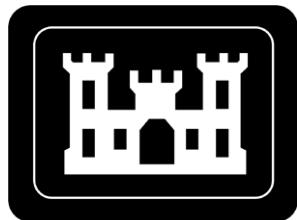

FUSRAP CY2015 NESHAP ANNUAL REPORT FOR NIAGARA FALLS STORAGE SITE (NFSS)

LEWISTON, NEW YORK

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**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 2015 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 CY2015, 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 for the month of December at the time of writing this report and the monthly Quality Controlled Local Climatological Data reports for the airport were used to calculate the 2015 annual mean temperature (8.5 degrees Centigrade) and the total precipitation (74.1 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 CY2015 meteorological data were entered into CAP88-PC (see Attachment E):

Average temperature	8.5 °C (47.3 °F) NFIA
Precipitation,	74.1 cm (29.19 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	1.4 E-04 mrem, SSW @ 914 m
Off-site worker - Adult	3.2 E-04 mrem, SE @ 533 m
School – Age Fifteen	5.1 E-05 mrem, W @ 2499 m
Farm - Infant	1.2 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	7.3 E-05 mrem, SE @ 533 m
School - Age Fifteen	1.2 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	7.3 E-05	NA	NA	NA	NA	NA
Resident SSW at 914 m	7.6 E-05	1.1 E-04	8.3 E-05	7.9 E-05	8.6 E-05	1.4 E-04
School W at 2499 m	6.8 E-06	1.2 E-05	8.0 E-06	7.3 E-06	NA	NA
Farmer S at 1105 m	5.9 E-05	8.9 E-05	6.5 E-05	6.1 E-05	6.8 E-05	1.2 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 3.02 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	1.28 E-03 person-rem
	Fifteen-year old	1.84 E-03 person-rem
	Ten-year old	1.48 E-03 person-rem
	Five-year old	1.44 E-03 person-rem
	One-year old	1.59 E-03 person-rem
	Infant	3.02 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 CY2015 are presented in the radon flux results with measurement locations (site map) in Attachment F.

Measured results for 2015 ranged from non-detect to 0.1226 pCi/m²/s, with an average result including detects and non-detects of 0.0180 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 2015, 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 2015 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:

$U_{a1} = 44$	$U_{a2} = 32$	$U_{a3} = 33$	$U_{a4} = 25$	$U_{a5} = 35$	$U_{a6} = 28$
$U_{a7} = 31$	$U_{a8} = 26$	$U_{a9} = 32$	$U_{a10} = 25$	$U_{a11} = 25$	$U_{a12} = 22$
$U_{a13} = 35$	$U_{a14} = 24$	$U_{a15} = 37$	$U_{a16} = 23$	$U_{a17} = 26$	$U_{a18} = 22$
$U_{a19} = 18$	$U_{a20} = 24$	$U_{a21} = 23$	$U_{a22} = 33$	$U_{a23} = 25$	$U_{a24} = 30$
$U_{a25} = 32$	$U_{a26} = 32$	$U_{a27} = 38$			

^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	1.36E+00	U ₁₁	7.70E-01	U ₂₁	7.08E-01
U ₂	9.86E-01	U ₁₂	6.78E-01	U ₂₂	1.02E+00
U ₃	1.02E+00	U ₁₃	1.08E+00	U ₂₃	7.70E-01
U ₄	7.70E-01	U ₁₄	7.39E-01	U ₂₄	9.24E-01
U ₅	1.08E-01	U ₁₅	1.14E+00	U ₂₅	9.86E-01
U ₆	8.62E-01	U ₁₆	7.08E-01	U ₂₆	9.86E-01
U ₇	9.55E-01	U ₁₇	8.01E-01	U ₂₇	1.17E+00
U ₈	8.01E-01	U ₁₈	6.78E-01		
U ₉	9.86E-01	U ₁₉	5.54E-01		
U ₁₀	7.70E+00	U ₂₀	7.39E-01		

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

$$P_N = 58 (U^* - U_t)^2 + 25(U^* - U_t) = 27.09 \text{ g/m}^2$$

The erosion potentials (P_N) for each period between disturbances are all less than or equal to the threshold friction velocity except for U₁, U₃, U₁₁, and U₂₄.

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:

$$P = k \sum P_N = 13.54 \text{ g/m}^2$$

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

$$PE = 110$$

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

$$PM_{10} = P(1-V) / (PE/50)^2 = 0.28 \text{ g/m}^2/\text{yr}$$

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

$$E = A (PM_{10}) = 218,265 \text{ g soil}$$

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 2015 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 2015

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	2.84E-06	Th-232	0.8	1.75E-07	U-235	1.1	2.40E-07
Th-234			Ra-228			Th-231		
Pa-234m			Ac-228			Pa-231		
Pa-234			Th-228	0.9	1.96E-07	Ac-227		
U-234	12.5	2.73E-06	Ra-224			Th-227		
Th-230	5.5	1.20E-06	Rn-220			Fr-223		
Ra-226	6.9	1.51E-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 May 31 14:10:59 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: Infant

Comments: NFSS Technical Memo 2015 Year
Individual Dose

Dataset Name: NFSS2015Ind.
Dataset Date: May 31, 2016 02:10 PM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.47E-04
UB_Wall	1.59E-04
Bone_Sur	9.82E-03
Brain	1.54E-04
Breasts	1.66E-04
St_Wall	1.57E-04
SI_Wall	1.57E-04
ULI_Wall	1.83E-04
LLI_Wall	2.53E-04
Kidneys	4.40E-04
Liver	4.02E-04
Muscle	1.70E-04
Ovaries	1.75E-04
Pancreas	1.48E-04
R_Marrow	1.28E-03
Skin	1.99E-03
Spleen	1.63E-04
Testes	1.97E-04
Thymus	1.54E-04
Thyroid	1.59E-04
GB_Wall	1.49E-04
Ht_Wall	1.54E-04
Uterus	1.52E-04
ET_Reg	1.23E-03
Lung_66	1.83E-03
Effectiv	6.36E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	2.75E-04
INHALATION	2.22E-04
AIR IMMERSION	6.94E-11
GROUND SURFACE	1.39E-04
INTERNAL	4.97E-04
EXTERNAL	1.39E-04
TOTAL	6.36E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	5.01E-05
Th-234	9.89E-07
Pa-234m	1.35E-05
Pa-234	2.67E-07
U-234	5.62E-05
Th-230	9.84E-05
Ra-226	2.28E-04
Rn-222	2.39E-08
Po-218	4.27E-13
Pb-214	1.56E-05
At-218	1.60E-12
Bi-214	9.11E-05
Rn-218	9.29E-15
Po-214	5.05E-09
Tl-210	3.56E-08
Pb-210	7.67E-08
Bi-210	1.24E-06
Hg-206	1.00E-13
Po-210	3.21E-10
Tl-206	2.90E-12
Th-232	1.86E-05
Ra-228	4.67E-09
Ac-228	5.23E-06
Th-228	4.23E-05
Ra-224	6.23E-08
Rn-220	3.81E-09
Po-216	9.20E-11
Pb-212	8.38E-07
Bi-212	9.77E-07
Po-212	0.00E+00
Tl-208	6.75E-06
U-235	6.02E-06
Th-231	1.55E-07
Pa-231	2.58E-10
Ac-227	8.64E-13
Th-227	4.13E-10
Fr-223	3.89E-12
Ra-223	4.61E-10
Rn-219	2.00E-10
At-219	0.00E+00
Bi-215	8.99E-16
Po-215	6.10E-13
Pb-211	3.92E-10
Bi-211	1.62E-10
Tl-207	2.03E-10
Po-211	7.78E-14
TOTAL	6.36E-04

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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	4.10E-12
INHALATION	6.11E-12
AIR IMMERSION	3.69E-17
GROUND SURFACE	6.82E-11
INTERNAL	1.02E-11
EXTERNAL	6.82E-11
TOTAL	7.84E-11

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NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	1.45E-12
Th-234	5.12E-13
Pa-234m	2.37E-12
Pa-234	1.45E-13
U-234	1.63E-12
Th-230	1.74E-12
Ra-226	4.03E-12
Rn-222	1.30E-14
Po-218	1.91E-19
Pb-214	8.34E-12
At-218	1.98E-19
Bi-214	4.81E-11
Rn-218	5.08E-21
Po-214	2.77E-15
Tl-210	1.90E-14
Pb-210	3.44E-14
Bi-210	1.37E-13
Hg-206	4.44E-20
Po-210	1.76E-16
Tl-206	3.26E-19
Th-232	3.66E-13
Ra-228	1.39E-15
Ac-228	2.78E-12
Th-228	1.16E-12
Ra-224	3.34E-14
Rn-220	2.09E-15
Po-216	5.06E-17
Pb-212	4.56E-13
Bi-212	3.77E-13
Po-212	0.00E+00
Tl-208	3.67E-12
U-235	9.55E-13
Th-231	7.10E-14
Pa-231	1.34E-16
Ac-227	3.23E-19
Th-227	2.24E-16
Fr-223	1.45E-18
Ra-223	2.49E-16
Rn-219	1.09E-16
At-219	0.00E+00
Bi-215	4.01E-22
Po-215	3.35E-19
Pb-211	1.40E-16
Bi-211	8.83E-17
Tl-207	2.61E-17
Po-211	4.26E-20
TOTAL	7.84E-11

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

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	4.6E-04	2.1E-04	1.7E-04	1.3E-04	1.2E-04	1.0E-04	6.7E-05
NNW	3.7E-04	1.7E-04	1.3E-04	1.0E-04	8.5E-05	7.0E-05	4.7E-05
NW	3.7E-04	1.5E-04	1.2E-04	9.8E-05	8.7E-05	7.5E-05	5.4E-05
WNW	4.0E-04	2.2E-04	1.7E-04	1.3E-04	1.1E-04	9.1E-05	5.8E-05
W	4.3E-04	2.3E-04	1.9E-04	1.5E-04	1.3E-04	1.1E-04	7.4E-05
WSW	4.3E-04	2.3E-04	1.8E-04	1.4E-04	1.2E-04	9.4E-05	5.9E-05
SW	4.0E-04	1.8E-04	1.4E-04	1.1E-04	1.0E-04	8.6E-05	5.9E-05
SSW	3.6E-04	1.8E-04	1.4E-04	1.1E-04	9.4E-05	7.8E-05	5.2E-05
S	3.9E-04	1.8E-04	1.5E-04	1.2E-04	1.0E-04	8.8E-05	6.1E-05
SSE	4.4E-04	2.2E-04	1.7E-04	1.3E-04	1.1E-04	9.2E-05	5.8E-05
SSE	5.0E-04	2.4E-04	1.9E-04	1.5E-04	1.3E-04	1.1E-04	7.1E-05
ESE	5.4E-04	2.8E-04	2.1E-04	1.6E-04	1.4E-04	1.1E-04	6.8E-05
E	6.1E-04	2.8E-04	2.2E-04	1.7E-04	1.4E-04	1.2E-04	7.4E-05
ENE	6.4E-04	3.2E-04	2.5E-04	1.8E-04	1.6E-04	1.2E-04	7.2E-05
NE	6.3E-04	3.2E-04	2.5E-04	2.0E-04	1.7E-04	1.4E-04	8.8E-05
NNE	5.6E-04	3.1E-04	2.4E-04	1.8E-04	1.5E-04	1.2E-04	7.0E-05

Distance (m)	
Direction	2629
N	6.5E-05
NNW	4.6E-05
NW	5.3E-05
WNW	5.7E-05
W	7.2E-05
WSW	5.7E-05
SW	5.8E-05
SSW	5.1E-05
S	5.9E-05
SSE	5.7E-05
SSE	6.8E-05
ESE	6.5E-05
E	7.1E-05
ENE	6.9E-05
NE	8.4E-05
NNE	6.8E-05

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

Direction	Distance (m)						
	533	783	914	1105	1250	1486	2499
N	5.6E-11	2.3E-11	1.8E-11	1.3E-11	1.1E-11	8.9E-12	4.6E-12
NNW	4.4E-11	1.8E-11	1.3E-11	8.9E-12	7.0E-12	4.9E-12	1.8E-12
NW	4.4E-11	1.6E-11	1.2E-11	8.7E-12	7.2E-12	5.6E-12	2.9E-12
WNW	4.7E-11	2.4E-11	1.8E-11	1.3E-11	1.0E-11	7.8E-12	3.4E-12
W	5.2E-11	2.6E-11	2.0E-11	1.5E-11	1.3E-11	1.0E-11	5.6E-12
WSW	5.2E-11	2.6E-11	1.9E-11	1.4E-11	1.1E-11	8.2E-12	3.5E-12
SW	4.8E-11	1.9E-11	1.4E-11	1.1E-11	8.9E-12	7.0E-12	3.6E-12
SSW	4.3E-11	1.9E-11	1.4E-11	1.0E-11	8.1E-12	6.0E-12	2.6E-12
S	4.6E-11	1.9E-11	1.5E-11	1.1E-11	9.3E-12	7.4E-12	3.8E-12
SSE	5.2E-11	2.5E-11	1.9E-11	1.3E-11	1.1E-11	7.9E-12	3.4E-12
SSE	6.0E-11	2.7E-11	2.1E-11	1.5E-11	1.3E-11	1.0E-11	5.1E-12
ESE	6.6E-11	3.2E-11	2.4E-11	1.7E-11	1.4E-11	1.0E-11	4.7E-12
E	7.5E-11	3.2E-11	2.4E-11	1.8E-11	1.5E-11	1.1E-11	5.5E-12
ENE	7.8E-11	3.8E-11	2.8E-11	2.0E-11	1.6E-11	1.2E-11	5.2E-12
NE	7.8E-11	3.8E-11	2.9E-11	2.2E-11	1.8E-11	1.4E-11	7.4E-12
NNE	6.9E-11	3.6E-11	2.7E-11	1.9E-11	1.5E-11	1.2E-11	5.0E-12

Direction	Distance (m)						
	2629						
N	4.3E-12						
NNW	1.7E-12						
NW	2.7E-12						
WNW	3.2E-12						
W	5.2E-12						
WSW	3.3E-12						
SW	3.3E-12						
SSW	2.4E-12						
S	3.6E-12						
SSE	3.2E-12						
SSE	4.8E-12						
ESE	4.4E-12						
E	5.1E-12						
ENE	4.9E-12						
NE	6.9E-12						
NNE	4.7E-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 May 31 14:12:43 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: One

Comments: NFSS Technical Memo 2015 Year
Individual Dose

Dataset Name: NFSS2015Ind.
Dataset Date: May 31, 2016 02:12 PM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.27E-04
UB_Wall	1.39E-04
Bone_Sur	2.86E-03
Brain	1.34E-04
Breasts	1.46E-04
St_Wall	1.36E-04
SI_Wall	1.37E-04
ULI_Wall	1.58E-04
LLI_Wall	2.17E-04
Kidneys	2.81E-04
Liver	2.52E-04
Muscle	1.50E-04
Ovaries	1.42E-04
Pancreas	1.28E-04
R_Marrow	3.85E-04
Skin	1.97E-03
Spleen	1.37E-04
Testes	1.62E-04
Thymus	1.34E-04
Thyroid	1.39E-04
GB_Wall	1.29E-04
Ht_Wall	1.34E-04
Uterus	1.32E-04
ET_Reg	1.28E-03
Lung_66	2.03E-03
Effectiv	4.56E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	6.67E-05
INHALATION	2.51E-04
AIR IMMERSION	6.94E-11
GROUND SURFACE	1.39E-04
INTERNAL	3.17E-04
EXTERNAL	1.39E-04
TOTAL	4.56E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	4.60E-05
Th-234	9.89E-07
Pa-234m	1.35E-05
Pa-234	2.67E-07
U-234	5.22E-05
Th-230	7.78E-05
Ra-226	7.71E-05
Rn-222	2.39E-08
Po-218	4.27E-13
Pb-214	1.56E-05
At-218	1.60E-12
Bi-214	9.11E-05
Rn-218	9.29E-15
Po-214	5.05E-09
Tl-210	3.56E-08
Pb-210	7.67E-08
Bi-210	1.24E-06
Hg-206	1.00E-13
Po-210	3.21E-10
Tl-206	2.90E-12
Th-232	1.69E-05
Ra-228	4.60E-09
Ac-228	5.23E-06
Th-228	4.38E-05
Ra-224	6.23E-08
Rn-220	3.81E-09
Po-216	9.20E-11
Pb-212	8.38E-07
Bi-212	9.77E-07
Po-212	0.00E+00
Tl-208	6.75E-06
U-235	5.67E-06
Th-231	1.55E-07
Pa-231	2.58E-10
Ac-227	8.64E-13
Th-227	4.13E-10
Fr-223	3.89E-12
Ra-223	4.61E-10
Rn-219	2.00E-10
At-219	0.00E+00
Bi-215	8.99E-16
Po-215	6.10E-13
Pb-211	3.92E-10
Bi-211	1.62E-10
Tl-207	2.03E-10
Po-211	7.78E-14
TOTAL	4.56E-04

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SUMMARY
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CANCER RISK SUMMARY

	Selected Individual
	Total Lifetime
Cancer	Fatal Cancer Risk

PATHWAY RISK SUMMARY

	Selected Individual
	Total Lifetime
Pathway	Fatal Cancer Risk
INGESTION	6.67E-12
INHALATION	8.07E-12
AIR IMMERSION	3.69E-17
GROUND SURFACE	6.82E-11
INTERNAL	1.47E-11
EXTERNAL	6.82E-11
TOTAL	8.29E-11

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	2.02E-12
Th-234	5.12E-13
Pa-234m	2.37E-12
Pa-234	1.45E-13
U-234	2.27E-12
Th-230	2.33E-12
Ra-226	6.21E-12
Rn-222	1.30E-14
Po-218	1.91E-19
Pb-214	8.34E-12
At-218	1.98E-19
Bi-214	4.81E-11
Rn-218	5.08E-21
Po-214	2.77E-15
Tl-210	1.90E-14
Pb-210	3.44E-14
Bi-210	1.37E-13
Hg-206	4.44E-20
Po-210	1.76E-16
Tl-206	3.26E-19
Th-232	4.89E-13
Ra-228	1.39E-15
Ac-228	2.78E-12
Th-228	1.53E-12
Ra-224	3.34E-14
Rn-220	2.09E-15
Po-216	5.06E-17
Pb-212	4.56E-13
Bi-212	3.77E-13
Po-212	0.00E+00
Tl-208	3.67E-12
U-235	1.01E-12
Th-231	7.10E-14
Pa-231	1.34E-16
Ac-227	3.23E-19
Th-227	2.24E-16
Fr-223	1.45E-18
Ra-223	2.49E-16
Rn-219	1.09E-16
At-219	0.00E+00
Bi-215	4.01E-22
Po-215	3.35E-19
Pb-211	1.40E-16
Bi-211	8.83E-17
Tl-207	2.61E-17
Po-211	4.26E-20
TOTAL	8.29E-11

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SUMMARY
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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	8.0E-05	6.8E-05	5.5E-05	3.1E-05
NNW	2.6E-04	1.1E-04	7.9E-05	5.5E-05	4.5E-05	3.3E-05	1.6E-05
NW	2.6E-04	9.4E-05	7.2E-05	5.4E-05	4.6E-05	3.7E-05	2.2E-05
WNW	2.8E-04	1.4E-04	1.1E-04	7.7E-05	6.4E-05	4.9E-05	2.5E-05
W	3.1E-04	1.5E-04	1.2E-04	9.2E-05	7.9E-05	6.4E-05	3.6E-05
WSW	3.0E-04	1.5E-04	1.1E-04	8.2E-05	6.7E-05	5.1E-05	2.5E-05
SW	2.8E-04	1.1E-04	8.7E-05	6.6E-05	5.6E-05	4.5E-05	2.5E-05
SSW	2.5E-04	1.2E-04	8.6E-05	6.2E-05	5.1E-05	3.9E-05	2.0E-05
S	2.7E-04	1.2E-04	8.9E-05	6.8E-05	5.7E-05	4.6E-05	2.7E-05
SSE	3.1E-04	1.5E-04	1.1E-04	7.9E-05	6.5E-05	5.0E-05	2.5E-05
SSE	3.5E-04	1.6E-04	1.2E-04	9.2E-05	7.8E-05	6.2E-05	3.4E-05
ESE	3.8E-04	1.9E-04	1.4E-04	1.0E-04	8.3E-05	6.4E-05	3.1E-05
E	4.4E-04	1.9E-04	1.4E-04	1.1E-04	8.8E-05	6.9E-05	3.6E-05
ENE	4.6E-04	2.2E-04	1.7E-04	1.2E-04	9.6E-05	7.3E-05	3.4E-05
NE	4.5E-04	2.2E-04	1.7E-04	1.3E-04	1.1E-04	8.5E-05	4.6E-05
NNE	4.0E-04	2.1E-04	1.6E-04	1.1E-04	9.1E-05	7.0E-05	3.3E-05

Distance (m)	
Direction	2629
N	2.9E-05
NNW	1.6E-05
NW	2.1E-05
WNW	2.4E-05
W	3.4E-05
WSW	2.4E-05
SW	2.4E-05
SSW	1.9E-05
S	2.5E-05
SSE	2.3E-05
SSE	3.2E-05
ESE	3.0E-05
E	3.4E-05
ENE	3.2E-05
NE	4.3E-05
NNE	3.1E-05

Tue May 31 14:12:43 2016

SUMMARY
Page 6INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

		Distance (m)						
Direction		533	783	914	1105	1250	1486	2499
N		5.9E-11	2.5E-11	1.9E-11	1.4E-11	1.2E-11	9.7E-12	5.2E-12
NNW		4.7E-11	1.9E-11	1.4E-11	9.7E-12	7.7E-12	5.6E-12	2.3E-12
NW		4.7E-11	1.7E-11	1.3E-11	9.5E-12	7.9E-12	6.3E-12	3.4E-12
WNW		5.0E-11	2.6E-11	1.9E-11	1.4E-11	1.1E-11	8.5E-12	4.0E-12
W		5.5E-11	2.8E-11	2.2E-11	1.6E-11	1.4E-11	1.1E-11	6.2E-12
WSW		5.5E-11	2.8E-11	2.1E-11	1.5E-11	1.2E-11	9.0E-12	4.1E-12
SW		5.1E-11	2.0E-11	1.6E-11	1.2E-11	9.8E-12	7.7E-12	4.1E-12
SSW		4.6E-11	2.1E-11	1.5E-11	1.1E-11	8.9E-12	6.6E-12	3.0E-12
S		4.9E-11	2.1E-11	1.6E-11	1.2E-11	1.0E-11	8.1E-12	4.4E-12
SSE		5.6E-11	2.7E-11	2.0E-11	1.4E-11	1.2E-11	8.7E-12	4.0E-12
SSE		6.4E-11	2.9E-11	2.2E-11	1.7E-11	1.4E-11	1.1E-11	5.8E-12
ESE		7.0E-11	3.4E-11	2.5E-11	1.8E-11	1.5E-11	1.1E-11	5.3E-12
E		7.9E-11	3.4E-11	2.6E-11	1.9E-11	1.6E-11	1.2E-11	6.1E-12
ENE		8.3E-11	4.1E-11	3.0E-11	2.2E-11	1.8E-11	1.3E-11	5.9E-12
NE		8.2E-11	4.0E-11	3.1E-11	2.3E-11	2.0E-11	1.6E-11	8.2E-12
NNE		7.3E-11	3.8E-11	2.8E-11	2.0E-11	1.7E-11	1.3E-11	5.7E-12

		Distance (m)						
Direction		2629						
N		4.9E-12						
NNW		2.2E-12						
NW		3.2E-12						
WNW		3.7E-12						
W		5.8E-12						
WSW		3.8E-12						
SW		3.9E-12						
SSW		2.9E-12						
S		4.1E-12						
SSE		3.8E-12						
SSE		5.4E-12						
ESE		5.0E-12						
E		5.8E-12						
ENE		5.5E-12						
NE		7.6E-12						
NNE		5.3E-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 May 31 14:13:40 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: Five

Comments: NFSS Technical Memo 2015 Year
Individual Dose

Dataset Name: NFSS2015Ind.
Dataset Date: May 31, 2016 02:13 PM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.23E-04
UB_Wall	1.36E-04
Bone_Sur	3.02E-03
Brain	1.30E-04
Breasts	1.42E-04
St_Wall	1.32E-04
SI_Wall	1.32E-04
ULI_Wall	1.45E-04
LLI_Wall	1.80E-04
Kidneys	2.51E-04
Liver	2.17E-04
Muscle	1.46E-04
Ovaries	1.42E-04
Pancreas	1.24E-04
R_Marrow	3.28E-04
Skin	1.97E-03
Spleen	1.34E-04
Testes	1.61E-04
Thymus	1.30E-04
Thyroid	1.36E-04
GB_Wall	1.25E-04
Ht_Wall	1.30E-04
Uterus	1.29E-04
ET_Reg	8.00E-04
Lung_66	1.88E-03
Effectiv	4.27E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	5.06E-05
INHALATION	2.38E-04
AIR IMMERSION	6.94E-11
GROUND SURFACE	1.39E-04
INTERNAL	2.88E-04
EXTERNAL	1.39E-04
TOTAL	4.27E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	4.10E-05
Th-234	9.89E-07
Pa-234m	1.35E-05
Pa-234	2.67E-07
U-234	4.65E-05
Th-230	7.89E-05
Ra-226	6.09E-05
Rn-222	2.39E-08
Po-218	4.27E-13
Pb-214	1.56E-05
At-218	1.60E-12
Bi-214	9.11E-05
Rn-218	9.29E-15
Po-214	5.05E-09
Tl-210	3.56E-08
Pb-210	7.67E-08
Bi-210	1.24E-06
Hg-206	1.00E-13
Po-210	3.21E-10
Tl-206	2.90E-12
Th-232	1.82E-05
Ra-228	4.59E-09
Ac-228	5.23E-06
Th-228	3.96E-05
Ra-224	6.21E-08
Rn-220	3.81E-09
Po-216	9.20E-11
Pb-212	8.38E-07
Bi-212	9.77E-07
Po-212	0.00E+00
Tl-208	6.75E-06
U-235	5.21E-06
Th-231	1.55E-07
Pa-231	2.58E-10
Ac-227	8.64E-13
Th-227	4.13E-10
Fr-223	3.89E-12
Ra-223	4.61E-10
Rn-219	2.00E-10
At-219	0.00E+00
Bi-215	8.99E-16
Po-215	6.10E-13
Pb-211	3.92E-10
Bi-211	1.62E-10
Tl-207	2.03E-10
Po-211	7.78E-14
TOTAL	4.27E-04

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	6.85E-13
INHALATION	2.61E-11
AIR IMMERSION	3.69E-17
GROUND SURFACE	6.82E-11
INTERNAL	2.67E-11
EXTERNAL	6.82E-11
TOTAL	9.49E-11

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	4.56E-12
Th-234	5.12E-13
Pa-234m	2.37E-12
Pa-234	1.45E-13
U-234	5.83E-12
Th-230	6.61E-12
Ra-226	3.18E-12
Rn-222	1.30E-14
Po-218	1.91E-19
Pb-214	8.34E-12
At-218	1.98E-19
Bi-214	4.81E-11
Rn-218	5.08E-21
Po-214	2.77E-15
Tl-210	1.90E-14
Pb-210	3.44E-14
Bi-210	1.37E-13
Hg-206	4.44E-20
Po-210	1.76E-16
Tl-206	3.26E-19
Th-232	1.40E-12
Ra-228	1.39E-15
Ac-228	2.78E-12
Th-228	5.00E-12
Ra-224	3.35E-14
Rn-220	2.09E-15
Po-216	5.06E-17
Pb-212	4.56E-13
Bi-212	3.77E-13
Po-212	0.00E+00
Tl-208	3.67E-12
U-235	1.28E-12
Th-231	7.10E-14
Pa-231	1.34E-16
Ac-227	3.23E-19
Th-227	2.24E-16
Fr-223	1.45E-18
Ra-223	2.49E-16
Rn-219	1.09E-16
At-219	0.00E+00
Bi-215	4.01E-22
Po-215	3.35E-19
Pb-211	1.40E-16
Bi-211	8.83E-17
Tl-207	2.61E-17
Po-211	4.26E-20
TOTAL	9.49E-11

Tue May 31 14:13:40 2016

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

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	3.1E-04	1.3E-04	9.8E-05	7.3E-05	6.2E-05	4.9E-05	2.7E-05
NNW	2.4E-04	9.9E-05	7.2E-05	5.0E-05	4.0E-05	2.9E-05	1.3E-05
NW	2.4E-04	8.6E-05	6.6E-05	4.9E-05	4.1E-05	3.2E-05	1.8E-05
WNW	2.6E-04	1.3E-04	9.9E-05	7.0E-05	5.8E-05	4.4E-05	2.1E-05
W	2.9E-04	1.4E-04	1.1E-04	8.4E-05	7.1E-05	5.8E-05	3.2E-05
WSW	2.8E-04	1.4E-04	1.1E-04	7.5E-05	6.1E-05	4.6E-05	2.1E-05
SW	2.6E-04	1.0E-04	8.0E-05	5.9E-05	5.0E-05	4.0E-05	2.1E-05
SSW	2.4E-04	1.1E-04	7.9E-05	5.6E-05	4.5E-05	3.4E-05	1.6E-05
S	2.5E-04	1.1E-04	8.1E-05	6.1E-05	5.2E-05	4.1E-05	2.3E-05
SSE	2.9E-04	1.4E-04	1.0E-04	7.2E-05	5.9E-05	4.4E-05	2.1E-05
SSE	3.3E-04	1.5E-04	1.1E-04	8.4E-05	7.1E-05	5.6E-05	2.9E-05
ESE	3.6E-04	1.7E-04	1.3E-04	9.2E-05	7.6E-05	5.7E-05	2.7E-05
E	4.1E-04	1.7E-04	1.3E-04	9.6E-05	8.0E-05	6.2E-05	3.1E-05
ENE	4.3E-04	2.1E-04	1.5E-04	1.1E-04	8.8E-05	6.6E-05	3.0E-05
NE	4.2E-04	2.0E-04	1.6E-04	1.2E-04	9.8E-05	7.8E-05	4.1E-05
NNE	3.8E-04	1.9E-04	1.4E-04	1.0E-04	8.4E-05	6.3E-05	2.9E-05

Distance (m)	
Direction	2629
N	2.5E-05
NNW	1.2E-05
NW	1.7E-05
WNW	2.0E-05
W	3.0E-05
WSW	2.0E-05
SW	2.0E-05
SSW	1.5E-05
S	2.1E-05
SSE	2.0E-05
SSE	2.7E-05
ESE	2.5E-05
E	2.9E-05
ENE	2.8E-05
NE	3.8E-05
NNE	2.7E-05

Tue May 31 14:13:40 2016

SUMMARY
Page 6

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

		Distance (m)						
Direction		533	783	914	1105	1250	1486	2499
N		6.8E-11	2.8E-11	2.1E-11	1.5E-11	1.3E-11	1.0E-11	4.8E-12
NNW		5.3E-11	2.1E-11	1.5E-11	1.0E-11	7.7E-12	5.3E-12	1.6E-12
NW		5.3E-11	1.8E-11	1.4E-11	9.8E-12	8.0E-12	6.1E-12	2.7E-12
WNW		5.7E-11	2.9E-11	2.1E-11	1.5E-11	1.2E-11	8.7E-12	3.4E-12
W		6.3E-11	3.1E-11	2.4E-11	1.8E-11	1.5E-11	1.2E-11	6.0E-12
WSW		6.2E-11	3.1E-11	2.3E-11	1.6E-11	1.3E-11	9.2E-12	3.6E-12
SW		5.8E-11	2.2E-11	1.7E-11	1.2E-11	1.0E-11	7.8E-12	3.6E-12
SSW		5.2E-11	2.3E-11	1.7E-11	1.1E-11	9.1E-12	6.5E-12	2.4E-12
S		5.6E-11	2.3E-11	1.7E-11	1.3E-11	1.1E-11	8.2E-12	3.9E-12
SSE		6.3E-11	3.0E-11	2.2E-11	1.5E-11	1.2E-11	8.9E-12	3.4E-12
SSE		7.3E-11	3.2E-11	2.5E-11	1.8E-11	1.5E-11	1.2E-11	5.4E-12
ESE		8.0E-11	3.8E-11	2.8E-11	2.0E-11	1.6E-11	1.2E-11	4.9E-12
E		9.1E-11	3.8E-11	2.9E-11	2.1E-11	1.7E-11	1.3E-11	5.9E-12
ENE		9.5E-11	4.6E-11	3.4E-11	2.4E-11	1.9E-11	1.4E-11	5.6E-12
NE		9.4E-11	4.5E-11	3.4E-11	2.5E-11	2.1E-11	1.7E-11	8.1E-12
NNE		8.3E-11	4.3E-11	3.2E-11	2.2E-11	1.8E-11	1.3E-11	5.3E-12

		Distance (m)
Direction		2629
N		4.5E-12
NNW		1.4E-12
NW		2.5E-12
WNW		3.2E-12
W		5.5E-12
WSW		3.3E-12
SW		3.3E-12
SSW		2.2E-12
S		3.6E-12
SSE		3.2E-12
SSE		5.0E-12
ESE		4.6E-12
E		5.4E-12
ENE		5.1E-12
NE		7.5E-12
NNE		4.9E-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 May 31 14:14:36 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: Ten

