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7. Abstract

This document presents the Plutonium Finishing Plant's wastewater sampling and analysis plan. The plan describes sampling methods, location, frequency, analytes, and stream sources. A description of the facility is also included.

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PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

A. SAMPLING OBJECTIVES

This plan provides information on how sampling and analysis of the Plutonium Finishing Plant (PFP) wastewater will be performed to accomplish the following:

1. Confirm that the waste stream characteristics do not change over time or during different facility operational configurations.

2. Support process design of wastewater treatment projects, as necessary.

3. Support preparation of the Treated Effluent Disposal Facility (TEDF) 240 Engineering Report, as necessary.

4. Routinely monitor the stream for flowrate, radionuclides and pH to ensure that internal limits are met.

5. Confirm the waste designation as identified in the PFP Wastewater Stream Specific Report (WHC-EP-0342, Addendum 8), per WAC 173-303-300.

Quality Assurance objectives for the sampling activities are described in the Liquid Effluent Sampling Quality Assurance Project Plan (WHC-SD-WM-QAPP-011).

Recharacterization of the stream will be done after additional flow reductions have been accomplished (January, 1994). All changes to the Sampling and Analysis Plan shall be considered Class III changes per the Hanford Tri-Party Agreement.

B. SITE BACKGROUND

B.1 PFP Facility Description

The Plutonium Finishing Plant is located in the 200 West area at Hanford. The PFP contains two major processing areas, the Plutonium Reclamation Facility (PRF) and the Remote Mechanical C Line (RMC). The objective of PFP operations is to stabilize nuclear reactive materials. The PRF is operated to reclaim plutonium from scrap solutions and solids. The scrap is treated in various ways to produce soluble and/or leachable forms of plutonium for recovery as plutonium nitrate. Plutonium (Pu) nitrate is received as feed and converted to plutonium oxide in the RMC Line.

The PFP consists of six major operations buildings, two major process chemical storage areas, two buildings in inactive status and a number of miscellaneous storage areas and workshops.

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

The major operations buildings are 234-5Z, 236-Z, 241-Z, 291-Z, 2736-Z, and 2736-ZB. The 234-5Z Building houses the active RMC Line and inactive Remote Mechanical A Line (RMA), Engineering and Development Laboratories, special nuclear material storage and handling facilities, various workshops, store rooms, offices, and locker rooms. The 236-Z Building contains the PRF. Building 241-Z receives and acts as intermediate storage for liquid mixed wastes from RMC and PRF production processes. Equipment is housed in the 291-Z Building to handle the ventilation exhaust from the 234-5Z, 236-Z, and 242-Z Buildings. Product handling operations are conducted in the 2736-ZB Building. Vaults for Pu material storage are in the 2736-Z Building. Buildings that are in inactive status are the 232-Z Incinerator Building and 242-Z Waste Treatment Facility.

B.2 Stream Description

The PFP wastewater stream consists of potentially contaminated non-contact process cooling water from PRF and RMC, miscellaneous wastewater from laboratory activities, steam condensate, air conditioning condensate, and storm sewer runoff from south of the main PFP complex. This wastewater is discharged to the 216-Z-20 Crib.

Past sampling, analysis, and process knowledge have indicated this stream is non-hazardous. The stream has previously been designated non-hazardous by comparing sample data to the dangerous waste criteria (WAC 173-303-100) and dangerous waste characteristics (WAC 173-303-090). Detailed documentation is provided in the PFP Wastewater Stream Specific Report (WHC-EP-0342, Addendum 8). WasteWaters which are known to be contaminated or to contain mixed wastes are collected in the 241-Z Tanks and sent to the Tank Farms.

The wastewater contains cooling waters from PRF and RMC only when those processes are operating. These cooling waters will constitute approximately 25 percent of the total wastewater flow rate. PRF and RMC operations are conducted on a 5-day per week, 24-hour per day schedule. Cooling water systems are only operated while the particular process vessels they are cooling are operated. The quality of the wastewater generated when PRF and RMC are operating is not expected to vary from non-operational conditions.

The bulk of the wastewater comes from Heating, Ventilation, and Air Conditioning (HVAC) activities. The PFP HVAC system is operated continuously to provide contamination control by isolating known and potentially contaminated areas in the plant. This wastewater does not contact process solutions and has a very low potential for contamination. Additional wastewater is generated from seal/cooling waters from process vacuum systems and the continuous air monitoring system vacuum pumps. Storm water runoff contributes to the wastewater during precipitation events.

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

The Appendix to this plan provides additional details on each wastewater contributor. Figure 1 is a diagram which shows these wastewater contributors.

