Idaho Chemical Processing Plant

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 59

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/29/93

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

4. Particular facility: 601
(building number - use code from attached list)

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

6. Waste stream:
Leached vycor glass.

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

8. Actual years disposed of at SDA:
Starting year 1966 Ending year 1970

9. Waste stream volume:
Amount 1.7380 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. EBR-II fabricated fuel elements in a pyrometallurgical process by pouring molten uranium into vycor glass tubing molds. The molds were then crushed to remove the uranium fuel rods. The crushed vycor glass was then transported to the CPP, where it was leached with hot nitric acid in the multicurie cell facility. The leached glass was then packaged and disposed of at the RWMC.

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

2. Details on physical form(particularly confinement related)
Broken pieces of glass.

3. Chemical form:
Primarily SiO2.

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

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

6. Other characteristics of interest:
The glass was returned to the metal paint cans in which it was shipped to CPP, the lid crimped shut, and the cans transported in a cask to the RWMC.

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
Y-90	Sorbed on particles of glass.	Probably present as the oxide.	T 9848.0000000000	CI	1966	1970	N	-50%	+50%	See comment below.
Ce-144	Sorbed on particles of glass.	Probably present as the oxide.	T 24620.000000000	CI	1966	1970	N	-50%	+50%	See comment below.
Sr-90	Sorbed on particles of glass.	Probably present as the oxide.	T 9848.0000000000	CI	1966	1970	N	-50%	+50%	See comment below.
Cs-137	Sorbed on particles of glass.	Probably present as the oxide.	T 4924.0000000000	CI	1966	1970	N	-50%	+50%	See comment below.
Pr-144	Sorbed on particles of glass.	Probably present as the oxide.	T 24620.000000000	CI	1966	1970	N	-50%	+50%	See comment below.

* 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 shipment records all listed MFP for the radionuclides; accordingly, it was necessary to break the MFP down into individual radionuclides as described in Section E. Also, the total curies for a shipment was probably determined from radiation readings that were applied a conversion factor.

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

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

2. Details concerning source (names, report no., dates, etc.)
The "qualifier flag" database, which lists items that were on the shipment record but not in RWMIS, provided a means for identifying the vycor glass shipments, even though they were listed on the records in at least 6 different ways. M.E. Jacobson, who worked on the process, was interviewed for additional information. Report used was EGG-WM-9857, June 1992.

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:
Method of determining total Ci per shipment was probably conversion of a radiation reading. Curies were reported as MFP, so it was necessary to convert these values to specific radionuclides.

8. Key assumptions used to deal with the unknowns:
Assumed that a +/-50% variance would account for any errors associated with converting radiation readings to curies. Assumed that the breakdown of MFP into specific radionuclides by using information supplied by ANL-W personnel and reported by EGG-WM-9857, June 1992 was reasonably accurate or at least within the +/-50% variance used.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 60

1. Preparer: Rhodes, Donald W.

2. Date prepared: 07/06/93

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

4. Particular facility: 601
(building number - use code from attached list)

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

6. Waste stream:
Insulation, pipe, wire, wood, plastic, rags and concrete.

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

8. Actual years disposed of at SDA:
Starting year 1960 Ending year 1970

9. Waste stream volume:
Amount 0.9140 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):

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

2. Details on physical form(particularly confinement related)
Primarily in the form of insulation covering pipe in the Waste Calciner Facility oil fired burner.

3. Chemical form:
Asbestos.

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

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

6. Other characteristics of interest:
All shipments were mixed with other waste, including metal pipe, wire, wood, plastic, rags and concrete.

7. Comments (specify number of pertinent question):
5. BXC, BLM. The waste calcining facility used an oil fired NaK heating system to provide heat for the calcination process. Circulating the heated NaK through the piping system produced corrosion on the piping, which occasionally resulted in a NaK fire when the corrosion resulted in a break in the piping. When this occurred, the system was shut down and the faulty pipe section was replaced with new pipe. The piping that was removed along with the asbestos that insulated the pipe, were disposed to the RWMC.

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
1332-21-4 Asbestos	Formed as a blanket around steel pipe.	Unknown.	T 240.00000000000	LB	1960	1970	N	-50%	+50%	Insulation was only 1 of the items in ea. shipment

* 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)

Estimated that asbestos was about 10% of the total container volume within +/-50%. This is believed to be a conservative value based on the fact that much of the material in the shipment was piping, which packs very loosely.

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
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)

The oil fired furnace that used the NaK for a heat exchange medium was in a non-radioactive area. Components other than insulation in the shipments were contaminated, but even that contamination amounted to less than 1 Ci for all shipments.

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

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

2. Details concerning source (names, report no., dates, etc.)
Some shipments that were listed in RWMIS as "paper, metal, and wood" were shown in the qualifier database to contain insulation.

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 amount of insulation was not specified. It was usually mixed with other waste in the shipment.

8. Key assumptions used to deal with the unknowns:
Assumed that the volume of insulation was 10% of the volume of the container, and that the variance was +/-50%. This is believed to be a conservative value.

Continuation of Part B Column or Question Number or Title 6.

Since the insulation came from the NaK heating system in the WCF, traces of NaK could have been in the piping that was shipped to the RWMC. This would have been a very small amount, and probably would not have been associated with the asbestos itself.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 74

1. Preparer: Rhodes, Donald W.

2. Date prepared: 07/13/93

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

4. Particular facility: 601
(building number - use code from attached list)

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

6. Waste stream:
Dissolved fuel specimens.

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

8. Actual years disposed of at SDA:
Starting year 1969 Ending year 1969

9. Waste stream volume:
Amount 0.0568 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):
6. This waste stream represents one waste shipment. Fuel specimens dissolved in HF-HNO3, then reacted with plaster of paris.

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

2. Details on physical form(particularly confinement related)
The liquid dissolver solution was reacted with plaster of paris, and the resulting solid was contained in three 5-gallon polyethylene bottles.

3. Chemical form:
Calcium sulfate, containing uranium, zirconium and radionuclides.

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

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

6. Other characteristics of interest:
The waste containers were three 5-gallon polyethylene bottles.

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
Sr-90	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 4000.0000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.
Y-90	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 4000.0000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.
Zr-95	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 1240.0000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.
Nb-95	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 1240.0000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.
Cs-137	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 4000.0000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.
Ce-144	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 7880.0000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.
Pr-144	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 7880.0000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.
Sb-125	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 1760.0000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.
Ru-106	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 4000.0000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.

* 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)

Physical form: Ions in solution sorbed on and reacted with calcium sulfate. Specimens of Navy fuel were irradiated in the ETR, then dissolved in a nitric acid-hydrofluoric acid mixture. At the completion of the experiment, the acidic dissolver product solution was reacted with Plaster of Paris (calcium sulfate) in 5-gallon plastic bottles and disposed to the RWMC. An interview with the chemist who performed the work indicated that the reactor history of the fuel specimens was well known. That, together with radiation measurements, was used to determine the total curies. On that basis, the variance was estimated to be +/-25%. The fission product distribution used was that given in EGG-WM-9857. The amount of U-235 is believed to be based on a sample analysis.

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
Rh-106	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 4000.0000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.
U-235	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T .15000000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page.
U-234	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T 4.7000000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page
U-238	Ions in sol. sorbed on & reacted w/calcium sulfate	Sulfate salts.	T .05000000000000	CI	1969	1969	N	-25%	+25%	No actual sample results available. See next page

* 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)
Physical form: Ions in solution sorbed on and reacted with calcium sulfate. Specimens of Navy fuel were irradiated in the ETR, then dissolved in a nitric acid-hydrofluoric acid mixture. At the completion of the experiment, the acidic dissolver product solution was reacted with Plaster of Paris (calcium sulfate) in 5-gallon plastic bottles and disposed to the RWMC. An interview with the chemist who performed the work indicated that the reactor history of the fuel specimens was well known. That, together with radiation measurements, was used to determine the total curies. On that basis, the variance was estimated to be +/-25%. The fission product distribution used was that given in EGG-WM-9857. The amount of U-235 is believed to be based on a sample analysis.