Comments: NFSS Technical Memo 2015 Year
Individual Dose

Dataset Name: NFSS2015Ind.
Dataset Date: May 31, 2016 02:14 PM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.22E-04
UB_Wall	1.34E-04
Bone_Sur	4.91E-03
Brain	1.28E-04
Breasts	1.40E-04
St_Wall	1.30E-04
SI_Wall	1.30E-04
ULI_Wall	1.39E-04
LLI_Wall	1.65E-04
Kidneys	2.42E-04
Liver	2.07E-04
Muscle	1.45E-04
Ovaries	1.43E-04
Pancreas	1.23E-04
R_Marrow	4.01E-04
Skin	1.96E-03
Spleen	1.35E-04
Testes	1.62E-04
Thymus	1.29E-04
Thyroid	1.34E-04
GB_Wall	1.24E-04
Ht_Wall	1.28E-04
Uterus	1.27E-04
ET_Reg	7.98E-04
Lung_66	1.76E-03
Effectiv	4.39E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	7.00E-05
INHALATION	2.30E-04
AIR IMMERSION	6.94E-11
GROUND SURFACE	1.39E-04
INTERNAL	3.00E-04
EXTERNAL	1.39E-04
TOTAL	4.39E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	3.90E-05
Th-234	9.89E-07
Pa-234m	1.35E-05
Pa-234	2.67E-07
U-234	4.50E-05
Th-230	7.66E-05
Ra-226	8.04E-05
Rn-222	2.39E-08
Po-218	4.27E-13
Pb-214	1.56E-05
At-218	1.60E-12
Bi-214	9.11E-05
Rn-218	9.29E-15
Po-214	5.05E-09
Tl-210	3.56E-08
Pb-210	7.67E-08
Bi-210	1.24E-06
Hg-206	1.00E-13
Po-210	3.21E-10
Tl-206	2.90E-12
Th-232	1.85E-05
Ra-228	4.60E-09
Ac-228	5.23E-06
Th-228	3.74E-05
Ra-224	6.22E-08
Rn-220	3.81E-09
Po-216	9.20E-11
Pb-212	8.38E-07
Bi-212	9.77E-07
Po-212	0.00E+00
Tl-208	6.75E-06
U-235	5.06E-06
Th-231	1.55E-07
Pa-231	2.58E-10
Ac-227	8.64E-13
Th-227	4.13E-10
Fr-223	3.89E-12
Ra-223	4.61E-10
Rn-219	2.00E-10
At-219	0.00E+00
Bi-215	8.99E-16
Po-215	6.10E-13
Pb-211	3.92E-10
Bi-211	1.62E-10
Tl-207	2.03E-10
Po-211	7.78E-14
TOTAL	4.39E-04

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SUMMARY
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	1.08E-12
INHALATION	3.63E-11
AIR IMMERSION	3.69E-17
GROUND SURFACE	6.82E-11
INTERNAL	3.74E-11
EXTERNAL	6.82E-11
TOTAL	1.06E-10

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	6.34E-12
Th-234	5.12E-13
Pa-234m	2.37E-12
Pa-234	1.45E-13
U-234	8.21E-12
Th-230	9.21E-12
Ra-226	4.34E-12
Rn-222	1.30E-14
Po-218	1.91E-19
Pb-214	8.34E-12
At-218	1.98E-19
Bi-214	4.81E-11
Rn-218	5.08E-21
Po-214	2.77E-15
Tl-210	1.90E-14
Pb-210	3.44E-14
Bi-210	1.37E-13
Hg-206	4.44E-20
Po-210	1.76E-16
Tl-206	3.26E-19
Th-232	1.96E-12
Ra-228	1.39E-15
Ac-228	2.78E-12
Th-228	6.98E-12
Ra-224	3.36E-14
Rn-220	2.09E-15
Po-216	5.06E-17
Pb-212	4.56E-13
Bi-212	3.77E-13
Po-212	0.00E+00
Tl-208	3.67E-12
U-235	1.47E-12
Th-231	7.10E-14
Pa-231	1.34E-16
Ac-227	3.23E-19
Th-227	2.24E-16
Fr-223	1.45E-18
Ra-223	2.49E-16
Rn-219	1.09E-16
At-219	0.00E+00
Bi-215	4.01E-22
Po-215	3.35E-19
Pb-211	1.40E-16
Bi-211	8.83E-17
Tl-207	2.61E-17
Po-211	4.26E-20
TOTAL	1.06E-10

Tue May 31 14:14:36 2016

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

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	3.1E-04	1.3E-04	1.0E-04	7.7E-05	6.6E-05	5.3E-05	3.0E-05
NNW	2.5E-04	1.0E-04	7.6E-05	5.3E-05	4.3E-05	3.2E-05	1.6E-05
NW	2.5E-04	9.0E-05	6.9E-05	5.2E-05	4.4E-05	3.6E-05	2.1E-05
WNW	2.7E-04	1.4E-04	1.0E-04	7.4E-05	6.1E-05	4.7E-05	2.4E-05
W	2.9E-04	1.5E-04	1.2E-04	8.8E-05	7.6E-05	6.2E-05	3.5E-05
WSW	2.9E-04	1.5E-04	1.1E-04	7.9E-05	6.5E-05	4.9E-05	2.4E-05
SW	2.7E-04	1.1E-04	8.4E-05	6.3E-05	5.4E-05	4.3E-05	2.4E-05
SSW	2.4E-04	1.1E-04	8.3E-05	6.0E-05	4.9E-05	3.7E-05	1.9E-05
S	2.6E-04	1.1E-04	8.6E-05	6.5E-05	5.5E-05	4.5E-05	2.6E-05
SSE	3.0E-04	1.4E-04	1.1E-04	7.6E-05	6.2E-05	4.8E-05	2.4E-05
SSE	3.4E-04	1.5E-04	1.2E-04	8.8E-05	7.5E-05	5.9E-05	3.2E-05
ESE	3.7E-04	1.8E-04	1.3E-04	9.7E-05	8.0E-05	6.1E-05	3.0E-05
E	4.2E-04	1.8E-04	1.4E-04	1.0E-04	8.5E-05	6.6E-05	3.4E-05
ENE	4.4E-04	2.1E-04	1.6E-04	1.1E-04	9.3E-05	7.0E-05	3.3E-05
NE	4.3E-04	2.1E-04	1.6E-04	1.2E-04	1.0E-04	8.2E-05	4.4E-05
NNE	3.9E-04	2.0E-04	1.5E-04	1.1E-04	8.8E-05	6.7E-05	3.2E-05

Distance (m)	
Direction	2629
N	2.8E-05
NNW	1.5E-05
NW	2.0E-05
WNW	2.3E-05
W	3.3E-05
WSW	2.3E-05
SW	2.3E-05
SSW	1.8E-05
S	2.4E-05
SSE	2.2E-05
SSE	3.0E-05
ESE	2.8E-05
E	3.2E-05
ENE	3.1E-05
NE	4.1E-05
NNE	3.0E-05

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SUMMARY
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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	2.3E-11	1.7E-11	1.4E-11	1.1E-11	5.3E-12
NNW		5.9E-11	2.3E-11	1.7E-11	1.1E-11	8.6E-12	5.9E-12	1.8E-12
NW		5.9E-11	2.0E-11	1.5E-11	1.1E-11	8.9E-12	6.8E-12	3.1E-12
WNW		6.4E-11	3.2E-11	2.3E-11	1.6E-11	1.3E-11	9.6E-12	3.8E-12
W		7.0E-11	3.5E-11	2.7E-11	2.0E-11	1.7E-11	1.3E-11	6.6E-12
WSW		6.9E-11	3.4E-11	2.5E-11	1.7E-11	1.4E-11	1.0E-11	3.9E-12
SW		6.4E-11	2.5E-11	1.9E-11	1.4E-11	1.1E-11	8.6E-12	4.0E-12
SSW		5.8E-11	2.5E-11	1.8E-11	1.3E-11	1.0E-11	7.2E-12	2.7E-12
S		6.2E-11	2.5E-11	1.9E-11	1.4E-11	1.2E-11	9.0E-12	4.3E-12
SSE		7.0E-11	3.3E-11	2.4E-11	1.7E-11	1.3E-11	9.8E-12	3.8E-12
SSE		8.1E-11	3.6E-11	2.7E-11	2.0E-11	1.7E-11	1.3E-11	6.0E-12
ESE		8.9E-11	4.2E-11	3.1E-11	2.2E-11	1.8E-11	1.3E-11	5.5E-12
E		1.0E-10	4.3E-11	3.2E-11	2.3E-11	1.9E-11	1.4E-11	6.5E-12
ENE		1.1E-10	5.1E-11	3.7E-11	2.6E-11	2.1E-11	1.5E-11	6.1E-12
NE		1.0E-10	5.0E-11	3.8E-11	2.8E-11	2.4E-11	1.8E-11	9.0E-12
NNE		9.3E-11	4.8E-11	3.5E-11	2.5E-11	2.0E-11	1.5E-11	5.9E-12

		Distance (m)
Direction		2629
N		4.9E-12
NNW		1.6E-12
NW		2.8E-12
WNW		3.5E-12
W		6.1E-12
WSW		3.6E-12
SW		3.7E-12
SSW		2.5E-12
S		4.0E-12
SSE		3.5E-12
SSE		5.6E-12
ESE		5.0E-12
E		6.0E-12
ENE		5.7E-12
NE		8.3E-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 May 31 14:15:32 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: Fifteen

Comments: NFSS Technical Memo 2015 Year
Individual Dose

Dataset Name: NFSS2015Ind.
Dataset Date: May 31, 2016 02:15 PM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.24E-04
UB_Wall	1.36E-04
Bone_Sur	1.16E-02
Brain	1.31E-04
Breasts	1.42E-04
St_Wall	1.32E-04
SI_Wall	1.31E-04
ULI_Wall	1.38E-04
LLI_Wall	1.57E-04
Kidneys	2.63E-04
Liver	2.15E-04
Muscle	1.47E-04
Ovaries	1.49E-04
Pancreas	1.25E-04
R_Marrow	6.16E-04
Skin	1.97E-03
Spleen	1.44E-04
Testes	1.68E-04
Thymus	1.31E-04
Thyroid	1.36E-04
GB_Wall	1.25E-04
Ht_Wall	1.30E-04
Uterus	1.29E-04
ET_Reg	6.22E-04
Lung_66	2.01E-03
Effectiv	5.64E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	1.48E-04
INHALATION	2.77E-04
AIR IMMERSION	6.94E-11
GROUND SURFACE	1.39E-04
INTERNAL	4.25E-04
EXTERNAL	1.39E-04
TOTAL	5.64E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	4.57E-05
Th-234	9.89E-07
Pa-234m	1.35E-05
Pa-234	2.67E-07
U-234	5.29E-05
Th-230	9.52E-05
Ra-226	1.61E-04
Rn-222	2.39E-08
Po-218	4.27E-13
Pb-214	1.56E-05
At-218	1.60E-12
Bi-214	9.11E-05
Rn-218	9.29E-15
Po-214	5.05E-09
Tl-210	3.56E-08
Pb-210	7.67E-08
Bi-210	1.24E-06
Hg-206	1.00E-13
Po-210	3.21E-10
Tl-206	2.90E-12
Th-232	2.45E-05
Ra-228	4.61E-09
Ac-228	5.23E-06
Th-228	4.18E-05
Ra-224	6.25E-08
Rn-220	3.81E-09
Po-216	9.20E-11
Pb-212	8.38E-07
Bi-212	9.77E-07
Po-212	0.00E+00
Tl-208	6.75E-06
U-235	5.67E-06
Th-231	1.55E-07
Pa-231	2.58E-10
Ac-227	8.64E-13
Th-227	4.13E-10
Fr-223	3.89E-12
Ra-223	4.61E-10
Rn-219	2.00E-10
At-219	0.00E+00
Bi-215	8.99E-16
Po-215	6.10E-13
Pb-211	3.92E-10
Bi-211	1.62E-10
Tl-207	2.03E-10
Po-211	7.78E-14
TOTAL	5.64E-04

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SUMMARY
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CANCER RISK SUMMARY

	Selected Individual
	Total Lifetime
Cancer	Fatal Cancer Risk

PATHWAY RISK SUMMARY

	Selected Individual
	Total Lifetime
Pathway	Fatal Cancer Risk
INGESTION	1.87E-11
INHALATION	2.62E-11
AIR IMMERSION	3.69E-17
GROUND SURFACE	6.82E-11
INTERNAL	4.49E-11
EXTERNAL	6.82E-11
TOTAL	1.13E-10

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	4.87E-12
Th-234	5.12E-13
Pa-234m	2.37E-12
Pa-234	1.45E-13
U-234	6.35E-12
Th-230	6.55E-12
Ra-226	2.08E-11
Rn-222	1.30E-14
Po-218	1.91E-19
Pb-214	8.34E-12
At-218	1.98E-19
Bi-214	4.81E-11
Rn-218	5.08E-21
Po-214	2.77E-15
Tl-210	1.90E-14
Pb-210	3.44E-14
Bi-210	1.37E-13
Hg-206	4.44E-20
Po-210	1.76E-16
Tl-206	3.26E-19
Th-232	1.49E-12
Ra-228	1.39E-15
Ac-228	2.78E-12
Th-228	4.70E-12
Ra-224	3.35E-14
Rn-220	2.09E-15
Po-216	5.06E-17
Pb-212	4.56E-13
Bi-212	3.77E-13
Po-212	0.00E+00
Tl-208	3.67E-12
U-235	1.27E-12
Th-231	7.10E-14
Pa-231	1.34E-16
Ac-227	3.23E-19
Th-227	2.24E-16
Fr-223	1.45E-18
Ra-223	2.49E-16
Rn-219	1.09E-16
At-219	0.00E+00
Bi-215	4.01E-22
Po-215	3.35E-19
Pb-211	1.40E-16
Bi-211	8.83E-17
Tl-207	2.61E-17
Po-211	4.26E-20
TOTAL	1.13E-10

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

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	4.1E-04	1.8E-04	1.4E-04	1.1E-04	9.0E-05	7.4E-05	4.5E-05
NNW	3.3E-04	1.4E-04	1.0E-04	7.4E-05	6.1E-05	4.8E-05	2.7E-05
NW	3.2E-04	1.2E-04	9.5E-05	7.3E-05	6.3E-05	5.2E-05	3.3E-05
WNW	3.5E-04	1.8E-04	1.4E-04	1.0E-04	8.5E-05	6.7E-05	3.7E-05
W	3.8E-04	2.0E-04	1.5E-04	1.2E-04	1.0E-04	8.5E-05	5.1E-05
WSW	3.8E-04	1.9E-04	1.5E-04	1.1E-04	8.9E-05	6.9E-05	3.8E-05
SW	3.5E-04	1.5E-04	1.1E-04	8.7E-05	7.5E-05	6.1E-05	3.8E-05
SSW	3.2E-04	1.5E-04	1.1E-04	8.3E-05	6.9E-05	5.4E-05	3.1E-05
S	3.4E-04	1.5E-04	1.2E-04	8.9E-05	7.7E-05	6.4E-05	3.9E-05
SSE	3.8E-04	1.9E-04	1.4E-04	1.0E-04	8.6E-05	6.7E-05	3.7E-05
SSE	4.4E-04	2.0E-04	1.6E-04	1.2E-04	1.0E-04	8.2E-05	4.8E-05
ESE	4.8E-04	2.3E-04	1.8E-04	1.3E-04	1.1E-04	8.5E-05	4.5E-05
E	5.4E-04	2.4E-04	1.8E-04	1.4E-04	1.1E-04	9.1E-05	5.0E-05
ENE	5.6E-04	2.8E-04	2.1E-04	1.5E-04	1.2E-04	9.6E-05	4.9E-05
NE	5.6E-04	2.7E-04	2.1E-04	1.6E-04	1.4E-04	1.1E-04	6.3E-05
NNE	5.0E-04	2.6E-04	2.0E-04	1.4E-04	1.2E-04	9.2E-05	4.7E-05

Distance (m)	
Direction	2629
N	4.3E-05
NNW	2.6E-05
NW	3.2E-05
WNW	3.5E-05
W	4.9E-05
WSW	3.6E-05
SW	3.6E-05
SSW	3.0E-05
S	3.8E-05
SSE	3.5E-05
SSE	4.6E-05
ESE	4.3E-05
E	4.8E-05
ENE	4.6E-05
NE	5.9E-05
NNE	4.5E-05

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

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	8.1E-11	3.4E-11	2.7E-11	2.0E-11	1.7E-11	1.4E-11	7.9E-12
NNW	6.5E-11	2.7E-11	2.0E-11	1.4E-11	1.1E-11	8.4E-12	4.1E-12
NW	6.5E-11	2.3E-11	1.8E-11	1.4E-11	1.2E-11	9.4E-12	5.5E-12
WNW	6.9E-11	3.6E-11	2.7E-11	2.0E-11	1.6E-11	1.2E-11	6.3E-12
W	7.6E-11	3.9E-11	3.0E-11	2.3E-11	2.0E-11	1.6E-11	9.3E-12
WSW	7.5E-11	3.8E-11	2.9E-11	2.1E-11	1.7E-11	1.3E-11	6.4E-12
SW	6.9E-11	2.8E-11	2.2E-11	1.7E-11	1.4E-11	1.1E-11	6.5E-12
SSW	6.3E-11	2.9E-11	2.2E-11	1.6E-11	1.3E-11	9.9E-12	5.1E-12
S	6.7E-11	2.9E-11	2.2E-11	1.7E-11	1.5E-11	1.2E-11	6.8E-12
SSE	7.6E-11	3.7E-11	2.8E-11	2.0E-11	1.6E-11	1.3E-11	6.3E-12
SSE	8.7E-11	4.0E-11	3.1E-11	2.3E-11	2.0E-11	1.6E-11	8.6E-12
ESE	9.5E-11	4.7E-11	3.5E-11	2.5E-11	2.1E-11	1.6E-11	8.0E-12
E	1.1E-10	4.7E-11	3.6E-11	2.7E-11	2.2E-11	1.8E-11	9.2E-12
ENE	1.1E-10	5.6E-11	4.2E-11	3.0E-11	2.4E-11	1.9E-11	8.8E-12
NE	1.1E-10	5.5E-11	4.2E-11	3.2E-11	2.7E-11	2.2E-11	1.2E-11
NNE	9.9E-11	5.2E-11	3.9E-11	2.8E-11	2.3E-11	1.8E-11	8.5E-12

Distance (m)	
Direction	2629
N	7.5E-12
NNW	3.9E-12
NW	5.2E-12
WNW	6.0E-12
W	8.7E-12
WSW	6.1E-12
SW	6.1E-12
SSW	4.8E-12
S	6.5E-12
SSE	6.0E-12
SSE	8.1E-12
ESE	7.6E-12
E	8.6E-12
ENE	8.3E-12
NE	1.1E-11
NNE	8.0E-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 May 31 14:04:10 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: Adult

Comments: NFSS Technical Memo 2015 Year
Individual Dose

Dataset Name: NFSS2015Ind.
Dataset Date: May 31, 2016 02:04 PM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd

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SUMMARY
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ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	1.21E-04
UB_Wall	1.34E-04
Bone_Sur	4.24E-03
Brain	1.28E-04
Breasts	1.40E-04
St_Wall	1.29E-04
SI_Wall	1.29E-04
ULI_Wall	1.36E-04
LLI_Wall	1.54E-04
Kidneys	2.45E-04
Liver	2.00E-04
Muscle	1.44E-04
Ovaries	1.44E-04
Pancreas	1.22E-04
R_Marrow	3.32E-04
Skin	1.96E-03
Spleen	1.31E-04
Testes	1.63E-04
Thymus	1.28E-04
Thyroid	1.34E-04
GB_Wall	1.23E-04
Ht_Wall	1.28E-04
Uterus	1.27E-04
ET_Reg	5.95E-04
Lung_66	1.76E-03
Effectiv	4.22E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	4.32E-05
INHALATION	2.40E-04
AIR IMMERSION	6.94E-11
GROUND SURFACE	1.39E-04
INTERNAL	2.83E-04
EXTERNAL	1.39E-04
TOTAL	4.22E-04

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	3.74E-05
Th-234	9.89E-07
Pa-234m	1.35E-05
Pa-234	2.67E-07
U-234	4.32E-05
Th-230	9.05E-05
Ra-226	5.04E-05
Rn-222	2.39E-08
Po-218	4.27E-13
Pb-214	1.56E-05
At-218	1.60E-12
Bi-214	9.11E-05
Rn-218	9.29E-15
Po-214	5.05E-09
Tl-210	3.56E-08
Pb-210	7.67E-08
Bi-210	1.24E-06
Hg-206	1.00E-13
Po-210	3.21E-10
Tl-206	2.90E-12
Th-232	2.38E-05
Ra-228	4.58E-09
Ac-228	5.23E-06
Th-228	3.52E-05
Ra-224	6.22E-08
Rn-220	3.81E-09
Po-216	9.20E-11
Pb-212	8.38E-07
Bi-212	9.77E-07
Po-212	0.00E+00
Tl-208	6.75E-06
U-235	4.91E-06
Th-231	1.55E-07
Pa-231	2.58E-10
Ac-227	8.64E-13
Th-227	4.13E-10
Fr-223	3.89E-12
Ra-223	4.61E-10
Rn-219	2.00E-10
At-219	0.00E+00
Bi-215	8.99E-16
Po-215	6.10E-13
Pb-211	3.92E-10
Bi-211	1.62E-10
Tl-207	2.03E-10
Po-211	7.78E-14
TOTAL	4.22E-04

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SUMMARY
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CANCER RISK SUMMARY

	Selected Individual
	Total Lifetime
Cancer	Fatal Cancer Risk

PATHWAY RISK SUMMARY

	Selected Individual
	Total Lifetime
Pathway	Fatal Cancer Risk
INGESTION	2.99E-11
INHALATION	7.02E-11
AIR IMMERSION	3.69E-17
GROUND SURFACE	6.82E-11
INTERNAL	1.00E-10
EXTERNAL	6.82E-11
TOTAL	1.68E-10

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	1.18E-11
Th-234	5.12E-13
Pa-234m	2.37E-12
Pa-234	1.45E-13
U-234	1.48E-11
Th-230	1.96E-11
Ra-226	3.56E-11
Rn-222	1.30E-14
Po-218	1.91E-19
Pb-214	8.34E-12
At-218	1.98E-19
Bi-214	4.81E-11
Rn-218	5.08E-21
Po-214	2.77E-15
Tl-210	1.90E-14
Pb-210	3.44E-14
Bi-210	1.37E-13
Hg-206	4.44E-20
Po-210	1.76E-16
Tl-206	3.26E-19
Th-232	5.07E-12
Ra-228	1.39E-15
Ac-228	2.78E-12
Th-228	1.26E-11
Ra-224	3.38E-14
Rn-220	2.09E-15
Po-216	5.06E-17
Pb-212	4.56E-13
Bi-212	3.77E-13
Po-212	0.00E+00
Tl-208	3.67E-12
U-235	1.89E-12
Th-231	7.10E-14
Pa-231	1.34E-16
Ac-227	3.23E-19
Th-227	2.24E-16
Fr-223	1.45E-18
Ra-223	2.49E-16
Rn-219	1.09E-16
At-219	0.00E+00
Bi-215	4.01E-22
Po-215	3.35E-19
Pb-211	1.40E-16
Bi-211	8.83E-17
Tl-207	2.61E-17
Po-211	4.26E-20
TOTAL	1.68E-10

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

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	3.0E-04	1.2E-04	9.5E-05	7.1E-05	6.0E-05	4.7E-05	2.5E-05
NNW	2.4E-04	9.6E-05	7.0E-05	4.8E-05	3.8E-05	2.7E-05	1.1E-05
NW	2.4E-04	8.4E-05	6.3E-05	4.7E-05	3.9E-05	3.0E-05	1.6E-05
WNW	2.6E-04	1.3E-04	9.6E-05	6.8E-05	5.5E-05	4.2E-05	1.9E-05
W	2.8E-04	1.4E-04	1.1E-04	8.2E-05	6.9E-05	5.6E-05	3.0E-05
WSW	2.8E-04	1.4E-04	1.0E-04	7.2E-05	5.9E-05	4.4E-05	1.9E-05
SW	2.6E-04	1.0E-04	7.7E-05	5.7E-05	4.8E-05	3.8E-05	1.9E-05
SSW	2.3E-04	1.0E-04	7.6E-05	5.4E-05	4.3E-05	3.2E-05	1.4E-05
S	2.5E-04	1.0E-04	7.9E-05	5.9E-05	4.9E-05	3.9E-05	2.1E-05
SSE	2.8E-04	1.3E-04	9.9E-05	7.0E-05	5.6E-05	4.2E-05	1.9E-05
SSE	3.2E-04	1.5E-04	1.1E-04	8.2E-05	6.8E-05	5.3E-05	2.7E-05
ESE	3.6E-04	1.7E-04	1.3E-04	9.0E-05	7.3E-05	5.5E-05	2.5E-05
E	4.0E-04	1.7E-04	1.3E-04	9.4E-05	7.8E-05	6.0E-05	2.9E-05
ENE	4.2E-04	2.0E-04	1.5E-04	1.1E-04	8.6E-05	6.4E-05	2.8E-05
NE	4.2E-04	2.0E-04	1.5E-04	1.1E-04	9.6E-05	7.6E-05	3.9E-05
NNE	3.7E-04	1.9E-04	1.4E-04	1.0E-04	8.1E-05	6.1E-05	2.7E-05

Distance (m)	
Direction	2629
N	2.3E-05
NNW	1.0E-05
NW	1.5E-05
WNW	1.8E-05
W	2.8E-05
WSW	1.8E-05
SW	1.8E-05
SSW	1.4E-05
S	1.9E-05
SSE	1.8E-05
SSE	2.5E-05
ESE	2.3E-05
E	2.7E-05
ENE	2.6E-05
NE	3.6E-05
NNE	2.5E-05

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SUMMARY
Page 6INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

Distance (m)							
Direction	533	783	914	1105	1250	1486	2499
N	1.2E-10	5.1E-11	3.9E-11	3.0E-11	2.5E-11	2.1E-11	1.2E-11
NNW	9.6E-11	4.0E-11	2.9E-11	2.1E-11	1.7E-11	1.2E-11	6.0E-12
NW	9.6E-11	3.5E-11	2.7E-11	2.0E-11	1.7E-11	1.4E-11	8.0E-12
WNW	1.0E-10	5.3E-11	4.0E-11	2.9E-11	2.4E-11	1.8E-11	9.2E-12
W	1.1E-10	5.7E-11	4.5E-11	3.4E-11	2.9E-11	2.4E-11	1.4E-11
WSW	1.1E-10	5.7E-11	4.2E-11	3.0E-11	2.5E-11	1.9E-11	9.4E-12
SW	1.0E-10	4.2E-11	3.2E-11	2.4E-11	2.1E-11	1.7E-11	9.4E-12
SSW	9.4E-11	4.3E-11	3.2E-11	2.3E-11	1.9E-11	1.4E-11	7.4E-12
S	1.0E-10	4.3E-11	3.3E-11	2.5E-11	2.1E-11	1.7E-11	9.9E-12
SSE	1.1E-10	5.5E-11	4.1E-11	2.9E-11	2.4E-11	1.8E-11	9.2E-12
SSE	1.3E-10	5.9E-11	4.6E-11	3.4E-11	2.9E-11	2.3E-11	1.3E-11
ESE	1.4E-10	6.9E-11	5.2E-11	3.7E-11	3.1E-11	2.4E-11	1.2E-11
E	1.6E-10	7.0E-11	5.3E-11	3.9E-11	3.3E-11	2.6E-11	1.3E-11
ENE	1.7E-10	8.2E-11	6.1E-11	4.4E-11	3.6E-11	2.7E-11	1.3E-11
NE	1.7E-10	8.1E-11	6.2E-11	4.7E-11	4.0E-11	3.2E-11	1.7E-11
NNE	1.5E-10	7.7E-11	5.8E-11	4.1E-11	3.4E-11	2.6E-11	1.2E-11

Distance (m)	
Direction	2629
N	1.1E-11
NNW	5.8E-12
NW	7.6E-12
WNW	8.7E-12
W	1.3E-11
WSW	8.9E-12
SW	9.0E-12
SSW	7.1E-12
S	9.4E-12
SSE	8.7E-12
SSE	1.2E-11
ESE	1.1E-11
E	1.3E-11
ENE	1.2E-11
NE	1.6E-11
NNE	1.2E-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 May 31 10:30:55 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: Infant

Comments: NFSS Technical Memo 2015 Year
Population Dose

Dataset Name: NFSS2015Pop.
Dataset Date: May 31, 2016 10:30 AM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd
Pop File: C:\Users\h5tdentm\Documents\CAP88\Population Files\NFSS2013.POP

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	7.32E-05	7.03E-04
UB_Wall	7.97E-05	7.53E-04
Bone_Sur	4.05E-03	6.47E-02
Brain	7.67E-05	7.30E-04
Breasts	8.30E-05	7.79E-04
St_Wall	7.80E-05	7.46E-04
SI_Wall	7.80E-05	7.51E-04
ULI_Wall	8.86E-05	9.24E-04
LLI_Wall	1.17E-04	1.40E-03
Kidneys	2.02E-04	2.46E-03
Liver	1.81E-04	2.35E-03
Muscle	8.53E-05	7.96E-04
Ovaries	8.68E-05	8.52E-04
Pancreas	7.36E-05	7.06E-04
R_Marrow	5.40E-04	8.28E-03
Skin	1.05E-03	8.24E-03
Spleen	8.04E-05	7.86E-04
Testes	9.85E-05	9.50E-04
Thymus	7.68E-05	7.31E-04
Thyroid	7.97E-05	7.53E-04
GB_Wall	7.41E-05	7.10E-04
Ht_Wall	7.66E-05	7.29E-04
Uterus	7.60E-05	7.24E-04
ET_Reg	6.27E-04	3.27E-03
Lung_66	9.36E-04	4.73E-03
Effectiv	2.99E-04	3.02E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	1.11E-04	1.92E-03
INHALATION	1.14E-04	5.29E-04
AIR IMMERSION	3.56E-11	5.47E-10
GROUND SURFACE	7.36E-05	5.69E-04
INTERNAL	2.25E-04	2.45E-03
EXTERNAL	7.36E-05	5.69E-04
TOTAL	2.99E-04	3.02E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	2.45E-05	1.69E-04
Th-234	5.24E-07	4.07E-06
Pa-234m	7.16E-06	5.54E-05
Pa-234	1.41E-07	1.09E-06
U-234	2.75E-05	1.87E-04
Th-230	4.90E-05	4.08E-04
Ra-226	9.14E-05	1.47E-03
Rn-222	1.26E-08	9.77E-08
Po-218	2.26E-13	1.75E-12
Pb-214	8.25E-06	6.38E-05
At-218	8.49E-13	6.56E-12
Bi-214	4.82E-05	3.73E-04
Rn-218	4.92E-15	3.80E-14
Po-214	2.67E-09	2.07E-08
Tl-210	1.88E-08	1.46E-07
Pb-210	4.06E-08	3.15E-07
Bi-210	6.57E-07	5.08E-06
Hg-206	5.30E-14	4.10E-13
Po-210	1.70E-10	1.32E-09
Tl-206	1.53E-12	1.19E-11
Th-232	9.29E-06	7.26E-05
Ra-228	2.47E-09	6.27E-08
Ac-228	2.77E-06	2.14E-05
Th-228	2.15E-05	1.25E-04
Ra-224	3.33E-08	5.72E-07
Rn-220	2.02E-09	1.56E-08
Po-216	4.87E-11	3.77E-10
Pb-212	4.44E-07	3.43E-06
Bi-212	5.18E-07	4.00E-06
Po-212	0.00E+00	0.00E+00
Tl-208	3.58E-06	2.76E-05
U-235	3.01E-06	2.14E-05
Th-231	8.23E-08	6.37E-07
Pa-231	1.36E-10	1.06E-09
Ac-227	4.58E-13	3.54E-12
Th-227	2.19E-10	1.69E-09
Fr-223	2.06E-12	1.59E-11
Ra-223	2.44E-10	1.89E-09
Rn-219	1.06E-10	8.18E-10
At-219	0.00E+00	0.00E+00
Bi-215	4.76E-16	3.68E-15
Po-215	3.23E-13	2.50E-12
Pb-211	2.08E-10	1.61E-09
Bi-211	8.56E-11	6.62E-10
Tl-207	1.08E-10	8.32E-10
Po-211	4.12E-14	3.19E-13

TOTAL	2.99E-04	3.02E-03
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	6.37E-13	6.54E-11
Stomach	2.47E-12	2.52E-10
Colon	6.61E-12	7.05E-10
Liver	1.02E-12	1.15E-10
LUNG	9.35E-12	8.26E-10
Bone	4.62E-13	9.31E-11
Skin	1.03E-12	1.03E-10
Breast	3.20E-12	3.24E-10
Ovary	8.53E-13	8.75E-11
Bladder	1.54E-12	1.58E-10
Kidneys	3.67E-13	4.24E-11
Thyroid	2.02E-13	2.06E-11
Leukemia	3.70E-12	3.81E-10
Residual	9.40E-12	1.00E-09
Total	4.09E-11	4.17E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	1.62E-12	3.71E-10
INHALATION	3.13E-12	1.88E-10
AIR IMMERSION	1.89E-17	3.83E-15
GROUND SURFACE	3.61E-11	3.62E-09
INTERNAL	4.75E-12	5.59E-10
EXTERNAL	3.61E-11	3.62E-09
TOTAL	4.09E-11	4.17E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	7.03E-13	6.68E-11
Th-234	2.71E-13	2.72E-11
Pa-234m	1.25E-12	1.26E-10
Pa-234	7.68E-14	7.68E-12
U-234	7.95E-13	7.38E-11
Th-230	8.87E-13	6.30E-11
Ra-226	1.68E-12	3.15E-10
Rn-222	6.90E-15	6.90E-13
Po-218	1.01E-19	1.01E-17
Pb-214	4.41E-12	4.42E-10
At-218	1.05E-19	1.05E-17
Bi-214	2.55E-11	2.55E-09
Rn-218	2.69E-21	2.69E-19
Po-214	1.47E-15	1.47E-13
Tl-210	1.01E-14	1.01E-12
Pb-210	1.82E-14	1.82E-12
Bi-210	7.28E-14	7.29E-12
Hg-206	2.35E-20	2.35E-18
Po-210	9.34E-17	9.35E-15
Tl-206	1.72E-19	1.73E-17
Th-232	1.87E-13	1.28E-11
Ra-228	7.36E-16	7.76E-14
Ac-228	1.47E-12	1.47E-10
Th-228	5.93E-13	3.73E-11
Ra-224	1.77E-14	1.87E-12
Rn-220	1.11E-15	1.11E-13
Po-216	2.68E-17	2.68E-15
Pb-212	2.41E-13	2.42E-11
Bi-212	2.00E-13	2.00E-11
Po-212	0.00E+00	0.00E+00
Tl-208	1.94E-12	1.95E-10
U-235	5.00E-13	4.97E-11
Th-231	3.76E-14	3.76E-12
Pa-231	7.12E-17	7.13E-15
Ac-227	1.71E-19	1.71E-17
Th-227	1.18E-16	1.19E-14
Fr-223	7.68E-19	7.69E-17
Ra-223	1.32E-16	1.32E-14
Rn-219	5.79E-17	5.80E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.13E-22	2.13E-20
Po-215	1.77E-19	1.77E-17
Pb-211	7.43E-17	7.44E-15
Bi-211	4.68E-17	4.68E-15
Tl-207	1.38E-17	1.39E-15
Po-211	2.26E-20	2.26E-18

