1991 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
	Airborne radioactive effluent points including LWTS and Vitrification Off-Gas	Continuous off-line air particulate monitors	→ Continuous measurement of fixed filter, replaced weekly	→ N/A	→ Real time alpha and beta monitoring
ANSTACK Main Plant Ventilation Exhaust Stack **ANSTSTK** Supernatant Treatment System (STS) Ventilation Exhaust	Required by: • OSR-GP-1 • 40 CFR 61 Reported in: • 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 filters	→ Weekly	→ 52 each location	→ Gross alpha/beta, gamma isotopic*
				Weekly filters composited to 4 each location	→ Quarterly composite for Sr-90, Pu/U isotopic, Am-241, gamma isotopic
		Continuous off-line desiccant columns for water vapor collection	→ Weekly	→ 52 each location	→ H-3
		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
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-1073T, 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.

1991 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
ANCSSTK Cement Solidification System (CSS) Ventilation Exhaust ANCSRFK Contact Size Reduction Facility Exhaust	Airborne radioactive effluent points Required by: • OSR-GP-1 • 40 CFR 61 Reported in: • 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*
				Weekly filters composited to 4 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	→ 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.

1991 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 Required by: • OSR-GP-1 • 40 CFR 61 Reported by: • 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.

1991 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	Grab liquid	→ Daily, during Lagoon 3 discharge*	→ 40-80	→ Daily for gross beta, conductivity, pH, flow
	Required by: • OSR-GP-2 • SPDES Permit			7-12	→ Every 6 days a sample is analyzed for gross alpha/beta, H-3, Sr-90, gamma isotopic
	Reported in: • Monthly SPDES DMR • Annual Effluent and On-Site Discharge Report • Annual Environmental Monitoring Report			Daily samples composited to 4-6	→ 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, Tributylphosphate, 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.

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.

1991 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	Combined facility liquid discharge Required by: • OSR-GP-2 Reported in: • 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
				Weekly samples composited to 12	→ Monthly composite for gamma isotopic and Sr-90
				Weekly samples composited to 4	→ Quarterly composite for C-14, I-129, Pu/U isotopic, Am-241
		Grab liquid	→ Semiannually	→ 2	→ TOC, TOX, Ca, Mg, Na, K, Ba, Mn, Fe, Cl, SO_4, NO_3, F, HCO_3, CO_3
WNSP007 Sanitary Waste Discharge	Liquid effluent point for sanitary and utility plant combined discharge Required by: • SPDES Permit Reported by: • 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	→ pH, settleable solids
		Grab liquid	→ Annually	→ 1	→ Chloroform
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.

1991 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 Reported in: • 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 Reported in: • 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 Reported in: • Monthly Environmental Monitoring Trend Analysis	Grab liquid	→ Weekly	→ 52	→ Gross alpha/beta, H-3, pH
				Weekly samples composited to 12 each location	→ Monthly composite for gamma isotopic, Sr-90
WNSP008 French drain	Drains subsurface water from LLWT Lagoon area Required by: • SPDES Permit Reported in: • 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. This site is also monitored as part of the groundwater program (see SSWMU #1).
WNSP008	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.

1991 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. Reported in: • Internal Review	Grab liquid	→ Monthly	→ 12	→ Gross alpha/beta, H-3, pH
WNCOOLW Cooling Tower Basin	Cools plant utility steam system water Reported in: • Internal Review	Grab liquid	→ Monthly	→ 12	→ Gross alpha/beta, H-3, pH
WNSP003 SDA Holding Lagoon	State Disposal Area Holding Lagoon Reported in: • Annual Environmental Monitoring Report • NYSERDA	Grab liquid	→ Annually (as required)	→ 2	→ Gross alpha/beta, H-3, pH, gamma isotopic, Sr-90,

	Sampling Rationale
WNSP005	Facility yard surface water drainage; generally in accordance with DOE/EH-0173T, 5.10.1.1. Formerly, 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.
WNSP003	SDA effluent and area surface water holding lagoon; generally in accordance with DOE/EH-0173T, 5.10.1.1. Formerly, in accordance with NYSDEC SPDES permit no. NY0000973. Operational sampling carried out to characterize waters contained within SDA holding lagoon. Characterization for radiological constituents only as per agreement with NYSERDA.

