Constellation

Clinton Power Station
8401 Power Road
Clinton, IL 61727

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Clinton Power Station, Unit 1
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Subject: Clinton Power Station 2023 Annual Radioactive Effluent Release Report

Clinton Power Station is submitting the 2023 Annual Radioactive Effluent Release Report. This report is submitted in accordance with Technical Specification requirement 5.6.3, "Radioactive Effluent Release Report," and covers the period from January 1, 2023, through December 31, 2023.

There are no regulatory commitments contained in this report.

Questions on this letter may be directed to Mr. Mohamad Fakhreddine, Chemistry Manager, at 217-937-3200.

Respectfully,

Andrew Krukowski
Plant Manager
Clinton Power Station

Attachment: Radioactive Effluent Release Report

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Clinton Power Station
Office of Nuclear Facility Safety – Illinois Emergency Management Agency

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NRR

Constellation℠

January 01, 2023 – December 31, 2023

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

CLINTON POWER STATION – DOCKET NUMBER 50-461

Prepared by:

Rachel Johnston

Clinton Clean Energy Center

TABLE OF CONTENTS

LIST OF TABLES

19	Nearest Residence	107
20	Nearest Broadleaf Garden	108
21	Nearest Milking Animal	109

LIST OF FIGURES

SECTION 1

EXECUTIVE SUMMARY

The Annual Radioactive Effluent Release Report (ARERR) is a detailed description of gaseous and liquid radioactive effluents released from Clinton Power Station (CPS) and the resulting radiation doses for the period of January 01, 2023 through December 31, 2023. During first quarter of 2023, Exelon split to form Constellation. Clinton Power Station also underwent a name change to Clinton Clean Energy Center, but will be referred to as Clinton power station and CPS for the entirety of this document. This report also includes a detailed meteorological section providing weather history of the surrounding area during this period. The information in the ARERR is used to calculate the offsite dose to our public.

The report also includes a summary of the amounts of radioactive material contained in solid waste that is packaged and shipped to a federally approved disposal/burial facility offsite. Additionally, this report notifies the U.S. Nuclear Regulatory Commission (NRC) staff of changes to CPS's Offsite Dose Calculation Manual (ODCM), as well as exceptions to the CPS effluent monitoring program and a summary of events that must be reported in accordance with ODCM Section 6.2.

The NRC requires that nuclear power facilities be designed, constructed and operated in such a manner as to maintain radioactive effluent releases to unrestricted areas As Low As Reasonably Achievable (ALARA). To ensure compliance with this criterion, the NRC has established limitations governing the release of radioactivity in effluents.

During 2023, effluent releases from CPS operations were well within these federally required limits. The maximum annual radiation dose delivered to the inhabitants of the area surrounding CPS, due to radioactivity released from the station, was 2.42E-01 mRem (millirem). The radiation dose to the public in the vicinity of CPS was calculated by using the concentration of radioactive nuclides from each gaseous effluent release coupled with historical weather conditions. The dose from CPS gaseous radioactive effluents is only a small fraction of the limit (1.61E+00%) for the maximum exposed member of the public. Integrated Leak Rate Testing (ILRT) of the Drywell and Containment was performed during C1R21. In this evolution, containment and drywell were depressurized through two pathways: penetration in the steam tunnel (which releases to HVAC stack) and pipe outside the Service Building (not an ODCM release pathway). Sampling and analysis were performed on both release paths during depressurization and no activity was detected. More detail is provided under Section 4. There were no liquid effluent releases in 2023. As such, there was no dose received by the public from the liquid radioactive effluent pathway.

SECTION 2

INTRODUCTION

CPS is located in Harp Township, DeWitt County approximately six miles east of the city of Clinton in east-central Illinois. CPS is a ~1,120 megawatt gross electrical power output boiling water reactor. Initial fuel load commenced in September of 1986 with initial criticality of the reactor occurring on February 27, 1987. Commercial operation commenced in April 1987 and the reactor reached 100% power for the first time on September 15, 1987.

CPS releases airborne effluents via two gaseous effluent release points to the environment. They are the Common Station Heating, Ventilating, and Air Conditioning (HVAC) Vent Stack and the Standby Gas Treatment System (SGTS) Vent as shown in *Figure 1*. As specified in the ODCM, the surveillance program consists of continuous monitoring of each gaseous effluent release point and periodic sampling and analysis.

CPS is licensed to release radioactive liquid effluents in a batch mode, however there were no radioactive liquid releases in 2023 at CPS. Each release would have been sampled and analyzed prior to release if this were to occur. Depending upon the amount of activity in a release, liquid effluents would vary from 10 to 300 gallons per minute (GPM). This flow rate is added to the combined flows from both Plant Service Water and Circulating Water streams which range from approximately 5,000 to 567,000 gpm. The combined flow stream enters the seal well, just prior to the 3.4-mile discharge flume which releases into Lake Clinton, as depicted in *Figure 2*.

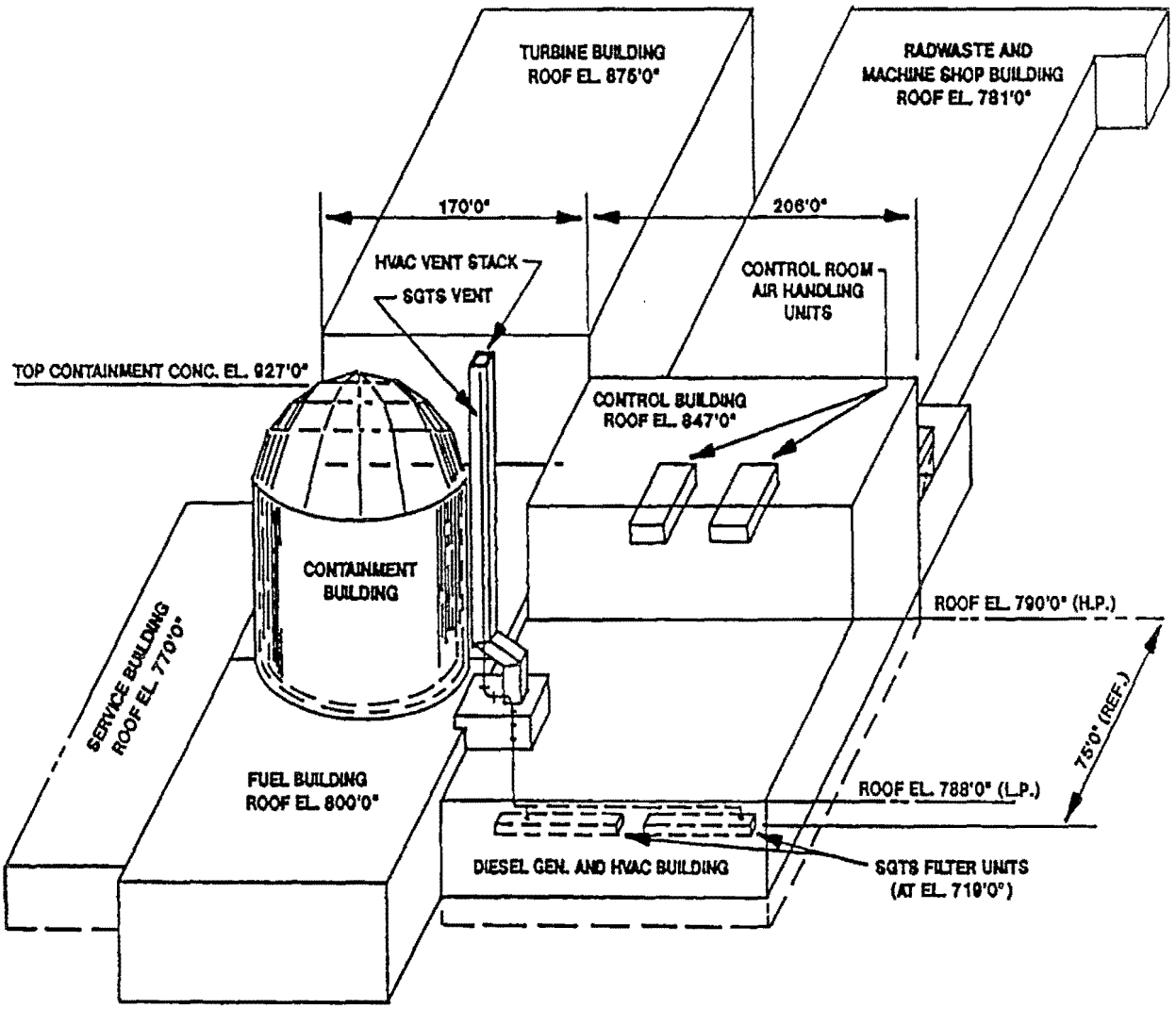
Processing and Monitoring

CPS controls effluents to ensure radioactivity released to the environment is maintained ALARA and does not exceed federal release limit criteria. Effluent controls include the operation of radiation monitoring systems within the plant as well as an offsite environmental analysis program. In-plant radiation monitoring systems are used to provide a continuous indication of radioactivity in effluent streams. Some are also used to collect particulate and radioiodine samples. Radioactive effluent related samples are analyzed in a controlled laboratory environment to identify the specific concentration of those radionuclides being released. Sampling and analysis provides a more sensitive and precise method of determining effluent composition to complement the information provided by real-time radiation monitoring instruments.

Beyond the plant itself, a Radiological Environmental Monitoring Program (REMP) is maintained in accordance with Federal Regulations. The purpose of the REMP program is to assess the radiological impact on the environment due to the operation of CPS. Implicit in this charter is the license requirement to trend and assess radiation exposure rates and radioactivity concentrations that may contribute to dose to the public. The program consists of two phases; pre-operational and operational. During the pre-operational phase of the program, the baseline for the local radiation environment was established. The operational phase of the program includes the objective of making confirmatory measurements to verify that the in-plant controls for the release of radioactive material are functioning as designed. Assessment of the operational impact of CPS on the environment is based on data collected since initial criticality of the reactor.

FIGURE 1

CPS AIRBORNE EFFLUENT RELEASE POINTS

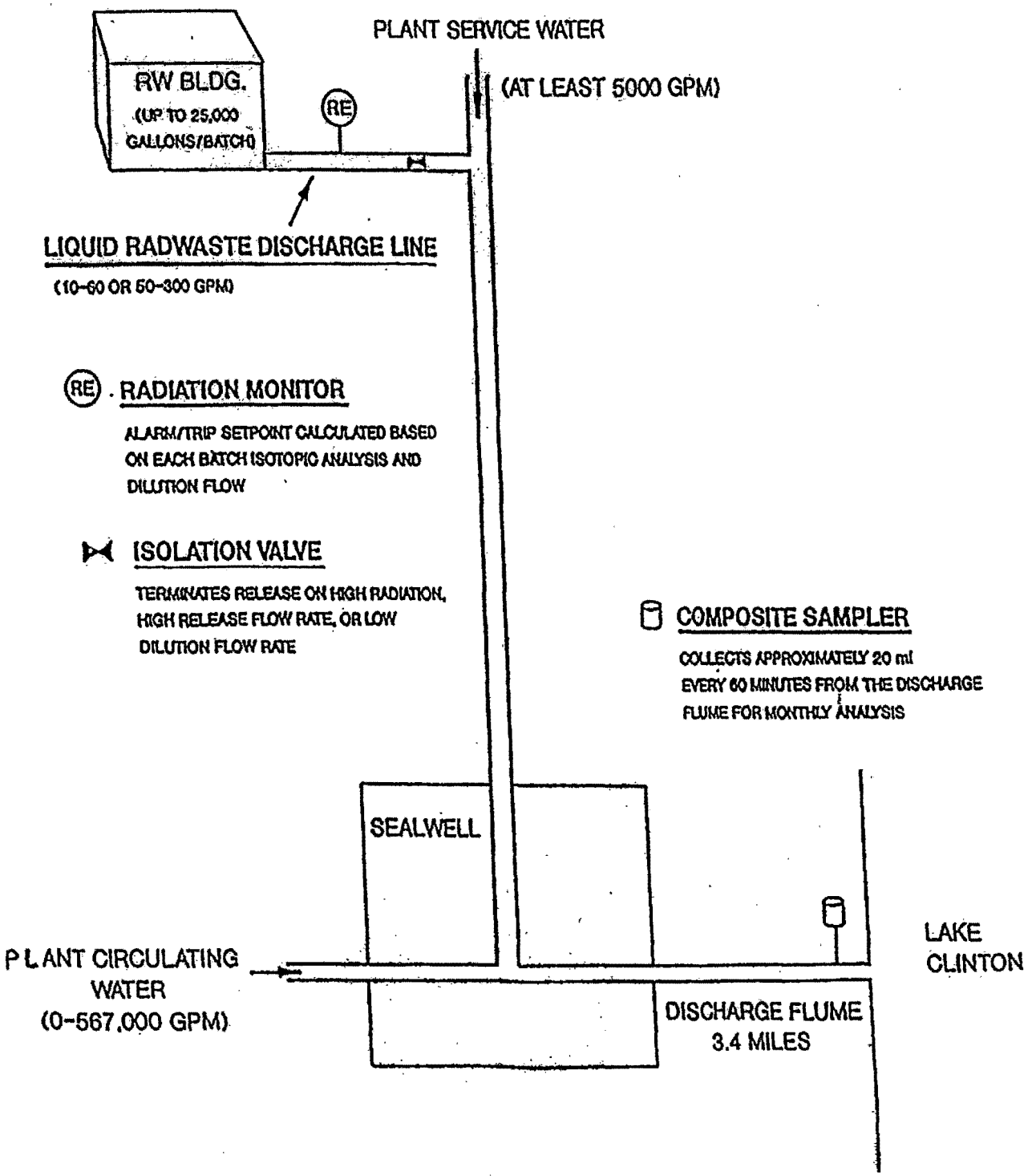


	HVAC Exhaust Vent	SGTS Exhaust Vent
Release Point Height (feet)	200	200
Building Height (feet)	190	190
Release Point Geometry	Duct	Pipe
Release Point Area (ft^2)	120	2
Release Point Diameter (feet)	12*	1
Annual Average Flow Rate (ft^3/sec)	3,945	67
Vertical Exit Velocity (feet/sec)	33	41

* Effective $2(A/\pi)^{1/2}$ diameter

FIGURE 2

CPS WATERBORNE EFFLUENTS RELEASE PATHWAY



Exposure Pathways

A radiological exposure pathway is the vehicle by which the public may become exposed to radioactivity released from nuclear facilities. The major pathways of concern are those that could cause the highest calculated radiation dose. These pathways are determined from the type and amount of radioactivity released, the environmental transport mechanism and how the plant environs are used (i.e., residence, gardens, etc.). The environmental transport mechanism includes the historical meteorological characteristics of the area that are defined by wind speed and wind direction. This information is used to evaluate how the radionuclides will be distributed within the surrounding area. The most important factor in evaluating the exposure pathway is the use of the environment by the public living around CPS. Factors such as location of homes in the area, use of cattle for milk and the growing of gardens for vegetable consumption are important considerations when evaluating exposure pathways. *Figure 3* illustrates the effluent exposure pathways that were considered.

The radioactive gaseous effluent exposure pathways include direct radiation, deposition on plants and soil and inhalation by animals and humans. The radioactive liquid effluent exposure pathways include fish consumption and direct exposure from Clinton Lake.

Dose Assessment

Whole body radiation involves the exposure of all organs in the human body to ionizing radiation. Most naturally occurring background radiation exposures consist of whole body exposure although specific organs can receive radiation exposure from distinct radionuclides. These radionuclides enter the body through inhalation and ingestion and seek different organs depending on the nuclide. For example, radioactive iodine selectively concentrates in the thyroid, radioactive strontium in mineralized bone, and radioactive cesium collects in muscle and liver tissue.