TOTAL

4.09E-11

4.17E-09

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SUMMARY
Page 5INDIVIDUAL COMMITTED EFFECTIVE DOSE EQUIVALENT (mrem)
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.8E-04	5.9E-05	2.8E-05	1.7E-05	1.2E-05	5.7E-06	
NNW	0.0E+00	1.4E-04	3.0E-05	8.8E-06	5.3E-06	3.7E-06	1.9E-06	
NW	0.0E+00	1.2E-04	3.5E-05	1.6E-05	9.5E-06	6.6E-06	3.2E-06	
WNW	0.0E+00	1.9E-04	5.0E-05	2.0E-05	1.2E-05	8.2E-06	3.9E-06	
W	0.0E+00	2.0E-04	7.0E-05	3.5E-05	2.1E-05	1.5E-05	6.9E-06	
WSW	0.0E+00	2.0E-04	5.3E-05	2.1E-05	1.2E-05	8.6E-06	4.2E-06	
SW	0.0E+00	1.4E-04	4.5E-05	2.1E-05	1.2E-05	8.7E-06	4.2E-06	
SSW	0.0E+00	1.5E-04	3.8E-05	1.4E-05	0.0E+00	5.8E-06	2.8E-06	
S	0.0E+00	1.5E-04	4.7E-05	2.2E-05	1.3E-05	9.4E-06	4.5E-06	
SSE	0.0E+00	1.9E-04	5.1E-05	2.0E-05	1.2E-05	8.3E-06	4.1E-06	
SSE	0.0E+00	2.1E-04	6.7E-05	3.2E-05	1.9E-05	1.3E-05	6.4E-06	
ESE	0.0E+00	2.5E-04	6.9E-05	2.9E-05	1.7E-05	1.2E-05	5.8E-06	
E	0.0E+00	2.5E-04	7.6E-05	3.4E-05	2.1E-05	1.4E-05	7.0E-06	
ENE	0.0E+00	3.0E-04	8.1E-05	3.2E-05	1.9E-05	1.4E-05	6.6E-06	
NE	0.0E+00	2.9E-04	9.7E-05	0.0E+00	2.9E-05	2.0E-05	9.6E-06	
NNE	0.0E+00	2.8E-04	7.7E-05	0.0E+00	1.9E-05	1.3E-05	6.3E-06	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.7E-07	3.2E-07	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.4E-07	2.2E-07	2.0E-07	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-07	2.6E-07	2.4E-07	
WNW	1.6E-06	0.0E+00	0.0E+00	0.0E+00	3.4E-07	2.7E-07	2.5E-07	
W	2.7E-06	1.4E-06	9.0E-07	6.6E-07	5.0E-07	3.9E-07	3.3E-07	
WSW	1.7E-06	8.7E-07	6.0E-07	4.6E-07	3.7E-07	3.0E-07	2.7E-07	
SW	1.7E-06	8.9E-07	6.1E-07	4.7E-07	3.7E-07	3.1E-07	0.0E+00	
SSW	1.2E-06	6.4E-07	4.6E-07	3.6E-07	0.0E+00	0.0E+00	2.3E-07	
S	1.8E-06	9.5E-07	6.5E-07	4.9E-07	3.9E-07	3.2E-07	2.8E-07	
SSE	1.7E-06	8.7E-07	6.0E-07	4.6E-07	3.7E-07	3.1E-07	2.8E-07	
SSE	2.6E-06	1.3E-06	8.7E-07	6.5E-07	5.0E-07	4.0E-07	3.5E-07	
ESE	2.3E-06	1.2E-06	8.1E-07	6.1E-07	4.8E-07	3.9E-07	3.4E-07	
E	2.8E-06	1.4E-06	9.5E-07	7.0E-07	5.4E-07	4.3E-07	3.8E-07	
ENE	2.7E-06	1.4E-06	9.2E-07	6.9E-07	5.4E-07	4.3E-07	3.7E-07	
NE	3.8E-06	1.9E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	2.5E-06	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.6E-07	

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SUMMARY
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COLLECTIVE COMMITTED EFFECTIVE DOSE EQUIVALENT (person rem)
(All Radionuclides and Pathways)

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	5.4E-07	4.7E-07	4.5E-07	3.4E-08	1.2E-06	1.0E-06
NNW	0.0E+00	4.2E-07	2.4E-07	6.8E-07	1.0E-07	3.4E-07	3.8E-07
NW	0.0E+00	3.5E-07	2.8E-07	1.7E-06	7.3E-07	6.8E-07	6.8E-06
WNW	0.0E+00	5.6E-07	4.0E-07	6.6E-06	4.2E-06	4.3E-07	2.4E-05
W	0.0E+00	6.0E-07	5.6E-07	3.2E-05	4.2E-06	5.8E-08	2.2E-06
WSW	0.0E+00	6.1E-07	4.3E-07	1.6E-07	1.5E-06	1.4E-06	2.6E-06
SW	0.0E+00	4.3E-07	3.6E-07	4.6E-07	3.5E-06	3.3E-06	2.5E-05
SSW	0.0E+00	4.5E-07	3.0E-07	3.3E-07	0.0E+00	2.5E-07	1.7E-05
S	0.0E+00	4.4E-07	3.8E-07	1.8E-06	1.1E-06	2.0E-06	8.5E-06
SSE	0.0E+00	5.8E-07	4.1E-07	1.2E-06	8.8E-07	6.2E-07	5.9E-06
SSE	0.0E+00	6.3E-07	5.4E-07	1.4E-06	1.2E-06	6.9E-07	4.3E-06
ESE	0.0E+00	7.4E-07	5.5E-07	1.1E-07	5.0E-07	1.9E-06	2.9E-06
E	0.0E+00	7.5E-07	6.1E-07	4.1E-07	6.4E-07	8.8E-07	3.8E-06
ENE	0.0E+00	9.0E-07	6.5E-07	3.6E-07	1.4E-07	8.4E-07	8.0E-06
NE	0.0E+00	8.7E-07	7.8E-07	0.0E+00	4.6E-07	2.0E-06	2.1E-06
NNE	0.0E+00	8.4E-07	6.1E-07	0.0E+00	7.5E-08	9.1E-07	1.7E-06

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

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	2.4E-11	8.2E-12	4.0E-12	2.4E-12	1.7E-12	8.2E-13
NNW	0.0E+00	1.9E-11	4.2E-12	1.2E-12	7.5E-13	5.3E-13	2.6E-13
NW	0.0E+00	1.6E-11	4.9E-12	2.3E-12	1.4E-12	9.5E-13	4.6E-13
WNW	0.0E+00	2.6E-11	7.0E-12	2.8E-12	1.7E-12	1.2E-12	5.6E-13
W	0.0E+00	2.7E-11	9.7E-12	5.0E-12	3.0E-12	2.1E-12	1.0E-12
WSW	0.0E+00	2.8E-11	7.4E-12	2.9E-12	1.8E-12	1.2E-12	6.0E-13
SW	0.0E+00	2.0E-11	6.3E-12	3.0E-12	1.8E-12	1.3E-12	6.1E-13
SSW	0.0E+00	2.1E-11	5.3E-12	2.0E-12	0.0E+00	8.3E-13	4.0E-13
S	0.0E+00	2.0E-11	6.6E-12	3.2E-12	1.9E-12	1.4E-12	6.6E-13
SSE	0.0E+00	2.7E-11	7.2E-12	2.8E-12	1.7E-12	1.2E-12	5.9E-13
SSE	0.0E+00	2.9E-11	9.4E-12	4.5E-12	2.7E-12	1.9E-12	9.4E-13
ESE	0.0E+00	3.4E-11	9.7E-12	4.1E-12	2.5E-12	1.7E-12	8.5E-13
E	0.0E+00	3.4E-11	1.1E-11	4.9E-12	3.0E-12	2.1E-12	1.0E-12
ENE	0.0E+00	4.1E-11	1.1E-11	4.6E-12	2.8E-12	2.0E-12	9.7E-13
NE	0.0E+00	4.0E-11	1.4E-11	0.0E+00	4.1E-12	2.9E-12	1.4E-12
NNE	0.0E+00	3.8E-11	1.1E-11	0.0E+00	2.7E-12	1.9E-12	9.2E-13

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SUMMARY
Page 8COLLECTIVE FATAL CANCER RISK Per Year
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	9.5E-13	8.5E-13	8.3E-13	6.2E-14	2.2E-12	1.9E-12	
NNW	0.0E+00	7.4E-13	4.4E-13	1.2E-12	1.9E-13	6.2E-13	6.9E-13	
NW	0.0E+00	6.3E-13	5.1E-13	3.2E-12	1.4E-12	1.3E-12	1.3E-11	
WNW	0.0E+00	1.0E-12	7.3E-13	1.2E-11	7.7E-12	7.9E-13	4.5E-11	
W	0.0E+00	1.1E-12	1.0E-12	5.8E-11	7.9E-12	1.1E-13	4.1E-12	
WSW	0.0E+00	1.1E-12	7.7E-13	3.0E-13	2.8E-12	2.7E-12	4.8E-12	
SW	0.0E+00	7.7E-13	6.5E-13	8.4E-13	6.4E-12	6.1E-12	4.6E-11	
SSW	0.0E+00	8.0E-13	5.5E-13	6.1E-13	0.0E+00	4.6E-13	3.2E-11	
S	0.0E+00	7.8E-13	6.9E-13	3.3E-12	2.0E-12	3.8E-12	1.6E-11	
SSE	0.0E+00	1.0E-12	7.5E-13	2.2E-12	1.7E-12	1.2E-12	1.1E-11	
SSE	0.0E+00	1.1E-12	9.8E-13	2.6E-12	2.2E-12	1.3E-12	8.2E-12	
ESE	0.0E+00	1.3E-12	1.0E-12	2.1E-13	9.3E-13	3.6E-12	5.4E-12	
E	0.0E+00	1.3E-12	1.1E-12	7.6E-13	1.2E-12	1.6E-12	7.2E-12	
ENE	0.0E+00	1.6E-12	1.2E-12	6.6E-13	2.5E-13	1.6E-12	1.5E-11	
NE	0.0E+00	1.5E-12	1.4E-12	0.0E+00	8.5E-13	3.8E-12	3.9E-12	
NNE	0.0E+00	1.5E-12	1.1E-12	0.0E+00	1.4E-13	1.7E-12	3.2E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.6E-11	1.5E-10	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.8E-11	1.9E-10	9.9E-11	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.2E-11	2.4E-10	1.5E-10	
WNW	2.6E-12	0.0E+00	0.0E+00	0.0E+00	1.6E-12	1.1E-10	2.3E-11	
W	1.6E-10	1.2E-10	1.1E-11	3.7E-11	1.8E-11	9.5E-11	1.2E-10	
WSW	7.0E-11	7.4E-11	5.2E-12	5.7E-12	2.8E-12	2.9E-12	8.9E-13	
SW	1.5E-10	1.7E-11	6.5E-11	5.4E-12	7.2E-13	2.1E-13	0.0E+00	
SSW	1.3E-10	3.6E-12	2.7E-12	6.5E-12	0.0E+00	0.0E+00	6.7E-13	
S	9.2E-11	2.0E-11	3.2E-11	2.0E-14	1.2E-11	7.4E-12	2.6E-12	
SSE	6.4E-11	2.0E-10	3.3E-10	9.9E-11	3.7E-11	4.7E-12	1.9E-12	
SSE	5.2E-11	1.1E-10	1.3E-10	4.8E-11	1.1E-11	3.5E-12	4.8E-12	
ESE	1.1E-11	7.7E-11	4.9E-12	6.6E-12	4.8E-12	1.2E-11	6.0E-12	
E	7.9E-12	2.6E-11	7.7E-12	1.6E-11	2.8E-12	9.1E-12	5.2E-12	
ENE	6.7E-12	1.6E-11	4.7E-12	2.8E-12	8.9E-13	5.6E-13	2.8E-13	
NE	1.8E-11	6.1E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	2.3E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.7E-12	

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 May 31 10:33:25 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: One

Comments: NFSS Technical Memo 2015 Year
Population Dose

Dataset Name: NFSS2015Pop.
Dataset Date: May 31, 2016 10:33 AM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd
Pop File: C:\Users\h5tdentm\Documents\CAP88\Population Files\NFSS2013.POP

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	6.45E-05	5.49E-04
UB_Wall	7.11E-05	6.00E-04
Bone_Sur	1.21E-03	1.46E-02
Brain	6.80E-05	5.76E-04
Breasts	7.44E-05	6.26E-04
St_Wall	6.91E-05	5.89E-04
SI_Wall	6.92E-05	5.95E-04
ULI_Wall	7.76E-05	7.27E-04
LLI_Wall	1.00E-04	1.09E-03
Kidneys	1.33E-04	1.27E-03
Liver	1.16E-04	1.22E-03
Muscle	7.67E-05	6.43E-04
Ovaries	7.24E-05	6.04E-04
Pancreas	6.50E-05	5.53E-04
R_Marrow	1.72E-04	1.91E-03
Skin	1.04E-03	8.09E-03
Spleen	6.98E-05	5.96E-04
Testes	8.28E-05	6.85E-04
Thymus	6.83E-05	5.78E-04
Thyroid	7.12E-05	6.00E-04
GB_Wall	6.55E-05	5.57E-04
Ht_Wall	6.80E-05	5.76E-04
Uterus	6.74E-05	5.72E-04
ET_Reg	6.56E-04	3.29E-03
Lung_66	1.04E-03	5.09E-03
Effectiv	2.27E-04	1.59E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	2.49E-05	4.28E-04
INHALATION	1.29E-04	5.96E-04
AIR IMMERSION	3.56E-11	5.47E-10
GROUND SURFACE	7.36E-05	5.69E-04
INTERNAL	1.53E-04	1.02E-03
EXTERNAL	7.36E-05	5.69E-04
TOTAL	2.27E-04	1.59E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	2.29E-05	1.29E-04
Th-234	5.24E-07	4.07E-06
Pa-234m	7.16E-06	5.54E-05
Pa-234	1.41E-07	1.09E-06
U-234	2.61E-05	1.45E-04
Th-230	3.97E-05	2.05E-04
Ra-226	3.18E-05	3.85E-04
Rn-222	1.26E-08	9.77E-08
Po-218	2.26E-13	1.75E-12
Pb-214	8.25E-06	6.38E-05
At-218	8.49E-13	6.56E-12
Bi-214	4.82E-05	3.73E-04
Rn-218	4.92E-15	3.80E-14
Po-214	2.67E-09	2.07E-08
Tl-210	1.88E-08	1.46E-07
Pb-210	4.06E-08	3.14E-07
Bi-210	6.57E-07	5.08E-06
Hg-206	5.30E-14	4.10E-13
Po-210	1.70E-10	1.32E-09
Tl-206	1.53E-12	1.19E-11
Th-232	8.63E-06	4.34E-05
Ra-228	2.43E-09	2.86E-08
Ac-228	2.77E-06	2.14E-05
Th-228	2.24E-05	1.07E-04
Ra-224	3.33E-08	5.34E-07
Rn-220	2.02E-09	1.56E-08
Po-216	4.87E-11	3.77E-10
Pb-212	4.44E-07	3.43E-06
Bi-212	5.18E-07	4.00E-06
Po-212	0.00E+00	0.00E+00
Tl-208	3.58E-06	2.76E-05
U-235	2.87E-06	1.78E-05
Th-231	8.23E-08	6.37E-07
Pa-231	1.36E-10	1.05E-09
Ac-227	4.58E-13	3.54E-12
Th-227	2.19E-10	1.69E-09
Fr-223	2.06E-12	1.59E-11
Ra-223	2.44E-10	1.89E-09
Rn-219	1.06E-10	8.18E-10
At-219	0.00E+00	0.00E+00
Bi-215	4.76E-16	3.68E-15
Po-215	3.23E-13	2.50E-12
Pb-211	2.08E-10	1.61E-09
Bi-211	8.56E-11	6.62E-10
Tl-207	1.08E-10	8.32E-10
Po-211	4.12E-14	3.19E-13

TOTAL	2.27E-04	1.59E-03
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	6.43E-13	6.66E-11
Stomach	2.49E-12	2.57E-10
Colon	6.84E-12	7.56E-10
Liver	1.06E-12	1.24E-10
LUNG	1.04E-11	8.97E-10
Bone	6.34E-13	1.30E-10
Skin	1.03E-12	1.03E-10
Breast	3.22E-12	3.26E-10
Ovary	8.61E-13	8.92E-11
Bladder	1.56E-12	1.61E-10
Kidneys	3.85E-13	4.59E-11
Thyroid	2.04E-13	2.10E-11
Leukemia	3.73E-12	3.88E-10
Residual	9.64E-12	1.05E-09
Total	4.27E-11	4.42E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	2.46E-12	5.53E-10
INHALATION	4.14E-12	2.49E-10
AIR IMMERSION	1.89E-17	3.83E-15
GROUND SURFACE	3.61E-11	3.62E-09
INTERNAL	6.60E-12	8.01E-10
EXTERNAL	3.61E-11	3.62E-09
TOTAL	4.27E-11	4.42E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	9.58E-13	9.39E-11
Th-234	2.71E-13	2.72E-11
Pa-234m	1.25E-12	1.26E-10
Pa-234	7.68E-14	7.68E-12
U-234	1.08E-12	1.04E-10
Th-230	1.19E-12	8.59E-11
Ra-226	2.41E-12	4.58E-10
Rn-222	6.90E-15	6.90E-13
Po-218	1.01E-19	1.01E-17
Pb-214	4.41E-12	4.42E-10
At-218	1.05E-19	1.05E-17
Bi-214	2.55E-11	2.55E-09
Rn-218	2.69E-21	2.69E-19
Po-214	1.47E-15	1.47E-13
Tl-210	1.01E-14	1.01E-12
Pb-210	1.82E-14	1.82E-12
Bi-210	7.28E-14	7.29E-12
Hg-206	2.35E-20	2.35E-18
Po-210	9.34E-17	9.35E-15
Tl-206	1.72E-19	1.73E-17
Th-232	2.49E-13	1.74E-11
Ra-228	7.36E-16	7.96E-14
Ac-228	1.47E-12	1.47E-10
Th-228	7.86E-13	4.98E-11
Ra-224	1.77E-14	1.90E-12
Rn-220	1.11E-15	1.11E-13
Po-216	2.68E-17	2.68E-15
Pb-212	2.41E-13	2.42E-11
Bi-212	2.00E-13	2.00E-11
Po-212	0.00E+00	0.00E+00
Tl-208	1.94E-12	1.95E-10
U-235	5.23E-13	5.22E-11
Th-231	3.76E-14	3.76E-12
Pa-231	7.12E-17	7.13E-15
Ac-227	1.71E-19	1.71E-17
Th-227	1.18E-16	1.19E-14
Fr-223	7.68E-19	7.69E-17
Ra-223	1.32E-16	1.32E-14
Rn-219	5.79E-17	5.80E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.13E-22	2.13E-20
Po-215	1.77E-19	1.77E-17
Pb-211	7.43E-17	7.44E-15
Bi-211	4.68E-17	4.68E-15
Tl-207	1.38E-17	1.39E-15
Po-211	2.26E-20	2.26E-18

TOTAL

4.27E-11

4.42E-09

Tue May 31 10:33:25 2016

SUMMARY

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

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.4E-04	4.4E-05	2.1E-05	1.2E-05	8.5E-06	4.0E-06
NNW	0.0E+00	1.1E-04	2.3E-05	6.5E-06	3.8E-06	2.6E-06	1.3E-06
NW	0.0E+00	9.0E-05	2.6E-05	1.2E-05	6.8E-06	4.7E-06	2.2E-06
WNW	0.0E+00	1.4E-04	3.8E-05	1.5E-05	8.7E-06	6.0E-06	2.8E-06
W	0.0E+00	1.5E-04	5.2E-05	2.6E-05	1.5E-05	1.1E-05	4.9E-06
WSW	0.0E+00	1.5E-04	4.0E-05	1.5E-05	9.0E-06	6.2E-06	2.9E-06
SW	0.0E+00	1.1E-04	3.4E-05	1.5E-05	9.1E-06	6.3E-06	3.0E-06
SSW	0.0E+00	1.1E-04	2.8E-05	1.0E-05	0.0E+00	4.1E-06	2.0E-06
S	0.0E+00	1.1E-04	3.5E-05	1.7E-05	9.8E-06	6.7E-06	3.2E-06
SSE	0.0E+00	1.5E-04	3.8E-05	1.5E-05	8.7E-06	6.0E-06	2.8E-06
SSE	0.0E+00	1.6E-04	5.0E-05	2.3E-05	1.4E-05	9.5E-06	4.5E-06
ESE	0.0E+00	1.9E-04	5.2E-05	2.1E-05	1.3E-05	8.7E-06	4.1E-06
E	0.0E+00	1.9E-04	5.7E-05	2.5E-05	1.5E-05	1.0E-05	4.9E-06
ENE	0.0E+00	2.3E-04	6.1E-05	2.4E-05	1.4E-05	9.8E-06	4.7E-06
NE	0.0E+00	2.2E-04	7.3E-05	0.0E+00	2.1E-05	1.4E-05	6.8E-06
NNE	0.0E+00	2.1E-04	5.8E-05	0.0E+00	1.4E-05	9.4E-06	4.5E-06

Tue May 31 10:33:25 2016

SUMMARY

COLLECTIVE COMMITTED EFFECTIVE DOSE EQUIVALENT (person rem)
(All Radionuclides and Pathways)

	Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500	
N	0.0E+00	4.1E-07	3.5E-07	3.3E-07	2.5E-08	8.7E-07	7.2E-07	
NNW	0.0E+00	3.2E-07	1.8E-07	5.0E-07	7.3E-08	2.4E-07	2.6E-07	
NW	0.0E+00	2.7E-07	2.1E-07	1.3E-06	5.3E-07	4.9E-07	4.7E-06	
WNW	0.0E+00	4.3E-07	3.0E-07	4.9E-06	3.0E-06	3.1E-07	1.7E-05	
W	0.0E+00	4.6E-07	4.2E-07	2.4E-05	3.1E-06	4.2E-08	1.5E-06	
WSW	0.0E+00	4.6E-07	3.2E-07	1.2E-07	1.1E-06	1.0E-06	1.8E-06	
SW	0.0E+00	3.3E-07	2.7E-07	3.4E-07	2.5E-06	2.4E-06	1.7E-05	
SSW	0.0E+00	3.4E-07	2.2E-07	2.4E-07	0.0E+00	1.8E-07	1.2E-05	
S	0.0E+00	3.4E-07	2.8E-07	1.3E-06	7.9E-07	1.4E-06	5.9E-06	
SSE	0.0E+00	4.4E-07	3.1E-07	8.9E-07	6.4E-07	4.4E-07	4.1E-06	
SSE	0.0E+00	4.8E-07	4.0E-07	1.0E-06	8.4E-07	4.9E-07	3.0E-06	
ESE	0.0E+00	5.6E-07	4.1E-07	8.5E-08	3.6E-07	1.4E-06	2.0E-06	
E	0.0E+00	5.7E-07	4.6E-07	3.0E-07	4.7E-07	6.3E-07	2.7E-06	
ENE	0.0E+00	6.8E-07	4.9E-07	2.6E-07	9.9E-08	6.1E-07	5.6E-06	
NE	0.0E+00	6.6E-07	5.8E-07	0.0E+00	3.3E-07	1.5E-06	1.5E-06	
NNE	0.0E+00	6.4E-07	4.6E-07	0.0E+00	5.5E-08	6.6E-07	1.2E-06	

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SUMMARY
Page 7INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	2.5E-11	8.5E-12	4.2E-12	2.5E-12	1.8E-12	8.5E-13	
NNW	0.0E+00	2.0E-11	4.4E-12	1.3E-12	7.9E-13	5.5E-13	2.7E-13	
NW	0.0E+00	1.7E-11	5.2E-12	2.3E-12	1.4E-12	9.9E-13	4.8E-13	
WNW	0.0E+00	2.7E-11	7.3E-12	2.9E-12	1.8E-12	1.2E-12	5.9E-13	
W	0.0E+00	2.9E-11	1.0E-11	5.2E-12	3.1E-12	2.2E-12	1.0E-12	
WSW	0.0E+00	2.9E-11	7.7E-12	3.0E-12	1.8E-12	1.3E-12	6.2E-13	
SW	0.0E+00	2.1E-11	6.6E-12	3.1E-12	1.9E-12	1.3E-12	6.3E-13	
SSW	0.0E+00	2.1E-11	5.5E-12	2.0E-12	0.0E+00	8.6E-13	4.2E-13	
S	0.0E+00	2.1E-11	6.9E-12	3.3E-12	2.0E-12	1.4E-12	6.9E-13	
SSE	0.0E+00	2.8E-11	7.5E-12	3.0E-12	1.8E-12	1.3E-12	6.1E-13	
SSE	0.0E+00	3.0E-11	9.8E-12	4.7E-12	2.9E-12	2.0E-12	9.8E-13	
ESE	0.0E+00	3.5E-11	1.0E-11	4.3E-12	2.6E-12	1.8E-12	8.8E-13	
E	0.0E+00	3.6E-11	1.1E-11	5.1E-12	3.1E-12	2.2E-12	1.1E-12	
ENE	0.0E+00	4.3E-11	1.2E-11	4.8E-12	2.9E-12	2.1E-12	1.0E-12	
NE	0.0E+00	4.2E-11	1.4E-11	0.0E+00	4.3E-12	3.0E-12	1.5E-12	
NNE	0.0E+00	4.0E-11	1.1E-11	0.0E+00	2.8E-12	2.0E-12	9.6E-13	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.9E-14	3.2E-14	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-14	1.5E-14	1.2E-14	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.0E-14	2.2E-14	1.8E-14	
WNW	2.3E-13	0.0E+00	0.0E+00	0.0E+00	3.4E-14	2.4E-14	1.9E-14	
W	4.1E-13	1.9E-13	1.2E-13	8.5E-14	6.0E-14	4.3E-14	3.4E-14	
WSW	2.5E-13	1.2E-13	7.7E-14	5.4E-14	3.9E-14	2.9E-14	2.3E-14	
SW	2.5E-13	1.2E-13	7.8E-14	5.5E-14	4.0E-14	3.0E-14	0.0E+00	
SSW	1.7E-13	8.3E-14	5.4E-14	3.8E-14	0.0E+00	0.0E+00	1.8E-14	
S	2.7E-13	1.3E-13	8.6E-14	6.0E-14	4.4E-14	3.2E-14	2.6E-14	
SSE	2.5E-13	1.2E-13	7.8E-14	5.6E-14	4.1E-14	3.1E-14	2.5E-14	
SSE	3.9E-13	1.9E-13	1.2E-13	8.6E-14	6.3E-14	4.7E-14	3.8E-14	
ESE	3.5E-13	1.7E-13	1.1E-13	7.9E-14	5.8E-14	4.3E-14	3.5E-14	
E	4.2E-13	2.1E-13	1.3E-13	9.4E-14	6.9E-14	5.1E-14	4.2E-14	
ENE	4.0E-13	2.0E-13	1.3E-13	9.2E-14	6.8E-14	5.1E-14	4.2E-14	
NE	5.9E-13	2.9E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	3.8E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.8E-14	

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SUMMARY
Page 8COLLECTIVE FATAL CANCER RISK Per Year
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	9.9E-13	8.8E-13	8.6E-13	6.5E-14	2.3E-12	2.0E-12	
NNW	0.0E+00	7.7E-13	4.6E-13	1.3E-12	1.9E-13	6.4E-13	7.2E-13	
NW	0.0E+00	6.5E-13	5.3E-13	3.3E-12	1.4E-12	1.3E-12	1.3E-11	
WNW	0.0E+00	1.0E-12	7.6E-13	1.3E-11	8.0E-12	8.3E-13	4.7E-11	
W	0.0E+00	1.1E-12	1.1E-12	6.1E-11	8.2E-12	1.1E-13	4.2E-12	
WSW	0.0E+00	1.1E-12	8.0E-13	3.2E-13	2.9E-12	2.8E-12	5.0E-12	
SW	0.0E+00	8.0E-13	6.8E-13	8.8E-13	6.7E-12	6.4E-12	4.8E-11	
SSW	0.0E+00	8.3E-13	5.7E-13	6.3E-13	0.0E+00	4.8E-13	3.3E-11	
S	0.0E+00	8.2E-13	7.2E-13	3.5E-12	2.1E-12	3.9E-12	1.7E-11	
SSE	0.0E+00	1.1E-12	7.8E-13	2.3E-12	1.7E-12	1.2E-12	1.2E-11	
SSE	0.0E+00	1.2E-12	1.0E-12	2.7E-12	2.3E-12	1.3E-12	8.6E-12	
ESE	0.0E+00	1.4E-12	1.0E-12	2.2E-13	9.7E-13	3.8E-12	5.6E-12	
E	0.0E+00	1.4E-12	1.2E-12	7.9E-13	1.2E-12	1.7E-12	7.4E-12	
ENE	0.0E+00	1.7E-12	1.2E-12	6.9E-13	2.6E-13	1.6E-12	1.6E-11	
NE	0.0E+00	1.6E-12	1.5E-12	0.0E+00	8.9E-13	4.0E-12	4.1E-12	
NNE	0.0E+00	1.6E-12	1.2E-12	0.0E+00	1.4E-13	1.8E-12	3.3E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.9E-11	1.6E-10	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-10	2.1E-10	1.1E-10	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.5E-11	2.6E-10	1.7E-10	
WNW	2.7E-12	0.0E+00	0.0E+00	0.0E+00	1.7E-12	1.2E-10	2.5E-11	
W	1.7E-10	1.3E-10	1.2E-11	3.9E-11	1.9E-11	1.0E-10	1.3E-10	
WSW	7.3E-11	7.7E-11	5.4E-12	6.0E-12	3.0E-12	3.1E-12	9.7E-13	
SW	1.5E-10	1.8E-11	6.8E-11	5.7E-12	7.6E-13	2.2E-13	0.0E+00	
SSW	1.3E-10	3.8E-12	2.8E-12	6.9E-12	0.0E+00	0.0E+00	7.4E-13	
S	9.6E-11	2.1E-11	3.3E-11	2.1E-14	1.3E-11	7.9E-12	2.8E-12	
SSE	6.7E-11	2.1E-10	3.4E-10	1.0E-10	3.9E-11	5.0E-12	2.0E-12	
SSE	5.4E-11	1.1E-10	1.3E-10	5.0E-11	1.2E-11	3.7E-12	5.1E-12	
ESE	1.1E-11	8.0E-11	5.1E-12	6.9E-12	5.0E-12	1.3E-11	6.4E-12	
E	8.2E-12	2.7E-11	8.0E-12	1.7E-11	2.9E-12	9.6E-12	5.5E-12	
ENE	7.0E-12	1.7E-11	4.9E-12	3.0E-12	9.4E-13	5.9E-13	3.0E-13	
NE	1.8E-11	6.4E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	2.4E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.2E-12	

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 May 31 10:32:25 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: Five

Comments: NFSS Technical Memo 2015 Year
Population Dose

Dataset Name: NFSS2015Pop.
Dataset Date: May 31, 2016 10:32 AM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd
Pop File: C:\Users\h5tdentm\Documents\CAP88\Population Files\NFSS2013.POP

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	6.31E-05	5.21E-04
UB_Wall	6.97E-05	5.72E-04
Bone_Sur	1.30E-03	1.38E-02
Brain	6.67E-05	5.49E-04
Breasts	7.31E-05	5.98E-04
St_Wall	6.76E-05	5.57E-04
SI_Wall	6.74E-05	5.59E-04
ULI_Wall	7.24E-05	6.34E-04
LLI_Wall	8.57E-05	8.41E-04
Kidneys	1.21E-04	1.06E-03
Liver	1.03E-04	9.72E-04
Muscle	7.53E-05	6.15E-04
Ovaries	7.27E-05	5.85E-04
Pancreas	6.36E-05	5.25E-04
R_Marrow	1.50E-04	1.49E-03
Skin	1.04E-03	8.06E-03
Spleen	6.84E-05	5.68E-04
Testes	8.26E-05	6.62E-04
Thymus	6.69E-05	5.50E-04
Thyroid	6.98E-05	5.72E-04
GB_Wall	6.42E-05	5.29E-04
Ht_Wall	6.66E-05	5.48E-04
Uterus	6.60E-05	5.43E-04
ET_Reg	4.10E-04	2.13E-03
Lung_66	9.63E-04	4.72E-03
Effectiv	2.14E-04	1.44E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	1.84E-05	3.11E-04
INHALATION	1.22E-04	5.65E-04
AIR IMMERSION	3.56E-11	5.47E-10
GROUND SURFACE	7.36E-05	5.69E-04
INTERNAL	1.40E-04	8.76E-04
EXTERNAL	7.36E-05	5.69E-04
TOTAL	2.14E-04	1.44E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	2.05E-05	1.11E-04
Th-234	5.24E-07	4.06E-06
Pa-234m	7.16E-06	5.54E-05
Pa-234	1.41E-07	1.09E-06
U-234	2.33E-05	1.25E-04
Th-230	4.00E-05	2.04E-04
Ra-226	2.54E-05	2.85E-04
Rn-222	1.26E-08	9.77E-08
Po-218	2.26E-13	1.75E-12
Pb-214	8.25E-06	6.38E-05
At-218	8.49E-13	6.56E-12
Bi-214	4.82E-05	3.73E-04
Rn-218	4.92E-15	3.80E-14
Po-214	2.67E-09	2.07E-08
Tl-210	1.88E-08	1.46E-07
Pb-210	4.06E-08	3.14E-07
Bi-210	6.57E-07	5.08E-06
Hg-206	5.30E-14	4.10E-13
Po-210	1.70E-10	1.32E-09
Tl-206	1.53E-12	1.19E-11
Th-232	9.28E-06	4.61E-05
Ra-228	2.43E-09	2.54E-08
Ac-228	2.77E-06	2.14E-05
Th-228	2.03E-05	9.59E-05
Ra-224	3.32E-08	5.00E-07
Rn-220	2.02E-09	1.56E-08
Po-216	4.87E-11	3.77E-10
Pb-212	4.44E-07	3.43E-06
Bi-212	5.18E-07	4.00E-06
Po-212	0.00E+00	0.00E+00
Tl-208	3.58E-06	2.76E-05
U-235	2.65E-06	1.62E-05
Th-231	8.23E-08	6.37E-07
Pa-231	1.36E-10	1.05E-09
Ac-227	4.58E-13	3.54E-12
Th-227	2.19E-10	1.69E-09
Fr-223	2.06E-12	1.59E-11
Ra-223	2.44E-10	1.89E-09
Rn-219	1.06E-10	8.18E-10
At-219	0.00E+00	0.00E+00
Bi-215	4.76E-16	3.68E-15
Po-215	3.23E-13	2.50E-12
Pb-211	2.08E-10	1.61E-09
Bi-211	8.56E-11	6.62E-10
Tl-207	1.08E-10	8.32E-10
Po-211	4.12E-14	3.19E-13

