Idaho
National
Engineering
Laboratory

INEL-95/0135
Rev. 1
August 1995

A Comprehensive Inventory of Radiological and Nonradiological Contaminants in Waste Buried or Projected to be Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1984–2003

Volume 2

Lockheed
Idaho Technologies Company

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Published August 1995

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Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
Under DOE Idaho Operations Office
Contract DE-AC07-94ID13223

PREFACE

This report, *A Comprehensive Inventory of Radiological and Nonradiological Contaminants in Waste Buried or Projected to be Buried in the Subsurface Disposal Area of the INEL RWMC During the Years 1984–2003*, is composed of three volumes. Volume 1 consists of the main body of the report and Appendices A, C, D, E, F, and G. Appendix B, the complete printout of the inventory database, is provided in Volumes 2 and 3. Because of its size, distribution of Appendix B has been limited. A copy of the volumes containing Appendix B can be provided on request.

Appendix B

Complete Printout of Contaminant Inventory and Other Information from the CIDRA Database

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION RDT - 245

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/20/94

3. Generator: ALE
(area or contractor - use code from attached list)

4. Particular facility: 317
(building number - use code from attached list)

5. Number of waste stream from this facility:
1R

6. Waste stream:
Biological waste.

7. Type of radioactive waste (check box):
[ ] TRU or suspect TRU
[X] LLW
[ ] non-radioactive

8. Actual years disposed of at SDA:
Starting year 1987 Ending year 1987

9. Waste stream volume:
Amount 3.4000 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [X] container volume or [ ] waste volume

10. Comments (specify number of pertinent question):

1. General physical form (see attached list)
Biological waste.
[ ] other (specify)

2. Details on physical form(particularly confinement related)
Tissue, feces, and other waste from small animals (dogs and mice).

3. Chemical form:
Included in tissue, feces and other waste from small animals (dogs and mice).

4. Inner packaging: [ ] plastic bag [ ] plastic liner
[ ] metal liner [ ] none [X] other (specify)
Three and/or 5-gallon paint cans.

5. Waste container type (see attached list)
Bin.

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Contaminant & CAS Registry Number	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
None.										

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Radionuclide	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
H-3	Liquid absorbed in animal fluid.	Tritiated water.	T 746.10000000000	CI	1987	1987	N	-50%	+50%	Professional judgment.
C-14	Bound in animal tissues.	Constituent of animal cells.	T .00010000000000	CI	1987	1987	N	-50%	+50%	Professional judgment.

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)
The biological samples were either analyzed directly or, in some cases, the values may have been obtained as a difference between the intake and the amount excreted, both of which would have been determined by analytical methods. The method of activity determination is not known for certain.

1. Type of source of information:
(check box)

[X] RWMIS [ ] other database
[ ] sample analysis data
[ ] operating records [X] interview
[ ] expert judgment [X] reports
[ ] other

2. Details concerning source (names, report no., dates, etc.)
RWMIS printout; Report WM-F1-82-010, ANL Laboratory East, Low-level Waste Sources and Forms, L.S. Kee, June 1982. Argonne National Laboratory Institutional Plan, FY 1986-FY 1991, November 1985. Telephone interview with M. Sodaro, Waste Management manager for ANL-E, on 06/15/94.

3. Do the estimates of contaminant quantities in Part C and D represent:
[X] best estimate
[ ] worst case
[ ] other

4. If other than best estimate, explain why:

5. Do the data conflict with RWMIS?
(Historical or Present Data Only)
[X] no
[ ] yes

6. If yes, explain why:

7. Major unknowns in inventories of contaminants:
The method used to determine the concentration of H-3 was not known.

8. Key assumptions used to deal with the unknowns:
Assumed that analytical methods were used to determine the concentration of H-3.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION RDT - 246

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/20/94

3. Generator: ALE
(area or contractor - use code from attached list)

4. Particular facility: 317
(building number - use code from attached list)

5. Number of waste stream from this facility:
2R

6. Waste stream:
General plant waste from research and development operations and waste from general upgrading of facilities.

7. Type of radioactive waste (check box):
[ ] TRU or suspect TRU
[X] LLW
[ ] non-radioactive

8. Actual years disposed of at SDA:
Starting year 1984 Ending year 1988

9. Waste stream volume:
Amount 1547.4000 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [X] container volume or [ ] waste volume

10. Comments (specify number of pertinent question):
6. Some substandard temporary buildings were demolished, other facilities were upgraded and substantial rehabilitation of laboratory and other research facilities occurred.