B.3 216-Z-20 CRIB DESCRIPTION

The 216-Z-20 Crib was constructed in September 1981 and commissioned for use in October 1981. The 216-Z-20 Crib is approximately 1,500 feet long and approximately 10 feet wide in cross section at the bottom. Gravel was used to backfill the crib excavation to a depth of approximately 2.5 feet. Perforated pipes, connected to the building effluent headers were embedded in the gravel backfill to distribute effluents throughout the crib. A vapor barrier was placed above the gravel backfill. Soil was placed over the top to bring the area back to the surrounding grade.

Four groundwater monitoring wells are located adjacent to the crib, and are monitored quarterly. In addition, a new vadose zone well was recently installed adjacent to the crib. Liquid level in the crib is measured on a weekly basis through risers installed every 500 feet along the length of the crib.

C. RESPONSIBILITIES

PFP Environmental Compliance personnel have prepared this Sampling and Analysis Plan and will prepare work plans for each sampling event. In addition, Environmental Compliance personnel will provide additional technical support to the sampling activities as necessary. The Cognizant Engineer for Effluents and Regulatory Compliance will be the Sampling Task Leader.

Office of Sample Management (OSM) personnel have arranged for the offsite laboratory to do the analysis. They have also assisted in preparing this plan by obtaining sample volume and preservative requirements and providing other information. Validation of laboratory data may be done by OSM in accordance with section 2 of WHC-CM-5-3 or by another qualified organization.

Protocol sampling (non-routine sampling which is to meet the quality assurance criteria of SW-846) will be performed by PFP Facilities Operations operators in accordance with written workplans. The sampling activities will be monitored and verified by cognizant PFP Quality Assurance personnel who have received training in environmental sampling requirements. Alternatively, protocol sampling may be performed by WHC Sampling And Mobile Laboratory personnel. Personnel in the WHC Sampling And Mobile Laboratory are fully qualified CERCLA and RCRA samplers, and will not require observation by a QA representative. WHC Sampling And Mobile Laboratory personnel take responsibility for the samples they have drawn being sent to the laboratory where they are to be analyzed.

