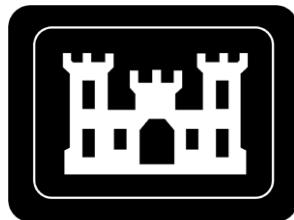

FUSRAP CY2010 NESHAP ANNUAL REPORT FOR NIAGARA FALLS STORAGE SITE (NFSS)

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
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 (page F-1, Attachment F). NFSS is approximately 77 hectare (~191 acre) site which includes: one former process building (Building 401), 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, 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 (See Appendix A, Figure 2), 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. Initial results show that isolated areas of elevated activity do exist.

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 3.0 (USEPA 2006)] 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 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 RI sampling Phases I, II, and III. A 95% upper confidence limit (UCL) without the subtraction of background radioactivity was calculated for each soil nuclide of concern and used 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
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 CY2010, the annual wind erosion emission, E_w (Attachment A) is calculated using local climatological data (Attachment F) 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. 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 sample data compiled during 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 3.0 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 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 are performed for a circular grid of distances and directions for a radius of 80 km (50 miles) around the facility. Agricultural arrays of milk cattle, beef cattle and agricultural crop area are generated automatically, requiring the user to supply only the State name or agricultural productivity values. Dose and risk factors for CAP88-PC, Version 3.0 are from Federal Guidance Report 13 and are based on the methods detailed in International Commission on Radiological Protection (ICRP) 72 (ICRP72). 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.

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 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 CY2010 meteorological data were entered into CAP88-PC (see Attachment E):

Average temperature	9.56 °C (49.2 °F) NFIA
Precipitation,	87.7 cm (34.5 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) are:

Resident	1.4 E-03 mrem, SSW @ 914 m
Off-site worker	6.0 E-03 mrem, SE @ 533 m
School	5.9 E-04 mrem, W @ 2499 m
Farm	1.1 E-03 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	1.4 E-03 mrem
School	1.3 E-04 mrem

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 year 2000 census data for New York State and 2001 census data for Ontario, Canada was used to create a population file for CAP88-PC. The effective dose equivalent for the collective population in person-rem/yr is from the CAP88-PC "Dose and Risk Equivalent Summaries" report.

The CAP88-PC annual effective dose for the population within 80 km of the facility (Attachment D) is:

Population:	4.2 E-02 person-rem
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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

CY2010 are presented in the radon flux results with measurement locations (site map) in Attachment F.

Measured results for 2010 ranged from non-detect to 0.09301 pCi/m²/s, with an average result including detects and non-detects of 0.04606 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

ANL 2003. CAP88-PC Population Files for NFSS, Argonne National Laboratory, Chicago, Illinois.

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 3.0 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 2010, 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. 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:

$U_{a1} = 37$	$U_{a2} = 32$	$U_{a3} = 45$	$U_{a4} = 23$	$U_{a5} = 18$	$U_{a6} = 25$
$U_{a7} = 29$	$U_{a8} = 32$	$U_{a9} = 28$	$U_{a10} = 26$	$U_{a11} = 23$	$U_{a12} = 22$
$U_{a13} = 31$	$U_{a14} = 28$	$U_{a15} = 25$	$U_{a16} = 25$	$U_{a17} = 30$	$U_{a18} = 25$
$U_{a19} = 35$	$U_{a20} = 40$	$U_{a21} = 24$	$U_{a22} = 37$	$U_{a23} = 31$	$U_{a24} = 28$
$U_{a25} = 28$	$U_{a26} = 33$	$U_{a27} = 39$			

^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:

$U_1 = 1.14 \text{ E+00}$	$U_2 = 9.86 \text{ E-01}$	$U_3 = 1.39 \text{ E+00}$	$U_4 = 7.08 \text{ E-01}$	$U_5 = 5.54 \text{ E-01}$	$U_6 = 7.70 \text{ E-01}$
$U_7 = 8.93 \text{ E-01}$	$U_8 = 9.86 \text{ E-01}$	$U_9 = 8.62 \text{ E-01}$	$U_{10} = 8.01 \text{ E-01}$	$U_{11} = 7.08 \text{ E-01}$	$U_{12} = 6.78 \text{ E-01}$
$U_{13} = 9.55 \text{ E-01}$	$U_{14} = 8.62 \text{ E-01}$	$U_{15} = 7.70 \text{ E-01}$	$U_{16} = 7.70 \text{ E-01}$	$U_{17} = 9.24 \text{ E-01}$	$U_{18} = 7.70 \text{ E-01}$
$U_{19} = 1.08 \text{ E+00}$	$U_{20} = 1.23 \text{ E+00}$	$U_{21} = 7.39 \text{ E-01}$	$U_{22} = 1.14 \text{ E+00}$	$U_{23} = 9.55 \text{ E-01}$	$U_{24} = 8.62 \text{ E-01}$
$U_{25} = 8.62 \text{ E-01}$	$U_{26} = 1.02 \text{ E+00}$	$U_{27} = 1.20 \text{ E+00}$			

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

$$P_N = 58 (U^* - U_t)^2 + 25(U^* - U_t) = 40.56 \text{ g/m}^2$$

The erosion potentials (P_N) for each period between disturbances are all less than or equal to the threshold friction velocity except for U_1 , U_3 , U_6 , and U_{23} .

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:

$$P = k \sum P_N = 20.28 \text{ g/m}^2$$

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:

$$PM_{10} = P(1-V) / (PE/50)^2 = 0.42 \text{ g/m}^2/\text{yr}$$

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

$$E = A (PM_{10}) = 326,797 \text{ g soil}$$

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 NESHAPS calculations was developed considering the radionuclides in the uranium, thorium, and actinium decay series as shown in Table B-1. Concentration data for these radioisotopes were taken from Phases I, II, and III of the Remedial Investigation and are listed in Table B-2. 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 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 dataset used for CY 2009 uses higher soil concentrations than in years before CY2004 and more conservatively estimates (biased high) the site concentration values.

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 NESHAPS 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 for the following reasons: 1) Radon isotopes including thoron and actinon are specifically excluded per the regulation or 2) nuclides of low abundance and stable nuclides do not contribute significantly 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.		

Table B-2. Summary of Phases I, II, and III Characterization Data Used in NESHPAP Dose Calculations

Analyte	Units	Results	Minimum Detect	Maximum Detect	Average Result	95% UCL of the Mean	Input Exposure Concentration
Radium-226 ^a (pCi/g)	552	0.0607	1140	10.23	26.09	26.09	
Thorium-228 (pCi/g)	552	0.0481	2.38	1.06	1.08	1.08	
Thorium-230 (pCi/g)	552	0.0906	978	8.68	22.74	22.74	
Thorium-232 (pCi/g)	551	0.0149	2.07	0.88	0.89	0.89	
Uranium-234 (pCi/g)	552	0.0416	8340	20.57	87.4	87.4	
Uranium-235 (pCi/g)	553	-0.16	886	1.94	8.97	8.97	
Uranium-238 (pCi/g)	551	0.049	8830	21.59	92.38	92.38	

^a Includes previous outlier 1,140 pCi/g (NiagAir1 on 25JUL00 at 15:36 using dataset allradnq)

Table B-3. Soil Concentration and Estimated Emission of Radionuclides from NFSS for CY 2009

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	92.38	3.02E-05	Th-232	0.89	2.91E-07	U-235	8.97	2.93E-06
Th-234	92.38	3.02E-05	Ra-228	0.89	2.91E-07	Th-231	8.97	2.93E-06
Pa-234m	92.38	3.02E-05	Ac-228	0.89	2.91E-07	Pa-231	8.97	2.93E-06
Pa-234	92.38	3.92E-08	Th-228	1.08	3.53E-07	Ac-227	8.97	2.93E-06
U-234	87.4	2.86E-05	Ra-224	1.08	3.53E-07	Th-227	8.97	2.89E-06
Th-230	22.74	7.43E-06	Rn-220	1.08	0.00E-00	Fr-223	8.97	4.05E-08
Ra-226	26.09	8.53E-06	Po-216	1.08	3.53E-07	Ra-223	8.97	2.93E-06
Rn-222	26.09	0.00E-00	Pb-212	1.08	3.53E-07	Rn-219	8.97	0.00E-00
Po-218	26.09	8.53E-06	Bi-212	1.08	3.53E-07	Po-215	8.97	2.93E-06
Pb-214	26.09	8.52E-06	Po-212	1.08	2.26E-07	Pb-211	8.97	2.93E-06
At-218	26.09	1.71E-09	Tl-208	1.08	1.27E-07	At-215	8.97	6.74E-12
Bi-214	26.09	8.53E-06	Pb-208 (stable)	1.08	0.00E-00	Bi-211	8.97	2.93E-06
Po-214	26.09	8.52E-06				Po-211	8.97	8.00E-09
Tl-210	26.09	1.79E-09				Tl-207	8.97	2.92E-06
Pb-210	26.09	8.53E-06				Pb-207 (stable)	8.97	0.00E-00
Bi-210	26.09	8.53E-06						
Po-210	26.09	8.53E-06						
Tl-206	26.09	1.11E-11						
Pb-206 (stable)	26.09	0.00E-00						

B.2 REFERENCES

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

ATTACHMENT C

CAPP88-PC REPORTS – INDIVIDUAL

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Individual Assessment
Jun 7, 2011 09:34 amm

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

Source Category: Area Source
Source Type: Area
Emission Year: 2010

Comments: NFSS Tech Memo 2010
Individual Dose

Dataset Name: NFSS 2010 Ind
Dataset Date: 6/7/2011 9:07:00 AM
Wind File: . C:\Program Files\CAP88-PC30\WindLib\IAG0905.WND

Jun 7, 2011 09:34 am

SUMMARY
Page 1

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)
INGESTION	2.26E-04
INHALATION	7.54E-03
AIR IMMERSION	2.76E-08
GROUND SURFACE	8.93E-06
INTERNAL	7.77E-03
EXTERNAL	8.96E-06
TOTAL	7.78E-03

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem/y)
U-238	7.15E-04
Th-234	2.46E-06
Pa-234m	1.49E-06
Pa-234	2.33E-10
U-234	8.23E-04
Th-230	8.58E-04
Ra-226	3.01E-04
Rn-222	5.41E-15
Po-218	3.27E-11
Pb-214	1.75E-06
Bi-214	6.46E-06
Po-214	3.00E-10
Pb-210	1.43E-04
Bi-210	6.64E-06
Po-210	2.49E-04
At-218	0.00E+00
Th-232	5.86E-05
Ra-228	6.23E-06
Ac-228	2.85E-08
Th-228	1.14E-04
Ra-224	8.52E-06
Rn-220	2.06E-13
Po-216	8.69E-15
Pb-212	4.92E-07
Bi-212	8.85E-08
Po-212	0.00E+00
Tl-208	6.83E-10
U-235	7.51E-05
Th-231	2.89E-08
Pa-231	2.24E-03
Ac-227	1.74E-03
Th-227	2.44E-04
Ra-223	1.80E-04
Rn-219	2.45E-10
Po-215	2.22E-10
Pb-211	3.89E-07
Bi-211	5.83E-08
Tl-207	7.32E-08
Po-211	9.28E-14
Fr-223	3.42E-09
TOTAL	7.78E-03

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk
Esophagus	4.34E-12
Stomach	1.06E-11
Colon	3.60E-11
Liver	1.55E-10
LUNG	3.01E-09
Bone	1.05E-10
Skin	4.83E-13
Breast	6.17E-12
Ovary	1.84E-11
Bladder	1.03E-11
Kidneys	1.92E-11
Thyroid	8.51E-13
Leukemia	2.01E-11
Residual	4.26E-11
Total	3.44E-09
TOTAL	6.89E-09

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk
INGESTION	6.90E-11
INHALATION	3.37E-09
AIR IMMERSION	1.47E-14
GROUND SURFACE	4.08E-12
INTERNAL	3.44E-09
EXTERNAL	4.10E-12
TOTAL	3.44E-09

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	5.89E-10
Th-234	2.49E-12
Pa-234m	2.39E-13
Pa-234	1.49E-16
U-234	6.79E-10
Th-230	4.38E-10
Ra-226	2.24E-10
Rn-222	2.94E-21
Po-218	1.79E-17
Pb-214	1.06E-12
Bi-214	3.41E-12
Po-214	1.65E-16
Pb-210	6.95E-11
Bi-210	5.72E-12
Po-210	2.00E-10
At-218	0.00E+00
Th-232	2.60E-11
Ra-228	2.98E-12
Ac-228	1.82E-14
Th-228	9.75E-11
Ra-224	7.34E-12
Rn-220	1.13E-19
Po-216	4.76E-21
Pb-212	4.24E-13
Bi-212	5.71E-14
Po-212	0.00E+00
Tl-208	3.77E-16
U-235	6.18E-11
Th-231	1.71E-14
Pa-231	2.12E-10
Ac-227	4.58E-10
Th-227	2.11E-10
Ra-223	1.54E-10
Rn-219	1.32E-16
Po-215	1.22E-16
Pb-211	2.68E-13
Bi-211	3.19E-14
Tl-207	9.35E-15
Po-211	5.09E-20
Fr-223	2.90E-15
TOTAL	3.44E-09

Jun 7, 2011 09:34 amm

SUMMARY
Page 5

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

Distance (m)

