

Figure S-1. Location of the West Valley Demonstration Project

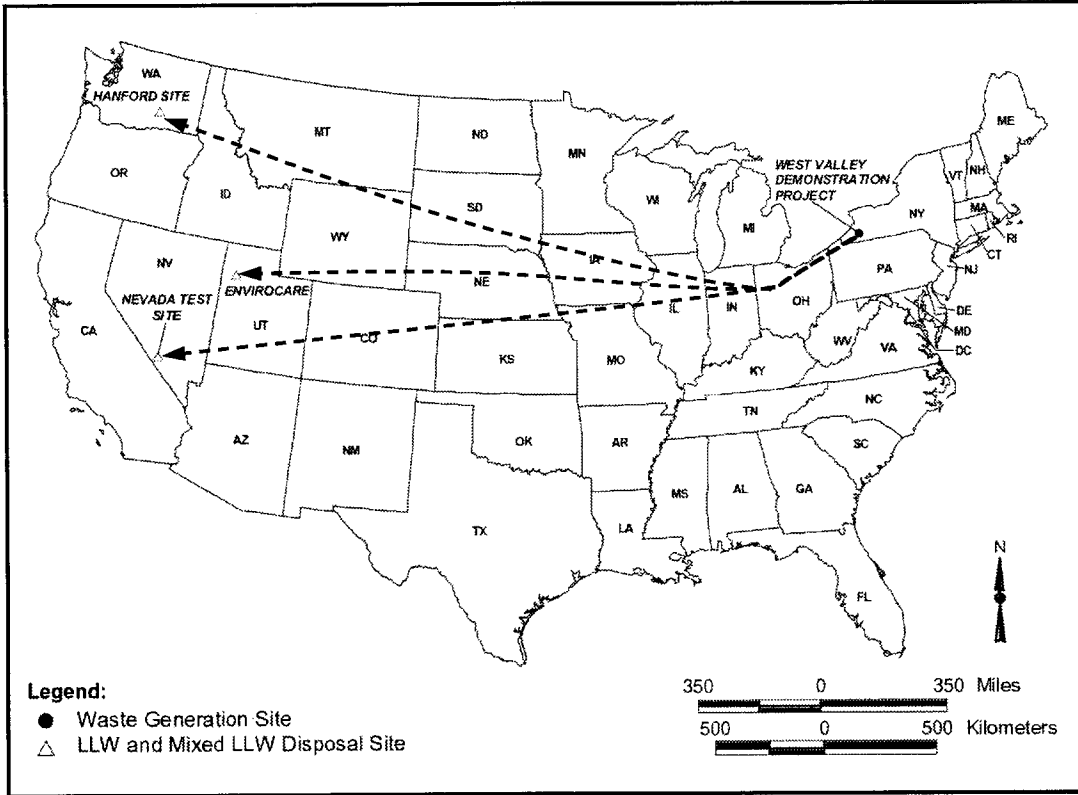


Figure 2-1. Waste Destinations Under the No Action Alternative

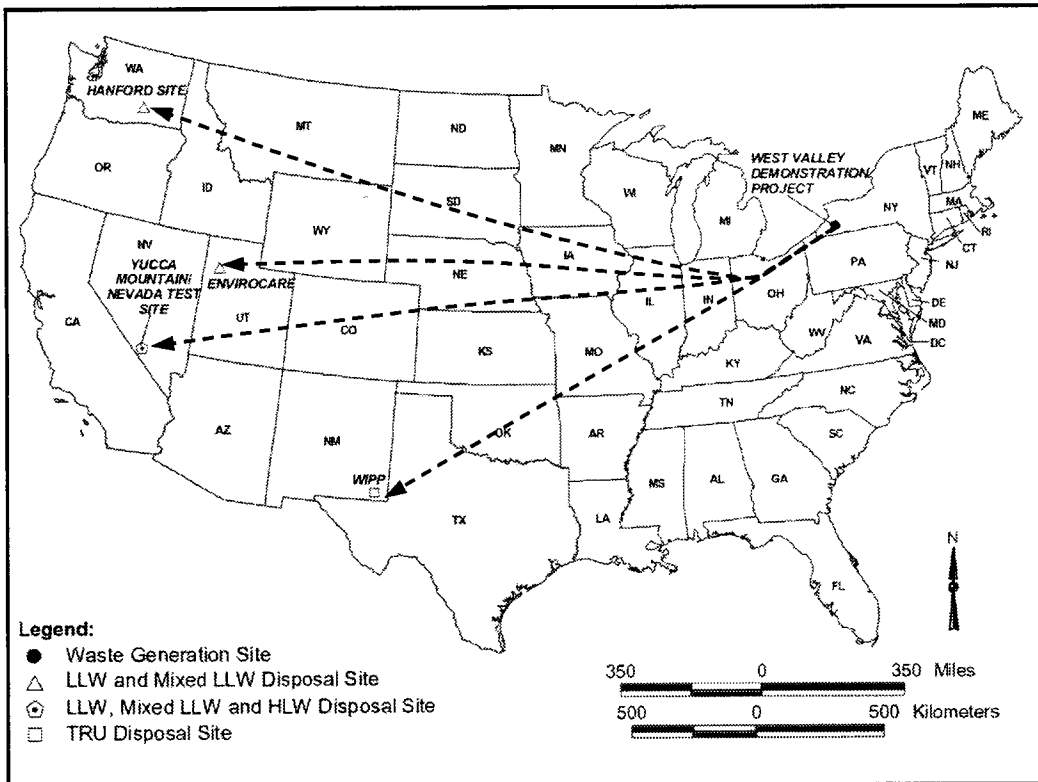


Figure 2-2. Waste Destinations Under Alternative A

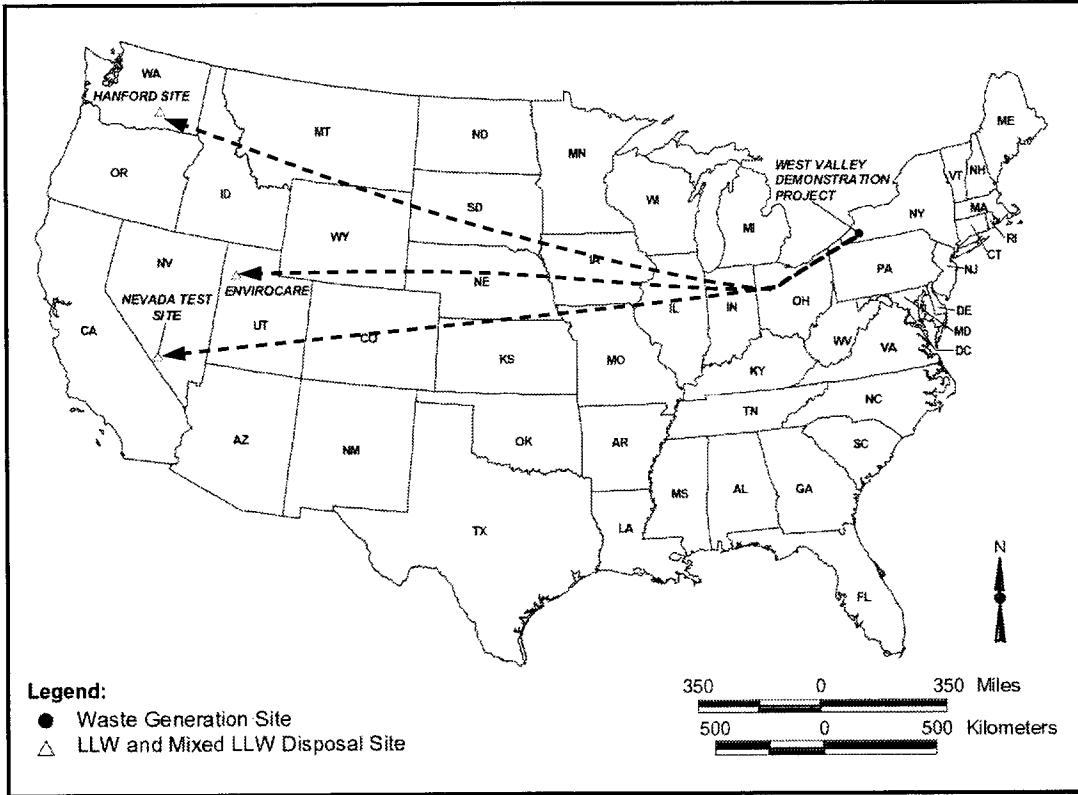


