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Western New York Nuclear Service Center

No Action Alternative Technical Report

Prepared for the

U.S. Department of Energy

West Valley, New York

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ACRONYMS AND ABBREVIATIONS

ALARA	As Low as Reasonably Achievable
ASER	Annual Site Environmental Report
CDD	Construction and Demolition Debris
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
D&D	Decontaminate and Decommission
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ES&H	Environmental, Safety, and Health
FTE	Full-Time Equivalent
GTCC	Greater Than Class C
HEPA	High-Efficiency Particulate Air
HLW	High-Level Waste
HVAC	Heating, Ventilating, and Air-Conditioning
IRTS	Integrated Radwaste Treatment System
LLW	Low-Level Radioactive Waste
LLWTF	Low-Level Waste Treatment Facility
LLW2	Low-Level Waste Treatment Building
LSA	Low-Specific Activity
LWTS	Liquid Waste Treatment System
M&M	Monitor and Maintain
M&O	Management and Operating
NDA	Nuclear Regulatory Commission-Licensed Disposal Area
NEPA	National Environmental Policy Act of 1969
NFS	Nuclear Fuel Services, Inc.
NRC	Nuclear Regulatory Commission
NYSERDA	New York State Energy Research and Development Authority
PPE	Personal Protective Equipment
PVS	Permanent Ventilation System
RCRA	Resource Conservation and Recovery Act
RHWF	Remote-Handled Waste Facility

ACRONYMS AND ABBREVIATIONS *(concluded)*

SAIC	Science Applications International Corporation
SDA	State-Licensed, Low-Level Radioactive Waste Disposal Area
STS	Supernatant Treatment System
TRU	Transuranic
UR	Utility Room
WMA	Waste Management Area
WNYNSC	Western New York Nuclear Service Center
WTF	Waste Tank Farm
WVDP	West Valley Demonstration Project
WVNSCO	West Valley Nuclear Services Company

1.0 INTRODUCTION

The Western New York Nuclear Service Center (WNYNSC) occupies 3,338 acres of land in northern Cattaraugus County and southern Erie County, NY, as shown on Figure 1-1. The WNYNSC was the site of the only commercial nuclear fuel reprocessing facility to have operated in the United States (1966 to 1972). Former fuel reprocessing operations generated approximately 600,000 gallons of liquid high-level radioactive waste (HLW) which was stored in underground tanks. The U.S. Congress passed the West Valley Demonstration Project Act in 1980 (WVDP Act) to solidify and dispose the HLW, and decommission the approximately 167 acres of the WNYNSC used by the reprocessing facility. The WVDP has successfully completed the retrieval and vitrification of the liquid HLW. This report supports the Environmental Impact Statement (EIS) being prepared to address the decommissioning and/or long-term stewardship of the WNYNSC.

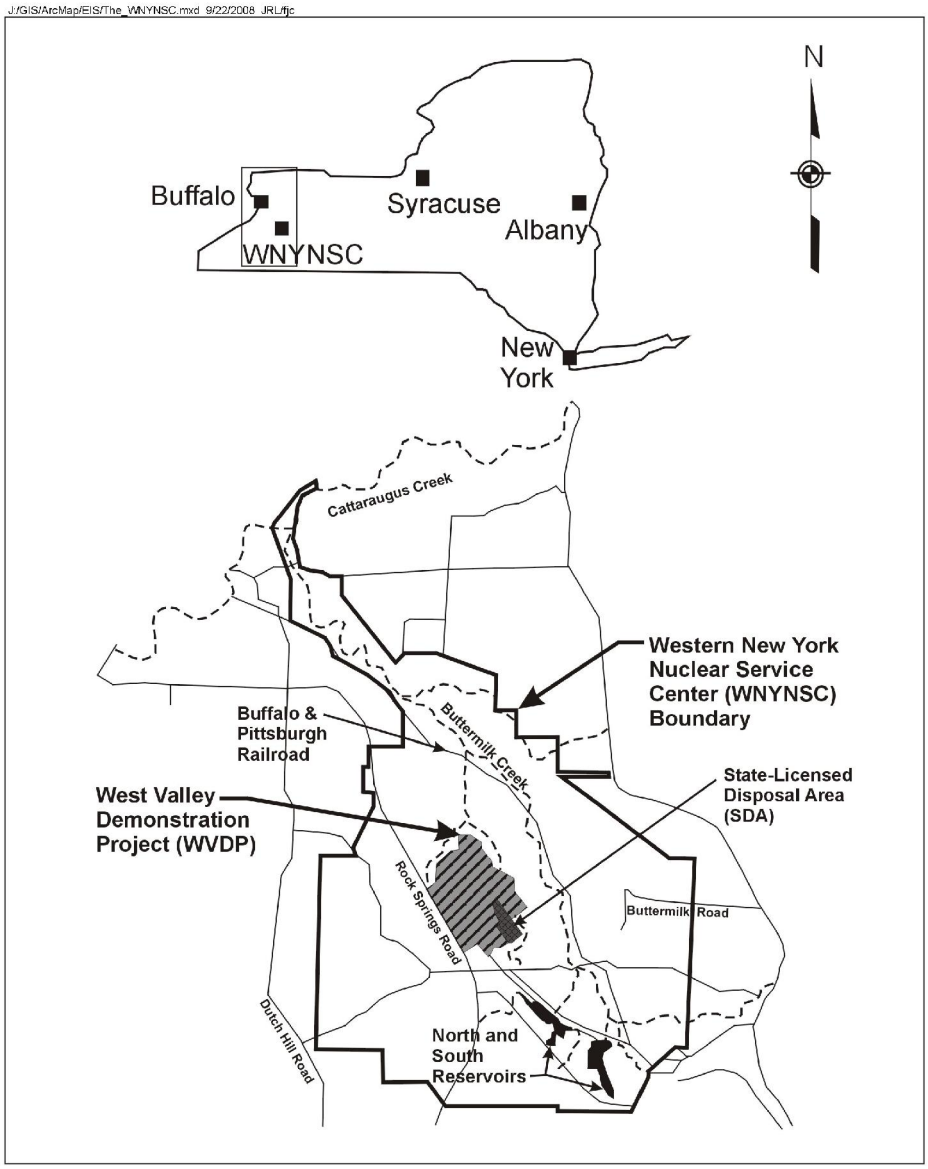

Figure 1-1. The Western New York Nuclear Service Center

The primary facility at the WNYNSC is a former irradiated nuclear fuel reprocessing plant that includes:

- Four associated underground radioactive waste storage tanks; and
- Two radioactive waste disposal areas.

One of the radioactive disposal areas is licensed by the NRC (WMA 7). The other disposal area is licensed by the New York State Department of Health (NYSDOH) and permitted by the New York State Department of Environmental Conservation (NYSDEC) (WMA 8).

The WNYNSC has been divided into 12 Waste Management Areas (WMAs), listed below. The locations of WMA 1 through WMA 10 are shown on Figure 1-2; WMA 11 and WMA 12 are located on the 3,338-acre WNYNSC, but outside of the 167-acre WVDP area.

- WMA 1: Main Plant Process Building and Vitrification Facility Area;
- WMA 2: Low-Level Waste Treatment Facility Area;
- WMA 3: Waste Tank Farm Area;
- WMA 4: Construction and Demolition Debris Landfill;
- WMA 5: Waste Storage Area;
- WMA 6: Central Project Premises;
- WMA 7: NRC-Licensed Disposal Area and Associated Facilities;
- WMA 8: State-Licensed Disposal Area and Associated Facilities;
- WMA 9: Radwaste Treatment System Drum Cell;
- WMA 10: Support Services Area;
- WMA 11: Bulk Storage Warehouse and Hydrofracture Test Well Area; and
- WMA 12: Balance of Site.

The Technical Reports (TRs) are being prepared as data inputs to the draft Decommissioning and/or Long-Term Stewardship Environmental Impact Statement (EIS). The TRs are intended to describe several site-wide closure alternatives and potential conceptual engineering approaches to implement the closure alternatives. All engineered approaches presented are conceptual, typical designs that could be applied to the WNYNSC facilities and are considered to be representative of the alternative being evaluated.

This report describes and presents impacts related to the No Action Alternative. This alternative is included to satisfy the requirements of 40 CFR 1502.14(d), and to set a baseline of existing impacts continued into the future against which to compare impacts of decommissioning action alternatives. The no action examples presented by the Council on Environmental Quality (CEQ) do not imply the inability to take *any* action whatsoever. CEQ states that to construct an alternative that is based on no management at all would be a useless academic exercise. Therefore, the No Action Alternative may be thought of in terms of continuing with the present course of action until that action is changed (Federal Register, 1986, #3). In addition, it was assumed that actions would be taken to ensure compliance with Environmental, Safety, and Health (ES&H) requirements.

Baseline assumptions of the status of various WMA elements at the starting point of the EIS, prior to the implementation of the No Action Alternative activities, are presented in Table 1-1.

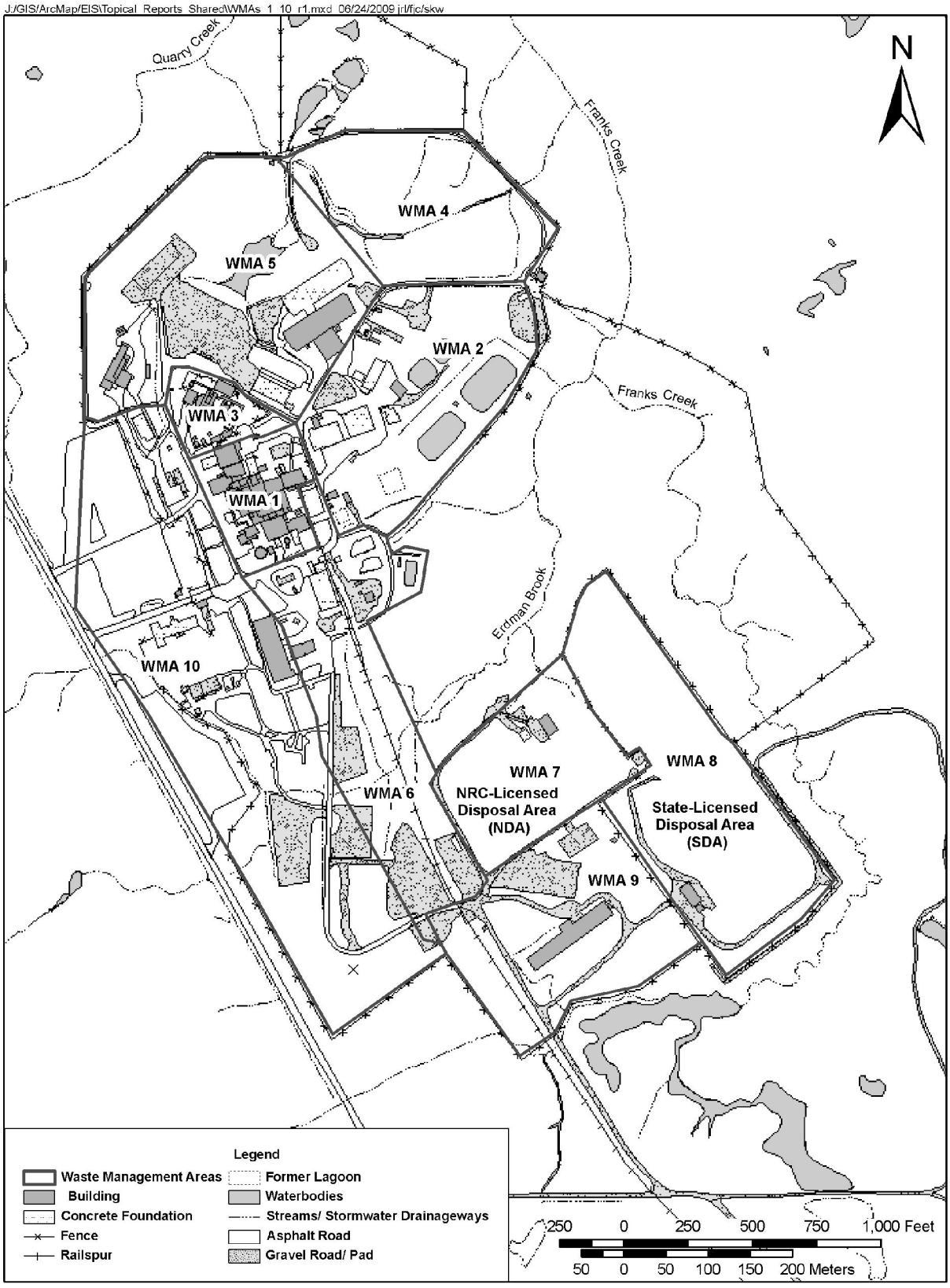

Figure 1-2. Location of Waste Management Areas 1 through 10

Table 1-1. Status of WNYNSC Facilities at EIS Starting Point and No Action Alternative Actions