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

[X] RWMIS [ ] other database
[ ] sample analysis data
[ ] operating records [X] interview
[X] expert judgment [ ] reports
[X] other
Waste shipping form.

2. Details concerning source (names, report no., dates, etc.)
The shipping form showed that the waste was buried in trench 50 on 07-15-69. The individual who was interviewed and who performed the experimental work was L.A. Decker, currently employed by WINCO at CPP. The report used was EGG-WM-9857.

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:
No analytical results to give the breakdown for radionuclides were available.

8. Key assumptions used to deal with the unknowns:
Assumed that the detailed knowledge of the reactor history of the fuel specimens together with the radiation readings taken at the time of disposal permitted the total curies to be estimated within +/-25%. Assumed also, that the radionuclide breakdown reported in EGG-WM-9857, was applicable to this waste stream.

Continuation of Part D Column or Question Number or Title Radionuclide.

The distribution for U-234 and U-238 was added, and the number of curies of U-235 was modified. All this was done per B. L. Rich, et al. "Health Physics Manual of Good Practices for Uranium Facilities", EG&G Idaho, Inc. EGG-2530, June 1988.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 86

1. Preparer: Rhodes, Donald W.

2. Date prepared: 07/28/93

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

4. Particular facility: 601
(building number - use code from attached list)

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

6. Waste stream:
Acidic aqueous liquid.

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

8. Actual years disposed of at SDA:
Starting year 1954 Ending year 1970

9. Waste stream volume:
Amount 173300.0000 Units Gallons.
Check box: [ ] annual or [X] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):
4. Much of this waste actually was produced at CF674A, which was a pilot plant located at CFA, but working on CPP dissolution and extraction experiments and processes.
8. More than 90% of this waste was generated in the years 1954-1957.

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

2. Details on physical form(particularly confinement related)
The waste was disposed as an acidic liquid, but many tons of lime were added to the disposal pit to neutralize the acid.

3. Chemical form:
Chemicals dissolved in acid and in water.

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

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

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
5. The liquid waste was usually transported in a dumpster stainless steel tank with a total capacity of 500 gallons. The waste was dumped into the disposal pit, and the dumpster returned to the facility for reuse. Occasionally a 55-gallon drum or a gallon bottle was used. These were disposed of at the pit.

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
7697-37-2 Nitric Acid	Liquid.	Ions in solution.	T 47960000.000000	GM	1954	1970	N			
7784-27-2 Aluminum Nitrate Nonahydrate	Liquid.	Ions in solution.	T 192400000.00000	GM	1954	1970	N			
7783-34-8 Mercury Nitrate Monohydrate	Liquid.	Ions in solution.	T 810200.00000000	GM	1954	1970	N			
10102064 Uranyl Nitrate	Liquid.	Ions in solution.	T 224100.00000000	GM	1954	1970	N			
7631-99-4 Sodium Nitrate	Liquid.	Ions in solution.	T 2391000.0000000	GM	1954	1970	N			
7664393 Hydrofluoric Acid	Liquid.	Ions in solution.	T 7523000.0000000	GM	1954	1970	N			
7664-93-9 Sulfuric Acid	Liquid.	Ions in solution.	T 108300.00000000	GM	1954	1970	N			
7440-47-3 Chromium	Liquid.	Ions in solution.	T 19.680000000000	GM	1954	1970	N			
7440-41-7 Beryllium	Liquid.	Ions in solution.	T 113.60000000000	GM	1954	1970	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)
In 1954, 8280 gallons of waste had no composition listed. It was assumed to have the composition 1.0 M HNO_3 and 1.2 M $Al(NO_3)_3$ - $9H_2O$ based on the process being developed at that time. In 1955, 22,144 gallons of waste was listed as "chem waste". The same composition, 1.0 M HNO_3 and 1.2 M $Al(NO_3)_3$-$9H_2O$, was assumed for this waste. In 1956, 13,494 gallons of waste was listed as "STR waste". This was waste from a process being developed for navy fuel and the composition was assumed to be 0.5 M HNO_3 and 0.25 M Hf based on the type of fuel and the time period involved. The Cr and Be were probably present as nitrate salts. Since the solutions usually contained HNO_3, an oxidizer, it is likely that the Cr could have been in the +6 state. No concentration was given for the $Cu(NO_3)_2$, but it was assumed that it was being used as a catalyst and that the concentration was 0.01 M. This value was used to calculate a value for the quantity. More than 90% of the liquid waste was disposed of in the period 1954-1957.

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
3251-23-8 Copper Nitrate	Liquid.	Ions in solution.	T 327.90000000000	GM	1954	1970	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)
In 1954, 8280 gallons of waste had no composition listed. It was assumed to have the composition 1.0 M HNO3 and 1.2 M Al(NO3)3 - 9H2O based on the process being developed at that time. In 1955, 22,144 gallons of waste was listed as "chem waste". The same composition, 1.0 M HNO3 and 1.2 M Al(NO3)3-9H2O, was assumed for this waste. In 1956, 13,494 gallons of waste was listed as "STR waste". This was waste from a process being developed for navy fuel and the composition was assumed to be 0.5 M HNO3 and 0.25 M Hf based on the type of fuel and the time period involved. The Cr and Be were probably present as nitrate salts. Since the solutions usually contained HNO3, an oxidizer, it is likely that the Cr could have been in the +6 state. No concentration was given for the Cu(NO3)2, but it was assumed that it was being used as a catalyst and that the concentration was 0.01 M. This value was used to calculate a value for the quantity. More than 90% of the liquid waste was disposed of in the period 1954-1957.

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
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)

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

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

2. Details concerning source (names, report no., dates, etc.)
The HP records consisted of special work permits, notegrams, IHP-36 forms, ID-110 forms and ID-124 forms.

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)
[ ] no
[ ] yes

6. If yes, explain why:
N/A.

7. Major unknowns in inventories of contaminants:
In many cases, no concentrations or compositions were listed on the records.

8. Key assumptions used to deal with the unknowns:
Assumed that the compositions and concentrations not listed on the records were similar to those listed for other wastes in the same time period.

Continuation of Part _____ Column or Question Number or Title General.

This stream included waste disposed of to locations listed as acid pit, chem pit, fluoride pit, acid disposal pit, slit trench, chem waste pit and burial trench 34. Actually, the liquid was probably disposed of at the acid pit and the container in the indicated trench. Some of the disposal location names are probably referring to the same pit, however, it is known that there was more than one pit used during the time period indicated.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 120

1. Preparer: Rhodes, Donald W.

2. Date prepared: 07/28/93

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

4. Particular facility: 601
(building number - use code from attached list)

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

6. Waste stream:
Organic solvents.

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

8. Actual years disposed of at SDA:
Starting year 1954 Ending year 1970

9. Waste stream volume:
Amount 4763.0000 Units Gallons.
Check box: [ ] annual or [X] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):
4. Much of the waste actually came from CF674A, which was a pilot plant located at CFA, but used to develop processes for dissolution and extraction for the ICPP.
8. More than 90% of the waste was produced in the period 1954-1957.

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

2. Details on physical form(particularly confinement related)
Waste solutions were released to the disposal pit as a free flowing liquid.

3. Chemical form:
Hydrocarbons with small amounts of other solvents.

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

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

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
2. The liquid was transported in a dumpster tank (500 gallons) and occasionally in a 55-gallon drum or gallon bottles. The dumpster was returned to the waste generator, but drums or bottles were disposed at the pit.