Figure 2-1. Waste Destinations Under the No Action Alternative

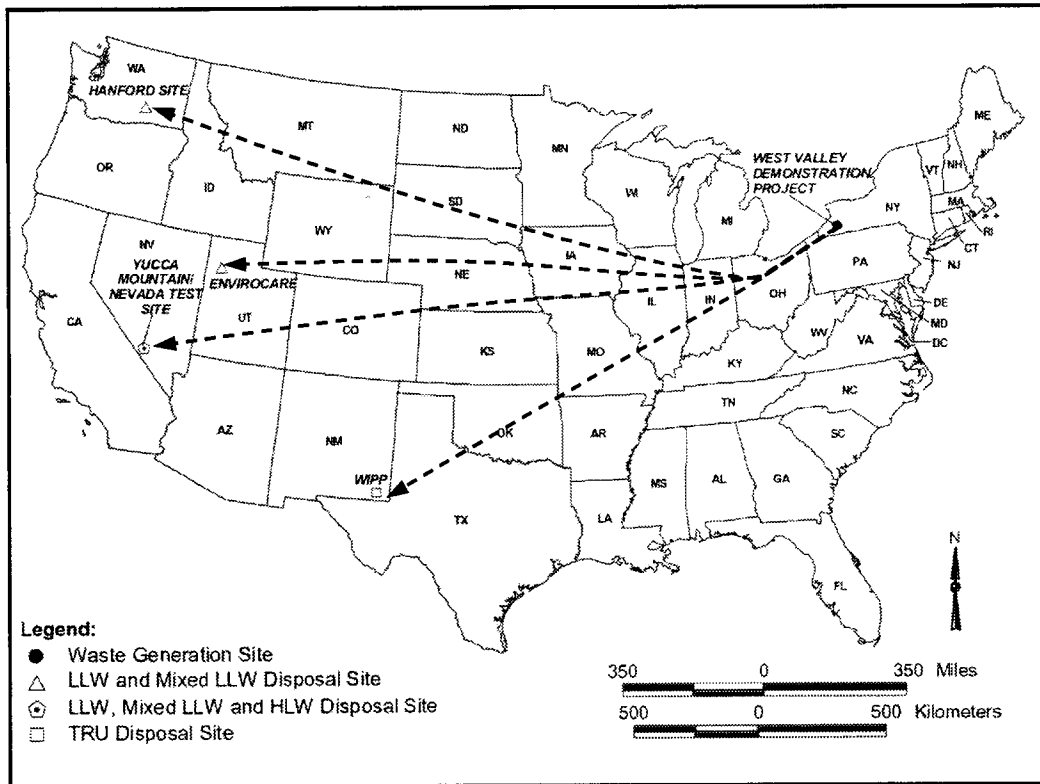


Figure 2-2. Waste Destinations Under Alternative A

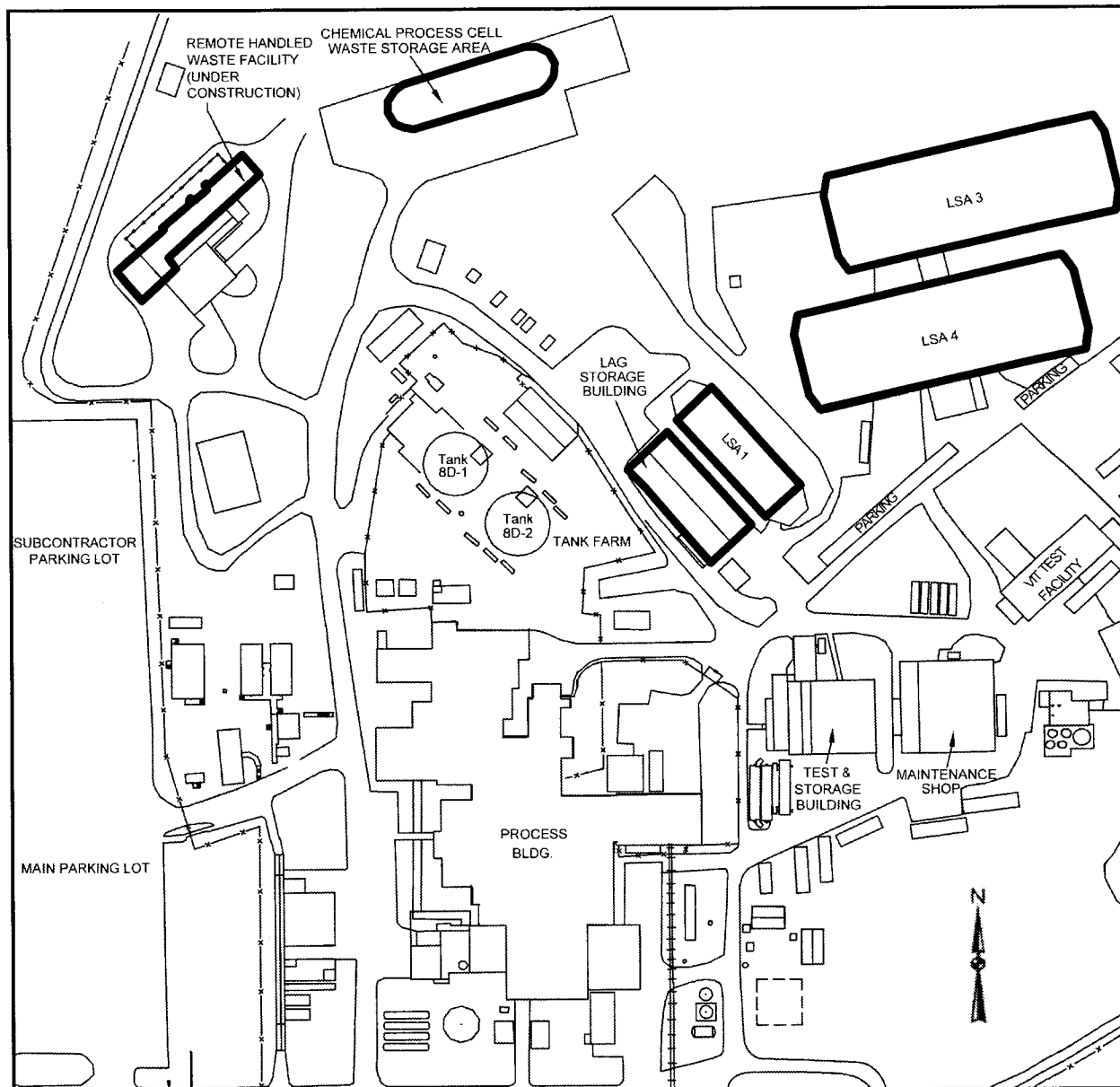


Figure 2-7. Lag Storage Building, Lag Storage Additions, Chemical Process Cell Waste Storage Area, and Remote Handled Waste Facility

