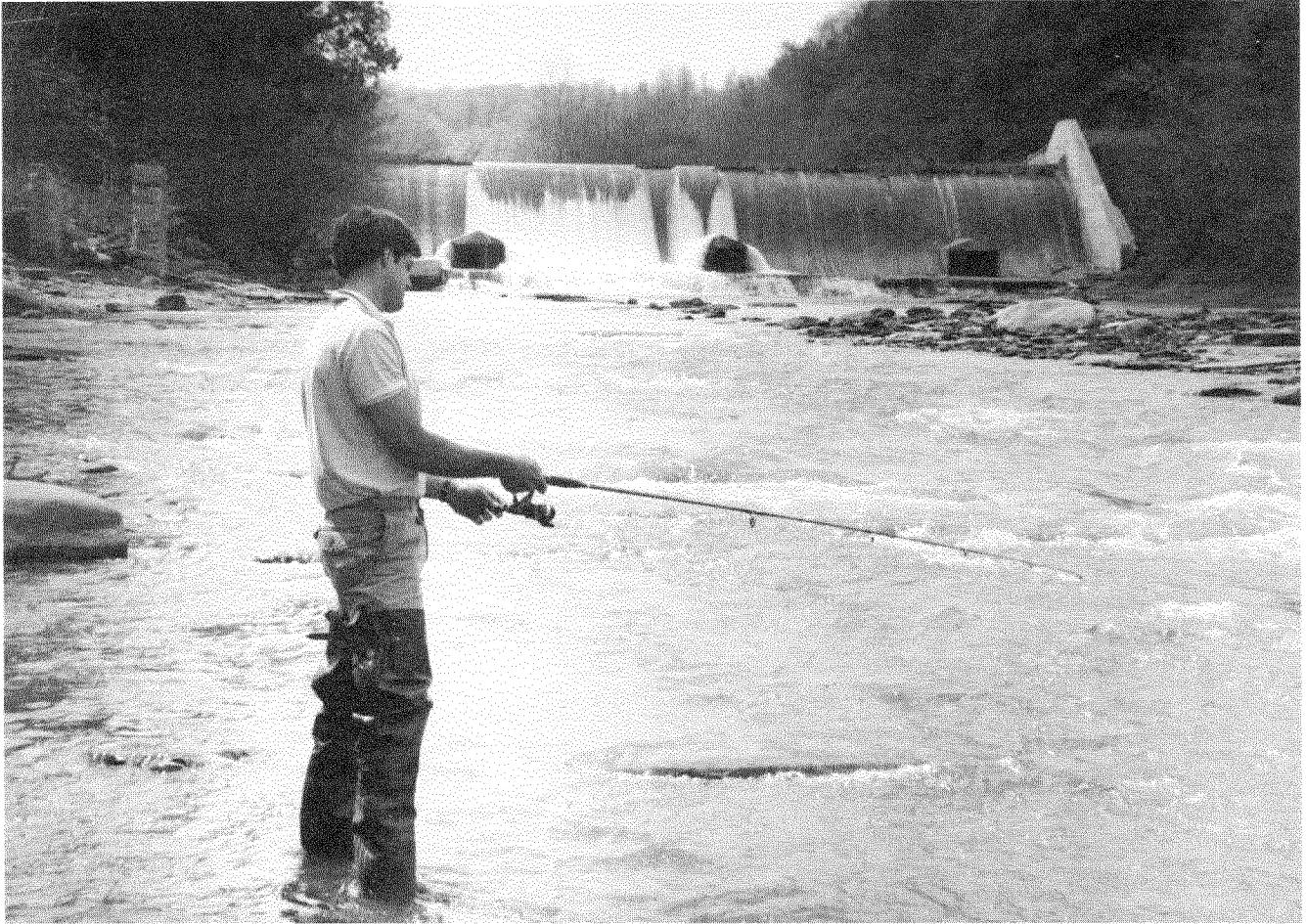


Appendix A

1992 Environmental Monitoring Program



Environmental Sampling — an Art as well as a Science

1992 Environmental Monitoring Program

The following schedule represents the West Valley Demonstration Project routine environmental monitoring program for 1992. This schedule meets or exceeds the minimum program needed to satisfy the requirements of DOE Order 5400.1. It also meets requirements of DOE 5400.5 and DOE/EH-0173T. Specific methods and recommended monitoring program elements are found in DOE/EP-0096, *Effluent Monitoring* and DOE/EP-0023, *Environmental Surveillance*, which are the bases for selecting most of the schedule specifics. Additional monitoring is mandated by Operational Safety Requirements (OSRs) and air and water discharge permits (40 CFR 61 and SPDES), which also require a formal report. These specific cases are identified in the schedule under MONITORING/REPORTING REQUIREMENTS.

