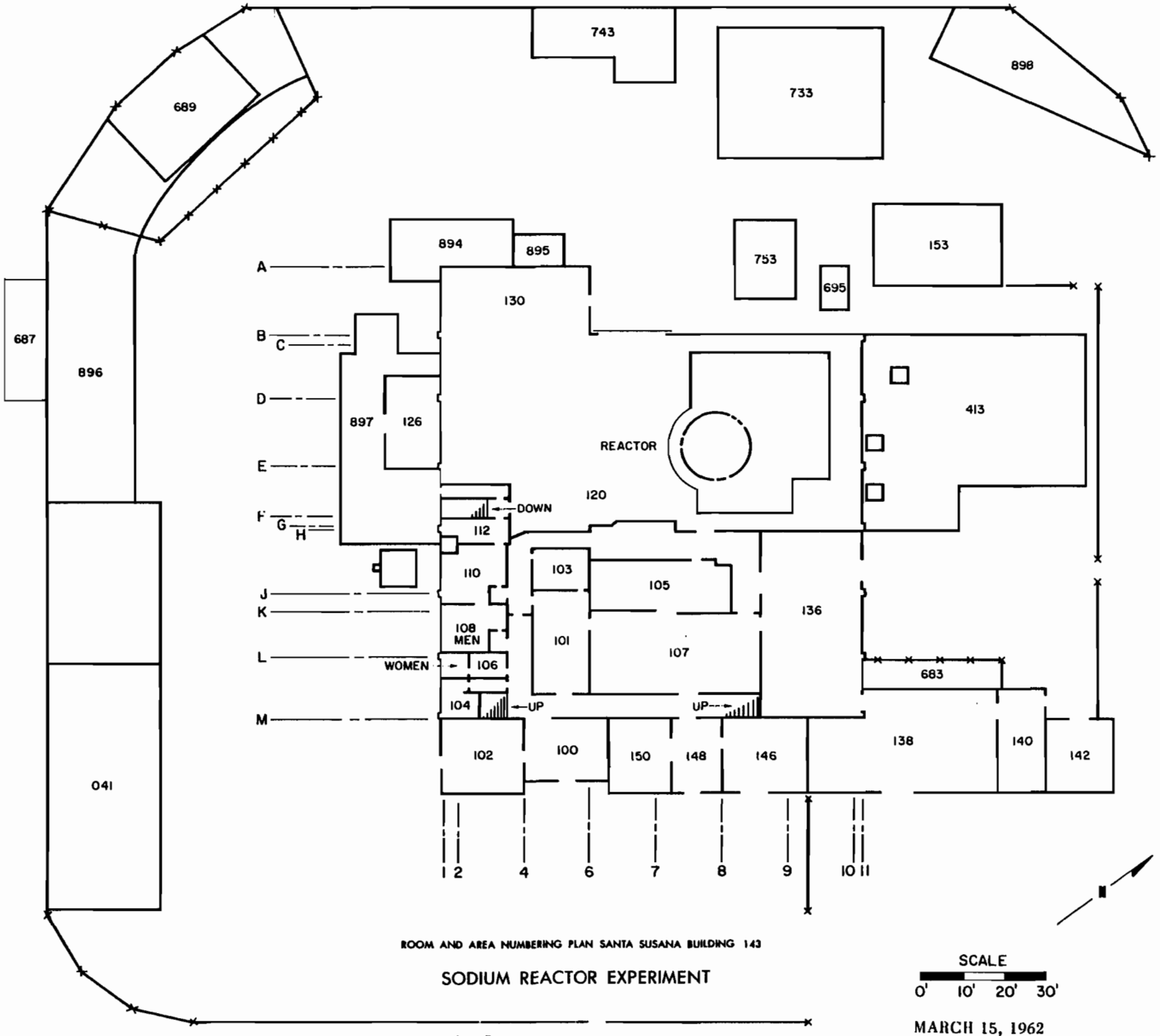
