

NRC RA17-048

2016 ANNUAL RADIOLOGICAL  
ENVIRONMENTAL OPERATING  
REPORT

PART 2

## **APPENDIX E**

### **EFFLUENT DATA**

## TABLE OF CONTENTS

<u>INTRODUCTION</u> .....	1
<u>SUMMARY</u> .....	2
<u>1.0. EFFLUENTS</u> .....	3
<u>1.1. Gaseous Effluents to the Atmosphere</u> .....	3
<u>1.2. Liquids Released to Illinois River</u> .....	3
<u>2.0. SOLID RADIOACTIVE WASTE</u> .....	3
<u>3.0. DOSE TO MAN</u> .....	3
<u>3.1. Gaseous Effluent Pathways</u> .....	3
<u>3.1.1. Noble Gases</u> .....	4
<u>3.1.1.1. Gamma Dose Rates</u> .....	4
<u>3.1.1.2. Beta Air and Skin Dose Rates</u> .....	4
<u>3.1.2. Radioactive Iodine</u> .....	5
<u>3.1.2.1. Dose to Thyroid</u> .....	5
<u>3.2. Liquid Effluent Pathways</u> .....	5
<u>3.3. Assessment of Dose to Member of Public</u> .....	5
<u>4.0. SITE METEOROLOGY</u> .....	6

Table of Contents (cont.)

APPENDIX E-1 DATA TABLES AND FIGURES..... E-1.1

Station Releases

Table 1.1-1 Gaseous Effluents Summation of all Releases..... E-1.2

Table 1.2-1 Summation of all Liquid Releases..... E-1.3

Table 2.1-1 Solid Radwaste Annual Report ..... E-1.4

Table 3.1-1 Maximum Doses Resulting from Gaseous Releases and  
Compliance Status ..... E-1.5

Table 3.2-1 Maximum Doses Resulting from Liquid Releases and  
Compliance Status ..... E-1.6

Table 3.3-1 10 CFR 20 Compliance Assessment ..... E-1.7

Table 3.4-1 Maximum Doses Resulting from Airborne Releases Based  
On Concurrent Meteorological Data ..... E-1.8



## INTRODUCTION

LaSalle County Station, a two-unit BWR, is located near Marseilles, Illinois in LaSalle County, 3.5 miles south of the Illinois River. Both units are rated at 3546 MWt. Unit 1 loaded fuel in March 1982. Unit 2 loaded fuel in late December 1983. The Station is designed to keep releases to the environment at levels below those specified in the regulations.

Liquid effluents, although no longer batch released from LaSalle County Station, were designed to be released to the Illinois River in controlled batches after radioassay of each batch. Gaseous effluents are released to the atmosphere after delay allowing time for short-lived (noble) gases to decay. Releases to the atmosphere are sampled and analyzed on a routine basis. The gaseous effluent samples are analyzed for particulate, iodine, noble gas, and tritium activity. The particulate and iodine sample results are obtained from continuously collected composite samples. The noble gas and tritium sample results are obtained from routine grab samples. The results of effluent analyses are summarized on a monthly basis and reported to the Nuclear Regulatory Commission as required per Technical Specifications. Airborne concentrations of noble gases, tritium, I-131, and particulate radioactivity in offsite areas are calculated using effluent and meteorological data.

Environmental monitoring is conducted by sampling at indicator and control (background) locations in the vicinity of LaSalle County Station to measure changes in radiation or radioactivity levels that may be attributable to station operations. If significant changes attributable to LaSalle County Station are measured, these changes are correlated with effluent releases. External gamma radiation exposure from noble gases and internal dose from I-131 in milk are the critical pathways at this site; however, an environmental monitoring program is conducted which also includes these and many other pathways which are less significant in terms of radiation protection.

## SUMMARY

Gaseous effluents for the period contributed to only a small fraction of the LaSalle County Station Radiological Effluent Controls Limits. Liquid effluents had no contribution to offsite dose, as no liquid batch radioactive discharges were conducted. Calculations of environmental concentrations based on effluent, Illinois River flow, and meteorological data for the period indicate that consumption by the public of radionuclides attributable to LaSalle County Station does not exceed regulatory limits. Radiation exposure from radionuclides released to the atmosphere represented the critical pathway for the period with a maximum individual total dose estimated to be 8.88E-01 mrem for the year, where a shielding factor of 0.7 and an occupancy factor of 0.95 are assumed for the nearest resident. The assessment of radiation doses is performed in accordance with the Offsite Dose Calculation Manual (ODCM), specifically, a comparison of preoperational studies with operational controls or with previous environmental surveillance reports and an assessment of the observed impacts of the plant operation on the environment. Control locations are basis for "preoperational data." The results of analysis confirm that the station is operating in compliance with 10 CFR 50 Appendix I, 10 CFR 20 and 40 CFR 190.

## 1.0 EFFLUENTS

### 1.1 Gaseous Effluents to the Atmosphere

Measured concentrations of noble gases, radioiodine, and particulate radioactivity released to the atmosphere during the year, are listed in Table 1.1-1. A total of  $2.94\text{E}+03$  curies of fission and activation gases were released with an average release rate of  $9.30\text{E}+01$   $\mu\text{Ci}/\text{sec}$ .

A total of  $2.46\text{E}-02$  curies of I-131 were released during the year with an average release rate of  $7.78\text{E}-04$   $\mu\text{Ci}/\text{sec}$ .

A total of  $5.90\text{E}-03$  curies of beta-gamma emitters were released as airborne particulate matter with an average release rate of  $1.87\text{E}-04$   $\mu\text{Ci}/\text{sec}$ . Alpha-emitting radionuclides were below the lower limit of detection (LLD). Carbon-14 released in 2016 was calculated separately with a total of  $3.45\text{E}+01$  curies released with an average release rate of  $1.10\text{E}+00$   $\mu\text{Ci}/\text{sec}$ .

A total of  $2.33\text{E}+01$  curies of tritium were released with an average release rate of  $7.34\text{E}-01$   $\mu\text{Ci}/\text{sec}$ .

### 1.2 Liquids Released to Illinois River

There were no liquid batch releases in 2016. Continuous release path activity was below applicable Lower Limits of Detection.

## 2.0 SOLID RADIOACTIVE WASTE

Solid radioactive wastes were shipped by truck to a disposal facility or to a waste processor. For further detail, refer the LaSalle 2016 Annual Radioactive Effluent Release Report (ARERR). This report was submitted to the USNRC by the required date of May 1<sup>st</sup>, 2017.

## 3.0 DOSE TO MAN

### 3.1 Gaseous Effluent Pathways

Table 3.1-1 summarizes the doses resulting from releases of airborne radioactivity via the different exposure pathways.

### 3.1.1 Noble Gases

#### 3.1.1.1 Gamma Dose Rates

Unit 1 and Unit 2 gaseous releases at LaSalle County Station are reported as Unit 1 releases due to a single station vent stack (SVS) release point. Offsite Gamma air and whole body dose rates are shown in Table 3.1-1 and were calculated based on measured release rates, isotopic composition of the noble gases and average meteorological data for the period. Doses based on concurrent meteorological data are shown in Table 3.4-1. Based on measured effluents and meteorological data, the maximum total body dose to an individual would be  $2.40\text{E-}02$  mrem (Table 3.1-1) for the year, with an occupancy factor of 0.95 and a shielding factor of 0.7 included. The maximum total body dose based on measured effluents and concurrent meteorological data would be  $1.30\text{E-}02$  mrem (Table 3.4-1).

The maximum gamma air dose was  $3.61\text{E-}02$  mrad from Table 3.1-1, and the maximum gamma air dose from concurrent meteorological data was  $4.51\text{E-}03$  mrad (Table 3.4-1).

#### 3.1.1.2 Beta Air and Skin Dose Rates

The range of beta particles in air is relatively small (on the order of a few meters or less); consequently, plumes of gaseous effluents may be considered "infinite" for purpose of calculating the dose from beta radiation incident on the skin. However, the actual dose to sensitive skin tissues is difficult to calculate due to the effect of the beta particle energies, thickness of inert skin and clothing covering sensitive tissues. For purposes of this report the skin is taken to have a thickness of  $7.0\text{ mg/cm}^2$  and an occupancy factor of 1.0 is used. The skin dose (from beta and gamma radiation) for the year was  $4.04\text{E-}02$  mrem from Table 3.1-1, and the skin dose from concurrent meteorological data was  $4.58\text{E-}03$  mrem (Table 3.4-1). The maximum offsite beta dose for the

year was 1.59E-03 mrad from Table 3.1-1, and the maximum offsite beta dose from concurrent meteorological data was 1.55E-03 mrad (Table 3.4-1).

### 3.1.2 Radioactive Iodine

The human thyroid exhibits a significant capacity to concentrate ingested or inhaled iodine. The radioiodine, I-131, released during routing operation of the plant, may be made available to man resulting in a dose to the thyroid. The principal pathway of interest for this radionuclide is ingestion of radioiodine in milk.

#### 3.1.2.1 Dose to Thyroid

The hypothetical thyroid dose to a maximum exposed individual living near the station via ingestion of milk was calculated. The radionuclide considered was I-131 and the source of milk was taken to be the nearest dairy farm with the cows pastured from May through October. The maximum thyroid dose due to I-131 was 1.26E-01 mrem for the year.

### 3.2 Liquid Effluent Pathways

The three principal pathways through the aquatic environment for potential doses to man from liquid waste are ingestion of potable water, eating aquatic foods, and exposure while on the shoreline. Not all of these pathways are significant or applicable at a given time but a reasonable approximation of the dose can be made by adjusting the dose formula for season of the year or type and degree of use of the aquatic environment. NRC developed equations\* were used to calculate the doses to the whole body, lower gastro-intestinal tracts, thyroid, bone and skin; specific parameters for use in the equations are given in the Offsite Dose Calculation Manual. The maximum whole body dose was 0.00E+00 mrem and organ dose was 0.00E+00 for the year mrem (Table 3.2-1).

### 3.3 Assessment of Dose to Member of Public

During the period January to December 2016, LaSalle County Station did not exceed these limits as shown in Table 3.1-1 and Table 3.2-1 (based on annual average meteorological data), and

as shown in Table 3.3-1:

- The Radiological Effluent Technical Standards (RETS) limits on dose or dose commitment to an individual due to radioactive materials in liquid effluents from each reactor unit (1.5 mrem to the whole body or 5 mrem to any organ during any calendar year; 3 mrem to the whole body or 10 mrem to any organ during the calendar year).
- The RETS limits on air dose in noble gases released in gaseous effluents to a member of the public from each reactor unit (5 mrad for gamma radiation or 10 mrad for beta radiation during any calendar quarter; 10 mrads for gamma radiation or 20 mrad for beta radiation during a calendar year).
- The RETS limits on dose to a member of the public due to iodine-131, iodine-133, tritium and radionuclides in particulate form with half-lives greater than eight days in gaseous effluents released from each reactor unit (7.5 mrem to any organ during any calendar quarter; 15 mrem to any organ during any calendar year).
- The 10 CFR 20 limit on Total Effective Dose Equivalent to individual members of the public (100 mrem).

#### 4.0 SITE METEOROLOGY

A summary of the site meteorological measurements taken during each calendar quarter of the year is given in Appendix F. The data are presented as cumulative joint frequency distributions of the wind direction for the 375' level and wind speed class by atmospheric stability class determined from the temperature difference between the 375' and 33' levels. Data recovery for these measurements was 99.7% during 2016.

