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Liquid Radioactive Waste Discharges from B-Plant to Cribs

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Abstract: This engineering report compiles information on types and quantities of liquid waste discharged from B-Plant directly to cribs, ditches, reverse wells, etc., that are associated with B-Plant. Waste discharges to these cribs via overflow from 241-B, 241-BX, and 241-BY tank farms, and waste discharged to these cribs from sources other than B-Plant are discussed. Discharges from B-Plant to other cribs, unplanned releases, or waste remaining in tanks are not included in the report. Waste stream composition information is used to predict quantities of individual chemicals sent to cribs. This provides an accurate mass balance of waste streams from B-Plant to these cribs. These predictions are compared with known crib inventories as a verification of the process.

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ENGINEERING REPORT
LIQUID RADIOACTIVE WASTE DISCHARGES
FROM B-PLANT TO CRIBS

WORK ORDER E44205

Prepared for
Westinghouse Hanford Company

May 1996

Subcontract WHC-380393

Prepared by
ICF Kaiser Hanford Company
Richland, Washington

E44205ER

E44205ER
ENGINEERING REPORT
FOR
LIQUID RADIOACTIVE WASTE DISCHARGES
FROM B-PLANT TO CRIBS
WORK ORDER E44205

Prepared by
ICF Kaiser Hanford Company
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for

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ABBREVIATIONS

Ci	curie
HVAC	heating, ventilating, and air conditioning
ITS	in-tank solidification
PRTR	Plutonium Recycle Test Reactor
SST	single-shell tank
TBP	tributyl phosphate
WESF	Waste Encapsulation and Storage Facility
WIDS	Waste Information Data System

ENGINEERING REPORT
LIQUID RADIOACTIVE WASTE DISCHARGES
FROM B-PLANT TO CRIBS
WORK ORDER E44205

I. INTRODUCTION

B-Plant was constructed between August 1943 and February 1945 to provide a chemical processing plant to separate plutonium from irradiated fuel slugs. The plant operated from April 1945 to October 1952 using the now obsolete bismuth phosphate process. The plant was decontaminated and shut down during the mid-1950s, but was refitted during the 1960s to process PUREX waste from A-Plant. These waste fractionation operations continued until final shutdown in 1985. The only active waste stream is the combined cooling water and chemical sewer discharge to the 216-B-3C pond.

The bismuth phosphate process generated six waste streams: fuel slug coating removal waste, metal waste, first-cycle plutonium decontamination waste, second-cycle plutonium decontamination waste, cell drainage, and plutonium concentration waste. Coating removal waste was combined with first-cycle decontamination waste, and this report only refers to this combined stream as first-cycle waste. Cell drainage and other liquid waste from the 221-B Building was collected in the 5-6 tank for interim storage before being discharged to the cribs. Plutonium concentration waste from the 224-B Building was sent to a small underground tank for settling before being discharged to the cribs.

Both the bismuth phosphate process and the waste fractionation process generated cooling water, steam condensate, and chemical sewer waste. The waste fractionation process generated its own process condensate waste stream.

II. PURPOSE

This engineering report compiles information on types and quantities of liquid waste discharged from B-Plant directly to cribs, ditches, reverse wells, etc., that are associated with B-Plant. Waste discharged from B-Plant to these cribs via overflow from 241-B, 241-BX, and 241-BY Tank Farms, and waste discharged to these cribs from sources other than B-Plant are discussed. Discharges from B-Plant to other cribs, unplanned releases, or waste remaining in tanks are not included in the report.

Waste stream composition information can be used to predict quantities of individual chemicals sent to the cribs. This would provide an accurate mass balance of waste streams from B-Plant to these cribs. Then, the predictions can be compared with known crib inventories as a verification of the process. The tables in Appendix A provide a framework for this process.

Most crib discharges occurred during periods when the Hanford Site was undergoing rapid expansion, and detailed documentation of low-level waste discharges was not always a high priority. Uncovering detailed information about crib discharges can be a time-consuming task, and, consequently, this report is preliminary in nature. Some information about the bismuth phosphate separations process, which may provide insight to the waste stream composition, has been declassified only recently. As the process information becomes available, the waste stream composition can be better characterized. Recommendations for future study are in Section IV.

This report organizes the various cribs by the following functions:

- Nonradioactive waste water streams discharged to the 216-B-3 pond from B-Plant via ditches.
- Radioactive waste water streams discharged to cribs from B-Plant auxiliary buildings.

- Radioactive waste water streams discharged from B-Plant directly to cribs.
- Waste discharged from 241-B Tank Farm to the cribs.
- Scavenged TBP waste and ITS condensate discharged to the 216-BY cribs.
- First-cycle supernatant waste discharged to the 216-BX trenches.
- Scavenged TBP waste discharged to the 216-BC cribs and trenches.

Appendix A contains three tables:

- Table A-1 gives information on each crib.
- Table A-2 gives the composition of each waste stream, and predicts the quantity of chemicals discharged to each crib.
- Table A-3 compares these predictions with known crib inventories.

Figures illustrating the crib groupings are shown in Appendix B.

III. DESCRIPTION

A. WASTE DISCHARGED FROM B-PLANT TO THE 216-B-3 POND VIA DITCHES (see Figure 1)

The 216-B-3 pond is located east of the 200-East Area, outside the area fence line. The 216-B-2 ditches (216-B-2-1, 216-B-2-2, and 216-B-2-3) are located in the northern part of the 200-East Area, east/southeast of the 241-B Tank Farm. The 216-B-3 ditches (216-B-3-1, 216-B-3-2, and 216-B-3-3) are east of the 200-East Area, extending from the area fence line to the 216-B-3 pond. The 216-B-63 emergency ditch is located next to the western half of the 216-B-2 ditches.

The 216-B-2 ditches and the 216-B-63 emergency ditch originate at the 207-B retention basin. The basin is fed by the 2904-E-1 cooling water line and the 2904-E-2 process sewer line from the 221-B Building. It is also connected to the ITS#1 cooling water drain and an abandoned cooling water drain from the 242-B Evaporator Building. The 9712 line sent the 244-BXR vault cooling water, the ITS#2 cooling water, and the tank farm equipment cooling water directly to the 216-B-2 ditches.

At the terminus of the 216-B-2 ditches, an underground line leads to the 216-B-3 ditches. A valve pit at this point also allows diversion to the 8823 line, which leads from PUREX to the 216-A-25 pond. The 216-A-29 ditch from PUREX connects with the 216-B-3 ditches near their outlet to the 216-B-3 pond.

The effluent line for the 284-E Powerhouse/283-E Water Treatment Plant originally connected to the 216-B-3 ditches, but was tied into the 8823 line in November 1967. This line has also transported cooling water from the 244-AR vault since 1969. After the 216-A-25 pond was closed in 1987, this stream was rerouted to the 216-B-3 pond until its closure in 1994. It now goes to the 216-B-3C pond.

The 216-B-2-1 ditch transported 221-B Building steam condensate, process cooling water, and chemical sewer waste from the 207-B retention basin to the 216-B-3 ditches from 1945 to 1963. It transported cooling water from the 244-BXR vault from 1951 to 1957. After 1952, it also transported cooling water from the 244-CR vault.

On November 7, 1963, approximately half a liter of the cerium-rare earth fraction of the fission product stream was released to the 216-B-2-1 ditch and the 216-B-3 pond by a hairline crack in a cooling coil for the 6-1 tank in B-Plant (UPR-200-E-32). The ditch was backfilled and replaced by the 216-B-2-2 ditch.

The 216-B-2-2 ditch transported 244-CR vault process cooling water, the 221-B Building cooling water, and the 221-B Building chemical sewer waste from the 207-B retention basin to the 216-B-3 ditches from 1963 to 1970. It also transported the 221-B Building steam condensate from 1963 to 1967, ITS#1 cooling water from 1965 to 1970, and ITS#2 cooling water from 1968 to 1970.

On March 22, 1970, 1000 Ci of Sr-90 escaped from the 8-1 product storage tank in the 221-B Building to the pipe gallery floor drain via an instrument line leak (UPR-200-E-138). This spill subsequently drained into the chemical sewer and the ditches leading to the 216-B-3 pond. Cleanup waste from the 207-B retention basin was sent to the 216-B-2-2 ditch, which subsequently was backfilled and replaced by the 216-B-2-3 ditch.

The 216-B-2-3 ditch transported the 221-B Building cooling water from the 207-B retention basin to the 216-B-3 ditches from 1970 to 1987. It transported ITS#1 and ITS#2 condenser cooling water from 1970 to 1973. It transported 244-CR vault cooling water from 1970 to 1986. The ditch was backfilled and replaced with an underground pipeline in 1987 (Project B-675).

The 216-B-63 emergency ditch received the 221-B Building chemical sewer waste from March 1970 to February 1992. The chemical sewer discharge was rerouted to the 216-B-3 pond in 1992, and to the 216-B-3C pond in 1994.

The 216-B-3-1 ditch transported the 221-B Building steam condensate, process cooling water, and chemical sewer waste to the 216-B-3 pond from 1945 to 1964. It also transported 284-E Powerhouse waste (from 1945 to 1964) and 244-CR vault cooling water (from 1952 to 1964) to this pond.

On June 11, 1964, the cooling coil of the F-15 tank in PUREX developed a leak, and 10,000 Ci of fission product waste stored in the tank backflowed into the coil while testing for the leak (UPR-200-E-34). This waste was later inadvertently flushed out to the 216-B-3-1 ditch and to the 216-A-25 pond. The ditch was backfilled and replaced with the 216-B-3-2 ditch.

The 216-B-3-2 ditch transported the 221-B Building process cooling water, steam condensate, and chemical sewer waste, and 244-CR vault cooling water, to the 216-B-3 pond from 1964 to 1970. From 1964 to 1967, it transported 284-E Powerhouse waste water. From 1965 to 1970, it transported ITS#1 cooling water. From 1968 to 1970, it transported ITS#2 cooling water. Following UPR-200-E-138 in 1970, the 216-B-3-2 ditch was backfilled and replaced with the 216-B-3-3 ditch.

The 216-B-3-3 ditch transported 244-CR vault cooling water to the 216-B-3 pond from 1970 to 1986. It transported ITS#1 and ITS#2 cooling water to the 216-B-3 pond from 1970 to 1973, and the 221-B Building cooling water from 1970 to 1994. From 1987 to 1994, it received the 283-E Water Treatment Plant/284-E Powerhouse/244-AR vault cooling water stream and the PUREX cooling water/chemical sewer waste stream. The PUREX cooling water stream included discharge from the 241-A-401 condenser and the 242-A Evaporator. In 1994, the ditch was closed and backfilled, and the effluent rerouted to the 216-B-3C pond via the newly-installed bypass line.

On May 18, 1977, 15 kilograms of cadmium was released from the 324 cadmium nitrate storage tank in PUREX to the 216-B-3-3 ditch and the 216-B-3 pond (UPR-200-E-51).

Although not within the scope of this report, the 216-A-29 ditch is mentioned since it also discharged to the 216-B-3 pond from its excavation in 1955 until its closure in 1991. This ditch transported

PUREX cooling water from 1955 to 1957 and chemical sewer waste from 1955 to 1991.

