244
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Washington, D.C. 20555

December, 1985

Please find attached the latest revision to the LaSalle Offsite Dose Calculation Manual, Site Specific Sections 7.2 & 8.0 Revision 11, as was submitted to you on December 9, 1985 in the November Monthly Operating Report.

Please remove and destroy the outdated site specific sections and insert the updated Revision 11 site specific sections.

Please sign, date, and return this control sheet to:

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ADD:
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FOB (VASSALLO)
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ODCM LIST OF TABLES FOR LA SALLE SECTION 7.2

ODCM LIST OF FIGURES FOR LA SALLE SECTION 7.2

7.2 DATA SPECIFIC TO EACH STATION

This section contains site descriptions and data (particularly meteorological data) that is relevant only to a specific site.

TABLE 7.2-1

AQUATIC ENVIRONMENT DOSE PARAMETERS

PARAMETER	LA SALLE
U^w, water usage, liters/hr	0.042
U^f, fish consumption, kg/hr	2.4×10^{-4}
$1/M^w$	1
$1/M^f$	1
F^w, ft^3/sec	1.37×10^4
F^f, ft^3/sec	1.37×10^4
t^f, hr*	24
t^w, hr**	97
B_i - Regulatory Guide 1.109, Revision 1, October 1977, Table A-1, Column 2 or freshwater fish. See Table 7.1-12.	
F^t, ft^3/sec	Not Applicable.*** No outdoor tanks without overflow pipes connected to other storage tanks.
F_o^w, ft^3/sec	
$1/M_o^w$	
t_o^w, hr	
V^t, gal	
t_o, hr	

*t^f (hr) = 24 hr (all stations) for the fish ingestion pathway

**t^w (hr) = 97 hr (distance to Peoria is 97 miles; flow rate of 1 mph assumed)

***There is a 10 Ci limit for temporary outdoor storage tanks without holding basins, unless parameters are specified.

TABLE 7.2-2

ANNUAL DESIGN OBJECTIVES SET BY 10 CFR 50,
APPENDIX I FOR EACH REACTOR

TYPE OF DOSE	ANNUAL DESIGN OBJECTIVES
Airborne Releases	
Gamma Air Dose	10 mrad
Beta Air Dose	20 mrad
Whole Body Dose	5 mrem
Skin Dose	15 mrem
Infant Thyroid Dose	15 mrem
Liquid Releases	
Whole Body Dose	3 mrem
Thyroid Dose	10 mrem
Bone Dose	10 mrem
Skin Dose	10 mrem

TABLE 7.2-3

STATION: La Salle

LOCATION: 6 miles south of Marseilles, Illinois - La Salle County

CHARACTERISTICS OF ELEVATED RELEASE POINT

1) Release Height = 112.8 m 2) Diameter = 5.6 m

2) Exit Speed = 18.3 ms^{-1} 4) Heat Content = 1.1E4 KCal s^{-1}

CHARACTERISTICS OF VENT STACK RELEASE POINT (NA)

1) Release Height = _____ m 2) Diameter = _____ m

3) Exit Speed = _____ ms^{-1}

CHARACTERISTICS OF GROUND LEVEL RELEASE (NA)

1) Release Height = 0 m

2) Building Factor (D) = 56 m

METEOROLOGICAL DATA

A 400 ft. Tower is Located 300 m SSW of elevated release point

Tower Data Used in Calculations

Release Point	Wind Speed and Direction	Differential Temperature
Elevated	375 ft	375-33 ft
Vent	(NA)	(NA)
Ground	33 ft	200-33 ft

TABLE 7.2-4

CRITICAL RANGES

DIRECTION	SITE BOUNDARY (m)	NEAREST RESIDENT (m)	NEAREST DAIRY FARM RANGE* (m)
N	1022	3540	
NNE	1330	2253	
NE	2408	2896	
ENE	4450	5471	
E	1996	4988	
ESE	838	2574	
SE	884	2414	
SSE	838	1770	
S	829	3540	
SSW	829	3218	
SW	610	1126	
WSW	509	2092	
W	509	1448	
WNW	625	1609	
NW	732	4183	
NNW	848	2414	

*Within 5 miles

TABLE 7.2-5

TERRAIN CORRECTION FACTORS (h_t)*

(h_t = 0 to Stated Range, Then h_t = Given Value)

DIRECTION	RANGE	ht
N	-	0
NNE	-	0
NE	-	0
ENE	-	0
E	-	0
SE	-	0
SSE	-	0
S	8.5 mi	13m
SSW	-	0
SW	1.5 mi	17m
WSW	1.0 mi	17m
W	1.0 mi	17m
WNW	1.0 mi	17m
NW	2.75 mi	17m
NNW	-	0

* Within 10 miles

TABLE 7.2-6

X/Q AND D/Q MAXIMA AT OR BEYOND THE UNRESTRICTED AREA BOUNDARY

DOWNWIND DIRECTION	ELEVATED(STACK) RELEASE				MIXED MODE(VENT) RELEASE			GROUND LEVEL RELEASE		
	RADIUS (METERS)	X/Q+ (SEC/M**3)	RADIUS (METERS)	D/Q Δ (1/M**2)	RADIUS (METERS)	X/Q+ (SEC/M**3)	D/Q Δ (1/M**2)	RADIUS (METERS)	X/Q+ (SEC/M**3)	D/Q Δ (1/M**2)
N	2800.	2.552-08	1022.	9.928-10	1022.	1.179-07	2.654-09	1022.	9.073-07	1.190-08
NNE	3000.	2.446-08	1330.	8.077-10	1330.	8.105-08	1.786-09	1330.	6.512-07	7.358-09
NE	2600.	2.420-08	2408.	4.660-10	2408.	4.772-08	7.377-10	2408.	2.444-07	2.349-09
ENE	4450.	2.374-08	4450.	2.845-10	4450.	3.055-08	3.566-10	4450.	9.947-08	8.018-10
E	2800.	3.322-08	1996.	8.853-10	1996.	6.215-08	1.328-09	1996.	3.575-07	3.941-09
ESE	2800.	3.199-08	838.	1.107-09	838.	1.522-07	3.538-09	838.	1.267-06	1.708-08
SE	2800.	2.207-08	884.	6.366-10	884.	9.527-08	2.005-09	884.	8.673-07	1.052-08
SSE	3000.	2.234-08	1000.	4.681-10	838.	7.312-08	1.506-09	838.	9.195-07	8.921-09
S	2600.	2.248-08	829.	5.442-10	829.	6.326-08	1.272-09	829.	7.524-07	7.582-09
SSW	2800.	2.775-08	829.	7.249-10	829.	5.667-08	1.355-09	829.	9.809-07	7.715-09
SW	2600.	2.486-08	610.	9.944-10	610.	9.495-08	2.336-09	610.	1.403-06	1.372-08
WSW	2800.	1.986-08	509.	8.853-10	509.	1.144-07	2.673-09	509.	1.345-06	1.643-08
W	509.	1.751-08	509.	8.196-10	509.	1.255-07	2.657-09	509.	1.459-06	1.573-08
WNW	2800.	1.404-08	625.	4.956-10	625.	9.074-08	1.777-09	625.	9.893-07	1.102-08
NW	3000.	2.156-08	732.	5.425-10	732.	9.384-08	1.901-09	732.	1.247-06	1.128-08
NNW	3000.	1.856-08	848.	7.826-10	848.	9.261-08	2.129-09	848.	9.930-07	1.048-08

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

+ Beta air, beta skin, and inhalation dose pathways.

Δ Produce and leafy vegetable pathways.

TABLE 7.2-6 (Cont'd)

LA SALLE COUNTY 1&2

AVERAGE WIND SPEED FOR EACH RELEASE MODE

Downwind Direction	Wind Speed (m/sec) Elevated Release
N	8.2
NNE	8.2
NE	7.9
ENE	7.7
E	8.0
ESE	8.2
SE	7.5
SSE	6.8
S	6.1
SSW	5.5
SW	6.1
WSW	6.6
W	6.9
WNW	6.9
NW	7.1
NNW	7.7

TABLE 7.2-7

D/Q AT THE NEAREST MILK COW AND MEAT ANIMAL LOCATIONS WITHIN 5 MILES

DOWNWIND DIRECTION	NEAREST MILK COW D/Q(1/M**2)				NEAREST MEAT ANIMAL D/Q(1/M**2)			
	RADIUS (METERS)	ELEVATED RELEASE	MIXED RELEASE	GROUND RELEASE	RADIUS (METERS)	ELEVATED RELEASE	MIXED RELEASE	GROUND RELEASE
N	8047.	1.244-10	1.566-10	3.299-10	2253.	6.165-10	9.949-10	3.075-09
NNE	8047.	1.133-10	1.454-10	3.196-10	2275.	5.751-10	9.306-10	2.929-09
NE	8047.	9.414-11	1.223-10	2.833-10	3219.	3.389-10	4.954-10	1.414-09
ENE	8047.	1.192-10	1.419-10	2.817-10	4506.	2.803-10	3.506-10	7.847-10
E	8047.	1.633-10	1.891-10	3.419-10	5150.	3.241-10	3.863-10	7.539-10
ESE	8047.	1.603-10	1.885-10	3.445-10	4345.	3.896-10	4.864-10	1.022-09
SE	8047.	1.018-10	1.195-10	2.309-10	4345.	2.470-10	3.071-10	6.851-10
SSE	8047.	9.203-11	1.026-10	1.799-10	5472.	1.663-10	1.891-10	3.557-10
S	8047.	8.057-11	8.809-11	1.503-10	2575.	3.381-10	4.188-10	1.108-09
SSW	8047.	8.487-11	9.057-11	1.529-10	2897.	3.325-10	3.836-10	9.167-10
SW	8047.	9.830-11	1.050-10	1.669-10	1287.	6.657-10	1.024-09	4.064-09
WSW	8047.	7.451-11	8.355-11	1.498-10	1448.	4.907-10	7.794-10	2.984-09
W	8047.	5.574-11	6.705-11	1.435-10	1770.	3.618-10	5.698-10	2.030-09
WNW	8047.	5.588-11	6.623-11	1.393-10	1609.	3.171-10	5.624-10	2.318-09
NW	8047.	7.190-11	8.684-11	1.834-10	1609.	3.896-10	7.292-10	3.051-09
NNW	8047.	8.559-11	1.041-10	2.153-10	1287.	5.964-10	1.243-09	5.242-09

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR KR 83M

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE RADIUS (METERS)	S (MRAD/YR)/(UCI/SEC)	SBAR	MIXED MODE(VENT) RELEASE RADIUS (METERS)	V (MRAD/YR)/(UCI/SEC)	VBAR	GROUND LEVEL RELEASE RADIUS (METERS)	G (MRAD/YR)/(UCI/SEC)	GBAR
N	1022.	1022.	2.556-06	2.308-07	1022.	1.388-05	1.253-06	1022.	9.844-05	8.889-06
NNE	1330.	1330.	2.373-06	2.143-07	1330.	9.525-06	8.601-07	1330.	6.766-05	6.109-06
NE	2408.	2408.	2.265-06	2.045-07	2408.	4.842-06	4.372-07	2408.	2.489-05	2.248-06
ENE	4450.	4450.	2.038-06	1.841-07	4450.	2.754-06	2.486-07	4450.	8.937-06	8.070-07
E	1996.	1996.	3.246-06	2.931-07	1996.	6.632-06	5.988-07	1996.	3.579-05	3.232-06
ESE	838.	838.	3.035-06	2.740-07	838.	1.808-05	1.633-06	838.	1.373-04	1.240-05
SE	884.	884.	2.965-06	1.775-07	884.	1.136-05	1.026-06	884.	9.472-05	8.553-06
SSE	838.	838.	1.627-06	1.470-07	838.	8.950-06	8.082-07	838.	9.610-05	8.678-06
S	829.	829.	2.319-06	2.094-07	829.	7.535-06	6.804-07	829.	8.048-05	7.268-06
SSW	829.	829.	2.392-06	2.160-07	829.	7.049-06	6.365-07	829.	1.004-04	9.065-06
SW	610.	610.	2.563-06	2.314-07	610.	1.132-05	1.023-06	610.	1.517-04	1.370-05
WSW	509.	509.	2.305-06	2.081-07	509.	1.386-05	1.252-06	509.	1.542-04	1.392-05
W	509.	509.	2.369-06	2.140-07	509.	1.484-05	1.340-06	509.	1.624-04	1.466-05
WNW	625.	625.	1.799-06	1.625-07	625.	1.073-05	9.686-07	625.	1.100-04	9.937-06
NW	732.	732.	1.691-06	1.527-07	732.	1.133-05	1.023-06	732.	1.320-04	1.192-05
NNW	848.	848.	1.968-06	1.777-07	848.	1.108-05	1.000-06	848.	1.048-04	9.466-06

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR KR 85M

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE RADIUS (METERS)	S (MRAD/YR)/(UCI/SEC)	SBAR	MIXED MODE(VENT) RELEASE RADIUS (METERS)	V (MRAD/YR)/(UCI/SEC)	VBAR	GROUND LEVEL RELEASE RADIUS (METERS)	G (MRAD/YR)/(UCI/SEC)	GBAR
N	1022.	1022.	1.438-04	7.665-05	1022.	1.940-04	1.022-04	1022.	5.816-04	2.999-04
NNE	1330.	1330.	1.145-04	6.100-05	1330.	1.473-04	7.775-05	1330.	4.292-04	2.217-04
NE	2408.	2408.	6.027-05	3.197-05	2408.	7.299-05	3.849-05	2408.	1.787-04	9.267-05
ENE	4450.	4450.	3.374-05	1.780-05	4450.	3.794-05	1.996-05	4450.	7.695-05	4.007-05
E	1996.	1996.	8.722-05	4.628-05	1996.	1.047-04	5.527-05	1996.	2.617-04	1.358-04
ESE	838.	838.	1.915-04	1.021-04	838.	2.585-04	1.363-04	838.	8.036-04	4.141-04
SE	884.	884.	1.292-04	6.887-05	884.	1.708-04	9.010-05	884.	5.459-04	2.812-04
SSE	838.	838.	1.299-04	6.933-05	838.	1.628-04	8.607-05	838.	5.638-04	2.904-04
S	829.	829.	1.221-04	6.507-05	829.	1.456-04	7.705-05	829.	4.859-04	2.507-04
SSW	829.	829.	1.514-04	8.070-05	829.	1.730-04	9.176-05	829.	6.214-04	3.205-04
SW	610.	610.	1.875-04	1.000-04	610.	2.264-04	1.198-04	610.	8.484-04	4.363-04
WSW	509.	509.	1.723-04	9.191-05	509.	2.204-04	1.164-04	509.	8.171-04	4.196-04
W	509.	509.	1.682-04	8.973-05	509.	2.181-04	1.150-04	509.	8.254-04	4.230-04
WNW	625.	625.	1.246-04	6.647-05	625.	1.616-04	8.527-05	625.	5.801-04	2.978-04
NW	732.	732.	1.572-04	8.391-05	732.	1.976-04	1.044-04	732.	7.297-04	3.750-04
NNW	848.	848.	1.327-04	7.073-05	848.	1.720-04	9.078-05	848.	5.865-04	3.015-04