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\*Nuclear Regulatory Commission, Regulatory Guide 1.109 (Rev. 1)

## **APPENDIX E-1**

### **DATA TABLES AND FIGURES**

**Table 1.1-1**

LASALLE COUNTY NUCLEAR POWER STATION  
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2016)  
UNIT 1 AND UNIT 2  
DOCKET NUMBERS 50-373 AND 50-374  
GASEOUS EFFLUENTS SUMMATION OF ALL RELEASES

<b>A. Fission &amp; Activation Gases</b>	<b>Unit</b>	<b>Quarter 1</b>	<b>Quarter 2</b>	<b>Quarter 3</b>	<b>Quarter4</b>	<b>Est. Total Error %</b>
1. Total Release	Ci	6.23E+02	8.47E+02	8.68E+02	6.01E+02	2.50E+01
2. Average release rate for the period	μCi/sec	7.92E+01	1.08E+02	1.09E+02	7.56E+01	
3. Percent of ODCM limit	%	*	*	*	*	

<b>B. Iodine</b>						
1. Total Iodine – 131	Ci	5.84E-03	6.95E-03	6.10E-03	5.70E-03	1.50E+01
2. Average release rate for the period	μCi/sec	7.42E-04	8.84E-04	7.68E-04	7.17E-04	
3. Percent of ODCM limit	%	*	*	*	*	

<b>C. Particulates</b>						
1. Particulates with half-lives > 8 days	Ci	8.32E-04	2.23E-03	2.15E-03	6.90E-04	3.50E+01
2. Average release rate for the period	μCi/sec	1.06E-04	2.83E-04	2.71E-04	8.68E-05	
3. Percent of ODCM limit	%	*	*	*	*	

<b>D. Tritium</b>						
1. Total Release	Ci	7.81E-01	6.02E+00	8.38E+00	8.11E+00	1.50E+01
2. Average release rate for the period	μCi/sec	9.93E-02	7.65E-01	1.05E+00	1.02E+00	
3. Percent of ODCM limit	%	*	*	*	*	

<b>E. Gross Alpha</b>						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	N/A
2. Average release rate for the period	μCi/sec	<LLD	<LLD	<LLD	<LLD	
3. Percent of ODCM limit	%	*	*	*	*	

<b>F. Carbon-14</b>						
1. Total Release	Ci	8.62E+00	8.62E+00	8.62E+00	8.62E+00	
2. Average release rate for the period	μCi/sec	1.10E+00	1.10E+00	1.09E+00	1.09E+00	
3. Percent of ODCM limit	%	*	*	*	*	

"" This information is contained in the Radiological Impact on Man section of the report.

"<" Indicates activity of sample is less than LLD given in μCi/ml

The LaSalle County Nuclear Power Station maximum expected annual dose from Carbon-14 has been calculated using the maximum gross thermal capacity at full power operation. The resultant bounding doses are based upon site specific assumptions of source term.



**Table 1.2-1**  
**LASALLE COUNTY NUCLEAR POWER STATION**  
**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2016)**  
**LIQUID RELEASES**  
**UNIT 1 AND UNIT 2**  
**SUMMATION OF ALL LIQUID RELEASES**

<b>A. Fission &amp; Activation Products</b>	<b>Unit</b>	<b>Quarter 1</b>	<b>Quarter 2</b>	<b>Quarter 3</b>	<b>Quarter4</b>	<b>Est. Total Error %</b>
1. Total Release (not including tritium, gases & alpha)	Ci	<LLD	<LLD	<LLD	<LLD	N/A
2. Average diluted concentration during period	μCi/mL	<LLD	<LLD	<LLD	<LLD	
3. Percent of applicable limit	%	*	*	*	*	

<b>B. Tritium</b>						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	N/A
2. Average diluted concentration during period	μCi/mL	<LLD	<LLD	<LLD	<LLD	
3. Percent of applicable limit	%	*	*	*	*	

<b>C. Dissolved &amp; Entrained Gases</b>						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	N/A
2. Average diluted concentration during period	μCi/mL	<LLD	<LLD	<LLD	<LLD	
3. Percent of applicable limit	%	*	*	*	*	

<b>D. Gross Alpha Activity</b>						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	N/A
2. Average release rate for the period	μCi/mL	<LLD	<LLD	<LLD	<LLD	
3. Percent of ODCM limit	%	*	*	*	*	

<b>E. Volume of Waste Released (prior to dilution)</b>	Liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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<b>F. Volume of Dilution Water Used During Period</b>	Liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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\*\*\* This information is contained in the Radiological Impact on Man section of the report.

"<" Indicates activity of sample is less than LLD given in μCi/ml

**Table 2.1-1**

**LASALLE COUNTY NUCLEAR POWER STATION  
SOLID WASTE ANNUAL REPORT**

Table 2.1-1 deliberately deleted. For solid waste disposal detail, refer to the LaSalle County Station 2016 Annual Radiological Effluent Release Report (ARERR).

**Table 3.1-1**

LASALLE COUNTY NUCLEAR POWER STATION  
 EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2016)  
 RADIOLOGICAL IMPACT ON MAN  
 MAXIMUM DOSES RESULTING FROM GASEOUS RELEASES AND COMPLIANCE STATUS

<b>Infant Receptor</b>	<b>Quarterly Limit</b>	<b>Units</b>	<b>1st Quarter</b>	<b>% of Limit</b>	<b>2nd Quarter</b>	<b>% of Limit</b>	<b>3<sup>rd</sup> Quarter</b>	<b>% of Limit</b>	<b>4th Quarter</b>	<b>% of Limit</b>	<b>Annual Limit</b>	<b>% of Limit</b>
Gamma Air	5.00E+00	mRad	7.85E-03	0.157	1.01E-02	0.202	1.04E-02	0.207	7.72E-03	0.154	1.00E+01	0.360
Beta Air	1.00E+01	mRad	3.36E-04	0.003	4.52E-04	0.005	4.57E-04	0.005	3.47E-04	0.003	2.00E+01	0.008
NG Total Body	2.50E+00	mRem	5.23E-03	0.209	6.73E-03	0.269	6.92E-03	0.277	5.15E-03	0.206	5.00E+00	0.481
NG Skin	7.50E+00	mRem	8.80E-03	0.117	1.13E-02	0.151	1.16E-02	0.155	8.67E-03	0.116	1.50E+01	0.270
NNG Organ	7.50E+00	mRem	2.97E-02	0.395	3.53E-02	0.471	3.13E-02	0.417	2.94E-02	0.392	1.50E+01	0.837
<b>Child Receptor</b>	<b>Quarterly Limit</b>	<b>Units</b>	<b>1st Quarter</b>	<b>% of Limit</b>	<b>2nd Quarter</b>	<b>% of Limit</b>	<b>3<sup>rd</sup> Quarter</b>	<b>% of Limit</b>	<b>4th Quarter</b>	<b>% of Limit</b>	<b>Annual Limit</b>	<b>% of Limit</b>
Gamma Air	5.00E+00	mRad	7.85E-03	0.157	1.01E-02	0.202	1.04E-02	0.207	7.72E-03	0.154	1.00E+01	0.360
Beta Air	1.00E+01	mRad	3.36E-04	0.003	4.52E-04	0.005	4.57E-04	0.005	3.47E-04	0.003	2.00E+01	0.008
NG Total Body	2.50E+00	mRem	5.23E-03	0.209	6.73E-03	0.269	6.92E-03	0.277	5.15E-03	0.206	5.00E+00	0.481
NG Skin	7.50E+00	mRem	8.80E-03	0.117	1.13E-02	0.151	1.16E-02	0.155	8.67E-03	0.116	1.50E+01	0.270
NNG Organ	7.50E+00	mRem	1.24E-02	0.165	1.47E-02	0.196	1.30E-02	0.173	1.23E-02	0.163	1.50E+01	0.349
<b>Teenager Receptor</b>	<b>Quarterly Limit</b>	<b>Units</b>	<b>1st Quarter</b>	<b>% of Limit</b>	<b>2nd Quarter</b>	<b>% of Limit</b>	<b>3<sup>rd</sup> Quarter</b>	<b>% of Limit</b>	<b>4th Quarter</b>	<b>% of Limit</b>	<b>Annual Limit</b>	<b>% of Limit</b>
Gamma Air	5.00E+00	mRad	7.85E-03	0.157	1.01E-02	0.202	1.04E-02	0.207	7.72E-03	0.154	1.00E+01	0.360
Beta Air	1.00E+01	mRad	3.36E-04	0.003	4.52E-04	0.005	4.57E-04	0.005	3.47E-04	0.003	2.00E+01	0.008
NG Total Body	2.50E+00	mRem	5.23E-03	0.209	6.73E-03	0.269	6.92E-03	0.277	5.15E-03	0.206	5.00E+00	0.481
NG Skin	7.50E+00	mRem	8.80E-03	0.117	1.13E-02	0.151	1.16E-02	0.155	8.67E-03	0.116	1.50E+01	0.270
NNG Organ	7.50E+00	mRem	6.19E-03	0.082	7.35E-03	0.098	6.51E-03	0.087	6.13E-03	0.082	1.50E+01	0.175
<b>Adult Receptor</b>	<b>Quarterly Limit</b>	<b>Units</b>	<b>1st Quarter</b>	<b>% of Limit</b>	<b>2nd Quarter</b>	<b>% of Limit</b>	<b>3<sup>rd</sup> Quarter</b>	<b>% of Limit</b>	<b>4th Quarter</b>	<b>% of Limit</b>	<b>Annual Limit</b>	<b>% of Limit</b>
Gamma Air	5.00E+00	mRad	7.85E-03	0.157	1.01E-02	0.202	1.04E-02	0.207	7.72E-03	0.154	1.00E+01	0.360
Beta Air	1.00E+01	mRad	3.36E-04	0.003	4.52E-04	0.005	4.57E-04	0.005	3.47E-04	0.003	2.00E+01	0.008
NG Total Body	2.50E+00	mRem	5.23E-03	0.209	6.73E-03	0.269	6.92E-03	0.277	5.15E-03	0.206	5.00E+00	0.481
NG Skin	7.50E+00	mRem	8.80E-03	0.117	1.13E-02	0.151	1.16E-02	0.155	8.67E-03	0.116	1.50E+01	0.270
NNG Organ	7.50E+00	mRem	3.89E-03	0.052	4.63E-03	0.062	4.10E-03	0.055	3.85E-03	0.051	1.50E+01	0.110

92 of 183

The LaSalle County Nuclear Power Station maximum expected annual dose from Carbon-14 has been calculated using the maximum gross thermal capacity at full power operation. The resultant bounding doses are based upon site specific assumptions of source term.

**Table 3.2-1**

LASALLE COUNTY NUCLEAR POWER STATION  
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2016)  
RADIOLOGICAL IMPACT ON MAN  
MAXIMUM DOSES RESULTING FROM LIQUID RELEASES AND COMPLIANCE STATUS

Infant Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
<b>10CFR50 Appendix I compliance</b>												
Total Body	1.50E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.00E+00	0.00
Organ	5.00E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.00E+01	0.00
<b>40CFR141 compliance (nearest public drinking water)</b>												
Total Body		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
Organ		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
<b>Child Receptor</b>												
Child Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
<b>10CFR50 Appendix I compliance</b>												
Total Body	1.50E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.00E+00	0.00
Organ	5.00E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.00E+01	0.00
<b>40CFR141 compliance (nearest public drinking water)</b>												
Total Body		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
Organ		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
<b>Teenager Receptor</b>												
Teenager Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
<b>10CFR50 Appendix I compliance</b>												
Total Body	1.50E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.00E+00	0.00
Organ	5.00E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.00E+01	0.00
<b>40CFR141 compliance (nearest public drinking water)</b>												
Total Body		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
Organ		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
<b>Adult Receptor</b>												
Adult Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
<b>10CFR50 Appendix I compliance</b>												
Total Body	1.50E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.00E+00	0.00
Organ	5.00E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.00E+01	0.00
<b>40CFR141 compliance (nearest public drinking water)</b>												
Total Body		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
Organ		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00

**Table 3.3-1**

LASALLE COUNTY NUCLEAR POWER STATION  
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2016)  
RADIOLOGICAL IMPACT ON MAN  
MAXIMUM DOSES RESULTING FROM RELEASES AND COMPLIANCE STATUS

**10CFR20 / 40CFR190 Compliance**

	1 <sup>st</sup> Quarter Dose (mRem)	2 <sup>nd</sup> Quarter Dose (mRem)	3 <sup>rd</sup> Quarter Dose (mRem)	4 <sup>th</sup> Quarter Dose (mRem)	Annual Dose (mRem)	Annual Limit (mRem/yr)	% Annual Limit
<b>Unit 1</b>							
40CFR190 Compliance							
U1 D <sup>Ex</sup>	6.62E-02	1.01E-01	1.03E-01	1.04E-01	3.74E-01	25	1.50
10CFR20 Compliance							
U1 D <sup>Tot</sup>	9.59E-02	1.37E-01	1.34E-01	1.33E-01	5.00E-01	100	0.50
40CFR190 Compliance							
Bone	7.05E-03	7.07E-03	7.05E-03	7.04E-03	2.82E-02	25	0.11
Liver	1.59E-03	1.60E-03	1.59E-03	1.59E-03	6.37E-03	25	0.03
Thyroid	2.97E-02	3.53E-02	3.13E-02	2.94E-02	1.26E-01	75	0.17
Kidney	1.60E-03	1.62E-03	1.61E-03	1.60E-03	6.43E-03	25	0.03
Lung	1.50E-03	1.50E-03	1.50E-03	1.50E-03	6.00E-03	25	0.02
GI-LLI	1.51E-03	1.50E-03	1.50E-03	1.50E-03	6.02E-03	25	0.02
<b>Unit 2</b>							
40CFR190 Compliance							
U2 D <sup>Ex</sup>	9.79E-02	9.47E-02	9.62E-02	9.88E-02	3.88E-01	25	1.55
10CFR20 Compliance							
U2 D <sup>Tot</sup>	9.79E-02	9.47E-02	9.62E-02	9.88E-02	3.88E-01	100	0.39
40CFR190 Compliance							
Bone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	25	0.00
Liver	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	25	0.00
Thyroid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	75	0.00
Kidney	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	25	0.00
Lung	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	25	0.00
GI-LLI	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	25	0.00