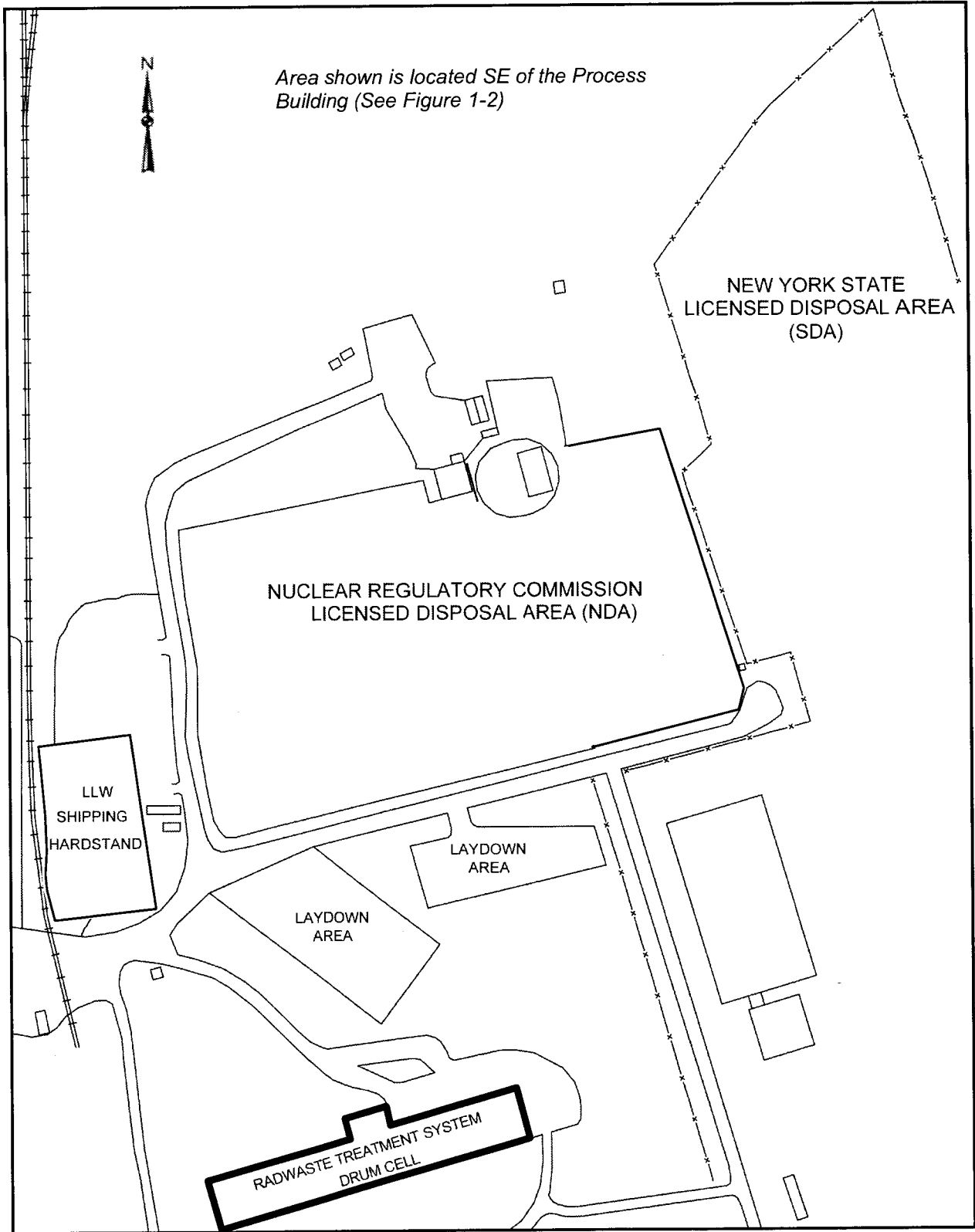


Figure 2-8. Radwaste Treatment System Drum Cell

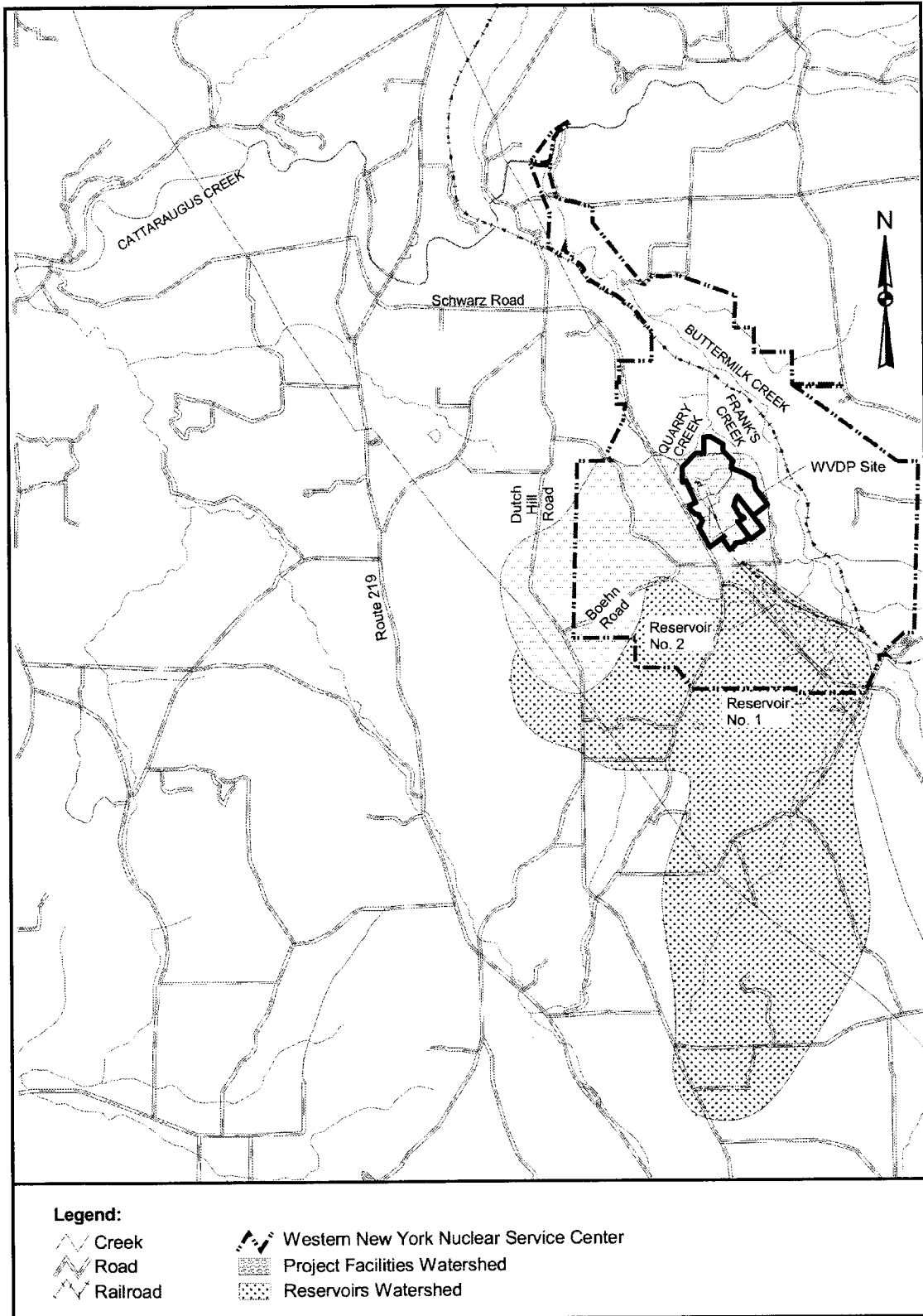


Figure 3-1. Watersheds on WVDP Premises

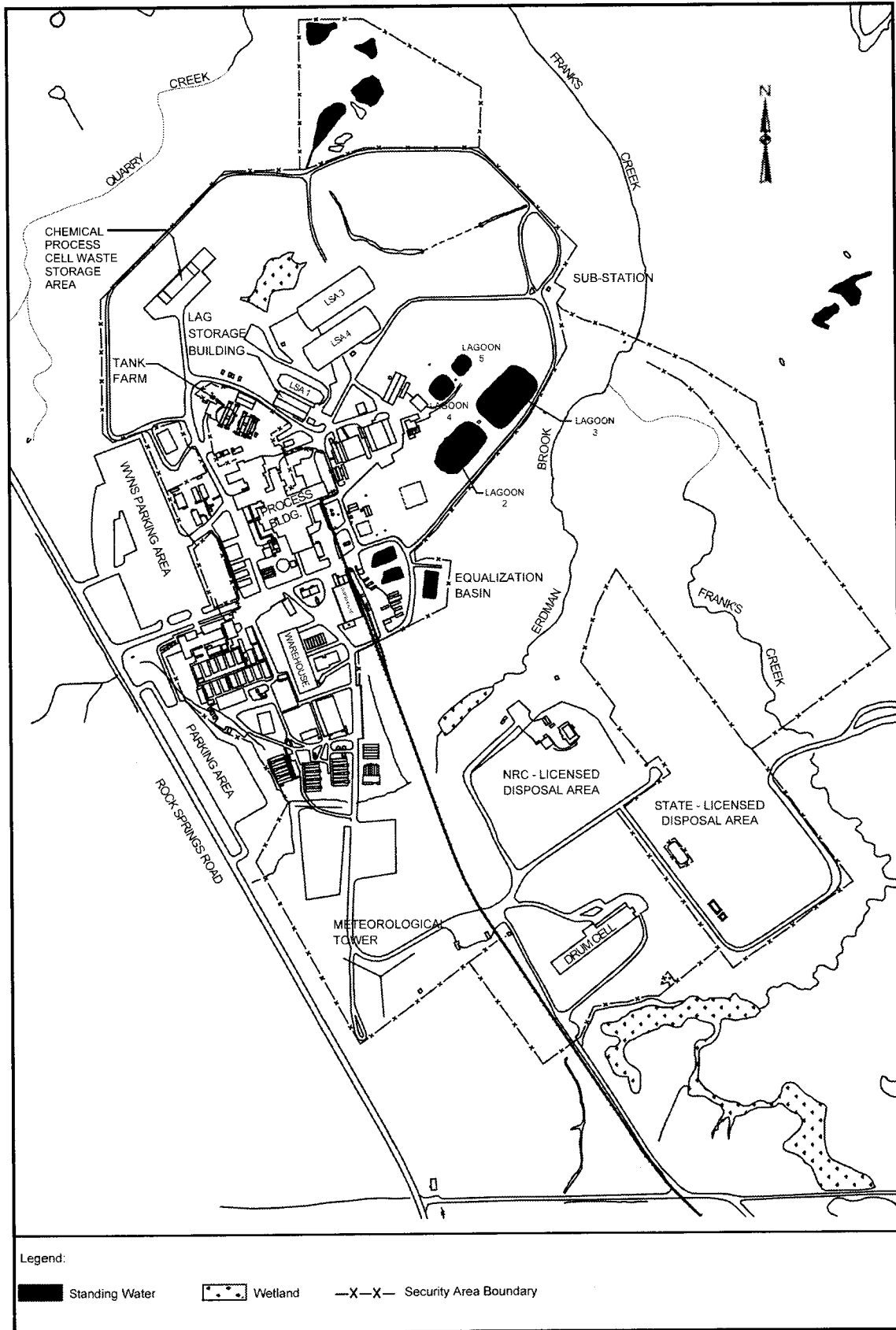


Figure 3-2. Surface Water on WVDP Premises

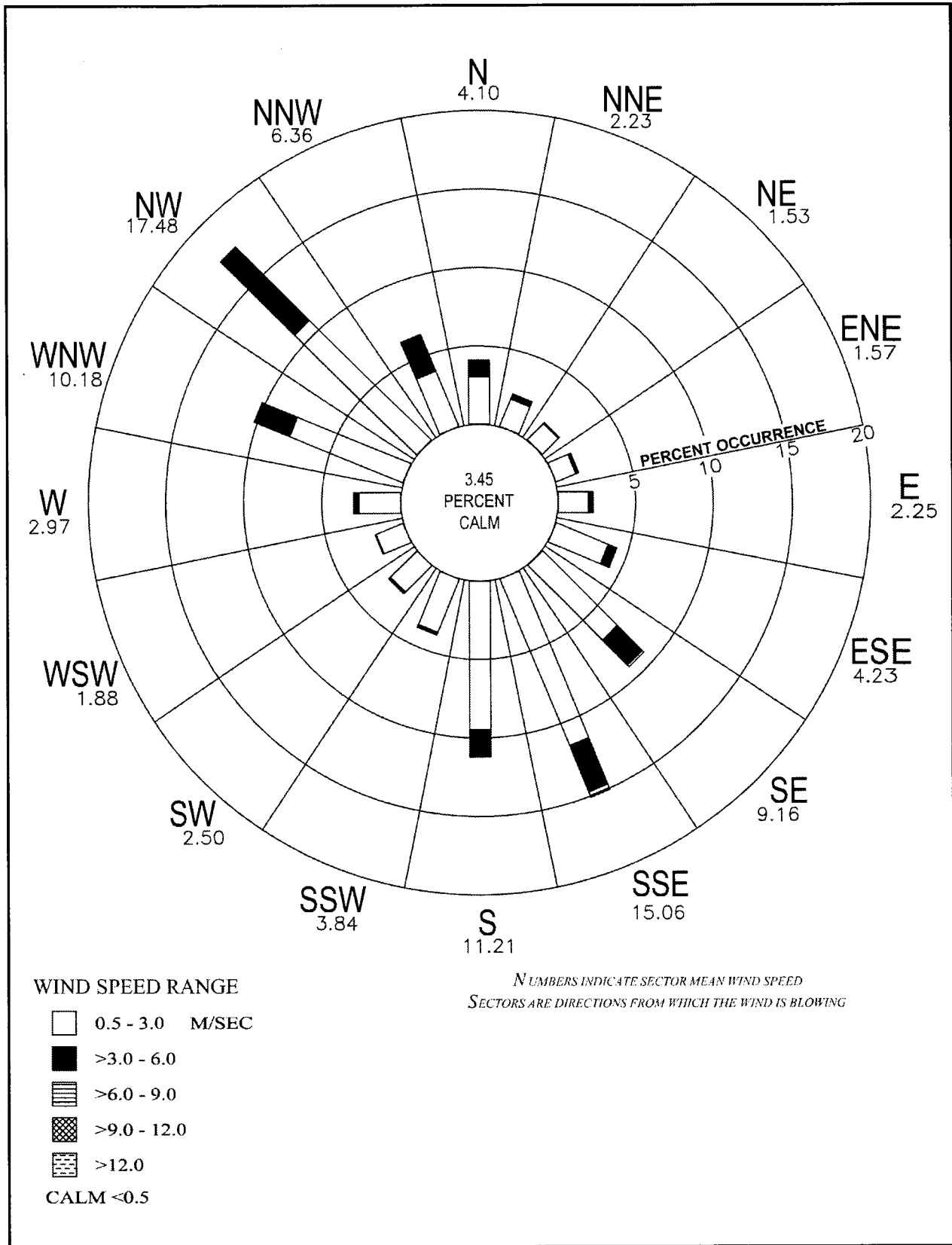


Figure 3-3. 10-Meter Wind Frequency Rose

