

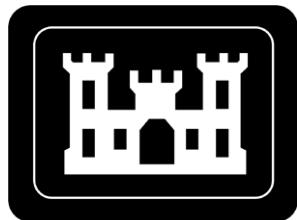
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# **FUSRAP CY2020 NESHAP ANNUAL REPORT FOR NIAGARA FALLS STORAGE SITE (NFSS)**

**LEWISTON, NEW YORK**

**JUNE 2021**

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

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## **ACRONYMS AND ABBREVIATIONS**

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

## **1.0 INTRODUCTION**

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

### **1.1 SITE DESCRIPTION**

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

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

### **1.2 SOURCE DESCRIPTION**

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

**Table 1. History and Description of Wastes Transferred to NFSS**

<b>Material</b>	<b>Description</b>	<b>Transferred to NFSS</b>
<b>L-50</b>	Low-activity radioactive residues from the processing of low-grade uranium ores at Linde Air Products, Tonawanda, New York.	1944
<b>R-10</b>	Low-activity radioactive residues from the processing of low-grade uranium ores at Linde Air Products, Tonawanda, New York.	1944
<b>F-32</b>	Low-activity radioactive residues from the processing of high-grade uranium ores at Middlesex, New Jersey.	1944 to early 1950
<b>L-30</b>	Low-activity radioactive residues from the processing of low-grade uranium ores at Linde Air Products, Tonawanda, New York.	1945
<b>K-65</b>	High-activity radioactive residues from the processing of high-grade uranium ores at Mallinckrodt Chemical Works, St. Louis, Missouri.	1949
<b>Middlesex Sands</b>	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 m<sup>3</sup>) are encapsulated in the IWCS, which is specifically designed to provide interim storage of the materials. Remedial investigation began at the end of 1999 to determine if any areas of the site contained radioactive or chemical contaminants at levels that could pose an unacceptable risk to human health and the environment. The CERCLA remedial investigation of the NFSS was completed in 2007. From 2012-2014 USACE investigated the NFSS Balance of Plant Operable Unit (which includes everything outside the IWCS, excluding groundwater). The Balance of Plant fieldwork delineated areas of groundwater and soil contamination as well as investigated underground utilities. The NFSS is currently in the feasibility study phase of the CERCLA process for the IWCS Operable Unit and the Balance of Plant Operable Unit.

## **2.0 REGULATORY STANDARDS**

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

### **2.1 40 CFR 61, SUBPART H**

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

### **2.2 40 CFR 61, SUBPART Q**

40 CFR 61, Subpart Q applies to storage and disposal facilities for radium-containing material that emits radon-222 into air. NFSS is specifically identified as one such facility in this subpart (in 40 CFR 61.190). Compliance with Subpart Q is verified by annual monitoring of the IWCS for radon-222 flux. The Subpart Q radon-222 emission limit is 20 pCi/m<sup>2</sup>/s.

## **3.0 AIR EMISSION DATA**

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

These calculations use the USEPA air pollution emission factor methodology (AP-42) to estimate the radioactive release from wind erosion, which is then used as the source term in the Clean Air Act Assessment Package (CAP88-PC) model to estimate airborne doses to hypothetically exposed individuals. The annual wind erosion emission estimate uses the most current soil data from the NFSS Remedial Investigations and has been revised for this report to include all subsequent soils data collected during the NFSS Balance of Plant field investigations. For the year 2020 average soil concentrations without the subtraction of background radioactivity were calculated for each soil nuclide of concern and were used as the soil concentration for the source term estimate. The area of the entire NFSS was assumed to be uniformly contaminated and to contribute to the source term.

**Table 2. Air Emission Data - NFSS**

<b>Point Sources</b>	<b>Type Control</b>	<b>Efficiency</b>	<b>Distance to Hypothetical Exposed Individual</b>
none	not applicable	not applicable	not applicable
<b>Area (Non-Point) Sources</b>	<b>Type Control</b>	<b>Efficiency</b>	<b>Distance and Direction from Center of Site to Hypothetical Exposed Individual</b>
<i>in situ</i> soil –area source	vegetative cover	90 percent <sup>a</sup>	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
<b>Group Sources</b>	<b>Type Control</b>	<b>Efficiency</b>	<b>Distance to Hypothetical Exposed Individual</b>
none	not applicable	not applicable	not applicable

<sup>a</sup> 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 CY2020, the annual wind erosion emission,  $E_w$  (Attachment A) is calculated using local climatological data (Attachment E) from the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center for the Niagara Falls International Airport (NFIA) in Niagara Falls, NY.  $E_w$  is calculated using the USEPA AP-42 methodology for “fugitive emissions” from an “area source” that uses the “fastest mile” wind speed data from local climatological data reports for the calendar year.  $E_w$ , in grams emitted, is then applied to the soil nuclide concentration to estimate the source term or annual emissions for each radionuclide. The soil concentration was developed from all sample data (new for this year) compiled since Phases I, II, and III of the Remedial Investigation for soil contamination (Attachment B). Contributions from radon gas, in accordance with regulatory guidance, are not considered in this calculation. Annual estimated emissions for each radionuclide were input into the USEPA’s CAP88-PC, Version 4.0 (revised 2014) code to calculate hypothetical receptor doses. The model estimates resultant doses from airborne particulates to hypothetical individuals at the distances to the nearest residence, commercial/industrial facility, school, and farm as measured from a central location on-site. Hypothetical doses are then corrected for occupancy.

Commercial/industrial facility and school occupancy is assumed to be 40 hr/week for 50 weeks/yr. Residential and farm occupancy is assumed to be full-time/continuous for 24 hr/day for 365 days/yr. The hypothetical individual receiving the higher of these calculated doses is then identified as the maximally exposed individual (MEI) for airborne particulate dose.

## **4.2 DESCRIPTION OF DOSE MODEL**

### **4.2.1 CAP88-PC Computer Program**

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

CAP88-PC uses a modified Gaussian plume equation to estimate the average dispersion of radionuclides released from a site. Assessments for population exposure are performed for a circular grid of distances and directions for a radius of 80 km (50 miles) around the facility. Agricultural arrays for EPA food source scenarios for vegetation, milk and meat, and for milk cattle and beef cattle density and land fraction cultivated are generated automatically. Dose and risk factors for CAP88-PC, Version 4.0 are from Federal Guidance Report 13 and are based on the methods detailed in International Commission on Radiological Protection (ICRP) 72 (ICRP72). CAP88-PC Version 4.0 includes a significant modification that adopts age-dependent dose and risk factors from FGR 13 for potential receptors including, adults, fifteen-year olds, ten-year olds, five-year olds, one-year olds and infants. This NESHP report includes age-dependent doses for these receptors. The dose calculations presented in this document used the default values for nuclide lung clearance type. These defaults correspond to the recommended values from FGR 13. Deposition velocity and scavenging coefficient are calculated by the code in accordance with USEPA policy. In the CAP88 model nuclides are depleted from the plume by precipitation scavenging, dry deposition and radioactive decay. The default scavenging coefficient is calculated as a function of annual precipitation. The program calculates the effective dose equivalents received by receptors by combining the inhalation and ingestion intake rates and the air and ground surface concentrations using the appropriate dose conversion factors. For this year's NESHP report the Quality Controlled Local Climatological Data report for Niagara Falls International Airport from NOAA was unavailable for the month of February and the hourly data was used for the contributing mean temperature and total precipitation. The monthly climatological reports for the airport were used to calculate the 2020 annual mean temperature (9.9 degrees Centigrade) and the total precipitation (64.2 centimeters) for input into CAP88. The data used to estimate these annual mean values is located in Attachment E.

### **4.2.2 CAP88-PC Input**

Input parameters for CAP88 include:

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

### **4.2.3 CAP88-PC Output**

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

#### **4.3 COMPLIANCE ASSESSMENT**

The released activity data from Attachment B is entered into the CAP88-PC modeling program to derive the hypothetical dose to the defined receptors. To derive the dose to the MEI, the CAP88-PC model must have weather data for the appropriate year, information on the emission source, and the distances and directions to the nearest residence, off-site worker, school, and farm. The following CY2020 meteorological data were entered into CAP88-PC (see Attachment E):

Average temperature	9.9 °C (49.8 °F) NFIA
Precipitation,	64.2 cm (25.3 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 <sup>2</sup>
Resident	914 m SSW
Resident (farm)	1105 m S
Resident	1250 m WSW
Resident	1486 m ESE
Off-site worker	533 m SE
Off-site worker	783 m S
School (building)	2499 m W
School (building)	2629 m WNW

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

Resident - Infant	2.7 E-04 mrem, SSW @ 914 m
Off-site worker - Adult	6.3 E-04 mrem, SE @ 533 m
School – Age Fifteen	9.9 E-05 mrem, W @ 2499 m
Farm - Infant	2.3 E-04 mrem, S @ 1105 m

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

Off-site worker – Adult	1.4 E-04 mrem, SE @ 533 m
School - Age Fifteen	2.3 E-05 mrem, W @ 2499 m

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

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

Receptor	Adult	Fifteen	Ten	Five	One	Infant
Worker SE at 533 m	<b>1.4 E-04</b>	NA	NA	NA	NA	NA
Resident SSW at 914 m	1.5 E-04	2.2 E-04	1.6 E-04	1.5 E-04	1.7 E-04	<b>2.7 E-04</b>
School W at 2499 m	1.3 E-05	<b>2.3 E-05</b>	1.5 E-05	1.4 E-05	NA	NA
Farmer S at 1105 m	1.1 E-04	1.7 E-04	1.3 E-04	1.2 E-04	5.1 E-05	<b>2.3 E-04</b>

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

## 5.0 SUPPLEMENTAL INFORMATION

### 5.1 POPULATION DOSE

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

The age-dependent maximum CAP88-PC annual effective dose for the population within 80 km of the facility is 5.74 E-03 person-rem for an infant. The maximum annual effective dose for the each population age group is as follows (Attachment D):

Population:	Adult	2.48 E-03 person-rem
	Fifteen-year old	3.55 E-03 person-rem
	Ten-year old	2.85 E-03 person-rem
	Five-year old	2.79 E-03 person-rem
	One-year old	3.07 E-03 person-rem
	Infant	5.74 E-03 person-rem

### 5.2 RADON-222 FLUX

Compliance with 40 CFR 61, Subpart Q is demonstrated by the average radon-222 flux for the entire source. Radon flux at NFSS is measured with 180 activated charcoal canisters systematically placed at 15-m intervals across the surface of the IWCS and sealed to the surface for a 24-hr exposure period (July 14th – 15th, 2019). Individual results ranged from non-detect to 0.2550 pCi/m<sup>2</sup>/s, with an arithmetic mean over all systematic measurements, including detects and non-detects, of 0.0585 pCi/m<sup>2</sup>/s. This result and all individual systematic measurements were well within the established standard of 20 pCi/m<sup>2</sup>/s specified in 40 CFR 61, Subpart Q. Results are presented in Attachment F, Table 6a.

As noted in the CY2019 Annual NESHAP Report, a cluster of localized and highly temporally variable areas were identified and confined within a representative area of approximately 225 m<sup>2</sup> on the southeast portion of the IWCS. Gamma walkover surveys and biased investigative flux sampling again confirmed the occurrence of discretely elevated flux. Two biased measurement locations from monitoring year 2019, B2 and B9, were chosen as representative of their immediate vicinities for continual investigative sampling in the spring of

2020. Two biased measurements were performed at each location over approximately 24-hours from May 6<sup>th</sup> – 7<sup>th</sup> and from May 20<sup>th</sup> – 21<sup>st</sup> to coincide with both high and low trending regional barometric pressure. Measurements were sought to coincide with these anticipated pressure gradients rather than immediately observable progeny surface activity to evaluate pressure-dependency, if any, and prevent perceived measurement bias to increase representativeness. These measurements ranged from 8.233 to 508.385 pCi/m<sup>2</sup>/s and are presented in Attachment F, Table 6b.

On June 1<sup>st</sup> USACE performed topsoil restoration within the area of heterogeneous flux to maintain optimal cover saturation and sustain healthy turf. This noninvasive action was first performed to evaluate effectiveness in retarding local radon emissions and to determine if more invasive remedies were warranted. Approximately 15 to 20 cm (6 to 8 inches) of clean topsoil were placed over the identified areas, compacted, and reseeded. The area was continually scrutinized throughout the remainder of the year with both monthly gamma walkover surveys and additional local flux monitoring. The gamma walkover surveys are weather insensitive and were performed to coincide with decreasing trending pressure gradients as a suspected bounding surrogate to qualitatively indicate the occurrence of elevated flux, if present. No indications of elevated flux were observed. Flux measurements were performed monthly at biased locations B2 and B9, as well as new local systematic grids in each cardinal direction within their immediate vicinities (i.e., RF-B2-N, RF-B2-E, etc.). These measurements ranged from non-detect to 0.105 pCi/m<sup>2</sup>/s with a mean of 0.035 pCi/m<sup>2</sup>/s from July through November suggesting a positive influence of the topsoil restoration. Results are presented in Attachment F, Table 6c.

The mean annual flux at the NFSS was measured to 0.0585 pCi/m<sup>2</sup>/s. As in previous years, this result is well below the 20 pCi/m<sup>2</sup>/s standard specified in 40 CFR Part 61, Subpart Q, and demonstrate the effectiveness of the containment cell design and construction in mitigating radon-222 migration.

### **5.3 NON-APPLICABILITY**

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

## **6.0 REFERENCES**

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

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

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

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

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

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

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

**ATTACHMENT A**

**ANNUAL WIND EROSION EMISSION CALCULATION**

## A.1 ANNUAL WIND EROSION

In 2020, the potential source of airborne emissions from NFSS is assumed to be from wind erosion of in-situ soil from the entire NFSS. The AP-42 model for industrial wind erosion for limited flat sources is used. In this model the potential airborne emissions are a function of the number of disturbances of contaminated soil. Attachment E contains the 2020 monthly weather summary reports. The following assumptions and calculations are made:

The air release source is wind erosion of in-situ soil from an area (A) of 780,000 m<sup>2</sup> 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<sup>a</sup>) from Local Climatological Data reports from NOAA for Niagara Falls International Airport (NFIA) in mph for the period between each disturbance are:

$U_{a1} = 38$	$U_{a2} = 31$	$U_{a3} = 32$	$U_{a4} = 35$	$U_{a5} = 18$	$U_{a6} = 26$
$U_{a7} = 45$	$U_{a8} = 22$	$U_{a9} = 32$	$U_{a10} = 24$	$U_{a11} = 25$	$U_{a12} = 24$
$U_{a13} = 32$	$U_{a14} = 25$	$U_{a15} = 35$	$U_{a16} = 25$	$U_{a17} = 26$	$U_{a18} = 37$
$U_{a19} = 25$	$U_{a20} = 39$	$U_{a21} = 28$	$U_{a22} = 21$	$U_{a23} = 35$	$U_{a24} = 35$
$U_{a25} = 40$	$U_{a26} = 25$	$U_{a27} = 39$			

<sup>a</sup>Maximum 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 <sub>1</sub>	1.17E+00	U <sub>11</sub>	7.70E-01	U <sub>21</sub>	8.62E-01
U <sub>2</sub>	9.55E-01	U <sub>12</sub>	7.39E-01	U <sub>22</sub>	6.47E-01
U <sub>3</sub>	9.86E-01	U <sub>13</sub>	9.86E-01	U <sub>23</sub>	1.08E+00
U <sub>4</sub>	1.08E+00	U <sub>14</sub>	7.70E-01	U <sub>24</sub>	1.08E+00
U <sub>5</sub>	5.54E-01	U <sub>15</sub>	1.08E+00	U <sub>25</sub>	1.23E+00
U <sub>6</sub>	8.01E-01	U <sub>16</sub>	7.70E-01	U <sub>26</sub>	7.70E-01
U <sub>7</sub>	1.39E+00	U <sub>17</sub>	8.01E-01	U <sub>27</sub>	1.20E+00
U <sub>8</sub>	6.78E-01	U <sub>18</sub>	1.14E+00		
U <sub>9</sub>	9.86E-01	U <sub>19</sub>	7.70E-01		
U <sub>10</sub>	7.39E-01	U <sub>20</sub>	1.20E+00		

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

$$P_N = 58 (U^* - U_t)^2 + 25(U^* - U_t) = 53.18 \text{ g/m}^2$$

The erosion potentials ( $P_N$ ) for each period between disturbances are all less than or equal to the threshold friction velocity except for U<sub>1</sub>, U<sub>5</sub>, and U<sub>27</sub>.

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

$$k = 0.5$$

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

$$P = k \sum P_N = 26.59 \text{ g/m}^2$$

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  $\mu$  particles (USEPA 1985 Equation 4-1) is:

$$PM_{10} = P(1-V) / (PE/50)^2 = 0.55 \text{ g/m}^2/\text{yr}$$

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

$$E = A (PM_{10}) = 428,548 \text{ g soil}$$

## A.2 REFERENCES

- EPA 2004. *Methods for Estimating Fugitive Air Emissions of Radionuclides from Diffuse Sources at USDOE Facilities*, Final Report, September 3, 2004.
- EPA 1995. *AP 42 Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Fifth Edition, 1995.
- M. J. Changery, *National Wind Data Index Final Report*, HCO/T1041-01 UC-60, National Climatic Center, Asheville, NC, December 1978.
- EPA 1985. *Rapid Assessment of Exposure to Particulate Emissions from Surface Contaminated Sites*, EPA/600/8-85/002, Office of Health and Environmental Assessment, Washington, DC (February).
- EPA 1985. *AP 42 Compilation of Air Pollution Emission Factors*, Third Edition (including supplements 1-7), August 1977.

**ATTACHMENT B**

**SOURCE TERM DEVELOPMENT AND ANNUAL AIR EMISSIONS**

## B.1 SOURCE TERM DEVELOPMENT

The source term for NFSS NESHAP calculations was developed considering the radionuclides significant to dose, that is uranium, thorium, and actinium decay series as shown in Table B-1. Concentration data for these radioisotopes were taken from all site data collected since and including the Phases I, II, and III of the Remedial Investigation and are listed in Table B-2. The total number of samples has almost doubled (to about 1000) from the previous database. The Phase I sampling was performed from November 1999 through January 2000. The Phase II was performed from August 2000 through October 2000. The Phase III sampling was performed from May 2001 through October 2003. The Balance of Plant investigations at the NFSS occurred between 2012 and 2014. During this field work samples were collected to delineate soil contamination across the NFSS. The soil source term used for the 2020 NESHAP was generated using surface soil data collected from all USACE investigations on the NFSS. The figure at the end of Attachment B shows the locations of surface soil samples used to generate this source term. The dataset has been verified to ensure data quality and includes the analysis of soils from biased high locations (i.e., locations that had elevated gamma survey readings).

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

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

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

**Table B-1. Radionuclides Considered in NESHAP Evaluation**

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

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

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

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

<sup>a</sup> Includes previous outlier 1,140 pCi/g

**Table B-3. Soil Concentration and Estimated Emission of Radionuclides from NFSS for CY 2020**

Soil Concentration and CAPP88 Input Source Term								
Uranium Series			Thorium Series			Actinium Series		
Nuclide	pCi/g	Ci/y	Nuclide	pCi/g	Ci/y	Nuclide	pCi/g	Ci/y
U-238	13	5.57E-06	Th-232	0.8	3.43E-07	U-235	1.1	4.71E-07
Th-234			Ra-228			Th-231		
Pa-234m			Ac-228			Pa-231		
Pa-234			Th-228	0.9	3.86E-07	Ac-227		
U-234	12.5	5.36E-06	Ra-224			Th-227		
Th-230	5.5	2.36E-06	Rn-220			Fr-223		
Ra-226	6.9	2.96E-06	Po-216			Ra-223		
Rn-222			Pb-212			Rn-219		
Po-218			Bi-212			Po-215		
Pb-214			Po-212			Pb-211		
At-218			Tl-208			At-215		
Bi-214			Pb-208 (stable)			Bi-211		
Po-214						Po-211		
Tl-210						Tl-207		
Pb-210						Pb-207 (stable)		
Bi-210								
Po-210								
Tl-206								
Pb-206 (stable)								

## B.2 REFERENCES

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

**ATTACHMENT C**  
**CAPP88-PC REPORTS – INDIVIDUAL**

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

Non-Radon Individual Assessment  
Wed Feb 10 13:46:40 2021

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

Source Category: Area  
Source Type: Area  
Emission Year: 2020  
DOSE Age Group: Adult

Comments: NFSS Technical Memo 2020 Year  
Individual Dose

Dataset Name: NFSS2020 Ind Adu  
Dataset Date: Feb 10, 2021 01:46 PM  
Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND

Wed Feb 10 13:46:40 2021

SUMMARY  
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	2.35E-04
UB_Wall	2.59E-04
Bone_Sur	8.28E-03
Brain	2.48E-04
Breasts	2.72E-04
St_Wall	2.51E-04
SI_Wall	2.50E-04
ULI_Wall	2.63E-04
LLI_Wall	2.98E-04
Kidneys	4.77E-04
Liver	3.89E-04
Muscle	2.80E-04
Ovaries	2.79E-04
Pancreas	2.37E-04
R_Marrow	6.46E-04
Skin	3.81E-03
Spleen	2.55E-04
Testes	3.17E-04
Thymus	2.49E-04
Thyroid	2.60E-04
GB_Wall	2.39E-04
Ht_Wall	2.48E-04
Uterus	2.46E-04
ET_Reg	1.17E-03
Lung_66	3.45E-03
Effectiv	8.25E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	8.38E-05
INHALATION	4.72E-04
AIR IMMERSION	1.36E-10
GROUND SURFACE	2.69E-04
INTERNAL	5.55E-04
EXTERNAL	2.69E-04
TOTAL	8.25E-04

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	7.33E-05
Th-234	1.92E-06
Pa-234m	2.62E-05
Pa-234	5.17E-07
U-234	8.47E-05
Th-230	1.78E-04
Ra-226	9.81E-05
Rn-222	4.63E-08
Po-218	8.27E-13
Pb-214	3.02E-05
At-218	3.11E-12
Bi-214	1.77E-04
Rn-218	1.80E-14
Po-214	9.79E-09
Tl-210	6.90E-08
Pb-210	1.49E-07
Bi-210	2.41E-06
Hg-206	1.94E-13
Po-210	6.23E-10
Tl-206	5.62E-12
Th-232	4.66E-05
Ra-228	8.88E-09
Ac-228	1.01E-05
Th-228	6.93E-05
Ra-224	1.21E-07
Rn-220	7.40E-09
Po-216	1.78E-10
Pb-212	1.62E-06
Bi-212	1.90E-06
Po-212	0.00E+00
Tl-208	1.31E-05
U-235	9.60E-06
Th-231	3.02E-07
Pa-231	5.00E-10
Ac-227	1.68E-12
Th-227	8.01E-10
Fr-223	7.55E-12
Ra-223	8.96E-10
Rn-219	3.88E-10
At-219	0.00E+00
Bi-215	1.75E-15
Po-215	1.18E-12
Pb-211	7.62E-10
Bi-211	3.14E-10
Tl-207	3.95E-10
Po-211	1.51E-13
TOTAL	8.25E-04

## CANCER RISK SUMMARY

	Selected Individual
	Total Lifetime
Cancer	Fatal Cancer Risk
_____	_____

## PATHWAY RISK SUMMARY

	Selected Individual
	Total Lifetime
Pathway	Fatal Cancer Risk
_____	_____
INGESTION	5.80E-11
INHALATION	1.38E-10
AIR IMMERSION	7.24E-17
GROUND SURFACE	1.32E-10
INTERNAL	1.96E-10
EXTERNAL	1.32E-10
TOTAL	3.28E-10

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	2.31E-11
Th-234	9.94E-13
Pa-234m	4.59E-12
Pa-234	2.81E-13
U-234	2.90E-11
Th-230	3.85E-11
Ra-226	6.91E-11
Rn-222	2.52E-14
Po-218	3.69E-19
Pb-214	1.62E-11
At-218	3.83E-19
Bi-214	9.33E-11
Rn-218	9.85E-21
Po-214	5.37E-15
Tl-210	3.68E-14
Pb-210	6.66E-14
Bi-210	2.67E-13
Hg-206	8.61E-20
Po-210	3.42E-16
Tl-206	6.31E-19
Th-232	9.94E-12
Ra-228	2.70E-15
Ac-228	5.39E-12
Th-228	2.49E-11
Ra-224	6.55E-14
Rn-220	4.05E-15
Po-216	9.81E-17
Pb-212	8.84E-13
Bi-212	7.31E-13
Po-212	0.00E+00
Tl-208	7.12E-12
U-235	3.69E-12
Th-231	1.38E-13
Pa-231	2.61E-16
Ac-227	6.27E-19
Th-227	4.34E-16
Fr-223	2.81E-18
Ra-223	4.84E-16
Rn-219	2.12E-16
At-219	0.00E+00
Bi-215	7.79E-22
Po-215	6.50E-19
Pb-211	2.72E-16
Bi-211	1.71E-16
Tl-207	5.07E-17
Po-211	8.27E-20
TOTAL	3.28E-10

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

Direction	Distance (m)						
	533	783	914	1105	1250	1486	2499
N	5.9E-04	2.4E-04	1.9E-04	1.4E-04	1.2E-04	9.2E-05	4.8E-05
NNW	4.7E-04	1.9E-04	1.4E-04	9.2E-05	7.3E-05	5.2E-05	2.1E-05
NW	4.7E-04	1.6E-04	1.2E-04	9.1E-05	7.6E-05	5.9E-05	3.1E-05
WNW	5.0E-04	2.5E-04	1.9E-04	1.3E-04	1.1E-04	8.1E-05	3.7E-05
W	5.5E-04	2.7E-04	2.1E-04	1.6E-04	1.3E-04	1.1E-04	5.8E-05
WSW	5.4E-04	2.7E-04	2.0E-04	1.4E-04	1.1E-04	8.5E-05	3.8E-05
SW	5.0E-04	2.0E-04	1.5E-04	1.1E-04	9.3E-05	7.3E-05	3.8E-05
SSW	4.5E-04	2.0E-04	1.5E-04	1.0E-04	8.4E-05	6.2E-05	2.8E-05
S	4.9E-04	2.0E-04	1.5E-04	1.1E-04	9.6E-05	7.6E-05	4.0E-05
SSE	5.5E-04	2.6E-04	1.9E-04	1.4E-04	1.1E-04	8.2E-05	3.6E-05
SSE	6.3E-04	2.8E-04	2.2E-04	1.6E-04	1.3E-04	1.0E-04	5.2E-05
ESE	6.9E-04	3.3E-04	2.5E-04	1.7E-04	1.4E-04	1.1E-04	4.8E-05
E	7.9E-04	3.3E-04	2.5E-04	1.8E-04	1.5E-04	1.2E-04	5.6E-05
ENE	8.2E-04	4.0E-04	2.9E-04	2.1E-04	1.7E-04	1.2E-04	5.4E-05
NE	8.2E-04	3.9E-04	3.0E-04	2.2E-04	1.9E-04	1.5E-04	7.5E-05
NNE	7.3E-04	3.7E-04	2.8E-04	1.9E-04	1.6E-04	1.2E-04	5.2E-05

Direction	Distance (m)						
	2629						
N	4.5E-05						
NNW	2.0E-05						
NW	2.9E-05						
WNW	3.4E-05						
W	5.4E-05						
WSW	3.5E-05						
SW	3.5E-05						
SSW	2.6E-05						
S	3.7E-05						
SSE	3.4E-05						
SSE	4.9E-05						
ESE	4.5E-05						
E	5.3E-05						
ENE	5.0E-05						
NE	6.9E-05						
NNE	4.9E-05						

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

Direction	Distance (m)						
	533	783	914	1105	1250	1486	2499
N	2.4E-10	9.9E-11	7.7E-11	5.8E-11	4.9E-11	4.0E-11	2.2E-11
NNW	1.9E-10	7.7E-11	5.7E-11	4.0E-11	3.2E-11	2.4E-11	1.2E-11
NW	1.9E-10	6.7E-11	5.2E-11	3.9E-11	3.3E-11	2.7E-11	1.5E-11
WNW	2.0E-10	1.0E-10	7.7E-11	5.6E-11	4.6E-11	3.5E-11	1.8E-11
W	2.2E-10	1.1E-10	8.7E-11	6.6E-11	5.7E-11	4.6E-11	2.6E-11
WSW	2.2E-10	1.1E-10	8.2E-11	5.9E-11	4.8E-11	3.7E-11	1.8E-11
SW	2.0E-10	8.2E-11	6.3E-11	4.7E-11	4.0E-11	3.2E-11	1.8E-11
SSW	1.8E-10	8.3E-11	6.2E-11	4.5E-11	3.7E-11	2.8E-11	1.4E-11
S	2.0E-10	8.3E-11	6.4E-11	4.9E-11	4.1E-11	3.3E-11	1.9E-11
SSE	2.2E-10	1.1E-10	7.9E-11	5.7E-11	4.7E-11	3.6E-11	1.8E-11
SSE	2.5E-10	1.2E-10	8.9E-11	6.6E-11	5.6E-11	4.5E-11	2.4E-11
ESE	2.8E-10	1.3E-10	1.0E-10	7.3E-11	6.0E-11	4.6E-11	2.2E-11
E	3.1E-10	1.4E-10	1.0E-10	7.6E-11	6.3E-11	5.0E-11	2.6E-11
ENE	3.3E-10	1.6E-10	1.2E-10	8.5E-11	6.9E-11	5.3E-11	2.5E-11
NE	3.3E-10	1.6E-10	1.2E-10	9.1E-11	7.7E-11	6.2E-11	3.3E-11
NNE	2.9E-10	1.5E-10	1.1E-10	8.0E-11	6.6E-11	5.0E-11	2.4E-11

Direction	Distance (m)						
	2629						
N	2.1E-11						
NNW	1.1E-11						
NW	1.5E-11						
WNW	1.7E-11						
W	2.5E-11						
WSW	1.7E-11						
SW	1.7E-11						
SSW	1.4E-11						
S	1.8E-11						
SSE	1.7E-11						
SSE	2.3E-11						
ESE	2.1E-11						
E	2.4E-11						
ENE	2.3E-11						
NE	3.1E-11						
NNE	2.3E-11						

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

Non-Radon Individual Assessment  
Wed Feb 10 13:53:05 2021

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

Source Category: Area  
Source Type: Area  
Emission Year: 2020  
DOSE Age Group: Fifteen

Comments: NFSS Technical Memo 2020 Year  
Individual Dose

Dataset Name: NFSS2020 Ind Fif  
Dataset Date: Feb 10, 2021 01:53 PM  
Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND

## ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	2.41E-04
UB_Wall	2.64E-04
Bone_Sur	2.26E-02
Brain	2.54E-04
Breasts	2.76E-04
St_Wall	2.56E-04
SI_Wall	2.55E-04
ULI_Wall	2.68E-04
LLI_Wall	3.05E-04
Kidneys	5.11E-04
Liver	4.19E-04
Muscle	2.85E-04
Ovaries	2.90E-04
Pancreas	2.42E-04
R_Marrow	1.20E-03
Skin	3.81E-03
Spleen	2.78E-04
Testes	3.27E-04
Thymus	2.54E-04
Thyroid	2.65E-04
GB_Wall	2.44E-04
Ht_Wall	2.53E-04
Uterus	2.50E-04
ET_Reg	1.22E-03
Lung_66	3.95E-03
Effectiv	1.10E-03

## PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	2.86E-04
INHALATION	5.44E-04
AIR IMMERSION	1.36E-10
GROUND SURFACE	2.69E-04
INTERNAL	8.31E-04
EXTERNAL	2.69E-04
TOTAL	1.10E-03