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR KR 85

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE RADIUS (METERS)	S (MRAD/YR)/(UCI/SEC)	SBAR	MIXED MODE(VENT) RELEASE RADIUS (METERS)	V (MRAD/YR)/(UCI/SEC)	VBAR	GROUND LEVEL RELEASE RADIUS (METERS)	G (MRAD/YR)/(UCI/SEC)	GBAR
N	1022.	1022.	1.881-06	1.164-06	1022.	2.390-06	1.479-06	1022.	6.395-06	3.958-06
NNE	1330.	1330.	1.511-06	9.355-07	1330.	1.846-06	1.143-06	1330.	4.827-06	2.988-06
NE	2408.	2408.	8.049-07	4.982-07	2408.	9.347-07	5.786-07	2408.	2.045-06	1.266-06
ENE	4450.	4450.	4.736-07	2.931-07	4450.	5.161-07	3.195-07	4450.	9.484-07	5.870-07
E	1996.	1996.	1.162-06	7.193-07	1996.	1.339-06	8.288-07	1996.	2.993-06	1.853-06
ESE	838.	838.	2.505-06	1.550-06	838.	3.189-06	1.974-06	838.	8.870-06	5.491-06
SE	884.	884.	1.684-06	1.043-06	884.	2.109-06	1.305-06	884.	5.982-06	3.703-06
SSE	838.	838.	1.716-06	1.062-06	838.	2.052-06	1.270-06	838.	6.290-06	3.894-06
S	829.	829.	1.597-06	9.885-07	829.	1.837-06	1.137-06	829.	5.385-06	3.333-06
SSW	829.	829.	2.014-06	1.247-06	829.	2.236-06	1.384-06	829.	7.013-06	4.341-06
SW	610.	610.	2.472-06	1.530-06	610.	2.866-06	1.774-06	610.	9.339-06	5.781-06
WSW	509.	509.	2.254-06	1.395-06	509.	2.742-06	1.697-06	509.	8.869-06	5.490-06
W	509.	509.	2.212-06	1.369-06	509.	2.719-06	1.683-06	509.	8.993-06	5.567-06
WNW	625.	625.	1.625-06	1.006-06	625.	2.002-06	1.239-06	625.	6.313-06	3.908-06
NW	732.	732.	2.084-06	1.290-06	732.	2.496-06	1.545-06	732.	8.111-06	5.021-06
NNW	848.	848.	1.747-06	1.081-06	848.	2.148-06	1.330-06	848.	6.504-06	4.026-06

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR KR 87

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE RADIUS (METERS)	S (MRAD/YR)/(UCI/SEC)	SBAR	MIXED MODE(VENT) RELEASE RADIUS (METERS)	V (MRAD/YR)/(UCI/SEC)	VBAR	GROUND LEVEL RELEASE RADIUS (METERS)	G (MRAD/YR)/(UCI/SEC)	GBAR
N	1022.	1022.	6.081-04	4.444-04	1022.	7.471-04	5.442-04	1022.	1.780-03	1.285-03
NNE	1330.	1330.	4.687-04	3.424-04	1330.	5.593-04	4.074-04	1330.	1.287-03	9.295-04
NE	2408.	2408.	2.356-04	1.720-04	2408.	2.700-04	1.966-04	2408.	5.395-04	3.899-04
ENE	4450.	4450.	1.236-04	9.011-05	4450.	1.344-04	9.784-05	4450.	2.247-04	1.626-04
E	1996.	1996.	3.445-04	2.514-04	1996.	3.916-04	2.853-04	1996.	7.848-04	5.673-04
ESE	838.	838.	8.102-04	5.923-04	838.	9.967-04	7.261-04	838.	2.451-03	1.769-03
SE	884.	884.	5.514-04	4.031-04	884.	6.671-04	4.861-04	884.	1.679-03	1.212-03
SSE	838.	838.	5.399-04	3.947-04	838.	6.312-04	4.602-04	838.	1.672-03	1.207-03
S	829.	829.	5.106-04	3.732-04	829.	5.758-04	4.200-04	829.	1.484-03	1.071-03
SSW	829.	829.	6.131-04	4.481-04	829.	6.730-04	4.911-04	829.	1.813-03	1.308-03
SW	610.	610.	7.946-04	5.809-04	610.	9.027-04	6.584-04	610.	2.543-03	1.836-03
WSW	509.	509.	7.514-04	5.494-04	509.	8.860-04	6.460-04	509.	2.511-03	1.813-03
W	509.	509.	7.274-04	5.319-04	509.	8.676-04	6.326-04	509.	2.510-03	1.811-03
WNW	625.	625.	5.393-04	3.944-04	625.	6.429-04	4.687-04	625.	1.784-03	1.288-03
NW	732.	732.	6.563-04	4.799-04	732.	7.693-04	5.610-04	732.	2.157-03	1.557-03
NNW	848.	848.	5.580-04	4.080-04	848.	6.677-04	4.867-04	848.	1.754-03	1.266-03

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR KR 88

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE RADIUS (METERS)	S	SBAR	MIXED MODE(VENT) RELEASE RADIUS (METERS)	V	VBAR	GROUND LEVEL RELEASE RADIUS (METERS)	G	GBAR
			(MRAD/YR)/(UCI/SEC)			(MRAD/YR)/(UCI/SEC)			(MRAD/YR)/(UCI/SEC)	
N	1022.	1022.	1.526-03	1.177-03	1022.	1.841-03	1.415-03	1022.	4.243-03	3.229-03
NNE	1330.	1330.	1.193-03	9.205-04	1330.	1.399-03	1.076-03	1330.	3.130-03	2.383-03
NE	2408.	2408.	6.086-04	4.690-04	2408.	6.873-04	5.285-04	2408.	1.328-03	1.013-03
ENE	4450.	4450.	3.232-04	2.534-04	4450.	3.544-04	2.725-04	4450.	5.809-04	4.437-04
E	1996.	1996.	8.846-04	6.817-04	1996.	9.921-04	7.630-04	1996.	1.936-03	1.476-03
ESE	838.	838.	2.040-03	1.574-03	838.	2.461-03	1.892-03	838.	5.843-03	4.446-03
SE	884.	884.	1.379-03	1.064-03	884.	1.641-03	1.262-03	884.	3.977-03	3.025-03
SSE	838.	838.	1.381-03	1.066-03	838.	1.587-03	1.221-03	838.	4.061-03	3.090-03
S	829.	829.	1.291 03	9.963-04	829.	1.439-03	1.107-03	829.	3.546-03	2.699-03
SSW	829.	829.	1.592-03	1.228-03	829.	1.727-03	1.330-03	829.	4.469-03	3.401-03
SW	610.	610.	2.009-03	1.550-03	610.	2.252-03	1.734-03	610.	6.116-03	4.651-03
WSW	509.	509.	1.868-03	1.442-03	509.	2.173-03	1.672-03	509.	5.919-03	4.500-03
W	509.	509.	1.823-03	1.407-03	509.	2.140-03	1.646-03	509.	5.961-03	4.530-03
WNW	625.	625.	1.344-03	1.038-03	625.	1.579-03	1.214-03	625.	4.210-03	3.201-03
NW	732.	732.	1.682-03	1.299-03	732.	1.938-03	1.491-03	732.	5.239-03	3.983-03
NNW	848.	848.	1.417-03	1.093-03	848.	1.664-03	1.280-03	848.	4.237-03	3.223-03

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR KR 89

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE			MIXED MODE(VENT) RELEASE			GROUND LEVEL RELEASE		
		RADIUS (METERS)	S (MRAD/YR)/(UCI/SEC)	SBAR	RADIUS (METERS)	V (MRAD/YR)/(UCI/SEC)	VBAR	RADIUS (METERS)	G (MRAD/YR)/(UCI/SEC)	GBAR
N	1022.	1022.	6.786-04	5.005-04	1022.	8.728-04	6.410-04	1022.	1.992-03	1.450-03
NNE	1330.	1330.	4.270-04	3.149-04	1330.	5.392-04	3.960-04	1330.	1.170-03	8.519-04
NE	2408.	2408.	1.232-04	9.078-05	2408.	1.504-04	1.105-04	2408.	2.940-04	2.142-04
ENE	4450.	4450.	2.630-05	1.935-05	4450.	2.999-05	2.202-05	4450.	4.808-05	3.510-05
E	1996.	1996.	2.265-04	1.669-04	1996.	2.703-04	1.985-04	1996.	5.104-04	3.720-04
ESE	838.	838.	9.713-04	7.165-04	838.	1.250-03	9.180-04	838.	2.915-03	2.123-03
SE	884.	884.	6.310-04	4.655-04	884.	7.964-04	5.851-04	884.	1.910-03	1.390-03
SSE	838.	838.	5.533-04	4.082-04	838.	6.826-04	5.017-04	838.	1.665-03	1.212-03
S	829.	829.	4.984-04	3.676-04	829.	5.891-04	4.332-04	829.	1.462-03	1.064-03
SSW	829.	829.	5.179-04	3.820-04	829.	5.982-04	4.400-04	829.	1.478-03	1.076-03
SW	610.	610.	8.875-04	6.547-04	610.	1.055-03	7.756-04	610.	2.731-03	1.989-03
WSW	509.	509.	9.934-04	7.330-04	509.	1.215-03	8.937-04	509.	3.258-03	2.372-03
W	509.	509.	9.133-04	6.739-04	509.	1.147-03	8.434-04	509.	3.113-03	2.266-03
WNW	625.	625.	6.671-04	4.923-04	625.	8.308-04	6.107-04	625.	2.201-03	1.602-03
NW	732.	732.	6.690-04	4.936-04	732.	8.424-04	6.191-04	732.	2.157-03	1.570-03
NNW	848.	848.	6.055-04	4.467-04	848.	7.674-04	5.638-04	848.	1.843-03	1.342-03

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR KR 90

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE			MIXED MODE(VENT) RELEASE			GROUND LEVEL RELEASE		
		RADIUS (METERS)	S	SBAR	RADIUS (METERS)	V	VBAR	RADIUS (METERS)	G	GBAR
			(MRAD/YR)/(UCI/SEC)			(MRAD/YR)/(UCI/SEC)			(MRAD/YR)/(UCI/SEC)	
N	1022.	1022.	9.738-05	6.981-05	'022.	1.348-04	9.601-05	1022.	3.031-04	2.138-04
NNE	1330.	1330.	3.526-05	2.527-05	1330.	4.800-05	3.419-05	1330.	1.036-04	7.307-05
NE	2408.	2408.	1.552-06	1.112-06	2408.	2.017-06	1.437-06	2408.	3.976-06	2.808-06
ENE	4450.	4450.	1.111-08	7.939-09	4450.	1.299-08	9.260-09	4450.	2.081-08	1.473-08
E	1996.	1996.	5.791-06	4.144-06	1996.	7.210-06	5.137-06	1996.	1.332-05	9.416-06
ESE	838.	838.	1.961-04	1.406-04	838.	2.685-04	1.913-04	838.	6.073-04	4.284-04
SE	884.	884.	9.875-05	7.080-05	884.	1.340-04	9.549-05	884.	3.078-04	2.171-04
SSE	838.	838.	8.074-05	5.789-05	838.	1.073-04	7.649-05	838.	2.496-04	1.760-04
S	829.	829.	5.836-05	4.184-05	829.	7.640-05	5.446-05	829.	1.775-04	1.252-04
SSW	829.	829.	5.203-05	3.729-05	829.	6.493-05	4.631-05	829.	1.480-04	1.045-04
SW	610.	610	1.724-04	1.236-04	610.	2.240-04	1.597-04	610.	5.466-04	3.855-04
WSW	509.	509.	2.701-04	1.937-04	509.	3.623-04	2.583-04	509.	9.256-04	6.526-04
W	509.	509.	2.640-04	1.893-04	509.	3.658-04	2.607-04	509.	9.490-04	6.690-04
WNW	625.	625.	1.462-04	1.048-04	625.	2.021-04	1.440-04	625.	5.095-04	3.592-04
NW	732.	732.	1.268-04	9.097-05	732.	1.787-04	1.273-04	732.	4.373-04	3 083-04
NNW	848.	848.	1.049-04	7.523-05	848.	1.453-04	1.035-04	848.	3.368-04	2.376-04

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR XE131M

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE			MIXED MODE(VENT) RELEASE			GROUND LEVEL RELEASE		
		RADIUS (METERS)	S	SBAR	RADIUS (METERS)	V	VBAR	RADIUS (METERS)	G	GBAR
			(MRAD/YR)/(UCI/SEC)			(MRAD/YR)/(UCI/SEC)			(MRAD/YR)/(UCI/SEC)	
N	1022.	1022.	5.171-06	1.843-06	1022.	1.506-05	3.184-06	1022.	9.205-05	1.366-05
NNE	1330.	1330.	4.426-06	1.509-06	1330.	1.072-05	2.371-06	1330.	6.609-05	9.985-06
NE	2408.	2408.	3.332-06	8.918-07	2408.	5.649-06	1.216-06	2408.	2.488-05	3.942-06
ENE	4450.	4450.	2.663-06	5.844-07	4450.	3.338-06	6.840-07	4450.	1.018-05	1.694-06
E	1996.	1996.	4.682-06	1.274-06	1996.	7.730-06	1.708-06	1996.	3.641-05	5.777-06
ESE	838.	838.	6.599-06	2.431-06	838.	1.972-05	4.214-06	838.	1.286-04	1.900-05
SE	884.	884.	4.388-06	1.629-06	884.	1.259-05	2.741-06	884.	8.763-05	1.291-05
SSE	838.	838.	4.146-06	1.632-06	838.	1.055-05	2.503-06	838.	9.261-05	1.361-05
S	829.	829.	4.589-06	1.587-06	829.	9.154-06	2.209-06	829.	7.573-05	1.132-05
SSW	829.	829.	5.308-06	1.957-06	829.	9.403-06	2.520-06	829.	9.912-05	1.479-05
SW	610.	610.	5.104-06	2.351-06	610.	1.374-05	3.387-06	610.	1.430-04	2.073-05
WSW	509.	509.	5.500-06	2.134-06	509.	1.548-05	3.462-06	509.	1.401-04	2.007-05
W	509.	509.	5.506-06	2.103-06	509.	1.623-05	3.512-06	509.	1.483-04	2.090-05
WNW	625.	625.	4.112-06	1.557-06	625.	1.183-05	2.582-06	625.	1.001-04	1.431-05
NW	732.	732.	4.795-06	1.955-06	732.	1.314-05	3.067-06	732.	1.258-04	1.812-05
NNW	848.	848.	4.456-06	1.680-06	848.	1.238-05	2.745-06	848.	9.977-05	1.443-05