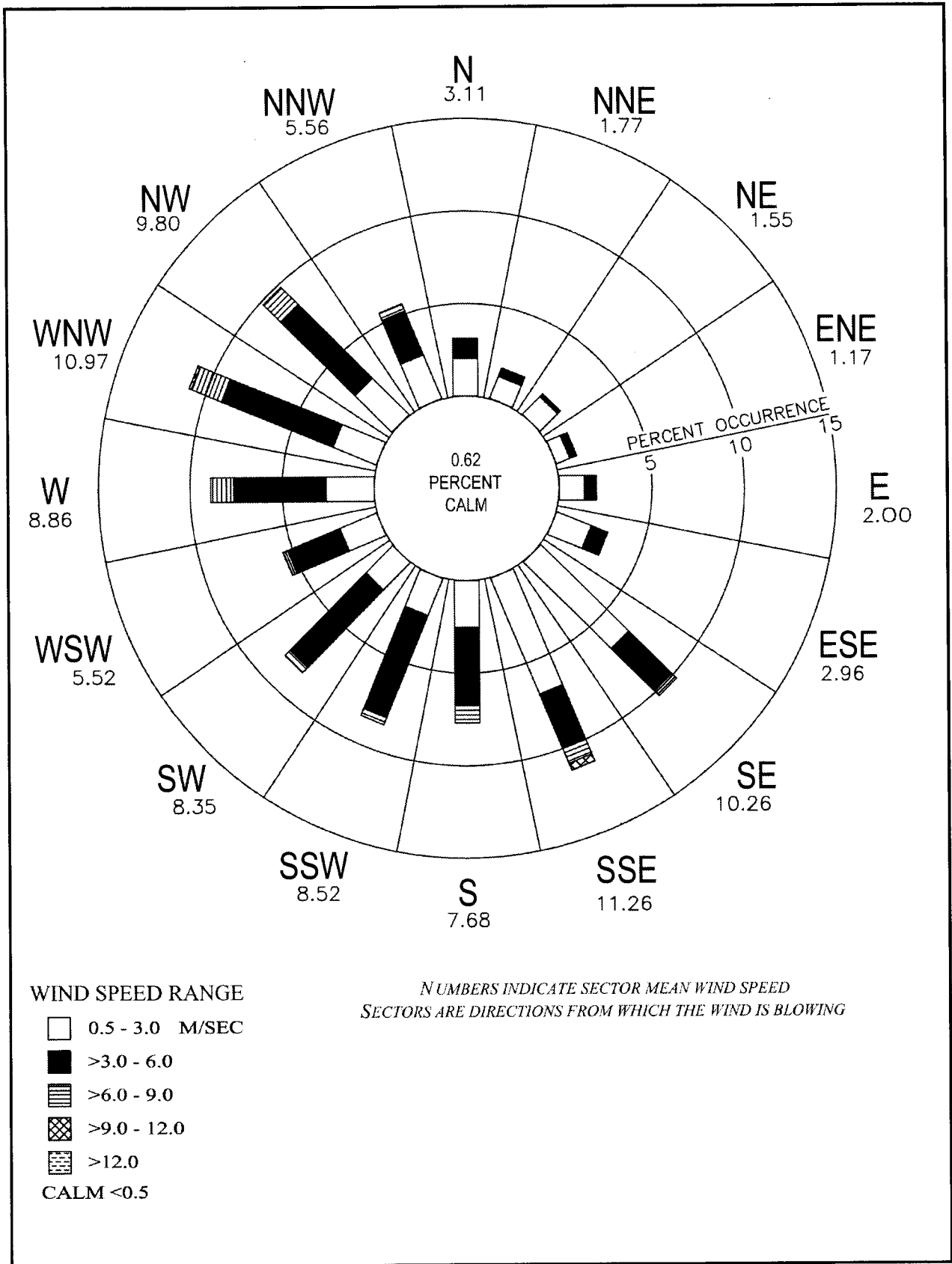


Figure 3-4. 60-Meter Wind Frequency Rose

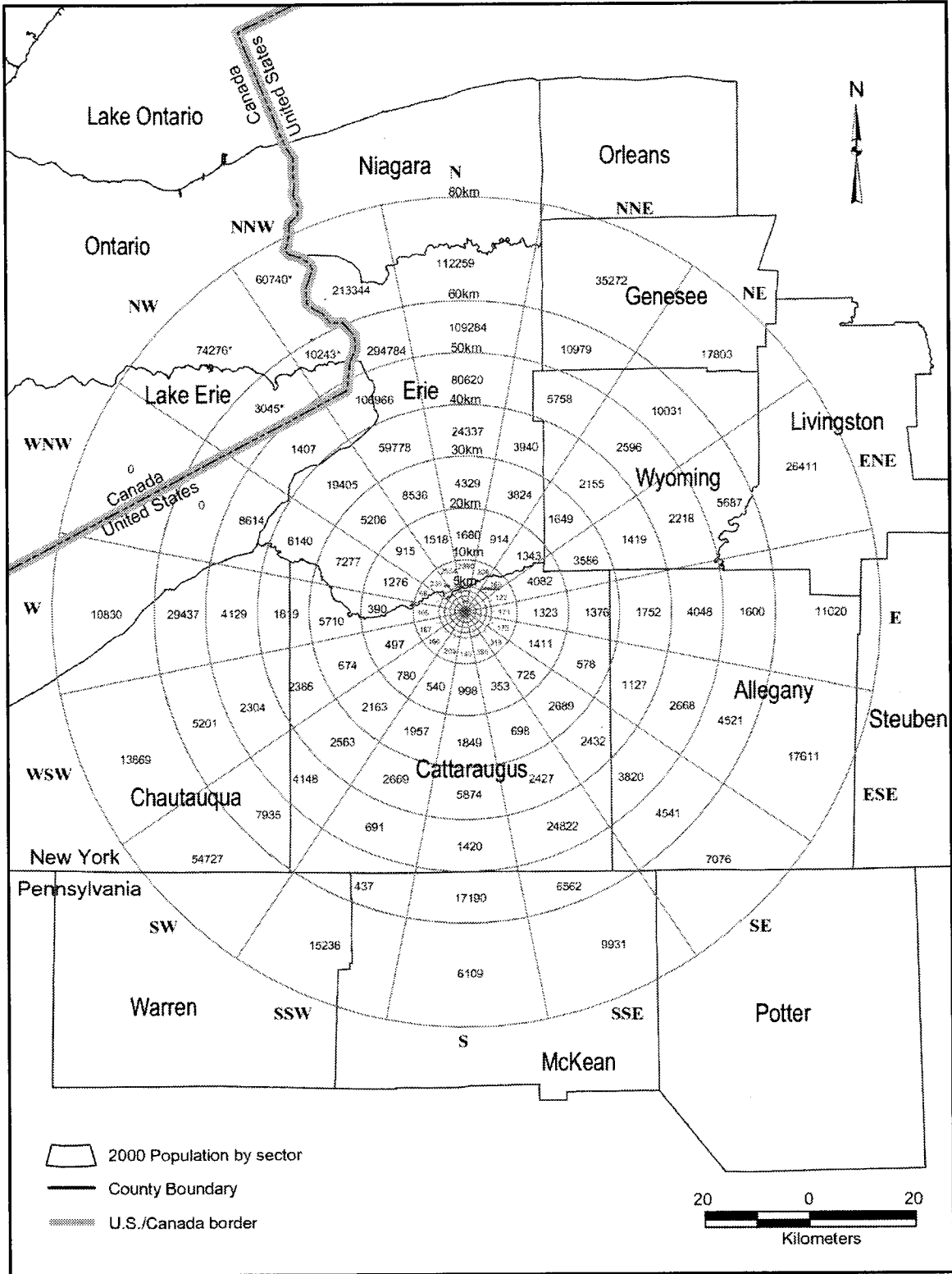


Figure 3-5. 2000 Population Density by Compass Direction (80-Kilometer Radius)
Note: The numbers with asterisks reflect the Canadian population within the corresponding sectors.