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

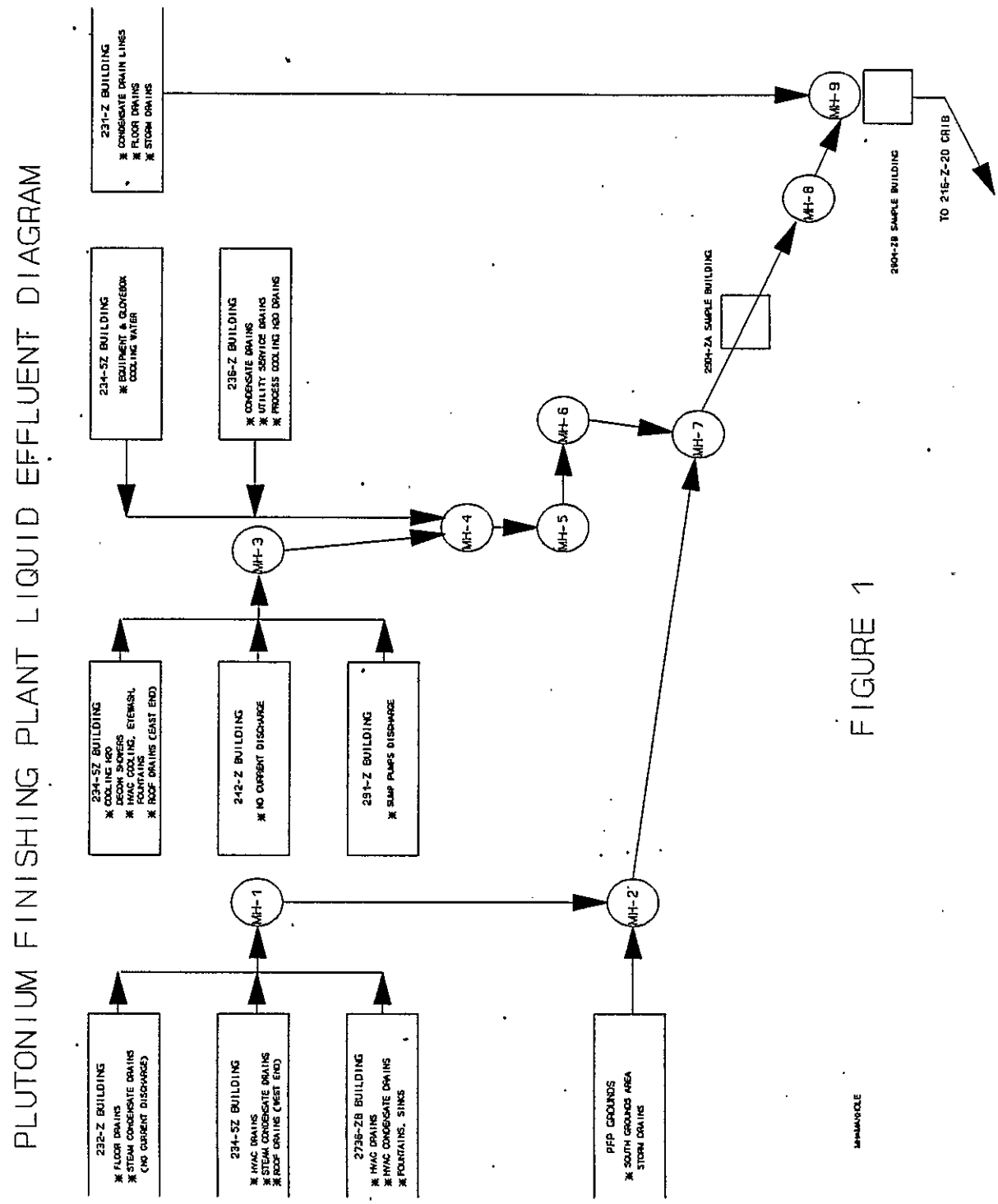

FIGURE 1

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

PFP Facilities Operations personnel will deliver the radionuclide screening samples, taken at each sampling event to classify the total activity of the samples for shipping purposes, to the 222-S Laboratory after PFP Occupational Health Physics technicians survey and release the sample containers. Field Shipping Support personnel will check that the protocol samples are packaged correctly and will prepare papers to ship the samples to the analytical laboratory after total activity screening has been completed by 222-S Laboratory personnel, if the samples are radioactive. If the samples are nonradioactive, the personnel who sampled will complete the shipping papers. WHC Transportation will deliver the samples to WHC Shipping for transport to the offsite laboratory for analysis. Handling and shipping of the samples will meet the requirements of Environmental Investigation Instruction 5.11.

PFP Facilities Operations personnel support routine monitoring of pH, flow data and total alpha activity. PFP Facilities Operations personnel collect samples from the Manning flow proportional sampler each 8 hour shift. The Facilities Operations personnel deliver it to the 222-S Laboratory after PFP Occupational Health Physics technicians survey and release the sample containers. Written procedures are used for these activities.

222-S laboratory personnel then analyze the shift monitor samples for total alpha activity and draw an aliquot from each sample which is composited for a monthly sample. These monthly samples are analyzed for specific radionuclides of interest.

D. SAMPLING LOCATION AND FREQUENCY

D.1 SAMPLING LOCATION

Routine monitoring is performed in the 2904-ZA and 2904-ZB Sample Buildings. Grab samples are taken at Manhole Number Four during periods of operation of the Plutonium Reclamation Facility. The 2904-ZA sample building is located approximately 250 yards downstream of PFP at Manhole 7. This location was selected to monitor all PFP complex effluent and give early warning of potential problems. The 2904-ZB sample building is located at Manhole 9, approximately 65 yards downstream of the 2904-ZA facility. This is the last manhole before the wastewater enters the crib and includes the stream from 231-Z. Manhole Number Four is located approximately 20 yards south of the 234-5Z Building and 10 yards west of the 236-Z Building. Manhole Number Four is the first manhole downstream of the Plutonium Reclamation Facility and was selected because it is the site that will provide the earliest warning of potential problems.

Protocol samples will be taken at Manhole Number 9. Figure 1 shows this manhole and the stream sources. This location was selected to ensure that the sample includes all effluent contributors to the discharge to the 216-Z-20

crib. Wastewater flow is very turbulent in this manhole, and this will ensure that the stream is well mixed and the sample is representative of the entire stream. This manhole is the most downstream position where a sample may be taken and accurately represents the wastewater quality as it is discharged to the crib.

An analysis of the wastewater contributors was performed and is described in the appendix to this sampling and analysis Plan. This was done to document that no sources of hazardous chemicals are discharged into the wastewater. Sampling at manhole number 9 is appropriate to fulfill the objectives of this plan.

D.2 FREQUENCY

Protocol samples will be taken at least annually. In addition, four samples will be taken during the operation of PRF, and four samples will be taken during the operations of the RMC. The samples will be collected at random during the campaigns to obtain data representative of process operational conditions (see Section B.2).

Protocol sampling will be initiated within 3 months after approval of this plan.