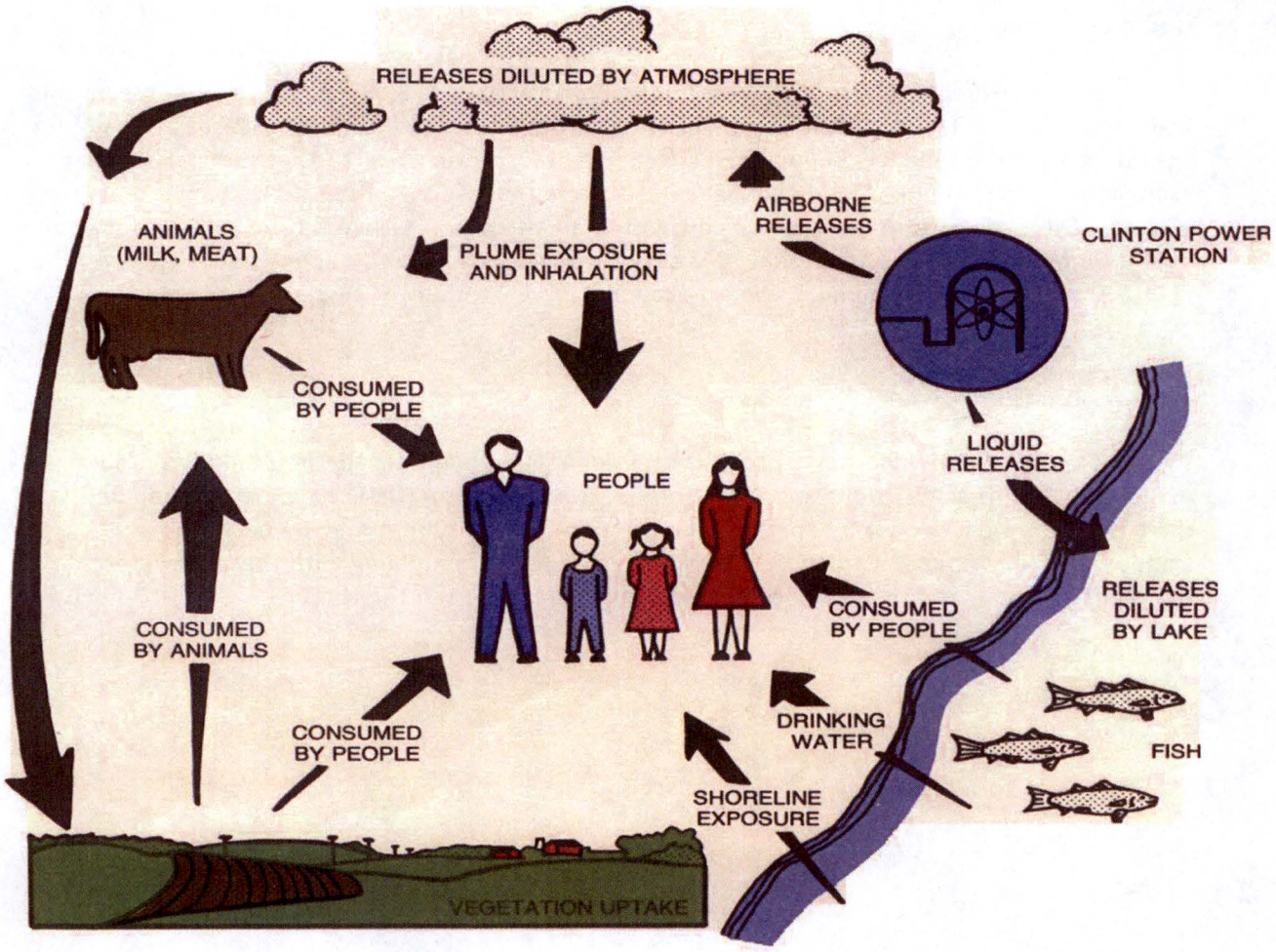
The total dose to organs from a given radionuclide also depends on the amount of activity in the organ and the amount of time that the radionuclide remains in the body. Some radionuclides remain for very short periods of time due to their rapid radioactive decay and/or elimination rate from the body, while others may remain longer.

Radiation dose to the public in the area surrounding CPS is calculated for each release using historical weather conditions coupled with the concentrations of radioactive material present. The dose is calculated for all sixteen geographical sectors surrounding CPS and includes the location of the nearest residents, vegetable gardens producing broad leaf vegetables and dairy animals in all sectors. The calculated dose also uses the scientific concept of a "maximum exposed individual" and "standard man," and the maximum use factors for the environment, such as how much milk an average person consumes and how much air a person breathes in a year.

Section 6 contains more detailed information on dose to the public.

FIGURE 3

EFFLUENT EXPOSURE PATHWAYS



Gaseous Effluents

Gaseous effluent radioactivity released from CPS is classified into two (2) categories. The first category is noble gases. The second category consists of I^{131}, I^{133}, H^3, C^{14} and all radionuclides in particulate form with radioactive half-lives greater than eight (8) days. Noble gases - such as xenon and krypton - are biologically and chemically non-reactive. As such, these radionuclides - specifically Kr^{85m}, Xe^{133} and Xe^{135} - are the major contributors to external doses. I^{131}, I^{133}, H^3, C^{14} and radionuclides in particulate form with radioactive half-lives greater than eight (8) days are the major contributors to internal doses.

Liquid Effluents

Liquid effluents may originate from two (2) sources at CPS. The first is effluent from the Radioactive Waste Treatment System. This water is demineralized prior to release, and samples are taken after the tank has been allowed to adequately recirculate. The second is from heat exchanger leaks found in closed cooling water systems that service radioactively contaminated systems. This second source would be considered an abnormal release if to occur. As a matter of station management commitment, CPS strives to be a zero (0) radioactive liquid release plant. The last radioactive liquid release occurred in September of 1992.

Solid Waste Shipments

To reduce the radiation exposure to personnel and maintain the federally required ALARA concept, the NRC and the Department of Transportation (DOT) have established limits on the types of radioactive waste and the amount of radioactivity that may be packaged and shipped offsite for burial or disposal. To ensure that CPS is complying with these regulations, the types of waste and the radioactivity present are reported to the NRC.

SECTION 3

SUPPLEMENTAL INFORMATION

I. REGULATORY LIMITS

The NRC requires nuclear power facilities to be designed, constructed and operated in such a way that the radioactivity in effluent releases to unrestricted areas is kept ALARA. To ensure these criteria are met, each license authorizing nuclear reactor operation includes the Offsite Dose Calculation Manual governing the release of radioactive effluents. The ODCM designates the limits for release of effluents, as well as the limits for doses to the general public from the release of radioactive liquids and gases. These limits are taken from Title 10 of the Code of Federal Regulations, Part 50, Appendix I (10CFR50 Appendix I), Title 10 of the Code of Federal Regulations, Part 20.1301 (10CFR20.1301) and Section 5.5.4 of Clinton Station's Technical Specifications. Maintaining effluent releases within these operating limitations demonstrates compliance with ALARA principles.

Specific limit information is given below.

A. Gaseous Effluents

1. The maximum permissible concentrations to limit doses for gaseous effluents shall not exceed the values provided within Section 5.5.4.g of Station's Technical Specifications. To ensure these concentrations are not exceeded, dose rates due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site area boundary shall be limited to the following:

   a. Noble gases

      - Less than or equal to 500 mRem/year to the total body.

      - Less than or equal to 3,000 mRem/year to the skin.

   b. I^{131}, I^{133}, H^3, and all radionuclides in particulate form with radioactive half-lives greater than eight (8) days:

      - Less than or equal to 1,500 mRem/year to any organ.

2. In accordance with 10CFR50 Appendix I, air dose due to noble gases released in gaseous effluents to areas at and beyond the site boundary shall be limited to the following:

   a. Less than or equal to 5 mRad for gamma radiation and less than or equal to 10 mRad for beta radiation during any calendar quarter.

   b. Less than or equal to 10 mRad for gamma radiation and less than or equal to 20 mRad for beta radiation during any calendar year.

3. In accordance with 10CFR50 Appendix I, dose to a member of the public (from I^{131}, I^{133}, H^3, and all radionuclides in particulate form with radioactive half-lives greater than eight (8) days) in gaseous effluents released to areas at and beyond the site boundary shall be limited to the following values:

   a. Less than or equal to 7.5 mRem to any organ, during any calendar quarter.

   b. Less than or equal to 15 mRem to any organ, during any calendar year.

B. Liquid Effluents

1. The concentration of radioactive material released in liquid effluents to unrestricted areas shall be limited to the values provided within Section 5.5.4.b of Station's Technical Specifications for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2.00E-04 µCi/ml total activity.

2. The dose or dose commitment to a member of the public from radioactive materials in liquid effluents released to unrestricted areas shall be limited to:

   a. Less than or equal to 1.5 mRem to the total body and less than or equal to 5 mRem to any organ during any calendar quarter.

   b. Less than or equal to 3 mRem to the total body and less than or equal to 10 mRem to any organ during any calendar year.

The above gaseous and liquid effluent limits are just a fraction of the dose limits established by the Environmental Protection Agency (EPA) found within Environmental Dose Standard Title 40, Code of Federal Regulations, Part 190 (40CFR190). The EPA has established dose limits for members of the public in the vicinity of a nuclear power plant. These dose limits are:

- Less than or equal to 25 mRem per year to the total body.
- Less than or equal to 75 mRem per year to the thyroid.
- Less than or equal to 25 mRem per year to any other organ.

II. AVERAGE ENERGY

The CPS ODCM limits the dose equivalent rates due to the release of fission and activation gases to less than or equal to 500 mRem per year to the total body and less than or equal to 3,000 mRem per year to the skin. These limits are based on dose calculations using actual isotopic concentrations from our effluent release streams and not based upon the gross count rate from our monitoring systems. Therefore, the average beta and gamma energies for gaseous effluents as described in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," are not applicable.

III. MEASUREMENT AND APPROXIMATIONS OF TOTAL RADIOACTIVITY

A. Fission and Activation Gases

1. Gas samples are collected weekly and are counted on a high purity germanium detector (HPGe) for principal gamma emitters. The HVAC and SGTS release points are continuously monitored and the average release flow rates for each release point are used to calculate the total activity released during a given time period.

2. Tritium is also collected by passing a known volume of the sample stream through a gas washer containing a known quantity of demineralized water. The collected samples are distilled and analyzed by liquid scintillation. The tritium released was calculated for each release point from the measured tritium concentration, the volume of the sample, the tritium collection efficiency, and the respective stack exhaust flow rates.

3. Carbon-14 release values were estimated using the methodology included in the EPRI Technical Report 1021106, using the 2023 Clinton Power Station specific parameters of normalized Carbon-14 production rate of 5.049 Ci/GWt-yr, a gaseous release fraction of 0.99, a Carbon-14 carbon dioxide fraction of 0.95, a reactor power rating of 3473 MWt, and equivalent full power operation of 308.4 days.

B. Iodines

Iodine is continuously collected on a silver zeolite cartridge filter via an isokinetic sampling assembly from each release point. Filters are normally exchanged once per week and then analyzed on an HPGe system. The flow rates for each release point are averaged over the duration of the sampling period and these results - along with specific isotopic concentrations - are then used to determine the total activity released during the time period in question.

C. Particulates

Particulates are continuously collected on a filter paper via an isokinetic sampling assembly on each release point. Filters are normally exchanged once per week and then analyzed on an HPGe system. The flow rates for each release point are averaged over the duration of the sampling period and these results - along with specific isotopic concentrations - are then used to determine the total activity released during the time period in question.

D. Liquid Effluents

Each tank of liquid radwaste is recirculated for at least two (2) tank volumes, sampled and analyzed for principal gamma emitters prior to release. Each sample tank is recirculated for a sufficient amount of time prior to sampling ensuring that a representative sample is obtained. Samples are then analyzed on an HPGe system and liquid release permits are generated based upon the values obtained from the isotopic analysis and the most recent values for H^3, gross alpha, Fe^{55}, Sr^{89} and Sr^{90}. An aliquot based on release volume is saved and added to composite containers. The concentrations of composited isotopes and the volumes of the releases

associated with these composites establish the proportional relationships that are then utilized for calculating the total activity released for these isotopes. However, there has not been a radioactive liquid release since September of 1992.

IV. DESCRIPTION OF ERROR ESTIMATES

Estimates of measurement and analytical error for gaseous and liquid effluents are calculated as follows:

$$E_T = \sqrt{[(E_1)^2 + (E_2)^2 + ...(E_n)^2]}$$

where: E_T = total percent error
$E_1 ... E_N$ = percent error due to calibration standards, laboratory analysis, instruments, sample flow, etc.

SECTION 4

RADIOACTIVE EFFLUENT DATA

TABLE 1
Gaseous Effluents - Summation Of All Releases
Data Period: January 01, 2023 - December 31, 2023
Continuous Mixed Mode

		Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error, %
A. Fission & Activation Gases							
1.	Total Release	Ci	3.48E+00	1.73E+01	1.22E+01	5.65E+00	3.00E+01
2.	Average release rate for period	µCi/sec	4.48E-01	2.20E+00	1.53E+00	7.11E-01	
3.	Percent of ODCM Limit	%	*	*	*	*	
B. Iodines							
1.	Total Iodine-131	Ci	9.57E-06	5.40E-06	<LLD	<LLD	3.10E+01
2.	Average release rate for period	µCi/sec	1.23E-06	6.87E-07	0.00E+00	0.00E+00	
3.	Percent of ODCM Limit	%	*	*	*	*	
C. Particulates							
1.	Particulates with half-lives >8 days	Ci	1.83E-05	6.02E-05	3.33E-04	5.93E-05	2.40E+01
2.	Average release rate for period	µCi/sec	2.35E-06	7.66E-06	4.19E-05	7.47E-06	
3.	Percent of ODCM Limit	%	*	*	*	*	
D. Tritium							
1.	Total Release	Ci	1.71E+01	6.51E+00	4.97E+00	3.87E+00	2.10E+01
2.	Average release rate for period	µCi/sec	2.19E+00	8.29E-01	6.25E-01	4.87E-01	
3.	Percent of ODCM Limit	%	*	*	*	*	
E. Gross Alpha							
1.	Total Release	Ci	<LLD	<LLD	<LLD	<LLD	
2.	Average release rate for period	µCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
F. Carbon-14							
1.	Total Release	Ci	4.04E+00	3.63E+00	3.38E+00	3.77E+00	
2.	Average release Rate for period	µCi/sec	5.20E-07	4.62E-07	4.25E-07	4.74E-07	

* Applicable limits are expressed in terms of dose. See Tables 1A and 1B of this report.

TABLE 1A
Air Doses Due to Gaseous Releases

Doses per Quarter (mRad)

Type of Radiation	ODCM Limit	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit
Gamma	5 mRad	1.61E-04	3.22E-03	9.13E-04	1.83E-02	6.43E-04	1.29E-02	2.98E-04	5.96E-03
Beta	10 mRad	5.69E-05	5.69E-04	3.22E-04	3.22E-03	2.27E-04	2.27E-03	1.05E-04	1.05E-03

Doses per Year (mRad)

Type of Radiation	ODCM Limit	Year	% of Limit
Gamma	10 mRad	2.02E-03	2.02E-02
Beta	20 mRad	7.11E-04	3.55E-03

TABLE 1B
Doses to a Member of the Public Due to Radioiodines, Tritium, Carbon-14, and Particulates in Gaseous Release

Doses per Quarter (mRem)

Organ	ODCM Limit	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit
Bone	7.5 mRem	6.59E-02	8.79E-01	5.92E-02	7.89E-01	5.51E-02	7.35E-01	6.14E-02	8.18E-01
Liver	7.5 mRem	3.94E-04	5.25E-03	1.50E-04	2.00E-03	1.25E-04	1.67E-03	8.98E-05	1.20E-03
TBody	7.5 mRem	1.36E-02	1.81E-01	1.20E-02	1.60E-01	1.11E-02	1.48E-01	1.24E-02	1.65E-01
Thyroid	7.5 mRem	4.34E-04	5.79E-03	1.64E-04	2.19E-03	1.12E-04	1.49E-03	8.75E-05	1.17E-03
Kidney	7.5 mRem	3.93E-04	5.24E-03	1.48E-04	1.97E-03	1.16E-04	1.55E-03	8.82E-05	1.18E-03
Lung	7.5 mRem	3.93E-04	5.24E-03	1.48E-04	1.97E-03	1.14E-04	1.52E-03	8.79E-05	1.17E-03
GI LLI	7.5 mRem	3.93E-04	5.24E-03	1.49E-04	1.99E-03	1.23E-04	1.64E-03	8.94E-05	1.19E-03

Doses per Year (mRem)

Type of Organ	ODCM Limit	Dose	% of Limit
Bone	15 mRem	2.42E-01	1.61E+00
Liver	15 mRem	7.58E-04	5.06E-03
TBody	15 mRem	4.91E-02	3.27E-01
Thyroid	15 mRem	7.98E-04	5.32E-03
Kidney	15 mRem	7.46E-04	4.97E-03
Lung	15 mRem	7.43E-04	4.95E-03
GI LLI	15 mRem	7.55E-04	5.04E-03

TABLE 2
Gaseous Effluents - Nuclides Released
Clinton Power Station
YEAR: 2023

Mixed Mode Release	X
Elevated Release	
Ground-Level Release	

Continuous Mode	X
Batch Mode	

	Units	Quarter 1[1]	Quarter 2[1]	Quarter 3[1]	Quarter 4[1]
A. Fission Gases					
Xe^{135}	Ci	<LLD	<LLD	<LLD	<LLD
Kr^{85m}	Ci	<LLD	<LLD	<LLD	<LLD
Xe^{133}	Ci	<LLD	<LLD	<LLD	<LLD
Kr^{88}	Ci	<LLD	<LLD	<LLD	<LLD
Ar^{41}	Ci	3.48E+00	1.73E+01	1.22E+01	5.65E+00
Total for Period	Ci	3.48E+00	1.73E+01	1.22E+01	5.65E+00
B. Iodines					
I^{131}	Ci	9.57E-06	5.40E-06	<LLD	<LLD
I^{133}	Ci	2.09E-05	<LLD	<LLD	<LLD
Total for Period	Ci	3.05E-05	5.40E-06	<LLD	<LLD
C. Particulates					
Co^{60}	Ci	<LLD	<LLD	<LLD	<LLD
Y^{91m} [2]	Ci	<LLD	<LLD	<LLD	<LLD
Nb^{95}	Ci	<LLD	<LLD	<LLD	<LLD
Ce^{141}	Ci	<LLD	<LLD	<LLD	<LLD
Cr^{51}	Ci	<LLD	<LLD	<LLD	<LLD
Mn^{54}	Ci	1.83E-05	6.02E-05	3.33E-04	5.93E-05
Na^{24} [2]	Ci	<LLD	<LLD	<LLD	<LLD
Cd^{109}	Ci	<LLD	<LLD	<LLD	<LLD
Cs^{138} [2]	Ci	<LLD	<LLD	<LLD	<LLD
Co^{58}	Ci	<LLD	<LLD	<LLD	<LLD
Zn^{65}	Ci	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	1.83E-05	6.02E-05	3.33E-04	5.93E-05
D. Gross Alpha					
Gross Alpha	Ci	<LLD	<LLD	<LLD	<LLD
E. Tritium					
Total for Period	Ci	1.71E+01	6.51E+00	4.97E+00	3.87E+00
F. Carbon-14					
Total for Period	Ci	4.04E+00	3.63E+00	3.38E+00	3.77E+00

[1] The lower the value of the actual sample activity - with respect to background activity – the greater the counting error. Proportionally, large errors are reported for the various components of CPS gaseous effluents because of their consistent low sample activity.