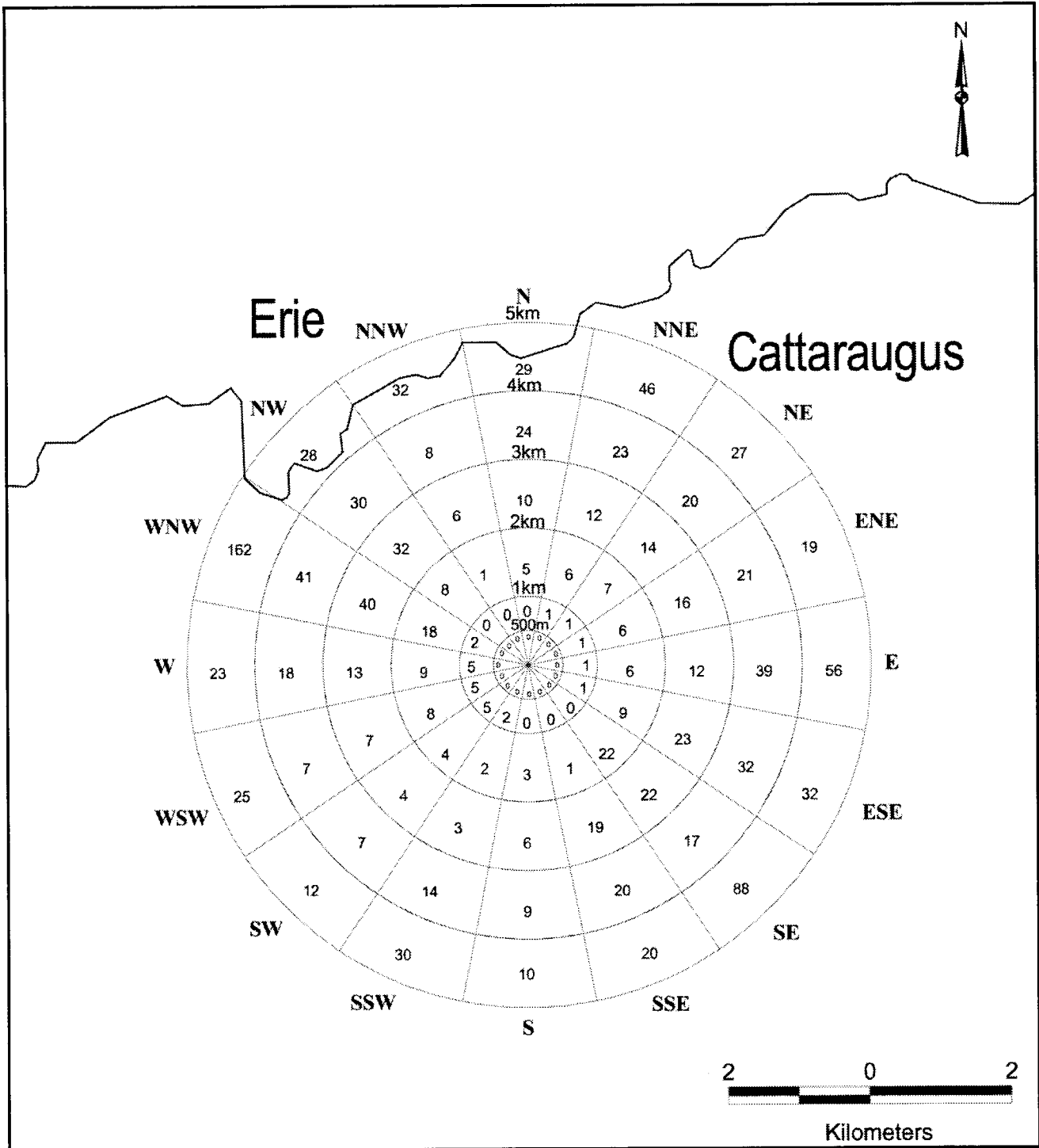


Figure 3-6. 2000 Population Density by Compass Direction (5-Kilometer Radius)

