
SAMPLING RATIONALE

Utility/ Plant Area Wells	DOE Orders 5400.1, IV.9; Draft DOE 5400.6, V.11.a.(3); and 40 CFR Parts 264 and 265, Subpart F. These wells monitor groundwater around site facilities. Sampling of these wells will be phased out when new wells installed for expanded solid waste management unit groundwater monitoring come on line. This program expansion is covered in the "Sampling and Analysis Plan (SAP) Groundwater Monitoring Network Report."
Fuel Storage Tank Subsurface Monitoring Well	DOE Orders 5400.1, IV.9; Draft DOE 5400.6, V.11.a.(3); and 40 CFR Parts 264 and 265, Subpart F. This well monitors groundwater in the vicinity of underground fuel storage tanks and is sampled primarily for radiological and selected indicator organic compounds. The PVC-cased well may be replaced by a stainless steel well during expansion of the groundwater monitoring program.

1990 OFF-SITE MONITORING PROGRAM

<u>SAMPLE LOCATION CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
Cattaraugus Creek at Felton Bridge WFFELBR	Unrestricted surface waters receiving plant effluents <u>Reported:</u> Monthly Environmental Monitoring Trend Analysis Annual Environmental Monitoring Report	Timed continuous composite liquid	Weekly *Weekly for monthly composite	52	Gross alpha/beta, H-3, pH. Flow-weighted monthly composite for gamma isotopic and Sr-90
Buttermilk Creek, Upstream of Cattaraugus Creek Confluence at Thomas Corners Road WFBCTCB	Restricted surface waters receiving plant effluents <u>Reported:</u> Annual Environmental Monitoring Report	Timed continuous composite liquid	*Biweekly	26	pH. Monthly for gross alpha/beta, H-3. Quarterly composite for gamma isotopic and Sr-90
Buttermilk Creek near Fox Valley WFBCKG	Restricted surface water background <u>Reported:</u> Monthly Environmental Monitoring Trend Analysis Annual Environmental Monitoring Report	Timed continuous composite liquid	*Biweekly	26	pH. Monthly for gross alpha/beta, H-3. Quarterly composite for gamma isotopic and Sr-90

*Samples are split with NYSDOH.

SAMPLING RATIONALE

WFFELBR Draft DOE 5400.6, V.11.a.(1).(a).

Since Buttermilk Creek is the surface water that receives all WVDP effluents and empties into Cattaraugus Creek, then WFFELBR monitors the potential influence of WVDP drainage into Cattaraugus Creek directly downstream of confluence with Buttermilk Creek.

WFBCTCB Draft DOE 5400.6, V.11.a.(1).(a).

Buttermilk Creek is the surface water receiving all WVDP effluents. WFBCTCB monitors the potential influence of WVDP drainage into Buttermilk Creek upstream of confluence with Cattaraugus Creek.

WFBCKBG Draft DOE 5400.6, V.11.a.(1).(b).

Monitors background conditions of Buttermilk Creek upstream of the WVDP. Allows for comparison to downstream conditions

1990 OFF-SITE MONITORING PROGRAM

<u>SAMPLE LOCATION CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
WFWEL Series Wells near WVDP outside WNYNSC Perimeter 3.0 km WNW WFWEL01 1.5 km NW WFWEL02 4.0 km NW WFWEL03 3.0 km NW WFWEL04 2.5 km SW WFWEL05 29 km S WFWEL06 (background) 4.0 km NNE WFWEL07 2.5 km ENE WFWEL08 3.0 km SE WFWEL09 7.0 km N WFWEL10	Drinking supply groundwater near facility <u>Reported:</u> Annual Environmental Monitoring Report	Grab liquid	Annual	10	Gross alpha/beta, H-3, gamma isotopic, pH, conductivity

SAMPLING RATIONALE

Off-site
Drinking
Water
WFVEL
Series

DOE 5400.1, IV.9; Draft DOE 5400.6, V.11.a.(3); and 40 CFR Parts 264 and 265, Subpart F.

Nine of the ten listed off-site private residential drinking water wells represent the nearest unrestricted uses of groundwater close to the WVDP. The tenth drinking water well, WFWEL06, is located 29 km south of the Project and is considered a background drinking water source.

1990 OFF-SITE MONITORING PROGRAM

<u>SAMPLE LOCATION CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
3.0 km SSE at Fox Valley AFFXVRD	Particulate air samples around WYNNSC perimeter	Continuous air particulate filter	Weekly	468 (52 per location)	Gross alpha/beta
3.7 km NNW at Thomas Corners Road AFTCORD	<u>Reported:</u> Annual Environmental Report				Quarterly composite for Sr-90, gamma isotopic
2.0 km NE on Route 240 AFRT240	Monthly Environmental Monitoring Trend Analysis (four sites only+)	Continuous desiccant column for water vapor collection	Weekly (2 sites only**)	104 (52 per site)	H-3
1.5 km NW on Rock Springs Road AFRSPRD		Continuous charcoal cartridge	Weekly (2 sites only**)	104 (52 per site)	Quarterly composite for I-129
29 km S at Great Valley (background) AFGRVAL					
7 km N at Springville AFSPRVL					
6 km SSE at West Valley AFWEVAL					
50 km W at Dunkirk (background) AFDNKRK					
2.3 km SW on Dutch Hill Road AFBOEHN					

+AFRT240, AFRSPRD, AFGRVAL and AFBOEHN.