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	8.95E-05
Th-234	1.92E-06
Pa-234m	2.62E-05
Pa-234	5.17E-07
U-234	1.04E-04
Th-230	1.87E-04
Ra-226	3.13E-04
Rn-222	4.63E-08
Po-218	8.27E-13
Pb-214	3.02E-05
At-218	3.11E-12
Bi-214	1.77E-04
Rn-218	1.80E-14
Po-214	9.79E-09
Tl-210	6.90E-08
Pb-210	1.49E-07
Bi-210	2.41E-06
Hg-206	1.94E-13
Po-210	6.23E-10
Tl-206	5.62E-12
Th-232	4.79E-05
Ra-228	8.93E-09
Ac-228	1.01E-05
Th-228	8.23E-05
Ra-224	1.21E-07
Rn-220	7.40E-09
Po-216	1.78E-10
Pb-212	1.62E-06
Bi-212	1.90E-06
Po-212	0.00E+00
Tl-208	1.31E-05
U-235	1.11E-05
Th-231	3.02E-07
Pa-231	5.00E-10
Ac-227	1.68E-12
Th-227	8.01E-10
Fr-223	7.55E-12
Ra-223	8.96E-10
Rn-219	3.88E-10
At-219	0.00E+00
Bi-215	1.75E-15
Po-215	1.18E-12
Pb-211	7.62E-10
Bi-211	3.14E-10
Tl-207	3.95E-10
Po-211	1.51E-13
TOTAL	1.10E-03

## CANCER RISK SUMMARY

	Selected Individual
	Total Lifetime
Cancer	Fatal Cancer Risk
_____	_____

## PATHWAY RISK SUMMARY

	Selected Individual
	Total Lifetime
Pathway	Fatal Cancer Risk
_____	_____
INGESTION	3.62E-11
INHALATION	5.14E-11
AIR IMMERSION	7.24E-17
GROUND SURFACE	1.32E-10
INTERNAL	8.76E-11
EXTERNAL	1.32E-10
TOTAL	2.20E-10

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	9.56E-12
Th-234	9.94E-13
Pa-234m	4.59E-12
Pa-234	2.81E-13
U-234	1.24E-11
Th-230	1.29E-11
Ra-226	4.03E-11
Rn-222	2.52E-14
Po-218	3.69E-19
Pb-214	1.62E-11
At-218	3.83E-19
Bi-214	9.33E-11
Rn-218	9.85E-21
Po-214	5.37E-15
Tl-210	3.68E-14
Pb-210	6.66E-14
Bi-210	2.67E-13
Hg-206	8.61E-20
Po-210	3.42E-16
Tl-206	6.31E-19
Th-232	2.92E-12
Ra-228	2.69E-15
Ac-228	5.39E-12
Th-228	9.25E-12
Ra-224	6.50E-14
Rn-220	4.05E-15
Po-216	9.81E-17
Pb-212	8.84E-13
Bi-212	7.31E-13
Po-212	0.00E+00
Tl-208	7.12E-12
U-235	2.47E-12
Th-231	1.38E-13
Pa-231	2.61E-16
Ac-227	6.27E-19
Th-227	4.34E-16
Fr-223	2.81E-18
Ra-223	4.84E-16
Rn-219	2.12E-16
At-219	0.00E+00
Bi-215	7.79E-22
Po-215	6.50E-19
Pb-211	2.72E-16
Bi-211	1.71E-16
Tl-207	5.07E-17
Po-211	8.27E-20
TOTAL	2.20E-10

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

Direction	533	783	914	1105	1250	1486	2499
N	7.9E-04	3.4E-04	2.7E-04	2.0E-04	1.8E-04	1.4E-04	8.6E-05
NNW	6.3E-04	2.7E-04	2.0E-04	1.4E-04	1.2E-04	9.2E-05	5.1E-05
NW	6.3E-04	2.4E-04	1.8E-04	1.4E-04	1.2E-04	1.0E-04	6.4E-05
WNW	6.8E-04	3.6E-04	2.7E-04	2.0E-04	1.6E-04	1.3E-04	7.1E-05
W	7.4E-04	3.8E-04	3.0E-04	2.3E-04	2.0E-04	1.6E-04	9.9E-05
WSW	7.3E-04	3.8E-04	2.8E-04	2.1E-04	1.7E-04	1.3E-04	7.3E-05
SW	6.8E-04	2.8E-04	2.2E-04	1.7E-04	1.5E-04	1.2E-04	7.3E-05
SSW	6.2E-04	2.9E-04	2.2E-04	1.6E-04	1.3E-04	1.1E-04	6.0E-05
S	6.6E-04	2.9E-04	2.3E-04	1.7E-04	1.5E-04	1.2E-04	7.6E-05
SSE	7.4E-04	3.6E-04	2.8E-04	2.0E-04	1.7E-04	1.3E-04	7.1E-05
SSE	8.5E-04	3.9E-04	3.1E-04	2.3E-04	2.0E-04	1.6E-04	9.2E-05
ESE	9.3E-04	4.6E-04	3.4E-04	2.5E-04	2.1E-04	1.6E-04	8.7E-05
E	1.1E-03	4.6E-04	3.5E-04	2.6E-04	2.2E-04	1.8E-04	9.7E-05
ENE	1.1E-03	5.4E-04	4.1E-04	2.9E-04	2.4E-04	1.9E-04	9.4E-05
NE	1.1E-03	5.3E-04	4.1E-04	3.1E-04	2.7E-04	2.2E-04	1.2E-04
NNE	9.7E-04	5.1E-04	3.8E-04	2.8E-04	2.3E-04	1.8E-04	9.2E-05

Direction	2629
N	8.2E-05
NNW	5.0E-05
NW	6.2E-05
WNW	6.9E-05
W	9.4E-05
WSW	7.0E-05
SW	7.0E-05
SSW	5.8E-05
S	7.3E-05
SSE	6.8E-05
SSE	8.8E-05
ESE	8.3E-05
E	9.3E-05
ENE	8.9E-05
NE	1.1E-04
NNE	8.7E-05

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

Direction	Distance (m)						
	533	783	914	1105	1250	1486	2499
N	1.6E-10	6.7E-11	5.2E-11	3.9E-11	3.3E-11	2.7E-11	1.5E-11
NNW	1.3E-10	5.2E-11	3.8E-11	2.7E-11	2.2E-11	1.6E-11	7.8E-12
NW	1.3E-10	4.5E-11	3.5E-11	2.6E-11	2.2E-11	1.8E-11	1.0E-11
WNW	1.3E-10	7.0E-11	5.2E-11	3.8E-11	3.1E-11	2.4E-11	1.2E-11
W	1.5E-10	7.5E-11	5.8E-11	4.5E-11	3.8E-11	3.1E-11	1.8E-11
WSW	1.5E-10	7.4E-11	5.6E-11	4.0E-11	3.3E-11	2.5E-11	1.2E-11
SW	1.4E-10	5.5E-11	4.2E-11	3.2E-11	2.7E-11	2.2E-11	1.2E-11
SSW	1.2E-10	5.6E-11	4.2E-11	3.0E-11	2.5E-11	1.9E-11	9.7E-12
S	1.3E-10	5.6E-11	4.3E-11	3.3E-11	2.8E-11	2.3E-11	1.3E-11
SSE	1.5E-10	7.2E-11	5.4E-11	3.9E-11	3.2E-11	2.4E-11	1.2E-11
SSE	1.7E-10	7.8E-11	6.0E-11	4.5E-11	3.8E-11	3.0E-11	1.7E-11
ESE	1.9E-10	9.0E-11	6.8E-11	4.9E-11	4.1E-11	3.1E-11	1.5E-11
E	2.1E-10	9.1E-11	7.0E-11	5.1E-11	4.3E-11	3.4E-11	1.8E-11
ENE	2.2E-10	1.1E-10	8.0E-11	5.8E-11	4.7E-11	3.6E-11	1.7E-11
NE	2.2E-10	1.1E-10	8.2E-11	6.2E-11	5.2E-11	4.2E-11	2.3E-11
NNE	1.9E-10	1.0E-10	7.6E-11	5.5E-11	4.5E-11	3.4E-11	1.6E-11

Direction	Distance (m)						
	2629						
N	1.4E-11						
NNW	7.6E-12						
NW	1.0E-11						
WNW	1.1E-11						
W	1.7E-11						
WSW	1.2E-11						
SW	1.2E-11						
SSW	9.3E-12						
S	1.2E-11						
SSE	1.1E-11						
SSE	1.6E-11						
ESE	1.5E-11						
E	1.7E-11						
ENE	1.6E-11						
NE	2.1E-11						
NNE	1.5E-11						

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

Non-Radon Individual Assessment  
Wed Feb 10 13:55:21 2021

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

Source Category: Area

Source Type: Area

Emission Year: 2020

DOSE Age Group: Ten

Comments: NFSS Technical Memo 2020 Year  
Individual Dose

Dataset Name: NFSS2020 Ind Ten

Dataset Date: Feb 10, 2021 01:55 PM

Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND

Wed Feb 10 13:55:21 2021

SUMMARY  
Page 1

ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	2.36E-04
UB_Wall	2.60E-04
Bone_Sur	9.56E-03
Brain	2.49E-04
Breasts	2.72E-04
St_Wall	2.52E-04
SI_Wall	2.52E-04
ULI_Wall	2.70E-04
LLI_Wall	3.19E-04
Kidneys	4.70E-04
Liver	4.02E-04
Muscle	2.81E-04
Ovaries	2.77E-04
Pancreas	2.38E-04
R_Marrow	7.79E-04
Skin	3.81E-03
Spleen	2.61E-04
Testes	3.14E-04
Thymus	2.50E-04
Thyroid	2.60E-04
GB_Wall	2.40E-04
Ht_Wall	2.49E-04
Uterus	2.47E-04
ET_Reg	1.56E-03
Lung_66	3.46E-03
Effectiv	8.57E-04

PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	1.36E-04
INHALATION	4.52E-04
AIR IMMERSION	1.36E-10
GROUND SURFACE	2.69E-04
INTERNAL	5.87E-04
EXTERNAL	2.69E-04
TOTAL	8.57E-04

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	7.65E-05
Th-234	1.92E-06
Pa-234m	2.62E-05
Pa-234	5.17E-07
U-234	8.82E-05
Th-230	1.51E-04
Ra-226	1.56E-04
Rn-222	4.63E-08
Po-218	8.27E-13
Pb-214	3.02E-05
At-218	3.11E-12
Bi-214	1.77E-04
Rn-218	1.80E-14
Po-214	9.79E-09
Tl-210	6.90E-08
Pb-210	1.49E-07
Bi-210	2.41E-06
Hg-206	1.94E-13
Po-210	6.23E-10
Tl-206	5.62E-12
Th-232	3.63E-05
Ra-228	8.91E-09
Ac-228	1.01E-05
Th-228	7.36E-05
Ra-224	1.21E-07
Rn-220	7.40E-09
Po-216	1.78E-10
Pb-212	1.62E-06
Bi-212	1.90E-06
Po-212	0.00E+00
Tl-208	1.31E-05
U-235	9.89E-06
Th-231	3.02E-07
Pa-231	5.00E-10
Ac-227	1.68E-12
Th-227	8.01E-10
Fr-223	7.55E-12
Ra-223	8.96E-10
Rn-219	3.88E-10
At-219	0.00E+00
Bi-215	1.75E-15
Po-215	1.18E-12
Pb-211	7.62E-10
Bi-211	3.14E-10
Tl-207	3.95E-10
Po-211	1.51E-13
TOTAL	8.57E-04

## CANCER RISK SUMMARY

	Selected Individual
	Total Lifetime
Cancer	Fatal Cancer Risk
_____	_____

## PATHWAY RISK SUMMARY

	Selected Individual
	Total Lifetime
Pathway	Fatal Cancer Risk
_____	_____
INGESTION	2.10E-12
INHALATION	7.14E-11
AIR IMMERSION	7.24E-17
GROUND SURFACE	1.32E-10
INTERNAL	7.35E-11
EXTERNAL	1.32E-10
TOTAL	2.06E-10

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	1.24E-11
Th-234	9.94E-13
Pa-234m	4.59E-12
Pa-234	2.81E-13
U-234	1.61E-11
Th-230	1.81E-11
Ra-226	8.51E-12
Rn-222	2.52E-14
Po-218	3.69E-19
Pb-214	1.62E-11
At-218	3.83E-19
Bi-214	9.33E-11
Rn-218	9.85E-21
Po-214	5.37E-15
Tl-210	3.68E-14
Pb-210	6.66E-14
Bi-210	2.67E-13
Hg-206	8.61E-20
Po-210	3.42E-16
Tl-206	6.31E-19
Th-232	3.84E-12
Ra-228	2.69E-15
Ac-228	5.39E-12
Th-228	1.37E-11
Ra-224	6.51E-14
Rn-220	4.05E-15
Po-216	9.81E-17
Pb-212	8.84E-13
Bi-212	7.31E-13
Po-212	0.00E+00
Tl-208	7.12E-12
U-235	2.87E-12
Th-231	1.38E-13
Pa-231	2.61E-16
Ac-227	6.27E-19
Th-227	4.34E-16
Fr-223	2.81E-18
Ra-223	4.84E-16
Rn-219	2.12E-16
At-219	0.00E+00
Bi-215	7.79E-22
Po-215	6.50E-19
Pb-211	2.72E-16
Bi-211	1.71E-16
Tl-207	5.07E-17
Po-211	8.27E-20
TOTAL	2.06E-10

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

Direction	533	783	914	1105	1250	1486	2499
N	6.1E-04	2.6E-04	2.0E-04	1.5E-04	1.3E-04	1.0E-04	5.7E-05
NNW	4.9E-04	2.0E-04	1.5E-04	1.0E-04	8.3E-05	6.2E-05	3.0E-05
NW	4.9E-04	1.8E-04	1.4E-04	1.0E-04	8.6E-05	6.9E-05	4.0E-05
WNW	5.2E-04	2.7E-04	2.0E-04	1.4E-04	1.2E-04	9.1E-05	4.6E-05
W	5.7E-04	2.9E-04	2.3E-04	1.7E-04	1.5E-04	1.2E-04	6.7E-05
WSW	5.7E-04	2.9E-04	2.1E-04	1.5E-04	1.3E-04	9.6E-05	4.7E-05
SW	5.3E-04	2.1E-04	1.6E-04	1.2E-04	1.0E-04	8.3E-05	4.7E-05
SSW	4.8E-04	2.2E-04	1.6E-04	1.2E-04	9.5E-05	7.3E-05	3.7E-05
S	5.1E-04	2.2E-04	1.7E-04	1.3E-04	1.1E-04	8.7E-05	4.9E-05
SSE	5.8E-04	2.8E-04	2.1E-04	1.5E-04	1.2E-04	9.2E-05	4.6E-05
SSE	6.6E-04	3.0E-04	2.3E-04	1.7E-04	1.4E-04	1.2E-04	6.2E-05
ESE	7.2E-04	3.5E-04	2.6E-04	1.9E-04	1.5E-04	1.2E-04	5.8E-05
E	8.2E-04	3.5E-04	2.7E-04	2.0E-04	1.6E-04	1.3E-04	6.6E-05
ENE	8.6E-04	4.2E-04	3.1E-04	2.2E-04	1.8E-04	1.4E-04	6.3E-05
NE	8.5E-04	4.1E-04	3.2E-04	2.4E-04	2.0E-04	1.6E-04	8.5E-05
NNE	7.5E-04	3.9E-04	2.9E-04	2.1E-04	1.7E-04	1.3E-04	6.2E-05

Direction	2629
N	5.4E-05
NNW	2.9E-05
NW	3.8E-05
WNW	4.4E-05
W	6.4E-05
WSW	4.4E-05
SW	4.5E-05
SSW	3.5E-05
S	4.7E-05
SSE	4.3E-05
SSE	5.9E-05
ESE	5.5E-05
E	6.2E-05
ENE	6.0E-05
NE	8.0E-05
NNE	5.8E-05

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

Direction	Distance (m)						
	533	783	914	1105	1250	1486	2499
N	1.5E-10	5.9E-11	4.5E-11	3.3E-11	2.8E-11	2.1E-11	1.0E-11
NNW	1.2E-10	4.6E-11	3.2E-11	2.2E-11	1.7E-11	1.1E-11	3.4E-12
NW	1.2E-10	3.9E-11	2.9E-11	2.1E-11	1.7E-11	1.3E-11	5.9E-12
WNW	1.2E-10	6.2E-11	4.5E-11	3.2E-11	2.5E-11	1.9E-11	7.3E-12
W	1.4E-10	6.7E-11	5.1E-11	3.8E-11	3.2E-11	2.6E-11	1.3E-11
WSW	1.3E-10	6.7E-11	4.9E-11	3.4E-11	2.7E-11	2.0E-11	7.6E-12
SW	1.2E-10	4.8E-11	3.6E-11	2.6E-11	2.2E-11	1.7E-11	7.7E-12
SSW	1.1E-10	4.9E-11	3.6E-11	2.5E-11	1.9E-11	1.4E-11	5.1E-12
S	1.2E-10	4.9E-11	3.7E-11	2.7E-11	2.3E-11	1.7E-11	8.3E-12
SSE	1.4E-10	6.4E-11	4.7E-11	3.3E-11	2.6E-11	1.9E-11	7.3E-12
SSE	1.6E-10	7.0E-11	5.3E-11	3.9E-11	3.2E-11	2.5E-11	1.2E-11
ESE	1.7E-10	8.2E-11	6.0E-11	4.3E-11	3.4E-11	2.5E-11	1.0E-11
E	2.0E-10	8.3E-11	6.2E-11	4.5E-11	3.7E-11	2.8E-11	1.3E-11
ENE	2.1E-10	9.9E-11	7.2E-11	5.1E-11	4.1E-11	3.0E-11	1.2E-11
NE	2.0E-10	9.7E-11	7.4E-11	5.4E-11	4.5E-11	3.6E-11	1.7E-11
NNE	1.8E-10	9.2E-11	6.8E-11	4.8E-11	3.8E-11	2.8E-11	1.1E-11
Direction	Distance (m)						
	2629						
N	9.5E-12						
NNW	3.1E-12						
NW	5.4E-12						
WNW	6.8E-12						
W	1.2E-11						
WSW	7.0E-12						
SW	7.1E-12						
SSW	4.7E-12						
S	7.6E-12						
SSE	6.8E-12						
SSE	1.1E-11						
ESE	9.7E-12						
E	1.2E-11						
ENE	1.1E-11						
NE	1.6E-11						
NNE	1.0E-11						

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

Non-Radon Individual Assessment  
Wed Feb 10 13:53:39 2021

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

Source Category: Area

Source Type: Area

Emission Year: 2020

DOSE Age Group: Five

Comments: NFSS Technical Memo 2020 Year  
Individual Dose

Dataset Name: NFSS2020 Ind Fiv

Dataset Date: Feb 10, 2021 01:53 PM

Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND

## ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	2.39E-04
UB_Wall	2.63E-04
Bone_Sur	5.88E-03
Brain	2.52E-04
Breasts	2.76E-04
St_Wall	2.56E-04
SI_Wall	2.56E-04
ULI_Wall	2.81E-04
LLI_Wall	3.49E-04
Kidneys	4.89E-04
Liver	4.23E-04
Muscle	2.84E-04
Ovaries	2.77E-04
Pancreas	2.41E-04
R_Marrow	6.38E-04
Skin	3.81E-03
Spleen	2.60E-04
Testes	3.13E-04
Thymus	2.53E-04
Thyroid	2.64E-04
GB_Wall	2.43E-04
Ht_Wall	2.52E-04
Uterus	2.50E-04
ET_Reg	1.57E-03
Lung_66	3.69E-03
Effectiv	8.35E-04

## PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	9.81E-05
INHALATION	4.67E-04
AIR IMMERSION	1.36E-10
GROUND SURFACE	2.69E-04
INTERNAL	5.65E-04
EXTERNAL	2.69E-04
TOTAL	8.35E-04

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	8.03E-05
Th-234	1.92E-06
Pa-234m	2.62E-05
Pa-234	5.17E-07
U-234	9.12E-05
Th-230	1.55E-04
Ra-226	1.19E-04
Rn-222	4.63E-08
Po-218	8.27E-13
Pb-214	3.02E-05
At-218	3.11E-12
Bi-214	1.77E-04
Rn-218	1.80E-14
Po-214	9.79E-09
Tl-210	6.90E-08
Pb-210	1.49E-07
Bi-210	2.41E-06
Hg-206	1.94E-13
Po-210	6.23E-10
Tl-206	5.62E-12
Th-232	3.57E-05
Ra-228	8.90E-09
Ac-228	1.01E-05
Th-228	7.81E-05
Ra-224	1.21E-07
Rn-220	7.40E-09
Po-216	1.78E-10
Pb-212	1.62E-06
Bi-212	1.90E-06
Po-212	0.00E+00
Tl-208	1.31E-05
U-235	1.02E-05
Th-231	3.02E-07
Pa-231	5.00E-10
Ac-227	1.68E-12
Th-227	8.01E-10
Fr-223	7.55E-12
Ra-223	8.96E-10
Rn-219	3.88E-10
At-219	0.00E+00
Bi-215	1.75E-15
Po-215	1.18E-12
Pb-211	7.62E-10
Bi-211	3.14E-10
Tl-207	3.95E-10
Po-211	1.51E-13
TOTAL	8.35E-04

## CANCER RISK SUMMARY

	Selected Individual
	Total Lifetime
Cancer	Fatal Cancer Risk

## PATHWAY RISK SUMMARY

	Selected Individual
	Total Lifetime
Pathway	Fatal Cancer Risk
INGESTION	1.33E-12
INHALATION	5.12E-11
AIR IMMERSION	7.24E-17
GROUND SURFACE	1.32E-10
INTERNAL	5.25E-11
EXTERNAL	1.32E-10
TOTAL	1.85E-10

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	8.94E-12
Th-234	9.94E-13
Pa-234m	4.59E-12
Pa-234	2.81E-13
U-234	1.14E-11
Th-230	1.30E-11
Ra-226	6.23E-12
Rn-222	2.52E-14
Po-218	3.69E-19
Pb-214	1.62E-11
At-218	3.83E-19
Bi-214	9.33E-11
Rn-218	9.85E-21
Po-214	5.37E-15
Tl-210	3.68E-14
Pb-210	6.66E-14
Bi-210	2.67E-13
Hg-206	8.61E-20
Po-210	3.42E-16
Tl-206	6.31E-19
Th-232	2.75E-12
Ra-228	2.69E-15
Ac-228	5.39E-12
Th-228	9.85E-12
Ra-224	6.50E-14
Rn-220	4.05E-15
Po-216	9.81E-17
Pb-212	8.84E-13
Bi-212	7.31E-13
Po-212	0.00E+00
Tl-208	7.12E-12
U-235	2.50E-12
Th-231	1.38E-13
Pa-231	2.61E-16
Ac-227	6.27E-19
Th-227	4.34E-16
Fr-223	2.81E-18
Ra-223	4.84E-16
Rn-219	2.12E-16
At-219	0.00E+00
Bi-215	7.79E-22
Po-215	6.50E-19
Pb-211	2.72E-16
Bi-211	1.71E-16
Tl-207	5.07E-17
Po-211	8.27E-20
TOTAL	1.85E-10

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

Direction	Distance (m)						
	533	783	914	1105	1250	1486	2499
N	6.0E-04	2.5E-04	1.9E-04	1.4E-04	1.2E-04	9.6E-05	5.1E-05
NNW	4.8E-04	1.9E-04	1.4E-04	9.7E-05	7.7E-05	5.6E-05	2.5E-05
NW	4.7E-04	1.7E-04	1.3E-04	9.5E-05	7.9E-05	6.3E-05	3.4E-05
WNW	5.1E-04	2.6E-04	1.9E-04	1.4E-04	1.1E-04	8.5E-05	4.0E-05
W	5.6E-04	2.8E-04	2.2E-04	1.6E-04	1.4E-04	1.1E-04	6.1E-05
WSW	5.5E-04	2.8E-04	2.0E-04	1.5E-04	1.2E-04	8.9E-05	4.1E-05
SW	5.1E-04	2.0E-04	1.6E-04	1.2E-04	9.7E-05	7.7E-05	4.1E-05
SSW	4.6E-04	2.1E-04	1.5E-04	1.1E-04	8.8E-05	6.6E-05	3.1E-05
S	5.0E-04	2.1E-04	1.6E-04	1.2E-04	1.0E-04	8.0E-05	4.4E-05
SSE	5.6E-04	2.7E-04	2.0E-04	1.4E-04	1.1E-04	8.6E-05	4.0E-05
SSE	6.4E-04	2.9E-04	2.2E-04	1.6E-04	1.4E-04	1.1E-04	5.6E-05
ESE	7.0E-04	3.4E-04	2.5E-04	1.8E-04	1.5E-04	1.1E-04	5.2E-05
E	8.0E-04	3.4E-04	2.6E-04	1.9E-04	1.6E-04	1.2E-04	6.0E-05
ENE	8.3E-04	4.0E-04	3.0E-04	2.1E-04	1.7E-04	1.3E-04	5.7E-05
NE	8.3E-04	4.0E-04	3.0E-04	2.3E-04	1.9E-04	1.5E-04	7.9E-05
NNE	7.3E-04	3.8E-04	2.8E-04	2.0E-04	1.6E-04	1.2E-04	5.6E-05

Direction	Distance (m)						
	2629						
N	4.8E-05						
NNW	2.4E-05						
NW	3.3E-05						
WNW	3.8E-05						
W	5.7E-05						
WSW	3.9E-05						
SW	3.9E-05						
SSW	3.0E-05						
S	4.1E-05						
SSE	3.8E-05						
SSE	5.3E-05						
ESE	4.9E-05						
E	5.6E-05						
ENE	5.4E-05						
NE	7.3E-05						
NNE	5.2E-05						

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

Direction	Distance (m)						
	533	783	914	1105	1250	1486	2499
N	1.3E-10	5.3E-11	4.1E-11	3.0E-11	2.5E-11	1.9E-11	9.3E-12
NNW	1.0E-10	4.1E-11	2.9E-11	1.9E-11	1.5E-11	1.0E-11	3.0E-12
NW	1.0E-10	3.5E-11	2.6E-11	1.9E-11	1.6E-11	1.2E-11	5.3E-12
WNW	1.1E-10	5.6E-11	4.1E-11	2.9E-11	2.3E-11	1.7E-11	6.6E-12
W	1.2E-10	6.0E-11	4.6E-11	3.5E-11	2.9E-11	2.3E-11	1.2E-11
WSW	1.2E-10	6.0E-11	4.4E-11	3.0E-11	2.4E-11	1.8E-11	6.8E-12
SW	1.1E-10	4.3E-11	3.3E-11	2.4E-11	2.0E-11	1.5E-11	6.9E-12
SSW	1.0E-10	4.4E-11	3.2E-11	2.2E-11	1.8E-11	1.3E-11	4.6E-12
S	1.1E-10	4.4E-11	3.3E-11	2.4E-11	2.0E-11	1.6E-11	7.4E-12
SSE	1.2E-10	5.8E-11	4.2E-11	2.9E-11	2.3E-11	1.7E-11	6.6E-12
SSE	1.4E-10	6.3E-11	4.8E-11	3.5E-11	2.9E-11	2.2E-11	1.0E-11
ESE	1.6E-10	7.4E-11	5.4E-11	3.8E-11	3.1E-11	2.3E-11	9.4E-12
E	1.8E-10	7.4E-11	5.6E-11	4.0E-11	3.3E-11	2.5E-11	1.1E-11
ENE	1.8E-10	8.9E-11	6.5E-11	4.6E-11	3.7E-11	2.7E-11	1.1E-11
NE	1.8E-10	8.7E-11	6.6E-11	4.9E-11	4.1E-11	3.2E-11	1.6E-11
NNE	1.6E-10	8.3E-11	6.1E-11	4.3E-11	3.5E-11	2.5E-11	1.0E-11

Direction	Distance (m)						
	2629						
N	8.6E-12						
NNW	2.8E-12						
NW	4.9E-12						
WNW	6.1E-12						
W	1.1E-11						
WSW	6.3E-12						
SW	6.4E-12						
SSW	4.2E-12						
S	6.9E-12						
SSE	6.1E-12						
SSE	9.6E-12						
ESE	8.7E-12						
E	1.0E-11						
ENE	9.9E-12						
NE	1.4E-11						
NNE	9.5E-12						

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

Non-Radon Individual Assessment  
Wed Feb 10 13:54:34 2021

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

Source Category: Area

Source Type: Area

Emission Year: 2020

DOSE Age Group: One

Comments: NFSS Technical Memo 2020 Year  
Individual Dose

Dataset Name: NFSS2020 Ind One

Dataset Date: Feb 10, 2021 01:54 PM

Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND

## ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	2.46E-04
UB_Wall	2.70E-04
Bone_Sur	5.57E-03
Brain	2.59E-04
Breasts	2.83E-04
St_Wall	2.64E-04
SI_Wall	2.65E-04
ULI_Wall	3.07E-04
LLI_Wall	4.21E-04
Kidneys	5.46E-04
Liver	4.88E-04
Muscle	2.91E-04
Ovaries	2.76E-04
Pancreas	2.48E-04
R_Marrow	7.47E-04
Skin	3.82E-03
Spleen	2.67E-04
Testes	3.15E-04
Thymus	2.60E-04
Thyroid	2.71E-04
GB_Wall	2.50E-04
Ht_Wall	2.59E-04
Uterus	2.57E-04
ET_Reg	2.51E-03
Lung_66	3.98E-03
Effectiv	8.91E-04

## PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	1.29E-04
INHALATION	4.92E-04
AIR IMMERSION	1.36E-10
GROUND SURFACE	2.69E-04
INTERNAL	6.22E-04
EXTERNAL	2.69E-04
TOTAL	8.91E-04

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	9.00E-05
Th-234	1.92E-06
Pa-234m	2.62E-05
Pa-234	5.17E-07
U-234	1.02E-04
Th-230	1.53E-04
Ra-226	1.50E-04
Rn-222	4.63E-08
Po-218	8.27E-13
Pb-214	3.02E-05
At-218	3.11E-12
Bi-214	1.77E-04
Rn-218	1.80E-14
Po-214	9.79E-09
Tl-210	6.90E-08
Pb-210	1.49E-07
Bi-210	2.41E-06
Hg-206	1.94E-13
Po-210	6.23E-10
Tl-206	5.62E-12
Th-232	3.31E-05
Ra-228	8.92E-09
Ac-228	1.01E-05
Th-228	8.63E-05
Ra-224	1.21E-07
Rn-220	7.40E-09
Po-216	1.78E-10
Pb-212	1.62E-06
Bi-212	1.90E-06
Po-212	0.00E+00
Tl-208	1.31E-05
U-235	1.11E-05
Th-231	3.02E-07
Pa-231	5.00E-10
Ac-227	1.68E-12
Th-227	8.01E-10
Fr-223	7.55E-12
Ra-223	8.96E-10
Rn-219	3.88E-10
At-219	0.00E+00
Bi-215	1.75E-15
Po-215	1.18E-12
Pb-211	7.62E-10
Bi-211	3.14E-10
Tl-207	3.95E-10
Po-211	1.51E-13
TOTAL	8.91E-04

## CANCER RISK SUMMARY

	Selected Individual
	Total Lifetime
Cancer	Fatal Cancer Risk
_____	_____

## PATHWAY RISK SUMMARY

	Selected Individual
	Total Lifetime
Pathway	Fatal Cancer Risk
_____	_____
INGESTION	1.29E-11
INHALATION	1.59E-11
AIR IMMERSION	7.24E-17
GROUND SURFACE	1.32E-10
INTERNAL	2.88E-11
EXTERNAL	1.32E-10
TOTAL	1.61E-10