**Table 3.4-1**

LASALLE COUNTY NUCLEAR POWER STATION  
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2016)  
RADIOLOGICAL IMPACT ON MAN  
MAXIMUM GAMMA AIR DOSE

**Doses Resulting From Airborne Releases**

The following are the maximum annual calculated cumulative offsite doses resulting from LaSalle County Station airborne releases:

**LaSalle County Generating Station:**

<u>Dose</u>	<u>Maximum Value</u>	<u>Sector Affected</u>
gamma air <sup>(1)</sup>	4.510 x 10 <sup>-3</sup> mrad	North-Northeast
beta air <sup>(2)</sup>	1.550 x 10 <sup>-3</sup> mrad	North-Northeast
whole body <sup>(3)</sup>	1.300 x 10 <sup>-2</sup> mrem	North-Northeast
skin <sup>(4)</sup>	4.580 x 10 <sup>-3</sup> mrem	North-Northeast
organ <sup>(5)</sup> (infant-thyroid)	6.010 x 10 <sup>-1</sup> mrem	East-Southeast

**Compliance Status**

<b>10 CFR 50 Appendix I</b>	<b>Yearly Objective</b>	<b>% of Appendix I</b>
gamma air	10.0 mrad	0.05
beta air	20.0 mrad	0.01
whole body	5.0 mrem	0.26
skin	15.0 mrem	0.03
organ	15.0 mrem	4.01

- 
- (1) Gamma Air Dose – GASPAR II, NUREG-0597
  - (2) Beta Air Dose – GASPAR II, NUREG-0597
  - (3) Whole Body Dose – GASPAR II, NUREG-0597
  - (4) Skin Dose – GASPAR II, NUREG-0597
  - (5) Inhalation and Food Pathways Dose – GASPAR II, NUREG-0597

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## **APPENDIX F**

### **METEOROLOGICAL DATA**



LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Extremely Unstable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	2	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	1	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	1	0	0	0	1
SSE	0	0	2	0	0	0	2
S	0	0	0	2	0	0	2
SSW	0	0	0	0	4	0	4
SW	0	0	0	0	4	0	4
WSW	0	0	1	0	2	0	3
W	0	0	1	0	0	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	5	5	10	0	20

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Moderately Unstable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	2	1	0	0	3
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	4	1	2	0	7
SSE	0	0	2	0	0	0	2
S	0	0	0	1	0	0	1
SSW	0	0	0	1	3	0	4
SW	0	0	2	2	1	2	7
WSW	0	0	3	3	0	0	6
W	0	0	2	2	0	0	4
WNW	0	0	3	1	0	0	4
NW	0	1	2	0	0	0	3
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	1	20	12	6	2	41

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Slightly Unstable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	2	1	0	0	3
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	2	1	0	0	3
E	0	0	3	0	0	0	3
ESE	0	2	0	0	1	0	3
SE	0	1	0	1	1	0	3
SSE	0	3	2	0	0	0	5
S	0	0	1	2	1	0	4
SSW	0	1	0	1	3	0	5
SW	0	1	4	3	1	1	10
WSW	0	0	5	6	2	0	13
W	0	0	4	4	0	0	8
WNW	0	1	8	11	5	0	25
NW	0	3	2	4	2	0	11
NNW	0	0	3	2	0	0	5
Variable	0	0	0	0	0	0	0
Total	0	12	36	36	16	1	101

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Neutral - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	31	34	8	3	0	78
NNE	3	31	20	6	0	0	60
NE	1	10	7	11	0	0	29
ENE	3	10	20	16	5	0	54
E	0	7	16	4	3	3	33
ESE	0	11	7	8	7	0	33
SE	1	11	16	9	4	4	45
SSE	2	11	8	9	1	0	31
S	3	6	14	10	1	0	34
SSW	4	2	17	7	9	1	40
SW	1	5	11	18	1	5	41
WSW	4	12	17	8	3	8	52
W	0	23	41	34	10	10	118
WNW	1	20	32	127	15	0	195
NW	0	20	30	31	11	0	92
NNW	1	24	57	53	27	0	162
Variable	0	0	0	0	0	0	0
Total	26	234	347	359	100	31	1097

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Slightly Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	21	4	0	0	0	27
NNE	4	17	0	0	0	0	21
NE	0	3	4	0	0	0	7
ENE	2	4	13	1	0	0	20
E	1	17	7	5	2	0	32
ESE	2	19	12	2	1	0	36
SE	1	10	7	4	5	0	27
SSE	1	7	16	7	2	1	34
S	1	9	30	15	8	0	63
SSW	1	10	22	39	5	0	77
SW	1	8	13	16	9	0	47
WSW	0	2	18	24	8	1	53
W	2	7	17	8	15	6	55
WNW	0	11	27	8	9	4	59
NW	1	4	16	2	0	0	23
NNW	0	11	5	0	0	0	16
Variable	0	0	0	0	0	0	0
Total	19	160	211	131	64	12	597

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Moderately Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	0	0	0	0	2
NNE	1	0	0	0	0	0	1
NE	0	2	0	0	0	0	2
ENE	1	0	0	0	0	0	1
E	0	4	2	0	0	0	6
ESE	0	7	7	0	0	0	14
SE	2	6	11	4	0	0	23
SSE	1	6	4	1	0	0	12
S	1	7	23	5	0	0	36
SSW	2	11	19	24	1	0	57
SW	0	4	8	18	1	0	31
WSW	0	2	6	9	0	0	17
W	1	5	10	2	0	0	18
WNW	0	3	7	0	0	0	10
NW	0	0	2	0	0	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	9	59	99	63	2	0	232

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Extremely Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	3	1	0	0	0	4
ESE	0	12	0	0	0	0	12
SE	0	16	4	0	0	0	20
SSE	0	8	4	0	0	0	12
S	0	2	5	1	0	0	8
SSW	0	4	11	7	0	0	22
SW	0	0	2	5	0	0	7
WSW	0	0	2	6	0	0	8
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	45	29	19	0	0	93

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016

Stability Class - Extremely Unstable - 375Ft-33Ft Delta-T (F)

Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3



LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Moderately Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	1	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	1	1
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	0	1	0	1	2

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Slightly Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	1	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	1	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	1	0	0	1
SSE	0	0	3	2	0	0	5
S	0	0	0	0	1	0	1
SSW	0	0	0	0	2	3	5
SW	0	0	0	0	1	4	5
WSW	0	0	0	1	2	0	3
W	0	0	0	0	1	0	1
WNW	0	0	0	0	0	0	0
NW	0	0	1	0	0	0	1
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	4	6	7	7	24

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Neutral - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	9	22	38	11	3	85
NNE	0	10	39	7	9	6	71
NE	0	6	13	8	12	0	39
ENE	0	9	8	15	9	2	43
E	1	8	10	19	7	3	48
ESE	1	6	8	3	3	8	29
SE	0	5	15	13	12	12	57
SSE	1	6	12	15	2	2	38
S	0	8	7	10	6	4	35
SSW	2	1	8	18	7	23	59
SW	1	3	10	14	12	15	55
WSW	0	8	24	13	14	14	73
W	2	9	22	27	29	30	119
WNW	1	11	16	50	80	25	183
NW	3	8	42	45	82	45	225
NNW	0	11	28	34	28	20	121
Variable	0	0	0	0	0	0	0
Total	14	118	284	329	323	212	1280

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 15  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016

Stability Class - Slightly Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	4	9	3	0	16
NNE	0	3	7	8	0	0	18
NE	1	2	4	11	1	0	19
ENE	0	8	2	1	1	0	12
E	0	10	7	16	2	5	40
ESE	2	5	14	7	1	3	32
SE	1	8	6	11	9	5	40
SSE	1	2	2	9	2	12	28
S	0	3	3	24	23	19	72
SSW	0	5	5	12	33	53	108
SW	0	1	14	17	28	26	86
WSW	1	0	1	6	7	20	35
W	0	1	0	13	16	21	51
WNW	0	0	5	11	19	12	47
NW	1	3	7	27	11	3	52
NNW	0	1	2	4	7	0	14
Variable	0	0	0	0	0	0	0
Total	7	52	83	186	163	179	670

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016

Stability Class - Moderately Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	2	1	0	0	3
ENE	0	1	3	0	0	0	4
E	0	0	0	1	0	0	1
ESE	0	1	3	1	3	0	8
SE	0	2	3	6	4	2	17
SSE	0	1	2	14	8	3	28
S	0	0	3	4	3	0	10
SSW	0	0	1	3	8	19	31
SW	0	0	2	9	5	13	29
WSW	0	0	0	1	1	13	15
W	0	0	0	2	2	6	10
WNW	0	0	1	1	0	0	2
NW	0	0	0	0	0	0	0
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	7	20	43	34	56	160

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2016  
 Stability Class - Extremely Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	1	0	0	0	0	1
ENE	0	0	1	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	3	0	0	3
SSE	0	0	0	2	0	0	2
S	0	0	3	5	1	0	9
SSW	0	0	0	5	3	0	8
SW	0	0	0	0	1	3	4
WSW	0	0	0	0	0	2	2
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	1	4	15	5	5	30

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016

Stability Class - Extremely Unstable - 200Ft-33Ft Delta-T (F)  
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	6	3	0	0	9
NNE	0	0	1	0	0	0	1
NE	0	0	0	1	0	0	1
ENE	0	0	0	1	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	2	7	0	0	9
SE	0	0	2	2	0	0	4
SSE	0	0	0	0	0	0	0
S	0	0	1	3	1	0	5
SSW	0	0	1	7	6	0	14
SW	0	0	0	1	4	4	9
WSW	0	0	2	4	2	0	8
W	0	0	7	9	1	0	17
WNW	0	0	4	16	0	1	21
NW	0	0	2	3	1	0	6
NNW	0	0	0	7	0	0	7
Variable	0	0	0	0	0	0	0
Total	0	0	28	64	15	5	112

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016

Stability Class - Moderately Unstable - 200Ft-33Ft Delta-T (F)  
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	11	5	0	0	17
NNE	0	0	6	0	0	0	6
NE	0	0	10	1	0	0	11
ENE	0	0	4	0	0	0	4
E	0	0	2	0	0	0	2
ESE	0	1	8	1	0	0	10
SE	0	2	7	1	0	0	10
SSE	0	0	3	0	0	0	3
S	0	0	5	2	3	0	10
SSW	0	0	4	5	1	0	10
SW	0	2	8	0	3	0	13
WSW	0	1	1	6	1	0	9
W	0	1	8	4	0	0	13
WNW	0	1	8	9	1	0	19
NW	0	0	8	3	2	0	13
NNW	0	1	3	6	1	0	11
Variable	0	0	0	0	0	0	0
Total	0	10	96	43	12	0	161

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3



LaSalle County Generating Station

Period of Record: April - June 2016  
 Stability Class - Slightly Unstable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	6	9	3	1	0	19
NNE	0	3	5	0	0	0	8
NE	0	7	8	1	0	0	16
ENE	0	3	2	0	0	0	5
E	1	4	1	3	0	0	9
ESE	0	6	9	3	0	0	18
SE	0	3	7	3	0	0	13
SSE	0	5	8	4	0	0	17
S	0	2	8	0	0	0	10
SSW	0	3	4	8	0	0	15
SW	0	7	4	2	0	1	14
WSW	0	2	3	2	0	0	7
W	0	2	9	1	0	0	12
WNW	0	1	9	8	2	0	20
NW	0	2	4	2	3	0	11
NNW	0	3	3	3	0	0	9
Variable	0	0	0	0	0	0	0
Total	1	59	93	43	6	1	203

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016  
 Stability Class - Neutral - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	29	28	8	0	0	65
NNE	3	40	22	1	0	0	66
NE	2	13	37	16	1	0	69
ENE	0	14	19	29	18	1	81
E	0	13	8	13	7	0	41
ESE	0	10	11	9	5	0	35
SE	0	11	6	6	6	0	29
SSE	1	8	5	11	3	0	28
S	0	7	15	8	8	0	38
SSW	1	12	22	15	2	0	52
SW	0	6	9	11	2	1	29
WSW	0	4	7	7	2	0	20
W	0	9	10	8	0	1	28
WNW	0	9	26	32	13	3	83
NW	0	8	10	22	5	4	49
NNW	2	4	22	15	6	4	53
Variable	0	0	0	0	0	0	0
Total	9	197	257	211	78	14	766