Field duplicate samples, field blanks, trip blanks, and equipment blanks will be taken during each sampling event. Field duplicate samples as defined in the Liquid Effluent Sampling Quality Assurance Project Plan (WHC-EP-0449) are samples taken at approximately the same time under identical conditions and preparation to verify the repeatability of laboratory data. A sample of the PFP sanitary water supply also will be taken during each sampling event and analyzed for the full set of analytes listed in section G.2. The duplicate samples and the blanks will be used to validate the laboratory data per section 2 of WHC-CM-5-3.

Monitoring of total alpha activity, flowrate and pH of the wastewater is done on a continuous basis. The 2904-ZA Manning sampler draws a sample approximately every 7 minutes, which is deposited in a 5 gallon carboy and collected each 8-hour shift for total alpha activity analysis. An aliquot of each 8-hour shift sample is collected for a monthly composite sample. A new Manning sampler being installed in 2904-ZB will be set to sample approximately every 3-5 minutes. During PRF periods of operation, a grab sample is taken at Manhole Number Four each 8-hour shift and sent to the 222-S Laboratory for Total Alpha activity.

E. SAMPLE DESIGNATION

A unique sample number shall be provided for each sample. Currently, the 8-hour monitoring samples drawn by PFP Facilities Operations are labeled with a Sample Analysis Request form which has a four digit number assigned

sequentially by PFP Facilities Operations personnel for each sample, and a four digit number preceded by a S assigned by 222-S personnel. The label also shows the date and time of sampling, and the sample location. The Hanford Environmental Information System (HEIS), a computer generated random number system will be used for protocol samples and may be used for the monitoring samples in the future.

If samples are drawn by the WHC Sampling And Mobile Laboratory personnel, they will be assigned a unique sample number by the sampling personnel. The general numbering method may be by using the HEIS system, or as follows:

Z - 000000 - 00000 A
(date) (seq. #) (bottle letter)

date = last two digits of month, day, and year.
(Date is optional in abbreviation of reports and labels.)
sequence number = laboratory log book number control number.
bottle letter = sequential lettering of multiple numbers
(Bottle letter is optional for single bottle samples.)

F. SAMPLING EQUIPMENT AND PROCEDURES

F.1. ROUTINE MONITORING

Routine monitoring of discharges to the 216-Z-20 Crib performed in the 2904-ZA and 2904-ZB Sample Buildings for pH, total alpha activity and flow rate provides continuous, real-time data on the wastewater flowrate and total alpha activity.

The pH of the wastewater is measured continuously by a Leeds and Northrup meter in the 2904-ZB building. This monitoring is performed to ensure that the wastewater is discharged within the limits imposed by internal Westinghouse Hanford Company guidelines and requirements and Department of Energy Orders. The pH monitor is capable of monitoring a pH level from 1 to 14 and alarms if the pH level goes below 6 or above 9. Calibration of the pH monitor is on a quarterly basis.

Continuous gross alpha activity is monitored by an On-Line Alpha Monitor (OLAM) at the 2904-ZA building. The sample collected from the Manning Sampler in The 2904-ZA Building is analyzed each 8-hour shift for total alpha activity and an aliquot of this sample is also composited for a monthly sample which is analyzed for specific isotopes of concern (Pu-238, 239, 241, Am-241, Cs-137, Sr-90). The OLAM provides a continuous readout of alpha activity in the wastewater and is used to provide an early warning of potential problems. Tests indicate the OLAM system capable of detecting alpha levels as low as 2.2 X 10^{-4} uCi/ml. The alarm setpoint is 2.8 X 10^{-3} uCi/ml to avoid false positive alarms. Calibration of the OLAM is on an annual basis. Surveillance of the

equipment is done on a shift basis and the strainer is cleaned monthly. The liquid sampling cell of the OLAM has tubular ports for continuous inflow and outflow of the effluent sample. An OLAM alarm signal is sent to at least one continuously manned location. A date- and time- stamped paper strip chart of alpha counts is recorded for each month. If the OLAM is unavailable due to scheduled maintenance or unforseen difficulties, samples are collected every two hours.. Grab samples are taken at Manhole Number Four during PRF operation using a bottle on a stick similar to SW-846 Figure 9-11, Dipper. The procedure specifies a 250 milliliter wide mouth polyethylene bottle and a Sampling Dip Stick. Preventative maintenance on the sampling equipment used at Manhole Number Four is not necessary.

Flow is measured and totalized in the 2904-ZA building. The 2904-ZA Analogic flow probe sends signals to a Texas Instrument flow recorder which records the effluent flow rate on a date- and time- stamped paper strip chart. Work is currently underway to install a second flow meter in the 2904-ZB Building. A Palmer-Bolus flume will be installed in manhole 9. This flume will send a signal to a recorder which will record the flow on a date- and time- stamped paper strip chart.. Calibration of the flowmeters is scheduled for twice a year.

