



DEPARTMENT OF THE ARMY
BUFFALO DISTRICT, CORPS OF ENGINEERS
1776 NIAGARA STREET
BUFFALO NY 14207-3199

REPLY TO
ATTENTION OF:

Special Projects Branch

June 21st, 2018

SUBJECT: Niagara Falls Storage Site 2017 National Emission Standards for Hazardous Air Pollutants Report

[REDACTED]
Radiation and Indoor Air Branch
U.S. Environmental Protection Agency, Region II
290 Broadway
New York, New York 10007

Dear [REDACTED]:

Enclosed please find the 2017 National Emission Standards for Hazardous Air Pollutants (NESHAP) report for the Niagara Falls Storage Site (NFSS). The results of this report, as it has in the past, will be included in the U.S. Army Corps of Engineers FUSRAP Niagara Falls Storage Site 2017 Environmental Surveillance Technical Memorandum, which is currently under development. In summary the Corps finds that the NFSS is in compliance with 40 CFR 61, Subpart H and Subpart Q.

Compliance with 40 CFR 61, Subpart H is determined by use of USEPA approved code CAP88-PC Version 4.0. The CAP88-PC hypothetical annual maximum dose to an off-site:

Resident (Infant):	1.6 E-04 mrem
Farmer (Infant):	1.3 E-04 mrem

The hypothetical annual doses to the nearest off-site worker and school corrected for 2,000 hours of exposure per year are:

Off-site worker (Adult):	8.2 E-05 mrem
School (Fifteen-year old):	1.3 E-05 mrem

The hypothetical annual dose to the maximally exposed off-site individual is therefore 1.6 E-04 mrem to a resident.

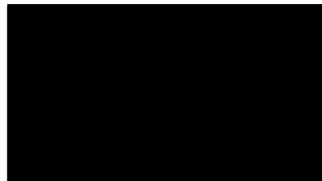
The CAP88-PC hypothetical annual effective dose for the population within 80 km of the facility is:

Population (Infant):	3.56 E-03 person-rem
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Compliance with 40 CFR 61, Subpart Q is demonstrated by the measurement of radon-222 (radon flux). Radon-222 flux at the NFSS was measured using 180 10-inch diameter activated carbon canisters placed at 15-meter intervals across the Interim Waste Containment Structure and sealed to the surface for a 24-hour exposure period, July 18th – 19th, 2017. Individual and average (0.0375 pCi/m²/sec) measurements were well below the NESHAP standard for radon flux of 20 pCi/m²/sec, with results ranging from non-detect to 0.1183 pCi/m²/s. These results are consistent with radon flux measured in previous years. The results do not exceed the established standard specified in 40 CFR 61, Subpart Q.

██████████ CHP is the technical point of contact for these results. He can be reached at ██████████ if you have any questions.

Sincerely,

A large black rectangular redaction box covering the signature of the Project Manager.

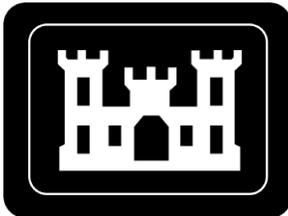
Project Manager – Niagara Falls Storage Site
Special Projects Branch

Enclosure

FUSRAP CY2017 NESHAP ANNUAL REPORT FOR NIAGARA FALLS STORAGE SITE (NFSS)

LEWISTON, NEW YORK

JUNE 2018



**U.S. Army Corps of Engineers
Buffalo District Office
Formerly Utilized Sites Remedial Action Program**

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ACRONYMS AND ABBREVIATIONS

BNI	Bechtel National, Inc.
CAP88-PC Ver 3	Clean Air Act Assessment Package-1988, Version 3.0 (Revised in 2013)
CAP88-PC Ver 4	Clean Air Act Assessment Package-1988, Version 4.0 (Revised in 2014)
CFR	Code of Federal Regulations
E_w	annual wind erosion emission
FUSRAP	Formerly Utilized Sites Remedial Action Program
ICRP	International Commission on Radiological Protection
IWCS	Interim Waste Containment Structure
m^2	square meter(s)
MEI	maximally exposed individual
ML	Modern Landfill
mph	miles per hour
NOAA	National Oceanic and Atmospheric Administration
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFIA	Niagara Falls International Airport
NFSS	Niagara Falls Storage Site
USAEC	United States Atomic Energy Commission
USACE	United States Army Corps of Engineers
UCL	upper confidence limit
USDOE	United States Department of Energy
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

In 1974, the United States Atomic Energy Commission (USAEC), a predecessor to the United States Department of Energy (USDOE), instituted the Formerly Utilized Sites Remedial Action Program (FUSRAP). This program is now managed by United States Army Corps of Engineers (USACE) to identify and clean up, or otherwise control sites where residual radioactivity remains from the early years of the nation's atomic energy program or from commercial operations causing conditions that Congress has authorized USACE to remedy under FUSRAP. The Niagara Falls Storage Site (NFSS) is a federally-owned storage site managed under FUSRAP. In October 1997, Congress transferred the responsibility for FUSRAP to USACE.

1.1 SITE DESCRIPTION

The Niagara Falls Storage Site (NFSS) is located in the Town of Lewiston in northwestern New York State, northeast of Niagara Falls and south of Lake Ontario (Attachment F). NFSS is approximately 77 hectare (~191 acre) site which includes: one metal storage building, one office building (Building 429), an equipment shed, and a 4 hectare (9.9 acre) interim waste containment structure (IWCS). The property is fenced, and public access is restricted.

Land use in the region is primarily rural; however, the site is bordered by a chemical waste disposal facility on the north, a solid waste disposal facility on the east and south, and a Niagara Mohawk Power Corporation right-of-way on the west. The nearest residential areas are approximately 1.1-km southwest of the site; the residences are primarily single-family dwellings.

1.2 SOURCE DESCRIPTION

Beginning in 1944, NFSS was used as a storage facility for radioactive residues and wastes. The residues and wastes are the process by-products of uranium extraction from pitchblende (uranium ore). Waste was also generated from remediation of buildings and process equipment used in the uranium extraction process. The residues originated at other sites and were transferred to NFSS for storage in buildings, on-site pits, and surface piles. Table 1 includes a brief history and description of the major radioactive residues and wastes transferred to NFSS. From 1953 to 1959 and 1965 to 1971, the former Building 401 was used as a boron-10 isotope separation plant.

Table 1. History and Description of Wastes Transferred to NFSS

Material	Description	Transferred to NFSS
L-50	Low-activity radioactive residues from the processing of low-grade uranium ores at Linde Air Products, Tonawanda, New York.	1944
R-10	Low-activity radioactive residues from the processing of low-grade uranium ores at Linde Air Products, Tonawanda, New York.	1944
F-32	Low-activity radioactive residues from the processing of high-grade uranium ores at Middlesex, New Jersey.	1944 to early 1950
L-30	Low-activity radioactive residues from the processing of low-grade uranium ores at Linde Air Products, Tonawanda, New York.	1945
K-65	High-activity radioactive residues from the processing of high-grade uranium ores at Mallinckrodt Chemical Works, St. Louis, Missouri.	1949
Middlesex Sands	Sand and abraded material from the sandblasting of buildings and process equipment where the F-32 residue was generated at Middlesex Metal Refinement Plant, Middlesex, New Jersey.	1950

Since 1971, activities at NFSS have been confined to residue and waste storage and remediation. On-site and off-site areas with residual radioactivity exceeding USDOE guidelines were remediated between 1981 and 1992. The materials generated during remedial actions (approximately 195,000 m³) are encapsulated in the IWCS, which is specifically designed to provide interim storage of the materials. Remedial investigation began at the end of 1999 to determine if any areas of the site contained radioactive or chemical contaminants at levels that could pose an unacceptable risk to human health and the environment. The CERCLA remedial investigation of the NFSS was completed in 2007. From 2012-2014 USACE investigated the NFSS Balance of Plant Operable Unit (which includes everything outside the IWCS, excluding groundwater). The Balance of Plant fieldwork delineated areas of groundwater and soil contamination as well as investigated underground utilities. The NFSS is currently in the feasibility study phase of the CERCLA process for the IWCS Operable Unit and the Balance of Plant Operable Unit.

2.0 REGULATORY STANDARDS

The United States Environmental Protection Agency's (USEPA) National Emission Standards for Hazardous Air Pollutants (NESHAP) are compliance standards that require annual reporting of emissions of radionuclides and radon gas from operations at nuclear facilities.

2.1 40 CFR 61, SUBPART H

40 CFR 61, Subpart H provides standards for reporting emissions of radionuclides (excluding radon-222 and radon-220) into the air from USDOE facilities. Although control and maintenance of the site currently rests with USACE, responsibility for NFSS will return to USDOE following completion of remedial actions. This regulation therefore provides an appropriate standard for NFSS. Compliance with Subpart H is verified by applying the USEPA approved code, CAP88-PC. CAP88-PC Version 4.0 (USEPA 2006, revised 2014) was used for this year's calculation. The applicable regulation, 40 CFR 61.92 limits exposure of the public to an annual effective dose equivalent of 10 mrem from airborne radioactive emissions.

2.2 40 CFR 61, SUBPART Q

40 CFR 61, Subpart Q applies to storage and disposal facilities for radium-containing material that emits radon-222 into air. NFSS is specifically identified as one such facility in this subpart (in 40 CFR 61.190). Compliance with Subpart Q is verified by annual monitoring of the IWCS for radon-222 flux. The Subpart Q radon-222 emission limit is 20 pCi/m²/s.

3.0 AIR EMISSION DATA

Table 2 summarizes the sources of air emissions. Attachment A contains the annual wind erosion emission (E_w) calculation. Attachment B contains the radioactive source term calculations and annual air releases.

These calculations use the USEPA air pollution emission factor methodology (AP-42) to estimate the radioactive release from wind erosion, which is then used as the source term in the Clean Air Act Assessment Package (CAP88-PC) model to estimate airborne doses to hypothetically exposed individuals. The annual wind erosion emission estimate uses the most current soil data from the NFSS Remedial Investigations and has been revised for this report to include all subsequent soils data collected during the NFSS Balance of Plant field investigations. For the year 2017 average soil concentrations without the subtraction of background radioactivity were calculated for each soil nuclide of concern and were used as the soil concentration for the source term estimate. The area of the entire NFSS was assumed to be uniformly contaminated and to contribute to the source term.

Table 2. Air Emission Data - NFSS

Point Sources	Type Control	Efficiency	Distance to Hypothetical Exposed Individual
none	not applicable	not applicable	not applicable
Area (Non-Point) Sources	Type Control	Efficiency	Distance and Direction from Center of Site to Hypothetical Exposed Individual
<i>in situ</i> soil –area source	vegetative cover	90 percent ^a	533 m SE Modern Scale-house Worker 783 m S Greenhouse Worker 914 m SSW Resident 1105 m S Resident (farm) 1250 m WSW Resident 1486 m ESE Resident 2499 m W School 2629 m WNW School
Group Sources	Type Control	Efficiency	Distance to Hypothetical Exposed Individual
none	not applicable	not applicable	not applicable

^a This is the fraction of vegetative cover used to correct emissions (Attachments A,B).

4.0 DOSE ASSESSMENTS

4.1 MODEL SOURCE DESCRIPTION

To determine the dose from airborne particulates potentially released from NFSS during CY2017, the annual wind erosion emission, E_w (Attachment A) is calculated using local climatological data (Attachment E) from the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center for the Niagara Falls International Airport (NFIA) in Niagara Falls, NY. E_w is calculated using the USEPA AP-42 methodology for “fugitive emissions” from an “area source” that uses the “fastest mile” wind speed data from local climatological data reports for the calendar year. E_w , in grams emitted, is then applied to the soil nuclide concentration to estimate the source term or annual emissions for each radionuclide. The soil concentration was developed from all sample data (new for this year) compiled since Phases I, II, and III of the Remedial Investigation for soil contamination (Attachment B). Contributions from radon gas, in accordance with regulatory guidance, are not considered in this calculation. Annual estimated emissions for each radionuclide were input into the USEPA’s CAP88-PC, Version 4.0 (revised 2014) code to calculate hypothetical receptor doses. The model estimates resultant doses from airborne particulates to hypothetical individuals at the distances to the nearest residence, commercial/industrial facility, school, and farm as measured from a central location on-site. Hypothetical doses are then corrected for occupancy. Commercial/industrial facility and school occupancy is assumed to be 40 hr/week for 50 weeks/yr. Residential and farm occupancy is assumed to be full-time/continuous for 24 hr/day for 365 days/yr. The hypothetical individual receiving the higher of these calculated doses is then identified as the maximally exposed individual (MEI) for airborne particulate dose.

4.2 DESCRIPTION OF DOSE MODEL

4.2.1 CAP88-PC Computer Program

The CAP88-PC model is a set of computer programs, databases, and associated utility programs that estimate the dose and risk from airborne radioactivity emissions. The USEPA NESHAP compliance procedures for airborne radioactivity emissions at USDOE facilities (40 CFR 61.93(a)) require the use of the CAP88-PC model, or other approved procedures to calculate effective dose equivalents to members of the public.

CAP88-PC uses a modified Gaussian plume equation to estimate the average dispersion of radionuclides released from a site. Assessments for population exposure are performed for a circular grid of distances and directions for a radius of 80 km (50 miles) around the facility. Agricultural arrays for EPA food source scenarios for vegetation, milk and meat, and for milk cattle and beef cattle density and land fraction cultivated are generated automatically. Dose and risk factors for CAP88-PC, Version 4.0 are from Federal Guidance Report 13 and are based on the methods detailed in International Commission on Radiological Protection (ICRP) 72 (ICRP72). CAP88-PC Version 4.0 includes a significant modification that adopts age-dependent dose and risk factors from FGR 13 for potential receptors including, adults, fifteen-year olds, ten-year olds, five-year olds, one-year olds and infants. This NESHAP report includes age-dependent doses for these receptors. The dose calculations presented in this document used the default values for nuclide lung clearance type. These defaults correspond to the recommended values from FGR 13. Deposition velocity and scavenging coefficient are calculated by the code in accordance with USEPA policy. In the CAP88 model nuclides are depleted from the plume by precipitation scavenging, dry deposition and radioactive decay. The default scavenging coefficient is calculated as a function of annual precipitation. The program calculates the effective dose equivalents received by receptors by combining the inhalation and ingestion intake rates and the air and ground surface concentrations using the appropriate dose conversion factors. For this year's NESHAP report the Annual Climatological Summary report for Niagara Falls International Airport from NOAA was unavailable at the time of writing this report and the monthly Quality Controlled Local Climatological Data reports for the airport were used to calculate the 2017 annual mean temperature (10.57 degrees Centigrade) and the total precipitation (105.82 centimeters) for input into CAP88. The data used to estimate these annual mean values is located in Attachment E.

4.2.2 CAP88-PC Input

Input parameters for CAP88 include:

- Radionuclide emissions (Attachment B),
- Weather data (average annual temperature, total annual precipitation) (Attachment E),
- Emission source height and area (Section 4.3), and
- Distance to nearest resident, off-site worker, school, and farm (Section 4.3).

4.2.3 CAP88-PC Output

The "Dose and Risk Equivalent Summaries" from CAP88-PC contains the resulting effective dose equivalents for each modeled scenario. The effective dose equivalent summary contains results for 16 compass directions (quadrants) around the facility for the nearest resident, off-site worker, school, and farm. CAP88-PC individual receptor and population output summaries are located in Attachment C and D, respectively.

4.3 COMPLIANCE ASSESSMENT

The released activity data from Attachment B is entered into the CAP88-PC modeling program to derive the hypothetical dose to the defined receptors. To derive the dose to the MEI, the CAP88-PC model must have weather data for the appropriate year, information on the emission source, and the distances and directions to the nearest residence, off-site worker, school, and farm. The following CY2017 meteorological data were entered into CAP88-PC (see Attachment E):

Average temperature	10.57 °C (51.98 °F) NFIA
Precipitation,	105.82 cm (25.37 inches) ML
Mixing height	1,000 m

The following emission source and nearest receptor distances and direction information were also entered into the program:

Source height	0 m
Source area	780,000 m ²
Resident	914 m SSW
Resident (farm)	1105 m S
Resident	1250 m WSW
Resident	1486 m ESE
Off-site worker	533 m SE
Off-site worker	783 m S
School (building)	2499 m W
School (building)	2629 m WNW

The CAP88-PC annual hypothetical dose to the nearest resident, off-site worker, school, and farm at the corresponding directions and distances taken from page six of the “Dose and Risk Equivalent Summaries” document for individual modeling (Attachment C) using age-dependent factors and listed including member of the public receiving the highest dose listed in Table 3 are:

Resident - Infant	1.6 E-04 mrem, SSW @ 914 m
Off-site worker - Adult	8.2 E-05 mrem, SE @ 533 m
School – Age Fifteen	1.3 E-05 mrem, W @ 2499 m
Farm - Infant	1.3 E-04 mrem, S @ 1105 m

The hypothetical doses to the nearest off-site worker and school corrected for an assumed 2,000 hr of exposure per year are:

Off-site worker – Adult	8.2 E-05 mrem, SE @ 533 m
School - Age Fifteen	1.3 E-05 mrem, W @ 2499 m

Table 3 lists the results of the age-dependent individual doses for all CAP88 receptors.

Table 3. Individual Doses to Hypothetical Receptors (mrem/year)

Receptor	Adult	Fifteen	Ten	Five	One	Infant
Worker SE at 533 m	8.2 E-05	NA	NA	NA	NA	NA
Resident SSW at 914 m	8.5 E-05	1.3 E-04	9.3 E-05	8.8 E-05	9.7 E-05	1.6 E-04
School W at 2499 m	8.0 E-06	1.3 E-05	9.1 E-06	8.2 E-06	NA	NA
Farmer S at 1105 m	6.6 E-05	1.0 E-04	7.3 E-05	6.8 E-05	7.6 E-05	1.3 E-04

Bold font indicates the highest individual (time corrected) used for the NESHAP reporting. NA indicates "not applicable."

5.0 SUPPLEMENTAL INFORMATION

5.1 POPULATION DOSE

The CAP88-PC model was also used to estimate the hypothetical airborne particulate dose to the population within 80 km of the site. Population data taken from Landscan 2013 Global Population Data from Oak Ridge National Laboratory, that included data for the United States and Canada, was used to create a population file for CAP88-PC. A population distribution map, generated using Landscan 2013 data, is included in Attachment F. The effective dose equivalent for the collective population in person-rem/yr is from the CAP88-PC "Dose and Risk Equivalent Summaries" report.

The age-dependent maximum CAP88-PC annual effective dose for the population within 80 km of the facility is 3.56 E-03 person-rem for an infant. The maximum annual effective dose for the each population age group is as follows (Attachment D):

Population:	Adult	1.44 E-03 person-rem
	Fifteen-year old	2.11 E-03 person-rem
	Ten-year old	1.69 E-03 person-rem
	Five-year old	1.64 E-03 person-rem
	One-year old	1.82 E-03 person-rem
	Infant	3.56 E-03 person-rem

5.2 RADON-222 FLUX

Measurement of radon-222 flux provides an indication of the rate of radon-222 emission from a surface. Radon-222 flux is measured with activated charcoal canisters placed at 15-m intervals across the surface of the IWCS for a 24-hr exposure period. Measurements for CY2017 are presented in the radon flux results with measurement locations (site map) in Attachment F.

Measured results for 2017 ranged from non-detect to 0.1183 pCi/m²/s, with an average result including detects and non-detects of 0.0375 pCi/m²/s. As in previous years, these results are well below the 20 pCi/m²/s standard specified in 40 CFR Part 61, Subpart Q, and demonstrate the effectiveness of the containment cell design and construction in mitigating radon-222 migration.

5.3 NON-APPLICABILITY

Requirements from section 61.93(b) of 40 CFR for continuous monitoring from point sources (stacks or vents) are not applicable to NFSS.

6.0 REFERENCES

Bechtel National, Inc. (BNI), 1997. "1996 Public Inhalation Dose" 14501-158-CV-030, Rev. 0, Oak Ridge, TN.

Environmental Protection Agency (EPA), 1995. *Compilation of Air Pollutant Emission Factors, Fifth Edition*, AP-42, Office of Air Quality Planning and Standards, Research Triangle Park, NC (January).

Environmental Protection Agency (EPA), 2006. CAP88-PC Version 4.0 Computer Code, U.S. Environmental Protection Agency.

Environmental Protection Agency (EPA), 1999. *Federal Guidance Report 13, Cancer Risk Coefficients for Environmental Exposure to Radionuclides*, EPA99 EPA 402-R-99_001, USEPA Office of Radiation and Indoor Air, Washington, DC.

International Commission on Radiological Protection (ICRP72), 1996. *Age Dependent Doses to Members of the Public from Intake of Radionuclides, Part 5, Compilation of Ingestion and Inhalation Dose Coefficients,* ICRP 72, Pergamon Press, Oxford.

40 CFR 61, Subpart H. *National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities.*

40 CFR 61, Subpart Q. *National Emission Standards for Radon Emissions from Department of Energy Facilities.*

ATTACHMENT A

ANNUAL WIND EROSION EMISSION CALCULATION

A.1 ANNUAL WIND EROSION

In 2017, the potential source of airborne emissions from NFSS is assumed to be from wind erosion of in-situ soil from the entire NFSS. The AP-42 model for industrial wind erosion for limited flat sources is used. In this model the potential airborne emissions are a function of the number of disturbances of contaminated soil. Attachment E contains the 2017 monthly weather summary reports. The following assumptions and calculations are made:

The air release source is wind erosion of in-situ soil from an area (A) of 780,000 m² of vegetation covered soil.

$$A = 780,000 \text{ m}^2$$

The calculation assumes that 90% of this area is covered by grass or vegetation (V).

$$V = 0.90$$

Weekly grass cutting is assumed for half the year, occurring May through October and in an April spring thaw. The number of estimated disturbances (N) is therefore:

$$N = 27$$

The threshold velocity (U_t) for overburden (USEPA 1995 Table 13.2.5-2) is:

$$U_t = 1.02 \text{ m/s}$$

Anemometer height adjustment is not necessary.

$$Z_r = \text{reference anemometer height} = 10 \text{ m}$$

$$Z_a = \text{actual anemometer height} = 10 \text{ m}$$

The roughness height for overburden is 0.3 cm (USEPA 1995 Table 13.2.5-2).

$$Z_o = 0.3 \text{ cm}$$

The corrected wind speed (U_{rN}) for each period (N) between disturbances (USEPA 1995 Equation 5) is:

$$U_{rN} = U_{aN} [\ln(Z_r/Z_o) / \ln(Z_a/Z_o)], \text{ therefore } U_{rN} = U_{aN}$$

The equivalent friction velocity (U_N) for each period between disturbances (USEPA 1995 Equation 4) is:

$$U_N = 0.053 U_{rN}$$

The fastest mile speeds (maximum 2-minute wind speeds^a) from Local Climatological Data reports from NOAA for Niagara Falls International Airport (NFIA) in mph for the period between each disturbance are:

U _{a1} = 41	U _{a2} = 38	U _{a3} = 30	U _{a4} = 37	U _{a5} = 30	U _{a6} = 26
U _{a7} = 31	U _{a8} = 26	U _{a9} = 35	U _{a10} = 28	U _{a11} = 26	U _{a12} = 21
U _{a13} = 22	U _{a14} = 20	U _{a15} = 30	U _{a16} = 24	U _{a17} = 28	U _{a18} = 29
U _{a19} = 22	U _{a20} = 33	U _{a21} = 17	U _{a22} = 14	U _{a23} = 29	U _{a24} = 33
U _{a25} = 41	U _{a26} = 33	U _{a27} = 32			

^aMaximum 2-minute wind speeds can be used to approximate fastest mile wind speeds (USEPA 2004 Table 7-4), however, this calculation applies an uncertainty correction factor, protective of human health, of 1.3 in order to approximate the fastest mile wind speeds.

The equivalent friction velocity in m/s for each period is:

U ₁	1.26E+00	U ₁₁	8.01E-01	U ₂₁	5.24E-01
U ₂	1.17E+00	U ₁₂	6.47E-01	U ₂₂	4.31E-01
U ₃	9.24E-01	U ₁₃	6.78E-01	U ₂₃	8.93E-01
U ₄	1.14E+00	U ₁₄	6.16E-01	U ₂₄	1.02E+00
U ₅	9.24E-01	U ₁₅	9.24E-01	U ₂₅	1.26E+00
U ₆	8.01E-01	U ₁₆	7.39E-01	U ₂₆	1.02E+00
U ₇	9.55E-01	U ₁₇	8.62E-01	U ₂₇	9.86E-01
U ₈	8.01E-01	U ₁₈	8.93E-01		
U ₉	1.08E+00	U ₁₉	6.78E-01		
U ₁₀	8.26E-01	U ₂₀	1.02E+00		

The erosion potential (P_N) for a dry exposed surface (USEPA 1985 Figure 4-2) is:

$$P_N = 58 (U^* - U_t)^2 + 25(U^* - U_t) = 29.52 \text{ g/m}^2$$

The erosion potentials (P_N) for each period between disturbances are all less than or equal to the threshold friction velocity except for U₁, U₂, U₄, U₉, and U₂₅.

The particle size multiplier (k) for 10 μ particles (USEPA 1995 Equation 2) is:

$$k = 0.5$$

The emission factor (P) for dry bare soil for 10 μ particles (USEPA 1995 Equation 2) is:

$$P = k \sum P_N = 14.76 \text{ g/m}^2$$

Thornthwaite's Precipitation Evaporation Index (PE), used as a measure of average soil moisture, is:

$$PE = 110$$

The corrected emission factor (PM₁₀) for 10 μ particles (USEPA 1985 Equation 4-1) is:

$$PM_{10} = P(1 - V) / (PE/50)^2 = 0.31 \text{ g/m}^2/\text{yr}$$

The annual wind erosion emission (E) is calculated to be:

$$E = A (PM_{10}) = 237,901 \text{ g soil}$$

A.2 REFERENCES

EPA 2004. *Methods for Estimating Fugitive Air Emissions of Radionuclides from Diffuse Sources at USDOE Facilities*, Final Report, September 3, 2004.

EPA 1995. *AP 42 Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Fifth Edition, 1995.

M. J. Changery, *National Wind Data Index Final Report*, HCO/T1041-01 UC-60, National Climatic Center, Asheville, NC, December 1978.

EPA 1985. *Rapid Assessment of Exposure to Particulate Emissions from Surface Contaminated Sites*, EPA/600/8-85/002, Office of Health and Environmental Assessment, Washington, DC (February).