1991 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
WNFRC67 Frank's Creek E of SDA	Drains NYS Low-Level Waste Disposal Area Reported in: • Internal Review • NYSERDA	Grab liquid	→ Monthly (samples collected simultaneously by NYSDOH)	→ 12	→ Gross alpha/beta, H-3, pH
WNERB53 Erdman Brook N of Disposal Areas	Drains NYS and WVDP disposal areas Reported in: • Internal Review • NYSERDA	Grab liquid	→ Weekly → Monthly sample collected by NYSDOH	→ 52 → 12	→ Gross alpha/beta, H-3, pH
WNNDADR Ditch N of WVDP NDA and SDA	Drains WVDP disposal and storage area Reported in: • Internal Review • Monthly Environmental Monitoring Trend Analysis	Timed continuous composite liquid	→ Weekly	→ 52 Weekly samples composited to 12 Weekly samples composited to 4	→ pH → Monthly composite for gross alpha/beta, gamma isotopic, H-3 → Quarterly composite for Sr-90, I-129
WNDCELD Drainage S of Drum Cell	Drains WVDP storage area Reported in: • Internal Review	Grab liquid	→ Monthly*	→ 12 Monthly samples composited to 4	→ pH, gross alpha/beta, gamma isotopic, H-3 → Quarterly composite for Sr-90, I-129

* Reduction of frequency of drum cell monitoring from weekly to monthly is pending DOE approval.

** Treatment system upgraded in 1991.

Sampling Rationale	
WNFRC67	DOE/EH-0173T, 5.10.1.1. Monitoring the potential influence of both the New York State low-level waste disposal area (SDA) and drum cell drainage into Frank's Creek east of the SDA and upstream of the confluence with Erdman Brook.
WNERB53	DOE/EH-0173T, 5.10.1.1. Monitors the potential influence of the drainages from the SDA and the WVDP disposal area into Erdman Brook upstream of the confluence with Frank's Creek.
WNNDADR	DOE/EH-0173T, 5.10.1.1. Monitors the potential influence of the WVDP storage and disposal area drainage into Lagoon Road Creek upstream from confluence with Erdman Brook.
WNDCELD	DOE/EH-0173T, 5.10.1.1 Monitors potential influence of drum cell drainage into Frank's Creek south of the SDA and upstream of WNFRC67.

1991 MONITORING PROGRAM
ENVIRONMENTAL SURVEILLANCE:

ON-SITE POTABLE WATER

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
WNDNK Series Site Potable Water includes: WNDNKMS Maintenance Shop Drinking Water WNDNKMP Main Plant Drinking Water	Sources of potable water within site perimeter Reported in: • Internal Review	Grab liquid	→ Monthly	→ 12 each per location	→ Gross alpha/beta, H-3, pH
WNDNKEL Environmental Lab Drinking Water		Grab liquid	→ Annually*	→ 1 each location	→ Toxic metals, pesticides, chemical pollutants
WNDNKUR Potable Water Storage Tank (UR)		Grab liquid	→ Quarterly**	→ 8	→ Volatile organic compounds

*WNDNKEL and WNDKUR only.

	Sampling Rationale
WNDNK Series	Site drinking water; generally according to DOE/EH-0173T, 5.10.1.3. Potable water sampling carried out to confirm no migration of radiological and/or nonradiological contamination into the site's drinking water supply.
WNDNKMS	Site drinking water; generally according to DOE/EH-0173T, 5.10.1.3. Potable water sampled at the maintenance shop in order to monitor a point that is at an intermediate distance from the point of potable water generation and that is used heavily by site personnel.
WNDNKMP	Site drinking water; generally according to DOE/EH-0173T, 5.10.1.3. Same rationale as WNDNKMS but sampled at the main plant water fountain.
WNDNKEL	Site drinking water; generally according to DOE/EH-0173T, 5.10.1.3. Potable water sampled at the Environmental Laboratory in order to monitor the point farthest away from the point of potable water generation.
WNDNKUR	Site drinking water; generally according to DOE/EH-0173T, 5.10.1.3. Sampled at the Utility Room so as to monitor the point closest to the point of potable water generation.