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
108-10-1 Methyl Isobutyl Ketone	Liquid.	Hydrocarbon.	T 8928000.0000000	GM	1954	1970	N			
64175 Ethyl Alcohol	Liquid.	Hydrocarbon.	T 22550.000000000	GM	1954	1970	N			
67-64-1 Acetone	Liquid.	Hydrocarbon.	T 22550.000000000	GM	1954	1970	N			
56-23-5 Carbon Tetrachloride	Liquid.	Hydrocarbon.	T 25550.000000000	GM	1954	1970	N			
126-73-8 Tributyl Phosphate	Liquid.	Hydrocarbon.	T 1002000.0000000	GM	1954	1970	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)
The volume of the total organic was used, together with an assumed density of 0.85, to calculate the grams of the other organics. The other organic was assumed to be 10% tri-butyl phosphate in hexone (methyl isobutyl ketone). One percent of the balance (hexone) was then equally divided among the alcohol, CCl_4, thiocyanate and acetone. No actual values were given for any of these components so the values were arbitrarily calculated based on probable process considerations. Some 5.308E+06 grams of waste oil (non-hazardous chemical) was disposed in the period 1954-1970.

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
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)

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

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

2. Details concerning source (names, report no., dates, etc.)
The HP disposal records consisted of Special Work Permits, Notegrams, IHP-36 forms, ID-110 forms, and ID-124 forms.

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)
[ ] no
[ ] yes

6. If yes, explain why:
Not entered in RWMIS.

7. Major unknowns in inventories of contaminants:
In many cases, concentrations and compositions were not recorded in the records.

8. Key assumptions used to deal with the unknowns:
Assumed that the compositions and concentrations not recorded on the records were similar to other waste produced in the same time period. Assumed 10% TBP with Hexone. It could vary from 5-25%. Assumed other solvents, alcohol, etc. were very small compared to the other organics, because they apparently came from laboratory sources, as indicated by the signature of the person who authorized the disposal.

Continuation of Part _____ Column or Question Number or Title General.

This stream included waste disposed to locations listed as acid pit, chem pit, fluoride pit, acid disposal pit, slit trench, chem waste pit, and buried trench. Two instances listed Trench 11 and Trench 34. The liquid was probably disposed to the pit and the container to the trench. In some cases, the organic was listed to be burned. Whether or not this was done is not recorded, but in later years a burner was installed at CPP to burn waste organics and eventually, in even later years, it was mixed with the kerosene that was used to heat the Waste Calcining Facility in the in-bed-combustion process. It is not clear which waste went to which pit. It is known that there was more than one pit, but often waste forms with different pits listed probably mean one single pit.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 122

1. Preparer: Rhodes, Donald W.

2. Date prepared: 08/02/93

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

4. Particular facility: 601
(building number - use code from attached list)

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

6. Waste stream:
Pipe, glass, gloves, cans, vessels, wire, valves, paper, metal, wood, clothing, filters, plastic bottles and rubber.

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

8. Actual years disposed of at SDA:
Starting year 1960 Ending year 1983

9. Waste stream volume:
Amount 21710.0000 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):
4. CPP-601 was listed as the source for this waste stream because it is the main process building. However, this waste stream is intended to include all of the miscellaneous type waste, which has not been included in the other waste streams that were reported on previously. For this reason, all of the buildings at CPP contributed waste to this stream. The volume of this waste stream was not obtained by summing up individual records, but rather by subtracting the volume already reported on for previous streams from the total volume given in the RWMIS. Summary sheet provided by Cathy Barnard.

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

2. Details on physical form(particularly confinement related)
Includes boxes, pipe, glass, gloves, cans, vessels, wire, valves, paper, metal, wood, vermiculite, anti-C clothing, filters, plastic bottles, rubber and various other discarded items.

3. Chemical form:
Cellulose, metal, polymers, silicates, etc.

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

5. Waste container type (see attached list)
Cardboard box.

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
1. The physical form was listed as combustibles, primarily because this was a prominent component of the waste, however, many other forms were also present as indicated in #2.
5. The most common type of container for this waste was cardboard boxes; however, metal barrels, wooden boxes and polyethylene sheets were also used.

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)
None identified.

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
Sr-90	Particulate and sorbed ions.	Probably oxide, sulfate and nitrate.	T 472.00000000000	CI	1960	1983	N	-50%	+50%	
Y-90	Particulate and sorbed ions.	Probably oxide, sulfate and nitrate.	T 472.00000000000	CI	1960	1983	N	-50%	+50%	
Zr-95	Particulate and sorbed ions.	Probably oxide, sulfate and nitrate.	T 146.00000000000	CI	1960	1983	N	-50%	+50%	
Nb-95	Particulate and sorbed ions.	Probably oxide, sulfate and nitrate.	T 146.00000000000	CI	1960	1983	N	-50%	+50%	
Cs-137	Particulate and sorbed ions.	Probably oxide, sulfate and nitrate.	T 472.00000000000	CI	1960	1983	N	-50%	+50%	
Ce-144	Particulate and sorbed ions.	Probably oxide, sulfate and nitrate.	T 930.00000000000	CI	1960	1983	N	-50%	+50%	
Pr-144	Particulate and sorbed ions.	Probably oxide, sulfate and nitrate.	T 930.00000000000	CI	1960	1983	N	-50%	+50%	
Sb-125	Particulate and sorbed ions.	Probably oxide, sulfate and nitrate.	T 208.00000000000	CI	1960	1983	N	-50%	+50%	
Ru-106	Particulate and sorbed ions.	Probably oxide, sulfate and nitrate.	T 472.00000000000	CI	1960	1983	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)

This waste stream is intended to include all of the radionuclides not included in the other waste streams reported on previously. The total curie value was assumed to be 1% of the total Ci for CPP. The radionuclide breakdown was made according to the distribution suggested by CPP personnel as reported in EGG-WM-9857.

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
Rh-106	Particulate and sorbed ions.	Probably oxide, sulfate and nitrate.	T 472.00000000000	CI	1960	1983	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)

This waste stream is intended to include all of the radionuclides not included in the other waste streams reported on previously. The total curie value was assumed to be 1% of the total Ci for CPP. The radionuclide breakdown was made according to the distribution suggested by CPP personnel as reported in EGG-WM-9857.

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

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

2. Details concerning source (names, report no., dates, etc.)
The distribution suggested for CPP, as reported in EGG-WM-9857 for radionuclides, was used.

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 volume and radionuclide content of the waste was not known.

8. Key assumptions used to deal with the unknowns:
Assumed that the waste volume was equal to the total volume for CPP as reported in RWMIS minus the volume already accounted for in waste streams reported previously. Also assumed that the radionuclide quantity was 1% of the total curies for CPP waste. This is a reasonable assumption, because the total curies for the CPP waste streams reported on previously is equal to 101%. Therefore, the curies for the remaining waste must be a low value. No G-M correction is needed to the best estimate. The preparer used 1% of total ICPP activity for the activity of this stream. The largest ICPP stream in activity in CPP-603-1 (70% of the total), the activity of which was estimated by analysis of the dissolver solution and for which the uncertainty is listed. Another major stream (8% of total) is CPP-601-1, which is a similar situation. The bounds used here are the same as those used on the predominant streams.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 230

1. Preparer: Rhodes, Donald W.

2. Date prepared: 11/16/93

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

4. Particular facility: 601
(building number - use code from attached list)

5. Number of waste stream from this facility:
7H

6. Waste stream:
Zirconium and zirconium-uranium alloy.

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

8. Actual years disposed of at SDA:
Starting year 1967 Ending year 1967

9. Waste stream volume:
Amount 11.7500 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):
The waste stream was listed as CPP-601 because the metal scrap was intended to be used for a "cold" dissolution and solvent extraction runs in the CPP-601 process building. Some of it was used for that purpose, and the rest was buried at the RWMC.

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

2. Details on physical form(particularly confinement related)
Miscellaneous shapes and sizes ranging from large pieces to long thin strips. The smallest pieces were about 1/64" x 1/16" x 12".