Direction	533	783	914	1105	1250	1486	2499
N	5.6E-03	2.3E-03	1.8E-03	1.3E-03	1.1E-03	9.1E-04	5.0E-04
NNW	4.5E-03	1.8E-03	1.3E-03	9.2E-04	7.4E-04	5.5E-04	2.7E-04
NW	4.5E-03	1.6E-03	1.2E-03	9.1E-04	7.7E-04	6.1E-04	3.5E-04
WNW	4.8E-03	2.4E-03	1.8E-03	1.3E-03	1.1E-03	8.1E-04	4.1E-04
W	5.2E-03	2.6E-03	2.0E-03	1.5E-03	1.3E-03	1.1E-03	5.9E-04
WSW	5.2E-03	2.6E-03	1.9E-03	1.4E-03	1.1E-03	8.5E-04	4.2E-04
SW	4.8E-03	1.9E-03	1.5E-03	1.1E-03	9.2E-04	7.4E-04	4.2E-04
SSW	4.3E-03	1.9E-03	1.4E-03	1.0E-03	8.4E-04	6.4E-04	3.3E-04
S	4.6E-03	1.9E-03	1.5E-03	1.1E-03	9.5E-04	7.6E-04	4.3E-04
SSE	5.2E-03	2.5E-03	1.8E-03	1.3E-03	1.1E-03	8.1E-04	4.0E-04
SE	6.0E-03	2.7E-03	2.0E-03	1.5E-03	1.3E-03	1.0E-03	5.4E-04
ESE	6.6E-03	3.1E-03	2.3E-03	1.7E-03	1.4E-03	1.0E-03	5.1E-04
E	7.4E-03	3.2E-03	2.4E-03	1.7E-03	1.4E-03	1.1E-03	5.8E-04
ENE	7.8E-03	3.7E-03	2.8E-03	2.0E-03	1.6E-03	1.2E-03	5.5E-04
NE	7.7E-03	3.7E-03	2.8E-03	2.1E-03	1.8E-03	1.4E-03	7.4E-04
NNE	6.9E-03	3.5E-03	2.6E-03	1.9E-03	1.5E-03	1.1E-03	5.4E-04

Distance (m)

Direction 2629

N	4.8E-04
NNW	2.6E-04
NW	3.4E-04
WNW	3.9E-04
W	5.6E-04
WSW	4.0E-04
SW	4.0E-04
SSW	3.2E-04
S	4.1E-04
SSE	3.8E-04
SE	5.1E-04
ESE	4.8E-04
E	5.4E-04
ENE	5.2E-04
NE	6.9E-04
NNE	5.1E-04

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

Distance (m)

Direction	533	783	914	1105	1250	1486	2499
N	2.5E-09	1.0E-09	7.7E-10	5.7E-10	4.8E-10	3.8E-10	2.0E-10
NNW	2.0E-09	7.8E-10	5.7E-10	3.9E-10	3.1E-10	2.2E-10	9.8E-11
NW	2.0E-09	6.8E-10	5.2E-10	3.8E-10	3.2E-10	2.5E-10	1.3E-10
WNW	2.1E-09	1.1E-09	7.8E-10	5.5E-10	4.5E-10	3.4E-10	1.6E-10
W	2.3E-09	1.1E-09	8.8E-10	6.6E-10	5.6E-10	4.5E-10	2.4E-10
WSW	2.3E-09	1.1E-09	8.3E-10	5.8E-10	4.7E-10	3.5E-10	1.6E-10
SW	2.1E-09	8.3E-10	6.3E-10	4.6E-10	3.9E-10	3.1E-10	1.6E-10
SSW	1.9E-09	8.4E-10	6.2E-10	4.4E-10	3.5E-10	2.6E-10	1.2E-10
S	2.0E-09	8.4E-10	6.4E-10	4.8E-10	4.0E-10	3.2E-10	1.7E-10
SSE	2.3E-09	1.1E-09	7.9E-10	5.6E-10	4.5E-10	3.4E-10	1.6E-10
SE	2.6E-09	1.2E-09	8.9E-10	6.5E-10	5.5E-10	4.3E-10	2.2E-10
ESE	2.9E-09	1.4E-09	1.0E-09	7.2E-10	5.9E-10	4.4E-10	2.0E-10
E	3.3E-09	1.4E-09	1.0E-09	7.5E-10	6.2E-10	4.8E-10	2.3E-10
ENE	3.4E-09	1.6E-09	1.2E-09	8.5E-10	6.8E-10	5.1E-10	2.2E-10
NE	3.4E-09	1.6E-09	1.2E-09	9.1E-10	7.6E-10	6.0E-10	3.1E-10
NNE	3.0E-09	1.5E-09	1.1E-09	8.0E-10	6.5E-10	4.9E-10	2.2E-10

Distance (m)

Direction 2629

N	1.9E-10
NNW	9.4E-11
NW	1.3E-10
WNW	1.5E-10
W	2.2E-10
WSW	1.5E-10
SW	1.5E-10
SSW	1.2E-10
S	1.6E-10
SSE	1.5E-10
SE	2.0E-10
ESE	1.9E-10
E	2.2E-10
ENE	2.1E-10
NE	2.8E-10
NNE	2.0E-10

ATTACHMENT D
CAPP88-PC REPORTS – POPULATION

C A P 8 8 - P C

Version 3.0

Clean Air Act Assessment Package - 1988

D O S E A N D R I S K E Q U I V A L E N T S U M M A R I E S

Non-Radon Population Assessment
Jun 6, 2011 11:21 amm

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

Source Category: Area Source
Source Type: Area
Emission Year: 2010

Comments: Population Dose
Population Dose

Dataset Name: NFSS 2010 Pop
Dataset Date: 6/6/2011 11:19:00 AM
Wind File: . C:\Program Files\CAP88-PC30\WindLib\IAG0905.WND
Population File: C:\Program Files\CAP88-PC30\Poplib\NFSS2003.POP

Jun 6, 2011 11:21 am

SUMMARY
Page 1

PATHWAY EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem/y)	Collective Population (person-rem/y)
INGESTION	2.55E-05	1.08E-03
INHALATION	3.01E-02	4.08E-02
AIR IMMERSION	1.10E-07	1.50E-07
GROUND SURFACE	3.35E-05	7.99E-05
INTERNAL	3.01E-02	4.18E-02
EXTERNAL	3.36E-05	8.01E-05
TOTAL	3.01E-02	4.19E-02

NUCLIDE EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem/y)	Collective Population (person-rem/y)
U-238	2.79E-03	3.87E-03
Th-234	7.98E-06	1.37E-05
Pa-234m	5.58E-06	1.33E-05
Pa-234	9.29E-10	1.26E-09
U-234	3.22E-03	4.45E-03
Th-230	3.36E-03	4.64E-03
Ra-226	9.59E-04	1.49E-03
Rn-222	2.12E-14	4.65E-14
Po-218	1.23E-10	2.93E-10
Pb-214	6.74E-06	1.26E-05
Bi-214	2.45E-05	5.42E-05
Po-214	1.12E-09	2.68E-09
Pb-210	3.14E-04	7.76E-04
Bi-210	2.62E-05	3.61E-05
Po-210	9.05E-04	1.34E-03
At-218	0.00E+00	0.00E+00
Th-232	2.33E-04	3.16E-04
Ra-228	2.48E-05	3.37E-05
Ac-228	1.14E-07	1.54E-07
Th-228	4.53E-04	6.15E-04
Ra-224	3.40E-05	4.60E-05
Rn-220	8.08E-13	1.77E-12
Po-216	3.46E-14	4.70E-14
Pb-212	1.96E-06	2.66E-06
Bi-212	3.53E-07	4.78E-07
Po-212	0.00E+00	0.00E+00
Tl-208	2.72E-09	3.69E-09
U-235	2.93E-04	4.07E-04
Th-231	1.10E-07	2.30E-07
Pa-231	8.86E-03	1.21E-02
Ac-227	6.91E-03	9.41E-03
Th-227	9.71E-04	1.32E-03
Ra-223	7.06E-04	9.62E-04
Rn-219	9.61E-10	2.10E-09
Po-215	8.34E-10	1.99E-09
Pb-211	1.52E-06	2.54E-06
Bi-211	2.19E-07	5.21E-07
Tl-207	2.75E-07	6.55E-07
Po-211	3.70E-13	5.02E-13
Fr-223	1.36E-08	1.85E-08
TOTAL	3.01E-02	4.19E-02

CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
Esophagus	1.51E-11	3.03E-10
Stomach	3.38E-11	7.38E-10
Colon	8.68E-11	2.43E-09
Liver	5.77E-10	1.08E-08
LUNG	1.20E-08	2.11E-07
Bone	3.81E-10	7.22E-09
Skin	1.68E-12	4.24E-11
Breast	1.98E-11	4.40E-10
Ovary	7.04E-11	1.29E-09
Bladder	3.59E-11	7.18E-10
Kidneys	5.21E-11	1.34E-09
Thyroid	2.75E-12	5.96E-11
Leukemia	6.81E-11	1.39E-09
Residual	1.19E-10	2.83E-09
Total	1.35E-08	2.41E-07

PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
INGESTION	7.52E-12	4.22E-09
INHALATION	1.34E-08	2.36E-07
AIR IMMERSION	5.87E-14	1.04E-12
GROUND SURFACE	1.53E-11	4.73E-10
INTERNAL	1.34E-08	2.40E-07
EXTERNAL	1.54E-11	4.74E-10
TOTAL	1.35E-08	2.41E-07

NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk (Deaths/y)
U-238	2.33E-09	4.12E-08
Th-234	7.26E-12	1.78E-10
Pa-234m	8.95E-13	2.77E-11
Pa-234	5.92E-16	1.04E-14
U-234	2.68E-09	4.75E-08
Th-230	1.74E-09	3.06E-08
Ra-226	8.10E-10	1.51E-08
Rn-222	1.15E-20	3.27E-19
Po-218	6.73E-17	2.08E-15
Pb-214	4.11E-12	9.63E-11
Bi-214	1.29E-11	3.72E-10
Po-214	6.17E-16	1.91E-14
Pb-210	1.92E-10	4.87E-09
Bi-210	2.24E-11	3.95E-10
Po-210	7.63E-10	1.40E-08
At-218	0.00E+00	0.00E+00
Th-232	1.04E-10	1.82E-09
Ra-228	1.19E-11	2.08E-10
Ac-228	7.25E-14	1.27E-12
Th-228	3.88E-10	6.82E-09
Ra-224	2.92E-11	5.14E-10
Rn-220	4.42E-19	1.25E-17
Po-216	1.90E-20	3.33E-19
Pb-212	1.69E-12	2.97E-11
Bi-212	2.28E-13	4.00E-12
Po-212	0.00E+00	0.00E+00
Tl-208	1.50E-15	2.64E-14
U-235	2.44E-10	4.33E-09
Th-231	6.61E-14	1.63E-12
Pa-231	8.37E-10	1.48E-08
Ac-227	1.82E-09	3.21E-08
Th-227	8.42E-10	1.48E-08
Ra-223	6.09E-10	1.07E-08
Rn-219	5.20E-16	1.47E-14
Po-215	4.57E-16	1.41E-14
Pb-211	1.06E-12	2.06E-11
Bi-211	1.20E-13	3.69E-12
Tl-207	3.51E-14	1.08E-12
Po-211	2.03E-19	3.56E-18
Fr-223	1.15E-14	2.03E-13
TOTAL	1.35E-08	2.41E-07

INDIVIDUAL EFFECTIVE DOSE EQUIVALENT RATE (mrem/y)
(All Radionuclides and Pathways)

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	3.0E-02	2.3E-03	7.2E-04	3.3E-04	1.9E-04	1.3E-04	5.9E-05	
NNW	3.0E-02	1.8E-03	3.7E-04	1.0E-04	5.9E-05	4.0E-05	1.8E-05	
NW	3.0E-02	1.5E-03	4.3E-04	1.8E-04	1.1E-04	7.1E-05	3.2E-05	
WNW	3.0E-02	2.5E-03	6.3E-04	2.4E-04	1.4E-04	9.2E-05	4.1E-05	
W	3.0E-02	2.6E-03	8.7E-04	4.2E-04	2.4E-04	1.6E-04	7.3E-05	
WSW	3.0E-02	2.6E-03	6.6E-04	2.4E-04	1.4E-04	9.6E-05	4.3E-05	
SW	3.0E-02	1.9E-03	5.6E-04	2.4E-04	1.4E-04	9.6E-05	4.3E-05	
SSW	3.0E-02	1.9E-03	4.6E-04	1.6E-04	9.2E-05	6.2E-05	2.8E-05	
S	3.0E-02	1.9E-03	5.8E-04	2.6E-04	1.5E-04	1.0E-04	4.6E-05	
SSE	3.0E-02	2.5E-03	6.3E-04	2.3E-04	1.3E-04	9.0E-05	4.1E-05	
SE	3.0E-02	2.7E-03	8.2E-04	3.7E-04	2.1E-04	1.4E-04	6.5E-05	
ESE	3.0E-02	3.2E-03	8.5E-04	3.4E-04	1.9E-04	1.3E-04	6.0E-05	
E	3.0E-02	3.2E-03	9.4E-04	4.0E-04	2.3E-04	1.6E-04	7.2E-05	
ENE	3.0E-02	3.9E-03	1.0E-03	3.8E-04	2.2E-04	1.5E-04	6.8E-05	
NE	3.0E-02	3.8E-03	1.2E-03	5.6E-04	3.3E-04	2.2E-04	1.0E-04	
NNE	3.0E-02	3.6E-03	9.5E-04	3.7E-04	2.1E-04	1.5E-04	6.6E-05	

		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	1.9E-06	1.5E-06	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.9E-07	6.4E-07	5.2E-07	
NW	1.1E-05	0.0E+00	0.0E+00	0.0E+00	1.4E-06	9.7E-07	7.7E-07	
WNW	1.5E-05	0.0E+00	0.0E+00	0.0E+00	1.8E-06	1.2E-06	9.0E-07	
W	2.7E-05	1.2E-05	7.2E-06	4.7E-06	3.2E-06	2.1E-06	1.6E-06	
WSW	1.6E-05	7.1E-06	4.3E-06	2.9E-06	2.0E-06	1.4E-06	1.1E-06	
SW	1.6E-05	7.0E-06	4.3E-06	2.9E-06	2.0E-06	1.4E-06	0.0E+00	
SSW	1.0E-05	4.5E-06	2.8E-06	1.9E-06	0.0E+00	9.4E-07	7.5E-07	
S	1.7E-05	7.4E-06	4.5E-06	3.1E-06	2.1E-06	1.5E-06	1.1E-06	
SSE	1.5E-05	6.6E-06	4.1E-06	2.8E-06	1.9E-06	1.4E-06	1.1E-06	
SE	2.3E-05	1.1E-05	6.4E-06	4.3E-06	3.0E-06	2.1E-06	1.6E-06	
ESE	2.2E-05	9.8E-06	6.0E-06	4.0E-06	2.8E-06	2.0E-06	1.5E-06	
E	2.6E-05	1.2E-05	7.3E-06	4.9E-06	3.4E-06	2.4E-06	1.9E-06	
ENE	2.5E-05	1.1E-05	7.0E-06	4.8E-06	3.4E-06	2.4E-06	1.9E-06	
NE	3.7E-05	1.7E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	2.4E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-06	