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	3.95E-12
Th-234	9.94E-13
Pa-234m	4.59E-12
Pa-234	2.81E-13
U-234	4.44E-12
Th-230	4.58E-12
Ra-226	1.21E-11
Rn-222	2.52E-14
Po-218	3.69E-19
Pb-214	1.62E-11
At-218	3.83E-19
Bi-214	9.33E-11
Rn-218	9.85E-21
Po-214	5.37E-15
Tl-210	3.68E-14
Pb-210	6.66E-14
Bi-210	2.67E-13
Hg-206	8.61E-20
Po-210	3.42E-16
Tl-206	6.31E-19
Th-232	9.57E-13
Ra-228	2.70E-15
Ac-228	5.39E-12
Th-228	3.02E-12
Ra-224	6.47E-14
Rn-220	4.05E-15
Po-216	9.81E-17
Pb-212	8.84E-13
Bi-212	7.31E-13
Po-212	0.00E+00
Tl-208	7.12E-12
U-235	1.96E-12
Th-231	1.38E-13
Pa-231	2.61E-16
Ac-227	6.27E-19
Th-227	4.34E-16
Fr-223	2.81E-18
Ra-223	4.84E-16
Rn-219	2.12E-16
At-219	0.00E+00
Bi-215	7.79E-22
Po-215	6.50E-19
Pb-211	2.72E-16
Bi-211	1.71E-16
Tl-207	5.07E-17
Po-211	8.27E-20
TOTAL	1.61E-10

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

Direction	Distance (m)						
	533	783	914	1105	1250	1486	2499
N	6.4E-04	2.7E-04	2.1E-04	1.6E-04	1.3E-04	1.1E-04	6.0E-05
NNW	5.1E-04	2.1E-04	1.5E-04	1.1E-04	8.7E-05	6.5E-05	3.1E-05
NW	5.1E-04	1.8E-04	1.4E-04	1.1E-04	9.0E-05	7.2E-05	4.2E-05
WNW	5.4E-04	2.8E-04	2.1E-04	1.5E-04	1.2E-04	9.5E-05	4.8E-05
W	6.0E-04	3.0E-04	2.3E-04	1.8E-04	1.5E-04	1.2E-04	7.0E-05
WSW	5.9E-04	3.0E-04	2.2E-04	1.6E-04	1.3E-04	9.9E-05	4.9E-05
SW	5.5E-04	2.2E-04	1.7E-04	1.3E-04	1.1E-04	8.7E-05	4.9E-05
SSW	5.0E-04	2.3E-04	1.7E-04	1.2E-04	9.9E-05	7.6E-05	3.9E-05
S	5.3E-04	2.2E-04	1.7E-04	1.3E-04	1.1E-04	9.0E-05	5.1E-05
SSE	6.0E-04	2.9E-04	2.1E-04	1.5E-04	1.3E-04	9.6E-05	4.8E-05
SSE	6.9E-04	3.1E-04	2.4E-04	1.8E-04	1.5E-04	1.2E-04	6.5E-05
ESE	7.5E-04	3.6E-04	2.7E-04	2.0E-04	1.6E-04	1.2E-04	6.1E-05
E	8.5E-04	3.7E-04	2.8E-04	2.0E-04	1.7E-04	1.3E-04	6.9E-05
ENE	8.9E-04	4.3E-04	3.2E-04	2.3E-04	1.9E-04	1.4E-04	6.6E-05
NE	8.8E-04	4.3E-04	3.3E-04	2.5E-04	2.1E-04	1.7E-04	8.9E-05
NNE	7.8E-04	4.1E-04	3.0E-04	2.2E-04	1.8E-04	1.4E-04	6.4E-05

Direction	Distance (m)						
	2629						
N	5.7E-05						
NNW	3.0E-05						
NW	4.0E-05						
WNW	4.6E-05						
W	6.6E-05						
WSW	4.6E-05						
SW	4.7E-05						
SSW	3.7E-05						
S	4.9E-05						
SSE	4.5E-05						
SSE	6.1E-05						
ESE	5.7E-05						
E	6.5E-05						
ENE	6.2E-05						
NE	8.3E-05						
NNE	6.1E-05						

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

Direction	Distance (m)						
	533	783	914	1105	1250	1486	2499
N	1.2E-10	4.8E-11	3.7E-11	2.8E-11	2.3E-11	1.9E-11	9.9E-12
NNW	9.1E-11	3.7E-11	2.7E-11	1.9E-11	1.5E-11	1.1E-11	4.4E-12
NW	9.1E-11	3.2E-11	2.5E-11	1.8E-11	1.5E-11	1.2E-11	6.4E-12
WNW	9.8E-11	5.0E-11	3.7E-11	2.7E-11	2.2E-11	1.6E-11	7.6E-12
W	1.1E-10	5.4E-11	4.2E-11	3.2E-11	2.7E-11	2.2E-11	1.2E-11
WSW	1.1E-10	5.4E-11	4.0E-11	2.8E-11	2.3E-11	1.7E-11	7.8E-12
SW	9.8E-11	3.9E-11	3.0E-11	2.2E-11	1.9E-11	1.5E-11	7.8E-12
SSW	8.9E-11	4.0E-11	3.0E-11	2.1E-11	1.7E-11	1.3E-11	5.8E-12
S	9.6E-11	4.0E-11	3.1E-11	2.3E-11	2.0E-11	1.6E-11	8.3E-12
SSE	1.1E-10	5.2E-11	3.8E-11	2.7E-11	2.2E-11	1.7E-11	7.6E-12
SSE	1.2E-10	5.6E-11	4.3E-11	3.2E-11	2.7E-11	2.1E-11	1.1E-11
ESE	1.4E-10	6.6E-11	4.9E-11	3.5E-11	2.9E-11	2.2E-11	1.0E-11
E	1.5E-10	6.6E-11	5.0E-11	3.7E-11	3.1E-11	2.4E-11	1.2E-11
ENE	1.6E-10	7.9E-11	5.8E-11	4.2E-11	3.4E-11	2.5E-11	1.1E-11
NE	1.6E-10	7.7E-11	5.9E-11	4.5E-11	3.8E-11	3.0E-11	1.6E-11
NNE	1.4E-10	7.4E-11	5.5E-11	3.9E-11	3.2E-11	2.4E-11	1.1E-11

Direction	Distance (m)						
	2629						
N	9.3E-12						
NNW	4.2E-12						
NW	6.1E-12						
WNW	7.1E-12						
W	1.1E-11						
WSW	7.3E-12						
SW	7.4E-12						
SSW	5.5E-12						
S	7.8E-12						
SSE	7.2E-12						
SSE	1.0E-11						
ESE	9.5E-12						
E	1.1E-11						
ENE	1.0E-11						
NE	1.5E-11						
NNE	1.0E-11						

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

Non-Radon Individual Assessment  
Wed Feb 10 13:54:58 2021

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

Source Category: Area  
Source Type: Area  
Emission Year: 2020  
DOSE Age Group: Infant

Comments: NFSS Technical Memo 2020 Year  
Individual Dose

Dataset Name: NFSS2020 Ind Inf  
Dataset Date: Feb 10, 2021 01:54 PM  
Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND

## ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)
Adrenal	2.85E-04
UB_Wall	3.09E-04
Bone_Sur	1.91E-02
Brain	2.98E-04
Breasts	3.21E-04
St_Wall	3.04E-04
SI_Wall	3.04E-04
ULI_Wall	3.54E-04
LLI_Wall	4.91E-04
Kidneys	8.55E-04
Liver	7.81E-04
Muscle	3.30E-04
Ovaries	3.39E-04
Pancreas	2.87E-04
R_Marrow	2.49E-03
Skin	3.86E-03
Spleen	3.15E-04
Testes	3.83E-04
Thymus	2.99E-04
Thyroid	3.09E-04
GB_Wall	2.89E-04
Ht_Wall	2.98E-04
Uterus	2.96E-04
ET_Reg	2.41E-03
Lung_66	3.59E-03
Effectiv	1.24E-03

## PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)
INGESTION	5.33E-04
INHALATION	4.37E-04
AIR IMMERSION	1.36E-10
GROUND SURFACE	2.69E-04
INTERNAL	9.70E-04
EXTERNAL	2.69E-04
TOTAL	1.24E-03

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclide	Selected Individual (mrem)
U-238	9.81E-05
Th-234	1.92E-06
Pa-234m	2.62E-05
Pa-234	5.17E-07
U-234	1.10E-04
Th-230	1.93E-04
Ra-226	4.42E-04
Rn-222	4.63E-08
Po-218	8.27E-13
Pb-214	3.02E-05
At-218	3.11E-12
Bi-214	1.77E-04
Rn-218	1.80E-14
Po-214	9.79E-09
Tl-210	6.90E-08
Pb-210	1.49E-07
Bi-210	2.41E-06
Hg-206	1.94E-13
Po-210	6.23E-10
Tl-206	5.62E-12
Th-232	3.63E-05
Ra-228	9.06E-09
Ac-228	1.01E-05
Th-228	8.33E-05
Ra-224	1.21E-07
Rn-220	7.40E-09
Po-216	1.78E-10
Pb-212	1.62E-06
Bi-212	1.90E-06
Po-212	0.00E+00
Tl-208	1.31E-05
U-235	1.18E-05
Th-231	3.02E-07
Pa-231	5.00E-10
Ac-227	1.68E-12
Th-227	8.01E-10
Fr-223	7.55E-12
Ra-223	8.96E-10
Rn-219	3.88E-10
At-219	0.00E+00
Bi-215	1.75E-15
Po-215	1.18E-12
Pb-211	7.62E-10
Bi-211	3.14E-10
Tl-207	3.95E-10
Po-211	1.51E-13
TOTAL	1.24E-03

## CANCER RISK SUMMARY

	Selected Individual
	Total Lifetime
Cancer	Fatal Cancer Risk
_____	_____

## PATHWAY RISK SUMMARY

	Selected Individual
	Total Lifetime
Pathway	Fatal Cancer Risk
_____	_____
INGESTION	7.95E-12
INHALATION	1.20E-11
AIR IMMERSION	7.24E-17
GROUND SURFACE	1.32E-10
INTERNAL	1.99E-11
EXTERNAL	1.32E-10
TOTAL	1.52E-10

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk
U-238	2.83E-12
Th-234	9.94E-13
Pa-234m	4.59E-12
Pa-234	2.81E-13
U-234	3.20E-12
Th-230	3.42E-12
Ra-226	7.82E-12
Rn-222	2.52E-14
Po-218	3.69E-19
Pb-214	1.62E-11
At-218	3.83E-19
Bi-214	9.33E-11
Rn-218	9.85E-21
Po-214	5.37E-15
Tl-210	3.68E-14
Pb-210	6.66E-14
Bi-210	2.67E-13
Hg-206	8.61E-20
Po-210	3.42E-16
Tl-206	6.31E-19
Th-232	7.17E-13
Ra-228	2.70E-15
Ac-228	5.39E-12
Th-228	2.28E-12
Ra-224	6.47E-14
Rn-220	4.05E-15
Po-216	9.81E-17
Pb-212	8.84E-13
Bi-212	7.31E-13
Po-212	0.00E+00
Tl-208	7.12E-12
U-235	1.86E-12
Th-231	1.38E-13
Pa-231	2.61E-16
Ac-227	6.27E-19
Th-227	4.34E-16
Fr-223	2.81E-18
Ra-223	4.84E-16
Rn-219	2.12E-16
At-219	0.00E+00
Bi-215	7.79E-22
Po-215	6.50E-19
Pb-211	2.72E-16
Bi-211	1.71E-16
Tl-207	5.07E-17
Po-211	8.27E-20
TOTAL	1.52E-10

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

Direction	533	783	914	1105	1250	1486	2499
N	9.0E-04	4.1E-04	3.3E-04	2.6E-04	2.3E-04	1.9E-04	1.3E-04
NNW	7.3E-04	3.3E-04	2.5E-04	1.9E-04	1.7E-04	1.4E-04	9.0E-05
NW	7.3E-04	2.9E-04	2.4E-04	1.9E-04	1.7E-04	1.5E-04	1.0E-04
WNW	7.7E-04	4.2E-04	3.3E-04	2.5E-04	2.2E-04	1.8E-04	1.1E-04
W	8.5E-04	4.5E-04	3.6E-04	2.9E-04	2.5E-04	2.2E-04	1.4E-04
WSW	8.4E-04	4.5E-04	3.5E-04	2.6E-04	2.2E-04	1.8E-04	1.1E-04
SW	7.8E-04	3.4E-04	2.8E-04	2.2E-04	1.9E-04	1.7E-04	1.1E-04
SSW	7.1E-04	3.5E-04	2.7E-04	2.1E-04	1.8E-04	1.5E-04	1.0E-04
S	7.6E-04	3.5E-04	2.8E-04	2.3E-04	2.0E-04	1.7E-04	1.2E-04
SSE	8.5E-04	4.4E-04	3.4E-04	2.6E-04	2.2E-04	1.8E-04	1.1E-04
SSE	9.6E-04	4.7E-04	3.7E-04	2.9E-04	2.5E-04	2.1E-04	1.4E-04
ESE	1.1E-03	5.4E-04	4.1E-04	3.1E-04	2.7E-04	2.2E-04	1.3E-04
E	1.2E-03	5.4E-04	4.2E-04	3.2E-04	2.8E-04	2.3E-04	1.4E-04
ENE	1.2E-03	6.3E-04	4.8E-04	3.6E-04	3.0E-04	2.4E-04	1.4E-04
NE	1.2E-03	6.2E-04	4.9E-04	3.8E-04	3.3E-04	2.7E-04	1.7E-04
NNE	1.1E-03	6.0E-04	4.6E-04	3.4E-04	2.9E-04	2.3E-04	1.4E-04

Direction	2629
N	1.2E-04
NNW	8.9E-05
NW	1.0E-04
WNW	1.1E-04
W	1.4E-04
WSW	1.1E-04
SW	1.1E-04
SSW	9.8E-05
S	1.1E-04
SSE	1.1E-04
SSE	1.3E-04
ESE	1.3E-04
E	1.4E-04
ENE	1.3E-04
NE	1.6E-04
NNE	1.3E-04

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

Direction	Distance (m)						
	533	783	914	1105	1250	1486	2499
N	1.1E-10	4.5E-11	3.5E-11	2.6E-11	2.2E-11	1.7E-11	8.8E-12
NNW	8.6E-11	3.5E-11	2.5E-11	1.7E-11	1.3E-11	9.5E-12	3.5E-12
NW	8.6E-11	3.0E-11	2.3E-11	1.7E-11	1.4E-11	1.1E-11	5.4E-12
WNW	9.2E-11	4.7E-11	3.5E-11	2.5E-11	2.0E-11	1.5E-11	6.5E-12
W	1.0E-10	5.1E-11	3.9E-11	3.0E-11	2.5E-11	2.0E-11	1.1E-11
WSW	1.0E-10	5.0E-11	3.7E-11	2.6E-11	2.1E-11	1.6E-11	6.7E-12
SW	9.3E-11	3.7E-11	2.8E-11	2.1E-11	1.7E-11	1.3E-11	6.8E-12
SSW	8.4E-11	3.8E-11	2.8E-11	1.9E-11	1.6E-11	1.1E-11	4.9E-12
S	9.0E-11	3.7E-11	2.9E-11	2.1E-11	1.8E-11	1.4E-11	7.3E-12
SSE	1.0E-10	4.9E-11	3.6E-11	2.5E-11	2.1E-11	1.5E-11	6.6E-12
SSE	1.2E-10	5.3E-11	4.0E-11	3.0E-11	2.5E-11	2.0E-11	9.8E-12
ESE	1.3E-10	6.2E-11	4.6E-11	3.3E-11	2.7E-11	2.0E-11	9.0E-12
E	1.5E-10	6.2E-11	4.7E-11	3.4E-11	2.8E-11	2.2E-11	1.1E-11
ENE	1.5E-10	7.4E-11	5.5E-11	3.9E-11	3.1E-11	2.3E-11	1.0E-11
NE	1.5E-10	7.3E-11	5.6E-11	4.2E-11	3.5E-11	2.8E-11	1.4E-11
NNE	1.3E-10	6.9E-11	5.2E-11	3.7E-11	3.0E-11	2.2E-11	9.6E-12

Direction	Distance (m)						
	2629						
N	8.2E-12						
NNW	3.3E-12						
NW	5.1E-12						
WNW	6.1E-12						
W	9.9E-12						
WSW	6.3E-12						
SW	6.4E-12						
SSW	4.6E-12						
S	6.8E-12						
SSE	6.2E-12						
SSE	9.1E-12						
ESE	8.4E-12						
E	9.8E-12						
ENE	9.3E-12						
NE	1.3E-11						
NNE	9.0E-12						

**ATTACHMENT D**  
**CAPP88-PC REPORTS – POPULATION**

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

Non-Radon Population Assessment  
Wed Feb 10 13:57:45 2021

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

Source Category: Area  
Source Type: Area  
Emission Year: 2020  
DOSE Age Group: Adult

Comments: NFSS Technical Memo 2020 Year  
Population Dose

Dataset Name: NFSS2020 Pop Adu  
Dataset Date: Feb 10, 2021 01:57 PM  
Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND  
Pop File: C:\Users\h5tderjc\Documents\CAP88\Population Files\NFSS2013.POP

## ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	1.18E-04	8.98E-04
UB_Wall	1.31E-04	9.94E-04
Bone_Sur	3.17E-03	2.29E-02
Brain	1.25E-04	9.50E-04
Breasts	1.37E-04	1.04E-03
St_Wall	1.26E-04	9.61E-04
SI_Wall	1.26E-04	9.56E-04
ULI_Wall	1.29E-04	9.97E-04
LLI_Wall	1.38E-04	1.11E-03
Kidneys	2.14E-04	1.57E-03
Liver	1.78E-04	1.34E-03
Muscle	1.42E-04	1.08E-03
Ovaries	1.39E-04	1.02E-03
Pancreas	1.19E-04	9.06E-04
R_Marrow	2.64E-04	2.08E-03
Skin	2.00E-03	1.51E-02
Spleen	1.28E-04	9.74E-04
Testes	1.59E-04	1.17E-03
Thymus	1.26E-04	9.53E-04
Thyroid	1.31E-04	9.95E-04
GB_Wall	1.20E-04	9.13E-04
Ht_Wall	1.25E-04	9.49E-04
Uterus	1.24E-04	9.40E-04
ET_Reg	5.96E-04	3.17E-03
Lung_66	1.77E-03	8.77E-03
Effectiv	4.01E-04	2.48E-03

## PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	1.67E-05	2.58E-04
INHALATION	2.42E-04	1.15E-03
AIR IMMERSION	6.99E-11	1.11E-09
GROUND SURFACE	1.42E-04	1.07E-03
INTERNAL	2.59E-04	1.41E-03
EXTERNAL	1.42E-04	1.07E-03
TOTAL	4.01E-04	2.48E-03

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	3.55E-05	1.83E-04
Th-234	1.01E-06	7.63E-06
Pa-234m	1.38E-05	1.04E-04
Pa-234	2.73E-07	2.05E-06
U-234	4.11E-05	2.11E-04
Th-230	8.77E-05	4.39E-04
Ra-226	3.28E-05	2.76E-04
Rn-222	2.44E-08	1.84E-07
Po-218	4.36E-13	3.28E-12
Pb-214	1.59E-05	1.20E-04
At-218	1.64E-12	1.23E-11
Bi-214	9.32E-05	7.01E-04
Rn-218	9.50E-15	7.15E-14
Po-214	5.16E-09	3.89E-08
Tl-210	3.64E-08	2.74E-07
Pb-210	7.85E-08	5.91E-07
Bi-210	1.27E-06	9.55E-06
Hg-206	1.02E-13	7.71E-13
Po-210	3.29E-10	2.47E-09
Tl-206	2.96E-12	2.23E-11
Th-232	2.34E-05	1.14E-04
Ra-228	4.68E-09	3.82E-08
Ac-228	5.35E-06	4.02E-05
Th-228	3.53E-05	1.69E-04
Ra-224	6.42E-08	9.98E-07
Rn-220	3.90E-09	2.94E-08
Po-216	9.42E-11	7.09E-10
Pb-212	8.57E-07	6.46E-06
Bi-212	1.00E-06	7.53E-06
Po-212	0.00E+00	0.00E+00
Tl-208	6.91E-06	5.20E-05
U-235	4.78E-06	2.83E-05
Th-231	1.59E-07	1.20E-06
Pa-231	2.64E-10	1.99E-09
Ac-227	8.85E-13	6.66E-12
Th-227	4.23E-10	3.18E-09
Fr-223	3.98E-12	3.00E-11
Ra-223	4.73E-10	3.56E-09
Rn-219	2.05E-10	1.54E-09
At-219	0.00E+00	0.00E+00
Bi-215	9.21E-16	6.93E-15
Po-215	6.25E-13	4.70E-12
Pb-211	4.02E-10	3.02E-09
Bi-211	1.66E-10	1.25E-09
Tl-207	2.08E-10	1.57E-09
Po-211	7.97E-14	6.00E-13
TOTAL	4.01E-04	2.48E-03

## CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	1.35E-12	1.43E-10
Stomach	5.22E-12	5.63E-10
Colon	1.40E-11	1.57E-09
Liver	3.50E-12	4.86E-10
LUNG	8.19E-11	5.61E-09
Bone	3.53E-12	5.99E-10
Skin	2.00E-12	1.96E-10
Breast	6.43E-12	6.55E-10
Ovary	1.97E-12	2.18E-10
Bladder	3.25E-12	3.42E-10
Kidneys	1.12E-12	1.35E-10
Thyroid	4.23E-13	4.49E-11
Leukemia	7.84E-12	8.36E-10
Residual	1.92E-11	2.07E-09
Total	1.52E-10	1.35E-08

## PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	1.14E-11	2.32E-09
INHALATION	7.07E-11	4.35E-09
AIR IMMERSION	3.71E-17	7.78E-15
GROUND SURFACE	6.98E-11	6.80E-09
INTERNAL	8.21E-11	6.67E-09
EXTERNAL	6.98E-11	6.80E-09
TOTAL	1.52E-10	1.35E-08

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	1.17E-11	7.29E-10
Th-234	5.24E-13	5.11E-11
Pa-234m	2.42E-12	2.36E-10
Pa-234	1.48E-13	1.45E-11
U-234	1.41E-11	9.33E-10
Th-230	1.93E-11	1.22E-09
Ra-226	1.83E-11	2.65E-09
Rn-222	1.33E-14	1.30E-12
Po-218	1.95E-19	1.90E-17
Pb-214	8.53E-12	8.31E-10
At-218	2.02E-19	1.97E-17
Bi-214	4.92E-11	4.80E-09
Rn-218	5.20E-21	5.07E-19
Po-214	2.83E-15	2.76E-13
Tl-210	1.94E-14	1.89E-12
Pb-210	3.52E-14	3.43E-12
Bi-210	1.41E-13	1.37E-11
Hg-206	4.54E-20	4.43E-18
Po-210	1.80E-16	1.76E-14
Tl-206	3.33E-19	3.25E-17
Th-232	5.10E-12	3.13E-10
Ra-228	1.42E-15	1.43E-13
Ac-228	2.84E-12	2.77E-10
Th-228	1.27E-11	7.84E-10
Ra-224	3.48E-14	5.83E-12
Rn-220	2.14E-15	2.08E-13
Po-216	5.18E-17	5.05E-15
Pb-212	4.66E-13	4.55E-11
Bi-212	3.86E-13	3.76E-11
Po-212	0.00E+00	0.00E+00
Tl-208	3.76E-12	3.66E-10
U-235	1.91E-12	1.48E-10
Th-231	7.27E-14	7.09E-12
Pa-231	1.38E-16	1.34E-14
Ac-227	3.31E-19	3.23E-17
Th-227	2.29E-16	2.23E-14
Fr-223	1.48E-18	1.45E-16
Ra-223	2.55E-16	2.49E-14
Rn-219	1.12E-16	1.09E-14
At-219	0.00E+00	0.00E+00
Bi-215	4.11E-22	4.01E-20
Po-215	3.43E-19	3.34E-17
Pb-211	1.44E-16	1.40E-14
Bi-211	9.04E-17	8.81E-15
Tl-207	2.67E-17	2.61E-15
Po-211	4.36E-20	4.25E-18
TOTAL	1.52E-10	1.35E-08

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

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	2.4E-04	7.7E-05	3.6E-05	2.1E-05	1.5E-05	6.9E-06
NNW	0.0E+00	1.9E-04	4.0E-05	1.1E-05	6.6E-06	4.5E-06	2.1E-06
NW	0.0E+00	1.6E-04	4.6E-05	2.0E-05	1.2E-05	8.1E-06	3.8E-06
WNW	0.0E+00	2.5E-04	6.6E-05	2.6E-05	1.5E-05	1.0E-05	4.8E-06
W	0.0E+00	2.7E-04	9.2E-05	4.5E-05	2.7E-05	1.8E-05	8.5E-06
WSW	0.0E+00	2.7E-04	7.0E-05	2.7E-05	1.6E-05	1.1E-05	5.0E-06
SW	0.0E+00	1.9E-04	5.9E-05	2.7E-05	1.6E-05	1.1E-05	5.1E-06
SSW	0.0E+00	2.0E-04	4.9E-05	1.8E-05	0.0E+00	7.1E-06	3.3E-06
S	0.0E+00	2.0E-04	6.2E-05	2.9E-05	1.7E-05	1.2E-05	5.4E-06
SSE	0.0E+00	2.6E-04	6.7E-05	2.5E-05	1.5E-05	1.0E-05	4.8E-06
SSE	0.0E+00	2.8E-04	8.8E-05	4.1E-05	2.4E-05	1.6E-05	7.7E-06
ESE	0.0E+00	3.3E-04	9.1E-05	3.7E-05	2.2E-05	1.5E-05	7.0E-06
E	0.0E+00	3.3E-04	1.0E-04	4.4E-05	2.6E-05	1.8E-05	8.5E-06
ENE	0.0E+00	4.0E-04	1.1E-04	4.2E-05	2.5E-05	1.7E-05	8.0E-06
NE	0.0E+00	3.9E-04	1.3E-04	0.0E+00	3.6E-05	2.5E-05	1.2E-05
NNE	0.0E+00	3.8E-04	1.0E-04	0.0E+00	2.4E-05	1.6E-05	7.7E-06

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

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	7.2E-07	6.2E-07	5.8E-07	4.3E-08	1.5E-06	1.2E-06
NNW	0.0E+00	5.6E-07	3.2E-07	8.6E-07	1.3E-07	4.1E-07	4.4E-07
NW	0.0E+00	4.7E-07	3.7E-07	2.2E-06	9.1E-07	8.4E-07	8.1E-06
WNW	0.0E+00	7.6E-07	5.3E-07	8.6E-06	5.3E-06	5.4E-07	2.9E-05
W	0.0E+00	8.1E-07	7.4E-07	4.1E-05	5.4E-06	7.3E-08	2.7E-06
WSW	0.0E+00	8.2E-07	5.6E-07	2.1E-07	1.9E-06	1.8E-06	3.1E-06
SW	0.0E+00	5.8E-07	4.7E-07	5.9E-07	4.4E-06	4.1E-06	3.0E-05
SSW	0.0E+00	6.0E-07	3.9E-07	4.2E-07	0.0E+00	3.1E-07	2.0E-05
S	0.0E+00	5.9E-07	5.0E-07	2.3E-06	1.4E-06	2.5E-06	1.0E-05
SSE	0.0E+00	7.8E-07	5.4E-07	1.6E-06	1.1E-06	7.6E-07	7.1E-06
SSE	0.0E+00	8.4E-07	7.0E-07	1.8E-06	1.5E-06	8.5E-07	5.2E-06
ESE	0.0E+00	1.0E-06	7.3E-07	1.5E-07	6.3E-07	2.4E-06	3.4E-06
E	0.0E+00	1.0E-06	8.0E-07	5.3E-07	8.1E-07	1.1E-06	4.6E-06
ENE	0.0E+00	1.2E-06	8.5E-07	4.6E-07	1.7E-07	1.1E-06	9.7E-06
NE	0.0E+00	1.2E-06	1.0E-06	0.0E+00	5.8E-07	2.6E-06	2.5E-06
NNE	0.0E+00	1.1E-06	8.1E-07	0.0E+00	9.5E-08	1.1E-06	2.1E-06

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

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	9.1E-11	2.9E-11	1.4E-11	8.3E-12	5.7E-12	2.7E-12	
NNW	0.0E+00	7.1E-11	1.5E-11	4.3E-12	2.6E-12	1.8E-12	8.5E-13	
NW	0.0E+00	6.0E-11	1.8E-11	7.8E-12	4.6E-12	3.2E-12	1.5E-12	
WNW	0.0E+00	9.6E-11	2.5E-11	9.9E-12	5.8E-12	4.0E-12	1.9E-12	
W	0.0E+00	1.0E-10	3.5E-11	1.7E-11	1.0E-11	7.1E-12	3.3E-12	
WSW	0.0E+00	1.0E-10	2.7E-11	1.0E-11	6.1E-12	4.2E-12	2.0E-12	
SW	0.0E+00	7.4E-11	2.3E-11	1.0E-11	6.1E-12	4.2E-12	2.0E-12	
SSW	0.0E+00	7.6E-11	1.9E-11	6.8E-12	0.0E+00	2.8E-12	1.3E-12	
S	0.0E+00	7.5E-11	2.4E-11	1.1E-11	6.6E-12	4.5E-12	2.1E-12	
SSE	0.0E+00	9.9E-11	2.6E-11	9.9E-12	5.8E-12	4.0E-12	1.9E-12	
SSE	0.0E+00	1.1E-10	3.4E-11	1.6E-11	9.3E-12	6.4E-12	3.0E-12	
ESE	0.0E+00	1.3E-10	3.5E-11	1.4E-11	8.4E-12	5.8E-12	2.8E-12	
E	0.0E+00	1.3E-10	3.8E-11	1.7E-11	1.0E-11	7.0E-12	3.3E-12	
ENE	0.0E+00	1.5E-10	4.1E-11	1.6E-11	9.6E-12	6.6E-12	3.2E-12	
NE	0.0E+00	1.5E-10	4.9E-11	0.0E+00	1.4E-11	9.8E-12	4.6E-12	
NNE	0.0E+00	1.4E-10	3.9E-11	0.0E+00	9.2E-12	6.4E-12	3.0E-12	
		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-13	9.6E-14	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.9E-14	4.6E-14	3.9E-14	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.0E-14	6.7E-14	5.5E-14	
WNW	7.2E-13	0.0E+00	0.0E+00	0.0E+00	1.1E-13	7.5E-14	6.1E-14	
W	1.3E-12	6.0E-13	3.8E-13	2.6E-13	1.8E-13	1.3E-13	1.0E-13	
WSW	7.6E-13	3.7E-13	2.3E-13	1.6E-13	1.2E-13	8.7E-14	7.1E-14	
SW	7.7E-13	3.7E-13	2.4E-13	1.7E-13	1.2E-13	8.9E-14	0.0E+00	
SSW	5.1E-13	2.5E-13	1.6E-13	1.1E-13	0.0E+00	0.0E+00	5.4E-14	
S	8.3E-13	4.0E-13	2.6E-13	1.8E-13	1.3E-13	9.6E-14	7.8E-14	
SSE	7.4E-13	3.6E-13	2.3E-13	1.6E-13	1.2E-13	9.0E-14	7.4E-14	
SSE	1.2E-12	5.7E-13	3.6E-13	2.5E-13	1.8E-13	1.4E-13	1.1E-13	
ESE	1.1E-12	5.2E-13	3.3E-13	2.3E-13	1.7E-13	1.3E-13	1.0E-13	
E	1.3E-12	6.2E-13	4.0E-13	2.8E-13	2.0E-13	1.5E-13	1.2E-13	
ENE	1.2E-12	6.0E-13	3.8E-13	2.7E-13	2.0E-13	1.5E-13	1.2E-13	
NE	1.8E-12	8.7E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	1.2E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-13	