3. Chemical form:
Metallic zirconium with some zirconium-uranium alloy in metallic form.

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

5. Waste container type (see attached list)
Metal barrel.

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
5. BXW and some metal cans were also used. The containers were reported to be in various stages of deterioration at the time of disposal.

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
7440-67-7 Zirconium	Scrap pieces of various shapes.	Zirconium metal and zirconium-uranium alloy.	T 18000000.000000	GM	1967	1967	N	-20%	+20%	See comment below.

* 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)
Approximately 90% of the zirconium was reported on one waste shipment record and the other 10% on a second record. The weight on the first record was reported as 30,000-40,000 lbs. The mean value of 35,000 lbs. was used as the weight of this shipment. This together with the weight of 3400 lbs. on the second record and a reported weight of 182kg of U-238 brought the total weight to 1.8E+7 gm. The minimum and maximum values are reported as +/-20%. Although the reported weights for the first shipment only varied from the mean value of 3500 lbs. by 14%, it was assumed that these weights were estimated, so the additional 6% was added to account for possible errors in estimating the weights.

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
U-238	Incorporated into zirconium metal.	Alloyed with zirconium.	T .61000000000000	CI	1967	1967	N	-20%	+20%	No basis for estimating the uncertainty.

* 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)

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

[X] RWMIS [ ] other database
[ ] sample analysis data
[ ] operating records [ ] interview
[ ] expert judgment [ ] reports
[X] other
Two waste shipment records.

2. Details concerning source (names, report no., dates, etc.)
Two waste shipment records were the source of the values for the Zirconium and Uranium-238.

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:
Only a range was reported on the waste shipment records for the zirconium.

8. Key assumptions used to deal with the unknowns:
The mean value of the range was used as the weight for the Zirconium. No G-M correction is needed to the best estimate. The U-238 was originally estimated by weight. The weight for Zr was +/-20%. The same method and uncertainty are assumed for the U-238.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 1

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/15/93

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

4. Particular facility: 603
(building number - use code from attached list)

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

6. Waste stream:
Fuel end pieces.

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

8. Actual years disposed of at SDA:
Starting year 1973 Ending year 1982

9. Waste stream volume:
Amount 1.7840 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):
6. Fuel elements from the EBR-II reactor were stored in the CPP-603 fuel storage basin for a time period varying from a few months to a few years. Prior to processing the fuel, the end pieces were sawed off and loaded into steel inserts on the floor of the basin. The inserts were then loaded into a cask and transported to the RWMC for burial in a trench.

1. General physical form (see attached list)
Irradiated end boxes.
[ ] other (specify)

2. Details on physical form(particularly confinement related)
The end boxes were approximately 3 inch hexagonal shaped pieces and 3 to 4 ft. in length.

3. Chemical form:
Metal alloy, 304 stainless steel. Chemical Composition was 18-20% chromium metal, 8-12% nickel, 1% silicon, and the balance, iron.

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

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

6. Other characteristics of interest:
The insert that contained the fuel end boxes was intended to serve only as a container for transporting the metal and was not intended to be a containment barrier.

7. Comments (specify number of pertinent question):
6. The activation radionuclides are an integral part of the metal alloy and would thus be resistant to leaching by water. Corrosion of the stainless steel would have to occur to release the radionuclides.

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-58	Metal.	Elemental.	T 86240.000000000	CI	1981	1982	N	43120	129360	See comment below.
Co-60	Metal.	Elemental.	T 1540.0000000000	CI	1981	1982	N	770	2310	
Cr-51	Metal.	Elemental.	T 4620.0000000000	CI	1981	1982	N	2310	6930	
Fe-59	Metal.	Elemental.	T 1540.0000000000	CI	1981	1982	N	770	2310	
Mn-54	Metal.	Elemental.	T 60060.000000000	CI	1981	1982	N	30030	90090	
Ni-63	Metal.	Elemental.	T 190.00000000000	CI	1981	1982	N	-50%	+50%	
Zr-93	Metal.	Elemental.	T .03400000000000	CI	1981	1982	N	-50%	+50%	
Ni-59	Metal.	Elemental.	T 1.3000000000000	CI	1981	1982	N	-50%	+50%	
C-14	Metal.	Elemental.	T .33000000000000	CI	1981	1982	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)

It is believed that the radionuclide breakdown may have come from an analysis of dissolver product solution during fuel processing, in which case, the analysis probably would have been within +/-10% accuracy. The major uncertainty was due to the fact that the weight of the boxes was estimated. It is likely that the accuracy for the weights could have been +/-50%. This was the value used to calculate the minimum and maximum values. Also, 23075 Ci of MAP were distributed equally between Co-58 and Mn-54. This is the suggested distribution obtained from NRF personnel and reported in Plansky and Hoiland (1992) for EBR-II fuel. These values were calculated based on the ratio of Co-60 to Ni-63, then the ratio of Ni-63 to these isotopes. The calculated ratios were based on information from the references DOE (1992).

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
Nb-94	Metal.	Elemental.	T .37000000000000	CI	1981	1982	N	-50%	+50%	
Co-58	Metal.	Elemental.	T 3900.0000000000	CI	1973	1973	N	1950	5850	
Co-60	Metal.	Elemental.	T 198250.00000000	CI	1973	1973	N	99125	297375	
Cr-51	Metal.	Elemental.	T 78975.000000000	CI	1973	1973	N	39488	118463	
Fe-59	Metal.	Elemental.	T 23075.000000000	CI	1973	1973	N	11538	34613	
Mn-54	Metal.	Elemental.	T 20800.000000000	CI	1973	1973	N	10400	31200	
Ni-63	Metal.	Elemental.	T 24415.000000000	CI	1973	1973	N	-50%	+50%	
Zr-93	Metal.	Elemental.	T 4.0000000000000	CI	1973	1973	N	-50%	+50%	
Ni-59	Metal.	Elemental.	T 161.00000000000	CI	1973	1973	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)

It is believed that the radionuclide breakdown may have come from an analysis of dissolver product solution during fuel processing, in which case, the analysis probably would have been within +/-10% accuracy. The major uncertainty was due to the fact that the weight of the boxes was estimated. It is likely that the accuracy for the weights could have been +/-50%. This was the value used to calculate the minimum and maximum values. Also, 23075 Ci of MAP were distributed equally between Co-58 and Mn-54. This is the suggested distribution obtained from NRF personnel and reported in Plansky and Hoiland (1992) for EBR-II fuel. These values were calculated based on the ratio of Co-60 to Ni-63, then the ratio of Ni-63 to these isotopes. The calculated ratios were based on information from the references DOE (1992).

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
C-14	Metal.	Elemental.	T 43.000000000000	CI	1973	1973	N	-50%	+50%	
Nb-94	Metal.	Elemental.	T 47.000000000000	CI	1973	1973	N	-50%	+50%	
Tc-99	Metal.	Elemental.	T .03000000000000	CI	1973	1973	N	-50%	+50%	
Tc-99	Metal.	Elemental.	T .00027000000000	CI	1981	1982	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)

It is believed that the radionuclide breakdown may have come from an analysis of dissolver product solution during fuel processing, in which case, the analysis probably would have been within +/-10% accuracy. The major uncertainty was due to the fact that the weight of the boxes was estimated. It is likely that the accuracy for the weights could have been +/-50%. This was the value used to calculate the minimum and maximum values. Also, 23075 Ci of MAP were distributed equally between Co-58 and Mn-54. This is the suggested distribution obtained from NRF personnel and reported in Plansky and Hoiland (1992) for EBR-II fuel. These values were calculated based on the ratio of Co-60 to Ni-63, then the ratio of Ni-63 to these isotopes. The calculated ratios were based on information from the references DOE (1992).