Area	Facility	EIS Starting Point	No Action Alternative Action
WMA 1	Main Plant Process Building	Deconned to Demolition-Ready	Monitor and Maintain
	Plant Office Building	Operational	Operate
	01-14 Building	Deconned to Demolition-Ready	Monitor and Maintain
	Load-In/Load-Out Facility	Operational	Monitor and Maintain
	Recirculation Vent System Building	Removed to Floor Slab	Monitor
	Contact Size-Reduction Facility	Removed to Floor Slab	Monitor
	Emergency Vehicle Shelter	Removed to Floor Slab	Monitor
	Radwaste Process (Hittman) Bldg.	Removed to Floor Slab	Monitor
	Main Plant Basements, Underground Process Pipelines, and NPP Source Area	In Place	Monitor and Maintain
	Underground Tanks 35104, 7D-13, 15D-6	Operational	Operate
	Off-Gas Trench	In Place	Monitor and Maintain
	Utility Room and URE	Operational	Operate
	Fire Pump House & Storage Tank	Operational	Operate
	Laundry Room	Removed to Floor Slab	Monitor
	Electrical Substation	Operational	Operate
	Vitrification Facility	Deconned to Demolition-Ready	Monitor and Maintain
	MSM Repair Shop Floor Slab	In Place	Monitor
	Cold Chemical Facility Floor Slab	In Place	Monitor
WMA 2	02 Building Floor Slab	In Place	Monitor
	Low-Level Waste Treatment Building (LLW2)	Operational	Operate
	Lagoon 1	Inactive	Monitor
	Lagoons 2–5	Operational	Operate
	Neutralization Pit	Operational	Operate
	Old and New Interceptors	Operational	Operate
	Test and Storage Building Floor Slab	In Place	Monitor
	Solvent Dike	Inactive	Monitor and Maintain
	Vitrification Test Facility	Removed to Floor Slab	Monitor
	Maintenance Shop Floor Slab	In Place	Monitor
	Maintenance Storage Area	Removed to Floor Slab	Monitor
	Vehicle Maintenance Shop	Removed to Floor Slab	Monitor
	Maintenance Shop Leach Field	Inactive	Monitor
	Vitrification Hardstand	Removed to Grade	Monitor
	Fire Brigade Training Area	Inactive	Monitor
	Industrial Waste Storage Area	Removed to Grade	Monitor
	Well Purge Water Storage Locations	Inactive	Monitor
	Wastewater Pipeines	Operational/Inactive	Monitor and Maintain

Table 1-1. Status of WNYNSC Facilities at EIS Starting Point and No Action Alternative Actions

Area	Facility	EIS Starting Point	No Action Alternative Action
WMA 3	Tanks 8D-1, 8D-2, 8D-3, 8D-4	Isolated, with tank and vault drying system in place and operational to evaporate remaining liquid	Monitor and Maintain
	High-Level Waste Tank Pump Storage Vaults	Transfer Pipelines and Pumps Remaining	Monitor
	High-Level Waste Transfer Trench	Inactive	Monitor and Maintain
	Permanent Ventilation System Building	Operational	Operate
	Supernatant Treatment System Support Building	Operational	Operate
	WTF Equipment Shelter & Condensers	Inactive	Monitor and Maintain
	Con-Ed Building	Inactive	Monitor and Maintain
WMA 4	Construction and Demolition Debris Landfill	Inactive, (previously closed)	Monitor and Maintain
WMA 5	Remote-Handled Waste Facility	Deactivated, Awaiting Demolition	Monitor and Maintain
	Lag Storage Building	Removed to Floor Slab	Monitor
	Lag Storage Area 1	Removed to Floor Slab	Monitor
	Lag Storage Area 2 Hardstand	Removed to Grade	Monitor
	Lag Storage Area 3	Removed to Floor Slab	Monitor
	Lag Storage Area 4, includes Shipping Depot	Operational	Operate
	Hazardous Waste Storage Lockers	Removed to Grade	Monitor
	Chemical Process Cell Waste Storage Area	Removed to Grade	Monitor
	Cold Hardstand Area	Removed to Grade	Monitor
	Construction and Demolition Area	Inactive	Monitor
	Vitrification Vault and Empty Container Hardstand	Removed to Grade	Monitor
	Old/New Hardstand Storage Area	Removed to Grade	Monitor
WMA 6	Rail Spur	Operational	Operate
	Old Warehouse	Removed to Floor Slab	Monitor
	Sewage Treatment Plant	Operational	Operate
	Cooling Tower	Removed to Grade	Monitor
	Equalization Basin	Operational	Operate
	Equalization Tank	Operational	Operate
	Demineralizer Sludge Ponds	Inactive	Monitor and Maintain
	WTF Test Towers	North Tower Removed, South Tower Operable	Operate South Tower
	Road-Salt & Sand Storage Shed	Removed to Asphalt	Monitor
	Product Storage Area	Inactive	Monitor
	Low-Level Waste Rail Packaging and Staging Area	Operable, Waste Removed	Operate

Table 1-1. Status of WNYNSC Facilities at EIS Starting Point and No Action Alternative Actions

Area	Facility	EIS Starting Point	No Action Alternative Action
WMA 7	NDA Interceptor Trench	Operational	Operate
	SDA Leachate Transfer Pipeline	Operational	Operate
	Liquid Pretreatment System	Operable	Monitor and Maintain
	NDA Hardstand Staging Area	Removed to Grade	Monitor
	NFS Deep Holes	Inactive, Geomembrane Cap, and Barrier Wall	Monitor and Maintain
	NFS Special Holes	Inactive, Geomembrane Cap, and Barrier Wall	Monitor and Maintain
	Former NDA Lagoon	Inactive, Geomembrane Cap, and Barrier Wall	Monitor and Maintain
	WVDP Disposal Area (trenches/caissons)	Inactive, Geomembrane Cap, and Barrier Wall	Monitor and Maintain
WMA 8	Mixed Waste Storage Facility	Operational	Operate
	SDA Disposal Trenches	Inactive, Geomembrane Cap, Barrier Wall (Trench 4)	Monitor and Maintain
	Former Filled SDA Lagoons	Inactive, Geomembrane Cap	Monitor and Maintain
WMA 9	Radwaste Treatment System Drum Cell	Operable	Monitor and Maintain
	Subcontractor Maintenance Area	In Place	Monitor
	NDA Trench Soil Container Area	Inactive	Monitor
WMA 10	Administration Building	Removed to Floor Slab	Monitor
	Expanded Environmental Lab	Removed to Floor Slab	Monitor
	New Warehouse	Operational	Operate
	Meteorological Tower	Operational	Operate
	Security Gatehouse and Fences	Operational	Operate
	Construction Fabrication Shop	Removed to Floor Slab	Monitor
	Vitrification Diesel Fuel Oil Storage Tank and Building	Removed to Floor Slab	Monitor
WMA 11	Scrap Material Landfill	Inactive	Monitor and Maintain
WMA 12	Railroad Spur (beyond WMA 6)	In Place	Operate
	Dams and Reservoirs	Operational	Operate
	Stream Sediments	In Place	Monitor
	Parking Lots and Roadways	In Place	Monitor
	Contaminated Soil	In Place	Monitor
NPP	North Plateau Plume (Non-Source Area)	In Place	Monitor
	North Plateau GW Recovery System	Operational	Monitor and Maintain
	Pilot-Scale Permeable Treatment Wall	Operational	Monitor
	Full-Scale Permeable Treatment Wall	Operational	Monitor and Maintain
CP	Cesium Prong	In Place	Monitor

2.0 IMPLEMENTATION ACTIVITIES

Under this No Action Alternative, no decommissioning implementation activities would take place. Once the EIS starting point activities are completed, the site would continue to be monitored and maintained as required by State and Federal regulations to protect the health and safety of workers, the public, and the environment.

The site maintenance program would be modified as appropriate for facility and system conditions at the EIS starting point. These conditions would include continued interim storage of the vitrified HLW canisters in the Main Plant Process Building (MPPB), operation of the Waste Tank Farm Tank and Vault Drying System, the installation of a full-scale permeable treatment wall (PTW) near the leading edge of the North Plateau Groundwater Plume.

Facilities would be repaired as necessary to maintain them in a safe, operable condition. Portions of facilities would be replaced periodically to this end, with examples being the roofs of the MPPB and the geomembrane covers over the waste disposal areas. Simiarly, the functioning of the PTW would be periodically restored with the installation of fresh media. These activities would take place during the No Action Alternative and so are not specifically considered implementation activities toward decommissioning.

Capabilities would remain in place to deal with unexpected failures of structures, systems, and components, such as a leaking waste tank, as well as with other site emergencies that may occur. Appropriate site management and oversight would remain in place.

3.0 DATA TABLES AND EXPLANATORY TEXT

This No Action Alternative does not require any implementation activities prior to the start of the stewardship period and thus, no implementation analysis, data tables, or explanatory text is necessary. Consistent with CEQ guidance (refer to Section 1.1.1), during the No Action Alternative stewardship period, actions may be taken consistent with current management practices to ensure protection of the public and the environment. These activities (e.g., periodic replacement of the disposal areas' geomembranes, building roof replacements, and installation of fresh PTW media) are analyzed and discussed in Section 4 as a part of the stewardship activities.

4.0 POST-IMPLEMENTATION/STEWARDSHIP ACTIVITIES AND IMPACTS

This section contains a series of tables which show the estimated impacts and costs associated with the No Action Alternative, which is essentially stewardship of the WNYNSC at the completion of the EIS starting point. The following four categories of engineering data are presented:

- **Resource Requirements** – includes estimated quantities of construction material, consumable materials and supplies, fuel consumption, water use, number of personnel, and typical activity duration;
- **Operational Issues** – includes estimates of injuries and fatalities, environmental radiological and non-radiological emissions and releases, and personnel radiation exposure;
- **Waste Generated** – includes estimated volumes of radioactive, mixed, hazardous, and demolition debris to be shipped off site for disposal; and

- **Cost Estimate** – includes cost estimates for new construction, consumable materials, energy and fuel, labor, and waste disposal/storage.

The activities associated with the stewardship of the site under this alternative have been divided into two categories: (1) those activities expected to occur annually (e.g., building maintenance, environmental monitoring, security); and (2) those activities expected to occur on a periodic basis (e.g., building roof replacement, disposal area geomembrane replacement, PTW media replacement). The impacts and costs associated with each category of activity are shown in the tables provided in this section.

4.1 Resource Requirements

4.1.1 New Construction/Capital Purchases

There are no new construction projects or capital purchases associated with the No Action Alternative.

4.1.2 Consumable Materials

Table 4-1 presents the estimates of the consumable material quantities that would be used during the implementation of the No Action Alternative. The annual WVDP and SDA estimates are based on the assumption that 25% of the Operations work effort (shown in Table 4-3) would occur in a radiation environment. For the roof replacement activities it was assumed that 50% of the Operations and Subcontractor work effort would occur in a radiation environment. For replacement of the NDA and SDA geomembrane covers, the consumable materials estimates were based on URS, 2005, with the SDA cover estimates scaled-up based on the SDA to NDA area ratio. Installation of fresh PTW media (i.e., zeolite) was assumed to be comparable to the amount initially installed (see the Sitewide Close-In-Place Alternative Technical Report). The consumable materials unit usage rates are shown in Appendix A, Table A.6-1.

Table 4-1. Resource Requirements – Consumable Materials

Category	Annual		Periodic (20 to 25 years)				
	WVDP	SDA	MPPB Roof	Other Roofs	PTW Replace	NDA Cover	SDA Cover
Anti-Contamination Clothing	870	neg.	1,600	580	neg.	neg.	neg.
Plastic Sheeting	44	80	1,600	580	neg.	neg.	neg.
Sample Bags	1,200	23	3,900	1,400	neg.	neg.	neg.
Tape	120	neg.	390	140	neg.	neg.	neg.
Filter Papers for Sampling	1,200	neg.	3,900	1,400	neg.	neg.	neg.
Smears for Sampling	2,500	660	9,300	3,400	neg.	neg.	neg.
Herculite Sheeting	25	neg.	93	34	neg.	neg.	neg.
Tygon Tubing for Sampling	120	neg.	470	170	neg.	neg.	neg.
TLDs	neg.	neg.	neg.	neg.	16	37	100
Geomembrane (ft^2)	0	0	0	0	0	296,000	805,000
Roofing Felt (ft^2)	0	0	186,000	68,000	0	0	0
Roofing Asphalt (ton)	0	0	33.0	12.1	0	0	0
Roofing stone (ton)	0	0	105.9	38.9	0	0	0
Zeolite (CY)	0	0	0	0	2,200	0	0
Sealand Containers	0	0	0	0	0	1	3
55-gallon Drums	140	4	0	0	0	0	0
B-25 Boxes (IP-1)	0	0	400	150	0	0	0
B-25 Boxes (Type A)	100	0	0	0	0	0	0
HICs	0	0	0	0	0	0	0
Lift Liners	0	0	0	0	0	8	22

4.1.3 Utilities

Utilities (including water, electricity, natural gas, diesel fuel, and gasoline) were estimated for the No Action Alternative, and are shown in Table 4-2.

Table 4-2. Resource Requirements – Utilities

Category		Annual		Periodic (20 to 25 years)				
		WVDP	SDA	MPPB Roof	Other Roofs	PTW Replace	NDA Cover	SDA Cover
Water (gallons)	Sanitary/Potable	700,000	93,000	290,000	110,000	51,000	120,000	330,000
	Non-Potable	3,200,000	420,000	1,300,000	480,000	230,000	550,000	1,500,000
	Augmentation	21,000	NA	NA	NA	NA	NA	NA
	Total	3,900,000	510,000	1,600,000	590,000	280,000	670,000	1,800,000
Electricity (kW-hrs)		3,000,000	410,000	1,300,000	470,000	220,000	530,000	1,400,000
Natural Gas (1,000 ft^3)		17,000	2,300	7,200	2,600	1,300	3,000	8,100
Fuel Oil (gallons)		7,000	660	neg.	neg.	neg.	neg.	neg.
Diesel Fuel (gallons)		660	neg.	neg.	neg.	11,000	neg.	neg.
Gasoline (gallons)		2,000	60	8,700	3,200	neg.	neg.	neg.

NA = not applicable

During the No Action Alternative stewardship period, the utilities requirements were estimated based on the assumption that they would be proportional to the number of on-site personnel (refer to Table 4-3) (i.e., the larger the number of on-site personnel, the larger the utility usage). The unit usage rates for natural gas, electricity, and water usage are found in WSMS, 2009.