EPA 1985. *AP 42 Compilation of Air Pollution Emission Factors*, Third Edition (including supplements 1-7), August 1977.

ATTACHMENT B

SOURCE TERM DEVELOPMENT AND ANNUAL AIR EMISSIONS

B.1 SOURCE TERM DEVELOPMENT

The source term for NFSS NESHAP calculations was developed considering the radionuclides significant to dose, that is uranium, thorium, and actinium decay series as shown in Table B-1. Concentration data for these radioisotopes were taken from all site data collected since and including the Phases I, II, and III of the Remedial Investigation and are listed in Table B-2. The total number of samples has almost doubled (to about 1000) from the previous database. The Phase I sampling was performed from November 1999 through January 2000. The Phase II was performed from August 2000 through October 2000. The Phase III sampling was performed from May 2001 through October 2003. The Balance of Plant investigations at the NFSS occurred between 2012 and 2014. During this field work samples were collected to delineate soil contamination across the NFSS. The soil source term used for the 2017 NESHAP was generated using surface soil data collected from all USACE investigations on the NFSS. The figure at the end of Attachment B shows the locations of surface soil samples used to generate this source term. The dataset has been verified to ensure data quality and includes the analysis of soils from biased high locations (i.e., locations that had elevated gamma survey readings).

The IWCS, completed in 1986 and added to in 1991, is surrounded by sufficient topsoil and compacted clay to consider radionuclide emissions negligible. In 1986, the entire IWCS was covered with 0.9 meters (3 feet) of low-permeability, compacted clay, a 0.3 meter (12 inch)-thick layer of loosely compacted soil, 0.15 meter (6 inches) of topsoil and covered with shallow-rooted grass. A clay cutoff wall and dike measuring 3.35 to 8.84 meters (11 to 29 feet) in thickness formed the perimeter. In 1991 additional soil with residual radioactivity from a vicinity property, along with 60 drums containing radioactive material, were placed over the existing IWCS. Six inches of clay was placed over the waste material and two feet of compacted clay was added on top along with 0.46 meter (1.5 feet) of topsoil material. However, the area of the cap was included in the site area estimate.

Radium-226 was detected at an elevated concentration of 1,140 pCi/g in one area during the Phase I remedial investigation. This was analyzed and determined to come from a stone in the sample. Although release rates are based on dust erosion and not buried stones, this detection was used in the source term calculation.

Soil concentration data, listed in Table B-3, are not available for all the radionuclides in Table B-1. If explicit results for a radionuclide were not available, it was assumed that the radionuclide was present in equilibrium with (i.e., at the same concentration as) the nearest long-lived parent. Branching ratios were used to estimate source term concentrations. Table B-3 lists the source term values used in the CAP-88 modeled scenarios.

Table B-1. Radionuclides Considered in NESHAP Evaluation

Uranium Series	Thorium Series	Actinium Series
U-238	Th-232	U-235
Th-234	Ra-228	Th-231
Pa-234m	Ac-228	Pa-231
Pa-234 (0.13%)	Th-228	Ac-227
U-234	Ra-224	Th-227 (98.62%)
Th-230	*Rn-220 (thoron)	Fr-223 (1.38%)
Ra-226	Po-216	Ra-223
*Rn-222 (radon)	Pb-212	*Rn-219 (actinon)
Po-218	Bi-212	Po-215
Pb-214 (99.98%)	Po-212 (64.07%)	Pb-211 (\approx 100%)
At-218 (0.02%)	Tl-208 (35.93%)	At-215 (0.00023%)
Bi-214	*Pb-208 (stable)	Bi-211
Po-214 (99.979%)		Po-211 (0.273%)
Tl-210 (0.021%)		Tl-207 (99.73%)
Pb-210		*Pb-207 (stable)
Bi-210		
Po-210 (\approx 100%)		
Tl-206 (0.00013%)		
*Pb-206 (stable)		

Nuclides with asterisks (*) were excluded from dose calculations because radon isotopes, including thoron and actinon, are specifically excluded per the regulation or they are stable nuclides and do not contribute to radiological dose. Nuclides are presented from top to bottom in order of decay starting from the parent radionuclides. Branching fractions are shown, as appropriate, for consideration in source term development. Fractions taken from Shleien, 1992. Because in the year 2014 EPA revised CAP88 Ver 4.0 the input into the source term was changed to the inclusion of all (maximum) sub-chains for the three series listed above. The subchains used are indicated in alternating highlight. Sub-chains were chosen because the database analyses included the radionuclides and daughter build-up in a 100 year time frame was not significant. Chain length was not limited to 10 daughters as in the previous version of the code.

Table B-2. Summary of Characterization Data Used in NESHAP Dose Calculations

Nuclide	Units	Results	Minimum Detect	Maximum Detect	Average Result and Input Exposure Concentration
Radium-226 ^a	(pCi/g)	1002	0.1	1140	6.9
Thorium-228	(pCi/g)	1003	0.0	2.4	0.9
Thorium-230	(pCi/g)	1003	0.1	978	5.5
Thorium-232	(pCi/g)	1004	0.0	2.2	0.8
Uranium-234	(pCi/g)	1007	0.0	8340	12.5
Uranium-235	(pCi/g)	1007	-0.1	886	1.1
Uranium-238	(pCi/g)	1007	0.0	8830	13.0

^a Includes previous outlier 1,140 pCi/g

Table B-3. Soil Concentration and Estimated Emission of Radionuclides from NFSS for CY 2017

Soil Concentration and CAPP88 Input Source Term								
Uranium Series			Thorium Series			Actinium Series		
Nuclide	pCi/g	Ci/y	Nuclide	pCi/g	Ci/y	Nuclide	pCi/g	Ci/y
U-238	13	3.09E-06	Th-232	0.8	1.90E-07	U-235	1.1	2.62E-07
Th-234			Ra-228			Th-231		
Pa-234m			Ac-228			Pa-231		
Pa-234			Th-228	0.9	2.14E-07	Ac-227		
U-234	12.5	2.97E-06	Ra-224			Th-227		
Th-230	5.5	1.31E-06	Rn-220			Fr-223		
Ra-226	6.9	1.64E-06	Po-216			Ra-223		
Rn-222			Pb-212			Rn-219		
Po-218			Bi-212			Po-215		
Pb-214			Po-212			Pb-211		
At-218			Tl-208			At-215		
Bi-214			Pb-208 (stable)			Bi-211		
Po-214						Po-211		
Tl-210						Tl-207		
Pb-210						Pb-207 (stable)		
Bi-210								
Po-210								
Tl-206								
Pb-206 (stable)								

B.2 REFERENCES

Shleien, 1992. *The Health Physics and Radiological Health Handbook*, Scinta, Inc., Silver Spring, MD.

ATTACHMENT C

CAPP88-PC REPORTS – INDIVIDUAL

D O S E A N D R I S K S U M M A R I E S

Non-Radon Individual Assessment
Tue Jun 12 09:23:07 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: Infant

Comments: NFSS Technical Memo 2017 Year
Individual Dose

Dataset Name: NFSS2017 Ind inf
Dataset Date:
Wind File: 

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.65E-04
UB_Wall	1.79E-04
Bone_Sur	1.10E-02
Brain	1.73E-04
Breasts	1.86E-04
St_Wall	1.76E-04
SI_Wall	1.76E-04
ULI_Wall	2.05E-04
LLI_Wall	2.85E-04
Kidneys	4.94E-04
Liver	4.52E-04
Muscle	1.91E-04
Ovaries	1.96E-04
Pancreas	1.66E-04
R_Marrow	1.44E-03
Skin	2.24E-03
Spleen	1.83E-04
Testes	2.21E-04
Thymus	1.73E-04
Thyroid	1.79E-04
GB_Wall	1.67E-04
Ht_Wall	1.73E-04
Uterus	1.71E-04
ET_Reg	1.34E-03
Lung_66	2.00E-03
Effectiv	7.08E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	3.10E-04
INHALATION	2.42E-04
AIR IMMERSION	7.57E-11
GROUND SURFACE	1.56E-04
INTERNAL	5.52E-04
EXTERNAL	1.56E-04
TOTAL	7.08E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	5.49E-05
Th-234	1.11E-06
Pa-234m	1.52E-05
Pa-234	3.00E-07
U-234	6.15E-05
Th-230	1.09E-04
Ra-226	2.56E-04
Rn-222	2.68E-08
Po-218	4.79E-13
Pb-214	1.75E-05
At-218	1.80E-12
Bi-214	1.02E-04
Rn-218	1.04E-14
Po-214	5.67E-09
Tl-210	4.00E-08
Pb-210	8.62E-08
Bi-210	1.39E-06
Hg-206	1.13E-13
Po-210	3.61E-10
Tl-206	3.25E-12
Th-232	2.04E-05
Ra-228	5.25E-09
Ac-228	5.87E-06
Th-228	4.64E-05
Ra-224	7.00E-08
Rn-220	4.29E-09
Po-216	1.03E-10
Pb-212	9.42E-07
Bi-212	1.10E-06
Po-212	0.00E+00
Tl-208	7.59E-06
U-235	6.67E-06
Th-231	1.76E-07
Pa-231	2.91E-10
Ac-227	9.77E-13
Th-227	4.66E-10
Fr-223	4.40E-12
Ra-223	5.21E-10
Rn-219	2.26E-10
At-219	0.00E+00
Bi-215	1.02E-15
Po-215	6.90E-13
Pb-211	4.43E-10
Bi-211	1.83E-10
Tl-207	2.30E-10
Po-211	8.79E-14
TOTAL	7.08E-04

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
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PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	4.62E-12
INHALATION	6.65E-12
AIR IMMERSION	4.02E-17
GROUND SURFACE	7.66E-11
INTERNAL	1.13E-11
EXTERNAL	7.66E-11
TOTAL	8.79E-11

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	1.59E-12
Th-234	5.77E-13
Pa-234m	2.67E-12
Pa-234	1.63E-13
U-234	1.79E-12
Th-230	1.91E-12
Ra-226	4.51E-12
Rn-222	1.46E-14
Po-218	2.14E-19
Pb-214	9.37E-12
At-218	2.22E-19
Bi-214	5.41E-11
Rn-218	5.71E-21
Po-214	3.11E-15
Tl-210	2.13E-14
Pb-210	3.86E-14
Bi-210	1.55E-13
Hg-206	4.99E-20
Po-210	1.98E-16
Tl-206	3.66E-19
Th-232	3.98E-13
Ra-228	1.56E-15
Ac-228	3.12E-12
Th-228	1.26E-12
Ra-224	3.75E-14
Rn-220	2.35E-15
Po-216	5.69E-17
Pb-212	5.12E-13
Bi-212	4.24E-13
Po-212	0.00E+00
Tl-208	4.13E-12
U-235	1.08E-12
Th-231	8.02E-14
Pa-231	1.52E-16
Ac-227	3.65E-19
Th-227	2.53E-16
Fr-223	1.64E-18
Ra-223	2.82E-16
Rn-219	1.24E-16
At-219	0.00E+00
Bi-215	4.53E-22
Po-215	3.78E-19
Pb-211	1.58E-16
Bi-211	9.97E-17
Tl-207	2.95E-17
Po-211	4.81E-20
TOTAL	8.79E-11

INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	5.2E-04	2.4E-04	1.9E-04	1.5E-04	1.3E-04	1.1E-04	7.7E-05
NNW	4.2E-04	1.9E-04	1.5E-04	1.1E-04	9.7E-05	8.0E-05	5.4E-05
NW	4.2E-04	1.7E-04	1.4E-04	1.1E-04	9.9E-05	8.6E-05	6.2E-05
WNW	4.4E-04	2.5E-04	1.9E-04	1.5E-04	1.3E-04	1.0E-04	6.7E-05
W	4.8E-04	2.6E-04	2.1E-04	1.7E-04	1.5E-04	1.3E-04	8.5E-05
WSW	4.8E-04	2.6E-04	2.0E-04	1.5E-04	1.3E-04	1.1E-04	6.8E-05
SW	4.5E-04	2.0E-04	1.6E-04	1.3E-04	1.1E-04	9.8E-05	6.8E-05
SSW	4.1E-04	2.0E-04	1.6E-04	1.2E-04	1.1E-04	8.9E-05	6.0E-05
S	4.3E-04	2.0E-04	1.6E-04	1.3E-04	1.2E-04	1.0E-04	7.0E-05
SSE	4.9E-04	2.5E-04	2.0E-04	1.5E-04	1.3E-04	1.1E-04	6.7E-05
SSE	5.5E-04	2.7E-04	2.2E-04	1.7E-04	1.5E-04	1.2E-04	8.1E-05
ESE	6.0E-04	3.1E-04	2.4E-04	1.8E-04	1.6E-04	1.3E-04	7.8E-05
E	6.8E-04	3.1E-04	2.5E-04	1.9E-04	1.6E-04	1.4E-04	8.5E-05
ENE	7.1E-04	3.6E-04	2.8E-04	2.1E-04	1.8E-04	1.4E-04	8.2E-05
NE	7.0E-04	3.6E-04	2.8E-04	2.2E-04	1.9E-04	1.6E-04	1.0E-04
NNE	6.3E-04	3.4E-04	2.7E-04	2.0E-04	1.7E-04	1.4E-04	8.1E-05

Distance (m)	
Direction	2629
N	7.4E-05
NNW	5.3E-05
NW	6.1E-05
WNW	6.5E-05
W	8.2E-05
WSW	6.6E-05
SW	6.6E-05
SSW	5.8E-05
S	6.8E-05
SSE	6.5E-05
SSE	7.8E-05
ESE	7.5E-05
E	8.1E-05
ENE	7.9E-05
NE	9.6E-05
NNE	7.8E-05

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	533	783	914	1105	1250	1486	2499
N	6.3E-11	2.6E-11	2.0E-11	1.5E-11	1.3E-11	1.0E-11	5.4E-12
NNW	5.0E-11	2.0E-11	1.5E-11	1.0E-11	8.0E-12	5.7E-12	2.2E-12
NW	5.0E-11	1.8E-11	1.3E-11	9.9E-12	8.3E-12	6.5E-12	3.4E-12
WNW	5.3E-11	2.8E-11	2.0E-11	1.5E-11	1.2E-11	9.0E-12	4.0E-12
W	5.8E-11	3.0E-11	2.3E-11	1.8E-11	1.5E-11	1.2E-11	6.5E-12
WSW	5.8E-11	2.9E-11	2.2E-11	1.6E-11	1.3E-11	9.4E-12	4.1E-12
SW	5.4E-11	2.2E-11	1.7E-11	1.2E-11	1.0E-11	8.1E-12	4.2E-12
SSW	4.8E-11	2.2E-11	1.6E-11	1.2E-11	9.4E-12	6.9E-12	3.0E-12
S	5.2E-11	2.2E-11	1.7E-11	1.3E-11	1.1E-11	8.5E-12	4.5E-12
SSE	5.9E-11	2.9E-11	2.1E-11	1.5E-11	1.2E-11	9.2E-12	4.1E-12
SSE	6.8E-11	3.1E-11	2.4E-11	1.8E-11	1.5E-11	1.2E-11	6.1E-12
ESE	7.4E-11	3.6E-11	2.7E-11	2.0E-11	1.6E-11	1.2E-11	5.5E-12
E	8.4E-11	3.7E-11	2.8E-11	2.0E-11	1.7E-11	1.3E-11	6.5E-12
ENE	8.8E-11	4.3E-11	3.2E-11	2.3E-11	1.9E-11	1.4E-11	6.2E-12
NE	8.7E-11	4.3E-11	3.3E-11	2.5E-11	2.1E-11	1.7E-11	8.8E-12
NNE	7.7E-11	4.1E-11	3.0E-11	2.2E-11	1.8E-11	1.3E-11	5.9E-12

	Distance (m)
Direction	2629
N	5.1E-12
NNW	2.0E-12
NW	3.2E-12
WNW	3.7E-12
W	6.1E-12
WSW	3.9E-12
SW	3.9E-12
SSW	2.8E-12
S	4.2E-12
SSE	3.8E-12
SSE	5.7E-12
ESE	5.2E-12
E	6.1E-12
ENE	5.8E-12
NE	8.2E-12
NNE	5.5E-12

D O S E A N D R I S K S U M M A R I E S

Non-Radon Individual Assessment
Tue Jun 12 09:36:30 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: One

Comments: NFSS Technical Memo 2017 Year
Individual Dose

Dataset Name: NFSS2017 Ind One
Dataset Date:
Wind File: 

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.43E-04
UB_Wall	1.57E-04
Bone_Sur	3.19E-03
Brain	1.50E-04
Breasts	1.64E-04
St_Wall	1.53E-04
SI_Wall	1.53E-04
ULI_Wall	1.78E-04
LLI_Wall	2.44E-04
Kidneys	3.14E-04
Liver	2.82E-04
Muscle	1.68E-04
Ovaries	1.60E-04
Pancreas	1.44E-04
R_Marrow	4.30E-04
Skin	2.21E-03
Spleen	1.54E-04
Testes	1.82E-04
Thymus	1.50E-04
Thyroid	1.57E-04
GB_Wall	1.45E-04
Ht_Wall	1.50E-04
Uterus	1.49E-04
ET_Reg	1.40E-03
Lung_66	2.21E-03
Effectiv	5.04E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	7.52E-05
INHALATION	2.73E-04
AIR IMMERSION	7.57E-11
GROUND SURFACE	1.56E-04
INTERNAL	3.48E-04
EXTERNAL	1.56E-04
TOTAL	5.04E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	5.02E-05
Th-234	1.11E-06
Pa-234m	1.52E-05
Pa-234	3.00E-07
U-234	5.70E-05
Th-230	8.51E-05
Ra-226	8.58E-05
Rn-222	2.68E-08
Po-218	4.79E-13
Pb-214	1.75E-05
At-218	1.80E-12
Bi-214	1.02E-04
Rn-218	1.04E-14
Po-214	5.67E-09
Tl-210	4.00E-08
Pb-210	8.62E-08
Bi-210	1.39E-06
Hg-206	1.13E-13
Po-210	3.61E-10
Tl-206	3.25E-12
Th-232	1.84E-05
Ra-228	5.17E-09
Ac-228	5.87E-06
Th-228	4.78E-05
Ra-224	7.00E-08
Rn-220	4.29E-09
Po-216	1.03E-10
Pb-212	9.42E-07
Bi-212	1.10E-06
Po-212	0.00E+00
Tl-208	7.59E-06
U-235	6.26E-06
Th-231	1.76E-07
Pa-231	2.91E-10
Ac-227	9.77E-13
Th-227	4.66E-10
Fr-223	4.40E-12
Ra-223	5.21E-10
Rn-219	2.26E-10
At-219	0.00E+00
Bi-215	1.02E-15
Po-215	6.90E-13
Pb-211	4.43E-10
Bi-211	1.83E-10
Tl-207	2.30E-10
Po-211	8.79E-14
TOTAL	5.04E-04

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
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PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	7.51E-12
INHALATION	8.79E-12
AIR IMMERSION	4.02E-17
GROUND SURFACE	7.66E-11
INTERNAL	1.63E-11
EXTERNAL	7.66E-11
TOTAL	9.29E-11

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	2.22E-12
Th-234	5.77E-13
Pa-234m	2.67E-12
Pa-234	1.63E-13
U-234	2.49E-12
Th-230	2.55E-12
Ra-226	6.96E-12
Rn-222	1.46E-14
Po-218	2.14E-19
Pb-214	9.37E-12
At-218	2.22E-19
Bi-214	5.41E-11
Rn-218	5.71E-21
Po-214	3.11E-15
Tl-210	2.13E-14
Pb-210	3.86E-14
Bi-210	1.55E-13
Hg-206	4.99E-20
Po-210	1.98E-16
Tl-206	3.66E-19
Th-232	5.32E-13
Ra-228	1.56E-15
Ac-228	3.12E-12
Th-228	1.68E-12
Ra-224	3.75E-14
Rn-220	2.35E-15
Po-216	5.69E-17
Pb-212	5.12E-13
Bi-212	4.24E-13
Po-212	0.00E+00
Tl-208	4.13E-12
U-235	1.13E-12
Th-231	8.02E-14
Pa-231	1.52E-16
Ac-227	3.65E-19
Th-227	2.53E-16
Fr-223	1.64E-18
Ra-223	2.82E-16
Rn-219	1.24E-16
At-219	0.00E+00
Bi-215	4.53E-22
Po-215	3.78E-19
Pb-211	1.58E-16
Bi-211	9.97E-17
Tl-207	2.95E-17
Po-211	4.81E-20
TOTAL	9.29E-11

INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	3.6E-04	1.5E-04	1.2E-04	9.0E-05	7.7E-05	6.2E-05	3.5E-05
NNW	2.9E-04	1.2E-04	8.8E-05	6.2E-05	5.0E-05	3.8E-05	1.9E-05
NW	2.9E-04	1.0E-04	8.1E-05	6.1E-05	5.2E-05	4.2E-05	2.5E-05
WNW	3.1E-04	1.6E-04	1.2E-04	8.7E-05	7.2E-05	5.5E-05	2.8E-05
W	3.4E-04	1.7E-04	1.3E-04	1.0E-04	8.8E-05	7.2E-05	4.1E-05
WSW	3.3E-04	1.7E-04	1.3E-04	9.2E-05	7.5E-05	5.8E-05	2.9E-05
SW	3.1E-04	1.3E-04	9.8E-05	7.4E-05	6.3E-05	5.0E-05	2.9E-05
SSW	2.8E-04	1.3E-04	9.7E-05	7.0E-05	5.7E-05	4.4E-05	2.3E-05
S	3.0E-04	1.3E-04	1.0E-04	7.6E-05	6.5E-05	5.2E-05	3.0E-05
SSE	3.4E-04	1.6E-04	1.2E-04	8.9E-05	7.3E-05	5.6E-05	2.8E-05
SSE	3.9E-04	1.8E-04	1.4E-04	1.0E-04	8.7E-05	7.0E-05	3.8E-05
ESE	4.3E-04	2.1E-04	1.6E-04	1.1E-04	9.3E-05	7.2E-05	3.6E-05
E	4.8E-04	2.1E-04	1.6E-04	1.2E-04	9.9E-05	7.8E-05	4.1E-05
ENE	5.0E-04	2.5E-04	1.8E-04	1.3E-04	1.1E-04	8.2E-05	3.9E-05
NE	5.0E-04	2.4E-04	1.9E-04	1.4E-04	1.2E-04	9.6E-05	5.2E-05
NNE	4.4E-04	2.3E-04	1.7E-04	1.3E-04	1.0E-04	7.8E-05	3.8E-05

Distance (m)	
Direction	2629
N	3.3E-05
NNW	1.8E-05
NW	2.3E-05
WNW	2.7E-05
W	3.9E-05
WSW	2.7E-05
SW	2.7E-05
SSW	2.2E-05
S	2.9E-05
SSE	2.7E-05
SSE	3.6E-05
ESE	3.4E-05
E	3.8E-05
ENE	3.7E-05
NE	4.9E-05
NNE	3.6E-05

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	6.6E-11	2.8E-11	2.2E-11	1.7E-11	1.4E-11	1.1E-11	6.1E-12
NNW	5.3E-11	2.2E-11	1.6E-11	1.1E-11	8.8E-12	6.4E-12	2.7E-12
NW	5.3E-11	1.9E-11	1.5E-11	1.1E-11	9.1E-12	7.3E-12	3.9E-12
WNW	5.6E-11	2.9E-11	2.2E-11	1.6E-11	1.3E-11	9.8E-12	4.6E-12
W	6.2E-11	3.2E-11	2.5E-11	1.9E-11	1.6E-11	1.3E-11	7.3E-12
WSW	6.1E-11	3.1E-11	2.3E-11	1.7E-11	1.4E-11	1.0E-11	4.7E-12
SW	5.7E-11	2.3E-11	1.8E-11	1.3E-11	1.1E-11	8.9E-12	4.8E-12
SSW	5.1E-11	2.4E-11	1.8E-11	1.3E-11	1.0E-11	7.7E-12	3.6E-12
S	5.5E-11	2.4E-11	1.8E-11	1.4E-11	1.2E-11	9.4E-12	5.1E-12
SSE	6.2E-11	3.0E-11	2.3E-11	1.6E-11	1.3E-11	1.0E-11	4.7E-12
SSE	7.1E-11	3.3E-11	2.6E-11	1.9E-11	1.6E-11	1.3E-11	6.8E-12
ESE	7.8E-11	3.9E-11	2.9E-11	2.1E-11	1.7E-11	1.3E-11	6.2E-12
E	8.9E-11	3.9E-11	3.0E-11	2.2E-11	1.8E-11	1.4E-11	7.2E-12
ENE	9.3E-11	4.6E-11	3.4E-11	2.5E-11	2.0E-11	1.5E-11	6.9E-12
NE	9.2E-11	4.5E-11	3.5E-11	2.7E-11	2.2E-11	1.8E-11	9.6E-12
NNE	8.2E-11	4.3E-11	3.2E-11	2.3E-11	1.9E-11	1.4E-11	6.6E-12

Distance (m)	
Direction	2629
N	5.7E-12
NNW	2.6E-12
NW	3.7E-12
WNW	4.3E-12
W	6.8E-12
WSW	4.5E-12
SW	4.5E-12
SSW	3.4E-12
S	4.8E-12
SSE	4.4E-12
SSE	6.4E-12
ESE	5.8E-12
E	6.8E-12
ENE	6.5E-12
NE	9.0E-12
NNE	6.2E-12

D O S E A N D R I S K S U M M A R I E S

Non-Radon Individual Assessment
Tue Jun 12 09:40:20 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: Five

Comments: NFSS Technical Memo 2017 Year
Individual Dose

Dataset Name: NFSS2017 Ind Fiv
Dataset Date:
Wind File: 