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

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	2.7E-04	6.5E-05	6.9E-05	4.5E-05	3.6E-05	3.1E-05	8.0E-05	
NNW	2.7E-04	5.0E-05	3.8E-05	1.4E-05	1.1E-05	8.9E-06	2.8E-05	
NW	2.7E-04	4.3E-05	4.8E-05	2.8E-05	2.0E-05	1.8E-05	2.6E-04	
WNW	2.7E-04	6.9E-05	6.9E-05	4.4E-05	3.3E-05	5.3E-05	1.6E-04	
W	2.7E-04	7.3E-05	9.6E-05	7.7E-05	3.9E-04	5.4E-05	8.3E-05	
WSW	2.7E-04	7.4E-05	7.3E-05	4.5E-05	2.2E-04	1.9E-04	2.9E-04	
SW	2.7E-04	5.3E-05	6.2E-05	4.5E-05	4.5E-05	2.0E-04	5.2E-04	
SSW	2.7E-04	5.4E-05	5.1E-05	2.9E-05	2.7E-05	9.6E-05	3.1E-04	
S	2.7E-04	5.3E-05	6.5E-05	4.8E-05	3.4E-05	3.0E-05	4.8E-04	
SSE	2.7E-04	7.0E-05	7.0E-05	4.3E-05	3.0E-05	2.6E-05	1.9E-04	
SE	2.7E-04	7.6E-05	9.2E-05	6.8E-05	5.1E-05	4.1E-05	2.0E-04	
ESE	2.7E-04	9.0E-05	9.5E-05	6.2E-05	5.0E-05	4.3E-05	1.5E-04	
E	2.7E-04	9.0E-05	1.0E-04	7.5E-05	6.0E-05	5.3E-05	1.7E-04	
ENE	2.7E-04	1.1E-04	1.1E-04	6.9E-05	4.3E-05	3.1E-05	2.2E-04	
NE	2.7E-04	1.1E-04	1.3E-04	6.9E-05	3.7E-05	3.2E-05	2.7E-04	
NNE	2.7E-04	1.0E-04	9.3E-05	4.9E-05	3.9E-05	3.0E-05	9.9E-05	

		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	1.5E-04	4.2E-04	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.9E-04	6.9E-04	3.6E-04	
NW	1.2E-05	0.0E+00	0.0E+00	0.0E+00	7.0E-06	7.9E-04	4.1E-04	
WNW	5.2E-05	0.0E+00	0.0E+00	0.0E+00	1.8E-09	2.9E-04	8.0E-05	
W	7.0E-04	7.6E-04	6.8E-05	1.3E-04	6.7E-05	3.5E-04	4.1E-04	
WSW	2.3E-04	3.3E-04	3.5E-05	2.0E-05	1.1E-05	1.3E-05	6.2E-06	
SW	1.1E-03	3.9E-05	2.5E-04	4.0E-05	3.8E-06	9.5E-07	0.0E+00	
SSW	1.2E-03	1.0E-05	2.1E-05	8.2E-06	0.0E+00	1.3E-07	1.1E-05	
S	1.5E-03	4.0E-04	4.3E-04	1.8E-05	2.2E-04	9.0E-05	4.2E-05	
SSE	1.1E-03	3.1E-03	3.6E-03	1.3E-03	3.1E-04	5.8E-05	2.6E-05	
SE	4.2E-04	1.3E-03	1.2E-03	4.6E-04	1.4E-04	5.0E-05	3.6E-05	
ESE	2.4E-04	8.0E-04	9.4E-05	9.8E-05	6.3E-05	1.3E-04	5.0E-05	
E	2.5E-04	6.3E-04	1.2E-04	1.9E-04	5.2E-05	9.2E-05	7.3E-05	
ENE	1.4E-04	2.5E-04	6.7E-05	3.2E-05	2.0E-05	7.9E-06	3.6E-06	
NE	3.1E-04	2.0E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	1.3E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.8E-05	

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

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	1.3E-08	1.0E-09	3.2E-10	1.5E-10	8.6E-11	5.8E-11	2.6E-11	
NNW	1.3E-08	8.0E-10	1.7E-10	4.6E-11	2.6E-11	1.8E-11	8.0E-12	
NW	1.3E-08	6.8E-10	1.9E-10	8.2E-11	4.7E-11	3.2E-11	1.4E-11	
WNW	1.3E-08	1.1E-09	2.8E-10	1.1E-10	6.1E-11	4.1E-11	1.8E-11	
W	1.3E-08	1.2E-09	3.9E-10	1.9E-10	1.1E-10	7.3E-11	3.3E-11	
WSW	1.3E-08	1.2E-09	2.9E-10	1.1E-10	6.3E-11	4.3E-11	1.9E-11	
SW	1.3E-08	8.4E-10	2.5E-10	1.1E-10	6.3E-11	4.3E-11	1.9E-11	
SSW	1.3E-08	8.7E-10	2.1E-10	7.1E-11	4.1E-11	2.8E-11	1.2E-11	
S	1.3E-08	8.5E-10	2.6E-10	1.2E-10	6.7E-11	4.6E-11	2.0E-11	
SSE	1.3E-08	1.1E-09	2.8E-10	1.0E-10	6.0E-11	4.0E-11	1.8E-11	
SE	1.3E-08	1.2E-09	3.7E-10	1.6E-10	9.5E-11	6.4E-11	2.9E-11	
ESE	1.3E-08	1.4E-09	3.8E-10	1.5E-10	8.7E-11	5.9E-11	2.7E-11	
E	1.3E-08	1.4E-09	4.2E-10	1.8E-10	1.0E-10	7.1E-11	3.2E-11	
ENE	1.3E-08	1.7E-09	4.5E-10	1.7E-10	9.9E-11	6.7E-11	3.0E-11	
NE	1.3E-08	1.7E-09	5.4E-10	2.5E-10	1.5E-10	9.9E-11	4.5E-11	
NNE	1.3E-08	1.6E-09	4.2E-10	1.6E-10	9.5E-11	6.5E-11	2.9E-11	

		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	8.3E-13	6.5E-13	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.8E-13	2.7E-13	2.1E-13	
NW	5.1E-12	0.0E+00	0.0E+00	0.0E+00	6.1E-13	4.2E-13	3.3E-13	
WNW	6.6E-12	0.0E+00	0.0E+00	0.0E+00	7.6E-13	5.0E-13	3.9E-13	
W	1.2E-11	5.2E-12	3.2E-12	2.1E-12	1.4E-12	9.3E-13	7.1E-13	
WSW	7.0E-12	3.1E-12	1.9E-12	1.3E-12	8.8E-13	6.0E-13	4.7E-13	
SW	6.9E-12	3.1E-12	1.9E-12	1.3E-12	8.8E-13	6.0E-13	0.0E+00	
SSW	4.5E-12	2.0E-12	1.2E-12	8.3E-13	0.0E+00	4.0E-13	3.2E-13	
S	7.4E-12	3.3E-12	2.0E-12	1.3E-12	9.2E-13	6.3E-13	4.9E-13	
SSE	6.5E-12	3.0E-12	1.8E-12	1.2E-12	8.4E-13	5.9E-13	4.6E-13	
SE	1.0E-11	4.7E-12	2.9E-12	1.9E-12	1.3E-12	9.2E-13	7.1E-13	
ESE	9.6E-12	4.3E-12	2.7E-12	1.8E-12	1.2E-12	8.6E-13	6.7E-13	
E	1.2E-11	5.3E-12	3.2E-12	2.2E-12	1.5E-12	1.0E-12	8.2E-13	
ENE	1.1E-11	5.1E-12	3.1E-12	2.1E-12	1.5E-12	1.1E-12	8.3E-13	
NE	1.6E-11	7.5E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	1.1E-11	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.8E-13	

COLLECTIVE FATAL CANCER RATE (deaths/y)
(All Radionuclides and Pathways)

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	1.6E-09	3.8E-10	4.0E-10	2.6E-10	2.1E-10	1.8E-10	4.6E-10
NNW	1.6E-09	2.9E-10	2.2E-10	7.9E-11	6.4E-11	5.1E-11	1.6E-10
NW	1.6E-09	2.5E-10	2.8E-10	1.6E-10	1.1E-10	1.1E-10	1.5E-09
WNW	1.6E-09	4.0E-10	4.0E-10	2.5E-10	1.9E-10	3.1E-10	9.0E-10
W	1.6E-09	4.2E-10	5.6E-10	4.5E-10	2.2E-09	3.1E-10	4.8E-10
WSW	1.6E-09	4.3E-10	4.2E-10	2.6E-10	1.2E-09	1.1E-09	1.7E-09
SW	1.6E-09	3.0E-10	3.6E-10	2.6E-10	2.6E-10	1.2E-09	3.0E-09
SSW	1.6E-09	3.1E-10	3.0E-10	1.7E-10	1.5E-10	5.5E-10	1.8E-09
S	1.6E-09	3.1E-10	3.7E-10	2.8E-10	1.9E-10	1.7E-10	2.7E-09
SSE	1.6E-09	4.1E-10	4.0E-10	2.5E-10	1.7E-10	1.5E-10	1.1E-09
SE	1.6E-09	4.4E-10	5.3E-10	3.9E-10	3.0E-10	2.4E-10	1.2E-09
ESE	1.6E-09	5.2E-10	5.5E-10	3.6E-10	2.9E-10	2.5E-10	8.7E-10
E	1.6E-09	5.2E-10	6.0E-10	4.3E-10	3.5E-10	3.1E-10	1.0E-09
ENE	1.6E-09	6.3E-10	6.4E-10	4.0E-10	2.5E-10	1.8E-10	1.3E-09
NE	1.6E-09	6.1E-10	7.6E-10	4.0E-10	2.2E-10	1.8E-10	1.6E-09
NNE	1.6E-09	5.9E-10	5.4E-10	2.9E-10	2.2E-10	1.7E-10	5.7E-10

ATTACHMENT E

NATIONAL CLIMATIC DATA CENTER, NIAGARA FALLS, NEW YORK

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)

NOAA, National Climatic Data Center

Month: 01/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)
NIAGARA FALLS , NY

Lat. 43.107 Lon. -78.945

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	max 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	34	20	27	M	24	27	38	0	-	-	SN BR	T	M	2.4	0.10	29.27	29.95	12.3	27	13.5	32	270	24	280	01	
02	20	9	15	M	8	12	50	0	-	-	SN FZFG BR BLSN	8	M	9.9	0.27	29.34	30.05	13.9	31	14.7	29	290	22	290	02	
03	17	12	15	M	10	13	50	0	-	-	SN FZFG BR BLSN	10	M	15.9	0.54	29.26	29.96	15.2	32	15.9	33	320	26	330	03	
04	19	14	17	M	12	15	48	0	-	-	SN BR	18	M	12.5	0.22	29.26	29.95	8.5	30	9.4	22	310	18	310	04	
05	27	16	22	M	16	19	43	0	-	-	FZRA FZDZ SN BR UP	18	M	4.4	0.16	29.23	29.92	10.0	29	11.0	22	310	20	310	05	
06	25	20	23	M	18	21	42	0	-	-	FZDZ SN BR	14	M	0.2s	T	29.27	29.98	11.0	29	12.8	25	320	21	320	06	
07	28	25	27	M	24	26	38	0	-	-	SN BR	13	M	T	T	29.32	29.99	6.8	26	8.0	17	260	14	260	07	
08	26	16	21	M	15	18	44	0	-	-	SN BR	12	M	2.7	0.12	29.27	29.99	8.2	35	9.5	22	320	18	330	08	
09	16	0	8	M	6	10	57	0	-	-	SN BR	14	M	3.2	0.09	29.62	30.35	4.4	33	4.8	16	350	13	350	09	
10	26	0	13	M	9	14	52	0	-	-	FG+ FZFG BR	14	M	0.0	0.00	29.63	30.32	12.8	24	13.0	38	220	30	230	10	
11	25	17	21	M	18	22	44	0	-	-	SN BR	10	M	1.1s	T	29.44	30.14	13.0	22	13.3	40	240	30	230	11	
12	23	15	19	M	14	19	46	0	-	-	SN BR	10	M	0.6	0.04	29.57	30.28	6.0	30	7.6	20	300	16	300	12	
13	30	19	25	M	22	25	40	0	-	-	BR BLSN	9	M	0.0	0.00	29.51	30.18	15.3	23	16.0	41	230	33	230	13	
14	41	22	32	M	25	30	33	0	-	-		8	M	0.0	0.00	29.43	30.10	13.8	22	14.0	32	250	28	240	14	
15	40	34	37	M	30	34	28	0	-	-	DZ BR HZ	5	M	0.0	T	29.47	30.17	11.7	24	11.8	33	240	28	250	15	
16	35	32	34	M	29	32	31	0	-	-	BR	4	M	0.0	0.00	29.52	30.19	14.5	23	14.7	37	230	29	230	16	
17	36	32	34	M	32	33	31	0	-	-	FG+ FG BR	3	M	0.0	0.00	29.26	29.89	1.8	08	3.3	13	230	10	230	17	
18	35	29	32	M	30	31	33	0	-	-	FZDZ FG+ FG BR	2	M	0.0	T	29.21	29.90	9.8	25	10.2	25	240	21	240	18	
19	34	25	30	M	26	29	35	0	-	-	SN BR	2	M	0.2	0.02	29.26	29.94	6.9	24	7.2	17	240	14	230	19	
20	31	22	27	M	21	25	38	0	-	-	SN BR	2	M	0.6	0.04	29.38	30.09	4.7	32	5.0	15	330	12	290	20	
21	33	12	23	M	19	23	42	0	-	-	BR	2	M	T	T	29.50	30.18	M	M	8.1	20	070	17	070	21	
22	36	23	30	M	22	26	35	0	-	-		2	M	0.0	0.00	29.37	30.07	9.2	07	9.4	22	080	18	070	22	
23	39	20	30	M	22	27	35	0	-	-		1	M	0.0	0.00	29.50	30.17	6.9	08	7.3	16	080	13	070	23	
24	45	29	37	M	32	36	28	0	-	-	RA FG BR	1	M	0.0	0.65	29.13	29.74	M	M	7.0	21	160	16	170	24	
25	45*	32	39*	M	35	37	26	0	-	-	RA DZ FG+ FG BR	T	M	0.0s	0.98	28.66	29.30	12.0	23	13.4	44	240	35	240	25	
26	34	29	32	M	24	29	33	0	-	-	SN BR UP	T	M	T	T	28.94	29.65	19.9	24	19.9	37	240	29	240	26	
27	30	24	27	M	21	25	38	0	-	-	SN BR BLSN	T	M	1.1	0.07	29.31	30.02	M	M	18.6	40	230	31	240	27	
28	29	12	21	M	13	18	44	0	-	-	SN BR BLSN	2	M	3.1	0.18	29.37	30.10	19.0	27	19.5	44	280	37	270	28	
29	15	8	12	M	4	10	53	0	-	-	SN FZFG BR	3	M	7.6	0.20	29.70	30.43	10.8	29	12.3	30	280	23	280	29	
30	14	-1*	7*	M	0	5	58	0	-	-	SN BR	3	M	0.4s	T	29.64	30.34	1.8	07	2.6	13	350	10	360	30	
31	24	0	12	M	10	16	53	0	-	-	SN BLSN	2	M	0.2s	T	29.43	30.14	15.4	24	15.7	37	230	29	240	31	
	29.4	18.3	23.9		19.1	22.8	40.8	0.0			<----Monthly Averages Totals---->	M	M	1.79s		29.36	30.03	7.4	26	11.3		<Monthly Average				
	M	M	M								<-----Departure From Normal----->	M														