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016  
 Stability Class - Slightly Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	20	7	0	0	0	29
NNE	2	16	3	0	0	0	21
NE	0	5	5	0	0	0	10
ENE	0	10	12	4	0	0	26
E	2	10	27	1	0	0	40
ESE	1	11	12	6	0	0	30
SE	0	14	11	1	1	0	27
SSE	0	5	11	7	4	0	27
S	1	5	18	5	1	0	30
SSW	0	5	35	4	3	0	47
SW	3	3	18	14	0	0	38
WSW	3	3	15	15	2	0	38
W	1	9	20	3	0	0	33
WNW	3	11	18	8	5	0	45
NW	4	14	11	1	0	0	30
NNW	0	5	16	1	0	0	22
Variable	0	0	0	0	0	0	0
Total	22	146	239	70	16	0	493

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016  
 Stability Class - Moderately Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	10	0	0	0	0	10
NNE	1	4	0	0	0	0	5
NE	3	0	0	0	0	0	3
ENE	1	1	2	0	0	0	4
E	1	13	29	0	0	0	43
ESE	0	17	5	0	0	0	22
SE	2	13	6	0	0	0	21
SSE	1	6	2	2	0	0	11
S	1	10	7	3	0	0	21
SSW	2	6	13	3	0	0	24
SW	0	5	6	2	0	0	13
WSW	3	9	12	4	1	0	29
W	1	12	14	3	0	0	30
WNW	1	15	1	0	0	0	17
NW	0	7	1	0	0	0	8
NNW	0	4	0	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	17	132	98	17	1	0	265

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016  
 Stability Class - Extremely Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	8	11	0	0	0	19
ESE	2	20	3	0	0	0	25
SE	0	13	2	0	0	0	15
SSE	0	10	1	0	0	0	11
S	0	10	3	0	0	0	13
SSW	2	8	13	0	0	0	23
SW	1	6	5	0	0	0	12
WSW	1	11	7	0	0	0	19
W	0	22	5	0	0	0	27
WNW	0	15	0	0	0	0	15
NW	0	1	0	0	0	0	1
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	6	125	50	0	0	0	181

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016

Stability Class - Extremely Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016  
 Stability Class - Moderately Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	2	0	2
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	1	1	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	0	0	1	1	2
SSW	0	0	0	0	2	4	6
SW	0	0	0	0	1	3	4
WSW	0	0	0	0	1	1	2
W	0	0	0	1	1	0	2
WNW	0	0	0	5	3	0	8
NW	0	0	0	1	0	0	1
NNW	0	0	0	2	1	1	4
Variable	0	0	0	0	0	0	0
Total	0	0	1	10	12	10	33

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016  
 Stability Class - Slightly Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	4	10	0	2	16
NNE	0	0	5	2	0	0	7
NE	0	0	0	3	2	0	5
ENE	0	0	0	3	0	0	3
E	0	0	1	0	0	0	1
ESE	0	0	1	7	1	0	9
SE	0	0	1	4	0	0	5
SSE	0	0	0	0	0	0	0
S	0	0	0	3	2	1	6
SSW	0	0	0	6	4	2	12
SW	0	0	1	0	4	2	7
WSW	0	0	2	1	3	1	7
W	0	0	2	7	3	1	13
WNW	0	0	6	13	5	1	25
NW	0	0	1	4	2	1	8
NNW	0	0	2	3	4	0	9
Variable	0	0	0	0	0	0	0
Total	0	0	26	66	30	11	133

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3



LaSalle County Generating Station

Period of Record: April - June 2016  
 Stability Class - Neutral - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	14	17	22	17	3	73
NNE	0	17	29	25	2	0	73
NE	1	14	20	63	13	3	114
ENE	0	15	15	37	20	17	104
E	1	14	3	10	14	5	47
ESE	0	7	17	18	6	11	59
SE	1	9	14	17	4	2	47
SSE	0	9	15	13	7	13	57
S	1	5	10	14	7	11	48
SSW	1	7	20	32	12	17	89
SW	0	7	20	15	4	4	50
WSW	1	4	8	15	16	8	52
W	0	4	8	18	3	1	34
WNW	0	5	18	30	20	9	82
NW	0	4	16	22	22	56	120
NNW	0	5	9	14	12	6	46
Variable	0	0	0	0	0	0	0
Total	6	140	239	365	179	166	1095

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016  
 Stability Class - Slightly Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	7	3	6	6	1	23
NNE	1	3	11	13	0	0	28
NE	0	2	11	11	1	0	25
ENE	0	6	11	10	2	0	29
E	1	3	12	8	6	1	31
ESE	0	6	8	11	19	2	46
SE	1	1	8	9	8	1	28
SSE	1	3	2	10	11	2	29
S	0	1	1	10	15	10	37
SSW	1	3	6	17	26	10	63
SW	0	3	6	16	15	9	49
WSW	2	4	1	11	13	9	40
W	2	7	8	16	7	3	43
WNW	0	3	5	19	13	5	45
NW	1	4	14	23	8	5	55
NNW	0	0	3	10	13	0	26
Variable	0	0	0	0	0	0	0
Total	10	56	110	200	163	58	597

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016  
 Stability Class - Moderately Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	1	0	0	0	4
NNE	0	1	4	1	1	0	7
NE	0	2	0	0	2	0	4
ENE	0	0	1	0	0	0	1
E	1	0	3	2	3	3	12
ESE	0	0	1	25	15	3	44
SE	0	1	4	18	9	0	32
SSE	0	0	4	8	4	0	16
S	0	2	2	4	4	0	12
SSW	0	1	8	6	3	7	25
SW	1	3	3	13	6	1	27
WSW	0	4	3	4	1	3	15
W	0	5	5	13	5	5	33
WNW	0	3	11	13	3	1	31
NW	0	0	8	5	0	0	13
NNW	0	2	2	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	2	27	60	112	56	23	280

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: April - June 2016

Stability Class - Extremely Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	5	1	1	3	0	10
SSE	0	0	1	3	0	0	4
S	0	0	1	2	0	0	3
SSW	0	0	4	3	0	0	7
SW	0	0	2	3	0	3	8
WSW	0	0	0	0	0	0	0
W	0	0	1	2	0	0	3
WNW	0	0	1	1	4	1	7
NW	0	0	0	0	0	0	0
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	6	11	15	7	4	43

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Extremely Unstable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	0	2	0	0	0	2
SE	0	0	0	0	0	0	0
SSE	0	1	0	0	0	0	1
S	0	0	2	0	0	0	2
SSW	0	0	5	1	0	0	6
SW	0	2	10	1	0	0	13
WSW	0	0	4	0	0	0	4
W	0	0	6	5	0	0	11
WNW	0	0	8	4	0	0	12
NW	0	0	0	1	0	0	1
NNW	0	0	0	1	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	3	38	13	0	0	54

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Moderately Unstable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	9	0	0	0	9
NNE	0	0	0	0	0	0	0
NE	0	0	3	0	0	0	3
ENE	0	0	7	1	0	0	8
E	0	3	5	0	0	0	8
ESE	0	5	3	1	0	0	9
SE	0	6	2	1	0	0	9
SSE	0	3	2	0	0	0	5
S	0	4	10	2	0	0	16
SSW	1	9	17	3	0	0	30
SW	0	3	11	3	0	0	17
WSW	0	5	13	0	0	0	18
W	0	0	7	3	0	0	10
WNW	0	3	7	2	0	0	12
NW	0	1	2	0	0	0	3
NNW	0	2	6	1	0	0	9
Variable	0	0	0	0	0	0	0
Total	1	44	104	17	0	0	166

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Slightly Unstable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	11	6	1	0	0	18
NNE	0	7	3	0	0	0	10
NE	0	3	3	1	0	0	7
ENE	0	4	6	0	0	0	10
E	0	8	5	0	0	0	13
ESE	0	13	5	1	0	0	19
SE	0	10	6	0	0	0	16
SSE	1	7	6	1	0	0	15
S	0	4	4	2	0	0	10
SSW	1	8	13	3	0	0	25
SW	0	4	8	5	0	0	17
WSW	0	10	9	2	0	0	21
W	0	18	11	3	0	0	32
WNW	0	6	4	4	3	0	17
NW	0	2	3	0	0	0	5
NNW	0	4	2	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	2	119	94	23	3	0	241

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Neutral - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	21	14	9	0	0	45
NNE	0	24	34	2	0	0	60
NE	0	16	29	1	0	0	46
ENE	0	9	25	4	0	0	38
E	1	17	27	5	0	0	50
ESE	1	18	19	1	0	0	39
SE	5	19	10	1	0	0	35
SSE	8	18	10	0	0	0	36
S	4	13	22	3	0	0	42
SSW	2	11	21	2	0	0	36
SW	4	11	26	4	0	0	45
WSW	1	14	16	2	0	0	33
W	2	11	26	6	3	0	48
WNW	2	12	17	16	5	0	52
NW	0	10	4	2	0	0	16
NNW	2	12	19	1	0	0	34
Variable	0	0	0	0	0	0	0
Total	33	236	319	59	8	0	655

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0



LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Slightly Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	18	3	1	0	0	23
NNE	5	28	1	0	0	0	34
NE	3	7	9	1	0	0	20
ENE	0	7	19	0	0	0	26
E	2	21	16	2	0	0	41
ESE	3	19	4	0	0	0	26
SE	2	15	9	0	0	0	26
SSE	6	11	9	0	0	0	26
S	5	18	27	1	0	0	51
SSW	3	12	35	0	0	0	50
SW	1	15	22	3	0	0	41
WSW	3	15	11	5	0	0	34
W	0	12	11	2	0	0	25
WNW	3	13	12	1	4	0	33
NW	1	14	7	0	0	0	22
NNW	1	16	4	1	0	0	22
Variable	0	0	0	0	0	0	0
Total	39	241	199	17	4	0	500

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Moderately Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	15	0	0	0	0	18
NNE	0	5	0	0	0	0	5
NE	0	0	0	0	0	0	0
ENE	1	2	0	0	0	0	3
E	4	36	2	0	0	0	42
ESE	0	31	1	0	0	0	32
SE	3	12	1	1	0	0	17
SSE	4	19	6	0	0	0	29
S	2	23	7	0	0	0	32
SSW	3	35	7	0	0	0	45
SW	5	23	4	0	0	0	32
WSW	2	22	7	0	0	0	31
W	2	10	11	0	0	0	23
WNW	5	20	4	0	0	0	29
NW	1	1	0	1	0	0	3
NNW	0	7	0	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	35	261	50	2	0	0	348

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Extremely Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	3	2	0	0	0	5
ESE	3	27	1	0	0	0	31
SE	1	28	0	0	0	0	29
SSE	1	15	0	0	0	0	16
S	1	48	4	0	0	0	53
SSW	4	29	6	0	0	0	39
SW	2	17	2	0	0	0	21
WSW	1	10	6	0	0	0	17
W	2	16	0	0	0	0	18
WNW	1	13	0	0	0	0	14
NW	1	0	0	0	0	0	1
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	17	206	21	0	0	0	244

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016

Stability Class - Extremely Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Moderately Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	2	0	2
WNW	0	0	0	1	1	0	2
NW	0	0	0	0	1	0	1
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	0	1	4	0	5

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Slightly Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	4	0	0	0	4
NNE	0	0	0	0	0	0	0
NE	0	0	1	0	0	0	1
ENE	0	0	0	3	0	0	3
E	0	1	0	0	0	0	1
ESE	0	1	4	0	0	0	5
SE	0	2	1	0	0	0	3
SSE	0	0	1	0	0	0	1
S	0	0	3	7	0	0	10
SSW	0	0	2	8	1	1	12
SW	0	0	6	2	2	0	10
WSW	0	0	1	1	0	0	2
W	0	0	2	3	1	0	6
WNW	0	0	2	4	1	0	7
NW	0	0	0	9	0	0	9
NNW	0	0	2	1	0	0	3
Variable	0	0	0	0	0	0	0
Total	0	4	29	38	5	1	77

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Neutral - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	13	20	11	8	3	56
NNE	0	3	18	28	7	0	56
NE	3	5	24	29	11	0	72
ENE	1	9	14	39	8	0	71
E	1	13	24	23	4	0	65
ESE	0	16	35	12	0	0	63
SE	2	32	22	6	2	0	64
SSE	2	15	15	6	0	0	38
S	2	23	19	23	5	1	73
SSW	3	8	24	33	9	0	77
SW	5	8	22	47	11	0	93
WSW	0	13	18	25	2	0	58
W	1	16	29	37	9	2	94
WNW	2	12	11	14	24	11	74
NW	0	5	14	9	5	3	36
NNW	1	6	27	6	2	0	42
Variable	0	0	0	0	0	0	0
Total	24	197	336	348	107	20	1032