The 216-B-3 pond is located in a natural topographic depression east of the 200-East Area. The pond was used beginning with B-Plant startup in April 1945, and was fed by the 216-B-3 ditches from B-Plant and by the 216-A-29 ditch from PUREX. Although the pond was intended to receive nonradioactive water, it was contaminated with 154 Ci of fission products as a result of UPR-200-E-34. Three expansion lobes, 216-B-3A, 216-B-3B, and 216-B-3C, for the pond were constructed in the early 1980s to accommodate increased wastewater flow from the restart of PUREX in 1984 and the closure of the 216-A-25 pond in 1987. The 216-E-28 pond was built as a contingency pond, but was never used. It connected to the 8823 line by an underground pipeline that was later extended to the expansion lobes. The Treated Effluent Disposal Facility (TEFD) also connects to this line. The 216-B-3 pond and expansion lobe 216-B-3A were closed and backfilled in 1994. Expansion lobe 216-B-3B has not been used since 1985 although it is classified as an active site.

Expansion lobe 216-B-3C became the 216-B-3C pond in 1994 and receives cooling water from B-Plant, chemical sewer waste from PUREX, cooling water from the 241-A-401 condenser, cooling water from the 244-AR vault, discharge from the 242-A Evaporator Building, and waste water from the 284-E Powerhouse and 283-E Water Treatment Plant.

B. WASTE DISCHARGED FROM B-PLANT AUXILIARY BUILDINGS TO CRIBS
(see Figure 2)

The 216-B-4 and 216-B-6 reverse wells, the 216-B-10A and 216-B-10B cribs, and the 216-B-13 French drain are on the south side of the 221-B Building. The 216-B-60 crib is west of the 221-B Building, under the Waste Encapsulation and Storage Facility (225-B Building).

The 216-B-4 reverse well collected drainage from the 291-B stack from April 1945 to August 1947. At that time, the stack drainage was rerouted to the 216-B-13 French drain, and the 216-B-4 reverse well collected floor drainage from the 292-B Stack Monitoring Building from then until December 1949. It was closed by blanking the inlet, and the floor drainage was sent to the 216-B-10A crib.

The 216-B-6 reverse well collected radioactive waste water from the 222-B laboratory regulated areas (decontamination sink and sample slurper) from April 1945 to December 1949, and was closed by blanking the inlet when the radionuclide capacity was reached. After that, the laboratory waste was sent to the 216-B-10A crib.

The 216-B-13 French drain collected drainage from the 291-B stack from August 1947 to June 1976, when it was deactivated. The stack drainage was rerouted into a cell drainage sample tank inside the 221-B Building.

The 216-B-10A crib started operations in December 1949, collecting acid waste from the 222-B laboratory decontamination sink and sample slurper, and floor drainage from the 292-B Building. Some waste overflowed into the 216-B-10B crib. The laboratory discontinued operation in December 1951, and the inlet line to the 216-B-10A crib was blanked at the sink. The laboratory has since been converted into office space with no floor drains, and liquid waste discharge is limited to HVAC drainage to the chemical sewer. The 216-B-10A crib continued to receive the 292-B Building floor drainage until October 1973 (some documents state an earlier closing date). This drainage is now routed to the chemical sewer.

The 216-B-10B crib collected overflow from the 216-B-10A crib from December 1949 to May 1969. At that time, the inlet line from the 216-B-10A crib was blanked off and rerouted to the 221-BC Building. The old line from the 222-B laboratory to the 216-B-10A crib was modified for

this purpose. The crib collected decontamination sink and shower waste water until October 1973.

The 216-B-60 crib collected the 221-B Building cell cleanout solid and liquid waste via the 24-in. sewer in November 1967. WESF (225-B) was constructed above this crib in 1974.

C. WASTE DISCHARGED FROM B-PLANT TO CRIBS (see Figure 3)

The 216-B-5 reverse well and the 216-B-9 and 216-B-56 cribs, located northeast of the 221-B Building, are piped to the 241-B-154 diversion box. Retention basin 216-B-59 is northeast of the 221-B Building and is piped to the building. The 216-B-55 and 216-B-62 cribs, and retention basin 216-B-64, are west of the 221-B Building (the 216-B-62 crib is northwest) and are piped to the building. The 216-B-12 crib is east of the 221-B Building and has been piped to the building and to the 241-ER-151 diversion box.

The 216-B-5 reverse well collected the 224-B Building liquid waste from April 1945 to September 1946. It collected the 221-B Building cell drainage from April 1945 to October 1947. This waste was piped from the 241-B-154 diversion box to the 241-B-361 tank, which overflowed to the 216-B-5 crib. In September 1946, the 224-B Building waste was rerouted to the 216-B-7A and 216-B-7B cribs (see Section D) via the 241-B-252 diversion box and the 241-B-201 tank. The 216-B-5 reverse well and the 241-B-361 tank were closed in October 1947 by blanking the inlet line when the crib's radionuclide capacity was reached and the groundwater was contaminated. The 221-B Building waste was then rerouted to the 216-B-7A and 216-B-7B cribs until the 216-B-9 crib opened in August 1948.

The 216-B-9 crib was built in August 1948 to replace the 216-B-5 reverse well. It collected the 221-B Building cell drainage via the 241-B-154 diversion box and the V204 line (this waste had been sent to the

216-B-7A and 216-B-7B cribs while the 216-B-9 crib was under construction). The crib was closed in July 1951 when the radionuclide capacity was reached and was deactivated by removing the diversion box jumper.

The 216-B-12 crib received process condensate from the 221-U and 224-U Buildings via the 241-ER-151 diversion box and the 270-E-1 tank via the V219 line from November 1952 to December 1957. The 270-E-1 tank was removed from service around 1960 and the V219 line was capped.

The 216-B-56 crib was constructed in 1965 to receive organic waste from the 221-B Building but the V203 line was never connected to the 241-B-154 diversion box and the crib was never used.

The 216-B-12 crib was inactive for 10 years, then received B-Plant renovation construction waste via new the V482 line in May through November 1967. The 216-B-12 crib received neutralized waste fractionation process condensate from the 221-B Building from November 1967 to November 1973, when the crib collapsed. A portion of the V482 line was capped off where it led to the 216-B-12 crib, and the remaining line was extended to the new 216-B-62 crib. The 216-B-62 crib received process condensate from the 221-B Building from 1973 until plant shutdown in 1985. The crib was decommissioned in 1991.

Retention basin 216-B-59 has operated since 1967. It was originally built as a trench but was converted to a lined retention basin in 1974. If radioactivity is detected in the 221-B Building cooling water, it is diverted to retention basin 216-B-59 and returned to the 221-B Building for treatment. One discharge to the unlined trench occurred in 1968.

The 216-B-55 crib received steam condensate from the 221-B Building from September 1967 to 1990 and was decommissioned in 1991.

Retention basin 216-B-64 was constructed in 1974 to receive contaminated process condensate from the 221-B Building, but was never used.

D. WASTE DISCHARGED FROM THE 241-B TANK FARM TO THE CRIBS (see Figure 4)

The 216-B-7A, 216-B-7B, and 216-B-8 cribs and the 216-B-11A and 216-B-11B reverse wells are located inside the 241-B Tank Farm.

The 216-B-7A and 216-B-7B cribs operated from 1946 to 1967. These cribs are piped only to the 241-B-252 diversion box via the 241-B-201 receiver tank inside the 241-B Tank Farm. From September 1946 to December 1954, they received the 224-B Building liquid waste. From October 1947 to August 1948, they also received the 221-B Building cell drainage because the 216-B-5 reverse well had filled up and the new 216-B-9 crib was not available. From December 1954 to September 1958, they again received the 221-B Building cell drainage and the 224-B Building equipment cleanout waste. - From September 1958 until October 1961, they occasionally received the 221-B Building cell drainage. From October 1961 to May 1967, they received the 221-B Building construction decontamination waste. They were deactivated by removing the jumper in the diversion box when the radionuclide capacity was reached. The waste was then sent to the 216-B-12 crib (see Part C).

Second-cycle waste had been stored in single-shell tanks (SSTs) until April 1948, then was cascaded through the 214-B-110, 241-B-111, and 241-B-112 tanks, and discharged to the 216-B-8 crib. This crib operated from April 1945 to July 1953. It is piped to the 241-B-112 tank and to a blind riser in the 241-B Tank Farm. From July to December 1951, the 216-B-8 crib also received the 221-B Building cell drainage. From December 1951 to December 1952, the 216-B-8 crib received shutdown decontamination waste from the 224-B Building. Some documents suggest that second-cycle waste, 221-B Building cell drainage, and

224-B Building liquid waste were combined into a common waste stream, but the best available data indicate that the 224-B Building liquid waste was not discharged to the 216-B-8 crib.

First-cycle waste (combined with coating removal waste) was evaporated in the 242-B facility to reduce the total volume of waste. Evaporation was begun in 1951, after the waste had several years to settle in SSTs. Evaporator condensate was discharged to the 216-B-11A and 216-B-11B reverse wells from December 1951 until December 1954, when evaporation of first-cycle waste was discontinued. The reverse wells were deactivated by blanking the line in the 242-B Building. In August 1955, the inlet line from the 241-B-112 tank to the 216-B-8 crib was rerouted to these wells. Liquid waste could have been routed to the 216-B-8 crib via this line after 1955, but no records of such discharges have been located.

E. WASTE DISCHARGED FROM THE TANK FARMS TO THE 216-BY CRIBS
(see Figure 5)

The 216-B-43 through 216-B-50 cribs are located north of the 241-BY Tank Farm and are piped to the 216-BY-201 flush tank. The 216-B-51 French drain is located northeast of the 241-BY Tank Farm and is piped to the 2905-E-2 pipeline which leads from the 216-BY-201 flush tank to the 216-BC cribs (see Section G). This line also connects with the 241-C Tank Farm via a valve box. The 216-B-57 and 216-B-61 cribs are located northwest of the 241-BY Tank Farm.

Metal waste from the bismuth phosphate process was stored in SSTs until 1952, when it was pumped to U-Plant in 200-West Area for uranium recovery by the tributyl phosphate (TBP) process. TBP waste was then sent from U-Plant to SSTs in the 200-East and 200-West Areas for storage but the large volumes of liquid waste produced by the TBP process soon filled all available tank space.

Ferrocyanide scavenging of TBP waste to remove long-lived cesium and strontium isotopes, allowing ground disposal, began in September 1954. Newly generated TBP waste was scavenged in U-Plant, then sent to the 200-East Area for settling and discharge to the 216-BY cribs, beginning in November 1954. TBP waste that had been stored in the 200-East Area was scavenged in the 244-CR vault beginning in May 1955, then settled in SSTs in the 241-C Tank Farm and discharged to the 216-BC cribs (see Section G) beginning in January 1956. TBP waste stored in the 200-West Area was intended to be scavenged but never was and still remains in those tanks.

The 216-B-43 through 216-B-49 cribs received scavenged TBP waste from 1954 through 1957, as shown in Table 1.

TABLE 1

SCAVENGED TBP WASTE		
Crib	Volume (liters)	Date
216-B-43	2.1×10^6	November 1954
216-B-44	5.6×10^6	November 1954 to March 19955
216-B-45	4.9×10^6	April 1955 to June 1955
216-B-46	6.7×10^6	September 1955 to December 1955
216-B-47	3.7×10^6	September 1955
216-B-48	4.1×10^6	November 1955 to July 1957
216-B-49	6.7×10^6	November 1955 to December 1957

All cribs were blank flanged in 1975.

The 216-B-51 French drain received scavenged TBP waste from 1956 to 1958 in the form of flush drainage from the 216-BC cribs pipeline. The pipeline to the French drain was valved out, and the 216-BC crib pipeline was blanked at the north end and plugged at the south end.

The 216-B-50 crib received 5.9×10^7 L of waste storage tank condensate from ITS#1 in the 241-BY Tank Farm from ITS#1 startup in 1965 until ITS#2 shutdown in 1974 (ITS#1 was used as a cooler for ITS#2 from 1971 to 1974). The condensate line was routed to the 216-BY-201 flush tank by welding a nozzle on an existing manhole cover. This line was blank flanged in 1975. The 216-B-61 crib was constructed in 1969 to replace 216-B-50, but was never used.