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR XE133M

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE RADIUS (METERS)	S (MRAD/YR)/(UCI/SEC)	SBAR	MIXED MODE(VENT) RELEASE RADIUS (METERS)	V (MRAD/YR)/(UCI/SEC)	VBAR	GROUND LEVEL RELEASE RADIUS (METERS)	G (MRAD/YR)/(UCI/SEC)	GBAR
N	1022.	1022.	2.274-05	1.121-05	1022.	3.868-05	1.563-05	1022.	1.631-04	5.029-05
NNE	1330.	1330.	1.857-05	9.044-06	1330.	2.883-05	1.192-05	1330.	1.192-04	3.744-05
NE	2408.	2408.	1.089-05	4.904-06	2408.	1.475-05	6.017-06	2408.	4.715-05	1.550-05
ENE	4450.	4450.	7.061-06	2.909-06	4450.	8.249-06	3.274-06	4450.	2.021-05	6.943-06
E	1996.	1996.	1.557-05	7.054-06	1996.	2.074-05	8.576-06	1996.	6.908-05	2.276-05
ESE	838.	838.	3.001-05	1.491-05	838.	5.121-05	2.080-05	838.	2.268-04	6.963-05
SE	884.	884.	2.011-05	1.001-05	884.	3.334-05	1.368-05	884.	1.541-04	4.713-05
SSE	838.	838.	2.016-05	1.018-05	838.	3.052-05	1.306-05	838.	1.622-04	4.948-05
S	829.	829.	1.955-05	9.559-06	829.	2.695-05	1.162-05	829.	1.352-04	4.198-05
SSW	829.	829.	2.412-05	1.199-05	829.	3.083-05	1.388-05	829.	1.764-04	5.471-05
SW	610.	610.	2.904-05	1.459-05	610.	4.136-05	1.801-05	610.	2.470-04	7.424-05
WSW	509.	509.	2.639-05	1.328-05	509.	4.216-05	1.754-05	509.	2.392-04	7.096-05
W	509.	509.	2.598-05	1.302-05	509.	4.271-05	1.747-05	509.	2.488-04	7.242-05
WNW	625.	625.	1.924-05	9.626-06	625.	3.141-05	1.291-05	625.	1.706-04	5.046-05
NW	732.	732.	2.417-05	1.230-05	732.	3.738-05	1.588-05	732.	2.158-04	6.441-05
NNW	848.	848.	2.074-05	1.036-05	848.	3.340-05	1.384-05	848.	1.719-04	5.155-05

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR XE133

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE			MIXED MODE(VENT) RELEASE			GROUND LEVEL RELEASE		
		RADIUS (METERS)	S	SBAR	RADIUS (METERS)	V	VBAR	RADIUS (METERS)	G	GBAR
			(MRAD/YR)/(UCI/SEC)			(MRAD/YR)/(UCI/SEC)			(MRAD/YR)/(UCI/SEC)	
N	1022.	1022.	2.329-05	9.006-06	1022.	4.138-05	1.403-05	1022.	1.830-04	5.346-05
NNE	1330.	1330.	1.928-05	7.397-06	1330.	3.098-05	1.067-05	1330.	1.345-04	3.978-05
NE	2408.	2408.	1.163-05	4.236-06	2408.	1.607-05	5.502-06	2408.	5.352-05	1.627-05
ENE	4450.	4450.	7.840-06	2.709-06	4450.	9.213-06	3.114-06	4450.	2.308-05	7.199-06
E	1996.	1996.	1.666-05	6.095-06	1996.	2.263-05	7.818-06	1996.	7.857-05	2.392-05
ESE	838.	838.	3.074-05	1.196-05	838.	5.482-05	1.865-05	838.	2.545-04	7.416-05
SE	884.	884.	2.058-05	8.019-06	884.	3.559-05	1.218-05	884.	1.725-04	5.012-05
SSE	838.	838.	2.048-05	8.058-06	838.	3.228-05	1.134-05	838.	1.819-04	5.277-05
S	829.	829.	2.020-05	7.770-06	829.	2.862-05	1.012-05	829.	1.522-04	4.469-05
SSW	829.	829.	2.474-05	9.629-06	829.	3.242-05	1.179-05	829.	1.988-04	5.834-05
SW	610.	610.	2.946-05	1.155-05	610.	4.342-05	1.542-05	610.	2.754-04	7.909-05
WSW	509.	509.	2.678-05	1.051-05	509.	4.443-05	1.531-05	509.	2.653-04	7.546-05
W	509.	509.	2.635-05	1.032-05	509.	4.493-05	1.530-05	509.	2.741-04	7.694-05
WNW	625.	625.	1.947-05	7.609-06	625.	3.312-05	1.132-05	625.	1.892-04	5.375-05
NW	732.	732.	2.432-05	9.621-06	732.	3.916-05	1.367-05	732.	2.405-04	6.878-05
NNW	848.	848.	2.110-05	8.241-06	848.	3.539-05	1.217-05	848.	1.914-04	5.484-05

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR XE135M

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE			MIXED MODE(VENT) RELEASE			GROUND LEVEL RELEASE		
		RADIUS (METERS)	S	SBAR	RADIUS (METERS)	V	VBAR	RADIUS (METERS)	G	GBAR
			(MRAD/YR)/(UCI/SEC)			(MRAD/YR)/(UCI/SEC)			(MRAD/YR)/(UCI/SEC)	
N	1022.	1022.	2.872-04	1.776-04	1022.	3.782-04	2.328-04	1022.	9.935-04	6.065-04
NNE	1330.	1330.	2.117-04	1.309-04	1330.	2.699-04	1.662-04	1330.	6.753-04	4.127-04
NE	2408.	2408.	9.634-05	5.948-05	2408.	1.167-04	7.184-05	2408.	2.562-04	1.568-04
ENE	4450.	4450.	4.210-05	2.595-05	4450.	4.754-05	2.926-05	4450.	8.430-05	5.167-05
E	1996.	1996.	1.482-04	9.149-05	1996.	1.769-04	1.090-04	1996.	3.829-04	2.344-04
ESE	838.	838.	3.805-04	2.353-04	838.	5.045-04	3.106-04	838.	1.368-03	8.351-04
SE	884.	884.	2.620-04	1.620-04	884.	3.381-04	2.083-04	884.	9.497-04	5.797-04
SSE	838.	838.	2.387-04	1.476-04	838.	2.989-04	1.842-04	838.	8.694-04	5.307-04
S	829.	829.	2.309-04	1.427-04	829.	2.738-04	1.688-04	829.	8.031-04	4.904-04
SSW	829.	829.	2.540-04	1.570-04	829.	2.932-04	1.808-04	829.	8.790-04	5.369-04
SW	610.	610.	3.613-04	2.234-04	610.	4.333-04	2.672-04	610.	1.351-03	8.241-04
WSW	509.	509.	3.643-04	2.253-04	509.	4.548-04	2.802-04	509.	1.449-03	8.833-04
W	509.	509.	3.415-04	2.112-04	509.	4.358-04	2.683-04	509.	1.404-03	8.555-04
WNW	625.	625.	2.592-04	1.603-04	625.	3.283-04	2.022-04	625.	1.024-03	6.244-04
NW	732.	732.	2.854-04	1.765-04	732.	3.606-04	2.222-04	732.	1.112-03	6.783-04
NNW	848.	848.	2.537-04	1.569-04	848.	3.263-04	2.009-04	848.	9.335-04	5.696-04

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR XE135

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE RADIUS (METERS)	S (MRAD/YR)/(UCI/SEC)	SBAR	MIXED MODE(VENT) RELEASE RADIUS (METERS)	V (MRAD/YR)/(UCI/SEC)	VBAR	GROUND LEVEL RELEASE RADIUS (METERS)	G (MRAD/YR)/(UCI/SEC)	GBAR
N	1022.	1022.	2.028-04	1.097-04	1022.	2.692-04	1.452-04	1022.	7.871-04	4.222-04
NNE	1330.	1330.	1.624-04	8.780-05	1330.	2.059-04	1.111-04	1330.	5.865-04	3.148-04
NE	2408.	2408.	8.581-05	4.637-05	2408.	1.028-04	5.545-05	2408.	2.461-04	1.322-04
ENE	4450.	4450.	4.879-05	2.634-05	4450.	5.445-05	2.937-05	4450.	1.092-04	5.869-05
E	1996.	1996.	1.239-04	6.697-05	1996.	1.473-04	7.949-05	1996.	3.610-04	1.939-04
ESE	838.	838.	2.703-04	1.462-04	838.	3.589-04	1.936-04	838.	1.088-03	5.835-04
SE	884.	884.	1.819-04	9.840-05	884.	2.370-04	1.279-04	884.	7.367-04	3.951-04
SSE	838.	838.	1.843-04	9.972-05	838.	2.278-04	1.230-04	838.	7.674-04	4.116-04
S	829.	829.	1.724-04	9.325-05	829.	2.035-04	1.099-04	829.	6.588-04	3.535-04
SSW	829.	829.	2.156-04	1.166-04	829.	2.443-04	1.320-04	829.	8.508-04	4.565-04
SW	610.	610.	2.650-04	1.434-04	610.	3.164-04	1.709-04	610.	1.148-03	6.155-04
WSW	509.	509.	2.423-04	1.311-04	509.	3.057-04	1.650-04	509.	1.097-03	5.881-04
W	509.	509.	2.371-04	1.283-04	509.	3.028-04	1.634-04	509.	1.109-03	5.941-04
WNW	625.	625.	1.753-04	9.485-05	625.	2.241-04	1.209-04	625.	7.793-04	4.176-04
NW	732.	732.	2.232-04	1.207-04	732.	2.764-04	1.492-04	732.	9.905-04	5.310-04
NNW	848.	848.	1.877-04	1.015-04	848.	2.397-04	1.293-04	848.	7.952-04	4.263-04

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR XE137

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE RADIUS (METERS)	S (MRAD/YR)/(UCI/SEC)	SBAR	MIXED MODE(VENT) RELEASE RADIUS (METERS)	V (MRAD/YR)/(UCI/SEC)	VBAR	GROUND LEVEL RELEASE RADIUS (METERS)	G (MRAD/YR)/(UCI/SEC)	GBAR
N	1022.	1022.	9.192-05	5.953-05	1022.	1.227-04	7.926-05	1022.	3.048-04	1.960-04
NNE	1330.	1330.	5.984-05	3.874-05	1330.	7.806-05	5.042-05	1330.	1.839-04	1.183-04
NE	2408.	2408.	1.898-05	1.228-05	2408.	2.376-05	1.535-05	2408.	4.989-05	3.209-05
ENE	4450.	4450.	4.730-06	3.058-06	4450.	5.476-06	3.536-06	4450.	9.264-06	5.964-06
E	1996.	1996.	3.389-05	2.192-05	1996.	4.135-05	2.671-05	1996.	8.391-05	5.398-05
ESE	838.	838.	1.291-04	8.360-05	838.	1.728-04	1.116-04	838.	4.409-04	2.835-04
SE	884.	884.	8.501-05	5.506-05	884.	1.112-04	7.183-05	884.	2.927-04	1.882-04
SSE	838.	838.	7.478-05	4.844-05	838.	9.532-05	6.161-05	838.	2.566-04	1.650-04
S	829.	829.	6.855-05	4.440-05	829.	8.301-05	5.366-05	829.	2.286-04	1.469-04
SSW	829.	829.	7.181-05	4.651-05	829.	8.471-05	5.478-05	829.	2.331-04	1.499-04
SW	610.	610.	1.187-04	7.686-05	610.	1.447-04	9.355-05	610.	4.158-04	2.673-04
WSW	509.	509.	1.300-04	8.422-05	509.	1.641-04	1.061-04	509.	4.873-04	3.132-04
W	509.	509.	1.195-04	7.743-05	509.	1.553-04	1.004-04	509.	4.654-04	2.991-04
WNW	625.	625.	8.843-05	5.729-05	625.	1.138-04	7.352-05	625.	3.328-04	2.139-04
NW	732.	732.	8.980-05	5.818-05	732.	1.168-04	7.549-05	732.	3.307-04	2.126-04
NNW	848.	848.	8.141-05	5.274-05	848.	1.068-04	6.903-05	848.	2.822-04	1.814-04

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR XE138

DOWNWIND DIRECTION	RESTRICTED AREA BOUND	ELEVATED(STACK) RELEASE			MIXED MODE(VENT) RELEASE			GROUND LEVEL RELEASE		
		RADIUS	S	SBAR	RADIUS	V	VBAR	RADIUS	G	GBAR
	(METERS)	(METERS)	(MRAD/YR)/(UCI/SEC)		(METERS)	(MRAD/YR)/(UCI/SEC)		(METERS)	(MRAD/YR)/(UCI/SEC)	
N	1022.	1022.	7.062-04	5.142-04	1022.	8.855-04	6.413-04	1022.	2.092-03	1.497-03
NNE	1330.	1330.	5.154-04	3.751-04	1330.	6.294-04	4.559-04	1330.	1.419-03	1.015-03
NE	2408.	2408.	2.283-04	1.660-04	2408.	2.679-04	1.940-04	2408.	5.375-04	3.850-04
ENE	4450.	4450.	9.599-05	6.969-05	4450.	1.065-04	7.713-05	4450.	1.766-04	1.268-04
E	1996.	1996.	3.523-04	2.561-04	1996.	4.085-04	2.959-04	1996.	8.082-04	5.790-04
ESE	838.	838.	9.410-04	6.854-04	838.	1.184-03	8.579-04	838.	2.869-03	2.052-03
SE	884.	884.	6.470-04	4.713-04	884.	7.969-04	5.775-04	884.	1.993-03	1.425-03
SSE	838.	838.	5.896-04	4.295-04	838.	7.075-04	5.130-04	838.	1.815-03	1.298-03
S	829.	829.	5.682-04	4.138-04	829.	6.521-04	4.733-04	829.	1.680-03	1.201-03
SSW	829.	829.	6.224-04	4.533-04	829.	6.990-04	5.075-04	829.	1.830-03	1.309-03
SW	610.	610.	8.907-04	6.488-04	610.	1.033-03	7.494-04	610.	2.823-03	2.018-03
WSW	509.	509.	9.041-04	6.588-04	509.	1.083-03	7.858-04	509.	3.038-03	2.171-03
W	509	509.	8.464-04	6.168-04	509.	1.034-03	7.495-04	509.	2.938-03	2.100-03
WNW	625.	625.	6.430-04	4.685-04	625.	7.797-04	5.654-04	625.	2.147-03	1.534-03
NW	732.	732.	7.058-04	5.143-04	732.	8.540-04	6.193-04	732.	2.317-03	1.656-03
NNW	848.	848.	6.270-04	4.567-04	848.	7.698-04	5.579-04	848.	1.954-03	1.397-03