Degree Days Monthly Season to Date
 Total Departure Total Departure
 Heating: 1266 M M M
 Cooling: 0 M

Greatest 24-hr Precipitation: 1.63s Date: 24-25

Greatest 24-hr Snowfall: M Date: M

Greatest Snow Depth: M Date: M

Sea Level Pressure Date Time

(LST)

Maximum 30.48 29 2345

Minimum 29.10 25 1016

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)

NOAA, National Climatic Data Center

Month: 02/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)

NIAGARA FALLS, NY

Lat. 43.107 Lon. -78.945

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	Res	Avg. Speed	max 5-second	max 2-minute	Speed	Dir	Speed	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	24	13	19	M	12	18	46	0	-	-	SN	2	M	0.2s	T	29.57	30.28	12.2	26	12.5	29	260	24	260	01
02	29	10	20	M	16	20	45	0	-	-	-	SN BR UP	2	M	0.2	0.01	29.51	30.18	2.1	10	3.2	10	050	9	070	02
03	31	16	24	M	21	25	41	0	-	-	-	SN FG+ FZFG BR	2	M	1.4	0.07	29.44	30.16	8.6	27	9.2	28	290	23	270	03
04	30	10	20	M	16	21	45	0	-	-	-	BR	2	M	0.0	0.00	29.71	30.41	6.4	25	7.0	20	210	16	210	04
05	32	16	24	M	20	24	41	0	-	-	-	BR HZ	2	M	0.0	0.00	29.58	30.24	7.0	07	7.7	31	080	24	070	05
06	23	8*	16*	M	10	15	49	0	-	-	-	SN	1	M	0.1s	T	29.36	30.05	12.4	05	13.1	35	050	28	060	06
07	26	9	18	M	11	17	47	0	-	-	-	SN	1	M	0.6	0.02	29.43	30.13	9.0	32	9.3	23	330	18	330	07
08	30	10	20	M	14	20	45	0	-	-	-	SN UP	1	M	0.0	0.00	29.47	30.18	8.0	28	8.8	21	280	17	280	08
09	27	24	26	M	19	23	39	0	-	-	-	SN BR	1	M	0.2	0.01	29.38	30.01	7.5	06	8.0	23	070	20	070	09
10	29	16	23	M	22	25	42	0	-	-	-	SN BR	1	M	0.0	0.00	28.93	29.62	8.0	02	12.2	24	330	20	330	10
11	54s	9	M	M	13	18	M	M	-	-	-	SN BR	1	M	0.0	0.00	29.18	29.89	10.7	26	10.9	24	260	20	260	11
12	29	16	23	M	17	23	42	0	-	-	-	SN BR	1	M	T	T	29.26	29.94	9.2	26	9.7	21	250	18	260	12
13	28	10	19	M	18	21	46	0	-	-	-	SN BR	1	M	1.3	0.05	29.11	29.77	7.3	29	8.3	24	280	20	290	13
14	30	25	28	M	23	26	37	0	-	-	-	SN BR	3	M	2.2	0.12	29.03	29.71	13.1	26	13.2	29	270	24	260	14
15	31	17	24	M	20	24	41	0	-	-	-	SN BR	2	M	T	T	29.05	29.72	7.9	24	8.5	23	240	18	220	15
16	30	23	27	M	20	25	38	0	-	-	-	SN	1	M	T	T	28.97	29.66	8.5	26	8.8	18	270	16	270	16
17	32	26	29	M	25	27	36	0	-	-	-	SN FG FZFG BR	1	M	3.8	0.33	28.98	29.65	M	M	13.8	26	280	21	300	17
18	33	29	31	M	25	29	34	0	-	-	-	FZRA SN BR	5	M	0.8	0.08	29.08	29.77	M	M	13.5	24	270	20	260	18
19	35	29	32	M	26	30	33	0	-	-	-	BR	5	M	0.0	0.00	29.26	29.96	15.5	26	15.6	28	260	22	260	19
20	34	21	28	M	24	27	37	0	-	-	-	RA FZRA SN FZFG BR UP	4	M	0.0	0.00	29.43	30.12	10.3	25	10.6	20	260	16	260	20
21	39	16	28	M	21	24	37	0	-	-	-	RA SN PL BR	4	M	0.0	0.00	29.42	30.10	4.3	26	5.5	14	320	13	320	21
22	33	16	25	M	23	26	40	0	-	-	-	SN BR	5	M	T	0.01	29.10	29.80	10.1	22	10.5	26	220	21	220	23
23	35	31	33	M	30	31	32	0	-	-	-	SN BR BLSN	4	M	T	T	29.24	29.91	2.8	30	3.1	12	350	9	310	24
24	36	19	28	M	23	27	37	0	-	-	-	SN GS FZFG BR BLSN	4	M	1.6	0.07	29.07	29.72	12.8	31	13.0	24	290	21	320	25
25	30	21	26	M	22	24	39	0	-	-	-	SN FG BR UP	6	M	2.7	0.16	28.82	29.51	10.2	30	12.2	30	310	23	310	26
26	30	22	26	M	24	25	39	0	-	-	-	SN BR	10	M	5.4	0.43	28.90	29.57	7.6	31	8.4	21	310	17	290	27
27	35	27	31	M	31	32	34	0	-	-	-	SN BR	11	M	0.7	0.07	29.08	29.77	7.8	34	8.8	17	010	14	340	28
	31.9	18.6	25.3		20.6	24.3	M	M	<-----Monthly Averages Totals----->				M	M	0.72s		29.23	29.91	M	M	9.8	<Monthly Average				
	M	M	M		<-----Departure From Normal----->							M														
Degree Days				Monthly	Season to Date				Greatest 24-hr Precipitation: 0.26s Date: 27-28														Sea Level Pressure Date Time (LST)			
Heating:				M	M	M	M		Greatest 24-hr Snowfall: M Date: M														Maximum 30.47 04 1034			
Cooling:				M	M	M	M		Greatest Snow Depth: M Date: M														Minimum 29.43 26 0639			

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA

(final)

NOAA, National Climatic Data Center

Month: 03/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)

NIAGARA FALLS , NY

Lat. 43.107 Lon. -78.945

Elevation(Ground): 585 ft. above sea level

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)

NOAA, National Climatic Data Center

Month: 04/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)
NIAGARA FALLS, NY

Lat. 43.107 Lon. -78.945

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	max 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	77	37	57	M	39	49	8	0	-	-	RA	0	M	0.0	0.00	29.32	29.96	3.0	20	4.7	18	200	15	210	01	
02	80	48	64	M	43	52	1	0	-	-		0	M	0.0	0.00	29.32	29.95	5.3	22	5.6	28	220	23	220	02	
03	85*	47	66*	M	44	54	0	1	-	-		0	M	0.0	T	29.21	29.85	10.0	22	11.9	48	250	37	250	03	
04	64	40	52	M	34	44	13	0	-	-		0	M	0.0	0.00	29.49	30.13	6.1	21	6.7	20	220	16	220	04	
05	70	48	59	M	42	51	6	0	-	-		0	M	0.0	T	29.31	29.94	12.1	21	12.8	31	210	25	220	05	
06	60	48	54	M	49	51	11	0	-	-		0	M	0.0	0.59	29.16	29.76	3.9	09	5.6	9s	040	7s	030	06	
07	66	49	58	M	51	54	7	0	-	-		0	M	0.0	0.66	29.02	29.66	8.1	22	9.1	31	240	24	250	07	
08	68	42	55	M	48	50	10	0	-	-		0	M	0.0	0.68	28.98	29.60	9.1	22	12.0	32	230	25	230	08	
09	42	34	38*	M	28	34	27	0	-	-		0	M	T	0.02	29.19	29.89	14.0	26	14.3	30	250	24	270	09	
10	53	33	43	M	31	38	22	0	-	-		0	M	0.0	0.00	29.53	30.20	12.3	24	13.3	36	230	28	230	10	
11	61	42	52	M	35	44	13	0	-	-		0	M	0.0	0.00	29.59	30.27	5.2	27	7.4	21	320	16	320	11	
12	56	35	46	M	29	39	19	0	-	-		0	M	0.0	0.00	29.77	30.44	3.7	35	5.0	21	320	15	350	12	
13	59	38	49	M	28	41	16	0	-	-		0	M	0.0	0.00	29.83	30.50	3.5	03	4.4	23	040	16	030	13	
14	64	32*	48	M	27	40	17	0	-	-		0	M	M	0.00	29.85	30.50	1.0	10	2.3	14	250	10	250	14	
15	72	40	56	M	39	48	9	0	-	-		0	M	M	0.00	29.56	30.20	5.3	20	5.6	21	180	15	200	15	
16	66	43	55	M	45	50	10	0	-	-		0	M	0.0	0.07	29.16	29.78	8.7	24	11.4	36	300	29	310	16	
17	45	37	41	M	30	37	24	0	-	-		0	M	T	T	29.19	29.86	16.2	28	16.6	31	270	24	290	17	
18	57	37	47	M	34	40	18	0	-	-		0	M	0.0	0.03	29.34	30.02	9.2	30	10.2	23	300	17	300	18	
19	60	38	49	M	31	41	16	0	-	-		0	M	0.0	0.00	29.44	30.11	7.5	30	8.8	22	330	15	320	19	
20	66	36	51	M	35	44	14	0	-	-		0	M	0.0	0.00	29.36	29.99	3.0	20	3.8	15	290	9	280	20	
21	66	39	53	M	35	44	12	0	-	-		0	M	0.0	0.00	29.15	29.79	5.3	23	8.2	23	220	18	210	21	
22	54	37	46	M	31	39	19	0	-	-		0	M	0.0	0.00	29.20	29.86	6.9	30	8.0	18	310	15	310	22	
23	60	34	47	M	29	40	18	0	-	-		0	M	0.0	0.00	29.34	30.01	1.8	01	3.0	16	040	12	060	23	
24	70	36	53	M	32	45	12	0	-	-		0	M	0.0	T	29.33	29.94	5.0	11	6.1	21	140	16	150	24	
25	55	49	52	M	46	48	13	0	-	-		0	M	0.0	0.24	28.94	29.54	11.1	08	11.4	28	070	22	070	25	
26	62	46	54	M	38	46	11	0	-	-		0	M	0.0	T	28.75	29.38	7.7	04	10.2	32	360	25	350	26	
27	51	37	44	M	24	36	21	0	-	-		0	M	0.0	0.00	28.95	29.63	13.8	34	14.7	33	320	24	360	27	
28	57	37	47	M	23	38	18	0	-	-		0	M	0.0	0.00	29.13	29.80	14.5	31	15.0	35	320	28	310	28	
29	65	34	50	M	29	41	15	0	-	-		0	M	0.0	0.00	29.24	29.89	8.5	24	10.2	28	250	22	230	29	
30	78	50	64	M	45	54	1	0	-	-		0	M	0.0	0.00	29.15	29.77	6.1	22	7.2	26	240	21	240	30	
	63.0	40.1	51.6		35.8	44.4	13.4	0.0	<----Monthly Averages Totals----->				M	M	2.29s	29.29	29.94	3.8	26	8.8	<Monthly Average					
	M	M	M		<-----Departure From Normal----->								M													

Degree Days	Monthly	Season to Date	Greatest 24-hr Precipitation: 1.12s Date: 07-08	Sea Level Pressure Date Time (LST)
Total Departure	Total Departure		Greatest 24-hr Snowfall: M Date: M	Maximum 30.62 14 0719
Heating: 401	M M M		Greatest Snow Depth: M Date: M	Minimum 29.33 26 1614
Cooling: 1	M			

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)

NOAA, National Climatic Data Center

Month: 05/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)
NIAGARA FALLS , NY