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.38E-04
UB_Wall	1.52E-04
Bone_Sur	3.36E-03
Brain	1.46E-04
Breasts	1.60E-04
St_Wall	1.48E-04
SI_Wall	1.48E-04
ULI_Wall	1.63E-04
LLI_Wall	2.02E-04
Kidneys	2.80E-04
Liver	2.43E-04
Muscle	1.64E-04
Ovaries	1.60E-04
Pancreas	1.40E-04
R_Marrow	3.66E-04
Skin	2.21E-03
Spleen	1.50E-04
Testes	1.80E-04
Thymus	1.46E-04
Thyroid	1.53E-04
GB_Wall	1.41E-04
Ht_Wall	1.46E-04
Uterus	1.45E-04
ET_Reg	8.75E-04
Lung_66	2.05E-03
Effectiv	4.72E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	5.70E-05
INHALATION	2.59E-04
AIR IMMERSION	7.57E-11
GROUND SURFACE	1.56E-04
INTERNAL	3.16E-04
EXTERNAL	1.56E-04
TOTAL	4.72E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	4.47E-05
Th-234	1.11E-06
Pa-234m	1.52E-05
Pa-234	3.00E-07
U-234	5.07E-05
Th-230	8.62E-05
Ra-226	6.76E-05
Rn-222	2.68E-08
Po-218	4.79E-13
Pb-214	1.75E-05
At-218	1.80E-12
Bi-214	1.02E-04
Rn-218	1.04E-14
Po-214	5.67E-09
Tl-210	4.00E-08
Pb-210	8.62E-08
Bi-210	1.39E-06
Hg-206	1.13E-13
Po-210	3.61E-10
Tl-206	3.25E-12
Th-232	1.98E-05
Ra-228	5.16E-09
Ac-228	5.87E-06
Th-228	4.33E-05
Ra-224	6.98E-08
Rn-220	4.29E-09
Po-216	1.03E-10
Pb-212	9.42E-07
Bi-212	1.10E-06
Po-212	0.00E+00
Tl-208	7.59E-06
U-235	5.76E-06
Th-231	1.76E-07
Pa-231	2.91E-10
Ac-227	9.77E-13
Th-227	4.66E-10
Fr-223	4.40E-12
Ra-223	5.21E-10
Rn-219	2.26E-10
At-219	0.00E+00
Bi-215	1.02E-15
Po-215	6.90E-13
Pb-211	4.43E-10
Bi-211	1.83E-10
Tl-207	2.30E-10
Po-211	8.79E-14
TOTAL	4.72E-04

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
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PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	7.73E-13
INHALATION	2.84E-11
AIR IMMERSION	4.02E-17
GROUND SURFACE	7.66E-11
INTERNAL	2.91E-11
EXTERNAL	7.66E-11
TOTAL	1.06E-10

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	4.95E-12
Th-234	5.77E-13
Pa-234m	2.67E-12
Pa-234	1.63E-13
U-234	6.35E-12
Th-230	7.21E-12
Ra-226	3.46E-12
Rn-222	1.46E-14
Po-218	2.14E-19
Pb-214	9.37E-12
At-218	2.22E-19
Bi-214	5.41E-11
Rn-218	5.71E-21
Po-214	3.11E-15
Tl-210	2.13E-14
Pb-210	3.86E-14
Bi-210	1.55E-13
Hg-206	4.99E-20
Po-210	1.98E-16
Tl-206	3.66E-19
Th-232	1.52E-12
Ra-228	1.56E-15
Ac-228	3.12E-12
Th-228	5.46E-12
Ra-224	3.76E-14
Rn-220	2.35E-15
Po-216	5.69E-17
Pb-212	5.12E-13
Bi-212	4.24E-13
Po-212	0.00E+00
Tl-208	4.13E-12
U-235	1.43E-12
Th-231	8.02E-14
Pa-231	1.52E-16
Ac-227	3.65E-19
Th-227	2.53E-16
Fr-223	1.64E-18
Ra-223	2.82E-16
Rn-219	1.24E-16
At-219	0.00E+00
Bi-215	4.53E-22
Po-215	3.78E-19
Pb-211	1.58E-16
Bi-211	9.97E-17
Tl-207	2.95E-17
Po-211	4.81E-20
TOTAL	1.06E-10

INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	3.4E-04	1.4E-04	1.1E-04	8.2E-05	6.9E-05	5.6E-05	3.0E-05
NNW	2.7E-04	1.1E-04	8.0E-05	5.6E-05	4.4E-05	3.3E-05	1.5E-05
NW	2.7E-04	9.6E-05	7.3E-05	5.5E-05	4.6E-05	3.7E-05	2.0E-05
WNW	2.9E-04	1.5E-04	1.1E-04	7.9E-05	6.4E-05	4.9E-05	2.4E-05
W	3.2E-04	1.6E-04	1.2E-04	9.4E-05	8.0E-05	6.5E-05	3.6E-05
WSW	3.1E-04	1.6E-04	1.2E-04	8.3E-05	6.8E-05	5.1E-05	2.4E-05
SW	2.9E-04	1.2E-04	8.9E-05	6.6E-05	5.6E-05	4.5E-05	2.4E-05
SSW	2.6E-04	1.2E-04	8.8E-05	6.3E-05	5.1E-05	3.9E-05	1.9E-05
S	2.8E-04	1.2E-04	9.1E-05	6.8E-05	5.8E-05	4.6E-05	2.6E-05
SSE	3.2E-04	1.5E-04	1.1E-04	8.1E-05	6.6E-05	5.0E-05	2.4E-05
SSE	3.6E-04	1.7E-04	1.3E-04	9.4E-05	7.9E-05	6.3E-05	3.3E-05
ESE	4.0E-04	1.9E-04	1.4E-04	1.0E-04	8.5E-05	6.5E-05	3.1E-05
E	4.5E-04	1.9E-04	1.5E-04	1.1E-04	9.0E-05	7.0E-05	3.5E-05
ENE	4.7E-04	2.3E-04	1.7E-04	1.2E-04	9.9E-05	7.4E-05	3.4E-05
NE	4.7E-04	2.3E-04	1.7E-04	1.3E-04	1.1E-04	8.8E-05	4.6E-05
NNE	4.2E-04	2.2E-04	1.6E-04	1.1E-04	9.4E-05	7.1E-05	3.3E-05

Distance (m)	
Direction	2629
N	2.8E-05
NNW	1.4E-05
NW	1.9E-05
WNW	2.2E-05
W	3.4E-05
WSW	2.3E-05
SW	2.3E-05
SSW	1.8E-05
S	2.4E-05
SSE	2.2E-05
SSE	3.1E-05
ESE	2.9E-05
E	3.3E-05
ENE	3.2E-05
NE	4.3E-05
NNE	3.1E-05

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	533	783	914	1105	1250	1486	2499
N	7.5E-11	3.1E-11	2.4E-11	1.8E-11	1.5E-11	1.1E-11	5.6E-12
NNW	6.0E-11	2.4E-11	1.7E-11	1.1E-11	8.8E-12	6.0E-12	1.8E-12
NW	5.9E-11	2.0E-11	1.5E-11	1.1E-11	9.1E-12	7.0E-12	3.2E-12
WNW	6.4E-11	3.2E-11	2.4E-11	1.7E-11	1.3E-11	9.9E-12	4.0E-12
W	7.0E-11	3.5E-11	2.7E-11	2.0E-11	1.7E-11	1.4E-11	6.9E-12
WSW	6.9E-11	3.5E-11	2.5E-11	1.8E-11	1.4E-11	1.0E-11	4.1E-12
SW	6.4E-11	2.5E-11	1.9E-11	1.4E-11	1.2E-11	8.9E-12	4.2E-12
SSW	5.8E-11	2.6E-11	1.9E-11	1.3E-11	1.0E-11	7.5E-12	2.8E-12
S	6.2E-11	2.6E-11	2.0E-11	1.4E-11	1.2E-11	9.4E-12	4.5E-12
SSE	7.1E-11	3.4E-11	2.5E-11	1.7E-11	1.4E-11	1.0E-11	4.0E-12
SSE	8.1E-11	3.7E-11	2.8E-11	2.0E-11	1.7E-11	1.3E-11	6.4E-12
ESE	8.9E-11	4.3E-11	3.2E-11	2.3E-11	1.8E-11	1.4E-11	5.7E-12
E	1.0E-10	4.3E-11	3.3E-11	2.4E-11	2.0E-11	1.5E-11	6.9E-12
ENE	1.1E-10	5.1E-11	3.8E-11	2.7E-11	2.2E-11	1.6E-11	6.5E-12
NE	1.0E-10	5.0E-11	3.9E-11	2.9E-11	2.4E-11	1.9E-11	9.5E-12
NNE	9.3E-11	4.8E-11	3.6E-11	2.5E-11	2.0E-11	1.5E-11	6.2E-12

	Distance (m)
Direction	2629
N	5.2E-12
NNW	1.7E-12
NW	3.0E-12
WNW	3.7E-12
W	6.4E-12
WSW	3.8E-12
SW	3.9E-12
SSW	2.6E-12
S	4.2E-12
SSE	3.7E-12
SSE	5.9E-12
ESE	5.3E-12
E	6.3E-12
ENE	6.0E-12
NE	8.8E-12
NNE	5.7E-12

D O S E A N D R I S K S U M M A R I E S

Non-Radon Individual Assessment
Tue Jun 12 09:49:57 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: Ten

Comments: NFSS Technical Memo 2017 Year
Individual Dose

Dataset Name: NFSS2017 Ind Ten
Dataset Date:
Wind File:

ND

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.37E-04
UB_Wall	1.51E-04
Bone_Sur	5.48E-03
Brain	1.44E-04
Breasts	1.58E-04
St_Wall	1.46E-04
SI_Wall	1.46E-04
ULI_Wall	1.56E-04
LLI_Wall	1.85E-04
Kidneys	2.70E-04
Liver	2.32E-04
Muscle	1.62E-04
Ovaries	1.60E-04
Pancreas	1.38E-04
R_Marrow	4.48E-04
Skin	2.21E-03
Spleen	1.51E-04
Testes	1.81E-04
Thymus	1.45E-04
Thyroid	1.51E-04
GB_Wall	1.39E-04
Ht_Wall	1.44E-04
Uterus	1.43E-04
ET_Reg	8.73E-04
Lung_66	1.92E-03
Effectiv	4.85E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	7.89E-05
INHALATION	2.50E-04
AIR IMMERSION	7.57E-11
GROUND SURFACE	1.56E-04
INTERNAL	3.29E-04
EXTERNAL	1.56E-04
TOTAL	4.85E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	4.26E-05
Th-234	1.11E-06
Pa-234m	1.52E-05
Pa-234	3.00E-07
U-234	4.90E-05
Th-230	8.38E-05
Ra-226	8.96E-05
Rn-222	2.68E-08
Po-218	4.79E-13
Pb-214	1.75E-05
At-218	1.80E-12
Bi-214	1.02E-04
Rn-218	1.04E-14
Po-214	5.67E-09
Tl-210	4.00E-08
Pb-210	8.62E-08
Bi-210	1.39E-06
Hg-206	1.13E-13
Po-210	3.61E-10
Tl-206	3.25E-12
Th-232	2.01E-05
Ra-228	5.16E-09
Ac-228	5.87E-06
Th-228	4.08E-05
Ra-224	6.99E-08
Rn-220	4.29E-09
Po-216	1.03E-10
Pb-212	9.42E-07
Bi-212	1.10E-06
Po-212	0.00E+00
Tl-208	7.59E-06
U-235	5.59E-06
Th-231	1.76E-07
Pa-231	2.91E-10
Ac-227	9.77E-13
Th-227	4.66E-10
Fr-223	4.40E-12
Ra-223	5.21E-10
Rn-219	2.26E-10
At-219	0.00E+00
Bi-215	1.02E-15
Po-215	6.90E-13
Pb-211	4.43E-10
Bi-211	1.83E-10
Tl-207	2.30E-10
Po-211	8.79E-14
TOTAL	4.85E-04

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
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PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	1.22E-12
INHALATION	3.95E-11
AIR IMMERSION	4.02E-17
GROUND SURFACE	7.66E-11
INTERNAL	4.07E-11
EXTERNAL	7.66E-11
TOTAL	1.17E-10

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	6.90E-12
Th-234	5.77E-13
Pa-234m	2.67E-12
Pa-234	1.63E-13
U-234	8.96E-12
Th-230	1.00E-11
Ra-226	4.72E-12
Rn-222	1.46E-14
Po-218	2.14E-19
Pb-214	9.37E-12
At-218	2.22E-19
Bi-214	5.41E-11
Rn-218	5.71E-21
Po-214	3.11E-15
Tl-210	2.13E-14
Pb-210	3.86E-14
Bi-210	1.55E-13
Hg-206	4.99E-20
Po-210	1.98E-16
Tl-206	3.66E-19
Th-232	2.12E-12
Ra-228	1.56E-15
Ac-228	3.12E-12
Th-228	7.62E-12
Ra-224	3.77E-14
Rn-220	2.35E-15
Po-216	5.69E-17
Pb-212	5.12E-13
Bi-212	4.24E-13
Po-212	0.00E+00
Tl-208	4.13E-12
U-235	1.64E-12
Th-231	8.02E-14
Pa-231	1.52E-16
Ac-227	3.65E-19
Th-227	2.53E-16
Fr-223	1.64E-18
Ra-223	2.82E-16
Rn-219	1.24E-16
At-219	0.00E+00
Bi-215	4.53E-22
Po-215	3.78E-19
Pb-211	1.58E-16
Bi-211	9.97E-17
Tl-207	2.95E-17
Po-211	4.81E-20
TOTAL	1.17E-10

INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	533	783	914	1105	1250	1486	2499
N	3.5E-04	1.5E-04	1.1E-04	8.7E-05	7.4E-05	6.0E-05	3.4E-05
NNW	2.8E-04	1.2E-04	8.5E-05	6.0E-05	4.8E-05	3.6E-05	1.8E-05
NW	2.8E-04	1.0E-04	7.8E-05	5.9E-05	5.0E-05	4.0E-05	2.4E-05
WNW	3.0E-04	1.5E-04	1.2E-04	8.3E-05	6.9E-05	5.3E-05	2.7E-05
W	3.3E-04	1.7E-04	1.3E-04	9.9E-05	8.5E-05	6.9E-05	4.0E-05
WSW	3.2E-04	1.6E-04	1.2E-04	8.8E-05	7.2E-05	5.5E-05	2.8E-05
SW	3.0E-04	1.2E-04	9.4E-05	7.1E-05	6.0E-05	4.8E-05	2.8E-05
SSW	2.7E-04	1.2E-04	9.3E-05	6.7E-05	5.5E-05	4.2E-05	2.2E-05
S	2.9E-04	1.2E-04	9.6E-05	7.3E-05	6.2E-05	5.0E-05	2.9E-05
SSE	3.3E-04	1.6E-04	1.2E-04	8.6E-05	7.0E-05	5.4E-05	2.7E-05
SSE	3.7E-04	1.7E-04	1.3E-04	9.9E-05	8.4E-05	6.7E-05	3.7E-05
ESE	4.1E-04	2.0E-04	1.5E-04	1.1E-04	9.0E-05	6.9E-05	3.4E-05
E	4.6E-04	2.0E-04	1.5E-04	1.1E-04	9.5E-05	7.5E-05	3.9E-05
ENE	4.9E-04	2.4E-04	1.8E-04	1.3E-04	1.0E-04	7.9E-05	3.7E-05
NE	4.8E-04	2.3E-04	1.8E-04	1.4E-04	1.2E-04	9.3E-05	5.0E-05
NNE	4.3E-04	2.2E-04	1.7E-04	1.2E-04	9.9E-05	7.5E-05	3.6E-05

	Distance (m)
Direction	2629
N	3.2E-05
NNW	1.7E-05
NW	2.2E-05
WNW	2.6E-05
W	3.7E-05
WSW	2.6E-05
SW	2.6E-05
SSW	2.1E-05
S	2.8E-05
SSE	2.6E-05
SSE	3.5E-05
ESE	3.2E-05
E	3.7E-05
ENE	3.5E-05
NE	4.7E-05
NNE	3.4E-05

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	8.4E-11	3.4E-11	2.6E-11	1.9E-11	1.6E-11	1.3E-11	6.2E-12
NNW	6.6E-11	2.6E-11	1.9E-11	1.3E-11	9.7E-12	6.7E-12	2.0E-12
NW	6.6E-11	2.3E-11	1.7E-11	1.2E-11	1.0E-11	7.7E-12	3.5E-12
WNW	7.1E-11	3.6E-11	2.6E-11	1.8E-11	1.5E-11	1.1E-11	4.4E-12
W	7.8E-11	3.9E-11	3.0E-11	2.2E-11	1.9E-11	1.5E-11	7.6E-12
WSW	7.7E-11	3.8E-11	2.8E-11	2.0E-11	1.6E-11	1.2E-11	4.5E-12
SW	7.1E-11	2.8E-11	2.1E-11	1.5E-11	1.3E-11	9.8E-12	4.6E-12
SSW	6.4E-11	2.9E-11	2.1E-11	1.4E-11	1.1E-11	8.3E-12	3.1E-12
S	6.9E-11	2.8E-11	2.2E-11	1.6E-11	1.3E-11	1.0E-11	5.0E-12
SSE	7.8E-11	3.7E-11	2.7E-11	1.9E-11	1.5E-11	1.1E-11	4.4E-12
SSE	9.0E-11	4.0E-11	3.1E-11	2.3E-11	1.9E-11	1.5E-11	7.0E-12
ESE	9.9E-11	4.7E-11	3.5E-11	2.5E-11	2.0E-11	1.5E-11	6.3E-12
E	1.1E-10	4.8E-11	3.6E-11	2.6E-11	2.2E-11	1.6E-11	7.5E-12
ENE	1.2E-10	5.7E-11	4.2E-11	3.0E-11	2.4E-11	1.8E-11	7.1E-12
NE	1.2E-10	5.6E-11	4.3E-11	3.2E-11	2.7E-11	2.1E-11	1.0E-11
NNE	1.0E-10	5.3E-11	3.9E-11	2.8E-11	2.2E-11	1.7E-11	6.8E-12

Distance (m)	
Direction	2629
N	5.7E-12
NNW	1.9E-12
NW	3.3E-12
WNW	4.1E-12
W	7.1E-12
WSW	4.2E-12
SW	4.3E-12
SSW	2.9E-12
S	4.6E-12
SSE	4.1E-12
SSE	6.5E-12
ESE	5.8E-12
E	7.0E-12
ENE	6.6E-12
NE	9.6E-12
NNE	6.3E-12

D O S E A N D R I S K S U M M A R I E S

Non-Radon Individual Assessment
Tue Jun 12 09:53:22 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: Fifteen

Comments: NFSS Technical Memo 2017 Year
Individual Dose

Dataset Name: NFSS2017 Ind Fif
Dataset Date:
Wind File: 

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.39E-04
UB_Wall	1.53E-04
Bone_Sur	1.30E-02
Brain	1.47E-04
Breasts	1.60E-04
St_Wall	1.48E-04
SI_Wall	1.47E-04
ULI_Wall	1.55E-04
LLI_Wall	1.76E-04
Kidneys	2.93E-04
Liver	2.40E-04
Muscle	1.65E-04
Ovaries	1.67E-04
Pancreas	1.40E-04
R_Marrow	6.89E-04
Skin	2.21E-03
Spleen	1.61E-04
Testes	1.88E-04
Thymus	1.47E-04
Thyroid	1.53E-04
GB_Wall	1.41E-04
Ht_Wall	1.46E-04
Uterus	1.45E-04
ET_Reg	6.82E-04
Lung_66	2.20E-03
Effectiv	6.24E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	1.66E-04
INHALATION	3.02E-04
AIR IMMERSION	7.57E-11
GROUND SURFACE	1.56E-04
INTERNAL	4.68E-04
EXTERNAL	1.56E-04
TOTAL	6.24E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	4.99E-05
Th-234	1.11E-06
Pa-234m	1.52E-05
Pa-234	3.00E-07
U-234	5.77E-05
Th-230	1.04E-04
Ra-226	1.80E-04
Rn-222	2.68E-08
Po-218	4.79E-13
Pb-214	1.75E-05
At-218	1.80E-12
Bi-214	1.02E-04
Rn-218	1.04E-14
Po-214	5.67E-09
Tl-210	4.00E-08
Pb-210	8.62E-08
Bi-210	1.39E-06
Hg-206	1.13E-13
Po-210	3.61E-10
Tl-206	3.25E-12
Th-232	2.66E-05
Ra-228	5.18E-09
Ac-228	5.87E-06
Th-228	4.56E-05
Ra-224	7.02E-08
Rn-220	4.29E-09
Po-216	1.03E-10
Pb-212	9.42E-07
Bi-212	1.10E-06
Po-212	0.00E+00
Tl-208	7.59E-06
U-235	6.26E-06
Th-231	1.76E-07
Pa-231	2.91E-10
Ac-227	9.77E-13
Th-227	4.66E-10
Fr-223	4.40E-12
Ra-223	5.21E-10
Rn-219	2.26E-10
At-219	0.00E+00
Bi-215	1.02E-15
Po-215	6.90E-13
Pb-211	4.43E-10
Bi-211	1.83E-10
Tl-207	2.30E-10
Po-211	8.79E-14
TOTAL	6.24E-04

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
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PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
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INGESTION	2.10E-11
INHALATION	2.85E-11
AIR IMMERSION	4.02E-17
GROUND SURFACE	7.66E-11
INTERNAL	4.95E-11
EXTERNAL	7.66E-11
TOTAL	1.26E-10

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	5.30E-12
Th-234	5.77E-13
Pa-234m	2.67E-12
Pa-234	1.63E-13
U-234	6.93E-12
Th-230	7.16E-12
Ra-226	2.32E-11
Rn-222	1.46E-14
Po-218	2.14E-19
Pb-214	9.37E-12
At-218	2.22E-19
Bi-214	5.41E-11
Rn-218	5.71E-21
Po-214	3.11E-15
Tl-210	2.13E-14
Pb-210	3.86E-14
Bi-210	1.55E-13
Hg-206	4.99E-20
Po-210	1.98E-16
Tl-206	3.66E-19
Th-232	1.62E-12
Ra-228	1.56E-15
Ac-228	3.12E-12
Th-228	5.12E-12
Ra-224	3.77E-14
Rn-220	2.35E-15
Po-216	5.69E-17
Pb-212	5.12E-13
Bi-212	4.24E-13
Po-212	0.00E+00
Tl-208	4.13E-12
U-235	1.41E-12
Th-231	8.02E-14
Pa-231	1.52E-16
Ac-227	3.65E-19
Th-227	2.53E-16
Fr-223	1.64E-18
Ra-223	2.82E-16
Rn-219	1.24E-16
At-219	0.00E+00
Bi-215	4.53E-22
Po-215	3.78E-19
Pb-211	1.58E-16
Bi-211	9.97E-17
Tl-207	2.95E-17
Po-211	4.81E-20
TOTAL	1.26E-10

INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	4.5E-04	2.0E-04	1.5E-04	1.2E-04	1.0E-04	8.4E-05	5.1E-05
NNW	3.6E-04	1.5E-04	1.2E-04	8.4E-05	6.9E-05	5.4E-05	3.0E-05
NW	3.6E-04	1.4E-04	1.1E-04	8.2E-05	7.1E-05	5.9E-05	3.8E-05
WNW	3.8E-04	2.0E-04	1.5E-04	1.1E-04	9.5E-05	7.5E-05	4.2E-05
W	4.2E-04	2.2E-04	1.7E-04	1.3E-04	1.2E-04	9.6E-05	5.8E-05
WSW	4.2E-04	2.2E-04	1.6E-04	1.2E-04	1.0E-04	7.8E-05	4.3E-05
SW	3.9E-04	1.6E-04	1.3E-04	9.8E-05	8.4E-05	7.0E-05	4.3E-05
SSW	3.5E-04	1.7E-04	1.3E-04	9.3E-05	7.8E-05	6.2E-05	3.5E-05
S	3.8E-04	1.6E-04	1.3E-04	1.0E-04	8.7E-05	7.2E-05	4.5E-05
SSE	4.2E-04	2.1E-04	1.6E-04	1.2E-04	9.7E-05	7.6E-05	4.2E-05
SSE	4.8E-04	2.3E-04	1.8E-04	1.3E-04	1.1E-04	9.3E-05	5.5E-05
ESE	5.3E-04	2.6E-04	2.0E-04	1.5E-04	1.2E-04	9.6E-05	5.1E-05
E	6.0E-04	2.6E-04	2.0E-04	1.5E-04	1.3E-04	1.0E-04	5.8E-05
ENE	6.2E-04	3.1E-04	2.3E-04	1.7E-04	1.4E-04	1.1E-04	5.5E-05
NE	6.2E-04	3.1E-04	2.4E-04	1.8E-04	1.5E-04	1.3E-04	7.2E-05
NNE	5.5E-04	2.9E-04	2.2E-04	1.6E-04	1.3E-04	1.0E-04	5.4E-05

Distance (m)	
Direction	2629
N	4.8E-05
NNW	3.0E-05
NW	3.6E-05
WNW	4.0E-05
W	5.5E-05
WSW	4.1E-05
SW	4.1E-05
SSW	3.4E-05
S	4.3E-05
SSE	4.0E-05
SSE	5.2E-05
ESE	4.9E-05
E	5.5E-05
ENE	5.3E-05
NE	6.8E-05
NNE	5.2E-05

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	533	783	914	1105	1250	1486	2499
N	9.1E-11	3.9E-11	3.0E-11	2.3E-11	2.0E-11	1.6E-11	9.2E-12
NNW	7.2E-11	3.0E-11	2.2E-11	1.6E-11	1.3E-11	9.7E-12	4.7E-12
NW	7.2E-11	2.6E-11	2.1E-11	1.6E-11	1.3E-11	1.1E-11	6.3E-12
WNW	7.7E-11	4.0E-11	3.0E-11	2.2E-11	1.8E-11	1.4E-11	7.2E-12
W	8.4E-11	4.3E-11	3.4E-11	2.6E-11	2.3E-11	1.9E-11	1.1E-11
WSW	8.3E-11	4.3E-11	3.2E-11	2.3E-11	1.9E-11	1.5E-11	7.4E-12
SW	7.7E-11	3.2E-11	2.5E-11	1.9E-11	1.6E-11	1.3E-11	7.5E-12
SSW	7.0E-11	3.3E-11	2.5E-11	1.8E-11	1.5E-11	1.1E-11	5.8E-12
S	7.5E-11	3.3E-11	2.5E-11	1.9E-11	1.7E-11	1.4E-11	7.9E-12
SSE	8.5E-11	4.2E-11	3.1E-11	2.3E-11	1.9E-11	1.5E-11	7.3E-12
SSE	9.7E-11	4.5E-11	3.5E-11	2.7E-11	2.3E-11	1.8E-11	1.0E-11
ESE	1.1E-10	5.3E-11	4.0E-11	2.9E-11	2.4E-11	1.9E-11	9.3E-12
E	1.2E-10	5.3E-11	4.1E-11	3.0E-11	2.5E-11	2.0E-11	1.1E-11
ENE	1.3E-10	6.3E-11	4.7E-11	3.4E-11	2.8E-11	2.1E-11	1.0E-11
NE	1.2E-10	6.2E-11	4.8E-11	3.6E-11	3.1E-11	2.5E-11	1.4E-11
NNE	1.1E-10	5.9E-11	4.4E-11	3.2E-11	2.6E-11	2.0E-11	9.9E-12