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

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

2. Details concerning source (names, report no., dates, etc.)
1. RWMIS and associated shipping records.
2. Interview with L.W. Madsen, who participated in the cutting and shipping of the fuel end pieces.
3. EGG-WM-9857, June 1992 - "Analysis of the Low-Level Waste Radionuclide Inventory for the RWMC Complex Performance Assessment". Some of the values were obtained from isotopic ratios calculated by P.R. Leonard using information from DOE (1992).
4. DOE (1992), "Characteristics of Potential Repository Wastes", DOE/RW-0184-R1, July 1992.

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 weight of the end boxes was estimated. Some 23,000 Ci of radionuclides was reported as MAP. It is not known for sure if the radionuclide breakdown was from an actual sample. If it was, there apparently was only one sample taken for each of the two campaigns. The inaccuracy in the weights was the major source of error.

8. Key assumptions used to deal with the unknowns:
1. The weight of the shipments of fuel end pieces was considered to vary from the reported value by +/-50% based on a conversation with the operator.
2. The MAP was converted to specific radionuclides according to the suggested distribution given in the above referenced document. The MAP was only approximately 5% of the total Ci. Assumed that the other uncertainties were negligible.

Continuation of Part D Column or Question Number or Title Radionuclide.

The total curies from this waste stream constitute approximately 70% of the total curies shipped from CPP to the RWMC. During dissolution of the fuel, a sample would have to be taken to determine the U-235 content. It seems logical that they may have analyzed for activation products on this same sample; however, this could not be confirmed. This waste was disposed to Trench 57 (1973) and Soil Vault Rows 12 (1982) and 10 (1981).

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 2

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/08/93

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

4. Particular facility: 603*
(building number - use code from attached list)

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

6. Waste stream:
Lead.

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

8. Actual years disposed of at SDA:
Starting year 1960 Ending year 1978

9. Waste stream volume:
Amount 2.3870 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):
Facilities include 601 and 603. Disposal was intermittent over the time period indicated.

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

2. Details on physical form(particularly confinement related)
Nearly half of the total waste consisted of contaminated lead bricks. There were several lead sheets, a shielding door, a lead pig and some miscellaneous lead.

3. Chemical form:
Metallic lead.

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

5. Waste container type (see attached list)
Metal barrel.

6. Other characteristics of interest:
These shipments were considered to be radioactive only because the lead surfaces had become contaminated with radionuclides while being used for shielding.

7. Comments (specify number of pertinent question):
2. The waste was considered to be stable (resistant to leaching) due to the physical (metallic) form of the waste. The container was not considered to be a barrier, but rather a means of transporting the waste.
5. Waste container type includes BLM, BXW, and BXC.

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
7439-92-1 Lead	Bricks.	Elemental metal.	T 24000.000000000	LB	1978	1978	N	21600	26400	See comment (a) below.
7439-92-1 Lead	Sheets, door, pig and miscellaneous.	Elemental metal.	T 34150.000000000	LB	1960	1977	N	25562	42688	See comment (b) below.

* 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)

a. The lead bricks were uniform in size and weight, so it was assumed that the total number of bricks multiplied by the known weight would be within +/-10%.

b. The lead sheets and other forms were more difficult to assign a weight, but it was assumed that the assigned weight would be within +/-25%.

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	Surface contamination.	Nitrate and oxide.	T 3.8000000000000	CI	1960	1978	N	1.9	5.7	See comment below.
Sr-90	Surface contamination.	Nitrate and oxide.	T 3.8000000000000	CI	1960	1978	N	1.9	5.7	See comment below.
Ce-144	Surface contamination.	Nitrate and oxide.	T 6.3000000000000	CI	1960	1978	N	3.2	9.5	See comment below.
Ru-106	Surface contamination.	Nitrate and oxide.	T 3.2000000000000	CI	1960	1978	N	1.6	4.8	See comment below.
Sb-125	Surface contamination.	Nitrate and oxide.	T 1.5000000000000	CI	1960	1978	N	.8	2.3	See comment below.
Zr-95	Surface contamination.	Nitrate and oxide.	T 2.1000000000000	CI	1960	1978	N	1.1	3.2	See comment below.

* 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)

Only one shipment (1971), out of 26 listed the radionuclides. It was assumed that the other shipments had a similar radionuclide distribution, and that the values were accurate within +/-50%. An UN-ID-B&G value of 1.3 curies was distributed evenly between Cs-137 and Sr-90. Other than Cs-137 and Sr-90, the Sb-125 has a half-life of 2.76 years, and the other radionuclides listed have a half-life of 1 year or less.

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

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

2. Details concerning source (names, report no., dates, etc.)
The "qualifier flag" database (a database that lists waste descriptions that are on the shipping records but not listed on RWMIS) was used to identify shipments that did not list lead on the RWMIS database, but did list lead on the shipping records. This information was then verified by examining a copy of the actual shipping record.

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 volume on the shipping record was usually the total volume of the shipment. The volume of lead was calculated from the shipping weight and lead density values.

8. Key assumptions used to deal with the unknowns:
1. Where there was more than one item in the shipment, assumed that lead was the major contributor to the weight.
2. Assumed that the weights were reasonably accurate and could be used with the density value to calculate the volume.
3. Assumed that the one reported radionuclide distribution was applicable to the other shipments.

Continuation of Part _____ Column or Question Number or Title General.

These wastes were disposed to Pits 4, 10, 15 and Trenches 16, 26, 43, 45, 52 and 55.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 3

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/15/93

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

4. Particular facility: 603
(building number - use code from attached list)

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

6. Waste stream:
Fuel storage pools and sludge.

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

8. Actual years disposed of at SDA:
Starting year 1977 Ending year 1980

9. Waste stream volume:
Amount 48.1500 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):
4. The fuel storage basin consisted of three pools for fuel storage. They were all interconnected by a transfer canal. The fuel was stored under approximately 20 feet of water. The building itself was not airtight and the large rollup doors were open frequently so that wind blown dust could easily be deposited in the pools. Originally, there was a lot of carbon steel in and over the basin. This corroded and became part of the sludge.

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

2. Details on physical form(particularly confinement related)
A slurry of finely divided solids solidified with the urea-formaldehyde process.

3. Chemical form:
Principally: SiO2 (20%), Al (10%), Fe (5%), and Mg (3%) present as oxides, carbonates, sulfates, oxalates, silicates and hydroxides.

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

5. Waste container type (see attached list)
Concrete cask.

6. Other characteristics of interest:
Sludge was dewatered, then solidified using a urea-formaldehyde process.

7. Comments (specify number of pertinent question):
2. The waste stream was produced as follows: sludge, consisting of corrosion products and wind-blown silt had accumulated on the walls and floor of the pools over 20+ years. This sludge sorbed radionuclides that had leaked from stored fuel elements. The sludge was vacuumed into a 25,000 gallon underground tank. The contents of the tank were sparged, then sampled and analyzed. The sludge was then transferred into concrete casks, with a steel liner, and solidified with urea-formaldehyde. A concrete plug was then poured into the top opening, and the casks were transferred to the RWMC for burial.

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
Nb-95	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 72.000000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Pr-144	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 4324.0000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Pu-238	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T .80900000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Pu-239	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T .37700000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Pu-240	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T .01000000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Pu-241	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 1.5030000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Pu-242	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T .10000000000000	CI	1977	1980	N	-20%	+20%	Quantity is listed as <.1 curies. See below.
Rh-106	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 86.000000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Ce-141	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 31.000000000000	CI	1977	1980	N	-20%	+20%	See comment below.

* 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)

In actual practice, the sludge was sampled either from the 25,000 gallon holding tank or possibly from the sludge cask itself on occasion, but the only results available are the values shown in RWMIS, which came directly from the shipping records. Some 10 different analyses for the 42 sludge casks are given in RWMIS ranging from <1 Ci to 1450 Ci per cask. A given radionuclide breakdown and curie content was repeated for anywhere from 1 cask to 17 casks. Based on professional judgment, as a technical advisor on the project, it is assumed that the analyses were correct within +/-20% because the sludge was thoroughly mixed; however, no actual sample results are available.