F.2. PROTOCOL SAMPLES

Protocol samples will be grab samples taken at Manhole Number 9 using a bottle on a stick similar to SW-846 Figure 9-11, Dipper. The PFP workplan for sampling manhole number 9 will specify use of a Long Handled Dipstick (metal rod) for lowering the bottle. The sample shall be drawn in a new precleaned bottle. The sampling workplan will be reviewed prior to each subsequent sampling event and updated as necessary.

Preventative maintenance on the Protocol sampling equipment is not necessary.

G. SAMPLE HANDLING AND ANALYSIS

G.1. ROUTINE MONITORING

The Manning sampler collects samples into a carboy from which an aliquot is placed into a new clean polyethylene bottle. The bottle is surveyed by a Health Physics Technician. Decontamination activities that are required are handled in accordance with a procedure for decontamination of surfaces outside of gloveboxes. A log sheet is filled out as is a Sample Analysis Request form. The Sample Analysis Request Form is taped to the sample bottle. The bottle is then placed into two bags, each individually sealed. The outer bag is then surveyed by a Health Physics Technician. A Radioactive Shipment Record is completed and accompanies the sample. The sample is transported to the 222-S Analytical Laboratory for total alpha activity analysis. An aliquot of each 8-hour shift sample is saved to collect a monthly composite sample.

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The monthly composite from the routine monitoring samples are analyzed for Plutonium 238,239,241, americium 241, cesium 137, and strontium 90.

At Manhole Number Four the sample bottle is capped and excess liquid is wiped off. The Health Physics Technician surveys the sample bottle and releases it if no detectable contamination is found. The sample bottle is sealed in a plastic bag with tape. A completed Sample Request Slip is completed and attached to the bag. The bagged sample is placed in a second bag which is then sealed with tape. The transported samples are accompanied by a valid onsite Radioactive Shipment Record. Delivery of the samples is documented by signing an Analytical Laboratory Sample Log Sheet.

Routine monitoring data will be sent to the Environmental Data Management Center on a quarterly basis and notification will be sent to the U.S. Environmental Protection Agency and the Washington Department of Ecology that the data is available. The data will be part of the administrative record for the Tri-Party Agreement milestone for PFP wastewater (currently m-17-11). The PFP Environmental Compliance manager will maintain the chain-of-custody records for routine monitoring samples.

G.2. PROTOCOL SAMPLING

Protocol samples will be analyzed for:
IC Anions
ICP Metals
GFAA Metals
PCB/Pesticides
Mercury
Volatile Organics
Semi-Volatile Organics
Plutonium 238, 239, 241, Americium 241, Strontium 90, Cesium 137
Total Dissolved Solids per EPA 160.1
Conductivity
Herbicides per SW-846 method 8150

These analytes were selected based on constituents known or suspected to be associated with the wastewater, and were determined after review of constituents detected during past characterization activities, especially sampling for the PFP Wastewater Stream Specific Report. Conductivity, anions and metals were selected since they give a good indication of overall wastewater quality. Mercury was selected as an analyte because it was detected in one sample taken for the PFP Wastewater Stream Specific Report (WHC-EP-0342, Addendum 8). It is believed to be an anomaly, so future sampling should confirm the absence of mercury in the wastewater. Volatile and semi-volatile analyses were selected to confirm that volatile/semi-volatile constituents used in process solutions are not present in the wastewater. Specific radionuclide analysis of plutonium 238, 239, 241, americium 241, strontium 90, and cesium 137 will provide information on

radionuclide content of the wastewater at the time sampling was performed. These radionuclides will be analyzed by the laboratories method as there is not a standard method. Total Dissolved Solids analysis will provide information to support wastewater management projects.

The temperature and pH monitoring data will be recorded in the field notes.

Protocol samples will be collected in commercially available, individually certified precleaned glass or plastic bottles. The certification of the precleaned condition shall accompany the bottle. The sample volumes and number of containers are prescribed by the analytical laboratory and are subject to change. Tentative sample volumes, container types, and preservatives are:

1. 125 ml plastic container with tetrafluoroethylene lined cap, no preservative for Ion Chromatograph anions and pH.

2. 250 ml plastic container with tetrafluoroethylene lined cap, pH<2 by nitric acid preservative for Inductive Coupled Plasma Metals.

3. 500 ml plastic container with tetrafluoroethylene lined cap, pH<2 by nitric acid preservative for mercury.

4. 2 duplicate 40 ml amber glass containers with septum caps (tetrafluoroethylene lined), for Volatile Organics, filled without bubble formation and with no head space.