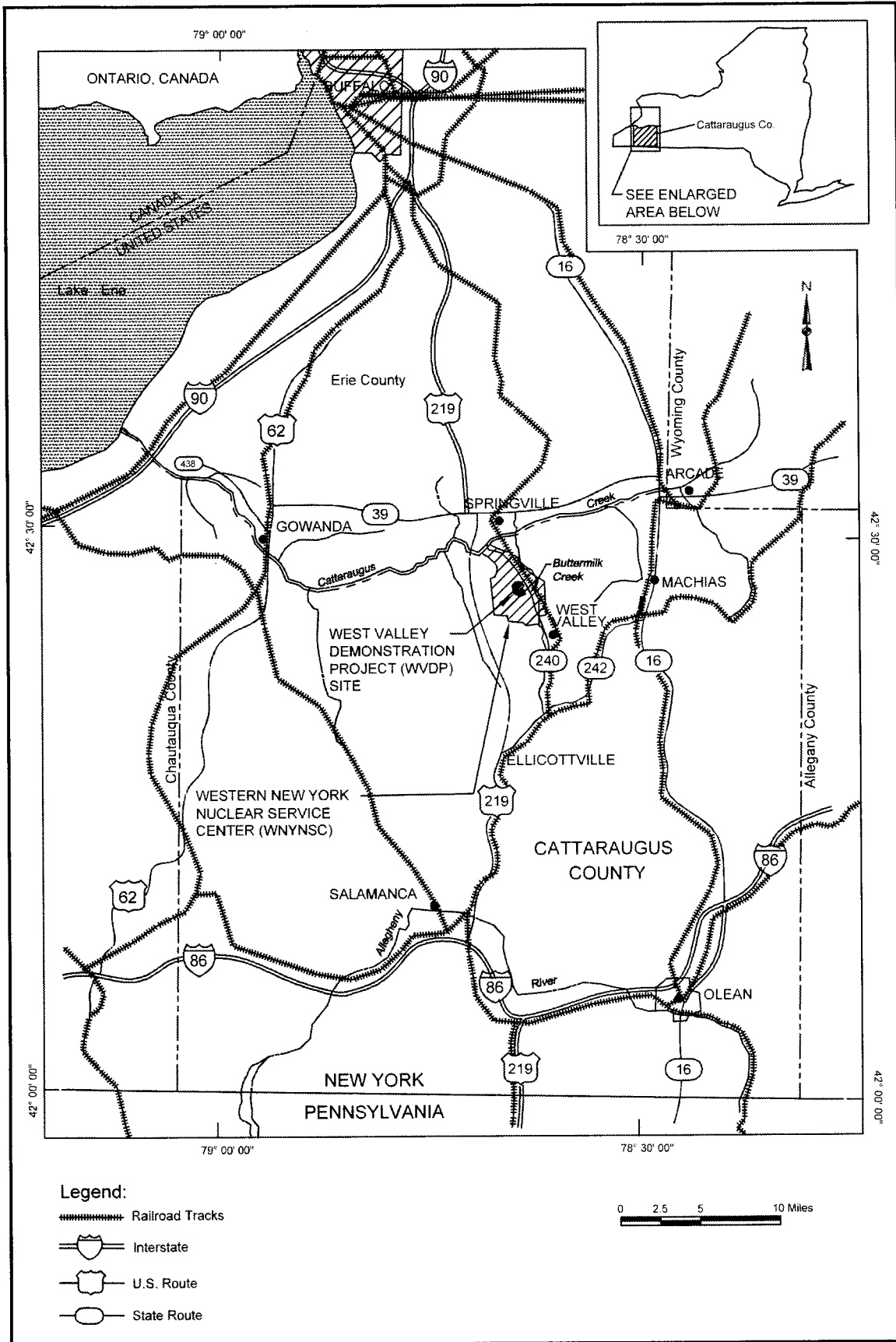


Figure 3-7. Transportation Routes in the Vicinity of the Center

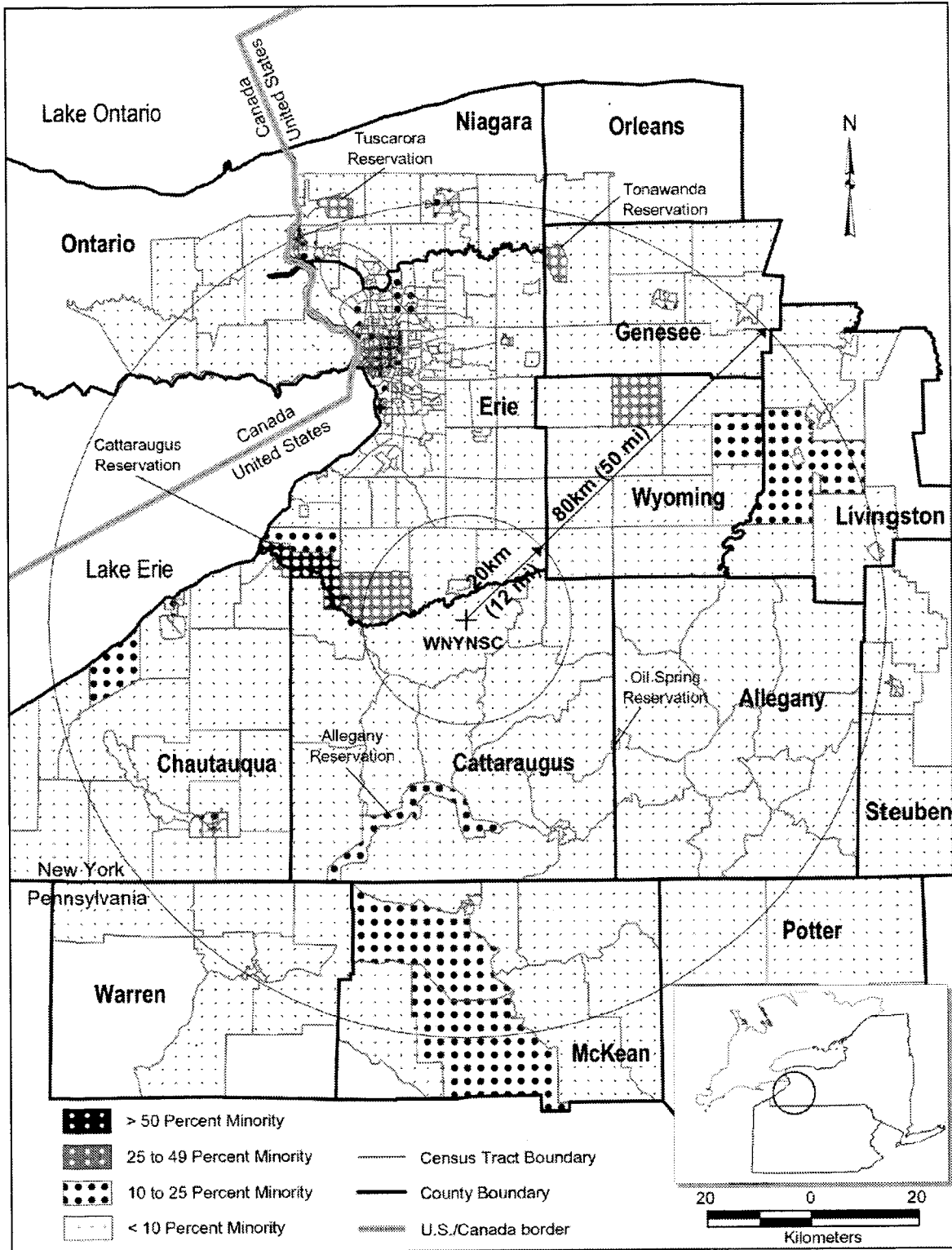


Figure 3-8. 2000 Minority Population Distribution

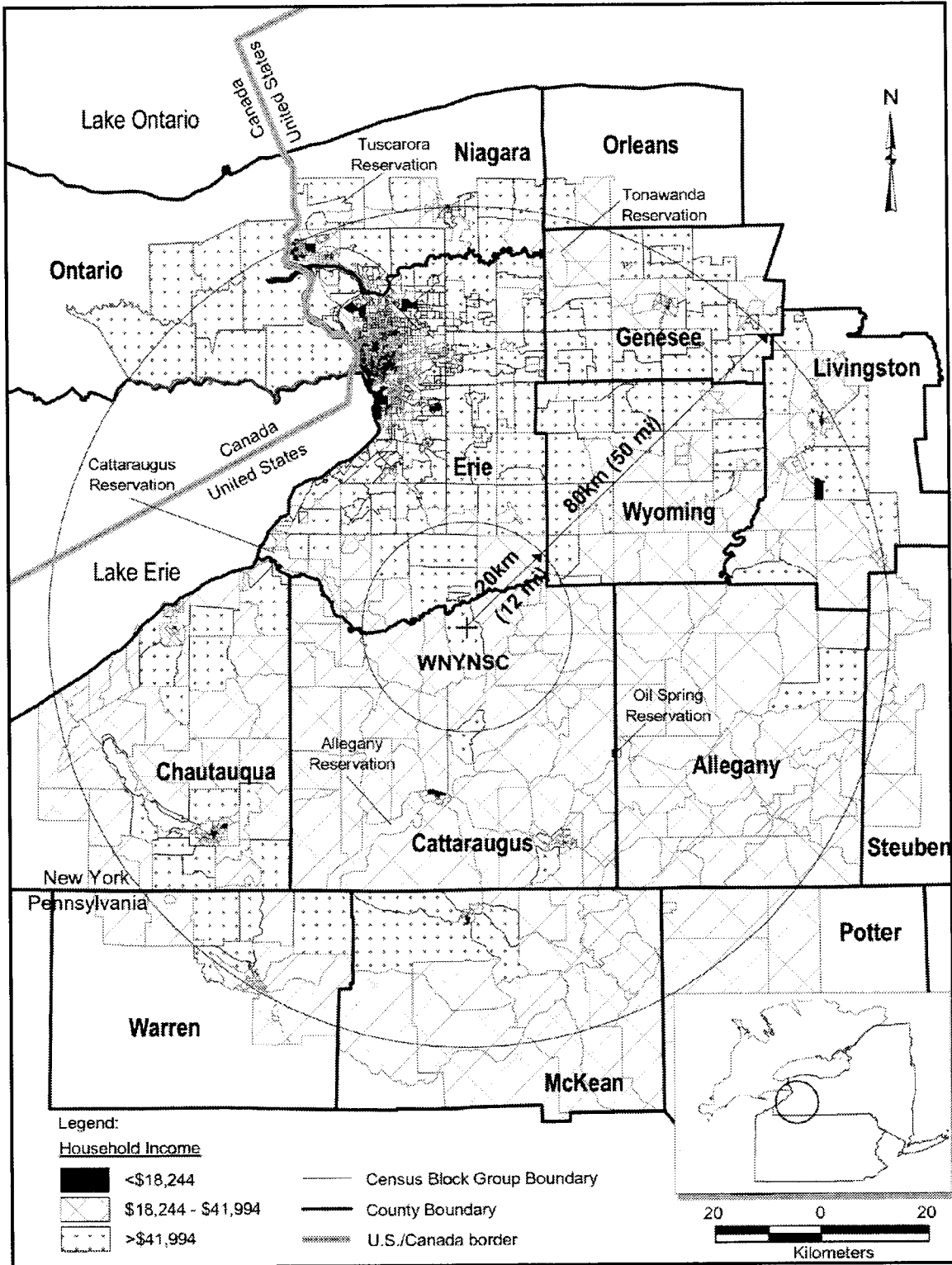


Figure 3-9. Low-income Population Distribution Within 80 Kilometers of the Center

Table S-2. Summary of Normal Operational Impacts at West Valley

Impact Area	Unit of Measure	No Action Alternative	Alternative A - Preferred	Alternative B
Human Health Impacts^a				
Public Impacts from Ongoing Operations				
MEI	LCF	3.7×10^{-7}	3.7×10^{-7}	3.7×10^{-7}
Population	LCF	1.5×10^{-3}	1.5×10^{-3}	1.5×10^{-3}
Worker Impacts				
Involved worker MEI	LCF	3.4×10^{-4}	1.3×10^{-3}	1.3×10^{-3}
Noninvolved worker MEI	LCF	3.0×10^{-4}	3.0×10^{-4}	3.0×10^{-4}
Involved worker population	LCF	2.1×10^{-3}	0.031	0.031
Noninvolved worker population	LCF	0.075	0.075	0.075
Total worker population	LCF	0.077	0.11	0.11
Transportation (from all causes – radiological and nonradiological; routine and accident conditions)				
Total	Shipments	169 (truck) 85 (rail)	2,550 (truck) 847 (rail)	3,120 (truck) ^b 1,079 (rail) ^c
Impacts				
Truck	Fatalities	0.034-0.041	0.79-0.82	0.84-0.93
Rail	Fatalities	0.042-0.049	0.60-0.68	0.66-0.79
Maximum Reasonably Foreseeable Accident				
Truck	LCF (probability)	1 (5×10^{-7})	4 (6×10^{-7})	4 (8×10^{-7})
Rail	LCF (probability)	2 (2×10^{-6})	4 (1×10^{-7})	4 (3×10^{-7})
Geology and Soils				
Water Quality and Resources				
Groundwater		No impact	No impact	No impact
Surface water		No impact	No impact	No impact
Wetlands		No impact	No impact	No impact
Floodplains		No impact	No impact	No impact
Noise and Aesthetics				
Ecological Resources				
Threatened and endangered species		No impact	No impact	No impact
Other plants and animals		No impact	No impact	No impact
Land Use				
Socioeconomics				
Environmental Justice				
Cultural Resources				

a. MEI = maximally exposed individual; LCF = latent cancer fatality (number of fatalities expected or probability).

b. Includes 270 TRU waste, and 300 HLW, truck shipments from interim storage to disposal. Alternative B would load the same number of truck shipments (2,550) at WVDP for shipment offsite as Alternative A.

c. Includes 172 TRU waste, and 60 HLW, rail shipments from interim storage to disposal. Alternative B would load the same number of rail shipments (847) at WVDP for shipment offsite as Alternative A.