1. General physical form (see attached list)
Combustibles (paper, cloth, wood, etc.)
[ ] other (specify)

2. Details on physical form(particularly confinement related)
Includes cloth, paper, wood, plastic, cut-up scrap, cut-up glove boxes and other undefined general plant waste.

3. Chemical form:
Cellulose, metallic, and plastic.

4. Inner packaging: [ ] plastic bag [ ] plastic liner
[ ] metal liner [X] none [ ] other (specify)

5. Waste container type (see attached list)
Bin.

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
1. Also 42, 44, and 10.

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Contaminant & CAS Registry Number	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
None.										

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Radionuclide	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
Cs-137	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T 78.800000000000	CI	1984	1988	N			
Sr-90	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T 7.6000000000000	CI	1984	1988	N			
Co-60	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T 8.9000000000000	CI	1984	1988	N			
H-3	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T 80.000000000000	CI	1984	1988	N	-50%	+50%	Professional judgment.
Cs-134	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .10000000000000	CI	1984	1988	N			
Pu-239	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .23000000000000	CI	1984	1988	N	-50%	+50%	
Pu-241	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .02000000000000	CI	1984	1988	N	-50%	+50%	
U-232	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T 2.2100000000000	CI	1984	1988	N	-50%	+50%	
U-238	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .01000000000000	CI	1984	1988	N	-50%	+50%	

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)
Sample data were not available, but it is likely that some sort of analytical examination was made. The large volume of waste and the low concentrations of radionuclides suggest the reliability of the analyses may not be very high. The method of measurement is not known for certain. The U-234 quantity was estimated assuming that the uranium was 50% enriched, a common enrichment for EBR-II fuel.

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Radionuclide	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
Ra-226	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T 1.1000000000000	CI	1984	1988	N	-50%	+50%	
Th-228	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T 8.2000000000000	CI	1984	1988	N	-50%	+50%	
Fe-59	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .36000000000000	CI	1984	1988	N			
Eu-152	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .10000000000000	CI	1984	1988	N			
Eu-154	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .26000000000000	CI	1984	1988	N			
Am-241	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .16000000000000	CI	1984	1988	N	-50%	+50%	
C-14	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .00300000000000	CI	1984	1988	N	-50%	+50%	
U-234	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .71000000000000	CI	1984	1988	N	-50%	+50%	
U-235	Imbedded/absorbed in the solid waste constituents.	Probably oxides or nitrates.	T .03000000000000	CI	1984	1988	N	-50%	+50%	

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column. If not, mark N and give the minimum value and maximum value.

Additional information or explanations (indicate pertinent contaminant)

Sample data were not available, but it is likely that some sort of analytical examination was made. The large volume of waste and the low concentrations of radionuclides suggest the reliability of the analyses may not be very high. The method of measurement is not known for certain. The U-234 quantity was estimated assuming that the uranium was 50% enriched, a common enrichment for EBR-II fuel.

1. Type of source of information:
(check box)

[X] RWMIS [ ] other database
[ ] sample analysis data
[ ] operating records [X] interview
[ ] expert judgment [X] reports
[ ] other

2. Details concerning source (names, report no., dates, etc.)
RWMIS printout 1984-93. Argonne National Laboratory Institutional Plan, FY 1986-FY 1991, November 1985. Telephone interview with M. Sodaro, Waste Management manager for ANL-E, on 06/15/94. Report WM-F1-82-010, ANL Laboratory East, Low-level Waste Sources and Forms, L.S. Kee, June 1982.

3. Do the estimates of contaminant quantities in Part C and D represent:
[X] best estimate
[ ] worst case
[ ] other

4. If other than best estimate, explain why:

5. Do the data conflict with RWMIS?
(Historical or Present Data Only)
[X] no
[ ] yes

6. If yes, explain why:

7. Major unknowns in inventories of contaminants:
The method used to determine the concentrations of radionuclides is not known.