5. 1 liter amber glass container with tetrafluoroethylene lined cap for Semi-volatile organics, filled without bubble formation and with no head space.

6. 1000 ml plastic container with tetrafluoroethylene lined cap preserved with 2 ml nitric acid, for plutonium 238, 239, 241, americium 241, strontium 90, and cesium 137.

7. 250 ml plastic container with tetrafluoroethylene lined cap, no preservative for Total Dissolved Solids.

8. 250 ml glass or plastic container, no preservative for conductivity.

9. 1000 ml glass bottle with no preservatives for herbicides.

10. 250 ml bottle preserved with 2 ml nitric acid for AA metals.

11. 1 liter amber glass bottle with no preservative for PCB/Pesticides.

Preservatives required above will be vendor supplied and added to the containers in the field. The caps will be sealed to the containers with tamper proof tape. The containers will labelled, then be bagged and re-bagged. The outer bag will be taped with tamper-proof tape. The samples will be refrigerated at 4 degrees Celsius until ready to ship, then be placed in a cooler containing ice.

A chain of custody form will be filled out at the time of bottle preparation (preservative addition and pre-labelling) and will accompany each sample. A sample may consist of several containers. The chain-of-custody will account for each container. Once the sample has been drawn it must be in the physical control or view of the custodian, locked in an area where it can not be tampered with, or prepared for shipping with tamper-proof tape applied. Physical control includes being in the sight of the custodian, being in a room which will signal an alarm when entered, or locked in a cabinet. When more than one person is involved in sampling, one person shall be designated and only that person signs as sampler. This person is the custodian until the samples are transferred to another location or group and shall sign when releasing the samples to the designated receiver. The Liquid Effluent Sampling Quality Assurance Project Plan (WHC-SD-WM-QAPP-011) contains a copy of the chain-of-custody form to be used. A private carrier used to transport the samples and chain of custody documentation shall be bonded.

The protocol samples will be routed to an approved Westinghouse Hanford Company participant contractor or subcontractor laboratory for analysis consistent with SW-846 requirements. The data will be considered representative so long as at least 90 percent of the data points meet the established requirements in the laboratory contract for precision and accuracy. Data which does not meet this objective will be reviewed to determine whether the data can be used or whether corrective action should be taken. If necessary, corrective action will consist of repeating the sampling and analysis activity. Acceptable data will be sent to the Environmental Data Management Center and a notification will be sent to the regulators stating that the data is available. The data will be part of the administrative record for Tri-Party Agreement milestones.

Field notes will be kept by sampling personnel which identify date, time, weather conditions, plant operational status, and any other relevant information from each sampling event.

All sampling and analytical data and field notes will be maintained by the Sampling Task Leader as quality records. Copies of the Sample Analysis Request Form, Chain-of-Custody, and activity screening results are faxed to OSM. The original shipping papers accompany the sample. Copies of the Sample Analysis Request Form and Chain-Of-Custody are returned to OSM from the

laboratory after the samples are received. The original shipping papers are kept by the laboratory with the copies maintained by OSM.

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

APPENDIX

PFP WASTEWATER SOURCE EVALUATION

Terms frequently used:

Enclosed piping	This drain is totally enclosed from the its source to the floor coupling. The pipe is either welded or fixed in place. This type of drain is used for HVAC drains and glovebox or equipment cooling water drains.
Open piping	This type of drain has an opening to the room, either as a sink, drinking fountain, or floor drain. Open drains also include funnel drains that act as a junction for several smaller sources and open stand pipes. It is possible for chemicals to enter the crib through these drains. To prevent this from happening all open drains are posted with a sign warning against disposing of chemicals in these drains. In addition, personnel are trained in the proper disposal of chemicals and the chemicals are typically kept in enclosed cabinets or above secondary spill containment pallets.
HVAC drains	Heating, Ventilation, and Air Conditioning drains are typically found above any laboratory room that requires exact temperature control. These units use cooling water and also produce condensate from the atmosphere. No chemicals are used in these units and both streams are essentially clean water. The cooling water is circulated through a non-contact heat exchanger. The two streams are removed through separate drains.
Equipment cooling drains	Some electrical equipment requires cooling water. These units also use non-contact cooling and discharge clean water. Some pumps use water to form a seal to maintain a vacuum. The water is discharged to the crib after use.
Glovebox drains	Gloveboxes are used throughout PFP for working on potentially contaminated materials. The glovebox will usually contain one or more processes and their support piping. Any cooling water required in a glovebox will use a non-contact heat exchanger. The cooling water does not come in contact with any contaminated material while in the glovebox.
Backflow Preventers	Process water backflow preventers are a safety measure installed in the lines to prevent contaminated water from backing up into the clean water supply. A sudden change in

water pressure will divert the water to the crib drain. The drain is an open standpipe located below a valve that diverts the water. This places the drain off the floor away from chemical spills.