**AFRSPRD and AFGRVAL.

SAMPLING RATIONALE

AFFXVRD AFTCORD AFRT240	<p>Draft DOE 5400.6, V.8.d.</p> <p>Air samplers put into service by NFS as part of the site's original monitoring program. Perimeter locations chosen to obtain data from places most likely to provide highest concentrations, based on meteorological data. Sample heads are placed 4 meters above the ground.</p> <p>Note: The remaining air sampling heads are positioned within the human breathing zone above ground.</p>
AFRSPRD	<p>Perimeter location chosen to obtain data from the place most likely to provide highest ground-level release concentrations based on meteorological data. AFRSPRD is on WVDP property but outside the main plant operations fence line. I-129 and H-3 are sampled here because the sampling trains were easy to incorporate and the location was most likely to receive effluent releases.</p>
AFBOEHN	<p>Perimeter location chosen to obtain data from the place most likely to provide highest elevated release concentrations based on meteorological data. AFBOEHN is located on privately owned property at the perimeter.</p>
AFGRVAL	<p>DOE/EP-0023, 4.2.3.</p> <p>Off-site (remote) sampler considered to be representative of natural background radiation. Located on privately owned property 29 km south of the site (typically upwind). I-129 and H-3 sampled here also.</p>
AFDNKRK	<p>DOE/EP-0023, 4.2.3.</p> <p>Off-site (remote) sampler considered to be representative of natural background radiation. Located 50 km west of the site (upwind) on privately owned property.</p>
AFWEVAL	<p>DOE/EP-0023, 4.2.3.</p> <p>Off-site (remote) sampler located on private property in nearby community within 15 km of the site (southeast).</p>
AFSPRVL	<p>DOE/EP-0023, 4.2.3.</p> <p>Off-site (remote) sampler located on private property in nearby community within 15 km of the site (north).</p>

1990 OFF-SITE MONITORING PROGRAM

<u>SAMPLE LOCATION CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
2.5 km SW AFDHFOP	Collection of fallout particulate and precipitation around WNYNSC perimeter <u>Reported:</u> Annual Environmental Report	Integrating liquid	Monthly	60 (12 per site)	Gross alpha/beta, H-3, pH
3.0 km SSE AFFXFOP					
3.7 km NNW AFTCFOP					
2.0 km NE AF24FOP					
Met Tower On- Site ANRGFOP					
Surface Soil (at each of nine air samplers plus 26 km SSW at Little Valley)	Long-term fallout accumulation <u>Reported:</u> Annual Environmental Monitoring Report	Surface plug composite soil	Annually	10	Gamma isotopic, Sr-90, Pu-239, Am-241 U-isotopic at SFRSPRD, SFBOEHN and SFGRVAL
SF Soil Series:					
Buttermilk Creek at Thomas Corners Road SFTCSED	Deposition in sediment downstream of facility effluents	Grab stream sediment	Semiannually 1st sample of SFBCSED and SFSDSED each spring*	10	Gross alpha/beta, isotopic gamma and Sr-90
Buttermilk Creek at Fox Valley Road (background) SFBCSED	<u>Reported:</u> Annual Environmental Monitoring Report		Annually (2 sites only**)	2	U/Pu isotopic, Am-241
Cattaraugus Creek at Springville Dam SFSDSED					
Cattaraugus Creek at Bigelow Bridge (background) SFBISED					
Cattaraugus Creek at Felton Bridge SFCCSED					

*Sample to be split with NYSDOH.

**Analysis on one of two semiannual collections at SFTCSED and SFBCSED.

SAMPLING RATIONALE

AFDHFOP DOE/EP-0023, 4.7.
AFFXFOP
AFTCFOP Collection of fallout particles and precipitation around the site perimeter established
AF24FOP air sampling locations. Indicates short-term effects.

ANRGFOP Collection of fallout particles and precipitation onsite at the meteorological tower.
Indicates short-term effects.

SF.. Draft DOE 5400.6, V.10 and DOE/EP-0023, 4.7.

SFWEVAL (West Valley), SFFXVRD (Fox Valley Road), SFSPRVL (Springville), SFTCORD (Thomas
Corners), SFRT240 (Route 240), SFDNKRK (Dunkirk), SFBOEHN (Boehn Road-Dutch Hill), SFGRVAL (Great
Valley), SFRSPRD (Rock Springs Road): Collection of long-term fallout data at established air
sampler locations via soil sampling.

SFTCSSED Sediment deposition in Buttermilk Creek immediately downstream of all facility liquid effluents.

SFBCESED Sediment deposition in Buttermilk Creek upstream of facility effluents (background).

SFCCSESED Sediment deposition in Cattaraugus Creek at Felton Bridge. Location is first access point of
Cattaraugus Creek downstream of the confluence with Buttermilk Creek.

SFSDSESED Sediment deposition in Cattaraugus Creek at Springville dam. Reservoir provides ideal settling
and collection location for sediments downstream of Buttermilk Creek confluence. Located
downstream of SFCCSESED.

SFBISESED Sediment deposition in Cattaraugus Creek at Bigelow Bridge. Location is upstream of the
Buttermilk Creek confluence and serves as a Cattaraugus Creek background location.

1990 OFF-SITE MONITORING PROGRAM

<u>SAMPLE LOCATION CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
Cattaraugus Creek downstream of the Buttermilk Creek Confluence BFFCATC*	Fish in waters up - and downstream of facility effluents <u>Reported:</u> Annual Environmental Monitoring Report	Individual collection, biological	Semiannually	5 (each sample is 10 fish)	Gamma isotopic and Sr-90 in edible portions of each individual fish
Control Sample from nearby stream not affected by WVDP (7 km or more upstream of site effluent point) BFFCTRL*					
Cattaraugus Creek downstream of Springville Dam BFFCATD			Annual	1 (each sample is 10 fish)	Gamma isotopic and Sr-90 in edible portions of each individual fish
Dairy Farm, 3.8 km NNW BFMREED*	Milk from animals foraging around facility perimeter	Grab biological	Monthly (BFMREED, BFMCOBO, BFMCTLS, BFMCTLN)	48 (12 per site)	Gamma isotopic, Sr-90, H-3, and I-129 of annual samples and quarterly composites of monthly samples
Dairy Farm, 1.9 km WNW BFMCOBO	<u>Reported:</u> Annual Environmental Monitoring Report				
Dairy Farm, 3.5 km SE of site BFMWIDR			Annual (BFMWIDR, BFMHAUR)	2	
Dairy Farm 2.5 km SSW BFMHAUR					
Control location 25 km S BFMCTLS					
Control location 30 km N BFMCTLN					

*Samples shared with NYSDOH.