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL

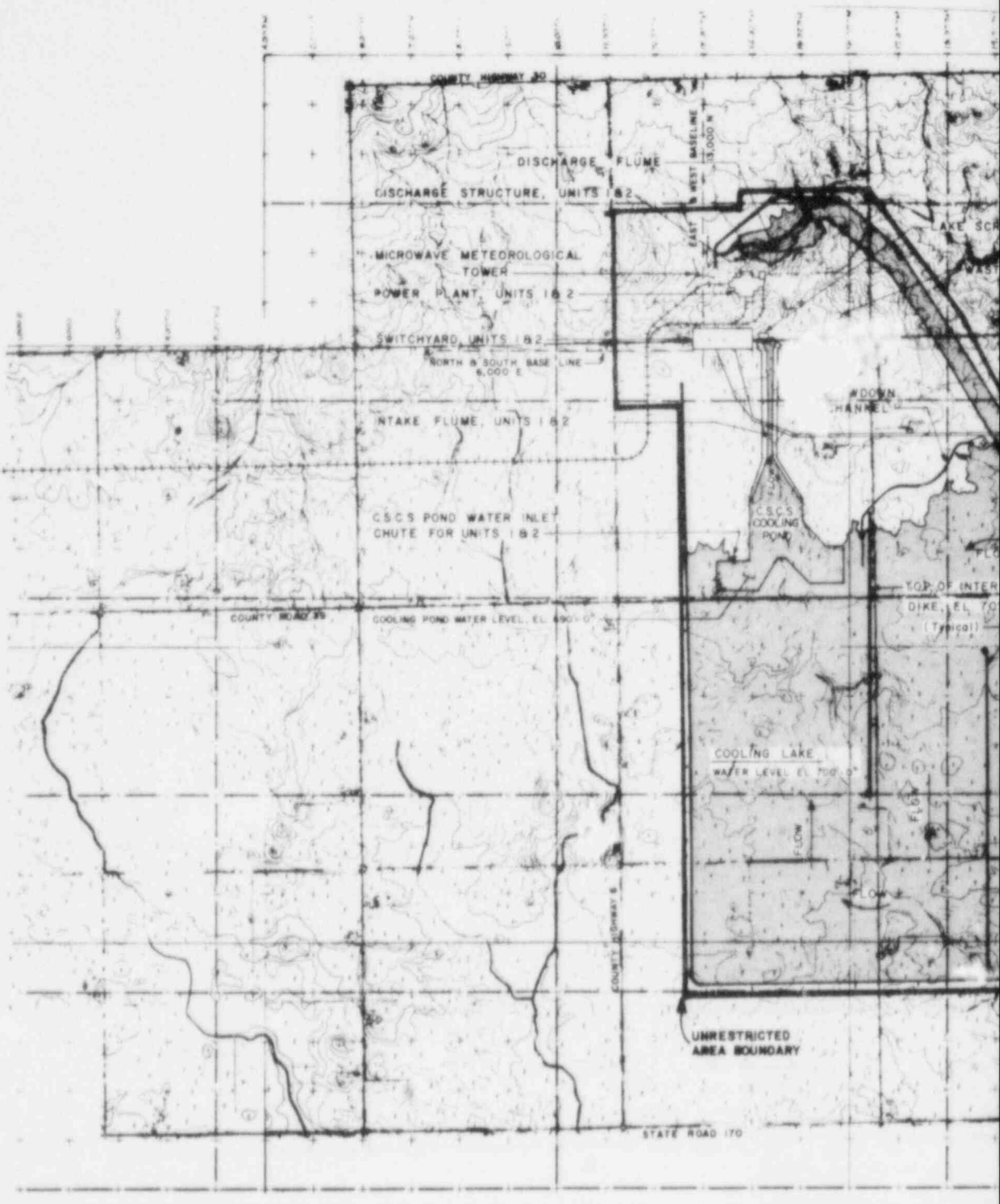
TABLE 7.2-8 (Cont'd)

LASALLE COUNTY 1&2

MAXIMUM OFFSITE FINITE PLUME GAMMA DOSE FACTORS FOR AR 41

DOWNWIND DIRECTION	RESTRICTED AREA BOUND (METERS)	ELEVATED(STACK) RELEASE			MIXED MODE(VENT) RELEASE			GROUND LEVEL RELEASE		
		RADIUS (METERS)	S (MRAD/YR)/(UCI/SEC)	SBAR	RADIUS (METERS)	V (MRAD/YR)/(UCI/SEC)	VBAR	RADIUS (METERS)	G (MRAD/YR)/(UCI/SEC)	GBAR
N	1022.	1022.	9.121-04	6.430-04	1022.	1.128-03	7.954-04	1022.	2.759-03	1.945-03
NNE	1330.	1330.	7.085-04	4.995-04	1330.	8.496-04	5.989-04	1330.	2.011-03	1.418-03
NE	2408.	2408.	3.586-04	2.528-04	2408.	4.127-04	2.909-04	2408.	8.455-04	5.961-04
ENE	4450.	4450.	1.929-04	1.360-04	4450.	2.101-04	1.481-04	4450.	3.586-04	2.528-04
E	1996.	1996.	5.228-04	3.686-04	1996.	5.968-04	4.207-04	1996.	1.230-03	8.672-04
ESE	838.	838.	1.218-03	8.590-04	838.	1.508-03	1.063-03	838.	3.802-03	2.681-03
SE	884.	884.	8.260-04	5.823-04	884.	1.006-03	7.091-04	884.	2.596-03	1.830-03
SSE	838.	838.	8.186-04	5.771-04	838.	9.605-04	6.771-04	838.	2.623-03	1.849-03
S	829.	829.	7.699-04	5.428-04	829.	8.713-04	6.143-04	829.	2.304-03	1.625-03
SSW	829.	829.	9.379-04	6.613-04	829.	1.031-03	7.270-04	829.	2.862-03	2.018-03
SW	610.	610.	1.198-03	8.449-04	610.	1.366-03	9.628-04	610.	3.965-03	2.795-03
WSW	509.	509.	1.126-03	7.938-04	509.	1.334-03	9.403-04	509.	3.869-03	2.727-03
W	509.	509.	1.094-03	7.711-04	509.	1.311-03	9.239-04	509.	3.888-03	2.741-03
WNW	625.	625.	8.059-04	5.681-04	625.	9.663-04	6.812-04	625.	2.754-03	1.942-03
NW	732.	732.	9.951-04	7.016-04	732.	1.171-03	8.253-04	732.	3.388-03	2.389-03
NNW	848.	848.	8.424-04	5.939-04	848.	1.013-03	7.139-04	848.	2.742-03	1.933-03

LASALLE SITE METEOROLOGICAL DATA 10/1/76 - 9/30/78 375 FT LEVEL


COUNTY HIGHWAY 30
DISCHARGE FLUME
DISCHARGE STRUCTURE, UNITS 1&2
MICROWAVE METEOROLOGICAL TOWER
POWER PLANT, UNITS 1&2
SWITCHYARD, UNITS 1&2
NORTH & SOUTH BASE LINE 6,000' E
EAST & WEST BASELINE 15,000' N
INTAKE FLUME, UNITS 1&2
C.S.C.S POND WATER INLET CHUTE FOR UNITS 1&2
C.S.C.S. COOLING POND
COUNTY ROAD 25
COOLING POND WATER LEVEL EL 690'-0"
COOLING LAKE
WATER LEVEL EL 700'-0"
COUNTY HIGHWAY 6
UNRESTRICTED AREA BOUNDARY
STATE ROAD 170

REVISION 11
NOVEMBER 1985

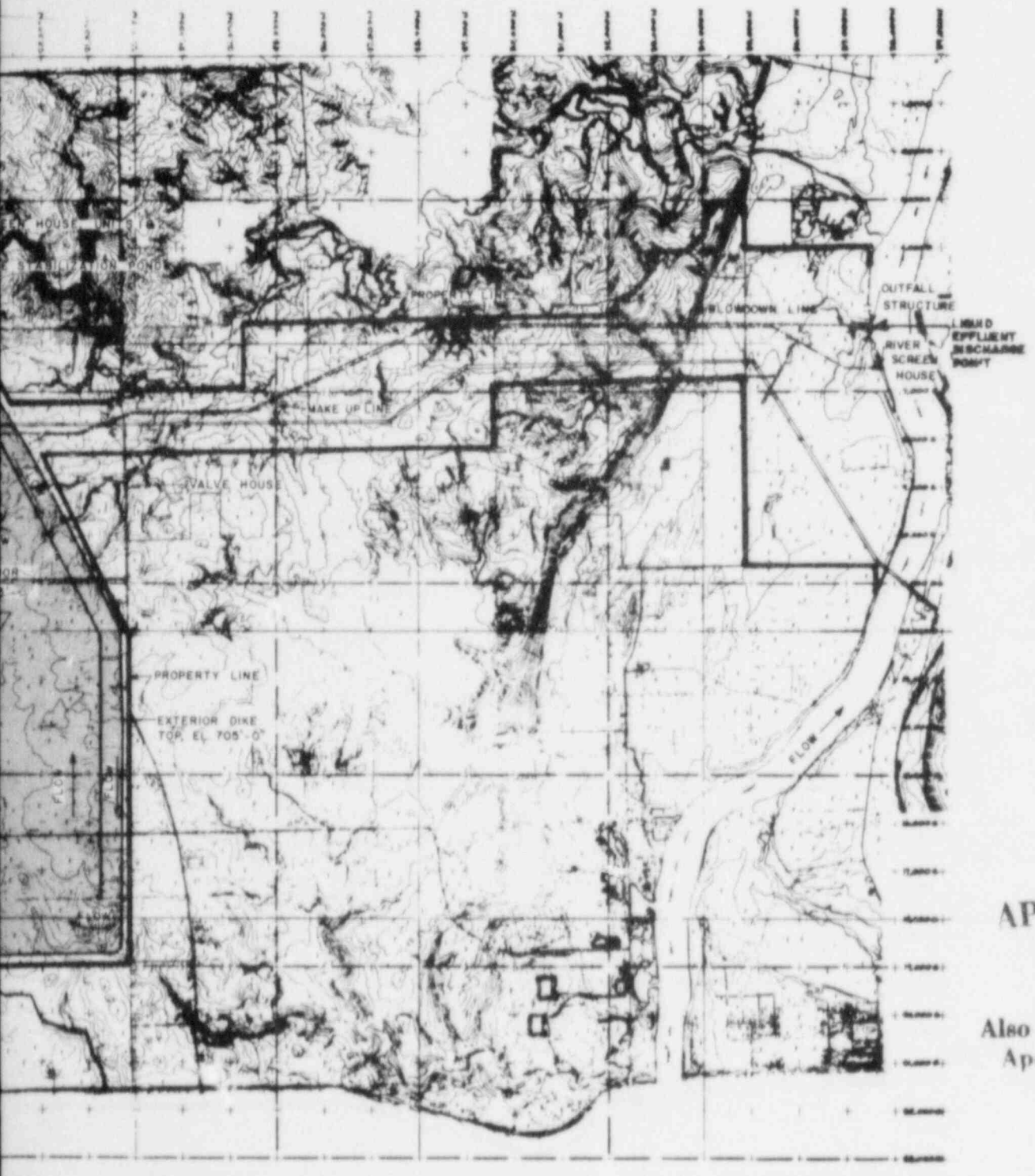


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FIGURE 7.2-1

UNRESTRICTED AREA BOUNDARY

8212270058-01

8.0 RADIOACTIVE EFFLUENT TREATMENT SYSTEMS, MODELS FOR SETTING GASEOUS AND LIQUID EFFLUENT MONITOR ALARM AND TRIP SETPOINTS, AND ENVIRONMENTAL RADIOLOGICAL MONITORING

TABLE OF CONTENTS

ODCM LIST OF TABLES FOR LA SALLE SECTION 8.0

ODCM LIST OF FIGURES FOR LA SALLE SECTION 8.0

8.0 RADIOACTIVE EFFLUENT TREATMENT SYSTEMS, MODELS FOR SETTING GASEOUS AND LIQUID EFFLUENT MONITOR ALARM AND TRIP SETPOINTS, AND ENVIRONMENTAL RADIOLOGICAL MONITORING

8.1 GASEOUS RELEASES

8.1.1 System Design

A simplified HVAC and gaseous radwaste flow diagram is provided in Figure 8.1-1.

8.1.1.1 Gaseous Radwaste Treatment System

A gaseous radwaste treatment system shall be any system designed and installed to reduce radioactive gaseous effluents by collecting primary coolant system off-gases from the primary system and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

8.1.1.2 Ventilation Exhaust Treatment System

A ventilation exhaust treatment system shall be any syste designed and installed to reduce gaseous radioiodine or radioactive material in particulate form in effluents by passing ventilation or vent exhaust gases through charcoal adsorbers and/or HEPA filters for the purpose of removing iodines or particulates from the gaseous exhaust stream prior to the release to the environment (such a system is not considered to have any effect on noble gas effluents). Engineered Safety Feature (ESF) atmospheric cleanup systems are not considered to be ventilation exhaust treatment system components.

8.1.2 Alarm and Trip Setpoints

Alarm and trip setpoints of gaseous effluent monitors at the principal points of release of ventilation exhaust air containing

radioactivity are established to ensure that the release limits of 10 CFR 20 are not exceeded. The setpoints are found by solving Equations 2.6 and 2.7 for each class of release.

For this evaluation the radioactivity mixture in the exhaust air is assumed to have the composition of gases listed in Table 3-3 from "Technical Derivation of BWR 1971 Design Basis Radioactive Material Source Terms," NEDO-10871, March 1973, General Electric Company. This mixture of radioactive gases is representative of the activity found at the point of release from the fuel; radioactive decay has not been included.

Equation 2.6 is rewritten using the fractional composition of each nuclide, f_i, and a total release rate, Q_t, for station vent stack* releases (the principal point of release of ventilation exhaust air containing radioactivity):

$$1.1] \sum_i \left[Q_{ts} \quad (\overline{S_i} \quad x \quad f_i \ ) \right] < 500 \quad \frac{mrem}{yr} \qquad (8.1)$$

f_i Fractional Radionuclide Composition
The release rate of radionuclide i divided by the total release of all radionuclides.

Q_{ts} Total Release Rate, (μCi/sec)
Vent Stack Release
The release rate for all radionuclides due to a station vent stack release.

$$Q_{is} = Q_{ts} f_i \qquad (8.2)$$

Equation 8.1 can be solved for Q_t for release limit determinations.

*The term "vent stack", as used in this section, is to be considered synonymous with "stack" as used in Section 2.1.

Similarly, Equation 2.7 can be rewritten:

$$\sum_i \left[\bar{L}_i \, (\chi/Q)_s Q_{ts} f_i \exp(-\lambda_i R/3600 u_s) + 1.11 \, S_i Q_{ts} f_i \right] < 3000 \, \frac{\text{mrem}}{\text{yr}} \qquad (8.3)$$

Equation 8.3 can be solved for Q_{ts} and a corresponding release limit be determined. The most conservative release limit determined from Equations 8.1 and 8.3 will be used in selecting the appropriate alarm and trip setpoints for a vent stack release.

The exact settings will be selected to ensure that 10 CFR 20 limits are not exceeded.

Surveillance frequencies for gaseous effluent monitors will be as stated in Table 4.3.7.11-1 of the Technical Specifications. Calibration methods will be consistent with the definitions found in Section 1.0 of the Technical Specifications.