TOTAL	2.14E-04	1.44E-03
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	6.30E-13	6.33E-11
Stomach	2.44E-12	2.45E-10
Colon	6.38E-12	6.48E-10
Liver	9.69E-13	9.94E-11
LUNG	1.93E-11	1.41E-09
Bone	1.76E-13	1.76E-11
Skin	1.03E-12	1.03E-10
Breast	3.19E-12	3.20E-10
Ovary	8.48E-13	8.50E-11
Bladder	1.53E-12	1.53E-10
Kidneys	3.56E-13	3.80E-11
Thyroid	2.00E-13	2.01E-11
Leukemia	3.63E-12	3.64E-10
Residual	9.00E-12	9.03E-10
Total	4.97E-11	4.47E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	2.58E-13	5.46E-11
INHALATION	1.34E-11	8.02E-10
AIR IMMERSION	1.89E-17	3.83E-15
GROUND SURFACE	3.61E-11	3.62E-09
INTERNAL	1.36E-11	8.57E-10
EXTERNAL	3.61E-11	3.62E-09
TOTAL	4.97E-11	4.47E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	2.34E-12	1.41E-10
Th-234	2.71E-13	2.72E-11
Pa-234m	1.25E-12	1.26E-10
Pa-234	7.68E-14	7.68E-12
U-234	2.91E-12	2.06E-10
Th-230	3.39E-12	2.04E-10
Ra-226	1.63E-12	1.03E-10
Rn-222	6.90E-15	6.90E-13
Po-218	1.01E-19	1.01E-17
Pb-214	4.41E-12	4.42E-10
At-218	1.05E-19	1.05E-17
Bi-214	2.55E-11	2.55E-09
Rn-218	2.69E-21	2.69E-19
Po-214	1.47E-15	1.47E-13
Tl-210	1.01E-14	1.01E-12
Pb-210	1.82E-14	1.82E-12
Bi-210	7.28E-14	7.29E-12
Hg-206	2.35E-20	2.35E-18
Po-210	9.34E-17	9.35E-15
Tl-206	1.72E-19	1.73E-17
Th-232	7.19E-13	4.36E-11
Ra-228	7.36E-16	7.41E-14
Ac-228	1.47E-12	1.47E-10
Th-228	2.56E-12	1.59E-10
Ra-224	1.78E-14	2.22E-12
Rn-220	1.11E-15	1.11E-13
Po-216	2.68E-17	2.68E-15
Pb-212	2.41E-13	2.42E-11
Bi-212	2.00E-13	2.00E-11
Po-212	0.00E+00	0.00E+00
Tl-208	1.94E-12	1.95E-10
U-235	6.65E-13	6.01E-11
Th-231	3.76E-14	3.76E-12
Pa-231	7.12E-17	7.13E-15
Ac-227	1.71E-19	1.71E-17
Th-227	1.18E-16	1.19E-14
Fr-223	7.68E-19	7.69E-17
Ra-223	1.32E-16	1.32E-14
Rn-219	5.79E-17	5.80E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.13E-22	2.13E-20
Po-215	1.77E-19	1.77E-17
Pb-211	7.43E-17	7.44E-15
Bi-211	4.68E-17	4.68E-15
Tl-207	1.38E-17	1.39E-15
Po-211	2.26E-20	2.26E-18

TOTAL

4.97E-11

4.47E-09

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SUMMARY

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

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.3E-04	4.1E-05	2.0E-05	1.2E-05	8.0E-06	3.8E-06
NNW	0.0E+00	9.9E-05	2.1E-05	6.1E-06	3.6E-06	2.5E-06	1.2E-06
NW	0.0E+00	8.4E-05	2.5E-05	1.1E-05	6.4E-06	4.4E-06	2.1E-06
WNW	0.0E+00	1.3E-04	3.6E-05	1.4E-05	8.1E-06	5.6E-06	2.6E-06
W	0.0E+00	1.4E-04	4.9E-05	2.4E-05	1.4E-05	9.9E-06	4.6E-06
WSW	0.0E+00	1.5E-04	3.8E-05	1.4E-05	8.5E-06	5.8E-06	2.7E-06
SW	0.0E+00	1.0E-04	3.2E-05	1.4E-05	8.5E-06	5.9E-06	2.8E-06
SSW	0.0E+00	1.1E-04	2.6E-05	9.5E-06	0.0E+00	3.9E-06	1.8E-06
S	0.0E+00	1.1E-04	3.3E-05	1.6E-05	9.2E-06	6.3E-06	3.0E-06
SSE	0.0E+00	1.4E-04	3.6E-05	1.4E-05	8.1E-06	5.6E-06	2.7E-06
SSE	0.0E+00	1.5E-04	4.7E-05	2.2E-05	1.3E-05	8.9E-06	4.2E-06
ESE	0.0E+00	1.8E-04	4.9E-05	2.0E-05	1.2E-05	8.1E-06	3.8E-06
E	0.0E+00	1.8E-04	5.4E-05	2.4E-05	1.4E-05	9.8E-06	4.6E-06
ENE	0.0E+00	2.1E-04	5.7E-05	2.3E-05	1.3E-05	9.2E-06	4.4E-06
NE	0.0E+00	2.1E-04	6.9E-05	0.0E+00	2.0E-05	1.4E-05	6.4E-06
NNE	0.0E+00	2.0E-04	5.4E-05	0.0E+00	1.3E-05	8.9E-06	4.2E-06

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SUMMARY

COLLECTIVE COMMITTED EFFECTIVE DOSE EQUIVALENT (person rem)
(All Radionuclides and Pathways)

	Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500	
N	0.0E+00	3.8E-07	3.3E-07	3.1E-07	2.3E-08	8.1E-07	6.7E-07	
NNW	0.0E+00	3.0E-07	1.7E-07	4.7E-07	6.8E-08	2.2E-07	2.4E-07	
NW	0.0E+00	2.5E-07	2.0E-07	1.2E-06	5.0E-07	4.6E-07	4.4E-06	
WNW	0.0E+00	4.0E-07	2.8E-07	4.6E-06	2.9E-06	2.9E-07	1.6E-05	
W	0.0E+00	4.3E-07	3.9E-07	2.2E-05	2.9E-06	4.0E-08	1.5E-06	
WSW	0.0E+00	4.4E-07	3.0E-07	1.1E-07	1.0E-06	9.8E-07	1.7E-06	
SW	0.0E+00	3.1E-07	2.5E-07	3.2E-07	2.4E-06	2.2E-06	1.6E-05	
SSW	0.0E+00	3.2E-07	2.1E-07	2.3E-07	0.0E+00	1.7E-07	1.1E-05	
S	0.0E+00	3.2E-07	2.7E-07	1.2E-06	7.4E-07	1.4E-06	5.6E-06	
SSE	0.0E+00	4.2E-07	2.9E-07	8.4E-07	6.0E-07	4.2E-07	3.9E-06	
SSE	0.0E+00	4.5E-07	3.8E-07	9.6E-07	7.9E-07	4.7E-07	2.9E-06	
ESE	0.0E+00	5.3E-07	3.9E-07	8.0E-08	3.4E-07	1.3E-06	1.9E-06	
E	0.0E+00	5.3E-07	4.3E-07	2.9E-07	4.4E-07	6.0E-07	2.5E-06	
ENE	0.0E+00	6.4E-07	4.6E-07	2.5E-07	9.3E-08	5.7E-07	5.3E-06	
NE	0.0E+00	6.2E-07	5.5E-07	0.0E+00	3.1E-07	1.4E-06	1.4E-06	
NNE	0.0E+00	6.0E-07	4.3E-07	0.0E+00	5.1E-08	6.2E-07	1.1E-06	

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SUMMARY
Page 7INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	3.0E-11	9.8E-12	4.7E-12	2.8E-12	2.0E-12	9.5E-13	
NNW	0.0E+00	2.3E-11	5.1E-12	1.5E-12	8.8E-13	6.1E-13	2.9E-13	
NW	0.0E+00	2.0E-11	5.9E-12	2.7E-12	1.6E-12	1.1E-12	5.3E-13	
WNW	0.0E+00	3.1E-11	8.4E-12	3.3E-12	2.0E-12	1.4E-12	6.5E-13	
W	0.0E+00	3.3E-11	1.2E-11	5.9E-12	3.5E-12	2.4E-12	1.2E-12	
WSW	0.0E+00	3.4E-11	8.9E-12	3.5E-12	2.1E-12	1.4E-12	6.9E-13	
SW	0.0E+00	2.4E-11	7.6E-12	3.5E-12	2.1E-12	1.5E-12	7.0E-13	
SSW	0.0E+00	2.5E-11	6.3E-12	2.3E-12	0.0E+00	9.6E-13	4.6E-13	
S	0.0E+00	2.5E-11	8.0E-12	3.8E-12	2.3E-12	1.6E-12	7.6E-13	
SSE	0.0E+00	3.2E-11	8.6E-12	3.4E-12	2.0E-12	1.4E-12	6.8E-13	
SSE	0.0E+00	3.5E-11	1.1E-11	5.3E-12	3.2E-12	2.2E-12	1.1E-12	
ESE	0.0E+00	4.1E-11	1.2E-11	4.8E-12	2.9E-12	2.0E-12	9.8E-13	
E	0.0E+00	4.1E-11	1.3E-11	5.8E-12	3.5E-12	2.4E-12	1.2E-12	
ENE	0.0E+00	5.0E-11	1.4E-11	5.5E-12	3.3E-12	2.3E-12	1.1E-12	
NE	0.0E+00	4.8E-11	1.6E-11	0.0E+00	4.8E-12	3.4E-12	1.6E-12	
NNE	0.0E+00	4.7E-11	1.3E-11	0.0E+00	3.2E-12	2.2E-12	1.1E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.9E-14	3.1E-14	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-14	1.2E-14	9.9E-15	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.9E-14	2.0E-14	1.6E-14	
WNW	2.5E-13	0.0E+00	0.0E+00	0.0E+00	3.3E-14	2.3E-14	1.8E-14	
W	4.5E-13	2.1E-13	1.3E-13	8.9E-14	6.2E-14	4.2E-14	3.3E-14	
WSW	2.7E-13	1.3E-13	8.0E-14	5.5E-14	3.9E-14	2.7E-14	2.2E-14	
SW	2.7E-13	1.3E-13	8.2E-14	5.6E-14	4.0E-14	2.8E-14	0.0E+00	
SSW	1.8E-13	8.6E-14	5.4E-14	3.8E-14	0.0E+00	0.0E+00	1.6E-14	
S	2.9E-13	1.4E-13	8.9E-14	6.1E-14	4.3E-14	3.1E-14	2.4E-14	
SSE	2.6E-13	1.3E-13	8.1E-14	5.6E-14	4.0E-14	2.9E-14	2.3E-14	
SSE	4.2E-13	2.0E-13	1.3E-13	8.9E-14	6.4E-14	4.6E-14	3.7E-14	
ESE	3.8E-13	1.8E-13	1.2E-13	8.1E-14	5.9E-14	4.3E-14	3.4E-14	
E	4.6E-13	2.2E-13	1.4E-13	9.8E-14	7.0E-14	5.1E-14	4.1E-14	
ENE	4.4E-13	2.1E-13	1.4E-13	9.5E-14	6.9E-14	5.1E-14	4.1E-14	
NE	6.4E-13	3.1E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	4.2E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.8E-14	

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SUMMARY
Page 8COLLECTIVE FATAL CANCER RISK Per Year
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.2E-12	1.0E-12	9.8E-13	7.3E-14	2.6E-12	2.2E-12	
NNW	0.0E+00	9.0E-13	5.3E-13	1.5E-12	2.2E-13	7.2E-13	7.8E-13	
NW	0.0E+00	7.6E-13	6.1E-13	3.8E-12	1.6E-12	1.5E-12	1.5E-11	
WNW	0.0E+00	1.2E-12	8.7E-13	1.4E-11	9.1E-12	9.3E-13	5.2E-11	
W	0.0E+00	1.3E-12	1.2E-12	6.9E-11	9.3E-12	1.3E-13	4.7E-12	
WSW	0.0E+00	1.3E-12	9.2E-13	3.6E-13	3.2E-12	3.1E-12	5.5E-12	
SW	0.0E+00	9.4E-13	7.8E-13	1.0E-12	7.5E-12	7.2E-12	5.3E-11	
SSW	0.0E+00	9.7E-13	6.5E-13	7.2E-13	0.0E+00	5.4E-13	3.7E-11	
S	0.0E+00	9.5E-13	8.2E-13	3.9E-12	2.4E-12	4.4E-12	1.8E-11	
SSE	0.0E+00	1.3E-12	8.9E-13	2.7E-12	1.9E-12	1.3E-12	1.3E-11	
SSE	0.0E+00	1.4E-12	1.2E-12	3.0E-12	2.5E-12	1.5E-12	9.4E-12	
ESE	0.0E+00	1.6E-12	1.2E-12	2.5E-13	1.1E-12	4.2E-12	6.2E-12	
E	0.0E+00	1.6E-12	1.3E-12	9.0E-13	1.4E-12	1.9E-12	8.2E-12	
ENE	0.0E+00	1.9E-12	1.4E-12	7.8E-13	3.0E-13	1.8E-12	1.7E-11	
NE	0.0E+00	1.9E-12	1.7E-12	0.0E+00	1.0E-12	4.5E-12	4.5E-12	
NNE	0.0E+00	1.8E-12	1.3E-12	0.0E+00	1.6E-13	2.0E-12	3.7E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.8E-11	1.5E-10	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.6E-11	1.7E-10	8.8E-11	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.3E-11	2.4E-10	1.5E-10	
WNW	2.9E-12	0.0E+00	0.0E+00	0.0E+00	1.7E-12	1.1E-10	2.3E-11	
W	1.8E-10	1.4E-10	1.2E-11	4.1E-11	2.0E-11	1.0E-10	1.3E-10	
WSW	7.9E-11	8.2E-11	5.7E-12	6.2E-12	3.0E-12	2.9E-12	8.9E-13	
SW	1.7E-10	1.9E-11	7.1E-11	5.8E-12	7.5E-13	2.1E-13	0.0E+00	
SSW	1.4E-10	3.9E-12	2.9E-12	6.8E-12	0.0E+00	0.0E+00	6.4E-13	
S	1.0E-10	2.2E-11	3.4E-11	2.1E-14	1.3E-11	7.6E-12	2.6E-12	
SSE	7.2E-11	2.2E-10	3.6E-10	1.1E-10	3.9E-11	4.8E-12	1.9E-12	
SSE	5.9E-11	1.2E-10	1.4E-10	5.2E-11	1.2E-11	3.6E-12	5.0E-12	
ESE	1.2E-11	8.5E-11	5.3E-12	7.1E-12	5.1E-12	1.3E-11	6.1E-12	
E	8.9E-12	2.9E-11	8.4E-12	1.8E-11	3.0E-12	9.6E-12	5.4E-12	
ENE	7.6E-12	1.8E-11	5.1E-12	3.1E-12	9.6E-13	5.9E-13	2.9E-13	
NE	2.0E-11	6.9E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	2.6E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.0E-12	

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 May 31 10:34:40 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: Ten

Comments: NFSS Technical Memo 2015 Year
Population Dose

Dataset Name: NFSS2015Pop.
Dataset Date: May 31, 2016 10:34 AM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd
Pop File: C:\Users\h5tdentm\Documents\CAP88\Population Files\NFSS2013.POP

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	6.20E-05	5.00E-04
UB_Wall	6.86E-05	5.51E-04
Bone_Sur	1.86E-03	2.10E-02
Brain	6.56E-05	5.28E-04
Breasts	7.19E-05	5.76E-04
St_Wall	6.63E-05	5.34E-04
SI_Wall	6.60E-05	5.34E-04
ULI_Wall	6.93E-05	5.81E-04
LLI_Wall	7.79E-05	7.08E-04
Kidneys	1.14E-04	9.46E-04
Liver	9.65E-05	8.48E-04
Muscle	7.42E-05	5.94E-04
Ovaries	7.23E-05	5.65E-04
Pancreas	6.25E-05	5.04E-04
R_Marrow	1.66E-04	1.73E-03
Skin	1.04E-03	8.04E-03
Spleen	6.80E-05	5.57E-04
Testes	8.26E-05	6.44E-04
Thymus	6.58E-05	5.29E-04
Thyroid	6.87E-05	5.51E-04
GB_Wall	6.30E-05	5.08E-04
Ht_Wall	6.55E-05	5.27E-04
Uterus	6.49E-05	5.22E-04
ET_Reg	4.09E-04	2.11E-03
Lung_66	9.04E-04	4.43E-03
Effectiv	2.13E-04	1.48E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	2.14E-05	3.65E-04
INHALATION	1.18E-04	5.46E-04
AIR IMMERSION	3.56E-11	5.47E-10
GROUND SURFACE	7.36E-05	5.69E-04
INTERNAL	1.39E-04	9.11E-04
EXTERNAL	7.36E-05	5.69E-04
TOTAL	2.13E-04	1.48E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	1.93E-05	1.03E-04
Th-234	5.24E-07	4.06E-06
Pa-234m	7.16E-06	5.54E-05
Pa-234	1.41E-07	1.09E-06
U-234	2.23E-05	1.18E-04
Th-230	3.86E-05	1.94E-04
Ra-226	2.92E-05	3.53E-04
Rn-222	1.26E-08	9.77E-08
Po-218	2.26E-13	1.75E-12
Pb-214	8.25E-06	6.38E-05
At-218	8.49E-13	6.56E-12
Bi-214	4.82E-05	3.73E-04
Rn-218	4.92E-15	3.80E-14
Po-214	2.67E-09	2.07E-08
Tl-210	1.88E-08	1.46E-07
Pb-210	4.06E-08	3.14E-07
Bi-210	6.57E-07	5.08E-06
Hg-206	5.30E-14	4.10E-13
Po-210	1.70E-10	1.32E-09
Tl-206	1.53E-12	1.19E-11
Th-232	9.37E-06	4.59E-05
Ra-228	2.43E-09	2.63E-08
Ac-228	2.77E-06	2.14E-05
Th-228	1.91E-05	8.98E-05
Ra-224	3.32E-08	5.21E-07
Rn-220	2.02E-09	1.56E-08
Po-216	4.87E-11	3.77E-10
Pb-212	4.44E-07	3.43E-06
Bi-212	5.18E-07	4.00E-06
Po-212	0.00E+00	0.00E+00
Tl-208	3.58E-06	2.76E-05
U-235	2.55E-06	1.56E-05
Th-231	8.23E-08	6.37E-07
Pa-231	1.36E-10	1.06E-09
Ac-227	4.58E-13	3.54E-12
Th-227	2.19E-10	1.69E-09
Fr-223	2.06E-12	1.59E-11
Ra-223	2.44E-10	1.89E-09
Rn-219	1.06E-10	8.18E-10
At-219	0.00E+00	0.00E+00
Bi-215	4.76E-16	3.68E-15
Po-215	3.23E-13	2.50E-12
Pb-211	2.08E-10	1.61E-09
Bi-211	8.56E-11	6.62E-10
Tl-207	1.08E-10	8.32E-10
Po-211	4.12E-14	3.19E-13

TOTAL	2.13E-04	1.48E-03
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	6.32E-13	6.36E-11
Stomach	2.45E-12	2.46E-10
Colon	6.43E-12	6.58E-10
Liver	9.85E-13	1.01E-10
LUNG	2.45E-11	1.72E-09
Bone	2.06E-13	2.01E-11
Skin	1.03E-12	1.03E-10
Breast	3.19E-12	3.20E-10
Ovary	8.54E-13	8.55E-11
Bladder	1.53E-12	1.54E-10
Kidneys	3.67E-13	3.92E-11
Thyroid	2.01E-13	2.02E-11
Leukemia	3.64E-12	3.65E-10
Residual	9.03E-12	9.06E-10
Total	5.51E-11	4.81E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	3.44E-13	7.28E-11
INHALATION	1.86E-11	1.12E-09
AIR IMMERSION	1.89E-17	3.83E-15
GROUND SURFACE	3.61E-11	3.62E-09
INTERNAL	1.90E-11	1.19E-09
EXTERNAL	3.61E-11	3.62E-09
TOTAL	5.51E-11	4.81E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	3.25E-12	1.96E-10
Th-234	2.71E-13	2.72E-11
Pa-234m	1.25E-12	1.26E-10
Pa-234	7.68E-14	7.68E-12
U-234	4.04E-12	2.84E-10
Th-230	4.72E-12	2.84E-10
Ra-226	2.23E-12	1.39E-10
Rn-222	6.90E-15	6.90E-13
Po-218	1.01E-19	1.01E-17
Pb-214	4.41E-12	4.42E-10
At-218	1.05E-19	1.05E-17
Bi-214	2.55E-11	2.55E-09
Rn-218	2.69E-21	2.69E-19
Po-214	1.47E-15	1.47E-13
Tl-210	1.01E-14	1.01E-12
Pb-210	1.82E-14	1.82E-12
Bi-210	7.28E-14	7.29E-12
Hg-206	2.35E-20	2.35E-18
Po-210	9.34E-17	9.35E-15
Tl-206	1.72E-19	1.73E-17
Th-232	1.00E-12	6.07E-11
Ra-228	7.36E-16	7.43E-14
Ac-228	1.47E-12	1.47E-10
Th-228	3.56E-12	2.20E-10
Ra-224	1.78E-14	2.40E-12
Rn-220	1.11E-15	1.11E-13
Po-216	2.68E-17	2.68E-15
Pb-212	2.41E-13	2.42E-11
Bi-212	2.00E-13	2.00E-11
Po-212	0.00E+00	0.00E+00
Tl-208	1.94E-12	1.95E-10
U-235	7.54E-13	6.63E-11
Th-231	3.76E-14	3.76E-12
Pa-231	7.12E-17	7.13E-15
Ac-227	1.71E-19	1.71E-17
Th-227	1.18E-16	1.19E-14
Fr-223	7.68E-19	7.69E-17
Ra-223	1.32E-16	1.32E-14
Rn-219	5.79E-17	5.80E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.13E-22	2.13E-20
Po-215	1.77E-19	1.77E-17
Pb-211	7.43E-17	7.44E-15
Bi-211	4.68E-17	4.68E-15
Tl-207	1.38E-17	1.39E-15
Po-211	2.26E-20	2.26E-18

TOTAL	5.51E-11	4.81E-09
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Tue May 31 10:34:40 2016

SUMMARY

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

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.3E-04	4.1E-05	2.0E-05	1.2E-05	8.0E-06	3.8E-06
NNW	0.0E+00	9.9E-05	2.1E-05	6.1E-06	3.6E-06	2.5E-06	1.2E-06
NW	0.0E+00	8.4E-05	2.5E-05	1.1E-05	6.4E-06	4.4E-06	2.1E-06
WNW	0.0E+00	1.3E-04	3.5E-05	1.4E-05	8.1E-06	5.6E-06	2.6E-06
W	0.0E+00	1.4E-04	4.9E-05	2.4E-05	1.4E-05	9.9E-06	4.6E-06
WSW	0.0E+00	1.4E-04	3.7E-05	1.4E-05	8.5E-06	5.8E-06	2.8E-06
SW	0.0E+00	1.0E-04	3.2E-05	1.4E-05	8.5E-06	5.9E-06	2.8E-06
SSW	0.0E+00	1.1E-04	2.6E-05	9.5E-06	0.0E+00	3.9E-06	1.8E-06
S	0.0E+00	1.0E-04	3.3E-05	1.6E-05	9.2E-06	6.3E-06	3.0E-06
SSE	0.0E+00	1.4E-04	3.6E-05	1.4E-05	8.1E-06	5.6E-06	2.7E-06
SSE	0.0E+00	1.5E-04	4.7E-05	2.2E-05	1.3E-05	8.9E-06	4.2E-06
ESE	0.0E+00	1.8E-04	4.9E-05	2.0E-05	1.2E-05	8.1E-06	3.9E-06
E	0.0E+00	1.8E-04	5.3E-05	2.4E-05	1.4E-05	9.8E-06	4.6E-06
ENE	0.0E+00	2.1E-04	5.7E-05	2.2E-05	1.3E-05	9.2E-06	4.4E-06
NE	0.0E+00	2.1E-04	6.9E-05	0.0E+00	2.0E-05	1.4E-05	6.4E-06
NNE	0.0E+00	2.0E-04	5.4E-05	0.0E+00	1.3E-05	8.9E-06	4.2E-06

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SUMMARY

COLLECTIVE COMMITTED EFFECTIVE DOSE EQUIVALENT (person rem)
(All Radionuclides and Pathways)

	Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500	
N	0.0E+00	3.8E-07	3.3E-07	3.1E-07	2.3E-08	8.1E-07	6.7E-07	
NNW	0.0E+00	3.0E-07	1.7E-07	4.7E-07	6.8E-08	2.2E-07	2.4E-07	
NW	0.0E+00	2.5E-07	2.0E-07	1.2E-06	5.0E-07	4.6E-07	4.5E-06	
WNW	0.0E+00	4.0E-07	2.8E-07	4.6E-06	2.9E-06	2.9E-07	1.6E-05	
W	0.0E+00	4.3E-07	3.9E-07	2.2E-05	2.9E-06	4.0E-08	1.5E-06	
WSW	0.0E+00	4.3E-07	3.0E-07	1.1E-07	1.0E-06	9.8E-07	1.7E-06	
SW	0.0E+00	3.1E-07	2.5E-07	3.2E-07	2.4E-06	2.2E-06	1.6E-05	
SSW	0.0E+00	3.2E-07	2.1E-07	2.3E-07	0.0E+00	1.7E-07	1.1E-05	
S	0.0E+00	3.1E-07	2.7E-07	1.2E-06	7.4E-07	1.4E-06	5.6E-06	
SSE	0.0E+00	4.2E-07	2.9E-07	8.4E-07	6.0E-07	4.2E-07	3.9E-06	
SSE	0.0E+00	4.5E-07	3.8E-07	9.6E-07	7.9E-07	4.7E-07	2.9E-06	
ESE	0.0E+00	5.3E-07	3.9E-07	7.9E-08	3.4E-07	1.3E-06	1.9E-06	
E	0.0E+00	5.3E-07	4.3E-07	2.9E-07	4.4E-07	6.0E-07	2.5E-06	
ENE	0.0E+00	6.4E-07	4.6E-07	2.5E-07	9.3E-08	5.7E-07	5.3E-06	
NE	0.0E+00	6.2E-07	5.5E-07	0.0E+00	3.1E-07	1.4E-06	1.4E-06	
NNE	0.0E+00	6.0E-07	4.3E-07	0.0E+00	5.1E-08	6.2E-07	1.1E-06	

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SUMMARY
Page 7INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	3.3E-11	1.1E-11	5.2E-12	3.1E-12	2.2E-12	1.0E-12	
NNW	0.0E+00	2.6E-11	5.6E-12	1.6E-12	9.6E-13	6.7E-13	3.2E-13	
NW	0.0E+00	2.2E-11	6.5E-12	2.9E-12	1.7E-12	1.2E-12	5.7E-13	
WNW	0.0E+00	3.5E-11	9.3E-12	3.7E-12	2.2E-12	1.5E-12	7.1E-13	
W	0.0E+00	3.7E-11	1.3E-11	6.5E-12	3.9E-12	2.7E-12	1.3E-12	
WSW	0.0E+00	3.7E-11	9.8E-12	3.8E-12	2.3E-12	1.6E-12	7.5E-13	
SW	0.0E+00	2.7E-11	8.3E-12	3.8E-12	2.3E-12	1.6E-12	7.6E-13	
SSW	0.0E+00	2.8E-11	6.9E-12	2.5E-12	0.0E+00	1.0E-12	5.0E-13	
S	0.0E+00	2.7E-11	8.8E-12	4.2E-12	2.5E-12	1.7E-12	8.2E-13	
SSE	0.0E+00	3.6E-11	9.5E-12	3.7E-12	2.2E-12	1.5E-12	7.3E-13	
SSE	0.0E+00	3.9E-11	1.2E-11	5.9E-12	3.5E-12	2.4E-12	1.2E-12	
ESE	0.0E+00	4.6E-11	1.3E-11	5.3E-12	3.2E-12	2.2E-12	1.1E-12	
E	0.0E+00	4.6E-11	1.4E-11	6.4E-12	3.8E-12	2.7E-12	1.3E-12	
ENE	0.0E+00	5.5E-11	1.5E-11	6.0E-12	3.6E-12	2.5E-12	1.2E-12	
NE	0.0E+00	5.4E-11	1.8E-11	0.0E+00	5.3E-12	3.7E-12	1.8E-12	
NNE	0.0E+00	5.2E-11	1.4E-11	0.0E+00	3.4E-12	2.4E-12	1.2E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-14	3.3E-14	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-14	1.3E-14	1.1E-14	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-14	2.2E-14	1.7E-14	
WNW	2.7E-13	0.0E+00	0.0E+00	0.0E+00	3.6E-14	2.4E-14	1.9E-14	
W	4.9E-13	2.3E-13	1.4E-13	9.6E-14	6.6E-14	4.5E-14	3.5E-14	
WSW	2.9E-13	1.4E-13	8.6E-14	5.9E-14	4.1E-14	2.9E-14	2.3E-14	
SW	2.9E-13	1.4E-13	8.8E-14	6.0E-14	4.3E-14	3.0E-14	0.0E+00	
SSW	1.9E-13	9.3E-14	5.8E-14	4.0E-14	0.0E+00	0.0E+00	1.7E-14	
S	3.2E-13	1.5E-13	9.5E-14	6.6E-14	4.6E-14	3.3E-14	2.6E-14	
SSE	2.8E-13	1.4E-13	8.6E-14	6.0E-14	4.3E-14	3.1E-14	2.5E-14	
SSE	4.5E-13	2.2E-13	1.4E-13	9.5E-14	6.8E-14	4.9E-14	3.9E-14	
ESE	4.1E-13	2.0E-13	1.3E-13	8.7E-14	6.3E-14	4.5E-14	3.6E-14	
E	5.0E-13	2.4E-13	1.5E-13	1.0E-13	7.5E-14	5.4E-14	4.3E-14	
ENE	4.7E-13	2.3E-13	1.5E-13	1.0E-13	7.4E-14	5.4E-14	4.3E-14	
NE	6.9E-13	3.4E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	4.5E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.0E-14	

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SUMMARY
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COLLECTIVE FATAL CANCER RISK Per Year (All Radionuclides and Pathways)

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.3E-12	1.1E-12	1.1E-12	8.0E-14	2.8E-12	2.4E-12
NNW	0.0E+00	9.9E-13	5.8E-13	1.6E-12	2.4E-13	7.8E-13	8.5E-13
NW	0.0E+00	8.4E-13	6.8E-13	4.2E-12	1.7E-12	1.6E-12	1.6E-11
WNW	0.0E+00	1.3E-12	9.6E-13	1.6E-11	9.9E-12	1.0E-12	5.6E-11
W	0.0E+00	1.4E-12	1.3E-12	7.6E-11	1.0E-11	1.4E-13	5.1E-12
WSW	0.0E+00	1.4E-12	1.0E-12	3.9E-13	3.5E-12	3.4E-12	6.0E-12
SW	0.0E+00	1.0E-12	8.6E-13	1.1E-12	8.2E-12	7.8E-12	5.7E-11
SSW	0.0E+00	1.1E-12	7.2E-13	7.9E-13	0.0E+00	5.8E-13	4.0E-11
S	0.0E+00	1.1E-12	9.1E-13	4.3E-12	2.6E-12	4.8E-12	2.0E-11
SSE	0.0E+00	1.4E-12	9.8E-13	2.9E-12	2.1E-12	1.5E-12	1.4E-11
SSE	0.0E+00	1.5E-12	1.3E-12	3.3E-12	2.8E-12	1.6E-12	1.0E-11
ESE	0.0E+00	1.8E-12	1.3E-12	2.7E-13	1.2E-12	4.6E-12	6.7E-12
E	0.0E+00	1.8E-12	1.5E-12	9.9E-13	1.5E-12	2.1E-12	8.9E-12
ENE	0.0E+00	2.1E-12	1.6E-12	8.5E-13	3.3E-13	2.0E-12	1.9E-11
NE	0.0E+00	2.1E-12	1.9E-12	0.0E+00	1.1E-12	4.9E-12	4.9E-12
NNE	0.0E+00	2.0E-12	1.5E-12	0.0E+00	1.8E-13	2.2E-12	4.0E-12