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

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	3.5E-12	3.0E-12	2.9E-12	2.1E-13	7.6E-12	6.3E-12
NNW	0.0E+00	2.7E-12	1.6E-12	4.3E-12	6.3E-13	2.1E-12	2.2E-12
NW	0.0E+00	2.3E-12	1.8E-12	1.1E-11	4.6E-12	4.2E-12	4.1E-11
WNW	0.0E+00	3.7E-12	2.6E-12	4.3E-11	2.7E-11	2.7E-12	1.5E-10
W	0.0E+00	4.0E-12	3.6E-12	2.1E-10	2.7E-11	3.7E-13	1.4E-11
WSW	0.0E+00	4.0E-12	2.8E-12	1.1E-12	9.5E-12	9.1E-12	1.6E-11
SW	0.0E+00	2.9E-12	2.3E-12	2.9E-12	2.2E-11	2.1E-11	1.5E-10
SSW	0.0E+00	3.0E-12	2.0E-12	2.1E-12	0.0E+00	1.5E-12	1.0E-10
S	0.0E+00	2.9E-12	2.5E-12	1.2E-11	6.9E-12	1.3E-11	5.2E-11
SSE	0.0E+00	3.8E-12	2.7E-12	7.8E-12	5.6E-12	3.9E-12	3.6E-11
SSE	0.0E+00	4.1E-12	3.5E-12	8.9E-12	7.3E-12	4.3E-12	2.7E-11
ESE	0.0E+00	4.9E-12	3.6E-12	7.4E-13	3.2E-12	1.2E-11	1.8E-11
E	0.0E+00	4.9E-12	4.0E-12	2.7E-12	4.1E-12	5.6E-12	2.3E-11
ENE	0.0E+00	5.9E-12	4.2E-12	2.3E-12	8.7E-13	5.3E-12	4.9E-11
NE	0.0E+00	5.7E-12	5.1E-12	0.0E+00	2.9E-12	1.3E-11	1.3E-11
NNE	0.0E+00	5.5E-12	4.0E-12	0.0E+00	4.8E-13	5.8E-12	1.1E-11

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

Non-Radon Population Assessment  
Wed Feb 10 13:58:22 2021

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

Source Category: Area  
Source Type: Area  
Emission Year: 2020  
DOSE Age Group: Fifteen

Comments: NFSS Technical Memo 2020 Year  
Population Dose

Dataset Name: NFSS2020 Pop Fif  
Dataset Date: Feb 10, 2021 01:58 PM  
Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND  
Pop File: C:\Users\h5tderjc\Documents\CAP88\Population Files\NFSS2013.POP

## ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	1.21E-04	9.36E-04
UB_Wall	1.33E-04	1.03E-03
Bone_Sur	7.02E-03	8.32E-02
Brain	1.28E-04	9.88E-04
Breasts	1.40E-04	1.07E-03
St_Wall	1.29E-04	9.94E-04
SI_Wall	1.28E-04	9.91E-04
ULI_Wall	1.32E-04	1.04E-03
LLI_Wall	1.43E-04	1.19E-03
Kidneys	2.30E-04	1.79E-03
Liver	1.90E-04	1.52E-03
Muscle	1.44E-04	1.11E-03
Ovaries	1.45E-04	1.08E-03
Pancreas	1.21E-04	9.40E-04
R_Marrow	4.18E-04	4.47E-03
Skin	2.00E-03	1.51E-02
Spleen	1.35E-04	1.09E-03
Testes	1.64E-04	1.22E-03
Thymus	1.28E-04	9.86E-04
Thyroid	1.33E-04	1.03E-03
GB_Wall	1.22E-04	9.46E-04
Ht_Wall	1.27E-04	9.83E-04
Uterus	1.26E-04	9.73E-04
ET_Reg	6.23E-04	3.32E-03
Lung_66	2.02E-03	1.00E-02
Effectiv	4.91E-04	3.55E-03

## PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	6.99E-05	1.16E-03
INHALATION	2.79E-04	1.32E-03
AIR IMMERSION	6.99E-11	1.11E-09
GROUND SURFACE	1.42E-04	1.07E-03
INTERNAL	3.49E-04	2.48E-03
EXTERNAL	1.42E-04	1.07E-03
TOTAL	4.91E-04	3.55E-03

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	4.36E-05	2.32E-04
Th-234	1.01E-06	7.63E-06
Pa-234m	1.38E-05	1.04E-04
Pa-234	2.73E-07	2.05E-06
U-234	5.08E-05	2.67E-04
Th-230	9.37E-05	4.68E-04
Ra-226	9.14E-05	1.18E-03
Rn-222	2.44E-08	1.84E-07
Po-218	4.36E-13	3.28E-12
Pb-214	1.59E-05	1.20E-04
At-218	1.64E-12	1.23E-11
Bi-214	9.32E-05	7.01E-04
Rn-218	9.50E-15	7.15E-14
Po-214	5.16E-09	3.89E-08
Tl-210	3.64E-08	2.74E-07
Pb-210	7.85E-08	5.91E-07
Bi-210	1.27E-06	9.55E-06
Hg-206	1.02E-13	7.71E-13
Po-210	3.29E-10	2.47E-09
Tl-206	2.96E-12	2.23E-11
Th-232	2.42E-05	1.19E-04
Ra-228	4.70E-09	5.38E-08
Ac-228	5.35E-06	4.02E-05
Th-228	4.21E-05	2.01E-04
Ra-224	6.46E-08	1.14E-06
Rn-220	3.90E-09	2.94E-08
Po-216	9.42E-11	7.09E-10
Pb-212	8.57E-07	6.46E-06
Bi-212	1.00E-06	7.53E-06
Po-212	0.00E+00	0.00E+00
Tl-208	6.91E-06	5.20E-05
U-235	5.52E-06	3.27E-05
Th-231	1.59E-07	1.20E-06
Pa-231	2.64E-10	1.99E-09
Ac-227	8.85E-13	6.66E-12
Th-227	4.23E-10	3.18E-09
Fr-223	3.98E-12	3.00E-11
Ra-223	4.73E-10	3.56E-09
Rn-219	2.05E-10	1.54E-09
At-219	0.00E+00	0.00E+00
Bi-215	9.21E-16	6.93E-15
Po-215	6.25E-13	4.70E-12
Pb-211	4.02E-10	3.02E-09
Bi-211	1.66E-10	1.25E-09
Tl-207	2.08E-10	1.57E-09
Po-211	7.97E-14	6.00E-13
TOTAL	4.91E-04	3.55E-03

## CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	1.31E-12	1.39E-10
Stomach	5.10E-12	5.41E-10
Colon	1.35E-11	1.47E-09
Liver	3.07E-12	4.35E-10
LUNG	3.82E-11	2.90E-09
Bone	2.62E-12	4.90E-10
Skin	2.00E-12	1.96E-10
Breast	6.36E-12	6.43E-10
Ovary	1.87E-12	2.06E-10
Bladder	3.17E-12	3.34E-10
Kidneys	9.25E-13	1.17E-10
Thyroid	4.13E-13	4.33E-11
Leukemia	7.63E-12	8.11E-10
Residual	1.88E-11	1.99E-09
Total	1.05E-10	1.03E-08

## PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	8.82E-12	1.90E-09
INHALATION	2.64E-11	1.62E-09
AIR IMMERSION	3.71E-17	7.78E-15
GROUND SURFACE	6.98E-11	6.80E-09
INTERNAL	3.52E-11	3.52E-09
EXTERNAL	6.98E-11	6.80E-09
TOTAL	1.05E-10	1.03E-08

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	4.87E-12	3.05E-10
Th-234	5.24E-13	5.11E-11
Pa-234m	2.42E-12	2.36E-10
Pa-234	1.48E-13	1.45E-11
U-234	6.00E-12	4.23E-10
Th-230	6.41E-12	4.20E-10
Ra-226	1.16E-11	1.99E-09
Rn-222	1.33E-14	1.30E-12
Po-218	1.95E-19	1.90E-17
Pb-214	8.53E-12	8.31E-10
At-218	2.02E-19	1.97E-17
Bi-214	4.92E-11	4.80E-09
Rn-218	5.20E-21	5.07E-19
Po-214	2.83E-15	2.76E-13
Tl-210	1.94E-14	1.89E-12
Pb-210	3.52E-14	3.43E-12
Bi-210	1.41E-13	1.37E-11
Hg-206	4.54E-20	4.43E-18
Po-210	1.80E-16	1.76E-14
Tl-206	3.33E-19	3.25E-17
Th-232	1.50E-12	9.20E-11
Ra-228	1.42E-15	1.41E-13
Ac-228	2.84E-12	2.77E-10
Th-228	4.72E-12	2.93E-10
Ra-224	3.44E-14	4.39E-12
Rn-220	2.14E-15	2.08E-13
Po-216	5.18E-17	5.05E-15
Pb-212	4.66E-13	4.55E-11
Bi-212	3.86E-13	3.76E-11
Po-212	0.00E+00	0.00E+00
Tl-208	3.76E-12	3.66E-10
U-235	1.29E-12	1.10E-10
Th-231	7.27E-14	7.09E-12
Pa-231	1.38E-16	1.34E-14
Ac-227	3.31E-19	3.23E-17
Th-227	2.29E-16	2.23E-14
Fr-223	1.48E-18	1.45E-16
Ra-223	2.55E-16	2.49E-14
Rn-219	1.12E-16	1.09E-14
At-219	0.00E+00	0.00E+00
Bi-215	4.11E-22	4.01E-20
Po-215	3.43E-19	3.34E-17
Pb-211	1.44E-16	1.40E-14
Bi-211	9.04E-17	8.81E-15
Tl-207	2.67E-17	2.61E-15
Po-211	4.36E-20	4.25E-18
TOTAL	1.05E-10	1.03E-08

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

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	2.9E-04	9.5E-05	4.5E-05	2.6E-05	1.8E-05	8.6E-06
NNW	0.0E+00	2.3E-04	4.9E-05	1.4E-05	8.2E-06	5.7E-06	2.7E-06
NW	0.0E+00	1.9E-04	5.7E-05	2.5E-05	1.5E-05	1.0E-05	4.7E-06
WNW	0.0E+00	3.1E-04	8.2E-05	3.2E-05	1.9E-05	1.3E-05	6.0E-06
W	0.0E+00	3.3E-04	1.1E-04	5.6E-05	3.3E-05	2.3E-05	1.1E-05
WSW	0.0E+00	3.3E-04	8.6E-05	3.3E-05	1.9E-05	1.3E-05	6.3E-06
SW	0.0E+00	2.4E-04	7.3E-05	3.3E-05	1.9E-05	1.3E-05	6.3E-06
SSW	0.0E+00	2.5E-04	6.1E-05	2.2E-05	0.0E+00	8.8E-06	4.2E-06
S	0.0E+00	2.4E-04	7.6E-05	3.6E-05	2.1E-05	1.4E-05	6.8E-06
SSE	0.0E+00	3.2E-04	8.3E-05	3.1E-05	1.9E-05	1.3E-05	6.1E-06
SSE	0.0E+00	3.4E-04	1.1E-04	5.0E-05	3.0E-05	2.0E-05	9.6E-06
ESE	0.0E+00	4.1E-04	1.1E-04	4.5E-05	2.7E-05	1.9E-05	8.8E-06
E	0.0E+00	4.1E-04	1.2E-04	5.5E-05	3.2E-05	2.2E-05	1.1E-05
ENE	0.0E+00	4.9E-04	1.3E-04	5.1E-05	3.0E-05	2.1E-05	1.0E-05
NE	0.0E+00	4.8E-04	1.6E-04	0.0E+00	4.5E-05	3.1E-05	1.5E-05
NNE	0.0E+00	4.6E-04	1.2E-04	0.0E+00	2.9E-05	2.0E-05	9.6E-06

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

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	8.8E-07	7.6E-07	7.2E-07	5.3E-08	1.9E-06	1.5E-06
NNW	0.0E+00	6.8E-07	3.9E-07	1.1E-06	1.6E-07	5.1E-07	5.5E-07
NW	0.0E+00	5.8E-07	4.6E-07	2.7E-06	1.1E-06	1.0E-06	1.0E-05
WNW	0.0E+00	9.3E-07	6.5E-07	1.1E-05	6.6E-06	6.7E-07	3.7E-05
W	0.0E+00	9.9E-07	9.0E-07	5.1E-05	6.7E-06	9.1E-08	3.3E-06
WSW	0.0E+00	1.0E-06	6.9E-07	2.6E-07	2.3E-06	2.2E-06	3.9E-06
SW	0.0E+00	7.1E-07	5.8E-07	7.3E-07	5.4E-06	5.1E-06	3.7E-05
SSW	0.0E+00	7.4E-07	4.8E-07	5.2E-07	0.0E+00	3.8E-07	2.6E-05
S	0.0E+00	7.3E-07	6.1E-07	2.8E-06	1.7E-06	3.1E-06	1.3E-05
SSE	0.0E+00	9.6E-07	6.6E-07	1.9E-06	1.4E-06	9.5E-07	8.9E-06
SSE	0.0E+00	1.0E-06	8.7E-07	2.2E-06	1.8E-06	1.1E-06	6.5E-06
ESE	0.0E+00	1.2E-06	8.9E-07	1.8E-07	7.8E-07	3.0E-06	4.3E-06
E	0.0E+00	1.2E-06	9.8E-07	6.5E-07	1.0E-06	1.4E-06	5.7E-06
ENE	0.0E+00	1.5E-06	1.0E-06	5.7E-07	2.1E-07	1.3E-06	1.2E-05
NE	0.0E+00	1.4E-06	1.3E-06	0.0E+00	7.2E-07	3.2E-06	3.1E-06
NNE	0.0E+00	1.4E-06	9.9E-07	0.0E+00	1.2E-07	1.4E-06	2.6E-06

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

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	6.3E-11	2.1E-11	9.9E-12	5.9E-12	4.1E-12	2.0E-12
NNW	0.0E+00	4.9E-11	1.1E-11	3.1E-12	1.8E-12	1.3E-12	6.2E-13
NW	0.0E+00	4.1E-11	1.2E-11	5.6E-12	3.3E-12	2.3E-12	1.1E-12
WNW	0.0E+00	6.6E-11	1.8E-11	7.0E-12	4.2E-12	2.9E-12	1.4E-12
W	0.0E+00	7.1E-11	2.5E-11	1.2E-11	7.4E-12	5.1E-12	2.4E-12
WSW	0.0E+00	7.1E-11	1.9E-11	7.3E-12	4.3E-12	3.0E-12	1.4E-12
SW	0.0E+00	5.1E-11	1.6E-11	7.3E-12	4.4E-12	3.0E-12	1.5E-12
SSW	0.0E+00	5.3E-11	1.3E-11	4.8E-12	0.0E+00	2.0E-12	9.7E-13
S	0.0E+00	5.2E-11	1.7E-11	7.9E-12	4.7E-12	3.3E-12	1.6E-12
SSE	0.0E+00	6.8E-11	1.8E-11	7.0E-12	4.2E-12	2.9E-12	1.4E-12
SSE	0.0E+00	7.4E-11	2.4E-11	1.1E-11	6.7E-12	4.7E-12	2.2E-12
ESE	0.0E+00	8.7E-11	2.4E-11	1.0E-11	6.1E-12	4.2E-12	2.0E-12
E	0.0E+00	8.8E-11	2.7E-11	1.2E-11	7.3E-12	5.1E-12	2.4E-12
ENE	0.0E+00	1.0E-10	2.9E-11	1.1E-11	6.9E-12	4.8E-12	2.3E-12
NE	0.0E+00	1.0E-10	3.4E-11	0.0E+00	1.0E-11	7.0E-12	3.4E-12
NNE	0.0E+00	9.8E-11	2.7E-11	0.0E+00	6.6E-12	4.6E-12	2.2E-12

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	2.4E-12	2.1E-12	2.1E-12	1.5E-13	5.5E-12	4.6E-12
NNW	0.0E+00	1.9E-12	1.1E-12	3.1E-12	4.5E-13	1.5E-12	1.7E-12
NW	0.0E+00	1.6E-12	1.3E-12	7.9E-12	3.3E-12	3.1E-12	3.1E-11
WNW	0.0E+00	2.6E-12	1.8E-12	3.0E-11	1.9E-11	1.9E-12	1.1E-10
W	0.0E+00	2.7E-12	2.5E-12	1.5E-10	1.9E-11	2.7E-13	9.9E-12
WSW	0.0E+00	2.8E-12	1.9E-12	7.5E-13	6.8E-12	6.6E-12	1.2E-11
SW	0.0E+00	2.0E-12	1.6E-12	2.1E-12	1.6E-11	1.5E-11	1.1E-10
SSW	0.0E+00	2.0E-12	1.4E-12	1.5E-12	0.0E+00	1.1E-12	7.7E-11
S	0.0E+00	2.0E-12	1.7E-12	8.2E-12	5.0E-12	9.2E-12	3.8E-11
SSE	0.0E+00	2.7E-12	1.9E-12	5.5E-12	4.0E-12	2.8E-12	2.7E-11
SSE	0.0E+00	2.9E-12	2.5E-12	6.4E-12	5.3E-12	3.1E-12	2.0E-11
ESE	0.0E+00	3.4E-12	2.5E-12	5.2E-13	2.3E-12	8.7E-12	1.3E-11
E	0.0E+00	3.4E-12	2.8E-12	1.9E-12	2.9E-12	4.0E-12	1.7E-11
ENE	0.0E+00	4.1E-12	3.0E-12	1.6E-12	6.2E-13	3.8E-12	3.6E-11
NE	0.0E+00	4.0E-12	3.6E-12	0.0E+00	2.1E-12	9.3E-12	9.4E-12
NNE	0.0E+00	3.8E-12	2.8E-12	0.0E+00	3.4E-13	4.2E-12	7.7E-12

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

Non-Radon Population Assessment  
Wed Feb 10 14:00:49 2021

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

Source Category: Area

Source Type: Area

Emission Year: 2020

DOSE Age Group: Ten

Comments: NFSS Technical Memo 2020 Year  
Population Dose

Dataset Name: NFSS2020 Pop Ten

Dataset Date: Feb 10, 2021 02:00 PM

Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND

Pop File: C:\Users\h5tderjc\Documents\CAP88\Population Files\NFSS2013.POP

## ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	1.20E-04	9.43E-04
UB_Wall	1.33E-04	1.04E-03
Bone_Sur	3.63E-03	3.99E-02
Brain	1.27E-04	9.95E-04
Breasts	1.39E-04	1.09E-03
St_Wall	1.28E-04	1.01E-03
SI_Wall	1.28E-04	1.01E-03
ULI_Wall	1.34E-04	1.09E-03
LLI_Wall	1.51E-04	1.33E-03
Kidneys	2.21E-04	1.80E-03
Liver	1.87E-04	1.61E-03
Muscle	1.43E-04	1.12E-03
Ovaries	1.40E-04	1.07E-03
Pancreas	1.21E-04	9.49E-04
R_Marrow	3.22E-04	3.28E-03
Skin	2.00E-03	1.51E-02
Spleen	1.31E-04	1.05E-03
Testes	1.60E-04	1.22E-03
Thymus	1.27E-04	9.96E-04
Thyroid	1.33E-04	1.04E-03
GB_Wall	1.22E-04	9.57E-04
Ht_Wall	1.27E-04	9.93E-04
Uterus	1.25E-04	9.84E-04
ET_Reg	8.01E-04	4.18E-03
Lung_66	1.77E-03	8.83E-03
Effectiv	4.15E-04	2.85E-03

## PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	4.14E-05	6.86E-04
INHALATION	2.32E-04	1.10E-03
AIR IMMERSION	6.99E-11	1.11E-09
GROUND SURFACE	1.42E-04	1.07E-03
INTERNAL	2.73E-04	1.78E-03
EXTERNAL	1.42E-04	1.07E-03
TOTAL	4.15E-04	2.85E-03

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	3.78E-05	2.05E-04
Th-234	1.01E-06	7.63E-06
Pa-234m	1.38E-05	1.04E-04
Pa-234	2.73E-07	2.05E-06
U-234	4.37E-05	2.34E-04
Th-230	7.59E-05	3.87E-04
Ra-226	5.67E-05	6.72E-04
Rn-222	2.44E-08	1.84E-07
Po-218	4.36E-13	3.28E-12
Pb-214	1.59E-05	1.20E-04
At-218	1.64E-12	1.23E-11
Bi-214	9.32E-05	7.01E-04
Rn-218	9.50E-15	7.15E-14
Po-214	5.16E-09	3.89E-08
Tl-210	3.64E-08	2.74E-07
Pb-210	7.85E-08	5.91E-07
Bi-210	1.27E-06	9.55E-06
Hg-206	1.02E-13	7.71E-13
Po-210	3.29E-10	2.47E-09
Tl-206	2.96E-12	2.23E-11
Th-232	1.84E-05	9.17E-05
Ra-228	4.70E-09	4.97E-08
Ac-228	5.35E-06	4.02E-05
Th-228	3.76E-05	1.81E-04
Ra-224	6.42E-08	1.02E-06
Rn-220	3.90E-09	2.94E-08
Po-216	9.42E-11	7.09E-10
Pb-212	8.57E-07	6.46E-06
Bi-212	1.00E-06	7.53E-06
Po-212	0.00E+00	0.00E+00
Tl-208	6.91E-06	5.20E-05
U-235	4.99E-06	3.03E-05
Th-231	1.59E-07	1.20E-06
Pa-231	2.64E-10	1.99E-09
Ac-227	8.85E-13	6.66E-12
Th-227	4.23E-10	3.18E-09
Fr-223	3.98E-12	3.00E-11
Ra-223	4.73E-10	3.56E-09
Rn-219	2.05E-10	1.54E-09
At-219	0.00E+00	0.00E+00
Bi-215	9.21E-16	6.93E-15
Po-215	6.25E-13	4.70E-12
Pb-211	4.02E-10	3.02E-09
Bi-211	1.66E-10	1.25E-09
Tl-207	2.08E-10	1.57E-09
Po-211	7.97E-14	6.00E-13
TOTAL	4.15E-04	2.85E-03

## CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	1.22E-12	1.20E-10
Stomach	4.74E-12	4.63E-10
Colon	1.24E-11	1.24E-09
Liver	1.90E-12	1.91E-10
LUNG	4.80E-11	3.39E-09
Bone	4.01E-13	3.85E-11
Skin	1.99E-12	1.94E-10
Breast	6.17E-12	6.02E-10
Ovary	1.65E-12	1.61E-10
Bladder	2.96E-12	2.90E-10
Kidneys	7.09E-13	7.40E-11
Thyroid	3.88E-13	3.79E-11
Leukemia	7.03E-12	6.86E-10
Residual	1.74E-11	1.70E-09
Total	1.07E-10	9.19E-09

## PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	6.65E-13	1.37E-10
INHALATION	3.66E-11	2.25E-09
AIR IMMERSION	3.71E-17	7.78E-15
GROUND SURFACE	6.98E-11	6.80E-09
INTERNAL	3.73E-11	2.39E-09
EXTERNAL	6.98E-11	6.80E-09
TOTAL	1.07E-10	9.19E-09

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	6.38E-12	3.93E-10
Th-234	5.24E-13	5.11E-11
Pa-234m	2.42E-12	2.36E-10
Pa-234	1.48E-13	1.45E-11
U-234	7.93E-12	5.64E-10
Th-230	9.28E-12	5.72E-10
Ra-226	4.37E-12	2.77E-10
Rn-222	1.33E-14	1.30E-12
Po-218	1.95E-19	1.90E-17
Pb-214	8.53E-12	8.31E-10
At-218	2.02E-19	1.97E-17
Bi-214	4.92E-11	4.80E-09
Rn-218	5.20E-21	5.07E-19
Po-214	2.83E-15	2.76E-13
Tl-210	1.94E-14	1.89E-12
Pb-210	3.52E-14	3.43E-12
Bi-210	1.41E-13	1.37E-11
Hg-206	4.54E-20	4.43E-18
Po-210	1.80E-16	1.76E-14
Tl-206	3.33E-19	3.25E-17
Th-232	1.96E-12	1.22E-10
Ra-228	1.42E-15	1.40E-13
Ac-228	2.84E-12	2.77E-10
Th-228	7.01E-12	4.43E-10
Ra-224	3.44E-14	4.61E-12
Rn-220	2.14E-15	2.08E-13
Po-216	5.18E-17	5.05E-15
Pb-212	4.66E-13	4.55E-11
Bi-212	3.86E-13	3.76E-11
Po-212	0.00E+00	0.00E+00
Tl-208	3.76E-12	3.66E-10
U-235	1.47E-12	1.27E-10
Th-231	7.27E-14	7.09E-12
Pa-231	1.38E-16	1.34E-14
Ac-227	3.31E-19	3.23E-17
Th-227	2.29E-16	2.23E-14
Fr-223	1.48E-18	1.45E-16
Ra-223	2.55E-16	2.49E-14
Rn-219	1.12E-16	1.09E-14
At-219	0.00E+00	0.00E+00
Bi-215	4.11E-22	4.01E-20
Po-215	3.43E-19	3.34E-17
Pb-211	1.44E-16	1.40E-14
Bi-211	9.04E-17	8.81E-15
Tl-207	2.67E-17	2.61E-15
Po-211	4.36E-20	4.25E-18
TOTAL	1.07E-10	9.19E-09

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	2.5E-04	8.0E-05	3.8E-05	2.2E-05	1.5E-05	7.2E-06
NNW	0.0E+00	1.9E-04	4.1E-05	1.2E-05	6.9E-06	4.8E-06	2.3E-06
NW	0.0E+00	1.6E-04	4.8E-05	2.1E-05	1.2E-05	8.5E-06	4.0E-06
WNW	0.0E+00	2.6E-04	6.9E-05	2.7E-05	1.6E-05	1.1E-05	5.0E-06
W	0.0E+00	2.8E-04	9.6E-05	4.7E-05	2.8E-05	1.9E-05	9.0E-06
WSW	0.0E+00	2.8E-04	7.3E-05	2.8E-05	1.6E-05	1.1E-05	5.3E-06
SW	0.0E+00	2.0E-04	6.2E-05	2.8E-05	1.6E-05	1.1E-05	5.3E-06
SSW	0.0E+00	2.1E-04	5.1E-05	1.8E-05	0.0E+00	7.5E-06	3.5E-06
S	0.0E+00	2.0E-04	6.5E-05	3.0E-05	1.8E-05	1.2E-05	5.7E-06
SSE	0.0E+00	2.7E-04	7.0E-05	2.7E-05	1.6E-05	1.1E-05	5.1E-06
SSE	0.0E+00	2.9E-04	9.2E-05	4.2E-05	2.5E-05	1.7E-05	8.1E-06
ESE	0.0E+00	3.4E-04	9.4E-05	3.8E-05	2.3E-05	1.6E-05	7.4E-06
E	0.0E+00	3.5E-04	1.0E-04	4.6E-05	2.7E-05	1.9E-05	8.9E-06
ENE	0.0E+00	4.2E-04	1.1E-04	4.3E-05	2.6E-05	1.8E-05	8.4E-06
NE	0.0E+00	4.0E-04	1.3E-04	0.0E+00	3.8E-05	2.6E-05	1.2E-05
NNE	0.0E+00	3.9E-04	1.0E-04	0.0E+00	2.5E-05	1.7E-05	8.1E-06

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

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	7.4E-07	6.4E-07	6.0E-07	4.5E-08	1.6E-06	1.3E-06
NNW	0.0E+00	5.8E-07	3.3E-07	9.0E-07	1.3E-07	4.3E-07	4.7E-07
NW	0.0E+00	4.9E-07	3.9E-07	2.3E-06	9.6E-07	8.8E-07	8.6E-06
WNW	0.0E+00	7.9E-07	5.5E-07	8.9E-06	5.5E-06	5.6E-07	3.1E-05
W	0.0E+00	8.4E-07	7.6E-07	4.3E-05	5.7E-06	7.7E-08	2.8E-06
WSW	0.0E+00	8.4E-07	5.8E-07	2.2E-07	2.0E-06	1.9E-06	3.3E-06
SW	0.0E+00	6.0E-07	4.9E-07	6.1E-07	4.6E-06	4.3E-06	3.1E-05
SSW	0.0E+00	6.2E-07	4.1E-07	4.4E-07	0.0E+00	3.2E-07	2.2E-05
S	0.0E+00	6.1E-07	5.2E-07	2.4E-06	1.4E-06	2.6E-06	1.1E-05
SSE	0.0E+00	8.1E-07	5.6E-07	1.6E-06	1.2E-06	8.0E-07	7.5E-06
SSE	0.0E+00	8.7E-07	7.3E-07	1.9E-06	1.5E-06	9.0E-07	5.5E-06
ESE	0.0E+00	1.0E-06	7.6E-07	1.5E-07	6.6E-07	2.5E-06	3.6E-06
E	0.0E+00	1.0E-06	8.3E-07	5.5E-07	8.5E-07	1.2E-06	4.8E-06
ENE	0.0E+00	1.2E-06	8.8E-07	4.8E-07	1.8E-07	1.1E-06	1.0E-05
NE	0.0E+00	1.2E-06	1.1E-06	0.0E+00	6.1E-07	2.7E-06	2.7E-06
NNE	0.0E+00	1.2E-06	8.4E-07	0.0E+00	9.9E-08	1.2E-06	2.2E-06

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	6.4E-11	2.1E-11	1.0E-11	5.9E-12	4.1E-12	2.0E-12
NNW	0.0E+00	5.0E-11	1.1E-11	3.1E-12	1.8E-12	1.3E-12	6.1E-13
NW	0.0E+00	4.2E-11	1.3E-11	5.6E-12	3.3E-12	2.3E-12	1.1E-12
WNW	0.0E+00	6.7E-11	1.8E-11	7.1E-12	4.2E-12	2.9E-12	1.4E-12
W	0.0E+00	7.2E-11	2.5E-11	1.2E-11	7.4E-12	5.1E-12	2.4E-12
WSW	0.0E+00	7.3E-11	1.9E-11	7.3E-12	4.3E-12	3.0E-12	1.4E-12
SW	0.0E+00	5.2E-11	1.6E-11	7.4E-12	4.4E-12	3.0E-12	1.4E-12
SSW	0.0E+00	5.4E-11	1.3E-11	4.9E-12	0.0E+00	2.0E-12	9.5E-13
S	0.0E+00	5.3E-11	1.7E-11	8.0E-12	4.7E-12	3.3E-12	1.6E-12
SSE	0.0E+00	7.0E-11	1.8E-11	7.1E-12	4.2E-12	2.9E-12	1.4E-12
SSE	0.0E+00	7.5E-11	2.4E-11	1.1E-11	6.7E-12	4.6E-12	2.2E-12
ESE	0.0E+00	8.9E-11	2.5E-11	1.0E-11	6.1E-12	4.2E-12	2.0E-12
E	0.0E+00	8.9E-11	2.7E-11	1.2E-11	7.3E-12	5.1E-12	2.4E-12
ENE	0.0E+00	1.1E-10	2.9E-11	1.2E-11	6.9E-12	4.8E-12	2.3E-12
NE	0.0E+00	1.0E-10	3.5E-11	0.0E+00	1.0E-11	7.0E-12	3.4E-12
NNE	0.0E+00	1.0E-10	2.7E-11	0.0E+00	6.6E-12	4.6E-12	2.2E-12