8.1.3 Station Vent Stack Monitor OPLD5J

Releases of radioactive noble gases from the station vent stack release point are monitored by an offline monitoring system consisting of three instrument channels. Samples of the effluent stream are taken by an isokinetic probe just prior to discharge into the atmosphere. Gas flow through the monitoring system is provided by vacuum pumps; one for the low-range detection system and one for the mid- and high-range detection systems. A sample conditioning skid (OPLD4J), upstream of the detection system, filters particulate and iodine and provides for collection of particulate and iodine grab samples.

The low-range detection system consists of a beta scintillation detector (OD18-N514), a shielded sampling chamber, and a preamplifier.

The mid- and high-range detection systems consists of solid-state CdTe(Cl) detectors (OD18-N515 and OD18-N516, respectively), shielded sample chambers, and preampliers. Signals from the three detection systems are processed by a microprocessor (OPLD6J) which also controls the system pumps and monitors process stream and sample flowrates. The individual detection system outputs and other system parameters are displayed on a digital readout and control module. A three-pen recorder is utilized to record the individual detection system results in $\mu Ci/cm^3$. The detection system whose output is indicative of the existing release activity is converted by the microprocessor to μCi/sec utilizing the existing process stream flowrate and recorded on a single-pen recorder. This μCi/sec value is also compared to an operator-entered alarm point.

The recorders and digital readout and control module are located in the main control room on panel OPM14J. The sample conditioning skid (OPLD4J), detection skid (OPLD5J), and microprocessor (OPLD6J) are located in the auxiliary building on the 786 ft 6 in. elevation. Power is supplied to this monitor from Division 1 power.

The efficiency factor for the monitor is based on the detector's response to Xe-133 gas. The detector's response to Kr-85 gas and to solid, sealed sources spanning a range of beta energies is also measured during the initial calibration. The monitor's efficiency factor is verified by the performance of a periodic surveillance utilizing the solid, sealed sources.

The alarm setpoint for this monitor will be selected to ensure that the combined release rate of the station vent stack and SGTS stack does not exceed the most conservative release limit determined from Equations 8.1 and 8.3 by setting the alarm point at or below one-half the release limit.

8.1.4 Standby Gas Treatment Stack Monitor OPLD2J

Release of radioactivity from the standby gas treatment system (SGTS) stack is monitored by an offline monitoring system consisting of three instrument channels.

This monitoring system utilizes two isokinetic probes to sample the effluent stream prior to discharge into the atmosphere. Gas flow through the system is provided by vacuum pumps, one for the low-range detection system and one for the mid- and high-range detection systems. A sample conditioning skid (OPLD1J), upstream of the detection system, filters particulate and iodine and provides for collection of particulate and iodine grab samples.

The low-range detection system consists of a beta scintillation detector (OD18-N511), a shielded sampling chamber, and a preamplifier. The mid- and high-range detection systems consist of solid-state CdTe(Cl) detectors (OD18-N512 and OD18-N513, respectively), shielded sample chambers, and preamplifiers. Signals from the three detection systems are processed by a microprocessor (OPLD3J) which also controls the system pumps and monitors process stream and sample flowrates.

The individual detection system outputs and other system parameters are displayed on a digital readout and control module. A three-pen recorder is utilized to record the individual detection system results in $\mu Ci/cm^3$. The detection system whose output is indicative of the existing release activity is converted by the microprocessor to $\mu Ci/sec$ utilizing the existing process stream flowrate and recorded on a single-pen recorder. This $\mu Ci/sec$ value is also compared to an operator-entered alarm point.

The recorders and digital readout and control module are located in the main control room on panel OPM15J. The sample conditioning skid (OPLD1J), detection skid (OPLD2J), and microprocessor (OPLD3J)

are located in the auxiliary building on the 786 ft 6 in. elevation. Power is supplied to this monitor from Division 2 power.

The efficiency factor for the monitor is based on the detector's response to Xe-133 gas. The detector's response to Kr-85 gas and to solid, sealed sources spanning a range of beta energies is also measured during the initial calibration. The monitor's efficiency factor is verified by the performance of a periodic surveillance utilizing the solid, sealed sources.

The alarm setpoint for this monitor will be selected to ensure that the combined release rate of the station vent stack and SGTS stack does not exceed the most conservative release limit determined from Equations 8.1 and 8.3 by setting the alarm point at or below one-half the release limit.

8.1.5 SJAE Off-Gas Monitors 1(2)D18-N002 and 1(2)D18-N012

The steam jet air ejector (SJAE) monitor subsystem continually measures and records the gamma radiation in the off-gas as it is drawn from the main condenser by the steam jet air ejectors before it passes through the holdup line and carbon beds enroute to the station vent stack.

A continuous representative sample is drawn from the off-gas system via a stainless steel sample line. A 14 cm^3 serum vial is inserted into the sample chamber, evacuated, then filled with a representative sample of off-gas. This sampling equipment is located on panel 1D18-J034 (2D18-J034) in the turbine building on the 754 ft elevation.

This monitor system consists of two channels. One channel contains a gamma sensitive ionization chamber and a linear radiation monitor and the other channel contains a gamma sensitive ionization chamber

and a logarithmic radiation monitor. The ion chambers sensitivity is 1 to 10^6 mR/hr. The gamma sensitive ionization chamber RE-1D18-N002 (RE-2D18-N002) is connected to the logarithmic readout channel. This channel has alarm functions but no trip functions. Power is supplied from Unit 1 (2) 125-Vdc power supply via inverters and from the 120-Vac instrument bus for the recorder. The gamma sensitive ionization chamber RE-1D18-N012 (RE-2D18-N012) is connected to the linear readout channel. Power is supplied to this channel from Unit 1 (2) 24-Vdc power supply and from the 120-Vac instrument bus for the recorder. Both channels measure the radiation levels in the off-gas, and their monitors and recorders are located in the control room on panels 1(2)H13-P600 and 1(2)H13-P604, respectively.

The monitor response and measured μCi/sec off-gas data are used to establish the alarm setpoint of the logarithmic channel at or below the Technical Specification 3.11.2.7 off-gas release rate limit.

8.1.6 Off-Gas Post-Treatment Monitors

The off-gas post-treatment monitor subsystem continually measures and records the gamma radiation in the off-gas after it has passed through the holdup line and carbon beds.

A continuous representative sample is drawn from the system by one of two vacuum pumps. This monitor system consists of two identical channels consisting of NaI(Tl) activated scintillation detectors (1(2)D18-N903A(B)), shielded sample chambers, preamplifiers, and log count rate monitors. The log count rate monitor includes an integral power supply, for providing high voltage to the detectors, and trip relays whose outputs initiate alarm annunciators and isolate the flow of off-gas to the station vent stack.

The off-gas isolation setpoint will be at or below one-half the station vent stack release limit and is converted into the monitor units of counts per seconds (cps):

$$cps \leq \frac{\text{Release limit } (\mu Ci/sec) \times \text{Efficiency } \frac{(\ cps\ )}{(\mu Ci/cm^3)}}{472\ \frac{(cm^3/sec)}{(\ cfm\ )} \times cfm} \qquad (8.4)$$

where:

cfm = off-gas flowrate

The initial efficiency factor is determined by calibration with Cs-137/Ba-137m solution. The response of a solid, sealed Cs-137/Ba-137m source is also measured during the initial calibration. The efficiency factor is verified during a periodic surveillance utilizing the solid, sealed Cs-137/Ba-137m source.

The sample panel (1(2)D18-J013) with pumps, detectors, shielded sample chambers, and preamplifiers is located in the off-gas filter building on the 690 ft elevation. The log count rate monitors and two-channel recorder are located in the main control room on panels 1(2)H13-P604. Power is supplied to these monitors from the Unit 1 (2) 24-Vdc power supply and from the 120-Vac instrument bus for the recorder.

8.1.7 Allocation of Effluents from Common Release Points

Radioactive gaseous effluents released from the plant vent stack are comprised of contributions from both units. Estimates of noble gas contributions from each unit will be allocated by considering appropriate operating conditions and measured SJAE

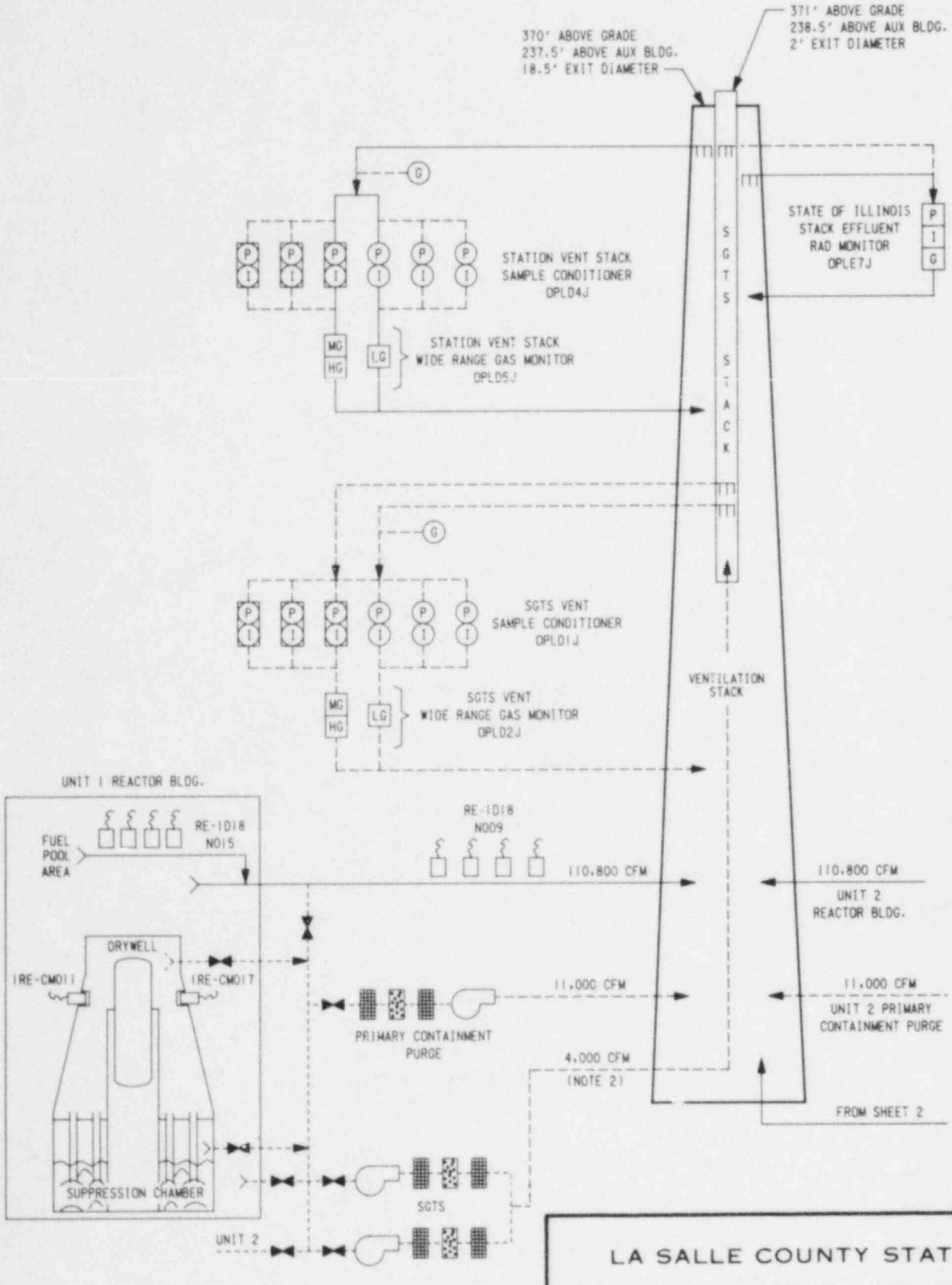
off-gas activities. Allocation of radioiodine and radioactive particulate releases to a specific unit is not as practical and is influenced greatly by in-plant leakage. Under normal operating conditions, allocation will be made using reactor coolant iodine activities. During unit shutdown or periods of known major in-plant leakage, the apportionment will be adjusted accordingly. The allocation of the effluents will be estimated on a monthly basis.

8.1.8 Symbols Used in Section 8.1

SYMBOLS	NAME	UNIT
Q_{ts}	Total Release Rate, Vent Stack Release	(μCi/sec)
$\bar{S}_i$	Gamma Whole Body Dose Constant, Vent Stack Release	(mrad/yr per μCi/sec)
f_i	Fractional Radionuclide Composition	
$\bar{L}_i$	Beta Skin Dose Constant	(mrem/yr per μCi/m^3)
$(\chi/Q)_s$	Relative Effluent Concentration, Vent Stack Release	(sec/m^3)
λ_i	Radiological Decay Constant	(hr^{-1})
R	Downwind Range	(m)
u_s	Average Wind Speed, Vent Stack Release	(m/sec)
Q_{is}	Release Rate of Nuclide i, Vent Stack Release	(μCi/sec)
S_i	Gamma Dose Constant, Vent Stack Release	(mrad/yr per μCi/sec

8.1.9 Constants Used In Section 8.1

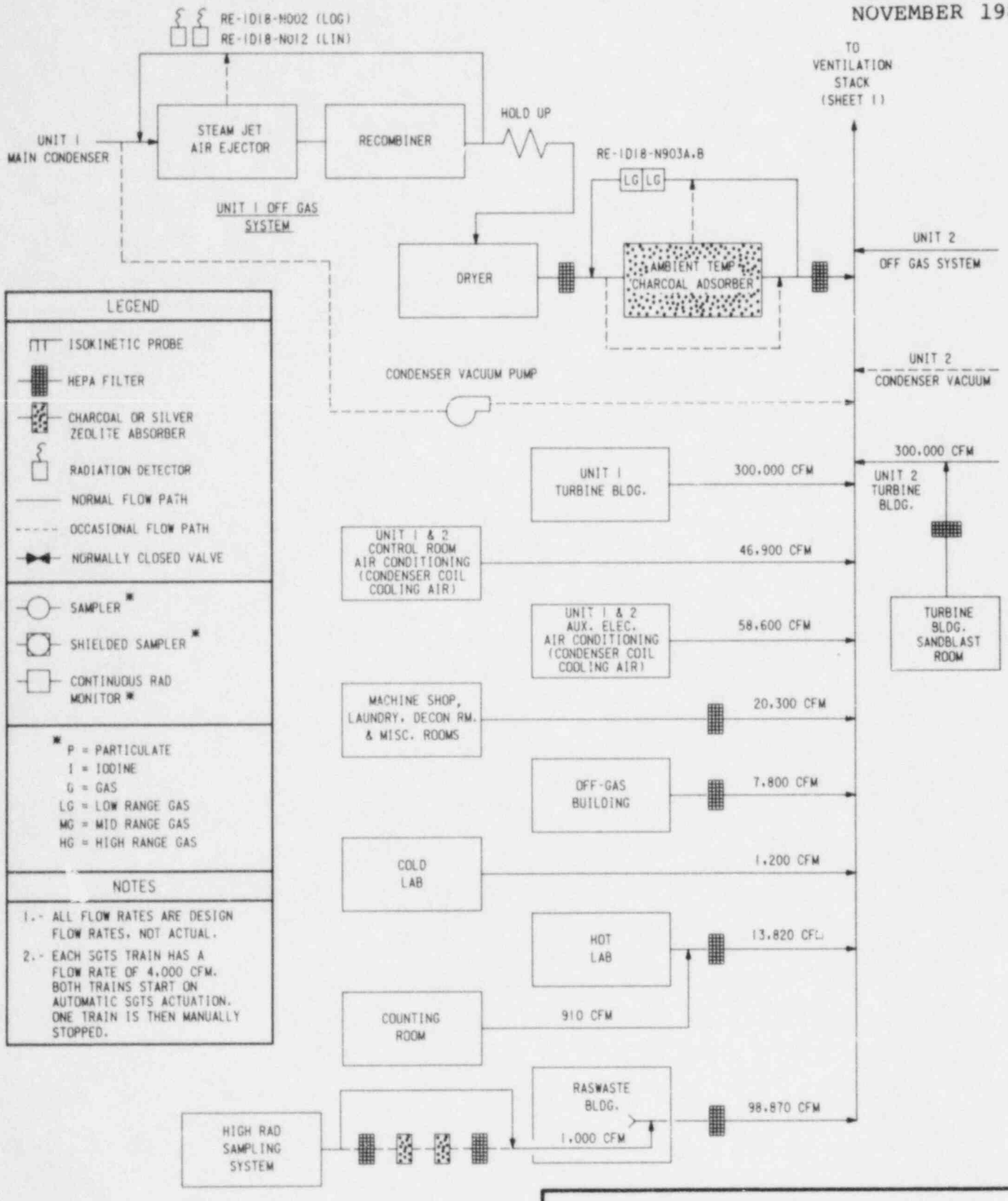
NUMERICAL VALUE	NAME	UNIT
1.11	Conversion Constant	(mrem/mrad)
3600	Conversion Constant	(sec/hr)