4.1.4 Personnel

Estimated personnel requirements during the No Action Alternative stewardship period are provided on Table 4-3.

Table 4-3. Resource Requirements – Personnel

Category	Annual		Periodic (20 to 25 years)				
	WVDP	SDA	MPPB Roof	Other Roofs	PTW Replace	NDA Cover	SDA Cover
Direct	16.0	0.0	14.0	5.3	0.0	0.0	0.0
Maintenance	1.4	0.0	0.0	0.0	0.1	0.1	0.4
Non-Exempt	9.4	0.0	0.0	0.0	0.8	1.8	4.8
Exempt	29.0	7.0	12.0	4.4	1.9	4.6	12.0
Subcontract	7.2	1.4	0.0	0.0	1.9	4.5	12.0
Total	63.0	8.4	26.0	9.7	4.7	11.0	30.0
Category	**WVDP**	**SDA**	**MPPB Roof**	**Other Roofs**	**PTW Replace**	**NDA Cover**	**SDA Cover**
Planning & Preparation	0.0	0.0	12.0	4.4	0.5	1.3	3.5
Construction	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Operations	63.0	8.4	0.0	0.0	0.0	5.2	14.0
Demolition & Restoration	0.0	0.0	14.0	5.3	4.1	4.5	12.0
Total	63.0	8.4	26.0	9.7	4.7	11.0	30.0

It has been estimated that approximately 63 full-time equivalent (FTE) personnel would be required to monitor and maintain the WNYNSC site, except for WMA 8. These personnel would include Operations personnel who would provide full-time staffing of the site (i.e., 24 hours a day, seven days a week). Also included would be Engineering and Maintenance personnel, as well as personnel within the various Support Organizations, including Quality Assurance, Industrial Hygiene and Safety, Purchasing, Financial, Environmental Affairs, Computer Support, Human Resources, Analytical Labs, and Security. These estimates are based on the 2003 and 2004 CAPR reports; refer to Appendix A, Section A.1.1 for a full description.

Based on data provided in NYSERDA, 2004, it has been estimated that 8.4 FTEs would be required to monitor and maintain the SDA (i.e., WMA 8). Personnel requirement estimates for periodic building roof replacement are based on the actual effort expended to replace the Main Plant Process Building roof between April 1997 and June 2000. For replacement of the SDA and NDA geomembrane covers, the personnel estimates were based on URS, 2005. While the personnel requirements for installation of fresh PTW media were taken from the Sitewide Close-In-Place

Alternative Technical Report.

4.1.5 Time

Figure 4-1 shows a typical schedule of the stewardship activities of the No Action Alternative. In short, the activities necessary to monitor, maintain, and/or operate the WVDP and SDA facilities, as indicated in Table 1-1, would be ongoing, while those activities taken to ensure protection of the public and the environment would be performed periodically (e.g., once every 20 to 25 years), and would be completed within one year.

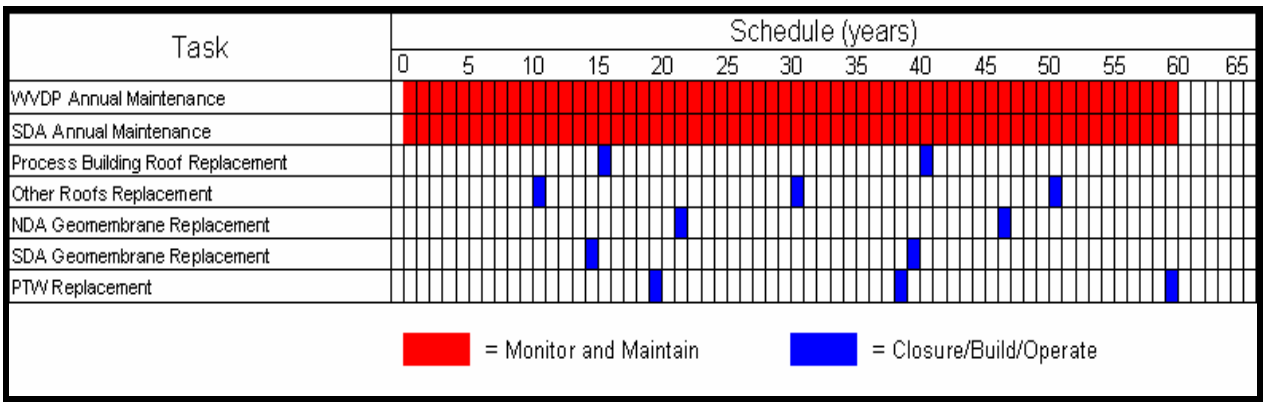

Figure 4-1. No Action Alternative Typical Stewardship Activity Schedule

The 60-year duration of the No Action Alternative stewardship period shown on Figure 4-1 was selected to be consistent with the duration of the Sitewide Removal Alternative. In reality, the No Action Alternative stewardship period is anticipated to last for a period of time that, although unspecified, is expected to last well into the future (i.e., on the order of at least several decades to about 100 years).

4.2 Operational Requirements

4.2.1 Injuries and Fatalities

Based on the estimated personnel requirements shown in Table 4-3, and assumed injury and fatality rates found in (WSMS, 2009, Table 3-2), the estimated number of injuries and fatalities for the various activities during the No Action Alternative stewardship period are presented in Table 4-4.

Table 4-4. Operational Requirements – Injuries and Fatalities

Category	Annual		Periodic (20 to 25 years)				
	WVDP	SDA	MPPB Roof	Other Roofs	PTW Replace	NDA Cover	SDA Cover
Reportable Cases	2.00	0.30	1.00	0.38	0.17	0.42	1.10
Lost Workday Cases	0.95	0.14	0.51	0.19	0.08	0.20	0.56
Fatalities	5.8E-04	9.5E-05	5.9E-04	2.2E-04	5.1E-05	2.1E-04	5.6E-04

4.2.2 Worker Exposure

As derived in Appendix A, Section A.5, the average WVDP employee exposure is 32.4 mrem/yr. Using the average WVDP exposure, and the personnel requirement from Table 4-3, the estimated annual exposure during the No Action Alternative stewardship period would be 2.0 person-rem, as shown in Table 4-5.

Table 4-5. Operational Requirements – Worker Exposure

Category	Annual		Periodic (20 to 25 years)				
	WVDP	SDA	MPPB Roof	Other Roofs	PTW Replace	NDA Cover	SDA Cover
Exposure (person-rem)	2.00	neg.	neg.	neg.	0.25	neg.	neg.

NYSERDA, 2004, indicated that there has been "No recorded exposures over the last 10 years" at the SDA. Therefore, for both the annual SDA monitoring and maintenance and the periodic replacement of the SDA geomembrane cover, worker exposures have been estimated to be negligible. Worker exposure estimates for roof replacement were also assumed to be negligible, due to the fact that low contamination levels are expected on the roofs.

4.2.3 Environmental Releases

Airborne Radiological Release

Airborne radiological releases are reported each year in the ASER (WVNSCO, various). In general, the more recent airborne releases of gross alpha and beta emitters are lower than the historical averages, refer to Appendix A, Section A.7 for the historical trend of airborne radiological releases.

The individual radionuclide releases shown on Table 4-6 are estimated for the EIS starting point period, and the geometric mean, the maximum, and the minimum of the historical WVDP data from the ASER. To account for a revised starting condition and a reduction in activities during the EIS starting point period, the geometric mean of the ASER values for the years 2003–2006 were calculated and then reduced by a factor of 10. Prior to 2003, activities such as vitrification were

still ongoing at WVDP and would therefore not be appropriate to use in estimating the Post-EIS starting point period. The reduction of the geometric mean value by a factor of 10 for this later period (2003–2006) is considered a reasonable estimate of the annual airborne release during the Post-EIS starting point (i.e., monitor and maintain) period.

Table 4-6. Operation Requirements – Annual Radionuclide Airborne Release (Ci)

Nuclide	Post-EIS Starting Point	Historical Data from ASERs		
		Mean*	Minimum	Maximum
Gross Beta	4.04E-06	1.50E-04	9.48E-06	1.51E-03
Gross Alpha	1.35E-07	1.95E-06	3.68E-07	2.26E-05
H-3	2.04E-04	3.31E-02	1.07E-03	4.14E-01
Co-60	1.40E-09	6.42E-08	-5.66E-08	1.95E-06
Sr-90	7.23E-07	2.52E-05	2.91E-06	4.75E-04
I-129	3.26E-06	9.14E-05	1.50E-06	7.43E-03
Cs-137	1.26E-06	4.85E-05	1.43E-06	8.60E-04
Eu-154	5.06E-09	1.83E-07	-6.50E-08	4.74E-04
U-232	8.60E-10	1.52E-08	-1.17E-08	9.19E-08
U-233/234	3.21E-09	3.77E-08	1.70E-09	9.45E-08
U-235/236	7.19E-10	7.96E-09	-3.10E-09	3.90E-08
U-238	2.72E-09	3.29E-08	4.30E-09	7.57E-08
Pu-238	1.96E-08	1.90E-07	4.11E-08	8.68E-07
Pu-239/240	2.68E-08	2.65E-07	6.55E-08	1.16E-06
Am-241	6.08E-08	6.84E-07	1.54E-07	2.78E-06

* Geometric mean calculated from positive airborne release values.

Liquid Effluent Radiological Release

Liquid effluent radiological releases are reported each year in the ASER (WVNSCO, various). The site's primary liquid discharge point is from Lagoon 3. In general, the more recent releases of gross alpha and beta emitters are lower than the historical average for Lagoon 3; refer to Appendix A, Section A.8 for the historical trend of liquid effluent radiological releases.

Table 4-7 shows the geometric mean, the maximum, and the minimum individual radionuclide annual releases from Lagoon 3; an estimate of the Post-EIS starting point releases is also presented. The geometric mean, the minimum and maximum releases are representative of the entire duration of the WVDP. Similar to the airborne radiological releases, the Post-EIS starting point releases were calculated using the geometric mean value for the years 2003–2006 and divided by 10.

Table 4-7. Operational Requirements – Annual Lagoon 3 Radionuclide Release (Ci)

Nuclide	Post-EIS Starting Point	Historical Data from ASERs		
		Mean	Minimum	Maximum
Gross Beta	1.42E-03	2.58E-02	1.14E-02	8.10E-02
Gross Alpha	9.03E-05	9.53E-04	1.54E-04	1.21E-02
H-3	8.78E-03	5.40E-01	5.00E-02	7.24E+00
C-14	3.56E-05	7.93E-04	5.80E-05	1.86E-02
K-40	7.35E-05	9.01E-04	1.40E-04	1.29E-02
Co-60	4.25E-06	5.05E-05	-9.40E-06	2.33E-03
Sr-90	5.35E-04	4.84E-03	2.50E-03	9.89E-03
Tc-99	1.11E-04	5.55E-03	5.77E-04	9.55E-02
I-129	8.07E-06	1.88E-04	5.54E-05	1.65E-03
Cs-137	2.65E-04	5.29E-03	6.67E-04	6.63E-02
U-232	3.83E-05	4.34E-04	1.72E-04	7.22E-04
U-233/234	2.40E-05	3.77E-04	7.70E-05	7.75E-03
U-235/236	1.53E-06	1.43E-05	3.31E-06	1.74E-04
U-238	1.86E-05	2.08E-04	3.24E-05	1.89E-03
Pu-238	6.02E-07	6.36E-06	9.48E-07	5.19E-05

Non-Radiological Airborne Releases

Estimated non-radiological airborne releases due to the on-site operation of equipment and the combustion of natural gas and fuel oil are shown on Table 4-8 and Table 4-9, respectively. The releases during the No Action Alternative stewardship period were based on the estimated amounts of diesel fuel and gasoline consumed, as per Table 4-2, as well as the emission factors found in (WSMS, 2009). Roof replacement equipment releases were based on the assumption that one gasoline-powered piece of equipment (e.g., a lift, a forklift) would be operating at all times during the workday. For replacement of the SDA and NDA geomembrane covers, the equipment releases were based on URS, 2005. The $PM_{2.5}$ fugitive dust emissions can be estimated by multiplying the PM_{10} fugitive dust emissions given on Table 4-8 by 0.15.

Table 4-8. Operational Requirements – Equipment and Fugitive Dust Releases (tons)

Pollutant	Annual		Periodic (20 to 25 years)				
	WVDP	SDA	MPPB Roof	Other Roofs	PTW Replace	NDA Cover	SDA Cover
Particulate Matter (PM_{10})	neg.	neg.	neg.	neg.	neg.	neg.	neg.
Carbon Monoxide	0.3	neg.	1.5	0.5	neg.	neg.	0.2
Hydrocarbons	neg.	neg.	neg.	neg.	neg.	0.1	0.3
Nitrogen Oxides	neg.	neg.	neg.	neg.	neg.	0.9	2.3
Carbon Dioxide	26	neg.	85	31	120	560	1,500
Benzene	neg.	neg.	neg.	neg.	neg.	neg.	neg.
Fugitive Dust (PM_{10})	neg.	neg.	neg.	neg.	neg.	3.2	8.6

Emissions from the combustion of natural gas and fuel oil were based on the estimated consumption, as per Table 4-2.