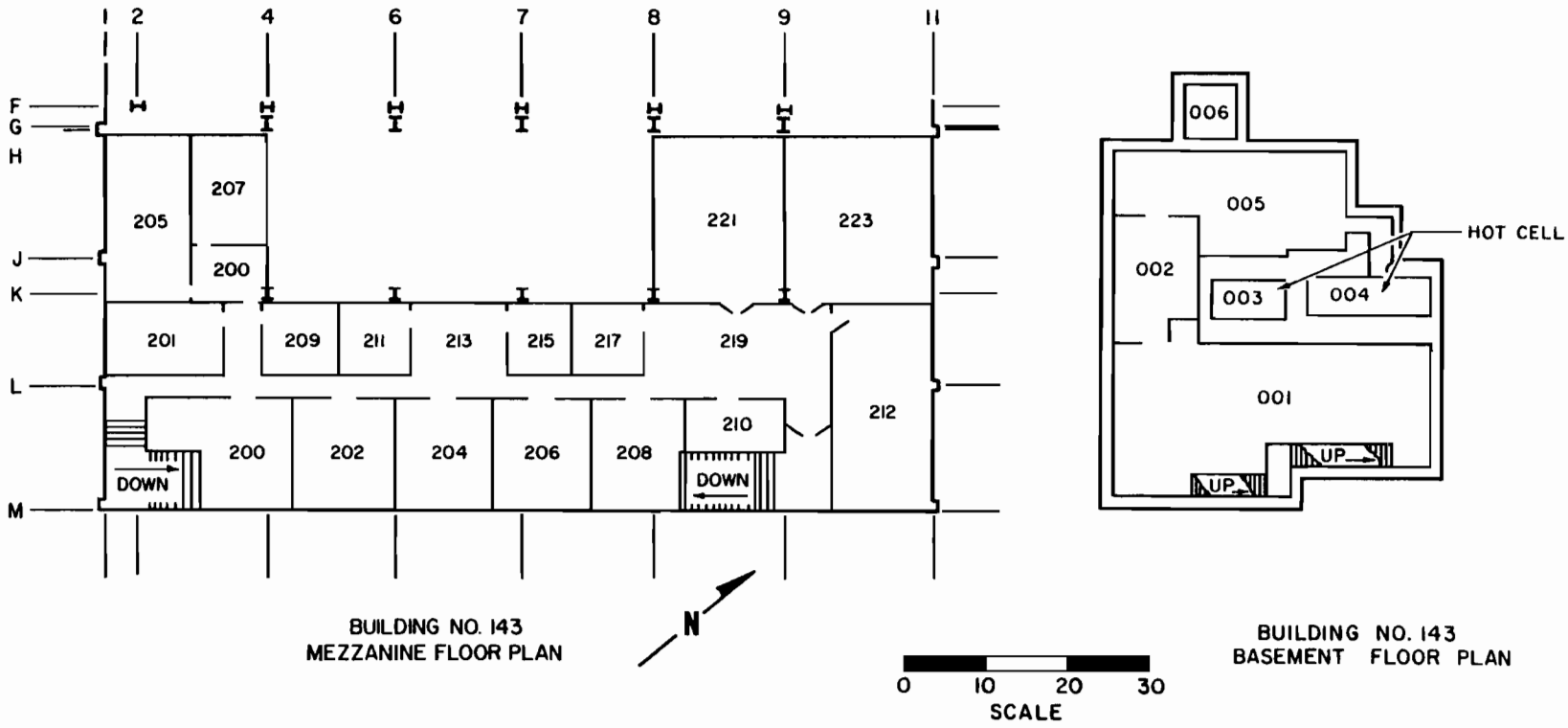