LA SALLE COUNTY STATION

FIGURE 8.1-1

SIMPLIFIED HVAC AND GASEOUS
RADWASTE FLOW DIAGRAM
(SHEET 1 OF 2)



LA SALLE COUNTY STATION

FIGURE 8.1-1

SIMPLIFIED HVAC AND GASEOUS RADWASTE FLOW DIAGRAM

(SHEET 2 OF 2)

8.2 LIQUID RELEASES

8.2.1 System Design

Simplified liquid radwaste processing and liquid effluent flow diagrams are provided in Figures 8.2-1 and 8.2-2.

A liquid radwaste treatment system shall be a system designed and installed to reduce radioactive liquid effluents by collecting the liquids, providing for retention or holdup, and providing for treatment by demineralizer or a concentrator for the purpose of reducing the total radioactivity prior to release to the environment.

8.2.2 Alarm Setpoints

Alarm setpoints of liquid effluent monitors at the principal release points are established to ensure that the limits of 10 CFR 20 are not exceeded in the unrestricted area. The concentration limit (C_{lim}) in the discharge line prior to dilution in the initial dilution stream is:

$$C_{lim} = MPC \left[\frac{F^d_{ave} + F^r_{max}}{F^r_{max}} \right] \qquad (8.5)$$

C_{lim} Limiting Concentration in Discharge Line (μCi/ml)

The maximum concentration in the discharge line permitted to be discharged to the initial dilution stream.

MPC Weighted Maximum Permissible Concentration (μCi/ml)

$$MPC = \frac{\sum_{i=1}^{n} C_i}{\sum_{i=1}^{n} \frac{C_i}{MPC_i}} \quad \text{or} \quad \frac{\sum_{i=1}^{n} A_i}{\sum_{i=1}^{n} \frac{A_i}{MPC_i}} \qquad (8.6)$$

where:

C_i = Ci/ml of nuc''de i;

MPC_i = maximum permissible concentration μCi/ml of nuclide i; and

A_i = Ci of nuclide i released in time t.

F^r_{max} Maximum Flow Rate, Radwaste Discharge (ft^3/sec)

The maximum flow rate of radwaste from the discharge tank to the initial dilution stream.

F^d_{ave} Average Flow Rate, Initial Dilution Stream (ft^3/sec)

The average flow rate of the initial dilution st'eam whi.h carries he radionuclides to the unrestricted area boundary.

Surveillance frequencies for liquid effluent monitors will be as stated in Table 4.3.7.10-1 of the Technical Specifications. Calibration methods will be consistent with the definitions found in Section 1.0 of the Technical Specifications.

8.2.3 Liquid Radwaste Effluent Monitor OD18-J007

The radwaste discharge line is continuously monitored for radioactivity by an offline monitoring system which uses a NaI(Tl) activated scintillation detector. Liquid effluent flow through the monitor is provided by a pump located on a local sample panel (OD18-J007).

The monitoring system consists of a scintillation detector (OD18-N907), shielded sampling chamber, a preamplifier, and a

log count rate monitor (OD18-K606). The log count rate monitor includes an integral power supply, for providing high voltage to the detector, and trip relays, whose outputs initiate high radiation alarm annunciators and initiate isolation of the liquid radwaste discharge header.

The radwaste discharge effluent monitor provides signals to a recorder in the main control room (on panel OPM08J) and a recorder in the radwaste control room (on panel OPL01J).

The monitor is powered from a local 120-Vac source through a d-c power supply.

The alarm setpoint for the liquid radwaste discharge monitor is established at or below the maximum concentration determined in Equation 8.5. The concentration is converted to an alarm setpoint in counts per minute (cpm) using an efficiency curve developed for the monitor through use of a Cs-137/Ba-137m liquid calibration and solid source responses.

8.2.4 Liquid Effluent Monitors

The Unit 1 (2) service water effluent header and Unit 1 (2) RHR service water effluent headers are continuously monitored for radioactivity by an offline monitoring system which uses a NaI(Tl) activated scintillation detector. Liquid effluent flow through each monitoring system is ensured by a pump located on local sample panels.

Each monitoring system consists of a scintillation detector, shielded sampling chamber, a preamplifier, and a log count rate monitor. The log count rate monitor includes an

integral power supply, for providing high voltage to the detector, and trip relays, whose outputs initiate high radiation alarm annunciators.

The service water effluent monitor (1(2)D18-N912) provides a signal to a two-pen recorder which it shares with the RBCCW process radiation monitor (1(2)D18-N910).

The RHR service water effluent monitors (1(2)D18-N906 and 1(2)D18-N908) share a common two-pen recorder in the main control room located on panel 1(2)H13-P600.

All the process liquid monitors have logarithmic scales with a range of 10 to 10^6 CPM. The monitors are powered from the Unit 1 (2) 125-Vdc batteries via inverters.

The equipment identification numbers for the log count rate monitors located in the main control room are 1D18-K608 (2D18-K608), service water effluent monitor; 1D18-K604 (2D18-K604), RHR service water A effluent; and 1D18-K605 (2D18-K605), RHR service water B effluent.

Alarm setpoints for liquid effluent monitors are set at 400 cpm above the normal full-power background reading to give indication of a significant change in the level of radioactivity monitored.

8.2.5 Allocation of Effluents from Common Release Points

Radioactive liquids released from the radwaste treatment system are comprised of contributions from both units. Under normal operating conditions, it is difficult to apportion the radioactivity between units. Consequently, allocation will normally be made evenly between units. During refueling outages or periods of known major in-plant leakage, the apportionment will be adjusted accordingly. The allocation of the effluents will be estimated on a monthly basis.

8.2.6 Administrative and Procedural Controls for Radwaste Discharges

Administrative and procedural controls have been designed to ensure proper control of radioactive liquid radwaste discharge in order to preclude a release in excess of 10 CFR 20 limits. The discharge rate for each batch is calculated by a technician and then independently verified by operating staff personnel. All liquid radwaste discharges will be from one of two river discharge tanks, 1WF05T or 2WF05T.

The keylock hand switch, OHS-WF048, used for selecting high or low discharge flow is kept locked except when discharging. The key for this switch and the locked valves is under the administrative control of the Shift Engineer.

A documented valve checklist is prepared for each batch discharge. The proper valve lineup is made by the Operator and rechecked by the Radwaste Foreman. The actual discharge is authorized by the Shift Engineer.

The system is equipped with a radiation trip point which alarms and initiates automatic valve closure on the radwaste discharge line to prevent the violation of 10 CFR 20 limits.

8.2.7 Determination of Initial Dilution Stream Flow Rates

For those release paths which have installed flow monitoring instrumentation, that instrumentation will be used to determine the flow rate of the initial dilution stream. This instrumentation will be operated and maintained as prescribed by the Technical Specifications. For those release paths which do not have installed flow monitoring instrumentation, flow rates will be determined by use of appropriate engineering data such as pump curves, differential pressures, or valve position indication.

8.2.8 Symbols Used In Section 8.2

SYMBOL	NAME	UNIT
C_{lim}	Limiting Concentration in Discharge Line	(μCi/ml)
MPC	Weighted Maximum Permissible Concentration	(μCi/ml)
C_i	Nuclide Concentration	(μCi/ml)
MPC_i	Maximum Permissible Concentration	(μCi/ml)
A_i	Nuclide Quantity Released	(μCi)
F^r_{max}	Maximum Flow Rate, Radwaste Discharge	(ft^3/sec)
F^d_{ave}	Average Flow Rate, Initial Dilution Stream	(ft^3/sec)

REVISION 11
NOVEMBER 1985

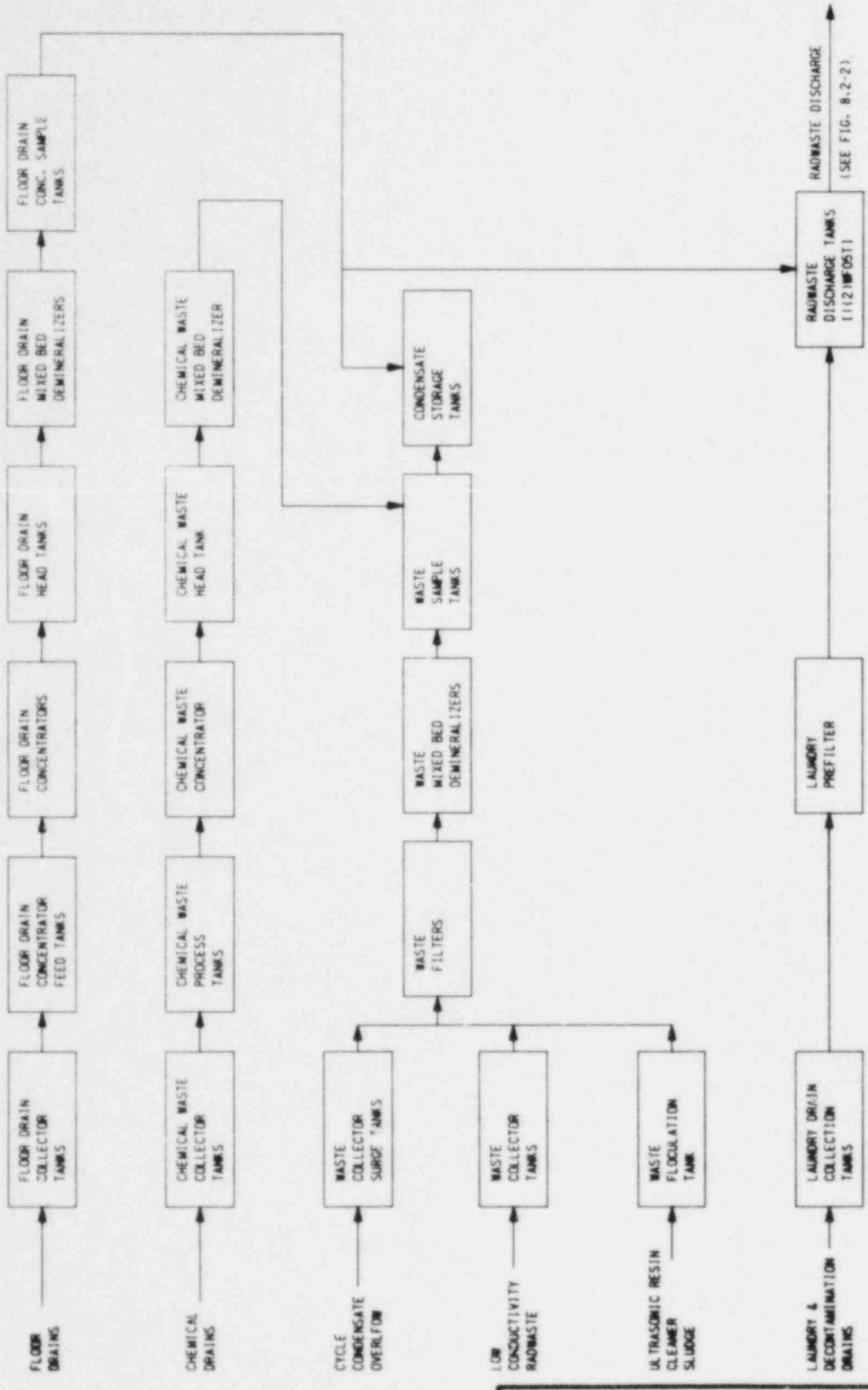


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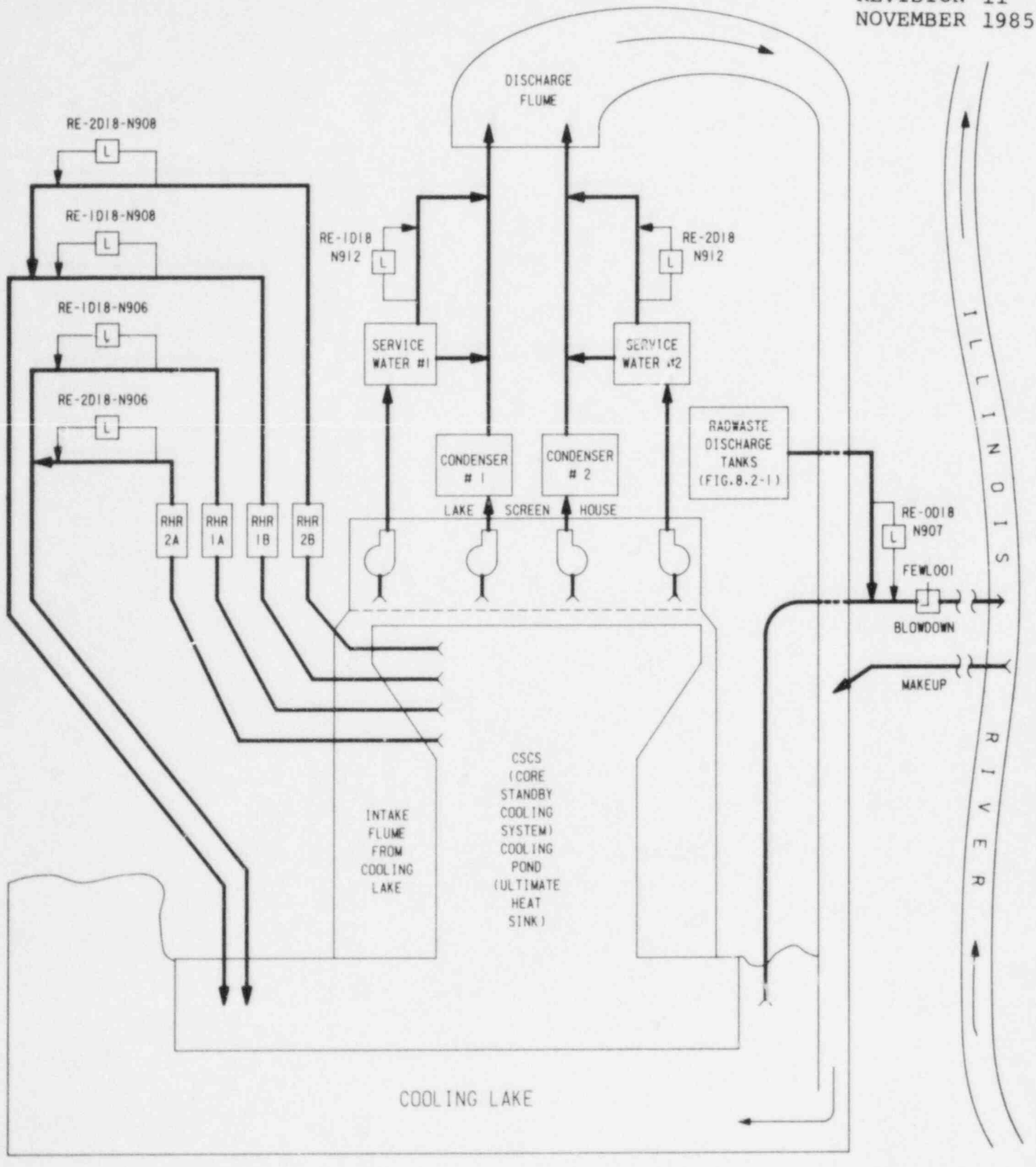
FIGURE 8.2-1