Lat. 43.107 Lon. -78.945

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	max 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	77	59	68	M	55	60	0	3	-	-	HZ			0	M	0.0	0.03	29.11	29.73	7.2	22	7.7	35	230	26	240	01
02	80	60	70	M	59	63	0	5	-	-	RA			M	M	M	T	29.06	29.68	9.4	21	9.9	30	240	22	230	02
03	75	52	64	M	53	58	1	0	-	-	RA			0	M	0.0	0.10	29.05	29.69	8.6	24	11.3	37	290	28	300	03
04	71	51	61	M	45	52	4	0	-	-	TSRA RA BR VCTS			0	M	0.0	0.01	29.18	29.82	11.4	23	12.7	37	240	25	240	04
05	81	51	66	M	46	55	0	1	-	-				0	M	0.0	0.75	29.15	29.77	12.4	22	12.9	38	220	31	230	05
06	62	42	52	M	42	48	13	0	-	-	RA BR			0	M	0.0	T	29.20	29.87	11.7	28	14.1	32	290	26	300	06
07	55	40	48	M	40	44	17	0	-	-	RA BR			0	M	0.0	0.61	29.30	29.90	7.8	07	8.8	43	080	32	070	07
08	54	38	46	M	37	42	19	0	-	-	SN			0	M	0.0	0.04	28.94	29.62	18.1	26	21.4	62	230	45	230	08
09	51	35	43	M	27	35	22	0	-	-				0	M	T	T	29.44	30.15	15.5	30	15.8	33	280	26	290	09
10	56	28*	42*	M	27	37	23	0	-	-	RA BR			0	M	0.0	0.00	29.68	30.37	5.8	28	7.5	23	280	16	310	10
11	53	34	44	M	32	39	21	0	-	-	RA DZ BR			0	M	0.0	0.16	29.63	30.26	10.5	11	11.0	31	100	21	100	11
12	54	38	46	M	41	43	19	0	-	-	RA BR			0	M	0.0	0.02	29.48	30.17	9.5	06	9.9	25	060	22	060	12
13	58	33	46	M	43	46	19	0	-	-	FG+ BR			0	M	0.0	0.73	29.54	30.19	5.4	09	6.4	22	130	15	120	13
14	69	51	60	M	51	55	5	0	-	-				0	M	0.0	T	29.38	30.02	11.4	25	12.2	37	240	30	220	14
15	59	47	53	M	43	48	12	0	-	-				0	M	0.0	0.00	29.52	30.19	8.8	30	9.4	24	300	20	320	15
16	69	46	58	M	42	49	7	0	-	-				0	M	0.0	0.00	29.58	30.23	2.1	04	4.4	18	060	15	060	16
17	69	43	56	M	40	49	9	0	-	-	RA			0	M	0.0	0.00	29.51	30.14	6.7	08	6.8	24	070	17	070	17
18	62	52	57	M	46	51	8	0	-	-				0	M	0.0	T	29.39	30.01	5.2	11	6.6	30	110	23	110	18
19	75	50	63	M	45	53	2	0	-	-				0	M	0.0	T	29.31	29.95	1.6	34	6.3	18	220	15	230	19
20	77	49	63	M	50	56	2	0	-	-	RA BR HZ			0	M	0.0	0.00	29.36	30.01	7.4	20	7.6	18	220	15	220	20
21	81	51	66	M	53	59	0	1	-	-	RA			0	M	0.0	T	29.44	30.08	2.3	08	4.1	21	060	17	060	21
22	73	62	68	M	56	60	0	3	-	-	BR			0	M	0.0	0.08	29.41	30.03	5.4	15	6.9	23	210	18	220	22
23	79	59	69	M	60	64	0	4	-	-	BR			0	M	0.0	0.00	29.49	30.13	1.4	06	3.9	18	310	14	330	23
24	84	59	72	M	61	65	0	7	-	-	BR			0	M	0.0	0.00	29.57	30.20	2.8	04	4.6	17	350	14	360	24
25	85	59	72	M	60	65	0	7	-	-	BR			0	M	0.0	0.00	29.55	30.16	0.5	36	2.7	17	350	14	350	25
26	87	60	74	M	61	66	0	9	-	-	BR			0	M	0.0	0.00	29.37	29.97	2.4	25	4.5	16	290	14	220	26
27	87	61	74*	M	61	65	0	9	-	-	BR			0	M	0.0	0.00	29.23	29.85	1.9	24	4.5	15	230	13	230	27
28	79	59	69	M	56	62	0	4	-	-				0	M	0.0	0.03	29.28	29.90	4.6	03	5.0	16	030	13	030	28
29	79	56	68	M	53	60	0	3	-	-				0	M	0.0	0.00	29.29	29.92	5.9	33	6.5	21	350	16	360	29
30	83	56	70	M	51	60	0	5	-	-				0	M	0.0	0.00	29.31	29.94	4.1	22	4.7	16	230	13	210	30
31	88*	58	73	M	60	65	0	8	-	-				0	M	0.0	0.03	29.26	29.87	5.9	21	6.9	30	230	25	210	31
	71.4	49.6	60.5		48.3	54.0	6.5	2.2	<-----Monthly Averages Totals----->						M	M	2.59s	29.36	29.99	2.2	24	8.3	<Monthly Average				
	M	M	M		<-----Departure From Normal----->						M																

Degree Days	Monthly	Season to Date	Greatest 24-hr Precipitation: 0.75 Date: 05-06	Sea Level Pressure Date Time (LST)
Total Departure	Total Departure		Greatest 24-hr Snowfall: M Date: M	Maximum 30.42 11 0358
Heating: 203	M	M	Greatest Snow Depth: M Date: M	Minimum 29.44 08 0152
Cooling: 69	M			

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)

NOAA, National Climatic Data Center

Month: 06/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)
NIAGARA FALLS , NY

Lat. 43.107 Lon. -78.945

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	max 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	81	61	71	M	57	63	0	6	-	-	RA BR	0	M	0.0	0.94	29.18	29.80	6.6	27	8.4	21	310	17	310	01	
02	81	59	70	M	60	64	0	5	-	-	RA BR	0	M	0.0	0.33	29.13	29.72	8.9	21	9.5	26	210	22	360	02	
03	72	62	67	M	61	63	0	2	-	-	TSRA DZ BR	0	M	0.0	0.22	29.08	29.72	3.9	28	5.6	21	330	15	330	03	
04	76	61	69	M	61	63	0	4	-	-	TSRA RA BR VCTS	0	M	0.0	0.29	29.19	29.79	0.7	05	4.7	20	270	15	260	04	
05	82	63	73	M	61	65	0	8	-	-	RA BR HZ	0	M	0.0	0.01	29.05	29.66	6.4	26	11.0	30	280	24	270	05	
06	64	54	59	M	52	55	6	0	-	-	RA DZ BR	0	M	0.0	1.03	28.95	29.61	7.6	02	10.4	35	010	29	010	06	
07	68	50	59	M	46	53	6	0	-	-		0	M	0.0	0.00	29.28	29.94	9.5	32	9.9	25	300	22	300	07	
08	69	46*	58*	M	44	51	7	0	-	-	RA DZ FG+ FG BR VCTS	0	M	0.0	0.00	29.49	30.13	4.2	30	5.7	21	320	14	310	08	
09	64	54	59	M	54	56	6	0	-	-	BR	0	M	0.0	0.37	29.26	29.87	3.4	15	6.9	18	140	15	130	09	
10	71	56	64	M	53	58	1	0	-	-		0	M	0.0	0.01	29.24	29.90	7.6	30	8.7	29	310	22	320	10	
11	75	53	64	M	55	59	1	0	-	-	RA BR	0	M	0.0	0.00	29.45	30.09	1.7	14	3.0	18	200	10	170	11	
12	85*	63	74	M	64	67	0	9	-	-	RA DZ BR	0	M	0.0	0.02	29.31	29.92	1.8	22	9.0	23	240	20	230	12	
13	70	62	66	M	61	63	0	1	-	-	RA BR	0	M	0.0	0.03	29.29	29.91	3.0	03	4.6	13	360	10	360	13	
14	78	62	70	M	61	64	0	5	-	-		0	M	0.0	T	29.28	29.91	1.6	35	5.5	17	050	14	060	14	
15	78	58	68	M	51	58	0	3	-	-	RA BR VCTS	0	M	0.0	0.00	29.45	30.08	6.1	07	6.6	21	040	15	070	15	
16	79	60	70	M	59	62	0	5	-	-		0	M	0.0	0.37	29.25	29.86	10.3	25	15.7	40	240	32	240	16	
17	76	58	67	M	53	58	0	2	-	-		0	M	0.0	0.00	29.39	30.03	6.2	32	9.2	26	290	21	290	17	
18	81	57	69	M	58	63	0	4	-	-		0	M	0.0	0.00	29.43	30.05	5.8	20	6.3	21	210	17	210	18	
19	83	70	77*	M	63	68	0	12	-	-		0	M	0.0	0.00	29.27	29.87	12.4	22	13.8	37	240	28	230	19	
20	82	66	74	M	60	65	0	9	-	-		0	M	0.0	0.00	29.31	29.94	6.0	30	7.0	25	270	18	280	20	
21	81	60	71	M	58	63	0	6	-	-	RA BR	0	M	0.0	0.00	29.46	30.08	1.6	29	3.6	17	200	12	220	21	
22	80	63	72	M	64	67	0	7	-	-	BR VCTS	0	M	0.0	0.16	29.36	29.96	5.5	24	7.9	32	270	24	280	22	
23	84	65	75	M	67	70	0	10	-	-	TSRA RA BR	0	M	0.0	T	29.30	29.90	9.3	22	9.6	28	230	22	240	23	
24	82	66	74	M	64	67	0	9	-	-		0	M	0.0	0.10	29.18	29.81	10.7	27	14.6	36	240	28	230	24	
25	77	59	68	M	58	62	0	3	-	-	RA BR HZ	0	M	0.0	0.00	29.39	30.02	5.4	27	7.8	23	270	18	270	25	
26	75	62	69	M	61	64	0	4	-	-	TSRA RA BR HZ	0	M	0.0	0.03	29.27	29.87	3.8	19	4.6	15	200	12	230	26	
27	82	63	73	M	67	69	0	8	-	-	RA BR	0	M	0.0	0.80	29.07	29.65	2.9	24	5.1	24	220	18	230	27	
28	82	64	73	M	67	69	0	8	-	-		0	M	0.0	0.54	28.93	29.57	10.6	25	11.8	33	320	26	320	28	
29	70	53	62	M	47	54	3	0	-	-		0	M	0.0	0.00	29.28	29.95	12.6	29	13.1	31	280	25	290	29	
30	70	48	59	M	44	52	6	0	-	-		0	M	0.0	0.00	29.49	30.14	12.2	29	12.3	28	290	23	300	30	
	76.6	59.3	68.0		57.7	61.8	1.2	4.3			<-----Monthly Averages Totals----->	M	M	5.33s		29.26	29.89	4.0	27	8.4						
	M	M	M								<-----Departure From Normal----->	M														

Degree Days Monthly Season to Date
 Total Departure Total Departure
 Heating: 36 M M M
 Cooling: 130 M

Greatest 24-hr Precipitation: 1.34s Date: 27-28

Greatest 24-hr Snowfall: M Date: M

Greatest Snow Depth: M Date: M

Sea Level Pressure Date Time

(LST)

Maximum 30.21 30 2359

Minimum 29.32 06 0541

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA

(final)

NOAA, National Climatic Data Center

Month: 07/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)
NIAGARA FALLS, NY

Lat. 43.107 Lon. -78.945

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
01	73	49*	61*	M	45	53	4	0	-	-		0	M	0.0	0.00	29.60	30.26	6.4	32	7.0	22	300	17	300	01
02	76	50	63	M	49	56	2	0	-	-		0	M	0.0	0.00	29.64	30.26	3.2	24	4.6	16	230	14	230	02
03	83	58	71	M	56	62	0	6	-	-	HZ	0	M	0.0	0.00	29.49	30.10	9.7	22	10.0	24	240	20	240	03
04	86	63	75	M	62	67	0	10	-	-	HZ	0	M	0.0	0.00	29.37	29.98	10.9	22	11.1	30	210	23	220	04
05	90	71	81	M	69	73	0	16	-	-	HZ	0	M	0.0	0.00	29.34	29.96	10.0	22	10.2	25	200	21	210	05
06	90	72	81	M	67	72	0	16	-	-	BR HZ	0	M	0.0	0.00	29.41	30.03	7.5	22	7.6	21	230	16	210	06
07	91	70	81	M	69	73	0	16	-	-	BR HZ	0	M	0.0	0.00	29.44	30.04	6.0	21	6.4	18	240	15	230	07
08	92*	73	83*	M	67	72	0	18	-	-	RA FG BR HZ VCTS	0	M	0.0	0.00	29.37	29.97	5.8	23	6.2	20	260	14	240	08
09	77	65	71	M	69	70	0	6	-	-	BR	0	M	0.0	0.47	29.26	29.87	2.6	30	4.0	15	350	13	340	09
10	83	60	72	M	56	63	0	7	-	-	FG+	0	M	0.0	0.00	29.29	29.91	5.1	32	5.3	17	310	14	320	10
11	84	59	72	M	61	66	0	7	-	-	HZ	0	M	0.0	0.00	29.26	29.87	4.1	22	4.8	21	210	15	220	11
12	85	66	76	M	64	68	0	11	-	-	BR HZ	0	M	0.0	T	29.16	29.77	2.8	20	4.6	17	260	15	240	12
13	83	71	77	M	69	72	0	12	-	-	BR HZ	0	M	0.0	0.00s	29.21	29.83	3.4	21	5.3	16	210	13	210	13
14	84	68	76	M	67	70	0	11	-	-	FG+ FG BR	0	M	0.0	0.00	29.37	30.00	4.7	03	5.2	16	030	13	040	14
15	87	65	76	M	65	70	0	11	-	-	HZ	0	M	0.0	T	29.38	29.98	5.5	21	6.2	22	230	16	240	15
16	86	73	80	M	67	71	0	15	-	-		0	M	0.0	T	29.24	29.85	11.0	24	12.1	28	240	22	230	16
17	87	72	80	M	66	70	0	15	-	-	RA	0	M	0.0	T	29.20	29.80	13.8	25	14.7	41	240	31	240	17
18	85	61	73	M	59	65	0	8	-	-	RA DZ BR	0	M	0.0	0.02	29.24	29.86	6.2	24	8.1	29	220	20	220	18
19	82	69	76	M	65	69	0	11	-	-		0	M	0.0	0.03	29.18	29.81	5.7	29	8.5	24	210	17	220	19
20	83	66	75	M	61	66	0	10	-	-		0	M	0.0	0.00	29.33	29.94	2.7	23	3.1	13	210	10	210	20
21	87	65	76	M	64	68	0	11	-	-	RA	0	M	0.0	T	29.28	29.89	8.2	27	9.7	33	260	25	300	21
22	85	63	74	M	61	66	0	9	-	-		M	M	M	0.00	29.38	30.00	6.3	27	8.1	21	330	15	320	22
23	88	66	77	M	72	74	0	12	-	-	RA BR HZ	0	M	0.0	0.79	29.21	29.81	10.3	22	12.6	31	250	24	240	23
24	83	68	76	M	72	73	0	11	-	-	RA BR	0	M	0.0	0.63	29.21	29.83	7.3	24	8.8	30	350	21	350	24
25	80	60	70	M	61	65	0	5	-	-	RA BR	0	M	0.0	0.18	29.28	29.93	5.7	34	6.4	22	320	18	330	25
26	83	59	71	M	61	65	0	6	-	-		0	M	0.0	0.00	29.44	30.07	5.3	27	6.3	20	290	15	250	26
27	84	61	73	M	61	66	0	8	-	-	BR	0	M	0.0	0.00	29.44	30.05	4.9	22	5.2	25	220	13	210	27
28	85	64	75	M	68	70	0	10	-	-	TSRA BR	0	M	0.0	0.46	29.28	29.88	11.1	23	11.7	36	240	28	230	28
29	76	61	69	M	57	62	0	4	-	-		0	M	0.0	0.00	29.34	29.97	6.5	33	7.0	20	320	14	320	29
30	78	58	68	M	57	62	0	3	-	-		0	M	0.0	0.00	29.36	29.98	2.2	01	4.0	14	020	12	360	30
31	76	58	67	M	58	62	0	2	-	-		0	M	0.0	0.00	29.31	29.93	2.4	34	2.8	15	330	13	330	31
	83.6	64.0	73.8		62.7	67.1	0.2	9.3			<-----Monthly Averages Totals----->	M	M	2.63s	29.34	29.95	4.8	25	7.3	<Monthly Average					
	M	M	M		<-----Departure From Normal----->						M														
Degree Days				Monthly		Season to Date		Greatest 24-hr Precipitation: 0.82s Date: 24-25						Sea Level Pressure Date Time (LST)											
								Greatest 24-hr Snowfall: M Date: M																	
								Greatest Snow Depth: M Date: M																	