Schedule of Environmental Sampling

The following table is a schedule of environmental sampling at the West Valley Demonstration Project. Locations of the sampling points are shown in Figures A-1 through A-9. The index below is a list of the codes for various sample locations. Table headings in the schedule are as follows:

- ***Sample Location Code.*** The physical location where the sample is collected is described. The code consists of seven characters. The first character identifies the sample medium as Air, Water, Soil/Sediment, Biological, or Direct Measurement. The second character specifies on-site or off-site. The remaining characters describe the specific location (e.g., **AFGRVAL** is Air off-site at **GR**eAt **VAL**ley).
- ***Monitoring/Reporting Requirements.*** The basis for monitoring that location and any additional references to permits or OSRs are noted, as well as the reports generated from sample data.
- ***Sampling Type/Medium.*** This describes the collection method and the physical characteristics of the medium.
- ***Collection Frequency.*** Indicates how often the samples are collected or retrieved.
- ***Total Annual Sample Collections.*** The number of discrete physical samples collected annually for each analyte.
- ***Analyses Performed/Composite Frequency.*** Parameters measured for the samples taken at each collection event; the frequency of composite and the analytes for the composite samples are described.

Summary of Monitoring Program Changes in 1992

<i>Location Code</i>	<i>Description of Changes</i>
WNSP003	The SDA holding lagoon was filled in and has been removed from the sampling program.
WNDNKEL WNDNKUR	The potable water system was upgraded in 1991; the required quarterly analysis of volatile organic compounds for one year was completed and has been deleted from the 1992 program.
AFFXVRD AFTCORD AFRT240	New air samplers with heads in the human breathing zone have been installed and were brought into operation in 1992.
WNW0909 WNW0910	Two additional monitoring wells were installed and brought on line in SSWMU #9 (NDA).
WNW8604	This well was deleted from the listing under SSWMU #6 but remains in SSWMU #1. Its status is currently being re-evaluated as to proper SSWMU assignment, and it may be assigned as a downgradient well of SSWMU #5.
WNWNB1S	This well has been re-assigned to SSWMU #3 to conform to the site RFI Work Plan.
AFBLKST	Additional off-site ambient air monitoring was added in December 1992 at the bulk storage warehouse on Buttermilk Road.

Index of Environmental Monitoring Program Sample Points

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* Not detailed on map

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* Not detailed on map

**1992 MONITORING PROGRAM
ON-SITE EFFLUENT MONITORING:**

AIR EFFLUENTS

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
ANSTACK Main Plant Ventilation Exhaust Stack ANSTSTK Supernatant Treatment System (STS) Ventilation Exhaust	Airborne radioactive effluent points including LWTS and Vitrification Off-Gas <u>Required by:</u> • OSR-GP-1 • 40 CFR 61 <u>Reported in:</u> • Monthly Environmental Monitoring Trend Analysis • Annual Effluent and On-Site Discharge Report • Annual Environmental Monitoring Report • Air Emissions Annual Report (NESHAP)	Continuous off-line air particulate monitors	→ Continuous measurement of fixed filter, replaced weekly	→ N/A	→ Real time alpha and beta monitoring
		Continuous off-line air particulate filters	→ Weekly	→ 52 each location	→ Gross alpha/beta, gamma isotopic*
		Continuous off-line desiccant columns for water vapor collection	→ Weekly	→ 52 each location	→ Quarterly composite for Sr-90, Pu/U isotopic, Am-241, gamma isotopic
		Continuous off-line charcoal cartridges	→ Weekly	→ Weekly cartridges composited to 4 each location	→ H-3 (ANSTACK and ANSTSTK only) → Quarterly composite for I-129

*Weekly gamma isotopic only if gross activity rises significantly.

Sampling Rationale

ANSTACK DOE/EH-0173T, 3.0; OSR-GP-1, 1.A, 2.B; and DOE/EP-0096, 3.3.

Monitors and samples HEPA-filtered ventilation from most process areas, including cell ventilation, vessel off-gas, FRS and head end ventilation, analytical area.

ANSTSTK DOE/EH-0173T, 3.0; OSR-GP-1, 1.B, 2.B; and DOE/EP-0096, 3.3.