[2] Half-life is less than 8 days, therefore not included in Table 1 Summation.

TABLE 3
Radioactive Gaseous Waste LLD Values

TYPE OF ACTIVITY ANALYSIS	Lower Limit of Detection[a] (μCi/cc)
Principal Gamma Emitters, [Noble Gases] [b,c]	≤1.00E-04
H^{3} [c]	≤1.00E-06
I^{131} [d]	≤1.00E-12
I^{133} [d]	≤1.00E-10
Principal Gamma Emitters, [Particulates] [b,e]	≤1.00E-11
Sr^{89}, Sr^{90} [g]	≤1.00E-11
Gross Alpha[f]	≤1.00E-11

Table 3 Notations:

[a] The Lower Limit of Detection (LLD) as defined for purposes of these specifications, as an "a priori" determination of the smallest concentration of radioactive material in a sample that will yield a net count - above system background - that will be detected with a 95% probability and with a low (5%) probability of incorrectly concluding that a blank observation represents a "real" signal.

For a particular measurement system, which may include radiochemical separation:

$$\mathrm{LLD} = \frac{4.66 \cdot s_b}{\mathrm{E} \cdot \mathrm{V} \cdot 2.22 \times 10^{6} \cdot \mathrm{Y} \cdot e^{-\lambda \Delta t}}$$

Where:

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

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

Table 3 Notations (continued):

E is the counting efficiency, in counts per disintegration,

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

2.22E+06 is the number of disintegrations per minute (dpm) per microcurie,

Y is the fractional radiochemical yield, when applicable,

λ is the radioactive decay constant for the particular radionuclide (sec^{-1}) and

Δt for plant effluents is the elapsed time between the midpoint of sample collection and the time of counting (sec).

Typical values of E, V, Y, and Δt should be used in the calculation.

The LLD is defined as an *a priori* (before the fact) limit representing the capability of a measurement system and not as an *a posteriori* (after the fact) limit for a particular measurement.

[b] The principal gamma emitters for which the LLD specification applies include the following radionuclides: Kr^{87}, Kr^{88}, Xe^{133}, Xe^{133m}, Xe^{135}, and Xe^{138} in noble gas releases and Mn^{54}, Fe^{59}, Co^{58}, Co^{60}, Zn^{65}, Mo^{99}, I^{131}, I^{133}, Cs^{134}, Cs^{137}, Ce^{141}, and Ce^{144} in iodine and particulate releases. This list does not mean that only these nuclides are to be considered. Other gamma peaks that are identifiable - together with those of the above nuclides - shall also be analyzed and reported in the Radioactive Effluent Release Report.

[c] Weekly grab sample and analysis

[d] Continuous charcoal sample analyzed weekly

[e] Continuous particulate sample analyzed weekly

[f] Composite particulate sample analyzed monthly

[g] Composite particulate sample analyzed quarterly

TABLE 4

Waterborne Effluents - Summation Of All Releases

Data Period: January 01, 2023 – December 31, 2023

There were zero (0) liquid radwaste releases from CPS in 2023.

		Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error, %
A. Fission & Activation Products[1]							
1.	Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
2.	Average diluted concentration during period	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3.	Percent of ODCM Limit	%	N/A	N/A	N/A	N/A	
B. Tritium[1]							
1.	Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
2.	Average diluted concentration during period	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3.	Percent of ODCM Limit	%	N/A	N/A	N/A	N/A	
C. Dissolved and Entrained Gases[1]							
1.	Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
2.	Average diluted concentration during period	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
3.	Percent of ODCM Limit	%	N/A	N/A	N/A	N/A	
D. Gross Alpha Radioactivity[1]							
Gross alpha radioactivity		Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
E. Volume of Waste Released (prior to Dilution)							
Volume of Waste Released (prior to Dilution)		Liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
F. Volume of dilution water used during period							
Volume of dilution water used during period		Liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A

[1] A value corresponding to ten times the values found in 10CFR20 Appendix B, Table 2, Column 2 is used for all Effluent Concentration Limit (ECL) calculations. For dissolved and entrained noble gases, the concentration is limited to 2.00E-04 µCi/ml total activity.

TABLE 5
Waterborne Effluents - Nuclides Released
Clinton Power Station
YEAR: 2023

There were zero (0) liquid radwaste releases from CPS in 2023.

Continuous Mode	
Batch Mode	

	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4
A. Tritium					
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
B. Fission and Activation Products					
Mn^{54}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co^{58}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{55}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe^{59}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co^{58}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co^{60}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn^{65}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{89}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr^{90}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb^{95}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zr^{95}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mo^{99}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I^{131}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs^{134}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs^{137}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba^{140}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
La^{140}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce^{141}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ce^{144}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C. Dissolved and Entrained Noble Gases					
Kr^{85m}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr^{87}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr^{88}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe^{133}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe^{135}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe^{138}	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 6
Radioactive Liquid Waste LLD Values

TYPE OF ACTIVITY ANALYSIS	Lower Limit of Detection (LLD) [a] (µCi/ml)
Principal Gamma Emitters [b]	≤5.00E-07
I^{131}	≤1.00E-06
Dissolved and Entrained Gases (Gamma Emitters) [c]	≤1.00E-05
H^3	≤1.00E-05
Gross Alpha	≤1.00E-07
Sr^{89}, Sr^{90}	≤5.00E-08
Fe^{55}	≤1.00E-06

Table 6 Notations:

[a] The Lower Limit of Detection (LLD) as defined for purposes of these specifications, as an "a priori" determination of the smallest concentration of radioactive material in a sample that will yield a net count - above system background - that will be detected with a 95% probability and with only a 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system, which may include radiochemical separation:

$$\mathrm{LLD} = \frac{4.66 \cdot s_b}{\mathrm{E} \cdot \mathrm{V} \cdot 2.22 \times 10^6 \cdot \mathrm{Y} \cdot e^{-\lambda \Delta t}}$$

Where:

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

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

E is the counting efficiency, as counts per disintegration,

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

2.22E+06 is the number of disintegrations per minute (dpm) per microcurie,

Table 6 Notations (continued):

Y is the fractional radiochemical yield, when applicable,

λ is the radioactive decay constant for the particular radionuclide (sec^{-1}) and

Δ_t for plant effluents is the elapsed time between the midpoint of sample collection and the time of counting (sec).

Typical values of E, V, Y, and λt should be used in the calculation.

The LLD is defined as an *a priori* (before the fact) limit representing the capability of a measurement system and not as an *a posteriori* (after the fact, MDA) limit for a particular measurement.

[b] The principal gamma emitters for which the LLD requirement applies include the following radionuclides: Mn^{54}, Fe^{59}, Co^{58}, Co^{60}, Zn^{65}, Mo^{99}, Cs^{134}, Cs^{137}, and Ce^{141}. Ce^{144} shall also be measured, but with an LLD of 5.0E-06. This list does not mean that only these nuclides are detected and reported. Other gamma peaks that are measurable - together with those of the above nuclides - shall also be analyzed and reported in the Radioactive Effluent Release Report.

[c] Dissolved and entrained gases are: Xe^{133}, Xe^{135}, Xe^{138}, Kr^{85m}, Kr^{87} and Kr^{88}.

BATCH RELEASES

There were zero (0) liquid radwaste releases from CPS in 2023.

A. Batch Liquid Releases: 2023

1.	Number of batch releases:	0
2.	Total time period for batch releases:	N/A
3.	Maximum time period for batch release:	N/A
4.	Average time period for batch release:	N/A
5.	Minimum time period for batch release:	N/A
6.	Average stream flow during periods of release:	N/A
7.	Total waste volume:	N/A
8.	Total dilution volume:	N/A

B. Batch Gaseous Releases: 2023

1.	Number of batch releases:	0
2.	Total time period for batch releases:	N/A
3.	Maximum time period for batch release:	N/A
4.	Average time period for batch release	N/A
5.	Minimum time period for batch release:	N/A

ABNORMAL RELEASES

Information concerning abnormal radioactive liquid and gaseous releases is presented below for the year 2023. There were no abnormal or unplanned liquid or gaseous releases from CPS in 2023.

Liquid Releases:

Number of Abnormal Liquid Releases: Zero (0)

Activity Released [Ci]: Zero (0)

Gaseous Releases:

Number of Abnormal Gaseous Releases: Zero (0)

Activity Released [Ci]: Zero (0)

ILRT was performed during C1R21 under Work Order 01871977 (PMID 00159446). The evolution involved depressurization of containment and the drywell through two pathways, one was through the steam tunnel which ultimately goes to the HVAC stack (ODCM monitored pathway) and the second was through a pipe exiting the Service Building.

A penetration in the steam tunnel was used for first time during the C1R21 ILRT evolution, and was designed to improve depressurization time. This was not relied on as a sole vent pathway due to the potential for inadvertently tripping Fuel Building Ventilation (VF) which would result in an unmonitored release. Venting from this pathway was monitored closely until it was determined that the risk for tripping VF was no longer present. The second vent pathway was performed utilizing a pipe exiting the Service Building, and was based on the original design of the pressurization/depressurization line.

ODCM required air sampling of the depressurized air through the first pathway was completed in accordance with ODCM HVAC surveillance requirements. ODCM required air sampling of the second pathway was completed at a location prior to environmental release. These samples included grab samples for noble gases and tritium, as well as continuous sampling for particulates and iodines. Additionally, the depressurized air was sampled continuously by Radiation Protection for particulates and iodines at the outlet of the pipe exiting the Service Building. No radioactivity was detected during the testing, and all results were submitted to Records for vaulting under Work Order package 01871977.

SECTION 5

SOLID WASTE DISPOSAL INFORMATION

During this reporting period –January 01, 2023 through December 31, 2023 - there were twenty-one (21) radioactive waste shipments and zero (0) irradiated fuel shipments from CPS. In addition, the CPS ODCM requires reporting of the following information for solid waste shipped offsite during the above reporting period:

1. Container volume:
   Class A Waste: 5.21E+02 m^3 / Class B Waste: 0.00E+00 m^3 / Class C Waste: 0.00E+00 m^3

   This total includes Dry Active Waste (DAW), resins, filter sludges, evaporator bottoms, and other low level waste such as other waste-mixed.

2. Total curie quantity: Class A Waste was 4.14E+01 curies and Class B Waste was 0.00E+00 curies and Class C Waste was 0.00E+00 curies in 2023 (determined by dose-to-curie and sample concentration methodology estimates).

3. Principal radionuclides: See Table 7-A.2 for listing of measured radionuclides.

4. Source of waste and processing employed: Non-compacted dry active waste, resins, filter sludges and evaporator bottoms dewatered.

5. Type of container: General Design and Type A Containers.

6. Solidification agent or absorbent: None.

TABLE 7
Solid Waste and Irradiated Fuel Shipments

A.1 Estimate of Solid Waste Shipped Offsite for Burial or Disposal: [***NOT*** irradiated fuel]

	A.1 Type of Waste	Units	January – December 2023	Est. Total Error, %
a.	Spent resins, filter sludges, evaporator bottoms, etc.	m^3	8.98E+01	2.50E+01
		Ci	4.08E+01	
b.	Dry compactable waste, contaminated equipment, etc.	m^3	4.32E+02	2.50E+01
		Ci	6.72E-01	
c.	Irradiated components, control rods, etc. (not fuel)	m^3	0.00E+00	2.50E+01
		Ci	0.00E+00	
d.	Other Wastes-Mixed	m^3	0.00E+00	2.50E+01
		Ci	0.00E+00	

* Total curie quantity and principal radionuclides were determined by measurements.

A.2 Estimate of Major Nuclide Composition (by type of waste):

1. Spent resins, filters, evaporator bottoms, etc.

Waste Class	Nuclide Name	% Percent Abundance	Curies
A	C-14	4.26%	1.74E+00
	Mn-54	33.85%	1.38E+01
	Fe-55	24.29%	9.92E+00
	Co-58	1.39%	5.69E-01
	Co-60	29.66%	1.21E+01
	Ni-63	1.43%	5.84E-01
	Zn-65	3.65%	1.49E+00

2. Dry compactable waste, contaminated equipment, etc.

Waste Class	Nuclide Name	% Percent Abundance	Curies
A	Mn-54	28.7%	1.93E-01
	Fe-55	48.21%	3.24E-01
	Fe-59	1.6%	1.07E-02
	Co-60	18.53%	1.25E-01
	Zn-65	1.34%	9.00E-03

TABLE 7 (continued)
Solid Waste and Irradiated Fuel Shipments

3. Irradiated Components

Waste Class	Nuclide Name	% Percent Abundance	Curies
C	N/A	N/A	N/A

4. Other Wastes - Mixed

Waste Class	Nuclide Name	% Percent Abundance	Curies
A	N/A	N/A	N/A

A.3 Solid Waste Disposition:

January – December 2023

Number of Shipments	Mode of Transportation	Destination
10	Hittman Transport	Energy Solutions - Bear Creek 1560 Bear Creek Road
10	Hittman Transport	EnergySolutions LLC. Clive Disposal Site - Treatment Facility
1	Hittman Transport	EnergySolutions LLC. Clive Disposal Site – Bulk Waste Facility

B. Irradiated Fuel Shipments Disposition:

January – December 2023

Number of Shipments	Mode of Transportation	Destination
0	N/A	N/A

SECTION 6

DOSE MEASUREMENTS AND ASSESSMENTS

This section of the Annual Effluent Release Report provides the dose received by receptors around CPS from gaseous and liquid effluents. The dose to the receptor that would have received the highest dose in each sector (defined as the Critical Receptor for that sector) is listed within this report. This section also provides the dose to individuals who were inside the Site Boundary. This section also summarizes CPS's compliance with the requirements found within 40CFR190.

The 2023 maximum expected annual dose from Carbon-14 released from CPS has been calculated using the methodology included in the EPRI Technical Report 1021106 using the maximum gross thermal capacity maintained for 308.4 days of equivalent full power operation.

The assumptions used in determining dose values are as follows:

- All receptors within a five (5) mile radius are included in the Annual Land Use Census. This Annual Census determines what dose pathways are present as well as the distance of each receptor from the site.

- The annual average meteorological data for 2023 was used in conjunction with the Annual Land Use Census to determine the dose to each receptor within five (5) miles.

- The doses for each receptor from each sector were determined using methodologies given in the ODCM.

- The activity used in these assessments is the total activity released by CPS for the year 2023 not including radionuclides with half-lives less than eight (8) days and when dose pathway factors were unavailable.

- The occupancy factor was taken into consideration by calculating the dose to individuals using areas inside the Site Boundary in non-residential areas. The occupancy factor is determined by dividing the number of hour(s) of occupancy per year (taken from the ODCM) and dividing that value by the total number of hour(s) per year.

- Dose to individuals using areas inside the Site Boundary (that are not residents) was calculated using the Ground Plane and Inhalation pathways.

TABLE 8
Maximum Offsite Doses and Dose Commitments
To Members of the Public in Each Sector
Data Period: January 01, 2023 – December 31, 2023

This table illustrates the dose that a member from the public would most likely be exposed to from radioactive effluents in each sector from CPS. These values represent the maximum dose likely to expose a member of the public in each sector.