FIGURE 1. SRE Facilities, Ground Floor



BUILDING NO. 143
MEZZANINE FLOOR PLAN

BUILDING NO. 143
BASEMENT FLOOR PLAN

MARCH 15, 1962

FIGURE 2. SRE Facility, Mezzanine and Basement

The contamination/radiation limits for unrestricted use that were applied in decontaminating this area are shown in Table 1 and the requirements for survey measurements in each region are shown in Table 2.

TABLE 1
RESIDUAL RADIOACTIVITY LIMITS
FOR RELEASE FOR UNRESTRICTED USE

	Total	Removal
Surfaces		
Alpha	100 dpm/100 cm^2	20 dpm/100 cm^2
Beta	0.1 mrad/hr at 1 cm through 7 mg/cm^2 absorber	100 dpm/100 cm^2
Soil	100 pCi/g gross detectable beta	
	1000 pCi/g gross detectable beta average below 3 m	
	3000 pCi/g gross detectable beta in isolated cracks below 3 m	

TABLE 2

SURVEY MEASUREMENT REQUIREMENTS

Region	Removal Contamination	Surface Radiation	Soil Samples	Concrete Samples	Water Samples
I	X	X	X	X	X
II	X	X	X		
III		X			
IV	X	X	X		
V		X	X	X	
VI		X	X		
VII		X	X		X
VIII		X			
IX	X	X	X		
X	X	X	X		
041	X	X			
063	X	X			
143 Offices	X	X			
143 High Bay	X	X	X	X	X

Measurements of removable contamination are omitted from those areas that consist solely of soil or asphalt-paved surfaces

II. SURVEYS AND RESULTS

A. SURFACE RADIATION – BELOW GRADE

Below Grade, Hot Cell Working Area. Radiation surveys were conducted using three survey instruments: A Technical Associates Model CP-7 ion chamber detector, a Technical Associates PUG-1 with a thin-window pancake GM detector for its faster response and audible output and a Ludlum Model-12 alpha scintillator detector. All surface radiation readings with the T/A CP-7 were below the Table 1 limit of 0.1 mrad/h with quality assurance verification.

B. SOIL SAMPLES

All below-grade soil samples were less than 100 pCi/g per the quality assurance verification sampling plan. All soil samples were counted in a Nuclear Measurements Corporation automatic counting system with a KCl standard, with an average background of 25-28 cpm. The maximum soil activity was 96 pCi/g with an average of 51 pCi/g.

C. SURFACE RADIATION – HIGH BAY

A total of 120, one-meter-square grids were selected for the final high bay survey. Survey instruments used for each individual grid were:

1) Ludlum Model 12S Micro-R-Meter with a NaI scintillator for gamma rays. A background reading was recorded at one meter away from each grid plus a grid surface reading. An average background reading for the high bay was 8 μR/h and an average of 10 μR/h for grid surfaces.
2) Technical Associates Model CP-7 ion chamber. An average background reading for the high bay was 0.04 mrad/h, and all selected grid surfaces were below the Table 1 limit of 0.1 mrad/h.

3) Technical Associates Model FS-8 automatic recycling scaler with a PAS-9 probe (alpha scintillator). This instrument was used on all selected grids for a 6-minute scan of the entire one-meter grid. An average 6-minute background count was also recorded.

D. REMOVABLE CONTAMINATION

A smear survey was performed on all selected grid surfaces throughout the high bay. Results of smear survey were documented at less than 10 dpm alpha and less than 70 dpm beta-gamma, all below the Table 1 limits.

All smears were counted for alpha and beta-gamma on a Nuclear Measurements Corporation automatic counting system. This system was checked daily with calibrated sources for efficiency. The background for alpha is 0-1 cpm with an average efficiency factor of 3.6. Background for beta is 25-29 cpm with an average efficiency factor of 3.8. Alpha contamination was not suspected at the SRE facility. However, had any occurred, it would have been detected with this counting system. In addition, a Technical Associates Model FS-8 automatic recycling scaler with a PAS-9 probe was used for a 20-minute survey on six selected grid surfaces for alpha contamination only with no detectable activity.

Smear and instrument surveys for the main floor office and support areas, mezzanine offices, and R/A exhaust systems were all below the Table 1 limits.

III. CONCLUSIONS

In each type of test performed, all samples indicated levels less than those limits prescribed by the decontamination and disposition of facilities program for release for unrestricted use.

All appropriate surveys indicate that current existing radioactivity in the area is below the applicable limits for release for unrestricted used.