The 216-B-57 crib received 8.4×10^7 L of waste storage tank condensate from ITS#2 in the 241-BY Tank Farm from ITS#2 startup in 1968 until ITS#2 shutdown in 1974.

F. WASTE DISCHARGED FROM THE TANK FARMS TO THE 216-BX TRENCHES (see Figure 5)

The 216-B-35 through 216-B-42 trenches are located west of the 241-BX Tank Farm. The overground pipeline to these trenches was removed in 1955.

Evaporation of first-cycle waste was discontinued in 1954 to make tank space more quickly available for TBP waste (see Section E), and the waste supernate was cascaded and discharged to specific retention trenches. First-cycle waste from T-Plant was scavenged to remove cesium and strontium, but B-Plant waste was not scavenged.

The 216-B-35 through 216-B-41 trenches (except 216-B-37) received first-cycle supernatant waste in 1954, as shown in Table 2.

TABLE 2

FIRST-CYCLE SUPERNATANT WASTE		
Trench	Volume (liters)	Date
216-B-35	1.06×10^6	February 1954 to March 1954
216-B-36	1.94×10^6	March 1954 to April 1954
216-B-38	1.43×10^6	July 1954 to August 1954
216-B-39	1.47×10^6	December 1953 to November 1954
216-B-40	1.64×10^6	April 1954 to July 1954
216-B-41	1.44×10^6	November 1954

The 216-B-37 trench received 4.32×10^6 L of evaporator bottoms from the 242-B evaporator in August 1954.

The 216-B-42 trench received 1.50×10^6 L of scavenged TBP waste in early 1955.

G. WASTE DISCHARGED FROM THE TANK FARMS AND THE 300 AREA TO THE 216-BC CRIBS AND TRENCHES (see Figure 5)

The 216-B-14 through 216-B-19 cribs, the 216-B-20 through 216-B-34 trenches, and the 216-B-52, 216-B-53A, 216-B-53B, 216-B-54, and 216-B-58 trenches are located in the 216-BC cribs area, south of Route 4S across from Baltimore Avenue.

The 216-B-14 through 216-B-19 cribs received scavenged TBP waste in 1956-1957, as shown in Table 3.

TABLE 3

SCAVENGED TBP WASTE		
Crib	Volume (liters)	Date
216-B-14	8.71×10^6	January 1956 to February 1956
216-B-15	6.32×10^6	April 1956 to December 1957
216-B-16	5.6×10^6	April 1956 to August 1956
216-B-17	3.41×10^6	January 1956
216-B-18	8.52×10^6	March 1956 to April 1956
216-B-19	6.4×10^6	February 1957 to October 1957

The 216-B-14 through 216-B-19 cribs were valved out in 1969.

The use of specific retention trenches began in 1956 when it was discovered that Co-60 and other radionuclides could migrate from cribs. The 216-B-20 through 216-B-34 and 216-B-52 trenches received scavenged TBP waste in 1956 and 1957 as shown in Table 4.

TABLE 4

SCAVENGED TBP WASTE		
Trench	Volume (liters)	Date
216-B-20	4.68×10^6	August 1956 to September 1956
216-B-21	4.67×10^6	September 1956 to October 1956
216-B-22	4.74×10^6	October 1956
216-B-23	4.52×10^6	October 1956
216-B-24	4.7×10^6	October 1956 to November 1956
216-B-25	3.76×10^6	November 1956 to December 1956
216-B-26	5.88×10^6	December 1956 to February 1957
216-B-27	4.42×10^6	February 1957 to April 1957
216-B-28	5.05×10^6	April 1957 to June 1957
216-B-29	4.84×10^6	June 1957 to July 1957
216-B-30	4.78×10^6	July 1957
216-B-31	4.74×10^6	July 1957 to August 1957
216-B-32	4.77×10^6	August 1957 to September 1957
216-B-33	4.74×10^6	September 1957 to October 1957
216-B-34	4.87×10^6	October 1957
216-B-52	8.53×10^6	December 1957 to January 1958

The 216-B-53A trench received 1.5×10^4 L of Plutonium Recycle Test Reactor (PRTR) waste from the 300 Area in 1965.

The 216-B-53B, 216-B-54, and 216-B-58 trenches received liquid waste from the 300 Area from 1962 to 1967, as shown in Table 5.

TABLE 5

300 AREA LIQUID WASTE		
Trench	Volume (liters)	Date
216-B-53B	1.51×10^4	November 1962 to March 1963
216-B-54	9.99×10^5	March 1963 to October 1965
216-B-58	4.13×10^5	November 1965 to June 1967

The overground pipeline for these trenches was removed in 1969.

IV. UNCERTAINTIES AND RECOMMENDATIONS FOR FURTHER STUDY

A. UNCERTAINTIES

Cooling water from the 244-CR vault reportedly was routed to the 216-B-2 ditches from 1952 to 1986, but it is not clear how this was done.

The 216-BC cribs and trenches, 216-BX trenches, and 216-BY cribs all received discharges from the tank farms. It is not known which tanks discharged to which cribs.

Various documents describe the 216-B-10A crib as closing in 1951, 1952, 1953, and 1954.

There is no record of the disposition of 221-B Building cell drainage from December 1951 to December 1954. B-Plant was shut down during this period, but was being decontaminated.

Discrepancies between the predicted amount of chemicals in each crib and the WIDS database (see Table A-3 in Appendix A) could be due to inaccurate waste stream information. Not all the chemicals known to be discharged to the 216-BC cribs are recorded in reference 10 (for example, ferrocyanide), and the list of chemicals for first-cycle waste does not match the chemicals recorded as being present in the 216-BY cribs (which received the first-cycle waste). Additionally, it is possible that waste stream compositions varied from one batch to another, which would make tracking of each batch from plant to tank to crib necessary. No information was available on the composition of several waste streams (see Table A-2 in Appendix A). More research on waste stream composition is needed.

B. RECOMMENDATIONS

The Data Quality Objectives (DQOs) should be reviewed for Waste Management and Environmental Restoration concerns that may apply to this report.

The radionuclide limits for cribs and specific retention trenches should be investigated.

Provide more detailed maps showing size, location, configuration, and disposal information for the cribs.

It would be useful to compare the predicted and WIDS amounts with crib core sampling data (a column in Table A-3 in Appendix A is provided for this purpose). However, no such sampling information has been found and a more intensive document search may discover such data. Crib sampling should be pursued.

For each group of cribs, first review the waste stream history (such as sampling and discharge records), then review available crib records for chemical data and note and reconcile any discrepancies. The crib groups are listed in the following order of priority:

- **Groups E and G (Waste Discharged From the Tank Farms to the 216-BY Cribs and 216-BC Cribs and Trenches)**

Large quantities of scavenged TBP waste were discharged to each of these cribs. This group represents the largest total curie loading of disposed waste and should be the highest priority. There is a high probability of finding discharge records, since specific-retention trenches required measurement of discharge. Available waste stream composition information is inconsistent regarding concentrations, but agrees with crib data on which chemicals are present. Additional waste stream composition information is needed.

- **Group C (Waste Discharged From B-Plant to Cribs)**

The 216-B-12 crib received the largest volume of waste (mostly U-Plant process condensate). For example, there are nearly 2,000 tons of ammonium nitrate in the 216-B-12 crib. Significant quantities of the 221-B Building cell drainage were discharged to the 216-B-5 reverse well and the 216-B-9 crib. Kilogram quantities of plutonium presently are in the 216-B-5 reverse well as a result of 224-B plutonium concentrator discharge to this well. Discharge records and waste stream composition information will probably be difficult to locate.

- **Group D (Waste Discharged From the 241-B Tank Farm to the Cribs)**

Significant quantities of waste were discharged to all cribs. The 216-B-7A, 217-B-7B, and 216-B-8 cribs received waste from a variety of sources, which will complicate the analysis. Kilogram quantities of plutonium are present in the 216-B-7A and

216-B-7B cribs. Discharge records and waste stream composition information will probably be difficult to locate.

- **Group F (Waste Discharged From the Tank Farms to the 216-BX Trenches)**

Large quantities of first-cycle waste were sent to each of these trenches. These are also specific-retention trenches, so discharge records should be available. Available waste stream composition information disagrees with crib records regarding what chemicals are present. This may be due to the presence of coating removal waste. Additional waste stream composition information is needed.

- **Group B (Waste Discharged From the B-Plant Auxiliary Buildings to the Cribs)**

Only the 216-B-10A crib received a significant quantity of waste. It is unlikely that discharge records were kept. This group of cribs potentially represents a large amount of effort for a small amount of information, which will be of limited value anyway.

- **Group A (Waste Discharged From B-Plant to 216-B-3 Pond Via Ditches)**

A large number of individual sources contributed to this waste stream, which was primarily water. It was intended to be, and was, a nonradioactive waste stream (except for known unplanned releases). A minor quantity of hazardous waste was discharged via this waste stream. The probability of finding discharge records is unlikely and a great deal of time could be wasted in the attempt. No further effort should be expended for investigating this stream (except for the 216-B-63 ditch).

A study similar to this effort should be made for the other separation plants. Upon completion, these studies can be integrated into a single report. This approach is necessary to account for waste streams that

affect more than one plant. For example, other plants known to affect the cribs, ditches, and ponds associated with B-Plant include A-Plant (waste water discharge), U-Plant (uranium recovery), and the 241-C Tank Farm (scavenging and 244-CR vault cooling water).

V. REFERENCES

A. DOCUMENTS

1. Waste Information Data System (WIDS), General Summary Report, June 23, 1995
2. DeFord, D.H. and R.W. Carpenter, "B-Plant Aggregate Area Management Study Technical Baseline Report, Document No. BHI-00179, May 1995.
3. Smith, D.L., "216-B-3 Pond Interim Stabilization Final Report," Document No. BHI-00219, January 1995.
4. U.S. Department of Energy, "216-B-3 Expansion Ponds Closure Plan," Document No. DOE-RL-89-28, October 1994.
5. U.S. Department of Energy, "State Waste Discharge Application, 200 Area Treated Effluent Disposal Facility (Project W-049H)," Document No. DOE-RL-94-29, August 1994.
6. Brevick, C.H. et al, "Supporting Document for the Historical Tank Content Estimate for B Tank Farm," Document No. WHC-SD-WM-ER-310, June 1994.

7. Golder Associates, "Engineering Study of 50 Miscellaneous Inactive Underground Radioactive Waste Tanks," Document No. WHC-SD-EN-040, February 1994.
8. Frederick, D.O., "Functional Design Criteria: First Lobe B Pond Bypass, Project X-009," Document No. WHC-SD-X009-FDC-001, May 1992.
9. Waite, J.L., "Tank Wastes Discharged Directly to the Soil at the Hanford Site," Document No. WHC-MR-0227, April 1991.
10. Anderson, J.D., "A History of the 200 Area Tank Farms," Document No. WHC-MR-0132, June 1990.
11. Smith, W.W., "216-B-2-3 Ditch Upgrade Conceptual Design Report," Document No. WHC-SD-675-CDR-001, September 1986.
12. Maxfield, H.L., "Handbook for 200 Areas Waste Sites," Document No. RHO-CD-673, April 1979.
13. U.S. Energy Research and Development Administration, "Final Environmental Impact Statement--Waste Management Operations," Document No. ERDA-1538, December 1975.
14. Lundgren, L.L., "200 East and North Areas Radioactive Liquid Waste Disposal Sites," Document No. ARH-1562, January 1970.
15. Clukey, H.V., "Tabulation of Radioactive Liquid Waste Disposal Facilities," Document No. HW-43121, May 1956.
16. Heid, K.R., "Unconfined Underground Radioactive Waste and Contamination in the 200 Areas," Document No. HW-41535, January 1956.