SIMPLIFIED LIQUID RADWASTE PROCESSING DIAGRAM



LEGEND AND NOTES	
L	LIQUID RADIATION MONITOR
J	FLOW ELEMENT

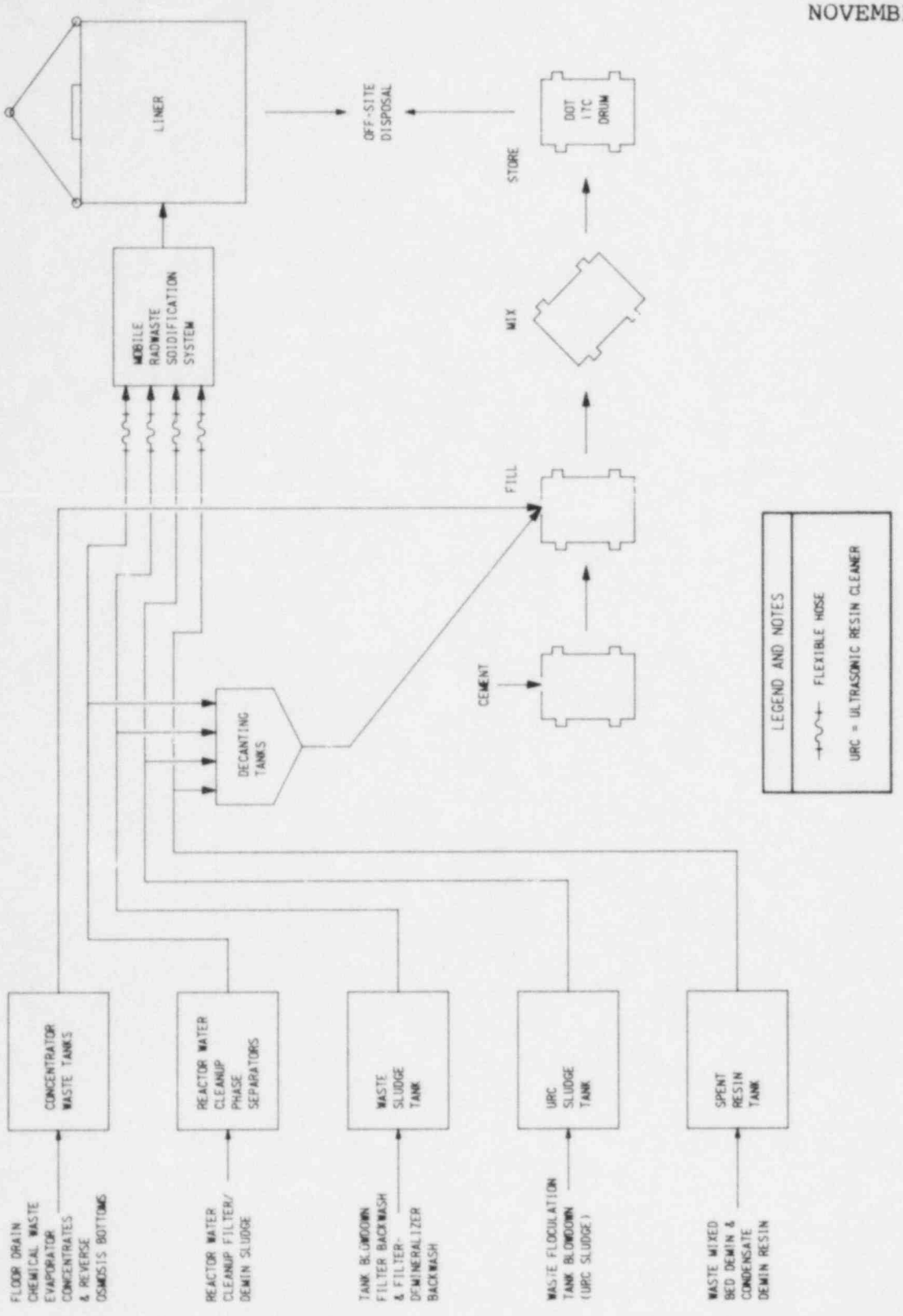
LA SALLE COUNTY STATION

FIGURE 8.2-2

SIMPLIFIED LIQUID EFFLUENT FLOW DIAGRAM

8.3 SOLIDIFICATION OF WASTE/PROCESS CONTROL PROGRAM

The process control program (PCP) shall contain the sampling, analysis, and formulation determination by which solidification of radioactive wastes from liquid systems is ensured. Figure 8.3-1 is a simplified diagram of solid radwaste processing.



LA SALLE COUNTY STATION

FIGURE 8.3-1

SIMPLIFIED SOLID RADWASTE
PROCESSING DIAGRAM

8.4 ENVIRONMENTAL RADIOLOGICAL MONITORING

The environmental radiological monitoring program to be performed in the environs around La Salle County Station is given in Table 8.4-1.

Figure 8.4-1 shows the 14 fixed air sampling sites and TLD locations; also shown are the "outer ring" (approximately 5 miles distant) TLD locations. Figure 8.4-2 shows the "inner ring" TLD locations. Figure 8.4-3 shows all other sampling locations. Most of the TLD's are code numbered as follows: XYY-N,

where:

X = 1 means inner ring,
X = 2 means outer ring, and
YY-N is an identification code.

The reporting levels for radioactivity concentrations in environmental samples are given in Table 8.4-2.

The lower limits of detection for this program are given in Table 8.4-3.

TABLE 8.4-1

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	SAMPLING OR MONITORING LOCATION	SAMPLING OR COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
1. Airborne	a. Onsite and Near Field[a]	Continuous sampler operation with sample collection weekly	Radioiodine Canisters:
Radioiodine and Particulates	L-01, Near-site Station 1, 0.5 mi NW L-02, Onsite Station 2, 0.6 mi N L-03, Onsite Station 3, 0.2 mi NE L-04, Near-site Station 4, 1.5 mi E L-05, Onsite Station 5, 0.3 mi SE L-06, Near-site Station 6, 0.4 mi W		I-131 analysis weekly Particulate Sampler: a. Gross beta analysis following filter change[b] b. Gamma isotopic on quarterly composite (by location)
	b. Far Field[a]		
	L-07, Seneca, 5.2 mi NNE L-08, Marseilles, 7.0 mi NW L-09, Grand Ridge, 10.* mi W L-10, Streator, 13.5 mi SW L-11, Ransom, 6.0 mi S L-12, Kernan, 5.0 mi SSW L-13, Route 6 at Gonnom, 4.3 mi E L-14, Ottawa, 12.0 mi NW		Sampling Train: Test and maintenance weekly

TABLE 8.4-1 (Cont'd)

EXPOSURE PATHWAY AND/OR SAMPLE	SAMPLING OR MONITORING LOCATION	SAMPLING OR COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
2. Direct Radiation	a. At Air Sampler Sites[a]	Quarterly	Gamma dose quarterly
	Same locations as fixed air sampling locations in Item 1.		
	b. Inner Ring[c]	Quarterly	Gamma dose quarterly
	101-1, 0.5 mi N		
	101-2, 0.5 mi N		
	102-1, 0.6 mi NNE		
	102-2, 0.6 mi NNE		
	103-1, 0.7 mi NE		
	103-2, 0.7 mi NE		
	105-1, 0.7 mi E		
	105-2, 0.7 mi E		
	106-1, 1.4 mi ESE		
	106-2, 1.4 mi ESE		
	107-1, 0.8 mi SE		
	107-2, 0.8 mi SE		
	109-1, 0.6 mi S		
	109-2, 0.6 mi S		
	110-1, 0.6 mi SSW		
	110-2, 0.6 mi SSW		
	111a-1, 0.7 mi SW		
	111a-2, 0.7 mi SW		
	111b-1, 0.8 mi SW		
	111b-2, 0.8 mi SW		
	112-1, 0.9 mi WSW		
	112-2, 0.9 mi WSW		
	113a-1, 0.8 mi W		
	113a-2, 0.8 mi W		
	113b-1, 0.8 mi W		
	113b-2, 0.8 mi W		
	114-1, 0.9 mi WNW		
	114-2, 0.9 mi WNW		

TABLE 8.4-1 (Cont'd)

EXPOSURE PATHWAY AND/OR SAMPLE	SAMPLING OR MONITORING LOCATION		SAMPLING OR COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
2. Direct Radiation (Cont'd)	c. Outer Ring[a]		Quarterly	Gamma dose quarterly
	201-1, 2.0 mi	N		
	201-2, 2.0 mi	N		
	202-1, 2.3 mi	NNE		
	202-2, 2.3 mi	NNE		
	203-1, 4.0 mi	NE		
	203-2, 4.0 mi	NE		
	204-1, 3.5 mi	ENE		
	204-2, 3.5 mi	ENE		
	205-1, 3.5 mi	E		
	205-2, 3.5 mi	E		
	206-1, 4.3 mi	ESE		
	206-2, 4.3 mi	ESE		
	207-1, 4.5 mi	SE		
	207-2, 4.5 mi	SE		
	208-1, 4.5 mi	SSE		
	208-2, 4.5 mi	SSE		
	209-1, 4.0 mi	S		
	209-2, 4.0 mi	S		
	210-1, 3.3 mi	SSW		
	210-2, 3.3 mi	SSW		
	211-1, 4.5 mi	SW		
	211-2, 4.5 mi	SW		
	212-1, 4.0 mi	WSW		
	212-2, 4.0 mi	WSW		
	213-1, 3.8 mi	W		
	213-2, 3.8 mi	W		
	214-1, 2.0 mi	WNW		
	214-2, 2.0 mi	WNW		
	215-1, 2.0 mi	NW		
	215-2, 2.0 mi	NW		
	216-1, 1.5 mi	NNW		
	216-2, 1.5 mi	NNW		

TABLE 8.4-1 (Cont'd)

EXPOSURE PATHWAY AND/OR SAMPLE	SAMPLING OR MONITORING LOCATION	SAMPLING OR COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
3. Waterborne[d]			
a. Surface	L-21, Illinois River at Seneca, 4.0 mi NNE L-23, Illinois Nitrogen Co., 5.3 mi NNW L-24, LSCS Cooling Lake near recreation area	Weekly collection composited monthly	Gamma isotopic on monthly composite; composite quarterly for tritium analysis.
b. Cooling Water	L-25, LSCS intake pipe at river, 4.8 mi N L-26, LSCS discharge pipe at river, 4.8 mi N	Weekly	Gross beta analysis weekly
c. Ground	L-28, Marseilles Well, 7.0 mi NW L-29, Seneca Well, 5.1 mi NNE L-30, Ransom Well, 6.0 mi S L-31, Ottawa Well, 12.8 mi NW L-32, Illinois State Park 6.5 mi NW	Quarterly	Gamma isotopic and tritium analysis quarterly
d. Sediment from Shoreline	L-34, Downstream of Cooling Lake discharge structure at station	Semiannually	Gamma isotopic analysis semiannually

TABLE 8.4-1 (Cont'd)

EXPOSURE PATHWAY AND/OR SAMPLE	SAMPLING OR MONITORING LOCATION		SAMPLING OR COLLECTION FREQUENCY	TYPE AND FREQUENCY OF ANALYSIS
4. Ingestion[d]				
a. Milk	L-15, Granby Farm, 7.0 mi	E	Weekly: May to October Monthly: November to April	Gamma isotopic and I-131 analysis on each sample
	L-16, Lowery Dairy, 7.2 mi	ESE		
	L-17, Norsen Dairy, 9.0 mi	NNW		
	L-18, Sunny Isle Farm, 12.8 mi	NNE		
b. Fish	L-24, LSCS Cooling Lake near recreation area		Semiannually	Gamma isotopic analysis on edible portions of each sample
	L-35, Marseilles Pool of Illinois River, 6.5 mi	NW		

a. See Figure 8.4-1.

b. Perform gamma isotopic analysis on each sample when gross beta activity is greater than (>) 10 times the yearly mean of control samples.

c. See Figure 8.4-2.

d. See Figure 8.4-3.

TABLE 8.4-2

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

ANALYSIS	REPORTING LEVELS			
	WATER (pCi/ℓ)	AIRBORNE PARTICULATE OR GASES (pCi/m^3)	FISH (pCi/kg, wet)	MILK (pCi/ℓ)
H-3	20,000*			
Mn-54	1,000		30,000	
Fe-59	400		10,000	
Co-58	1,000		30,000	
Co-60	300		10,000	
Zn-65	300		20,000	
Zr-Nb-95	400			
I-131	2	0.9		3
Cs-134	30	10	1,000	60
Cs-137	50	20	2,000	70
Ba-La-140	200			300

* For drinking water samples. This is 40 CFR Part 141 value.