RECEPTOR INFORMATION					AIRBORNE EFFLUENT DOSE					WATERBORNE EFFLUENT DOSE (mRem) [1]	
					Iodines and Particulates (mRem)			Noble Gases (mRad)			
Sector	Distance (km)	Pathways	Organ	Age	Organ	Skin	Total Body	Gamma	Beta	Organ	Total Body
N	1.50	GP, I, M	B	A	2.12E-02	4.36E-05	4.48E-03	1.54E-03	7.85E-04	0.00E+00	0.00E+00
NNE	1.50	GP, I	B	A	1.31E-03	5.08E-05	4.75E-04	1.70E-03	8.66E-04		
NE	2.07	GP, I	B	A	4.59E-04	1.36E-05	1.64E-04	5.97E-04	3.05E-04		
ENE	4.20	GP, I	B	A	3.23E-04	5.52E-06	1.13E-04	4.24E-04	2.17E-04		
E	1.67	GP, I, M, V	B	A	3.95E-02	3.05E-05	8.20E-03	8.07E-04	4.12E-04		
ESE	5.14	GP, I	B	A	5.25E-05	9.58E-06	1.59E-04	5.92E-04	3.02E-04		
SE	4.44	GP, I	B	C	9.54E-04	1.04E-05	2.51E-04	6.38E-04	3.26E-04		
SSE	2.90	GP, I	B	A	3.58E-04	9.56E-06	1.27E-03	4.67E-04	2.38E-04		
S	4.78	GP, I	B	A	3.02E-04	5.54E-06	1.06E-04	3.96E-04	2.02E-04		
SSW	4.68	GP, I	B	A	2.47E-04	4.11E-06	8.60E-05	3.24E-04	1.66E-04		
SW	1.17	GP, I	B	A	7.83E-04	3.05E-05	2.83E-04	1.01E-03	5.16E-04		
WSW	3.62	GP, I	B	A	3.74E-04	7.26E-06	1.31E-04	4.90E-04	2.51E-04		
W	1.95	GP, I	B	T	4.45E-04	9.70E-06	1.37E-04	4.07E-04	2.08E-04		
WNW	2.63	GP, I, V	B	A	1.49E-02	5.37E-06	3.12E-03	4.15E-04	2.12E-04		
NW	2.65	GP, I	B	A	5.03E-04	9.66E-06	1.76E-04	6.60E-04	3.37E-04		
NNW	2.05	GP, I, M	B	A	1.12E-02	1.59E-05	2.37E-03	8.14E-04	4.16E-04		

Key for Table 8

Pathways	Organ	Age
GP = Ground Plane	B = Bone	A = Adult
I = Inhalation		T = Teen
M = Meat		I = Infant
V = Vegetation		C = Child

[1]There were zero (0) liquid radwaste releases from CPS in 2023. All doses were within all regulatory limits, including limits from 40CFR190.

COMPLIANCE WITH 40CFR190 REQUIREMENTS

Dosimeter of Legal Records (DLRs) are stationed around CPS to measure the ambient gamma radiation field. Monitoring stations are placed near the site boundary, which includes the Independent Spent Fuel Storage Installation (ISFSI) pad, and approximately five (5) miles from the reactor, in locations representing the sixteen (16) compass sectors. Other locations are chosen to measure the radiation field at places of special interest such as nearby residences, meeting places and population centers. Control sites are located further than ten (10) miles from the site, in areas that should not be affected by plant operations. The results from the field dosimeters are reported in the Annual Radiological Environmental Operating Report (AREOR) and indicated no excess dose to offsite areas. The organ and whole body doses reported in the above tables are determined using 10CFR50 Appendix I methodology, which encompasses the limits of 40CFR190. The requirement requires the preparation and submittal of a Special Report whenever the calculated doses from plant generated radioactive effluents and direct radiation exceed 25 mRem to the total body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mRem. During 2023, Clinton Power Station operated at 1.96E-01% (4.91E-02 mrem) of the 40CFR190 total body limit, 9.66E-01% of the 40CFR190 organ limit (2.42E-01 mrem) and 1.06E-03% 40CFR190 thyroid limit (7.98E-04 mrem).

INDENDENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

No radioactive effluents were released from the Clinton Station ISFSI and no additional casks were placed on the pad for the period January 1, 2023 through December 31, 2023. Over the long term, as more storage modules containing dry shielded canisters of spent fuel are placed on the ISFSI pad, it is expected that ISFSI operations will become the prominent contributor to dose limits in this section. ISFSI dose contribution is in the form of direct radiation as no liquid or gas releases are expected to occur from the ISFSI canisters. The CPS 10CFR72.212 Report prepared in accordance with 10CFR72 requirements assumes a certain array of storage modules exists on the pad. The dose contribution from this array of casks combination with historical uranium fuel cycle operations prior to ISFSI operations was analyzed to be within 40CFR190 and 10CFR72.104 limits and is documented in Holtec Report No. HI-2135750, Site Boundary Dose Rate Calculations for HI-STORM FW System for Clinton Power Station. The REMP Dosimeters recorded no net direct radiation dose to any Member of the Public from ISFSI.

DOSE TO MEMBERS OF THE PUBLIC WITHIN THE SITE BOUNDARY

CPS Offsite Dose Calculation Manual section 6.2 requires that the Radioactive Effluent Release Report include an assessment of the radiation doses from radioactive liquids and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY. Within the CPS site boundary there are seven areas that are open to members of the public as identified by CPS ODCM Table 5-3 (see *Figure 4*):

- The Department of Natural Resources Recreation Area at 1.287 kilometers (0.8 miles) in the ESE sector
- A road at 0.495 kilometers (0.3 miles) in the SE sector
- A residence at 2.736 kilometers (1.7 miles) in the SSE sector
- A residence at 1.219 kilometers (0.8 miles) in the SW sector
- Agricultural acreage at 1.372 kilometers (0.9 miles) in the SSW sector

- A residence at 2.414 kilometers (1.5 miles) in the WSW sector
- A portion of Clinton Lake at 0.335 kilometers (0.2 miles) in the NW sector

At all of the above locations, the plume, inhalation and ground-plane exposure pathways are used for dose calculations. The 2023 Annual Land Use Census identified no other exposure pathways. All dose calculations were performed using the methodology contained in the CPS ODCM, with the exception of dose due to C-14, which was calculated using methodology included in the EPRI Technical Report 1021106.

FIGURE 4

AREAS WITHIN THE CPS SITE BOUNDARY OPEN TO MEMBERS OF THE PUBLIC

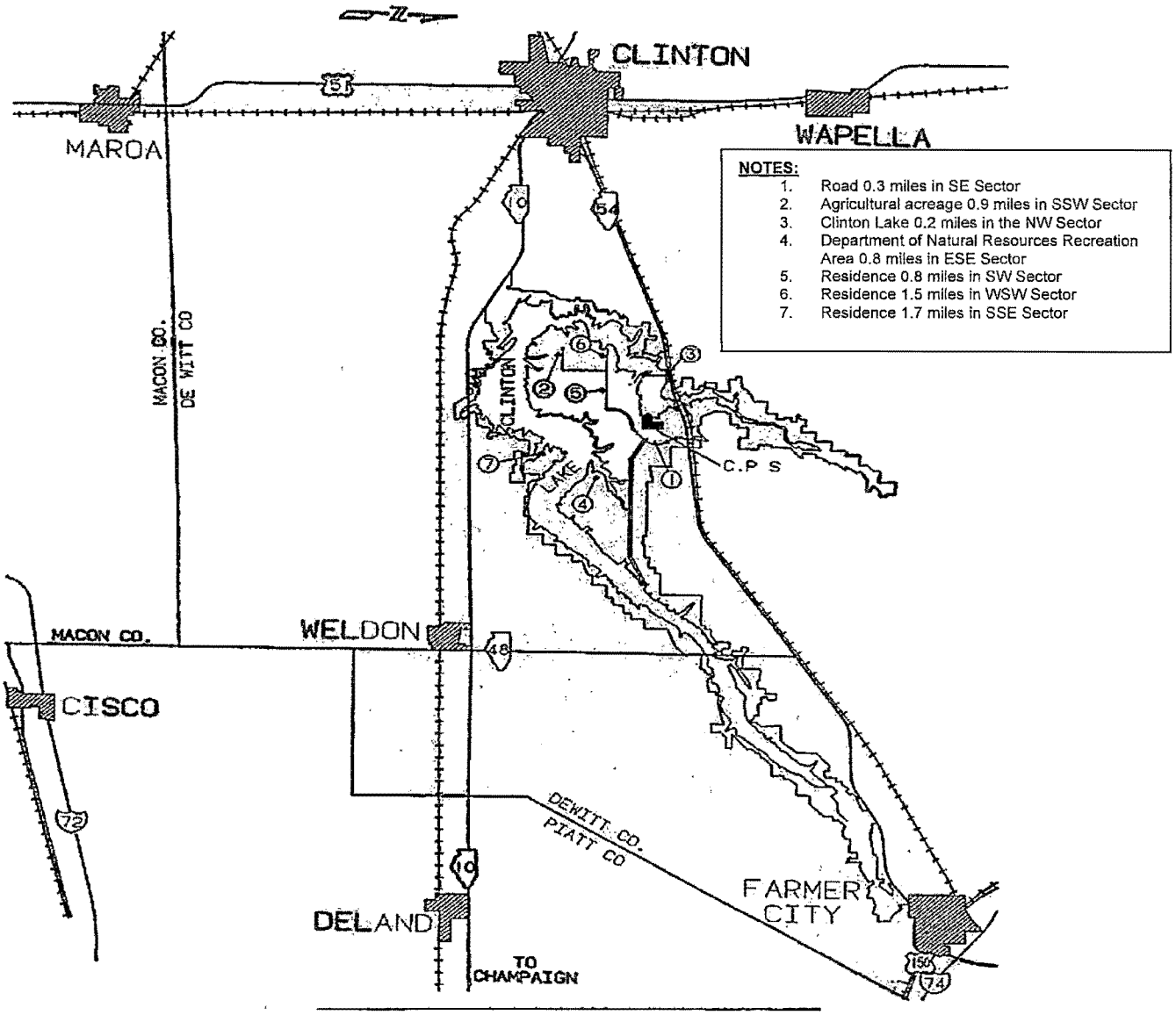


TABLE 9

Calculated Doses to Members of the Public During Use of the Department of Natural Resources Recreation Area in the East-Southeast Sector within the CPS Site Boundary

Data Period: January 01, 2023 – December 31, 2023

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	3.76E-04	mRem/year
Skin Dose Rate (Noble Gases)	5.50E-04	mRem/year
Gamma Air Dose	3.93E-04	mRad
Beta Air Dose	2.01E-04	mRad
Total Body Dose[1]	1.63E-04	mRem
Skin Dose[1]	1.67E-05	mRem

[1] Dose includes the dose values resulting from the release of iodines, particulates (with half lives >8 days), tritium, and C-14 in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Bone	3.08E-04	mRem
Teen Bone	4.35E-04	mRem
Child Bone	5.96E-04	mRem
Infant Bone	4.43E-04	mRem

TABLE 10
Calculated Doses to Members of the Public During Use of the Road in the Southeast Sector within the CPS Site Boundary
Data Period: January 01, 2023 –December 31, 2023

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	1.10E-04	mRem/year
Skin Dose Rate (Noble Gases)	1.61E-04	mRem/year
Gamma Air Dose	1.25E-04	mRad
Beta Air Dose	6.39E-05	mRad
Total Body Dose[1]	5.19E-05	mRem
Skin Dose[1]	5.25E-06	mRem

[1] Dose includes the dose values resulting from the release of iodines, particulates (with half lives >8 days), tritium, and C-14 in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Bone	9.81E-05	mRem
Teen Bone	1.39E-04	mRem
Child Bone	1.90E-04	mRem
Infant Bone	1.41E-04	mRem

TABLE 11
Calculated Doses for the Residents in the South-Southeast Sector within the CPS Site Boundary
Data Period: January 01, 2023 – December 31, 2023

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	4.56E-04	mRem/year
Skin Dose Rate (Noble Gases)	6.67E-04	mRem/year
Gamma Air Dose	4.80E-04	mRad
Beta Air Dose	2.45E-04	mRad
Total Body Dose[1]	1.91E-04	mRem
Skin Dose[1]	1.04E-05	mRem

[1] Dose includes the dose values resulting from the release of iodines, particulates (with half lives >8 days), tritium, and C-14 in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Bone	3.69E-04	mRem
Teen Bone	5.24E-04	mRem
Child Bone	7.20E-04	mRem
Infant Bone	5.33E-04	mRem

TABLE 12

Calculated Doses for the Residents in the Southwest Sector within the CPS Site Boundary

Data Period: January 01, 2023 – December 31, 2023

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	9.23E-04	mRem/year
Skin Dose Rate (Noble Gases)	1.35E-03	mRem/year
Gamma Air Dose	9.71E-04	mRad
Beta Air Dose	4.96E-04	mRad
Total Body Dose[1]	3.94E-04	mRem
Skin Dose[1]	2.93E-05	mRem

[1] Dose includes the dose values resulting from the release of iodines, particulates (with half lives >8 days), tritium, and C-14 in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Bone	7.52E-04	mRem
Teen Bone	1.07E-03	mRem
Child Bone	1.46E-03	mRem
Infant Bone	1.08E-03	mRem

TABLE 13
Calculated Doses to Members of the Public During Use of the Agricultural Acreage in the South-Southwest Sector within the CPS Site Boundary
Data Period: January 01, 2023 – December 31, 2023

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	5.89E-05	mRem/year
Skin Dose Rate (Noble Gases)	8.61E-05	mRem/year
Gamma Air Dose	6.18E-05	mRad
Beta Air Dose	3.16E-05	mRad
Total Body Dose[1]	2.14E-05	mRem
Skin Dose[1]	2.19E-06	mRem

[1] Dose includes the dose values resulting from the release of iodines, particulates (with half lives >8 days), tritium, and C-14 in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Bone	4.82E-05	mRem
Teen Bone	6.82E-05	mRem
Child Bone	NA[2]	mRem
Infant Bone	NA[2]	mRem

[2] Dose(s) are calculated only for the age groups likely to be in the field

TABLE 14
Calculated Doses for the Residents in the West-Southwest Sector within the CPS Site Boundary
Data Period: January 01, 2023 – December 31, 2023

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	5.41E-04	mRem/year
Skin Dose Rate (Noble Gases)	7.90E-04	mRem/year
Gamma Air Dose	5.69E-04	mRad
Beta Air Dose	2.91E-04	mRad
Total Body Dose[1]	2.26E-04	mRem
Skin Dose[1]	1.21E-05	mRem

[1] Dose includes the dose values resulting from the release of iodines, particulates (with half lives >8 days), tritium, and C-14 in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Bone	4.37E-04	mRem
Teen Bone	6.21E-04	mRem
Child Bone	8.53E-04	mRem
Infant Bone	6.32E-04	mRem

TABLE 15

Calculated Doses to Members of the Public During Use of Clinton Lake in the Northwest Sector within the CPS Site Boundary

Data Period: January 01, 2023 – December 31, 2023

DESCRIPTION	DOSE	UNITS
Total Body Dose Rate (Noble Gases)	7.77E-04	mRem/year
Skin Dose Rate (Noble Gases)	1.14E-03	mRem/year
Gamma Air Dose	8.10E-04	mRad
Beta Air Dose	4.15E-04	mRad
Total Body Dose[1]	3.25E-04	mRem
Skin Dose[1]	2.03E-05	mRem

[1] Dose includes the dose values resulting from the release of iodines, particulates (with half lives >8 days), tritium, and C-14 in gaseous effluents.

Highest Organ Dose by Age Group:

Adult Bone	6.25E-04	mRem
Teen Bone	8.87E-04	mRem
Child Bone	1.22E-03	mRem
Infant Bone	9.03E-04	mRem

SECTION 7

METEOROLOGICAL DATA AND DISPERSION ESTIMATES

On 13 April 1972, the meteorological monitoring program commenced at the Clinton Power Station site. The meteorological system consists of a tower 199 feet high with two (2) levels of instrumentation at the 10-meter and 60-meter elevations. A combined cup and vane sensor measures wind direction and wind speed(s) at the 10-meter and 60-meter levels. An aspirated dual temperature sensor senses the temperatures at these levels. One-half of the dual sensors at each elevation are used for ambient temperature while the other half are used to provide a differential temperature between the 10-meter and 60-meter levels.

Meteorological monitoring instruments have been placed on the Clinton Power Station backup meteorological tower at the 10-meter level to serve as a backup to the primary meteorological tower.

Clinton Power Station meteorological data is transmitted to the Main Control Room (MCR) via a dedicated communication link. Once the signals are received at the MCR, they are then converted to a 4 to 20 milliamp signal and fed individually to a microprocessor and chart recorders. The microprocessor is part of the Clinton Power Station Radiation Monitoring System (RMS). Meteorological data is available via the microprocessors in the Main Control Room and the Technical Support Center (TSC).

Dispersion modeling for effluents for normal operation of Clinton Power Station is a straight-line, sector-averaged Gaussian plume model designed to estimate average relative concentration at various receptor points. The model was developed in accordance with routine release analysis procedures specified in Regulatory Guide 1.111. For joint frequency input data, periods of calm are distributed in accordance with a directional distribution. For hourly input data, periods of calm are the previous hour's wind direction. Periods of calm are assigned a wind speed value of half the specified instrument threshold value. Reference Table 18 for more detailed information on meteorology and dispersion data.