Monitors and samples HEPA-filtered ventilation from building areas involved in treatment of high-level waste supernatant.

**1992 MONITORING PROGRAM
ON-SITE EFFLUENT MONITORING:**

AIR EFFLUENTS

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/Composite Frequency
ANCSTK Cement Solidification System (CSS) Ventilation Exhaust ANCSRFK Contact Size-Reduction Facility Exhaust	Airborne radioactive effluent points <u>Required by:</u> • OSR-GP-1 • 40 CFR 61 <u>Reported in:</u> • Monthly Environmental Monitoring Trend Analysis • Annual Effluent and On-Site Discharge Report • Annual Environmental Monitoring Report • Air Emissions Annual Report (NESHAP)	Continuous off-line air particulate monitors	→ Continuous measurement of fixed filter, replaced weekly	→ N/A	→ Real-time alpha and beta monitoring
		Continuous off-line air particulate filters	→ Weekly	→ 52 each location Weekly filters composited to 4 each location	→ Gross alpha/beta, gamma isotopic* → Quarterly composite for Sr-90, Pu/U isotopic, Am-241, gamma isotopic
		Continuous off-line charcoal cartridges	→ Weekly	→ Weekly cartridges composited to 4 each location	→ Quarterly composite for I-129

*Weekly gamma isotopic only if gross activity rises significantly.

Sampling Rationale

ANCSSTK DOE/EH-0173T, 3.0; OSR-GP-1, 1.B, 2.B; and DOE/EP-0096, 3.3.

Monitors and samples HEPA-filtered ventilation from process areas and cell used for decontaminated high-level radioactive supernatant solidification with cement.

ANCSRFK DOE/EH-0173T, 3.0; OSR-GP-1, 1.B, 2.B; and DOE/EP-0096, 3.3.

Monitors and samples HEPA-filtered ventilation from process area where radioactive tanks, pipes, and other equipment are reduced in volume by cutting with a plasma torch.

**1992 MONITORING PROGRAM
ON-SITE EFFLUENT MONITORING:**

AIR EFFLUENTS

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
ANSUPCV Supercompactor Exhaust	Airborne radioactive effluent point <u>Required by:</u> • OSR-GP-1 • 40 CFR 61 <u>Reported by:</u> • Monthly Environmental Monitoring Trend Analysis • Annual Effluent and On-Site Discharge Report • Annual Environmental Monitoring Report • Air Emissions Annual Report (NESHAP)	Continuous off-line air particulate monitor during operation	→ Continuous measurement of fixed filter	→ N/A	→ Real time beta monitoring
		Continuous off-line air particulate filter (maximum of 26 operating weeks expected)	→ Collected and replaced every seven operating days, or at least monthly when unit is operated	→ 26	→ Filters for gross alpha/beta, gamma isotopic* upon collection
				Collected filters composited to 4	→ Quarterly composites for Sr-90, Pu/U isotopic, Am-241, gamma isotopic

*Weekly gamma isotopic only if gross activity rises significantly.

Sampling Rationale

ANSUPCV DOE/EH-0173T, 3.0; OSR-GP-1, 1.B, 2.B; and DOE/EP-0096, 3.3.

Monitors and samples HEPA-filtered ventilation from area where low-level radioactive waste volume is reduced by compaction.

**1992 MONITORING PROGRAM
ON-SITE EFFLUENT MONITORING:**

LIQUID EFFLUENTS

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
WNSP001 Lagoon 3 Discharge Weir	Primary point of liquid effluent batch release <u>Required by:</u> • OSR-GP-2 • SPDES Permit <u>Reported in:</u> • Monthly SPDES DMR • Annual Effluent and On-Site Discharge Report • Annual Environmental Monitoring Report	Grab liquid	→ Daily, during lagoon 3 discharge*	→ 40-80	→ Daily for gross beta, conductivity, pH, flow
				7-12	→ Every 6 days a sample is analyzed for gross alpha/beta, H-3, Sr-90, gamma isotopic
				Daily samples composited to 4-8	→ Weighted monthly composite for gross alpha/beta, H-3, C-14, Sr-90, I-129, gamma isotopic, Pu/U isotopic, Am-241
		Composite liquid	→ Twice during discharge, near start and near end	→ 8-16	→ Two 24-hour composites for Al, NH ₃ , As, BOD-5, Fe, Zn, pH, suspended solids, SO ₄ , NO ₃ , NO ₂ , Cr ⁺⁶ , Cd, Cu, Pb, Ni
		Grab liquid	→ Twice during discharge, near start and near end	→ 8-16	→ Settleable solids, pH, cyanide amenable to chlorination, oil and grease, Dichlorodifluoromethane, Trichlorofluoromethane, 3,3-Dichlorobenzidine, Tributyl phosphate, Vanadium
		Composite liquid	→ Annually	→ 1	→ Annually, a 24-hour composite for: Cr, Se, Ba, Sb
		Grab liquid	→ Annually	→ 1	→ Chloroform
		Grab liquid	→ Semiannually	→ 2	→ Bis(2-Ethylhexyl) Phthalate, 4-Dodecene