SAMPLING RATIONALE

BFFCATC Draft DOE 5400.6, V.12.a.(1).
BFFCATD

Radioactivity may enter a food chain in which fish are a major component and are consumed by the local population.

BFFCTRL Draft DOE 5400.6, V.9.c.(1).

BFMREED Draft DOE 5400.6, V.9.c.(1).
BFMCOBO
BFMWIDR
BFMHAUR

Milk from animals foraging around facility perimeter. Milk is consumed by all age groups and is frequently the most important food that could contribute to the radiation dose. Dairy animals pastured near the site and at two background locations allow adequate monitoring.

BFMCTLS Background control samples collected far from site.
BFMCTLN

1990 OFF-SITE MONITORING PROGRAM

<u>SAMPLE LOCATION CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
Nearby locations BFVNEAR	Fruit and vegetables grown near facility perimeter downwind if possible	Grab biological (3 each)	*Annually, at harvest	6	Gamma isotopic and Sr-90 analysis of edible portions, H-3 in free moisture
Remote locations (16 km or more from facility) BFVCTRL	<u>Reported:</u> Annual Environmental Monitoring Report				
Beef cattle/ milk cow forage from near-site location N BFHNEAR		Grab biological	Annually	2	Gamma isotopic, Sr-90
Beef cattle/ milk cow forage from control south location or north location BFHCTLS or BFHCTLM					
Beef animal from nearby farm in downwind direction BFBNEAR	Meat-beef foraging near facility perimeter, downwind if possible	Grab biological	Semiannually	4	Gamma isotopic and Sr-90 analysis of meat, H-3 in free moisture
Beef animal from control location 16 km or more from facility BFBCTRL	<u>Reported:</u> Annual Environmental Monitoring Report				
In vicinity of the site (3) BFDNEAR	Meat-deer foraging near facility perimeter	Individual collection biological	*Annually, during hunting season	3	Gamma isotopic and Sr-90 analysis of meat, H-3 in free moisture
Control animals (3) 16 km or more from facility BFDCTRL	<u>Reported:</u> Annual Environmental Monitoring Report		*During year as available	3	

*Sample to be split with NYSDOH.

SAMPLING RATIONALE

BFVNEAR	Draft Doe 5400.6, V.9.c.(2). Fruits and vegetables collected from areas near the site. Collected, if possible, from areas near the site predicted to have worst case downwind concentrations of radionuclides in air and soil. Sample analysis reflects steady state/chronic uptake or contamination of foodstuffs as a result of site activities. Possible pathway to humans or indirectly through animals.
BFVCTRL	Draft DOE 5400.6, V.9.c.(2). Fruits and vegetables collected from area remote from the site. Background fruits and vegetables collected for comparison with near-site samples. Collected in areas(s) of no possible site impact.
BFHNEAR	Draft DOE 5400.6, V.9.c.(2). Hay collected from areas near the site. Same as for near-site fruits and vegetables (BFVNEAR). Indirect pathway to humans through animals. Collected with either beef or milk sample location.
BFHCTLS BFHCTLN	Draft DOE 5400.6, V.9.c.(2). Hay collected from areas remote from the site. Background hay collected for comparison with near-site samples. Collected in area(s) of no possible site impact.
BFBNEAR	DOE 5400.6, V.9.c.(3). Beef collected from animals raised near the site. Following the rationale for vegetable matter collected near site (BFVNEAR and BFHNEAR), edible flesh portion of beef animals is analyzed to determine possible radionuclide content passable directly to humans. For animals foraging downwind in areas of maximum probable site impact.
BFBCTRL	Draft DOE 5400.6, V.9.c.(3). Beef collected from animals raised far from the site. Background beef collected for comparison with near-site samples. Collected in area(s) of no possible site impact.
BFDNEAR	Draft DOE 5400.6, V.9.d. Venison from deer herd found living near the site. Same as for beef (BFBNEAR).
BFDCTRL	Draft DOE 5400.6, V.9.d. Venison from deer herd living far from the site. Background deer meat collected for comparison with near-site samples. Collected in area(s) of no possible site impact.

1990 OFF-SITE MONITORING PROGRAM

<u>SAMPLE LOCATION CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
Thermoluminescent Dosimetry (TLD) off-site: DFTLD Series	Direct radiation around facility	Integrating LiF TLD	Quarterly	460 (5 TLDs at each of 23 locations, collected 4 times per year)	Quarterly gamma radiation exposure
At each of 16 compass sectors, at nearest accessible perimeter point #1-16	<u>Reported:</u> Monthly Environmental Monitoring Trend Analysis Annual Environmental Monitoring Report				
"5 Points" land-fill, 19 km SW (background) #17					
1500 m NW (downwind receptor) #20					
Springville 7 km N #21					
West Valley 5 km SSE #22					
Great Valley, 29 km S (background) #23					
Dunkirk, 50 km NW (background) #37					
Sardinia-Savage Rd. 24 km NE (background) #41					

SAMPLING RATIONALE

DOSIMETRY off-site

Draft DOE 5400.6, V.7 and DOE/EP-0023, 4.6.3.

TLDs offer continuous integrated environmental gamma-ray monitoring and have been deployed systematically about the site. Off-site TLDs are used to verify that site activities have not adversely affected the surrounding environs.

In addition to general NRC crosschecks, a biennial HPIC gamma radiation measurement is completed at all TLD locations.