B. DRAWINGS

1. H-2-1649, Rev. 3, "216-B-10A & 216-B-10B Cribs"
2. H-2-2021, Rev. 30, Sh. 1, "First Cycle Evaporation, 200 East Plot Plan"
3. H-2-2028, Rev. 9, "First Cycle Evaporation, Schematic & Flow Diagram"
4. H-2-2603, Rev. 7, "Cribs 216-B-43 through B-50, BY Crib Area, Plot Plan"
5. H-2-2928, Rev. 2, "Re-routing 3-in. Effluent to 216-B-8 to Reverse Well 216-B-11A Plan, Profile & Details"
6. H-2-32267, Rev. 2, "2-in. Drain to Cribs, Plan & Profile"
7. H-2-34572, Rev. 2, "Crib 216-B-61 Plan & Profile"
8. H-2-37411, Rev. 3, "Process Drain to Catch Tank and Crib"
9. H-2-37693, Rev. 0, "Crib 216-B-10(A&B) Abandonment"
10. H-2-37899, Rev. 2, "Piping Arrangement, 216-B-59 Retention Basin"
11. H-2-41975, Sh 1, Rev. 5, "Piping Arrangement Outside Utility Lines - Sheet #1"
12. H-2-44501, Sh. 86, Rev. 9, "Area Map - 200 East - B Plant Facilities;" Sh. 96, Rev. 9, "Area Map - 200 East - B Plant Facilities;" Sh. 97, Rev. 11, "Area Map - 200 East - B Plant Facilities;" Sh. 128,

Rev. 9, "Area Map - 200 East - C Plant Facilities;" Sh. 129, Rev. 12, "Area Map - 200 East - B Plant Facilities;" Sh. 140, Rev. 11, "Area Map - 200 East - B Plant Facilities"

13. H-6-5334, Rev. 1, "200 East Contingency Pond, Project B-561, Contingency Pond Earthwork Plan"
14. H-6-5335, Rev. 1, "200 East Contingency Pond, Project B-561, Water Conveyance Plan & Profile"
15. H-6-5337, Rev. 1, "200 East Contingency Pond, Project B-561, Contingency Pond Details"

VI. GLOSSARY

Bismuth Phosphate Process

A chemical separation process used to extract plutonium from irradiated fuel slugs. It was used at B-Plant from 1945 to 1952.

Cell Drainage

Low-level liquid waste from individual cells in B-Plant. This waste was stored in the 5-6 tank before being discharged to cribs.

Crib

An underground liquid waste disposal facility filled with soil and/or crushed gravel utilizing the ion exchange properties to remove radioactive contamination. Cribs were typically operated until contamination was observed in the groundwater beneath the crib.

Ditch

An unlined excavation used to allow large quantities of water to flow to a pond.

Ferrocyanide Scavenging

A chemical precipitation process to remove long-lived fission product isotopes from liquid waste generated by the tributyl phosphate (TBP) process. Scavenged liquid waste was discharged to the ground by cribs or specific retention trenches. This process was used at U-Plant from 1954 to 1957, and at the 241-C Tank Farm from 1955 to 1957.

First-Cycle Waste

Byproduct waste from the first decontamination cycle following the plutonium separation phase of the bismuth phosphate process. This waste contained about 10% of the fission products of the irradiated fuel.

French Drain

A buried horizontal pipe filled with rock, open-ended or perforated, for disposal of liquid waste by seepage into the ground.

Metal Waste

Byproduct waste from the first plutonium separation phase of the bismuth phosphate process. Metal waste contained unfissioned uranium and approximately 90% of the fission products of the irradiated fuel.

Pond (swamp)

A body of water enclosed in a natural or diked surface depression used for the disposal (by evaporation or percolation) of liquid effluent.

Plutonium Concentrator Waste (224-B Waste)

Low-level liquid waste from the 224-B plutonium concentrator facility. This waste stream was the primary contributor to plutonium contamination of the soil.

Reverse Well

A buried vertical pipe with the lower end open or perforated to allow seepage of liquid waste into the ground.

Second-Cycle Waste

Byproduct waste from the second and last decontamination cycle following the plutonium separation phase of the bismuth phosphate process. This waste contained less than 0.1% of the fission products of the irradiated fuel.

Specific Retention Trench

An unlined excavation used for the disposal of a designated volume of low-level or intermediate-level radioactive waste. Liquid is retained in the trench soil and does not migrate to the groundwater.

Tributyl Phosphate Process

A solvent extraction process used to recover uranium from metal waste generated as part of the bismuth phosphate process. This process was used at U-Plant from 1952 to 1957.

APPENDIX A

Tables

Table A-1	B-Plant Cribs
Table A-2	Waste Stream Predictions
Table A-3	B-Plant Crib Chemical Inventory

TABLE A-1

B-PLANT CRIBS							
Group	Site Name	Type/Location	Source	Dates	Type	Amount (liters)	Comments
	216-B-1	Crib					Never built.
A	216-B-2-1	Ditch southeast of the 241-B Tank Farm	221-B Building	4/45-11/63	Process cooling water		Contaminated in 1963, replaced by the 216-B-2-2 ditch.
			221-B Building	4/45-11/63	Steam condensate		
			221-B Building	4/45-11/63	Chemical sewer waste		
			244-BXR vault	1951-1957	Cooling water		
			244-CR vault	3/52-11/63	Cooling water		
A	216-B-2-2	Ditch southeast of the 241-B Tank Farm	221-B Building	11/63-4/70	Process cooling water		Contaminated in 1970, replaced by the 216-B-2-3 ditch.
			221-B Building	11/63-11/67	Steam condensate		
			221-B Building	11/63-4/70	Chemical sewer waste		
			244-CR vault	11/63-4/70	Cooling water		
			ITS#1 in the 241-BY Tank Farm	1/65-4/70	Cooling water		
			ITS#2 in the 241-BY Tank Farm	2/68-4/70	Cooling water		
A	216-B-2-3	Ditch southeast of the 241-B Tank Farm	207-B retention basin	4/70	Cleanup waste		Replaced with underground line.
			221-B Building	1970-1987	Process cooling water		
			244-CR vault	1970-1986	Cooling water		
			ITS#1 in the 241-BY Tank Farm	4/70-7/73	Cooling water		
A	216-B-3	Pond east of 200-East Area	ITS#2 in the 241-BY Tank Farm	4/70-7/73	Cooling water		154 Ci in 1964 from UPR-200-E-34
			216-B-3 ditches	1945-1994	Low-level waste water		
A	216-B-3C	Pond east of 200-East Area	216-A-29 ditch	1955-1994	Low-level waste water		
			216-B-3 pond	1984-1994	Overflow		
			PUREX	1994-present	Chemical sewer waste		
					242-A evaporator discharge		
					241-A-401 cooling water		
A	216-B-3-1	Ditch east of 200-East Area	283-E Water Treatment Plant 284-E Powerhouse 244-AR vault	1994-present	Waste water		Contaminated with 3 Ci in 1964. Replaced by the 216-B-3-2 ditch.
			221-B Building	1994-present	Cooling water		
			221-B Building	4/45-7/64	Cooling water		
			221-B Building	4/45-7/64	Steam condensate		
			221-B Building	4/45-7/64	Chemical sewer waste		
A	216-B-3-2	Ditch east of 200-East Area	244-BXR vault	1951-1957	Cooling water		
			244-CR vault	3/52-7/64	Cooling water		

TABLE A-1 (Continued)

B-PLANT CRIBS							
Group	Site Name	Type/Location	Source	Dates	Type	Amount (liters)	Comments
A	216-B-3-2	Ditch east of 200-E Area	283-E Water Treatment Plant 284-E Powerhouse	4/45-7/64	Waste water		Contaminated in 1970. Replaced by the 216-B-3-3 ditch.
			221-B Building	7/64-9/70	Cooling water		
			221-B Building	7/64-9/70	Steam condensate		
			221-B Building	7/64-9/70	Chemical sewer waste		
			244-CR vault	7/64-9/70	Cooling water		
			283-E Water Treatment Plant 284-E Powerhouse	7/64-11/67	Waste water		
			ITS#1 in 241-BY Tank Farm	1/65-9/70	Cooling water		
			ITS#2 in 241-BY Tank Farm	2/68-9/70	Cooling water		
A	216-B-3-3	Ditch east of 200-East Area	244-CR vault	10/70-1986	Cooling water		
			ITS#1 in 241-BY Tank Farm	10/70-7/73	Cooling water		
			ITS#2 in 241-BY Tank Farm	10/70-7/73	Cooling water		
			PUREX	1987-1992	Cooling water		
				1987-1994	Chemical sewer waste		
					242-A evaporator discharge		
					241-A-401 cooling water		
			283-E Water Treatment Plant 284-E Powerhouse 244-AR vault	1987-1994	Cooling water		
221-B Building	10/70-1994	Cooling water					
B	216-B-4	Reverse well south of B-Plant	291-B stack	4/45-8/47	Stack drainage		
			292-B Building	8/47-12/49	Floor drainage		
C	216-B-5	Reverse well northeast of B-Plant	224-B Building	4/45-9/46	Liquid waste	3.06x10 ⁷	Radionuclide capacity reached. The 224-B Building effluent rerouted to the 216-B-7A and 216-B-7B cribs.
			221-B Building	4/45-10/47	Cell drainage		
B	216-B-6	Reverse well south of B-Plant	222-B laboratory regulated area	4/45-12/49	Radioactive waste water		Radionuclide capacity reached.
D	216-B-7A	Crib north of 241-B Tank Farm	224-B Building	9/46-12/54	Liquid waste	4.30x10 ⁷	Radionuclide capacity reached.
			221-B Building	10/47-8/48	Cell drainage	216-B-7A and 216-B-7B combined	
			221-B Building	12/54-10/61	Cell drainage		
			224-B Building	12/54-9/58	Equipment cleanout waste		

TABLE A-1 (Continued)