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Slightly Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	2	9	12	7	3	34
NNE	0	5	11	11	4	0	31
NE	0	11	22	5	14	0	52
ENE	1	2	10	9	1	0	23
E	1	6	14	20	6	1	48
ESE	2	3	8	21	0	0	34
SE	1	3	13	10	7	0	34
SSE	1	5	16	8	7	0	37
S	3	5	12	17	22	6	65
SSW	1	7	10	13	19	5	55
SW	1	2	4	29	26	3	65
WSW	1	4	17	28	5	2	57
W	0	3	14	11	3	1	32
WNW	1	1	8	20	12	2	44
NW	0	5	7	13	4	4	33
NNW	0	3	3	6	2	1	15
Variable	0	0	0	0	0	0	0
Total	14	67	178	233	139	28	659

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0



LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Moderately Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	4	2	0	0	7
NNE	1	2	10	3	0	0	16
NE	0	1	3	1	0	0	5
ENE	2	4	1	0	0	0	7
E	0	1	5	2	1	0	9
ESE	0	1	6	22	8	0	37
SE	1	1	11	8	6	0	27
SSE	0	1	14	12	2	1	30
S	0	6	4	10	7	1	28
SSW	1	2	4	27	18	1	53
SW	1	1	15	22	10	0	49
WSW	1	12	8	12	3	0	36
W	1	2	6	5	3	6	23
WNW	1	0	8	4	4	1	18
NW	0	5	8	7	3	0	23
NNW	0	5	6	4	0	0	15
Variable	0	0	0	0	0	0	0
Total	9	45	113	141	65	10	383

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: July - September 2016  
 Stability Class - Extremely Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	2	0	0	2
SSE	0	0	6	3	0	2	11
S	0	0	3	3	3	0	9
SSW	0	0	1	8	2	2	13
SW	0	0	2	5	0	0	7
WSW	0	0	1	3	0	0	4
W	0	0	0	3	0	0	3
WNW	0	0	0	1	0	0	1
NW	0	1	0	0	0	0	1
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	1	1	13	28	5	4	52

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 0

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Extremely Unstable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	1	0	0	1
SSW	0	0	0	1	2	0	3
SW	0	0	0	3	0	0	3
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	2	0	0	2
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	0	7	2	0	9

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Moderately Unstable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	3	0	0	3
SSW	0	0	0	5	0	0	5
SW	0	0	2	0	0	0	2
WSW	0	0	0	2	3	0	5
W	0	0	0	0	1	0	1
WNW	0	1	2	1	0	0	4
NW	0	0	1	0	0	0	1
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	1	5	11	4	0	21

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Slightly Unstable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	2	0	0	0	3
NNE	0	2	1	1	0	0	4
NE	0	0	1	0	0	0	1
ENE	0	2	0	0	0	0	2
E	0	0	0	0	0	0	0
ESE	0	0	0	3	0	0	3
SE	0	0	0	1	0	0	1
SSE	0	0	2	3	0	0	5
S	0	0	1	3	0	0	4
SSW	0	0	7	3	1	0	11
SW	0	0	4	5	0	0	9
WSW	0	0	8	2	2	0	12
W	0	2	3	0	1	0	6
WNW	0	1	4	1	0	0	6
NW	0	2	4	5	1	0	12
NNW	0	1	4	3	1	0	9
Variable	0	0	0	0	0	0	0
Total	0	11	41	30	6	0	88

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Neutral - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	30	17	5	0	0	53
NNE	2	9	12	0	0	0	23
NE	3	7	4	0	0	0	14
ENE	3	4	5	1	0	0	13
E	0	7	12	9	2	0	30
ESE	2	7	8	15	2	0	34
SE	0	11	15	31	2	0	59
SSE	1	7	12	18	3	1	42
S	0	11	14	12	13	0	50
SSW	0	11	17	15	4	0	47
SW	0	11	10	8	1	0	30
WSW	2	10	22	24	5	0	63
W	2	17	59	43	2	0	123
WNW	2	20	47	67	12	0	148
NW	2	8	33	16	4	0	63
NNW	0	25	37	18	2	0	82
Variable	0	0	0	0	0	0	0
Total	20	195	324	282	52	1	874

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Slightly Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	21	14	0	0	0	35
NNE	1	16	3	0	0	0	20
NE	1	1	12	1	0	0	15
ENE	0	3	7	0	0	0	10
E	1	7	24	3	0	0	35
ESE	0	13	3	6	3	0	25
SE	1	7	4	6	2	0	20
SSE	0	12	13	9	3	0	37
S	0	5	33	22	11	0	71
SSW	4	5	19	39	13	0	80
SW	4	7	12	18	19	1	61
WSW	1	6	12	21	7	0	47
W	4	9	18	24	7	5	67
WNW	4	11	13	26	31	19	104
NW	1	5	15	3	1	0	25
NNW	1	7	14	1	0	0	23
Variable	0	0	0	0	0	0	0
Total	23	135	216	179	97	25	675

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Moderately Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	13	0	0	0	0	13
NNE	0	0	0	0	0	0	0
NE	1	0	0	0	0	0	1
ENE	2	0	0	0	0	0	2
E	0	12	6	0	0	0	18
ESE	0	16	0	0	0	0	16
SE	1	5	5	0	0	0	11
SSE	1	5	5	4	0	0	15
S	1	11	20	7	0	0	39
SSW	1	7	19	5	0	0	32
SW	1	8	21	3	0	0	33
WSW	0	7	14	25	0	0	46
W	1	11	11	1	0	0	24
WNW	0	6	6	0	0	2	14
NW	2	6	4	0	0	0	12
NNW	1	7	2	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	12	114	113	45	0	2	286

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2



LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Extremely Stable - 200Ft-33Ft Delta-T (F)  
 Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	0	0	0	0	3
NNE	1	0	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	1	9	0	0	0	0	10
ESE	0	17	1	0	0	0	18
SE	0	13	8	0	0	0	21
SSE	1	16	9	0	0	0	26
S	1	10	15	0	0	0	26
SSW	1	18	26	0	0	0	45
SW	0	10	22	3	0	0	35
WSW	1	3	25	8	0	0	37
W	0	10	2	0	0	0	12
WNW	0	9	2	0	0	0	11
NW	1	4	0	0	0	0	5
NNW	1	2	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	8	124	110	11	0	0	253

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Extremely Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Moderately Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	1	0	1
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	1	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	0	0	2	0	2

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Slightly Unstable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	1	0	1
SSW	0	0	0	0	0	3	3
SW	0	0	0	0	2	0	2
WSW	0	0	0	0	0	0	0
W	0	0	0	0	1	0	1
WNW	0	0	0	0	1	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	0	0	5	3	8

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Neutral - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	18	18	17	7	0	60
NNE	2	5	7	16	1	0	31
NE	2	6	15	5	3	0	31
ENE	0	3	6	8	1	0	18
E	1	1	5	11	7	2	27
ESE	0	10	2	9	8	13	42
SE	2	7	5	15	20	7	56
SSE	1	4	8	18	16	6	53
S	0	8	9	15	11	24	67
SSW	0	4	12	17	22	16	71
SW	1	3	15	17	14	4	54
WSW	1	5	10	21	21	17	75
W	0	6	35	32	42	18	133
WNW	0	6	30	36	48	23	143
NW	0	5	34	34	14	16	103
NNW	1	7	18	14	11	0	51
Variable	0	0	0	0	0	0	0
Total	11	98	229	285	246	146	1015

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 85  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Slightly Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	3	14	15	5	39
NNE	2	6	3	10	2	0	23
NE	1	4	7	13	2	0	27
ENE	1	0	4	4	2	0	11
E	0	0	2	10	4	0	16
ESE	0	3	4	2	7	2	18
SE	1	2	4	11	3	4	25
SSE	0	3	17	6	8	7	41
S	0	1	7	8	27	28	71
SSW	0	4	8	15	26	63	116
SW	0	5	11	10	22	28	76
WSW	0	3	10	8	16	13	50
W	0	1	6	14	7	21	49
WNW	0	1	4	17	7	55	84
NW	0	2	3	8	6	6	25
NNW	0	0	3	4	3	1	11
Variable	0	0	0	0	0	0	0
Total	5	37	96	154	157	233	682

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 22  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Moderately Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	1	2	4	1	1	10
NNE	1	2	5	2	0	0	10
NE	1	1	2	3	0	0	7
ENE	0	2	1	0	0	0	3
E	0	2	1	0	0	0	3
ESE	0	1	1	18	3	0	23
SE	0	3	1	6	2	0	12
SSE	0	0	7	4	5	6	22
S	1	0	4	7	5	11	28
SSW	0	2	5	13	9	11	40
SW	0	3	8	28	19	8	66
WSW	0	1	4	14	17	16	52
W	0	0	1	12	2	5	20
WNW	0	1	2	10	2	1	16
NW	1	0	4	4	5	0	14
NNW	0	0	2	4	2	0	8
Variable	0	0	0	0	0	0	0
Total	5	19	50	129	72	59	334

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2016  
 Stability Class - Extremely Stable - 375Ft-33Ft Delta-T (F)  
 Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	1	3	0	0	4
SE	0	0	1	3	0	0	4
SSE	0	0	0	2	2	3	7
S	0	0	0	7	0	0	7
SSW	0	0	0	2	1	1	4
SW	0	0	2	6	3	0	11
WSW	0	0	2	0	5	3	10
W	0	0	0	6	2	1	9
WNW	0	0	1	0	0	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	1	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	0	8	29	13	8	58

Hours of calm in this stability class: 0  
 Hours of missing wind measurements in this stability class: 0  
 Hours of missing stability measurements in all stability classes: 2



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## **APPENDIX G**

## **ERRATA DATA**

There is no errata data for 2016.

## **APPENDIX H**

# **ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)**

# **LASALLE COUNTY STATION UNITS 1 and 2**

Annual Radiological  
Groundwater Protection Program Report

1 January through 31 December 2016

**Prepared By**  
Teledyne Brown Engineering  
Environmental Services



LaSalle County Station  
Marseilles, IL 61341

**May 2017**

## Table Of Contents

I. Summary and Conclusions .....	1
II. Introduction .....	2
A. Objectives of the RGPP .....	2
B. Implementation of the Objectives .....	3
C. Program Description.....	3
D. Characteristics of Tritium (H-3) .....	4
III. Program Description .....	5
A. Sample Analysis.....	5
B. Data Interpretation .....	6
C. Background Analysis .....	6
1. Background Concentrations of Tritium .....	7
IV. Results and Discussion .....	9
A. Groundwater Results .....	9
B. Surface Water Results .....	10
C. Drinking Water Well Survey .....	11
D. Summary of Results – Inter-laboratory Comparison Program .....	11
E. Leaks, Spills, and Releases .....	11
F. Trends .....	11
G. Investigations .....	12
H. Actions Taken.....	12

## Appendices

### Appendix A Location Designation

#### Tables

Table A-1 LaSalle County Station Groundwater Monitoring Sample Point List, 2016

#### Figures

Figure A-1 LaSalle County Station Map of Groundwater Monitoring Sampling Locations, 2016

### Appendix B Data Tables

#### Tables

Table B-I.1 Concentrations of Tritium, Strontium, Gross Alpha and Gross Beta in Groundwater Samples Collected in the Vicinity of LaSalle County Station, 2016

Table B-I.2 Concentrations of Gamma Emitters in Groundwater Samples Collected in the Vicinity of LaSalle County Station, 2016

Table B-I.3 Concentrations of Hard-to-Detects in Groundwater Samples Collected as Part of the Radiological Groundwater Protection Program, LaSalle County Station, 2016

Table B-II.1 Concentrations of Tritium in Surface Water Samples Collected in the Vicinity of LaSalle County Station, 2016

Table B-II.2 Concentrations of Gamma Emitters in Surface Water Samples Collected in the Vicinity of LaSalle County Station, 2016

## I. Summary and Conclusions

In 2006, Exelon instituted a comprehensive program to evaluate the impact of station operations on groundwater and surface water in the vicinity of LaSalle County Station. This evaluation involved numerous station personnel and contractor support personnel. Following baseline sampling and subsequent recommendations, LaSalle's Radiological Groundwater Protection Program (RGPP) program now consists of the four surface water and twenty groundwater well sampling locations. The results for LaSalle's RGPP sampling efforts in 2016 are included in this report.