1990 EFFLUENT AND ON-SITE MONITORING PROGRAM

<u>SAMPLE LOCATION CODE</u>	<u>MONITORING/REPORTING REQUIREMENTS</u>	<u>SAMPLING TYPE/MEDIUM</u>	<u>COLLECTION FREQUENCY</u>	<u>TOTAL ANNUAL SAMPLES</u>	<u>ANALYSES PERFORMED/ COMPOSITE FREQUENCY</u>
Thermoluminescent Dosimetry (TLD) onsite: DNTLD Series	Direct radiation on facility grounds	Integrating LiF TLD	Quarterly	360 (5 TLDs at each of 18 sites collected 4 times per year)	Quarterly gamma radiation exposure
At three corners of SDA #18, #19, #33	<u>Reported:</u> Monthly Environmental Monitoring Trend Analysis				
(9) at security fence around site #24, 26-34	Annual Environmental Monitoring Report				
(5) on-site near operational areas #35, 36, 38-40					
Rock Springs Road 500 m NNW of plant #25					

SAMPLING RATIONALE

DOSIMETRY
on-site

Draft DOE 5400.6, V.7.

On-site TLDs monitor waste management units and verify that the potential dose rate to the general public, (i.e., Rock Springs Road), is below 100 mr/annum from site activities.

Potential TLD sampling locations are continually evaluated with respect to site activities.

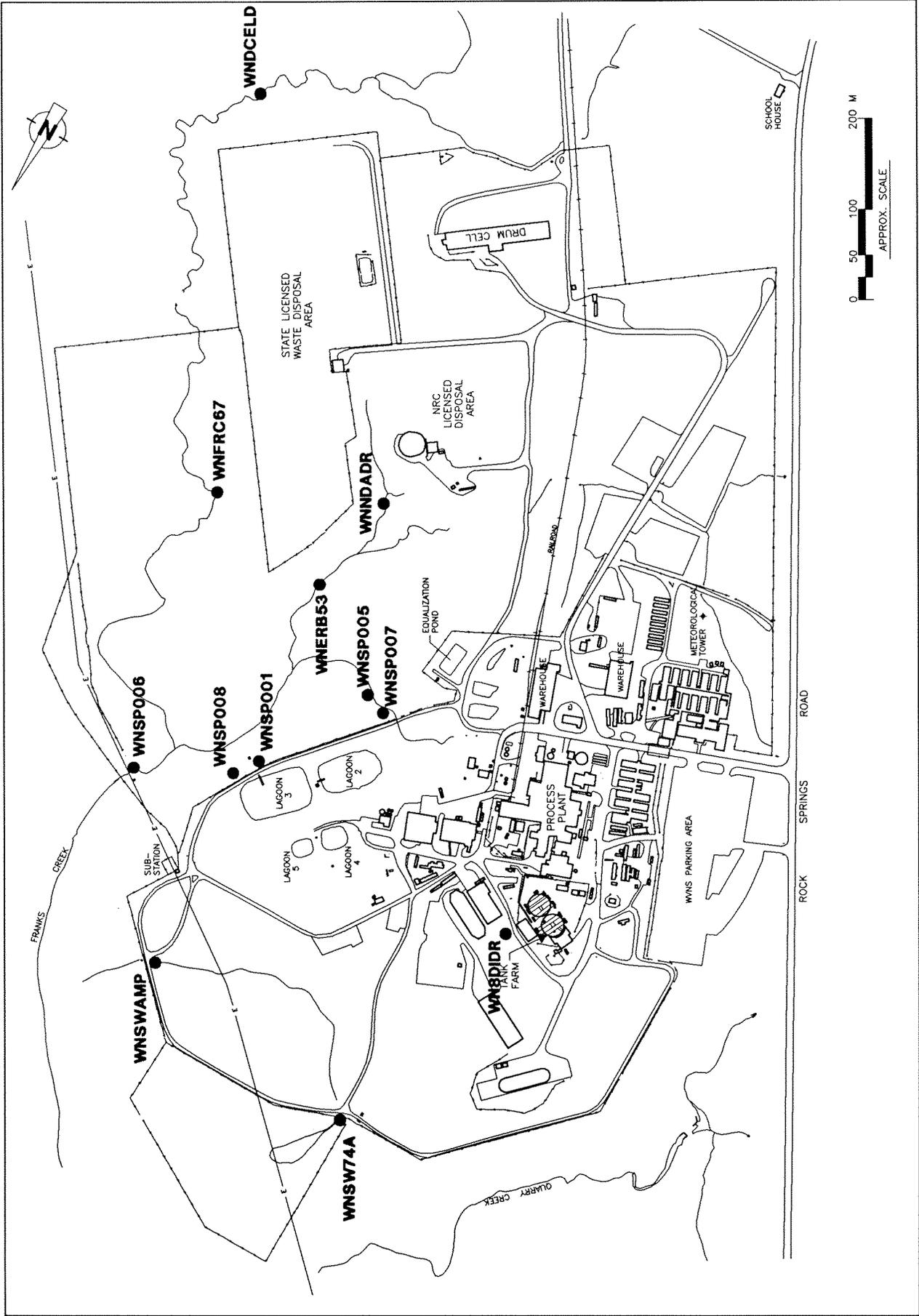


Figure A-2. Sampling Locations for On-Site Surface Water.