B-PLANT CRIBS							
Group	Site Name	Type/Location	Source	Dates	Type	Amount (liters)	Comments
			221-B reactivation	10/61-5/67	Decontamination and construction waste water		
D	216-B-7B	Crib north of 241-B Tank Farm	216-B-7A crib overflow	9/46-5/67	High salt, neutral/basic		
D	216-B-8	Crib and tile field north of 241-B Tank Farm	221-B Building	4/48-12/51	Second cycle supernatant waste	2.72x10 ⁷	
			221-B Building	7/51-12/51	Cell drainage		
			224-B Building	12/51-12/52	Shutdown decontamination waste		
C	216-B-9	Crib and tile field south of 241-B Tank Farm	221-B Building (via diversion box 241-B-154)	8/48-7/51	Cell drainage	3.6x10 ⁷	Radionuclide capacity reached.
B	216-B-10A	Crib south of B-Plant	222-B laboratory	12/49-12/51	Acid waste from decontamination sink and sample slurper	1x10 ⁸	Overflowed to crib 216-B-10B. Closing date uncertain.
			292-B Building	12/49-10/73	Floor drainage		
B	216-B-10B	Crib south of B-Plant	216-B-10A crib	12/49-5/69	Overflow	2.8x10 ⁴	
			221-BC building	5/69-10/73	Decontamination sink and shower		
D	216-B-11A	Reverse well north of 241-B Tank Farm	242-B evaporator	12/51-12/54	Process condensate. Low salt, neutral/basic	2.96x10 ⁷ 11A and 11B combined	Overflowed to the 216-B-11B crib
D	216-B-11B	Reverse well north of 241-B Tank Farm	216-B-11A crib overflow	12/51-12/54	Low salt, neutral/basic		
C	216-B-12	Crib northwest of B-Plant	221-U and 224-U Buildings via the 241-ER-151 diversion box and the 270-E-1 tank	11/52-12/57	Evaporator process condensate	5.8x10 ⁸	Inactive 12/57-5/67
			221-B Building	5/67-11/67	Construction waste		
			221-BB Building	11/67-11/73	Neutralized process condensate, low salt, neutral/basic		
B	216-B-13	French drain south of B-Plant	291-B stack	8/47-6/76	Stack drainage. Low salt, neutral/basic		
G	216-B-14	Crib south of 200-East Area	244-CR vault	1/56-2/56	Scavenged TBP waste, low salt, neutral/basic	8.71x10 ⁶	
G	216-B-15	Crib south of 200-East Area	244-CR vault	4/56-12/57	Scavenged TBP waste, low salt, neutral/basic	6.32x10 ⁶	
G	216-B-16	Crib south of 200-East Area	244-CR vault	4/56-8/56	Scavenged TBP waste, low salt, neutral/basic	5.60x10 ⁶	
G	216-B-17	Crib south of 200-East Area	244-CR vault	1/56	Scavenged TBP waste, low salt, neutral/basic	3.41x10 ⁶	
G	216-B-18	Crib south of 200-East Area	244-CR vault	3/56-4/56	Scavenged TBP waste, low salt, neutral/basic	8.52x10 ⁶	
G	216-B-19	Crib south of 200-East Area	244-CR vault	2/57-10/57	Scavenged TBP waste, low salt, neutral/basic	6.4x10 ⁶	

TABLE A-1 (Continued)

B-PLANT CRIBS							
Group	Site Name	Type/Location	Source	Dates	Type	Amount (liters)	Comments
G	216-B-20	Trench south of 200-East Area	244-CR vault	8/56-9/56	Scavenged TBP waste, salt, neutral/basic	low 4.68×10^6	Radionuclide capacity reached.
G	216-B-21	Trench south of 200-East Area	244-CR vault	9/56-10/56	Scavenged TBP waste, salt, neutral/basic	low 4.67×10^6	Radionuclide capacity reached.
G	216-B-22	Trench south of 200-East Area	244-CR vault	10/56	Scavenged TBP waste, salt, neutral/basic	low 4.74×10^6	Radionuclide capacity reached.
G	216-B-23	Trench south of 200-East Area	244-CR vault	10/56	Scavenged TBP waste, salt, neutral/basic	low 4.52×10^6	Radionuclide capacity reached.
G	216-B-24	Trench south of 200-East Area	244-CR vault	10/56-11/56	Scavenged TBP waste, salt, neutral/basic	low 4.7×10^6	Radionuclide capacity reached.
G	216-B-25	Trench south of 200-East Area	244-CR vault	11/56-12/56	Scavenged TBP waste, salt, neutral/basic	low 3.76×10^6	Radionuclide capacity reached.
G	216-B-26	Trench south of 200-East Area	244-CR vault	12/56-2/57	Scavenged TBP waste, salt, neutral/basic	low 5.88×10^6	Radionuclide capacity reached.
G	216-B-27	Trench south of 200-East Area	244-CR vault	2/57-4/57	Scavenged TBP waste, salt, neutral/basic	low 4.42×10^6	Radionuclide capacity reached.
G	216-B-28	Trench south of 200-East Area	244-CR vault	4/57-6/57	Scavenged TBP waste, salt, neutral/basic	low 5.05×10^6	Radionuclide capacity reached.
G	216-B-29	Trench south of 200-East Area	244-CR vault	6/57-7/57	Scavenged TBP waste, salt, neutral/basic	low 4.84×10^6	Radionuclide capacity reached.
G	216-B-30	Trench south of 200-East Area	244-CR vault	7/57	Scavenged TBP waste, salt, neutral/basic	low 4.78×10^6	Radionuclide capacity reached.
G	216-B-31	Trench south of 200-East Area	244-CR vault	7/57-8/57	Scavenged TBP waste, salt, neutral/basic	low 4.74×10^6	Radionuclide capacity reached.
G	216-B-32	Trench south of 200-East Area	244-CR vault	8/57-9/57	Scavenged TBP waste, salt, neutral/basic	low 4.77×10^6	Radionuclide capacity reached.
G	216-B-33	Trench south of 200-East Area	244-CR vault	9/57-10/57	Scavenged TBP waste, salt, neutral/basic	low 4.74×10^6	Radionuclide capacity reached.
G	216-B-34	Trench south of 200-East Area	244-CR vault	10/57	Scavenged TBP waste, salt, neutral/basic	low 4.87×10^6	Radionuclide capacity reached.
F	216-B-35	Trench west of the 241-BX Tank Farm	221-B Building	2/54-3/54	First cycle supernatant. High salt, neutral/basic	1.06×10^6	
F	216-B-36	Trench west of the 241-BX Tank Farm	221-B Building	3/54-4/54	First cycle supernatant. High salt, neutral/basic	1.94×10^6	
F	216-B-37	Trench west of the 241-BX Tank Farm	242-B Evaporator	8/54	First cycle bottoms. High salt, neutral/basic	4.32×10^6	

TABLE A-1 (Continued)

B-PLANT CRIBS							
Group	Site Name	Type/Location	Source	Dates	Type	Amount (liters)	Comments
F	216-B-38	Trench west of the 241-BX Tank Farm	221-B Building	7/54-8/54	First cycle supernatant. High salt, neutral/basic	1.43×10^6	
F	216-B-39	Trench west of the 241-BX Tank Farm	221-B Building	12/53-11/54	First cycle supernatant. High salt, neutral/basic	1.47×10^6	
F	216-B-40	Trench west of the 241-BX Tank Farm	221-B Building	4/54-7/54	First cycle supernatant. High salt, neutral/basic	1.64×10^6	
F	216-B-41	Trench west of the 241-BX Tank Farm	221-B Building	11/54	First cycle supernatant. High salt, neutral/basic	1.44×10^6	
F	216-B-42	Trench west of the 241-BX Tank Farm	221-U Building	1/55-2/55	Scavenged TBP waste, high salt, neutral/basic	1.50×10^6	
E	216-B-43	Crib north of the 241-BY Tank Farm	221-U Building	11/54	Scavenged TBP waste, high salt, neutral/basic	2.1×10^6	Contaminated by overflow from nearby flush tank in 1955.
E	216-B-44	Crib north of the 241-BY Tank Farm	221-U Building	11/54-3/55	Scavenged TBP waste, high salt, neutral/basic	5.6×10^6	
E	216-B-45	Crib north of the 241-BY Tank Farm	221-U Building	4/55-6/55	Scavenged TBP waste, high salt, neutral/basic	4.9×10^6	
E	216-B-46	Crib north of the 241-BY Tank Farm	221-U Building	9/55-12/55	Scavenged TBP waste, high salt, neutral/basic	6.7×10^6	
E	216-B-47	Crib north of the 241-BY Tank Farm	221-U Building	9/55	Scavenged TBP waste, high salt, neutral/basic	3.7×10^6	
E	216-B-48	Crib north of the 241-BY Tank Farm	221-U Building	11/55-7/57	Scavenged TBP waste, high salt, neutral/basic	4.1×10^6	
E	216-B-49	Crib north of the 241-BY Tank Farm	221-U Building	11/55-12/57	Scavenged TBP waste, high salt, neutral/basic	6.7×10^6	
E	216-B-50	Crib north of the 241-BY Tank Farm	ITS#1 in the 241-BY Tank Farm	1/65-1/74	Waste storage tank condensate	5.9×10^7	
E	216-B-51	French drain north of the 241-B Tank Farm	221-U Building	1/56-1/58	216-BC crib pipeline flush drainage		
G	216-B-52	Trench south of 200-East Area	244-CR vault	12/57-1/58	Scavenged TBP waste, low salt, neutral/basic	8.53×10^6	Radionuclide capacity reached.
G	216-B-53A	Trench south of 200-East Area	PRTR (300 Area)	10/65-11/65	Low salt, neutral/basic	5.49×10^5	Radionuclide capacity reached.
G	216-B-53B	Trench south of 200-East Area	300 Area	11/62-3/63	Low salt, neutral/basic	1.51×10^4	
G	216-B-54	Trench south of 200-East Area	300 Area	3/63-10/65	Low salt, neutral/basic	9.99×10^5	Radionuclide capacity reached.

TABLE A-1 (Continued)

B-PLANT CRIBS							
Group	Site Name	Type/Location	Source	Dates	Type	Amount (liters)	Comments
C	216-B-55	Trench west of B-Plant	221-BB Building	9/67-9/91	Steam condensate. Low salt, neutral/basic		
C	216-B-56	Crib northeast of B-Plant	221-B Building via the 241-B-154 diversion box	Built 1965	Organic waste	0	Never used
F	216-B-57	Trench northwest of the 241-BY Tank Farm	ITS#2 in the 241-BY Tank Farm	2/68-6/73	Waste storage tank condensate	8.4x10 ⁷	
G	216-B-58	Trench south of 200-East Area	300 Area	11/65-6/67	Low salt, neutral/basic	4.13x10 ⁵	
C	216-B-59	Retention basin northeast of B-Plant	221-B Building	12/67-present	Diverted cooling water drainage and steam condensate	4.8x10 ⁵	Used once as a disposal site
B	216-B-60	Crib under 225-B Building (WESF)	221-B Building 24-in. sewer	11/67	Cell cleanout solid and liquid waste, low salt, neutral/basic		Under WESF
E	216-B-61	Crib northwest of the 241-BY Tank Farm	ITS#1 in the 241-BY Tank Farm	Built 1969	Waste storage tank condensate	0	Never used. Was to replace 216-B-50 crib.
C	216-B-62	Trench northwest of B-Plant	221-BB Building	11/73-9/91	Process condensate		Replaced 216-B-12 crib
A	216-B-63	Ditch southeast of the 241-B Tank Farm	B-Plant	3/70-2/92	Chemical sewer waste	1.4x10 ⁷	
C	216-B-64	Retention basin west of B-Plant	221-B Building	Built 1974	Steam condensate	0	Never used
A	207-B	Retention basin south of the 241-B Tank Farm	B-Plant	4/45-present			Not a disposal site

SUMMARY	
A	(216-B-3 pond via the ditches): 216-B-2-1, 2-2, 2-3, 3, 3C, 3-1, 3-2, 3-3, 63, 207-B
B	(B-Plant auxiliary buildings): 216-B-4, 6, 10A, 10B, 13, 60
C	(B-Plant to the cribs): 216-B-5, 9, 12, 55, 56, 59, 62, 64
D	(241-B Tank Farm to the cribs): 216-B-7A, 7B, 8, 11A, 11B
E	(216-BY cribs): 216-B-43 through 50, 51, 57, 61
F	(216-BX trenches): 216-B-35 through 42
G	(216-BC cribs and trenches): 216-B-14 through 34, 52, 53A, 53B, 54, 58