8. Key assumptions used to deal with the unknowns:
It is assumed the variability in the concentration may be due to the large volume of waste from various sources and the inherent difficulty in measuring low concentrations in a large volume of waste.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION RDT - 247

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/21/94

3. Generator: ALE
(area or contractor - use code from attached list)

4. Particular facility: 317
(building number - use code from attached list)

5. Number of waste stream from this facility:
3R

6. Waste stream:
Filters.

7. Type of radioactive waste (check box):
[ ] TRU or suspect TRU
[X] LLW
[ ] non-radioactive

8. Actual years disposed of at SDA:
Starting year 1984 Ending year 1988

9. Waste stream volume:
Amount 384.0000 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [X] container volume or [ ] waste volume

10. Comments (specify number of pertinent question):

1. General physical form (see attached list)
HEPA filters.
[ ] other (specify)

2. Details on physical form(particularly confinement related)
HEPA and other types of filters. Generally not compacted.

3. Chemical form:
Fiberglass.

4. Inner packaging: [ ] plastic bag [ ] plastic liner
[ ] metal liner [X] none [ ] other (specify)

5. Waste container type (see attached list)
Bin.

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
1. Also 23.

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Contaminant & CAS Registry Number	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
None.										

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Radionuclide	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
Co-60	Absorbed on particulate matter.	Probably oxides.	T .10000000000000	CI	1984	1988	N			
Pu-238	Absorbed on particulate matter.	Probably oxides.	T .20000000000000	CI	1984	1988	N	-50%	+50%	Professional judgment.
Pu-239	Absorbed on particulate matter.	Probably oxides.	T .40000000000000	CI	1984	1988	N	-50%	+50%	
Pu-240	Absorbed on particulate matter.	Probably oxides.	T .02000000000000	CI	1984	1988	N	-50%	+50%	
U-238	Absorbed on particulate matter.	Probably oxides.	T .08000000000000	CI	1984	1988	N	-50%	+50%	
C-14	Absorbed on particulate matter.	Probably oxides.	T .01000000000000	CI	1984	1988	N	-50%	+50%	
H-3	Absorbed on particulate matter.	Probably oxides.	T 18.800000000000	CI	1984	1988	N	-50%	+50%	
Cs-137	Absorbed on particulate matter.	Probably oxides.	T 24.700000000000	CI	1984	1988	N			

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)
No actual sample data were available, but it was assumed that an analysis had to be done to obtain the Pu, U, C and H-3 isotopes.

1. Type of source of information:
(check box)

[X] RWMIS [ ] other database
[ ] sample analysis data
[ ] operating records [X] interview
[ ] expert judgment [X] reports
[ ] other

2. Details concerning source (names, report no., dates, etc.)
RWMIS printout. Report, ANL-E Low-level Waste Sources and Forms, WM-F1-82-010, L.S. Kee, June 1982. RWMIS printout 1984-93. Argonne National Laboratory Institutional Plan, FY 1986-FY 1991, November 1985. Telephone interview with M. Sodaro, Waste Management manager for ANL-E on 06/15/94.

3. Do the estimates of contaminant quantities in Part C and D represent:
[X] best estimate
[ ] worst case
[ ] other

4. If other than best estimate, explain why:

5. Do the data conflict with RWMIS?
(Historical or Present Data Only)
[X] no
[ ] yes

6. If yes, explain why:

7. Major unknowns in inventories of contaminants:
The major part of the radioactivity was MFP.

8. Key assumptions used to deal with the unknowns:
This was assumed to be Cs-137, the only fission product that was reported in significant quantities in the analysis.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION RDT - 248

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/21/94

3. Generator: ALE
(area or contractor - use code from attached list)

4. Particular facility: 317
(building number - use code from attached list)

5. Number of waste stream from this facility:
4R

6. Waste stream:
Paving, roofing, concrete, soil, and brick.

7. Type of radioactive waste (check box):
[ ] TRU or suspect TRU
[X] LLW
[ ] non-radioactive

8. Actual years disposed of at SDA:
Starting year 1987 Ending year 1988

9. Waste stream volume:
Amount 136.0000 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [X] container volume or [ ] waste volume

10. Comments (specify number of pertinent question):

1. General physical form (see attached list)
Concrete, brick, and asphalt.
[ ] other (specify)

2. Details on physical form(particularly confinement related)
Generally loose material from replacement of roads and buildings.

3. Chemical form:
Silicates, cellulose, and aluminates.

4. Inner packaging: [ ] plastic bag [ ] plastic liner
[ ] metal liner [X] none [ ] other (specify)

5. Waste container type (see attached list)
Bin.

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
1. Also 43.
4. Due to the type of waste, it was assumed that it would not have been placed in paint cans, but placed in the bins directly.

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Contaminant & CAS Registry Number	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
None.										