1991 MONITORING PROGRAM
ENVIRONMENTAL SURVEILLANCE:

SURFACE WATER

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
WNSTAW Series On-Site Standing Water ponds not receiving effluent includes: **WNSTAW4** Border pond SW of AFRT240 **WNSTAW5** Border pond SW of DFTLD13 **WNSTAW6** Borrow pit NE of project facilities **WNSTAW9** North reservoir near intake **WNSTAWB** Background pond at Sprague Brook maintenance building	Water within vicinity of plant airborne or groundwater effluent Reported in: • Internal Review	Grab liquid	→ Annually	→ 1* each location	→ Gross alpha/beta, H-3, pH, conductivity, chloride, Fe, Mn, Na, phenols, SO_4

*Sampling depends upon on-site ponding conditions during the year.

Sampling Rationale	
WNSTAW Series	DOE-EH-0173T, 5.10.1.1. Monitoring of on- and off-site standing waters at locations listed below. Although none receive effluent directly, the potential for contamination is present except at the background location. Former collecting sites 1, 2, 3, 7, and 8 were deleted from the monitoring program because they were built over or are now dry. This reduction of sites is pending DOE approval.
WNSTAW4	Border pond located south of AFRT240. Chosen to be a location for obtaining high potential concentration based on meteorological data. Perimeter location adjacent to a working farm. Drainage extends through private property and is accessible to public.
WNSTAW5	Border pond located west of Project facilities near the perimeter fence and DFTLD13. Chosen to be a location for obtaining high potential concentration based on meteorological data. Location is adjacent to private residence and potentially accessible by the general public.
WNSTAW6	Borrow pit northeast of Project facilities just outside of inner security fence. Considered to be the closest standing water to the main plant and high-level waste facilities (in lieu of the availability of WNSTAW1).
WNSTAW9	North reservoir near intake. Chosen to provide data in the event of potentially contaminated site potable water supply. Location is south of main plant facilities.
WNSTAWB	Pond located near the Sprague Brook maintenance building. Considered a background location approximately 14 km north of the WVDP.

1991 MONITORING PROGRAM
ENVIRONMENTAL SURVEILLANCE:

ON-SITE GROUNDWATER

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
Low-Level Waste Treatment Facilities (SSWMU #1) **WNW** **0103 U** **0104 U** **0105** **0106** **0107** **0108** **0109** **0110** **0111** **0114** **0115** **0116** **8603** **8604** **8605** Surface: **WNSP008** Miscellaneous Small Units (SSWMU #2) **WNW** **0201 U** **0202 U** **0203 U** **0204 U** **0205** **0206** **0207** **0208** **8606**	Groundwater monitoring wells around site super solid waste management units (SSWMUs) Reported in: • Annual Environmental Monitoring Report • RCRA RFI Reports	Grab liquid	→ 4 times semiannually	→ 8 each well	→ Gross alpha/beta, H-3, gamma isotopic, TOC, TOX, VOA
		Direct measurement of sample discharge water	→ Before and after grab sample collection	→ 16 each well	→ Temperature, pH, conductivity
		Grab liquid	→ Semiannually	→ 2 each well	→ Cl, Mn, Na, K, Ca, Mg, Fe, Phenols, SO_4, NH_3, NO_3+NO_2-N, HCO_3, CO_3
		Grab liquid	→ 4 times annually - first year of monitoring only	→ 4 each well	→ As, Ba, Cd, Cr, F, Pb, Hg, Se, Ag, Endrin, Lindane, Methoxychlor, 2,4,5-TP (Silvex), 2,4-D, Toxaphene, Radium, NO_3+NO_2-N, Turbidity

NOTE: "U" designates upgradient well; "B" designates background well; the remainder are downgradient. Sampling and analysis conducted as outlined in the RCRA Groundwater Technical Enforcement Guidance Document (EPA OSWER 9950.1) and the Statistical Analysis of Monitoring Data at RCRA Facilities (EPA/530-SW-89-026). Well WNW8604 is being re-evalutated for possible SSWMU reassignment.