	Distance (m)
Direction	2629
N	8.7E-12
NNW	4.5E-12
NW	6.1E-12
WNW	6.9E-12
W	1.0E-11
WSW	7.0E-12
SW	7.1E-12
SSW	5.6E-12
S	7.5E-12
SSE	7.0E-12
SSE	9.5E-12
ESE	8.8E-12
E	1.0E-11
ENE	9.6E-12
NE	1.3E-11
NNE	9.3E-12

D O S E A N D R I S K S U M M A R I E S

Non-Radon Individual Assessment
Tue Jun 12 09:51:46 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: Adult

Comments: NFSS Technical Memo 2017 Year
Individual Dose

Dataset Name: NFSS2017 Ind Adu
Dataset Date:
Wind File: 

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.36E-04
UB_Wall	1.50E-04
Bone_Sur	4.69E-03
Brain	1.44E-04
Breasts	1.57E-04
St_Wall	1.45E-04
SI_Wall	1.45E-04
ULI_Wall	1.52E-04
LLI_Wall	1.73E-04
Kidneys	2.73E-04
Liver	2.23E-04
Muscle	1.62E-04
Ovaries	1.61E-04
Pancreas	1.37E-04
R_Marrow	3.70E-04
Skin	2.21E-03
Spleen	1.48E-04
Testes	1.83E-04
Thymus	1.44E-04
Thyroid	1.50E-04
GB_Wall	1.38E-04
Ht_Wall	1.44E-04
Uterus	1.42E-04
ET_Reg	6.52E-04
Lung_66	1.92E-03
Effectiv	4.66E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	4.87E-05
INHALATION	2.61E-04
AIR IMMERSION	7.57E-11
GROUND SURFACE	1.56E-04
INTERNAL	3.10E-04
EXTERNAL	1.56E-04
TOTAL	4.66E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	4.08E-05
Th-234	1.11E-06
Pa-234m	1.52E-05
Pa-234	3.00E-07
U-234	4.71E-05
Th-230	9.89E-05
Ra-226	5.58E-05
Rn-222	2.68E-08
Po-218	4.79E-13
Pb-214	1.75E-05
At-218	1.80E-12
Bi-214	1.02E-04
Rn-218	1.04E-14
Po-214	5.67E-09
Tl-210	4.00E-08
Pb-210	8.62E-08
Bi-210	1.39E-06
Hg-206	1.13E-13
Po-210	3.61E-10
Tl-206	3.25E-12
Th-232	2.59E-05
Ra-228	5.15E-09
Ac-228	5.87E-06
Th-228	3.84E-05
Ra-224	6.98E-08
Rn-220	4.29E-09
Po-216	1.03E-10
Pb-212	9.42E-07
Bi-212	1.10E-06
Po-212	0.00E+00
Tl-208	7.59E-06
U-235	5.43E-06
Th-231	1.76E-07
Pa-231	2.91E-10
Ac-227	9.77E-13
Th-227	4.66E-10
Fr-223	4.40E-12
Ra-223	5.21E-10
Rn-219	2.26E-10
At-219	0.00E+00
Bi-215	1.02E-15
Po-215	6.90E-13
Pb-211	4.43E-10
Bi-211	1.83E-10
Tl-207	2.30E-10
Po-211	8.79E-14
TOTAL	4.66E-04

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
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PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
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INGESTION	3.37E-11
INHALATION	7.64E-11
AIR IMMERSION	4.02E-17
GROUND SURFACE	7.66E-11
INTERNAL	1.10E-10
EXTERNAL	7.66E-11
TOTAL	1.87E-10

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	1.28E-11
Th-234	5.77E-13
Pa-234m	2.67E-12
Pa-234	1.63E-13
U-234	1.61E-11
Th-230	2.14E-11
Ra-226	3.97E-11
Rn-222	1.46E-14
Po-218	2.14E-19
Pb-214	9.37E-12
At-218	2.22E-19
Bi-214	5.41E-11
Rn-218	5.71E-21
Po-214	3.11E-15
Tl-210	2.13E-14
Pb-210	3.86E-14
Bi-210	1.55E-13
Hg-206	4.99E-20
Po-210	1.98E-16
Tl-206	3.66E-19
Th-232	5.50E-12
Ra-228	1.56E-15
Ac-228	3.12E-12
Th-228	1.38E-11
Ra-224	3.80E-14
Rn-220	2.35E-15
Po-216	5.69E-17
Pb-212	5.12E-13
Bi-212	4.24E-13
Po-212	0.00E+00
Tl-208	4.13E-12
U-235	2.09E-12
Th-231	8.02E-14
Pa-231	1.52E-16
Ac-227	3.65E-19
Th-227	2.53E-16
Fr-223	1.64E-18
Ra-223	2.82E-16
Rn-219	1.24E-16
At-219	0.00E+00
Bi-215	4.53E-22
Po-215	3.78E-19
Pb-211	1.58E-16
Bi-211	9.97E-17
Tl-207	2.95E-17
Po-211	4.81E-20
TOTAL	1.87E-10

INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	3.3E-04	1.4E-04	1.1E-04	7.9E-05	6.7E-05	5.3E-05	2.8E-05
NNW	2.6E-04	1.1E-04	7.7E-05	5.3E-05	4.2E-05	3.0E-05	1.2E-05
NW	2.6E-04	9.3E-05	7.1E-05	5.2E-05	4.4E-05	3.4E-05	1.8E-05
WNW	2.8E-04	1.4E-04	1.1E-04	7.6E-05	6.2E-05	4.7E-05	2.1E-05
W	3.1E-04	1.6E-04	1.2E-04	9.1E-05	7.7E-05	6.2E-05	3.4E-05
WSW	3.1E-04	1.5E-04	1.1E-04	8.1E-05	6.5E-05	4.9E-05	2.2E-05
SW	2.8E-04	1.1E-04	8.6E-05	6.4E-05	5.4E-05	4.2E-05	2.2E-05
SSW	2.6E-04	1.2E-04	8.5E-05	6.0E-05	4.9E-05	3.6E-05	1.6E-05
S	2.8E-04	1.1E-04	8.8E-05	6.6E-05	5.6E-05	4.4E-05	2.3E-05
SSE	3.1E-04	1.5E-04	1.1E-04	7.8E-05	6.3E-05	4.7E-05	2.1E-05
SSE	3.6E-04	1.6E-04	1.2E-04	9.1E-05	7.7E-05	6.0E-05	3.1E-05
ESE	3.9E-04	1.9E-04	1.4E-04	1.0E-04	8.2E-05	6.2E-05	2.8E-05
E	4.4E-04	1.9E-04	1.4E-04	1.1E-04	8.7E-05	6.8E-05	3.3E-05
ENE	4.7E-04	2.3E-04	1.7E-04	1.2E-04	9.6E-05	7.2E-05	3.1E-05
NE	4.6E-04	2.2E-04	1.7E-04	1.3E-04	1.1E-04	8.5E-05	4.4E-05
NNE	4.1E-04	2.1E-04	1.6E-04	1.1E-04	9.1E-05	6.8E-05	3.0E-05

Distance (m)	
Direction	2629
N	2.6E-05
NNW	1.2E-05
NW	1.7E-05
WNW	2.0E-05
W	3.1E-05
WSW	2.1E-05
SW	2.1E-05
SSW	1.6E-05
S	2.2E-05
SSE	2.0E-05
SSE	2.9E-05
ESE	2.7E-05
E	3.1E-05
ENE	2.9E-05
NE	4.1E-05
NNE	2.8E-05

INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

	Distance (m)						
Direction	533	783	914	1105	1250	1486	2499
N	1.3E-10	5.7E-11	4.4E-11	3.4E-11	2.9E-11	2.3E-11	1.3E-11
NNW	1.1E-10	4.5E-11	3.3E-11	2.3E-11	1.9E-11	1.4E-11	6.8E-12
NW	1.1E-10	3.9E-11	3.0E-11	2.3E-11	1.9E-11	1.6E-11	9.1E-12
WNW	1.1E-10	5.9E-11	4.5E-11	3.2E-11	2.7E-11	2.1E-11	1.0E-11
W	1.3E-10	6.4E-11	5.0E-11	3.8E-11	3.3E-11	2.7E-11	1.5E-11
WSW	1.2E-10	6.3E-11	4.7E-11	3.4E-11	2.8E-11	2.2E-11	1.1E-11
SW	1.1E-10	4.7E-11	3.6E-11	2.7E-11	2.3E-11	1.9E-11	1.1E-11
SSW	1.0E-10	4.8E-11	3.6E-11	2.6E-11	2.1E-11	1.6E-11	8.5E-12
S	1.1E-10	4.8E-11	3.7E-11	2.8E-11	2.4E-11	2.0E-11	1.1E-11
SSE	1.3E-10	6.1E-11	4.6E-11	3.3E-11	2.7E-11	2.1E-11	1.1E-11
SSE	1.4E-10	6.6E-11	5.1E-11	3.9E-11	3.3E-11	2.6E-11	1.4E-11
ESE	1.6E-10	7.7E-11	5.8E-11	4.2E-11	3.5E-11	2.7E-11	1.3E-11
E	1.8E-10	7.8E-11	6.0E-11	4.4E-11	3.7E-11	2.9E-11	1.5E-11
ENE	1.9E-10	9.2E-11	6.9E-11	4.9E-11	4.1E-11	3.1E-11	1.5E-11
NE	1.9E-10	9.0E-11	7.0E-11	5.3E-11	4.5E-11	3.6E-11	2.0E-11
NNE	1.6E-10	8.7E-11	6.5E-11	4.7E-11	3.8E-11	2.9E-11	1.4E-11

	Distance (m)
Direction	2629
N	1.2E-11
NNW	6.6E-12
NW	8.7E-12
WNW	1.0E-11
W	1.5E-11
WSW	1.0E-11
SW	1.0E-11
SSW	8.1E-12
S	1.1E-11
SSE	1.0E-11
SSE	1.4E-11
ESE	1.3E-11
E	1.4E-11
ENE	1.4E-11
NE	1.8E-11
NNE	1.3E-11

ATTACHMENT D

CAPP88-PC REPORTS – POPULATION

D O S E A N D R I S K S U M M A R I E S

Non-Radon Population Assessment
Tue Jun 12 11:17:56 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: Infant

Comments: NFSS Technical Memo 2017 Year
Population Dose

Dataset Name: NFSS2017 Pop Inf

Dataset Date:

Wi

Pop File:



ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	8.31E-05	8.52E-04
UB_Wall	9.06E-05	9.13E-04
Bone_Sur	4.59E-03	7.83E-02
Brain	8.71E-05	8.84E-04
Breasts	9.43E-05	9.44E-04
St_Wall	8.86E-05	9.04E-04
SI_Wall	8.86E-05	9.11E-04
ULI_Wall	1.01E-04	1.12E-03
LLI_Wall	1.33E-04	1.70E-03
Kidneys	2.29E-04	2.96E-03
Liver	2.06E-04	2.85E-03
Muscle	9.69E-05	9.65E-04
Ovaries	9.85E-05	1.03E-03
Pancreas	8.36E-05	8.56E-04
R_Marrow	6.12E-04	1.00E-02
Skin	1.19E-03	1.00E-02
Spleen	9.14E-05	9.52E-04
Testes	1.12E-04	1.15E-03
Thymus	8.73E-05	8.86E-04
Thyroid	9.06E-05	9.13E-04
GB_Wall	8.42E-05	8.60E-04
Ht_Wall	8.70E-05	8.83E-04
Uterus	8.63E-05	8.78E-04
ET_Reg	6.86E-04	3.46E-03
Lung_66	1.02E-03	4.94E-03
Effectiv	3.34E-04	3.56E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	1.26E-04	2.33E-03
INHALATION	1.24E-04	5.36E-04
AIR IMMERSION	3.88E-11	5.34E-10
GROUND SURFACE	8.37E-05	6.91E-04
INTERNAL	2.50E-04	2.87E-03
EXTERNAL	8.37E-05	6.91E-04
TOTAL	3.34E-04	3.56E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	2.69E-05	1.87E-04
Th-234	5.97E-07	4.95E-06
Pa-234m	8.16E-06	6.73E-05
Pa-234	1.61E-07	1.33E-06
U-234	3.02E-05	2.05E-04
Th-230	5.44E-05	4.69E-04
Ra-226	1.03E-04	1.78E-03
Rn-222	1.44E-08	1.19E-07
Po-218	2.57E-13	2.12E-12
Pb-214	9.38E-06	7.74E-05
At-218	9.65E-13	7.97E-12
Bi-214	5.48E-05	4.52E-04
Rn-218	5.59E-15	4.61E-14
Po-214	3.04E-09	2.51E-08
Tl-210	2.14E-08	1.77E-07
Pb-210	4.62E-08	3.82E-07
Bi-210	7.47E-07	6.16E-06
Hg-206	6.03E-14	4.97E-13
Po-210	1.93E-10	1.60E-09
Tl-206	1.74E-12	1.44E-11
Th-232	1.02E-05	8.22E-05
Ra-228	2.81E-09	7.41E-08
Ac-228	3.15E-06	2.60E-05
Th-228	2.36E-05	1.34E-04
Ra-224	3.78E-08	6.28E-07
Rn-220	2.30E-09	1.89E-08
Po-216	5.54E-11	4.57E-10
Pb-212	5.04E-07	4.17E-06
Bi-212	5.88E-07	4.86E-06
Po-212	0.00E+00	0.00E+00
Tl-208	4.07E-06	3.35E-05
U-235	3.34E-06	2.44E-05
Th-231	9.41E-08	7.76E-07
Pa-231	1.56E-10	1.29E-09
Ac-227	5.23E-13	4.32E-12
Th-227	2.50E-10	2.06E-09
Fr-223	2.35E-12	1.94E-11
Ra-223	2.79E-10	2.30E-09
Rn-219	1.21E-10	9.98E-10
At-219	0.00E+00	0.00E+00
Bi-215	5.44E-16	4.49E-15
Po-215	3.69E-13	3.05E-12
Pb-211	2.37E-10	1.96E-09
Bi-211	9.78E-11	8.07E-10
Tl-207	1.23E-10	1.01E-09
Po-211	4.71E-14	3.89E-13
TOTAL	3.34E-04	3.56E-03

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagu	7.25E-13	7.94E-11
Stomach	2.81E-12	3.06E-10
Colon	7.51E-12	8.56E-10
Liver	1.16E-12	1.40E-10
LUNG	1.05E-11	9.65E-10
Bone	5.25E-13	1.13E-10
Skin	1.17E-12	1.25E-10
Breast	3.64E-12	3.93E-10
Ovary	9.69E-13	1.06E-10
Bladder	1.76E-12	1.92E-10
Kidneys	4.17E-13	5.14E-11
Thyroid	2.30E-13	2.50E-11
Leukemia	4.21E-12	4.62E-10
Residual	1.07E-11	1.21E-09
Total	4.63E-11	5.03E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	1.84E-12	4.51E-10
INHALATION	3.41E-12	1.91E-10
AIR IMMERSION	2.06E-17	3.74E-15
GROUND SURFACE	4.11E-11	4.39E-09
INTERNAL	5.25E-12	6.42E-10
EXTERNAL	4.11E-11	4.39E-09
TOTAL	4.63E-11	5.03E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	7.72E-13	7.45E-11
Th-234	3.09E-13	3.30E-11
Pa-234m	1.43E-12	1.53E-10
Pa-234	8.74E-14	9.34E-12
U-234	8.73E-13	8.21E-11
Th-230	9.71E-13	6.70E-11
Ra-226	1.89E-12	3.79E-10
Rn-222	7.84E-15	8.38E-13
Po-218	1.15E-19	1.23E-17
Pb-214	5.02E-12	5.36E-10
At-218	1.19E-19	1.27E-17
Bi-214	2.90E-11	3.10E-09
Rn-218	3.06E-21	3.27E-19
Po-214	1.67E-15	1.78E-13
Tl-210	1.14E-14	1.22E-12
Pb-210	2.07E-14	2.21E-12
Bi-210	8.28E-14	8.85E-12
Hg-206	2.67E-20	2.86E-18
Po-210	1.06E-16	1.13E-14
Tl-206	1.96E-19	2.09E-17
Th-232	2.03E-13	1.34E-11
Ra-228	8.37E-16	9.39E-14
Ac-228	1.67E-12	1.79E-10
Th-228	6.47E-13	3.85E-11
Ra-224	2.01E-14	2.24E-12
Rn-220	1.26E-15	1.34E-13
Po-216	3.05E-17	3.25E-15
Pb-212	2.74E-13	2.93E-11
Bi-212	2.27E-13	2.43E-11
Po-212	0.00E+00	0.00E+00
Tl-208	2.21E-12	2.36E-10
U-235	5.69E-13	6.01E-11
Th-231	4.30E-14	4.59E-12
Pa-231	8.13E-17	8.69E-15
Ac-227	1.96E-19	2.09E-17
Th-227	1.35E-16	1.45E-14
Fr-223	8.77E-19	9.38E-17
Ra-223	1.51E-16	1.61E-14
Rn-219	6.62E-17	7.07E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.43E-22	2.60E-20
Po-215	2.02E-19	2.16E-17
Pb-211	8.49E-17	9.07E-15
Bi-211	5.34E-17	5.71E-15
Tl-207	1.58E-17	1.69E-15
Po-211	2.58E-20	2.76E-18
TOTAL	4.63E-11	5.03E-09

D O S E A N D R I S K S U M M A R I E S

Non-Radon Population Assessment
Tue Jun 12 11:22:30 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: One

Comments: NFSS Technical Memo 2017 Year
Population Dose

Dataset Name: NFSS2017 Pop One

Dataset Date:

Wi

Pop File:



ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	7.32E-05	6.64E-04
UB_Wall	8.07E-05	7.26E-04
Bone_Sur	1.36E-03	1.73E-02
Brain	7.72E-05	6.97E-04
Breasts	8.45E-05	7.57E-04
St_Wall	7.85E-05	7.12E-04
SI_Wall	7.86E-05	7.20E-04
ULI_Wall	8.82E-05	8.81E-04
LLI_Wall	1.14E-04	1.32E-03
Kidneys	1.50E-04	1.51E-03
Liver	1.31E-04	1.46E-03
Muscle	8.71E-05	7.78E-04
Ovaries	8.20E-05	7.27E-04
Pancreas	7.38E-05	6.69E-04
R_Marrow	1.94E-04	2.29E-03
Skin	1.18E-03	9.82E-03
Spleen	7.92E-05	7.21E-04
Testes	9.38E-05	8.25E-04
Thymus	7.75E-05	6.99E-04
Thyroid	8.08E-05	7.27E-04
GB_Wall	7.44E-05	6.74E-04
Ht_Wall	7.72E-05	6.97E-04
Uterus	7.65E-05	6.92E-04
ET_Reg	7.17E-04	3.45E-03
Lung_66	1.13E-03	5.28E-03
Effectiv	2.52E-04	1.82E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	2.83E-05	5.21E-04
INHALATION	1.40E-04	6.04E-04
AIR IMMERSION	3.88E-11	5.34E-10
GROUND SURFACE	8.37E-05	6.91E-04
INTERNAL	1.68E-04	1.12E-03
EXTERNAL	8.37E-05	6.91E-04
TOTAL	2.52E-04	1.82E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	2.50E-05	1.37E-04
Th-234	5.97E-07	4.94E-06
Pa-234m	8.16E-06	6.73E-05
Pa-234	1.61E-07	1.33E-06
U-234	2.85E-05	1.53E-04
Th-230	4.34E-05	2.15E-04
Ra-226	3.55E-05	4.56E-04
Rn-222	1.44E-08	1.19E-07
Po-218	2.57E-13	2.12E-12
Pb-214	9.38E-06	7.74E-05
At-218	9.65E-13	7.97E-12
Bi-214	5.48E-05	4.52E-04
Rn-218	5.59E-15	4.61E-14
Po-214	3.04E-09	2.51E-08
Tl-210	2.14E-08	1.77E-07
Pb-210	4.62E-08	3.81E-07
Bi-210	7.47E-07	6.16E-06
Hg-206	6.03E-14	4.97E-13
Po-210	1.93E-10	1.60E-09
Tl-206	1.74E-12	1.44E-11
Th-232	9.38E-06	4.49E-05
Ra-228	2.77E-09	3.41E-08
Ac-228	3.15E-06	2.60E-05
Th-228	2.45E-05	1.10E-04
Ra-224	3.78E-08	5.83E-07
Rn-220	2.30E-09	1.89E-08
Po-216	5.54E-11	4.57E-10
Pb-212	5.04E-07	4.17E-06
Bi-212	5.88E-07	4.86E-06
Po-212	0.00E+00	0.00E+00
Tl-208	4.07E-06	3.35E-05
U-235	3.19E-06	2.00E-05
Th-231	9.41E-08	7.77E-07
Pa-231	1.56E-10	1.29E-09
Ac-227	5.23E-13	4.32E-12
Th-227	2.50E-10	2.06E-09
Fr-223	2.35E-12	1.94E-11
Ra-223	2.79E-10	2.30E-09
Rn-219	1.21E-10	9.98E-10
At-219	0.00E+00	0.00E+00
Bi-215	5.44E-16	4.49E-15
Po-215	3.69E-13	3.05E-12
Pb-211	2.37E-10	1.96E-09
Bi-211	9.78E-11	8.07E-10
Tl-207	1.23E-10	1.01E-09
Po-211	4.71E-14	3.89E-13
TOTAL	2.52E-04	1.82E-03

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagu	7.31E-13	8.08E-11
Stomach	2.83E-12	3.13E-10
Colon	7.78E-12	9.17E-10
Liver	1.21E-12	1.50E-10
LUNG	1.16E-11	1.04E-09
Bone	7.21E-13	1.57E-10
Skin	1.17E-12	1.26E-10
Breast	3.66E-12	3.96E-10
Ovary	9.79E-13	1.08E-10
Bladder	1.77E-12	1.95E-10
Kidneys	4.37E-13	5.58E-11
Thyroid	2.32E-13	2.55E-11
Leukemia	4.24E-12	4.70E-10
Residual	1.10E-11	1.28E-09
Total	4.84E-11	5.31E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	2.80E-12	6.72E-10
INHALATION	4.50E-12	2.52E-10
AIR IMMERSION	2.06E-17	3.74E-15
GROUND SURFACE	4.11E-11	4.39E-09
INTERNAL	7.31E-12	9.24E-10
EXTERNAL	4.11E-11	4.39E-09
TOTAL	4.84E-11	5.31E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	1.05E-12	1.05E-10
Th-234	3.09E-13	3.31E-11
Pa-234m	1.43E-12	1.53E-10
Pa-234	8.74E-14	9.34E-12
U-234	1.19E-12	1.16E-10
Th-230	1.30E-12	9.18E-11
Ra-226	2.72E-12	5.51E-10
Rn-222	7.84E-15	8.38E-13
Po-218	1.15E-19	1.23E-17
Pb-214	5.02E-12	5.36E-10
At-218	1.19E-19	1.27E-17
Bi-214	2.90E-11	3.10E-09
Rn-218	3.06E-21	3.27E-19
Po-214	1.67E-15	1.78E-13
Tl-210	1.14E-14	1.22E-12
Pb-210	2.07E-14	2.21E-12
Bi-210	8.28E-14	8.85E-12
Hg-206	2.67E-20	2.86E-18
Po-210	1.06E-16	1.13E-14
Tl-206	1.96E-19	2.09E-17
Th-232	2.71E-13	1.83E-11
Ra-228	8.37E-16	9.63E-14
Ac-228	1.67E-12	1.79E-10
Th-228	8.58E-13	5.15E-11
Ra-224	2.01E-14	2.28E-12
Rn-220	1.26E-15	1.34E-13
Po-216	3.05E-17	3.25E-15
Pb-212	2.74E-13	2.93E-11
Bi-212	2.27E-13	2.43E-11
Po-212	0.00E+00	0.00E+00
Tl-208	2.21E-12	2.36E-10
U-235	5.94E-13	6.29E-11
Th-231	4.30E-14	4.59E-12
Pa-231	8.13E-17	8.69E-15
Ac-227	1.96E-19	2.09E-17
Th-227	1.35E-16	1.45E-14
Fr-223	8.77E-19	9.38E-17
Ra-223	1.51E-16	1.61E-14
Rn-219	6.62E-17	7.07E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.43E-22	2.60E-20
Po-215	2.02E-19	2.16E-17
Pb-211	8.49E-17	9.07E-15
Bi-211	5.34E-17	5.71E-15
Tl-207	1.58E-17	1.69E-15
Po-211	2.58E-20	2.76E-18
TOTAL	4.84E-11	5.31E-09

D O S E A N D R I S K S U M M A R I E S

Non-Radon Population Assessment
Tue Jun 12 11:26:31 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: Five

Comments: NFSS Technical Memo 2017 Year
Population Dose

Dataset Name: NFSS2017 Pop Fiv
Dataset Date:

Wi [REDACTED]
Pop File: [REDACTED]