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

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	2.5E-12	2.2E-12	2.1E-12	1.5E-13	5.5E-12	4.5E-12	
NNW	0.0E+00	1.9E-12	1.1E-12	3.1E-12	4.5E-13	1.5E-12	1.6E-12	
NW	0.0E+00	1.6E-12	1.3E-12	8.0E-12	3.3E-12	3.1E-12	3.0E-11	
WNW	0.0E+00	2.6E-12	1.9E-12	3.0E-11	1.9E-11	1.9E-12	1.1E-10	
W	0.0E+00	2.8E-12	2.6E-12	1.5E-10	1.9E-11	2.7E-13	9.8E-12	
WSW	0.0E+00	2.8E-12	2.0E-12	7.6E-13	6.8E-12	6.6E-12	1.1E-11	
SW	0.0E+00	2.0E-12	1.7E-12	2.1E-12	1.6E-11	1.5E-11	1.1E-10	
SSW	0.0E+00	2.1E-12	1.4E-12	1.5E-12	0.0E+00	1.1E-12	7.5E-11	
S	0.0E+00	2.0E-12	1.8E-12	8.3E-12	5.0E-12	9.1E-12	3.8E-11	
SSE	0.0E+00	2.7E-12	1.9E-12	5.6E-12	4.0E-12	2.8E-12	2.6E-11	
SSE	0.0E+00	2.9E-12	2.5E-12	6.4E-12	5.3E-12	3.1E-12	1.9E-11	
ESE	0.0E+00	3.4E-12	2.6E-12	5.3E-13	2.3E-12	8.7E-12	1.3E-11	
E	0.0E+00	3.5E-12	2.8E-12	1.9E-12	2.9E-12	4.0E-12	1.7E-11	
ENE	0.0E+00	4.2E-12	3.0E-12	1.6E-12	6.2E-13	3.8E-12	3.6E-11	
NE	0.0E+00	4.0E-12	3.6E-12	0.0E+00	2.1E-12	9.3E-12	9.3E-12	
NNE	0.0E+00	3.9E-12	2.8E-12	0.0E+00	3.4E-13	4.2E-12	7.6E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.9E-11	3.1E-10	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-10	3.5E-10	1.8E-10	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.9E-11	4.9E-10	3.0E-10	
WNW	6.1E-12	0.0E+00	0.0E+00	0.0E+00	3.6E-12	2.4E-10	4.8E-11	
W	3.8E-10	2.8E-10	2.6E-11	8.5E-11	4.1E-11	2.1E-10	2.7E-10	
WSW	1.6E-10	1.7E-10	1.2E-11	1.3E-11	6.1E-12	6.0E-12	1.8E-12	
SW	3.4E-10	3.9E-11	1.5E-10	1.2E-11	1.5E-12	4.3E-13	0.0E+00	
SSW	2.9E-10	8.0E-12	5.8E-12	1.4E-11	0.0E+00	0.0E+00	1.3E-12	
S	2.1E-10	4.6E-11	7.0E-11	4.4E-14	2.6E-11	1.5E-11	5.3E-12	
SSE	1.5E-10	4.6E-10	7.2E-10	2.1E-10	7.9E-11	9.7E-12	3.8E-12	
SSE	1.2E-10	2.4E-10	2.8E-10	1.1E-10	2.4E-11	7.4E-12	1.0E-11	
ESE	2.5E-11	1.7E-10	1.1E-11	1.5E-11	1.0E-11	2.6E-11	1.2E-11	
E	1.8E-11	6.0E-11	1.7E-11	3.6E-11	6.1E-12	1.9E-11	1.1E-11	
ENE	1.6E-11	3.7E-11	1.0E-11	6.3E-12	1.9E-12	1.2E-12	6.0E-13	
NE	4.1E-11	1.4E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	5.3E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-11	

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

Non-Radon Population Assessment  
Wed Feb 10 13:59:12 2021

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

Source Category: Area

Source Type: Area

Emission Year: 2020

DOSE Age Group: Five

Comments: NFSS Technical Memo 2020 Year  
Population Dose

Dataset Name: NFSS2020 Pop Fiv

Dataset Date: Feb 10, 2021 01:59 PM

Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND

Pop File: C:\Users\h5tderjc\Documents\CAP88\Population Files\NFSS2013.POP

## ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	1.22E-04	9.82E-04
UB_Wall	1.35E-04	1.08E-03
Bone_Sur	2.53E-03	2.64E-02
Brain	1.29E-04	1.03E-03
Breasts	1.41E-04	1.13E-03
St_Wall	1.31E-04	1.05E-03
SI_Wall	1.30E-04	1.05E-03
ULI_Wall	1.40E-04	1.20E-03
LLI_Wall	1.66E-04	1.58E-03
Kidneys	2.34E-04	2.02E-03
Liver	2.00E-04	1.84E-03
Muscle	1.46E-04	1.16E-03
Ovaries	1.41E-04	1.11E-03
Pancreas	1.23E-04	9.89E-04
R_Marrow	2.91E-04	2.83E-03
Skin	2.01E-03	1.52E-02
Spleen	1.32E-04	1.07E-03
Testes	1.60E-04	1.25E-03
Thymus	1.29E-04	1.04E-03
Thyroid	1.35E-04	1.08E-03
GB_Wall	1.24E-04	9.97E-04
Ht_Wall	1.29E-04	1.03E-03
Uterus	1.28E-04	1.02E-03
ET_Reg	8.04E-04	4.22E-03
Lung_66	1.89E-03	9.41E-03
Effectiv	4.17E-04	2.79E-03

## PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	3.56E-05	5.85E-04
INHALATION	2.39E-04	1.14E-03
AIR IMMERSION	6.99E-11	1.11E-09
GROUND SURFACE	1.42E-04	1.07E-03
INTERNAL	2.75E-04	1.72E-03
EXTERNAL	1.42E-04	1.07E-03
TOTAL	4.17E-04	2.79E-03

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	4.02E-05	2.21E-04
Th-234	1.01E-06	7.64E-06
Pa-234m	1.38E-05	1.04E-04
Pa-234	2.73E-07	2.05E-06
U-234	4.57E-05	2.49E-04
Th-230	7.87E-05	4.07E-04
Ra-226	4.94E-05	5.44E-04
Rn-222	2.44E-08	1.84E-07
Po-218	4.36E-13	3.28E-12
Pb-214	1.59E-05	1.20E-04
At-218	1.64E-12	1.23E-11
Bi-214	9.32E-05	7.01E-04
Rn-218	9.50E-15	7.15E-14
Po-214	5.16E-09	3.89E-08
Tl-210	3.64E-08	2.74E-07
Pb-210	7.85E-08	5.91E-07
Bi-210	1.27E-06	9.55E-06
Hg-206	1.02E-13	7.71E-13
Po-210	3.29E-10	2.47E-09
Tl-206	2.96E-12	2.23E-11
Th-232	1.82E-05	9.19E-05
Ra-228	4.69E-09	4.80E-08
Ac-228	5.35E-06	4.02E-05
Th-228	3.99E-05	1.93E-04
Ra-224	6.41E-08	9.81E-07
Rn-220	3.90E-09	2.94E-08
Po-216	9.42E-11	7.09E-10
Pb-212	8.57E-07	6.46E-06
Bi-212	1.00E-06	7.53E-06
Po-212	0.00E+00	0.00E+00
Tl-208	6.91E-06	5.20E-05
U-235	5.18E-06	3.16E-05
Th-231	1.59E-07	1.20E-06
Pa-231	2.64E-10	1.99E-09
Ac-227	8.85E-13	6.66E-12
Th-227	4.23E-10	3.18E-09
Fr-223	3.98E-12	3.00E-11
Ra-223	4.73E-10	3.56E-09
Rn-219	2.05E-10	1.54E-09
At-219	0.00E+00	0.00E+00
Bi-215	9.21E-16	6.93E-15
Po-215	6.25E-13	4.70E-12
Pb-211	4.02E-10	3.02E-09
Bi-211	1.66E-10	1.25E-09
Tl-207	2.08E-10	1.57E-09
Po-211	7.97E-14	6.00E-13
TOTAL	4.17E-04	2.79E-03

## CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	1.22E-12	1.19E-10
Stomach	4.72E-12	4.62E-10
Colon	1.23E-11	1.22E-09
Liver	1.87E-12	1.87E-10
LUNG	3.78E-11	2.76E-09
Bone	3.43E-13	3.36E-11
Skin	1.99E-12	1.94E-10
Breast	6.16E-12	6.01E-10
Ovary	1.64E-12	1.60E-10
Bladder	2.95E-12	2.89E-10
Kidneys	6.89E-13	7.15E-11
Thyroid	3.87E-13	3.78E-11
Leukemia	7.02E-12	6.85E-10
Residual	1.74E-11	1.70E-09
Total	9.65E-11	8.52E-09

## PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	4.99E-13	1.03E-10
INHALATION	2.63E-11	1.61E-09
AIR IMMERSION	3.71E-17	7.78E-15
GROUND SURFACE	6.98E-11	6.80E-09
INTERNAL	2.68E-11	1.72E-09
EXTERNAL	6.98E-11	6.80E-09
TOTAL	9.65E-11	8.52E-09

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	4.58E-12	2.82E-10
Th-234	5.24E-13	5.11E-11
Pa-234m	2.42E-12	2.36E-10
Pa-234	1.48E-13	1.45E-11
U-234	5.71E-12	4.08E-10
Th-230	6.67E-12	4.10E-10
Ra-226	3.20E-12	2.05E-10
Rn-222	1.33E-14	1.30E-12
Po-218	1.95E-19	1.90E-17
Pb-214	8.53E-12	8.31E-10
At-218	2.02E-19	1.97E-17
Bi-214	4.92E-11	4.80E-09
Rn-218	5.20E-21	5.07E-19
Po-214	2.83E-15	2.76E-13
Tl-210	1.94E-14	1.89E-12
Pb-210	3.52E-14	3.43E-12
Bi-210	1.41E-13	1.37E-11
Hg-206	4.54E-20	4.43E-18
Po-210	1.80E-16	1.76E-14
Tl-206	3.33E-19	3.25E-17
Th-232	1.41E-12	8.73E-11
Ra-228	1.42E-15	1.40E-13
Ac-228	2.84E-12	2.77E-10
Th-228	5.03E-12	3.19E-10
Ra-224	3.43E-14	4.25E-12
Rn-220	2.14E-15	2.08E-13
Po-216	5.18E-17	5.05E-15
Pb-212	4.66E-13	4.55E-11
Bi-212	3.86E-13	3.76E-11
Po-212	0.00E+00	0.00E+00
Tl-208	3.76E-12	3.66E-10
U-235	1.29E-12	1.15E-10
Th-231	7.27E-14	7.09E-12
Pa-231	1.38E-16	1.34E-14
Ac-227	3.31E-19	3.23E-17
Th-227	2.29E-16	2.23E-14
Fr-223	1.48E-18	1.45E-16
Ra-223	2.55E-16	2.49E-14
Rn-219	1.12E-16	1.09E-14
At-219	0.00E+00	0.00E+00
Bi-215	4.11E-22	4.01E-20
Po-215	3.43E-19	3.34E-17
Pb-211	1.44E-16	1.40E-14
Bi-211	9.04E-17	8.81E-15
Tl-207	2.67E-17	2.61E-15
Po-211	4.36E-20	4.25E-18
TOTAL	9.65E-11	8.52E-09

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	2.5E-04	8.0E-05	3.8E-05	2.2E-05	1.5E-05	7.2E-06
NNW	0.0E+00	1.9E-04	4.1E-05	1.2E-05	6.9E-06	4.8E-06	2.3E-06
NW	0.0E+00	1.6E-04	4.8E-05	2.1E-05	1.2E-05	8.5E-06	4.0E-06
WNW	0.0E+00	2.6E-04	6.9E-05	2.7E-05	1.6E-05	1.1E-05	5.0E-06
W	0.0E+00	2.8E-04	9.6E-05	4.7E-05	2.8E-05	1.9E-05	9.0E-06
WSW	0.0E+00	2.8E-04	7.3E-05	2.8E-05	1.6E-05	1.1E-05	5.3E-06
SW	0.0E+00	2.0E-04	6.2E-05	2.8E-05	1.6E-05	1.1E-05	5.3E-06
SSW	0.0E+00	2.1E-04	5.1E-05	1.8E-05	0.0E+00	7.5E-06	3.5E-06
S	0.0E+00	2.1E-04	6.5E-05	3.0E-05	1.8E-05	1.2E-05	5.7E-06
SSE	0.0E+00	2.7E-04	7.0E-05	2.7E-05	1.6E-05	1.1E-05	5.1E-06
SSE	0.0E+00	2.9E-04	9.2E-05	4.2E-05	2.5E-05	1.7E-05	8.1E-06
ESE	0.0E+00	3.5E-04	9.5E-05	3.9E-05	2.3E-05	1.6E-05	7.4E-06
E	0.0E+00	3.5E-04	1.0E-04	4.6E-05	2.7E-05	1.9E-05	8.9E-06
ENE	0.0E+00	4.2E-04	1.1E-04	4.4E-05	2.6E-05	1.8E-05	8.4E-06
NE	0.0E+00	4.1E-04	1.3E-04	0.0E+00	3.8E-05	2.6E-05	1.2E-05
NNE	0.0E+00	3.9E-04	1.1E-04	0.0E+00	2.5E-05	1.7E-05	8.1E-06

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

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	7.5E-07	6.4E-07	6.1E-07	4.5E-08	1.6E-06	1.3E-06
NNW	0.0E+00	5.8E-07	3.3E-07	9.0E-07	1.3E-07	4.3E-07	4.6E-07
NW	0.0E+00	4.9E-07	3.9E-07	2.3E-06	9.6E-07	8.8E-07	8.5E-06
WNW	0.0E+00	7.9E-07	5.5E-07	9.0E-06	5.6E-06	5.6E-07	3.1E-05
W	0.0E+00	8.4E-07	7.7E-07	4.3E-05	5.7E-06	7.7E-08	2.8E-06
WSW	0.0E+00	8.5E-07	5.8E-07	2.2E-07	2.0E-06	1.9E-06	3.3E-06
SW	0.0E+00	6.1E-07	4.9E-07	6.2E-07	4.6E-06	4.3E-06	3.1E-05
SSW	0.0E+00	6.3E-07	4.1E-07	4.4E-07	0.0E+00	3.2E-07	2.1E-05
S	0.0E+00	6.2E-07	5.2E-07	2.4E-06	1.4E-06	2.6E-06	1.1E-05
SSE	0.0E+00	8.1E-07	5.6E-07	1.6E-06	1.2E-06	8.0E-07	7.5E-06
SSE	0.0E+00	8.8E-07	7.3E-07	1.9E-06	1.5E-06	9.0E-07	5.5E-06
ESE	0.0E+00	1.0E-06	7.6E-07	1.5E-07	6.6E-07	2.5E-06	3.6E-06
E	0.0E+00	1.0E-06	8.3E-07	5.6E-07	8.5E-07	1.2E-06	4.8E-06
ENE	0.0E+00	1.3E-06	8.9E-07	4.8E-07	1.8E-07	1.1E-06	1.0E-05
NE	0.0E+00	1.2E-06	1.1E-06	0.0E+00	6.1E-07	2.7E-06	2.7E-06
NNE	0.0E+00	1.2E-06	8.4E-07	0.0E+00	9.9E-08	1.2E-06	2.2E-06

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

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	5.8E-11	1.9E-11	9.1E-12	5.4E-12	3.8E-12	1.8E-12	
NNW	0.0E+00	4.5E-11	9.8E-12	2.8E-12	1.7E-12	1.2E-12	5.6E-13	
NW	0.0E+00	3.8E-11	1.1E-11	5.1E-12	3.0E-12	2.1E-12	1.0E-12	
WNW	0.0E+00	6.1E-11	1.6E-11	6.4E-12	3.8E-12	2.6E-12	1.2E-12	
W	0.0E+00	6.5E-11	2.3E-11	1.1E-11	6.7E-12	4.7E-12	2.2E-12	
WSW	0.0E+00	6.5E-11	1.7E-11	6.6E-12	4.0E-12	2.8E-12	1.3E-12	
SW	0.0E+00	4.7E-11	1.5E-11	6.7E-12	4.0E-12	2.8E-12	1.3E-12	
SSW	0.0E+00	4.8E-11	1.2E-11	4.4E-12	0.0E+00	1.8E-12	8.8E-13	
S	0.0E+00	4.8E-11	1.5E-11	7.3E-12	4.3E-12	3.0E-12	1.4E-12	
SSE	0.0E+00	6.3E-11	1.7E-11	6.4E-12	3.8E-12	2.7E-12	1.3E-12	
SSE	0.0E+00	6.8E-11	2.2E-11	1.0E-11	6.1E-12	4.3E-12	2.0E-12	
ESE	0.0E+00	8.0E-11	2.2E-11	9.3E-12	5.5E-12	3.9E-12	1.8E-12	
E	0.0E+00	8.0E-11	2.5E-11	1.1E-11	6.6E-12	4.6E-12	2.2E-12	
ENE	0.0E+00	9.7E-11	2.6E-11	1.0E-11	6.3E-12	4.4E-12	2.1E-12	
NE	0.0E+00	9.4E-11	3.2E-11	0.0E+00	9.2E-12	6.4E-12	3.1E-12	
NNE	0.0E+00	9.0E-11	2.5E-11	0.0E+00	6.0E-12	4.2E-12	2.0E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.4E-14	5.9E-14	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	3.3E-14	2.4E-14	1.9E-14	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	5.5E-14	3.9E-14	3.1E-14	
WNW	4.8E-13	0.0E+00	0.0E+00	0.0E+00	6.4E-14	4.4E-14	3.4E-14	
W	8.5E-13	4.0E-13	2.5E-13	1.7E-13	1.2E-13	8.2E-14	6.4E-14	
WSW	5.1E-13	2.4E-13	1.5E-13	1.0E-13	7.4E-14	5.2E-14	4.1E-14	
SW	5.1E-13	2.5E-13	1.6E-13	1.1E-13	7.6E-14	5.4E-14	0.0E+00	
SSW	3.4E-13	1.6E-13	1.0E-13	7.2E-14	0.0E+00	0.0E+00	3.0E-14	
S	5.6E-13	2.7E-13	1.7E-13	1.2E-13	8.3E-14	5.9E-14	4.7E-14	
SSE	5.0E-13	2.4E-13	1.5E-13	1.1E-13	7.6E-14	5.6E-14	4.4E-14	
SSE	7.9E-13	3.8E-13	2.4E-13	1.7E-13	1.2E-13	8.8E-14	7.0E-14	
ESE	7.2E-13	3.5E-13	2.2E-13	1.5E-13	1.1E-13	8.1E-14	6.5E-14	
E	8.7E-13	4.2E-13	2.7E-13	1.9E-13	1.3E-13	9.7E-14	7.8E-14	
ENE	8.3E-13	4.0E-13	2.6E-13	1.8E-13	1.3E-13	9.6E-14	7.7E-14	
NE	1.2E-12	5.9E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	7.9E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	7.2E-14	

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

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	2.2E-12	2.0E-12	1.9E-12	1.4E-13	5.0E-12	4.2E-12	
NNW	0.0E+00	1.7E-12	1.0E-12	2.8E-12	4.1E-13	1.4E-12	1.5E-12	
NW	0.0E+00	1.5E-12	1.2E-12	7.3E-12	3.0E-12	2.8E-12	2.8E-11	
WNW	0.0E+00	2.4E-12	1.7E-12	2.8E-11	1.7E-11	1.8E-12	9.9E-11	
W	0.0E+00	2.5E-12	2.3E-12	1.3E-10	1.8E-11	2.4E-13	9.0E-12	
WSW	0.0E+00	2.5E-12	1.8E-12	6.9E-13	6.2E-12	6.0E-12	1.1E-11	
SW	0.0E+00	1.8E-12	1.5E-12	1.9E-12	1.4E-11	1.4E-11	1.0E-10	
SSW	0.0E+00	1.9E-12	1.3E-12	1.4E-12	0.0E+00	1.0E-12	6.9E-11	
S	0.0E+00	1.8E-12	1.6E-12	7.5E-12	4.5E-12	8.4E-12	3.5E-11	
SSE	0.0E+00	2.4E-12	1.7E-12	5.1E-12	3.7E-12	2.6E-12	2.4E-11	
SSE	0.0E+00	2.6E-12	2.3E-12	5.8E-12	4.8E-12	2.9E-12	1.8E-11	
ESE	0.0E+00	3.1E-12	2.3E-12	4.8E-13	2.1E-12	8.0E-12	1.2E-11	
E	0.0E+00	3.1E-12	2.5E-12	1.7E-12	2.7E-12	3.7E-12	1.6E-11	
ENE	0.0E+00	3.8E-12	2.7E-12	1.5E-12	5.7E-13	3.5E-12	3.3E-11	
NE	0.0E+00	3.6E-12	3.3E-12	0.0E+00	1.9E-12	8.5E-12	8.6E-12	
NNE	0.0E+00	3.5E-12	2.6E-12	0.0E+00	3.1E-13	3.8E-12	7.0E-12	
		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	9.2E-11	2.9E-10	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-10	3.3E-10	1.7E-10	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.3E-11	4.6E-10	2.8E-10	
WNW	5.6E-12	0.0E+00	0.0E+00	0.0E+00	3.3E-12	2.2E-10	4.5E-11	
W	3.5E-10	2.6E-10	2.4E-11	7.9E-11	3.8E-11	1.9E-10	2.5E-10	
WSW	1.5E-10	1.6E-10	1.1E-11	1.2E-11	5.7E-12	5.6E-12	1.7E-12	
SW	3.1E-10	3.6E-11	1.4E-10	1.1E-11	1.4E-12	4.1E-13	0.0E+00	
SSW	2.7E-10	7.4E-12	5.4E-12	1.3E-11	0.0E+00	0.0E+00	1.2E-12	
S	2.0E-10	4.2E-11	6.5E-11	4.1E-14	2.4E-11	1.4E-11	4.9E-12	
SSE	1.4E-10	4.2E-10	6.7E-10	2.0E-10	7.4E-11	9.1E-12	3.6E-12	
SSE	1.1E-10	2.3E-10	2.6E-10	9.8E-11	2.3E-11	6.9E-12	9.4E-12	
ESE	2.3E-11	1.6E-10	1.0E-11	1.4E-11	9.6E-12	2.5E-11	1.2E-11	
E	1.7E-11	5.5E-11	1.6E-11	3.3E-11	5.7E-12	1.8E-11	1.0E-11	
ENE	1.4E-11	3.4E-11	9.7E-12	5.8E-12	1.8E-12	1.1E-12	5.6E-13	
NE	3.8E-11	1.3E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	4.9E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.7E-11	

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

Non-Radon Population Assessment  
Wed Feb 10 14:00:23 2021

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

Source Category: Area

Source Type: Area

Emission Year: 2020

DOSE Age Group: One

Comments: NFSS Technical Memo 2020 Year  
Population Dose

Dataset Name: NFSS2020 Pop One

Dataset Date: Feb 10, 2021 02:00 PM

Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND

Pop File: C:\Users\h5tderjc\Documents\CAP88\Population Files\NFSS2013.POP

## ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	1.25E-04	1.03E-03
UB_Wall	1.37E-04	1.13E-03
Bone_Sur	2.35E-03	2.77E-02
Brain	1.32E-04	1.09E-03
Breasts	1.44E-04	1.18E-03
St_Wall	1.34E-04	1.11E-03
SI_Wall	1.34E-04	1.12E-03
ULI_Wall	1.50E-04	1.37E-03
LLI_Wall	1.94E-04	2.06E-03
Kidneys	2.58E-04	2.41E-03
Liver	2.25E-04	2.30E-03
Muscle	1.48E-04	1.21E-03
Ovaries	1.40E-04	1.14E-03
Pancreas	1.26E-04	1.04E-03
R_Marrow	3.34E-04	3.61E-03
Skin	2.01E-03	1.52E-02
Spleen	1.35E-04	1.12E-03
Testes	1.60E-04	1.29E-03
Thymus	1.32E-04	1.09E-03
Thyroid	1.38E-04	1.13E-03
GB_Wall	1.27E-04	1.05E-03
Ht_Wall	1.31E-04	1.08E-03
Uterus	1.30E-04	1.08E-03
ET_Reg	1.29E-03	6.55E-03
Lung_66	2.04E-03	1.02E-02
Effectiv	4.43E-04	3.07E-03

## PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	4.81E-05	8.06E-04
INHALATION	2.53E-04	1.20E-03
AIR IMMERSION	6.99E-11	1.11E-09
GROUND SURFACE	1.42E-04	1.07E-03
INTERNAL	3.01E-04	2.00E-03
EXTERNAL	1.42E-04	1.07E-03
TOTAL	4.43E-04	3.07E-03

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	4.49E-05	2.55E-04
Th-234	1.01E-06	7.65E-06
Pa-234m	1.38E-05	1.04E-04
Pa-234	2.73E-07	2.05E-06
U-234	5.12E-05	2.87E-04
Th-230	7.81E-05	4.09E-04
Ra-226	6.18E-05	7.33E-04
Rn-222	2.44E-08	1.84E-07
Po-218	4.36E-13	3.28E-12
Pb-214	1.59E-05	1.20E-04
At-218	1.64E-12	1.23E-11
Bi-214	9.32E-05	7.01E-04
Rn-218	9.50E-15	7.15E-14
Po-214	5.16E-09	3.89E-08
Tl-210	3.64E-08	2.74E-07
Pb-210	7.85E-08	5.91E-07
Bi-210	1.27E-06	9.55E-06
Hg-206	1.02E-13	7.71E-13
Po-210	3.29E-10	2.47E-09
Tl-206	2.96E-12	2.23E-11
Th-232	1.69E-05	8.65E-05
Ra-228	4.70E-09	5.41E-08
Ac-228	5.35E-06	4.02E-05
Th-228	4.42E-05	2.15E-04
Ra-224	6.43E-08	1.05E-06
Rn-220	3.90E-09	2.94E-08
Po-216	9.42E-11	7.09E-10
Pb-212	8.57E-07	6.46E-06
Bi-212	1.00E-06	7.53E-06
Po-212	0.00E+00	0.00E+00
Tl-208	6.91E-06	5.20E-05
U-235	5.62E-06	3.47E-05
Th-231	1.59E-07	1.20E-06
Pa-231	2.64E-10	1.99E-09
Ac-227	8.85E-13	6.66E-12
Th-227	4.23E-10	3.18E-09
Fr-223	3.98E-12	3.00E-11
Ra-223	4.73E-10	3.56E-09
Rn-219	2.05E-10	1.54E-09
At-219	0.00E+00	0.00E+00
Bi-215	9.21E-16	6.93E-15
Po-215	6.25E-13	4.70E-12
Pb-211	4.02E-10	3.02E-09
Bi-211	1.66E-10	1.25E-09
Tl-207	2.08E-10	1.57E-09
Po-211	7.97E-14	6.00E-13
TOTAL	4.43E-04	3.07E-03

## CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	1.24E-12	1.25E-10
Stomach	4.82E-12	4.84E-10
Colon	1.32E-11	1.42E-09
Liver	2.05E-12	2.33E-10
LUNG	2.02E-11	1.72E-09
Bone	1.23E-12	2.44E-10
Skin	1.99E-12	1.94E-10
Breast	6.22E-12	6.14E-10
Ovary	1.66E-12	1.68E-10
Bladder	3.00E-12	3.02E-10
Kidneys	7.43E-13	8.65E-11
Thyroid	3.94E-13	3.95E-11
Leukemia	7.21E-12	7.29E-10
Residual	1.86E-11	1.98E-09
Total	8.26E-11	8.34E-09

## PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	4.76E-12	1.04E-09
INHALATION	8.13E-12	5.00E-10
AIR IMMERSION	3.71E-17	7.78E-15
GROUND SURFACE	6.98E-11	6.80E-09
INTERNAL	1.29E-11	1.54E-09
EXTERNAL	6.98E-11	6.80E-09
TOTAL	8.26E-11	8.34E-09

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	1.87E-12	1.82E-10
Th-234	5.24E-13	5.12E-11
Pa-234m	2.42E-12	2.36E-10
Pa-234	1.48E-13	1.45E-11
U-234	2.12E-12	2.01E-10
Th-230	2.33E-12	1.70E-10
Ra-226	4.68E-12	8.65E-10
Rn-222	1.33E-14	1.30E-12
Po-218	1.95E-19	1.90E-17
Pb-214	8.53E-12	8.31E-10
At-218	2.02E-19	1.97E-17
Bi-214	4.92E-11	4.80E-09
Rn-218	5.20E-21	5.07E-19
Po-214	2.83E-15	2.76E-13
Tl-210	1.94E-14	1.89E-12
Pb-210	3.52E-14	3.43E-12
Bi-210	1.41E-13	1.37E-11
Hg-206	4.54E-20	4.43E-18
Po-210	1.80E-16	1.76E-14
Tl-206	3.33E-19	3.25E-17
Th-232	4.88E-13	3.44E-11
Ra-228	1.42E-15	1.50E-13
Ac-228	2.84E-12	2.77E-10
Th-228	1.55E-12	9.99E-11
Ra-224	3.42E-14	3.60E-12
Rn-220	2.14E-15	2.08E-13
Po-216	5.18E-17	5.05E-15
Pb-212	4.66E-13	4.55E-11
Bi-212	3.86E-13	3.76E-11
Po-212	0.00E+00	0.00E+00
Tl-208	3.76E-12	3.66E-10
U-235	1.01E-12	9.88E-11
Th-231	7.27E-14	7.09E-12
Pa-231	1.38E-16	1.34E-14
Ac-227	3.31E-19	3.23E-17
Th-227	2.29E-16	2.23E-14
Fr-223	1.48E-18	1.45E-16
Ra-223	2.55E-16	2.49E-14
Rn-219	1.12E-16	1.09E-14
At-219	0.00E+00	0.00E+00
Bi-215	4.11E-22	4.01E-20
Po-215	3.43E-19	3.34E-17
Pb-211	1.44E-16	1.40E-14
Bi-211	9.04E-17	8.81E-15
Tl-207	2.67E-17	2.61E-15
Po-211	4.36E-20	4.25E-18
TOTAL	8.26E-11	8.34E-09