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)

NOAA, National Climatic Data Center

Month: 08/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)
NIAGARA FALLS , NY

Lat. 43.107 Lon. -78.945

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	max 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	83	65	74	M	63	67	0	9	-	-		0	M	0.0	0.00	29.34	29.96	4.6	06	5.3	20	050	14	040	01		
02	83	67	75	M	66	69	0	10	-	-		0	M	0.0	0.00	29.38	30.00	6.3	21	6.6	17	220	13	220	02		
03	87	71	79	M	69	72	0	14	-	-	BR HZ	0	M	0.0	0.00	29.32	29.92	12.2	22	12.6	30	250	24	230	03		
04	87	73	80	M	71	74	0	15	-	-	BR HZ	0	M	0.0	0.00	29.20	29.79	9.9	22	10.2	25	220	18	230	04		
05	88	69	79	M	68	71	0	14	-	-	RA BR HZ	0	M	0.0	0.02	29.05	29.66	9.2	24	10.1	31	230	24	230	05		
06	78	57	68	M	54	60	0	3	-	-	RA	0	M	0.0	0.06	29.17	29.81	7.1	30	8.9	30	260	25	270	06		
07	75	52	64	M	51	57	1	0	-	-	RA	0	M	0.0	0.00	29.33	29.97	3.8	24	6.1	20	240	16	200	07		
08	82	66	74	M	62	66	0	9	-	-	RA	0	M	0.0	T	29.29	29.91	11.4	22	11.8	31	240	25	230	08		
09	81	71	76	M	68	71	0	11	-	-	RA BR	0	M	0.0	0.47	29.31	29.93	7.3	22	8.1	26	240	20	240	09		
10	87	69	78	M	71	73	0	13	-	-	BR HZ	0	M	0.0	0.00	29.30	29.92	2.5	28	4.3	16	300	12	210	10		
11	86	67	77	M	70	72	0	12	-	-	BR	0	M	0.0	0.00	29.28	29.89	2.9	05	3.8	13	080	12	010	11		
12	84	67	76	M	66	69	0	11	-	-	RA	0	M	0.0	0.01	29.21	29.84	7.5	09	7.9	23	070	18	080	12		
13	85	64	75	M	64	67	0	10	-	-	BR	0	M	0.0	0.00	29.32	29.94	4.7	16	5.8	20	160	15	150	13		
14	88	63	76	M	65	69	0	11	-	-	TSRA BR HZ VCTS	0	M	0.0	0.00	29.29	29.90	8.0	18	8.8	23	190	17	190	14		
15	87	72	80	M	70	72	0	15	-	-	TSRA BR HZ VCTS	0	M	0.0	0.04	29.21	29.82	11.0	20	11.8	36	240	28	250	15		
16	83	67	75	M	60	66	0	10	-	-		0	M	0.0	0.06	29.24	29.87	12.7	24	13.0	39	200	30	190	16		
17	82	58	70	M	57	63	0	5	-	-		0	M	0.0	0.00	29.36	30.00	10.3	24	11.2	31	250	24	240	17		
18	77	62	70	M	58	62	0	5	-	-	RA	0	M	0.0	T	29.41	30.03	1.0	11	3.0	12	250	9	250	18		
19	85	58	72	M	63	66	0	7	-	-	TSRA BR VCTS	0	M	0.0	0.42	29.28	29.90	5.1	25	7.7	33	240	25	230	19		
20	76	57	67	M	56	61	0	2	-	-		0	M	0.0	0.00	29.38	30.01	5.0	06	5.8	16	120	12	120	20		
21	82	61	72	M	64	67	0	7	-	-	RA BR	0	M	0.0	0.44	29.27	29.88	2.4	15	5.2	30	220	25	220	21		
22	75	67	71	M	66	68	0	6	-	-	RA BR	0	M	0.0	0.46	29.24	29.88	6.5	05	6.9	18	030	16	030	22		
23	68	61	65	M	62	64	0	0	-	-	RA DZ BR	0	M	0.0	0.16	29.38	30.01	11.0	04	11.9	28	060	21	050	23		
24	77	59	68	M	59	62	0	3	-	-		0	M	0.0	0.00	29.42	30.05	5.7	09	6.0	20	080	15	050	24		
25	79	59	69	M	61	64	0	4	-	-	RA BR	0	M	0.0	0.28	29.30	29.92	2.4	30	4.2	22	260	17	260	25		
26	72	56	64	M	53	58	1	0	-	-		0	M	0.0	0.00	29.41	30.06	8.1	31	8.9	25	290	18	300	26		
27	75	50*	63*	M	53	57	2	0	-	-		M	M	Ts	29.52	30.15	4.0	23	5.2	20	210	16	200	27			
28	81	59	70	M	59	63	0	5	-	-	BR	0	M	0.0	0.00	29.54	30.17	6.6	21	6.8	21	230	17	230	28		
29	85	54	70	M	59	64	0	5	-	-	BR	0	M	0.0	0.00	29.57	30.20	5.3	22	5.5	20	190	14	210	29		
30	88	62	75	M	66	70	0	10	-	-	BR HZ	0	M	0.0	0.00	29.59	30.21	5.9	20	5.9	16	220	13	190	30		
31	90*	69	80*	M	66	70	0	15	-	-	BR HZ	0	M	0.0	0.00	29.51	30.11	6.5	22	6.8	20	240	16	240	31		
	81.8	63.0	72.4		62.6	66.3	0.1	7.8			<-----Monthly Averages Totals----->	M	0	2.42s		29.34	29.96	3.1	22	7.6		<Monthly Average					
	M	M	M								<-----Departure From Normal----->	M															

Degree Days Monthly Season to Date
 Total Departure Total Departure
 Heating: 4 M M M
 Cooling: 241 M

Greatest 24-hr Precipitation: 0.90s Date: 21-22

Greatest 24-hr Snowfall: M Date: M

Greatest Snow Depth: M Date: M

Sea Level Pressure Date Time

(LST)

Maximum 30.28 30 0739

Minimum 29.61 05 1533

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)

NOAA, National Climatic Data Center

Month: 09/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)
NIAGARA FALLS, NY

Lat. 43.107 Lon. -78.945

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) (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	max 2-minute Dir	Speed	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	88	71	80*	M	66	70	0	15	-	-	BR HZ	0	M	0.0	0.00	29.36	29.96	8.5	22	8.8	29	230	24	230	01			
02	84	70	77	M	69	72	0	12	-	-	RA BR	0	M	0.0	0.36	29.28	29.88	7.8	23	8.3	26	240	21	240	02			
03	83	63	73	M	63	67	0	8	-	-	RA	0	M	0.0	0.03	29.04	29.63	11.6	23	12.7	41	280	35	270	03			
04	64	54	59	M	48	53	6	0	-	-	RA	0	M	0.0	0.03	29.01	29.66	19.4	26	19.6	44	240	35	260	04			
05	67	50	59	M	47	52	6	0	-	-	RA	0	M	0.0	0.00s	29.28	29.94	12.4	26	12.9	30	230	23	250	05			
06	75	50	63	M	53	59	2	0	-	-	RA	0	M	0.0	T	29.41	30.05	11.2	20	11.5	31	230	26	220	06			
07	88	65	77	M	58	65	0	12	-	-	TSRA	0	M	0.0	0.19	29.29	29.87	15.1	21	15.8	53	210	40	210	07			
08	68	56	62	M	51	56	3	0	-	-	RA	0	M	0.0	T	29.21	29.84	17.0	27	17.3	35	280	26	280	08			
09	63	53	58	M	51	54	7	0	-	-	RA DZ	0	M	0.0	T	29.28	29.93	11.6	29	11.9	26	290	22	280	09			
10	70	50	60	M	50	54	5	0	-	-	RA FG+ FG BR	0	M	0.0	0.00	29.37	30.02	5.1	34	5.6	16	330	14	360	10			
11	75	45	60	M	50	55	5	0	-	-	RA FG+ FG BR	0	M	0.0	0.11	29.36	29.97	4.1	12	4.9	20	100	15	110	11			
12	70	57	64	M	57	60	1	0	-	-	BR	0	M	0.0	0.04	29.28	29.93	6.0	25	7.5	25	210	17	270	12			
13	76	55	66	M	51	57	0	1	-	-	RA VCTS	M	M	M	0.03	29.27	29.89	4.8	28	9.3	31	300	24	300	13			
14	68	47	58	M	46	52	7	0	-	-	RA VCTS	0	M	0.0	0.00	29.35	30.00	9.4	28	10.0	26	300	21	290	14			
15	65	44	55	M	44	50	10	0	-	-	RA DZ BR	0	M	0.0	0.00	29.49	30.15	4.5	29	6.5	20	300	15	300	15			
16	66	48	57	M	52	53	8	0	-	-	RA DZ BR	0	M	0.0	0.51	29.21	29.83	2.2	08	9.1	23	200	17	200	16			
17	62	46	54	M	46	50	11	0	-	-	BR	0	M	0.0	0.00	29.42	30.10	3.3	01	4.5	20	030	15	030	17			
18	72	46	59	M	52	56	6	0	-	-	RA	0	M	0.0	T	29.51	30.14	5.7	23	7.6	28	200	23	220	18			
19	65	48	57	M	47	52	8	0	-	-	RA BR	0	M	0.0	0.08	29.52	30.17	2.9	35	3.5	14	320	10	310	19			
20	66	42	54	M	43	49	11	0	-	-	RA BR	0	M	0.0	0.00	29.53	30.17	2.2	36	2.8	13	010	10	360	20			
21	82	42*	62	M	52	58	3	0	-	-	RA BR	0	M	0.0	0.00	29.38	29.98	11.3	21	11.7	32	220	25	210	21			
22	75	55	65	M	61	63	0	0	-	-	RA BR	0	M	0.0	0.25	29.33	29.99	3.4	25	6.4	32	320	25	320	22			
23	79	50	65	M	59	62	0	0	-	-	RA	M	M	M	0.00	29.47	30.08	3.7	18	5.0	18	200	14	200	23			
24	88*	61	75	M	62	67	0	10	-	-	RA	0	M	0.0	T	29.20	29.80	16.3	23	18.0	52	230	37	220	24			
25	67	48	58	M	46	52	7	0	-	-	RA	0	M	0.0	0.00	29.25	29.90	15.5	26	16.0	33	250	26	280	25			
26	64	44	54*	M	45	49	11	0	-	-	RA DZ BR	M	M	M	0.00	29.43	30.09	0.2	34	3.7	16	210	10	060	26			
27	62	47	55	M	53	55	10	0	-	-	RA DZ BR	0	M	0.0	0.15	29.31	29.91	7.7	07	7.7	21	080	17	080	27			
28	72	57	65	M	58	59	0	0	-	-	RA FG+ BR	0	M	0.0	0.42	28.95	29.59	7.6	24	11.5	40	210	31	210	28			
29	68	52	60	M	53	56	5	0	-	-	RA FG+ BR	0	M	0.0	0.00	29.24	29.89	6.0	23	7.1	22	260	17	200	29			
30	62	53	58	M	54	56	7	0	-	-	RA BR	0	M	0.0	0.10	29.16	29.79	1.1	01	2.7	16	340	13	330	30			
	71.8	52.3	62.1		52.9	57.1	4.6	1.9			<-----Monthly Averages Totals----->	M	0.0	2.30s		29.31	29.94	5.6	25	9.3	<Monthly Average							
	M	M	M								<-----Departure From Normal----->	M																

Degree Days Monthly Season to Date
 Total Departure Total Departure
 Heating: 139 M M M
 Cooling: 58 M