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 May 31 11:15:26 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: Fifteen

Comments: NFSS Technical Memo 2015 Year
Population Dose

Dataset Name: NFSS2015Pop.
Dataset Date: May 31, 2016 11:15 AM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd
Pop File: C:\Users\h5tdentm\Documents\CAP88\Population Files\NFSS2013.POP

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	6.24E-05	4.96E-04
UB_Wall	6.89E-05	5.45E-04
Bone_Sur	3.61E-03	4.38E-02
Brain	6.60E-05	5.24E-04
Breasts	7.22E-05	5.70E-04
St_Wall	6.65E-05	5.27E-04
SI_Wall	6.61E-05	5.26E-04
ULI_Wall	6.83E-05	5.54E-04
LLI_Wall	7.38E-05	6.30E-04
Kidneys	1.19E-04	9.41E-04
Liver	9.80E-05	8.02E-04
Muscle	7.45E-05	5.89E-04
Ovaries	7.47E-05	5.68E-04
Pancreas	6.28E-05	4.98E-04
R_Marrow	2.16E-04	2.36E-03
Skin	1.04E-03	8.03E-03
Spleen	6.97E-05	5.76E-04
Testes	8.48E-05	6.46E-04
Thymus	6.60E-05	5.23E-04
Thyroid	6.90E-05	5.46E-04
GB_Wall	6.33E-05	5.02E-04
Ht_Wall	6.58E-05	5.21E-04
Uterus	6.52E-05	5.16E-04
ET_Reg	3.18E-04	1.68E-03
Lung_66	1.03E-03	5.01E-03
Effectiv	2.52E-04	1.84E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	3.62E-05	6.15E-04
INHALATION	1.42E-04	6.59E-04
AIR IMMERSION	3.56E-11	5.47E-10
GROUND SURFACE	7.36E-05	5.69E-04
INTERNAL	1.78E-04	1.27E-03
EXTERNAL	7.36E-05	5.69E-04
TOTAL	2.52E-04	1.84E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	2.22E-05	1.17E-04
Th-234	5.24E-07	4.05E-06
Pa-234m	7.16E-06	5.54E-05
Pa-234	1.41E-07	1.09E-06
U-234	2.59E-05	1.34E-04
Th-230	4.76E-05	2.34E-04
Ra-226	4.71E-05	6.22E-04
Rn-222	1.26E-08	9.77E-08
Po-218	2.26E-13	1.75E-12
Pb-214	8.25E-06	6.38E-05
At-218	8.49E-13	6.56E-12
Bi-214	4.82E-05	3.73E-04
Rn-218	4.92E-15	3.80E-14
Po-214	2.67E-09	2.07E-08
Tl-210	1.88E-08	1.46E-07
Pb-210	4.06E-08	3.14E-07
Bi-210	6.57E-07	5.08E-06
Hg-206	5.30E-14	4.10E-13
Po-210	1.70E-10	1.32E-09
Tl-206	1.53E-12	1.19E-11
Th-232	1.23E-05	5.94E-05
Ra-228	2.43E-09	2.84E-08
Ac-228	2.77E-06	2.14E-05
Th-228	2.14E-05	9.98E-05
Ra-224	3.34E-08	5.77E-07
Rn-220	2.02E-09	1.56E-08
Po-216	4.87E-11	3.77E-10
Pb-212	4.44E-07	3.43E-06
Bi-212	5.18E-07	4.00E-06
Po-212	0.00E+00	0.00E+00
Tl-208	3.58E-06	2.76E-05
U-235	2.83E-06	1.68E-05
Th-231	8.23E-08	6.37E-07
Pa-231	1.36E-10	1.06E-09
Ac-227	4.58E-13	3.54E-12
Th-227	2.19E-10	1.69E-09
Fr-223	2.06E-12	1.59E-11
Ra-223	2.44E-10	1.89E-09
Rn-219	1.06E-10	8.18E-10
At-219	0.00E+00	0.00E+00
Bi-215	4.76E-16	3.68E-15
Po-215	3.23E-13	2.50E-12
Pb-211	2.08E-10	1.61E-09
Bi-211	8.56E-11	6.62E-10
Tl-207	1.08E-10	8.32E-10
Po-211	4.12E-14	3.19E-13

TOTAL	2.52E-04	1.84E-03
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	6.80E-13	7.40E-11
Stomach	2.64E-12	2.88E-10
Colon	6.99E-12	7.84E-10
Liver	1.59E-12	2.31E-10
LUNG	1.96E-11	1.49E-09
Bone	1.35E-12	2.60E-10
Skin	1.03E-12	1.04E-10
Breast	3.29E-12	3.42E-10
Ovary	9.68E-13	1.10E-10
Bladder	1.64E-12	1.78E-10
Kidneys	4.78E-13	6.19E-11
Thyroid	2.14E-13	2.30E-11
Leukemia	3.95E-12	4.31E-10
Residual	9.71E-12	1.06E-09
Total	5.41E-11	5.43E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	4.57E-12	1.01E-09
INHALATION	1.34E-11	8.06E-10
AIR IMMERSION	1.89E-17	3.83E-15
GROUND SURFACE	3.61E-11	3.62E-09
INTERNAL	1.80E-11	1.82E-09
EXTERNAL	3.61E-11	3.62E-09
TOTAL	5.41E-11	5.43E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	2.48E-12	1.52E-10
Th-234	2.71E-13	2.72E-11
Pa-234m	1.25E-12	1.26E-10
Pa-234	7.68E-14	7.68E-12
U-234	3.06E-12	2.13E-10
Th-230	3.26E-12	2.10E-10
Ra-226	5.96E-12	1.05E-09
Rn-222	6.90E-15	6.90E-13
Po-218	1.01E-19	1.01E-17
Pb-214	4.41E-12	4.42E-10
At-218	1.05E-19	1.05E-17
Bi-214	2.55E-11	2.55E-09
Rn-218	2.69E-21	2.69E-19
Po-214	1.47E-15	1.47E-13
Tl-210	1.01E-14	1.01E-12
Pb-210	1.82E-14	1.82E-12
Bi-210	7.28E-14	7.29E-12
Hg-206	2.35E-20	2.35E-18
Po-210	9.34E-17	9.35E-15
Tl-206	1.72E-19	1.73E-17
Th-232	7.63E-13	4.59E-11
Ra-228	7.36E-16	7.48E-14
Ac-228	1.47E-12	1.47E-10
Th-228	2.39E-12	1.46E-10
Ra-224	1.78E-14	2.29E-12
Rn-220	1.11E-15	1.11E-13
Po-216	2.68E-17	2.68E-15
Pb-212	2.41E-13	2.42E-11
Bi-212	2.00E-13	2.00E-11
Po-212	0.00E+00	0.00E+00
Tl-208	1.94E-12	1.95E-10
U-235	6.61E-13	5.74E-11
Th-231	3.76E-14	3.76E-12
Pa-231	7.12E-17	7.13E-15
Ac-227	1.71E-19	1.71E-17
Th-227	1.18E-16	1.19E-14
Fr-223	7.68E-19	7.69E-17
Ra-223	1.32E-16	1.32E-14
Rn-219	5.79E-17	5.80E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.13E-22	2.13E-20
Po-215	1.77E-19	1.77E-17
Pb-211	7.43E-17	7.44E-15
Bi-211	4.68E-17	4.68E-15
Tl-207	1.38E-17	1.39E-15
Po-211	2.26E-20	2.26E-18

TOTAL

5.41E-11

5.43E-09

Tue May 31 11:15:26 2016

SUMMARY

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

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.5E-04	4.9E-05	2.3E-05	1.4E-05	9.4E-06	4.5E-06
NNW	0.0E+00	1.2E-04	2.5E-05	7.2E-06	4.3E-06	2.9E-06	1.4E-06
NW	0.0E+00	9.9E-05	2.9E-05	1.3E-05	7.6E-06	5.2E-06	2.5E-06
WNW	0.0E+00	1.6E-04	4.2E-05	1.6E-05	9.6E-06	6.6E-06	3.1E-06
W	0.0E+00	1.7E-04	5.8E-05	2.9E-05	1.7E-05	1.2E-05	5.5E-06
WSW	0.0E+00	1.7E-04	4.4E-05	1.7E-05	1.0E-05	6.9E-06	3.3E-06
SW	0.0E+00	1.2E-04	3.7E-05	1.7E-05	1.0E-05	7.0E-06	3.3E-06
SSW	0.0E+00	1.3E-04	3.1E-05	1.1E-05	0.0E+00	4.6E-06	2.2E-06
S	0.0E+00	1.2E-04	3.9E-05	1.8E-05	1.1E-05	7.5E-06	3.5E-06
SSE	0.0E+00	1.6E-04	4.3E-05	1.6E-05	9.6E-06	6.7E-06	3.2E-06
SSE	0.0E+00	1.8E-04	5.6E-05	2.6E-05	1.5E-05	1.1E-05	5.0E-06
ESE	0.0E+00	2.1E-04	5.7E-05	2.3E-05	1.4E-05	9.6E-06	4.6E-06
E	0.0E+00	2.1E-04	6.3E-05	2.8E-05	1.7E-05	1.2E-05	5.5E-06
ENE	0.0E+00	2.5E-04	6.7E-05	2.7E-05	1.6E-05	1.1E-05	5.2E-06
NE	0.0E+00	2.4E-04	8.1E-05	0.0E+00	2.3E-05	1.6E-05	7.6E-06
NNE	0.0E+00	2.4E-04	6.4E-05	0.0E+00	1.5E-05	1.0E-05	5.0E-06

Tue May 31 11:15:26 2016

SUMMARY

COLLECTIVE COMMITTED EFFECTIVE DOSE EQUIVALENT (person rem)
(All Radionuclides and Pathways)

	Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500	
N	0.0E+00	4.5E-07	3.9E-07	3.7E-07	2.7E-08	9.6E-07	8.0E-07	
NNW	0.0E+00	3.5E-07	2.0E-07	5.5E-07	8.1E-08	2.7E-07	2.9E-07	
NW	0.0E+00	3.0E-07	2.3E-07	1.4E-06	5.9E-07	5.4E-07	5.3E-06	
WNW	0.0E+00	4.8E-07	3.4E-07	5.4E-06	3.4E-06	3.4E-07	1.9E-05	
W	0.0E+00	5.1E-07	4.7E-07	2.6E-05	3.5E-06	4.7E-08	1.7E-06	
WSW	0.0E+00	5.1E-07	3.5E-07	1.4E-07	1.2E-06	1.2E-06	2.0E-06	
SW	0.0E+00	3.7E-07	3.0E-07	3.7E-07	2.8E-06	2.6E-06	1.9E-05	
SSW	0.0E+00	3.8E-07	2.5E-07	2.7E-07	0.0E+00	2.0E-07	1.3E-05	
S	0.0E+00	3.7E-07	3.1E-07	1.5E-06	8.8E-07	1.6E-06	6.6E-06	
SSE	0.0E+00	4.9E-07	3.4E-07	9.9E-07	7.1E-07	4.9E-07	4.6E-06	
SSE	0.0E+00	5.3E-07	4.5E-07	1.1E-06	9.3E-07	5.5E-07	3.4E-06	
ESE	0.0E+00	6.3E-07	4.6E-07	9.4E-08	4.0E-07	1.5E-06	2.2E-06	
E	0.0E+00	6.3E-07	5.1E-07	3.4E-07	5.2E-07	7.1E-07	3.0E-06	
ENE	0.0E+00	7.6E-07	5.4E-07	2.9E-07	1.1E-07	6.8E-07	6.3E-06	
NE	0.0E+00	7.3E-07	6.5E-07	0.0E+00	3.7E-07	1.6E-06	1.6E-06	
NNE	0.0E+00	7.1E-07	5.1E-07	0.0E+00	6.1E-08	7.3E-07	1.3E-06	

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SUMMARY
Page 7INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	3.2E-11	1.1E-11	5.2E-12	3.1E-12	2.2E-12	1.0E-12	
NNW	0.0E+00	2.5E-11	5.5E-12	1.6E-12	9.7E-13	6.8E-13	3.3E-13	
NW	0.0E+00	2.1E-11	6.5E-12	2.9E-12	1.7E-12	1.2E-12	5.8E-13	
WNW	0.0E+00	3.4E-11	9.2E-12	3.7E-12	2.2E-12	1.5E-12	7.2E-13	
W	0.0E+00	3.6E-11	1.3E-11	6.4E-12	3.8E-12	2.7E-12	1.3E-12	
WSW	0.0E+00	3.7E-11	9.7E-12	3.8E-12	2.3E-12	1.6E-12	7.6E-13	
SW	0.0E+00	2.6E-11	8.2E-12	3.8E-12	2.3E-12	1.6E-12	7.7E-13	
SSW	0.0E+00	2.7E-11	6.9E-12	2.5E-12	0.0E+00	1.1E-12	5.1E-13	
S	0.0E+00	2.7E-11	8.7E-12	4.1E-12	2.5E-12	1.7E-12	8.3E-13	
SSE	0.0E+00	3.5E-11	9.4E-12	3.7E-12	2.2E-12	1.5E-12	7.4E-13	
SSE	0.0E+00	3.8E-11	1.2E-11	5.8E-12	3.5E-12	2.4E-12	1.2E-12	
ESE	0.0E+00	4.5E-11	1.3E-11	5.3E-12	3.2E-12	2.2E-12	1.1E-12	
E	0.0E+00	4.5E-11	1.4E-11	6.3E-12	3.8E-12	2.7E-12	1.3E-12	
ENE	0.0E+00	5.4E-11	1.5E-11	6.0E-12	3.6E-12	2.5E-12	1.2E-12	
NE	0.0E+00	5.3E-11	1.8E-11	0.0E+00	5.3E-12	3.7E-12	1.8E-12	
NNE	0.0E+00	5.1E-11	1.4E-11	0.0E+00	3.4E-12	2.4E-12	1.2E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.8E-14	3.9E-14	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.5E-14	1.9E-14	1.7E-14	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.7E-14	2.8E-14	2.3E-14	
WNW	2.8E-13	0.0E+00	0.0E+00	0.0E+00	4.2E-14	3.0E-14	2.5E-14	
W	5.0E-13	2.4E-13	1.5E-13	1.0E-13	7.3E-14	5.2E-14	4.2E-14	
WSW	3.0E-13	1.4E-13	9.3E-14	6.6E-14	4.8E-14	3.6E-14	2.9E-14	
SW	3.0E-13	1.5E-13	9.5E-14	6.7E-14	4.9E-14	3.7E-14	0.0E+00	
SSW	2.0E-13	1.0E-13	6.5E-14	4.7E-14	0.0E+00	0.0E+00	2.3E-14	
S	3.3E-13	1.6E-13	1.0E-13	7.3E-14	5.3E-14	4.0E-14	3.3E-14	
SSE	3.0E-13	1.5E-13	9.4E-14	6.7E-14	5.0E-14	3.8E-14	3.1E-14	
SSE	4.7E-13	2.3E-13	1.5E-13	1.0E-13	7.6E-14	5.6E-14	4.6E-14	
ESE	4.2E-13	2.1E-13	1.3E-13	9.5E-14	7.0E-14	5.3E-14	4.3E-14	
E	5.1E-13	2.5E-13	1.6E-13	1.1E-13	8.3E-14	6.2E-14	5.1E-14	
ENE	4.8E-13	2.4E-13	1.5E-13	1.1E-13	8.1E-14	6.1E-14	5.0E-14	
NE	7.1E-13	3.5E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	4.6E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.7E-14	

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SUMMARY
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COLLECTIVE FATAL CANCER RISK Per Year (All Radionuclides and Pathways)

	Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500	
N	0.0E+00	1.3E-12	1.1E-12	1.1E-12	8.0E-14	2.9E-12	2.4E-12	
NNW	0.0E+00	9.8E-13	5.7E-13	1.6E-12	2.4E-13	7.9E-13	8.7E-13	
NW	0.0E+00	8.3E-13	6.7E-13	4.1E-12	1.7E-12	1.6E-12	1.6E-11	
WNW	0.0E+00	1.3E-12	9.5E-13	1.6E-11	9.9E-12	1.0E-12	5.7E-11	
W	0.0E+00	1.4E-12	1.3E-12	7.6E-11	1.0E-11	1.4E-13	5.2E-12	
WSW	0.0E+00	1.4E-12	1.0E-12	3.9E-13	3.5E-12	3.4E-12	6.1E-12	
SW	0.0E+00	1.0E-12	8.5E-13	1.1E-12	8.2E-12	7.9E-12	5.8E-11	
SSW	0.0E+00	1.1E-12	7.1E-13	7.8E-13	0.0E+00	5.9E-13	4.1E-11	
S	0.0E+00	1.0E-12	9.0E-13	4.3E-12	2.6E-12	4.8E-12	2.0E-11	
SSE	0.0E+00	1.4E-12	9.7E-13	2.9E-12	2.1E-12	1.5E-12	1.4E-11	
SSE	0.0E+00	1.5E-12	1.3E-12	3.3E-12	2.8E-12	1.6E-12	1.0E-11	
ESE	0.0E+00	1.7E-12	1.3E-12	2.7E-13	1.2E-12	4.6E-12	6.8E-12	
E	0.0E+00	1.8E-12	1.4E-12	9.8E-13	1.5E-12	2.1E-12	9.1E-12	
ENE	0.0E+00	2.1E-12	1.5E-12	8.5E-13	3.3E-13	2.0E-12	1.9E-11	
NE	0.0E+00	2.0E-12	1.8E-12	0.0E+00	1.1E-12	4.9E-12	5.0E-12	
NNE	0.0E+00	2.0E-12	1.5E-12	0.0E+00	1.8E-13	2.2E-12	4.0E-12	

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 May 31 09:39:55 2016

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

Source Category: Area
Source Type: Area
Emission Year: 2015
DOSE Age Group: Adult

Comments: NFSS Technical Memo 2015 Year
Population Dose

Dataset Name: NFSS2015Pop.
Dataset Date: May 31, 2016 09:39 AM
Wind File: C:\Users\h5tdentm\Documents\CAP88\Wind Files\iag0905.wnd
Pop File: C:\Users\h5tdentm\Documents\CAP88\Population Files\NFSS2013.POP

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SUMMARY
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	6.12E-05	4.76E-04
UB_Wall	6.78E-05	5.27E-04
Bone_Sur	1.62E-03	1.18E-02
Brain	6.47E-05	5.04E-04
Breasts	7.11E-05	5.53E-04
St_Wall	6.54E-05	5.10E-04
SI_Wall	6.49E-05	5.07E-04
ULI_Wall	6.68E-05	5.29E-04
LLI_Wall	7.14E-05	5.88E-04
Kidneys	1.10E-04	8.25E-04
Liver	9.19E-05	7.04E-04
Muscle	7.33E-05	5.70E-04
Ovaries	7.19E-05	5.40E-04
Pancreas	6.17E-05	4.80E-04
R_Marrow	1.36E-04	1.09E-03
Skin	1.04E-03	8.01E-03
Spleen	6.61E-05	5.17E-04
Testes	8.23E-05	6.20E-04
Thymus	6.49E-05	5.05E-04
Thyroid	6.78E-05	5.28E-04
GB_Wall	6.22E-05	4.84E-04
Ht_Wall	6.47E-05	5.03E-04
Uterus	6.41E-05	4.99E-04
ET_Reg	3.04E-04	1.61E-03
Lung_66	9.01E-04	4.39E-03
Effectiv	2.05E-04	1.28E-03

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	8.63E-06	1.37E-04
INHALATION	1.23E-04	5.71E-04
AIR IMMERSION	3.56E-11	5.47E-10
GROUND SURFACE	7.36E-05	5.69E-04
INTERNAL	1.32E-04	7.08E-04
EXTERNAL	7.36E-05	5.69E-04
TOTAL	2.05E-04	1.28E-03

NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	1.81E-05	9.19E-05
Th-234	5.24E-07	4.05E-06
Pa-234m	7.16E-06	5.54E-05
Pa-234	1.41E-07	1.09E-06
U-234	2.10E-05	1.06E-04
Th-230	4.46E-05	2.19E-04
Ra-226	1.68E-05	1.43E-04
Rn-222	1.26E-08	9.77E-08
Po-218	2.26E-13	1.75E-12
Pb-214	8.25E-06	6.38E-05
At-218	8.49E-13	6.56E-12
Bi-214	4.82E-05	3.73E-04
Rn-218	4.92E-15	3.80E-14
Po-214	2.67E-09	2.07E-08
Tl-210	1.88E-08	1.46E-07
Pb-210	4.06E-08	3.14E-07
Bi-210	6.57E-07	5.08E-06
Hg-206	5.30E-14	4.10E-13
Po-210	1.70E-10	1.32E-09
Tl-206	1.53E-12	1.19E-11
Th-232	1.19E-05	5.72E-05
Ra-228	2.42E-09	2.03E-08
Ac-228	2.77E-06	2.14E-05
Th-228	1.79E-05	8.38E-05
Ra-224	3.32E-08	5.08E-07
Rn-220	2.02E-09	1.56E-08
Po-216	4.87E-11	3.77E-10
Pb-212	4.44E-07	3.43E-06
Bi-212	5.18E-07	4.00E-06
Po-212	0.00E+00	0.00E+00
Tl-208	3.58E-06	2.76E-05
U-235	2.45E-06	1.45E-05
Th-231	8.23E-08	6.37E-07
Pa-231	1.36E-10	1.06E-09
Ac-227	4.58E-13	3.54E-12
Th-227	2.19E-10	1.69E-09
Fr-223	2.06E-12	1.59E-11
Ra-223	2.44E-10	1.89E-09
Rn-219	1.06E-10	8.18E-10
At-219	0.00E+00	0.00E+00
Bi-215	4.76E-16	3.68E-15
Po-215	3.23E-13	2.50E-12
Pb-211	2.08E-10	1.61E-09
Bi-211	8.56E-11	6.62E-10
Tl-207	1.08E-10	8.32E-10
Po-211	4.12E-14	3.19E-13

TOTAL	2.05E-04	1.28E-03
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CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	6.98E-13	7.60E-11
Stomach	2.70E-12	2.99E-10
Colon	7.27E-12	8.34E-10
Liver	1.81E-12	2.58E-10
LUNG	4.18E-11	2.84E-09
Bone	1.82E-12	3.17E-10
Skin	1.04E-12	1.04E-10
Breast	3.33E-12	3.48E-10
Ovary	1.02E-12	1.16E-10
Bladder	1.68E-12	1.82E-10
Kidneys	5.78E-13	7.11E-11
Thyroid	2.19E-13	2.38E-11
Leukemia	4.06E-12	4.44E-10
Residual	9.95E-12	1.10E-09
Total	7.80E-11	7.01E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	5.88E-12	1.23E-09
INHALATION	3.60E-11	2.16E-09
AIR IMMERSION	1.89E-17	3.83E-15
GROUND SURFACE	3.61E-11	3.62E-09
INTERNAL	4.19E-11	3.40E-09
EXTERNAL	3.61E-11	3.62E-09
TOTAL	7.80E-11	7.01E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	5.99E-12	3.63E-10
Th-234	2.71E-13	2.72E-11
Pa-234m	1.25E-12	1.26E-10
Pa-234	7.68E-14	7.68E-12
U-234	7.20E-12	4.68E-10
Th-230	9.83E-12	6.09E-10
Ra-226	9.43E-12	1.39E-09
Rn-222	6.90E-15	6.90E-13
Po-218	1.01E-19	1.01E-17
Pb-214	4.41E-12	4.42E-10
At-218	1.05E-19	1.05E-17
Bi-214	2.55E-11	2.55E-09
Rn-218	2.69E-21	2.69E-19
Po-214	1.47E-15	1.47E-13
Tl-210	1.01E-14	1.01E-12
Pb-210	1.82E-14	1.82E-12
Bi-210	7.28E-14	7.29E-12
Hg-206	2.35E-20	2.35E-18
Po-210	9.34E-17	9.35E-15
Tl-206	1.72E-19	1.73E-17
Th-232	2.60E-12	1.56E-10
Ra-228	7.36E-16	7.57E-14
Ac-228	1.47E-12	1.47E-10
Th-228	6.44E-12	3.89E-10
Ra-224	1.80E-14	2.99E-12
Rn-220	1.11E-15	1.11E-13
Po-216	2.68E-17	2.68E-15
Pb-212	2.41E-13	2.42E-11
Bi-212	2.00E-13	2.00E-11
Po-212	0.00E+00	0.00E+00
Tl-208	1.94E-12	1.95E-10
U-235	9.80E-13	7.66E-11
Th-231	3.76E-14	3.76E-12
Pa-231	7.12E-17	7.13E-15
Ac-227	1.71E-19	1.71E-17
Th-227	1.18E-16	1.19E-14
Fr-223	7.68E-19	7.69E-17
Ra-223	1.32E-16	1.32E-14
Rn-219	5.79E-17	5.80E-15
At-219	0.00E+00	0.00E+00
Bi-215	2.13E-22	2.13E-20
Po-215	1.77E-19	1.77E-17
Pb-211	7.43E-17	7.44E-15
Bi-211	4.68E-17	4.68E-15
Tl-207	1.38E-17	1.39E-15
Po-211	2.26E-20	2.26E-18

TOTAL

7.80E-11

7.01E-09

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SUMMARY

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

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.2E-04	4.0E-05	1.9E-05	1.1E-05	7.6E-06	3.6E-06
NNW	0.0E+00	9.5E-05	2.0E-05	5.8E-06	3.4E-06	2.4E-06	1.1E-06
NW	0.0E+00	8.1E-05	2.4E-05	1.0E-05	6.1E-06	4.2E-06	2.0E-06
WNW	0.0E+00	1.3E-04	3.4E-05	1.3E-05	7.8E-06	5.3E-06	2.5E-06
W	0.0E+00	1.4E-04	4.7E-05	2.3E-05	1.4E-05	9.5E-06	4.4E-06
WSW	0.0E+00	1.4E-04	3.6E-05	1.4E-05	8.1E-06	5.6E-06	2.6E-06
SW	0.0E+00	1.0E-04	3.0E-05	1.4E-05	8.1E-06	5.6E-06	2.6E-06
SSW	0.0E+00	1.0E-04	2.5E-05	9.0E-06	0.0E+00	3.7E-06	1.7E-06
S	0.0E+00	1.0E-04	3.2E-05	1.5E-05	8.7E-06	6.0E-06	2.8E-06
SSE	0.0E+00	1.3E-04	3.5E-05	1.3E-05	7.8E-06	5.3E-06	2.5E-06
SSE	0.0E+00	1.4E-04	4.5E-05	2.1E-05	1.2E-05	8.5E-06	4.0E-06
ESE	0.0E+00	1.7E-04	4.7E-05	1.9E-05	1.1E-05	7.7E-06	3.6E-06
E	0.0E+00	1.7E-04	5.1E-05	2.3E-05	1.3E-05	9.3E-06	4.4E-06
ENE	0.0E+00	2.1E-04	5.5E-05	2.2E-05	1.3E-05	8.8E-06	4.2E-06
NE	0.0E+00	2.0E-04	6.6E-05	0.0E+00	1.9E-05	1.3E-05	6.1E-06
NNE	0.0E+00	1.9E-04	5.2E-05	0.0E+00	1.2E-05	8.5E-06	4.0E-06

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SUMMARY
Page 6COLLECTIVE COMMITTED EFFECTIVE DOSE EQUIVALENT (person rem)
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	3.7E-07	3.2E-07	3.0E-07	2.2E-08	7.8E-07	6.4E-07	
NNW	0.0E+00	2.9E-07	1.6E-07	4.5E-07	6.5E-08	2.1E-07	2.3E-07	
NW	0.0E+00	2.4E-07	1.9E-07	1.1E-06	4.7E-07	4.3E-07	4.2E-06	
WNW	0.0E+00	3.9E-07	2.7E-07	4.4E-06	2.7E-06	2.8E-07	1.5E-05	
W	0.0E+00	4.1E-07	3.8E-07	2.1E-05	2.8E-06	3.8E-08	1.4E-06	
WSW	0.0E+00	4.2E-07	2.9E-07	1.1E-07	9.8E-07	9.3E-07	1.6E-06	
SW	0.0E+00	3.0E-07	2.4E-07	3.0E-07	2.3E-06	2.1E-06	1.5E-05	
SSW	0.0E+00	3.1E-07	2.0E-07	2.2E-07	0.0E+00	1.6E-07	1.1E-05	
S	0.0E+00	3.0E-07	2.6E-07	1.2E-06	7.1E-07	1.3E-06	5.3E-06	
SSE	0.0E+00	4.0E-07	2.8E-07	8.0E-07	5.7E-07	4.0E-07	3.7E-06	
SSE	0.0E+00	4.3E-07	3.6E-07	9.2E-07	7.5E-07	4.4E-07	2.7E-06	
ESE	0.0E+00	5.1E-07	3.7E-07	7.6E-08	3.3E-07	1.2E-06	1.8E-06	
E	0.0E+00	5.1E-07	4.1E-07	2.7E-07	4.2E-07	5.7E-07	2.4E-06	
ENE	0.0E+00	6.2E-07	4.4E-07	2.4E-07	8.9E-08	5.5E-07	5.0E-06	
NE	0.0E+00	6.0E-07	5.3E-07	0.0E+00	3.0E-07	1.3E-06	1.3E-06	
NNE	0.0E+00	5.8E-07	4.2E-07	0.0E+00	4.9E-08	5.9E-07	1.1E-06	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-05	4.2E-05	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.9E-05	5.4E-05	2.9E-05	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-05	7.0E-05	4.3E-05	
WNW	8.5E-07	0.0E+00	0.0E+00	0.0E+00	5.0E-07	3.4E-05	6.9E-06	
W	5.2E-05	3.9E-05	3.5E-06	1.2E-05	5.6E-06	2.8E-05	3.6E-05	
WSW	2.3E-05	2.3E-05	1.6E-06	1.7E-06	8.4E-07	8.5E-07	2.6E-07	
SW	4.7E-05	5.4E-06	2.0E-05	1.6E-06	2.1E-07	6.0E-08	0.0E+00	
SSW	4.0E-05	1.1E-06	8.0E-07	1.9E-06	0.0E+00	0.0E+00	1.9E-07	
S	2.9E-05	6.2E-06	9.5E-06	5.9E-09	3.5E-06	2.1E-06	7.3E-07	
SSE	2.0E-05	6.2E-05	9.8E-05	2.9E-05	1.1E-05	1.3E-06	5.3E-07	
SSE	1.6E-05	3.3E-05	3.7E-05	1.4E-05	3.3E-06	9.9E-07	1.3E-06	
ESE	3.4E-06	2.3E-05	1.5E-06	2.0E-06	1.4E-06	3.5E-06	1.7E-06	
E	2.5E-06	8.1E-06	2.3E-06	4.8E-06	8.2E-07	2.6E-06	1.5E-06	
ENE	2.1E-06	5.0E-06	1.4E-06	8.4E-07	2.6E-07	1.6E-07	8.0E-08	
NE	5.7E-06	1.9E-07	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	7.3E-08	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.5E-06	

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SUMMARY
Page 7INDIVIDUAL LIFETIME RISK (deaths)
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	4.7E-11	1.5E-11	7.2E-12	4.3E-12	3.0E-12	1.4E-12	
NNW	0.0E+00	3.6E-11	7.9E-12	2.2E-12	1.3E-12	9.3E-13	4.4E-13	
NW	0.0E+00	3.1E-11	9.2E-12	4.1E-12	2.4E-12	1.7E-12	7.8E-13	
WNW	0.0E+00	4.9E-11	1.3E-11	5.1E-12	3.0E-12	2.1E-12	9.8E-13	
W	0.0E+00	5.2E-11	1.8E-11	9.0E-12	5.4E-12	3.7E-12	1.7E-12	
WSW	0.0E+00	5.3E-11	1.4E-11	5.3E-12	3.1E-12	2.2E-12	1.0E-12	
SW	0.0E+00	3.8E-11	1.2E-11	5.3E-12	3.2E-12	2.2E-12	1.0E-12	
SSW	0.0E+00	3.9E-11	9.7E-12	3.5E-12	0.0E+00	1.4E-12	6.9E-13	
S	0.0E+00	3.8E-11	1.2E-11	5.8E-12	3.4E-12	2.4E-12	1.1E-12	
SSE	0.0E+00	5.1E-11	1.3E-11	5.1E-12	3.0E-12	2.1E-12	1.0E-12	
SSE	0.0E+00	5.5E-11	1.7E-11	8.1E-12	4.8E-12	3.4E-12	1.6E-12	
ESE	0.0E+00	6.5E-11	1.8E-11	7.4E-12	4.4E-12	3.0E-12	1.4E-12	
E	0.0E+00	6.5E-11	2.0E-11	8.9E-12	5.3E-12	3.7E-12	1.7E-12	
ENE	0.0E+00	7.8E-11	2.1E-11	8.3E-12	5.0E-12	3.5E-12	1.7E-12	
NE	0.0E+00	7.6E-11	2.5E-11	0.0E+00	7.3E-12	5.1E-12	2.4E-12	
NNE	0.0E+00	7.3E-11	2.0E-11	0.0E+00	4.8E-12	3.3E-12	1.6E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	6.1E-14	4.9E-14	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.1E-14	2.4E-14	2.0E-14	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	4.7E-14	3.5E-14	2.9E-14	
WNW	3.7E-13	0.0E+00	0.0E+00	0.0E+00	5.4E-14	3.9E-14	3.1E-14	
W	6.7E-13	3.1E-13	2.0E-13	1.3E-13	9.5E-14	6.7E-14	5.3E-14	
WSW	4.0E-13	1.9E-13	1.2E-13	8.5E-14	6.1E-14	4.5E-14	3.7E-14	
SW	4.0E-13	1.9E-13	1.2E-13	8.6E-14	6.3E-14	4.6E-14	0.0E+00	
SSW	2.7E-13	1.3E-13	8.4E-14	6.0E-14	0.0E+00	0.0E+00	2.8E-14	
S	4.3E-13	2.1E-13	1.3E-13	9.3E-14	6.8E-14	5.0E-14	4.0E-14	
SSE	3.9E-13	1.9E-13	1.2E-13	8.6E-14	6.3E-14	4.7E-14	3.9E-14	
SSE	6.2E-13	3.0E-13	1.9E-13	1.3E-13	9.6E-14	7.1E-14	5.7E-14	
ESE	5.6E-13	2.7E-13	1.7E-13	1.2E-13	8.9E-14	6.6E-14	5.4E-14	
E	6.8E-13	3.3E-13	2.1E-13	1.5E-13	1.1E-13	7.8E-14	6.3E-14	
ENE	6.4E-13	3.1E-13	2.0E-13	1.4E-13	1.0E-13	7.7E-14	6.3E-14	
NE	9.4E-13	4.6E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	6.2E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.9E-14	