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Radionuclide	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
H-3	Liquid imbedded in dry material.	Tritiated water.	T 19.300000000000	CI	1987	1988	N	-50%	+50%	Professional judgment.

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)
No contaminants other than H-3 were listed. It is not known which of the materials disposed of contained the H-3, but it is likely that it was not in a form that could be considered "contained".

1. Type of source of information:
(check box)

[X] RWMIS [ ] other database
[ ] sample analysis data
[ ] operating records [X] interview
[ ] expert judgment [X] reports
[ ] other

2. Details concerning source (names, report no., dates, etc.)
RWMIS printout 1984-93. Report, ANL-East Low-level Waste Sources and Forms, L.S. Kee, WM-F1-82-010, June 1982. Argonne National Laboratory Institutional Plan, FY 1986-FY 1991, November 1985. Telephone interview with M. Sodaro, Waste Management manager for ANL-E on 06/15/94.

3. Do the estimates of contaminant quantities in Part C and D represent:
[X] best estimate
[ ] worst case
[ ] other

4. If other than best estimate, explain why:

5. Do the data conflict with RWMIS?
(Historical or Present Data Only)
[X] no
[ ] yes

6. If yes, explain why:

7. Major unknowns in inventories of contaminants:
It is not known what part of the waste the H-3 was in.

8. Key assumptions used to deal with the unknowns:
It was assumed that the H-3 was in a form that was readily leachable.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION RDT - 249

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/21/94

3. Generator: ALE
(area or contractor - use code from attached list)

4. Particular facility: 317
(building number - use code from attached list)

5. Number of waste stream from this facility:
5R

6. Waste stream:
Absorbed liquids, sludge, and evaporator bottoms.

7. Type of radioactive waste (check box):
[ ] TRU or suspect TRU
[X] LLW
[ ] non-radioactive

8. Actual years disposed of at SDA:
Starting year 1984 Ending year 1987

9. Waste stream volume:
Amount 139.2000 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [X] container volume or [ ] waste volume

10. Comments (specify number of pertinent question):

1. General physical form (see attached list)
Vermiculite and other sorbents.
[ ] other (specify)

2. Details on physical form(particularly confinement related)
Liquids from laboratory studies were absorbed in dry materials, such as vermiculite. Likewise sludge and evaporator bottoms contaminated with low-level radionuclides were absorbed in dry materials and packaged in 3 or 5-gallon paint cans for shipment.

3. Chemical form:
Nitrates and/or oxides.

4. Inner packaging: [ ] plastic bag [ ] plastic liner
[ ] metal liner [ ] none [X] other (specify)
Paint cans.

5. Waste container type (see attached list)
Bin.

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
1. Also 11.

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Contaminant & CAS Registry Number	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
None.										

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Radionuclide	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
Co-60	Contained in dry solids.	Nitrates and/or oxides.	T .01000000000000	CI	1984	1987	N			
Fe-59	Contained in dry solids.	Nitrates and/or oxides.	T .01000000000000	CI	1984	1987	N			
H-3	Contained in dry solids.	Nitrates and/or oxides.	T .02000000000000	CI	1984	1987	N	-50%	+50%	Professional judgment.
Mn-54	Contained in dry solids.	Nitrates and/or oxides.	T .01000000000000	CI	1984	1987	N			
Na-22	Contained in dry solids.	Nitrates and/or oxides.	T .01000000000000	CI	1984	1987	N			
Pu-239	Contained in dry solids.	Nitrates and/or oxides.	T .04000000000000	CI	1984	1987	N	-50%	+50%	
Pu-240	Contained in dry solids.	Nitrates and/or oxides.	T .02000000000000	CI	1984	1987	N	-50%	+50%	
U-238	Contained in dry solids.	Nitrates and/or oxides.	T .02000000000000	CI	1984	1987	N	-50%	+50%	
V-48	Contained in dry solids.	Nitrates and/or oxides.	T .40000000000000	CI	1984	1987	N			

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)
No sample data were available, but it was assumed that some analysis was made, because of the detailed radionuclide concentrations reported.

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Radionuclide	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
Cs-137	Contained in dry solids.	Nitrates and/or oxides.	T 13.700000000000	CI	1984	1987	N			

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)
No sample data were available, but it was assumed that some analysis was made, because of the detailed radionuclide concentrations reported.