This is the eleventh in a series of annual reports on the status of the RGPP conducted at LaSalle County Station. This report covers groundwater and surface water samples, collected from the environment, both on and off station property in 2016. During that time period, 264 analyses were performed on 94 samples from 24 locations (4 surface water and 20 groundwater monitoring locations). The monitoring was conducted by station personnel.

In assessing all the data gathered for this report, it was concluded that the operation of LaSalle County Station had no adverse radiological impact on the environment, and there are no known active releases into the groundwater at LaSalle County Station.

Strontium-89 and Strontium-90 were not detected in any groundwater samples during 2016.

No gamma-emitting radionuclides attributable to licensed plant operations were detected in any of the groundwater or surface water samples.

In the case of tritium, Exelon specified that its laboratories achieve a lower limit of detection (LLD) 100 times lower than that required by federal regulation.

Tritium was not detected in surface water samples at concentrations greater than the United States Environmental Protection Agency (USEPA) drinking water standard (and the Nuclear Regulatory Commission Reporting Limit) of 20,000 pCi/L. Tritium levels were detected at concentrations greater than the LLD of 200 pCi/L in 3 of 16 surface water samples analyzed. The tritium concentrations ranged from <LLD to  $290 \pm 131$  pCi/L. Tritium levels were detected at concentrations greater than the LLD of 200 pCi/L in 21 of 78 groundwater samples analyzed. The tritium concentrations ranged from <LLD to  $19,800 \pm 2,030$  pCi/L. The elevated tritium levels (>200 pCi/L) being observed in groundwater are associated with the U1 CY tank leak that occurred in the June/July 2010 timeframe, as documented in the Station's 10 CFR 50.75(g) report.



Gross alpha and gross beta analyses in the dissolved and suspended fractions were performed on groundwater samples throughout the year in 2016. Gross alpha (dissolved) was detected in 1 of 16 samples affecting 1 of 12 groundwater locations analyzed. The concentration was  $11.5 \pm 6.9$  pCi/L.

Gross alpha (suspended) was detected in 5 of 16 samples affecting 5 of 12 groundwater locations analyzed. The concentrations ranged from 2.0 to 5.3 pCi/L.

Gross beta (dissolved) was detected in 10 of 16 samples affecting 8 of 12 groundwater locations analyzed. The concentrations ranged from 2.6 to 27.2 pCi/L.

Gross beta (suspended) was detected in 5 of 16 samples affecting 5 of 12 groundwater locations analyzed. The concentrations ranged from 2.1 to 17.7 pCi/L.

Hard-to-detect analyses were performed on 12 of the groundwater sampling locations in accordance with the LaSalle RGPP and to aid in establishing background levels. The analyses included Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-234, U-235, and U-238. The isotopes of U-234 and U-238 were detected in seven and nine samples, respectively, affecting 5 of 12 groundwater locations. The U-234 concentrations ranged from 0.19 to 1.19 pCi/L. The U-238 concentrations ranged from 0.19 to 1.10 pCi/L. U-234 and U-238 are commonly found in groundwater at low concentrations due to the naturally occurring Radium (Uranium) Decay Series.

## II. Introduction

The LaSalle County Station (LSCS), consisting of two boiling water reactors, each rated for 3,546 MWt, owned and operated by Exelon Corporation, is located in LaSalle County, Illinois. Unit 1 went critical on March 16, 1982. Unit 2 went critical on December 2, 1983. The site is located in northern Illinois, approximately 75 miles southwest of Chicago, Illinois.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) on samples collected in 2016.

### A. Objectives of the RGPP

The long-term objectives of the RGPP are as follows:

1. Identify suitable locations to monitor and evaluate potential impacts from station operations before significant radiological impact to the environment and potential drinking water sources.

2. Understand the local hydrogeologic regime in the vicinity of the station and maintain up-to-date knowledge of flow patterns on the surface and shallow subsurface.
3. Perform routine water sampling and radiological analysis of water from selected locations.
4. Report new leaks, spills, or other detections with potential radiological significance to stakeholders in a timely manner.
5. Regularly assess analytical results to identify adverse trends.
6. Take necessary corrective actions to protect groundwater resources.

**B. Implementation of the Objectives**

The objectives identified have been implemented at LaSalle County Station as discussed below:

1. Exelon and its consultant identified locations as described in the 2006 Phase 1 study. Phase 1 studies were conducted by Conestoga Rovers and Associates (CRA) and the results and conclusions were made available to state and federal regulators.
2. The LaSalle County Station reports describe the local hydrogeologic regime. Periodically, the flow patterns on the surface and shallow subsurface are updated based on ongoing measurements.
3. LaSalle County Station will continue to perform routine sampling and radiological analysis of water from selected locations.
4. LaSalle County Station has implemented procedures to identify and report new leaks, spills, or other detections with potential radiological significance in a timely manner.
5. LaSalle County Station staff and consulting hydrogeologist assess analytical results on an ongoing basis to identify adverse trends.

**C. Program Description**

**1. Sample Collection**

Sample locations can be found in Figure A–1, Appendix A.

## Groundwater and Surface Water

Samples of water are collected, managed, transported and analyzed in accordance with approved procedures following EPA methods. Both groundwater and surface samples water are collected. Sample locations, sample collection frequencies and analytical frequencies are controlled in accordance with approved station procedures. Contractor and/or station personnel are trained in the collection, preservation management, and shipment of samples, as well as in documentation of sampling events. Analytical laboratories are subject to internal quality assurance programs, industry cross-check programs, as well as nuclear industry audits. Station personnel review and evaluate all analytical data deliverables as data are received.

Analytical data results are reviewed by both station personnel and an independent hydrogeologist for adverse trends or changes to hydrogeologic conditions.

### D. Characteristics of Tritium (H-3)

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most common form of tritium is tritium oxide, which is also called "tritiated water." The chemical properties of tritium are essentially those of ordinary hydrogen.

Tritiated water behaves the same as ordinary water in both the environment and the body. Tritium can be taken into the body by drinking water, breathing air, eating food, or absorption through skin. Once tritium enters the body, it disperses quickly and is uniformly distributed throughout the body. Tritium is excreted primarily through urine with a clearance rate characterized by an effective biological half-life of about 14 days. Within one month or so after ingestion, essentially all tritium is cleared. Organically bound tritium (tritium that is incorporated in organic compounds) can remain in the body for a longer period.

Tritium is produced naturally in the upper atmosphere when cosmic rays strike air molecules. Tritium is also produced during nuclear weapons explosions, as a by-product in reactors producing electricity, and in special production reactors, where the isotopes lithium-7 and/or boron-10 are activated to produce tritium. Like normal water, tritiated water is colorless and odorless. Tritiated water behaves chemically and physically like non-tritiated water in the subsurface, and therefore tritiated water will travel at the same velocity as the average groundwater velocity.

Tritium has a half-life of approximately 12.3 years. It decays spontaneously to helium-3 ( $^3\text{He}$ ). This radioactive decay releases a beta particle (low-energy electron). The radioactive decay of tritium is the source of the health risk from exposure to tritium. Tritium is one of the least dangerous radionuclides because it emits very weak radiation and leaves the body relatively quickly. Since tritium is almost always found as water, it goes directly into soft tissues and organs. The associated dose to these tissues is generally uniform and is dependent on the water content of the specific tissue.

### III. Program Description

#### A. Sample Analysis

This section describes the general analytical methodologies used by TBE to analyze the environmental samples for radioactivity for the LaSalle County Station RGPP in 2016. Sample and analysis and frequency is based upon well location, assessed risk and site hydrogeology as described in the RGPP.

In order to achieve the stated objectives, the current program includes the following analyses:

1. Concentrations of gamma emitters in groundwater and surface water
2. Concentrations of strontium in groundwater
3. Concentrations of tritium in groundwater and surface water
4. Concentrations of Gross Alpha, Dissolved and Suspended and Gross Beta, Dissolved and Suspended in groundwater
5. Concentrations of Am-241 in groundwater
6. Concentrations of Cm-242 and Cm-243/244 in groundwater
7. Concentrations of Pu-238 and PU-239/240 in groundwater
8. Concentrations of U-234, U-235 and U-238 in groundwater
9. Concentrations of Fe-55 in groundwater
10. Concentrations of Ni-63 in groundwater

## B. Data Interpretation

The radiological data collected prior to LaSalle County Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, LaSalle County Station was considered operational at initial criticality. Several factors were important in the interpretation of the data:

### 1. Lower Limit of Detection and Minimum Detectable Concentration

The lower limit of detection (LLD) is specified by federal regulation as a minimum sensitivity value that must be achieved routinely by the analytical parameter.

### 2. Laboratory Measurements Uncertainty

The estimated uncertainty in measurement of tritium in environmental samples is frequently on the order of 50% of the measurement value.

Statistically, the exact value of a measurement is expressed as a range with a stated level of confidence. The convention is to report results with a 95% level of confidence. The uncertainty comes from calibration standards, sample volume or weight measurements, sampling uncertainty and other factors. Exelon reports the uncertainty of a measurement created by statistical process (counting error) as well as all sources of error (Total Propagated Uncertainty or TPU). Each result has two values calculated. Exelon reports the TPU by following the result with plus or minus  $\pm$  the estimated sample standard deviation, as TPU, that is obtained by propagating all sources of analytical uncertainty in measurements.

Analytical uncertainties are reported at the 95% confidence level in this report for reporting consistency with the AREOR.

## C. Background Analysis

A pre-operational radiological environmental monitoring program (pre-operational REMP) was conducted to establish background radioactivity levels prior to operation of the Station. The environmental media sampled and analyzed during the pre-operational REMP were atmospheric radiation, fall-out, domestic water, surface water, precipitation, marine life, and foodstuffs. The results of the monitoring were detailed in the report entitled, Environmental Radiological Monitoring for LaSalle County Nuclear Power Station, Commonwealth Edison Company, Annual Reports

for the years 1979 and 1981. The pre-operational REMP contained analytical results from samples collected from the surface water and groundwater.

## 1. Background Concentrations of Tritium

The purpose of the following discussion is to summarize background measurements of tritium in various media performed by others. Additional detail may be found by consulting references (CRA 2006).

### a. Tritium Production

Tritium is created in the environment from naturally occurring processes both cosmic and subterranean, as well as from anthropogenic (i.e., man-made) sources. In the upper atmosphere, "Cosmogenic" tritium is produced from the bombardment of stable nuclides and combines with oxygen to form tritiated water, which will then enter the hydrologic cycle. Below ground, "lithogenic" tritium is produced by the bombardment of natural lithium present in crystalline rocks by neutrons produced by the radioactive decay of naturally abundant uranium and thorium. Lithogenic production of tritium is usually negligible compared to other sources due to the limited abundance of lithium in rock. The lithogenic tritium is introduced directly to groundwater.

A major anthropogenic source of tritium and strontium-90 comes from the former atmospheric testing of thermonuclear weapons. Levels of tritium in precipitation increased significantly during the 1950s and early 1960s, and later with additional testing, resulting in the release of significant amounts of tritium to the atmosphere. The Canadian heavy water nuclear power reactors, other commercial power reactors, nuclear research and weapons production continue to influence tritium concentrations in the environment.

### b. Precipitation Data

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provide tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected world wide from 1960 to 2006.

RadNet provides tritium precipitation concentration data for samples collected at stations throughout the U.S. from 1960 up to and including 2006. Based on GNIP data for sample stations located in the U.S. Midwest, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of thermonuclear weapons. Tritium concentrations in surface water showed a sharp decline up until 1975 followed by a gradual decline since that time. Tritium concentrations in Midwest precipitation have typically been below 100 pCi/L since around 1980. LaSalle's 1979 or 1981 pre-operational REMP showed precipitation tritium concentrations >300 pCi/L. Tritium concentrations in wells may still be above the 200 pCi/L detection limit from the external causes described above. Water from previous years and decades is naturally captured in groundwater, so some well water sources today are affected by the surface water from the 1960s that was elevated in tritium.

c. Surface Water Data

Tritium concentrations are routinely measured in large surface water bodies, including Lake Michigan and the Mississippi River. Illinois surface water data were typically less than 100 pCi/L. Illinois River H-3 results have shown >200 pCi/L, as evidenced in LaSalle's REMP program sample results. This is attributable to releases from Braidwood and Dresden upstream.

The USEPA RadNet surface water data typically has a reported 'Combined Standard Uncertainty' of 35 to 50 pCi/L. According to USEPA, this corresponds to a  $\pm 70$  to 100 pCi/L 95% confidence bound on each given measurement. Therefore, the typical background data provided may be subject to measurement uncertainty of approximately  $\pm 70$  to 100 pCi/L.