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

MANHOLE 1 (cont.)

234-5Z Building, Roof Drains

The roof drains only receive storm water. No chemicals are stored or used on the 234-5Z building roof.

2736-ZB Building and Vaults

The complex has 3 drinking fountains, 1 condensate drain, and 3 floor drains. Two of these are curbed floor drains in janitor closets which contain no hazardous chemicals. The other floor drain is in the HVAC room. Chemicals stored nearby in the room are locked in flammable proof cabinets. The drinking fountains have warning signs which prohibit disposal of chemicals in them.

MANHOLE 2

Manhole 2 receives runoff from the storm drains located on the south side of the plant. The paint shop is located near one of the storm drains so all painting supplies and solvents are kept in locked flammable proof cabinets. There are no routine wastewater contributions to the Z-20 crib.

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MANHOLE 3

Manhole 3 receives liquid effluents from the 291-Z Exhaust Fan House, the inactive 242-Z Waste Treatment and Americium facility, the 234-5Z 1st floor cold chemical and clean water drainage, and the east end of the 234-5Z duct level, 2nd floor, and roof drains. Routine wastewater flow to manhole 3 from 234-5Z sources is estimated to be in the range of 2-15 GPM. Routine wastewater flow to manhole 3 from 291-Z sources is estimated to be in the range of 75-80 GPM.

291-Z Exhaust Fan House

This building houses the main exhaust fans, the instrument air compressors, as well as several pumps and equipment. All the compressor condensate and pump seal water are sent to open floor drains as clean water. The only chemicals used near the drains include nonhazardous cleaning agents and Valvoline motor oil. The open floor drains are labeled against disposing of chemicals in them.

242-Z Waste Treatment and Americium Facility

Processing activities were suspended in this building in 1976. The water is turned of in this building and no chemicals are stored or used in the building. There are no routine contributions from 242-Z to manhole 3.

234-5Z Building, First Floor

Wastewater contributors from the first level consist of 3 drinking fountains, 1 kitchen sink, 2 eye wash stations, 2 floor drains, 1 process water backflow preventer, 1 HVAC condensate drain, 3 equipment cooling water drains, and 2 glovebox cooling water drains. The HVAC condensate drains and the glovebox cooling water drains are enclosed. All other drains are open but are not near where chemicals are used or stored. The exception is the floor drain and eye wash station in the Cold Development Lab. These drains are clearly labeled against disposing of chemicals in them. Chemicals in this room are stored away from the drains in enclosed storage cabinets.

234-5Z Building, Duct level

Wastewater contributors from the east end of the duct level consist of 1 process water backflow preventer and 6 equipment cooling water drains. The equipment cooling water drains all have enclosed piping. The backflow preventer has an open drain, but there are no chemicals stored or used near the backflow preventer.

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

MANHOLE 3 (cont.)

234-5Z Building, Second level

Wastewater contributors from the east end of the second floor consist of 1 HVAC drain and 3 floor drains. The HVAC condensate drain has enclosed piping. There are no chemicals stored near the floor drain in the ventilation room. The other two floor drains are in the instrument repair shop. Chemicals used in the shop are stored in a flammable proof cabinet.

234-5Z Building, Roof Drains

The roof drains only receive storm water. No chemicals are stored or used on the 234-5Z building roof.

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

MANHOLE 4

Manhole 4 receives liquid effluents from 234-5Z process cooling water drains, 236-Z process cooling water drains, 236-Z steam condensate drains, and 236-Z waste water drains. Routine wastewater flow to manhole 4 from 234-5Z sources is estimated to be in the range of 1-5 GPM. Routine wastewater flow to manhole 4 from 236-Z sources is estimated to be 13-32 GPM. Wastewater flow from 236-Z during Plutonium Reclamation Facility (PRF) operation is estimated to be approximately an additional 25 GPM.

234-5Z Building

Crib contributors originate from either the analytical or development labs or from the inactive Remote Mechanical A (RMA) line and Remote Mechanical C (RMC) line. There are 4 glovebox cooling water drains in the production lines (2 are inactive), 1 drinking fountain in the RMC control room, and one equipment cooling water drain on the duct level. The glovebox and equipment drains are totally enclosed and chemicals are not stored or used in the RMC control room.

The analytical lab has 1 sink and 1 HVAC drain line. The HVAC drain line has 2 open drains on it and collects the cooling water and condensate from five sources, primarily air conditioners. A warning sign has been posted above each opening. The sink is located in the "clean" lab. This room is used only for nonradioactive lab work. All the hazardous chemicals are stored in special cabinets situated away from the sink. The sink is clearly labeled against disposing of any chemicals in it.