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	7.16E-05	6.30E-04
UB_Wall	7.92E-05	6.92E-04
Bone_Sur	1.45E-03	1.63E-02
Brain	7.57E-05	6.64E-04
Breasts	8.30E-05	7.23E-04
St_Wall	7.67E-05	6.74E-04
SI_Wall	7.65E-05	6.76E-04
ULI_Wall	8.22E-05	7.68E-04
LLI_Wall	9.73E-05	1.02E-03
Kidneys	1.36E-04	1.26E-03
Liver	1.16E-04	1.16E-03
Muscle	8.55E-05	7.44E-04
Ovaries	8.23E-05	7.02E-04
Pancreas	7.22E-05	6.35E-04
R_Marrow	1.69E-04	1.78E-03
Skin	1.18E-03	9.79E-03
Spleen	7.77E-05	6.87E-04
Testes	9.36E-05	7.96E-04
Thymus	7.59E-05	6.65E-04
Thyroid	7.92E-05	6.92E-04
GB_Wall	7.28E-05	6.40E-04
Ht_Wall	7.56E-05	6.63E-04
Uterus	7.49E-05	6.57E-04
ET_Reg	4.49E-04	2.26E-03
Lung_66	1.05E-03	4.89E-03
Effectiv	2.37E-04	1.64E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	2.10E-05	3.78E-04
INHALATION	1.33E-04	5.73E-04
AIR IMMERSION	3.88E-11	5.34E-10
GROUND SURFACE	8.37E-05	6.91E-04
INTERNAL	1.54E-04	9.51E-04
EXTERNAL	8.37E-05	6.91E-04
TOTAL	2.37E-04	1.64E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	2.23E-05	1.17E-04
Th-234	5.97E-07	4.93E-06
Pa-234m	8.16E-06	6.73E-05
Pa-234	1.61E-07	1.33E-06
U-234	2.54E-05	1.32E-04
Th-230	4.37E-05	2.13E-04
Ra-226	2.82E-05	3.35E-04
Rn-222	1.44E-08	1.19E-07
Po-218	2.57E-13	2.12E-12
Pb-214	9.38E-06	7.74E-05
At-218	9.65E-13	7.97E-12
Bi-214	5.48E-05	4.52E-04
Rn-218	5.59E-15	4.61E-14
Po-214	3.04E-09	2.51E-08
Tl-210	2.14E-08	1.77E-07
Pb-210	4.62E-08	3.81E-07
Bi-210	7.47E-07	6.16E-06
Hg-206	6.03E-14	4.97E-13
Po-210	1.93E-10	1.60E-09
Tl-206	1.74E-12	1.44E-11
Th-232	1.01E-05	4.75E-05
Ra-228	2.76E-09	3.04E-08
Ac-228	3.15E-06	2.60E-05
Th-228	2.21E-05	9.81E-05
Ra-224	3.77E-08	5.49E-07
Rn-220	2.30E-09	1.89E-08
Po-216	5.54E-11	4.57E-10
Pb-212	5.04E-07	4.16E-06
Bi-212	5.88E-07	4.86E-06
Po-212	0.00E+00	0.00E+00
Tl-208	4.07E-06	3.35E-05
U-235	2.94E-06	1.82E-05
Th-231	9.41E-08	7.76E-07
Pa-231	1.56E-10	1.29E-09
Ac-227	5.23E-13	4.32E-12
Th-227	2.50E-10	2.06E-09
Fr-223	2.35E-12	1.94E-11
Ra-223	2.79E-10	2.30E-09
Rn-219	1.21E-10	9.98E-10
At-219	0.00E+00	0.00E+00
Bi-215	5.44E-16	4.49E-15
Po-215	3.69E-13	3.05E-12
Pb-211	2.37E-10	1.96E-09
Bi-211	9.78E-11	8.07E-10
Tl-207	1.23E-10	1.01E-09
Po-211	4.71E-14	3.89E-13
TOTAL	2.37E-04	1.64E-03

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagu	7.16E-13	7.69E-11
Stomach	2.78E-12	2.98E-10
Colon	7.25E-12	7.86E-10
Liver	1.10E-12	1.20E-10
LUNG	2.13E-11	1.56E-09
Bone	1.98E-13	2.06E-11
Skin	1.17E-12	1.25E-10
Breast	3.63E-12	3.88E-10
Ovary	9.64E-13	1.03E-10
Bladder	1.73E-12	1.86E-10
Kidneys	4.05E-13	4.59E-11
Thyroid	2.28E-13	2.44E-11
Leukemia	4.13E-12	4.42E-10
Residual	1.02E-11	1.10E-09
Total	5.59E-11	5.27E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	2.94E-13	6.64E-11
INHALATION	1.45E-11	8.14E-10
AIR IMMERSION	2.06E-17	3.74E-15
GROUND SURFACE	4.11E-11	4.39E-09
INTERNAL	1.48E-11	8.80E-10
EXTERNAL	4.11E-11	4.39E-09
TOTAL	5.59E-11	5.27E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	2.54E-12	1.43E-10
Th-234	3.09E-13	3.30E-11
Pa-234m	1.43E-12	1.53E-10
Pa-234	8.74E-14	9.34E-12
U-234	3.17E-12	2.17E-10
Th-230	3.69E-12	2.08E-10
Ra-226	1.78E-12	1.07E-10
Rn-222	7.84E-15	8.38E-13
Po-218	1.15E-19	1.23E-17
Pb-214	5.02E-12	5.36E-10
At-218	1.19E-19	1.27E-17
Bi-214	2.90E-11	3.10E-09
Rn-218	3.06E-21	3.27E-19
Po-214	1.67E-15	1.78E-13
Tl-210	1.14E-14	1.22E-12
Pb-210	2.07E-14	2.21E-12
Bi-210	8.28E-14	8.85E-12
Hg-206	2.67E-20	2.86E-18
Po-210	1.06E-16	1.13E-14
Tl-206	1.96E-19	2.09E-17
Th-232	7.80E-13	4.42E-11
Ra-228	8.36E-16	8.98E-14
Ac-228	1.67E-12	1.79E-10
Th-228	2.79E-12	1.63E-10
Ra-224	2.02E-14	2.59E-12
Rn-220	1.26E-15	1.34E-13
Po-216	3.05E-17	3.25E-15
Pb-212	2.74E-13	2.93E-11
Bi-212	2.27E-13	2.43E-11
Po-212	0.00E+00	0.00E+00
Tl-208	2.21E-12	2.36E-10
U-235	7.49E-13	7.07E-11
Th-231	4.30E-14	4.59E-12
Pa-231	8.13E-17	8.69E-15
Ac-227	1.96E-19	2.09E-17
Th-227	1.35E-16	1.45E-14
Fr-223	8.77E-19	9.38E-17
Ra-223	1.51E-16	1.61E-14
Rn-219	6.62E-17	7.07E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.43E-22	2.60E-20
Po-215	2.02E-19	2.16E-17
Pb-211	8.49E-17	9.07E-15
Bi-211	5.34E-17	5.71E-15
Tl-207	1.58E-17	1.69E-15
Po-211	2.58E-20	2.76E-18
TOTAL	5.59E-11	5.27E-09

D O S E A N D R I S K S U M M A R I E S

Non-Radon Population Assessment
Tue Jun 12 11:31:41 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: Ten

Comments: NFSS Technical Memo 2017 Year
Population Dose

Dataset Name: NFSS2017 Pop Ten

Dataset Date:

Wi

Pop File:



ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	7.04E-05	6.05E-04
UB_Wall	7.79E-05	6.66E-04
Bone_Sur	2.08E-03	2.47E-02
Brain	7.44E-05	6.38E-04
Breasts	8.17E-05	6.97E-04
St_Wall	7.53E-05	6.46E-04
SI_Wall	7.49E-05	6.45E-04
ULI_Wall	7.87E-05	7.02E-04
LLI_Wall	8.84E-05	8.56E-04
Kidneys	1.28E-04	1.12E-03
Liver	1.09E-04	1.01E-03
Muscle	8.42E-05	7.18E-04
Ovaries	8.18E-05	6.77E-04
Pancreas	7.10E-05	6.09E-04
R_Marrow	1.87E-04	2.06E-03
Skin	1.18E-03	9.76E-03
Spleen	7.71E-05	6.74E-04
Testes	9.35E-05	7.73E-04
Thymus	7.46E-05	6.39E-04
Thyroid	7.80E-05	6.67E-04
GB_Wall	7.15E-05	6.14E-04
Ht_Wall	7.44E-05	6.37E-04
Uterus	7.37E-05	6.31E-04
ET_Reg	4.48E-04	2.24E-03
Lung_66	9.87E-04	4.60E-03
Effectiv	2.36E-04	1.69E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	2.44E-05	4.43E-04
INHALATION	1.28E-04	5.54E-04
AIR IMMERSION	3.88E-11	5.34E-10
GROUND SURFACE	8.37E-05	6.91E-04
INTERNAL	1.53E-04	9.97E-04
EXTERNAL	8.37E-05	6.91E-04
TOTAL	2.36E-04	1.69E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	2.10E-05	1.08E-04
Th-234	5.97E-07	4.93E-06
Pa-234m	8.16E-06	6.73E-05
Pa-234	1.61E-07	1.33E-06
U-234	2.43E-05	1.24E-04
Th-230	4.22E-05	2.01E-04
Ra-226	3.26E-05	4.18E-04
Rn-222	1.44E-08	1.19E-07
Po-218	2.57E-13	2.12E-12
Pb-214	9.38E-06	7.74E-05
At-218	9.65E-13	7.97E-12
Bi-214	5.48E-05	4.52E-04
Rn-218	5.59E-15	4.61E-14
Po-214	3.04E-09	2.51E-08
Tl-210	2.14E-08	1.77E-07
Pb-210	4.62E-08	3.81E-07
Bi-210	7.47E-07	6.16E-06
Hg-206	6.03E-14	4.97E-13
Po-210	1.93E-10	1.60E-09
Tl-206	1.74E-12	1.44E-11
Th-232	1.02E-05	4.72E-05
Ra-228	2.76E-09	3.15E-08
Ac-228	3.15E-06	2.60E-05
Th-228	2.08E-05	9.16E-05
Ra-224	3.77E-08	5.68E-07
Rn-220	2.30E-09	1.89E-08
Po-216	5.54E-11	4.57E-10
Pb-212	5.04E-07	4.17E-06
Bi-212	5.88E-07	4.86E-06
Po-212	0.00E+00	0.00E+00
Tl-208	4.07E-06	3.35E-05
U-235	2.83E-06	1.74E-05
Th-231	9.41E-08	7.76E-07
Pa-231	1.56E-10	1.29E-09
Ac-227	5.23E-13	4.32E-12
Th-227	2.50E-10	2.06E-09
Fr-223	2.35E-12	1.94E-11
Ra-223	2.79E-10	2.30E-09
Rn-219	1.21E-10	9.98E-10
At-219	0.00E+00	0.00E+00
Bi-215	5.44E-16	4.49E-15
Po-215	3.69E-13	3.05E-12
Pb-211	2.37E-10	1.96E-09
Bi-211	9.78E-11	8.07E-10
Tl-207	1.23E-10	1.01E-09
Po-211	4.71E-14	3.89E-13
TOTAL	2.36E-04	1.69E-03

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagu	7.18E-13	7.71E-11
Stomach	2.79E-12	2.99E-10
Colon	7.31E-12	7.98E-10
Liver	1.12E-12	1.23E-10
LUNG	2.70E-11	1.87E-09
Bone	2.30E-13	2.34E-11
Skin	1.17E-12	1.25E-10
Breast	3.63E-12	3.89E-10
Ovary	9.70E-13	1.04E-10
Bladder	1.74E-12	1.87E-10
Kidneys	4.16E-13	4.74E-11
Thyroid	2.28E-13	2.45E-11
Leukemia	4.14E-12	4.42E-10
Residual	1.03E-11	1.10E-09
Total	6.17E-11	5.61E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	3.92E-13	8.86E-11
INHALATION	2.03E-11	1.13E-09
AIR IMMERSION	2.06E-17	3.74E-15
GROUND SURFACE	4.11E-11	4.39E-09
INTERNAL	2.06E-11	1.22E-09
EXTERNAL	4.11E-11	4.39E-09
TOTAL	6.17E-11	5.61E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	3.54E-12	1.98E-10
Th-234	3.09E-13	3.30E-11
Pa-234m	1.43E-12	1.53E-10
Pa-234	8.74E-14	9.34E-12
U-234	4.40E-12	2.99E-10
Th-230	5.15E-12	2.89E-10
Ra-226	2.43E-12	1.43E-10
Rn-222	7.84E-15	8.38E-13
Po-218	1.15E-19	1.23E-17
Pb-214	5.02E-12	5.36E-10
At-218	1.19E-19	1.27E-17
Bi-214	2.90E-11	3.10E-09
Rn-218	3.06E-21	3.27E-19
Po-214	1.67E-15	1.78E-13
Tl-210	1.14E-14	1.22E-12
Pb-210	2.07E-14	2.21E-12
Bi-210	8.28E-14	8.85E-12
Hg-206	2.67E-20	2.86E-18
Po-210	1.06E-16	1.13E-14
Tl-206	1.96E-19	2.09E-17
Th-232	1.09E-12	6.16E-11
Ra-228	8.36E-16	9.00E-14
Ac-228	1.67E-12	1.79E-10
Th-228	3.88E-12	2.26E-10
Ra-224	2.03E-14	2.76E-12
Rn-220	1.26E-15	1.34E-13
Po-216	3.05E-17	3.25E-15
Pb-212	2.74E-13	2.93E-11
Bi-212	2.27E-13	2.43E-11
Po-212	0.00E+00	0.00E+00
Tl-208	2.21E-12	2.36E-10
U-235	8.46E-13	7.73E-11
Th-231	4.30E-14	4.59E-12
Pa-231	8.13E-17	8.69E-15
Ac-227	1.96E-19	2.09E-17
Th-227	1.35E-16	1.45E-14
Fr-223	8.77E-19	9.38E-17
Ra-223	1.51E-16	1.61E-14
Rn-219	6.62E-17	7.07E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.43E-22	2.60E-20
Po-215	2.02E-19	2.16E-17
Pb-211	8.49E-17	9.07E-15
Bi-211	5.34E-17	5.71E-15
Tl-207	1.58E-17	1.69E-15
Po-211	2.58E-20	2.76E-18
TOTAL	6.17E-11	5.61E-09

D O S E A N D R I S K S U M M A R I E S

Non-Radon Population Assessment
Tue Jun 12 11:32:53 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: Fifteen

Comments: NFSS Technical Memo 2017 Year
Population Dose

Dataset Name: NFSS2017 Pop Fif
Dataset Date:

Wi [REDACTED]
Pop File: [REDACTED]

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	7.08E-05	5.99E-04
UB_Wall	7.81E-05	6.58E-04
Bone_Sur	4.04E-03	5.19E-02
Brain	7.48E-05	6.32E-04
Breasts	8.19E-05	6.89E-04
St_Wall	7.55E-05	6.37E-04
SI_Wall	7.50E-05	6.35E-04
ULI_Wall	7.74E-05	6.68E-04
LLI_Wall	8.37E-05	7.61E-04
Kidneys	1.33E-04	1.11E-03
Liver	1.10E-04	9.52E-04
Muscle	8.45E-05	7.11E-04
Ovaries	8.43E-05	6.78E-04
Pancreas	7.12E-05	6.02E-04
R_Marrow	2.42E-04	2.81E-03
Skin	1.18E-03	9.75E-03
Spleen	7.91E-05	6.95E-04
Testes	9.58E-05	7.72E-04
Thymus	7.49E-05	6.31E-04
Thyroid	7.83E-05	6.60E-04
GB_Wall	7.18E-05	6.06E-04
Ht_Wall	7.46E-05	6.29E-04
Uterus	7.39E-05	6.23E-04
ET_Reg	3.49E-04	1.80E-03
Lung_66	1.13E-03	5.19E-03
Effectiv	2.79E-04	2.11E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	4.12E-05	7.48E-04
INHALATION	1.55E-04	6.68E-04
AIR IMMERSION	3.88E-11	5.34E-10
GROUND SURFACE	8.37E-05	6.91E-04
INTERNAL	1.96E-04	1.42E-03
EXTERNAL	8.37E-05	6.91E-04
TOTAL	2.79E-04	2.11E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	2.42E-05	1.22E-04
Th-234	5.97E-07	4.93E-06
Pa-234m	8.16E-06	6.73E-05
Pa-234	1.61E-07	1.33E-06
U-234	2.82E-05	1.40E-04
Th-230	5.20E-05	2.41E-04
Ra-226	5.28E-05	7.42E-04
Rn-222	1.44E-08	1.19E-07
Po-218	2.57E-13	2.12E-12
Pb-214	9.38E-06	7.74E-05
At-218	9.65E-13	7.97E-12
Bi-214	5.48E-05	4.52E-04
Rn-218	5.59E-15	4.61E-14
Po-214	3.04E-09	2.51E-08
Tl-210	2.14E-08	1.77E-07
Pb-210	4.62E-08	3.81E-07
Bi-210	7.47E-07	6.16E-06
Hg-206	6.03E-14	4.97E-13
Po-210	1.93E-10	1.60E-09
Tl-206	1.74E-12	1.44E-11
Th-232	1.34E-05	6.07E-05
Ra-228	2.77E-09	3.39E-08
Ac-228	3.15E-06	2.60E-05
Th-228	2.33E-05	1.02E-04
Ra-224	3.80E-08	6.22E-07
Rn-220	2.30E-09	1.89E-08
Po-216	5.54E-11	4.57E-10
Pb-212	5.04E-07	4.17E-06
Bi-212	5.88E-07	4.86E-06
Po-212	0.00E+00	0.00E+00
Tl-208	4.07E-06	3.35E-05
U-235	3.13E-06	1.87E-05
Th-231	9.41E-08	7.76E-07
Pa-231	1.56E-10	1.29E-09
Ac-227	5.23E-13	4.32E-12
Th-227	2.50E-10	2.06E-09
Fr-223	2.35E-12	1.94E-11
Ra-223	2.79E-10	2.30E-09
Rn-219	1.21E-10	9.98E-10
At-219	0.00E+00	0.00E+00
Bi-215	5.44E-16	4.49E-15
Po-215	3.69E-13	3.05E-12
Pb-211	2.37E-10	1.96E-09
Bi-211	9.78E-11	8.07E-10
Tl-207	1.23E-10	1.01E-09
Po-211	4.71E-14	3.89E-13
TOTAL	2.79E-04	2.11E-03

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagu	7.73E-13	8.98E-11
Stomach	3.00E-12	3.49E-10
Colon	7.94E-12	9.51E-10
Liver	1.80E-12	2.80E-10
LUNG	2.16E-11	1.65E-09
Bone	1.53E-12	3.14E-10
Skin	1.18E-12	1.26E-10
Breast	3.74E-12	4.15E-10
Ovary	1.10E-12	1.33E-10
Bladder	1.87E-12	2.16E-10
Kidneys	5.42E-13	7.48E-11
Thyroid	2.43E-13	2.79E-11
Leukemia	4.49E-12	5.23E-10
Residual	1.10E-11	1.28E-09
Total	6.09E-11	6.43E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	5.19E-12	1.23E-09
INHALATION	1.46E-11	8.17E-10
AIR IMMERSION	2.06E-17	3.74E-15
GROUND SURFACE	4.11E-11	4.39E-09
INTERNAL	1.98E-11	2.04E-09
EXTERNAL	4.11E-11	4.39E-09
TOTAL	6.09E-11	6.43E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	2.70E-12	1.55E-10
Th-234	3.09E-13	3.30E-11
Pa-234m	1.43E-12	1.53E-10
Pa-234	8.74E-14	9.34E-12
U-234	3.33E-12	2.24E-10
Th-230	3.56E-12	2.18E-10
Ra-226	6.70E-12	1.26E-09
Rn-222	7.84E-15	8.38E-13
Po-218	1.15E-19	1.23E-17
Pb-214	5.02E-12	5.36E-10
At-218	1.19E-19	1.27E-17
Bi-214	2.90E-11	3.10E-09
Rn-218	3.06E-21	3.27E-19
Po-214	1.67E-15	1.78E-13
Tl-210	1.14E-14	1.22E-12
Pb-210	2.07E-14	2.21E-12
Bi-210	8.28E-14	8.85E-12
Hg-206	2.67E-20	2.86E-18
Po-210	1.06E-16	1.13E-14
Tl-206	1.96E-19	2.09E-17
Th-232	8.28E-13	4.64E-11
Ra-228	8.36E-16	9.06E-14
Ac-228	1.67E-12	1.79E-10
Th-228	2.61E-12	1.49E-10
Ra-224	2.02E-14	2.66E-12
Rn-220	1.26E-15	1.34E-13
Po-216	3.05E-17	3.25E-15
Pb-212	2.74E-13	2.93E-11
Bi-212	2.27E-13	2.43E-11
Po-212	0.00E+00	0.00E+00
Tl-208	2.21E-12	2.36E-10
U-235	7.44E-13	6.73E-11
Th-231	4.30E-14	4.59E-12
Pa-231	8.13E-17	8.69E-15
Ac-227	1.96E-19	2.09E-17
Th-227	1.35E-16	1.45E-14
Fr-223	8.77E-19	9.38E-17
Ra-223	1.51E-16	1.61E-14
Rn-219	6.62E-17	7.07E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.43E-22	2.60E-20
Po-215	2.02E-19	2.16E-17
Pb-211	8.49E-17	9.07E-15
Bi-211	5.34E-17	5.71E-15
Tl-207	1.58E-17	1.69E-15
Po-211	2.58E-20	2.76E-18
TOTAL	6.09E-11	6.43E-09

D O S E A N D R I S K S U M M A R I E S

Non-Radon Population Assessment
Tue Jun 12 11:33:44 2018

Facility: Niagara Falls Storage Site
Address: 1397 Pletcher Road
City: Lewiston
State: NY Zip: 14174

Source Category: Area
Source Type: Area
Emission Year: 2017
DOSE Age Group: Adult

Comments: NFSS Technical Memo 2017 Year
Population Dose

Dataset Name: NFSS2017 Pop Adu
Dataset Date:

Wi
Pop File:



ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	6.94E-05	5.75E-04
UB_Wall	7.69E-05	6.37E-04
Bone_Sur	1.78E-03	1.33E-02
Brain	7.34E-05	6.08E-04
Breasts	8.07E-05	6.68E-04
St_Wall	7.42E-05	6.15E-04
SI_Wall	7.37E-05	6.12E-04
ULI_Wall	7.58E-05	6.39E-04
LLI_Wall	8.09E-05	7.11E-04
Kidneys	1.23E-04	9.66E-04
Liver	1.03E-04	8.33E-04
Muscle	8.32E-05	6.89E-04
Ovaries	8.12E-05	6.45E-04
Pancreas	7.00E-05	5.80E-04
R_Marrow	1.52E-04	1.28E-03
Skin	1.18E-03	9.73E-03
Spleen	7.50E-05	6.24E-04
Testes	9.30E-05	7.42E-04
Thymus	7.36E-05	6.10E-04
Thyroid	7.70E-05	6.38E-04
GB_Wall	7.06E-05	5.85E-04
Ht_Wall	7.34E-05	6.08E-04
Uterus	7.27E-05	6.02E-04
ET_Reg	3.34E-04	1.72E-03
Lung_66	9.83E-04	4.56E-03
Effectiv	2.27E-04	1.44E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	9.83E-06	1.67E-04
INHALATION	1.34E-04	5.79E-04
AIR IMMERSION	3.88E-11	5.34E-10
GROUND SURFACE	8.37E-05	6.91E-04
INTERNAL	1.44E-04	7.45E-04
EXTERNAL	8.37E-05	6.91E-04
TOTAL	2.27E-04	1.44E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	1.97E-05	9.54E-05
Th-234	5.97E-07	4.93E-06
Pa-234m	8.16E-06	6.73E-05
Pa-234	1.61E-07	1.33E-06
U-234	2.28E-05	1.10E-04
Th-230	4.87E-05	2.27E-04
Ra-226	1.86E-05	1.64E-04
Rn-222	1.44E-08	1.19E-07
Po-218	2.57E-13	2.12E-12
Pb-214	9.38E-06	7.74E-05
At-218	9.65E-13	7.97E-12
Bi-214	5.48E-05	4.52E-04
Rn-218	5.59E-15	4.61E-14
Po-214	3.04E-09	2.51E-08
Tl-210	2.14E-08	1.77E-07
Pb-210	4.62E-08	3.81E-07
Bi-210	7.47E-07	6.16E-06
Hg-206	6.03E-14	4.97E-13
Po-210	1.93E-10	1.60E-09
Tl-206	1.74E-12	1.44E-11
Th-232	1.29E-05	5.85E-05
Ra-228	2.76E-09	2.44E-08
Ac-228	3.15E-06	2.60E-05
Th-228	1.96E-05	8.54E-05
Ra-224	3.77E-08	5.55E-07
Rn-220	2.30E-09	1.89E-08
Po-216	5.54E-11	4.57E-10
Pb-212	5.04E-07	4.17E-06
Bi-212	5.88E-07	4.86E-06
Po-212	0.00E+00	0.00E+00
Tl-208	4.07E-06	3.35E-05
U-235	2.71E-06	1.62E-05
Th-231	9.41E-08	7.76E-07
Pa-231	1.56E-10	1.29E-09
Ac-227	5.23E-13	4.32E-12
Th-227	2.50E-10	2.06E-09
Fr-223	2.35E-12	1.94E-11
Ra-223	2.79E-10	2.30E-09
Rn-219	1.21E-10	9.98E-10
At-219	0.00E+00	0.00E+00
Bi-215	5.44E-16	4.49E-15
Po-215	3.69E-13	3.05E-12
Pb-211	2.37E-10	1.96E-09
Bi-211	9.78E-11	8.07E-10
Tl-207	1.23E-10	1.01E-09
Po-211	4.71E-14	3.89E-13
TOTAL	2.27E-04	1.44E-03

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagu	7.93E-13	9.21E-11
Stomach	3.07E-12	3.63E-10
Colon	8.26E-12	1.01E-09
Liver	2.05E-12	3.12E-10
LUNG	4.58E-11	3.02E-09
Bone	2.05E-12	3.80E-10
Skin	1.18E-12	1.27E-10
Breast	3.78E-12	4.22E-10
Ovary	1.16E-12	1.40E-10
Bladder	1.91E-12	2.20E-10
Kidneys	6.53E-13	8.51E-11
Thyroid	2.49E-13	2.89E-11
Leukemia	4.61E-12	5.38E-10
Residual	1.13E-11	1.33E-09
Total	8.69E-11	8.08E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	6.69E-12	1.50E-09
INHALATION	3.92E-11	2.19E-09
AIR IMMERSION	2.06E-17	3.74E-15
GROUND SURFACE	4.11E-11	4.39E-09
INTERNAL	4.59E-11	3.69E-09
EXTERNAL	4.11E-11	4.39E-09
TOTAL	8.69E-11	8.08E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	6.51E-12	3.69E-10
Th-234	3.09E-13	3.30E-11
Pa-234m	1.43E-12	1.53E-10
Pa-234	8.74E-14	9.34E-12
U-234	7.84E-12	4.84E-10
Th-230	1.07E-11	6.25E-10
Ra-226	1.05E-11	1.64E-09
Rn-222	7.84E-15	8.38E-13
Po-218	1.15E-19	1.23E-17
Pb-214	5.02E-12	5.36E-10
At-218	1.19E-19	1.27E-17
Bi-214	2.90E-11	3.10E-09
Rn-218	3.06E-21	3.27E-19
Po-214	1.67E-15	1.78E-13
Tl-210	1.14E-14	1.22E-12
Pb-210	2.07E-14	2.21E-12
Bi-210	8.28E-14	8.85E-12
Hg-206	2.67E-20	2.86E-18
Po-210	1.06E-16	1.13E-14
Tl-206	1.96E-19	2.09E-17
Th-232	2.82E-12	1.58E-10
Ra-228	8.37E-16	9.15E-14
Ac-228	1.67E-12	1.79E-10
Th-228	7.03E-12	3.97E-10
Ra-224	2.04E-14	3.34E-12
Rn-220	1.26E-15	1.34E-13
Po-216	3.05E-17	3.25E-15
Pb-212	2.74E-13	2.93E-11
Bi-212	2.27E-13	2.43E-11
Po-212	0.00E+00	0.00E+00
Tl-208	2.21E-12	2.36E-10
U-235	1.09E-12	8.68E-11
Th-231	4.30E-14	4.59E-12
Pa-231	8.13E-17	8.69E-15
Ac-227	1.96E-19	2.09E-17
Th-227	1.35E-16	1.45E-14
Fr-223	8.77E-19	9.38E-17
Ra-223	1.51E-16	1.61E-14
Rn-219	6.62E-17	7.07E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.43E-22	2.60E-20
Po-215	2.02E-19	2.16E-17
Pb-211	8.49E-17	9.07E-15
Bi-211	5.34E-17	5.71E-15
Tl-207	1.58E-17	1.69E-15
Po-211	2.58E-20	2.76E-18
TOTAL	8.69E-11	8.08E-09