Greatest 24-hr Precipitation: 0.54s Date: 27-28

Greatest 24-hr Snowfall: M Date: M

Greatest Snow Depth: M Date: M

Sea Level Pressure Date Time
(LST)

Maximum 30.21 20 1032

Minimum 29.44 28 0936

QUALITY CONTROLLED LOCAL CLIMATOLOGICAL DATA

(final)

NOAA, National Climatic Data Center

Month: 10/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)
NIAGARA FALLS, NY

Lat. 43.107 Lon. -78.945

Elevation(Ground): 585 ft. above sea level

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)

NOAA, National Climatic Data Center

Month: 11/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)
NIAGARA FALLS, NY

Lat. 43.107 Lon. -78.945

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) (In)				Precipitation (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	max 2-minute Dir	Speed	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	42	28	35	M	24	31	30	0	-	-	BR	0	M	0.0	0.00	29.75	30.46	3.4	35	4.1	16	310	13	320	01	
02	48	24	36	M	28	33	29	0	-	-		0	M	0.0	0.00	29.81	30.47	3.1	05	3.8	16	040	14	030	02	
03	51	27	39	M	30	36	26	0	-	-		0	M	0.0	0.00	29.42	30.04	2.9	21	4.6	16	220	12	200	03	
04	45	42	44	M	40	42	21	0	-	-	RA BR	0	M	0.0	0.32	29.05	29.68	1.7	15	3.4	10	010	8	360	04	
05	43	37	40	M	36	38	25	0	-	-	RA DZ SN BR	0	M	T	0.32	29.00	29.71	8.4	34	9.1	22	330	16	340	05	
06	44	28	36	M	29	33	29	0	-	-	RA UP	0	M	T	T	29.55	30.27	2.7	02	3.4	14	010	12	010	06	
07	48	26	37	M	31	35	28	0	-	-	BR	0	M	0.0	0.00	29.65	30.30	5.2	23	5.5	23	250	18	260	07	
08	49	25	37	M	31	35	28	0	-	-	BR	0	M	0.0	0.00	29.39	30.04	3.7	35	4.4	20	360	13	340	08	
09	44	27	36	M	34	36	26	29	0	-	FZFG BR	0	M	0.0	0.00	29.44	30.13	1.8	05	2.6	12	130	9	110	09	
10	54	32	43	M	37	40	22	0	-	-	FG+ BR	0	M	0.0	0.00	29.61	30.31	4.2	04	4.7	16	050	14	010	10	
11	60	27	44	M	35	39	21	0	-	-	BR	0	M	0.0	0.00	29.75	30.43	3.2	06	3.9	14	080	10	060	11	
12	58	28	43	M	36	38	22	0	-	-	FG+ FZFG BR	0	M	0.0	0.00	29.75	30.41	1.7	34	1.9	10	330	8	320	12	
13	57	29	43	M	36	38	22	0	-	-	FG+ FZFG BR	0	M	0.0	0.00	29.53	30.17	1.0	01	1.5	12	320	8	330	13	
14	58	38	48	M	37	43	17	0	-	-	RA BR	0	M	0.0	0.02	29.26	29.92	7.8	23	9.3	28	260	22	240	14	
15	52	31	42	M	32	38	23	0	-	-		0	M	0.0	Ts	29.34	30.01	6.4	20	7.4	24	230	21	210	15	
16	53	33	43	M	37	42	22	0	-	-	RA BR	0	M	0.0	0.65	29.21	29.81	8.0	09	8.1	26	080	20	080	16	
17	54	41	48	M	40	44	17	0	-	-	RA DZ BR	0	M	0.0	0.11	28.90	29.61	14.8	26	17.7	53	290	41	280	17	
18	45	34	40	M	35	37	25	0	-	-	RA BR	0	M	0.0	0.04	29.41	30.10	6.8	29	8.3	25	300	22	300	18	
19	46	28	37	M	28	34	28	0	-	-		0	M	0.0	0.00	29.54	30.19	6.7	24	9.3	39	220	28	240	19	
20	47	28	38	M	30	37	27	0	-	-		0	M	0.0	0.00	29.49	30.20	12.0	28	13.6	36	250	26	250	20	
21	54	28	41	M	30	35	24	0	-	-		0	M	0.0	0.00	29.67	30.31	7.9	11	9.8	26	200	21	190	21	
22	62	54	58*	M	50	53	7	0	-	-	RA BR	0	M	0.0	0.62	29.36	29.98	12.6	20	13.0	29	200	21	210	22	
23	62*	34	48	M	40	45	17	0	-	-	RA BR	0	M	0.0	0.31	29.21	29.88	15.9	25	19.4	40	270	31	260	23	
24	39	30	35	M	23	30	30	0	-	-		M	M	M	0.00	29.63	30.32	4.5	34	8.1	29	250	22	270	24	
25	45	30	38	M	31	36	27	0	-	-	RA BR	0	M	0.0	0.33	29.31	29.89	8.5	12	9.8	23	100	16	090	25	
26	50	28	39	M	23	30	26	0	-	-	RA SN BR	0	M	T	0.22	28.95	29.64	19.8	26	21.1	46	290	35	290	26	
27	38	30	34	M	23	30	31	0	-	-	SN UP	0	M	T	T	29.10	29.83	17.8	27	18.7	45	250	33	280	27	
28	38	26	32*	M	27	31	33	0	-	-	BR	0	M	T	T	29.60	30.31	7.5	26	8.4	26	290	21	290	28	
29	48	24*	36	M	24	31	29	0	-	-		0	M	0.0	0.00	29.66	30.33	5.7	15	6.5	17	180	15	180	29	
30	57	35	46	M	43	46	19	0	-	-	RA BR	0	M	0.0	0.53	29.29	29.89	12.4	17	13.2	36	190	25	160	30	
	49.7	31.1	40.4			32.7	37.2	24.5	0.0							M	M	3.47s	29.42	30.09	3.0	25	8.5			<Monthly Average
	M	M	M													M										<-----Departure From Normal----->

Degree Days	Monthly	Season to Date	Greatest 24-hr Precipitation: 0.93s Date: 22-23	Sea Level Pressure Date Time (LST)
Total	Departure	Total Departure	Greatest 24-hr Snowfall: M Date: M	Maximum 30.56 02 0838
Heating:	734	M M M	Greatest Snow Depth: M Date: M	Minimum 29.25 17 0342
Cooling:	0	M		

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(final)

NOAA, National Climatic Data Center

Month: 12/2010

Station Location: NIAGARA FALLS INTL AIRPORT (04724)
NIAGARA FALLS , NY

Lat. 43.107 Lon. -78.945

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	max 2-minute Dir	Speed	Dir	Speed	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			
	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	55*	31	43	M	32	35	22	0	-	-	RA SN FG BR	M	M	M	0.75	29.05	29.74	13.9	25	14.3	29	250	22	260	01			
02	34	30	32	M	23	28	33	0	-	-	SN	T	M	T	T	29.36	30.06	10.5	26	10.7	24	260	20	260	02			
03	36	28	32	M	25	29	33	0	-	-	SN BR	0	M	0.5	0.05	29.42	30.10	6.3	27	6.8	16	320	13	320	03			
04	32	24	28	M	21	26	37	0	-	-	SN	T	M	T	T	29.34	30.00	M	M	10.4	22	330	18	330	04			
05	33	24	29	M	19	25	36	0	-	-	SN	T	M	0.1	0.01	29.18	29.85	18.8	30	19.4	43	300	32	300	05			
06	28	24	26	M	21	24	39	0	-	-	SN FZFG BR	1	M	6.7	0.50	29.04	29.70	13.5	31	14.0	30	290	23	300	06			
07	29	22	26	M	18	23	39	0	-	-	SN UP	5	M	1.5	0.09	29.05	29.75	17.9	29	18.4	33	300	26	290	07			
08	25	18	22	M	13	19	43	0	-	-	SN	4	M	0.1s	T	29.29	30.02	13.1	27	13.4	28	250	22	290	08			
09	24	7*	16	M	9	15	49	0	-	-	SN BR	4	M	T	T	29.59	30.30	2.5	28	5.6	21	290	10	310	09			
10	39	22	31	M	22	27	34	0	-	-	SN	3	M	T	T	29.44	30.10	10.1	19	11.8	30	200	23	200	10			
11	39	32	36	M	30	33	29	0	-	-	BR HZ	2	M	0.0	0.00	29.43	30.09	1.7	14	6.7	21	250	15	240	11			
12	38	32	35	M	33	34	30	0	-	-	RA SN BR	T	M	T	0.79	28.84	29.44	2.8	17	9.7	33	240	25	240	12			
13	33	11	22	M	11	15	43	0	-	-	SN FZFG BR UP HZ BLSN	T	M	4.2	0.15	28.79	29.52	15.6	32	16.7	29	330	24	310	13			
14	20	12	16*	M	10	15	49	0	-	-	SN BR HZ BLSN	7	M	6.8	0.27	29.05	29.77	17.6	32	18.0	32	320	25	330	14			
15	25	16	21	M	12	18	44	0	-	-	SN	6	M	0.3	0.01	29.18	29.87	15.1	28	15.8	32	300	28	290	15			
16	27	21	24	M	15	21	41	0	-	-	SN	4	M	0.1s	T	29.08	29.77	14.6	25	14.9	29	250	23	260	16			
17	32	25	29	M	20	25	36	0	-	-	SN BR UP	4	M	0.1s	T	29.24	29.95	12.8	25	13.0	28	240	21	250	17			
18	28	23	26	M	20	24	39	0	-	-	SN BR UP	5	M	3.0	0.18	29.35	30.04	13.5	22	13.8	31	230	25	210	18			
19	26	22	24	M	20	23	41	0	-	-	SN BR	M	M	M	T	29.38	30.06	6.9	20	7.5	17	200	15	200	19			
20	30	22	26	M	22	25	39	0	-	-	SN BR HZ	M	M	M	0.02	29.42	30.10	4.5	28	6.1	13	330	10	340	20			
21	27	17	22	M	18	22	43	0	-	-	SN	M	M	M	T	29.47	30.15	4.0	33	4.6	16	330	13	340	21			
22	27	23	25	M	20	24	40	0	-	-	SN	M	M	M	T	29.40	30.08	M	10.0	26	330	23	330	22				
23	28	26	27	M	20	25	38	0	-	-	SN UP	M	M	M	T	29.54	30.22	13.7	33	13.8	28	330	23	320	23			
24	27	19	23	M	17	22	42	0	-	-	SN BR UP	M	M	M	T	29.59	30.27	6.7	31	7.3	18	310	15	310	24			
25	27	17	22	M	20	23	43	0	-	-	SN BR	3	M	0.4	0.02	29.46	30.14	5.8	03	6.4	17	050	14	050	25			
26	24	19	22	M	14	20	43	0	-	-	SN UP	3	M	T	T	29.39	30.06	12.1	02	12.4	26	030	20	010	26			
27	29	16	23	M	15	20	42	0	-	-	SN UP	3	M	0.1s	T	29.28	29.98	15.6	33	16.8	39	320	31	320	27			
28	29	25	27	M	21	25	38	0	-	-	SN	3	M	T	T	29.29	29.99	17.9	25	18.0	37	240	31	240	28			
29	31	17	24	M	23	26	41	0	-	-	SN MIFG BR HZ	3	M	T	T	29.39	30.09	8.4	25	9.2	3s	130	3s	130	29			
30	42	14	28	M	25	28	37	0	-	-	MIFG BR	3	M	T	T	29.42	30.09	5.1	18	5.5	16	190	14	180	30			
31	51	40	46*	M	40	43	19	0	-	-	RA	2	M	0.0	0.05	29.33	29.98	8.9	19	9.1	21	200	17	200	31			
	31.5	21.9	26.7		20.3	24.6	38.1	0.0			<-----Monthly Averages Totals----->	M	M	1.78s		29.29	29.97	7.2	28	11.6	<Monthly Average							
	M	M	M								<-----Departure From Normal----->	M																

Degree Days Monthly Season to Date
 Total Departure Total Departure
 Heating: 1182 M M M
 Cooling: 0 M

Greatest 24-hr Precipitation: 1.13s Date: 01
 Greatest 24-hr Snowfall: M Date: M
 Greatest Snow Depth: M Date: M

Sea Level Pressure Date Time
 (LST)
 Maximum 30.36 09 1915
 Minimum 29.21 13 0129

ANNUAL CLIMATOLOGICAL SUMMARY (2010)

Station: 305840/99999, NIAGARA FALLS INTL AP, New York

Elev. 519 ft. above sea level

Lat. 43°06'N, Lon. 78°57'W

Date	Temperature (° F)														Precipitation (inches)										
	MMXT	MMNT	MNTM	DPNT	HTDD	CLDD	EMXT		EMNP		DT90	DX32	DT32	DT00	TPCP	DPNP	EMXP		TSNW	MXSD		DP01	DP05	DP10	
2010 Month	Mean Max.	Mean Min.	Mean	Depart. from Normal	Heating Degree Days	Cooling Degree Days	Highest	High Date	Lowest	Low Date	Max >=90°	Max <=32°	Min <=32°	Min =<0°	Total	Depart. from Normal	Greatest Observed	Snow, Sleet		Number of Days					
	1	29.9	18.5	24.2	0.0	1257	0	45	26	-1	30	0	17	29	3		Day	Date	Total Fall	Max Depth	Max Date	>=.10	>=.50	>=1.0	
	2	30.7	17.9	24.3	-1.0	1131	0	39	22	8	7	0	19	28	0	1.16	-1.16	0.40	18	18.9	10	27	5	0	0
1	29.9	18.5	24.2	0.0	1257	0	45	26	-1	30	0	17	29	3	3.63	1.08	1.50	25	65.3	18	5	8	2	1	
2	30.7	17.9	24.3	-1.0	1131	0	39	22	8	7	0	19	28	0	1.16	-1.16	0.40	18	18.9	10	27	5	0	0	
3	45.9	29.3	37.6	3.8	840	0	61	18	15	6	0	1	22	0	2.45	-0.18	0.83	14	0.4	9	1	5	2	0	
4	62.5	38.5	50.5	5.4	428	0	85	4	27	1	0	0	3	0	2.29	-0.17	0.86	8	0.0T	0T	28	5	1	0	
5	71.0	49.2	60.1	3.0	208	64	87	28	28	10	0	0	1	0	2.56	-0.38	0.75	6	0.0T	0T	9	4	3	0	
6	77.2	59.5	68.4	2.6	34	143	88	1	46	8	0	0	0	0	5.28	2.02	0.97	1	0.0	0	11	4	0	0	
7	83.5	64.2	73.9	2.5	8	289	92	9	49	1	4	0	0	0	2.58	-0.11	0.81	25	0.0	0	5	2	0	0	
8	81.4	61.8	71.6	2.0	6	217	88	31	50	27	0	0	0	0	2.42	-0.61	0.88	22	0.0	0	6	1	0	0	
9	72.7	52.2	62.5	0.8	137	69	90	1	42	21	1	0	0	0	2.20	-1.32	0.51	17	0.0	0	7	1	0	0	
10	60.1	42.6	51.4	1.3	414	0	76	27	32	14	0	0	2	0	3.42	0.75	0.45	6	0.0	0	12	0	0	0	
11	49.2	30.4	39.8	-0.1	749	0	62	24	24	29	0	0	23	0	2.97	-0.01	0.93	23	0.0T	0T	28	5	3	0	
12	30.5	21.0	25.8	-3.9	1209	0	57	1	7	10	0	22	30	0	3.58	0.70	1.14	1	30.4	7	14	9	2	1	0
Annual	57.9	40.4	49.2	1.4	6421	782	92	Jul	-1	Jan	5	59	138	3	34.54	0.61	1.50	Jan	115.0	18	Jan	82	21	2	0

Notes

(blank) Not reported.