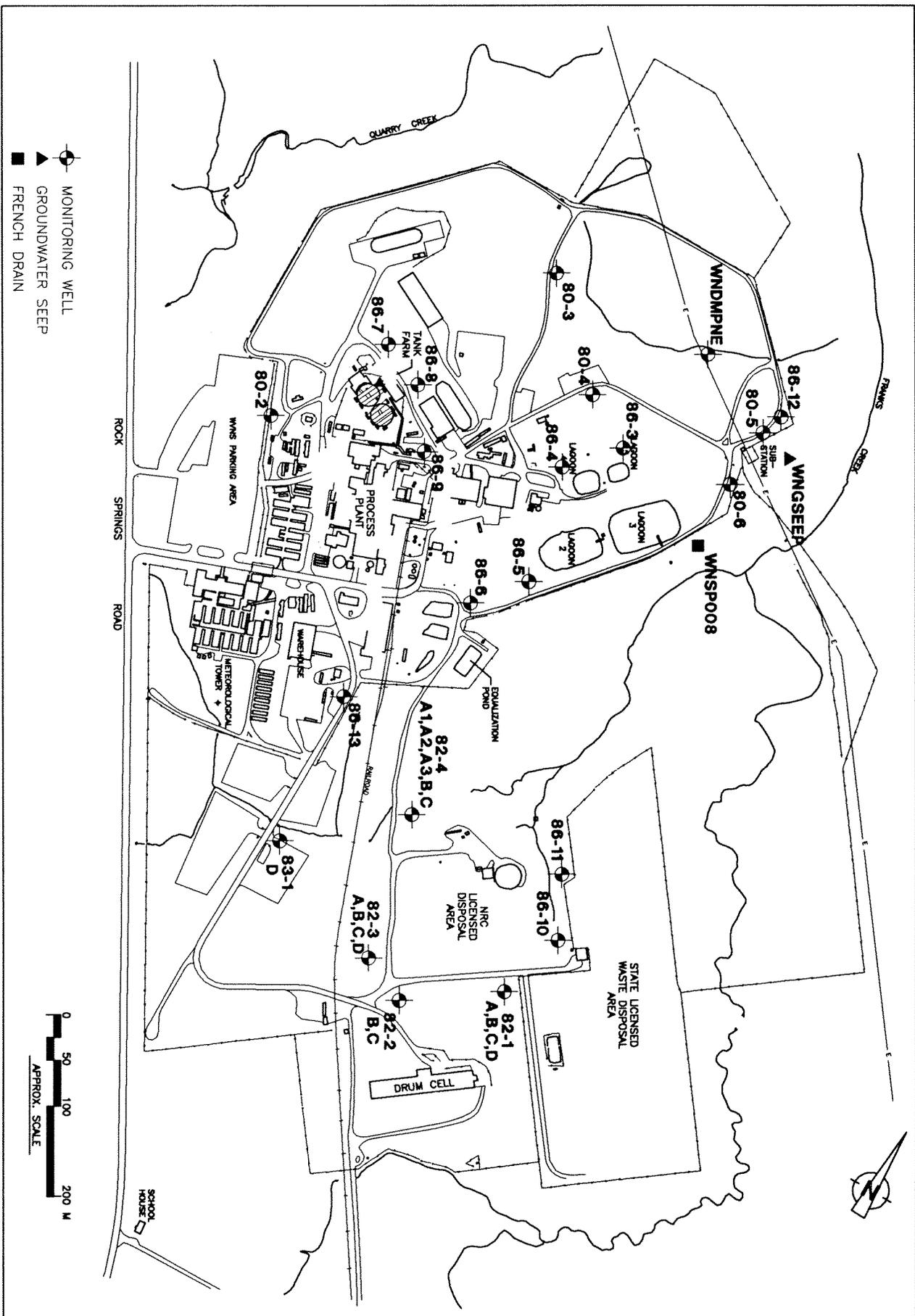


Figure A-3. Location of On-Site Groundwater Monitoring Points.