*Lagoon 3 is discharged between 4 and 8 times per year, as necessary, averaging 10 days per discharge.

Technetium-99 sampling was added during the third quarter of 1992.

Sampling Rationale

WNSP001 DOE 5400.5 and DOE/EH-0173T, 2.3.3.

By DOE Order all liquid effluent streams from DOE facilities shall be evaluated and their potential for release of radionuclides addressed.

New York State SPDES permit no. NY0000973.

These regulations are met for radiological parameters by daily grab sampling during periods of lagoon 3 discharge. Sampling for chemical constituents is performed near the beginning and end of discharge periods to meet the site SPDES permit. Both grab samples and 24-hour composite samples are collected.

**1992 MONITORING PROGRAM
ON-SITE EFFLUENT MONITORING:**

LIQUID EFFLUENTS

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
WNSP006 Frank's Creek at Security Fence	<p>Combined facility liquid discharge</p> <p><u>Required by:</u></p> <ul style="list-style-type: none"> • OSR-GP-2 <p><u>Reported in:</u></p> <ul style="list-style-type: none"> • Monthly Environmental Monitoring Trend Analysis • Annual Environmental Monitoring Report 	Timed continuous composite liquid	→ Weekly (samples collected simultaneously for NYSDOH)	→ 52	→ Gross alpha/beta, H-3, pH, conductivity
		Grab liquid	→ Semiannually	→ 2	→ Monthly composite for gamma isotopic and Sr-90
WNSP007 Sanitary Waste Discharge	<p>Liquid effluent point for sanitary and utility plant combined discharge</p> <p><u>Required by:</u></p> <ul style="list-style-type: none"> • SPDES Permit <p><u>Reported by:</u></p> <ul style="list-style-type: none"> • Monthly SPDES DMR • Monthly Environmental Monitoring Trend Analysis • Annual Effluent and On-Site Discharge Report • Annual Environmental Monitoring Report 	24-hour composite liquid	→ 3 each month	→ 36	→ Gross alpha/beta, H-3, suspended solids, NH ₃ , BOD-5, Fe, Sr-90, gamma scan
		Grab liquid	→ Weekly	→ 52	→ Monthly composite for gamma isotopic and Sr-90
		Grab liquid	→ Annually	→ 1	→ pH, settleable solids
WNSTPBS Sanitary Waste Sludge	Operational STP Monitoring	Grab sludge	→ On demand (at least monthly)	→ 12	→ Gross alpha/beta, H-3

Sampling Rationale

WNSP006 DOE/EH-0173T, 5.10.1.1.

By DOE Order all liquid effluent streams from DOE facilities shall be evaluated and their potential for release of radionuclides addressed.

WNSP007 DOE 5400.5 and DOE/EH-0173T, 2.3.3.

Sampling rationale is based on New York State SPDES permit no. NY0000973 and DOE 5400.5 criteria for discharge of radioactivity to and from the sewage treatment plant.

WNSTPBS DOE 5400.5.

Composite of STP surge tank, sludge holding tank, and clarifier sludge analyzed for operational screening.