TABLE 16
Meteorological Data Availability
Data Period: January 01, 2023 – December 31, 2023

PARAMETER	PERCENT OF VALID PARAMETER HOURS			
	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Wind Speed				
a. 10-Meter sensor	99.9	100.0	99.8	100.0
b. 60 Meter sensor	94.3	100.0	99.8	100.0
2. Wind Direction				
a. 10-Meter sensor	99.9	100.0	99.8	100.0
b. 60 Meter sensor	99.9	99.6	99.8	100.0
3. Temperature				
a. 10-Meter sensor	99.9	100.0	99.8	100.0
b. 60 Meter sensor	99.9	100.0	99.8	100.0
c. Temperature Difference (10m-60m)	99.9	100.0	99.8	100.0
4. Percent of hours for which valid 10-meter Wind Speed, Wind Direction, and Delta Temperature were available	99.9	100.0	99.8	100.0
5. Percent of hours for which valid 60-meter Wind Speed, Wind Direction, and Delta Temperature were available	94.3	99.6	99.8	100.0

Clinton Power Station was able to achieve 99.7% Meteorological Recoverable Data during 2023 exceeding the minimum criteria of 90% as delineated within Regulatory Guide 1.23.

TABLE 17
Classification of Atmospheric Stability

Stability Classification	Pasquill Category	Defining Conditions
Extremely unstable	A	------ $<\Delta T \leq -1.9$
Moderately unstable	B	$-1.9 <\Delta T \leq -1.7$
Slightly unstable	C	$-1.7 <\Delta T \leq -1.5$
Neutral	D	$-1.5 <\Delta T \leq -0.5$
Slightly stable	E	$-0.5 <\Delta T \leq 1.5$
Moderately stable	F	$1.5 <\Delta T \leq 4.0$
Extremely stable	G	$4.0 <\Delta T \leq$ ------

ΔT = temperature difference in degrees Celsius per 100 meters

TABLE 18
Joint Wind Frequency Distribution by Stability Class
Reporting Period: January 01, 2023 – December 31, 2023

The following table contains the joint wind frequency tables for CPS. The tables are segregated by sensor evelation and calendar quarter. All tabled values are in hours.

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Extremely Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	4	0	0	0	6
NNE	0	0	4	0	0	0	4
NE	0	0	1	0	0	0	1
ENE	0	0	2	2	0	0	4
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	2	0	0	0	2
SSE	0	0	2	0	0	0	2
S	0	0	2	0	0	0	2
SSW	0	0	1	1	0	0	2
SW	0	0	0	1	0	0	1
WSW	0	0	0	0	0	0	0
W	0	0	3	2	0	0	5
WNW	0	0	0	4	3	0	7
NW	0	0	7	0	0	0	7
NNW	0	3	5	0	0	0	8
Variable	0	0	0	0	0	0	0
Total	0	5	33	10	3	0	51

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

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Moderately Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	3	0	0	0	3
NNE	0	0	1	0	0	0	1
NE	0	2	4	0	0	0	6
ENE	0	1	2	1	0	0	4
E	0	2	0	0	0	0	2
ESE	0	1	3	0	0	0	4
SE	0	2	6	0	0	0	8
SSE	0	1	0	0	0	0	1
S	0	6	0	4	0	0	10
SSW	0	0	4	8	0	0	12
SW	0	0	2	4	0	0	6
WSW	0	2	6	0	0	0	8
W	0	1	5	6	0	0	12
WNW	0	2	5	7	1	0	15
NW	0	3	8	1	0	0	12
NNW	0	1	2	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	0	24	51	31	1	0	107

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

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Slightly Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	7	0	0	0	10
NNE	0	0	2	0	0	0	2
NE	0	0	1	0	0	0	1
ENE	0	1	3	0	0	0	4
E	0	0	2	0	0	0	2
ESE	0	3	5	0	0	0	8
SE	0	1	6	0	0	0	7
SSE	0	1	0	3	0	0	4
S	0	1	3	1	0	0	5
SSW	0	2	3	6	2	0	13
SW	0	1	2	6	0	0	9
WSW	0	1	4	1	0	0	6
W	0	1	3	4	0	0	8
WNW	0	2	10	7	1	0	20
NW	0	3	8	1	1	0	13
NNW	1	2	1	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	1	22	60	29	4	0	116

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

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Neutral - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	31	56	15	0	0	102
NNE	2	11	16	6	0	1	36
NE	2	16	39	3	1	3	64
ENE	4	20	62	2	0	0	88
E	3	14	37	2	0	0	56
ESE	2	19	20	0	0	0	41
SE	2	14	14	0	0	0	30
SSE	0	16	48	10	1	0	75
S	1	21	37	20	4	0	83
SSW	0	13	17	33	9	0	72
SW	0	7	17	8	6	0	38
WSW	2	5	28	9	4	0	48
W	2	17	28	45	9	0	101
WNW	0	14	57	66	9	0	146
NW	2	14	42	48	7	0	113
NNW	2	31	49	9	0	0	91
Variable	0	0	0	0	0	0	0
Total	24	263	567	276	50	4	1184

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

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Slightly Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	3	2	2	1	0	10
NNE	5	10	6	0	1	0	22
NE	3	13	1	0	0	0	17
ENE	0	16	7	0	0	0	23
E	3	13	8	0	0	0	24
ESE	3	14	4	0	0	0	21
SE	4	8	9	0	0	0	21
SSE	2	16	31	7	0	0	56
S	4	12	46	11	0	0	73
SSW	1	23	57	21	5	0	107
SW	6	23	13	4	2	0	48
WSW	5	17	23	3	0	0	48
W	5	8	9	3	0	0	25
WNW	2	19	16	2	0	0	39
NW	5	8	8	1	0	0	22
NNW	0	10	4	0	0	0	14
Variable	0	0	0	0	0	0	0
Total	50	213	244	54	9	0	570

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

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Moderately Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	2	0	0	0	0	4
NNE	2	1	0	0	0	0	3
NE	9	9	0	0	0	0	18
ENE	5	1	0	0	0	0	6
E	1	4	0	0	0	0	5
ESE	5	0	0	0	0	0	5
SE	2	5	0	0	0	0	7
SSE	2	3	0	0	0	0	5
S	6	2	0	0	0	0	8
SSW	2	2	1	0	0	0	5
SW	0	4	0	0	0	0	4
WSW	3	3	0	0	0	0	6
W	2	0	1	0	0	0	3
WNW	3	2	0	0	0	0	5
NW	0	8	0	0	0	0	8
NNW	3	3	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	47	49	2	0	0	0	98

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

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Extremely Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
NE	0	1	0	0	0	0	1
ENE	2	0	0	0	0	0	2
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	1	2	0	0	0	0	3
SSE	4	5	0	0	0	0	9
S	6	0	0	0	0	0	6
SSW	0	1	0	0	0	0	1
SW	2	0	0	0	0	0	2
WSW	2	0	0	0	0	0	2
W	2	0	0	0	0	0	2
WNW	2	0	0	0	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	22	9	0	0	0	0	31

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

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Extremely Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	2	1	0	0	3
NNE	0	0	1	0	0	0	1
NE	0	0	1	0	0	0	1
ENE	0	0	0	2	2	0	4
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	1	1	0	0	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	0	5	0	0	5
SSW	0	0	0	0	1	0	1
SW	0	0	0	0	1	0	1
WSW	0	0	0	0	0	0	0
W	0	0	2	1	2	0	5
WNW	0	0	2	2	2	3	9
NW	0	0	4	2	0	0	6
NNW	0	0	4	5	0	0	9
Variable	0	0	0	0	0	0	0
Total	1	1	16	18	8	3	47

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 4
Hours of missing stability measurements in all stability classes: 3

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Moderately Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	3	0	0	0	3
NNE	0	0	0	1	0	0	1
NE	0	0	4	2	0	0	6
ENE	0	0	2	0	2	0	4
E	0	0	2	0	0	0	2
ESE	0	0	1	1	0	0	2
SE	1	1	4	0	0	0	6
SSE	0	0	0	1	0	0	1
S	0	4	3	3	1	0	11
SSW	0	0	3	1	7	1	12
SW	0	0	2	0	3	0	5
WSW	0	1	4	6	0	0	11
W	0	1	3	4	3	0	11
WNW	0	0	5	3	5	2	15
NW	0	2	2	5	0	0	9
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	1	10	39	27	21	3	101

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 6
Hours of missing stability measurements in all stability classes: 3

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Slightly Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	0	8	0	0	11
NNE	0	0	0	0	0	0	0
NE	0	0	0	1	0	0	1
ENE	0	0	2	1	1	0	4
E	0	0	0	2	0	0	2
ESE	0	1	3	0	0	0	4
SE	0	1	1	2	0	0	4
SSE	0	1	0	0	2	1	4
S	0	2	1	1	1	1	6
SSW	0	0	5	4	3	1	13
SW	0	0	0	1	6	0	7
WSW	0	2	2	5	0	0	9
W	0	0	1	3	5	0	9
WNW	1	1	10	5	4	2	23
NW	0	1	2	4	1	0	8
NNW	0	1	2	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	1	13	29	37	23	5	108

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 8
Hours of missing stability measurements in all stability classes: 3

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Neutral - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	10	30	36	12	1	89
NNE	1	4	3	12	5	1	26
NE	0	2	9	26	9	5	51
ENE	1	3	15	32	24	1	76
E	1	5	6	22	12	0	46
ESE	0	5	8	13	1	0	27
SE	1	10	9	10	1	0	31
SSE	0	4	14	33	25	4	80
S	1	8	14	21	29	10	83
SSW	0	6	11	9	26	13	65
SW	0	4	10	12	6	8	40
WSW	1	0	6	21	6	9	43
W	1	9	27	27	30	14	108
WNW	2	4	17	45	48	28	144
NW	0	4	21	41	29	3	98
NNW	0	6	26	38	15	1	86
Variable	0	0	0	0	0	0	0
Total	9	84	226	398	278	98	1093

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 91
Hours of missing stability measurements in all stability classes: 3

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Slightly Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	5	5	3	1	3	17
NNE	0	2	10	5	0	0	17
NE	0	1	1	9	1	0	12
ENE	0	1	10	5	0	0	16
E	0	0	12	17	1	0	30
ESE	0	2	5	7	3	0	17
SE	0	9	7	6	0	0	22
SSE	0	1	6	19	13	5	44
S	1	1	5	44	30	5	86
SSW	1	4	12	39	23	8	87
SW	0	3	9	25	9	3	49
WSW	0	3	12	25	6	2	48
W	3	4	12	12	7	2	40
WNW	1	4	8	16	7	0	36
NW	0	1	7	9	1	0	18
NNW	2	2	8	6	0	0	18
Variable	0	0	0	0	0	0	0
Total	8	43	129	247	102	28	557

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 13
Hours of missing stability measurements in all stability classes: 3

Clinton Power Station

Period of Record: January - March 2023
Stability Class - Moderately Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	5	0	0	0	5
NNE	0	1	8	2	0	0	11
NE	0	1	7	1	0	0	9
ENE	0	0	5	1	0	0	6
E	0	0	1	2	0	0	3
ESE	0	1	0	0	0	0	1
SE	0	0	1	0	0	0	1
SSE	0	1	7	1	0	0	9
S	1	2	0	3	0	0	6
SSW	0	4	0	3	1	0	8
SW	0	2	1	1	0	0	4
WSW	0	4	3	1	0	0	8
W	2	1	3	3	0	0	9
WNW	0	1	6	0	0	0	7
NW	0	0	2	4	0	0	6
NNW	0	1	1	1	0	0	3
Variable	0	0	0	0	0	0	0
Total	3	19	50	23	1	0	96

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 2
Hours of missing stability measurements in all stability classes: 3

Period of Record: January - March 2023
Stability Class - Extremely Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
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	1	0	0	0	1
E	0	0	1	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	1	0	0	0	0	0	1
SSE	0	0	1	2	0	0	3
S	0	1	2	1	0	0	4
SSW	0	2	3	0	0	0	5
SW	0	6	2	0	0	0	8
WSW	0	0	0	0	0	0	0
W	0	3	2	0	0	0	5
WNW	0	0	3	0	0	0	3
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	1	12	15	3	0	0	31

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

Period of Record: April - June 2023
Stability Class - Extremely Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	5	9	0	0	0	14
NNE	0	3	2	0	0	0	5
NE	0	2	12	0	0	0	14
ENE	0	1	19	0	0	0	20
E	0	4	9	0	0	0	13
ESE	0	1	0	0	0	0	1
SE	0	1	7	0	0	0	8
SSE	0	0	2	0	0	0	2
S	0	0	1	3	0	0	4
SSW	0	0	0	0	0	0	0
SW	0	2	0	0	0	0	2
WSW	0	0	3	3	1	0	7
W	0	0	1	2	1	0	4
WNW	0	0	1	9	4	0	14
NW	0	1	9	2	0	0	12
NNW	0	3	7	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	0	23	82	19	6	0	130

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

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Moderately Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	1	0	0	0	2
NNE	0	6	2	0	0	0	8
NE	0	5	3	0	0	0	8
ENE	0	5	9	0	0	0	14
E	0	6	5	0	0	0	11
ESE	0	3	1	0	0	0	4
SE	0	3	4	0	0	0	7
SSE	0	3	3	0	0	0	6
S	0	10	2	2	0	0	14
SSW	0	6	3	0	0	0	9
SW	0	2	1	0	0	0	3
WSW	0	2	5	1	0	0	8
W	0	2	1	0	0	0	3
WNW	0	2	4	5	1	0	12
NW	0	2	3	2	3	0	10
NNW	0	3	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	0	61	47	10	4	0	122

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

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Slightly Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	1	0	0	0	2
NNE	1	4	0	3	0	0	8
NE	0	4	5	0	0	0	9
ENE	0	6	5	0	0	0	11
E	0	2	0	0	0	0	2
ESE	0	2	2	0	0	0	4
SE	0	9	2	0	0	0	11
SSE	0	7	1	0	0	0	8
S	0	16	7	2	0	0	25
SSW	0	8	1	0	0	0	9
SW	1	3	2	2	0	0	8
WSW	0	1	3	0	0	0	4
W	1	0	1	0	0	0	2
WNW	0	5	5	9	4	0	23
NW	2	5	6	4	0	0	17
NNW	0	6	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	5	79	41	20	4	0	149

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

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Neutral - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	9	7	0	0	0	18
NNE	0	12	12	5	0	0	29
NE	3	21	24	3	0	0	51
ENE	3	30	28	1	0	0	62
E	4	23	5	0	0	0	32
ESE	5	15	1	0	0	0	21
SE	6	41	3	1	0	0	51
SSE	12	40	18	4	0	0	74
S	5	33	27	7	1	0	73
SSW	9	7	8	2	3	0	29
SW	3	5	7	4	1	0	20
WSW	2	8	3	3	0	0	16
W	1	4	11	13	10	3	42
WNW	3	12	35	39	15	1	105
NW	2	19	15	13	2	0	51
NNW	1	10	6	1	0	0	18
Variable	0	0	0	0	0	0	0
Total	61	289	210	96	32	4	692

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

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Slightly Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	9	8	1	0	0	21
NNE	2	18	5	0	0	0	25
NE	4	37	25	1	0	0	67
ENE	6	38	12	0	0	0	56
E	8	28	4	1	0	0	41
ESE	10	51	6	1	0	0	68
SE	15	41	4	0	0	0	60
SSE	14	42	11	0	0	0	67
S	8	36	20	7	1	0	72
SSW	1	26	26	6	15	1	75
SW	7	2	10	2	0	0	21
WSW	5	6	11	1	0	0	23
W	3	5	6	0	0	0	14
WNW	4	20	18	1	0	0	43
NW	5	21	6	1	1	0	34
NNW	2	7	2	0	0	0	11
Variable	0	0	0	0	0	0	0
Total	97	387	174	22	17	1	698

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

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Moderately Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	5	0	0	0	0	7
NNE	5	7	0	0	0	0	12
NE	9	48	1	0	0	0	58
ENE	13	11	0	0	0	0	24
E	9	8	0	0	0	0	17
ESE	7	5	0	0	0	0	12
SE	8	8	0	0	0	0	16
SSE	8	4	0	0	0	0	12
S	6	18	2	0	0	0	26
SSW	5	5	3	0	0	0	13
SW	3	1	2	0	0	0	6
WSW	3	4	0	0	0	0	7
W	0	3	0	0	0	0	3
WNW	4	1	1	0	0	0	6
NW	2	1	0	0	0	0	3
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	85	129	9	0	0	0	223

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

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Extremely Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	11	0	0	0	0	0	11
NNE	14	4	0	0	0	0	18
NE	21	32	0	0	0	0	53
ENE	8	2	0	0	0	0	10
E	3	1	0	0	0	0	4
ESE	2	1	0	0	0	0	3
SE	2	0	0	0	0	0	2
SSE	2	0	0	0	0	0	2
S	2	1	0	0	0	0	3
SSW	5	0	0	0	0	0	5
SW	5	2	0	0	0	0	7
WSW	1	0	0	0	0	0	1
W	5	0	0	0	0	0	5
WNW	16	0	0	0	0	0	16
NW	18	1	0	0	0	0	19
NNW	9	1	0	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	124	45	0	0	0	0	169