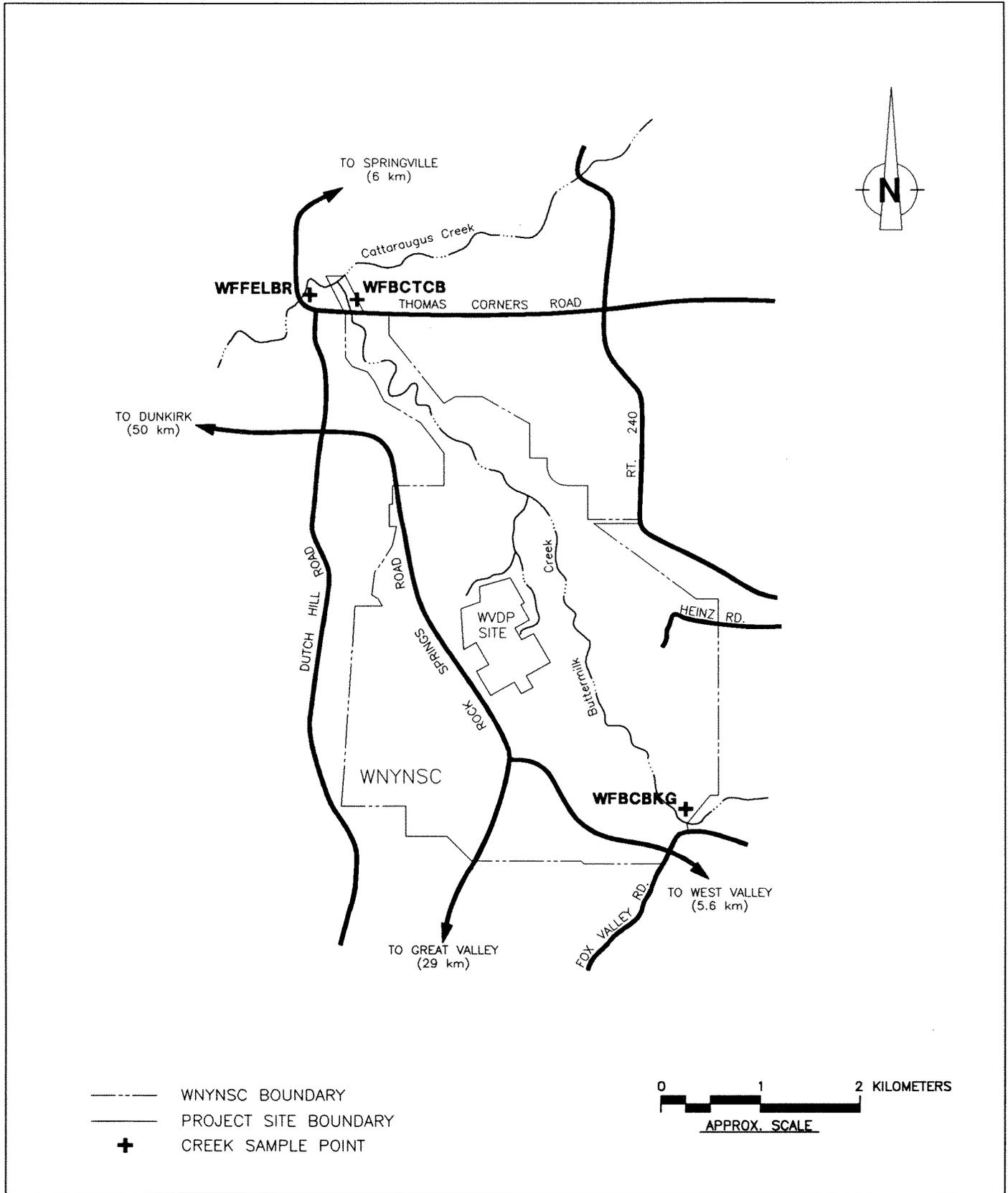


Figure A-4. Location of Off-Site Surface Water Samplers.

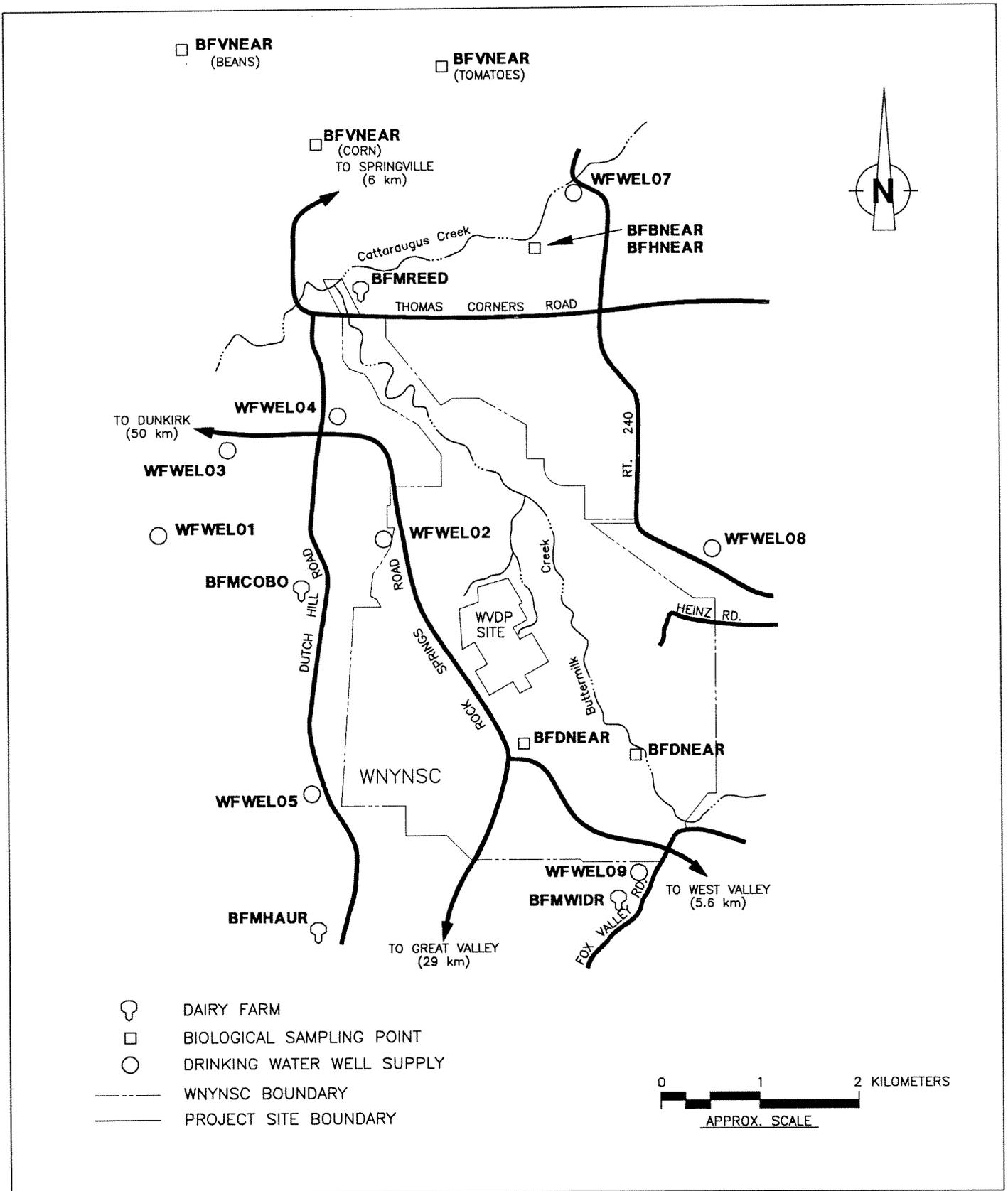


Figure A-5. Near-Site Drinking Water and Biological Sampling Points – 1990.