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SUMMARY
Page 8COLLECTIVE FATAL CANCER RISK Per Year
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.8E-12	1.6E-12	1.5E-12	1.1E-13	3.9E-12	3.3E-12	
NNW	0.0E+00	1.4E-12	8.1E-13	2.2E-12	3.3E-13	1.1E-12	1.2E-12	
NW	0.0E+00	1.2E-12	9.5E-13	5.8E-12	2.4E-12	2.2E-12	2.2E-11	
WNW	0.0E+00	1.9E-12	1.4E-12	2.2E-11	1.4E-11	1.4E-12	7.8E-11	
W	0.0E+00	2.0E-12	1.9E-12	1.1E-10	1.4E-11	1.9E-13	7.1E-12	
WSW	0.0E+00	2.1E-12	1.4E-12	5.5E-13	4.9E-12	4.7E-12	8.3E-12	
SW	0.0E+00	1.5E-12	1.2E-12	1.5E-12	1.1E-11	1.1E-11	7.9E-11	
SSW	0.0E+00	1.5E-12	1.0E-12	1.1E-12	0.0E+00	8.1E-13	5.5E-11	
S	0.0E+00	1.5E-12	1.3E-12	6.0E-12	3.6E-12	6.6E-12	2.7E-11	
SSE	0.0E+00	2.0E-12	1.4E-12	4.0E-12	2.9E-12	2.0E-12	1.9E-11	
SSE	0.0E+00	2.1E-12	1.8E-12	4.6E-12	3.8E-12	2.3E-12	1.4E-11	
ESE	0.0E+00	2.5E-12	1.9E-12	3.8E-13	1.6E-12	6.3E-12	9.2E-12	
E	0.0E+00	2.5E-12	2.0E-12	1.4E-12	2.1E-12	2.9E-12	1.2E-11	
ENE	0.0E+00	3.0E-12	2.2E-12	1.2E-12	4.5E-13	2.8E-12	2.6E-11	
NE	0.0E+00	2.9E-12	2.6E-12	0.0E+00	1.5E-12	6.7E-12	6.7E-12	
NNE	0.0E+00	2.8E-12	2.1E-12	0.0E+00	2.5E-13	3.0E-12	5.5E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.6E-11	2.4E-10	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-10	3.3E-10	1.8E-10	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.1E-11	4.1E-10	2.6E-10	
WNW	4.4E-12	0.0E+00	0.0E+00	0.0E+00	2.8E-12	2.0E-10	4.1E-11	
W	2.7E-10	2.0E-10	1.8E-11	6.2E-11	3.0E-11	1.6E-10	2.1E-10	
WSW	1.2E-10	1.2E-10	8.6E-12	9.6E-12	4.7E-12	4.8E-12	1.5E-12	
SW	2.5E-10	2.9E-11	1.1E-10	8.9E-12	1.2E-12	3.5E-13	0.0E+00	
SSW	2.1E-10	5.9E-12	4.4E-12	1.1E-11	0.0E+00	0.0E+00	1.2E-12	
S	1.5E-10	3.3E-11	5.1E-11	3.3E-14	2.0E-11	1.2E-11	4.3E-12	
SSE	1.1E-10	3.3E-10	5.3E-10	1.6E-10	6.1E-11	7.7E-12	3.1E-12	
SSE	8.6E-11	1.8E-10	2.0E-10	7.7E-11	1.8E-11	5.6E-12	7.7E-12	
ESE	1.8E-11	1.3E-10	7.9E-12	1.1E-11	7.7E-12	2.0E-11	9.7E-12	
E	1.3E-11	4.3E-11	1.2E-11	2.6E-11	4.5E-12	1.5E-11	8.4E-12	
ENE	1.1E-11	2.7E-11	7.6E-12	4.6E-12	1.4E-12	9.0E-13	4.6E-13	
NE	3.0E-11	1.0E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	3.8E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.4E-11	

ATTACHMENT E

NATIONAL CLIMATIC DATA CENTER, NIAGARA FALLS, NEW YORK

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)												Station Location: NIAGARA FALLS INTL AIRPORT (04724) NIAGARA FALLS, NY Lat. 43.108 Lon. -78.938 Elevation(Ground): 585 ft. above sea level														
D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees		Sun		Significant Weather	Snow/Ice on Ground(In)		Precipitation (In)		Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees								D a t e
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST		1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max Speed	5-second Dir	max Speed	2-minute Dir		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
01	31	19	25	M	15	22	40	0	-	-	SN	M	M	T	29.27	29.96	23.5	24	24.2	48	250	39	240	01		
02	32	18	25	M	16	24	40	0	-	-	SN	M	M	T	29.52	30.26	11.6	26	12.9	33	240	24	260	02		
03	42	18	30	M	24	27	35	0	-	-	RA FZRA SN GS BR	M	M	0.45	29.54	30.17	6.8	10	7.5	19	100	16	080	03		
04	46*	26	36	M	37	38	29	0	-	-	RA DZ SN GS FG BR	M	M	0.96	29.03	29.70	13.9	25	15.2	51	240	40	250	04		
05	26	9	18	M	3	11	47	0	-	-	SN	M	M	0.01	29.59	30.34	21.6	27	22.0	41	270	33	270	05		
06	18	9	14	M	5	12	51	0	-	-	SN	M	M	0.01	29.52	30.19	11.6	26	12.7	34	280	28	270	06		
07	17	1	9	M	0	6	56	0	-	-	SN HZ BLSN	M	M	0.02	29.46	30.22	15.9	29	18.4	39	260	32	260	07		
08	17	4	11	M	3	10	54	0	-	-	SN FZFG BR BLSN	M	M	T	29.54	30.20	20.0	23	21.5	46	240	35	240	08		
09	19	9	14	M	7	13	51	0	-	-	SN FG+ FZFG BR UP HZ BLSN	M	M	0.35	29.21	29.97	20.4	26	20.8	46	220	35	220	09		
10	19	5	12	M	3	10	53	0	-	-	SN HZ BLSN	M	M	0.05	29.66	30.40	21.1	25	21.7	40	250	32	260	10		
11	32	19	26	M	15	23	39	0	-	-	SN BR	M	M	T	29.70	30.40	13.6	22	14.2	38	220	31	230	11		
12	31	14	23	M	22	25	42	0	-	-	SN BR	M	M	0.26	29.62	30.34	7.7	31	11.5	29	340	22	350	12		
13	14	-3	6*	M	0	4	59	0	-	-	SN HZ	M	M	T	30.01	30.74	5.9	06	7.3	21	010	17	360	13		
14	20	-7*	7	M	1	6	58	0	-	-	SN BR HZ	M	M	0.00	29.69	30.38	4.2	21	6.3	19	250	16	250	14		
15	29	7	18	M	13	18	47	0	-	-	SN BR UP HZ BLSN	M	M	T	29.41	30.07	16.7	23	17.3	45	240	36	230	15		
16	29	4	17	M	10	17	48	0	-	-	SN BR UP HZ BLSN	M	M	T	29.34	30.09	12.4	29	15.4	37	240	31	250	16		
17	39	-1	19	M	10	17	46	0	-	-	SN	M	M	0.00	29.44	30.09	8.1	16	9.5	34	200	25	190	17		
18	44	32	38*	M	30	34	27	0	-	-	RA DZ SN BR	M	M	0.05	29.05	29.72	14.5	22	15.6	36	210	29	240	18		
19	32	22	27	M	21	26	38	0	-	-	SN	M	M	T	29.23	29.93	13.4	29	14.5	29	290	23	300	19		
20	22	8	15	M	10	15	50	0	-	-	SN BR	M	M	T	29.36	30.07	3.4	33	4.4	16	300	14	300	20		
21	25	5	15	M	9	14	50	0	-	-	SN	M	M	0.00	29.44	30.15	3.7	06	4.1	14	080	10	080	21		
22	31	21	26	M	17	22	39	0	-	-	SN	M	M	T	29.62	30.34	5.9	28	8.1	20	240	16	230	22		
23	28	24	26	M	20	24	39	0	-	-	BR	M	M	0.00	29.52	30.15	15.8	23	16.1	37	240	29	220	23		
24	32	23	28	M	24	26	37	0	-	-	RA FZDZ SN BR HZ	M	M	T	28.98	29.63	13.1	24	13.3	27	260	21	260	24		
25	32	12	22	M	11	16	43	0	-	-	SN	M	M	T	29.20	29.93	7.1	36	9.7	26	280	23	280	25		
26	21	12	17	M	8	14	48	0	-	-	SN	M	M	0.02	29.31	30.01	14.0	07	14.4	32	050	25	060	26		
27	18	3	11	M	7	13	54	0	-	-	SN BR	M	M	0.01	29.37	30.09	7.4	03	8.3	22	060	18	060	27		
28	24	0	12	M	6	11	53	0	-	-	SN	M	M	0.00	29.59	30.32	4.7	23	6.1	15	230	13	230	28		
29	36	12	24	M	18	24	41	0	-	-	SN BR	M	M	0.16	29.32	29.97	4.9	20	9.3	24	310	20	290	29		
30	30	10	20	M	10	16	45	0	-	-	SN UP BLSN	M	M	T	29.47	30.22	15.0	32	15.3	37	330	30	340	30		
31	27	0	14	M	11	14	51	0	-	-	SN BR	M	M	T	29.63	30.32	8.5	23	8.8	23	250	20	230	31		
	27.8	10.8	19.3		12.5	17.8	45.5	0.0	<----Monthly Averages Totals----->				M	M	2.35	29.44	30.14	7.6	26	13.1	<Monthly Average					
	M	M	M						<-----Departure From Normal----->				M													
Degree Days Monthly Season to Date												Greatest 24-hr Precipitation: 1.40 Date: 03-04 Greatest 24-hr Snowfall: M Date: M Greatest Snow Depth: M Date: M														
Total Departure						Number of Days with ----->						Max Temp >=90: 0 Max Temp <=32: 26 Thunderstorms : 0						Min Temp <=32: 31 Min Temp <=0 : 5 Heavy Fog : 1		Precipitation >=.01 inch: 12 Precipitation >=.10 inch: 5 Snowfall >=1.0 inch : M						
* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.												Data Version: VER3														

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)												Station Location: NIAGARA FALLS INTL AIRPORT (04724) NIAGARA FALLS, NY Lat. 43.108 Lon. -78.938 Elevation(Ground): 585 ft. above sea level																
D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees		Sun		Significant Weather	Snow/Ice on Ground(In)				Precipitation (In)		Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees								D a t e
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST		1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max 5-second Speed	Dir	max 2-minute Speed	Dir				
	Depth											Water Equiv	Snow Fall	Water Equiv														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26			
01	27	13	20	M	15	18	45	0	-	-	SN FZFG BR UP HZ BLSN	M	M	0.03	29.49	30.15	11.7	06	16.0	39	060	31	070	01				
02	14	-2	6	M	6	9	59	0	-	-	SN FG FZFG BR BLSN	M	M	0.20	29.13	29.88	10.1	02	15.0	37	060	29	060	02				
03	21	-3	9	M	8	13	56	0	-	-	SN BR BLSN	M	M	T	29.49	30.21	13.8	23	14.3	38	230	29	240	03				
04	32*	20	26	M	23	25	39	0	-	-	FZDZ SN BR	M	M	0.06	29.35	30.02	10.7	25	13.4	30	230	22	280	04				
05	21	4	13	M	2	10	52	0	-	-	SN	M	M	0.01	29.57	30.30	8.0	30	12.2	24	220	20	220	05				
06	23	7	15	M	10	15	50	0	-	-	SN BR HZ BLSN	M	M	0.01	29.46	30.15	18.0	24	18.4	41	220	31	220	06				
07	31	23	27*	M	21	25	38	0	-	-	SN BR UP HZ	M	M	0.04	29.33	30.00	3.1	17	7.4	22	080	18	080	07				
08	24	13	19	M	15	17	46	0	-	-	SN BR	M	M	0.09	29.19	29.89	17.0	07	17.2	34	070	24	070	08				
09	17	13	15	M	10	14	50	0	-	-	SN BR	M	M	0.11	29.40	30.12	8.7	05	8.9	28	060	21	060	09				
10	21	10	16	M	14	17	49	0	-	-	SN FG+ FZFG BR	M	M	T	29.57	30.28	2.9	05	3.4	13	030	10	020	10				
11	30	8	19	M	17	20	46	0	-	-	FZDZ SN FZFG BR	M	M	0.11	29.36	30.02	6.7	22	9.9	26	240	21	230	11				
12	28	4	16	M	7	13	49	0	-	-	SN BR BLSN	M	M	T	29.29	30.03	16.1	30	17.0	30	330	25	280	12				
13	13	-9	2	M	-2	3	63	0	-	-	SN BR	M	M	T	29.55	30.24	9.1	24	11.9	29	230	23	220	13				
14	22	2	12	M	10	14	53	0	-	-	SN FG+ FZFG BR BLSN	M	M	0.16	29.04	29.74	12.9	28	17.8	36	320	28	310	14				
15	2	-7	-2	M	-7	-2	67	0	-	-	SN BLSN	M	M	0.01	29.58	30.35	13.9	32	14.4	31	320	24	320	15				
16	5	-13*	-4*	M	-9	-3	69	0	-	-	SN BR HZ	M	M	T	29.64	30.34	3.5	23	4.5	14	240	12	220	16				
17	13	-10	2	M	-4	3	63	0	-	-	SN	M	M	T	29.27	29.98	7.2	22	8.7	26	220	21	220	17				
18	17	10	14	M	9	13	51	0	-	-	SN FG+ FZFG BR HZ	M	M	0.07	29.13	29.82	8.0	24	11.0	27	280	18	320	18				
19	12	-3	5	M	-5	1	60	0	-	-	SN BLSN	M	M	T	29.34	30.09	17.6	28	18.1	38	270	30	280	19				
20	2	-8	-3	M	-10	-3	68	0	-	-	SN BLSN	M	M	T	29.64	30.38	11.6	24	13.4	28	240	23	240	20				
21	23	-3	10	M	9	14	55	0	-	-	SN FG+ FZFG BR	M	M	0.12	29.41	30.11	1.8	20	5.1	13	200	10	200	21				
22	24	-2	11	M	8	12	54	0	-	-	SN FG+ FZFG BR	M	M	T	29.54	30.29	7.5	25	9.6	29	230	23	310	22				
23	8	-7	1	M	-8	0	64	0	-	-	SN UP	M	M	T	29.82	30.55	12.5	27	15.1	27	320	22	310	23				
24	20	-7	7	M	-2	7	58	0	-	-	SN BR BLSN	M	M	T	29.34	29.98	18.9	22	19.6	40	220	32	220	24				
25	21	6	14	M	4	11	51	0	-	-	SN BR UP	M	M	T	29.20	29.95	14.3	26	15.0	33	230	28	290	25				
26	16	7	12	M	5	10	53	0	-	-	SN BR HZ	M	M	T	29.46	30.19	5.4	03	6.9	16	040	14	040	26				
27	12	-10	1	M	0	4	64	0	-	-	SN BR	M	M	T	29.81	30.56	9.6	25	10.7	24	230	20	230	27				
28	18	0	9	M	0	6	56	0	-	-	HZ	M	M	0.00	30.06	30.78	8.3	22	8.9	20	230	17	240	28				
	18.5	2.0	10.2		5.2	10.2	54.6	0.0	<----Monthly Averages Totals----->				M	M	1.02	29.45	30.16	5.5	26	12.3	<Monthly Average							
	M	M	M		<-----Departure From Normal----->								M															
Degree Days	Monthly	Season to Date																										
Total	Departure	Total	Departure																									
Heating:	1528	M	M	M																								
Cooling:	0	M	M	M																								
* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.																								Data Version: VER3				
																								Sea Level Pressure Date (LST)				
																								Maximum 30.86 28 1219				
																								Minimum 29.57 14 1310				
																								Max Temp >=90: 0				
																								Min Temp <=32: 28				
																								Number of Days with -----> Max Temp <=32: 28				
																								Thunderstorms : 0				
																								Heavy Fog : 5				
																								Precipitation >=.01 inch: 13				
																								Precipitation >= 10 inch: 5				
																								Snowfall >=1.0 inch : M				

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)												Station Location: NIAGARA FALLS INTL AIRPORT (04724) NIAGARA FALLS, NY Lat. 43.108 Lon. -78.938 Elevation(Ground): 585 ft. above sea level															
D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees			Sun		Significant Weather	Snow/Ice on Ground(In)		Precipitation (In)		Pressure(inches of Hg)				Wind: Speed=mph Dir=tens of degrees						D a t e
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST	1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	5-second Speed	max Dir	max Speed	2-minute Dir				
	1	2	3	4	5	6	7	8	9	10	11	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
01	25	0	13	M	14	17	52	0	-	-	-	SN BR	M	M	M	0.06	29.72	30.39	4.6	23	5.6	17	250	14	250	01	
02	26	9	18	M	13	18	47	0	-	-	-	SN BR BLSN	M	M	M	T	29.62	30.34	14.7	26	15.5	32	270	26	270	02	
03	38	3	21	M	17	20	44	0	-	-	-	RA DZ FZRA FZDZ SN FZFG BR HZ	M	M	M	0.25	29.41	30.04	6.3	20	9.2	43	250	33	240	03	
04	34	21	28	M	22	27	37	0	-	-	-	SN BR UP	M	M	M	T	29.18	29.91	13.8	28	14.9	30	330	25	340	04	
05	20	2	11	M	0	8	54	0	-	-	-	SN	M	M	M	T	29.64	30.39	10.4	30	11.5	30	320	24	330	05	
06	19	-1*	9*	M	3	9	56	0	-	-	-		M	M	M	0.00	29.78	30.46	13.8	22	14.1	33	220	26	230	06	
07	31	18	25	M	18	23	40	0	-	-	-	SN BR UP HZ	M	M	M	T	29.43	30.09	16.0	24	16.4	37	220	28	240	07	
08	34	26	30	M	23	28	35	0	-	-	-	BR HZ	M	M	M	T	29.41	30.10	12.2	24	13.1	28	280	24	280	08	
09	38	23	31	M	25	29	34	0	-	-	-	BR	M	M	M	0.00	29.49	30.19	9.7	22	10.2	29	230	23	230	09	
10	45	22	34	M	29	33	31	0	-	-	-	BR HZ	M	M	M	0.00	29.44	30.09	5.8	21	6.2	21	220	15	230	10	
11	40	32	36	M	31	34	29	0	-	-	-	FG BR	M	M	M	0.00	29.44	30.14	11.1	23	12.6	29	240	23	240	11	
12	36	22	29	M	13	25	36	0	-	-	-		M	M	M	0.00	29.88	30.60	2.5	02	5.1	19	350	16	360	12	
13	48*	23	36	M	18	30	29	0	-	-	-		M	M	M	0.00	29.72	30.34	3.8	11	6.2	17	210	14	200	13	
14	43	35	39*	M	34	37	26	0	-	-	-	RA DZ BR	M	M	M	0.01	29.24	29.88	8.6	24	11.9	28	290	23	290	14	
15	38	30	34	M	27	31	31	0	-	-	-	SN	M	M	M	T	29.36	30.06	12.3	28	14.0	32	270	26	280	15	
16	43	30	37	M	32	35	28	0	-	-	-	RA DZ BR	M	M	M	0.08	29.28	29.90	7.4	21	8.2	20	220	16	230	16	
17	39	26	33	M	22	30	32	0	-	-	-	BR	M	M	M	T	29.24	29.95	15.9	31	17.6	43	320	32	310	17	
18	35	21	28	M	12	23	37	0	-	-	-	SN	M	M	M	T	29.52	30.22	12.6	30	12.7	35	320	25	290	18	
19	35	16	26	M	12	22	39	0	-	-	-		M	M	M	0.00	29.67	30.36	2.2	06	3.3	15	030	10	090	19	
20	45	28	37	M	24	32	28	0	-	-	-	RA BR	M	M	M	0.00	29.46	30.11	6.5	20	8.5	18	230	15	210	20	
21	43	24	34	M	26	32	31	0	-	-	-	RA BR	M	M	M	0.05	29.31	29.99	12.4	27	16.1	33	290	26	290	21	
22	28	17	23	M	10	19	42	0	-	-	-	SN	M	M	M	T	29.57	30.27	12.2	31	13.3	27	290	22	310	22	
23	23	16	20	M	4	16	45	0	-	-	-		M	M	M	0.00	29.68	30.38	6.0	01	7.3	20	020	16	020	23	
24	38	15	27	M	13	22	38	0	-	-	-		M	M	M	0.00	29.70	30.38	5.0	07	5.7	19	070	13	080	24	
25	44	23	34	M	30	34	31	0	-	-	-	RA BR	M	M	M	0.11	29.41	30.05	8.2	20	11.8	30	230	23	240	25	
26	40	32	36	M	32	34	29	0	-	-	-	RA SN FG BR HZ	M	M	M	0.32	29.23	29.88	5.7	24	6.5	16	260	13	260	26	
27	34	19	27	M	20	25	38	0	-	-	-	SN	M	M	M	T	29.24	29.94	10.1	32	11.2	21	330	17	340	27	
28	28	16	22	M	8	18	43	0	-	-	-	SN	M	M	M	T	29.48	30.20	9.9	34	10.8	26	340	18	310	28	
29	41	16	29	M	17	25	36	0	-	-	-	RA	M	M	M	T	29.52	30.16	13.1	21	14.0	44	250	31	230	29	
30	44	27	36	M	29	33	29	0	-	-	-	RA BR	M	M	M	0.03	29.13	29.81	16.2	25	17.7	39	220	32	220	30	
31	42	23	33	M	23	29	32	0	-	-	-		M	M	M	0.00	29.21	29.89	2.1	36	4.6	18	350	14	360	31	
	36.0	19.8	27.9		19.4	25.7	36.7	0.0	<----Monthly Averages Totals----->				M	M	0.91	29.46	30.15	6.3	26	10.8	<Monthly Average						
	M	M	M						<-----Departure From Normal----->				M														
Degree Days Monthly Season to Date												Greatest 24-hr Precipitation: 0.36 Date: 25-26 Greatest 24-hr Snowfall: M Date: M Greatest Snow Depth: M Date: M												Sea Level Pressure Date (LST)			
Total Departure Total Departure												Maximum 30.67 12 1153 Minimum 29.60 03 2053												Precipitation >=.01 inch: 8 Precipitation >=.10 inch: 3 Snowfall >=1.0 inch: M			
Heating: 1139 M M M Cooling: 0 M M M												Number of Days with -----> Max Temp >=90: 0 Min Temp <=32: 30 Max Temp <=32: 8 Min Temp <=0 : 2 Thunderstorms : 0 Heavy Fog : 0												Data Version: VER3			
* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.																											

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)												Station Location: NIAGARA FALLS INTL AIRPORT (04724) NIAGARA FALLS, NY Lat. 43.108 Lon. -78.938 Elevation(Ground): 585 ft. above sea level																
D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees			Sun		Significant Weather	Snow/Ice on Ground(In)	Precipitation (In)	Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees								D a t e			
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST	1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max 5-second Speed	Dir	max 2-minute Speed	Dir					
	Depth	Water Equiv	Snow Fall	Water Equiv																								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26			
01	45	23*	34	M	20	30	31	0	-	-	M	M	M	0.00	29.46	30.14	0.4	11	5.0	15	190	12	200	01				
02	66	50	58	M	38	45	7	0	-	-	RA BR	M	M	0.24	29.20	29.84	11.8	21	15.0	47	240	33	240	02				
03	53	38	46	M	41	43	19	0	-	-	RA FG+ FG BR	M	M	0.21	29.17	29.82	5.9	25	9.2	26	320	22	320	03				
04	41	32	37	M	26	31	28	0	-	-	SN	M	M	T	29.36	30.07	13.5	27	15.6	32	230	26	220	04				
05	35	28	32*	M	27	31	33	0	-	-	SN BR	M	M	0.01	29.52	30.20	0.8	24	4.4	14	300	10	220	05				
06	57	33	45	M	33	38	20	0	-	-	RA BR	M	M	T	29.52	30.18	6.3	08	9.2	22	070	18	080	06				
07	45	34	40	M	25	34	25	0	-	-	RA	M	M	0.00	29.61	30.29	14.9	07	15.2	26	080	24	070	07				
08	42	33	38	M	34	36	27	0	-	-	RA DZ BR	M	M	0.65	29.47	30.12	11.1	07	13.1	28	100	20	100	08				
09	63	35	49	M	44	46	16	0	-	-	RA DZ BR	M	M	0.40	29.33	29.95	4.7	15	7.7	28	180	22	190	09				
10	63	36	50	M	42	46	15	0	-	-	RA VCTS	M	M	0.07	29.02	29.68	16.4	22	19.1	58	230	44	240	10				
11	49	36	43	M	30	36	22	0	-	-	M	M	M	0.00	29.44	30.14	11.9	27	13.6	29	280	23	290	11				
12	62	33	48	M	33	41	17	0	-	-	M	M	M	0.00	29.59	30.24	5.9	22	6.1	22	210	17	230	12				
13	78*	41	60*	M	42	50	5	0	-	-	RA BR	M	M	0.18	29.39	30.03	9.3	24	13.3	40	300	32	300	13				
14	59	38	49	M	32	42	16	0	-	-	M	M	M	0.00	29.56	30.21	4.6	26	7.0	18	310	15	310	14				
15	59	32	46	M	27	39	19	0	-	-	M	M	M	0.00	29.70	30.36	4.0	02	4.9	20	040	15	020	15				
16	69	35	52	M	33	43	13	0	-	-	RA DZ BR	M	M	0.14	29.58	30.24	3.8	19	7.5	28	250	22	240	16				
17	63	41	52	M	48	50	13	0	-	-	RA BR HZ	M	M	0.10	29.38	30.02	7.7	22	8.3	24	230	18	230	17				
18	68	39	54	M	34	44	11	0	-	-	BR	M	M	0.00	29.41	30.06	6.1	33	11.0	31	360	24	360	18				
19	61	38	50	M	33	42	15	0	-	-	RA BR	M	M	0.10	29.44	30.04	15.6	08	15.9	32	080	25	080	19				
20	64	44	54	M	47	50	11	0	-	-	RA	M	M	0.72	28.87	29.48	12.3	18	14.5	35	150	25	140	20				
21	54	41	48	M	34	41	17	0	-	-	RA	M	M	T	28.97	29.62	19.3	23	19.8	58	230	44	240	21				
22	49	32	41	M	31	36	24	0	-	-	RA SN BR	M	M	0.16	28.99	29.65	14.9	25	15.9	37	230	30	230	22				
23	37	30	34	M	23	30	31	0	-	-	SN	M	M	T	29.17	29.86	15.6	28	16.2	31	290	24	300	23				
24	44	29	37	M	22	31	28	0	-	-	M	M	M	0.00	29.34	30.02	13.1	29	13.8	35	280	24	300	24				
25	50	25	38	M	25	33	27	0	-	-	M	M	M	0.00	29.28	29.93	4.2	01	5.5	20	030	17	020	25				
26	54	30	42	M	31	38	23	0	-	-	RA	M	M	0.00	29.17	29.83	7.8	33	8.1	23	330	17	310	26				
27	50	39	45	M	36	40	20	0	-	-	RA BR	M	M	0.03	29.22	29.90	8.1	32	9.4	19	340	15	340	27				
28	62	36	49	M	38	43	16	0	-	-	M	M	M	0.00	29.34	29.98	6.7	25	9.3	22	230	17	220	28				
29	65	36	51	M	39	45	14	0	-	-	BR	M	M	0.00	29.18	29.82	7.1	21	7.5	20	230	16	200	29				
30	66	40	53	M	40	47	12	0	-	-	HZ	M	M	0.00	29.15	29.82	4.3	03	5.0	21	040	17	030	30				
	55.8	35.2	45.5		33.6	40.0	19.2	0.0	<----Monthly Averages Totals---->				M	M	3.01	29.33	29.98	3.4	25	10.9	<Monthly Average							
	M	M	M		<-----Departure From Normal----->												M											
Degree Days Monthly Season to Date												Greatest 24-hr Precipitation: 0.82 Date: 19-20 Greatest 24-hr Snowfall: M Date: M Greatest Snow Depth: M Date: M Number of Days with -----> Max Temp >=90: 0 Number of Days with -----> Max Temp <=32: 0 Thunderstorms : 0 Max Temp >=90: 0 Min Temp <=32: 9 Min Temp <=0 : 0 Heavy Fog : 1													Sea Level Pressure Date (LST) Maximum 30.42 15 2353 Minimum 29.37 20 1453		Precipitation >=.01 inch: 13 Precipitation >=.10 inch: 10 Snowfall >=1.0 inch : M	
* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.												Data Version: VER3																

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)

NOAA, National Climatic Data Center

Month: 05/2015

Station Location: NIAGARA FALLS INTL AIRPORT (04724)

NIAGARA FALLS, NY

Lat. 43.108 Lon. -78.938

Elevation(Ground): 585 ft. above sea level

D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees		Sun		Significant Weather	Snow/Ice on Ground(In)	Precipitation (In)	Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees						D a t e					
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST		1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max 5-second Speed	Dir	max 2-minute Speed	Dir			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
01	69	39	54	M	39	47	11	0	-	-	M	M	M	0.00	29.34	29.99	4.4	35	6.4	20	340	15	350	01			
02	71	39	55	M	38	47	10	0	-	-	M	M	M	0.00	29.39	30.03	6.3	22	6.8	20	210	16	220	02			
03	75	45	60	M	39	50	5	0	-	-	M	M	M	0.00	29.40	30.05	9.5	22	9.8	26	230	22	220	03			
04	80	49	65	M	46	54	0	0	-	-	RA	M	M	T	29.44	30.08	11.3	23	12.3	42	240	32	250	04			
05	66	42	54	M	47	51	11	0	-	-	RA BR HZ		M	M	T	29.61	30.27	1.6	36	3.6	13	360	10	360	05		
06	75	51	63	M	42	52	2	0	-	-	M	M	M	0.00	29.60	30.23	5.5	07	6.7	20	110	16	040	06			
07	79	45	62	M	50	56	3	0	-	-	M	M	M	0.00	29.51	30.13	0.5	36	3.0	16	350	13	340	07			
08	87	52	70	M	54	61	0	5	-	-	BR	M	M	M	0.00	29.41	30.03	5.3	22	5.6	21	210	17	210	08		
09	88*	57	73	M	56	63	0	8	-	-	HZ	M	M	M	0.00	29.41	30.03	7.6	22	8.8	28	220	21	210	09		
10	82	62	72	M	61	65	0	7	-	-	M	M	M	T	29.42	30.04	4.8	21	6.3	19	310	17	310	10			
11	84	54	69	M	60	63	0	4	-	-	TSRA RA BR		M	M	M	0.50	29.31	29.91	4.1	22	6.5	45	280	24	270	11	
12	66	51	59	M	48	53	6	0	-	-	RA	M	M	M	T	29.23	29.89	18.8	24	19.2	42	220	33	220	12		
13	56	38	47*	M	37	43	18	0	-	-	M	M	M	T	29.59	30.28	10.3	30	11.2	32	330	24	310	13			
14	66	35	51	M	34	43	14	0	-	-	M	M	M	0.00	29.76	30.40	2.0	09	4.2	18	020	12	050	14			
15	67	48	58	M	45	52	7	0	-	-	RA	M	M	M	0.06	29.49	30.12	5.3	19	6.8	21	210	18	220	15		
16	74	57	66	M	58	60	0	1	-	-	FG+ BR HZ		M	M	M	0.00	29.42	30.06	5.3	22	6.6	20	220	16	220	16	
17	81	59	70	M	57	62	0	5	-	-	M	M	M	0.00	29.50	30.13	3.2	07	4.6	14	070	13	070	17			
18	82	63	73	M	63	66	0	8	-	-	HZ	M	M	M	T	29.38	29.98	11.3	22	11.7	31	220	24	230	18		
19	66	45	56	M	47	53	9	0	-	-	BR	M	M	M	0.00	29.30	29.95	11.8	28	14.0	30	280	23	300	19		
20	57	39	48	M	32	40	17	0	-	-	M	M	M	0.00	29.44	30.09	9.8	27	12.4	26	280	20	280	20			
21	63	45	54	M	34	44	11	0	-	-	M	M	M	0.00	29.31	29.95	10.6	22	10.9	29	220	25	220	21			
22	61	39	50	M	32	42	15	0	-	-	M	M	M	0.00	29.41	30.10	7.3	31	9.5	32	320	23	320	22			
23	64	31*	48	M	28	41	17	0	-	-	M	M	M	0.00	29.71	30.37	9.5	22	9.9	29	200	22	210	23			
24	78	46	62	M	42	53	3	0	-	-	RA	M	M	M	0.00	29.60	30.22	10.2	21	10.3	27	210	22	210	24		
25	82	59	71	M	56	62	0	6	-	-	RA	M	M	T	29.42	30.04	10.2	21	11.7	40	220	26	220	25			
26	81	64	73*	M	61	66	0	8	-	-	M	M	M	0.00	29.41	30.03	11.5	21	12.1	29	230	23	230	26			
27	82	62	72	M	60	64	0	7	-	-	RA	M	M	M	0.08	29.35	29.98	16.8	23	17.1	45	270	35	270	27		
28	77	58	68	M	53	59	0	3	-	-	M	M	M	0.00	29.54	30.19	6.6	28	9.2	30	240	23	290	28			
29	85	53	69	M	56	62	0	4	-	-	RA	M	M	T	29.54	30.14	5.7	19	7.3	24	190	21	210	29			
30	84	59	72	M	63	67	0	7	-	-	RA BR		M	M	M	0.02	29.34	29.97	8.9	24	14.1	38	220	28	240	30	
31	59	44	52	M	44	46	13	0	-	-	RA BR		M	M	M	1.76	29.49	30.16	16.3	05	16.8	35	070	26	070	31	
	73.8	49.4	61.6		47.8	54.4	5.5	2.4	<-----Monthly Averages Totals----->						M	M	2.42	29.45	30.09	5.2	23	9.5	<Monthly Average				