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
Ce-144	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 4324.0000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Co-60	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 74.000000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Cs-134	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 429.00000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Cs-137	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 11503.000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Eu-152	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 236.00000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Eu-154	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 232.00000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Eu-155	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 79.000000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Zr-95	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 47.000000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Ru-106	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 86.000000000000	CI	1977	1980	N	-20%	+20%	See comment below.

* 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)

In actual practice, the sludge was sampled either from the 25,000 gallon holding tank or possibly from the sludge cask itself on occasion, but the only results available are the values shown in RWMIS, which came directly from the shipping records. Some 10 different analyses for the 42 sludge casks are given in RWMIS ranging from <1 Ci to 1450 Ci per cask. A given radionuclide breakdown and curie content was repeated for anywhere from 1 cask to 17 casks. Based on professional judgment, as a technical advisor on the project, it is assumed that the analyses were correct within +/-20% because the sludge was thoroughly mixed; however, no actual sample results are available.

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
Sb-125	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 11.000000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Sr-90	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 1490.0000000000	CI	1977	1980	N	-20%	+20%	See comment below.
U-234	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T .13300000000000	CI	1977	1980	N	-20%	+20%	See comment below.
U-235	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T .00600000000000	CI	1977	1980	N	-20%	+20%	See comment below.
U-236	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T .00400000000000	CI	1977	1980	N	-20%	+20%	See comment below.
U-238	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T .00100000000000	CI	1977	1980	N	-20%	+20%	See comment below.
Y-90	Sorbed on finely divided sludge particles.	Oxides, silicates, carbonates, and hydroxides.	T 1490.0000000000	CI	1977	1980	N	-20%	+20%	See comment below.

* 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)

In actual practice, the sludge was sampled either from the 25,000 gallon holding tank or possibly from the sludge cask itself on occasion, but the only results available are the values shown in RWMIS, which came directly from the shipping records. Some 10 different analyses for the 42 sludge casks are given in RWMIS ranging from <1 Ci to 1450 Ci per cask. A given radionuclide breakdown and curie content was repeated for anywhere from 1 cask to 17 casks. Based on professional judgment, as a technical advisor on the project, it is assumed that the analyses were correct within +/-20% because the sludge was thoroughly mixed; however, no actual sample results are available.

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

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

2. Details concerning source (names, report no., dates, etc.)
RWMIS run 09/24/92 - this was the source for the radionuclide breakdown values. Report: ICP-1195, "Removal and Disposal of Radioactive Sludge from the Fuel Storage Basin at the ICPP", June 1979. Report: EGG-WM-9857, "Analysis of Low-Level Waste Radionuclide Inventory for the RWMC Performance Assessment".

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:
There were no chemical hazards. The number of curies in a cask were highly variable. The low values were for startup when the process was being tested. One hundred six curies of MFP were distributed among the various radionuclides as described in (8).

8. Key assumptions used to deal with the unknowns:
The total curies for each radionuclide were summed for the 42 casks and reported here as totals. Distribution of the MFP among the various radionuclides was made according to the distribution provided by CPP personnel as reported in EGG-WM-9857.

Continuation of Part _____ Column or Question Number or Title General.

The 42 sludge casks were all buried in Pit 16. Sketch of sludge cask attached. The solidified sludge is surrounded on all sides by an 18 inch thick concrete barrier, so the contained radionuclides would be essentially non-mobile until the concrete disintegrated. Well over 50% (2.771 E+00 Ci) of the total plutonium shipped from the ICPP to the RWMC was contained in these sludge casks.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 61

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/23/93

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

4. Particular facility: 603
(building number - use code from attached list)

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

6. Waste stream:
Decontamination chemicals.

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

8. Actual years disposed of at SDA:
Starting year 1960 Ending year 1978

9. Waste stream volume:
Amount 18.0000 Units Gallons.
Check box: [X] annual or [ ] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):
The decon chemical was used to saturate a rag and then the rag was used to wipe down the outside of the cask. The rag was then discarded to a waste box (cardboard), containing other miscellaneous items, and eventually shipped to the RWMC. Methachlor and Oakite Swift decontamination chemicals were used to decontaminate fuel shipping casks.

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

2. Details on physical form(particularly confinement related)

3. Chemical form:
Methyl chloroform.

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

5. Waste container type (see attached list)
Cardboard box.

6. Other characteristics of interest:
The rags containing the methachlor often remained in the open cardboard box for several days, so some of the chemical would vaporize.

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
71-55-6 1,1,1-Trichloroethane	Liquid absorbed on a cloth rag.	Unknown.	A 200.00000000000	LB	1960	1978	N	200	400	No records. See comment below.

* 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 amount used is based on an interview with L.W. Madsen, who was an operator at the 603 fuel storage basin at the time this chemical was used. After 1978, a non-hazardous chemical was substituted for the methyl chloroform. It is believed that the operators estimate should be considered as the minimum value, but that the maximum amount used could have been 100% greater. This is a conservative, but reasonable, approach.

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	Absorbed in a cloth rag.	Nitrate salt.	T 1.0000000000000	CI	1960	1978	N	-50%	+50%	
Sr-90	Absorbed in a cloth rag.	Nitrate salt.	T 1.0000000000000	CI	1960	1978	N	-50%	+50%	
Y-90	Absorbed in a cloth rag.	Nitrate salt.	T 1.0000000000000	CI	1960	1978	N	-50%	+50%	
Ce-144	Absorbed in a cloth rag.	Nitrate salt.	T 1.0000000000000	CI	1960	1978	N	-50%	+50%	
Pr-144	Absorbed in a cloth rag.	Nitrate salt.	T 1.0000000000000	CI	1960	1978	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)

There was never a measurement of the radionuclides on the wipe down rags, but there was always a small amount of contamination. The isotopes listed are those that were predominant in the basin water. A value of one curie per isotope was listed just to show that some contaminants were present.

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

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

2. Details concerning source (names, report.no., dates, etc.)
L.W. Madsen was the operator interviewed. He was considered to be the most knowledgeable person available to provide information for this waste stream.

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:
No RWMIS data available for this waste stream.

7. Major unknowns in inventories of contaminants:
No records available.

8. Key assumptions used to deal with the unknowns:
Assumed that the operators estimate of the amount used would be a minimum and that the maximum would be 100% greater. No G-M correction is needed to the best estimate. The activity and bounds were estimated strictly by the judgment of the waste expert.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 63

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/27/93

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

4. Particular facility: 603
(building number - use code from attached list)

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

6. Waste stream:
Zeolite.

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

8. Actual years disposed of at SDA:
Starting year 1964 Ending year 1973

9. Waste stream volume:
Amount 25.3600 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):
6. When the ion exchange material was loaded with radionuclides, the drum containing the ion exchanger was removed, capped, and disposed of at the RWMC. The inorganic ion exchange material, clinoptilolite, was placed in 55-gallon drums, and water from the fuel storage basin was passed through the ion exchanger to remove the radionuclides.

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

2. Details on physical form(particularly confinement related)
The ion exchange material was in particulate form, mostly in the size range 0.25 to 2.0 mm diameter.

3. Chemical form:
The zeolite is essentially an aluminosilicate mineral.

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

5. Waste container type (see attached list)
Metal barrel.

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
1. The waste material functioned like an organic ion exchange resin, but it was actually a natural occurring mineral, zeolite.

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	Ions sorbed on ion exchange solids.	Indiv. ions in water & on ion exchanger. See below	T 500.00000000000	CI	1964	1973	N	500	750	See comment below.
Sr-90	Ions sorbed on ion exchange solids.	Indiv. ions in water & on ion exchanger. See below	T 500.00000000000	CI	1964	1973	N	500	750	See comment below.