ATTACHMENT E

NATIONAL CLIMATIC DATA CENTER, NIAGARA FALLS, NEW YORK

Local Climatological Data Daily Summary January 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH							
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL		Avg Speed	Direction = Degrees						
																		Peak Speed		Peak Dir	Sust. Speed	Sust. Dir				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
01	39	26	32	5.9	66	23	29	33	0	0748	1651	HZ	0.00			29.44	30.17	11.0	33	270	25	280				
02	41	25	33	7.1	71	27	32	32	0	0748	1652	BR	0.00			29.60	30.26	6.6	17	120	14	120				
03	44	39	42	16.3	86	38	40	23	0	0748	1653	RA BR HZ	0.54			29.13	29.73	6.2	16	110	14	110				
04	40	19	30	4.5	67	21	27	35	0	0748	1654	RA SN FG BR UP	0.02			28.90	29.60	21.9	43	250	36	260				
05	22	14	18	-7.4	62	8	16	47	0	0748	1655	SN	T			29.19	29.91	15.9	39	240	31	250				
06	20	9	14	-11.2	56	1	11	51	0	0748	1656		0.00			29.44	30.17	12.2	23	250	18	250				
07	21	5*	13	-12.0	61	2	11	52	0	0747	1657		0.00			29.65	30.36	10.1	25	250	20	250				
08	20	13	16	-8.9	55	3	13	49	0	0747	1658	SN	T			29.72	30.46	17.2	36	320	29	310				
09	30	16	23	-1.7	57	10	19	42	0	0747	1659	SN	T			29.80	30.49	13.9	34	220	28	230				
10	47	25	36	11.4	65	25	32	29	0	0747	1700	RA SN	0.26			29.41	30.00	15.3	44	200	35	200				
11	52	35	44	19.5	60	31	38	21	0	0746	1701	RA	0.10			29.24	29.94	19.7	64	240	48	240				
12	58*	34	46	21.7	82	39	42	19	0	0746	1703	RA BR	0.22			29.21	29.91	13.3	42	220	31	220				
13	34	24	29	4.8	57	15	24	36	0	0746	1704	SN	T			29.91	30.65	12.5	26	280	22	290				
14	28	19	24	-0.1	68	15	21	41	0	0745	1705	SN	T			29.88	30.54	4.9	13	050	12	060				
15	33	20	26	2.0	73	19	24	39	0	0745	1706	BR HZ	0.00			29.72	30.42	4.8	13	250	10	220				
16	39	18	28	4.1	65	20	27	37	0	0744	1707	RA HZ	T			29.67	30.35	5.8	17	210	15	220				
17	41	34	38	14.2	84	33	35	27	0	0744	1709	RA FG BR	0.60			29.32	29.95	8.7	20	110	16	100				
18	40	37	38	14.2	87	34	36	27	0	0743	1710	RA FG BR HZ	0.02			29.28	29.98	11.7	24	230	18	230				
19	38	34	36	12.3	84	31	34	29	0	0743	1711	BR HZ	0.00			29.40	30.06	8.0	28	240	21	250				
20	46	35	40	16.4	86	36	38	25	0	0742	1712	RA FG BR	0.06			29.17	29.82	5.0	20	230	15	230				
21	54	37	46	22.4	88	42	44	19	0	0741	1714	FG BR HZ	0.00			29.11	29.76	4.3	19	250	15	240				
22	46	35	40	16.5	89	37	38	25	0	0741	1715	RA FG BR	0.02			29.05	29.72	9.8	28	080	22	070				
23	47	36	42	18.5	79	34	37	23	0	0740	1716	BR	0.01			29.10	29.75	15.0	29	080	23	070				
24	36	32	34	10.5	80	28	32	31	0	0739	1717	SN BR HZ	0.02			29.05	29.71	8.6	18	070	15	070				
25	47	33	40	16.5	76	32	36	25	0	0738	1719	RA	T			29.00	29.63	9.5	28	240	21	230				
26	45	35	40	16.5	76	32	36	25	0	0737	1720	RA SN BR	0.09			28.80	29.48	16.4	34	230	26	230				
27	37	31	34	10.5	65	23	30	31	0	0736	1721	SN	T			29.00	29.66	18.2	37	250	28	250				
28	32	29	30	6.5	73	23	28	35	0	0735	1723	SN UP HZ	T			28.97	29.64	16.1	29	270	23	240				
29	31	22	26	2.5	60	16	24	39	0	0735	1724	SN UP	T			29.03	29.72	14.2	31	290	24	280				
30	25	14	20	-3.5	67	11	18	45	0	0734	1725	SN BR	T			29.21	29.91	5.9	19	260	15	280				
31	31	21	26	2.4	72	18	24	39	0	0733	1727	SN BR UP HZ	0.07			29.08	29.73	5.0	16	100	13	100				
Monthly Averages Totals													2.03			29.31	29.97	11.2								
Departure from Normal (1981-2010)													0.39													
Degree Days											Number of days with...															
Monthly					Season-to-date					Temperature				Precipitation		Snow		Weather								
Total		Departure			Total		Departure			Max		Min		Precipitation		Snow		Weather								
Heating		1028			-235			>=90°			<=32°		<=32°		<=0°		>=0.01"		>=0.1"		>=1"		T-Storms		Heavy Fog	
Cooling		0			0			0			0		10		19		0		13		5					
Date of 5-sec to 3-sec wind equipment change							Sea Level Pressure							Greatest...												
N/A							Maximum			30.81		Date		13		Time		2149		24-Hr...			Snowfall		Snow Depth	
							Minimum			29.39		26		1253		0.61										
														Date				17-18								
Station Augmentation																										
Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																										

Local Climatological Data
Daily Summary
February 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH				
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL		Avg Speed	Direction = Degrees			
																		Peak Speed		Peak Dir	Sust. Speed	Sust. Dir	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
01	38	29	34	10.4				31	0	0731	1728	SN BR UP	T			29.21		15.7	30	250	24	250	
02	31	20	26	2.3				39	0	0730	1729	SN	0.01			29.44		14.8	34	280	29	270	
03	25	16*	20	-3.8				45	0	0729	1731	SN	T			29.57		17.1	30	270	24	260	
04	32	17	24	0.1				41	0	0728	1732		0.00			29.62		15.4	37	260	29	250	
05	35	27	31	7.1				34	0	0727	1733	SN UP	T			29.25		15.8	33	250	26	250	
06	38	20	29	5.0				36	0	0726	1735		0.00			29.41		8.0	22	230	17	230	
07	55	32	44	19.8				21	0	0725	1736	RA FZRA BR	0.47			28.99		14.9	45	240	33	240	
08	52	23	38	13.7				27	0	0723	1737	RA SN BR UP	T			29.03		16.0	37	260	29	270	
09	24	17	20	-4.4				45	0	0722	1739	SN	T			29.31		12.5	32	300	25	290	
10	33	19	26	1.5				39	0	0721	1740	SN	0.03			29.47		13.8	34	260	25	260	
11	41	28	34	9.3				31	0	0719	1741	HZ	0.00			29.23		6.9	16	240	13	240	
12	36	30	33	8.2				32	0	0718	1743	RA FZRA SN FG BR UP HZ	0.49			29.18		13.9	48	310	39	290	
13	31	24	28	3.0				37	0	0717	1744	SN UP	T			29.38		16.2	46	280	33	290	
14	42	23	32	6.9				33	0	0715	1745	RA	0.02			29.12		13.0	40	230	32	240	
15	37	25	31	5.7				34	0	0714	1747	SN FG BR UP	0.05			28.89		13.1	31	300	25	290	
16	28	20	24	-1.5				41	0	0712	1748	SN UP	T			29.13		14.6	26	330	21	290	
17	38	22	30	4.3				35	0	0711	1749		0.00			29.24		4.6	14	290	13	300	
18	56	32	44	18.1				21	0	0710	1751		0.00			29.00		14.6	47	220	35	230	
19	58	32	45	18.9				20	0	0708	1752	BR	0.00			29.23		9.1	24	310	21	250	
20	46	31	38	11.7				27	0	0707	1753		0.00			29.62		8.3	21	100	15	100	
21	58	31	44	17.5				21	0	0705	1755	RA BR HZ	0.03			29.40		6.8	22	200	17	200	
22	60	35	48	21.3				17	0	0704	1756	FG BR HZ	0.00			29.23		7.4	23	230	17	230	
23	64	39	52	25.1				13	0	0702	1757	RA HZ	T			29.09		11.9	34	230	29	230	
24	67*	39	53	25.9				12	0	0700	1758	RA BR HZ	0.26			29.10		7.5			15	120	
25	56	30	43	15.6				22	0	0659	1800	RA SN BR	0.38			28.90		17.3	46	240	37	250	
26	38	27	32	4.4				33	0	0657	1801	SN UP	0.01			29.34		16.9	35	230	28	280	
27	50	35	42	14.2				23	0	0656	1802		0.00			29.54		13.7	36	220	29	220	
28	59	32	46	17.9				19	0	0654	1803		0.00			29.46		6.5	22	180	18	210	
	43.9	27.0	35.4										1.75			29.26	29.93	12.3					
	9.9	10.1	9.9										-0.35										
Degree Days												Number of days with...											
Monthly				Season-to-date				Temperature				Precipitation		Snow		Weather							
Total		Departure		Total		Departure		Max		Min		>=0.01"		>=0.1"		>=1"		T-Storms		Heavy Fog			
Heating		826		-281				>=90°		<=32°		<=32°		<=0°									
Cooling		0		0		0		0		6		24		0		10		4					
Date of 5-sec to 3-sec wind equipment change						Sea Level Pressure						Greatest...											
N/A						Maximum		30.40		Date		20		Time		1057		24-Hr...		Snow Depth			
						Minimum		29.27				07		2211		0.49							
																12-12							
Station Augmentation																							
Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																							

Local Climatological Data
Daily Summary
April 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH						
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL		Avg Speed	Direction = Degrees					
																		Peak Speed		Peak Dir	Sust. Speed	Sust. Dir			
1	2	3	4	5	6	7	8	9	10	11	12	13				14	15	16	17	18	19	20	21	22	23
01	49	34	42	2.6	78	33	36	23	0	0558	1842	RA BR UP	T			29.34	30.05	10.5	24	020	18	010			
02	57	33	45	5.2	69	34	39	20	0	0556	1843	BR	0.00			29.49	30.15	8.1	21	220	17	220			
03	65	39	52	11.7	59	37	45	13	0	0555	1844	RA BR	0.28			29.25	29.84	8.8	27	100	22	100			
04	58	43	50	9.3	77	43	47	15	0	0553	1845	RA BR HZ	0.55			28.82	29.54	17.7	56	240	41	240			
05	52	42	47	5.8	69	36	41	18	0	0551	1847		0.00			29.24	29.88	12.8	35	080	26	080			
06	52	34	43	1.4	84	40	43	22	0	0550	1848	RA SN BR	1.37			28.77	29.37	12.6	31	020	24	020			
07	39	32	36	-6.1	70	26	32	29	0	0548	1849	RA SN FG BR UP	0.41			28.93	29.64	17.9	37	330	28	330			
08	50	29*	40	-2.6	57	26	35	25	0	0546	1850		0.00			29.31	30.00	10.2	23	220	18	210			
09	70	37	54	11.0	40	30	44	11	0	0544	1851		0.00			29.36	30.00	9.9	29	230	24	220			
10	75	52	64	20.5	45	42	53	1	0	0543	1852	TS RA	0.09			29.29	29.93	14.0	50	220	37	240			
11	68	51	60	16.1	71	50	55	5	0	0541	1854	RA	0.04			29.39	30.05	12.1	33	210	23	220			
12	51	38	44	-0.4	65	35	41	21	0	0539	1855		0.00			29.63	30.32	11.8	25	240	21	240			
13	56	32	44	-0.8	54	28	38	21	0	0538	1856		0.00			29.80	30.46	3.0	10	270	8	220			
14	64	38	51	5.7	44	29	42	14	0	0536	1857		0.00			29.72	30.37	6.4	20	040	16	060			
15	73	42	58	12.3	59	43	51	7	0	0534	1858	RA	0.08			29.44	30.05	9.4	40	200	28	200			
16	76	56	66	19.9	58	51	57	0	1	0533	1859		0.00			29.18	29.81	16.3	54	230	41	240			
17	61	38	50	3.4	56	36	44	15	0	0531	1901		0.00			29.45	30.13	11.9	28	290	23	310			
18	59	34	46	-1.0	61	33	40	19	0	0529	1902		0.00			29.70	30.35	8.4	17	060	15	050			
19	63	45	54	6.6	72	47	52	11	0	0528	1903	RA BR HZ	0.20			29.43	30.06	10.7	30	200	23	210			
20	53	44	48	0.2	84	42	45	17	0	0526	1904	TS RA BR	1.45			29.39	30.00	13.2	31	080	25	080			
21	54	43	48	-0.2	78	43	46	17	0	0525	1905	RA FG BR	0.01			29.21	29.89	11.2	26	240	21	300			
22	56	38	47	-1.6	63	34	41	18	0	0523	1906		0.00			29.41	30.08	9.0	21	320	17	320			
23	65	36	50	1.0	54	34	43	15	0	0521	1907		0.00			29.45	30.10	7.5	20	240	15	210			
24	62	39	50	0.6	58	36	44	15	0	0520	1909		0.00			29.46	30.09	12.8	26	080	21	080			
25	65	44	54	4.2	73	47	51	11	0	0518	1910	RA BR	0.40			29.31	29.93	9.2	21	130	16	120			
26	74	51	62	11.9	73	52	56	3	0	0517	1911		0.00			29.12	29.74	5.6	16	030	14	030			
27	86*	52	69	18.5	65	55	60	0	4	0515	1912	RA	0.09			29.01	29.63	9.5	41	270	33	270			
28	66	48	57	6.1	62	43	50	8	0	0514	1913		T			29.32	29.97	12.6	29	230	23	220			
29	62	44	53	1.8	58	39	46	12	0	0513	1914	RA	T			29.46	30.13	6.2	19	350	15	360			
30	58	39	48	-3.6	72	37	42	17	0	0511	1916	TS RA BR	1.14			29.46	30.07	15.3	33	300	28	300			
	61.3	40.9	51.1									Monthly Averages Totals				6.11		29.34	29.98	10.7					
	5.6	5.1	5.3	Departure from Normal (1981-2010)								3.20													
Degree Days											Number of days with...														
Monthly				Season-to-date				Temperature				Precipitation		Snow		Weather									
Total		Departure		Total		Departure		Max		Min		>=0.01"		>=0.1"		>=1"		T-Storms		Heavy Fog					
Heating		422		-157				>=90°		<=32°		<=32°		<=0°		13		8							
Cooling		5		3		5		0		0		3		0											
Date of 5-sec to 3-sec wind equipment change							Sea Level Pressure					Greatest...													
N/A							Maximum		30.55		Date		13		Time		0903		24-Hr...		Snow Depth				
							Minimum		29.23				06				1559		Precip		Snowfall				
												Date													
												06-07													
Station Augmentation																									
Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																									

Local Climatological Data Daily Summary May 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH								
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		Weather Type	TLC	Snow Fall	Snow Depth	Avg Stn		Avg SL	Avg Speed	Direction = Degrees						
												Peak Speed						Peak Dir			Sust. Speed	Sust. Dir					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
01	70	46	58	6.1	83	51	53	7	0	0510	1917	TS RA FG BR	1.28			29.02	29.64	8.6	38	220	29	230					
02	55	47	51	-1.2	68	40	46	14	0	0508	1918	RA	0.01			28.95	29.61	19.6	50	220	38	240					
03	59	42	50	-2.6	55	33	42	15	0	0507	1919	RA	T			29.38	30.08	11.9	31	270	26	270					
04	55	42	48	-4.9	72	39	44	17	0	0506	1920	RA BR	0.51			29.46	30.07	8.0	22	070	17	070					
05	50	46	48	-5.2	86	44	46	17	0	0504	1921	RA BR	1.44			28.98	29.57	11.5	24	050	20	060					
06	47	42	44	-9.5	86	40	42	21	0	0503	1922	RA BR	0.32			28.77	29.43	13.8	25	310	21	300					
07	53	41	47	-6.8	61	33	40	18	0	0502	1924	RA BR	0.07			29.05	29.74	13.8	30	320	24	320					
08	56	34*	45	-9.1	49	26	38	20	0	0500	1925		0.00			29.28	29.94	12.2	30	320	25	300					
09	56	36	46	-8.4	49	29	40	19	0	0459	1926		0.00			29.35	30.01	7.1	20	240	14	340					
10	58	43	50	-4.7	53	33	42	15	0	0458	1927		0.00			29.44	30.09	7.7	21	070	17	060					
11	62	44	53	-2.0	53	35	45	12	0	0457	1928		0.00			29.34	29.99	11.2	25	070	21	070					
12	64	44	54	-1.3	67	43	49	11	0	0456	1929	HZ	T			29.32	29.95	6.0	16	030	13	350					
13	66	49	58	2.4	63	44	51	7	0	0455	1930	RA	T			29.21	29.84	4.6	16	220	14	220					
14	67	47	57	1.1	63	42	48	8	0	0454	1931	TS RA BR HZ	0.01			29.11	29.78	11.8	37	310	30	330					
15	68	45	56	-0.2	58	40	48	9	0	0452	1932		0.00			29.33	29.99	9.9	26	320	21	310					
16	73	46	60	3.5	66	46	52	5	0	0451	1933	RA	0.02			29.36	29.97	5.0	17	170	14	180					
17	86	59	72	15.2	54	57	64	0	7	0450	1934		0.00			29.21	29.83	14.1	41	230	30	240					
18	86*	66	76	18.9	48	57	65	0	11	0449	1935		0.00			29.15	29.77	17.7	46	240	37	240					
19	67	54	60	2.6	63	44	51	5	0	0448	1936		0.00			29.39	30.06	9.3	24	310	20	310					
20	66	49	58	0.3	46	36	47	7	0	0448	1937	RA	0.01			29.62	30.27	14.5	28	070	22	070					
21	68	54	61	3.0	75	53	57	4	0	0447	1938	RA BR HZ	0.56			29.44	30.04	8.5	23	190	18	180					
22	66	51	58	-0.3	67	49	54	7	0	0446	1939		0.02			29.31	29.95	13.7	36	220	30	220					
23	76	50	63	4.3	56	47	55	2	0	0445	1940		0.00			29.23	29.85	7.9	23	220	18	220					
24	80	55	68	9.0	47	46	56	0	3	0444	1941	RA	T			29.03	29.64	8.7	28	140	22	140					
25	64	57	60	0.7	85	54	56	5	0	0443	1942	RA FG BR HZ	1.60			28.90	29.52	9.2	20	080	16	060					
26	67	53	60	0.4	85	54	56	5	0	0443	1943	RA FG BR	0.10			29.06	29.73	7.7	17	300	14	310					
27	70	54	62	2.0	75	54	57	3	0	0442	1944	BR HZ	0.00			29.26	29.90	3.0	10	360	9	360					
28	80	51	66	5.7	67	56	61	0	1	0441	1945	BR	T			29.17	29.78	6.9	21	190	15	210					
29	76	63	70	9.4	65	54	60	0	5	0441	1946	RA BR HZ	0.15			29.13	29.78	11.6	34	240	26	230					
30	77	59	68	7.0	59	51	58	0	3	0440	1947	RA	0.08			29.28	29.90	11.6	33	240	24	230					
31	75	55	65	3.7	53	48	56	0	0	0440	1948		0.00			29.26	29.89	12.7	35	230	26	230					
Monthly Averages Totals													6.18			29.22	29.85	10.3									
Departure from Normal (1981-2010)													3.01														
Degree Days											Number of days with...																
Monthly					Season-to-date					Temperature				Precipitation		Snow		Weather									
Total		Departure			Total		Departure			Max		Min		Precipitation		Snow		Weather									
Heating		250			-30					>=90°		<=32°		<=32°		<=0°		>=0.01"		>=0.1"		>=1"		T-Storms		Heavy Fog	
Cooling		29			11			34		0		0		0		0		15		8							
Date of 5-sec to 3-sec wind equipment change							Sea Level Pressure							Greatest...													
N/A							Maximum		30.33		Date		20		Time		0904		24-Hr...		Precip		Snowfall		Snow Depth		
							Minimum		29.36		Date		06		Time		0253		1.69								
							Date																				
							04-05																				
Station Augmentation																											
Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																											

Local Climatological Data Daily Summary June 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH					
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		Weather Type	TLC	Snow Fall	Snow Depth	Avg Stn		Avg SL	Avg Speed	Direction = Degrees			
																		Peak Speed			Peak Dir	Sust. Speed	Sust. Dir	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
01	68	51	60	-1.7	53	42	51	5	0	0439	1948	RA	0.01			29.34	29.98	11.3	28	320	23	300		
02	71	47*	59	-3.0	53	41	50	6	0	0439	1949		0.00			29.36	30.01	8.4	26	290	21	320		
03	73	50	62	-0.4	47	42	52	3	0	0438	1950		T			29.40	30.03	5.5	22	310	16	220		
04	77	56	66	3.3	70	54	58	0	1	0438	1951	RA HZ	0.12			29.21	29.80	8.4	26	220	20	230		
05	63	56	60	-3.1	81	54	56	5	0	0437	1951	FG BR HZ	0.00			29.10	29.73	5.9	18	350	15	360		
06	63	52	58	-5.4	84	52	55	7	0	0437	1952	RA BR HZ	0.25			29.18	29.84	11.4	25	040	21	040		
07	72	52	62	-1.8	62	47	53	3	0	0437	1953		0.00			29.41	30.06	7.2	22	360	14	040		
08	77	49	63	-1.1	55	47	55	2	0	0436	1953		0.00			29.35	29.96	3.3	17	340	13	010		
09	78	53	66	1.5	61	53	59	0	1	0436	1954		0.00			29.18	29.80	9.6	23	220	20	210		
10	83	62	72	7.2	58	57	63	0	7	0436	1954		0.00			29.24	29.87	11.7	31	220	24	220		
11	86	69	78	12.8	50	58	65	0	13	0436	1955		0.00			29.34	29.95	17.9	40	240	31	230		
12	88	68	78	12.5	53	60	67	0	13	0436	1956		0.00			29.34	29.95	14.0	33	220	26	230		
13	83	65	74	8.2	65	60	65	0	9	0436	1956		T			29.34	29.96	7.1	21	010	18	020		
14	82	57	70	3.8	51	49	58	0	5	0436	1957	FG BR HZ	0.00			29.40	30.03	8.6	22	080	18	070		
15	85	62	74	7.5	61	55	62	0	9	0436	1957	RA	0.13			29.23	29.84	5.8	24	240	20	240		
16	86	65	76	9.2	61	62	68	0	11	0436	1957	BR HZ	0.00			29.18	29.79	9.0	22	210	18	200		
17	90*	72	81	13.9	55	63	69	0	16	0436	1958		T			29.13	29.74	10.7	22	210	17	230		
18	89	71	80	12.6	68	67	71	0	15	0436	1958	TS RA	0.14			29.00	29.61	14.9	37	210	26	220		
19	82	64	73	5.3	63	60	65	0	8	0436	1958	TS	0.00			29.10	29.72	9.6	27	270	22	270		
20	75	60	68	0.0	68	57	61	0	3	0436	1959	TS RA	0.34			29.21	29.85	13.7	33	310	25	310		
21	77	56	66	-2.3	65	54	59	0	1	0436	1959		0.00			29.31	29.94	8.1	21	320	17	330		
22	82	55	68	-0.5	68	59	64	0	3	0436	1959	RA FG BR	0.03			29.29	29.90	8.7	30	230	24	230		
23	78	71	74	5.2	80	68	70	0	9	0437	1959	RA BR HZ	0.47			29.00	29.60	12.1	30	190	22	210		
24	78	61	70	1.0	62	55	61	0	5	0437	1959	TS RA	0.92			29.13	29.77	9.6	53	290	35	300		
25	75	59	67	-2.3	56	50	57	0	2	0437	1959	TS RA	T			29.31	29.95	12.4	36	240	28	250		
26	74	55	64	-5.5	64	50	56	1	0	0438	1959	TS RA	0.14			29.34	29.96	9.5	36	230	28	210		
27	68	55	62	-7.7	70	50	55	3	0	0438	1959	TS RA	0.85			29.31	29.97	9.3	32	240	24	230		
28	76	57	66	-3.9	55	51	58	0	1	0438	1959	RA	T			29.41	30.05	10.0	27	280	23	290		
29	83	62	72	1.9	65	61	65	0	7	0439	1959	TS RA	0.22			29.28	29.89	11.5	30	240	22	230		
30	81	70	76	5.8	74	65	69	0	11	0439	1959	RA	0.16			29.24	29.85	12.7	31	250	23	240		
Monthly Averages Totals													3.78			29.26	29.88	9.8						
Departure from Normal (1981-2010)													0.68											
Degree Days											Number of days with...													
Monthly						Season-to-date					Temperature				Precipitation		Snow	Weather						
Total		Departure		Total		Departure			Max		Min		Precipitation		Snow	Weather								
Heating		37		-28		184		>=90°		<=32°		<=32°		<=0°		>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog				
Cooling		150		44		184		1		0		0		0		13	11							
Date of 5-sec to 3-sec wind equipment change								Sea Level Pressure					Greatest...											
N/A								Maximum		30.10		Date		07		Time		1053		24-Hr...		Snow Depth		
								Minimum		29.51		23		1653		Precip		0.99		Snowfall				
								Date					26-27											
Station Augmentation																								
Name: N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																								