The radio-analytical laboratory is counting tritium results to an Exelon specified LLD of 200 pCi/L. Typically, the lowest positive measurement will be reported within a range of 40 – 240 pCi/L or  $140 \pm 100$  pCi/L. Clearly, these sample results cannot be distinguished as different from background at this concentration.



## IV. Results and Discussion

### A. Groundwater Results

#### Groundwater

Samples were collected from onsite wells throughout the year in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below.

#### Tritium

Samples from 20 locations were analyzed for tritium activity. Tritium values ranged from <LLD to 19,800 pCi/L. The highest tritium activity was found at well TW-LS-118S. Based on the hydrogeological study conducted at LaSalle, there is no feasible pathway into a drinking water supply. Based on established aquifer flow paths the location most representative of potential offsite release into groundwater was also less than the detection limit (Table B-I.1, Appendix B).

#### Strontium

A total of 18 samples from 12 groundwater locations were analyzed for Sr-89 and Sr-90. The results were less than the required detection limit of 10 pCi/L for Sr-89 and less than the required detection limit of 1.0 pCi/liter for Sr-90 (Table B-I.1, Appendix B).

#### Gross Alpha and Gross Beta (dissolved and suspended)

Gross alpha and gross beta analyses in the dissolved and suspended fractions were performed on groundwater samples throughout the year in 2016. Gross alpha (dissolved) was detected in 1 of 16 samples affecting 1 of 12 groundwater locations. The concentration was  $11.5 \pm 6.9$  pCi/L. Gross alpha (suspended) was detected in 5 of 16 samples affecting 5 of 12 groundwater locations analyzed. The concentrations ranged from 2.0 to 5.3 pCi/L. Gross beta (dissolved) was detected in 10 of 16 samples affecting 8 of 12 groundwater locations analyzed. The concentrations ranged from 2.6 to 27.2 pCi/L. Gross beta (suspended) was detected in 5 of 16 samples affecting 5 of 12 groundwater locations analyzed. The concentrations ranged from 2.1 to 17.7 pCi/L. These concentrations of gross alpha and gross beta, which are slightly above detectable levels, are considered to be background and are not the result of plant effluents (Table B-I.1, Appendix B).



### Gamma Emitters

No gamma emitting nuclides were detected in any of the samples analyzed (Table B-1.2, Appendix B).

### Hard-To-Detect

Hard-to-detect analyses were performed on 12 of the groundwater sampling locations in accordance with the LaSalle RGPP and to aid in establishing background levels. The analyses included Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-234, U-235, and U-238. U-234 was detected in 7 of 11 samples, affecting 4 of 12 groundwater locations. The concentrations ranged from 0.19 to 1.19 pCi/L. U-238 was detected 9 of 11 samples, affecting 5 of 12 groundwater locations. The concentration ranged from 0.19 to 1.10 pCi/L. U-234 and U-238 are commonly found in groundwater at low concentrations due to the naturally occurring Radium (Uranium) Decay Series. The concentrations of U-234 and U-238 discussed above are considered to be background and are not the result of plant effluents (Table B-1.3, Appendix B).

All other hard-to-detect nuclides were not detected at concentrations greater than their respective minimum detectable concentrations.

## B. Surface Water Results

### Surface Water

Samples were collected from on and off-site surface water locations throughout the year in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below.

### Tritium

Samples from 4 locations were analyzed for tritium activity. Three (3) of 16 samples from 2 surface water locations indicated activity above the minimum detectable concentration (MDC). The concentrations ranged from 187 to 290 pCi/L. Based on the hydrogeological study conducted at LaSalle, there is no feasible pathway into a drinking water supply. Based on established aquifer flow paths, the location most representative of potential offsite release into groundwater was also less than the detection limit. (Table B-II.1, Appendix B).

### Strontium

Sr-89 and Sr-90 analyses were not performed on surface water samples in 2016.

### Gross Alpha and Gross Beta (dissolved and suspended)

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were not performed on surface water samples in 2016.

### Gamma Emitters

Naturally occurring Potassium-40 (K-40) was detected in one of four samples affecting 1 of 4 stations. The concentration was  $112 \pm 73$  pCi/L. All other gamma-emitting nuclides were not detected at concentrations greater than their respective minimum detectable concentrations. (Table B-II.2, Appendix B).

#### C. Drinking Water Well Survey

A drinking water well survey was conducted during the summer 2006 by CRA (CRA 2006) around the LaSalle County Station. This survey concluded that no residents in the vicinity of the plant utilize the shallow water aquifer as a drinking water supply. Site hydrological studies of aquifer flow and permeation rates from the shallow aquifer to the deep aquifer concluded that there is no feasible dose receptor via a ground water pathway at LaSalle.

#### D. Summary of Results – Inter-Laboratory Comparison Program

Inter-Laboratory Comparison Program results for TBE and Environmental Inc. (Midwest Labs) are presented in the AREOR.

#### E. Leaks, Spills, and Releases

There were no new leaks identified at LaSalle Station during the reporting period.

#### F. Trends

Analysis results from samples continue to be trended in order to assess impact to groundwater at LaSalle Station. There were no new leaks identified in the reporting period. Sample data from the plume arising from the historic 2010 U1 CY tank leak is being trended per the LaSalle RGPP. The plume had been dispersing with groundwater flow, and

extraction wells have been installed to provide additional control of the plume migration (see Section H.3. below). Currently, no tritium has migrated offsite, and tritium migration offsite is not expected.

G. Investigations

No new investigations were carried out during the reporting period.

H. Actions Taken

1. Compensatory Actions

No compensatory actions were taken during the reporting period.

2. Installation of Monitoring Wells

No new monitoring wells have been installed during the reporting period.

3. Actions to Recover/Reverse Plumes

Two (2) extraction wells (RW-LS-100S and RW-LS-101S) were installed to control the migration of the tritium plume near U1 CY tank. RW-LS-100S became operational in October 2012. RW-LS-101S became operational in April 2014.

## **APPENDIX A**

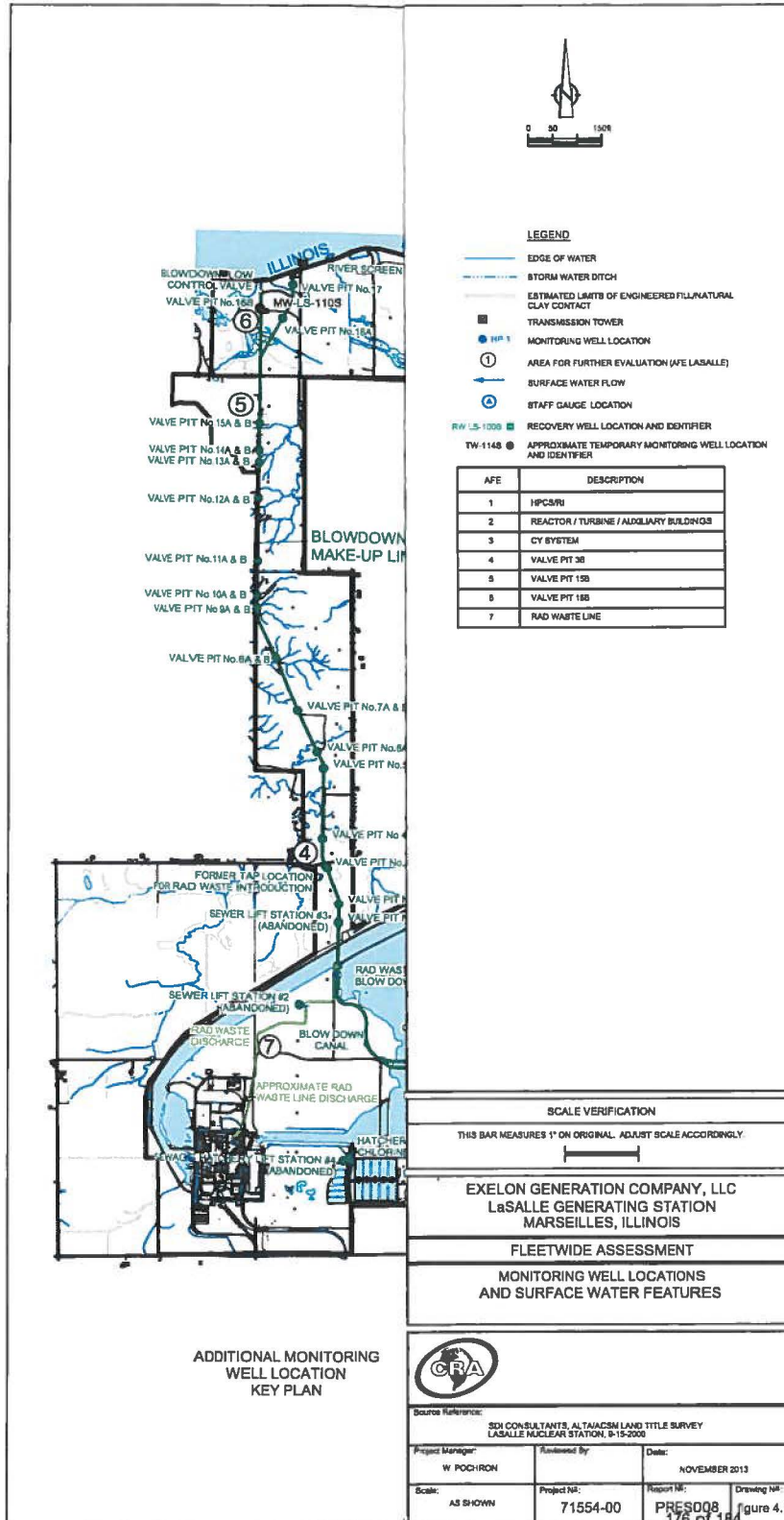
### **LOCATION DESIGNATION**

**TABLE A-1****LaSalle County Station Groundwater Monitoring Sample Point List, 2016**

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<b>Site</b>	<b>Site Type</b>
SW-LS-101	Surface Water
SW-LS-102	Surface Water
SW-LS-103	Surface Water
SW-LS-104	Surface Water
SW-LS-105	Surface Water
SW-LS-106	Surface Water
MW-LS-101S	Monitoring Well
MW-LS-102S	Monitoring Well
MW-LS-103S	Monitoring Well
MW-LS-104S	Monitoring Well
MW-LS-105S	Monitoring Well
MW-LS-106S	Monitoring Well
MW-LS-107S	Monitoring Well
MW-LS-108S	Monitoring Well
MW-LS-109S	Monitoring Well
MW-LS-110S	Monitoring Well
MW-LS-111S	Monitoring Well
MW-LS-112S	Monitoring Well
MW-LS-113S	Monitoring Well
HP-2	Monitoring Well
HP-5	Monitoring Well
HP-7	Monitoring Well
HP-10	Monitoring Well
RW-LS-100S	Extraction Well
RW-LS-101S	Extraction Well
TW-LS-114S	Monitoring Well
TW-LS-115S	Monitoring Well
TW-LS-116S	Monitoring Well
TW-LS-117S	Monitoring Well
TW-LS-118S	Monitoring Well
TW-LS-119S	Monitoring Well
TW-LS-120S	Monitoring Well
TW-LS-121S	Monitoring Well

A-2



175 of 183

ADDITIONAL MONITORING WELL LOCATION KEY PLAN

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## **APPENDIX B**

### **DATA TABLES**



**TABLE B-I.1 CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA, AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2016 RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA**