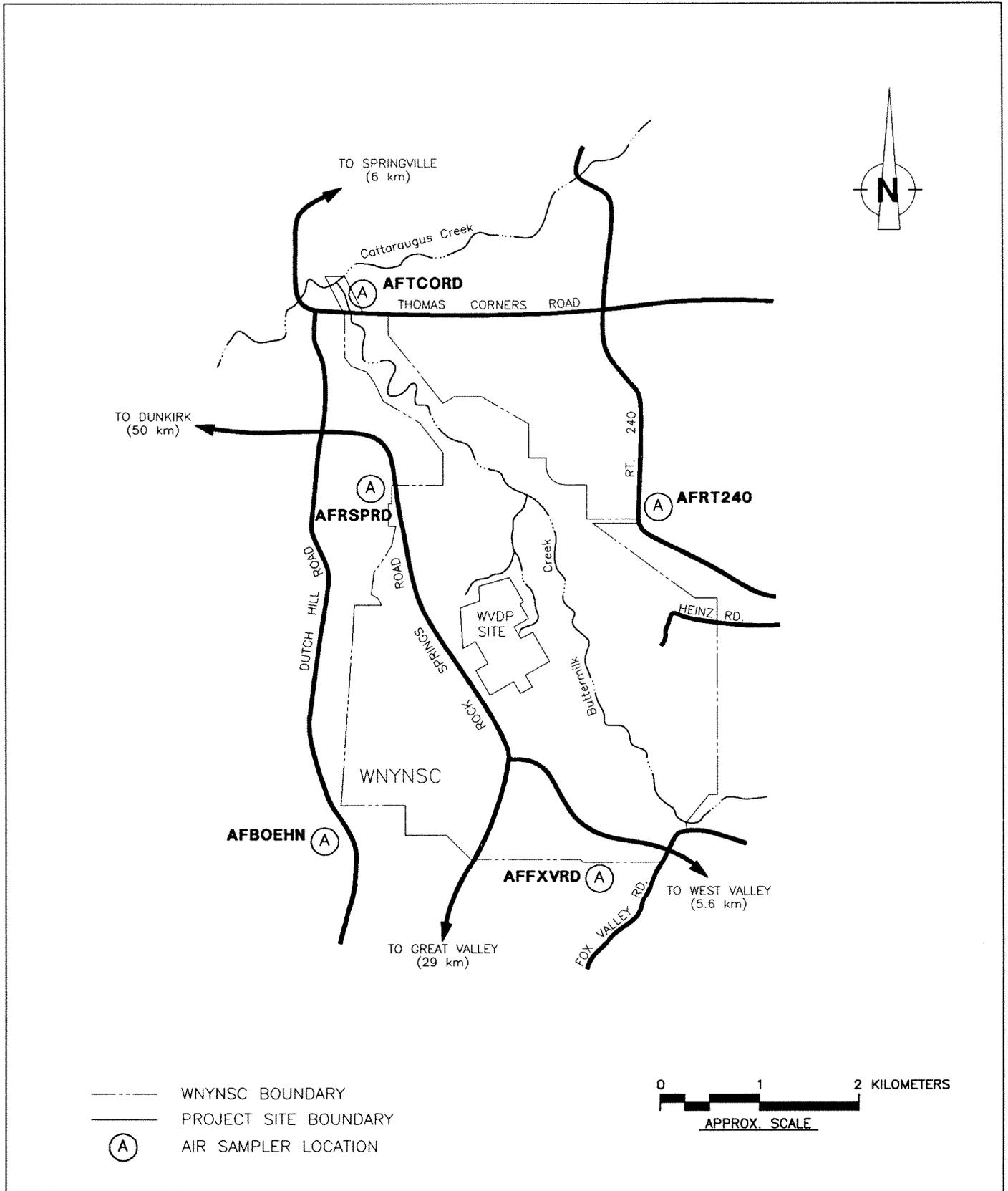


Figure A-6. Location of Perimeter Air Samplers.