Table S-3. Summary of Accident Impacts^a

Accident	No Action Alternative ^b			Alternative A ^b			Alternative B ^b		
	Worker	MEI	Population ^c	Worker	MEI	Population ^c	Worker	MEI	Population ^c
	(LCF)			(LCF)			(LCF)		
Drum Puncture ^d	3.6×10^{-9}	1.4×10^{-9}	4.5×10^{-6}	6.0×10^{-8}	2.3×10^{-8}	7.2×10^{-5}	6.0×10^{-8}	2.3×10^{-8}	7.2×10^{-5}
Pallet Drop ^d	2.1×10^{-8}	8.4×10^{-9}	2.6×10^{-5}	3.5×10^{-7}	1.4×10^{-7}	4.4×10^{-4}	3.5×10^{-7}	1.4×10^{-7}	4.4×10^{-4}
Box Puncture ^d	4.3×10^{-8}	1.7×10^{-8}	5.4×10^{-5}	6.0×10^{-7}	2.3×10^{-7}	7.2×10^{-4}	6.0×10^{-7}	2.3×10^{-7}	7.2×10^{-4}
Drum Cell Drop	NA ^g	NA	NA	2.4×10^{-8}	9.6×10^{-9}	3.0×10^{-5}	2.4×10^{-8}	9.6×10^{-9}	3.0×10^{-5}
HIC ^e Drop	NA	NA	NA	7.5×10^{-7}	3.1×10^{-7}	9.6×10^{-4}	7.5×10^{-7}	3.1×10^{-7}	9.6×10^{-4}
CH-TRU Drum Puncture	NA	NA	NA	1.9×10^{-5}	7.8×10^{-6}	0.025	1.9×10^{-5}	7.8×10^{-6}	0.025
RHWF ^f Fire	NA	NA	NA	6.5×10^{-5}	2.6×10^{-5}	0.084	6.5×10^{-5}	2.6×10^{-5}	0.084
Collapse of Tank 8D-2 (Wet) ^d	1.2×10^{-6}	4.9×10^{-7}	1.5×10^{-3}	1.2×10^{-6}	4.9×10^{-7}	1.5×10^{-3}	1.2×10^{-6}	4.9×10^{-7}	1.5×10^{-3}
Collapse of Tank 8D-2 (Dry) ^d	1.4×10^{-6}	5.7×10^{-7}	1.8×10^{-3}	1.4×10^{-6}	5.7×10^{-7}	1.8×10^{-3}	1.4×10^{-6}	5.7×10^{-7}	1.8×10^{-3}

- a. Based on atmospheric conditions (stability class and wind speed) that are not exceeded 50 percent of the time.
b. MEI = maximally exposed individual; LCF = latent cancer fatality (probability).
c. Collective dose to the 1.5 million people living within 80 kilometers (50 miles) of the WVDP site.
d. Ground-level release.
e. HIC = High integrity container.
f. RHWF = Remote-Handled Waste Facility.
g. NA = Not Applicable. Accident scenario could not occur under specified alternative.

Note: Of the 12 accidents analyzed, 5 could occur under any of the three alternatives and 7 could occur only under Alternatives A or B (see Appendix C). The accident impacts shown for the No Action Alternative primarily involve Class A LLW. The accident impacts shown for Alternatives A and B primarily involve Class C LLW.

Table S-4. Summary of Offsite Human Health Impacts

Site	No Action Alternative			Alternative A			Alternative B		
Envirocare ^a	Disposal of Class A LLW ^b			Disposal of LLW ^c and mixed LLW ^d			Disposal of LLW ^c and mixed LLW ^d		
	Worker	MEI	Population	Worker	MEI	Population	Worker	MEI	Population
	(LCF)			(LCF)			(LCF)		
	5.4×10^{-3}	6.9×10^{-6}	NA ^e	3.6×10^{-2}	5.1×10^{-5}	NA	3.6×10^{-2}	5.1×10^{-5}	NA
Hanford Site	Disposal of Class A LLW ^b			Disposal of LLW ^c and mixed LLW ^d			Disposal of LLW ^c and mixed LLW ^d		
	Worker	MEI	Population	Worker	MEI	Population	Worker	MEI	Population
	(LCF)			(LCF)			(LCF)		
	5.4×10^{-3}	6.9×10^{-6}	NA	3.6×10^{-2}	5.1×10^{-5}	NA	Interim Storage of TRU waste ^f		
							Worker	MEI	Population
							(LCF)		
							1.3×10^{-3}	3.4×10^{-8}	1.7×10^{-3}
	Interim Storage of HLW ^g			Interim Storage of HLW ^g			Interim Storage of HLW ^g		
	Worker	MEI	Population	Worker	MEI	Population	Worker	MEI	Population
	(LCF)			(LCF)			(LCF)		
						3.6×10^{-2}	NA	NA	
INEEL	No activities			No activities			Interim Storage of TRU waste ^f		
	No activities			No activities			Worker	MEI	Population
	No activities			No activities			(LCF)		
						2.5×10^{-3}	5.1×10^{-8}	4.1×10^{-4}	
NTS	Disposal of Class A LLW ^b			Disposal of LLW ^c and mixed LLW ^d			Disposal of LLW ^c and mixed LLW ^d		
	Worker	MEI	Population	Worker	MEI	Population	Worker	MEI	Population
	(LCF)			(LCF)			(LCF)		
	4.8×10^{-3}	3.0×10^{-16}	NA	3.2×10^{-2}	2.1×10^{-15}	NA	3.2×10^{-2}	2.1×10^{-15}	NA
ORNL	No activities			No activities			Interim Storage of TRU waste ^f		
	No activities			No activities			Worker	MEI	Population
	No activities			No activities			(LCF)		
						9.0×10^{-4}	1.4×10^{-8}	4.6×10^{-4}	

Table S-4. Summary of Offsite Human Health Impacts (cont)

Site	No Action Alternative	Alternative A			Alternative B		
						Interim Storage of TRU waste ^f	
SRS	No activities	No activities			Worker	MEI	Population
					(LCF)		
					7.4×10^{-4}	2.1×10^{-10}	2.3×10^{-5}
					Interim Storage of HLW ^g		
					Worker	MEI	Population
					(LCF)		
				2.0×10^{-2}	NA	NA	
WIPP	No activities	Disposal of TRU waste ^f			Interim Storage of TRU waste ^f		
		Worker	MEI	Population	Worker	MEI	Population
		(LCF)			(LCF)		
		1.0×10^{-2}	3.0×10^{-9}	3.0×10^{-6}	1.6×10^{-4}	6.9×10^{-7}	2.6×10^{-3}
		Disposal of TRU waste ^f			Disposal of TRU waste ^f		
		Worker	MEI	Population	Worker	MEI	Population
(LCF)			(LCF)				
				1.0×10^{-2}	3.0×10^{-9}	3.0×10^{-6}	
Yucca Mountain Repository	No activities	Disposal of HLW ^g			Disposal of HLW ^g		
		Worker	MEI	Population	Worker	MEI	Population
		(LCF)			(LCF)		
		6.8×10^{-2}	3.1×10^{-7}	2.0×10^{-2}	6.8×10^{-2}	3.1×10^{-7}	2.0×10^{-2}

- Impacts of disposal of Class A LLW and mixed LLW at Envirocare are assumed to be similar to impacts at Hanford.
- The volume Class A LLW to be disposed of would be 145,000 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- The volume of LLW to be disposed of would be 685,515 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- The volume of mixed LLW to be disposed of would be 7,889 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- NA = Not available.
- The volume of TRU waste to be stored or disposed of would be 49,000 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- The volume of HLW to be stored or disposed of is assumed to be 300 canisters for purposes of analysis; actual number of canisters is 275.

Sources: *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*, DOE/EIS-0200-F (May 1997) and the *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement*, DOE/EIS-0026-S-2 (September 1997).

Table 2-3. Waste Volumes, Containers, and Shipments Under Alternatives A and B

Waste Type	Totals			
	Volume (cubic feet) ^a	Containers	Alternative A Shipments	Alternative B Shipments
LLW				
Class A, boxes	351,586	4,341	311 (truck) 156 (rail)	311 (truck) 156 (rail)
Class A, drums	83,014	12,058	144 (truck) 72 (rail)	144 (truck) 72 (rail)
Class B, high-integrity containers	38,500	428	428 (truck) 107 (rail)	428 (truck) 107 (rail)
Class B, drums	194	29	1 (truck) 1 (rail)	1 (truck) 1 (rail)
Class C, high-integrity containers	12,618	141	141 (truck) 36 (rail)	141 (truck) 36 (rail)
Class C, 55-gallon drums	6,198	901	91 (truck) 23 (rail)	91 (truck) 23 (rail)
Class C, 71-gallon drums	193,405	20,377	850 (truck) 213 (rail)	850 (truck) 213 (rail)
Total LLW	685,515	38,275	1,966 (truck) 608 (rail)	1,966 (truck) 608 (rail)
TRU^b				
Contact-handled	40,000	5,810	139 (truck) 139 (rail)	278 (truck) ^d 278 (rail) ^d
Remote-handled	9,000	1,308	131 (truck) 33 (rail)	262 (truck) ^c 66 (rail) ^f
Total TRU	49,000	7,118	270 (truck) 172 (rail)	540 (truck)^e 344 (rail)^h
HLW				
HLW canisters		300 ⁱ	300 (truck) 60 (rail)	600 (truck) ^j 120 (rail) ^k
Mixed LLW^c				
Mixed A, drums	7,889	1,146	14 (truck) 7 (rail)	14 (truck) 7 (rail)
Total Volume	742,404			
Total Containers		46,839		
Total Shipments			2,550 (truck) 847 (rail)	3,120 (truck)^l 1,079 (rail)^m

Source: Marschke 2001

- To convert cubic feet to cubic meters, multiply by 0.028.
- Defined by NRC and DOE as waste containing more than 100 nanocuries of alpha-emitting isotopes, with half-lives greater than 20 years, per gram of waste.
- Generally at WVDP, mixed LLW is shipped off the site for treatment at a commercial facility and from there to a disposal site. Any mixed LLW shipped off the site for disposal must meet the disposal facilities' waste acceptance criteria.
- 139 CH-TRU shipments from WVDP to interim storage, 139 CH-TRU shipments from interim storage to disposal.
- 131 RH-TRU shipments from WVDP to interim storage, 131 RH-TRU shipments from interim storage to disposal.
- 33 RH-TRU shipments from WVDP to interim storage, 33 RH-TRU shipments from interim storage to disposal.
- 270 TRU shipments from WVDP to interim storage, 270 TRU shipments from interim storage to disposal.
- 172 TRU shipments from WVDP to interim storage, 172 TRU shipments from interim storage to disposal.
- Assumed to be 300 for purposes of analysis; actual number of canisters is 275.
- 300 HLW shipments from WVDP to interim storage, 300 HLW shipments from interim storage to disposal.
- 60 HLW shipments from WVDP to interim storage, 60 HLW shipments from interim storage to disposal.
- Includes 270 TRU waste, and 300 HLW, truck shipments from interim storage to disposal. Alternative B would load the same number of truck shipments (2,550) at WVDP for shipment offsite as Alternative A.
- Includes 172 TRU waste, and 60 HLW, rail shipments from interim storage to disposal. Alternative B would load the same number of rail shipments (847) at WVDP for shipment offsite as Alternative A.