IVI M M

Total Departure Total Departure

Heating: 172 M M M

Cooling: 73 M M M

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EXTREME FOR THE MONTH - LAST

Greatest 24-hr Precipitation: 1.76 Date: 31

Greatest 24-hr Snowfall: M Date: M

Greatest Snow Depth: M Date: M

Time

(LST)

minimum 20.77 12 0153

	Max Temp >=90: 0	Min Temp <=32: 1
Number of Days with ----->	Max Temp <=32: 0	Min Temp <=0 : 0
	Thunderstorms: 1	Heavy Fog: 1

Number of Days with ----->Max Temp <=32: 0 Min Temp <=0 : 0
Thunderstorms : 1 Heavy Fog : 1

Data Version: VER3

* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)												Station Location: NIAGARA FALLS INTL AIRPORT (04724) NIAGARA FALLS, NY Lat. 43.108 Lon. -78.938 Elevation(Ground): 585 ft. above sea level																
D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees			Sun		Significant Weather	Snow/Ice on Ground(In)	Precipitation (In)	Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees								D a t e			
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST	1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max 5-second Speed	Dir	max 2-minute Speed	Dir					
	Depth	Water Equiv	Snow Fall	Water Equiv																								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26			
01	56	44	50*	M	46	48	15	0	-	-	DZ BR	M	M	M	0.01	29.52	30.19	9.7	04	10.0	26	050	20	050	01			
02	68	47	58	M	46	52	7	0	-	-		M	M	M	0.00	29.54	30.19	6.9	05	7.8	21	050	16	080	02			
03	73	45	59	M	47	53	6	0	-	-		M	M	M	0.00	29.53	30.16	7.6	08	8.1	20	100	16	060	03			
04	76	50	63	M	55	59	2	0	-	-		M	M	M	0.00	29.47	30.09	3.0	20	4.6	17	240	13	170	04			
05	79	61	70	M	60	63	0	5	-	-		M	M	T		29.36	29.98	2.6	24	9.7	36	300	26	310	05			
06	66	46	56	M	42	50	9	0	-	-		M	M	M	0.00	29.49	30.14	9.5	05	10.0	23	020	18	040	06			
07	80	41*	61	M	50	56	4	0	-	-	RA BR VCTS	M	M	M	0.17	29.34	29.93	8.3	20	10.2	23	230	18	200	07			
08	72	61	67	M	61	63	0	2	-	-	TSRA RA BR	M	M	M	0.85	29.05	29.65	12.7	22	13.3	35	260	25	250	08			
09	68	56	62	M	59	60	3	0	-	-	RA BR	M	M	M	0.36	29.05	29.69	6.5	23	7.8	22	200	17	210	09			
10	80	55	68	M	57	61	0	3	-	-	BR	M	M	M	0.11	29.10	29.73	12.4	23	14.5	42	220	31	220	10			
11	74	56	65	M	54	59	0	0	-	-		M	M	M	0.00	29.28	29.92	6.5	23	7.4	21	220	15	220	11			
12	78	57	68	M	59	61	0	3	-	-	RA DZ BR VCTS	M	M	M	0.20	29.23	29.87	1.8	01	6.6	30	310	26	310	12			
13	74	58	66	M	58	61	0	1	-	-		M	M	M	0.00	29.40	30.04	4.8	04	5.9	16	020	13	030	13			
14	77	62	70	M	64	66	0	5	-	-	RA FG+ BR	M	M	M	0.65	29.36	29.97	3.2	20	5.1	16	210	13	220	14			
15	77	63	70	M	66	67	0	5	-	-	RA DZ FG+ FG BR	M	M	M	0.01	29.29	29.91	5.5	21	6.0	20	220	16	220	15			
16	80	62	71	M	61	65	0	6	-	-	RA BR	M	M	M	0.06	29.28	29.94	6.4	30	10.1	24	310	18	320	16			
17	76	58	67	M	55	60	0	2	-	-		M	M	M	0.00	29.47	30.08	3.3	09	6.8	18	110	14	110	17			
18	78	59	69	M	62	65	0	4	-	-	RA BR	M	M	M	0.03	29.30	29.91	5.5	22	6.6	23	230	18	220	18			
19	69	55	62	M	52	57	3	0	-	-		M	M	M	0.00	29.39	30.03	7.0	05	8.0	21	050	17	060	19			
20	77	50	64	M	58	61	1	0	-	-	RA HZ	M	M	T		29.31	29.92	1.4	12	3.5	17	200	14	190	20			
21	81*	61	71	M	62	65	0	6	-	-	RA	M	M	M	0.04	29.15	29.79	8.4	25	9.5	26	220	23	220	21			
22	80	61	71*	M	59	63	0	6	-	-	TSRA RA	M	M	M	0.01	29.32	29.92	7.0	20	7.7	32	210	25	200	22			
23	79	60	70	M	60	64	0	5	-	-		M	M	M	0.29	29.15	29.81	14.7	26	18.1	45	210	32	300	23			
24	76	53	65	M	53	58	0	0	-	-		M	M	M	0.00	29.44	30.07	6.0	24	8.2	25	230	21	220	24			
25	79	58	69	M	55	60	0	4	-	-		M	M	M	0.00	29.41	30.02	1.1	16	7.2	21	030	17	040	25			
26	75	57	66	M	51	58	0	1	-	-	BR	M	M	M	0.00	29.41	30.05	8.4	06	8.9	21	060	17	060	26			
27	64	56	60	M	54	57	5	0	-	-	RA BR	M	M	M	1.40	29.29	29.90	12.7	08	12.9	35	070	25	070	27			
28	60	54	57	M	54	55	8	0	-	-	RA DZ BR	M	M	M	0.13	29.08	29.72	4.6	02	10.0	22	070	17	070	28			
29	74	57	66	M	55	59	0	1	-	-		M	M	M	0.00	29.23	29.88	4.5	26	7.1	18	280	14	200	29			
30	74	59	67	M	60	62	0	2	-	-	TSRA RA DZ BR	M	M	M	0.13	29.18	29.79	5.1	20	8.0	21	230	17	230	30			
	74.0	55.4	64.7		55.8	59.6	2.1	2.0	<----Monthly Averages Totals----->					M	M	4.45	29.31	29.94	1.2	22	8.7	<Monthly Average						
	M	M	M		<-----Departure From Normal----->												M											
Degree Days Monthly Season to Date												Greatest 24-hr Precipitation: 1.48 Date: 27-28 Greatest 24-hr Snowfall: M Date: M Greatest Snow Depth: M Date: M Number of Days with -----> Max Temp >=90: 0 Number of Days with -----> Max Temp <=32: 0 Thunderstorms : 3 Heavy Fog : 2													Sea Level Pressure Date Time Maximum 30.23 03 0851 Minimum 29.59 09 0253			
Total Departure Total Departure												Max Temp >=90: 0 Min Temp <=32: 0 Max Temp <=32: 0 Min Temp <=0 : 0 Thunderstorms : 3 Heavy Fog : 2													Precipitation >=.01 inch: 16 Precipitation >=.10 inch: 10 Snowfall >=1.0 inch : M			
Heating: 63 M M M Cooling: 61 M M M																									Data Version: VER3			
* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.																												

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)												Station Location: NIAGARA FALLS INTL AIRPORT (04724) NIAGARA FALLS, NY Lat. 43.108 Lon. -78.938 Elevation(Ground): 585 ft. above sea level																										
D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees			Sun		Significant Weather	Snow/Ice on Ground(In)	Precipitation (In)	Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees								D a t e													
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST	1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max 5-second Speed	Dir	max 2-minute Speed	Dir															
	Depth	Water Equiv	Snow Fall	Water Equiv																																		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26													
01	74	61	68	M	58	62	0	3	-	-	BR HZ	M	M	M	T	29.15	29.79	9.1	28	10.6	24	290	21	290	01													
02	71	51	61*	M	50	56	4	0	-	-		M	M	M	0.00	29.33	29.96	4.1	01	5.0	17	030	13	350	02													
03	75	49*	62	M	48	54	3	0	-	-		M	M	M	0.00	29.34	29.97	2.3	04	4.1	23	030	15	040	03													
04	76	56	66	M	51	58	0	1	-	-		M	M	M	0.00	29.30	29.95	2.3	34	6.7	14	220	12	220	04													
05	79	59	69	M	59	63	0	4	-	-		M	M	M	0.00	29.47	30.10	5.4	22	5.8	20	200	13	220	05													
06	86	60	73	M	63	67	0	8	-	-	TS	M	M	M	0.00	29.41	30.02	2.1	19	4.1	18	240	14	240	06													
07	86	62	74	M	67	69	0	9	-	-	RA BR	M	M	M	0.12	29.26	29.87	10.5	22	13.2	32	230	25	220	07													
08	70	59	65	M	53	58	0	0	-	-		M	M	M	0.00	29.41	30.05	5.8	03	7.9	20	320	16	320	08													
09	69	57	63	M	57	59	2	0	-	-	RA DZ BR	M	M	M	0.26	29.31	29.94	1.8	03	5.2	16	010	14	360	09													
10	79	52	66	M	55	60	0	1	-	-	FG BR	M	M	M	0.00	29.42	30.06	2.7	25	3.6	15	220	13	240	10													
11	81	58	70	M	59	63	0	5	-	-	BR	M	M	M	0.00	29.48	30.11	4.8	21	5.1	18	220	14	220	11													
12	82	63	73	M	61	65	0	8	-	-		M	M	M	0.00	29.41	30.01	3.3	21	4.4	14	230	10	220	12													
13	85	63	74	M	62	67	0	9	-	-	RA	M	M	M	T	29.20	29.77	4.3	19	6.4	24	190	18	190	13													
14	73	67	70	M	67	68	0	5	-	-	RA BR	M	M	M	0.30	28.94	29.55	3.9	17	7.6	26	040	20	030	14													
15	70	54	62	M	49	55	3	0	-	-		M	M	M	T	29.25	29.92	10.0	02	10.2	29	020	22	030	15													
16	76	50	63	M	51	57	2	0	-	-		M	M	M	0.00	29.44	30.07	4.0	07	5.4	18	030	15	030	16													
17	78	57	68	M	61	64	0	3	-	-	RA	M	M	M	0.05	29.29	29.89	6.7	19	7.7	23	180	18	190	17													
18	84	69	77	M	70	72	0	12	-	-	BR	M	M	M	0.02	29.21	29.83	7.3	23	8.4	22	190	17	200	18													
19	85	70	78	M	69	72	0	13	-	-	BR VCTS	M	M	M	0.65	29.18	M	10.5	23	11.8	42	220	35	200	19													
20	81	62	72	M	61	65	0	7	-	-		M	M	M	0.00	29.13	29.73	8.3	23	8.8	24	220	20	230	20													
21	78	60	69	M	57	63	0	4	-	-		M	M	M	T	29.07	29.69	9.6	29	11.0	25	310	20	290	21													
22	76	58	67	M	50	58	0	2	-	-		M	M	M	0.00	29.22	29.86	11.4	30	11.6	27	290	21	290	22													
23	78	53	66	M	51	58	0	1	-	-		M	M	M	T	29.31	29.95	5.7	31	6.2	23	320	17	330	23													
24	81	55	68	M	53	60	0	3	-	-		M	M	M	0.00	29.34	29.97	5.4	22	5.7	18	210	15	220	24													
25	85	63	74	M	62	67	0	9	-	-	RA	M	M	M	0.25	29.29	29.90	10.2	22	10.6	30	240	24	220	25													
26	85	63	74	M	64	67	0	9	-	-		M	M	M	0.00	29.29	29.92	1.4	35	3.8	17	350	13	340	26													
27	88	62	75	M	62	67	0	10	-	-	BR	M	M	M	0.00	29.36	29.98	1.7	27	2.9	14	330	12	220	27													
28	89	65	77	M	61	67	0	12	-	-		M	M	M	0.00	29.37	29.99	1.8	31	2.8	15	340	12	330	28													
29	90*	65	78*	M	63	69	0	13	-	-		M	M	M	0.00	29.31	29.90	5.4	22	6.3	20	210	16	210	29													
30	85	69	77	M	61	67	0	12	-	-		M	M	M	0.00	29.21	29.82	10.3	25	11.6	33	230	24	230	30													
31	84	60	72	M	59	65	0	7	-	-	RA	M	M	M	0.07	29.21	29.82	9.4	24	11.3	36	230	29	230	31													
	80.0	59.7	69.9		58.5	63.3	0.5	5.5	<----Monthly Averages Totals----->			M	M	1.72	29.29	29.91	3.2	25	7.3	<Monthly Average																		
	M	M	M						<-----Departure From Normal----->			M																										
Degree Days Monthly Season to Date Total Departure Total Departure Heating: 14 M M M Cooling: 170 M M M												Greatest 24-hr Precipitation: 0.65 Date: 19 Greatest 24-hr Snowfall: M Date: M Greatest Snow Depth: M Date: M Number of Days with -----> Max Temp >=90: 1 Number of Days with -----> Max Temp <=32: 0 Thunderstorms : 1 Max Temp <=32: 0 Min Temp <=0 : 0 Heavy Fog : 0														Sea Level	Pressure	Date	Time (LST)	Maximum 30.15	11	0854	Minimum 29.49	14	1519	Precipitation >=.01 inch: 8 Precipitation >=.10 inch: 5 Snowfall >=1.0 inch : M		
* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.												Data Version: VER3																										

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)												Station Location: NIAGARA FALLS INTL AIRPORT (04724) NIAGARA FALLS, NY Lat. 43.108 Lon. -78.938 Elevation(Ground): 585 ft. above sea level																					
D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees			Sun		Significant Weather	Snow/Ice on Ground(In)	Precipitation (In)	Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees								D a t e								
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST	1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max 5-second Speed	Dir	max 2-minute Speed	Dir										
	Depth	Water Equiv	Snow Fall	Water Equiv																													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26								
01	80	59	70	M	57	62	0	5	-	-	M	M	M	0.20	29.20	29.83	7.5	26	8.9	31	220	26	220	01									
02	81	61	71	M	59	64	0	6	-	-	M	M	M	0.04	29.18	29.78	9.7	23	11.4	52	330	37	320	02									
03	80	63	72	M	60	64	0	7	-	-	M	M	M	0.02	29.10	29.72	11.3	24	12.0	28	220	22	220	03									
04	80	61	71	M	58	62	0	6	-	-	M	M	M	0.16	29.23	29.87	4.6	25	6.5	32	220	25	220	04									
05	74	56	65	M	53	59	0	0	-	-	M	M	M	0.00	29.34	29.98	10.1	31	10.4	26	310	21	330	05									
06	76	52	64	M	52	58	1	0	-	-	M	M	M	0.00	29.38	29.99	2.3	34	4.1	16	350	10	010	06									
07	79	53	66	M	53	59	0	1	-	-	M	M	M	0.00	29.33	29.96	5.4	06	5.9	22	040	18	060	07									
08	76	55	66	M	53	58	0	1	-	-	M	M	M	0.00	29.39	30.03	7.4	08	7.9	24	080	18	080	08									
09	80	50	65	M	56	60	0	0	-	-	M	M	M	0.00	29.40	30.03	5.3	06	5.9	22	070	15	070	09									
10	83	56	70	M	61	63	0	5	-	-	M	M	M	0.50	29.25	29.85	0.7	02	4.1	26	340	21	340	10									
11	78	63	71	M	61	65	0	6	-	-	M	M	M	0.00	29.18	29.81	10.4	31	10.7	23	300	18	310	11									
12	75	55	65	M	54	59	0	0	-	-	M	M	M	0.01	29.33	29.97	9.0	32	9.4	24	300	18	320	12									
13	77	51	64	M	56	60	1	0	-	-	M	M	M	0.00	29.41	30.04	10.1	22	10.3	27	230	23	230	13									
14	78	69	74	M	66	68	0	9	-	-	M	M	M	0.62	29.41	30.04	12.8	22	13.1	33	240	24	240	14									
15	83	65	74	M	66	69	0	9	-	-	M	M	M	0.06	29.46	30.09	3.7	23	5.9	15	150	12	240	15									
16	85	65	75	M	66	69	0	10	-	-	M	M	M	0.00	29.48	30.09	7.9	22	8.2	20	220	17	210	16									
17	86	66	76	M	67	70	0	11	-	-	M	M	M	0.00	29.41	30.02	8.9	21	9.1	23	210	18	210	17									
18	82	68	75	M	68	70	0	10	-	-	M	M	M	0.06	29.33	29.93	4.0	20	4.9	22	200	18	200	18									
19	87*	68	78*	M	67	71	0	13	-	-	M	M	M	0.00	29.23	29.84	6.8	18	7.6	24	180	17	180	19									
20	78	66	72	M	64	67	0	7	-	-	M	M	M	0.68	29.18	29.80	11.8	22	14.1	38	210	26	240	20									
21	73	58	66	M	54	59	0	1	-	-	M	M	M	0.00	29.41	30.07	6.5	26	7.4	21	290	17	260	21									
22	76	52	64	M	53	57	1	0	-	-	M	M	M	0.00	29.52	30.16	2.4	02	3.0	17	350	12	040	22									
23	80	53	67	M	56	61	0	2	-	-	M	M	M	0.00	29.36	29.95	2.0	14	4.0	21	200	14	210	23									
24	75	62	69	M	56	61	0	4	-	-	M	M	M	0.00	29.20	29.82	11.3	23	12.8	28	210	22	220	24									
25	70	57	64	M	51	56	1	0	-	-	M	M	M	T	29.26	29.90	8.4	24	9.4	23	230	18	210	25									
26	68	56	62	M	53	57	3	0	-	-	M	M	M	0.02	29.37	30.02	7.0	28	8.1	22	300	17	300	26									
27	68	55	62*	M	52	57	3	0	-	-	M	M	M	0.00	29.49	30.13	5.1	30	6.0	18	310	15	320	27									
28	75	50*	63	M	54	58	2	0	-	-	M	M	M	0.00	29.54	30.18	3.5	21	4.6	21	260	14	360	28									
29	79	54	67	M	57	61	0	2	-	-	M	M	M	0.00	29.49	30.12	2.5	21	3.5	15	200	12	200	29									
30	80	65	73	M	63	66	0	8	-	-	M	M	M	T	29.42	30.04	3.6	22	4.7	17	200	13	230	30									
31	83	64	74	M	67	69	0	9	-	-	M	M	M	0.00	29.39	30.01	6.5	23	7.4	23	280	18	220	31									
	78.2	59.0	68.6		58.5	62.5	0.4	4.3	<----Monthly Averages Totals----->		M	M	2.37	29.34	29.97	4.1	24	7.8	<Monthly Average														
	M	M	M		<-----Departure From Normal----->										M																		
Degree Days Monthly Season to Date												Greatest 24-hr Precipitation: 0.68 Date: 20 Greatest 24-hr Snowfall: M Date: M Greatest Snow Depth: M Date: M Max Temp >=90: 0 Number of Days with -----> Max Temp <=32: 0 Thunderstorms : 3														Sea Level Pressure Date (LST) Maximum 30.22 28 0751 Minimum 29.62 02 2153		Min Temp <=32: 0 Min Temp <=0 : 0 Heavy Fog : 0		Precipitation >=.01 inch: 11 Precipitation >=.10 inch: 5 Snowfall >=1.0 inch : M			
* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.																										Data Version: VER3							

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)												Station Location: NIAGARA FALLS INTL AIRPORT (04724) NIAGARA FALLS, NY Lat. 43.108 Lon. -78.938 Elevation(Ground): 585 ft. above sea level																					
D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees			Sun		Significant Weather	Snow/Ice on Ground(In)	Precipitation (In)	Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees								D a t e								
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST	1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max 5-second Speed	Dir	max 2-minute Speed	Dir										
	Depth	Water Equiv	Snow Fall	Water Equiv																													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26								
01	83	61	72	M	66	68	0	7	-	-	FG+ FG BR	M	M	M	0.00	29.42	30.05	5.3	22	5.4	18	200	15	220	01								
02	87	65	76	M	68	70	0	11	-	-	FG+ FG BR HZ	M	M	M	0.00	29.36	29.97	6.4	22	6.9	20	240	16	220	02								
03	86	68	77	M	69	71	0	12	-	-	FG+ BR HZ VCTS	M	M	M	0.00	29.30	29.92	0.4	32	3.8	11	340	9	350	03								
04	86	66	76	M	62	67	0	11	-	-	BR	M	M	M	0.00	29.41	30.05	8.9	08	9.2	24	080	21	060	04								
05	88	63	76	M	65	69	0	11	-	-		M	M	M	0.00	29.49	30.12	4.2	19	6.4	19	240	14	250	05								
06	87	70	79	M	67	70	0	14	-	-		M	M	M	0.00	29.47	30.08	8.5	21	8.9	21	220	16	240	06								
07	89*	69	79	M	68	71	0	14	-	-		M	M	M	0.00	29.37	29.98	11.3	22	11.5	33	250	24	240	07								
08	88	72	80*	M	69	72	0	15	-	-	RA BR	M	M	M	T	29.31	29.90	6.3	22	7.2	22	200	17	230	08								
09	78	63	71	M	63	67	0	6	-	-		M	M	M	0.18	29.22	29.85	5.5	29	9.1	26	280	21	310	09								
10	77	54	66	M	52	58	0	1	-	-		M	M	M	0.00	29.29	29.92	4.3	07	5.2	20	100	15	080	10								
11	78	50	64	M	52	57	1	0	-	-	RA BR	M	M	M	0.07	29.23	29.86	4.0	36	4.7	21	350	17	350	11								
12	59	53	56	M	54	55	9	0	-	-	RA BR	M	M	M	2.16	29.20	29.81	11.6	02	12.6	26	010	21	360	12								
13	55	52	54*	M	50	52	11	0	-	-	RA BR	M	M	M	0.38	29.17	29.83	11.2	28	12.3	26	290	20	280	13								
14	72	45	59	M	49	54	6	0	-	-		M	M	M	0.00	29.43	30.10	10.5	24	11.2	26	220	23	230	14								
15	78	55	67	M	57	61	0	2	-	-		M	M	M	0.00	29.64	30.29	6.3	21	6.5	22	230	18	220	15								
16	81	54	68	M	58	62	0	3	-	-	BR	M	M	M	0.00	29.65	30.27	4.3	21	4.5	20	210	12	240	16								
17	81	56	69	M	58	62	0	4	-	-	BR	M	M	M	0.00	29.49	30.10	4.6	21	4.8	20	210	16	210	17								
18	81	55	68	M	57	62	0	3	-	-	BR	M	M	M	0.00	29.31	29.92	4.8	22	5.4	25	210	21	220	18								
19	76	58	67	M	60	63	0	2	-	-	TSRA RA	M	M	M	0.34	29.16	29.80	8.7	24	13.3	41	220	33	220	19								
20	66	48	57	M	47	52	8	0	-	-		M	M	M	0.00	29.51	30.16	4.2	03	4.8	14	040	12	040	20								
21	69	45*	57	M	47	51	8	0	-	-		M	M	M	0.00	29.57	30.21	5.6	08	6.7	20	080	17	070	21								
22	74	47	61	M	52	56	4	0	-	-		M	M	M	0.00	29.59	30.24	1.6	13	3.6	13	010	8	030	22								
23	75	48	62	M	52	56	3	0	-	-	BR	M	M	M	0.00	29.64	30.29	1.4	36	1.8	15	330	12	350	23								
24	78	51	65	M	55	59	0	0	-	-		M	M	M	0.00	29.68	30.34	4.8	08	5.3	18	050	15	040	24								
25	73	54	64	M	54	57	1	0	-	-		M	M	M	0.00	29.70	30.34	7.7	06	8.0	18	060	14	060	25								
26	74	52	63	M	54	57	2	0	-	-		M	M	M	0.00	29.75	30.39	7.2	08	7.6	17	040	14	050	26								
27	76	55	66	M	53	58	0	1	-	-		M	M	M	0.00	29.64	30.25	6.8	18	7.4	19	210	16	200	27								
28	71	64	68	M	63	64	0	3	-	-	RA DZ BR	M	M	M	0.04	29.47	30.08	9.7	20	9.8	21	220	16	230	28								
29	69	55	62	M	62	63	3	0	-	-	RA DZ BR	M	M	M	0.51	29.33	29.95	0.6	31	9.1	28	030	22	050	29								
30	61	50	56	M	48	52	9	0	-	-	RA DZ BR	M	M	M	0.09	29.41	30.09	13.1	04	13.4	27	030	22	030	30								
	76.5	56.6	66.6		57.7	61.2	2.2	4.0	<----Monthly Averages Totals----->				M	M	3.77	29.44	30.07	1.3	21	7.5	<Monthly Average												
	M	M	M		<-----Departure From Normal----->												M																
Degree Days Monthly Season to Date												Greatest 24-hr Precipitation: 2.19 Date: 11-12 Greatest 24-hr Snowfall: M Date: M Greatest Snow Depth: M Date: M Number of Days with -----> Max Temp >=90: 0 Number of Days with -----> Max Temp <=32: 0 Thunderstorms : 1 Heavy Fog : 3														Sea Level Pressure Date (LST) Maximum 30.44 26 1026 Minimum 29.67 19 1500							
Heating: 65 M M M Cooling: 120 M M M												Min Temp <=32: 0 Min Temp <=0 : 0 Thunderstorms : 1 Heavy Fog : 3 Precipitation >=.01 inch: 8 Precipitation >=.10 inch: 5 Snowfall >=1.0 inch : M														Data Version: VER3							
* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.																																	

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)

NOAA, National Climatic Data Center

Month: 10/2015

Station Location: NIAGARA FALLS INTL AIRPORT (04724)

NIAGARA FALLS, NY

Lat. 43.108 Lon. -78.938

Elevation(Ground): 585 ft. above sea level

Date	Temperature (Fahrenheit)						Degree Days Base 65 Degrees		Sun		Significant Weather	Snow/Ice on Ground(In)	Precipitation (In)	Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees						Date				
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST		1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max 5-second		max 2-minute			
												Depth	Water Equiv	Water Fall	Water Equiv						Speed	Dir	Speed	Dir		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	
01	56	45	51	M	38	44	14	0	-	-	M	M	M	0.00	29.65	30.32	13.7	05	13.8	31	070	25	060	01		
02	53	45	49	M	36	42	16	0	-	-	M	M	M	0.00	29.74	30.40	16.8	06	17.0	39	060	30	060	02		
03	49	45	47	M	37	43	18	0	-	-	RA	M	M	0.02	29.71	30.37	18.5	07	18.6	37	070	30	070	03		
04	64	47	56	M	45	49	9	0	-	-	RA DZ	M	M	0.01	29.64	30.28	7.3	08	7.7	20	110	15	100	04		
05	62	44	53	M	49	51	12	0	-	-	DZ BR	M	M	M	T	29.54	30.19	2.8	02	3.4	13	350	10	340	05	
06	61	54	58	M	53	55	7	0	-	-	RA BR	M	M	M	T	29.46	30.09	2.1	31	3.2	12	340	9	340	06	
07	67	49	58	M	51	54	7	0	-	-	RA BR	M	M	M	0.00	29.41	30.06	3.8	24	6.5	19	220	16	220	07	
08	65	43	54	M	44	49	11	0	-	-	RA BR	M	M	M	12	29.47	30.08	4.7	09	5.7	19	100	14	110	08	
09	63	41	52	M	51	53	13	0	-	-	RA BR	M	M	M	0.48	29.24	29.91	9.1	29	11.9	31	340	24	340	09	
10	59	40	50	M	42	46	15	0	-	-	RA	M	M	M	0.00	29.48	30.12	4.0	20	5.3	19	240	14	200	10	
11	66	49	58	M	48	53	7	0	-	-	RA	M	M	M	0.00	29.20	29.82	14.6	22	14.9	42	230	32	220	11	
12	73*	56	65*	M	48	55	0	0	-	-	RA	M	M	M	0.06	29.03	29.63	13.2	20	13.4	30	210	23	200	12	
13	64	54	59	M	49	53	6	0	-	-	RA	M	M	M	0.04	28.84	29.49	15.2	24	16.8	30	270	25	270	13	
14	56	39	48	M	41	45	17	0	-	-	RA	M	M	M	0.01	29.15	29.83	11.1	28	11.8	25	270	20	280	14	
15	62	39	51	M	43	47	14	0	-	-	RA	M	M	M	0.07	29.25	29.89	13.1	24	14.3	39	270	31	280	15	
16	57	36	47	M	37	42	18	0	-	-	TSRA	M	M	M	0.11	29.34	30.02	11.4	28	11.7	40	270	32	300	16	
17	44	35	40	M	28	35	25	0	-	-	RA	M	M	M	T	29.54	30.24	7.9	34	8.4	21	320	17	330	17	
18	44	31	38*	M	27	33	27	0	-	-	SN	M	M	M	T	29.68	30.37	4.7	33	6.2	24	330	18	330	18	
19	58	28*	43	M	32	40	22	0	-	-	RA BR	M	M	M	0.00	29.60	30.24	14.5	21	15.0	42	230	32	220	19	
20	63	53	58	M	46	51	7	0	-	-	RA BR	M	M	M	0.15	29.47	30.12	13.7	23	13.9	35	230	29	240	20	
21	63	52	58	M	49	53	7	0	-	-	RA BR VCTS	M	M	M	0.05	29.56	30.19	5.3	19	5.8	21	210	16	220	21	
22	64	46	55	M	45	51	10	0	-	-	RA	M	M	M	0.00	29.47	30.13	10.8	28	14.3	31	220	24	240	22	
23	52	33	43	M	33	39	22	0	-	-	RA	M	M	M	0.00	29.68	30.35	5.6	05	6.9	23	030	18	020	23	
24	61	41	51	M	43	48	14	0	-	-	RA BR	M	M	M	0.24	29.40	30.00	9.8	18	11.4	38	190	26	190	24	
25	59	41	50	M	41	46	15	0	-	-	RA BR	M	M	M	0.06	29.46	30.18	10.9	29	12.1	35	300	28	300	25	
26	53	31	42	M	32	37	23	0	-	-	RA	M	M	M	0.00	29.81	30.49	3.4	08	4.4	15	140	13	130	26	
27	55	35	45	M	35	40	20	0	-	-	RA BR	M	M	M	0.00	29.78	30.43	6.8	08	7.2	19	060	16	060	27	
28	62	46	54	M	51	53	11	0	-	-	RA BR	M	M	M	1.96	29.18	29.73	7.2	15	11.4	32	240	24	240	28	
29	61	43	52	M	37	43	13	0	-	-	RA	M	M	M	0.05	28.90	29.58	21.7	24	22.1	50	240	38	240	29	
30	48	32	40	M	33	38	25	0	-	-	RA	M	M	M	T	29.35	30.05	6.9	30	7.8	34	270	26	270	30	
31	52	29	41	M	34	39	24	0	-	-	RA	M	M	M	T	29.44	30.07	4.2	15	4.9	15	190	13	130	31	
	58.6	42.0	50.3		41.2	46.0	14.5	0.0			<-----Monthly Averages Totals----->	M	M	3.43		29.43	30.09	2.6	24	10.6	<Monthly Average					

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Total Departure Total Departure

Heating: 449 M M M

Cooling: 0 M M M

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* EXTREME FOR THE MONTH - LAST

Greatest 24-hr Precipitation: 1.97 Date: 28-29

Greatest 24-hr Snowfall: M Date: M

Greatest Snow Depth: M Date: M

Sea Level Pressure Data Time

(LST)

Winnipeg 20.39 12 0428

* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.