Local Climatological Data Daily Summary July 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH												
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL		Avg Speed	Direction = Degrees											
																		Peak Speed		Peak Dir	Sust. Speed	Sust. Dir									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
01	79	65	72	1.6	76	64	67	0	7	0440	1959	TS RA	0.20			29.20	29.83	10.4	30	300	25	300									
02	82	60	71	0.5	64	59	64	0	6	0440	1959	BR HZ	0.00			29.32	29.95	9.6	34	220	26	230									
03	80	60	70	-0.7	59	55	61	0	5	0441	1959		0.00			29.39	30.03	6.1	19	320	14	330									
04	82	60	71	0.2	54	53	61	0	6	0442	1958		0.00			29.48	30.12	5.1	18	040	14	030									
05	87	56	72	1.1	54	55	62	0	7	0442	1958		0.00			29.50	30.11	5.8	21	010	16	030									
06	87	64	76	5.0	61	61	67	0	11	0443	1958		0.00			29.36	29.95	6.9	18	210	14	230									
07	82	67	74	3.0	74	64	68	0	9	0443	1958	TS RA BR HZ	1.44			29.16	29.76	8.6	35	240	22	250									
08	76	58	67	-4.1	61	55	61	0	2	0444	1957	TS RA BR HZ	0.02			29.16	29.81	10.7	25	340	21	320									
09	80	57	68	-3.2	51	52	60	0	3	0445	1957		0.00			29.34	29.97	12.8	34	220	26	240									
10	79	67	73	1.8	69	61	65	0	8	0446	1956	RA BR	0.03			29.30	29.92	9.9	26	230	21	230									
11	84	66	75	3.7	69	65	69	0	10	0446	1956		0.00			29.27	29.89	5.8	19	210	15	210									
12	82	71	76	4.7	80	69	71	0	11	0447	1955	RA BR HZ	0.13			29.31	29.93	8.6	24	230	20	220									
13	78	63	70	-1.3	85	65	67	0	5	0448	1955	TS RA FG BR HZ	1.29			29.33	29.96	7.0	20	050	16	050									
14	81	64	72	0.7	75	64	67	0	7	0449	1954	RA HZ	0.03			29.33	29.94	7.7	24	320	20	310									
15	78	63	70	-1.3	70	60	64	0	5	0450	1953		0.00			29.36	29.98	8.8	22	230	17	210									
16	81	64	72	0.7	71	63	67	0	7	0450	1953	TS RA HZ	0.12			29.33	29.94	8.4	23	200	20	200									
17	79	66	72	0.7	73	64	67	0	7	0451	1952	TS RA FG BR HZ	0.47			29.36	29.98	6.8	19	210	16	210									
18	82	64	73	1.7	66	61	66	0	8	0452	1951	BR HZ	0.00			29.44	30.06	7.1	17	200	14	240									
19	88*	67	78	6.7	67	66	70	0	13	0453	1950		0.02			29.40	30.01	7.8	22	240	17	220									
20	78	63	70	-1.3	76	63	66	0	5	0454	1950	TS RA BR HZ	0.75			29.34	29.94	6.5	29	360	22	030									
21	86	68	77	5.7	65	64	69	0	12	0455	1949	BR HZ	0.00			29.29	29.91	5.0	20	320	16	330									
22	79	68	74	2.8	71	64	67	0	9	0456	1948	RA	T			29.24	29.84	3.6	15	040	13	040									
23	85	69	77	5.8	76	66	69	0	12	0457	1947	TS RA BR HZ	0.29			29.13	29.73	7.0	16	080	13	070									
24	75	64	70	-1.2	75	61	65	0	5	0458	1946	TS RA	0.02			29.15	29.80	9.0	21	250	17	250									
25	74	59	66	-5.1	66	55	60	0	1	0459	1945	RA	T			29.51	30.16	6.8	19	020	16	030									
26	77	55*	66	-5.1	68	57	61	0	1	0500	1944	RA	T			29.52	30.12	5.8	19	190	15	190									
27	82	68	75	3.9	74	64	68	0	10	0501	1943	RA	0.10			29.31	29.92	4.6	23	240	20	250									
28	76	61	68	-3.0	66	56	61	0	3	0502	1942		0.00			29.31	29.94	9.8	25	040	18	030									
29	81	60	70	-1.0	58	56	62	0	5	0503	1941		0.00			29.36	29.99	8.2	22	050	17	010									
30	86	63	74	3.0	57	58	65	0	9	0504	1940		0.00			29.43	30.06	6.2	15	340	13	320									
31	86	63	74	3.1	66	62	66	0	9	0505	1939	TS RA	0.04			29.46	30.07	5.6	21	340	17	320									
Monthly Averages Totals													4.95			29.34	29.95	7.4													
Departure from Normal (1981-2010)													1.69																		
Degree Days											Number of days with...																				
Monthly					Season-to-date					Temperature				Precipitation		Snow		Weather													
Total		Departure			Total		Departure			Max		Min		>=0.01"		>=0.1"		>=1"		T-Storms		Heavy Fog									
Heating		0			-8			0		>=90°		<=32°		<=32°		<=0°		15		9		>=1"		T-Storms	Heavy Fog						
Cooling		223			26			406		0		0		0		0		15		9		>=1"		T-Storms	Heavy Fog						
Date of 5-sec to 3-sec wind equipment change								Sea Level Pressure								Greatest...															
N/A								Maximum				30.23				Date		26		Time		0506		24-Hr...							
N/A								Minimum				29.67				Date		24		Time		0229		Precip		1.46		Snowfall		Snow Depth	
N/A								N/A								Date															
N/A								N/A								07-08															
Station Augmentation																															
Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																															

Local Climatological Data Daily Summary August 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH																												
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL		Avg Speed	Direction = Degrees																											
																		Peak Speed		Peak Dir	Sust. Speed	Sust. Dir																									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23																									
01	87	64	76	5.1	72	65	69	0	11	0506	1938	TS RA BR HZ	T			29.42	30.04	3.8	27	270	21	280																									
02	87	68	78	7.2	64	63	68	0	13	0507	1936		0.00			29.39	30.01	8.9	25	250	20	240																									
03	87*	69	78	7.2	68	64	69	0	13	0508	1935	TS RA BR HZ	0.30			29.40	30.00	5.6	21	150	16	250																									
04	83	64	74	3.2	77	64	67	0	9	0509	1934	TS RA BR	1.14			29.21	29.82	10.4	39	210	30	220																									
05	74	57	66	-4.7	62	52	58	0	1	0510	1933	RA	T			29.25	29.90	14.3	35	270	25	290																									
06	78	54	66	-4.7	64	55	60	0	1	0511	1931	RA	T			29.41	30.04	8.2	27	210	22	210																									
07	78	60	69	-1.6	78	60	62	0	4	0512	1930	RA BR	0.10			29.36	29.98	4.2	20	030	16	030																									
08	78	57	68	-2.6	66	56	61	0	3	0513	1929	FG BR	0.00			29.41	30.05	8.5	24	220	20	230																									
09	83	66	74	3.5	65	61	66	0	9	0515	1927		0.00			29.51	30.14	10.3	25	200	20	240																									
10	84	62	73	2.5	58	58	64	0	8	0516	1926	HZ	0.00			29.52	30.13	4.9	16	230	13	200																									
11	78	69	74	3.6	72	62	66	0	9	0517	1924	TS RA	0.08			29.37	29.97	8.4	26	230	21	230																									
12	80	65	72	1.7	73	62	65	0	7	0518	1923	TS RA HZ	0.24			29.23	29.86	7.7	29	290	24	240																									
13	79	60	70	-0.3	64	57	62	0	5	0519	1922		0.00			29.37	30.01	5.6	19	210	14	240																									
14	84	63	74	3.8	66	60	65	0	9	0520	1920		T			29.33	29.93	3.1	14	040	13	010																									
15	80	63	72	1.9	62	57	64	0	7	0521	1919	TS RA BR HZ	0.76			29.24	29.87	4.0	30	280	21	270																									
16	79	63	71	1.0	57	54	61	0	6	0522	1917		0.00			29.40	30.04	4.1	14	040	12	010																									
17	81	60	70	0.1	74	63	66	0	5	0523	1916	RA BR HZ	0.24			29.31	29.90	6.7	17	200	14	170																									
18	83	73	78	8.2	69	66	70	0	13	0524	1914		0.00			29.10	29.72	14.8	34	240	28	230																									
19	79	63	71	1.3	67	59	64	0	6	0525	1913	TS	0.14			29.21	29.85	11.4	26	320	21	300																									
20	82	61	72	2.4	66	60	65	0	7	0527	1911		0.00			29.41	30.06	8.0	25	230	18	240																									
21	84	65	74	4.5	70	65	69	0	9	0528	1909	HZ	0.00			29.45	30.06	6.2	18	230	14	240																									
22	83	62	72	2.7	72	66	69	0	7	0529	1908	TS RA	0.22			29.18	29.77	14.3	37	230	29	220																									
23	76	57	66	-3.2	60	52	58	0	1	0530	1906		T			29.23	29.87	11.3	30	270	22	280																									
24	71	53	62	-7.0	68	51	56	3	0	0531	1905		0.01			29.38	30.02	5.3	17	320	13	310																									
25	71	54	62	-6.9	59	47	55	3	0	0532	1903		0.00			29.54	30.20	4.3	18	360	14	360																									
26	73	49	61	-7.7	62	48	54	4	0	0533	1901		0.00			29.65	30.29	2.5	15	020	13	020																									
27	78	49*	64	-4.5	61	50	56	1	0	0534	1900		0.00			29.61	30.24	7.5	22	060	18	060																									
28	78	55	66	-2.3	59	52	58	0	1	0535	1858		0.00			29.55	30.18	6.7	20	130	15	130																									
29	75	60	68	-0.1	61	53	59	0	3	0536	1856		0.00			29.49	30.10	5.7	15	070	13	070																									
30	79	55	67	-0.9	68	57	62	0	2	0538	1855	FG BR HZ	0.00			29.36	29.98	5.8	20	210	16	210																									
31	69	54	62	-5.6	63	50	56	3	0	0539	1853	RA	T			29.41	30.07	9.5	25	320	17	350																									
Monthly Averages Totals													3.23			29.38	30.00	7.6																													
Departure from Normal (1981-2010)													0.03																																		
Degree Days											Number of days with...																																				
Monthly					Season-to-date					Temperature				Precipitation		Snow		Weather																													
Total		Departure			Total		Departure			Max		Min		Precipitation		Snow		Weather																													
Heating		14			0			14		>=90°			<=32°		<=32°		<=0°		>=0.01"		>=0.1"		>=1"		T-Storms		Heavy Fog																				
Cooling		167			5			574		0		0		0		0		10		8																											
Date of 5-sec to 3-sec wind equipment change								Sea Level Pressure								Greatest...																															
N/A								Maximum				30.33				Date				26				Time				1010				24-Hr...				Snow Depth											
								Minimum				29.65				Date				22				Time				1735				Precip								1.42				Snowfall			
								Date								03-04																															
Station Augmentation																																															
Name: N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																																															

Local Climatological Data
Daily Summary
September 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH					
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL		Avg Speed	Direction = Degrees				
																		Peak Speed		Peak Dir	Sust. Speed	Sust. Dir		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
01	63	47	55	-12.4	59	41	48	10	0	0540	1851		0.00			29.57	30.22	4.6	19	020	16	040		
02	74	44	59	-8.1	59	45	52	6	0	0541	1849	RA	0.01			29.47	30.09	7.4	20	190	17	190		
03	71	59	65	-1.9	73	55	59	0	0	0542	1848	RA BR	0.43			29.23	29.86	10.5	25	290	22	280		
04	81	63	72	5.4	65	60	65	0	7	0543	1846	TS RA	0.25			29.12	29.73	16.6	43	230	33	220		
05	73	55	64	-2.3	75	56	59	1	0	0544	1844	RA	0.10			29.10	29.74	6.0	27	290	20	280		
06	70	52	61	-5.0	74	53	57	4	0	0545	1842	TS RA HZ	0.05			29.23	29.89	2.4	16	300	13	290		
07	68	52	60	-5.7	72	50	54	5	0	0546	1841	TS RA	0.18			29.23	29.88	9.9	33	250	28	260		
08	67	51	59	-6.3	69	49	53	6	0	0547	1839	RA	0.09			29.46	30.14	7.3	18	320	15	340		
09	65	49	57	-8.0	61	43	50	8	0	0548	1837		0.00			29.75	30.41	5.4	28	020	16	010		
10	68	47	58	-6.7	62	49	55	7	0	0550	1835	FG	0.00			29.82	30.37		19	030	13	020		
11	75	55	65	0.7	63	53	59	0	0	0551	1833		0.00			29.68	30.01		16	360	14	360		
12	80	48	64	0.1	67	52	57	1	0	0552	1832	FG BR HZ	0.00			29.39	30.00	2.0	12	020	9	010		
13	81	53	67	3.4	70	57	61	0	2	0553	1830	BR HZ	0.00			29.21	29.83	2.7	15	230	12	250		
14	80	63	72	8.8	73	61	65	0	7	0554	1828	BR HZ	0.00			29.23	29.87	8.1	20	210	17	210		
15	82	60	71	8.2	71	60	64	0	6	0555	1826	BR HZ	0.00			29.44	30.08	4.2	12	020	10	020		
16	82	57	70	7.6	72	60	63	0	5	0556	1824	FG BR HZ	0.00			29.53	30.16	2.4	13	340	12	340		
17	85	59	72	9.9	70	61	65	0	7	0557	1823	FG BR HZ	0.00			29.48	30.10	2.2	12	230	9	220		
18	84	61	72	10.3	72	63	67	0	7	0558	1821	FG BR HZ	0.00			29.42	30.04	2.5	11	260	9	240		
19	83	66	74	12.7	74	64	67	0	9	0559	1819	BR HZ	0.00			29.38	29.99	3.9	14	330	12	030		
20	84	60	72	11.1	71	61	65	0	7	0601	1817	BR HZ	0.00			29.38	30.01	4.3	16	070	14	060		
21	86	57	72	11.5	69	60	64	0	7	0602	1815	BR HZ	0.00			29.46	30.09	4.1	16	010	13	010		
22	85	58	72	11.9	63	57	63	0	7	0603	1814	HZ	0.00			29.49	30.11	3.1	14	040	10	060		
23	90	59	74	14.3	63	60	65	0	9	0604	1812	HZ	0.00			29.47	30.09	4.2	14	270	12	210		
24	93	65	79	19.8	66	65	69	0	14	0605	1810	FG BR HZ	0.00			29.49	30.10	2.0	11	010	9	360		
25	93*	64	78	19.2	68	66	70	0	13	0606	1808	MIFG BR HZ FG	0.00			29.41	30.04	2.7	13	020	12	020		
26	91	69	80	21.6	65	64	69	0	15	0607	1806	BR HZ	0.00			29.34	29.95	4.5	16	210	13	210		
27	89	62	76	18.0	66	61	66	0	11	0608	1805	TS RA HZ	0.09			29.26	29.88	9.1	29	320	22	320		
28	64	51	58	0.4	57	44	52	7	0	0609	1803		0.00			29.39	30.04	9.5	23	340	16	330		
29	67	45	56	-1.2	74	46	50	9	0	0611	1801	TS RA HZ	0.51			29.38	30.02	11.9	37	010	29	010		
30	60	42*	51	-5.8	64	40	46	14	0	0612	1759	RA	0.02			29.67	30.36	7.1	28	360	22	010		
	77.8	55.8	66.8										1.73			29.41	30.03	5.8						
	5.7	3.0	4.3										-1.94											
	Departure from Normal (1981-2010)																							
	Degree Days							Number of days with...																
	Monthly				Season-to-date			Temperature				Precipitation		Snow		Weather								
	Total	Departure	Total	Departure	Max	Min	>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog									
	Heating	79	-43	93			4	0	0	0	10	5												
	Cooling	133	88	706																				
	Date of 5-sec to 3-sec wind equipment change							Sea Level Pressure				Greatest...												
	N/A							Maximum		30.52		Date		10		24-Hr...		Snow Depth						
								Minimum		29.55		04		1853		Precip		Snowfall						
															Date									
															29-30									
	Station Augmentation																							
	Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																							

Local Climatological Data Daily Summary October 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH																				
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		Weather Type	TLC	Snow Fall	Snow Depth	Avg Stn		Avg SL	Avg Speed	Direction = Degrees																		
												Peak Speed						Peak Dir			Sust. Speed	Sust. Dir																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23																	
01	67	38	52	-4.5	66	40	46	13	0	0613	1757		0.00			29.73	30.38	3.3	13	050	12	040																	
02	75	42	58	1.9	63	43	50	7	0	0614	1756		0.00			29.72	30.38	3.5	14	030	12	040																	
03	78	45	62	6.3	58	48	55	3	0	0615	1754		0.00			29.77	30.41	7.4	21	230	17	220																	
04					62	58	64			0616	1752	TS RA BR	0.51			29.59	29.98	15.9	37	220	30	230																	
05					70	54	59			0617	1750		T			29.48	29.75	9.3	26	230	22	220																	
06	70	60	65	10.5	76	57	60	0	0	0618	1749	RA BR HZ	0.05			29.42	30.03	3.5	10	190	8	190																	
07	82*	65	74	19.8	66	61	65	0	9	0620	1747	RA BR HZ	0.11			29.25	29.84	9.6	30	210	23	210																	
08	78	62	70	16.2	69	58	62	0	5	0621	1745	RA	0.03			29.17	29.81	13.8	43	230	33	240																	
09	68	60	64	10.6	85	60	62	1	0	0622	1743	RA FG BR HZ	2.08			29.23	29.87	8.9	29	070	23	060																	
10	77	55	66	12.9	71	55	59	0	1	0623	1742	FG BR	0.00			29.47	30.12	4.5	15	250	12	200																	
11	60	51	56	3.3	77	48	51	9	0	0624	1740	RA BR	0.47			29.54	30.18	14.7	35	070	26	070																	
12	66	53	60	7.7	78	52	55	5	0	0626	1738	RA BR HZ	0.01			29.59	30.25	12.7	27	050	22	070																	
13	70	59	64	12.0	69	53	58	1	0	0627	1737		T			29.57	30.20	9.4	24	190	18	190																	
14	72	59	66	14.4	78	57	60	0	1	0628	1735	RA HZ	0.03			29.53	30.14	6.4	15	190	13	030																	
15	79	50	64	12.7	66	55	60	1	0	0629	1733		T			29.15	29.78	19.6	52	290	41	280																	
16	51	37	44	-6.9	63	34	41	21	0	0630	1732		0.00			29.52	30.21	8.1	27	340	20	350																	
17	64	36	50	-0.6	63	41	48	15	0	0632	1730		0.00			29.55	30.20	14.7	42	210	33	220																	
18	69	53	61	10.7	64	48	54	4	0	0633	1728		0.00			29.55	30.19	11.4	31	230	23	230																	
19	69	47	58	8.1	63	48	54	7	0	0634	1727		0.00			29.42	30.06	13.8	41	240	31	220																	
20	69	43	56	6.4	56	40	48	9	0	0635	1725		0.00			29.55	30.21	5.3	19	220	15	220																	
21	74	46	60	10.8	60	44	52	5	0	0636	1724		0.00			29.60	30.25	4.2	18	210	15	210																	
22	79	50	64	15.1	57	49	56	1	0	0638	1722		0.00			29.57	30.20	5.5	16	180	13	180																	
23	73	61	67	18.5	64	54	59	0	2	0639	1721	RA	0.07			29.31	29.88	10.4	43	230	32	230																	
24	64	53	58	9.8	61	45	52	7	0	0640	1719	RA	0.15			28.98	29.62	16.8	42	210	32	220																	
25	56	44	50	2.2	71	40	46	15	0	0641	1718	RA	0.15			29.07	29.73	11.7	39	220	29	220																	
26	54	35*	44	-3.5	69	35	40	21	0	0643	1716	BR HZ	0.00			29.23	29.90	3.8	20	310	14	300																	
27	68	36	52	4.9	60	39	46	13	0	0644	1715		0.00			29.23	29.87	6.3	20	210	15	210																	
28	61	43	52	5.2	75	41	46	13	0	0645	1713	RA	0.07			29.16	29.81	7.9	23	200	20	200																	
29	47	42	44	-2.4	77	38	41	21	0	0646	1712	RA	0.28			29.11	29.73	6.4	26	320	21	310																	
30	53	43	48	1.9	66	35	41	17	0	0648	1711	RA	0.05			28.85	29.53	19.3	41	290	31	250																	
31	48	37	42	-3.7	56	29	38	23	0	0649	1709		0.00			29.28	30.00	12.6	40	270	33	270																	
Monthly Averages Totals													4.06			29.39	30.03	9.6																					
Departure from Normal (1981-2010)													0.97																										
Degree Days											Number of days with...																												
Monthly					Season-to-date					Temperature				Precipitation		Snow		Weather																					
Total		Departure			Total		Departure			Max		Min		Precipitation		Snow		Weather																					
Heating		229			-210			322		>=90°		<=32°		<=32°		<=0°		>=0.01"		>=0.1"		>=1"		T-Storms		Heavy Fog													
Cooling		17			12			724		0		0		0		0		14		7																			
Date of 5-sec to 3-sec wind equipment change								Sea Level Pressure								Greatest...																							
N/A								Maximum				30.47				Date				03				Time				0753				24-Hr...				Snow Depth			
								Minimum				29.38				30				0253				Precip				2.09				Snowfall							
																Date																							
																08-09																							
Station Augmentation																																							
Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																																							

Local Climatological Data
Daily Summary
November 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH															
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL		Avg Speed	Direction = Degrees														
																		Peak Speed		Peak Dir	Sust. Speed	Sust. Dir												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23												
01	48	41	44	-1.4	67	34	40	21	0	0650	1708	RA	T			29.51	30.17	7.0	19	180	16	180												
02	64	45	54	9.0	76	52	55	11	0	0651	1707	RA BR	0.46			29.36	29.99	11.5	26	200	22	190												
03	64	36	50	5.4	71	41	46	15	0	0653	1705	RA	0.33			29.48	30.18	9.3	25	320	21	330												
04	48	34	41	-3.3	69	33	39	24	0	0654	1704	TS RA	0.25			29.62	30.25	9.6	28	080	23	080												
05	62	44	53	9.1	81	52	54	12	0	0655	1703	TS RA BR	0.92			29.23	29.85	13.8	35	160	28	170												
06	62	39	50	6.5	66	37	43	15	0	0657	1702	RA	0.09			29.37	30.07	10.4	29	270	21	300												
07	47	32	40	-3.1	64	29	36	25	0	0658	1700		0.00			29.62	30.28	3.8	14	030	10	060												
08	49	29	39	-3.8	68	27	34	26	0	0659	1659	HZ	0.00			29.62	30.28	3.4	20	200	16	230												
09	50	30	40	-2.4	67	30	36	25	0	0700	1658	RA SN	0.04			29.38	30.04	12.3	50	280	40	290												
10	30	21	26	-16.0	52	9	20	39	0	0702	1657	SN	T			29.75	30.50	15.3	41	310	31	310												
11	37	19*	28	-13.6	56	15	24	37	0	0703	1656		0.00			29.88	30.55	5.8	20	110	15	090												
12	44	31	38	-3.2	55	23	33	27	0	0704	1655	RA SN	0.03			29.70	30.38	4.6	11	150	9	140												
13	42	35	38	-2.9	81	33	36	27	0	0706	1654	RA SN BR HZ	0.06			29.70	30.38	2.9	12	330	9	260												
14	45	31	38	-2.5	76	33	37	27	0	0707	1653	BR HZ	0.00			29.69	30.36	3.1	8	320	7	350												
15	49	29	39	-1.1	66	30	36	26	0	0708	1652	RA BR	0.04			29.43	30.03	8.9	34	190	26	210												
16	50	36	43	3.3	68	34	39	22	0	0709	1651	RA	0.06			29.16	29.87	19.1	39	230	30	250												
17	37	32	34	-5.3	65	24	31	31	0	0711	1650		0.00			29.52	30.17	7.9	27	310	22	320												
18	50	32	41	2.1	78	39	43	24	0	0712	1649	RA BR HZ	0.56			28.90	29.46	8.1	28	210	20	210												
19	48	31	40	1.5	70	29	34	25	0	0713	1649	RA SN BR	0.41			28.89	29.63	18.4	44	350	31	330												
20	45	31	38	-0.2	61	26	34	27	0	0714	1648	SN UP	T			29.29	29.96	17.5	35	220	26	250												
21	54	41	48	10.2	52	30	40	17	0	0716	1647	RA	0.06			29.15	29.81	20.9	53	220	39	220												
22	41	27	34	-3.4	63	22	30	31	0	0717	1646	RA	0.08			29.45	30.15	11.4	29	310	23	310												
23	42	29	36	-1.0	59	24	32	29	0	0718	1646		0.00			29.42	30.07	10.2	26	260	21	260												
24	52	36	44	7.3	50	28	38	21	0	0719	1645		0.00			29.19	29.81	15.9	43	230	32	230												
25	54	38	46	9.7	62	34	42	19	0	0721	1645	RA	0.08			29.01	29.68	14.3	38	230	28	250												
26	43	35	39	3.1	63	26	33	26	0	0722	1644		T			29.33	30.01	16.3	38	250	26	260												
27	42	30	36	0.4	66	26	32	29	0	0723	1644		0.00			29.44	30.13	8.3	26	270	21	270												
28	65*	30	48	12.8	49	32	43	17	0	0724	1643		0.00			29.41	30.04	15.9	40	220	30	240												
29	58	28	43	8.2	57	27	36	22	0	0725	1643		0.00			29.52	30.22	11.1	36	240	28	240												
30	54	27	40	5.5	69	32	37	25	0	0726	1642	RA	0.10			29.39	30.03	12.0	35	250	26	250												
	49.2	32.6	40.9										3.57			29.41	30.07	11.0																
	1.2	0.8	1.0										0.07																					
Monthly Averages Totals																																		
Departure from Normal (1981-2010)																																		
Degree Days										Number of days with...																								
Monthly					Season-to-date					Temperature				Precipitation		Snow		Weather																
Total		Departure			Total		Departure			Max		Min		>=0.01"		>=0.1"		>=1"		T-Storms		Heavy Fog												
Heating		721			-32		1043			>=90°		<=32°		<=32°		<=0°		16		7														
Cooling		0			0		724			0		1		18		0																		
Date of 5-sec to 3-sec wind equipment change								Sea Level Pressure				Greatest...																						
N/A								Maximum		30.68		Date		11		Time		0908		24-Hr... Precip		1.17		Snowfall		Snow Depth								
								Minimum		29.08				18		2351																		
																				Date														
												04-05																						
Station Augmentation																																		
Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																																		