TABLE A-2

WASTE STREAM PREDICTIONS						
Waste Stream	Composition		To Crib	Quantity (liters) ³	Constituent	Quantity in Crib (kg) (1x2x3)
	Constituent/ Mol. Wt. ¹	Molarity ²				
Coating Removal	NaAlO ₂ 82	1.2 M	Combined with first-cycle waste			
	NaOH 40	1.0 M				
	NaNO ₃ 85	0.6 M				
	NaNO ₂ 69	0.9 M				
	Na ₂ SiO ₃ 122	0.02M				
First-Cycle Waste	NaNO ₃ 85	0.85 M	216-B-35	1.06x10 ⁶	NaAlO ₂	
	Fe ₂ (SO ₄) ₃ 400	0.07 M			Na ₂ SiO ₃	
	NaPO ₄ 118	0.75 M			NaOH	
	NH ₄ (SO ₄) 114	0.04 M			NO ₃	
	NH ₄ (SiFe) 102	0.07 M			SO ₄	
	NH ₄ NO ₃ 80	0.06 M			PO ₄	
	Pu	1%	216-B-36	1.94x10 ⁶	NaAlO ₂	
					Na ₂ SiO ₃	
					NaOH	
					NO ₃	
					SO ₄	
					PO ₄	
			216-B-37	4.32x10 ⁶	NaAlO ₂	
					Na ₂ SiO ₃	
					NaOH	
					NO ₃	
					SO ₄	
					PO ₄	
			216-B-38	1.43x10 ⁶	NaAlO ₂	
					Na ₂ SiO ₃	
					NaOH	
					NO ₃	
					SO ₄	
					PO ₄	
			216-B-39	1.47x10 ⁶	NaAlO ₂	
					Na ₂ SiO ₃	
					NaOH	
					NO ₃	
					SO ₄	
					PO ₄	

TABLE A-2 (Continued)

WASTE STREAM PREDICTIONS						
Waste Stream	Composition		To Crib	Quantity (liters) ⁵	Constituent	Quantity in Crib (kg) (1x2x3)
	Constituent/ Mol. Wt. ¹	Molarity ²				
			216-B-40	1.64x10 ⁶	NaAlO ₂	
					Na ₂ SiO ₃	
					NaOH	
					NO ₃	
					SO ₄	
					PO ₄	
			216-B-41	1.44x10 ⁶	NaAlO ₂	
					Na ₂ SiO ₃	
					NaOH	
					NO ₃	
					SO ₄	
					PO ₄	
Cell Drainage	BiPO ₄ 304	0.08 M	216-B-9	3.6x10 ⁷	Nitrate	
	KOH 56	0.45 M				
	KNO ₃ 101	0.01 M				
	NaNO ₃ 85	0.34 M				
	NaF 42	0.03 M				
	Mn(NO ₃) ₂ 179	0.02 M				
	NH ₄ NO ₃ 80	0.01 M				
	Pu	1%				
Scavenged TBP Waste	UNH 253	0.0026 M	216-B-14	8.71x10 ⁶	Ferrocyanide	
	SO ₄ 96	0.346 M			Nitrate	3.32x10 ₆
	PO ₄ 95	0.25 M			Sulfate	2.89x10 ⁵
	NO ₃ 92	6.14 M			Sodium	1.51x10 ⁶
	Cl 33.5	0.022 M			Phosphate	2.07x10 ⁵
	Na 23	7.57 M			Plutonium	
	OH 17	0.94 M	216-B-15	6.32x10 ⁶	Ferrocyanide	
					Nitrate	2.40x10 ⁶
					Sulfate	2.10x10 ⁵
					Sodium	1.10x10 ⁶
					Phosphate	1.50x10 ⁵
					Plutonium	

TABLE A-2 (Continued)

WASTE STREAM PREDICTIONS						
Waste Stream	Composition		To Crib	Quantity (liters) ³	Constituent	Quantity in Crib (kg) (1x2x3)
	Constituent/ Mol. Wt.	Molarity ²				
			216-B-16	5.60x10 ⁶	Ferrocyanide	
					Nitrate	2.13x10 ⁶
					Sulfate	1.86x10 ⁵
					Sodium	9.75x10 ⁵
					Phosphate	1.33x10 ⁵
					Plutonium	
			216-B-17	3.14x10 ⁶	Ferrocyanide	
					Nitrate	1.19x10 ⁶
					Sulfate	1.04x10 ⁵
					Sodium	5.47x10 ⁵
					Phosphate	7.46x10 ⁴
					Plutonium	
			216-B-18	8.52x10 ⁶	Ferrocyanide	
					Nitrate	3.24x10 ⁶
					Sulfate	2.83x10 ⁵
					Sodium	1.48x10 ⁶
					Phosphate	2.02x10 ⁵
					Plutonium	
			216-B-19	6.4x10 ⁶	Ferrocyanide	
					Nitrate	2.44x10 ⁶
					Sulfate	2.13x10 ⁵
					Sodium	1.11x10 ⁶
					Phosphate	1.52x10 ⁵
					Plutonium	
			216-B-20	4.68x10 ⁶	Ferrocyanide	
					Nitrate	2.64x10 ⁶
					Sulfate	1.55x10 ⁵
					Sodium	8.15x10 ⁵
					Phosphate	1.11x10 ⁵
					Plutonium	
			216-B-21	4.67x10 ⁶	Ferrocyanide	
					Nitrate	2.64x10 ⁶
					Sulfate	1.55x10 ⁵
					Sodium	8.13x10 ⁵
					Phosphate	1.11x10 ⁵
					Plutonium	
			216-B-22	4.74x10 ⁶	Ferrocyanide	
					Nitrate	2.68x10 ⁶
					Sulfate	1.57x10 ⁵
					Sodium	8.25x10 ⁵
					Phosphate	1.13x10 ⁵
					Plutonium	

TABLE A-2 (Continued)

WASTE STREAM PREDICTIONS						
Waste Stream	Composition		To Crib	Quantity (liters) ⁵	Constituent	Quantity in Crib (kg) (1x2x3)
	Constituent/ Mol. Wt.	Molarity ²				
			216-B-23	4.52x10 ⁶	Ferrocyanide	
					Nitrate	2.55x10 ⁶
					Sulfate	1.50x10 ⁵
					Sodium	7.87x10 ⁵
					Phosphate	1.07x10 ⁵
					Plutonium	
			216-B-24	4.7x10 ⁶	Ferrocyanide	
					Nitrate	2.65x10 ⁶
					Sulfate	1.56x10 ⁵
					Sodium	8.18x10 ⁵
					Phosphate	1.12x10 ⁵
					Plutonium	
			216-B-25	3.76x10 ⁶	Ferrocyanide	
					Nitrate	2.12x10 ⁶
					Sulfate	1.25x10 ⁵
					Sodium	6.55x10 ⁵
					Phosphate	8.93x10 ⁴
					Plutonium	
			216-B-26	5.88x10 ⁶	Ferrocyanide	
					Nitrate	3.32x10 ⁶
					Sulfate	1.95x10 ⁵
					Sodium	1.02x10 ⁶
					Phosphate	1.40x10 ⁵
					Plutonium	
			216-B-27	4.42x10 ⁶	Ferrocyanide	
					Nitrate	2.50x10 ⁶
					Sulfate	1.47x10 ⁵
					Sodium	7.70x10 ⁵
					Phosphate	1.05x10 ⁵
					Plutonium	
			216-B-28	5.05x10 ⁶	Ferrocyanide	
					Nitrate	2.85x10 ⁶
					Sulfate	1.68x10 ⁵
					Sodium	8.79x10 ⁵
					Phosphate	1.20x10 ⁵
					Plutonium	
			216-B-29	4.84x10 ⁶	Ferrocyanide	
					Nitrate	2.76x10 ⁶
					Sulfate	1.61x10 ⁵
					Sodium	8.43x10 ⁵
					Phosphate	1.15x10 ⁵
					Plutonium	

TABLE A-2 (Continued)

WASTE STREAM PREDICTIONS						
Waste Stream	Composition		To Crib	Quantity (liters) ³	Constituent	Quantity in Crib (kg) (1x2x3)
	Constituent/ Mol. Wt. ¹	Molarity ²				
			216-B-30	4.78x10 ⁶	Ferrocyanide	
					Nitrate	2.70x10 ⁶
					Sulfate	1.59x10 ⁵
					Sodium	8.32x10 ⁵
					Phosphate	1.14x10 ⁵
					Plutonium	
			216-B-31	4.74x10 ⁶	Ferrocyanide	
					Nitrate	2.68x10 ⁶
					Sulfate	1.57x10 ⁵
					Sodium	8.25x10 ⁵
					Phosphate	1.13x10 ⁵
					Plutonium	
			216-B-32	4.77x10 ⁶	Ferrocyanide	
					Nitrate	2.69x10 ⁶
					Sulfate	1.58x10 ⁵
					Sodium	8.31x10 ⁵
					Phosphate	1.13x10 ⁵
					Plutonium	
			216-B-33	4.74x10 ⁶	Ferrocyanide	
					Nitrate	2.68x10 ⁶
					Sulfate	1.57x10 ⁵
					Sodium	8.25x10 ⁵
					Phosphate	1.13x10 ⁵
					Plutonium	
			216-B-34	4.87x10 ⁶	Ferrocyanide	
					Nitrate	2.75x10 ⁶
					Sulfate	1.62x10 ⁵
					Sodium	8.48x10 ⁵
					Phosphate	1.16x10 ⁵
					Plutonium	
			216-B-42	1.50x10 ⁶	Ferrocyanide	
					Nitrate	8.47x10 ⁵
					Sulfate	4.98x10 ⁴
					Sodium	2.61x10 ⁵
					Phosphate	3.56x10 ⁴
					Plutonium	
			216-B-43	2.1x10 ⁶	Ferrocyanide	
					Nitrate	1.19x10 ⁶
					Sulfate	6.98x10 ⁴
					Sodium	3.66x10 ⁵
					Phosphate	4.99x10 ⁴
					Plutonium	

TABLE A-2 (Continued)

WASTE STREAM PREDICTIONS						
Waste Stream	Composition		To Crib	Quantity (liters) ³	Constituent	Quantity in Crib (kg) (1x2x3) ⁵
	Constituent/ Mol. Wt.	Molarity ²				
			216-B-44	5.6x10 ⁶	Ferrocyanide	
					Nitrate	3.16x10 ⁶
					Sulfate	1.86x10 ⁵
					Sodium	9.75x10 ⁵
					Phosphate	1.33x10 ⁵
					Plutonium	
			216-B-45	4.9x10 ⁶	Ferrocyanide	
					Nitrate	2.77x10 ⁶
					Sulfate	1.63x10 ⁵
					Sodium	8.53x10 ⁵
					Phosphate	1.16x10 ⁵
					Plutonium	
			216-B-46	6.7x10 ⁶	Ferrocyanide	
					Nitrate	3.78x10 ⁶
					Sulfate	2.22x10 ⁵
					Sodium	1.17x10 ⁶
					Phosphate	1.59x10 ⁵
					Plutonium	
			216-B-47	3.7x10 ⁶	Ferrocyanide	
					Nitrate	2.09x10 ⁶
					Sulfate	1.23x10 ⁵
					Sodium	6.44x10 ⁵
					Phosphate	8.79x10 ⁴
					Plutonium	
			216-B-48	4.1x10 ⁶	Ferrocyanide	
					Nitrate	2.32x10 ⁶
					Sulfate	1.36x10 ⁵
					Sodium	7.14x10 ⁵
					Phosphate	9.74x10 ⁴
					Plutonium	
			216-B-49	6.7x10 ⁶	Ferrocyanide	
					Nitrate	3.79x10 ⁶
					Sulfate	2.23x10 ⁵
					Sodium	1.17x10 ⁶
					Phosphate	1.59x10 ⁵
					Plutonium	
242-B Evaporator Condensate			216-B-11A and 216-B-11B	2.96x10 ⁷	Plutonium	

TABLE A-2 (Continued)