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Extremely Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	11	4	0	0	15
NNE	0	0	7	1	0	0	8
NE	0	0	5	3	0	0	8
ENE	0	0	4	17	1	0	22
E	0	0	4	4	1	0	9
ESE	0	0	1	0	0	0	1
SE	0	0	1	0	0	0	1
SSE	0	0	6	1	1	0	8
S	0	0	2	0	0	0	2
SSW	0	0	0	1	2	0	3
SW	0	2	0	0	0	0	2
WSW	0	0	1	3	2	2	8
W	0	0	1	0	2	1	4
WNW	0	0	8	4	5	6	23
NW	0	0	2	4	1	0	7
NNW	0	0	6	3	0	0	9
Variable	0	0	0	0	0	0	0
Total	0	2	59	45	15	9	130

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

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Moderately Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	2	1	0	0	4
NNE	0	2	7	0	0	0	9
NE	0	0	4	2	0	0	6
ENE	0	0	2	5	1	0	8
E	0	1	3	3	0	0	7
ESE	0	0	1	0	0	0	1
SE	0	0	1	0	0	0	1
SSE	0	0	5	4	0	0	9
S	0	6	4	2	2	0	14
SSW	0	5	2	0	0	0	7
SW	0	1	5	0	0	0	6
WSW	0	2	1	5	0	0	8
W	0	3	3	1	0	0	7
WNW	0	1	3	3	5	5	17
NW	0	1	2	1	1	0	5
NNW	0	3	7	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	0	26	52	27	9	5	119

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

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Slightly Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	6	0	1	0	7
NNE	0	3	2	1	2	0	8
NE	0	1	0	2	0	0	3
ENE	0	0	1	4	0	0	5
E	0	1	1	1	0	0	3
ESE	0	1	2	0	0	0	3
SE	0	3	5	0	0	0	8
SSE	0	2	5	0	0	0	7
S	0	5	5	2	0	0	12
SSW	1	1	4	2	2	0	10
SW	1	4	6	1	0	0	12
WSW	0	9	1	3	0	0	13
W	1	2	0	6	2	0	11
WNW	1	3	5	4	7	6	26
NW	1	5	3	1	1	0	11
NNW	0	6	3	0	0	0	9
Variable	0	0	0	0	0	0	0
Total	5	46	49	27	15	6	148

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 1
Hours of missing stability measurements in all stability classes: 0

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Neutral - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	6	15	10	5	0	36
NNE	0	2	14	7	5	0	28
NE	1	4	12	16	8	1	42
ENE	1	2	18	20	5	0	46
E	2	4	14	4	0	0	24
ESE	2	6	3	2	0	0	13
SE	2	12	14	2	0	0	30
SSE	6	10	18	8	3	0	45
S	2	13	27	18	3	3	66
SSW	3	6	14	16	9	2	50
SW	0	7	10	8	0	3	28
WSW	4	13	8	9	2	0	36
W	4	15	2	12	13	19	65
WNW	1	8	21	35	38	27	130
NW	3	9	10	8	0	2	32
NNW	1	7	4	3	0	0	15
Variable	0	0	0	0	0	0	0
Total	32	124	204	178	91	57	686

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 6
Hours of missing stability measurements in all stability classes: 0

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Slightly Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	9	8	0	0	18
NNE	0	3	12	12	0	0	27
NE	0	1	13	40	8	1	63
ENE	0	3	15	21	3	0	42
E	0	2	9	11	0	1	23
ESE	0	1	8	11	2	1	23
SE	0	4	16	16	2	0	38
SSE	1	5	45	21	1	0	73
S	0	3	35	32	3	4	77
SSW	0	2	21	31	7	23	84
SW	0	10	21	18	6	1	56
WSW	1	11	4	16	5	0	37
W	2	10	11	9	0	0	32
WNW	2	9	22	20	8	2	63
NW	1	3	12	2	0	0	18
NNW	0	4	7	10	2	1	24
Variable	0	0	0	0	0	0	0
Total	7	72	260	278	47	34	698

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

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Moderately Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	6	0	0	0	8
NNE	1	0	4	6	0	0	11
NE	0	1	5	32	0	0	38
ENE	0	3	14	12	0	0	29
E	0	2	10	5	0	0	17
ESE	0	5	5	1	0	0	11
SE	0	4	5	2	0	0	11
SSE	0	2	10	1	0	0	13
S	0	1	6	1	0	0	8
SSW	0	3	11	10	0	0	24
SW	1	1	4	12	0	0	18
WSW	0	2	6	2	0	0	10
W	0	7	3	4	0	0	14
WNW	0	2	2	0	0	0	4
NW	0	2	2	0	0	0	4
NNW	1	0	2	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	3	37	95	88	0	0	223

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

Clinton Power Station

Period of Record: April - June 2023
Stability Class - Extremely Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	3	2	0	0	0	7
NNE	0	5	2	1	0	0	8
NE	1	6	1	4	0	0	12
ENE	0	4	14	19	0	0	37
E	1	7	8	3	0	0	19
ESE	1	6	2	0	0	0	9
SE	0	4	0	0	0	0	4
SSE	1	3	1	0	0	0	5
S	0	0	3	0	0	0	3
SSW	0	3	4	0	0	0	7
SW	1	0	6	1	0	0	8
WSW	0	3	3	0	0	0	6
W	0	12	5	0	0	0	17
WNW	0	4	3	0	0	0	7
NW	1	8	3	0	0	0	12
NNW	1	6	2	0	0	0	9
Variable	0	0	0	0	0	0	0
Total	9	74	59	28	0	0	170

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

Period of Record: July - September 2023
Stability Class - Extremely Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	5	2	0	0	0	7
NNE	0	1	8	0	0	0	9
NE	0	5	0	0	0	0	5
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	1	0	0	0	0	1
SE	0	4	0	0	0	0	4
SSE	0	3	1	0	0	0	4
S	0	2	10	0	0	0	12
SSW	0	0	1	0	0	0	1
SW	0	0	3	0	0	0	3
WSW	0	1	4	0	0	0	5
W	0	1	7	3	0	0	11
WNW	0	2	3	0	0	0	5
NW	0	0	9	0	0	0	9
NNW	0	3	7	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	0	29	55	3	0	0	87

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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Moderately Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	2	0	0	0	3
NNE	0	4	7	0	0	0	11
NE	0	11	2	0	0	0	13
ENE	0	7	0	0	0	0	7
E	1	5	0	0	0	0	6
ESE	0	5	0	0	0	0	5
SE	0	7	0	0	0	0	7
SSE	1	4	0	0	0	0	5
S	0	8	8	0	0	0	16
SSW	0	6	7	1	0	0	14
SW	0	4	8	2	0	0	14
WSW	0	3	13	0	0	0	16
W	0	6	9	0	0	0	15
WNW	0	3	1	0	0	0	4
NW	0	8	6	0	0	0	14
NNW	0	3	4	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	2	85	67	3	0	0	157

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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Slightly Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	3	0	0	0	5
NNE	0	4	2	0	0	0	6
NE	1	10	3	0	0	0	14
ENE	0	5	1	0	0	0	6
E	0	2	0	0	0	0	2
ESE	0	9	0	0	0	0	9
SE	1	25	0	0	0	0	26
SSE	1	6	0	0	0	0	7
S	1	15	2	0	0	0	18
SSW	1	10	8	2	0	0	21
SW	0	4	6	0	0	0	10
WSW	0	10	9	1	0	0	20
W	0	6	12	0	0	0	18
WNW	2	5	6	0	0	0	13
NW	2	11	2	1	0	0	16
NNW	1	7	4	0	0	0	12
Variable	0	0	0	0	0	0	0
Total	10	131	58	4	0	0	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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Neutral - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	41	4	0	0	0	48
NNE	4	27	10	1	0	0	42
NE	4	45	11	0	0	0	60
ENE	3	19	1	0	0	0	23
E	7	13	0	0	0	0	20
ESE	4	9	0	0	0	0	13
SE	12	25	2	0	0	0	39
SSE	14	32	6	0	0	0	52
S	7	33	19	0	0	0	59
SSW	4	20	18	1	0	0	43
SW	2	25	10	2	0	0	39
WSW	1	24	12	0	0	0	37
W	4	23	15	0	0	0	42
WNW	6	18	17	1	0	0	42
NW	0	38	7	2	0	0	47
NNW	6	16	4	0	0	0	26
Variable	0	0	0	0	0	0	0
Total	81	408	136	7	0	0	632

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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Slightly Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	19	0	1	0	0	25
NNE	7	9	3	0	0	0	19
NE	14	42	3	0	0	0	59
ENE	7	12	0	0	0	0	19
E	16	18	0	0	0	0	34
ESE	18	29	2	0	0	0	49
SE	29	41	1	0	0	0	71
SSE	11	41	1	0	0	0	53
S	6	69	6	0	0	0	81
SSW	9	44	18	1	0	0	72
SW	8	34	14	0	0	0	56
WSW	12	15	5	0	0	0	32
W	7	11	0	0	0	0	18
WNW	11	12	5	0	0	0	28
NW	12	34	1	0	0	0	47
NNW	5	9	0	0	0	0	14
Variable	0	0	0	0	0	0	0
Total	177	439	59	2	0	0	677

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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Moderately Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	10	6	0	0	0	0	16
NNE	11	11	0	0	0	0	22
NE	22	29	0	0	0	0	51
ENE	7	5	0	0	0	0	12
E	15	10	0	0	0	0	25
ESE	12	3	0	0	0	0	15
SE	8	8	0	0	0	0	16
SSE	11	8	0	0	0	0	19
S	2	2	0	0	0	0	4
SSW	12	9	0	0	0	0	21
SW	8	7	0	0	0	0	15
WSW	6	10	0	0	0	0	16
W	13	0	0	0	0	0	13
WNW	6	4	0	0	0	0	10
NW	14	5	0	0	0	0	19
NNW	4	3	0	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	161	120	0	0	0	0	281

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Extremely Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	6	0	0	0	0	0	6
NNE	14	1	0	0	0	0	15
NE	31	30	0	0	0	0	61
ENE	7	1	0	0	0	0	8
E	2	0	0	0	0	0	2
ESE	3	0	0	0	0	0	3
SE	5	0	0	0	0	0	5
SSE	2	0	0	0	0	0	2
S	2	0	0	0	0	0	2
SSW	1	0	0	0	0	0	1
SW	7	1	0	0	0	0	8
WSW	8	0	0	0	0	0	8
W	10	0	0	0	0	0	10
WNW	16	0	0	0	0	0	16
NW	11	1	0	0	0	0	12
NNW	7	0	0	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	132	34	0	0	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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Extremely Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	5	1	0	0	6
NNE	0	0	5	3	0	0	8
NE	0	3	2	0	0	0	5
ENE	0	0	2	0	0	0	2
E	0	0	0	0	0	0	0
ESE	0	1	0	0	0	0	1
SE	0	1	6	0	0	0	7
SSE	0	0	2	1	0	0	3
S	0	0	3	7	0	0	10
SSW	0	0	3	0	0	0	3
SW	0	0	1	0	0	0	1
WSW	0	0	2	4	0	0	6
W	0	1	3	5	1	0	10
WNW	0	0	5	1	0	0	6
NW	0	0	6	2	0	0	8
NNW	0	0	7	4	0	0	11
Variable	0	0	0	0	0	0	0
Total	0	6	52	28	1	0	87

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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Moderately Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	1	1	0	0	3
NNE	0	3	6	1	0	0	10
NE	0	6	6	0	0	0	12
ENE	0	6	5	0	0	0	11
E	0	4	1	0	0	0	5
ESE	0	5	0	0	0	0	5
SE	0	4	5	0	0	0	9
SSE	0	1	1	2	0	0	4
S	0	5	9	4	0	0	18
SSW	0	2	11	2	0	0	15
SW	0	0	5	3	2	0	10
WSW	0	1	10	7	0	0	18
W	0	3	6	4	0	0	13
WNW	0	1	2	0	0	0	3
NW	0	4	7	0	1	0	12
NNW	0	2	5	2	0	0	9
Variable	0	0	0	0	0	0	0
Total	0	48	80	26	3	0	157

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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Slightly Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	1	1	0	0	5
NNE	0	0	3	2	0	0	5
NE	0	7	7	0	0	0	14
ENE	0	2	2	1	0	0	5
E	0	3	0	0	0	0	3
ESE	0	12	2	0	0	0	14
SE	0	21	2	0	0	0	23
SSE	1	5	2	0	0	0	8
S	0	12	10	1	1	0	24
SSW	1	2	6	2	1	0	12
SW	0	7	7	4	1	0	19
WSW	0	3	8	2	0	0	13
W	0	4	9	3	0	0	16
WNW	0	4	2	5	0	0	11
NW	0	12	5	1	0	0	18
NNW	0	6	4	3	0	0	13
Variable	0	0	0	0	0	0	0
Total	2	103	70	25	3	0	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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Neutral - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	20	23	5	0	0	50
NNE	2	13	9	7	1	0	32
NE	1	14	32	11	0	0	58
ENE	0	10	8	1	0	0	19
E	2	14	7	1	0	0	24
ESE	3	12	1	0	0	0	16
SE	3	32	11	3	0	0	49
SSE	3	22	22	8	1	0	56
S	4	10	15	20	0	0	49
SSW	3	9	23	8	1	0	44
SW	1	17	14	4	2	0	38
WSW	2	16	14	8	0	0	40
W	1	16	14	10	0	0	41
WNW	1	14	13	10	2	0	40
NW	3	7	26	4	2	0	42
NNW	3	9	16	6	0	0	34
Variable	0	0	0	0	0	0	0
Total	34	235	248	106	9	0	632

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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Slightly Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	8	12	3	0	0	23
NNE	3	5	7	5	0	0	20
NE	1	5	17	11	0	0	34
ENE	1	6	18	9	0	0	34
E	1	6	12	5	0	0	24
ESE	0	14	24	15	1	0	54
SE	0	25	61	3	0	0	89
SSE	1	11	48	9	0	0	69
S	2	6	49	20	1	0	78
SSW	0	5	35	29	1	0	70
SW	0	7	16	17	0	0	40
WSW	1	12	10	8	0	0	31
W	0	7	14	5	0	0	26
WNW	1	9	10	6	0	0	26
NW	1	8	27	7	0	0	43
NNW	1	3	10	1	0	1	16
Variable	0	0	0	0	0	0	0
Total	13	137	370	153	3	1	677

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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Moderately Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	5	2	0	0	9
NNE	2	2	14	1	0	0	19
NE	1	5	10	13	0	0	29
ENE	2	6	14	8	0	0	30
E	1	4	14	6	0	0	25
ESE	1	1	13	5	0	0	20
SE	0	7	12	1	0	0	20
SSE	1	3	10	7	0	0	21
S	0	6	2	1	0	0	9
SSW	2	2	13	1	0	0	18
SW	0	1	10	1	0	0	12
WSW	0	7	7	2	0	0	16
W	0	4	14	0	0	0	18
WNW	0	2	7	0	0	0	9
NW	0	2	9	0	0	0	11
NNW	2	4	8	2	0	0	16
Variable	0	0	0	0	0	0	0
Total	12	58	162	50	0	0	282

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: 4

Clinton Power Station

Period of Record: July - September 2023
Stability Class - Extremely Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	2	5	0	0	0	8
NNE	0	4	4	1	0	0	9
NE	1	8	8	5	0	0	22
ENE	1	8	11	13	0	0	33
E	0	3	11	2	0	0	16
ESE	0	7	8	0	0	0	15
SE	1	1	3	0	0	0	5
SSE	0	4	1	0	0	0	5
S	0	2	1	0	0	0	3
SSW	0	1	2	0	0	0	3
SW	1	1	5	0	0	0	7
WSW	0	0	7	0	0	0	7
W	0	3	6	0	0	0	9
WNW	1	3	5	0	0	0	9
NW	1	4	6	0	0	0	11
NNW	0	2	2	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	7	53	85	21	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: 4

Period of Record: October - December 2023
Stability Class - Extremely Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	5	0	0	0	5
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	1	0	0	0	1
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	4	0	0	0	4
NNW	0	0	4	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	0	0	14	0	0	0	14

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Moderately Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	5	0	0	0	5
NNE	0	0	2	1	0	0	3
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	4	0	0	0	0	4
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	0	1
SSW	0	1	2	0	0	0	3
SW	0	0	2	0	0	0	2
WSW	0	0	0	0	0	0	0
W	0	0	0	3	0	0	3
WNW	0	0	4	2	0	0	6
NW	0	1	11	1	0	0	13
NNW	0	3	3	2	0	0	8
Variable	0	0	0	0	0	0	0
Total	0	9	30	9	0	0	48

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Slightly Unstable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	4	0	0	0	7
NNE	0	1	2	0	0	0	3
NE	0	1	4	0	0	0	5
ENE	0	3	0	0	0	0	3
E	0	0	0	0	0	0	0
ESE	0	1	1	0	0	0	2
SE	0	2	0	0	0	0	2
SSE	0	0	0	0	0	0	0
S	2	7	8	0	0	0	17
SSW	0	6	12	4	0	0	22
SW	0	1	5	0	0	0	6
WSW	0	0	11	0	0	0	11
W	0	3	6	2	0	0	11
WNW	0	2	1	4	1	0	8
NW	0	2	14	3	0	0	19
NNW	0	2	2	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	2	34	70	13	1	0	120