Table 4-9. Operational Requirements – Combustion Emissions (tons)

Pollutant	Annual		Periodic (20 to 25 years)				
	WVDP	SDA	MPPB Roof	Other Roofs	PTW Replace	NDA Cover	SDA Cover
Particulate Matter (PM_{10})	0.065	0.009	0.027	0.010	0.005	0.011	0.031
Nitrogen Oxides	0.857	0.114	0.358	0.131	0.063	0.149	0.406
Sulfur Dioxide	0.005	neg.	0.002	neg.	neg.	neg.	0.002
Carbon Monoxide	0.720	0.096	0.300	0.110	0.053	0.125	0.341
Carbon Dioxide	1,000	140	430	160	76	180	490
Methane	0.020	0.003	0.008	0.003	0.001	0.003	0.009
Total Organic Compounds	0.094	0.013	0.039	0.015	0.007	0.016	0.045
Volatile Organic Compounds	0.047	0.006	0.020	0.007	0.003	0.008	0.022
Benzene	neg.	neg.	neg.	neg.	neg.	neg.	neg.
Toluene	neg.	neg.	neg.	neg.	neg.	neg.	neg.
Lead	neg.	neg.	neg.	neg.	neg.	neg.	neg.

4.3 Wastes for Disposal

Estimated volumes of waste to be shipped off site for disposal are presented in Table 4-10.

Table 4-10. Waste Volumes for Off-Site Disposal (ft^3)

Waste Type	Annual		Periodic (20 to 25 years)				
	WVDP	SDA	MPPB Roof	Other Roofs	PTW Replace	NDA Cover	SDA Cover
Construction and Demolition Debris	1,100	30	neg.	neg.	neg.	neg.	neg.
Hazardous Waste	26	neg.	neg.	neg.	neg.	neg.	neg.
LSA Waste	neg.	neg.	neg.	neg.	72,000	1,800	4,800
Class A Waste	10,000	30	36,000	13,000	neg.	neg.	neg.
Class C Waste	neg.	neg.	neg.	neg.	neg.	neg.	neg.
Low-Level Mixed Waste	neg.	neg.	neg.	neg.	neg.	neg.	neg.

In Appendix A, the basis for how these waste off-site disposal volumes were estimated is discussed in Section A.9.1 for Construction and Demolition Debris (CDD), Section A.9.2 for Hazardous and Low-Level Mixed Wastes, and Section A.9.3 for Low-Level Radioactive Waste.

4.4 Costs

The estimated annual and periodic costs to monitor and maintain the WNYNSC are shown on Table 4-11.

Table 4-11. Total Cost Estimate (Y2008)

Category	Annual		Periodic (20 to 25 years) Cost				
	WVDP	SDA	MPPB Roof	Other Roofs	PTW Replace	NDA Cover	SDA Cover
Material	$1,400,000	$320	$1,700,000	$610,000	$1,800,000	$410,000	$1,100,000
Labor	$6,100,000	$1,500,000	$2,000,000	$720,000	$890,000	$1,500,000	$4,100,000
Waste Disposal	$270,000	$1,300	$860,000	$310,000	$860,000	$61,000	$110,000
Contingency	$1,900,000	$370,000	$1,100,000	$410,000	$890,000	$490,000	$1,300,000
Total Cost (2008)	$9,700,000	$1,900,000	$5,700,000	$2,100,000	$4,400,000	$2,500,000	$6,600,000

The annual cost estimate to monitor and maintain the WVDP site was based on actual cost data found in the 2003 and 2004 CAPRs, as described in Appendix A, Section A.1. Likewise, the annual cost estimate to maintain the SDA was based on information provided by NYSERDA, as described in Appendix A, Section A.2. The cost estimate for the periodic replacement of the Main Plant Process Building roof was based on experience from the last time that the roof was replaced (i.e., April 1997 to June 2000) (refer to Appendix A, Section A.3). The cost estimate for replacement of the PTW media was taken from the Sitewide Close-In-Place Alternative Technical Report. Where necessary, these actual cost data were supplemented with additional data in order to complete the cost estimates. For example, waste disposal costs were estimated and added. Also, a 25% contingency factor was applied to the subtotal of labor, materials, and waste disposal. Finally, NDA and SDA geomembrane replacement costs were based on URS, 2005 (refer to Appendix A, Section A.4).

Given the typical schedule shown on Figure 4-1, Figure 4-11 shows the total cost by stewardship year for the No Action Alternative.

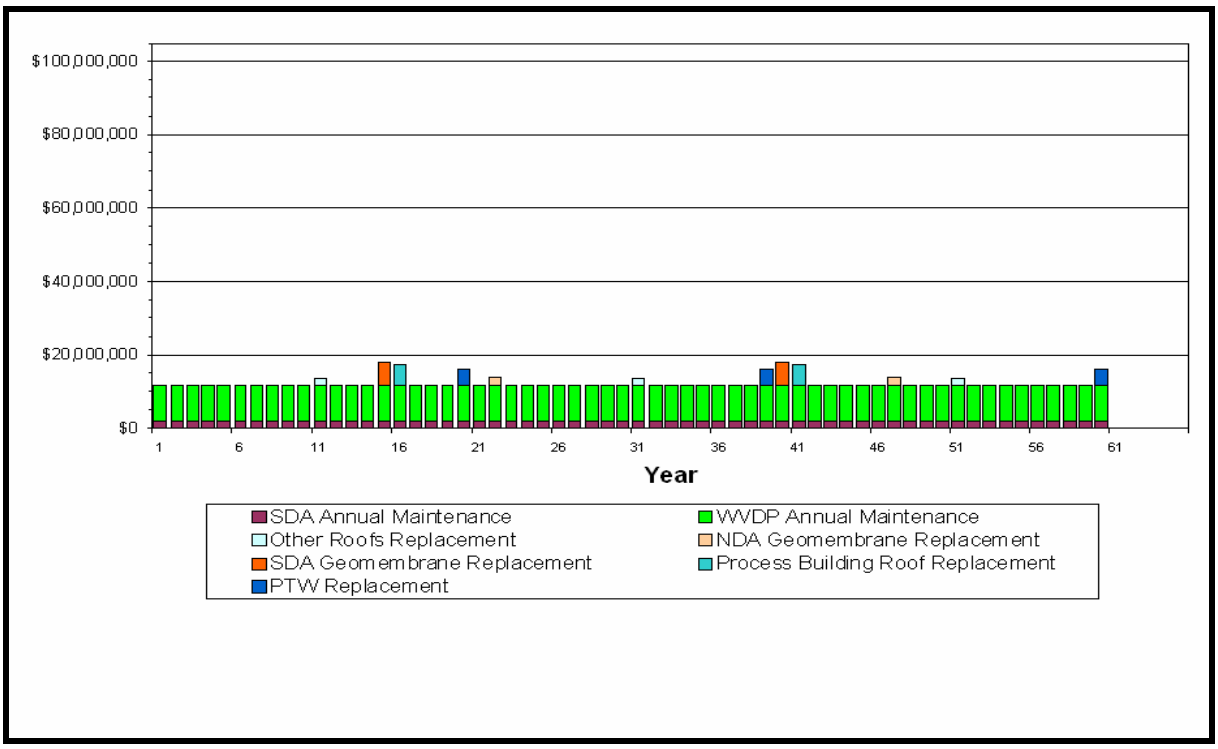

Figure 4-2. Total Costs (Y2008) by Stewardship Year

4.4.1 LLW Disposal Locations

For this report, low-level radioactive waste (including low-specific activity waste) from the WVDP was assumed to be shipped to either the DOE facility or a commercial disposal facility. Table 4-12 shows the disposal costs estimated for both of the sites analyzed for disposal of LLW generated during the No Action Alternative stewardship period. The values in Table 4-12 can be used to estimate the total No Action Alternative cost for LLW disposal at a commercial site. Since the Nevada Test Site only receives LLW from DOE facilities, it was assumed that LLW from the SDA would only be disposed of at a commercial facility.

Table 4-12. Waste Transportation and Disposal Cost Estimate (Y2008)

Category	Annual Cost*		Periodic (20 to 25 years) Cost*				
	WVDP	SDA	MPPB Roof	Other Roofs	PTW Replace	NDA Cover	SDA Cover
DOE Facility	$270,000	N.A.	$860,000	$310,000	$860,000	$61,000	N.A.
Commercial	$260,000	$1,300	$870,000	$320,000	$860,000	$41,000	$110,000

* Costs do not include contingency.
N.A. - Not applicable, waste from SDA would not go to a DOE facility. Commercial cost applied instead.

The above waste transportation and disposal costs are based on the *standard* TR assumptions, as described in WSMS, 2008.

5.0 REFERENCES

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APPENDIX A: NO ACTION ALTERNATIVE ESTIMATING BASIS

Many of the assumptions used for estimating the impacts and costs that would be associated with accomplishing the decommissioning under the different alternatives being evaluated in the EIS can be found in Section 3 of Western New York Nuclear Service Center – Facility Description and Methodology Technical Report (WSMS, 2009). However, as opposed to the other alternatives being evaluated for the EIS, the No Action Alternative would continue to perform the current activities at the WVDP. Thus, many of the No Action Alternative impacts were based on WVDP current activities instead of using the estimating basis described in WSMS, 2009. For example, the No Action Alternative analysis used recent experience at the WVDP by utilizing the Cost Account Planning Reports (CAPRs) from 2003 and 2004 to estimate the annual personnel and cost requirements. Likewise, airborne and aqueous radiological releases were based on the results given in the Annual Site Environmental Reports (ASERs). Finally, data concerning the State-Licensed Disposal Area (SDA) were provided by New York State Energy Research and Development Authority (NYSERDA, 2004).

This appendix describes the estimating bases unique to the No Action Alternative. For those estimating methodologies and parameters not specifically discussed in this appendix (e.g., injuries and fatalities, noise, emission factors, cost, etc.), the assumptions and estimating bases described in WSMS, 2009 were used for the No Action Alternative.

A.1 WVDP MONITOR AND MAINTENANCE

A.1.1 Labor and Cost

The budget and personnel requirements during the No Action Alternative stewardship period were estimated based on recent experience at the WVDP. Each year of the WVDP, work tasks are defined and costs to perform those tasks are estimated. For two recent years (i.e., FY03 and FY04), Table A.1-1 shows the categories of work that were defined, and the estimated fraction of the total budget allocated for each category. Many of the Table A.1-1 work categories have two or more subcategories associated with them. The Table A.1-1 FY03 and FY04 data were taken from cost account planning reports (CAPRs) prepared by the site's management and operating (M&O) contractor.

The first step in developing the No Action Alternative stewardship period budget was to eliminate those work categories and/or subcategories that are not anticipated as being required. By their descriptions, it is obvious that many of the Table A.1-1 work categories would not be required during the stewardship period (e.g., all the decontamination tasks, RHWF construction). The three columns on the right of Table A.1-1 show the work categories that are expected to be required during the stewardship period based on data from FY03 and FY04, and the average of both years. The 10 subcategories that contribute the most to the estimated budget are shown on Table A.1-2. As anticipated, the budget for the stewardship period is dominated by operations and maintenance categories of work.

The second step in developing the No Action Alternative stewardship period budget was to reduce the estimated budget for each Table A.1-2 subcategory from its current operational level to reflect the reduced amount of work anticipated during the stewardship period. As Table A.1-2 shows, of the work subcategories assumed to be necessary during the stewardship period, Site Operations is the largest contributor to the budget. The FY03 and FY04 Site Operations budgets allowed for approximately 54 and 61 FTEs, respectively. In (DOE, 2006), the DOE "proposes to demolish and remove 42 unneeded and unused

building and other structures," plus three associated building slabs. Additionally, the DOE intends to achieve the EIS starting point for the WVDP prior to the start of the activities described in the Decommissioning and/or Long-Term Stewardship EIS. The EIS starting point includes the decontamination of the Main Plant Process Building (MPPB), the Remote-Handled Waste Facility (RHWF), and the Vitrification Facility, and the deactivation, decontamination, and removal of all DOE-managed facilities (foundations remain), with the exception of the RHWF, the Vitrification Facility, the MPPB, and any support facilities required for the interim storage of the (HLW) canisters.

With the removal of approximately 45 facilities, plus the additional reduction allowed by placing the WVDP in the EIS starting point, the potential exists for a significant reduction in the number of Site Operations workers necessary to maintain the site. For the No Action Alternative stewardship period, it was assumed that three (3) Site Operations workers would be on site at all times, plus one additional Site Operations worker would be on site during the first shift. Assuming that each worker works 1,760 hours per year, a total of 16.1 full-time equivalent (FTE) Site Operations workers would be required. Thus, the No Action Alternative stewardship Site Operations budget was estimated by multiplying the FY03 and FY04 budgets by (16.1/54 =) 29.8% and (16.1/61 =) 26.4%, respectively. It was further assumed that two (2) Security subcontractor personnel would be on site 24 hours per day, 7 day per week, or about 10.0 FTEs. Thus, the monitor and maintain Security subcontractor budget was estimated by multiplying the FY03 and FY04 budgets by (10.0/23 =) 43.5% and (10.0/25 =) 40.0%, respectively. Finally, the budgets for all of the other work categories were assumed to be reduced in the same proportion as the Site Operations budget.