* 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)

Chemical form: The radionuclides were present as individual ions in the water and on the ion exchanger. The associated anion in the water was nitrate. The curies were calculated from the measured concentration of total radionuclides in the basin water at the mid-point of each year, and the known flow rate of the water through the ion exchange columns. The calculated amount was considered to be the minimum and the maximum was estimated to be 50% higher. This is believed to be a conservative estimate. In addition, the total activity was considered to be all Cs-137 and Sr-90. This was true for the early years, but some shorter lived radionuclides (half-life is less than 5 years) were also present in the water after an EBR-II can, that was stored in the basin, ruptured in 1969. This would make the above numbers additionally conservative.

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

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

2. Details concerning source (names, report no., dates, etc.)
Reports used were: ENICO-1082, IDO-14657, IN-1201, and Drawing CPP-B-6216. Persons interviewed were V. H. Barnes and L.W. Madsen, both of whom were involved in the operation of the system.

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)
[ ] no
[X] yes

6. If yes, explain why:
The shipments could not be identified clearly in RWMIS, because the individual making out the shipping records used 10 different names to identify the ion exchange material.

7. Major unknowns in inventories of contaminants:
Number of drums of material shipped was uncertain and a breakdown of radionuclides was not given on the shipping records or in reports.

8. Key assumptions used to deal with the unknowns:
Obtained information that was available from individual shipping records and supplemented this with calculations based on the concentrations of radionuclides in the water at mid-year and the flow rates through the columns. This information was obtained from reports and was used to calculate curies. Assumed that all of the curies were due to Cs-137 and Sr-90; this may not have been true after 1969, but is a conservative approach.

Continuation of Part B Column or Question Number or Title 2.

The Cs-137 and Sr-90 were held very tightly by the clinoptilolite ion exchange material as evidenced by the fact that several attempts to regenerate the columns with concentrated solutions of salts, such as ammonium nitrate, were not successful i.e., the radionuclides were not replaced by the salt. For this reason, the Cs-137 and Sr-90 would be essentially non-mobile in the RWMC and would not be transported by water passing through the waste material.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 64

1. Preparer: Rhodes, Donald W.

2. Date prepared: 07/07/93

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

4. Particular facility: 603
(building number - use code from attached list)

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

6. Waste stream:
Contaminated roof materials and top soil.

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

8. Actual years disposed of at SDA:
Starting year 1959 Ending year 1959

9. Waste stream volume:
Amount 181.0000 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):
9. Individual records show 60 truckloads of dirt were hauled from CPP to the RWMC in 1959. No volumes were given, but records in later years for similar loads show that a truck would normally haul 5 tons or 10,000 lbs. Accordingly, the volume was calculated using the total weight (600,000 lbs.) and a density of 1.5. The volume of the roof materials would have been small compared to the volume of dirt.

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

2. Details on physical form(particularly confinement related)
The dirt was typical sand, silt and gravel surface soil.
The roof material was sheets of transite.

3. Chemical form:
The soil was essentially aluminosilicates.
The roof material was solid sheets of transite (asbestos in a resin-type matrix).

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

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

6. Other characteristics of interest:
The dirt was normally loaded into a dump truck without any container.

7. Comments (specify number of pertinent question):
In October, 1958, a HEPA filter on the Fuel Element Cutting Facility (FECF) was breached allowing particulate from the fuel chopping process to vent to the air. The roof of CPP-603 building and the ground surface in the surrounding area were contaminated with radioactive particulate matter. An estimate of the number of curies released was made from a radiation survey of the roof and soil surfaces. In 1959, pieces of the roof were removed as well as about 60 truckloads of contaminated soil, and were disposed at the RWMC.

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
Sr-90	Particulate.	Al-U alloy.	T 120.00000000000	CI	1959	1959	N	-50%	+100%	See comment below.
Y-90	Particulate.	Al-U alloy.	T 120.00000000000	CI	1959	1959	N	-50%	+100%	See comment below.
Zr-95	Particulate.	Al-U alloy.	T 37.200000000000	CI	1959	1959	N	-50%	+100%	See comment below.
Nb-95	Particulate.	Al-U alloy.	T 37.200000000000	CI	1959	1959	N	-50%	+100%	See comment below.
Cs-137	Particulate.	Al-U alloy.	T 120.00000000000	CI	1959	1959	N	-50%	+100%	See comment below.
Ce-144	Particulate.	Al-U alloy.	T 236.40000000000	CI	1959	1959	N	-50%	+100%	See comment below.
Pr-144	Particulate.	Al-U alloy.	T 236.40000000000	CI	1959	1959	N	-50%	+100%	See comment below.
Sb-125	Particulate.	Al-U alloy.	T 52.800000000000	CI	1959	1959	N	-50%	+100%	See comment below.
Ru-106	Particulate.	Al-U alloy.	T 120.00000000000	CI	1959	1959	N	-50%	+100%	See comment below.

* 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 radionuclide values were given. An estimate of 1200 curies released in the incident was the only value available. The value of 1200 curies of MFP was broken down into individual radionuclides using the distribution suggested by CPP personnel and reported in EGG-WM-9857, June 1992. The uncertainty value of -50% was used to indicate that there was at least a possibility that the values were overestimated. The value of +100% was used because there was a large area contaminated, and areas could have been missed that contained radioactive particulate.

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
Rh-106	Particulate.	Al-U alloy.	T 120.00000000000	CI	1959	1959	N	-50%	+100%	See comment below.

* 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 radionuclide values were given. An estimate of 1200 curies released in the incident was the only value available. The value of 1200 curies of MFP was broken down into individual radionuclides using the distribution suggested by CPP personnel and reported in EGG-WM-9857, June 1992. The uncertainty value of -50% was used to indicate that there was at least a possibility that the values were overestimated. The value of +100% was used because there was a large area contaminated, and areas could have been missed that contained radioactive particulate.

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

[ ] RWMIS [ ] other database
[ ] sample analysis data
[X] operating records [ ] interview
[X] expert judgment [ ] reports
[X] other
Letter BLR-6-59A.

2. Details concerning source (names, report no., dates, etc.)
The operating (shipment) records show only the number of truckloads sent to the RWMC. The letter gives an estimated distribution for the radionuclides on the roof and on the ground. Other letters pertaining to the incident are, LY-16-59A, HA-210-58A and a communication from J.R. Horan to J.W. McCaslin, Dec. 24, 1958.

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)
[ ] no
[ ] yes

6. If yes, explain why:
This information has not been included in RWMIS because of the early date.

7. Major unknowns in inventories of contaminants:
The "total curies" was obtained by taking radiation readings within the contaminated areas. No radionuclide identification was made.

8. Key assumptions used to deal with the unknowns:
Assumed a variance of -50% to +100% to be conservative. Made radionuclide breakdown according to information in EGG-WM-9857. Assumed that volume of roof material was negligible compared to the total volume. Assumed that a truck load of dirt weighed 10,000 lbs.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 62

1. Preparer: Rhodes, Donald W.

2. Date prepared: 07/02/93

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

4. Particular facility: 604*
(building number - use code from attached list)

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

6. Waste stream:
Surface soil.

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

8. Actual years disposed of at SDA:
Starting year 1974 Ending year 1981

9. Waste stream volume:
Amount 1428.0000 Units Cubic meters.
Check box: [ ] annual or [X] total over all years
Check box: [ ] container volume or [X] waste volume

10. Comments (specify number of pertinent question):
4. The building number is the building from which the contamination originated. Some 58% of the shipments were from 604, another 16% were from 603.
4. (*)This includes waste from buildings 601, 603, 627, 628, 630, and 633.

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

2. Details on physical form(particularly confinement related)
A mixture of sand, silt, gravel and clay that made up the surface soil at the ICPP.

3. Chemical form:
The soil is primarily aluminosilicate. The radionuclides are probably nitrates, oxides, or carbonates.

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

5. Waste container type (see attached list)
Wooden box*.

6. Other characteristics of interest:

7. Comments (specify number of pertinent question):
5. BXC and "Other".
5. Some shipments were made using cardboard boxes, some used wood boxes, and some used dempster dumpsters. In all cases, the container was lined with plastic, which was lapped over at the top and sealed with duct tape.