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Neutral - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	23	36	1	0	0	61
NNE	1	8	28	5	0	0	42
NE	0	14	7	0	0	0	21
ENE	1	9	11	0	0	0	21
E	3	5	18	0	0	0	26
ESE	1	12	6	0	0	0	19
SE	3	22	6	0	0	0	31
SSE	4	36	18	0	0	0	58
S	3	45	53	4	0	0	105
SSW	2	13	74	42	0	0	131
SW	3	13	20	3	0	0	39
WSW	1	8	24	5	1	0	39
W	1	16	48	13	0	0	78
WNW	1	16	50	32	3	0	102
NW	0	10	70	18	11	0	109
NNW	1	7	46	1	0	0	55
Variable	0	0	0	0	0	0	0
Total	26	257	515	124	15	0	937

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Slightly Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	16	6	0	0	0	23
NNE	0	9	8	0	0	0	17
NE	3	4	0	0	0	0	7
ENE	1	13	2	0	0	0	16
E	6	13	4	0	0	0	23
ESE	2	17	0	0	0	0	19
SE	10	46	9	2	0	0	67
SSE	11	48	8	0	0	0	67
S	3	60	58	2	0	0	123
SSW	1	40	89	33	0	0	163
SW	2	32	14	0	0	0	48
WSW	3	25	8	2	0	0	38
W	6	20	3	0	0	0	29
WNW	6	32	19	0	0	0	57
NW	3	24	31	1	0	0	59
NNW	6	17	10	0	0	0	33
Variable	0	0	0	0	0	0	0
Total	64	416	269	40	0	0	789

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Moderately Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	1	0	0	0	0	2
NNE	1	6	0	0	0	0	7
NE	2	4	0	0	0	0	6
ENE	2	1	0	0	0	0	3
E	2	1	0	0	0	0	3
ESE	5	3	0	0	0	0	8
SE	4	16	0	0	0	0	20
SSE	5	15	0	0	0	0	20
S	4	24	5	0	0	0	33
SSW	1	14	2	0	0	0	17
SW	0	11	0	0	0	0	11
WSW	6	4	0	0	0	0	10
W	6	11	0	0	0	0	17
WNW	2	7	0	0	0	0	9
NW	3	8	1	0	0	0	12
NNW	2	2	0	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	46	128	8	0	0	0	182

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Extremely Stable - 60m-10m Delta-T (F)
Winds Measured at 10 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	4	0	0	0	0	0	4
NNE	1	0	0	0	0	0	1
NE	10	6	0	0	0	0	16
ENE	6	0	0	0	0	0	6
E	9	0	0	0	0	0	9
ESE	7	1	0	0	0	0	8
SE	9	0	0	0	0	0	9
SSE	1	0	0	0	0	0	1
S	1	3	0	0	0	0	4
SSW	4	6	1	0	0	0	11
SW	2	4	0	0	0	0	6
WSW	5	3	0	0	0	0	8
W	11	4	0	0	0	0	15
WNW	2	0	0	0	0	0	2
NW	6	4	1	0	0	0	11
NNW	6	1	0	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	84	32	2	0	0	0	118

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Extremely Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	4	0	0	5
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	1	0	0	1
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	5	0	0	5
NNW	0	0	0	3	0	0	3
Variable	0	0	0	0	0	0	0
Total	0	0	1	13	0	0	14

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Moderately Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	2	3	0	0	5
NNE	0	0	0	3	0	0	3
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	0	0	0	1
SE	0	0	3	0	0	0	3
SSE	0	0	0	0	0	0	0
S	0	1	1	1	0	0	3
SSW	0	0	0	2	0	0	2
SW	0	0	1	0	0	0	1
WSW	0	0	0	0	0	0	0
W	0	0	0	0	3	0	3
WNW	0	0	1	4	2	0	7
NW	0	0	6	6	2	0	14
NNW	0	1	3	1	1	0	6
Variable	0	0	0	0	0	0	0
Total	0	2	18	20	8	0	48

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Slightly Unstable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	2	1	0	0	5
NNE	0	0	0	2	0	0	2
NE	0	2	1	3	0	0	6
ENE	0	2	1	0	0	0	3
E	0	0	0	0	0	0	0
ESE	0	1	1	1	0	0	3
SE	0	0	1	0	0	0	1
SSE	1	0	0	0	0	0	1
S	0	6	13	3	1	0	23
SSW	0	3	0	12	1	0	16
SW	0	1	5	2	0	0	8
WSW	0	0	7	3	0	0	10
W	0	2	6	3	0	0	11
WNW	0	0	1	1	4	2	8
NW	0	2	5	10	2	0	19
NNW	0	0	1	3	0	0	4
Variable	0	0	0	0	0	0	0
Total	1	21	44	44	8	2	120

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Neutral - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	6	18	28	5	0	57
NNE	0	3	8	17	2	0	30
NE	0	2	8	10	0	0	20
ENE	1	1	7	11	3	0	23
E	1	8	0	11	11	0	31
ESE	1	4	6	6	1	0	18
SE	1	12	16	5	4	0	38
SSE	2	20	23	23	1	0	69
S	1	16	42	40	22	3	124
SSW	2	4	14	53	29	0	102
SW	0	4	19	7	2	0	32
WSW	2	5	21	15	3	3	49
W	1	0	29	38	7	0	75
WNW	1	2	26	39	32	9	109
NW	0	1	19	60	13	10	103
NNW	0	4	11	38	4	0	57
Variable	0	0	0	0	0	0	0
Total	13	92	267	401	139	25	937

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Slightly Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	10	13	0	0	23
NNE	0	1	4	11	0	0	16
NE	0	3	3	1	0	0	7
ENE	1	2	4	6	0	0	13
E	0	4	6	14	1	0	25
ESE	0	1	8	4	0	0	13
SE	0	7	51	17	4	0	79
SSE	0	6	31	32	1	0	70
S	1	4	42	90	23	1	161
SSW	0	1	26	59	28	8	122
SW	1	2	28	17	1	0	49
WSW	1	0	10	16	1	0	28
W	0	4	19	8	1	0	32
WNW	1	5	24	21	0	0	51
NW	1	9	24	29	2	0	65
NNW	0	3	16	16	0	0	35
Variable	0	0	0	0	0	0	0
Total	6	52	306	354	62	9	789

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Moderately Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	3	0	0	0	5
NNE	0	1	6	4	0	0	11
NE	0	1	3	0	0	0	4
ENE	0	0	1	2	0	0	3
E	0	0	3	0	0	0	3
ESE	0	0	4	0	0	0	4
SE	0	1	13	4	0	0	18
SSE	0	0	13	11	0	0	24
S	0	0	9	11	0	0	20
SSW	0	0	7	22	0	0	29
SW	0	0	4	10	0	0	14
WSW	0	1	4	3	0	0	8
W	0	2	8	5	0	0	15
WNW	0	0	11	2	0	0	13
NW	0	0	5	3	0	0	8
NNW	0	0	3	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	0	8	97	77	0	0	182

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

Clinton Power Station

Period of Record: October - December 2023
Stability Class - Extremely Stable - 60m-10m Delta-T (F)
Winds Measured at 60 Meters

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	3	0	0	0	4
NNE	2	0	3	0	0	0	5
NE	1	3	6	1	0	0	11
ENE	0	4	1	2	0	0	7
E	1	1	4	0	0	0	6
ESE	0	2	4	0	0	0	6
SE	2	4	6	0	0	0	12
SSE	0	2	8	1	0	0	11
S	1	2	4	0	0	0	7
SSW	0	4	3	1	0	0	8
SW	1	2	3	5	0	0	11
WSW	1	2	5	5	0	0	13
W	0	0	1	4	0	0	5
WNW	0	2	4	0	0	0	6
NW	0	0	0	3	0	0	3
NNW	0	1	2	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	9	30	57	22	0	0	118

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

SECTION 8

ODCM OPERATIONAL REMEDIAL REQUIREMENT REPORT

In accordance with CPS ODCM 3.1.1 Action G.1, 3.2.1 Action F.1, and 3.2.2 Action G.1; NON-FUNCTIONAL radioactive liquid and gaseous effluent monitoring instrumentation channels remaining in a NON-FUNCTIONAL condition for greater than the designated time shall be reported in the Annual Radioactive Effluent Release Report.

During the course of 2023, there were three (3) instances where a gaseous effluent monitoring instrumentation channel remained in a NON-FUNCTIONAL condition for greater than a seventy-two (72) hour period. The three instances are documented below.

Throughout 2023, there was one (1) instance of missed ODCM required samples and two (2) instances of delayed ODCM required samples. There was one (1) instance in which the required LLDs were not met for a weekly ODCM surveillance. A summary of the sample exceptions are captured below.

During the course of 2023, there was one (1) instance where the Constellation fleet radiochemistry crosscheck results performed by the vendor lab, Teledyne Brown Engineering, were not in agreement with the Eckert and Ziegler values. The instance is documented below. Additionally, there was one (1) instance where the gross-alpha radiochemistry crosscheck was not performed by Clinton during 2023. This instance is documented below.

January 27, 2021 – Issue Report # 04398363

0RIX-PR008, Standby Gas Treatment System Exhaust AXM, Channel 4 (Intermediate-Range Noble Gas Activity Monitor) was declared Non-Functional on 1/27/21. The AXM was previously declared Non-Functional when setting conditions for IMD to commence the intermediate-range noble gas channel calibration. The Cd-109 source check following the calibration of channel 4 failed high, and with the AS LEFT counts high out of specification, 0RIX-PR008 remained in Non-Functional Status. 0RIX-PR008 is required to either be restored to Functional status within 72 hours or an immediate initiation of the preplanned alternate method of monitoring the appropriate parameter must be promptly put in place. Although the instrument was not placed back into service within the 72 hour timeframe, the equipment for the pre-planned alternate method was immediately staged to satisfy ODCM 3.2.2 Condition F. The Work Order to troubleshoot and repair 0RIX-PR008 channel 4 was placed on the Plan of Day (POD) as a B3 priority due and Work Order 05122086 was generated. The extended Non-Functional condition is due to the troubleshooting and repair time required to obtain a new Cd-109 source and replace the GM detector.

August 31, 2021 – Issue Report # 04444333

0RIX-PR008, Standby Gas Treatment System Exhaust AXM, was declared Non-Functional on 8/31/21 due to the sample flow indicating 3.5 LPM when the sample pump was not in operation. Sample flow rate is required to be between 4-6 LPM when the pump is running per the requirement in 9000.02D001. Because the sample pump was not running and the sample flow indication was reading abnormally, 0RIX-PR008 was declared to remain in the Non-Functional status. 0RIX-PR008 is required to either be restored to Functional status within 72

hours or an immediate initiation of the preplanned alternate method of monitoring the appropriate parameter must be promptly put in place. Although the instrument was not placed back into service within the 72 hour timeframe, the equipment for the pre-planned alternate method was immediated staged to satisfy ODCM 3.2.2 Action F. Work Order 051595182 was generated to replace and calibrate 0RIX-PR008 flow indication. This work was given a status of C7 for priority. The extended Non-Functional condition is due to the troubleshooting and repair time required to replace and calibrate flowmeter 0FI-PR008B.

March 23, 2023 – Issue Report # 04564258
0RIX-PR012 SAMPLE PUMP IS FAILED

0RIX-PR012, Station HVAC Exhaust AXM, was declared Non-functional on 3/23/23 due to intermittent flow issues during the weekly chemistry surveillance for noble gas and tritium sampling. Sample flow rate was observed at 0 LPM when the requirement per 9000.02D001 states flow rate must be 4-6 LPM when the pump is running. Chemistry established alternate sampling from the in-service Station HVAC Exhaust PRM to obtain the weekly samples. Work Order 05349266 was performed on 3/30/23 by IMD to perform troubleshooting and repair of the failed sample pump. The pump was started several times and flow was monitored with no issues identified. On 3/31/23 the flow issues presented again and 0RIX-PR012 remained Non-Functional. There were no other instances during 2023 where the sample pump was non-functional. 0RIX-PR012 is required to either be restored to Functional status within 72 hours or an immediate Inititation of the preplanned alternate method of monitoring the appropriate parameter must be promptly put in place. Although the instrument was not placed back into service within the 72 hour timeframe, the equipment for the pre-planned alternate method was immediately staged to satisfy ODCM 3.2.2 Action F. The Work Order to correct the issue with the 0RIX-PR012 sample pump was placed on the Plan of Day (POD) as a B3 priority, and Work Order 05493927 was generated. The extended Non-Functional condition is due to the troubleshooting and repair time required to obtain and replace the sample pump.

September 28, 2023 – Issue Report # 4705738
DELAYED ODCM NG & TRITIUM

A SGTS (VG) run was initiated at 0315 on 9/28/23 as a result of CRVICS testing during C1R21. At this time, 0RIX-PR008 not available to obtain grab samples due to the AR/PR LAN being secured to support a power outage (Unit Sub P). 0RIX-PR008 is not required to FUNCTIONAL in Modes 4 or 5, however, noble gas and tritium samples for SGTS are required to be obtained "upon initiation of flow without delay in a controlled manner" for each release in accordance with ODCM, CY-CL-170-301, Table 4.4.1-1 B.1. In the event 0RIX-PR008 is not available for sampling, the grab samples can be taken through the alternate sampling method from the in-service PRM. The chemistry samples were not obtained until the following shift at 0837 and 0908 on 9/28/23, resulting in grab samples taken upwards of five hours following the start-up of VG. This does not constitue obtaining a sample without delay per the ODCM. The delay in obtaining samples was due to a miscommunication over the requirements for sampling VG. The delayed noble gas and tritium results were as anticipated.

October 5, 2023 – Issue Report# 04708574

ODCM/RETS LLDs Not Met for Weekly Gas Effluent SR

Particulate and iodine filter media were collected from 0RIX-PR003, Standby Gas Treatment System Exhaust PRM, in accordance with ODCM, CY-CL-170-301, Table 4.4.1-1 B.2 and B.3 to meet the weekly surveillance requirements. Due to very minimal sample volume collected on the filter media with a total run time of 13 minutes (0.22 hours) during the week, the ODCM required LLDs could not be met for I-133. The particulate filter was analzyed for 4.29 hours on the HPGe detectors and was able to meet ODCM LLD requirements. The iodine cartridge was analzyed for 7.22 hours and was able to meet ODCM LLD requirements for I-131, but the LLD requirement for I-133 was not met. Because VG ran the week prior, the results for I-133 activity would be used in dose projections as a conservative measure. No I-133 activity was seen in the previous week's VG run and therefore, no I-133 was included in the weekly dose projections.

November 7, 2023 – Issue Report # 04715931
ODCM SAMPLE WITH START OF VG

A SGTS (VG) run was manually initiated at 0247 at 11/7/23 to maintain secondary containment differential pressure after VF dampers closed from loss of air. Due to lack of chemistry resources, the noble gas and tritium samples were collected on the following shift at 0926 on 11/7/23. The ODCM, CY-CL-170-301, Table 4.4.1-1, B.1 requires a noble gas and tritium sample to be obtained "upon initiation of flow without delay in a controlled manner." The chemistry samples were taken upwards of six hours following the start-up of VG which does not constitute obtaining a sample without delay. The delayed noble gas and tritium results were as anticipated.

December 1, 2023 – Issue Report # 04721436
ODCM SAMPLES COLLECTED OUTSIDE SURVEILLANCE GRACE PERIOD

On 12/1/23 the ODCM surveillance requirement for obtaining samples IAW CY-CL-17-301 Table 4.4.1-1 was completed outside of the surveillance grace period. Per ODCM 4.4.1.1 and 4.4.1.2, the frequency of the Surveillance Requirement to sample and analyze is performed IAW ODCM Table 4.4.1-1. Table 4.4.1-1.A.1 states that Noble Gas and Tritium are sampled and analyzed weekly. Additionally, Table 4.4.1-1.A.2 and A.3 state that Iodine and Particulate, respectively, are collected continuously and analyzed weekly. Table notations further define this sampling and analysis period for iodine/particulate in Table 4.4.1-1 Table Notation 4 which states, "Samples shall be changed at least once per 7 days and analysis shall be completed within 48 hours after changing, or after removal from sampler." Additionally, ODCM Table 1-1 Surveillance Frequency Notation defines notation W (Weekly) with a frequency of once per 7 days. The surveillance interval is interpreted to begin once the previous surveillance has been completed.

Section 4.0 Surveillance Requirements of the ODCM provides additional guidance. Section 4.0.1 states, "Surveillance requirements shall be met during the OPERATIONAL MODES or other conditions specified for individual Controls unless otherwise stated in an individual Surveillance Requirement." Section 4.0.2 goes on to state, "Each Surveillance Requirement shall be performed within the specified time interval with: a. A maximum allowable extension not to exceed 25% of the surveillance interval." Section 4.0.3 states, "Failure to perform a Surveillance Requirement, whether such failure is experienced during the performance of the surveillance or between performances of the surveillance, within the allowed surveillance interval, defined by Specification 4.0.2, shall constitute noncompliance with the FUNCTIONALITY requirements for a Control. The time limits of the ACTION requirements are applicable at the time it is identified that

a Surveillance Requirement has not been performed. The ACTION requirements may be delayed for up to 24 hours to permit the completion of the surveillance when the allowable outage time limits of the ACTION requirements are less than 24 hours. Surveillance Requirements do not have to be performed on non-functional equipment."