Table A.1-1. WVDP Monitor and Maintain Budget Breakdown Estimate

CAPR Category		Budget		Monitor & Maintain		
ID	**Descriptor**	**FY03**	**FY04**	**FY03**	**FY04**	**Ave.**
107100	Site Operations & Infrastructure	19.3%	23.6%	62.9%	77.8%	70.3%
107300	Safe Storage of Waste	3.9%	4.3%	12.7%	12.6%	12.7%
109100	Safeguards & Security	2.4%	2.4%	7.9%	8.0%	7.9%
107500	HLW Facilities Management	6.6%	0.1%	13.4%	0.0%	6.7%
107200	Environmental Restoration	0.9%	0.4%	2.9%	1.2%	2.0%
106200	Low-Level Waste (LLW) Disposition	1.8%	4.0%	0.2%	0.4%	0.3%
105210	Vitrification Facility Decontamination	0.2%	19.5%	0.0%	0.0%	0.0%
105120	Extraction Cells Decontamination	7.0%	12.6%	0.0%	0.0%	0.0%
106100	Remote-Handled Waste Facility (RHWF)	20.5%	11.4%	0.0%	0.0%	0.0%
105110	Head End Cells Decontamination	7.3%	7.2%	0.0%	0.0%	0.0%
107400	Site Disposition Planning	6.3%	5.2%	0.0%	0.0%	0.0%
106500	Sodium Bearing Waste Disposition	1.8%	3.2%	0.0%	0.0%	0.0%
105310	Facility Characterization	5.8%	3.1%	0.0%	0.0%	0.0%
105140	Project Facilities Decon Infrastructure Mgmt	2.0%	1.8%	0.0%	0.0%	0.0%
106400	Transuranic (TRU) Disposition	0.4%	1.2%	0.0%	0.0%	0.0%
10A999	WVDP Administrative	0.3%	0.0%	0.0%	0.0%	0.0%
105130	Balance of Plant Decontamination	5.6%	0.0%	0.0%	0.0%	0.0%
103200	Spent Nuclear Fuel Staging and Shipment	4.4%	0.0%	0.0%	0.0%	0.0%
103100	Fuel Receiving and Storage Area Decon	3.3%	0.0%	0.0%	0.0%	0.0%

Table A.1-2. Top Ten Subcategory M&M Budget Contributors

CAPR Subcategory		Contribution		
ID	Descriptor	FY03	FY04	Ave.
107100001	Site Operations	41.3%	45.9%	43.6%
107100002	Site Maintenance	12.3%	18.8%	15.5%
107300003	Waste Storage Facilities Management	7.7%	7.7%	7.7%
107500002	HLW Surveillance & Maintenance	13.3%	0.0%	6.6%
109100001	Physical Protection	4.2%	4.6%	4.4%
107100007	Infrastructure Tasks	4.2%	1.9%	3.1%
107300001	Radioactive Waste Management	2.7%	3.2%	2.9%
107100011	Environmental Protection	0.0%	5.3%	2.6%
107100004	Analytical & Process Chemistry Lab Op's	1.7%	3.4%	2.5%
109100002	Cyber Security	2.1%	2.0%	2.0%
Total for Remaining 15 Subcategories		10.5%	7.3%	8.9%

In order to estimate the total number of on-site personnel during the No Action Alternative stewardship period, the direct-billed FTEs estimates from the FY03 and FY04 budget estimates were coupled with data from concurrent organization charts for the site's M&O contractor. The ratio of indirect to direct FTEs was assumed to remain unchanged from the FY03 and FY04 levels during the stewardship period. Table A.1-3 shows the on-site staffing for FY03 and FY04, and the estimated staffing during the No Action Alternative stewardship period.

Table A.1-3. WVDP Monitor and Maintenance Personnel Estimates (FTEs)

Category			Actual		Monitor & Maintenance		
			02/03	06/04	FY03	FY04	Ave.
M&O Contractor	Direct	Management	48	46	7.8	6.0	6.9
		Exempt	115	122	15.1	13.0	14.1
		Non-Exempt	50	56	4.6	6.7	5.6
		Hourly	105	127	21.7	17.4	19.6
		Total Direct	318	351	49.2	43.1	46.2
	Indirect	Management	26	23	4.0	2.8	3.4
		Exempt	63	50	13.2	6.2	9.7
		Non-Exempt	64	49	5.9	6.0	5.9
		Hourly	11	10	2.3	1.2	1.8
		Total Indirect	164	132	25.4	16.2	20.8
Total M&O			482	483	74.6	59.3	67.0
Security			23	25	10.0	10.0	10.0
Total On site			505	508	84.6	69.3	77.0

The budget estimate for the No Action Alternative stewardship period was developed based on the same FY03 and FY04 data as used for the personnel estimates. Table A.1-4 shows the resulting stewardship period budget estimates, and compares them to the FY03 and FY04 actual budgets. The labor budget estimate has been broken into direct and indirect

labor, and materials and services (M&S). WVNSCO, 2003 indicated that $24.85M of the $54.38M labor FY03 budget was for overhead. The same percentage of the stewardship period labor budget was allocated for overhead, and was divided into indirect labor and M&S budgets, based on information provided by Wiesen, 2003 regarding actual WVDP overhead expenditures during a recent year. The fractional contribution of Subcontractors and Materials & Services are reduced during the stewardship period primarily due to the completion of the construction of the RHWF. The primary Subcontractor costs during the stewardship period are for site security and environmental monitoring. The FY03 and FY04 budgets did not explicitly include a contingency allowance. To be consistent with the TRs being prepared for the other alternatives and consistent with DOE G 430.1-1, Chapter 11, a contingency factor of 25% has been included in the No Action Alternative stewardship period budget estimate.

Table A.1-4. WVDP Monitor and Maintenance Annual Budget Estimate

Category	Actual Budgets		Monitor & Maintenance Estimates		
	FY03	FY04	FY03	FY04	Average
Labor	$54,375,692	$59,689,721	$7,615,840	$6,370,383	$6,993,112
Direct	$29,525,692	$32,411,180	$4,135,358	$3,459,082	$3,797,220
Indirect	$24,850,000	$27,278,541	$1,782,206	$1,490,753	$1,636,479
Overhead			$1,698,276	$1,420,549	$1,559,412
Materials & Services	$15,393,867	$23,456,262	$1,342,345	$1,147,417	$1,244,881
Subcontracts	$33,713,128	$19,429,453	$2,792,666	$2,771,148	$2,781,907
Baseline Budget	$103,482,687	$102,575,436	$11,750,851	$10,288,948	$11,019,900
Contingency	$0	$0	$2,937,713	$2,572,237	$2,754,975
Total	$103,482,687	$102,575,436	$14,688,564	$12,861,186	$13,774,875

A.1.2 WVDP Waste

WVDP-087 (WVNSCO, 2001), Attachment C provides the 2005 generation goals of the Waste Minimization/Pollution Prevention Awareness Plan for the various types of waste generated by the WVDP, including low-level radioactive, hazardous, mixed, and clean waste. Because there is expected to be fewer activities during the stewardship period, the WVDP-087 goals are believed to represent estimates of the annual No Action Alternative stewardship period waste generation. Additional discussion of waste generation during the No Action Alternative stewardship period is provided in Section A.9.

A.2 SDA MONITORING AND MAINTENANCE

Monitoring and maintenance of the State-Licensed Disposal Area is not part of the West Valley Demonstration Project, and has been performed by the New York State Energy Research and Development Authority (NYSERDA). In 1983, NYSERDA assumed management responsibility for the SDA from Nuclear Fuel Services. In the 1990s, NYSERDA focused its efforts on minimizing water infiltration through an active maintenance program. Infiltration control measures, consisting of a geomembrane cover over the entire SDA and installation of a belowground barrier wall, have been successful in eliminating increases in trench water levels. During the No Action Alternative, these infiltration control measures would be monitored and maintained.

NYSERDA, 2004 provided historical data on the resources and impacts associated with the management of the SDA. Some Section 4 estimates were taken directly from the NYSERDA data (e.g., seven FTEs to conduct and manage the SDA, waste volumes, occupational exposures, radiological and non-radiological effluents, etc.), while other estimates were calculated based on the NYSERDA data and assumptions that are consistent with the Technical Reports being prepared for the other alternatives.

A.3 ROOF REPLACEMENT

Replacement of the roofs of the MPPB, RHWF, STS Support Building, and the PVS Building would be expected to occur about every 20 to 25 years. Because these roof replacements would occur so infrequently, the impacts and costs associated with this effort are not included in the annual monitor and maintenance estimates.

A.3.1 Labor, Material, and Cost

Between April 1997 and June 2000, the roofs of the MPPB was replaced. Data provided from that effort served as the basis for the resources and cost estimates for the future periodic roof replacements.

The MPPB roof replacement was performed under two subcontracts: 19-89413-C-CA and 19-90193-C-CA. Invoices from these two subcontracts were reviewed, and data is summarized in Table A.3-1. In addition to the MPPB roofs, the roofs of the Test and Storage Building, the Maintenance Building, the Lag Storage Building, the Lag Storage Addition 4 tent, and Office-Building 1 (OB-1) were replaced under the two contracts. The right two columns of Table A.3-1 show the estimated cost for the replacement of the MPPB roof only.

Table A.3-1. Actual Costs for Main Plant Process Building Roof Replacement

Item		Total Invoice		MPPB Only	
		Work-hours	Costs	Work-hours	Costs
Labor	Administration	16,232.5		12,834.6	
	General	10,245.7		7,955.2	
	Demobilize	486.0		358.6	
	Roof Work	32,266.8		25,307.3	
	Total	59,231.0	$2,142,370.85	46,455.7	$1,680,290.86
Material			$613,323.84		$481,038.31
Equipment			$544,984.66		$427,438.95
Subcontract (M&E)			$14,864.88		$11,658.73
Total			$3,315,544.23		$2,600,426.85

Included under the Administration category in Table A.3-1 are the Project Manager, the Project Engineer, the Site Supervisor, and the Safety Professional. The General category includes mobilization, training, etc.

The Material category includes such items as roof material, personnel protective equipment, lumber, etc. The Equipment category includes such items as scaffolding, lifts, forklifts, air compressors, hydrocutters, etc. The Subcontract (M&E) category includes materials and equipment items that the roofing subcontractor contracted to others. The estimate of the amount of roof material consumed was derived from Means, 2000, which gives data for the construction of a typical four-ply built-up roof.

A.3.2 Waste

The Table A.3-1 roof replacement costs do not include the cost associated with the disposal of material removed from the roofs. WVDP-280 indicates that 408 B-25 boxes (i.e., 90 ft^3 per box) of low-level radioactive waste (LLW) were generated during the roof replacement. In addition, WVDP-313 (WVNS, 1998) indicates that 72 S-70 containers (i.e., 70 ft^3 per container) of LLW were generated during the replacement of the Utility Room (UR) and the UR Expansion roofs. The LLW in these boxes and containers includes removed roofing material and associated media such as ballast stone, anti-contamination clothing, herculite, etc. It has been estimated that a total of 35,700 ft^3 of LLW would need to be disposed of due to the replacement of the MPPB roof.

A.4 GEOMEMBRANE REPLACEMENT

As with building roofs, the geomembrane covers over the NDA and SDA would need to be replaced periodically during the No Action Alternative stewardship period. The estimates of the impacts (including material consumed) and costs associated with the installation of the new NDA geomembrane cover were taken from URS, 2005. Only those impacts and costs associated with the construction of the geomembrane cover were included. Similarly, for replacement of the SDA geomembrane cover, the impacts and costs were scaled-up from the NDA estimates based on the ratio of the surface areas of the two disposal areas. Replacement of the geomembranes was assumed to have the same support labor (e.g., non-exempt, exempt, and management employees) as the 2006 site M&O contractor (WSMS, 2009, Table 3-1). The impacts and costs associated with the removal of the old geomembrane have been assumed to be small compared to those associated with the installation of the new geomembrane.

A.4.1 Waste

URS, 2005 did not provide an estimate of the volume of waste generated during the replacement of the disposal area geomembrane cover. For this report a waste volume estimate has been made based on the size and thickness of the cover, and an assumed packing efficiency of 66.7% (for textiles a packing efficiency of ~80% is the practical upper limit, with hydraulic pressure assistance). Because the geomembrane is located on the surface, well away from the buried waste, it is not expected that the geomembrane cover would become contaminated, and would likely be able to be disposed of as CDD. Nonetheless, because there is a slight chance of contamination, the calculated volume of waste generated due to the replacement of the geomembrane covers has been shown as being low-specific activity waste on Table 4-10.

A.5 RADIOLOGICAL OCCUPATIONAL EXPOSURES

Radiation exposure to operations workers was estimated on a task-by-task basis. The estimates were made based upon the historical records at the WVDP (Brooks, 2003) and the DOE-published annual occupational radiation report (DOE, not dated). Both the WVDP and DOE records take into account the nature of the work, the radiation fields where the work was performed, and the total amount of radiation exposure recorded by all workers involved. This approach was used (1) to reflect local work practices, (2) to assure that the exposures received by all people involved in a task, such as maintenance workers, were taken into account, and (3) to assure that exposures received when responding to unanticipated "contingency" events were taken into account.

Figure A.5-1 shows the recorded WVDP occupational exposure from 1996 to 2001 (Brooks, 2003). Beginning in 1999, portions of the Main Plant Process Building have undergone decontamination, with corresponding occupational exposures. Since it is not expected that there would be any similar decontamination operations during the No Action Alternative stewardship period, Figure A.5-1 shows the exposure without these D&D Operations group contributions. The average annual total occupational exposure, without the contribution from the D&D Operations group is 9.6 person-rem, as shown by the dotted line on Figure A.5-1.