The cold development lab contains 3 lab sinks and 1 floor drain. All the drains are clearly labeled against disposing of chemicals in them. Hazardous chemicals in this room are stored in cabinets.

The hot development lab has one enclosed drain for the thermal analyzer cooling water. This lab unit uses a non-contact cooling system.

236-Z Building, First floor

Wastewater contributors from the first floor of PRF consist of 1 drinking fountain, 2 fire water drains, and 10 glovebox cooling water drains. The glovebox drains and the fire water drains are enclosed piping. The drinking fountain has been labeled against the disposing of chemical into the drain.

236-Z Building, Second floor

Second floor PRF contains no drains to the Z-20 crib.

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

MANHOLE 4 (cont.)

236-Z Building, Third floor

Third floor PRF contains 10 steam condensate drains, 4 process water backflow preventers, 1 floor drain, 3 ventilation equipment drains, 1 process water overflow drain, and 4 process cooling water drains. There are no chemicals stored on this floor of PRF. The process cooling water drains are enclosed piping. All other drains are open and have been labeled against disposing of chemicals in them.

236-Z Building, Fourth floor

Fourth floor PRF contains 1 drinking fountain, 1 hood sink, 1 HVAC condensate drain, and 9 glove box cooling water drains. The glovebox drains are enclosed piping as is the HVAC condensate drain. The drinking fountain is located in the PRF control room.

236-Z Building, Sixth floor

This floor contains 1 process water backflow preventer. There are no chemicals stored on this floor.

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

MANHOLE 9

Manhole 9 receives the effluents from the 231-Z building. Routine wastewater flow to manhole 9 from 231-Z sources is estimated to be 7 GPM.

231-Z Building, First floor

Crib contributors from this facility consist of 3 floor drains, 2 sink drains, 1 HVAC drain, and 1 restroom. All of these drains are open but only two of them, a lab sink and the HVAC condensate drain, are in a room where chemicals are stored and used. The condensate drain is a floor drain and has 4 condensate lines running into it. The HVAC system is currently inactive and there are no chemicals stored nearby. There are chemicals stored in the room with the lab sink. The hazardous chemicals are kept in a special cabinet and the sink is clearly labeled against disposing of any chemicals into the sink. The sink is used to wash glassware.

231-Z Building, Second floor

The second floor contains all the HVAC systems for the 231-Z building except for the inactive supply fan on the first floor. There are 7 drains to remove condensate from the ventilation and seal water from the pumps. The drains are open piping but no chemicals are stored or used on the level.

PLUTONIUM FINISHING PLANT WASTEWATER SAMPLING AND ANALYSIS PLAN

MANHOLE 1

Manhole 1 receives liquid effluents from the inactive 232-Z Incinerator building, from the west end of the 234-5Z building duct level and 2nd floor, and from the 2736-ZB complex. Routine wastewater flow to manhole 1 from 234-5Z and 2736-ZB sources is estimated to be in the range of 4-10 GPM.

232-Z Building

Processing activities were suspended in this building in 1972. The water is turned off in the building and no chemicals are stored or used in the building. There are no routine contributions from 232-Z to manhole 1.

234-5Z Building, Duct level

Wastewater contributors from the duct level consist of 4 equipment cooling water discharges, 3 process water backflow preventers, and 8 safety showers. The equipment cooling water drains are enclosed piping. The backflow preventers have open drain pipes, however, no chemicals are stored or used nearby. The safety showers only have a potential for chemical release to the crib if one is used for personal safety during an emergency which involved chemical contamination.

234-5Z Building, 2nd level

The second level contributors can be divided into two groups, the ventilation drains and the Chemical Preparation (CHEMPREP) drains. The ventilation section of the second floor has 6 floor drains; 1 drinking fountain, and 4 HVAC condensate drains. There are no chemicals stored near the floor drains or the drinking fountain. The drinking fountain has a warning sign which prohibits disposal of chemicals in it. It is unlikely that a chemical discharge could occur at the HVAC drains as these funnel drains are off the floor on standpipes. There are no chemicals stored or used in the immediate vicinity.

The two CHEMPREP rooms for the RMC line contain 5 floor drains and 2 sinks. The CHEMPREP tanks are situated over a large sump that drains to the 2735-Z chemical overflow tank. Chemical spills from the tanks will not go to the Z-20 crib. The sinks are labeled against disposing of chemicals in them and have been temporarily plugged as an added measure of safety. The floor drains are located outside of the CHEMPREP tanks sump. Work is planned to also block these drains.

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