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OAK RIDGE GASEOUS DIFFUSION PLANT  
INVENTORY OF RADIOACTIVITY  
RELEASED TO ONSITE AND OFFSITE ENVIRONMENTS

The quantities of material released from 1946 through 1972 are shown in Table 13. This table is a summary of the available information found in release reports, effluent sampling data, and analytical information. When a uranium assay is not available, curie quantities are based on an assumed assay of one percent  $^{235}\text{U}$  in the liquid effluents and three percent (average) for the gaseous emissions, or based on assays typical at the specific release point.

Table 14 shows five locations at which material from the ORGDP has been buried onsite or offsite:

K-1407-B Holding Pond. The quantity shown is the result of the summation of "discard records" for the period 1959 through 1972. An estimated 8158 kilograms (2.9 curies) was dredged from the holding pond and pumped to the K-1407-C retention basin in March of 1973.

ORGDP Burial Ground. The quantity of material is the result of the summation of "discard records" for the period 1959 through 1972.

ORNL and Y-12 Burial Grounds. The quantity of material is cumulative from 1946 through 1964.

Sludge Disposal Area. The material is sludge which was removed from the K-1407-B holding pond in 1961.

Sampling of the sediment in the bed of Poplar Creek was performed near 1960. An estimated quantity of 6594 kilograms of uranium with an activity of 2.3 curies was in the creek bed at that time.

The concentrations of plutonium and transuranics in the ORGDP effluents are of such low magnitude that they are not considered significant. However, it is realized that the plant has received and processed reactor returns which contained minute quantities of these nuclides. Very little analytical information is available concerning the concentrations of the nuclides in the reactor returns.

The present location of the plutonium is indeterminant at this time. There are explanations as to where portions of the plutonium may be located. Some of the plutonium was shipped from the plant in the earlier operating years in the form of tower ash. Some of the plutonium is still located in the process cascade. Although analytical information is not available, it is possible that some of the plutonium was released to offsite water streams. Any releases would have been of low concentration.

APPROVAL FOR RELEASE

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Title/Subject OAK RIDGE GASEOUS DIFFUSION PLANT INVENTORY OF OFFSITE RADIOACTIVITY RELEASED TO ONSITE AND ENVIRONMENTS

Approval for unrestricted release of this document is authorized by the Oak

Ridge K-25 Site Classification and Information Control Office, Martin Marietta Energy Systems, Inc., PO Box 2003, Oak Ridge, TN 37831-7307.

AS Just  
K-25 Classification & Information Control Officer

12/29/92  
Date

TABLE 13

URANIUM RELEASED<sup>(1)</sup>

YEAR	Atmosphere (Offsite) Estimated		Ground (Onsite) <sup>(2)</sup> Estimated		Stream (Offsite) <sup>(3)</sup> Estimated	
	Kilograms	Curies	Kilograms	Curies	Kilograms	Curies
1946 <sup>(4)</sup>			580	0.244		
1947			18	0.007		
1948	4	0.002	4	0.002		
1949			10	0.004		
1950			1	0.001		
1951						
1952	324	0.114	3	0.001		
1953	551	0.188	89	0.032		
1954	133	0.047	15	0.006		
1955	217	0.075	26	0.010		
1956	434	0.151	48	0.016		
1957	267	0.092	19	0.070		
1958	366	0.126	19	0.007		
1959	512	0.177				
1960	1448	0.501	6	0.002		
1961	1448	0.503	203	0.069		
1962	4	0.002	142	0.055		
1963 <sup>(5)</sup>	23	0.011				
1964	5	0.002				
1965	23	0.008	3	0.001		
1966			9	0.003		
1967			1	0.002		
1968			2	0.001		
1969	50	0.019			325	0.114
1970	51	0.020	227	0.077	484	0.170
1971	174	0.067	9	0.003	420	0.147
1972	<u>84</u>	<u>0.032</u>	<u>      </u>	<u>      </u>	<u>468</u>	<u>0.164</u>
Total	6118	2.14	1434	0.613	1697	0.595

(1) The data in this table are unofficial estimates and include measured and estimated quantities. All curie quantities are based on 3000 kilograms  $^{238}\text{U}$  being one curie and 477 kilograms  $^{235}\text{U}$  being one curie. Most of the uranium was normal or depleted in the  $^{235}\text{U}$  isotope.

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- (2) Portions of the material released to the ground would have been eventually received by an offsite water stream.
- (3) The estimated quantity released to an offsite water stream was based on effluent monitoring. This type of sampling program was not in effect prior to 1969. Neither is analytical information available for this period.
- (4) Little analytical information is available for the earlier operating years of the plant.
- (5) Analytical and data records were not maintained fully from 1963 to 1968 due to a reduction in the work force at the ORGDP.

TABLE 14

URANIUM DISPOSED OF IN SOLID FORM<sup>(1)</sup>

<u>Location</u>	<u>Quantity (Kilograms)</u>	<u>Activity (Curies)</u>
K-1407-B Holding Pond	11398 <sup>(2)</sup>	3.92
ORGDP Burial Ground	18398	6.31
ORNL Burial Ground	2874	1.00
Sludge Disposal Area	152	0.060
Y-12 Burial Ground	1171	0.408

(1) The data in this table are unofficial estimates and include measured and estimated quantities. All curie quantities of uranium are based on 3000 kilograms  $^{238}\text{U}$  being one curie and 477 kilograms  $^{235}\text{U}$  being one curie.

REFERENCES (ORGDP)

UCC-ND-162, Radioactive Effluent Monitoring and Control (1969).

UCC-ND-168, Radioactive Effluent Monitoring and Control (1970).

U.S.AEC Liquid and Airborne Radioactive Effluent Data, Nuclide Data, AEC Forms 789A and 789B, 1971.

U.S.AEC Liquid and Airborne Radioactive Effluent Data, Nuclide Data, AEC Forms 789A and 789B, 1972.

ORO-723 (ORGDP), "Radioactive Waste Management Plans, Oak Ridge Gaseous Diffusion Plant."

K-P-3530, Part 6 (Secret), "FZA (AEC), Uranium Control Department, SS Material Control Report (U), December, 1972."

K-P-1806 (Secret), "Oak Ridge Gaseous Diffusion Plant, Quarterly Report (U), Second Quarter FY 1969, October 1, 1968 through December 31, 1968."