	Sampling Rationale
On-Site Groundwater	DOE Order 5400.1, IV.9; DOE/EH-0173T, 5.10.1.3; 40 CFR Parts 264 and 265, Subpart F. The on-site WVDP groundwater monitoring program focuses on radiological and chemical surveillance of both active and inactive super solid waste management units (SSWMUs). The program allows for the determination of water quality. In addition, using wells situated hydraulically upgradient (background) and downgradient of SSWMUs allows for both detection of groundwater contamination and evaluation of the effects associated with the individual SSWMUs. The groundwater monitoring program covered in the "Sampling and Analysis Plan (SAP) Groundwater Monitoring Network," Draft W, October 1990, in the Annual Site Groundwater Protection Management Program Plan, WVDP-091, and in the 1991 RCRA RFI Workplan.
SSWMU #1	Low-level waste treatment facilities, including four active lagoons, Lagoons 2,3,4 and 5 and an inactive, filled-in lagoon, Lagoon 1.
SSWMU #2	Miscellaneous small units, including the sludge pond, the solvent dike, the paper incinerator, and the kerosene tank.

1991 MONITORING PROGRAM
ENVIRONMENTAL SURVEILLANCE:

ON-SITE GROUNDWATER

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
Liquid Waste Treatment System (SSWMU #3) **WNW** **0301 U** **0302 U** **0305** xx**0306** **0307** **NB1S B** HLW Storage and Processing Tank (SSWMU #4) **WNW** **0401 U** **0402 U** **0403 U** **0404 U** **0405** **0406** **0407** **0408** **0409** xx**0410 U** xx**0411 U** **8607** **8608** **8609**	Groundwater monitoring wells around site super solid waste management units (SSWMUs) Reported in: • Annual Environmental Monitoring Report • RCRA RFI Reports	Grab liquid	→ 4 times semiannually	→ 8 each well	→ Gross alpha/beta, H-3, gamma isotopic, TOC, TOX, VOA
		Direct measurement of sample discharge water	→ Before and after grab sample collection	→ 16 each well	→ Temperature, pH, conductivity
		Grab liquid	→ Semiannually	→ 2 each well	→ Cl, Mn, Na, K, Ca, Mg, Fe, Phenols, SO_4, NH_3, NO_3+NO_2-N, HCO_3, CO_3
		Grab liquid	→ 4 times annually - first year of monitoring only	→ 4 each well	→ As, Ba, Cd, Cr, F, Pb, Hg, Se, Ag, Endrin, Lindane, Methoxychlor, 2,4,5-TP (Silvex), 2,4-D, Toxaphene, Radium, NO_3+NO_2-N, Turbidity

NOTE: "U" designates upgradient well; "B" designates background well; the remainder are downgradient.

xx- Installed wells which are dry and not used for groundwater monitoring. They are not included in the total of 106 wells of the monitoring program.

	Sampling Rationale
On-Site Groundwater	DOE Order 5400.1, IV.9; DOE/EH-0173T, 5.10.1.3; 40 CFR Parts 264 and 265, Subpart F. The on-site WVDP groundwater monitoring program focuses on radiological and chemical surveillance of both active and inactive super solid waste management units (SSWMUs). The program allows for the determination of water quality. In addition, using wells situated hydraulically upgradient (background) and downgradient of SSWMUs allows for both detection of groundwater contamination and evaluation of the effects associated with the individual SSWMUs. The groundwater monitoring program covered in the "Sampling and Analysis Plan (SAP) Groundwater Monitoring Network" Draft W, October 1990, in the Annual Site Groundwater Protection Management Program Plan, WVDP-091, and in the 1991 RCRA RFI Workplan.
SSWMU #3	Liquid waste treatment system containing liquid effluent from the supernatant treatment system.
SSWMU #4	High level waste storage and processing area, including the high-level radioactive waste tanks, the supernatant treatment sytem, and the vitrification facility.