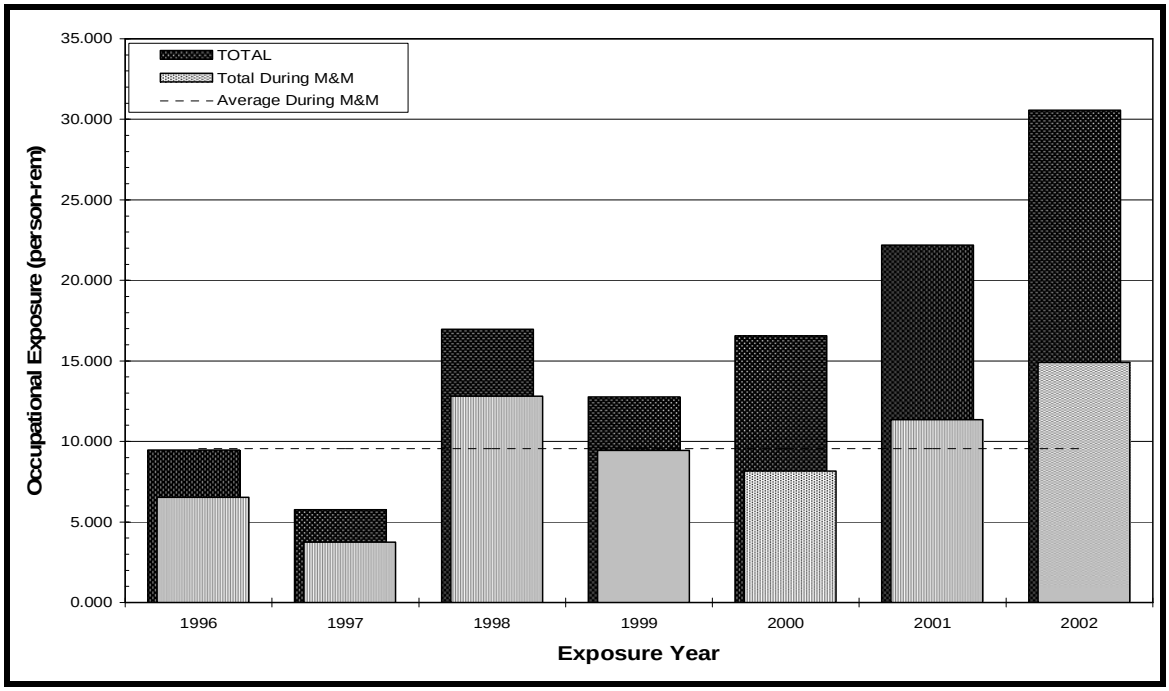

Figure A.5-1. Historical WVDP Occupational Exposure

In 2002, the total WVDP occupational exposure was 15.6 person-rem (not including D&D Operations), and there were (at the end of the year) 482 employees on site. Therefore, the average employee exposure in 2002 was approximately 32.4 millirem.

A.6 RESOURCE REQUIREMENTS

A.6.1 Consumables

Consumable materials were those things that would be needed or used by the direct labor during the No Action Alternative stewardship period. These included PPE, radiological control materials, small tools, waste packages, and the like. Other consumable materials, such as office and janitorial supplies, were accounted with overhead costs.

Health Physics Supplies and Equipment

PPE consumption was based upon an assumption that one radiation worker would make one entry into a contaminated area per day. PPE includes re-usable equipment such as respirators, and single-use equipment, such as paper overalls. Quantities of other consumables were estimated based on the usage rates provided in Table A.6-1.

Table A.6-1. Consumable Material Usage Rates

Consumable	Usage Rate	Units
Anti-Contamination Clothing	1	per worker per day
Plastic Sheeting	1	rolls per month
Sample Bags	10	per crew-day
Respirator Cartridges	NA	per in-cell worker per day
HEPA Filter Replacements	1	per crew-year
Bioassay Containers	1	per worker per year
Tape	1	rolls per crew per day
Filter Papers for Sampling	10	per crew-day
Smears for Sampling	100	per crew per week
Herculite Sheeting	1	rolls per crew per week
Tygon Tubing for Sampling	5	feet per crew per week
TLDs	1	per worker per year
Small Tools	NA	per in-cell worker per week

NA = not applicable, in-cell work is not anticipated

A.7 AIRBORNE RADIOLOGICAL RELEASE

Airborne radiological releases are reported each year in the ASERs (WVNSCO, various). Table A.7-1 shows the airborne radiological releases from each release point for the year 2006. As shown, the airborne radiological release is dominated by the release from the MPPB stack. Therefore, the MPPB stack has been used as a surrogate for all site airborne release.

In the early 1980s the airborne releases were relatively high, but decreased during the late 1980s and early 1990s, and during the late 1990s they tended to level off. The more recent data concerning beta and alpha releases tend to be lower than the historical mean for the MPPB stack. No association between on-site activities (e.g., vitrification) and the airborne release of radionuclides could be identified.

Table A.7-1. 2006 Airborne Radionuclide Release from Each Release Point (Ci)

Nuclide	ANSTACK	ANVITSK	ANCSSTK	ANSTSTK	ANCSPFK	ANRHWFK	OVEs/PVUs
Gross Beta	9.48E-06	-3.50E-08	-2.40E-08	-3.05E-09	2.27E-09	-2.86E-08	6.28E-09
Gross Alpha	4.31E-07	1.00E-10	-2.03E-09	-9.50E-10	-1.37E-10	-5.70E-10	-1.81E-09
H-3	1.21E-03	NR	NR	-4.65E-05	N.R.	NR	NR
Co-60	1.00E-09	6.16E-09	1.16E-09	9.30E-10	2.43E-10	-8.00E-11	5.40E-10
Sr-90	2.91E-06	2.40E-09	1.38E-09	-3.30E-10	4.75E-10	1.30E-09	8.30E-10
I-129	2.29E-05	1.90E-08	6.65E-08	8.14E-06	1.16E-07	6.38E-08	N.R.
Cs-137	3.55E-06	3.72E-09	7.00E-11	3.58E-09	1.32E-10	-1.49E-09	6.55E-10
Eu-154	-1.20E-08	-1.78E-08	-1.24E-08	-3.02E-09	-5.00E-10	-4.60E-09	-1.00E-09
U-232	2.49E-09	-9.40E-10	1.64E-10	-6.30E-11	-2.24E-11	1.60E-10	-4.70E-11
U-233/234	1.73E-08	9.97E-09	3.32E-09	1.87E-09	5.69E-10	6.32E-09	1.36E-09
U-235/236	4.80E-09	2.06E-09	8.28E-10	2.42E-10	1.25E-10	1.84E-09	2.06E-10
U-238	1.63E-08	6.12E-09	4.37E-09	1.80E-10	4.40E-10	6.74E-09	1.03E-09
Pu-238	5.38E-08	0.00E+00	-1.39E-10	1.71E-10	0.00E+00	-1.21E-10	2.00E-11
Pu-239/240	9.08E-08	1.80E-10	-6.00E-11	2.12E-10	7.84E-11	1.31E-10	1.16E-10
Am-241	1.83E-07	-4.60E-10	1.11E-10	-2.11E-10	1.95E-11	1.22E-10	-4.50E-11

ANSTACK	Main Plant Process Building Ventilation Stack
ANVITSK	Vitrification System (HVAC) Ventilation Stack
ANCSSTK	01-14 Building Ventilation Exhaust
ANSTSTK	Supernatant Treatment System Ventilation Stack
ANCSPFK	Container Sorting and Packaging Facility Stack
ANRHWFK	Remove-Handled Waste Facility Stack
OVEs/PVUs	Outdoor Ventilation Enclosures/Portable Ventilation Units
NR	Not Reported

Figure A.7-1 shows the historical airborne releases of gross beta- and alpha-emitting radionuclides, the dotted lines represent the geometric mean for the entire duration. Figures A.7-2 and A.7-3 breakdown the airborne releases for specific radionuclides. Figure A.7-2 shows the historical emissions for H-3, Sr-90, I-129, and Cs-137, while Figure A.7-3 shows the historical emissions for U-235/236, U-238, Pu-238, Pu-239/240, and Am-241.

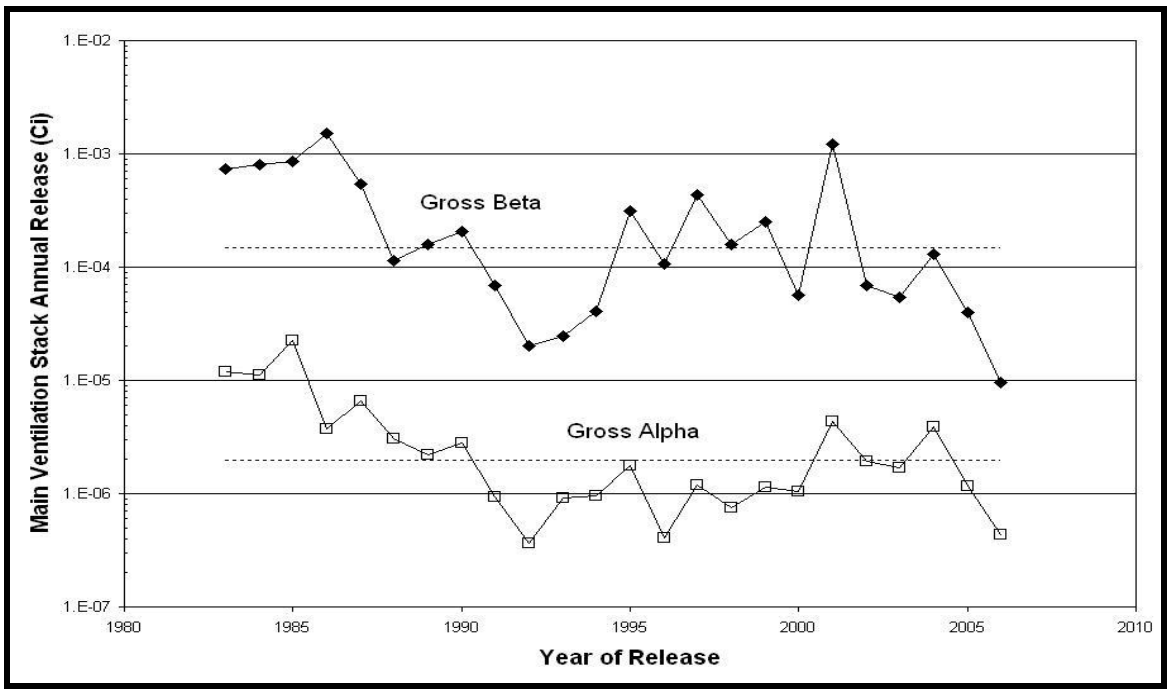

Figure A.7-1. Historical Main Ventilation Stack Radiation Releases

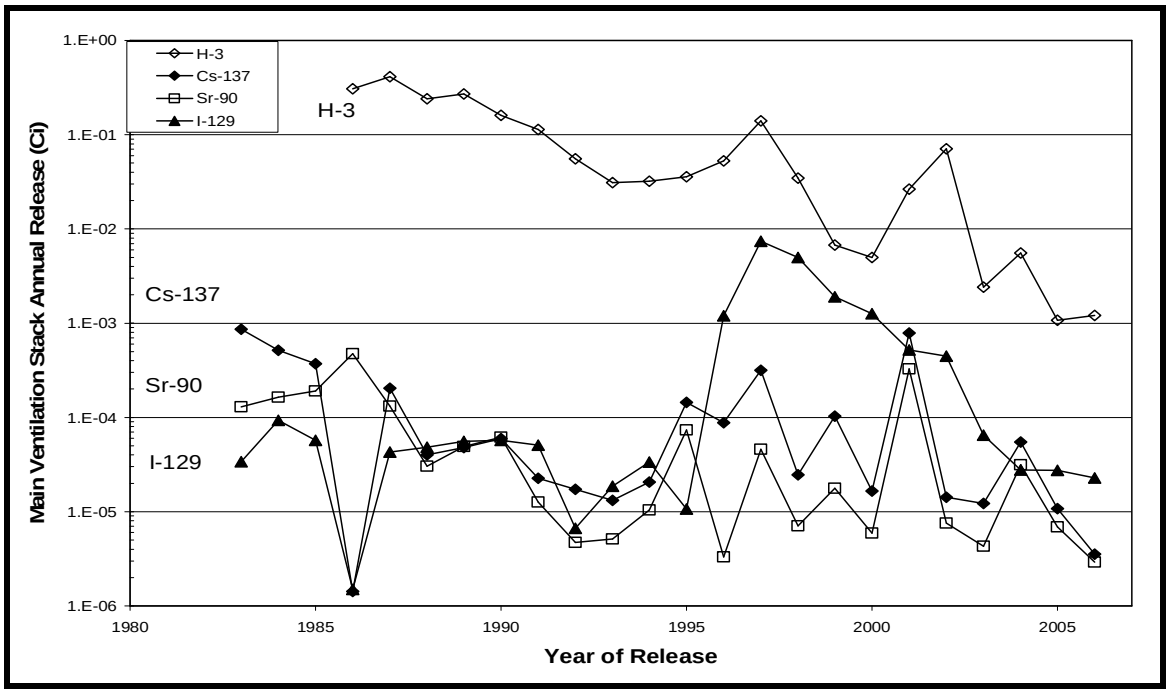

Figure A.7-2. Historical Main Stack Releases for Specific Radionuclides

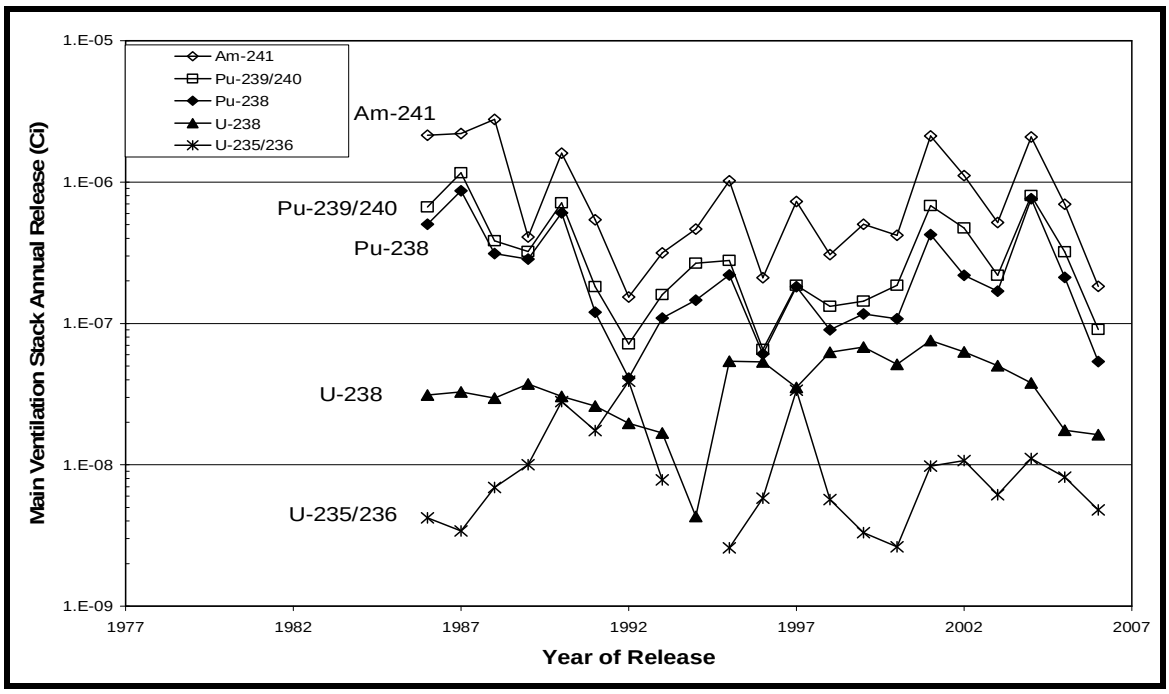

Figure A.7-3. Historical Main Stack Releases for Specific Radionuclides

A.8 AQUEOUS RADIOLOGICAL RELEASE

Figure A.8-1 shows the historical liquid effluent releases of gross beta- and alpha-emitting radionuclides from Lagoon 3, which is considered representative of all effluent releases. The lightly dotted lines represent the geometric mean for the entire duration, while the darker dotted lines shows the linear trend of total activity released in the effluent water.