Local Climatological Data
Daily Summary
December 2017

Current Location: Elev: 585 ft. Lat: 43.1083° N Lon: -78.9381° W

Generated on 04/16/2018

Station: **NIAGARA FALLS INTERNATIONAL AIRPORT, NY US 04724**

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather	Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH												
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set		TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL		Avg Speed	Direction = Degrees											
																		Peak Speed		Peak Dir	Sust. Speed	Sust. Dir									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23									
01	47	32	40	5.8	64	29	36	25	0	0727	1642		0.00			29.54	30.22	5.4	17	270	15	270									
02	47	33	40	6.2	74	32	36	25	0	0728	1642		0.00			29.55	30.21	2.1	11	180	8	170									
03	51	30	40	6.5	74	32	36	25	0	0730	1641	HZ	0.00			29.51	30.20	3.6	19	220	14	240									
04	54	28	41	7.8	62	30	37	24	0	0731	1641	FG FZFG BR HZ	0.00			29.54	30.17	7.1	24	190	20	180									
05	55*	35	45	12.2	65	36	42	20	0	0732	1641	RA	0.38			29.13	29.78	22.5	50	240	38	240									
06	41	33	37	4.5	52	21	31	28	0	0733	1641	SN	T			29.21	29.87	22.1	50	240	38	250									
07	36	28	32	-0.2	54	17	28	33	0	0734	1641		0.00			29.27	29.95	16.0	36	270	24	260									
08	35	27	31	-0.9	56	17	26	34	0	0734	1641	SN	T			29.28	29.96	16.8	39	220	30	220									
09	35	27	31	-0.6	56	17	27	34	0	0735	1641		0.00			29.18	29.84	7.6	21	180	17	180									
10	32	29	30	-1.3	64	19	27	35	0	0736	1641	SN HZ	T			29.18	29.87	16.4	33	250	25	250									
11	30	25	28	-3.0	76	20	25	37	0	0737	1641	SN	0.05			29.29	29.95	5.8	16	270	14	300									
12	32	16	24	-6.7	71	16	22	41	0	0738	1641	SN BR HZ	0.17			28.96	29.63	15.2	35	290	29	290									
13	20	12	16	-14.5	64	8	15	49	0	0739	1641	SN UP	0.03			29.02	29.70	11.8	31	280	25	300									
14	19	9	14	-16.2	66	7	15	51	0	0740	1641	SN	0.01			29.18	29.92	10.2	21	320	18	320									
15	28	4	16	-13.9	73	13	18	49	0	0740	1641	SN BR UP HZ	0.02			29.24	29.92	11.9	32	270	26	260									
16	29	14	22	-7.7	65	14	21	43	0	0741	1642	SN UP	T			29.41	30.06	9.5	34	260	26	260									
17	26	12	19	-10.4	68	14	20	46	0	0742	1642		0.00			29.58	30.26	6.4	15	070	13	080									
18	43	25	34	4.9	79	31	35	31	0	0742	1642	RA BR HZ	0.01			29.27	29.94	12.3	29	230	23	220									
19	46	38	42	13.1	73	35	40	23	0	0743	1643		T			29.12	29.77	21.2	47	230	35	240									
20	38	27	32	3.4	56	20	29	33	0	0744	1643		T			29.37	30.03	11.9	28	300	22	300									
21	35	26	30	1.6	64	19	26	35	0	0744	1644	SN	0.04			29.55	30.24	7.6	19	100	14	090									
22	32	27	30	1.8	81	25	28	35	0	0745	1644	FZRA SN FZFG BR UP HZ FG	0.10			29.40	30.07	11.2	24	080	18	080									
23	33	23	28	0.1	84	26	29	37	0	0745	1645	FZRA SN FG BR UP HZ	0.29			29.27	29.97	8.2	19	270	15	270									
24	31	19	25	-2.7	77	21	25	40	0	0746	1645	SN BR	0.06			29.37	30.11	7.4	21	080	17	080									
25	34	14	24	-3.5	67	14	21	41	0	0746	1646	SN BR HZ BLSN	0.04			29.11	29.93	20.8	41	260	35	250									
26	14	6	10	-17.3	54	-3	7	55	0	0746	1646		0.00			29.72	30.43	18.2	34	260	28	260									
27	15	2	8	-19.1	63	0	7	57	0	0747	1647	SN	T			29.88	30.58	13.0	25	260	22	260									
28	12	-3*	4	-22.9	71	0	5	61	0	0747	1648	SN BR HZ	T			29.93	30.66	3.5	12	290	12	280									
29	18	8	13	-13.7	69	4	11	52	0	0747	1649	SN HZ	T			29.65	30.33	7.0	17	150	13	270									
30	19	9	14	-12.5	67	7	13	51	0	0747	1649	SN HZ BLSN	0.05			29.35	30.07	12.5	29	320	24	340									
31	11	1	6	-20.3	67	-1	5	59	0	0747	1650		T			29.70	30.44	8.9	20	340	16	340									
	32.2	19.9	26.0										1.25			29.38	30.07	11.4													
	-4.3	-3.3	-3.9										-1.74																		
Monthly Averages Totals													1.25			29.38	30.07	11.4													
Departure from Normal (1981-2010)													-1.74																		
Degree Days													Number of days with...																		
Monthly						Season-to-date						Temperature				Precipitation		Snow	Weather												
Total		Departure		Total		Departure		Max		Min		Precipitation		Snow		Weather															
Heating		1204		115		2248		>=90°		<=32°		<=32°		<=0°		>=0.01"		>=0.1"		>=1"		T-Storms		Heavy Fog							
Cooling		0		0		724		0		16		27		1		13		4													
Date of 5-sec to 3-sec wind equipment change								Sea Level Pressure								Greatest...															
N/A								Maximum				30.73				Date		28		Time		1053		24-Hr...				Snow Depth			
								Minimum				29.54						12		0726		0.38		Snowfall							
																						Date									
																05-05															
Station Augmentation																															
Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A																															

Attachment F

2017 NIAGARA FALLS STORAGE SITE

- **Radon Flux Results**
- **Site Map**
- **Census Data**

Table 6
2017 Radon Flux Monitoring Results^a
Niagara Falls Storage Site

NFSS Sample ID	Qualifier ^d	Radon-222 Flux				NFSS Sample ID	Qualifier ^d	Radon-222 Flux			
		(pCi/m ² /s)		MDA				(pCi/m ² /s)		MDA	
1	U	0.0297	±	0.0115	0.0434	51		0.0840	±	0.0256	0.0760
2		0.0982	±	0.0270	0.0520	52		0.0313	±	0.0099	0.0215
3	U	0.0770	±	0.0267	0.0993	53		0.0839	±	0.0214	0.0458
4	U	0.0360	±	0.0175	0.0502	54	U	0.0324	±	0.0120	0.0485
5		0.0334	±	0.0080	0.0119	55		0.0640	±	0.0133	0.0202
6	U	0.0299	±	0.0312	0.0992	56		0.0536	±	0.0193	0.0452
7		0.0519	±	0.0096	0.0119	57	U	0.0345	±	0.0138	0.0620
8	U	0.0458	±	0.0144	0.0546	58		0.0410	±	0.0114	0.0213
9		0.0504	±	0.0095	0.0118	59	U	0.0199	±	0.0103	0.0597
10		0.0536	±	0.0166	0.0378	60		0.0982	±	0.0266	0.0449
10-DUP ^b	U	0.0603	±	0.0316	0.1073	60-DUP ^b	U	0.0712	±	0.0591	0.1365
11		0.0381	±	0.0084	0.0306	61		0.0765	±	0.0145	0.0141
12		0.0907	±	0.0169	0.0446	62		0.0283	±	0.0093	0.0199
13		0.0362	±	0.0098	0.0289	63	U	0.0057	±	0.0132	0.0490
14		0.0446	±	0.0094	0.0321	64	U	-0.0278	±	0.0338	0.0940
15		0.0574	±	0.0118	0.0240	65		0.0549	±	0.0116	0.0141
16	U	0.0539	±	0.0157	0.0679	66		0.0342	±	0.0098	0.0200
17	U	0.0086	±	0.0248	0.0908	67	U	0.0344	±	0.0137	0.0700
18		0.0448	±	0.0092	0.0180	68		0.0825	±	0.0215	0.0358
19	U	0.0361	±	0.0116	0.0398	69	U	0.0167	±	0.0187	0.0621
20	U	0.0332	±	0.0121	0.0652	70		0.0565	±	0.0123	0.0287
20-DUP ^b		0.0529	±	0.0122	0.0307	70-DUP ^b		0.0485	±	0.0118	0.0287
21		0.0662	±	0.0108	0.0180	71	U	0.0258	±	0.0165	0.0686
22		0.0621	±	0.0109	0.0169	72		0.0732	±	0.0222	0.0455
23	U	0.0606	±	0.0315	0.1038	73	U	0.0268	±	0.0168	0.0523
24		0.0308	±	0.0073	0.0226	74		0.0263	±	0.0071	0.0134
25		0.0480	±	0.0097	0.0240	75	U	0.0103	±	0.0154	0.1332
26		0.0352	±	0.0083	0.0112	76	U	0.0187	±	0.0179	0.0622
27	U	0.0182	±	0.0249	0.0749	77	U	0.0150	±	0.0089	0.0537
28	U	0.0300	±	0.0104	0.0475	78	U	0.0444	±	0.0159	0.0642
29		0.0517	±	0.0107	0.0170	79		0.0509	±	0.0187	0.0451
30		0.0403	±	0.0093	0.0140	80		0.0349	±	0.0110	0.0331
30-DUP ^b		0.0409	±	0.0094	0.0112	80-DUP ^b		0.0321	±	0.0092	0.0213
31	U	0.0150	±	0.0276	0.0859	81	U	0.0312	±	0.0107	0.0389
32		0.0393	±	0.0083	0.0307	82	U	0.0711	±	0.0285	0.1318
33		0.0301	±	0.0079	0.0169	83		0.0353	±	0.0103	0.0343
34	U	0.0155	±	0.0311	0.1079	84	U	0.0062	±	0.0153	0.0395
35	U	0.0254	±	0.0142	0.0442	85	U	0.0703	±	0.0336	0.1023
36	U	0.0249	±	0.0158	0.0510	86	U	0.0275	±	0.0153	0.0591
37	U	0.0295	±	0.0115	0.0566	87	U	0.0601	±	0.0190	0.0630
38		0.0405	±	0.0152	0.0386	88	U	0.0397	±	0.0150	0.0602
39		0.0296	±	0.0077	0.0182	89	U	0.0155	±	0.0266	0.1110
40	U	0.0000	±	0.0315	0.0458	90		0.0591	±	0.0122	0.0216
40-DUP ^b		0.0336	±	0.0086	0.0172	90-DUP ^b		0.0661	±	0.0133	0.0333
41		0.0636	±	0.0183	0.0386	91		0.0381	±	0.0128	0.0374
42		0.0506	±	0.0097	0.0182	92	U	0.0017	±	0.0179	0.0537
43	U	0.0371	±	0.0124	0.0492	93	U	0.0507	±	0.0289	0.1033
44		0.0557	±	0.0170	0.0385	94	U	0.0289	±	0.0110	0.0289
45		0.0204	±	0.0061	0.0100	95	U	0.0249	±	0.0116	0.0470
46	U	0.0550	±	0.0160	0.0652	96	U	0.0928	±	0.0334	0.1197
47	U	-0.0158	±	0.0170	0.0390	97		0.0221	±	0.0059	0.0100
48		0.0867	±	0.0214	0.0386	98	U	0.0263	±	0.0105	0.0406
49		0.0668	±	0.0150	0.0322	99	U	0.0000	±	0.0187	0.0547
50		0.0845	±	0.0167	0.0202	100		0.0794	±	0.0183	0.0303
50-DUP ^b		0.0772	±	0.0155	0.0202	100-DUP ^b		0.1183	±	0.0233	0.0385

Table 6 (cont.)
2017 Radon Flux Monitoring Results^a
Niagara Falls Storage Site

NFSS Sample ID	Qualifier ^d	Radon-222 Flux			NFSS Sample ID	Qualifier ^d	Radon-222 Flux		
		(pCi/m ² /s)		MDA			(pCi/m ² /s)		MDA
101		0.0466	± 0.0109	0.0244	151	U	0.0280	± 0.0144	0.0406
102	U	0.0313	± 0.0253	0.0582	152	U	0.0179	± 0.0188	0.0895
103	U	0.0238	± 0.0093	0.0335	153	U	0.0087	± 0.0121	0.0470
104	U	0.0128	± 0.0075	0.0458	154	U	0.0273	± 0.0147	0.0408
105	U	0.0000	± 0.0186	0.0447	155	U	-0.0056	± 0.0330	0.0995
106	U	0.0612	± 0.0239	0.1096	156	U	0.0192	± 0.0137	0.0570
107		0.0435	± 0.0086	0.0100	157		0.0273	± 0.0078	0.0255
108		0.0572	± 0.0143	0.0431	158	U	0.0035	± 0.0230	0.0484
109		0.0445	± 0.0102	0.0114	159	U	0.0075	± 0.0275	0.0971
110	U	0.0428	± 0.0252	0.1131	160		0.0597	± 0.0126	0.0311
110-DUP ^b	U	0.0378	± 0.0269	0.0969	160-DUP ^b		0.0637	± 0.0106	0.0272
111		0.0352	± 0.0085	0.0121	161	U	0.0327	± 0.0112	0.0436
112		0.0361	± 0.0094	0.0244	162	U	0.0520	± 0.0234	0.0943
113	U	0.0289	± 0.0227	0.0530	163		0.0747	± 0.0156	0.0252
114	U	0.0359	± 0.0158	0.0460	164		0.0650	± 0.0179	0.0545
115		0.0451	± 0.0093	0.0245	165	U	0.0448	± 0.0206	0.0996
116	U	0.0135	± 0.0126	0.0532	166		0.0412	± 0.0080	0.0124
117	U	0.0531	± 0.0451	0.1059	167		0.0529	± 0.0119	0.0251
118		0.0232	± 0.0074	0.0184	168	U	0.0184	± 0.0135	0.0544
119	U	0.0421	± 0.0121	0.0439	169	U	0.0416	± 0.0330	0.0948
120		0.0446	± 0.0101	0.0144	170		0.0311	± 0.0090	0.0188
120-DUP ^b	U	0.0237	± 0.0132	0.0515	170-DUP ^b	U	0.0210	± 0.0177	0.0572
121	U	0.0317	± 0.0081	0.0329	171		0.0375	± 0.0091	0.0177
122		0.0455	± 0.0092	0.0173	172	U	0.0143	± 0.0127	0.0568
123	U	0.0342	± 0.0241	0.1151	173	U	0.0150	± 0.0227	0.0844
124		0.0553	± 0.0098	0.0100	174	U	0.0208	± 0.0192	0.0415
125		0.0653	± 0.0138	0.0493	175		0.0207	± 0.0065	0.0118
126		0.0557	± 0.0096	0.0115	176	U	0.0120	± 0.0237	0.0900
127	U	0.0355	± 0.0181	0.0937	177	U	0.0140	± 0.0071	0.0421
128		0.0478	± 0.0096	0.0123	178	U	0.0009	± 0.0203	0.0563
129	U	0.0134	± 0.0226	0.0628	179	U	-0.0163	± 0.0176	0.0404
130	U	0.0393	± 0.0104	0.0423	180	U	-0.0011	± 0.0402	0.1081
130-DUP ^b	U	0.0226	± 0.0140	0.0404	180-DUP ^b	U	-0.0003	± 0.0242	0.0646
131	U	-0.0015	± 0.0417	0.1029	181 ^c	U	0.0301	± 0.0185	0.0468
132		0.0415	± 0.0076	0.0123	182 ^c	U	0.0154	± 0.0132	0.0428
133	U	0.0365	± 0.0187	0.0587	183 ^c	U	0.0201	± 0.0148	0.0424
134	U	0.0155	± 0.0286	0.0710	Average background	0.02191 (pCi/m ² /s)			
135	U	0.0091	± 0.0148	0.0498		IWCS Value Units			
136	U	0.0130	± 0.0144	0.0569		Average ^c 0.0375 (pCi/m ² /s)			
137	U	0.0043	± 0.0120	0.0463		High ^f 0.1183 (pCi/m ² /s)			
138	U	0.0356	± 0.0182	0.0891		Low -0.0278 (pCi/m ² /s)			
139		0.0271	± 0.0062	0.0123					
140	U	0.0218	± 0.0099	0.0547					
140-DUP ^b		0.0249	± 0.0075	0.0176					
141	U	0.0357	± 0.0442	0.1159					
142		0.0442	± 0.0084	0.0187					
143		0.0497	± 0.0095	0.0117					
144	U	0.0686	± 0.0308	0.0841					
145	U	0.0242	± 0.0128	0.0436					
146	U	0.0068	± 0.0216	0.0652					
147	U	0.0308	± 0.0156	0.0376					
148	U	-0.0044	± 0.0270	0.0957					
149		0.0414	± 0.0109	0.0290					
150		0.0337	± 0.0095	0.0176					
150-DUP ^b	U	0.0218	± 0.0100	0.0572					

NOTE: The EPA Standard for Radon-222 Flux is 20 pCi/m²/sec

a. Radon-222 flux was performed on July 18-19, 2017 (24 hour exposure).

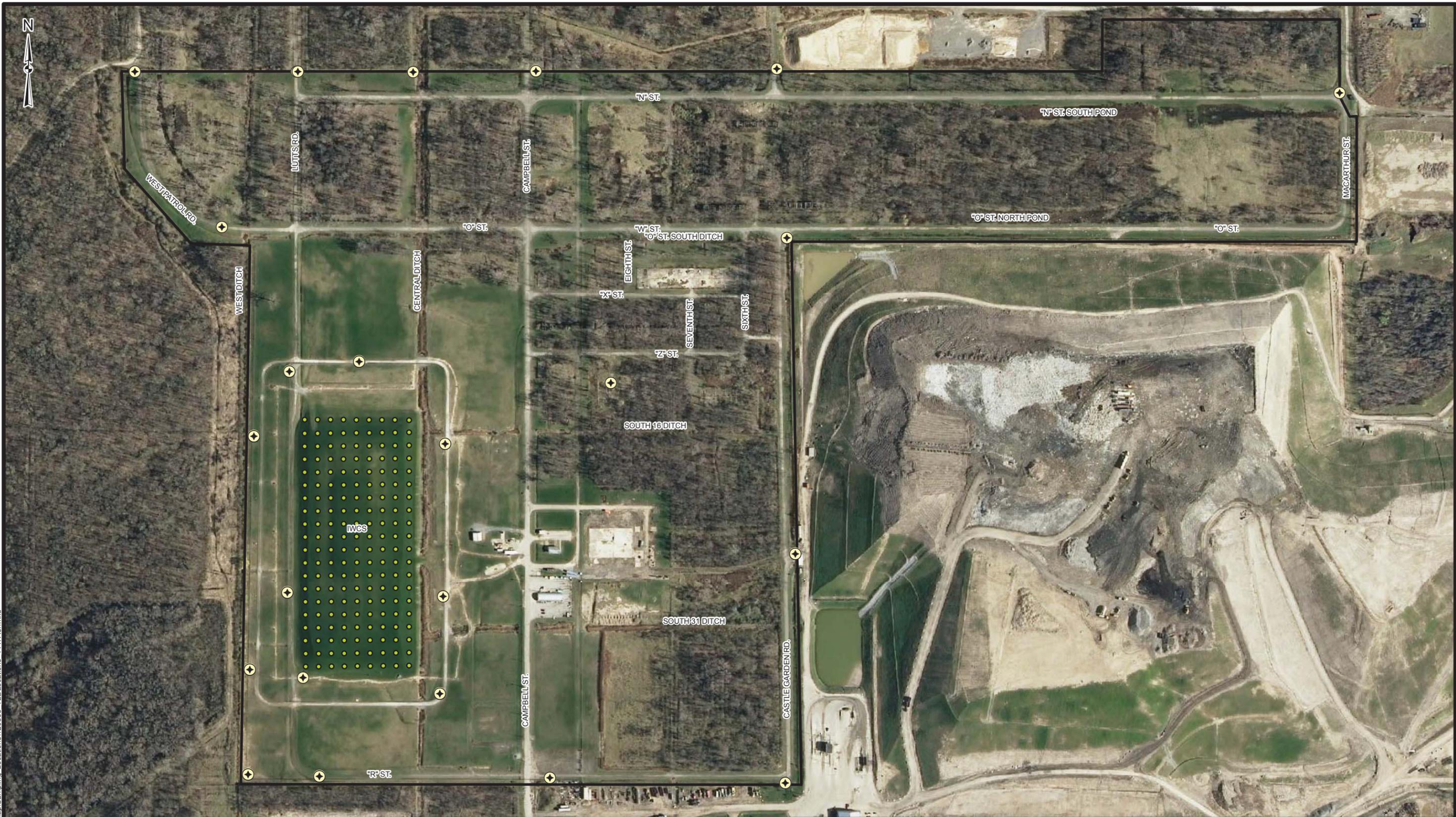
b. Every 10th canister is counted twice as a quality control (QC) duplicate to evaluate analytical precision.

c. Background:
 181-Lewiston-Porter Central School
 182-Lewiston Water Pollution Control Center
 183-Balmer Rd. (CWM Secondary Gate)

d. Data Qualifier: U - no analyte was detected (Non-Detect).
 J - indicates a estimated value when relative percent difference > 30% and Z-score > 1.96 between the primary finding and duplicate (-DUP).

e. Average of all values (detects and Un-detects)

f. Highest detectable finding.



- Legend**
- Radon Flux Sample Location
 - ⬇ TLD/Radon Monitoring Location
 - NFSS Site Boundary



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TLD/RADON MONITORING AND RADON FLUX
SAMPLING LOCATION MAP

NIAGARA FALLS STORAGE SITE
LEWISTON, NEW YORK

FIGURE :



Environmental Monitoring Locations

- A - Lewiston Water Pollution Control Center
- B - Lewiston Porter School Campus
- C - Balmer Road Location
- D - Niagara Falls Storage Site

Locations A, B, and C are background locations for TLD, RadTrack and Radon Flux Sampling.



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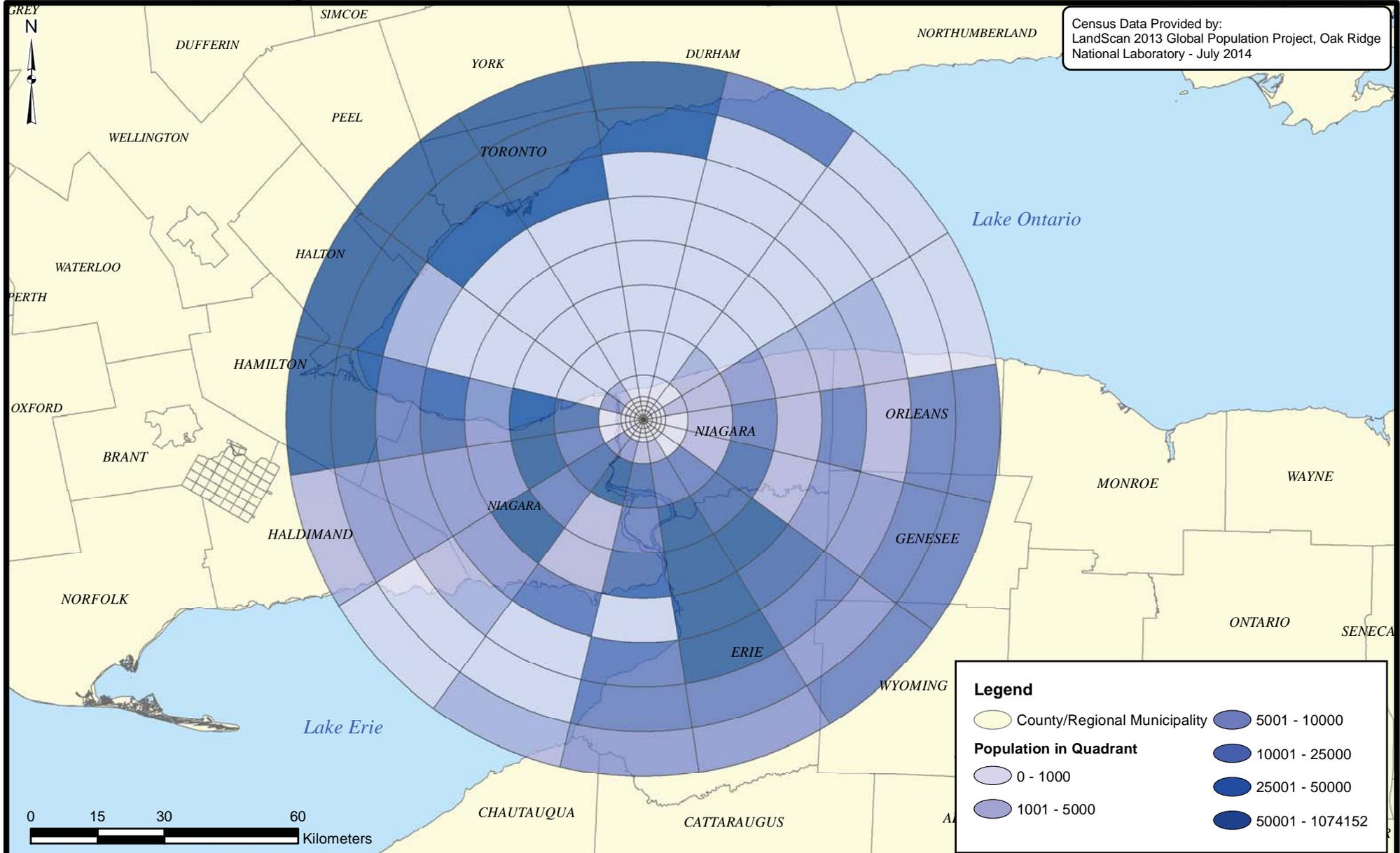
OFF-SITE EXTERNAL GAMMA RADIATION/RADON MONITORING
 AND RADON FLUX SAMPLING LOCATION MAP

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NIAGARA FALLS STORAGE SITE
 LEWISTON, NEW YORK

FIGURE

Census Data Provided by:
LandScan 2013 Global Population Project, Oak Ridge
National Laboratory - July 2014



Legend

	County/Regional Municipality		5001 - 10000
Population in Quadrant			10001 - 25000
	0 - 1000		25001 - 50000
	1001 - 5000		50001 - 1074152



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CENSUS DATA

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