1991 MONITORING PROGRAM
ENVIRONMENTAL SURVEILLANCE:

ON-SITE GROUNDWATER

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
Maintenance Shop Leach Fields (SSWMU #5) WNW 0501 U 0502 Low-Level Waste Storage Area (SSWMU #6) WNW 0601 0602 0603 U 0604 0605 8607 U 8608 U CPC Waste Storage Area (SSWMU #7) WNW 0701 U 0702 0703 0704 0705 0706 U 0707	Groundwater monitoring wells around site super solid waste management units (SSWMUs) Reported in: • Annual Environmental Monitoring Report • RCRA RFI Reports	Grab liquid	→ 4 times semiannually	→ 8 each well	→ Gross alpha/beta, H-3, gamma isotopic, TOC, TOX, VOA
		Direct measurement of sample discharge water	→ Before and after grab sample collection	→ 16 each well	→ Temperature, pH conductivity
		Grab liquid	→ Semiannually	→ 2 each well	→ Cl, Mn, Na, K, Mg, Ca, Fe, Phenols, SO_4, NH_3, NO_3+NO_2-N, HCO_3, CO_3
		Grab liquid	→ 4 times annually - first year of monitoring only	→ 4 each well	→ As, Ba, Cd, Cr, F, Pb, Hg, Se, Ag, Endrin, Lindane, Methoxychlor, 2,4,5-TP (Silvex,) 2,4-D, Toxaphene, Radium, NO_3+NO_2-N, Turbidity

NOTE: "U" designates upgradient well; "B" designates background well; the remainder are downgradient.

	Sampling Rationale
On-Site Groundwater	DOE Order 5400.1, IV.9; DOE/EH-0173T, 5.10.1.3; 40 CFR Parts 264 and 265, Subpart F. The on-site WVDP groundwater monitoring program focuses on radiological and chemical surveillance of both active and inactive super solid waste management units (SSWMUs). The program allows for the determinaton of water quality. In addition, using wells situated hydraulically upgradient (background) and downgradient of SSWMUs allows for both detection of groundwater contamination and evaluation of the effects associated with the individual SSWMUs. The groundwater monitoring program is covered in the "Sampling and Analysis Plan (SAP) Groundwater Monitoring Network" Draft W, October 1990, in the Annual Site Groundwater Protection Management Program Plan, WVDP-091, and in the 1991 RCRA RFI Workplan.
SSWMU #5	Maintenance shop sanitary leach field, formally used by NFS and WVNS to process domestic sewage generated by the maintenance shop.
SSWMU #6	Low-level waste storage area includes metal and fabric structures housing low-level radioactive wastes being stored for future disposal.
SSWMU #7	Chemical process cell (CPC) waste storage area contains packages of pipes, vessels and debris from decontamination and cleanup of chemical process cell in the former reprocessing plant.

1991 MONITORING PROGRAM
ENVIRONMENTAL SURVEILLANCE:

ON-SITE GROUNDWATER

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
Construction and Demolition Debris Landfill (SSWMU #8) WNW **0801 U** **0802** **0803** **0804 U** **WNGSEEP** **WNDMPNE** **8612**	Groundwater monitoring wells around site super solid waste management units (SSWMUs) Reported in: • Annual Environmental Monitoring Report • RCRA RFI Reports	Grab liquid	→ 4 times semiannually	→ 8 each well	→ Gross alpha/beta, H-3, gamma isotopic, TOC, TOX, VOA
		Direct measurement of sample discharge water	→ Before and after grab sample collection	→ 16 each well	→ Temperature, pH, conductivity
		Grab liquid	→ Semiannually	→ 2 each well	→ Cl, Mn, Na, K, Mg, Fe, Ca, Phenols, SO_4, NH_3, NO_3+NO_2-N, HCO_3, CO_3
NRC-licensed disposal area (SSWMU #9) WNW **0901 U** **0902 U** **0903** **0904** **0905** **0906** **0907** **0908 U** **8610** **8611**			→ 4 times annually - first year of monitoring only	→ 4 each well	→ As, Ba, Cd, Cr, F, Pb, Hg, Se, Ag, Endrin, Lindane, Methoxychlor, 2,4,5-TP (Silvex), 2,4-D, Toxaphene, Radium, NO_3+NO_2-N,Turbidity
RTS Drum Cell (SSWMU #10) **WNW** **1001 U** **1002** **1003** **1004** **1005 U** **1006** **1007** **1008b B** **1008c B**					

NOTE: "U" designates upgradient well; "B" designates background well; the remainder are downgradient.