Table 2-4. Summary of Normal Operational Impacts at West Valley

(See Chapter 4 for further discussion of impacts)

Impact Area	Unit of Measure	No Action Alternative	Alternative A - Preferred	Alternative B
Human Health Impacts^a				
Public Impacts from Continued Operations				
MEI	LCF	3.7×10^{-7}	3.7×10^{-7}	3.7×10^{-7}
Population	LCF	1.5×10^{-3}	1.5×10^{-3}	1.5×10^{-3}
Worker Impacts				
Involved worker MEI	LCF	3.4×10^{-4}	1.3×10^{-3}	1.3×10^{-3}
Noninvolved worker MEI	LCF	3.0×10^{-4}	3.0×10^{-4}	3.0×10^{-4}
Involved worker population	LCF	2.1×10^{-3}	0.031	0.031
Noninvolved worker population	LCF	0.075	0.075	0.075
Total worker population	LCF	0.077	0.11	0.11
Transportation				
Total	Shipments	169 (truck) 85 (rail)	2,550 (truck) 847 (rail)	3,120 (truck) ^b 1,079 (rail) ^c
Impacts (from all causes – radiological and nonradiological; routine and accident conditions)				
Truck	Fatalities	0.034 – 0.041	0.79 – 0.82	0.84 – 0.93
Rail	Fatalities	0.042 – 0.049	0.60 – 0.68	0.66 – 0.79
Maximum reasonably foreseeable accidents				
Truck	LCF (Probability)	$1 (5 \times 10^{-7})$	$4 (6 \times 10^{-7})$	$4 (8 \times 10^{-7})$
Rail	LCF (Probability)	$2 (2 \times 10^{-6})$	$4 (1 \times 10^{-7})$	$4 (3 \times 10^{-7})$
Geology and Soils				
Water Quality and Resources				
Groundwater		No impact	No impact	No impact
Surface water		No impact	No impact	No impact
Wetlands		No impact	No impact	No impact
Floodplains		No impact	No impact	No impact
Noise and Aesthetics				
Ecological Resources				
Threatened and endangered species		No impact	No impact	No impact
Other plants and animals		No impact	No impact	No impact
Land Use				
Socioeconomics				
Environmental Justice				
Cultural Resources				

- a. MEI = maximally exposed individual; LCF = latent cancer fatality (number of fatalities expected or probability).
- b. Includes 270 TRU waste, and 300 HLW, truck shipments from interim storage to disposal. Alternative B would make the same number of truck shipments (2,550) from WVDP as Alternative A.
- c. Includes 172 TRU waste, and 60 HLW, rail shipments from interim storage to disposal. Alternative B would make the same number of rail shipments (847) from WVDP as Alternative A.

Table 2-5. Summary of Accident Impacts^a

Accident	No Action Alternative ^b			Alternative A ^b			Alternative B ^b		
	Worker	MEI (LCF)	Population ^c	Worker	MEI (LCF)	Population ^c	Worker	MEI (LCF)	Population ^c
	Drum Puncture ^d	3.6×10^{-9}	1.4×10^{-9}	4.5×10^{-6}	6.0×10^{-8}	2.3×10^{-8}	7.2×10^{-5}	6.0×10^{-8}	2.3×10^{-8}
Pallet Drop ^d	2.1×10^{-8}	8.4×10^{-9}	2.6×10^{-5}	3.5×10^{-7}	1.4×10^{-7}	4.4×10^{-4}	3.5×10^{-7}	1.4×10^{-7}	4.4×10^{-4}
Box Puncture ^d	4.3×10^{-8}	1.7×10^{-8}	5.4×10^{-5}	6.0×10^{-7}	2.3×10^{-7}	7.2×10^{-4}	6.0×10^{-7}	2.3×10^{-7}	7.2×10^{-4}
Drum Cell Drop	NA ^g	NA	NA	2.4×10^{-8}	9.6×10^{-9}	3.0×10^{-5}	2.4×10^{-8}	9.6×10^{-9}	3.0×10^{-5}
HIC ^e Drop	NA	NA	NA	7.5×10^{-7}	3.1×10^{-7}	9.6×10^{-4}	7.5×10^{-7}	3.1×10^{-7}	9.6×10^{-4}
CH-TRU Drum Puncture	NA	NA	NA	1.9×10^{-5}	7.8×10^{-6}	0.025	1.9×10^{-5}	7.8×10^{-6}	0.025
RHWF ^f Fire	NA	NA	NA	6.5×10^{-5}	2.6×10^{-5}	0.084	6.5×10^{-5}	2.6×10^{-5}	0.084
Collapse of Tank 8D-2 (Wet) ^d	1.2×10^{-6}	4.9×10^{-7}	1.5×10^{-3}	1.2×10^{-6}	4.9×10^{-7}	1.5×10^{-3}	1.2×10^{-6}	4.9×10^{-7}	1.5×10^{-3}
Collapse of Tank 8D-2 (Dry) ^d	1.4×10^{-6}	5.7×10^{-7}	1.8×10^{-3}	1.4×10^{-6}	5.7×10^{-7}	1.8×10^{-3}	1.4×10^{-6}	5.7×10^{-7}	1.8×10^{-3}

a. Based on atmospheric conditions (stability class and wind speed) that are not exceeded 50 percent of the time.

b. MEI = maximally exposed individual; LCF = latent cancer fatality (probability).

c. Collective dose to the 1.5 million people living within 80 kilometers (50 miles) of the WVDP site.

d. Ground-level release.

e. HIC = High integrity container.

f. RHWF = Remote Handled Waste Facility.

g. NA = Not Applicable. Accident scenario could not occur under specified alternative.

Note: Of the 12 accidents analyzed, 5 could occur under any of the three alternatives and 7 could occur only under Alternatives A or B (see Appendix C). The accident impacts shown for the No Action Alternative primarily involve Class A LLW. The accident impacts shown for Alternatives A and B primarily involve Class C LLW.

Table 2-6. Summary of Offsite Human Health Impacts

Site	No Action Alternative			Alternative A			Alternative B		
	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	Population	Worker	MEI (LCF)	Population
Envirocare ^a	5.4×10^{-3}	6.9×10^{-6}	NA ^c	3.6×10^{-2}	5.1×10^{-5}	NA	3.6×10^{-2}	5.1×10^{-5}	NA
Hanford Site									
	5.4×10^{-3}	6.9×10^{-6}	NA	3.6×10^{-2}	5.1×10^{-5}	NA			
INEEL									
NTS									
	4.8×10^{-3}	3.0×10^{-16}	NA	3.2×10^{-2}	2.1×10^{-15}	NA	3.2×10^{-2}	2.1×10^{-15}	NA
ORNL									

Table 2-6. Summary of Offsite Human Health Impacts (cont)

Site	No Action Alternative	Alternative A			Alternative B		
		Worker	MEI (LCF)	Population	Worker	MEI (LCF)	Population
SRS	No activities	No activities					
		Interim Storage of TRU waste ^f					
		7.4 × 10 ⁻⁴	2.1 × 10 ⁻¹⁰	2.3 × 10 ⁻⁵			
		Interim Storage of HLW ^g					
WIPP	No activities	Disposal of TRU waste ^f					
		Disposal of HLW ^g					
		1.0 × 10 ⁻²	3.0 × 10 ⁻⁹	3.0 × 10 ⁻⁶			
		Disposal of TRU waste ^f					
Yucca Mountain Repository	No activities	Disposal of HLW ^g					
		Disposal of TRU waste ^f					
		6.8 × 10 ⁻²	3.1 × 10 ⁻⁷	2.0 × 10 ⁻²			
		Disposal of HLW ^g					

- a. Impacts of disposal of Class A LLW and mixed LLW at Envirocare are assumed to be similar to impacts at Hanford.
- b. The volume Class A LLW to be disposed of would be 145,000 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- c. The volume of LLW to be disposed of would be 685,515 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- d. The volume of mixed LLW to be disposed of would be 7,889 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- e. NA = Not available.
- f. The volume of TRU waste to be stored or disposed of would be 49,000 cubic feet. To convert cubic feet to cubic meters, multiply by 0.028.
- g. The volume of HLW to be stored or disposed of is assumed to be 300 canisters for purposes of analysis; actual number of canisters is 275.

Sources: DOE 1997a, 1997b.