TABLE 8.4-3

MAXIMUM VALUES FOR THE LOWER LIMITS OF DETECTION (LLD)[a,b]

ANALYSIS	WATER (pCi/ℓ)	AIRBORNE PARTICULATE OR GASES (pCi/m^3)	FISH (pCi/kg, wet)	MILK (pCi/ℓ)	SEDIMENT (pCi/kg, dry)
Gross Beta	5	0.01	1,000	NA	2,000
H-3	200	NA	NA	NA	NA
Mn-54	*	NA	**	*	**
Fe-59	*	NA	**	*	**
Co-58,60	*	NA	**	*	**
Zn-65	*	NA	**	*	**
Zr-95	*	NA	**	*	**
Nb-95	*	NA	**	*	**
I-131	NA	0.1	**	0.5	**
Cs-134	10	0.01	100	10	**
Cs-137	10	0.01	100	10	**
Ba-140	*	NA	**	*	**
La-140	*	NA	**	*	**

* Gamma isotopic analysis provides LLD of ~ 20 pCi/ℓ per nuclide.

**Gamma isotopic analysis provides LLD of ~ 20 pCi/kg per nuclide.

TABLE 8.4-3 (Cont'd)

TABLE NOTATION

a. The LLD is the smallest concentration of radioactive material in a sample that will be detected with 95% probability with 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system (which may include radiochemical separation):

$$LLD = \frac{4.66\ s_b}{E \cdot V \cdot 2.22 \cdot Y \cdot \exp(-\lambda \Delta t)}$$

where:

LLD is the "a priori" lower limit of detection as defined above (as picocurie per unit mass or volume),

s_b is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute),

E is the counting efficiency (as counts per transformation),

V is the sample size (in units of mass or volume),

2.22 is the number of transformations per minute per picocurie,

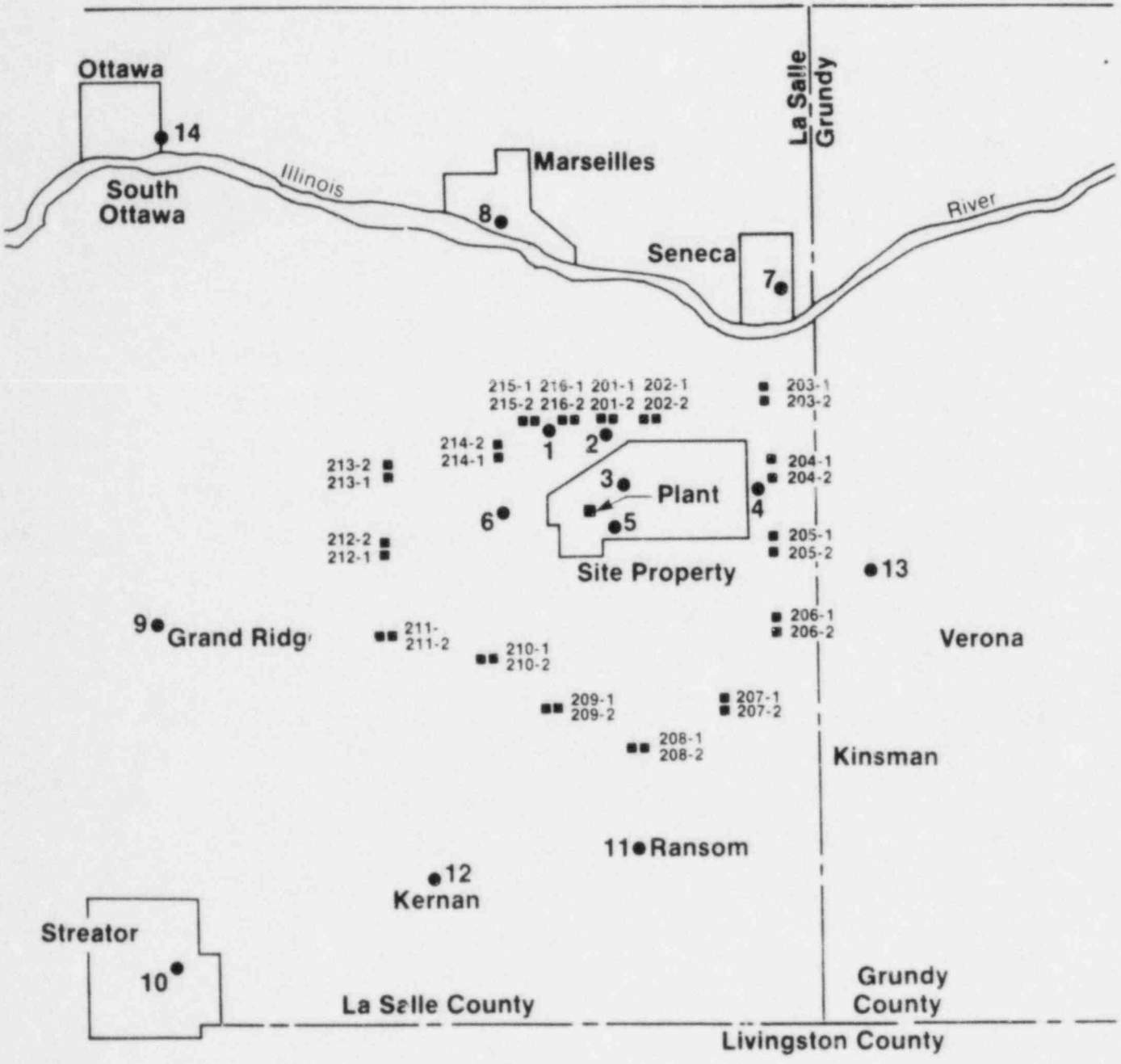
Y is the fractional radiochemical yield (when applicable),

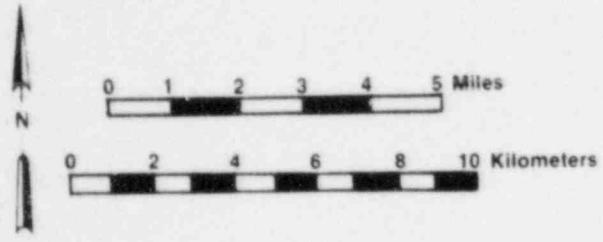
λ is the radioactive decay constant for the particular radionuclide, and

Δt is the elapsed time between sample collection (or end of the sample collection period) and time of counting (for environmental samples, not plant effluents).

The value of s_b used in the calculation of the LLD for a detection system shall be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background shall include the typical contributions of other radionuclides normally present in the samples (e.g., potassium-40 in milk samples). Typical values of E, V, Y, and Δt shall be used in the calculations.

b. Other peaks which are measurable and identifiable, together with the radionuclides in Table 8.4-3 shall be identified and reported.





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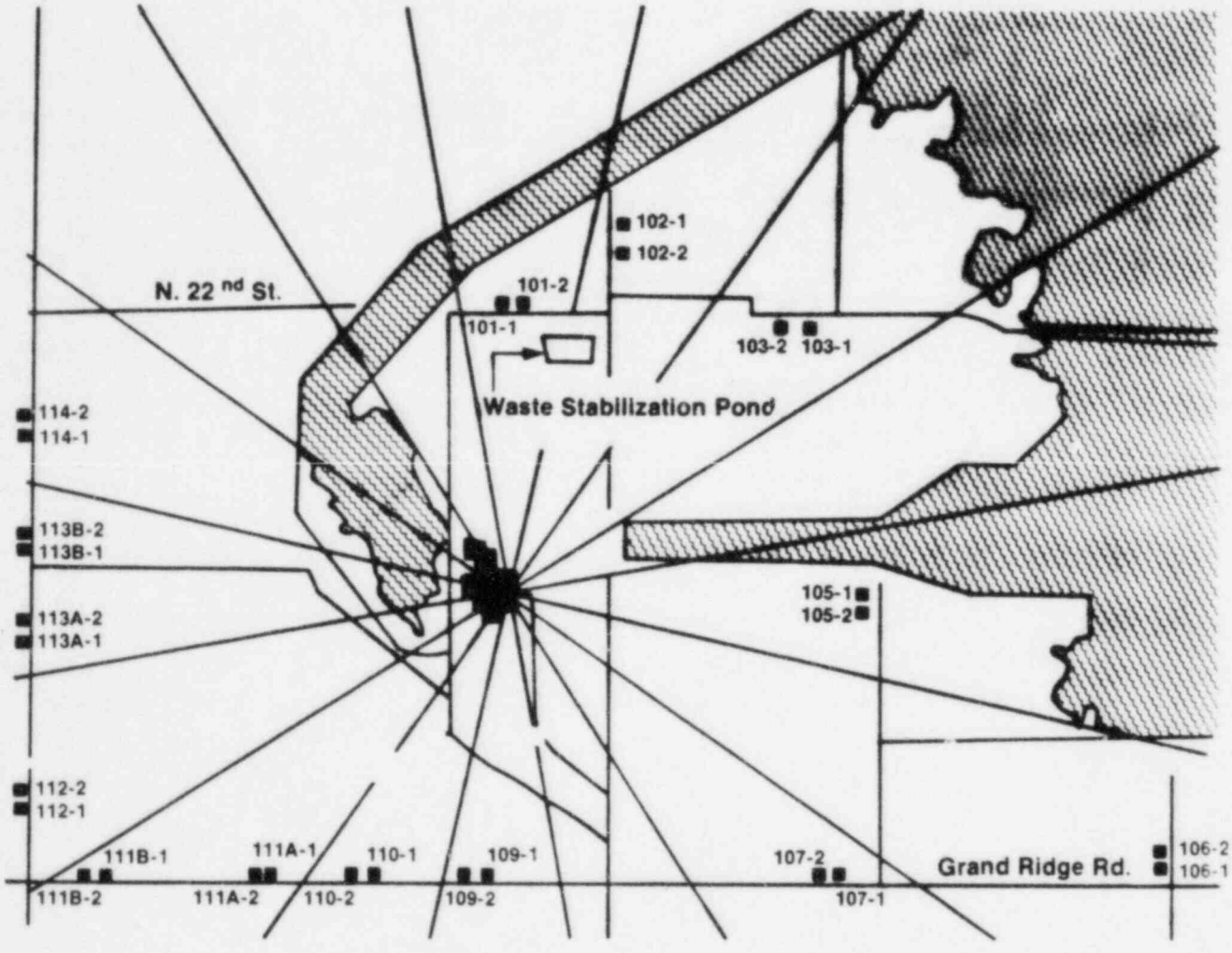
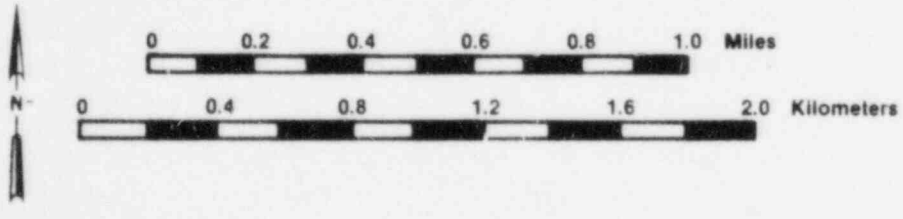
LA SALLE COUNTY STATION

FIGURE 8.4-1

FIXED AIR SAMPLING SITES AND OUTER RING TLD LOCATIONS





LA SALLE COUNTY STATION

FIGURE 8.4-2

INNER RING TLD LOCATIONS

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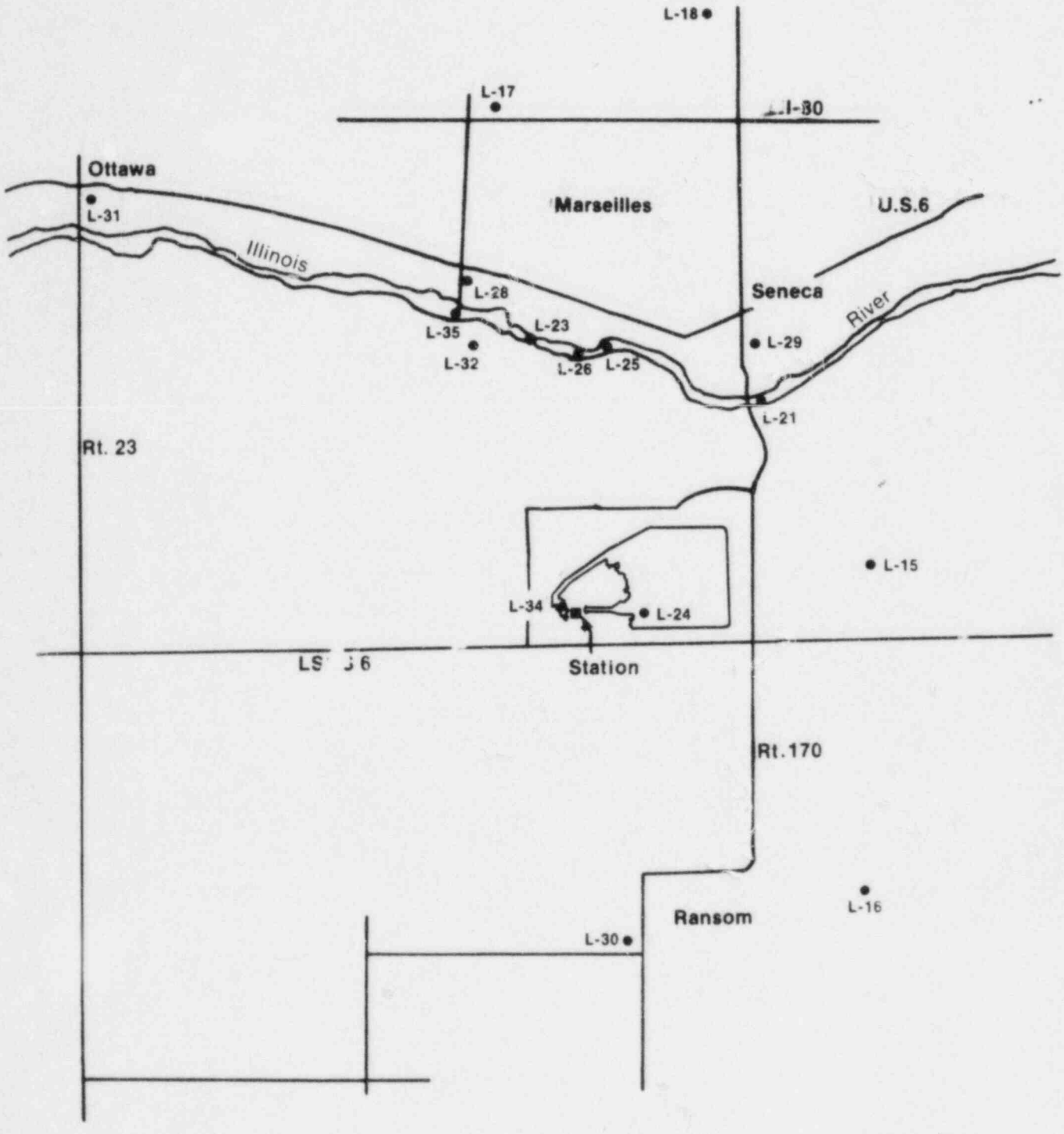
NOVEMBER 1985



LA SALLE COUNTY STATION

FIGURE 8.4-3

INGESTION AND WATERBORNE EXPOSURE PATHWAY SAMPLE LOCATIONS

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