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

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	2.6E-04	8.5E-05	4.0E-05	2.4E-05	1.6E-05	7.7E-06
NNW	0.0E+00	2.1E-04	4.4E-05	1.2E-05	7.4E-06	5.1E-06	2.4E-06
NW	0.0E+00	1.7E-04	5.1E-05	2.2E-05	1.3E-05	9.1E-06	4.3E-06
WNW	0.0E+00	2.8E-04	7.4E-05	2.9E-05	1.7E-05	1.2E-05	5.4E-06
W	0.0E+00	3.0E-04	1.0E-04	5.0E-05	3.0E-05	2.0E-05	9.5E-06
WSW	0.0E+00	3.0E-04	7.8E-05	3.0E-05	1.7E-05	1.2E-05	5.6E-06
SW	0.0E+00	2.1E-04	6.6E-05	3.0E-05	1.8E-05	1.2E-05	5.7E-06
SSW	0.0E+00	2.2E-04	5.5E-05	1.9E-05	0.0E+00	7.9E-06	3.7E-06
S	0.0E+00	2.2E-04	6.9E-05	3.2E-05	1.9E-05	1.3E-05	6.1E-06
SSE	0.0E+00	2.9E-04	7.4E-05	2.8E-05	1.7E-05	1.2E-05	5.4E-06
SSE	0.0E+00	3.1E-04	9.8E-05	4.5E-05	2.7E-05	1.8E-05	8.6E-06
ESE	0.0E+00	3.7E-04	1.0E-04	4.1E-05	2.4E-05	1.7E-05	7.9E-06
E	0.0E+00	3.7E-04	1.1E-04	4.9E-05	2.9E-05	2.0E-05	9.5E-06
ENE	0.0E+00	4.4E-04	1.2E-04	4.6E-05	2.7E-05	1.9E-05	9.0E-06
NE	0.0E+00	4.3E-04	1.4E-04	0.0E+00	4.0E-05	2.8E-05	1.3E-05
NNE	0.0E+00	4.2E-04	1.1E-04	0.0E+00	2.6E-05	1.8E-05	8.6E-06

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

Distance (m)							
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	7.9E-07	6.8E-07	6.4E-07	4.7E-08	1.7E-06	1.4E-06
NNW	0.0E+00	6.2E-07	3.5E-07	9.6E-07	1.4E-07	4.6E-07	5.0E-07
NW	0.0E+00	5.2E-07	4.1E-07	2.5E-06	1.0E-06	9.4E-07	9.1E-06
WNW	0.0E+00	8.4E-07	5.9E-07	9.5E-06	5.9E-06	6.0E-07	3.3E-05
W	0.0E+00	8.9E-07	8.2E-07	4.6E-05	6.0E-06	8.2E-08	3.0E-06
WSW	0.0E+00	9.0E-07	6.2E-07	2.4E-07	2.1E-06	2.0E-06	3.5E-06
SW	0.0E+00	6.4E-07	5.3E-07	6.5E-07	4.9E-06	4.6E-06	3.3E-05
SSW	0.0E+00	6.7E-07	4.4E-07	4.7E-07	0.0E+00	3.4E-07	2.3E-05
S	0.0E+00	6.5E-07	5.5E-07	2.6E-06	1.5E-06	2.8E-06	1.1E-05
SSE	0.0E+00	8.6E-07	6.0E-07	1.7E-06	1.2E-06	8.5E-07	8.0E-06
SSE	0.0E+00	9.3E-07	7.8E-07	2.0E-06	1.6E-06	9.5E-07	5.8E-06
ESE	0.0E+00	1.1E-06	8.1E-07	1.6E-07	7.0E-07	2.7E-06	3.9E-06
E	0.0E+00	1.1E-06	8.9E-07	5.9E-07	9.0E-07	1.2E-06	5.1E-06
ENE	0.0E+00	1.3E-06	9.4E-07	5.1E-07	1.9E-07	1.2E-06	1.1E-05
NE	0.0E+00	1.3E-06	1.1E-06	0.0E+00	6.5E-07	2.8E-06	2.8E-06
NNE	0.0E+00	1.2E-06	8.9E-07	0.0E+00	1.1E-07	1.3E-06	2.3E-06

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	4.9E-11	1.6E-11	7.9E-12	4.8E-12	3.3E-12	1.6E-12
NNW	0.0E+00	3.8E-11	8.5E-12	2.5E-12	1.5E-12	1.0E-12	5.1E-13
NW	0.0E+00	3.3E-11	9.9E-12	4.5E-12	2.7E-12	1.9E-12	9.0E-13
WNW	0.0E+00	5.2E-11	1.4E-11	5.6E-12	3.4E-12	2.3E-12	1.1E-12
W	0.0E+00	5.5E-11	2.0E-11	9.9E-12	5.9E-12	4.1E-12	2.0E-12
WSW	0.0E+00	5.6E-11	1.5E-11	5.8E-12	3.5E-12	2.4E-12	1.2E-12
SW	0.0E+00	4.0E-11	1.3E-11	5.9E-12	3.5E-12	2.5E-12	1.2E-12
SSW	0.0E+00	4.1E-11	1.1E-11	3.9E-12	0.0E+00	1.6E-12	7.9E-13
S	0.0E+00	4.1E-11	1.3E-11	6.4E-12	3.8E-12	2.7E-12	1.3E-12
SSE	0.0E+00	5.4E-11	1.4E-11	5.6E-12	3.4E-12	2.4E-12	1.2E-12
SSE	0.0E+00	5.8E-11	1.9E-11	9.0E-12	5.4E-12	3.8E-12	1.8E-12
ESE	0.0E+00	6.9E-11	1.9E-11	8.1E-12	4.9E-12	3.4E-12	1.7E-12
E	0.0E+00	6.9E-11	2.1E-11	9.7E-12	5.9E-12	4.1E-12	2.0E-12
ENE	0.0E+00	8.3E-11	2.3E-11	9.2E-12	5.5E-12	3.9E-12	1.9E-12
NE	0.0E+00	8.0E-11	2.7E-11	0.0E+00	8.1E-12	5.7E-12	2.8E-12
NNE	0.0E+00	7.7E-11	2.2E-11	0.0E+00	5.3E-12	3.7E-12	1.8E-12

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

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.9E-12	1.7E-12	1.6E-12	1.2E-13	4.4E-12	3.7E-12
NNW	0.0E+00	1.5E-12	8.8E-13	2.5E-12	3.7E-13	1.2E-12	1.3E-12
NW	0.0E+00	1.3E-12	1.0E-12	6.4E-12	2.7E-12	2.5E-12	2.5E-11
WNW	0.0E+00	2.0E-12	1.5E-12	2.4E-11	1.5E-11	1.6E-12	8.8E-11
W	0.0E+00	2.2E-12	2.0E-12	1.2E-10	1.6E-11	2.1E-13	8.0E-12
WSW	0.0E+00	2.2E-12	1.5E-12	6.0E-13	5.5E-12	5.3E-12	9.4E-12
SW	0.0E+00	1.6E-12	1.3E-12	1.7E-12	1.3E-11	1.2E-11	9.0E-11
SSW	0.0E+00	1.6E-12	1.1E-12	1.2E-12	0.0E+00	9.1E-13	6.3E-11
S	0.0E+00	1.6E-12	1.4E-12	6.6E-12	4.0E-12	7.4E-12	3.1E-11
SSE	0.0E+00	2.1E-12	1.5E-12	4.5E-12	3.3E-12	2.3E-12	2.2E-11
SSE	0.0E+00	2.3E-12	2.0E-12	5.1E-12	4.3E-12	2.5E-12	1.6E-11
ESE	0.0E+00	2.7E-12	2.0E-12	4.2E-13	1.8E-12	7.1E-12	1.1E-11
E	0.0E+00	2.7E-12	2.2E-12	1.5E-12	2.4E-12	3.2E-12	1.4E-11
ENE	0.0E+00	3.2E-12	2.4E-12	1.3E-12	5.0E-13	3.1E-12	3.0E-11
NE	0.0E+00	3.1E-12	2.8E-12	0.0E+00	1.7E-12	7.5E-12	7.7E-12
NNE	0.0E+00	3.0E-12	2.2E-12	0.0E+00	2.8E-13	3.4E-12	6.3E-12

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

Non-Radon Population Assessment  
Wed Feb 10 13:59:56 2021

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

Source Category: Area  
Source Type: Area  
Emission Year: 2020  
DOSE Age Group: Infant

Comments: NFSS Technical Memo 2020 Year  
Population Dose

Dataset Name: NFSS2020 Pop Inf  
Dataset Date: Feb 10, 2021 01:59 PM  
Wind File: C:\Users\h5tderjc\Documents\CAP88\Wind Files\IAG0905.WND  
Pop File: C:\Users\h5tderjc\Documents\CAP88\Population Files\NFSS2013.POP

## ORGAN DOSE EQUIVALENT SUMMARY

Organ	Selected Individual (mrem)	Collective Population (person-rem)
Adrenal	1.41E-04	1.32E-03
UB_Wall	1.54E-04	1.42E-03
Bone_Sur	7.84E-03	1.22E-01
Brain	1.48E-04	1.37E-03
Breasts	1.60E-04	1.47E-03
St_Wall	1.51E-04	1.40E-03
SI_Wall	1.51E-04	1.42E-03
ULI_Wall	1.71E-04	1.74E-03
LLI_Wall	2.27E-04	2.64E-03
Kidneys	3.92E-04	4.65E-03
Liver	3.51E-04	4.43E-03
Muscle	1.65E-04	1.50E-03
Ovaries	1.68E-04	1.61E-03
Pancreas	1.42E-04	1.33E-03
R_Marrow	1.04E-03	1.56E-02
Skin	2.03E-03	1.55E-02
Spleen	1.55E-04	1.48E-03
Testes	1.91E-04	1.79E-03
Thymus	1.49E-04	1.38E-03
Thyroid	1.54E-04	1.42E-03
GB_Wall	1.43E-04	1.34E-03
Ht_Wall	1.48E-04	1.37E-03
Uterus	1.47E-04	1.36E-03
ET_Reg	1.23E-03	6.49E-03
Lung_66	1.84E-03	9.41E-03
Effectiv	5.81E-04	5.74E-03

## PATHWAY COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Pathway	Selected Individual (mrem)	Collective Population (person-rem)
INGESTION	2.15E-04	3.61E-03
INHALATION	2.24E-04	1.06E-03
AIR IMMERSION	6.99E-11	1.11E-09
GROUND SURFACE	1.42E-04	1.07E-03
INTERNAL	4.39E-04	4.67E-03
EXTERNAL	1.42E-04	1.07E-03
TOTAL	5.81E-04	5.74E-03

## NUCLIDE COMMITTED EFFECTIVE DOSE EQUIVALENT SUMMARY

Nuclides	Selected Individual (mrem)	Collective Population (person-rem)
U-238	4.80E-05	3.30E-04
Th-234	1.01E-06	7.66E-06
Pa-234m	1.38E-05	1.04E-04
Pa-234	2.73E-07	2.05E-06
U-234	5.40E-05	3.65E-04
Th-230	9.58E-05	7.88E-04
Ra-226	1.77E-04	2.78E-03
Rn-222	2.44E-08	1.84E-07
Po-218	4.36E-13	3.28E-12
Pb-214	1.59E-05	1.20E-04
At-218	1.64E-12	1.23E-11
Bi-214	9.32E-05	7.01E-04
Rn-218	9.50E-15	7.15E-14
Po-214	5.16E-09	3.89E-08
Tl-210	3.64E-08	2.74E-07
Pb-210	7.85E-08	5.92E-07
Bi-210	1.27E-06	9.55E-06
Hg-206	1.02E-13	7.71E-13
Po-210	3.29E-10	2.47E-09
Tl-206	2.96E-12	2.23E-11
Th-232	1.81E-05	1.40E-04
Ra-228	4.77E-09	1.19E-07
Ac-228	5.35E-06	4.02E-05
Th-228	4.23E-05	2.46E-04
Ra-224	6.43E-08	1.12E-06
Rn-220	3.90E-09	2.94E-08
Po-216	9.42E-11	7.09E-10
Pb-212	8.57E-07	6.46E-06
Bi-212	1.00E-06	7.53E-06
Po-212	0.00E+00	0.00E+00
Tl-208	6.91E-06	5.20E-05
U-235	5.87E-06	4.13E-05
Th-231	1.59E-07	1.20E-06
Pa-231	2.64E-10	1.99E-09
Ac-227	8.85E-13	6.66E-12
Th-227	4.23E-10	3.18E-09
Fr-223	3.98E-12	3.00E-11
Ra-223	4.73E-10	3.56E-09
Rn-219	2.05E-10	1.54E-09
At-219	0.00E+00	0.00E+00
Bi-215	9.21E-16	6.93E-15
Po-215	6.25E-13	4.70E-12
Pb-211	4.02E-10	3.02E-09
Bi-211	1.66E-10	1.25E-09
Tl-207	2.08E-10	1.57E-09
Po-211	7.97E-14	6.00E-13
TOTAL	5.81E-04	5.74E-03

## CANCER RISK SUMMARY

Cancer	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
Esophagus	1.23E-12	1.23E-10
Stomach	4.77E-12	4.75E-10
Colon	1.28E-11	1.33E-09
Liver	1.97E-12	2.17E-10
LUNG	1.82E-11	1.58E-09
Bone	8.92E-13	1.75E-10
Skin	1.99E-12	1.94E-10
Breast	6.19E-12	6.09E-10
Ovary	1.65E-12	1.65E-10
Bladder	2.98E-12	2.98E-10
Kidneys	7.08E-13	7.97E-11
Thyroid	3.91E-13	3.88E-11
Leukemia	7.15E-12	7.17E-10
Residual	1.82E-11	1.88E-09
Total	7.90E-11	7.88E-09

## PATHWAY RISK SUMMARY

Pathway	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
INGESTION	3.12E-12	6.99E-10
INHALATION	6.15E-12	3.78E-10
AIR IMMERSION	3.71E-17	7.78E-15
GROUND SURFACE	6.98E-11	6.80E-09
INTERNAL	9.28E-12	1.08E-09
EXTERNAL	6.98E-11	6.80E-09
TOTAL	7.90E-11	7.88E-09

## NUCLIDE RISK SUMMARY

Nuclide	Selected Individual Total Lifetime Fatal Cancer Risk	Total Collective Population Fatal Cancer Risk Per Year
U-238	1.37E-12	1.30E-10
Th-234	5.24E-13	5.11E-11
Pa-234m	2.42E-12	2.36E-10
Pa-234	1.48E-13	1.45E-11
U-234	1.56E-12	1.44E-10
Th-230	1.74E-12	1.25E-10
Ra-226	3.25E-12	5.95E-10
Rn-222	1.33E-14	1.30E-12
Po-218	1.95E-19	1.90E-17
Pb-214	8.53E-12	8.31E-10
At-218	2.02E-19	1.97E-17
Bi-214	4.92E-11	4.80E-09
Rn-218	5.20E-21	5.07E-19
Po-214	2.83E-15	2.76E-13
Tl-210	1.94E-14	1.89E-12
Pb-210	3.52E-14	3.43E-12
Bi-210	1.41E-13	1.37E-11
Hg-206	4.54E-20	4.43E-18
Po-210	1.80E-16	1.76E-14
Tl-206	3.33E-19	3.25E-17
Th-232	3.66E-13	2.53E-11
Ra-228	1.42E-15	1.46E-13
Ac-228	2.84E-12	2.77E-10
Th-228	1.17E-12	7.48E-11
Ra-224	3.41E-14	3.53E-12
Rn-220	2.14E-15	2.08E-13
Po-216	5.18E-17	5.05E-15
Pb-212	4.66E-13	4.55E-11
Bi-212	3.86E-13	3.76E-11
Po-212	0.00E+00	0.00E+00
Tl-208	3.76E-12	3.66E-10
U-235	9.68E-13	9.40E-11
Th-231	7.27E-14	7.09E-12
Pa-231	1.38E-16	1.34E-14
Ac-227	3.31E-19	3.23E-17
Th-227	2.29E-16	2.23E-14
Fr-223	1.48E-18	1.45E-16
Ra-223	2.55E-16	2.49E-14
Rn-219	1.12E-16	1.09E-14
At-219	0.00E+00	0.00E+00
Bi-215	4.11E-22	4.01E-20
Po-215	3.43E-19	3.34E-17
Pb-211	1.44E-16	1.40E-14
Bi-211	9.04E-17	8.81E-15
Tl-207	2.67E-17	2.61E-15
Po-211	4.36E-20	4.25E-18
TOTAL	7.90E-11	7.88E-09

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	3.5E-04	1.1E-04	5.4E-05	3.2E-05	2.2E-05	1.1E-05
NNW	0.0E+00	2.7E-04	5.9E-05	1.7E-05	1.0E-05	7.2E-06	3.5E-06
NW	0.0E+00	2.3E-04	6.8E-05	3.0E-05	1.8E-05	1.3E-05	6.1E-06
WNW	0.0E+00	3.7E-04	9.8E-05	3.8E-05	2.3E-05	1.6E-05	7.6E-06
W	0.0E+00	3.9E-04	1.4E-04	6.8E-05	4.0E-05	2.8E-05	1.3E-05
WSW	0.0E+00	3.9E-04	1.0E-04	4.0E-05	2.4E-05	1.7E-05	7.9E-06
SW	0.0E+00	2.8E-04	8.7E-05	4.0E-05	2.4E-05	1.7E-05	8.0E-06
SSW	0.0E+00	2.9E-04	7.3E-05	2.6E-05	0.0E+00	1.1E-05	5.4E-06
S	0.0E+00	2.9E-04	9.2E-05	4.3E-05	2.6E-05	1.8E-05	8.6E-06
SSE	0.0E+00	3.8E-04	9.9E-05	3.8E-05	2.3E-05	1.6E-05	7.7E-06
SSE	0.0E+00	4.1E-04	1.3E-04	6.1E-05	3.6E-05	2.5E-05	1.2E-05
ESE	0.0E+00	4.8E-04	1.3E-04	5.5E-05	3.3E-05	2.3E-05	1.1E-05
E	0.0E+00	4.8E-04	1.5E-04	6.6E-05	4.0E-05	2.8E-05	1.3E-05
ENE	0.0E+00	5.8E-04	1.6E-04	6.2E-05	3.7E-05	2.6E-05	1.3E-05
NE	0.0E+00	5.6E-04	1.9E-04	0.0E+00	5.5E-05	3.8E-05	1.8E-05
NNE	0.0E+00	5.4E-04	1.5E-04	0.0E+00	3.6E-05	2.5E-05	1.2E-05

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

Direction	Distance (m)						
	250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.0E-06	9.1E-07	8.7E-07	6.5E-08	2.3E-06	1.9E-06
NNW	0.0E+00	8.1E-07	4.7E-07	1.3E-06	1.9E-07	6.4E-07	7.3E-07
NW	0.0E+00	6.9E-07	5.5E-07	3.3E-06	1.4E-06	1.3E-06	1.3E-05
WNW	0.0E+00	1.1E-06	7.8E-07	1.3E-05	8.0E-06	8.2E-07	4.6E-05
W	0.0E+00	1.2E-06	1.1E-06	6.1E-05	8.2E-06	1.1E-07	4.1E-06
WSW	0.0E+00	1.2E-06	8.2E-07	3.2E-07	2.9E-06	2.8E-06	4.9E-06
SW	0.0E+00	8.5E-07	7.0E-07	8.8E-07	6.6E-06	6.3E-06	4.7E-05
SSW	0.0E+00	8.7E-07	5.8E-07	6.3E-07	0.0E+00	4.7E-07	3.3E-05
S	0.0E+00	8.6E-07	7.3E-07	3.5E-06	2.1E-06	3.9E-06	1.6E-05
SSE	0.0E+00	1.1E-06	7.9E-07	2.3E-06	1.7E-06	1.2E-06	1.1E-05
SSE	0.0E+00	1.2E-06	1.0E-06	2.7E-06	2.2E-06	1.3E-06	8.2E-06
ESE	0.0E+00	1.4E-06	1.1E-06	2.2E-07	9.6E-07	3.7E-06	5.4E-06
E	0.0E+00	1.5E-06	1.2E-06	7.9E-07	1.2E-06	1.7E-06	7.2E-06
ENE	0.0E+00	1.7E-06	1.3E-06	6.9E-07	2.6E-07	1.6E-06	1.5E-05
NE	0.0E+00	1.7E-06	1.5E-06	0.0E+00	8.8E-07	3.9E-06	3.9E-06
NNE	0.0E+00	1.6E-06	1.2E-06	0.0E+00	1.4E-07	1.7E-06	3.2E-06

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

	Distance (m)						
Direction	250	750	1500	2500	3500	4500	7500
N	0.0E+00	4.7E-11	1.6E-11	7.6E-12	4.6E-12	3.2E-12	1.5E-12
NNW	0.0E+00	3.7E-11	8.1E-12	2.4E-12	1.4E-12	1.0E-12	4.9E-13
NW	0.0E+00	3.1E-11	9.5E-12	4.3E-12	2.6E-12	1.8E-12	8.6E-13
WNW	0.0E+00	5.0E-11	1.3E-11	5.4E-12	3.2E-12	2.2E-12	1.1E-12
W	0.0E+00	5.3E-11	1.9E-11	9.5E-12	5.7E-12	4.0E-12	1.9E-12
WSW	0.0E+00	5.3E-11	1.4E-11	5.6E-12	3.3E-12	2.3E-12	1.1E-12
SW	0.0E+00	3.8E-11	1.2E-11	5.6E-12	3.4E-12	2.4E-12	1.1E-12
SSW	0.0E+00	4.0E-11	1.0E-11	3.7E-12	0.0E+00	1.6E-12	7.6E-13
S	0.0E+00	3.9E-11	1.3E-11	6.1E-12	3.7E-12	2.6E-12	1.2E-12
SSE	0.0E+00	5.1E-11	1.4E-11	5.4E-12	3.3E-12	2.3E-12	1.1E-12
SSE	0.0E+00	5.6E-11	1.8E-11	8.6E-12	5.2E-12	3.6E-12	1.8E-12
ESE	0.0E+00	6.6E-11	1.9E-11	7.8E-12	4.7E-12	3.3E-12	1.6E-12
E	0.0E+00	6.6E-11	2.0E-11	9.3E-12	5.6E-12	3.9E-12	1.9E-12
ENE	0.0E+00	7.9E-11	2.2E-11	8.8E-12	5.3E-12	3.7E-12	1.8E-12
NE	0.0E+00	7.7E-11	2.6E-11	0.0E+00	7.8E-12	5.5E-12	2.7E-12
NNE	0.0E+00	7.4E-11	2.1E-11	0.0E+00	5.1E-12	3.6E-12	1.7E-12

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

		Distance (m)						
Direction		250	750	1500	2500	3500	4500	7500
N	0.0E+00	1.8E-12	1.6E-12	1.6E-12	1.2E-13	4.2E-12	3.6E-12	
NNW	0.0E+00	1.4E-12	8.4E-13	2.4E-12	3.5E-13	1.2E-12	1.3E-12	
NW	0.0E+00	1.2E-12	9.8E-13	6.1E-12	2.6E-12	2.4E-12	2.4E-11	
WNW	0.0E+00	1.9E-12	1.4E-12	2.3E-11	1.5E-11	1.5E-12	8.5E-11	
W	0.0E+00	2.1E-12	1.9E-12	1.1E-10	1.5E-11	2.1E-13	7.7E-12	
WSW	0.0E+00	2.1E-12	1.5E-12	5.8E-13	5.2E-12	5.1E-12	9.1E-12	
SW	0.0E+00	1.5E-12	1.3E-12	1.6E-12	1.2E-11	1.2E-11	8.7E-11	
SSW	0.0E+00	1.5E-12	1.0E-12	1.2E-12	0.0E+00	8.7E-13	6.0E-11	
S	0.0E+00	1.5E-12	1.3E-12	6.3E-12	3.9E-12	7.1E-12	3.0E-11	
SSE	0.0E+00	2.0E-12	1.4E-12	4.3E-12	3.1E-12	2.2E-12	2.1E-11	
SSE	0.0E+00	2.2E-12	1.9E-12	4.9E-12	4.1E-12	2.4E-12	1.5E-11	
ESE	0.0E+00	2.5E-12	1.9E-12	4.0E-13	1.8E-12	6.8E-12	1.0E-11	
E	0.0E+00	2.6E-12	2.1E-12	1.5E-12	2.3E-12	3.1E-12	1.3E-11	
ENE	0.0E+00	3.1E-12	2.3E-12	1.3E-12	4.8E-13	3.0E-12	2.8E-11	
NE	0.0E+00	3.0E-12	2.7E-12	0.0E+00	1.6E-12	7.2E-12	7.4E-12	
NNE	0.0E+00	2.9E-12	2.1E-12	0.0E+00	2.6E-13	3.2E-12	6.0E-12	

		Distance (m)						
Direction		15000	25000	35000	45000	55000	65000	75000
N	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.7E-11	2.8E-10	
NNW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.8E-10	3.5E-10	1.9E-10	
NW	0.0E+00	0.0E+00	0.0E+00	0.0E+00	8.0E-11	4.6E-10	2.9E-10	
WNW	4.9E-12	0.0E+00	0.0E+00	0.0E+00	3.1E-12	2.2E-10	4.5E-11	
W	3.0E-10	2.3E-10	2.1E-11	7.1E-11	3.5E-11	1.8E-10	2.4E-10	
WSW	1.3E-10	1.4E-10	9.8E-12	1.1E-11	5.3E-12	5.4E-12	1.7E-12	
SW	2.7E-10	3.2E-11	1.2E-10	1.0E-11	1.4E-12	3.9E-13	0.0E+00	
SSW	2.4E-10	6.7E-12	5.0E-12	1.2E-11	0.0E+00	0.0E+00	1.3E-12	
S	1.7E-10	3.8E-11	5.9E-11	3.8E-14	2.3E-11	1.4E-11	4.9E-12	
SSE	1.2E-10	3.8E-10	6.1E-10	1.9E-10	7.0E-11	8.8E-12	3.6E-12	
SSE	9.8E-11	2.0E-10	2.4E-10	9.0E-11	2.1E-11	6.6E-12	9.1E-12	
ESE	2.0E-11	1.4E-10	9.1E-12	1.2E-11	8.9E-12	2.3E-11	1.1E-11	
E	1.5E-11	4.9E-11	1.4E-11	3.0E-11	5.3E-12	1.7E-11	9.8E-12	
ENE	1.3E-11	3.1E-11	8.7E-12	5.3E-12	1.7E-12	1.1E-12	5.3E-13	
NE	3.3E-11	1.2E-12	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	
NNE	4.3E-13	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	1.6E-11	

**ATTACHMENT E**

**NATIONAL CLIMATIC DATA CENTER, NIAGARA FALLS, NEW YORK**

**Local Climatological Data**  
**Daily Summary**  
**January 2020**

Generated on 02/10/2021

Date	Temperature (F)								Degree Days (base 65F)		Sun (LST)		Weather				Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH						
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type				TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir	Direction = Degrees			
1	2	3	4	5	6	7	8	9	10	11	12	13				14	15	16	17	18	19	20	21	22	23				
01	33	27	30	3.9	77	23	27	35	0	0748	1651	SN BR				T			29.09	29.76	15.2	30	250	24	250				
02	45	31	38	12.1	65	29	36	27	0	0748	1652					0.00			29.07	29.73	17.4	37	230	26	230				
03	45	38	42	16.3	83	38	40	23	0	0748	1653					0.00			29.10	29.77	8.2	23	220	18	230				
04	38	31	35	9.5	87	29	32	30	0	0748	1654	SN BR				0.12			29.12	29.79	9.5	22	310	18	290				
05	34	30	32	6.6	80	26	29	33	0	0748	1655	SN BR UP				0.06			29.28	29.96	12.1	30	320	22	300				
06	36	25	31	5.8	76	26	31	34	0	0748	1656	RA FZRA SN BR UP				0.02			29.21	29.91	17.3	36	250	28	240				
07	37	24	31	6.0	79	25	29	34	0	0747	1657	SN BR				T			29.29	29.95	8.9	31	250	24	270				
08	32	19	26	1.1	68	16	23	39	0	0747	1658	SN BR UP HZ				T			29.39	30.15	17.0	36	300	28	300				
09	40	18	29	4.3	59	12	21	36	0	0747	1659					0.00			29.86	30.53	8.0	26	190	18	200				
10	47	39	43	18.4	87	39	41	22	0	0747	1700	RA BR				0.23			29.56	30.23	12.0	41	210	33	220				
11	59*	37	48	23.5	91	45	46	17	0	0746	1701	TS RA BR				0.96			29.24	29.85	12.7	37	210	28	210				
12	43	26	35	10.7	86	27	30	30	0	0746	1703	RA SN BR				0.13			29.40	30.15	12.4	54	210	43	230				
13	37	26	32	7.8	90	30	31	33	0	0746	1704	RA SN BR				0.01			29.67	30.36	6.0	20	250	16	250				
14	46	26	36	11.9	85	32	35	29	0	0745	1705	BR				T			29.52	30.17	7.8	24	270	18	240				
15	39	33	36	12.0	74	29	34	29	0	0745	1706					0.00			29.47	30.12	8.1	27	270	22	280				
16	36	19	28	4.1	78	24	28	37	0	0744	1707	RA SN BR UP				0.09			29.47	30.23	17.5	35	320	30	290				
17	19	13	16	-7.8	72	7	13	49	0	0744	1709					T			30.09	30.82	8.3	30	350	22	340				
18	39	15	27	3.2	82	22	25	38	0	0743	1710	RA SN FZFG BR FG				0.34			29.25	30.01	13.6	42	230	31	250				
19	34	17	26	2.3	80	19	23	39	0	0743	1711	SN FZFG BR FG				0.01			29.20	29.94	16.0	37	250	29	260				
20	19	6*	13	-10.6	70	7	14	52	0	0742	1712	SN HZ				T			29.75	30.48	8.0	16	330	14	330				
21	26	15	21	-2.6	78	16	21	44	0	0741	1714	SN BR				T			29.81	30.51	10.5	26	240	18	250				
22	30	22	26	2.5	75	21	25	39	0	0741	1715					0.00			29.69	30.38	14.6	31	220	25	220				
23	39	20	30	6.5	59	18	26	35	0	0740	1716	HZ				0.00			29.62	30.30	4.6	14	080	10	080				
24	47	30	39	15.5	68	27	33	26	0	0739	1717	RA BR				0.39			29.51	30.15	7.6	17	110	13	100				
25	41	33	37	13.5	90	34	35	28	0	0738	1719	RA BR				0.28			29.23	29.87	8.8	20	230	17	230				
26	37	32	35	11.5	92	31	33	30	0	0737	1720	RA SN BR UP				0.06			29.10	29.75	15.1	33	240	26	240				
27	33	32	33	9.5	85	29	31	32	0	0736	1721	SN BR				0.01			29.10	29.79	10.4	24	250	17	270				
28	33	30	32	8.5	78	25	29	33	0	0735	1723	SN				T			29.29	29.99	10.7	20	290	16	290				
29	30	17	24	0.5	81	19	22	41	0	0735	1724	UP				T			29.53	30.24	5.8	19	020	15	020				
30	30	17	24	0.5	78	17	21	41	0	0734	1725	BR				0.00			29.60	30.29	6.0	13	080	10	080				
31	32	25	29	5.4	77	22	27	36	0	0733	1727	SN BR				T			29.57	30.24	2.1	9	230	8	110				
	36.6	24.9	30.8									Monthly Averages   Totals				2.71			29.42	30.11	10.7								
	4.9	8.1	6.5									Departure from Normal (1981-2010)				1.07													

## Degree Days

## Monthly

## Season-to-date

## Temperature

## Number of days with...

Total	Departure	Total	Departure	Max	Min	Precipitation	Snow	Weather
-------	-----------	-------	-----------	-----	-----	---------------	------	---------

Heating	1057	-206	3533	>=90°	<=32°	<=32°	>=0.01"	>=0.1"
Cooling	0	0	0	0	8	26	0	14

## Date of 5-sec to 3-sec wind equipment change

## Sea Level Pressure

## Greatest...

N/A		Date	Time	24-Hr...	
		Maximum	30.93	17	1108

Minimum	29.55	18	1953	0.98	Date
				11-12	

## Station Augmentation

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

# Local Climatological Data

## Daily Summary

### February 2020

Generated on 02/10/2021

### **Departure from Normal (1981-2010)**

### **Number of days with..**

---

Station Augmentation

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

U.S. Department of Commerce

National Oceanic &amp; Atmospheric Administration

National Environmental Satellite, Data, and Information Service

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

Station: NIAGARA FALLS INTERNATIONAL AIRPORT, NY US WBAN: 72528704724  
(KIAF)