Data Version: VER3

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)												Station Location: NIAGARA FALLS INTL AIRPORT (04724) NIAGARA FALLS, NY Lat. 43.108 Lon. -78.938 Elevation(Ground): 585 ft. above sea level																													
D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees			Sun		Significant Weather	Snow/Ice on Ground(In)	Precipitation (In)	Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees								D a t e																
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST	1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max 5-second Speed	Dir	max 2-minute Speed	Dir																		
	Depth	Water Equiv	Snow Fall	Water Equiv																																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26																
01	59	44	52	M	46	50	13	0	-	-	RA	M	M	M	0.08	29.14	29.81	15.5	24	16.9	41	250	32	250	01																
02	59	36	48	M	40	44	17	0	-	-	BR	M	M	M	0.00	29.41	30.08	3.1	20	3.5	15	190	12	180	02																
03	68	45	57	M	46	51	8	0	-	-	BR	M	M	M	0.00	29.50	30.17	6.2	22	7.3	19	230	15	240	03																
04	72	40	56	M	44	50	9	0	-	-	BR	M	M	M	0.00	29.57	30.21	2.3	21	3.2	19	230	16	220	04																
05	72*	48	60*	M	53	56	5	0	-	-	RA	M	M	M	0.00	29.46	30.08	4.3	20	4.6	20	220	16	210	05																
06	67	50	59	M	52	56	6	0	-	-	RA	M	M	M	0.04	29.20	29.84	13.4	24	16.0	47	240	38	240	06																
07	54	36	45	M	37	42	20	0	-	-	RA	M	M	M	0.02	29.44	30.12	11.0	28	11.8	27	280	23	270	07																
08	50	33	42	M	32	37	23	0	-	-		M	M	M	0.00	29.71	30.39	6.9	26	8.1	22	230	18	230	08																
09	56	29	43	M	33	37	22	0	-	-		BR HZ	M	M	M	0.00	29.68	30.34	2.7	09	3.7	13	050	10	040	09															
10	52	34	43	M	44	45	22	0	-	-	RA DZ BR	M	M	M	0.31	29.41	30.04	4.9	08	5.1	14	100	12	080	10																
11	51	38	45	M	44	46	20	0	-	-	RA DZ BR	M	M	M	0.04	29.30	29.95	4.6	24	6.3	17	260	14	250	11																
12	58	40	49	M	42	45	16	0	-	-	RA BR	M	M	M	0.08	28.90	29.52	16.6	23	19.8	55	240	41	250	12																
13	49	39	44	M	33	39	21	0	-	-	RA	M	M	T		28.99	29.68	24.1	26	24.3	48	250	38	260	13																
14	43	33	38	M	28	34	27	0	-	-		M	M	M	0.00	29.48	30.19	13.7	28	14.7	32	310	25	310	14																
15	57	37	47	M	41	45	18	0	-	-		M	M	M	0.00	29.54	30.19	11.9	23	12.1	25	220	21	210	15																
16	58	38	48	M	38	42	17	0	-	-		M	M	M	0.00	29.60	30.29	0.9	08	6.0	14	100	12	080	16																
17	54	32	43	M	32	39	22	0	-	-		M	M	M	0.00	29.69	30.34	8.9	09	9.3	19	100	15	090	17																
18	63	44	54	M	44	50	11	0	-	-	RA	M	M	T		29.44	30.06	13.7	17	14.0	44	170	30	170	18																
19	63	43	53	M	45	51	12	0	-	-	RA	M	M	M	0.10	29.21	29.86	15.8	22	19.6	44	180	32	170	19																
20	45	28	37	M	20	32	28	0	-	-		M	M	M	0.00	29.49	30.18	13.0	26	13.7	37	250	29	260	20																
21	46	29	38	M	29	35	27	0	-	-	RA	M	M	T		29.42	30.02	4.1	11	6.7	42	220	33	210	21																
22	44	21	33	M	24	30	32	0	-	-	SN	M	M	M	0.02	29.28	30.00	15.6	26	16.2	53	220	41	230	22																
23	37	18*	28*	M	20	27	37	0	-	-	SN BR	M	M	M	0.01	29.48	30.16	5.3	23	7.1	21	210	16	200	23																
24	44	26	35	M	28	33	30	0	-	-	BR HZ	M	M	T		29.61	30.33	5.8	25	7.0	17	280	14	280	24																
25	53	25	39	M	27	35	26	0	-	-	BR HZ	M	M	M	0.00	29.86	30.55	6.0	16	6.7	23	180	18	180	25																
26	63	48	56	M	36	47	9	0	-	-		M	M	M	0.00	29.80	30.45	15.0	20	15.1	30	200	22	200	26																
27	62	38	50	M	42	48	15	0	-	-	RA BR	M	M	M	0.27	29.62	30.26	12.0	23	17.5	41	240	31	240	27																
28	38	31	35	M	31	34	30	0	-	-	RA DZ BR	M	M	M	0.03	29.66	30.34	6.1	02	6.4	15	010	13	360	28																
29	40	29	35	M	26	32	30	0	-	-		M	M	M	0.00	29.70	30.39	3.0	07	3.8	15	050	13	030	29																
30	45	30	38	M	26	33	27	0	-	-		M	M	M	0.00	29.67	30.34	6.8	08	7.3	16	080	12	060	30																
	54.1	35.4	44.7		36.1	41.5	20.0	0.0	<----Monthly Averages Totals----->				M	M	1.00	29.47	30.13	5.8	23	10.5	<Monthly Average																				
	M	M	M		<-----Departure From Normal----->												M																								
Degree Days Monthly Season to Date												Greatest 24-hr Precipitation: 0.35 Date: 10-11 Greatest 24-hr Snowfall: M Date: M Greatest Snow Depth: M Date: M Number of Days with -----> Max Temp >=90: 0 Number of Days with -----> Max Temp <=32: 0 Thunderstorms : 0 Max Temp >=90: 0 Min Temp <=32: 11 Min Temp <=0 : 0 Heavy Fog : 0														Sea Level Pressure Date (LST) Maximum 30.62 25 0853 Minimum 29.34 12 1307		Precipitation >=.01 inch: 11 Precipitation >=.10 inch: 3 Snowfall >=1.0 inch : M													
* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.												Data Version: VER3																													

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA (final)												Station Location: NIAGARA FALLS INTL AIRPORT (04724) NIAGARA FALLS, NY Lat. 43.108 Lon. -78.938 Elevation(Ground): 585 ft. above sea level																					
D a t e	Temperature (Fahrenheit)						Degree Days Base 65 Degrees			Sun		Significant Weather	Snow/Ice on Ground(In)	Precipitation (In)	Pressure(inches of Hg)		Wind: Speed=mph Dir=tens of degrees								D a t e								
	Max.	Min.	Avg.	Dep From Normal	Avg. Dew pt.	Avg Wet Bulb	Heating	Cooling	Sunrise LST	Sunset LST	1200 UTC	1800 UTC	2400 LST	2400 LST	Avg. Station	Avg. Sea Level	Resultant Speed	Res Dir	Avg. Speed	max 5-second Speed	Dir	max 2-minute Speed	Dir										
	Depth	Water	Snow	Fall	Water	Equiv																											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26								
01	54	39	47	M	41	44	18	0	-	-	RA DZ BR	M	M	M	0.02	29.29	29.96	4.3	12	7.0	15	100	13	200	01								
02	51	31	41	M	35	39	24	0	-	-	BR	M	M	M	0.02	29.18	29.81	3.5	33	5.7	19	260	15	280	02								
03	46	31	39	M	33	37	26	0	-	-	RA BR	M	M	M	T	29.41	30.06	11.0	28	11.5	28	290	23	290	03								
04	43	37	40	M	30	37	25	0	-	-	BR HZ	M	M	M	0.00	29.79	30.47	13.1	26	13.6	36	260	29	260	04								
05	47	30	39	M	32	35	26	0	-	-	FG+ MIFG BR HZ	M	M	M	0.00	29.99	30.67	4.1	23	4.7	17	240	14	240	05								
06	48	31	40	M	35	38	25	0	-	-	BR HZ	M	M	M	0.00	29.79	30.40	5.8	22	6.4	17	210	15	210	06								
07	44	29	37	M	32	36	28	0	-	-	BR HZ	M	M	M	0.00	29.55	30.21	1.3	30	3.7	13	310	12	310	07								
08	43	34	39	M	31	36	26	0	-	-	HZ	M	M	M	0.00	29.44	30.10	5.2	17	5.6	14	130	12	130	08								
09	58	38	48	M	38	43	17	0	-	-	RA DZ BR	M	M	M	0.01	29.21	29.85	10.3	19	11.2	32	200	22	190	09								
10	55	40	48	M	41	46	17	0	-	-	BR HZ	M	M	M	0.00	29.18	29.82	9.9	20	10.3	27	200	21	200	10								
11	59	42	51	M	39	46	14	0	-	-	M	M	M	M	0.00	29.11	29.79	16.8	23	17.7	49	260	39	240	11								
12	54	32	43	M	38	42	22	0	-	-	BR	M	M	M	T	29.41	30.08	2.5	06	3.0	10	070	8	060	12								
13	52	45	49	M	43	45	16	0	-	-	RA DZ BR	M	M	M	T	29.44	30.06	6.6	08	6.7	19	100	15	100	13								
14	72*	46	59*	M	47	51	6	0	-	-	RA	M	M	M	0.22	28.96	29.56	7.9	20	10.3	45	250	37	250	14								
15	52	39	46	M	37	42	19	0	-	-	DZ	M	M	M	T	29.02	29.73	13.0	26	15.5	36	260	30	270	15								
16	47	38	43	M	35	39	22	0	-	-	DZ BR	M	M	M	T	29.34	29.97	5.5	11	6.8	17	110	14	110	16								
17	52	38	45	M	36	42	20	0	-	-	RA	M	M	M	0.02	29.08	29.75	10.5	23	12.6	26	240	20	280	17								
18	40	30	35	M	21	30	30	0	-	-	SN	M	M	M	T	29.20	29.87	12.8	27	13.0	29	280	23	270	18								
19	33	25	29	M	15	25	36	0	-	-	RA DZ BR	M	M	M	0.00	29.41	30.14	18.6	26	18.7	37	260	30	260	19								
20	43	23*	33	M	19	29	32	0	-	-	RA FG+ BR	M	M	M	0.04	29.69	30.35	10.8	21	12.2	29	200	23	190	20								
21	52	43	48	M	34	42	17	0	-	-	RA FG+ BR	M	M	M	0.04	29.31	29.95	15.8	21	15.9	31	220	25	220	21								
22	57	44	51	M	47	49	14	0	-	-	RA FG+ BR	M	M	M	0.01	29.20	29.86	7.3	21	8.1	23	250	18	250	22								
23	65	37	51	M	47	50	14	0	-	-	RA FG+ FG MIFG BR	M	M	M	0.05	29.21	29.81	7.0	14	8.1	27	190	20	190	23								
24	66	43	55	M	40	47	10	0	-	-	RA	M	M	M	0.02	29.16	29.85	18.5	23	19.4	47	230	36	230	24								
25	49	34	42	M	37	40	23	0	-	-	RA	M	M	M	0.04	29.55	30.25	0.6	36	3.3	11	220	9	220	25								
26	44	30	37	M	32	36	28	0	-	-	RA BR	M	M	M	0.08	29.73	30.37	8.5	08	9.3	21	080	17	080	26								
27	44	34	39	M	34	37	26	0	-	-	RA BR	M	M	M	0.61	29.38	30.08	8.4	34	9.2	22	340	17	340	27								
28	34	24	29*	M	19	25	36	0	-	-	FZRA SN PL BR	M	M	M	0.45	29.75	30.40	15.1	06	16.9	36	080	26	070	28								
29	46	31	39	M	34	37	26	0	-	-	RA DZ BR	M	M	M	0.26	29.24	29.94	4.5	22	9.8	30	080	23	230	29								
30	39	35	37	M	32	35	28	0	-	-	RA DZ PL BR HZ	M	M	M	0.03	29.49	30.16	5.8	25	6.7	25	270	20	270	30								
31	36	32	34	M	26	31	31	0	-	-	SN	M	M	M	T	29.47	30.15	14.1	26	14.2	30	230	22	230	31								
	49.2	35.0	42.1		34.2	39.1	22.6	0.0			<----Monthly Averages Totals----->	M	M	M	1.88	29.39	30.05	4.9	23	10.2	<Monthly Average												
	M	M	M								<-----Departure From Normal----->	M																					
Degree Days Monthly Season to Date												Greatest 24-hr Precipitation: 0.71 Date: 28-29 Greatest 24-hr Snowfall: M Date: M Greatest Snow Depth: M Date: M Number of Days with -----> Max Temp >=90: 0 Number of Days with -----> Max Temp <=32: 0 Thunderstorms : 0														Sea Level Pressure Date (LST)							
Total Departure Total Departure												Maximum 30.72 05 1110 Minimum 29.34 14 1853 Min Temp <=32: 13 Min Temp <=0 : 0 Thunderstorms : 3 Heavy Fog : M														Precipitation >=.01 inch: 15 Precipitation >=.10 inch: 4 Snowfall >=1.0 inch : M							
Heating: 702 M M M Cooling: 0 M M M												Data Version: VER3																					
* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.												Data Version: VER3																					

Annual Climatological Summary

(2015)

Generated on 05/02/2016

Date	Temperature (F)													Precipitation (inches)										
	MMXT	MMNT	MNTM	DPNT	HTDD	CLDD	EMXT		EMNT		DT90	DX32	DT32	DT00	TPCP	DPNP	EMXP		TSNW	MXSD		DP01	DP05	DP10
Month	Mean Max.	Mean Min.	Mean	Depart. from Normal	Heating Degree Days	Cooling Degree Days	Highest	High Date	Lowest	Low Date	Number Of Days				Total	Depart. from Normal	Greatest Observed		Snow, Sleet			Number Of Days		
	Max >=90	Max <=32									Min <=32	Min <=0					Day	Date	Total Fall	Max Depth	Max Date	>=.10	>=.50	>=1.0
1	27.4	10.9	19.2	-4.6	1414	0	46	05	-7	15	0	26	31	5	2.49	-0.07	0.92	04	19.2	7	09	6	2	0
2	19.5	0.8	10.2	-15.2	1530	0	32	05	-13	17	0	28	28	16	1.35	-0.84	0.20	09	32.9	19	24	7	0	0
3	35.0	18.5	26.8	-6.4	1178	0	48	14	-1	06	0	10	29	2	0.95	-1.46	0.32	27	7.1	16	02	4	0	0
4	55.0	34.2	44.6	-0.6	605	0	78	14	23	01	0	0	10	0	3.01	0.32	0.56	20	0.2	0		10	1	0
5	74.0	48.5	61.3	4.9	175	67	88	10	31	23	0	0	1	0	0.90	-2.17	0.50	12	0.0	0		2	1	0
6	73.5	55.4	64.5	-1.6	71	63	81	22	41	07	0	0	0	0	5.92	2.99	1.53	01	0.0	0		9	4	2
7	79.6	59.2	69.4	-1.5	19	163	90	30	49	04	1	0	0	0	2.00	-1.23	0.65	19	0.0	0		7	1	0
8	78.3	58.5	68.4	-0.7	20	132	87	20	50	29	0	0	0	0	2.47	-0.55	0.68	21	0.0X	0		5	3	0
9	77.3	56.1	66.7	5.1	63	120	89	08	45	21	0	0	0	0	3.79	0.44	1.22	12	0.0	0		6	3	2
10	58.7	41.3	50.0	-0.2	458	0	73	13	28	19	0	0	5	0	3.43	0.55	1.91	29	0.0T	0		6	2	1
11	54.0	35.3	44.7	4.9	602	0	72	06	18	23	0	0	12	0	1.00	-2.40	0.34	11	0.1	0		2	0	0
12																								
Annual	57.5*	38.1*	47.8*		6135*	545*	90*	Jul*	-13*	Feb*	1*	64*	116*	23*	27.31*		1.91*	Oct*	59.5*	19*	Feb*	64*	17*	5*

Notes

(blank) Data element not reported or missing.

+ Occurred on one or more previous dates during the month. The date in the Date field is the last day of occurrence. Used through December 1983 only.

A Accumulated amount. This value is a total that may include data from a previous month or months or year (for annual value).

B Adjusted total. Monthly value totals based on proportional available data across the entire month.

E An estimated monthly or annual total.

X Monthly means or totals based on incomplete time series. 1 to 9 days are missing. Annual means or totals include one or more months which had 1 to 9 days that were missing.

T Trace of precipitation, snowfall, or snowdepth. The precipitation data value will equal zero.

Elem Element types are included to provide cross-reference for users of the NCDC CDO system.

Station Station is identified by: COOP ID, Station Name, State

S Precipitation amount is continuing to be accumulated. Total will be included in a subsequent monthly or yearly value. Example: Days 1-20 had 1.35 inches of precipitation, then a period of accumulation began. The element TPCP would then be 00135S and the total accumulated amount value appears in a subsequent monthly value.

* Annual value missing; summary value computed from available month values.

Attachment F

2015 NIAGARA FALLS STORAGE SITE

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

2015 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
		Mean	SD				Mean	SD	
1	U	0.0173	± 0.0056	0.0200	51	U	0.0337	± 0.0278	0.0423
2	U	0.0169	± 0.0129	0.0452	52	U	0.0029	± 0.0288	0.0765
3	U	-0.0185	± 0.0437	0.0790	53	U	0.0309	± 0.0296	0.0340
4		0.0317	± 0.0067	0.0096	54	U	0.0088	± 0.0205	0.0647
5		0.0642	± 0.0109	0.0261	55	U	0.0082	± 0.0178	0.0449
6		0.0322	± 0.0079	0.0110	56	U	0.0128	± 0.0171	0.0427
7	U	0.0197	± 0.0520	0.0981	57	U	0.0352	± 0.0409	0.0768
8		0.0393	± 0.0076	0.0181	58	U	0.0116	± 0.0178	0.0400
9	U	0.0132	± 0.0153	0.0396	59	U	0.0169	± 0.0079	0.0266
10	J	0.0324	± 0.0077	0.0108	60	U	0.0000	± 0.0489	0.0428
10-DUP ^b	U	0.0153	± 0.0279	0.0504	60-DUP ^b	U	-0.0165	± 0.0352	0.0875
11	U	0.0425	± 0.0420	0.0851	61	U	-0.0021	± 0.0101	0.0310
12		0.0605	± 0.0114	0.0359	62		0.0410	± 0.0082	0.0160
13		0.0436	± 0.0270	0.0319	63		0.0507	± 0.0341	0.0370
14	U	0.0062	± 0.0440	0.0846	64	U	0.0193	± 0.0456	0.0877
15		0.0262	± 0.0072	0.0156	65	U	0.0102	± 0.0137	0.0366
16	U	0.0262	± 0.0107	0.0456	66	U	-0.0063	± 0.0139	0.0391
17	U	0.0182	± 0.0230	0.0459	67	U	0.0000	± 0.0351	0.0698
18	U	0.0184	± 0.0270	0.0329	68	U	0.0136	± 0.0159	0.0395
19	U	0.0186	± 0.0845	0.0390	69	U	0.0017	± 0.0158	0.0398
20	U	0.0169	± 0.0215	0.0331	70	U	0.0144	± 0.0311	0.0493
20-DUP ^b	U	0.0041	± 0.0090	0.0304	70-DUP ^b	U	0.0140	± 0.0220	0.0425
21		0.0341	± 0.0088	0.0157	71	U	0.0312	± 0.0499	0.0927
22	U	0.0152	± 0.0236	0.0439	72		0.0454	± 0.0105	0.0100
23	U	0.0200	± 0.0190	0.0469	73	U	0.0176	± 0.0067	0.0236
24	U	0.0069	± 0.0167	0.0323	74	U	0.0000	± 0.0360	0.0237
25		0.0270	± 0.0080	0.0205	75	U	0.0062	± 0.0178	0.0448
26	U	0.0228	± 0.0290	0.0391	76	U	0.0278	± 0.0286	0.0506
27		0.0250	± 0.0064	0.0158	77	U	0.0136	± 0.0220	0.0472
28	U	0.0207	± 0.0255	0.0503	78	U	0.0000	± 0.0503	0.0771
29		0.0329	± 0.0074	0.0158	79	U	-0.0043	± 0.0160	0.0413
30	U	0.0166	± 0.0193	0.0364	80	J	0.0484	± 0.0097	0.0210
30-DUP ^b	U	0.0296	± 0.0290	0.0417	80-DUP ^b	U	0.0086	± 0.0160	0.0412
31	U	0.0261	± 0.0280	0.0296	81	U	0.0029	± 0.0579	0.1143
32		0.0221	± 0.0054	0.0108	82	U	0.0312	± 0.0242	0.0383
33	U	0.0104	± 0.0194	0.0501	83		0.0344	± 0.0083	0.0124
34	U	0.0277	± 0.0472	0.0325	84	U	0.0445	± 0.0460	0.0890
35	U	0.0126	± 0.0169	0.0394	85		0.0231	± 0.0058	0.0097
36	U	0.0115	± 0.0260	0.0415	86	U	0.0172	± 0.0240	0.0358
37	U	0.0133	± 0.0217	0.0335	87	U	0.0171	± 0.0199	0.0475
38	U	0.0302	± 0.0235	0.0372	88	U	0.0111	± 0.0412	0.0936
39	U	0.0125	± 0.0168	0.0393	89	U	-0.0069	± 0.0196	0.0434
40	U	0.0178	± 0.0067	0.0229	90	U	0.0124	± 0.0179	0.0423
40-DUP ^b	U	0.0161	± 0.0207	0.0373	90-DUP ^b	U	0.0000	± 0.0227	0.0511
41	U	-0.0021	± 0.0169	0.0395	91	U	0.0385	± 0.0299	0.0477
42	U	0.0151	± 0.0191	0.0393	92	U	0.0177	± 0.0291	0.0822
43		0.0284	± 0.0081	0.0113	93	U	0.0172	± 0.0179	0.0452
44	U	0.0286	± 0.0271	0.0413	94	U	0.0107	± 0.0244	0.0498
45	U	0.0188	± 0.0276	0.0444	95	U	0.0000	± 0.0358	0.0889
46	U	0.0043	± 0.0284	0.0619	96		0.0282	± 0.0066	0.0189
47	U	0.0111	± 0.0175	0.0373	97	U	0.0104	± 0.0139	0.0334
48	U	-0.0063	± 0.0098	0.0308	98	U	-0.0129	± 0.0100	0.0316
49	U	0.0087	± 0.0404	0.0817	99	U	0.0453	± 0.0587	0.0640
50	U	-0.0017	± 0.0081	0.0232	100	U	-0.0009	± 0.0160	0.0417
50-DUP ^b	U	0.0051	± 0.0176	0.0299	100-DUP ^b	U	0.0145	± 0.0198	0.0437

2015 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	U	0.0064	± 0.0141	0.0398	151	U	0.0277	± 0.0102	0.0364	
102	U	-0.0030	± 0.0207	0.0655	152	U	0.0535	± 0.0623	0.0727	
103	U	0.0052	± 0.0180	0.0453	153	U	0.0197	± 0.0205	0.0329	
104	U	0.0138	± 0.0224	0.0431	154	U	0.0147	± 0.0255	0.0519	
105	U	0.0223	± 0.0414	0.0837	155	U	0.0295	± 0.0471	0.1216	
106		0.0327	± 0.0075	0.0190	156		0.0414	± 0.0110	0.0216	
107	U	-0.0035	± 0.0181	0.0385	157	U	0.0184	± 0.0225	0.0438	
108	U	-0.0119	± 0.0142	0.0402	158	U	0.0395	± 0.0325	0.0575	
109	U	-0.0084	± 0.0467	0.0719	159	U	-0.0034	± 0.0474	0.1020	
110	U	0.0061	± 0.0162	0.0342	160	U	0.0280	± 0.0261	0.0517	
110-DUP ^b	U	0.0057	± 0.0162	0.0419	160-DUP ^b	U	0.0205	± 0.0073	0.0217	
111	U	0.0052	± 0.0195	0.0407	161	U	-0.0025	± 0.0198	0.0528	
112	U	0.0050	± 0.0174	0.0346	162	U	0.0621	± 0.0254	0.1035	
113	U	-0.0119	± 0.0360	0.0839	163	U	0.0338	± 0.0320	0.0465	
114		0.0400	± 0.0314	0.0337	164	U	0.0000	± 0.0230	0.0432	
115	U	0.0087	± 0.0143	0.0402	165	U	-0.0238	± 0.0238	0.0752	
116	U	0.0010	± 0.0362	0.0949	166	U	0.0222	± 0.0082	0.0275	
117	U	0.0262	± 0.0270	0.0364	167		0.0452	± 0.0108	0.0129	
118	U	0.0173	± 0.0202	0.0348	168	U	0.0147	± 0.0197	0.0393	
119	U	0.0045	± 0.0295	0.0833	169	U	0.0000	± 0.0236	0.0747	
120	U	0.0139	± 0.0162	0.0225	170	U	0.0307	± 0.0089	0.0356	
120-DUP ^b	U	0.0194	± 0.0215	0.0384	170-DUP ^b		0.0331	± 0.0098	0.0217	
121	U	0.0275	± 0.0466	0.0783	171	U	0.0172	± 0.0226	0.0463	
122	U	0.0152	± 0.0267	0.0482	172	U	-0.0049	± 0.0280	0.0573	
123	U	0.0000	± 0.0368	0.0243	173	U	-0.0014	± 0.0531	0.1185	
124	U	0.0115	± 0.0182	0.0457	174		0.0283	± 0.0086	0.0187	
125	U	0.0174	± 0.0202	0.0409	175	U	0.0080	± 0.0324	0.0641	
126	U	0.0360	± 0.0553	0.0900	176	U	0.0102	± 0.0592	0.1181	
127	U	0.0053	± 0.0182	0.0406	177		0.0437	± 0.0097	0.0117	
128	U	0.0230	± 0.0267	0.0410	178		0.0403	± 0.0107	0.0107	
129		0.0222	± 0.0057	0.0098	179	U	0.0409	± 0.0362	0.0574	
130	U	0.0348	± 0.0286	0.0436	180	U	0.0611	± 0.0581	0.1407	
130-DUP ^b	U	0.0131	± 0.0175	0.0437	180-DUP ^b		0.1226	± 0.0258	0.0184	
131	U	0.0146	± 0.0146	0.0388	181 ^c	U	0.0386	± 0.0306	0.0531	
132	U	0.0212	± 0.0201	0.0498	182 ^c	U	0.0157	± 0.0255	0.0393	
133	U	0.0220	± 0.0228	0.0441	183 ^c		0.0420	± 0.0100	0.0255	
134		0.0265	± 0.0068	0.0099	Average background		0.03210 (pCi/m ² /s)			
135	U	0.0022	± 0.0205	0.0119						
136	U	0.0190	± 0.0259	0.0344			IWCS	Value	Units	
137	U	0.0131	± 0.0176	0.0469			Average ^e	0.0180	(pCi/m ² /s)	
138		0.0351	± 0.0078	0.0103			High ^f	0.1226	(pCi/m ² /s)	
139	U	0.0022	± 0.0203	0.0383			Low	-0.0238	(pCi/m ² /s)	
140		0.0180	± 0.0055	0.0098						
140-DUP ^b	U	0.0211	± 0.0200	0.0443						
141	U	0.0184	± 0.0061	0.0233						
142		0.0218	± 0.0074	0.0194						
143	U	-0.0077	± 0.0142	0.0380						
144	U	0.0054	± 0.0187	0.0362						
145	U	0.0271	± 0.0090	0.0297						
146	U	0.0158	± 0.0243	0.0461						
147	U	0.0110	± 0.0227	0.0461						
148	U	0.0081	± 0.0526	0.0809						
149	U	0.0178	± 0.0261	0.0479						
150	U	0.0048	± 0.0242	0.0410						
150-DUP ^b		0.0245	± 0.0075	0.0186						

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

a. Radon-222 flux was performed on July 6-7, 2015

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)

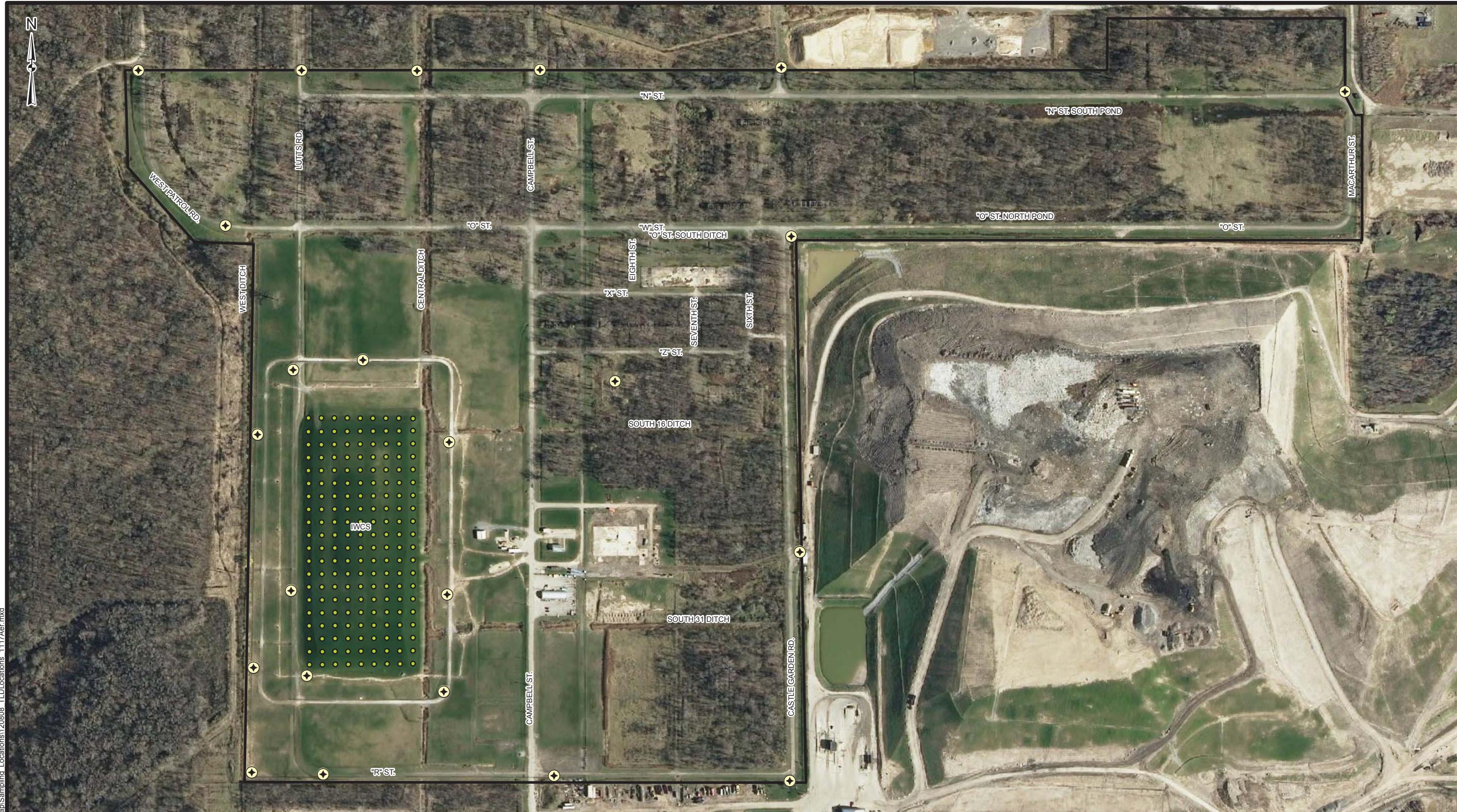
d. Data Qualifier: U - no analyte was detected (Non-Detect).

J - indicates an 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.



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Legend

- Radon Flux Sample Location
- ◆ TLD/Radon Monitoring Location
- NFSS Site Boundary

0 175 350 700
Feet



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Buffalo District

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TLD/RADON MONITORING AND RADON FLUX SAMPLING LOCATION MAP

NIAGARA FALLS STORAGE SITE
LEWISTON, NEW YORK

FIGURE :



Environmental Monitoring Locations

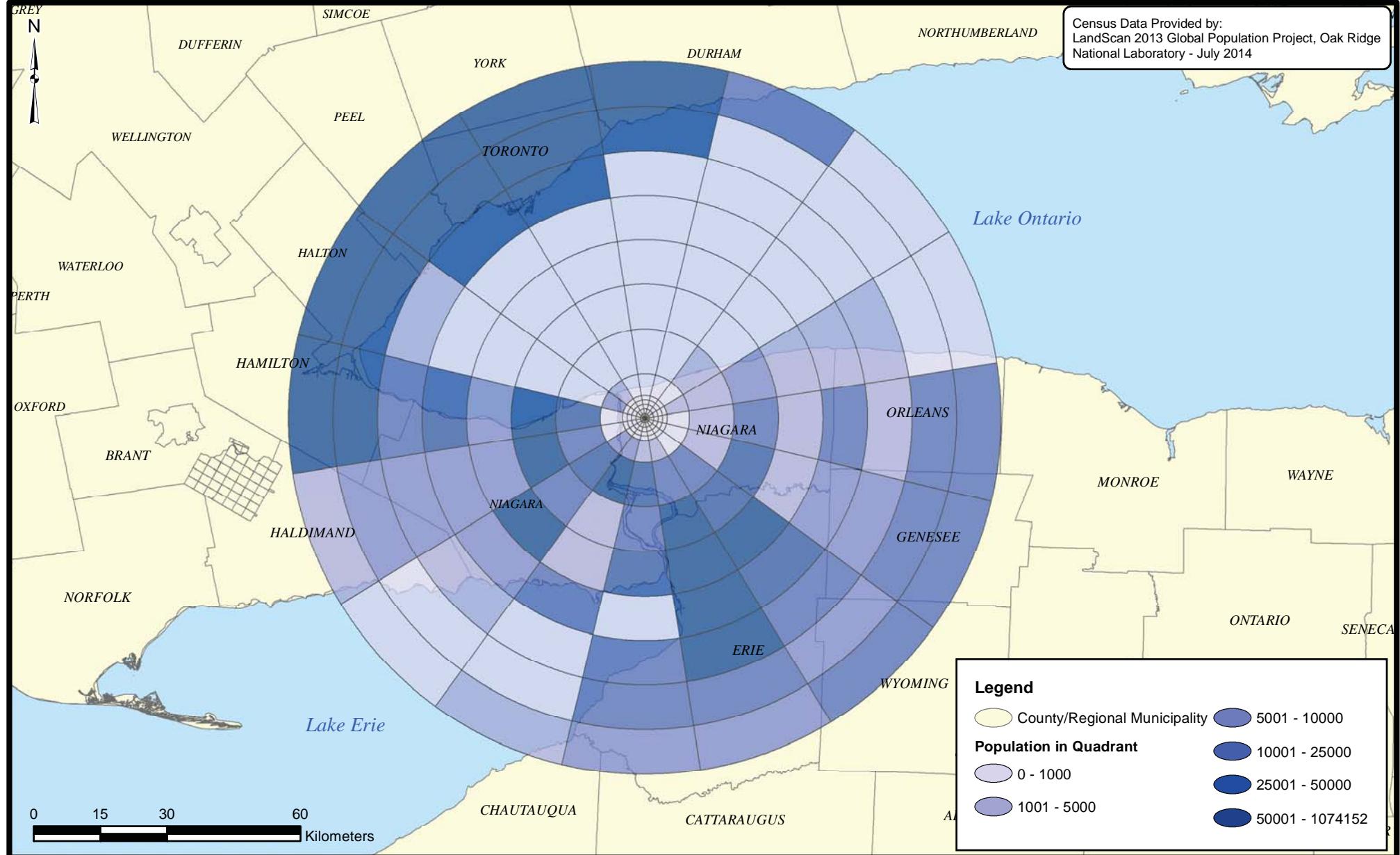
- A - Lewiston Water Pollution Control Center
- B - Lewiston Porter School Campus
- C - Balmer Road Location
- D - Niagara Falls Storage Site

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
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