1. Type of source of information:
(check box)

[X] RWMIS [ ] other database
[ ] sample analysis data
[ ] operating records [X] interview
[ ] expert judgment [X] reports
[ ] other

2. Details concerning source (names, report no., dates, etc.)
RWMIS printout 1984-93. Report ANL-E Low-level Waste Sources and Forms, WM-F1-82-010, L.S. Kee, June 1982. Argonne National Laboratory Institutional Plan, FY 1986-FY 1991, November 1985. Telephone interview with M. Sodaro, Waste Management manager for ANL-E, on 06/15/94.

3. Do the estimates of contaminant quantities in Part C and D represent:
[X] best estimate
[ ] worst case
[ ] other

4. If other than best estimate, explain why:

5. Do the data conflict with RWMIS?
(Historical or Present Data Only)
[X] no
[ ] yes

6. If yes, explain why:

7. Major unknowns in inventories of contaminants:
The majority of the curies was reported as MFP.

8. Key assumptions used to deal with the unknowns:
The MFP value was assigned to Cs-137, the only fission product reported to be present in significant quantities.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION RDT - 250

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/21/94

3. Generator: ALE
(area or contractor - use code from attached list)

4. Particular facility: 317
(building number - use code from attached list)

5. Number of waste stream from this facility:
6R

6. Waste stream:
Ferrous and non-ferrous metals, metal combinations, and assemblies.

7. Type of radioactive waste (check box):
[ ] TRU or suspect TRU
[X] LLW
[ ] non-radioactive

8. Actual years disposed of at SDA:
Starting year 1987 Ending year 1987

9. Waste stream volume:
Amount 40.8000 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [X] container volume or [ ] waste volume

10. Comments (specify number of pertinent question):

1. General physical form (see attached list)
Other scrap metals.
[ ] other (specify)

2. Details on physical form(particularly confinement related)
Metals from experiments related to fuel cycle facility development and IFR feasibility related experiments. Metals reduced in size to fit into a bin for transport.

3. Chemical form:
Probably stainless steel components (Fe, Ni, Cr).

4. Inner packaging: [ ] plastic bag [ ] plastic liner
[ ] metal liner [X] none [ ] other (specify)

5. Waste container type (see attached list)
Bin.

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
It was assumed that the size and configuration of the metal pieces prevented them from being packaged in paint cans, so they were probably packaged loosely in the bins.

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Contaminant & CAS Registry Number	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
None.										

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)

For each contaminant, complete at least one line on the following table. If any entries for that contaminant vary by year, fill out additional lines as needed to cover the varying entries for different years. For example, if the annual quantity disposed was x kg for 1952-56 and y kg for 1956-84, use two lines to handle this situation.

Radionuclide	Physical Form	Chemical Form	(A)nnual/(T)otal Quantity	Unit	Begin Year	End Year	Samples?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
H-3	Imbedded in metal.	Unknown, assume atomic oxide.	T 28.900000000000	CI	1987	1987	N	-50%	+50%	Professional judgment.
Cs-137	Imbedded in metal.	Unknown, assume atomic oxide.	T .20000000000000	CI	1987	1987	N			

* If sample data are available, mark Y in the column titled "Samples?" and provide number of samples in the next column and standard deviation in the next column.
If not, mark N and give the minimum value and maximum value.
Additional information or explanations (indicate pertinent contaminant)
No sample analysis was available, but it was assumed that the indicated concentrations were obtained by radiochemical analysis.

1. Type of source of information:
(check box)

[X] RWMIS [ ] other database
[ ] sample analysis data
[ ] operating records [X] interview
[ ] expert judgment [X] reports
[ ] other

2. Details concerning source (names, report no., dates, etc.)
RWMIS printout 1984-93. Report, ANL-E Low-level Waste Sources and Forms, WM-F1-82-010, L.S. Kee, June 1982. Argonne National Laboratory Institutional Plan, FY 1986-FY 1991, November 1985. Telephone interview with M. Sodaro, Waste Management manager for ANL-E, on 06/15/94.

3. Do the estimates of contaminant quantities in Part C and D represent:
[X] best estimate
[ ] worst case
[ ] other

4. If other than best estimate, explain why:

5. Do the data conflict with RWMIS?
(Historical or Present Data Only)
[X] no
[ ] yes

6. If yes, explain why:

7. Major unknowns in inventories of contaminants:
The method of determining the radionuclide content was not known. Activation products could be present in the metal, but none were identified in the record.

8. Key assumptions used to deal with the unknowns:
It was assumed that the activity of tritium was determined by radiochemical analysis.