WASTE STREAM PREDICTIONS						
Waste Stream	Composition		To Crib	Quantity (liters)	Constituent	Quantity in Crib (kg) (1x2x3)
	Constituent/ Mol. Wt.	Molarity ²				
Plutonium Concentrator Waste (224-B)			216-B-5		Aluminum Nitrate	
Cell Drainage	BiPO ₄ 304	0.08 M			Fluoride	
	KOH 56	0.45 M			Potassium	
	KNO ₃ 101	0.01 M			Sodium	
	NaNO ₃ 85	0.34 M			Nitrate	
	NaF 42	0.03 M			Oxalate	
	Mn(NO ₃) ₂ 179	0.02 M			Phosphate	
	NH ₄ NO ₃ 80	0.01 M			Sulfate	
	Pu	1%			Plutonium	
Plutonium Concentrator Waste (224-B)	As above		216-B-7A and 216-B-7B		Fluoride	
Cell Drainage	BiPO ₄ 304	0.08 M			Potassium	
	KOH 56	0.45 M			Sodium	
	KNO ₃ 101	0.01 M			Ammonium Nitrate	
	NaNO ₃ 85	0.34 M			Nitrate	
	NaF 42	0.03 M			Oxalate	
	Mn(NO ₃) ₂ 179	0.02 M			Phosphate	
	NH ₄ NO ₃ 80	0.01 M			Sulfate	
	Pu	1%			Plutonium	
221-B Construction						
Second-Cycle Waste			216-B-8		Fluoride	
Cell Drainage	BiPO ₄ 304	0.08 M			Sulfuric Acid	
	KOH 56	0.45 M			Potassium	
	KNO ₃ 101	0.01 M			Sodium	
	NaNO ₃ 85	0.34 M			Ammonium Nitrate	
	NaF 42	0.03 M			Nitrate	
	Mn(NO ₃) ₂ 179	0.02 M			Oxalate	
	NH ₄ NO ₃ 80	0.01 M			Phosphate	

TABLE A-2 (Continued)

WASTE STREAM PREDICTIONS						
Waste Stream	Composition		To Crib	Quantity (liters)	Constituent	Quantity in Crib (kg) (1x2x3)
	Constituent/ Mol. Wt.	Molarity ²				
	Pu	1%			Sulfate	
224-B Shutdown Decontamination Waste					Plutonium	
291-B Stack Drainage			216-B-4		Nitric Acid	
292-B Floor Drainage						
222-B Laboratory Waste			216-B-10A		Nitric Acid	
292-B Floor Drainage	As above				Sodium Dichromate	
					Nitrate	
					Sulfate	
					Plutonium	
222-B Laboratory Waste	As above		216-B-10B		Nitric Acid	
292-B Floor Drainage	As above					
221-BC Sink Waste						
References for Waste Stream Composition:						
Coating Removal: Anderson (1990)						
First-Cycle: Anderson (1990)						
Cell Drainage: Anderson (1990)						
Scavenged TBP: Anderson (1990)						

TABLE A-3

Note: No quantities smaller than 1 gram or 0.5 Curie are recorded.