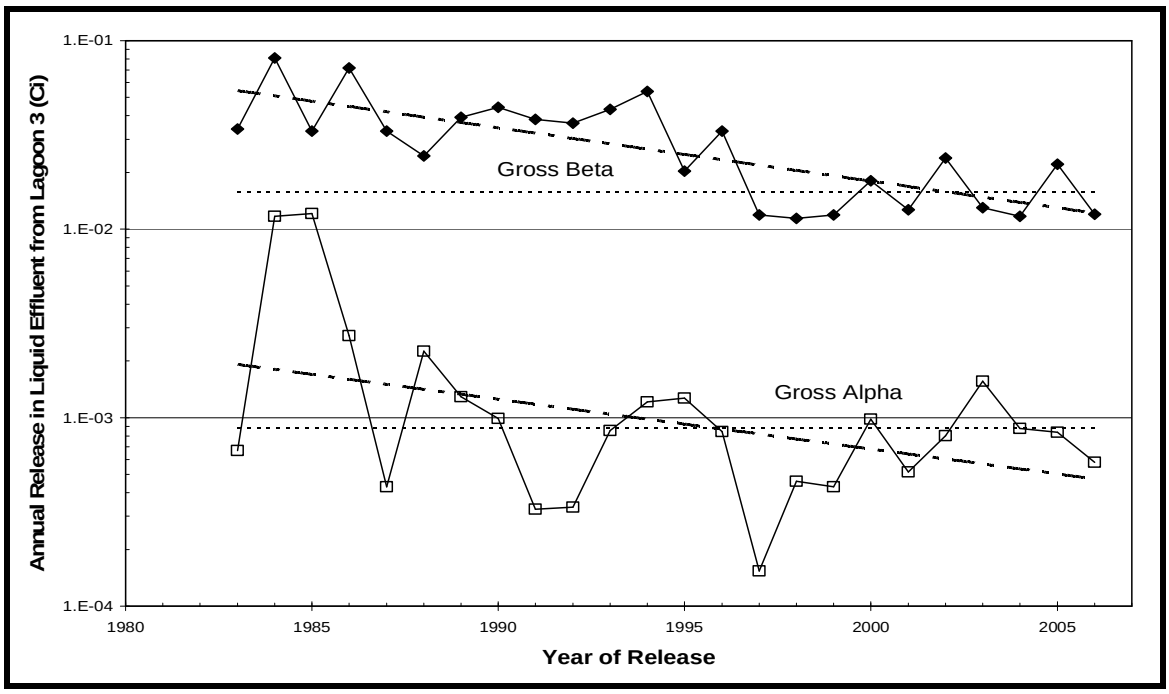

Figure A.8-1. Historical Lagoon 3 Radioactivity Releases

Figure A.8-2 shows the historical activity concentration of beta and alpha emitters contained in the effluent water released from Lagoon 3. The lightly dotted lines represent the geometric mean over the entire duration, while the darker dotted lines show the linear trend of the activity concentration.

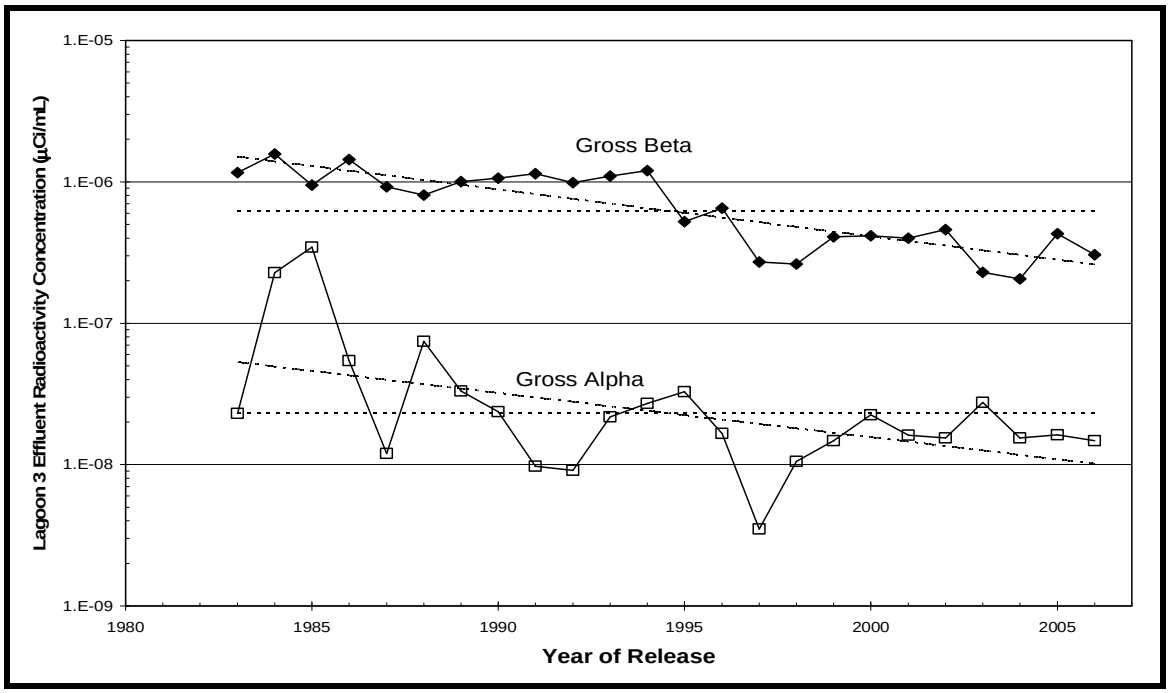

Figure A.8-2. Historical Lagoon 3 Radioactivity Concentrations in Effluent Water

Figures A.8-3 and A.8-4 breakdown the annual effluent radiological releases by specific radionuclides released from Lagoon 3. Figure A.8-3 displays the results for H-3, Sr-90, I-129, and Cs-137, while Figure A.8-4 displays the results for U-235/236, U-238, Pu-238, Pu-239/240, and Am-241.

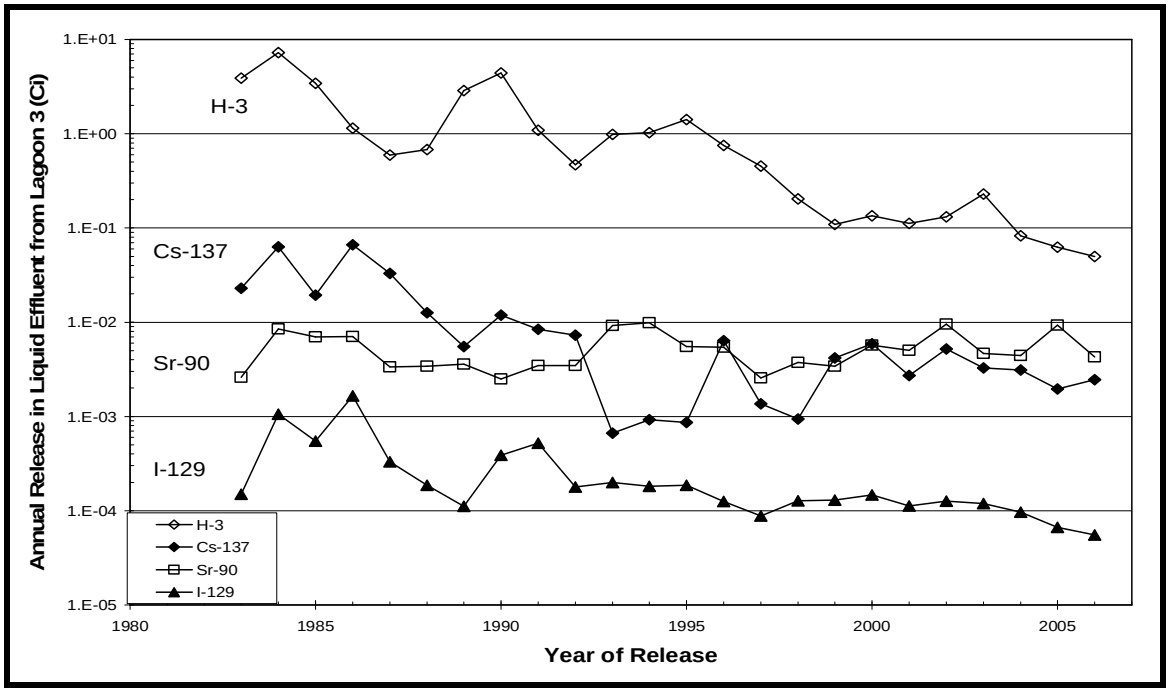

Figure A.8-3. Historical Lagoon 3 Radioactivity Release for Specific Radionuclides

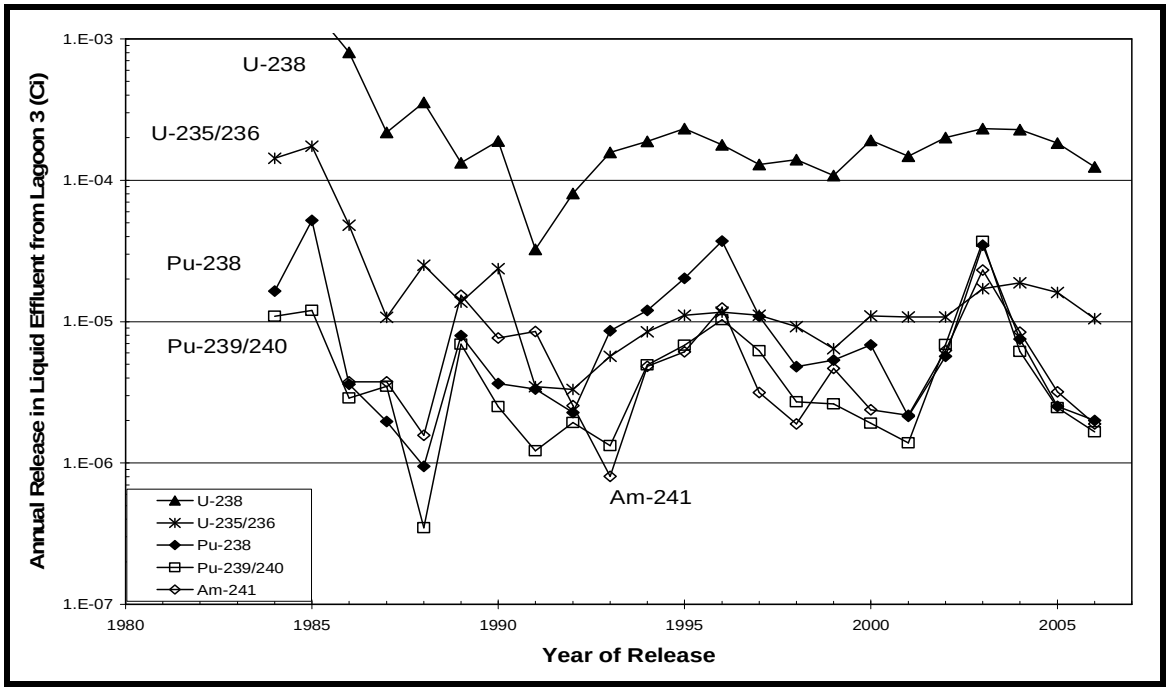

Figure A.8-4. Historical Lagoon 3 Radioactivity Release for Specific Radionuclides

Figure A.8-5 displays the annual volume of liquid released from Lagoon 3, the dotted line represents the average annual volume released. Figure A.8-6 compares the annual volume of liquid released from Lagoon 3 against the annual rainfall for that given year. The dotted line in Figure A.8-6 represents a polynomial-based trendline for the data.