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
HP-2	03/06/16		< 194						
HP-2	06/21/16		< 189	< 2.2	< 0.3	< 1.0	< 0.5	5.7 ± 1.0	< 1.5
HP-2	09/14/16		< 180						
HP-2	11/07/16		< 198						
HP-5	03/06/16		< 177						
HP-5	06/16/16		< 188	< 3.7	< 0.5	< 1.7	< 0.5	3.6 ± 1.0	< 1.5
HP-5	09/14/16		< 186						
HP-5	11/07/16		< 199						
HP-7	03/18/16		< 197						
HP-7	06/17/16		< 191	< 2.9	< 0.6	< 1.6	4.0 ± 1.4	7.4 ± 1.1	6.3 ± 1.6
HP-7	09/14/16		< 186						
HP-7	11/07/16		< 195						
HP-10	03/06/16		< 175						
HP-10	06/16/16	Original	< 190	< 4.9	< 0.8	< 3.3	5.3 ± 0.9	< 2.7	2.1 ± 0.9
HP-10	06/16/16	Recount					5.1 ± 1.5		4.3 ± 1.3
HP-10	09/14/16		< 186						
HP-10	11/07/16		< 195						
MW-LS-104S	03/05/16		14800 ± 1530						
MW-LS-104S	06/16/16		11900 ± 1240	< 2.6	< 0.4	< 0.9	< 0.5	< 1.7	< 1.5
MW-LS-104S	09/09/16		3040 ± 360	< 5.3	< 0.6	< 1.4	< 0.5	< 1.3	< 1.5
MW-LS-104S	11/04/16		3080 ± 366	< 6.0	< 0.7	< 1.7	< 0.5	< 1.8	< 1.5
MW-LS-105S	03/06/16		< 176						
MW-LS-105S	06/16/16		< 189	< 4.3	< 0.8	< 1.4	4.8 ± 1.8	2.6 ± 0.8	14.4 ± 2.2
MW-LS-105S	09/14/16		< 182						
MW-LS-105S	11/04/16		< 188						
MW-LS-106S	03/06/16		< 175						
MW-LS-106S	06/17/16		< 189						
MW-LS-107S	03/06/16		< 176						
MW-LS-107S	06/16/16		< 188	< 2.8	< 0.4	< 9.3	2.6 ± 1.5	8.6 ± 5.5	17.7 ± 2.1
MW-LS-107S	09/14/16		< 181						
MW-LS-107S	11/04/16		< 188						
MW-LS-111S	03/06/16		< 179						
MW-LS-111S	06/17/16		< 189	< 2.7	< 0.5	11.5 ± 6.9	2.0 ± 0.8	27.2 ± 4.6	9.8 ± 1.6
MW-LS-111S	09/16/16		< 184						
MW-LS-111S	11/07/16		< 176						
OIL SEPARATOR	03/05/16		< 198						
OIL SEPARATOR	06/17/16		< 188						
OIL SEPARATOR	09/13/16		238 ± 120						
OIL SEPARATOR	11/04/16		< 191						
RW-LS-100S	03/06/16		10500 ± 1100						
RW-LS-100S	06/16/16	Original	5780 ± 634	< 5.2	< 0.9				
RW-LS-100S	06/16/16	Recount	5670 ± 621						
RW-LS-100S	06/16/16	Reanalysis	5660 ± 624						
RW-LS-100S	09/09/16		4730 ± 527	< 6.0	< 0.5	< 1.2	< 0.5	5.1 ± 1.2	< 1.5
RW-LS-100S	11/04/16		5530 ± 608	< 6.0	< 0.6	< 1.9	< 0.5	7.4 ± 1.4	< 1.5
RW-LS-101S	03/06/16		6960 ± 756						
RW-LS-101S	06/16/16		8490 ± 901	< 3.4	< 0.9				
RW-LS-101S	09/09/16		6870 ± 740	< 4.8	< 0.5	< 1.3	< 0.5	4.8 ± 0.9	< 1.5
RW-LS-101S	11/04/16		6140 ± 668	< 5.4	< 0.6	< 1.4	< 0.5	6.1 ± 1.1	< 1.5
TW-LS-114S	03/06/16		< 177						
TW-LS-114S	06/16/16		< 190						
TW-LS-114S	09/12/16		< 185						
TW-LS-114S	11/07/16		< 195						
TW-LS-115S	03/06/16		< 171						
TW-LS-115S	06/16/16		< 189						

**TABLE B-I.1 CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA, AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2016**  
RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
TW-LS-115S	09/12/16	< 181						
TW-LS-115S	11/04/16	< 198						
TW-LS-116S	03/05/16	9230 ± 985						
TW-LS-116S	06/16/16	10000 ± 1060						
TW-LS-116S	09/09/16	7490 ± 800						
TW-LS-116S	11/04/16	8780 ± 927	< 6.2	< 0.6	< 1.6	< 0.5	< 1.7	< 1.5
TW-LS-117S	03/06/16	< 174						
TW-LS-117S	06/17/16	< 191						
TW-LS-117S	09/14/16	< 178						
TW-LS-117S	11/04/16	< 197						
TW-LS-118S	03/05/16	19800 ± 2030						
TW-LS-118S	06/16/16	Original 6170 ± 673						
TW-LS-118S	06/16/16	Recount 6120 ± 668						
TW-LS-118S	06/16/16	Reanalysis 5620 ± 619						
TW-LS-118S	09/12/16	11900 ± 1240						
TW-LS-118S	11/04/16	6100 ± 666	< 5.6	< 0.7	< 1.3	< 0.5	< 1.5	< 1.5
TW-LS-119S	03/14/16	< 178						
TW-LS-119S	06/16/16	< 188						
TW-LS-119S	09/12/16	< 184						
TW-LS-119S	11/04/16	< 195						
TW-LS-120S	03/05/16	< 174						
TW-LS-120S	06/16/16	< 188						
TW-LS-120S	09/12/16	< 181						
TW-LS-120S	11/04/16	< 194						
TW-LS-121S	03/05/16	< 176						
TW-LS-121S	06/16/16	< 187						
TW-LS-121S	09/12/16	< 181						
TW-LS-121S	11/04/16	< 191						

TABLE B-I.2

CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER  
 SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
	DATE														
HP-2	06/21/16	< 36	< 93	< 4	< 4	< 7	< 4	< 8	< 3	< 6	< 9	< 4	< 3	< 25	< 7
HP-5	06/16/16	< 42	< 41	< 6	< 4	< 14	< 5	< 8	< 5	< 8	< 14	< 5	< 5	< 36	< 9
HP-7	06/17/16	< 38	< 40	< 4	< 4	< 10	< 4	< 10	< 5	< 9	< 13	< 4	< 5	< 29	< 9
HP-10	06/16/16	< 40	< 42	< 4	< 5	< 9	< 4	< 8	< 5	< 9	< 14	< 5	< 4	< 29	< 10
MW-LS-104S	06/16/16	< 17	< 15	< 2	< 2	< 4	< 2	< 3	< 2	< 4	< 15	< 1	< 2	< 23	< 7
MW-LS-104S	09/09/16	< 21	< 19	< 2	< 2	< 5	< 2	< 4	< 3	< 4	< 11	< 2	< 2	< 19	< 6
MW-LS-104S	11/04/16	< 36	< 39	< 4	< 4	< 10	< 4	< 9	< 5	< 8	< 15	< 4	< 4	< 29	< 8
MW-LS-105S	06/16/16	< 40	< 93	< 5	< 5	< 10	< 5	< 10	< 5	< 8	< 14	< 5	< 4	< 34	< 11
MW-LS-106S	06/17/16	< 44	< 107	< 5	< 6	< 15	< 5	< 13	< 6	< 12	< 15	< 5	< 5	< 40	< 13
MW-LS-107S	06/16/16	< 38	< 46	< 3	< 5	< 9	< 4	< 10	< 5	< 7	< 14	< 4	< 4	< 28	< 9
MW-LS-111S	06/17/16	< 39	< 45	< 4	< 4	< 9	< 4	< 9	< 5	< 6	< 13	< 4	< 4	< 26	< 8
RW-LS-100S	06/16/16	< 17	< 14	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 15	< 1	< 2	< 22	< 7
RW-LS-100S	09/09/16	< 16	< 15	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 9	< 2	< 2	< 16	< 5
RW-LS-100S	11/04/16	< 41	< 96	< 4	< 5	< 12	< 5	< 9	< 6	< 8	< 15	< 4	< 5	< 35	< 12
RW-LS-101S	06/16/16	< 17	< 34	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 14	< 1	< 2	< 21	< 6
RW-LS-101S	09/09/16	< 18	< 16	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 9	< 2	< 2	< 17	< 6
RW-LS-101S	11/04/16	< 43	< 49	< 4	< 5	< 11	< 4	< 10	< 5	< 8	< 14	< 4	< 4	< 34	< 10
TW-LS-116S	11/04/16	< 25	< 19	< 3	< 3	< 6	< 2	< 5	< 3	< 5	< 11	< 2	< 3	< 21	< 6
TW-LS-118S	11/04/16	< 30	< 34	< 3	< 3	< 7	< 3	< 6	< 4	< 6	< 13	< 3	< 3	< 25	< 8

TABLE B-I.3

**CONCENTRATIONS OF HARD-TO-DETECTS IN GROUNDWATER SAMPLES COLLECTED AS PART OF  
THE GROUNDWATER PROTECTION PROGRAM, LASALLE COUNTY STATION, 2016  
RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA**

SITE	COLLECTION	Am-241	Cm-242	Cm-243/244	Pu-238	Pu-239/240	U-234	U-235	U-238	Fe-55	Ni-63
	DATE										
HP-2	06/21/16									< 136	< 4
HP-5	06/16/16									< 132	< 4
HP-7	06/17/16									< 139	< 4
HP-10	06/16/16									< 139	< 4
MW-LS-104S	06/16/16	< 0.12	< 0.04	< 0.09	< 0.13	< 0.09	1.03 ± 0.26	< 0.05	0.72 ± 0.22	< 180	< 4
MW-LS-104S	09/09/16	< 0.08	< 0.15	< 0.08	< 0.16	< 0.08	0.70 ± 0.21	< 0.05	0.46 ± 0.17	< 168	< 3
MW-LS-104S	11/04/16	< 0.02	< 0.04	< 0.06	< 0.11	< 0.15	0.59 ± 0.19	< 0.06	0.57 ± 0.18	< 110	< 4
MW-LS-105S	06/16/16									< 173	< 5
MW-LS-107S	06/16/16									< 174	< 4
MW-LS-111S	06/17/16									< 193	< 3
RW-LS-100S	06/16/16	< 0.09	< 0.04	< 0.07	< 0.08	< 0.18	< 0.14	< 0.05	0.19 ± 0.11	< 126	< 4
RW-LS-100S	09/09/16	< 0.08	< 0.03	< 0.05	< 0.05	< 0.07	< 0.04	< 0.11	< 0.04	< 163	< 4
RW-LS-100S	11/04/16	< 0.15	< 0.09	< 0.10	< 0.14	< 0.17	< 0.07	< 0.09	< 0.06	< 178	< 4
RW-LS-101S	06/16/16	< 0.13	< 0.07	< 0.14	< 0.14	< 0.14	0.30 ± 0.14	< 0.07	0.35 ± 0.16	< 178	< 4
RW-LS-101S	09/09/16	< 0.19	< 0.09	< 0.11	< 0.05	< 0.11	< 0.11	< 0.11	0.25 ± 0.13	< 183	< 4
RW-LS-101S	11/04/16	< 0.13	< 0.08	< 0.02	< 0.18	< 0.11	0.19 ± 0.12	< 0.06	0.22 ± 0.12	< 187	< 4
TW-LS-116S	11/04/16	< 0.05	< 0.13	< 0.17	< 0.10	< 0.19	1.19 ± 0.27	< 0.05	1.10 ± 0.26	< 171	< 4
TW-LS-118S	11/04/16	< 0.11	< 0.05	< 0.06	< 0.06	< 0.13	0.66 ± 0.20	< 0.02	0.41 ± 0.16	< 140	< 4

B-4

**TABLE B-II.1    CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES  
 COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2016  
 RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA**

SITE	COLLECTION		H-3
	DATE		
SW-LS-101	03/06/16		< 176
SW-LS-101	06/16/16		< 191
SW-LS-101	09/09/16		< 186
SW-LS-101	11/07/16		< 192
SW-LS-102	03/06/16		< 194
SW-LS-102	06/16/16		< 194
SW-LS-102	09/09/16		< 179
SW-LS-102	11/07/16		< 191
SW-LS-103	03/06/16		< 174
SW-LS-103	06/22/16		< 188
SW-LS-103	09/09/16		187 ± 120
SW-LS-103	11/07/16		221 ± 130
SW-LS-106	03/07/16		< 175
SW-LS-106	06/17/16		< 192
SW-LS-106	09/14/16		< 182
SW-LS-106	11/04/16		290 ± 131

TABLE B-II.2

**CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES  
COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2016  
RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA**

SITE	COLLECTION	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
	DATE														
SW-LS-101	06/16/16	< 47	< 46	< 5	< 5	< 13	< 5	< 10	< 7	< 11	< 15	< 5	< 5	< 34	< 11
SW-LS-102	06/16/16	< 44	< 39	< 4	< 4	< 9	< 4	< 7	< 5	< 8	< 14	< 4	< 4	< 29	< 11
SW-LS-103	06/22/16	< 50	112 ± 73	< 5	< 6	< 10	< 6	< 8	< 6	< 9	< 13	< 5	< 6	< 27	< 11
SW-LS-106	06/17/16	< 48	< 93	< 5	< 6	< 12	< 4	< 11	< 7	< 11	< 14	< 6	< 4	< 38	< 11