Because the 12/1/23 surveillance for ODCM gaseous effluent sampling and analysis was completed 9 days following the collection on 11/22/23, the surveillance is considered to have been completed outside of the 7-day surveillance interval with additional grace period of 25% (or 8-days). The 11/22/23 surveillance was scheduled a day early (originally scheduled on 11/23/23) to support Chemistry resources with the upcoming holiday. The following week, the surveillance was post-poned a day (originally scheduled for 11/30/23) due to a lack of chemistry resources. Samples were collected on the 9th day and results were as anticipated. The surveillance was rescheduled within the ODCM required sampling frequency following the discovery.

January 18, 2024 – Issue Report # 04732328
RADIOCHEMISTRY CROSSCHECK RESULTS 4th QUARTER

Multiple disagreements in the 4th quarter crosscheck results between Teledyne Brown and Eckert and Ziegler were identified. One discrepancy was the result of Eckert and Ziegler incorrectly entering a concentration for an isotope that was not present in the crosscheck sample. Another discrepancy by Eckert and Ziegler Analytics (EZA) was due to an error in dilution calculations. Once those issues were resolved, three disagreements remained for Ce-141, Cr-51, and Cs-137 activity. Teledyne Brown reprepared/reanalyzed the crosscheck sample in a different geometry which was a better match for the sample type, and the results were in agreement. Nonconformance report (NCR No. NCR 23-25) was prepared and submitted along with a revised analysis report of the rerun with a different geometry.

March 14, 2024 – Issue Report # 04758078
GROSS-ALPHA INTERLABORATORY CROSSCHECKS NOT PERFORMED

It was discovered the interlaboratory crosscheck analysis for gross-alpha had not been performed for the previous ten years IAW RG 4.15, Rev. 1 and USAR CH01 Section 8 and USAR CH12 Section 5. Because gross-alpha is performed once per 31 days on samples from Station HVAC Exhaust and SGTS Exhaust, a crosscheck is required to be performed annually. It was discovered Clinton historically sent the gaseous effluent samples to TBE for both HTD and gross-alpha analyses on a monthly frequency, and since the gross-alpha analysis was being performed at the vendor lab (which participated in the interlaboratory comparison program), compliance with RG 4.15 was met.

However, this changed in 2014 and gross-alpha analysis was performed by TBE for the last time on the October 2014 HVAC and SGTS particulate filters. The change in process resulted in the gross-alpha analysis being performed on-site by RP techs as part of the 9947.01 surveillance. Communications with EZA confirmed that since 2014, Clinton has not ordered a gross-alpha crosscheck source. Because no gross-alpha crosscheck source was ordered, Clinton has not been participating in the interlaboratory comparison program for this analysis. A gross-alpha crosscheck source has been ordered through EZA for analysis in May 2024, and arrangements have been made to send the monthly composite to TBE for gross-alpha analysis beginning in March 2024.

SECTION 9

CHANGES TO RADIOACTIVE WASTE TREATMENT SYSTEMS

In accordance with Section 6.2 of the CPS ODCM, licensee-initiated changes to the liquid, gaseous or solid radioactive waste treatment systems shall be reported in the Annual Radioactive Effluent Release Report.

There were no permanent changes to the Radioactive Waste Treatment Systems during the course of the 2023 reporting period; therefore, there is no documentation required in the 2023 Annual Radioactive Effluent Release Report.

SECTION 10

NEW LOCATIONS FOR DOSE CALCULATION AND/OR ENVIRONMENTAL MONITORING

The following is a summary of the 2023 Annual Land Use Census. It shows changes in locations for dose calculations and/or environmental monitoring identified by the Annual Land Use Census. The distance of the receptor is being listed in the report in lieu of the name of the resident. This is being done to maintain and respect the privacy of the residents.

1.0 Nearest Residents

TABLE 19
Nearest Residence

The nearest residents identified in each of the sixteen (16) sectors are shown below.

SECTOR	2023 RESIDENT (km)	AGE GROUP	2022 RESIDENT (km)	AGE GROUP
N	1.50	A	1.50	A
NNE	1.50	A	1.50	A
NE	2.07	A	2.07	A
ENE	4.20*	A*	2.86	C/A*
E	1.67	A	1.67	A
ESE	5.14	A	5.14	A
SE	4.44	C/T*/A	4.44	C/A
SSE	2.90	A	2.90	A
S	4.78	4	4.78	A
SSW	4.68	A	4.68	A
SW	1.17	A	1.17	A
WSW	3.62	A	3.62	A
W	1.95	T/A	1.95	T/A
WNW	2.63	A	2.63	A
NW	2.65	A	2.65	A
NNW	2.05	A	2.05	A

*Indicates any changes from the previous year

(I)nfant (C)hild (T)een (A)dult

2.0 Broadleaf Garden Census

Fifty-seven (57) gardens within a five (5) kilometer radius were located in the sixteen (16) geographical sectors surrounding CPS. Fifteen (15) gardens contained broad leaf vegetation, which were specifically identified for this report. Although other crops were identified within these areas, they are not addressed as part of this report.

The nearest gardens greater than fifty (50) square-meters and producing broadleaf vegetation identified in each of the sixteen (16) geographical sectors are shown below.

TABLE 20
Nearest Broadleaf Garden

SECTOR	2023 GARDENS (km)	AGE GROUPS	2022 GARDENS (km)	AGE GROUPS
N	4.87*	A	1.50	A
NNE	4.78	A	4.78	A
NE	>8		>8*	
ENE	4.35	A*	4.35*	C/A
E	1.67	A	1.67*	A*
ESE	>8		>8	
SE	>8		>8	
SSE	4.32	C/T/A	4.32*	C/T/A*
S	>8		>8	
SSW	>8		>8	
SW	>8*		5.61*	A*
WSW	>8*		3.66	A
W	3.32*	A*	>8*	
WNW	2.63	A	2.63	A
NW	4.70	C/A	4.70	C/A
NNW	3.76*	A	2.05	A

*Indicates any changes from the previous year

(I)nfant (C)hild (T)een (A)dult

3.0 Milking Animal Census

Milking animals within the sixteen (16) geographical sectors were located within five (5) miles surrounding CPS. These milking animals were either used for the nursing of the animal's offspring or used for meat production for the resident's own personal use and sold commercially. There were no residents that milked their animals for human consumption.

Milking animals were specifically identified for this report. Although other livestock were identified within these areas, they are not addressed as part of this report.

The nearest milking animals identified in each of the sixteen (16) geographical sectors are shown below.

TABLE 21
Nearest Milking Animal

SECTOR	2023 MILKING ANIMALS (km)	AGE GROUPS*	2022 MILKING ANIMALS (km)	AGE GROUPS
N	1.50	A	1.50	A
NNE	5.75*	A*	>8	
NE	>8		>8	
ENE	>8		>8	
E	>8		>8	
ESE	>8		>8	
SE	>8		>8	
SSE	>8		>8	
S	>8		>8	
SSW	>8		>8	
SW	>8		>8	
WSW	4.32	A*	4.32	A/T
W	>8		>8	
WNW	>8		>8	
NW	>8		>8	
NNW	2.05	A	2.05	A

*Indicates any changes from the previous year

(I)nfant (C)hild (T)een (A)dult

SECTION 11

CORRECTIONS TO DATA REPORTED IN PREVIOUS REPORTS

There were administrative changes identified against two previously submitted Annual Radioactive Effluent Release Reports resulting in errata data submittal to the Commision.

In the 2022 ARERR report, a transpositional error was identified in the gaseous effluent release table (Table 2). Table 2 Section A, reported 1.51E+00 Curies for the Ar-41 and total fission gases released during the third quarter. The correct value for Ar-41 and total fission gases released in the third quarter of 2022 is listed under Section 4, Table 1 as 1.51+01 Curies. This error did not affect the reporting of dose or dose rate as the correct value for Ar-41 was used in the calculations. Attachment 1 depicts the corrected pages. **Attt**

In the 2021 and 2022 ARERR reports, it was discovered that the Non-Functional status of 0RIX-PR008 was not reported under Section 8, ODCM Operational Remedial Requirement Report. During the course of 2021 and 2022, there were two (2) instances where a gaseous effluent monitoring instrumentation channel remained in a NON-FUNCTIONAL condition for greater than a seventy-two (72) hour period. 0RIX-PR008 was declared Non-Functional on 1/27/21 and has remained Non-Functional. Therefore, the Non-Functional status is required to be reported in the ARERR in accordance with CPS ODCM, CY-CL-170-301, 3.2.2 Action G.1. Attachment 2 and Attachment 3 depict the corrected pages.

ATTACHMENT 1
UPDATED 2022 TABLE 2
Gaseous Effluents - Nuclides Released
Clinton Power Station
YEAR: 2022

Mixed Mode Release	X
Elevated Release	
Ground-Level Release	

Continuous Mode	X
Batch Mode	

	Units	Quarter 1[1]	Quarter 2[1]	Quarter 3[1]	Quarter 4[1]
A. Fission Gases					
Xe^{135}	Ci	3.35E+00	<LLD	<LLD	<LLD
Kr^{85m}	Ci	<LLD	<LLD	<LLD	<LLD
Xe^{133}	Ci	<LLD	<LLD	<LLD	<LLD
Kr^{88}	Ci	<LLD	<LLD	<LLD	<LLD
Ar^{41}	Ci	1.65E+00	3.40E+00	1.51E+01	5.95E+00
Total for Period	Ci	5.00E+00	3.40E+00	1.51E+01	5.95E+00
B. Iodines					
I^{131}	Ci	<LLD	<LLD	<LLD	<LLD
I^{133}	Ci	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD
C. Particulates					
Co^{60}	Ci	<LLD	<LLD	<LLD	<LLD
Y^{91m} [2]	Ci	<LLD	<LLD	<LLD	<LLD
Nb^{95}	Ci	<LLD	<LLD	<LLD	<LLD
Ce^{141}	Ci	<LLD	<LLD	<LLD	<LLD
Cr^{51}	Ci	<LLD	<LLD	<LLD	<LLD
Mn^{54}	Ci	1.19E-05	<LLD	<LLD	<LLD
Na^{24} [2]	Ci	<LLD	<LLD	<LLD	<LLD
Cd^{109}	Ci	<LLD	<LLD	<LLD	<LLD
Cs^{138} [2]	Ci	<LLD	<LLD	<LLD	<LLD
Co^{58}	Ci	<LLD	<LLD	<LLD	<LLD
Zn^{65}	Ci	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	1.19E-05	<LLD	<LLD	<LLD
D. Gross Alpha					
Gross Alpha	Ci	<LLD	<LLD	<LLD	<LLD
E. Tritium					
Total for Period	Ci	6.99E+00	6.97E+00	6.63E+00	8.66E+00
F. Carbon-14					
Total for Period	Ci	4.01E+00	4.35E+00	4.38E+00	4.41E+00

[1] The lower the value of the actual sample activity - with respect to background activity – the greater the counting error. Proportionally, large errors are reported for the various components of CPS gaseous effluents because of their consistent low sample activity.

[2] Half-life is less than 8 days, therefore not included in Table 1 Summation.

ATTACHMENT 2
UPDATED 2021 SECTION 8

ODCM OPERATIONAL REMEDIAL REQUIREMENT REPORT

In accordance with CPS ODCM 3.1.1 Action G.1, 3.2.1 Action F.1, and 3.2.2 Action G.1; NON-FUNCTIONAL radioactive liquid and gaseous effluent monitoring instrumentation channels remaining in a NON-FUNCTIONAL condition for greater than the designated time shall be reported in the Annual Radioactive Effluent Release Report.

During the course of 2021, there were two (2) instances where a gaseous effluent monitoring instrumentation channel remained in a NON-FUNCTIONAL condition for greater than a seventy-two (72) hour period. The two instances are documented below.

January 27, 2021 – Issue Report # 04398363

0RIX-PR008, Standby Gas Treatment System Exhaust AXM, Channel 4 (Intermediate-Range Noble Gas Activity Monitor) was declared Non-Functional on 1/27/21. The AXM was previously declared Non-Functional when setting conditions for IMD to commence the intermediate-range noble gas channel calibration. The Cd-109 source check following the calibration of channel 4 failed high, and with the AS LEFT counts high out of specification, 0RIX-PR008 remained in Non-Functional Status. 0RIX-PR008 is required to either be restored to Functional status within 72 hours or an immediate initiation of the preplanned alternate method of monitoring the appropriate parameter must be promptly put in place. Although the instrument was not placed back into service within the 72 hour timeframe, the equipment for the pre-planned alternate method was immediated staged to satisfy ODCM 3.2.2 Action F. The Work Order to troubleshoot and repair 0RIX-PR008 channel 4 was placed on the Plan of Day (POD) as a B3 priority due and Work Order 05122086 was generated. The extended Non-Functional condition is due to the troubleshooting and repair time required to obtain a new Cd-109 source and replace the GM detector.

August 31, 2021 – Issue Report # 04444333

0RIX-PR008, Standby Gas Treatment System Exhaust AXM, was declared Non-Functional on 8/31/21 due to the sample flow indicating 3.5 LPM when the sample pump was not in operation. Sample flow rate is required to be between 4-6 LPM when the pump is running per the requirement in 9000.02D01. Because the sample pump was not running and the sample flow indication was reading abnormally, 0RIX-PR008 was declared to remain in the Non-Functional status. 0RIX-PR008 is required to either be restored to Functional status within 72 hours or an immediate initiation of the preplanned alternate method of monitoring the appropriate parameter must be promptly put in place. Although the instrument was not placed back into service within the 72 hour timeframe, the equipment for the pre-planned alternate method was immediated staged to satisfy ODCM 3.2.2 Action F. Work Order 051595182 was generated to replace and calibrate 0RIX-PR008 flow indication. This work was given a status of C7 for priority. The extended Non-Functional condition is due to the troubleshooting and repair time required to replace and calibrate flowmeter 0FI-PR008B.

ATTACHMENT 3
UPDATED 2022 SECTION 8

ODCM OPERATIONAL REMEDIAL REQUIREMENT REPORT

In accordance with CPS ODCM 3.1.1 Action G.1, 3.2.1 Action F.1, and 3.2.2 Action G.1; NON-FUNCTIONAL radioactive liquid and gaseous effluent monitoring instrumentation channels remaining in a NON-FUNCTIONAL condition for greater than the designated time shall be reported in the Annual Radioactive Effluent Release Report.

During the course of 2022, there were two (2) instances where a gaseous effluent monitoring instrumentation channel remained in a NON-FUNCTIONAL condition for greater than a seventy-two (72) hour period. The two instances are documented below.

January 27, 2021 – Issue Report # 04398363

0RIX-PR008, Standby Gas Treatment System Exhaust AXM, Channel 4 (Intermediate-Range Noble Gas Activity Monitor) was declared Non-Functional on 1/27/21. The AXM was previously declared Non-Functional when setting conditions for IMD to commence the intermediate-range noble gas channel calibration. The Cd-109 source check following the calibration of channel 4 failed high, and with the AS LEFT counts high out of specification, 0RIX-PR008 remained in Non-Functional Status. 0RIX-PR008 is required to either be restored to Functional status within 72 hours or an immediate initiation of the preplanned alternate method of monitoring the appropriate parameter must be promptly put in place. Although the instrument was not placed back into service within the 72 hour timeframe, the equipment for the pre-planned alternate method was immediated staged to satisfy ODCM 3.2.2 Action F. The Work Order to troubleshoot and repair 0RIX-PR008 channel 4 was placed on the Plan of Day (POD) as a B3 priority due and Work Order 05122086 was generated. The extended Non-Functional condition is due to the troubleshooting and repair time required to obtain a new Cd-109 source and replace the GM detector.

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0RIX-PR008, Standby Gas Treatment System Exhaust AXM, was declared Non-Functional on 8/31/21 due to the sample flow indicating 3.5 LPM when the sample pump was not in operation. Sample flow rate is required to be between 4-6 LPM when the pump is running per the requirement in 9000.02D01. Because the sample pump was not running and the sample flow indication was reading abnormally, 0RIX-PR008 was declared to remain in the Non-Functional status. 0RIX-PR008 is required to either be restored to Functional status within 72 hours or an immediate initiation of the preplanned alternate method of monitoring the appropriate parameter must be promptly put in place. Although the instrument was not placed back into service within the 72 hour timeframe, the equipment for the pre-planned alternate method was immediated staged to satisfy ODCM 3.2.2 Action F. Work Order 051595182 was generated to replace and calibrate 0RIX-PR008 flow indication. This work was given a status of C7 for priority. The extended Non-Functional condition is due to the troubleshooting and repair time required to replace and calibrate flowmeter 0FI-PR008B.

SECTION 12

CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL

The Offsite Dose Calculation Manual (ODCM) was last revised in September 2022. Revision 26 of the ODCM is not included with this submittal since no updates were made in 2023.