	Sampling Rationale
On-Site Groundwater	DOE Order 5400.1, IV.9; DOE/EH-0173T, 5.10.1.3; 40 CFR Parts 264 and 265, Subpart F. The on-site WVDP groundwater monitoring program focuses on radiological and chemical surveillance of both active and inactive super solid waste management units (SSWMUs). The program allows for the determination of water quality. In addition, using wells situated hydraulically upgradient (background) and downgradient of SSWMUs allows for both detection of groundwater contamination and evaluation of the effects associated with the individual SSWMUs. The groundwater monitoring program is covered in the "Sampling and Analysis Plan (SAP) Groundwater Monitoring Network," Draft W, October 1990, and in the Annual Site Groundwater Protection Management Program Plan, WVDP-091, and in the 1991 RCRA RFI Workplan.
SSWMU #8	Construction and demolition debris landfill, used by NFS and the WVDP to dispose of nonhazardous and nonradioactive materials.
SSWMU #9	NRC-licensed disposal area (NDA) contains radioactive wastes generated by NFS and the WVDP.
SSWMU #10	Radioactive waste treatment drum cell contains stored cement stabilized low-level radioactive waste.

1991 MONITORING PROGRAM
ENVIRONMENTAL SURVEILLANCE:

ON-SITE GROUNDWATER

Sample Location Code	Monitoring/Reporting Requirements	Sampling Type/Medium	Collection Frequency	Total Annual Sample Collections	Analyses Performed/ Composite Frequency
State-licensed Disposal Area (SSWMU #11) **WNW** **1101a U** **1101b U** **1101c U** **1102a** **1102b** **1103a** **1103b** **1103c** **1104a** **1104b** **1104c** **1105a** **1105b** **1106a U** **1106b U** **1107a** **1108a U** **1109a U** **1109b U** **1110a** **1111a** Fuel Storage Area **WNW** **8613A** **8613B** **8613C**	Groundwater monitoring wells around site super solid waste management units (SSWMUs) Reported in: • Annual Environmental Monitoring Report • RCRA RFI Reports	Grab liquid	→ 4 times semiannually	→ 8 each well	→ Gross alpha/beta, H-3, gamma isotopic, TOC, TOX, VOA
		Direct measurement of sample discharge	→ Before and after grab sample collection	→ 16 each well	→ Temperature, pH, conductivity
		Grab liquid	→ Semiannually	→ 2 each well	→ Cl, Mn, Na, K, Mg, Pb, Ca, Fe, Phenols, SO_4, NH_3, NO_3+NO_2-N, HCO_3, CO_3
		Grab liquid	→ 4 times annually - first year of monitoring only	→ 4 each well	→ As, Ba, Cd, Cr, F, Pb, Hg, Se, Ag, Endrin, Lindane, Methoxychlor, 2,4,5-TP (Silvex), 2,4-D, Toxaphene, Radium, NO_3+NO_2-N, Turbidity

NOTE: "U" designates upgradient well; "B" designates background well; the remainder are downgradient.

	Sampling Rationale
On-Site Groundwater	DOE Order 5400.1, IV.9; DOE/EH-0173T, 5.10.1.3; 40 CFR Parts 264 and 265, Subpart F. The on-site WVDP groundwater monitoring program focuses on radiological and chemical surveillance of both active and inactive super solid waste management units (SSWMUs). The program allows for the determination of water quality. In addition, using wells situated hydraulically upgradient (background) and downgradient of SSWMUs allows for both detection of groundwater contamination and evaluation of the effects associated with the individual SSWMUs. The groundwater monitoring program is covered in the "Sampling and Analysis Plan (SAP) Groundwater Monitoring Network," Draft W, October 1990, in the Annual Site Groundwater Protection Management Program Plan, WVDP-091, and in the 1991 RCRA RFI Workplan.
SSWMU #11	State-licensed disposal area (SDA) was operated by NFS as a commercial low level disposal facility and also received wastes from NFS reprocessing operations.
Fuel Storage Area	Monitors groundwater in the vicinity of underground fuel storage tanks; this is not included in any of the SSWMUs.