# Local Climatological Data

## Hourly Observations

### February 2020

Generated on 02/10/2021

National Centers for Environmental Information

151 Patton Avenue

Asheville, North Carolina 28801

Date	Time (LST)	Station Type	Sky Conditions	Visibility	Weather Type (see documentation)	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Hum %	Wind Speed (MPH)	Wind Dir (Deg)	Wind Gusts (MPH)	Station Press (inHg)	Press. Tend.	Net 3-Hr Change (inHg)	Sea Level Press. (inHg)	Report Type	Precip Total (in)	Altimeter Setting (inHg)	
						(F)	(C)	(F)	(C)	(F)	(C)												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
01	0053	4		5.00		29	-1.7			26	-3.3	89	0	000						30.13	FM-15		30.08
01	0132	4		6.00		29	-1.7			26	-3.3	89	0	000							FM-16		30.07
01	0153	4		6.00		29	-1.7			26	-3.3	89	0	000						30.11	FM-15		30.07
01	0253	4		5.00		29	-1.7			26	-3.3	89	0	000						30.10	FM-15		30.05
01	0353	4		5.00		29	-1.7			26	-3.3	89	3	260						30.09	FM-15		30.04
01	0453	4		5.00		29	-1.7			26	-3.3	89	5	250						30.08	FM-15		30.04
01	0553	4		6.00		29	-1.7			26	-3.3	89	0	000						30.06	FM-15		30.02
01	0602	4		6.00		29	-1.7			26	-3.3	89	0	000						FM-16		30.02	
01	0653	4		7.00		29	-1.7			26	-3.3	89	0	000						30.06	FM-15		30.02
01	0753	4		7.00		28	-2.2			26	-3.3	92	0	000						30.06	FM-15		30.01
01	0853	4		5.00		29	-1.7			26	-3.3	89	3	200						30.04	FM-15		29.99
01	0953	4		7.00		30	-1.1			25	-3.9	82	5	210						30.02	FM-15		29.97
01	1053	4		8.00		31	-0.6			25	-3.9	79	5	220						30.01	FM-15		29.96
01	1153	4		10.00		32	0.0			24	-4.4	73	5	200						29.97	FM-15		29.93
01	1253	4		10.00		32	0.0			23	-5.0	69	6	240						29.93	FM-15		29.89
01	1348	4		10.00		32	0.0			23	-5.0	69	5	210						FM-16		29.85	
01	1353	4		10.00		32	0.0			23	-5.0	69	6	250						29.89	FM-15		29.85
01	1453	4		10.00		32	0.0			23	-5.0	69	6	230						29.85	FM-15		29.81
01	1553	4		10.00		32	0.0			22	-5.6	66	8	180						29.83	FM-15		29.79
01	1600	4		10.00		32	0.0			22	-5.6	66	8	190						FM-16		29.78	
01	1653	4		9.00	[SN]	31	-0.6			23	-5.0	72	8	230						29.81	FM-15	T	29.76
01	1753	4		4.00	[SN]	30	-1.1			24	-4.4	79	9	230						29.80	FM-15	T	29.76
01	1853	4		2.00	[SN]	29	-1.7			26	-3.3	89	6	240						29.80	FM-15	T	29.76
01	1914	4		2.00	[SN]	29	-1.7			26	-3.3	89	5	220						FM-16	T	29.75	
01	1953	4		2.00	[SN]	29	-1.7			26	-3.3	89	3	190						29.78	FM-15	0.02	29.74
01	2053	4		2.00	[SN]	29	-1.7			27	-2.8	92	5	170						29.76	FM-15	0.01	29.72
01	2116	4		1.75	[SN]	29	-1.7			27	-2.8	92	5	190						FM-16	T	29.71	
01	2128	4		2.00	[SN]	29	-1.7			27	-2.8	92	5	190						FM-16	T	29.71	
01	2134	4		1.25	[SN]	29	-1.7			27	-2.8	92	6	190						FM-16	0.01	29.70	
01	2153	4		1.75	[SN]	29	-1.7			27	-2.8	92	5	190						29.74	FM-15	0.01	29.70
01	2203	4		1.50	[SN]	29	-1.7			27	-2.8	92	5	180						FM-16	T	29.69	
01	2210	4		1.75	[SN]	29	-1.7			27	-2.8	92	5	190						FM-16	0.01	29.69	
01	2217	4		2.00	[SN]	29	-1.7			27	-2.8	92	6	190						FM-16	0.01	29.69	
01	2229	4		3.00	[SN]	29	-1.7			27	-2.8	92	6	190						FM-16	0.01	29.68	
01	2242	4		4.00	[SN]	29	-1.7			28	-2.2	96	6	180						FM-16	0.01	29.67	
01	2253	4		3.00	[SN]	30	-1.1			28	-2.2	92	5	180						29.71	FM-15	0.01	29.67
01	2307	4		5.00	[SN]	30	-1.1			28	-2.2	92	6	200						FM-16	T	29.66	
01	2350	4		8.00		30	-1.1			28	-2.2	93	9	220						FM-16	T	29.65	
01	2353	4		8.00		31	-0.6			29	-1.7	92	9	210						29.69	FM-15	T	29.65
02	0030	4		2.00	[SN]	31	-0.6			29	-1.7	92	8	210						FM-16	T	29.62	
02	0037	4		1.75	[SN]	31	-0.6			29	-1.7	92	8	220						FM-16	T	29.62	
02	0053	4		2.50	[SN]	31	-0.6			29	-1.7	92	7	220						29.66	FM-15	T	29.62
02	0101	4		3.00	[SN]	31	-0.6			29	-1.7	92	9	220						FM-16	T	29.61	
02	0138	4		5.00		31	-0.6			31	-0.6	100	8	220						FM-16	T	29.61	
02	0153	4		4.00		32	0.0			31	-0.6	96	8	220						29.65	FM-15	T	29.61
02	0219	4		4.00	[SN]	32	0.0			31	-0.6	96	6	220						FM-16	T	29.60	

02	0253	4		5.00		32	0.0			31	-0.6	96	7	230					29.63	FM-15	T	29.59	
02	0300	4		5.00		32	0.0			31	-0.6	96	7	240						FM-16			29.59
02	0308	4		5.00		32	0.0			31	-0.6	96	7	230						FM-16			29.59
02	0342	4		6.00		32	0.0			30	-1.1	92	8	240						FM-16			29.59
02	0353	4		7.00		32	0.0			30	-1.1	92	9	240					29.62	FM-15		29.58	
02	0417	4		7.00		32	0.0			30	-1.1	92	10	240						FM-16			29.58
02	0453	4		7.00		32	0.0			30	-1.1	92	11	240					29.61	FM-15		29.57	
02	0534	4		7.00		32	0.0			30	-1.1	92	11	250						FM-16			29.57
02	0544	4		7.00		32	0.0			30	-1.1	92	11	250						FM-16			29.57
02	0553	4		8.00		32	0.0			29	-1.7	88	14	250					29.61	FM-15		29.57	
02	0653	4		7.00		31	-0.6			28	-2.2	89	9	240					29.60	FM-15		29.56	
02	0753	4		8.00		31	-0.6			28	-2.2	89	10	230					29.59	FM-15		29.54	
02	0841	4		1.75	SN	31	-0.6			28	-2.2	89	7	220						FM-16	T		29.54
02	0846	4		1.25	SN	31	-0.6			29	-1.7	92	7	220						FM-16	T		29.54
02	0853	4		1.25	SN	31	-0.6			29	-1.7	92	8	220					29.58	FM-15	T	29.53	
02	0920	4		1.25	SN	32	0.0			30	-1.1	92	7	210						FM-16	0.01		29.52
02	0944	4		1.50	SN	32	0.0			30	-1.1	92	7	200						FM-16	0.01		29.50
02	0953	4		1.50	SN	32	0.0			30	-1.1	92	6	200					29.54	FM-15	0.01	29.49	
02	1002	4		1.00	SN	32	0.0			30	-1.1	92	7	200						FM-16	T		29.49
02	1020	4		0.75	SN	32	0.0			31	-0.6	96	9	220						FM-16	0.01		29.48
02	1045	4		1.00	SN	32	0.0			31	-0.6	96	11	210						FM-16	0.01		29.47
02	1053	4		0.75	SN	32	0.0			31	-0.6	96	11	210					29.51	FM-15	0.01	29.47	
02	1108	4		0.75	SN	32	0.0			31	-0.6	96	10	210						FM-16	0.01		29.46
02	1153	4		0.75	SN	32	0.0			31	-0.6	96	10	190					29.47	FM-15	0.02	29.43	
02	1253	4		0.75	SN	33	0.6			31	-0.6	92	10	190					29.43	FM-15	0.01	29.39	
02	1315	4		2.50	SN	33	0.6			31	-0.6	92	7	180						FM-16	T		29.38
02	1322	4		4.00	SN	33	0.6			31	-0.6	92	7	170						FM-16	T		29.37
02	1351	4		2.50	SN	34	1.1			30	-1.1	87	10	190						FM-16	T		29.37
02	1353	4		2.50	SN	33	0.6			31	-0.6	92	9	190					29.40	FM-15	T	29.37	
02	1420	4		2.50	SN	33	0.6			30	-1.1	89	9	180						FM-16	0.01		29.36
02	1433	4		1.75	SN	33	0.6			31	-0.6	92	7	170						FM-16	0.01		29.36
02	1453	4		1.50	SN	33	0.6			31	-0.6	92	9	180					29.39	FM-15	0.02	29.36	
02	1553	4		1.50	SN	33	0.6			32	0.0	96	6	170					29.40	FM-15	0.02	29.36	
02	1653	4		1.75	SN	33	0.6			32	0.0	96	5	180					29.42	FM-15	T	29.38	
02	1700	4		1.50	SN	33	0.6			32	0.0	96	5	240						FM-16	T		29.39
02	1753	4		1.50	SN	33	0.6			32	0.0	96	7	250					29.46	FM-15	0.01	29.42	
02	1800	4		3.00	SN	33	0.6			32	0.0	96	8	250						FM-16	T		29.42
02	1853	4		3.00	SN	33	0.6			32	0.0	96	8	260					29.48	FM-15	T	29.44	
02	1953	4		3.00	SN	33	0.6			32	0.0	96	6	260					29.51	FM-15	0.02	29.47	
02	2053	4		4.00	SN	33	0.6			32	0.0	96	8	240					29.52	FM-15	T	29.49	
02	2121	4		3.00	SN	33	0.6			32	0.0	96	8	240						FM-16	T		29.49
02	2153	4		3.00	SN	34	1.1			32	0.0	92	8	240					29.54	FM-15	T	29.50	
02	2253	4		4.00		34	1.1			32	0.0	92	10	260					29.57	FM-15	T	29.53	
02	2353	4		4.00	RA	35	1.7			32	0.0	89	13	260					29.60	FM-15	T	29.56	
03	0015	4		3.00		35	1.7			33	0.6	93	14	250						FM-16	T		29.57
03	0041	4		5.00		35	1.7			33	0.6	93	13	250						FM-16	T		29.58
03	0053	4		5.00		35	1.7			33	0.6	93	13	240					29.62	FM-15	T	29.58	
03	0153	4		7.00		35	1.7			33	0.6	93	10	250					29.66	FM-15		29.62	
03	0227	4		7.00		36	2.2			33	0.6	89	11	260						FM-16			29.64
03	0253	4		8.00		36	2.2			33	0.6	89	10	250					29.69	FM-15		29.65	
03	0314	4		8.00		35	1.7			32	0.0	89	11	260						FM-16			29.66
03	0353	4		10.00		36	2.2			32	0.0	86	14	250					29.72	FM-15		29.69	
03	0453	4		10.00		36	2.2			32	0.0	86	15	250					29.76	FM-15		29.72	
03	0513	4		10.00		35	1.7			32	0.0	89	10	250						FM-16			29.74
03	0553	4		10.00		35	1.7			32	0.0	89	11	240					29.79	FM-15		29.75	
03	0653	4		10.00		35	1.7			31	-0.6	85	9	240					29.82	FM-15		29.78	
03	0753	4		10.00		35	1.7			31	-0.6	85	8	240					29.85	FM-15		29.82	

03	0853	4		10.00		36	2.2			31	-0.6	82	10	230					29.88	FM-15		29.84
03	0953	4		10.00		37	2.8			32	0.0	82	9	240					29.88	FM-15		29.85
03	1033	4		10.00		39	3.9			32	0.0	76	11	250						FM-16		29.84
03	1053	4		10.00		40	4.4			33	0.6	77	9	250	20				29.89	FM-15		29.85
03	1153	4		10.00		42	5.6			34	1.1	73	14	270					29.88	FM-15		29.84
03	1242	4		10.00		42	5.6			32	0.0	68	14	280						FM-16		29.83
03	1253	4		10.00		42	5.6			33	0.6	71	13	270					29.86	FM-15		29.83
03	1353	4		10.00		41	5.0			32	0.0	70	13	260					29.85	FM-15		29.82
03	1453	4		10.00		42	5.6			33	0.6	71	9	310					29.85	FM-15		29.82
03	1553	4		10.00		42	5.6			32	0.0	68	8	330					29.85	FM-15		29.82
03	1653	4		10.00		39	3.9			31	-0.6	73	5	010					29.85	FM-15		29.82
03	1753	4		10.00		35	1.7			29	-1.7	78	6	050					29.87	FM-15		29.83
03	1853	4		10.00		34	1.1			29	-1.7	82	3	090					29.88	FM-15		29.84
03	1953	4		10.00		31	-0.6			27	-2.8	85	6	060					29.86	FM-15		29.82
03	2053	4		10.00		33	0.6			28	-2.2	82	6	080					29.84	FM-15		29.80
03	2153	4		10.00		34	1.1			30	-1.1	85	7	080					29.82	FM-15		29.78
03	2253	4		10.00		35	1.7			30	-1.1	82	8	070					29.79	FM-15		29.76
03	2353	4		10.00		35	1.7			30	-1.1	82	8	070					29.77	FM-15		29.74
04	0053	4		10.00		34	1.1			30	-1.1	85	9	070					29.75	FM-15		29.71
04	0153	4		10.00		33	0.6			29	-1.7	85	6	030					29.75	FM-15		29.71
04	0253	4		10.00		33	0.6			29	-1.7	85	6	020					29.74	FM-15		29.71
04	0353	4		10.00		33	0.6			29	-1.7	85	5	360					29.73	FM-15		29.70
04	0453	4		10.00		34	1.1			30	-1.1	85	7	010					29.75	FM-15		29.71
04	0530	4		9.00		34	1.1			31	-0.6	89	8	360						FM-16		29.73
04	0539	4		8.00		34	1.1			31	-0.6	89	10	010						FM-16		29.73
04	0553	4		7.00		34	1.1			32	0.0	92	9	010					29.77	FM-15		29.73
04	0620	4		10.00		34	1.1			32	0.0	92	10	350						FM-16		29.76
04	0628	4		10.00		34	1.1			32	0.0	92	9	010						FM-16		29.76
04	0635	4		10.00		34	1.1			32	0.0	92	9	010						FM-16		29.77
04	0653	4		10.00		34	1.1			31	-0.6	89	9	360					29.83	FM-15		29.79
04	0753	4		10.00		34	1.1			30	-1.1	85	7	350					29.85	FM-15		29.81
04	0853	4		10.00		35	1.7			29	-1.7	78	7	350					29.87	FM-15		29.83
04	0953	4		10.00		35	1.7			29	-1.7	78	8	330					29.90	FM-15		29.86
04	1053	4		10.00		34	1.1			26	-3.3	73	8	330					29.91	FM-15		29.87
04	1153	4		10.00		35	1.7			27	-2.8	72	11	350					29.91	FM-15		29.87
04	1253	4		10.00		34	1.1			26	-3.3	73	7	350					29.91	FM-15		29.87
04	1353	4		10.00		35	1.7			27	-2.8	72	6	320					29.90	FM-15		29.86
04	1453	4		10.00		35	1.7			27	-2.8	72	8	310					29.91	FM-15		29.87
04	1653	4		10.00		34	1.1			24	-4.4	67	7	330					29.95	FM-15		29.91
04	1753	4		10.00		33	0.6			24	-4.4	70	6	320					29.97	FM-15		29.93
04	1853	4		10.00		33	0.6			25	-3.9	72	3	320					29.99	FM-15		29.95
04	1953	4		10.00		33	0.6			25	-3.9	72	5	340					30.00	FM-15		29.96
04	2053	4		10.00		32	0.0			26	-3.3	79	5	330					30.01	FM-15		29.97
04	2144	4		10.00		32	0.0			25	-3.9	75	9	330						FM-16		29.98
04	2153	4		10.00		32	0.0			25	-3.9	75	8	340					30.02	FM-15		29.98
04	2230	4		10.00		31	-0.6			22	-5.6	69	15	320						FM-16		30.00
04	2253	4		10.00		30	-1.1			21	-6.1	69	16	330	23				30.05	FM-15		30.01
04	2353	4		10.00		29	-1.7			19	-7.2	66	16	310					30.06	FM-15		30.02
05	0053	4		10.00		28	-2.2			19	-7.2	69	11	320					30.06	FM-15		30.02
05	0144	4		10.00		27	-2.8			19	-7.2	72	14	320						FM-16		30.04
05	0153	4		10.00		27	-2.8			19	-7.2	72	15	340					30.08	FM-15		30.04
05	0253	4		10.00		25	-3.9			14	-10.0	63	16	330					30.13	FM-15		30.08
05	0339	4		10.00		24	-4.4			14	-10.0	65	13	330	20					FM-16		30.08
05	0353	4		10.00		24	-4.4			14	-10.0	65	11	340					30.12	FM-15		30.07
05	0415	4		10.00		24	-4.4			15	-9.4	68	10	340						FM-16		30.10
05	0426	4		10.00		24	-4.4			15	-9.4	68	11	330						FM-16		30.11
05	0453	4		10.00		24	-4.4			15	-9.4	68	11	340					30.17	FM-15		30.12

05	0553	4		10.00		24	-4.4			15	-9.4	68	8	330					30.17	FM-15		30.13
05	0653	4		10.00		23	-5.0			15	-9.4	72	7	360					30.20	FM-15		30.15
05	0753	4		10.00		23	-5.0			15	-9.4	72	7	010					30.22	FM-15		30.17
05	0853	4		10.00		24	-4.4			15	-9.4	68	8	020					30.24	FM-15	T	30.19
05	0953	4		10.00		24	-4.4			15	-9.4	68	8	010					30.22	FM-15	T	30.17
05	1053	4		10.00		24	-4.4			15	-9.4	68	3	VRB					30.24	FM-15	T	30.19
05	1153	4		8.00		24	-4.4			16	-8.9	71	6	360					30.23	FM-15		30.18
05	1253	4		10.00		25	-3.9			17	-8.3	72	8	020					30.20	FM-15		30.15
05	1353	4		10.00		26	-3.3			16	-8.9	66	6	060					30.15	FM-15		30.10
05	1453	4		10.00		26	-3.3			16	-8.9	66	0	000					30.15	FM-15		30.10
05	1553	4		10.00		26	-3.3			16	-8.9	66	6	040					30.16	FM-15		30.10
05	1600	4		10.00		26	-3.3			16	-8.9	66	5	020					FM-16			30.10
05	1653	4		10.00		25	-3.9			17	-8.3	72	9	040					30.12	FM-15		30.06
05	1753	4		10.00		23	-5.0			17	-8.3	78	10	030					30.09	FM-15		30.03
05	1853	4		10.00		24	-4.4			16	-8.9	71	10	060					30.08	FM-15		30.02
05	1953	4		10.00		24	-4.4			17	-8.3	75	10	070					30.06	FM-15		30.00
05	2053	4		10.00		24	-4.4			17	-8.3	75	10	060					30.03	FM-15		29.97
05	2153	4		10.00		24	-4.4			17	-8.3	75	14	060					29.96	FM-15		29.91
05	2253	4		10.00		25	-3.9			18	-7.8	75	9	100					29.92	FM-15		29.87
05	2320	4		2.00	SN	24	-4.4			19	-7.2	81	11	100					FM-16	T		29.85
05	2325	4		1.25	SN	24	-4.4			20	-6.7	84	11	090					FM-16	T		29.85
05	2338	4	19	1.00	SN	24	-4.4			20	-6.7	84	8	090					FM-16	T		29.85
05	2346	4		1.50	SN	24	-4.4			21	-6.1	88	9	080					FM-16	0.01		29.85
05	2353	4		1.25	SN	24	-4.4			21	-6.1	88	9	080					29.90	FM-15	0.01	29.85
06	0003	4	18	1.00	SN	24	-4.4			21	-6.1	88	9	070					FM-16	T		29.84
06	0015	4	14	0.75	SN	24	-4.4			21	-6.1	88	11	070					FM-16	0.01		29.82
06	0025	4	11	0.50	FG SN	24	-4.4			21	-6.1	88	11	070					FM-16	0.02		29.81
06	0045	4	12	0.75	SN	24	-4.4			21	-6.1	88	14	070					FM-16	0.03		29.76
06	0053	4	13	0.75	SN	23	-5.0			21	-6.1	92	14	070					29.80	FM-15	0.04	29.75
06	0118	4		1.00	SN	24	-4.4			22	-5.6	91	9	040					FM-16	0.01		29.78
06	0125	4		1.25	SN	24	-4.4			21	-6.1	88	9	050					FM-16	0.01		29.78
06	0134	4		1.50	SN	24	-4.4			21	-6.1	88	10	050					FM-16	0.01		29.77
06	0150	4		1.25	SN	23	-5.0			21	-6.1	93	11	060					FM-16	0.02		29.76
06	0153	4		1.25	SN	23	-5.0			21	-6.1	92	10	050					29.81	FM-15	0.03	29.76
06	0205	4	14	1.00	SN	23	-5.0			21	-6.1	92	10	050					FM-16	T		29.77
06	0216	4	12	0.75	SN	23	-5.0			21	-6.1	92	11	060					FM-16	T		29.76
06	0228	4	13	1.00	SN	23	-5.0			21	-6.1	92	13	050					FM-16	0.01		29.74
06	0249	4		1.25	SN	23	-5.0			21	-6.1	93	13	050					FM-16	0.01		29.72
06	0253	4		1.25	SN	23	-5.0			21	-6.1	92	13	060					29.77	FM-15	0.01	29.72
06	0306	4		1.75	SN	23	-5.0			21	-6.1	92	13	060					FM-16	T		29.73
06	0317	4		2.00	SN	23	-5.0			21	-6.1	92	13	060					FM-16	T		29.73
06	0342	4		1.25	SN	24	-4.4			21	-6.1	88	13	060					FM-16	T		29.72
06	0353	4		1.50	SN	24	-4.4			21	-6.1	88	11	060					29.77	FM-15	T	29.72
06	0423	4		2.00	SN	24	-4.4			21	-6.1	88	14	070					FM-16	T		29.69
06	0431	4		2.00	SN	24	-4.4			21	-6.1	88	14	080					FM-16	0.01		29.68
06	0453	4		2.50	SN	24	-4.4			22	-5.6	91	13	080					29.73	FM-15	0.01	29.68
06	0507	4		3.00	SN	25	-3.9			22	-5.6	88	13	080					FM-16	T		29.67
06	0537	4		10.00		25	-3.9			23	-5.0	92	13	080					FM-16	T		29.66
06	0553	4		10.00		25	-3.9			23	-5.0	92	14	070					29.71	FM-15	T	29.65
06	0619	4		9.00		26	-3.3			23	-5.0	88	11	060					FM-16			29.65
06	0653	4		5.00		26	-3.3			24	-4.4	92	11	070					29.68	FM-15	T	29.63
06	0721	4		2.50	SN	26	-3.3			24	-4.4	92	11	080					FM-16	T		29.61
06	0753	4		2.50	SN	26	-3.3			24	-4.4	92	10	070					29.67	FM-15	T	29.62
06	0816	4		5.00	SN	26	-3.3			24	-4.4	92	8	070					FM-16	T		29.62
06	0848	4		5.00	SN	27	-2.8			25	-3.9	93	9	060					FM-16	T		29.58
06	0853	4		6.00	SN	27	-2.8			25	-3.9	92	8	050					29.63	FM-15	T	29.58
06	0953	4		9.00	SN	28	-2.2			26	-3.3	92	10	060					29.61	FM-15	T	29.56

06	1053	4		8.00		29	-1.7			27	-2.8	92	10	040					29.62	FM-15	T	29.58
06	1153	4		10.00		28	-2.2			26	-3.3	92	16	050					29.61	FM-15		29.56
06	1251	4		1.25	SN	28	-2.2			27	-2.8	93	14	040						FM-16	T	29.55
06	1253	4		1.25	SN	28	-2.2			27	-2.8	96	14	040					29.60	FM-15	T	29.55
06	1256	4		1.25	SN	28	-2.2			26	-3.3	92	17	040	24					FM-16	T	29.55
06	1336	4		4.00	SN	28	-2.2			26	-3.3	92	15	050						FM-16	0.01	29.53
06	1345	4		4.00	SN	27	-2.8			25	-3.9	92	21	030	29					FM-16	0.01	29.50
06	1353	4		4.00	SN	27	-2.8			25	-3.9	92	15	040	29				29.55	FM-15	0.01	29.50
06	1400	4		4.00	SN	28	-2.2			25	-3.9	88	15	050	23					FM-16	T	29.52
06	1403	4		3.00	FZRA	28	-2.2			26	-3.3	92	14	060	23					FM-16	T	29.52
06	1435	4		10.00		27	-2.8			25	-3.9	92	17	070						FM-16	T	29.50
06	1453	4		4.00	SN	27	-2.8			25	-3.9	92	15	060					29.52	FM-15	T	29.48
06	1553	4		10.00		27	-2.8			24	-4.4	89	13	050					29.49	FM-15	T	29.45
06	1614	4		10.00		26	-3.3			24	-4.4	92	16	040						FM-16		29.47
06	1649	4		10.00		27	-2.8			25	-3.9	93	16	050						FM-16		29.46
06	1653	4		10.00		26	-3.3			24	-4.4	92	16	050					29.50	FM-15		29.46
06	1700	4		8.00		26	-3.3			24	-4.4	92	17	060						FM-16		29.45
06	1738	4		5.00		26	-3.3			25	-3.9	96	18	060						FM-16		29.44
06	1753	4		5.00		26	-3.3			25	-3.9	96	22	060	26				29.48	FM-15		29.43
06	1853	4		5.00	FZRA	26	-3.3			25	-3.9	96	14	050					29.49	FM-15	T	29.45
06	1924	4		3.00	SN	26	-3.3			25	-3.9	96	14	050						FM-16	T	29.46
06	1933	4		3.00	SN	26	-3.3			25	-3.9	96	14	040						FM-16	T	29.45
06	1948	4		2.00	SN	27	-2.8			25	-3.9	93	13	040						FM-16	0.01	29.44
06	1953	4		2.00	SN	26	-3.3			25	-3.9	96	14	040					29.48	FM-15	0.01	29.43
06	2053	4		1.50	SN	26	-3.3			24	-4.4	92	11	040					29.47	FM-15	0.02	29.42
06	2056	4		1.25	SN	26	-3.3			24	-4.4	92	11	050						FM-16	T	29.42
06	2103	4	11	0.75	SN	26	-3.3			24	-4.4	92	9	030						FM-16	T	29.43
06	2129	4	15	1.00	SN	26	-3.3			25	-3.9	96	9	040						FM-16	0.01	29.42
06	2132	4		1.25	SN	26	-3.3			25	-3.9	96	11	030						FM-16	0.01	29.42
06	2140	4		1.50	SN	26	-3.3			24	-4.4	92	14	040						FM-16	0.02	29.41
06	2153	4		1.25	SN	26	-3.3			24	-4.4	92	10	020					29.47	FM-15	0.02	29.42
06	2204	4		1.75	SN	26	-3.3			24	-4.4	92	14	030						FM-16	T	29.42
06	2253	4		2.50	SN	25	-3.9			23	-5.0	92	14	050					29.44	FM-15	T	29.39
06	2303	4		3.00	SN	25	-3.9			23	-5.0	92	13	040						FM-16	T	29.40
06	2314	4		5.00		25	-3.9			23	-5.0	92	15	040						FM-16	T	29.38
06	2353	4		2.50	SN	25	-3.9			23	-5.0	92	10	030					29.43	FM-15	0.01	29.39
07	0010	4		1.75	SN	25	-3.9			23	-5.0	92	10	030						FM-16	T	29.41
07	0021	4		1.25	SN	25	-3.9			23	-5.0	92	9	030						FM-16	T	29.39
07	0031	4		0.75	SN	25	-3.9			23	-5.0	92	10	030						FM-16	T	29.39
07	0038	4	13	0.75	SN	25	-3.9			23	-5.0	92	9	040						FM-16	0.01	29.37
07	0045	4	14	1.00	SN	25	-3.9			23	-5.0	92	9	020						FM-16	0.01	29.39
07	0053	4	14	1.00	SN	25	-3.9			24	-4.4	96	6	030					29.44	FM-15	0.01	29.40
07	0055	4		1.25	SN	25	-3.9			23	-5.0	92	7	030						FM-16	T	29.40
07	0133	4		2.00	SN	25	-3.9			23	-5.0	92	9	050						FM-16	0.01	29.37
07	0144	4		3.00	SN	25	-3.9			23	-5.0	92	9	030						FM-16	0.01	29.37
07	0153	4		3.00	SN	25	-3.9			23	-5.0	92	11	030					29.39	FM-15	0.01	29.34
07	0204	4		2.50	SN	25	-3.9			23	-5.0	92	10	060						FM-16	T	29.37
07	0215	4		3.00	SN	25	-3.9			22	-5.6	88	11	050						FM-16	T	29.36
07	0223	4		4.00	SN	25	-3.9			23	-5.0	92	10	050						FM-16	T	29.35
07	0234	4		2.50	SN	24	-4.4			23	-5.0	96	9	050						FM-16	T	29.36
07	0253	4		2.00	SN	24	-4.4			22	-5.6	91	8	030					29.41	FM-15	T	29.36
07	0330	4		3.00	SN	24	-4.4			22	-5.6	91	9	020						FM-16	T	29.34
07	0337	4		2.50	SN	24	-4.4			22	-5.6	91	7	020						FM-16	T	29.35
07	0347	4		3.00	SN	25	-3.9			23	-5.0	93	7	010						FM-16	T	29.35
07	0353	4		4.00	SN	24	-4.4			23	-5.0	96	8	010					29.40	FM-15	T	29.35
07	0419	4		10.00		25	-3.9			22	-5.6	88	11	030						FM-16	T	29.32
07	0453	4		10.00		25	-3.9			22	-5.6	88	10	030					29.35	FM-15	T	29.31