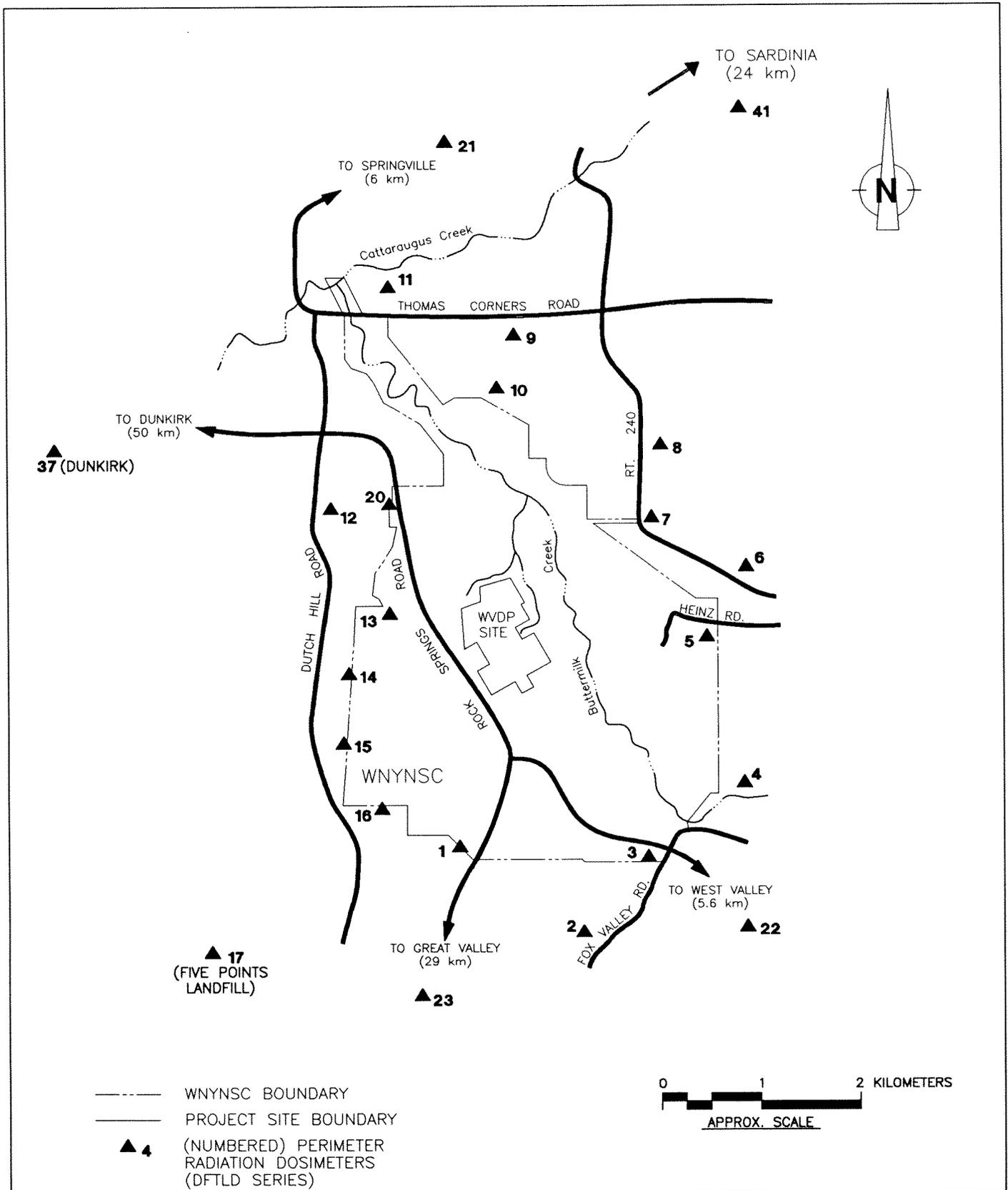
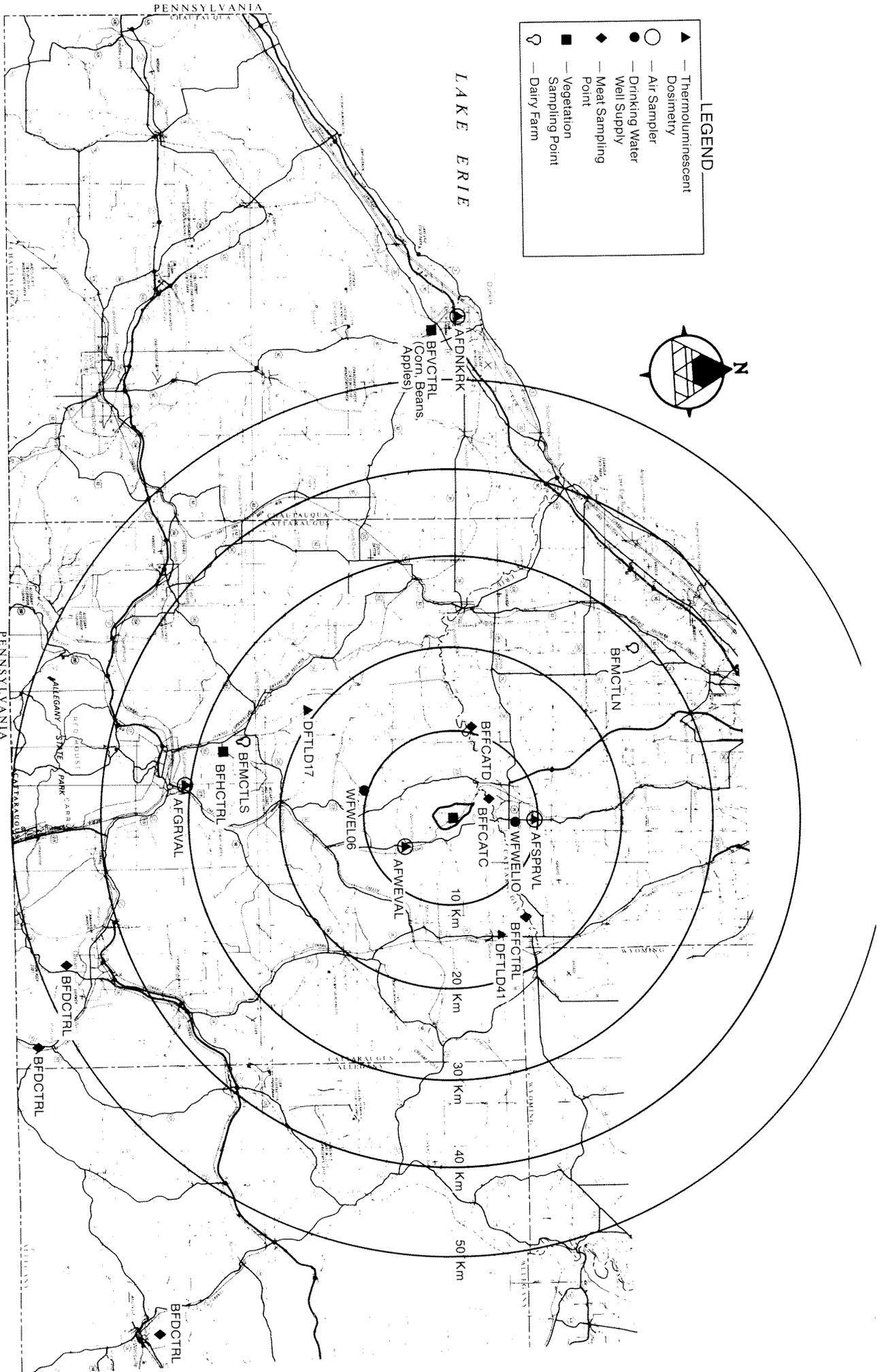


Figure A-7. Location of Off-Site Thermoluminescent Dosimetry (TLD).



REF: NYS DOT, New York State Map — West Sheet,
1:250,000, Revised 1982

FIGURE A-9. ENVIRONMENTAL SAMPLE POINTS MORE THAN 5 KM FROM THE WVDP SITE