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
Ce-144	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 441.40000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Co-60	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 20.200000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Cs-134	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 58.300000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Cs-137	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 1204.7000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Eu-152	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T .10000000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Eu-154	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 55.100000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Eu-155	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 32.000000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Mn-54	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 8.0000000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Pr-144	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 441.40000000000	CI	1974	1981	N	-50%	+50%	See comment below.

* 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)

Basis for uncertainty: Radionuclides came from several sources, at different times, and were probably analyzed by different techniques. The major source of the radionuclides in this waste stream was a leak in a waste line that carried first cycle extraction waste from the processing plant to the waste tanks. This incident was extensively documented, and about 3000 curies of radionuclides (65% of the total) came from this one source. The other sources that produced this waste stream are not so well documented, hence, the +/- variance. About 58 curies of MFP were distributed among the listed radionuclides according to the distribution given in EGG-WM-9857. Where a curie value was given (combined) for a parent/daughter pair, the curies were divided equally between the two radionuclides. Where the parent/daughter curies were different, the value of the lower one was increased to equal the higher one, because they would be in equilibrium.

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
Pu-238	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T .20000000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Pu-239	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T .10000000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Ru-106	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 126.00000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Rh-106	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 126.00000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Sb-125	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T .70000000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Sr-90	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 1412.0000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Y-90	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 1412.0000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Zr-95	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 1.8000000000000	CI	1974	1981	N	-50%	+50%	See comment below.
Nb-95	Sorbed on very fine particles of soil.	Nitrates, oxides, or carbonates.	T 1.8000000000000	CI	1974	1981	N	-50%	+50%	See comment below.

* 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)

Basis for uncertainty: Radionuclides came from several sources, at different times, and were probably analyzed by different techniques. The major source of the radionuclides in this waste stream was a leak in a waste line that carried first cycle extraction waste from the processing plant to the waste tanks. This incident was extensively documented, and about 3000 curies of radionuclides (65% of the total) came from this one source. The other sources that produced this waste stream are not so well documented, hence, the +/- variance. About 58 curies of MFP were distributed among the listed radionuclides according to the distribution given in EGG-WM-9857. Where a curie value was given (combined) for a parent/daughter pair, the curies were divided equally between the two radionuclides. Where the parent/daughter curies were different, the value of the lower one was increased to equal the higher one, because they would be in equilibrium.

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

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

2. Details concerning source (names, report no., dates, etc.)
The "other data base" used was the Qualifier Flag database. The report is titled "ICPP Tank Farm Contaminated Soil Incident", Oct. 1, 1974. It does not have a number, but was attached to a letter FHA-118-75 from F.H. Anderson to R. Glenn Bradley. The report EGG-WM-9857 was used to distribute the MFP among the listed radionuclides.

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:
Some of the incidents that produced the contaminated soil are not well documented.

8. Key assumptions used to deal with the unknowns:
Assumed that essentially all of the contaminated soil was transported to the RWMC, or that the fraction transported was known. Assumed that radionuclide content of the soil could be reasonably estimated by measuring the amount of liquid spilled and knowing the composition of the liquid, which was often the method used to obtain the composition.

Continuation of Part _____ Column or Question Number or Title _____

Nearly 300 loads of about 5 tons each made up this waste stream. These different sources that made up the nearly 300 loads all occurred within about a 7 year period, so it was believed that they could be consolidated into one stream, without producing any significant problems with the half-life calculations. An earlier pre-1960 soil contamination incident will be reported separately.

DATA INPUT FOR HISTORICAL DATA TASK FOR RWMC SUBSURFACE DISPOSAL AREA

PART A - GENERAL INFORMATION HDT - 65

1. Preparer: Rhodes, Donald W.

2. Date prepared: 06/22/93

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

4. Particular facility: 633
(building number - use code from attached list)

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

6. Waste stream:
HEPA 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 1975 Ending year 1983

9. Waste stream volume:
Amount 176.1000 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. The off-gas from the WCF fluidized bed calciner was passed through scrubbers, cyclones, etc. to remove particulate matter, and the final clean-up unit was a bank of HEPA filters. When the pressure drop exceeded a certain value, the filters were replaced with new filters, and the contaminated filters were disposed of to the RWMC.

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

2. Details on physical form(particularly confinement related)
The filters were placed in stainless steel (1/4" plate) boxes with lids for disposal.

3. Chemical form:
Glass fibers.

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

5. Waste container type (see attached list)
Metal box.

6. Other characteristics of interest:
The bulk of the waste solids were made up of aluminum oxide and calcium fluorozirconate particles (0.006 to 0.26 micron diameter).

7. Comments (specify number of pertinent question):
The stainless steel boxes were placed in a shielding cask (WCF cask) for transport to the RWMC. The filters were disposed to the pits and trenches until 1978. From 1978 to 1983 they were disposed to the soil vaults.

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	Samp les?	Minimum Value/#Samp	Maximum Value/STD	Basis for Uncertainty
Ce-144	Very finely divided solids.	Oxide - fluorozirconates.	T 4017.0000000000	CI	1975	1983	N	-20%	+20%	See comment below.
Cs-137	Very finely divided solids.	Oxide - fluorozirconates.	T 19661.000000000	CI	1975	1983	N	-20%	+20%	See comment below.
Nb-95	Very finely divided solids.	Oxide - fluorozirconates.	T 613.00000000000	CI	1975	1983	N	-20%	+20%	See comment below.
Pr-144	Very finely divided solids.	Oxide - fluorozirconates.	T 4017.0000000000	CI	1975	1983	N	-20%	+20%	See comment below.
Rh-106	Very finely divided solids.	Oxide - fluorozirconates.	T 1962.0000000000	CI	1975	1983	N	-20%	+20%	See comment below.
Ru-106	Very finely divided solids.	Oxide - fluorozirconates.	T 1962.0000000000	CI	1975	1983	N	-20%	+20%	See comment below.
Sb-125	Very finely divided solids.	Oxide - fluorozirconates.	T 880.00000000000	CI	1975	1983	N	-20%	+20%	See comment below.
Sr-90	Very finely divided solids.	Oxide - fluorozirconates.	T 1924.0000000000	CI	1975	1983	N	-20%	+20%	See comment below.
Y-90	Very finely divided solids.	Oxide - fluorozirconates.	T 1924.0000000000	CI	1975	1983	N	-20%	+20%	See comment below.

* 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)

A representative sample was obtained by pulling a small side stream of the off-gas through a millipore HA filter. This filter was then analyzed in the laboratory. The 20% variance is based on the premise that the laboratory determinations were accurate within +/-10%, but that handling the samples (filters) and possible downtime for equipment repair would add another +/-10%. No sample results were available.

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
Zr-95	Very finely divided solids.	Oxide - fluorozirconates.	T 613.00000000000	CI	1975	1983	N	-20%	+20%	See comment below.

* 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)

A representative sample was obtained by pulling a small side stream of the off-gas through a millipore HA filter. This filter was then analyzed in the laboratory. The 20% variance is based on the premise that the laboratory determinations were accurate within +/-10%, but that handling the samples (filters) and possible downtime for equipment repair would add another +/-10%. No sample results were available.

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

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

2. Details concerning source (names, report no., dates, etc.)
RWMIS values for pit and trench disposal and soil vault disposal were combined to give the values reported. Additional information was obtained from the report IDO-14607, "Removal of Particulates from WCF Off-Gas", June, 1965. Also, Barry O'Brian at the ICPP was contacted for information.

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:
No actual sample results were found.

8. Key assumptions used to deal with the unknowns:
Based on a knowledge of the process, the sampling techniques used, and good measurements of the off-gas flow rate, the accuracy of the results reported in Part D were considered to be reasonably good.