+ 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.

M Used to indicate data element missing.

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

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

Station Station is identified by: CoopID/WBAN, 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. If TPCP = "M" there was no precipitation measured during the month. Flag is set to "S" and the total accumulated amount appears in a subsequent monthly value.

Dynamically generated Wed May 11 09:45:04 EDT 2011 via <http://hurricane/ancsum/ACS>

Data provided from the NCDC CDO System

Additional documentation can be found at <http://cdm.ucar.edu/cdm/3220doc.txt>

Attachment F

2010 NIAGARA FALLS STORAGE SITE

- **Radon Flux Results**
- **Site Map**

2010 Radon Flux Monitoring Results^a

Niagara Falls Storage Site

NFSS ID	Sample ID	Qualifier ^d	Radon-222 Flux			NFSS Sample ID	Qualifier ^d	Radon-222 Flux			
			(pCi/m ² /s)		MDA			(pCi/m ² /s)		MDA	
1	U	0.03619	±	0.02107	0.05773	51	U	0.03906	±	0.02258	0.06143
2	U	0.05365	±	0.04508	0.12760	52	U	0.03201	±	0.02292	0.05665
3	U	0.05149	±	0.02744	0.07260	53	U	0.11750	±	0.05830	0.15900
4	U	0.01725	±	0.05340	0.12040	54		0.07842	±	0.02127	0.04019
5	U	0.06687	±	0.03053	0.07981	55	U	0.16250	±	0.08956	0.21700
6	U	0.00604	±	0.04976	0.10920	56	U	0.01331	±	0.01789	0.04760
7	U	0.04673	±	0.02669	0.06789	57	U	0.02824	±	0.04361	0.11390
8	U	0.00775	±	0.05683	0.12070	58	U	0.04482	±	0.02352	0.06360
9		0.07985	±	0.02146	0.03526	59	U	0.00216	±	0.03154	0.08071
10	U	0.12550	±	0.07046	0.18140	60	U	0.01347	±	0.02024	0.05080
10-DUP ^b	U	0.10960	±	0.05928	0.16060	60-DUP ^b	U	0.01619	±	0.02310	0.05579
11	U	0.04222	±	0.02747	0.06305	61	U	0.08964	±	0.05529	0.15080
12	U	0.03320	±	0.02626	0.06087	62		0.06577	±	0.03337	0.06149
13	U	0.01138	±	0.06360	0.13250	63	U	0.03631	±	0.04679	0.12220
14	U	0.02008	±	0.02392	0.05806	64	U	0.04470	±	0.02865	0.07126
15	U	0.07675	±	0.05443	0.14750	65	U	0.01683	±	0.05410	0.12180
16	U	0.04141	±	0.03031	0.07068	66	U	0.01408	±	0.01567	0.04527
17	U	0.07913	±	0.05736	0.13640	67	U	0.08908	±	0.04636	0.13110
18	U	0.07169	±	0.03495	0.08544	68	U	0.03822	±	0.02273	0.06183
19	U	0.09834	±	0.05081	0.14070	69	U	0.04113	±	0.05586	0.13620
20	U	0.03475	±	0.03100	0.06207	70	U	0.04550	±	0.02939	0.07409
20-DUP ^b	U	0.03179	±	0.02522	0.05808	70-DUP ^b	U	0.03944	±	0.02761	0.06687
21	U	0.03716	±	0.03826	0.11160	71	U	0.00017	±	0.04933	0.10620
22	U	0.10460	±	0.04367	0.10470	72	U	0.11830	±	0.05905	0.15960
23	U	0.02886	±	0.03452	0.10300	73	U	0.06246	±	0.03009	0.07886
24	U	0.03046	±	0.01905	0.05309	74	U	0.00211	±	0.03078	0.07875
25	U	0.03769	±	0.03881	0.11320	75		0.04980	±	0.02091	0.04675
26	U	0.05375	±	0.02788	0.06884	76	U	-0.00084	±	0.04003	0.09079
27	U	0.00985	±	0.04442	0.10430	77	U	0.03328	±	0.02381	0.05899
28		0.09301	±	0.02158	0.03085	78	U	0.04083	±	0.05546	0.13520
29	U	0.04948	±	0.06361	0.14890	79	U	0.03563	±	0.02269	0.06173
30	U	0.08386	±	0.03626	0.09070	80	U	0.03834	±	0.03948	0.11510
30-DUP ^b	U	0.06516	±	0.03252	0.08167	80-DUP ^b	U	0.07027	±	0.05290	0.14650
31	U	0.00709	±	0.04309	0.10050	81	U	0.03919	±	0.02919	0.07095
32	U	0.04458	±	0.04944	0.12890	82	U	0.04574	±	0.05072	0.13220
33	U	0.00428	±	0.01907	0.04474	83	U	0.06659	±	0.03443	0.08918
34	U	0.08320	±	0.05718	0.14980	84	U	0.03651	±	0.05452	0.13250
35	U	0.04303	±	0.02987	0.06750	85	U	0.02832	±	0.02064	0.05700
36	U	0.08260	±	0.06431	0.14830	86	U	0.04363	±	0.02375	0.06423
37	U	0.02757	±	0.01989	0.05217	87	U	0.00318	±	0.01792	0.06447
38	U	0.07134	±	0.04934	0.13790	88		0.07344	±	0.01906	0.03606
39	U	0.03855	±	0.02631	0.06511	89	U	0.02796	±	0.01953	0.05443
40	U	0.12000	±	0.07361	0.16870	90	U	0.06712	±	0.03175	0.07940
40-DUP ^b	U	-0.00083	±	0.05488	0.11360	90-DUP ^b	U	0.07307	±	0.03375	0.08680
41	U	0.05135	±	0.03315	0.07555	91	U	0.05646	±	0.02850	0.07540
42	U	0.03378	±	0.05279	0.12810	92	U	0.04649	±	0.03021	0.07202
43	U	0.03982	±	0.02573	0.06649	93	U	0.06766	±	0.03670	0.08470
44	U	-0.00054	±	0.04786	0.10270	94	U	0.05333	±	0.04255	0.08903
45	U	0.03495	±	0.02910	0.06361	95	U	0.01226	±	0.04067	0.10560
46	U	0.05369	±	0.05237	0.13620	96	U	0.03391	±	0.02496	0.06512
47	U	0.06098	±	0.03002	0.07513	97	U	-0.02930	±	0.04294	0.07228
48	U	0.01844	±	0.04742	0.11320	98	U	0.04141	±	0.03075	0.07260
49	U	0.04528	±	0.02440	0.06563	99	U	0.15520	±	0.08606	0.20970
50	U	0.03792	±	0.03904	0.11390	100		0.05083	±	0.02001	0.04893
50-DUP ^b	U	0.04811	±	0.05335	0.13910	100-DUP ^b	U	0.04817	±	0.03406	0.07868

2010 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	Sigma				Mean	Sigma						
101	U	0.02952	±	0.04815	0.12580	151	U	0.06573	±	0.05795	0.14180			
102	U	0.04294	±	0.03236	0.07527	152	U	-0.00755	±	0.03039	0.07387			
103	U	0.00243	±	0.03551	0.09087	153	U	0.03961	±	0.02354	0.06498			
104		0.08008	±	0.03744	0.07773	154	U	0.01549	±	0.06069	0.13570			
105	U	0.01063	±	0.03982	0.10330	155	U	0.03077	±	0.02854	0.06522			
106	U	0.04193	±	0.02966	0.07790	156	U	0.02075	±	0.04507	0.11760			
107	U	0.00019	±	0.05484	0.11810	157	U	0.04688	±	0.03118	0.07551			
108	U	0.04617	±	0.03093	0.07690	158	U	-0.01862	±	0.03749	0.07336			
109	U	0.03001	±	0.05717	0.13780	159	U	0.05579	±	0.03209	0.08379			
110	U	0.04580	±	0.03693	0.07859	160	U	0.03129	±	0.03903	0.11720			
110-DUP ^b	U	0.05586	±	0.04067	0.08630	160-DUP ^b	U	0.05131	±	0.04822	0.13870			
111	U	0.05049	±	0.06383	0.15590	161	U	0.03093	±	0.02868	0.06553			
112	U	0.04181	±	0.05313	0.13870	162	U	0.07174	±	0.06396	0.16610			
113	U	0.03078	±	0.02740	0.06386	163	U	0.04913	±	0.03729	0.08464			
114	U	0.00019	±	0.05494	0.11830	164	U	-0.00975	±	0.05176	0.10700			
115	U	-0.00153	±	0.02447	0.05214	165	U	0.08938	±	0.04158	0.10570			
116	U	0.03200	±	0.04941	0.12910	166	U	0.01885	±	0.05352	0.12740			
117	U	0.04612	±	0.03928	0.08381	167		0.08367	±	0.02177	0.03515			
118	U	0.03208	±	0.04953	0.12940	168	U	0.11230	±	0.06252	0.17170			
119	U	0.04338	±	0.03693	0.07906	169	U	0.04423	±	0.02901	0.07204			
120	U	0.04004	±	0.06075	0.14760	170	U	0.03839	±	0.05998	0.14560			
120-DUP ^b	U	0.00667	±	0.06499	0.13730	170-DUP ^b	U	0.00922	±	0.05803	0.12810			
121	U	0.04921	±	0.03277	0.07499	171	U	0.08725	±	0.03668	0.09541			
122	U	0.09152	±	0.05963	0.16510	172	U	0.01544	±	0.02319	0.05819			
123	U	0.04292	±	0.02819	0.06993	173	U	0.05998	±	0.05999	0.15610			
124	U	0.03795	±	0.06030	0.14630	174	U	0.03886	±	0.02459	0.06735			
125	U	0.05321	±	0.02799	0.07529	175	U	0.09938	±	0.06319	0.15610			
126	U	0.09867	±	0.06304	0.17310	176	U	0.02164	±	0.02002	0.05656			
127	U	0.06507	±	0.03976	0.09363	177	U	0.05041	±	0.06372	0.15570			
128	U	0.02922	±	0.05693	0.13710	178	U	0.02451	±	0.02348	0.06188			
129	U	0.05273	±	0.03911	0.08429	179	U	0.09084	±	0.05874	0.16090			
130	U	0.05816	±	0.05057	0.14380	180		0.07015	±	0.02023	0.04022			
130-DUP ^b	U	0.08088	±	0.04850	0.13900	180-DUP ^b	U	0.03577	±	0.02757	0.06616			
131	U	0.01249	±	0.02208	0.05528	181 ^c	U	-0.00892	±	0.04384	0.09557			
132	U	0.06164	±	0.02987	0.07846	182 ^c	U	0.05422	±	0.03000	0.07845			
133	U	-0.06714	±	0.07068	0.10330	183 ^c	U	-0.01009	±	0.05351	0.11060			
134	U	0.04811	±	0.03280	0.07971	Average background	U	(pCi/m ² /s)						
135	U	0.12440	±	0.06281	0.17250									
136	U	0.03827	±	0.03310	0.06822									
137	U	0.03230	±	0.04987	0.13030									
138	U	0.03662	±	0.03356	0.07526									
139	U	0.09333	±	0.04892	0.14020									
140	U	0.00000	±	0.00000	0.00000									
140-DUP ^b	U	0.04482	±	0.03113	0.07712									
141	U	0.08626	±	0.08050	0.19110									
142	U	0.03419	±	0.02841	0.06493									
143	U	0.10850	±	0.07154	0.16430									
144	U	0.05407	±	0.03384	0.08337									
145	U	0.13760	±	0.06722	0.18330									
146	U	0.04450	±	0.03078	0.07774									
147	U	0.04402	±	0.04532	0.13220									
148	U	0.00516	±	0.02482	0.05615									
149	U	0.00135	±	0.04730	0.10820									
150	U	0.05508	±	0.04004	0.08993									
150-DUP ^b	U	0.05222	±	0.02725	0.07103									

IWCS	Value	Units
Average ^e	0.04606	(pCi/m ² /s)
High ^f	0.09301	(pCi/m ² /s)
Low	-0.06714	(pCi/m ² /s)

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

a. Radon-222 flux was performed on August 17-18, 2010

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-Balmer Rd. (CWM Secondary Gate)

183-Lewiston Water Pollution Control Center

d. Validated Qualifier: U - indicates that no analyte was detected (Non-Detect).

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

f. Highest detectable finding.