**1992 MONITORING PROGRAM
ENVIRONMENTAL SURVEILLANCE:**

ON-SITE SURFACE WATER

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
WNSWAMP N.E. Swamp Drainage	Site surface drainage <u>Reported in:</u> • Annual Effluent and On-Site Discharge Report	Grab liquid	→ Monthly (samples collected simultaneously for NYSDOH)	→ 12	→ Gross alpha/beta, H-3, pH
		Grab liquid	→ Semiannually	→ 2	→ TOC, TOX, Ca, Mg, Na, K, Ba, Mn, Fe, Cl, SO ₄ , NO ₃ , F, HCO ₃ , CO ₃
WNSW74A North Swamp Drainage	Site surface drainage <u>Reported in:</u> • Annual Effluent and On-Site Discharge Report	Timed continuous composite liquid	→ Weekly	→ 52	→ Gross alpha/beta, H-3, pH, conductivity
				Weekly samples composited to 12	→ Monthly composite for gamma isotopic, Sr-90
				Weekly samples composited to 4	→ Quarterly composite for C-14, I-129, Pu/U isotopic, Am-241
		Grab liquid	→ Seimiannually	→ 2	→ TOC, TOX, Ca, Mg, Na, K, Ba, Mn, Fe, Cl, SO ₄ , NO ₃ , F, HCO ₃ , CO ₃
WN8D1DR High-Level Waste Farm Underdrain	Drains subsurface water from HLW storage tank area <u>Reported in:</u> • Monthly Environmental Monitoring Trend Analysis	Grab liquid	→ Weekly	→ 52	→ Gross alpha/beta, H-3, pH
				Weekly samples composited to 12	→ Monthly composite for gamma isotopic, Sr-90
WNSP008 French drain	Drains subsurface water from LLWT Lagoon area <u>Required by:</u> • SPDES Permit <u>Reported in:</u> • Monthly SPDES DMR • Annual Effluent and On-Site Discharge Report • Annual Environmental Monitoring Report	Grab liquid	→ 3 each month	→ 36	→ pH, conductivity, BOD-5, Fe
		Grab liquid	→ Monthly	→ 12	→ Gross alpha/beta, H-3
		Grab liquid	→ Annually	→ 1	→ Ag, Zn

Sampling Rationale

WNSWAMP DOE/EH-0173T, 5.10.1.1.

NE site surface water drainage; provides for the sampling of this discrete drainage path for uncontrolled surface waters just before they leave the site's controlled boundary. Waters collected represent surface and subsurface drainages from the construction and demolition debris landfill (CDDL), old hardstand areas, and other possible north plateau sources of radiological or nonradiological contamination.

WNSW74A DOE/EH-0173T, 5.10.1.1.

N site surface water drainage; provides for the sampling of this discrete drainage path for uncontrolled surface waters just before they leave the site's controlled boundary. Waters collected represent surface and subsurface drainages from lag storage areas and other possible north plateau sources of radiological or nonradiological contamination.

WN8D1DR DOE/EH-0173T, 5.10.1.3.

Monitors the potential influence on subsurface drainage surrounding the high-level waste tank farm.

WN8P008 DOE/EH-0173T, 5.10.1.3.

French drain of subsurface water from lagoon (LLWTF) area. NYSDEC SPDES permit also provides for the sampling of this discrete drainage path for uncontrolled subsurface waters before they flow into Erdman Brook. Waters collected represent subsurface drainages from downward infiltration around the LLWTF and lagoon systems. This point would also monitor any subsurface spillover from the overfilling of lagoons 2 and 3. Sampling of significance for both radiological and nonradiological contamination.

This site is also monitored as part of the groundwater program. (See SSWMU #1.)

**1992 MONITORING PROGRAM
ENVIRONMENTAL SURVEILLANCE:**

ON-SITE SURFACE WATER

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/Composite Frequency
WNSP005 Facility Yard Drainage	Combined drainage from facility yard area. <u>Reported in:</u> • Internal Review	Grab liquid	→ Monthly	→ 12	→ Gross alpha/beta, H-3, pH
WNCOOLW Cooling Tower Basin	Cools plant utility steam system water <u>Reported in:</u> • Internal Review	Grab liquid	→ Monthly	→ 12	→ Gross alpha/beta, H-3, pH

Sampling Rationale

WNSP005 Facility yard surface water drainage; generally in accordance with DOE/EH-0173T, 5.10.1.1. Previously in accordance with NYSDEC SPDES permit no. NY0000973.

Provides for the sampling of this discrete drainage path for uncontrolled surface waters just after outfall 007 discharge into the drainage and before they flow to Erdman Brook. Waters collected represent surface and subsurface drainages primarily from the main plant yard area. Historically, this point was used to monitor sludge pond(s) and utility room discharges to the drainage. These two sources have been rerouted. Migration of residual site contamination around the main plant dictates surveillance of this point for radiological parameters primarily.

WNCoolW Facility cooling tower circulation water; generally in accordance with DOE/EH-0173T, 5.10.1.1.

Operational sampling carried out to confirm no migration of radiological contamination into the primary coolant loop of the HLWTF and/or plant utility steam systems. Migration from either source might indicate radiological control failure. Process knowledge indicates that radiological monitoring is of primary significance.