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
A	216-B-2-2	Sr-90	147 Ci		
A	216-B-2-3	Sr-90	432 Ci		
A	216-B-3	Am-241	3.96 Ci		
		Cs-137	93.5 Ci		
		H-3	790 Ci		
		Pm-147	0.818 Ci		
		Ru-106	1.42 Ci		
		Sr-90	101 Ci		
		Uranium	2.1 Ci		
		Plutonium	250 g		
B	216-B-4	Nitric Acid	1000 kg		
C	216-B-5	Aluminum Nitrate	5000 kg		
		Potassium	80,000 kg		
		Nitrate	400,000 kg		
		Phosphate	29,000 kg		
		Fluoride	50,000 kg		
		Sodium	350,000 kg		
		Oxalate	12,000 kg		
		Sulfate	3300 kg		
		Plutonium	4.27 kg		
		Cs-137	29.2 Ci		
B	216-B-6	Sr-90	25.5 Ci		
		Sulfuric Acid	10,000 kg		
		Sodium Dichromate	100 kg		
D	216-B-7A and 216-B-78	Nitric Acid	10,000 kg		
		Fluoride	240,000 kg		
		Sodium	1,600,000 kg		
		Nitrate	1,800,000 kg		
		Phosphate	130,000 kg		
		Potassium	400,000 kg		
		Ammonium Nitrate	22,000 kg		
		Oxalate	600,000 kg		
		Sulfate	150,000 kg		
		Cs-137	43.2 Ci		
		Sr-90	2200 Ci		
		Plutonium	4300 g		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
D	216-B-8	Fluoride	25,000 kg		
		Potassium	40,000 kg		
		Ammonium Nitrate	160,000kg		
		Oxalate	6000 kg		
		Sulfate	70,000 kg		
		Sulfuric Acid	1,400,000 kg		
		Sodium	90,000 kg		
		Nitrate	1,400,000 kg		
		Phosphate	900,000 kg		
		Cs-137	19.8 Ci		
		Sr-90	5.58 Ci		
		Plutonium	3 g		
C	216-B-9	Nitrate	1000 kg		
		Cs-137	3.92 Ci		
		Sr-90	5.52Ci		
		Plutonium	174 g		
B	216-B-10A	Nitric Acid	1000 kg		
		Nitrate	1000 kg		
		Sodium Dichromate	100 kg		
		Sulfate	1000 kg		
		Cs-137	0.401 Ci		
		Sr-90	1.89 Ci		
		Plutonium	9.8 g		
B	216-B-10B	Nitric Acid	2 kg		
D	216-B-11A and 216-B-11B	Cs-137	21.3 Ci		
		Sr-90	2.01 Ci		
		Plutonium	4 g		
C	216-B-12	Ammonium Nitrate	1,800,000 kg		
		Cs-137	716 Ci		
		Sr-90	7.93 Ci		
		Plutonium	374 g		
		Uranium	6.96 Ci		
B	216-B-13	Nitrate	2000 kg		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
G	216-B-14	Ferrocyanide	5000 kg		
		Nitrate	1,500,000 kg	3,320,000 kg	
		Sulfate	50,000 kg	289,000 kg	
		Sodium	600,000 kg	1,510,000 kg	
		Phosphate	40,000 kg	207,000 kg	
		Cs-137	114 Ci		
		Sr-90	1720 Ci		
G	216-B-15	Plutonium	25 g		
		Ferrocyanide	3300 kg		
		Nitrate	900,000 kg	2,400,000 kg	
		Sulfate	60,000 kg	210,000 kg	
		Sodium	400,000 kg	1,100,000 kg	
		Phosphate	50,000 kg	150,000 kg	
		Cs-137	92.4 Ci		
G	216-B-16	Sr-90	87.3 Ci		
		Plutonium	5 g		
		Ferrocyanide	3000 kg		
		Nitrate	1,100,000 kg	2,130,000 kg	
		Sulfate	110,000 kg	186,000 kg	
		Sodium	500,000 kg	975,000 kg	
		Phosphate	70,000 kg	133,000 kg	
G	216-B-17	Cs-137	296 Ci		
		Sr-90	302 Ci		
		Plutonium	10 g		
		Ferrocyanide	1800 kg		
		Nitrate	1,100,000 kg	1,190,000 kg	
		Sulfate	90,000 kg	104,000 kg	
		Sodium	500,000 kg	547,000 kg	
G	216-B-17	Phosphate	60,000 kg	74,600 kg	
		Cs-137	100 Ci		
		Sr-90	68.9 Ci		
		Plutonium	10 g		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
G	216-B-18	Ferrocyanide	5000 kg		
		Nitrate	1,000,000 kg	3,240,000 kg	
		Sulfate	70,000 kg	283,000 kg	
		Sodium	400,000 kg	1,480,000 kg	
		Phosphate	50,000 kg	202,000 kg	
		Cs-137	114 Ci		
		Sr-90	81.8 Ci		
G	216-B-19	Plutonium	10 g		
		Ferrocyanide	3400 kg		
		Nitrate	1,500,000 kg	2,440,000 kg	
		Sulfate	90,000 kg	213,000 kg	
		Sodium	700,000 kg	1,110,000 kg	
		Phosphate	100,000 kg	152,000 kg	
		Cs-137	126 Ci		
G	216-B-20	Sr-90	88.3 Ci		
		Plutonium	10 g		
		Ferrocyanide	2500 kg		
		Nitrate	1,100,000 kg	2,640,000 kg	
		Sulfate	100,000 kg	155,000 kg	
		Sodium	500,000 kg	815,000 kg	
		Phosphate	80,000 kg	111,000 kg	
G	216-B-21	Cs-137	684 Ci		
		Sr-90	340 Ci		
		Plutonium	1.3 g		
		Ferrocyanide	2500 kg		
		Nitrate	700,000 kg	2,640,000 kg	
		Sulfate	60,000 kg	155,000 kg	
		Sodium	310,000 kg	813,000 kg	
		Phosphate	40,000 kg	111,000 kg	
		Cs-137	169 Ci		
		Sr-90	318 Ci		
		Plutonium	10.3 g		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
G	216-B-22	Ferrocyanide	2500 kg		
		Nitrate	900,000 kg	2,680,000 kg	
		Sulfate	80,000 kg	157,000 kg	
		Sodium	400,000 kg	825,000 kg	
		Phosphate	40,000 kg	113,000 kg	
		Cs-137	20.5 Ci		
		Sr-90	176 Ci		
		Plutonium	26 g		
G	216-B-23	Ferrocyanide	2400 kg		
		Nitrate	1,000,000 kg	2,550,000 kg	
		Sulfate	60,000 kg	150,000 kg	
		Sodium	400,000 kg	787,000 kg	
		Phosphate	60,000 kg	107,000 kg	
		Cs-137	50.9 Ci		
		Sr-90	62.5 Ci		
		Plutonium	1.8 g		
G	216-B-24	Ferrocyanide	2500 kg		
		Nitrate	600,000 kg	2,650,000 kg	
		Sulfate	50,000 kg	156,000 kg	
		Sodium	280,000 kg	818,000 kg	
		Phosphate	34,000 kg	112,000 kg	
		Cs-137	58.6 Ci		
		Sr-90	78 Ci		
		Plutonium	7.7 g		
G	215-B-25	Ferrocyanide	2000 kg		
		Nitrate	500,000 kg	2,120,000 kg	
		Sulfate	40,000 kg	125,000 kg	
		Sodium	220,000 kg	655,000 kg	
		Phosphate	27,000 kg	89,300 kg	
		Cs-137	25.5 Ci		
		Sr-90	88.3 Ci		
		Plutonium	2 g		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
G	216-B-26	Ferrocyanide	3100 kg		
		Nitrate	800,000 kg	3,320,000 kg	
		Sulfate	60,000 kg	195,000 kg	
		Sodium	350,000 kg	1,020,000 kg	
		Phosphate	40,000 kg	140,000 kg	
		Cs-137	438 Ci		
		Sr-90	475 Ci		
G	216-B-27	Plutonium	2.5 g		
		Ferrocyanide	2300 kg		
		Nitrate	600,000 kg	2,500,000 kg	
		Sulfate	50,000 kg	147,000 kg	
		Sodium	260,000 kg	770,000 kg	
		Phosphate	32,000 kg	105,000 kg	
		Cs-137	15.8 Ci		
G	216-B-28	Sr-90	263 Ci		
		Ferrocyanide	2700 kg		
		Nitrate	1,000,000 kg	2,850,000 kg	
		Sulfate	80,000 kg	168,000 kg	
		Sodium	400,000 kg	879,000 kg	
		Phosphate	50,000 kg	120,000 kg	
		Cs-137	10.7 Ci		
G	216-B-29	Sr-90	49.5 Ci		
		Plutonium	5.6 g		
		Ferrocyanide	2600 kg		
		Nitrate	700,000 kg	2,760,000 kg	
		Sulfate	50,000 kg	161,000 kg	
		Sodium	280,000 kg	843,000 kg	
		Phosphate	35,000 kg	115,000 kg	
G	216-B-30	Cs-137	27.4 Ci		
		Sr-90	84.8 Ci		
		Plutonium	1.2 g		
		Ferrocyanide	2500 kg		
		Nitrate	1,100,000 kg	2,700,000 kg	
		Sulfate	110,000 kg	159,000 kg	
		Sodium	500,000 kg	832,000 kg	
G	216-B-30	Phosphate	70,000	114,000 kg	
		Cs-137	1570 Ci		
		Sr-90	265 Ci		
		Plutonium	2.1 g		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
G	216-B-31	Ferrocyanide	2500 kg		
		Nitrate	1,100,000 kg	2,68,000 kg	
		Sulfate	90,000 kg	157,000 kg	
		Sodium	500,000 kg	825,000 kg	
		Phosphate	60,000 kg	113,000 kg	
		Cs-137	13 Ci		
		Sr-90	92.3 Ci		
		Plutonium	5.2 g		
G	216-B-32	Ferrocyanide	2500 kg		
		Nitrate	1,000,000 kg	2,690,000 kg	
		Sulfate	90,000 kg	158,000 kg	
		Sodium	500,000 kg	831,000 kg	
		Phosphate	60,000 kg	113,000 kg	
		Cs-137	58.6 Ci		
		Sr-90	113 Ci		
		Plutonium	2.6 g		
G	216-B-33	Ferrocyanide	2500 kg		
		Nitrate	1,700,000 kg	2,680,000 kg	
		Sulfate	110,000 kg	157,000 kg	
		Sodium	700,000 kg	825,000 kg	
		Phosphate	100,000 kg	113,000 kg	
		Cs-137	127 Ci		
		Sr-90	18.1 Ci		
		Plutonium	11.8 g		
G	216-B-34	Ferrocyanide	2600 kg		
		Nitrate	1,900,000 kg	2,750,000 kg	
		Sulfate	90,000 kg	162,000 kg	
		Sodium	800,000 kg	848,000 kg	
		Phosphate	80,000 kg	116,000 kg	
		Cs-137	7.91 Ci		
		Sr-90	18.1 Ci		
		Plutonium	5.7 g		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
F	216-B-35	Fluoride	2600 kg		
		Sodium Aluminate	10,000 kg		
		Sodium Silicate	5500 kg		
		Nitrate	90,000 kg		
		Sulfate	4000 kg		
		Sodium	60,000 kg		
		Sodium Hydroxide	20,000 kg		
		Nitrite	10,000 kg		
		Phosphate	20,000 kg		
		Cs-137	185 Ci		
		Sr-90	96.4 Ci		
		Plutonium	1.2 g		
F	216-B-36	Fluoride	5000 kg		
		Sodium Aluminate	24,000 kg		
		Sodium Silicate	10,000 kg		
		Nitrate	160,000 kg		
		Sulfate	8000 kg		
		Sodium	120,000 kg		
		Sodium Hydroxide	3800 kg		
		Nitrite	18,000 kg		
		Phosphate	40,000 kg		
		Cs-137	336 Ci		
		Sr-90	199 Ci		
		Plutonium	2 g		
F	216-B-37	Fluoride	50,000 kg		
		Sodium Aluminate	250,000 kg		
		Sodium Silicate	100,000 kg		
		Nitrate	170,000 kg		
		Sulfate	90,000 kg		
		Sodium	1,300,000 kg		
		Sodium Hydroxide	38,000 kg		
		Nitrite	200,000 kg		
		Phosphate	400,000 kg		
		Cs-137	1350 Ci		
		Sr-90	6.56 Ci		
		Plutonium	2 g		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
F	216-B-38	Fluoride	4000 kg		
		Sodium Aluminate	18,000 kg		
		Sodium Silicate	8000 kg		
		Nitrate	120,000 kg		
		Sulfate	6000 kg		
		Sodium	90,000 kg		
		Sodium Hydroxide	2800 kg		
		Nitrite	13,000 kg		
		Phosphate	27,000 kg		
		Cs-137	221 Ci		
		Sr-90	759 Ci		
		Plutonium	1.2 g		
F	216-B-39	Fluoride	4000 kg		
		Sodium Aluminate	18,000 kg		
		Sodium Silicate	8000 kg		
		Nitrate	120,000 kg		
		Sulfate	6000 kg		
		Sodium	90,000 kg		
		Sodium Hydroxide	2800 kg		
		Nitrite	14,000 kg		
		Phosphate	29,000 kg		
		Cs-137	192 Ci		
		Sr-90	9.27 Ci		
		Plutonium	1.5 g		
F	216-B-40	Fluoride	4000 kg		
		Sodium Aluminate	20,000 kg		
		Sodium Silicate	8000 kg		
		Nitrate	130,000 kg		
		Sulfate	7000 kg		
		Sodium	100,000 kg		
		Sodium Hydroxide	3300 kg		
		Nitrite	15,000 kg		
		Phosphate	31,000 kg		
		Cs-137	153 Ci		
		Sr-90	115 Ci		
		Plutonium	1 g		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
F	216-B-41	Fluoride	4000 kg		
		Sodium Aluminate	18,000 kg		
		Sodium Silicate	8000 kg		
		Nitrate	120,000 kg		
		Sulfate	6000 kg		
		Sodium	90,000 kg		
		Sodium Hydroxide	2800 kg		
		Nitrite	13,000 kg		
		Phosphate	27,000 kg		
		Cs-137	386 Ci		
		Sr-90	19.3 Ci		
F	216-B-42	Ferrocyanide	800 kg		
		Nitrate	210,000 kg	847,000 kg	
		Sulfate	15,000 kg	49,800 kg	
		Sodium	90,000 kg	261,000 kg	
		Phosphate	11,000 kg	35,600 kg	
		Cs-137	42.7 Ci		
		Sr-90	463 Ci		
E	216-B-43	Plutonium	10 g		
		Ferrocyanide	1100 kg		
		Nitrate	400,000 kg	1,190,000 kg	
		Sulfate	29,000 kg	69,800 kg	
		Sodium	170,000 kg	366,000 kg	
		Phosphate	21,000 kg	49,900 kg	
		Cs-137	130 Ci		
E	216-B-44	Sr-90	574 Ci		
		Ferrocyanide	3000 kg		
		Nitrate	800,000 kg	3,160,000 kg	
		Sulfate	800,000 kg	186,000 kg	
		Sodium	330,000 kg	975,000 kg	
		Phosphate	40,000 kg	133,000 kg	
		Cs-137	309 Ci		
		Sr-90	1200 Ci		
		Plutonium	15 g		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
E	216-B-45	Ferrocyanide	2600 kg		
		Nitrate	90,000 kg	2,770,000 kg	
		Sulfate	60,000 kg	163,000 kg	
		Sodium	340,000 kg	853,000 kg	
		Phosphate	41,000 kg	116,000 kg	
		Cs-137	666 Ci		
		Sr-90	1180 Ci		
E	216-B-46	Plutonium	10 g		
		Ferrocyanide	4000 kg		
		Nitrate	1,200,000 kg	3,780,000 kg	
		Sulfate	100,000 kg	222,000 kg	
		Sodium	500,000 kg	1,170,000 kg	
		Phosphate	70,000 kg	159,000 kg	
		Cs-137	88.9 Ci		
E	216-B-47	Sr-90	631 Ci		
		Plutonium	20 g		
		Ferrocyanide	2000 kg		
		Nitrate	700,000 kg	2,090,000 kg	
		Sulfate	60,000 kg	123,000 kg	
		Sodium	310,000 kg	644,000 kg	
		Phosphate	40,000 kg	87,900 kg	
E	216-B-48	Cs-137	66.6 Ci		
		Sr-90	261 Ci		
		Plutonium	5 g		
		Ferrocyanide	2200 kg		
		Nitrate	1,000,000 kg	2,320,000 kg	
		Sulfate	80,000 kg	136,000 kg	
		Sodium	400,000 kg	714,000 kg	
E	216-B-48	Phosphate	60,000 kg	97,400 kg	
		Cs-137	200 Ci		
		Sr-90	547 Ci		
		Plutonium	5 g		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
E	216-B-49	Ferrocyanide	4000 kg		
		Nitrate	150,000 kg	3,790,000 kg	
		Sulfate	80,000 kg	223,000 kg	
		Sodium	600,000 kg	1,170,000 kg	
		Phosphate	60,000 kg	159,000 kg	
		Cs-137	182 Ci		
		Sr-90	1140 Ci		
E	216-B-50	Plutonium	15 g		
		Sodium	500 kg		
		Ammonium Nitrate	10,000 kg		
		Ammonium Carbonate	9100 kg		
		Nitrate	1500 kg		
		Cs-137	51.2 Ci		
E	216-B-51	Sr-90	3.39 Ci		
		Sodium	808 kg		
		Phosphate	8 kg		
		Nitrate	19 kg		
G	216-B-52	Sulfate	11 kg		
		Ferrocyanide	5000 kg		
		Sodium Oxalate	1000 kg		
		Phosphate	80,000 kg		
		Sodium	860,000 kg		
		Nitrate	2,100,000 kg		
		Sulfate	80,000 kg		
		Cs-137	160 kg		
		Sr-90	4.92 Ci		
G	216-B-53A	Plutonium	100g		
G	216-B-53B	Plutonium	19 g		
		Cs-137	3.7 Ci		
		Sr-90	5.06 Ci		
G	216-B-54	Plutonium	5 g		
C	216-B-55	Plutonium	5 g		
		Cs-137	13.7 Ci		
		Tritium	2.68 Ci		
F	216-B-57	Sr-90	7.23 Ci		
		Cs-137	226 Ci		
		Sr-90	1.83 Ci		

TABLE A-3 (Continued)

B-PLANT CRIBS CHEMICAL INVENTORY					
Group	Crib	Chemical	Quantity (WIDS)	Quantity (predicted)	Quantity (sampling)
G	216-B-58	Cs-137	4.4 Ci		
		Sr-90	5.55 Ci		
		Plutonium	6.7 g		
B	216-B-60	Cs-137	4.68 Ci		
C	216-B-62	Cs-137	135 Ci		
		Tritium	14.7 Ci		
		Sr-90	74.6 Ci		
A	216-B-63	Cs-137	0.625 Ci		
		Sr-90	2.41 Ci		

APPENDIX B

Figures

- Figure 1 Waste Discharged to 216-B-3 Pond Via Ditches
- Figure 2 Waste Discharged from B-Plant Auxiliary Buildings to Cribs
- Figure 3 Waste Discharged from B-Plant to Cribs
- Figure 4 Waste Discharged from 241-B Tank Farm to Cribs
- Figure 5 Waste Discharged from Tank Farms to Cribs and Trenches

FIGURE 2. WASTE DISCHARGED FROM B PLANT AUXILIARY BLDGS TO CRIBS

FIGURE 3. WASTE DISCHARGED FROM B PLANT TO CRIBS

FIGURE 5. WASTE DISCHARGED FROM TANK FARMS TO CRIBS & TRENCHES

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	C. H. Brevick S3-10	Date May 23, 1996
Project Title/Work Order		EDT No. 612793
Liquid Radioactive Waste Discharges from B-Plant to Cribs/ER44205		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
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Westinghouse Hanford Company

T. M. Brown	R2-12	X			
J. W. Cammann	R2-12	X			
M. L. Dexter	R1-51	X			
D. B. Engelman	L6-37	X			
M. S. Gerber	N1-40	X			
J. W. Hunt	R2-12	X			
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B. C. Simpson	R2-12	X			
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