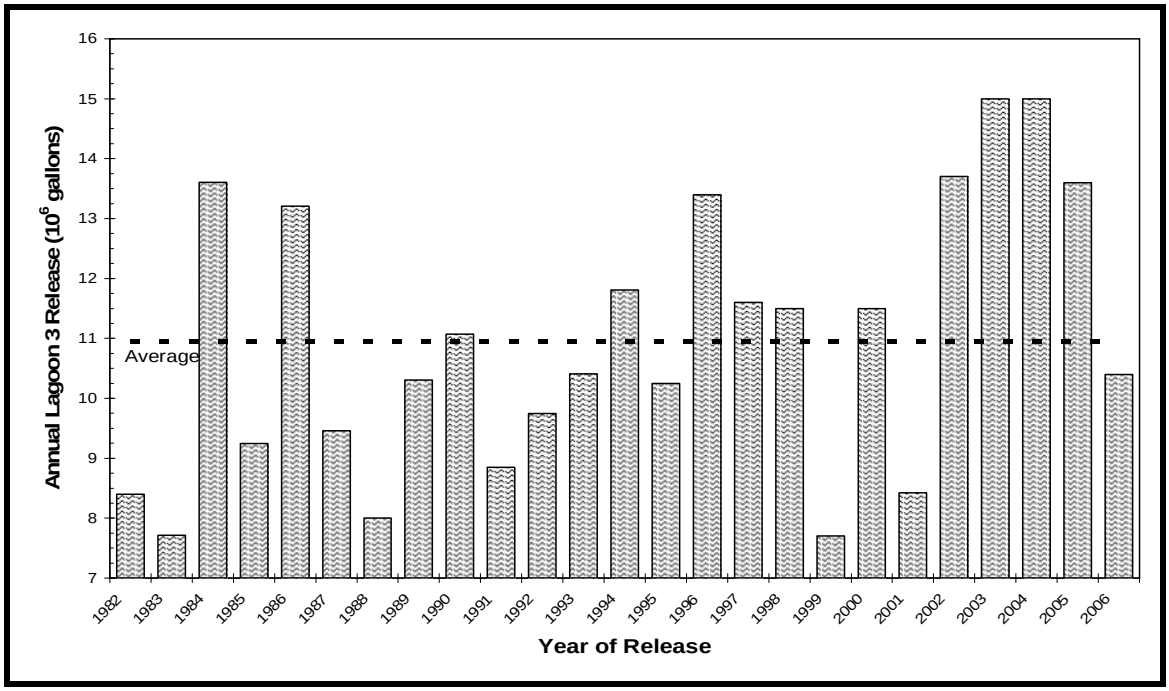

Figure A.8-5. Historical Lagoon 3 Total Volume of Liquid Released

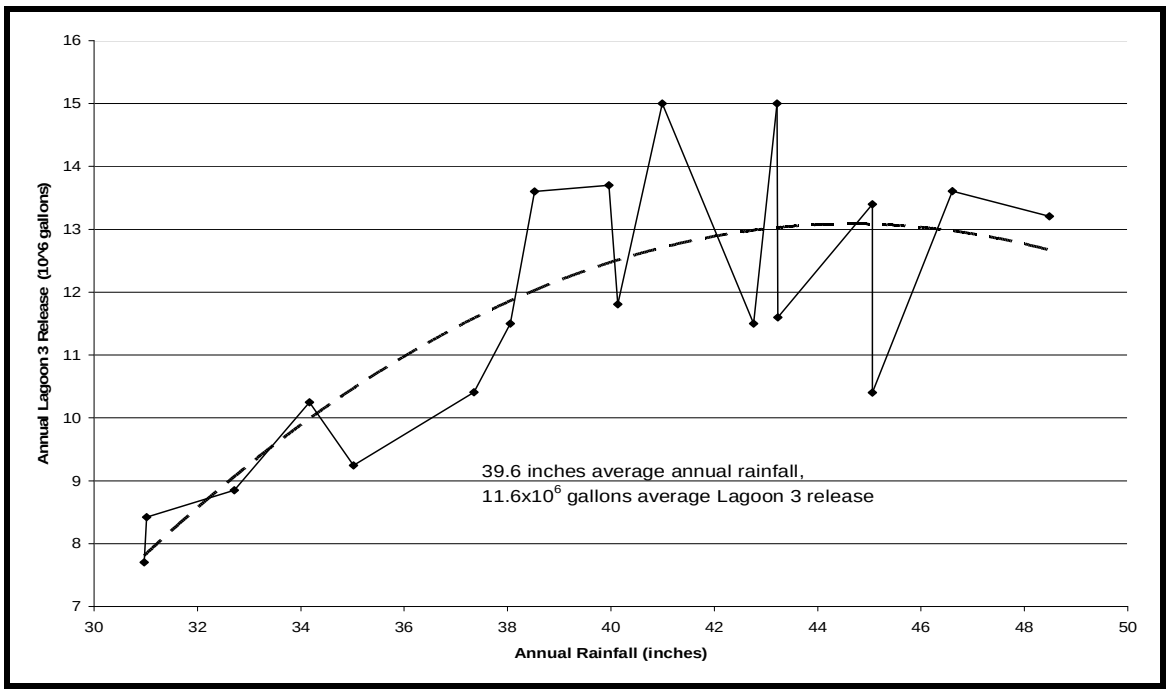

Figure A.8-6. Comparison of Annual Rainfall versus Volume of Liquid Released from Lagoon 3

A.9 WASTE FOR DISPOSAL

This section describes the methodology used to estimate the volume of waste to be shipped off site for disposal.

A.9.1 Construction and Demolition Debris

WVDP-087 (WVNSCO, 2001), Attachment C shows that the 2005 industrial (clean) generation goal of the Waste Minimization/Pollution Prevention Awareness Plan is 8,889 kg of waste. WVDP-087 also indicates that 22,222 and 9,915 kg of industrial waste were generated in 1993 and 2001, respectively. The density of construction and demolition debris ranges from 0.075 tons/yd^3 for plastics to 0.5 tons/yd^3 for concrete and asphalt, with an average of about 0.24 tons/yd^3. Based on this average debris density, the volume of this type of waste during the No Action Alternative stewardship period is estimated at 1,100 ft^3 per year.

NYSERDA, 2004 indicated that monitoring and maintenance of the SDA resulted in approximately 30 ft^3 of non-radioactive, non-hazardous debris each year.

Although the roofs and the NDA and SDA geomembrane covers are expected to have little, if any, contamination, waste generated from their replacements has been included on Table 4-10 as Class A and low-specific activity waste, respectively, and not as clean debris.

A.9.2 Hazardous Wastes

Every year the WVDP submits a hazardous waste report to the New York State Department of Environmental Conservation (NYSDEC). This hazardous waste report identifies and quantifies the various streams of hazardous waste: 1) generated on site; 2) treated, disposed

of, or recycled on site; and 3) shipped off site. In order to estimate the average annual generation of hazardous and mixed waste at the WVDP, the hazardous waste reports submitted to NYSDEC over the last four years were reviewed (WVNSCO, 2000, 2001a, 2002a, 2003). Over that time interval, it was found that 38 different hazardous waste streams were identified, ranging from those directly associated with the vitrification of the HLW (including the HLW itself) to the replacement of fluorescent light bulbs. Four of the largest volume waste streams are treated on site so that there is no net volume of shipped hazardous waste from these streams (e.g., the neutralization of acids and caustics, the vitrification of the HLW). Of the remaining 34 hazardous waste streams, 16 streams were reported as being generated in only one of the four years reviewed. This indicates that these 16 waste streams are either very infrequent or unique, one-time events which should not be included in an annual average waste estimate. For the remaining 18 hazardous waste streams, the annual average net amounts generated were summed into a hazardous (only) annual waste estimate of 1,100 kg per year and a mixed (both hazardous and radiological) waste estimate of 2,640 kg per year. Streams of hazardous (only) waste include lab packs, fluorescent light bulbs, corrosive liquids, etc., while the mixed waste streams include TRU-contaminated lead, glass debris, organic liquids, etc. To estimate the volume (rather than mass) of waste for this report, an estimate of the density of each waste stream was made (e.g., 11,340 kg/m^3 for lead, 1,000 kg/m^3 for liquids, 2,330 kg/m^3 for glass) and the annual average volumes of hazardous and mixed waste were estimated as 1.3 and 0.7 m^3 (60.0 and 24.7 ft^3), respectively.

WVDP-087 (WVNSCO, 2001), Attachment C shows that the 2005 hazardous and mixed waste generation goals of the Waste Minimization/Pollution Prevention Awareness Plan are 1,136 and 524 kg of hazardous and mixed waste, respectively. Using densities based on the waste stream reported to the NYSDEC, the WVDP-087 generation goals convert to about 26 and 5 ft^3 for hazardous and mixed waste, respectively. Because there are expected to be fewer activities during the No Action Alternative stewardship period, the WVDP-087 estimates are believed to represent estimates of the annual hazardous and mixed waste generation. The volume of 5 ft^3 of mixed waste is considered to be a negligible amount in Table 4-10.

A.9.3 Low-Level Radioactive Wastes

As of December 2000, the WVDP has generated about 466,000 ft^3 of low-level radioactive waste (LLW). Of this amount, about 88,000 ft^3 have been shipped off site for disposal, leaving about 378,000 ft^3 in storage (WVNSCO, 2000). The historical generation of this stored waste is shown on Figure A.9-1. The annual average LLW generation rate is about 27,000 ft^3. The large increase in LLW generation during 1990 was due to contaminated soil generated during the construction of Lag Storage Additions 3 and 4.

WVDP-087 (WVNSCO, 2001), Attachment C shows that the 2005 LLW generation goal of the Waste Minimization/Pollution Prevention Awareness Plan is 10,125 ft^3 of LLW. Because there are expected to be fewer activities during the No Action Alternative stewardship period, the WVDP-087 estimates are believed to represent estimates of the annual low-level radioactive waste generation, and are reflected in Table 4-10.

The total annual volume of radioactive waste estimated by NYSERDA, 2004 (i.e., 30 ft^3) has been assumed to be Class A waste. The volume of waste reported by WVDP-280 and WVDP-313 as being generated during Main Plant Process Building roof replacement has been assumed to be Class A waste.

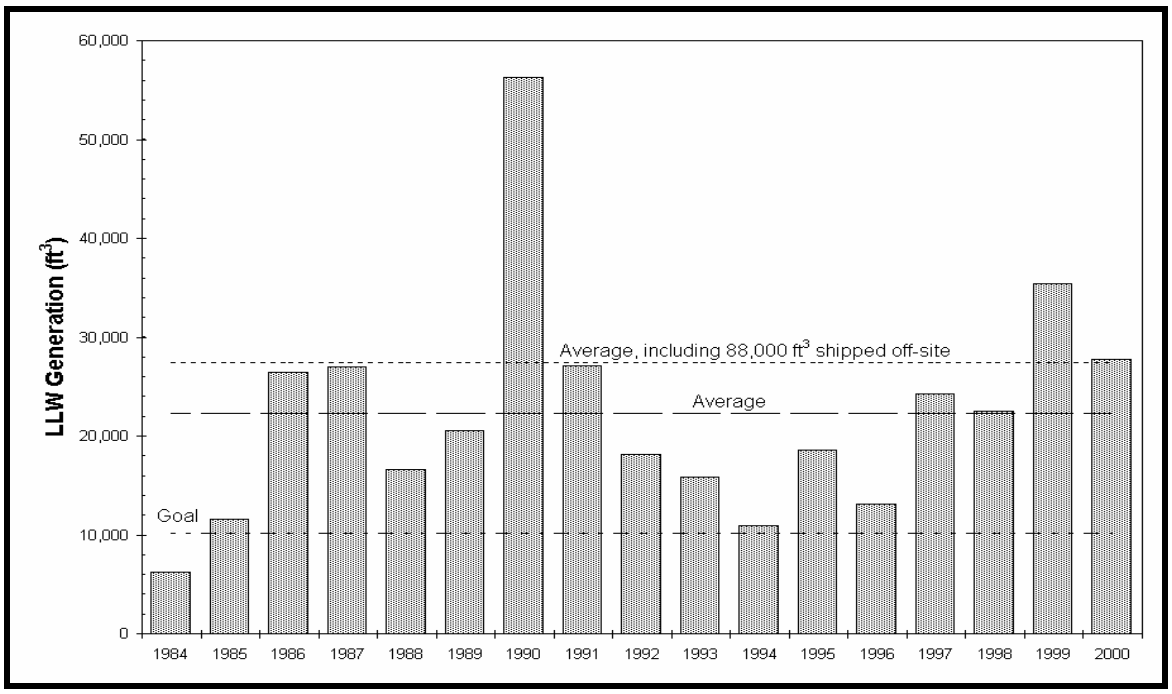

Figure A.9-1. Historical Low-Level Radioactive Waste Generation

A.10 REPLACEMENT OF THE PERMEABLE TREATMENT WALL

Prior to the start of the No Action Alternative, a full-scale permeable treatment wall (PTW) would be installed near the leading edge of the North Plateau Plume (NPP). The PTW is estimated to be at least 500 feet long and oriented in a northwest-southeast manner. The PTW structure would be orientated approximately perpendicular to the direction of groundwater flow so as to capture this flow. The PTW is estimated to be about two to four feet thick, and 25 feet deep and extend down into the unweathered Lavery till.

The PTW would be replaced, as needed on an estimated 20-year interval, as part of the No Action Alternative. Replacement of the PTW would consist of removal and disposal of the spent PTW media, and backfilling with fresh media to restore the PTW function. Depending upon the performance of the media over time, this material could end up as a Class A waste, but disposal estimates are based on the waste being classified as LSA waste.

No Action Alternative Technical Report
WSMS-WV-08-0003
Revision 1, December 2009

Revision Log

- Minor Revisions to Table 1-1 to update anticipated conditions at the EIS Starting Point, including the recognition of the installation and operation of a tank and vault drying system.
- Updated WNYNSC acreage to 3,338 to match other EIS documents.
- Minor text edits made throughout document to incorporate use of acronyms for site elements after first citation of an element in the text.
- Revised Table 4-11 to identify updated annual O&M costs.
- Add discussion of the replacement of the Permeable Treatment Wall media to Section A.10.