07	0530	4		4.00	SN	25	-3.9			22	-5.6	88	14	030					FM-16	T	29.28	
07	0553	4		9.00		24	-4.4			22	-5.6	91	10	040					29.32	FM-15	T	29.28
07	0600	4		10.00		24	-4.4			22	-5.6	91	9	040					FM-16		29.28	
07	0653	4		10.00		24	-4.4			21	-6.1	88	10	030					29.31	FM-15	T	29.27
07	0753	4		4.00	SN	24	-4.4			21	-6.1	88	9	010					29.31	FM-15	0.01	29.27
07	0809	4		2.50	SN	24	-4.4			21	-6.1	88	8	010					FM-16	0.01	29.29	
07	0853	4		2.50	SN	24	-4.4			22	-5.6	91	13	360					29.33	FM-15	0.03	29.28
07	0900	4	13	0.50	FG SN	24	-4.4			21	-6.1	88	11	360					FM-16	T	29.28	
07	0953	4		1.00	SN	24	-4.4			21	-6.1	88	11	360					29.35	FM-15	0.01	29.30
07	1053	4		1.00	SN	24	-4.4			21	-6.1	88	14	350					29.36	FM-15	0.01	29.31
07	1100	4		1.00	SN	24	-4.4			22	-5.6	91	13	350					FM-16	T	29.31	
07	1105	4		0.75	SN	24	-4.4			21	-6.1	88	14	350	22				FM-16	T	29.31	
07	1150	4		1.00	SN	25	-3.9			21	-6.1	86	13	350					FM-16	0.01	29.33	
07	1153	4		1.00	SN	24	-4.4			21	-6.1	88	15	340	22				29.38	FM-15	0.01	29.33
07	1253	4		1.00	SN	24	-4.4			21	-6.1	88	18	340					29.39	FM-15	T	29.34
07	1353	4	10	0.50	FG SN	24	-4.4			21	-6.1	88	14	340					29.42	FM-15	0.01	29.37
07	1420	4		1.25	SN	25	-3.9			21	-6.1	85	16	330					FM-16	T	29.39	
07	1425	4		2.00	SN	25	-3.9			20	-6.7	81	17	330					FM-16	T	29.39	
07	1440	4		3.00	SN	25	-3.9			19	-7.2	78	15	330					FM-16	T	29.40	
07	1453	4		4.00	SN	25	-3.9			18	-7.8	75	21	330	26				29.47	FM-15	T	29.42
07	1551	4		2.00	SN	25	-3.9			18	-7.8	74	17	330					FM-16	T	29.48	
07	1553	4		2.00	SN	25	-3.9			18	-7.8	75	17	320					29.53	FM-15	T	29.48
07	1556	4		1.75	SN	24	-4.4			18	-7.8	77	20	310					FM-16	T	29.49	
07	1630	4		9.00	SN	24	-4.4			17	-8.3	75	14	310	26				FM-16	T	29.52	
07	1653	4		10.00		24	-4.4			16	-8.9	71	15	310	24				29.59	FM-15	T	29.54
07	1753	4		10.00		24	-4.4			15	-9.4	68	10	300					29.64	FM-15	T	29.59
07	1853	4		10.00		23	-5.0			14	-10.0	68	18	300					29.70	FM-15		29.65
07	1953	4		10.00		23	-5.0			13	-10.6	65	16	310	28				29.75	FM-15		29.70
07	2053	4		10.00		22	-5.6			12	-11.1	66	14	300					29.81	FM-15		29.76
07	2153	4		10.00		19	-7.2			10	-12.2	68	10	290					29.86	FM-15		29.80
07	2253	4		10.00		18	-7.8			10	-12.2	71	8	290					29.88	FM-15		29.82
07	2353	4		10.00		18	-7.8			10	-12.2	71	9	260					29.91	FM-15		29.86
08	0053	4		10.00		16	-8.9			9	-12.8	74	10	270					29.94	FM-15		29.88
08	0153	4		10.00		16	-8.9			9	-12.8	74	9	260					29.96	FM-15		29.90
08	0248	4		10.00		18	-7.8			12	-11.1	79	7	240					FM-16		29.92	
08	0253	4		10.00		18	-7.8			13	-10.6	81	8	250					29.98	FM-15		29.93
08	0338	4		10.00		15	-9.4			10	-12.2	80	7	250					FM-16		29.94	
08	0353	4		10.00		14	-10.0			10	-12.2	84	6	270					30.01	FM-15		29.95
08	0453	4		10.00		13	-10.6			10	-12.2	88	7	270					30.04	FM-15		29.98
08	0514	4		10.00		13	-10.6			11	-11.7	92	5	260					FM-16		29.98	
08	0553	4		10.00		15	-9.4			12	-11.1	88	6	270					30.06	FM-15		30.00
08	0609	4		10.00		16	-8.9			13	-10.6	88	7	280					FM-16		30.01	
08	0653	4		10.00		17	-8.3			13	-10.6	84	7	020					30.10	FM-15		30.04
08	0753	4		10.00		16	-8.9			12	-11.1	84	5	030					30.14	FM-15		30.08
08	0853	4		8.00	SN	17	-8.3			12	-11.1	80	9	030					30.18	FM-15	T	30.12
08	0953	4		6.00	SN	16	-8.9			12	-11.1	84	9	050					30.20	FM-15	T	30.14
08	1053	4		7.00	SN	17	-8.3			12	-11.1	80	9	030					30.23	FM-15	T	30.17
08	1153	4		6.00	SN	18	-7.8			12	-11.1	77	8	030					30.24	FM-15	T	30.18
08	1200	4		4.00	SN	18	-7.8			13	-10.6	81	9	060					FM-16	T	30.18	
08	1253	4		6.00	SN	18	-7.8			12	-11.1	77	7	050					30.24	FM-15	T	30.17
08	1353	4		10.00		19	-7.2			12	-11.1	74	7	050					30.24	FM-15	T	30.18
08	1453	4		10.00		19	-7.2			12	-11.1	74	9	050					30.24	FM-15		30.18
08	1553	4		10.00		18	-7.8			10	-12.2	71	7	090					30.27	FM-15	T	30.20
08	1653	4		10.00		18	-7.8			11	-11.7	74	8	060					30.30	FM-15		30.23
08	1753	4		10.00		15	-9.4			9	-12.8	77	7	070					30.32	FM-15		30.25
08	1853	4		10.00		16	-8.9			10	-12.2	77	7	080					30.34	FM-15		30.27
08	1953	4		10.00		16	-8.9			10	-12.2	77	6	080					30.35	FM-15		30.28

08	2053	4		10.00		13	-10.6			8	-13.3	81	5	080					30.36	FM-15		30.29
08	2153	4		10.00		11	-11.7			7	-13.9	84	5	070					30.37	FM-15		30.30
08	2253	4		10.00		11	-11.7			8	-13.3	88	5	070					30.37	FM-15		30.30
08	2353	4		10.00		12	-11.1			8	-13.3	84	5	080					30.37	FM-15		30.30
09	0053	4		10.00		11	-11.7			8	-13.3	88	3	070					30.37	FM-15		30.30
09	0153	4		10.00		11	-11.7			9	-12.8	92	3	050					30.38	FM-15		30.31
09	0253	4		10.00		12	-11.1			8	-13.3	84	3	090					30.39	FM-15		30.32
09	0353	4		10.00		12	-11.1			9	-12.8	87	0	000					30.40	FM-15		30.33
09	0425	4		10.00		14	-10.0			10	-12.2	84	0	000					FM-16			30.34
09	0453	4		10.00		15	-9.4			10	-12.2	80	3	040					30.41	FM-15		30.34
09	0553	4		9.00		17	-8.3			13	-10.6	84	3	060					30.42	FM-15		30.35
09	0653	4		9.00		19	-7.2			16	-8.9	88	3	110					30.43	FM-15		30.37
09	0728	4		8.00		19	-7.2			16	-8.9	88	6	110					FM-16			30.37
09	0753	4		7.00		19	-7.2			16	-8.9	88	5	100					30.44	FM-15		30.37
09	0821	4		1.75	SN	21	-6.1			18	-7.8	88	7	110					FM-16	T		30.37
09	0834	4		2.00	SN	21	-6.1			18	-7.8	88	5	130					FM-16	T		30.37
09	0853	4		2.00		22	-5.6			19	-7.2	89	3	120					30.44	FM-15	T	30.37
09	0900	4		7.00		22	-5.6			19	-7.2	89	3	140					FM-16			30.37
09	0919	4		7.00		22	-5.6			20	-6.7	92	6	130					FM-16			30.37
09	0953	4		8.00		26	-3.3			22	-5.6	84	7	160					30.45	FM-15		30.38
09	1050	4		2.00	SN	28	-2.2			27	-2.8	93	7	170					FM-16	T		30.38
09	1053	4		2.00	SN	29	-1.7			26	-3.3	89	7	170					30.44	FM-15	0.01	30.38
09	1100	4		1.00	SN	29	-1.7			27	-2.8	92	7	170					FM-16	T		30.38
09	1103	4		1.50	SN	29	-1.7			27	-2.8	92	6	170					FM-16	T		30.37
09	1107	4		1.75	SN	29	-1.7			27	-2.8	92	5	160					FM-16	T		30.37
09	1121	4		2.00	SN	30	-1.1			29	-1.7	96	3	190					FM-16	T		30.37
09	1134	4		3.00		30	-1.1			28	-2.2	92	7	310					FM-16	T		30.38
09	1153	4		5.00		31	-0.6			29	-1.7	92	8	210					30.42	FM-15	T	30.36
09	1253	4		9.00		34	1.1			28	-2.2	79	16	230					30.40	FM-15		30.34
09	1304	4		9.00		34	1.1			28	-2.2	79	16	230					FM-16			30.33
09	1353	4		10.00		34	1.1			28	-2.2	79	14	210					30.36	FM-15		30.31
09	1453	4		10.00		35	1.7			27	-2.8	72	15	210					30.34	FM-15		30.29
09	1553	4		10.00		35	1.7			26	-3.3	70	13	220					30.35	FM-15		30.29
09	1653	4		10.00		35	1.7			27	-2.8	72	8	200					30.33	FM-15		30.27
09	1753	4		10.00		34	1.1			27	-2.8	75	8	180					30.28	FM-15		30.23
09	1853	4		10.00		34	1.1			27	-2.8	75	14	180					30.26	FM-15		30.21
09	1946	4		1.75	SN	33	0.6			28	-2.2	82	18	190	25				FM-16	T		30.16
09	1953	4		1.25	SN	33	0.6			29	-1.7	85	13	190	23				30.21	FM-15	T	30.16
09	2009	4		1.00	SN	32	0.0			30	-1.1	92	14	190					FM-16	T		30.15
09	2033	4		1.25	SN	32	0.0			30	-1.1	92	13	180					FM-16	T		30.14
09	2053	4		1.25	SN	32	0.0			30	-1.1	92	16	180					30.16	FM-15	T	30.12
09	2153	4		1.25	SN	32	0.0			30	-1.1	92	14	180					30.13	FM-15	0.01	30.08
09	2158	4		1.75	SN	32	0.0			30	-1.1	92	13	170					FM-16	T		30.08
09	2202	4		1.75	SN	32	0.0			31	-0.6	96	11	180					FM-16	T		30.08
09	2217	4		1.75	SN	32	0.0			31	-0.6	96	13	170					FM-16	0.01		30.06
09	2224	4		1.75	SN	32	0.0			31	-0.6	96	11	170					FM-16	0.01		30.05
09	2253	4		1.50	SN	32	0.0			31	-0.6	96	13	160					30.07	FM-15	0.01	30.03
09	2305	4		1.50	SN	32	0.0			31	-0.6	96	13	160					FM-16	T		30.02
09	2316	4		1.75	SN	32	0.0			31	-0.6	96	13	170					FM-16	T		30.01
09	2323	4		2.50	SN	32	0.0			31	-0.6	96	14	170					FM-16	T		30.00
09	2334	4		3.00	SN	33	0.6			31	-0.6	92	15	180					FM-16	0.01		29.99
09	2342	4		3.00	SN	33	0.6			31	-0.6	92	16	180					FM-16	0.01		29.99
09	2353	4		3.00	SN	33	0.6			31	-0.6	92	15	180					30.02	FM-15	0.01	29.98
10	0037	4		5.00		33	0.6			32	0.0	96	14	200					FM-16	T		29.96
10	0048	4		5.00	RA	34	1.1			32	0.0	93	14	200					FM-16	T		29.96
10	0053	4		5.00	RA	33	0.6			32	0.0	96	13	200					29.99	FM-15	T	29.95
10	0153	4		7.00	RA	36	2.2			33	0.6	89	15	200					29.96	FM-15	0.01	29.91

10	0208	4		5.00	IRA	36	2.2			33	0.6	89	14	200						FM-16	T	29.91	
10	0226	4		10.00		36	2.2			34	1.1	93	14	210						FM-16	T	29.91	
10	0253	4		10.00		36	2.2			34	1.1	93	15	210						29.94	FM-15	T	29.90
10	0340	4		4.00		37	2.8			34	1.1	89	15	230						FM-16		29.89	
10	0353	4		4.00		36	2.2			35	1.7	97	14	220						29.92	FM-15		29.89
10	0400	4		5.00		37	2.8			35	1.7	93	14	230						FM-16		29.89	
10	0453	4		3.00		36	2.2			35	1.7	97	9	230						29.93	FM-15		29.89
10	0501	4		2.50		36	2.2			35	1.7	97	10	230						FM-16		29.90	
10	0516	4		2.50		36	2.2			35	1.7	97	11	240						FM-16	0.01	29.90	
10	0546	4		3.00		36	2.2			35	1.7	97	11	250						FM-16	0.01	29.91	
10	0553	4		4.00		36	2.2			35	1.7	97	13	260						29.94	FM-15	0.01	29.91
10	0629	4		6.00		35	1.7			35	1.7	100	9	250						FM-16		29.92	
10	0653	4		6.00	IRA	35	1.7			34	1.1	96	8	260						29.97	FM-15	T	29.93
10	0753	4		8.00		35	1.7			34	1.1	96	8	250						30.00	FM-15	T	29.96
10	0853	4		6.00		35	1.7			33	0.6	93	8	240						30.03	FM-15		29.99
10	0953	4		6.00		35	1.7			33	0.6	93	10	250						30.05	FM-15		30.01
10	1053	4		8.00		35	1.7			32	0.0	89	10	270						30.06	FM-15		30.03
10	1100	4		8.00		35	1.7			33	0.6	93	11	270						FM-16		30.03	
10	1153	4		8.00		36	2.2			32	0.0	86	14	280						30.08	FM-15		30.04
10	1200	4		8.00		35	1.7			32	0.0	89	13	300						FM-16		30.04	
10	1223	4		9.00		35	1.7			31	-0.6	85	9	270						FM-16		30.04	
10	1253	4		9.00		36	2.2			32	0.0	86	9	300						30.08	FM-15		30.04
10	1353	4		10.00		36	2.2			27	-2.8	70	10	290						30.08	FM-15		30.04
10	1453	4		10.00		37	2.8			27	-2.8	67	9	310						30.09	FM-15		30.06
10	1553	4		10.00		37	2.8			27	-2.8	67	8	320						30.11	FM-15		30.08
10	1653	4		10.00		36	2.2			27	-2.8	70	7	340						30.12	FM-15		30.08
10	1735	4		10.00		36	2.2			25	-3.9	64	0	000						FM-16		30.08	
10	1753	4		10.00		35	1.7			26	-3.3	70	3	260						30.13	FM-15		30.09
10	1853	4		10.00		35	1.7			28	-2.2	76	6	030						30.14	FM-15		30.09
10	1953	4		10.00		34	1.1			27	-2.8	75	0	000						30.13	FM-15		30.09
10	2053	4		10.00		33	0.6			27	-2.8	78	3	070						30.13	FM-15		30.09
10	2153	4		10.00		33	0.6			27	-2.8	78	5	070						30.13	FM-15		30.09
10	2253	4		10.00		33	0.6			28	-2.2	82	5	070						30.11	FM-15		30.07
10	2353	4		10.00		33	0.6			28	-2.2	82	0	000						30.11	FM-15		30.07
11	0053	4		10.00		31	-0.6			27	-2.8	85	0	000						30.08	FM-15		30.04
11	0153	4		10.00		31	-0.6			27	-2.8	85	0	000						30.06	FM-15		30.02
11	0253	4		10.00		31	-0.6			28	-2.2	89	0	000						30.07	FM-15		30.03
11	0353	4		8.00		30	-1.1			27	-2.8	88	0	000						30.06	FM-15		30.02
11	0451	4		8.00		28	-2.2			27	-2.8	93	0	000						FM-16		30.01	
11	0453	4		8.00		29	-1.7			27	-2.8	92	0	000						30.05	FM-15		30.01
11	0553	4		7.00		29	-1.7			27	-2.8	92	0	000						30.06	FM-15		30.01
11	0653	4		5.00		30	-1.1			28	-2.2	92	3	210						30.04	FM-15		30.00
11	0753	4		5.00		30	-1.1			29	-1.7	96	3	240						30.05	FM-15		30.01
11	0853	4		5.00		32	0.0			29	-1.7	88	3	230						30.04	FM-15		30.00
11	0953	4		5.00		33	0.6			30	-1.1	89	5	240						30.02	FM-15		29.98
11	1053	4		5.00		33	0.6			30	-1.1	89	8	230						30.00	FM-15		29.96
11	1153	4		9.00		33	0.6			27	-2.8	78	11	260						30.00	FM-15		29.96
11	1253	4		10.00		35	1.7			27	-2.8	72	17	230						29.96	FM-15		29.92
11	1353	4		10.00		34	1.1			26	-3.3	73	13	240						29.94	FM-15		29.90
11	1453	4		10.00		34	1.1			26	-3.3	73	15	240						29.92	FM-15		29.88
11	1553	4		10.00		34	1.1			26	-3.3	73	16	230						29.94	FM-15		29.90
11	1653	4		8.00		33	0.6			27	-2.8	78	18	230						29.94	FM-15		29.90
11	1753	4		10.00		32	0.0			26	-3.3	79	15	230						29.94	FM-15		29.90
11	1853	4		10.00		32	0.0			26	-3.3	79	15	240						29.97	FM-15		29.93
11	1953	4		10.00		32	0.0			27	-2.8	82	15	240						29.98	FM-15		29.94
11	2053	4		9.00		32	0.0			27	-2.8	82	11	260						29.99	FM-15		29.95
11	2153	4		9.00		32	0.0			26	-3.3	79	13	260						30.02	FM-15		29.98

11	2227	4		7.00	ISN	32	0.0			26	-3.3	79	10	260						FM-16	T	29.99	
11	2253	4		9.00		32	0.0			26	-3.3	79	15	290						30.05	FM-15	T	30.01
11	2341	4		10.00		30	-1.1			20	-6.7	66	20	280	33					FM-16			30.04
11	2353	4		10.00		30	-1.1			20	-6.7	66	20	280	28					30.08	FM-15		30.04
12	0053	4		10.00		29	-1.7			19	-7.2	66	20	280						30.11	FM-15		30.06
12	0153	4		10.00		27	-2.8			18	-7.8	69	14	270						30.12	FM-15		30.08
12	0253	4		10.00		26	-3.3			18	-7.8	71	11	250						30.15	FM-15		30.10
12	0353	4		10.00		27	-2.8			19	-7.2	72	9	250						30.16	FM-15		30.11
12	0453	4		10.00		27	-2.8			18	-7.8	69	9	250						30.18	FM-15		30.13
12	0553	4		10.00		27	-2.8			18	-7.8	69	14	240						30.19	FM-15		30.14
12	0633	4		10.00		26	-3.3			17	-8.3	69	13	270						FM-16			30.14
12	0648	4		10.00		27	-2.8			18	-7.8	69	8	260						FM-16			30.14
12	0653	4		10.00		25	-3.9			17	-8.3	72	7	270						30.18	FM-15		30.13
12	0736	4		10.00		24	-4.4			18	-7.8	77	7	250						FM-16			30.13
12	0753	4		10.00		25	-3.9			19	-7.2	78	7	240						30.18	FM-15		30.13
12	0853	4		10.00		28	-2.2			19	-7.2	69	8	230						30.17	FM-15		30.13
12	0902	4		10.00		28	-2.2			20	-6.7	72	8	230						FM-16			30.12
12	0953	4		10.00		29	-1.7			21	-6.1	72	9	220						30.15	FM-15		30.10
12	1025	4		10.00		31	-0.6			23	-5.0	72	11	230						FM-16			30.11
12	1053	4		10.00		32	0.0			24	-4.4	73	16	230						30.16	FM-15		30.12
12	1153	4		10.00		33	0.6			24	-4.4	70	22	220	29					30.15	FM-15		30.11
12	1253	4		10.00		32	0.0			24	-4.4	73	17	220						30.11	FM-15		30.07
12	1353	4		10.00		33	0.6			25	-3.9	72	18	240						30.11	FM-15		30.07
12	1453	4		10.00		33	0.6			24	-4.4	70	14	220						30.08	FM-15		30.04
12	1553	4		10.00		34	1.1			25	-3.9	70	10	220						30.07	FM-15		30.03
12	1653	4		10.00		34	1.1			24	-4.4	67	9	210						30.04	FM-15		30.00
12	1753	4		10.00		33	0.6			25	-3.9	72	9	220						30.01	FM-15		29.96
12	1853	4		10.00		33	0.6			25	-3.9	72	5	180						29.98	FM-15		29.93
12	1953	4		10.00		32	0.0			26	-3.3	79	3	180						29.94	FM-15		29.90
12	2053	4		10.00		32	0.0			26	-3.3	79	7	200						29.92	FM-15		29.87
12	2153	4		10.00		32	0.0			26	-3.3	79	5	180						29.88	FM-15		29.84
12	2257	4	2.00	ISN		33	0.6			27	-2.8	78	11	220						FM-16	T		29.85
12	2319	4	14	1.00	ISN	31	-0.6			28	-2.2	89	8	250						FM-16	T		29.84
12	2337	4		1.25	ISN	31	-0.6			29	-1.7	92	6	230						FM-16	0.01		29.81
12	2353	4		1.25	ISN	31	-0.6			30	-1.1	96	3	250						29.85	FM-15	0.02	29.80
12	2358	4		1.50	ISN	31	-0.6			30	-1.1	96	3	270						FM-16	T		29.80
13	0053	4		2.00	ISN	31	-0.6			30	-1.1	96	6	280						29.84	FM-15	0.01	29.80
13	0104	4		2.00	ISN	31	-0.6			30	-1.1	96	5	300						FM-16	0.01		29.78
13	0137	4		5.00		31	-0.6			30	-1.1	96	7	320						FM-16	0.01		29.75
13	0153	4		9.00		31	-0.6			29	-1.7	92	8	340						29.77	FM-15	0.01	29.73
13	0246	4		6.00		31	-0.6			29	-1.7	92	5	340						FM-16			29.71
13	0253	4		5.00		31	-0.6			29	-1.7	92	6	340						29.75	FM-15		29.70
13	0327	4		5.00		31	-0.6			29	-1.7	92	10	340						FM-16			29.70
13	0353	4		9.00		30	-1.1			28	-2.2	92	7	350						29.73	FM-15		29.69
13	0418	4		2.50	ISN	30	-1.1			28	-2.2	92	7	350						FM-16	T		29.70
13	0426	4		3.00	ISN	30	-1.1			28	-2.2	92	8	340						FM-16	0.01		29.70
13	0433	4		2.00	ISN	30	-1.1			27	-2.8	88	8	350						FM-16	0.01		29.69
13	0446	4		1.75	ISN	29	-1.7			28	-2.2	96	6	330						FM-16	0.01		29.71
13	0453	4		1.75	ISN	29	-1.7			28	-2.2	96	5	340						29.75	FM-15	0.02	29.71
13	0508	4		1.75	ISN	29	-1.7			28	-2.2	96	6	330						FM-16	T		29.71
13	0518	4		2.00	ISN	29	-1.7			28	-2.2	96	6	340						FM-16	T		29.69
13	0525	4		2.00	ISN	29	-1.7			28	-2.2	96	6	330						FM-16	T		29.69
13	0539	4		2.00	ISN	29	-1.7			28	-2.2	96	6	330						FM-16	T		29.70
13	0553	4		2.50	ISN	29	-1.7			28	-2.2	96	6	340						29.72	FM-15	0.01	29.68
13	0603	4		3.00	ISN	29	-1.7			28	-2.2	96	7	350						FM-16	T		29.69
13	0629	4		4.00	ISN	29	-1.7			27	-2.8	92	5	020						FM-16	T		29.67
13	0653	4		6.00		29	-1.7			28	-2.2	96	6	340						29.74	FM-15	T	29.70

13	0753	4		7.00	SN	30	-1.1			28	-2.2	92	3	350					29.75	FM-15		29.71
13	0837	4		2.50	SN	30	-1.1			29	-1.7	96	0	000						FM-16	T	29.72
13	0853	4		1.25	SN	30	-1.1			29	-1.7	96	0	000					29.76	FM-15	T	29.72
13	0953	4		1.00	SN	30	-1.1			29	-1.7	96	3	330					29.76	FM-15	0.02	29.72
13	1053	4		5.00		31	-0.6			28	-2.2	89	6	290					29.78	FM-15	T	29.73
13	1153	4		8.00		32	0.0			28	-2.2	85	6	310					29.78	FM-15	T	29.73
13	1253	4		4.00	SN	32	0.0			29	-1.7	88	6	300					29.76	FM-15	T	29.72
13	1304	4		1.75	SN	32	0.0			28	-2.2	85	10	280					FM-16	T	29.72	
13	1314	4		1.00	SN	32	0.0			29	-1.7	88	9	300					FM-16	T	29.72	
13	1334	4		0.75	SN	31	-0.6			29	-1.7	92	9	300					FM-16	0.01	29.72	
13	1351	4		1.00	SN	32	0.0			30	-1.1	93	9	300					FM-16	0.01	29.73	
13	1353	4		1.00	SN	32	0.0			30	-1.1	92	10	300					29.77	FM-15	0.01	29.73
13	1359	4		1.50	SN	32	0.0			29	-1.7	88	10	300					FM-16	T	29.73	
13	1453	4		2.00	SN	31	-0.6			29	-1.7	92	8	300					29.80	FM-15	T	29.76
13	1523	4		1.50	SN	30	-1.1			28	-2.2	92	11	310					FM-16	0.01	29.77	
13	1553	4		1.50	SN	29	-1.7			26	-3.3	89	11	340					29.84	FM-15	0.01	29.79
13	1653	4		1.50	SN	25	-3.9			23	-5.0	92	15	330					29.89	FM-15	0.01	29.84
13	1723	4		1.25	SN	25	-3.9			22	-5.6	88	14	320					FM-16	T	29.87	
13	1733	4		1.00	SN	24	-4.4			21	-6.1	88	14	310					FM-16	T	29.87	
13	1741	4		1.50	SN	23	-5.0			21	-6.1	92	17	310					FM-16	T	29.88	
13	1748	4		1.00	SN	23	-5.0			19	-7.2	86	16	320					FM-16	T	29.89	
13	1753	4		3.00	SN	23	-5.0			20	-6.7	88	14	320					29.95	FM-15	T	29.90
13	1807	4		1.75	SN	22	-5.6			20	-6.7	92	16	320					FM-16	T	29.91	
13	1843	4		3.00	SN	21	-6.1			18	-7.8	88	11	340					FM-16	T	29.94	
13	1853	4		3.00	SN	20	-6.7			17	-8.3	89	14	340					29.99	FM-15	T	29.94
13	1931	4		5.00	SN	20	-6.7			16	-8.9	85	15	340					FM-16	T	29.96	
13	1953	4		3.00	SN	19	-7.2			15	-9.4	84	13	340					30.02	FM-15	T	29.97
13	2028	4		2.50	SN	19	-7.2			15	-9.4	84	15	330					FM-16	T	30.01	
13	2053	4		2.00	SN	18	-7.8			15	-9.4	88	11	340					30.08	FM-15	T	30.02
13	2107	4		2.00	SN	18	-7.8			14	-10.0	84	15	340					FM-16	T	30.03	
13	2116	4		1.50	SN	18	-7.8			14	-10.0	84	17	330					FM-16	T	30.04	
13	2125	4		1.25	SN	18	-7.8			14	-10.0	84	15	340					FM-16	T	30.05	
13	2131	4		1.00	SN	17	-8.3			13	-10.6	84	15	330					FM-16	T	30.05	
13	2141	4		1.50	SN	16	-8.9			12	-11.1	84	17	330					FM-16	T	30.06	
13	2147	4		2.00	SN	16	-8.9			12	-11.1	86	14	340					FM-16	T	30.06	
13	2153	4		2.50	SN	16	-8.9			11	-11.7	80	15	330					30.12	FM-15	T	30.07
13	2200	4		3.00	SN	15	-9.4			11	-11.7	84	15	340					FM-16	T	30.07	
13	2209	4		2.00	SN	15	-9.4			10	-12.2	80	16	340					FM-16	T	30.08	
13	2245	4		4.00	SN	15	-9.4			9	-12.8	77	16	320					FM-16	T	30.11	
13	2253	4		2.50	SN	14	-10.0			9	-12.8	80	16	320					30.17	FM-15	T	30.11
13	2309	4		2.50	SN	14	-10.0			9	-12.8	80	14	320					FM-16	T	30.12	
13	2323	4		3.00	SN	14	-10.0			9	-12.8	80	15	310					FM-16	T	30.13	
13	2353	4		5.00	SN	14	-10.0			8	-13.3	77	17	310					30.20	FM-15	T	30.14
14	0032	4		1.75	SN	13	-10.6			7	-13.9	77	16	340					FM-16	T	30.16	
14	0040	4		1.25	SN	13	-10.6			8	-13.3	81	14	330					FM-16	T	30.17	
14	0044	4		2.00	SN	13	-10.6			8	-13.3	81	15	340					FM-16	T	30.18	
14	0053	4		5.00	SN	12	-11.1			6	-14.4	77	16	330					30.24	FM-15	T	30.18
14	0131	4		9.00		11	-11.7			4	-15.6	73	16	340					FM-16	T	30.20	
14	0153	4		10.00		10	-12.2			3	-16.1	73	18	340					30.28	FM-15	T	30.22
14	0209	4		10.00		10	-12.2			3	-16.1	73	14	350					FM-16		30.23	
14	0253	4		10.00		9	-12.8			1	-17.2	70	13	350					30.32	FM-15		30.25
14	0353	4		9.00		7	-13.9			1	-17.2	76	15	320					30.35	FM-15	T	30.28
14	0453	4		6.00	SN	7	-13.9			1	-17.2	76	15	340					30.38	FM-15	T	30.31
14	0553	4		9.00		5	-15.0			-1	-18.3	76	11	340					30.42	FM-15	T	30.35
14	0653	4		9.00		4	-15.6			-2	-18.9	76	11	350					30.46	FM-15	T	30.38
14	0753	4		4.00	SN	4	-15.6			0	-17.8	83	7	350					30.50	FM-15	T	30.43
14	0853	4		5.00	FU	5	-15.0			-1	-18.3	76	9	360					30.53	FM-15	T	30.45

14	0953	4		4.00	ISN	7	-13.9			2	-16.7	80	7	360					30.55	FM-15	T	30.48
14	1053	4		3.00	ISN	8	-13.3			2	-16.7	76	9	020					30.59	FM-15	T	30.51
14	1153	4		4.00	ISN	9	-12.8			1	-17.2	70	7	360					30.60	FM-15	T	30.52
14	1253	4		10.00		10	-12.2			1	-17.2	67	6	330					30.59	FM-15	T	30.51
14	1353	4		10.00		10	-12.2			0	-17.8	63	3	200					30.59	FM-15		30.51
14	1453	4		10.00		12	-11.1			-1	-18.3	56	0	000					30.59	FM-15		30.51
14	1553	4		10.00		13	-10.6			-1	-18.3	54	5	160					30.60	FM-15		30.52
14	1653	4		10.00		13	-10.6			0	-17.8	56	7	200					30.60	FM-15		30.53
14	1753	4		10.00		12	-11.1			1	-17.2	61	10	210					30.62	FM-15		30.54
14	1853	4		10.00		10	-12.2			1	-17.2	67	8	200					30.63	FM-15		30.55
14	1953	4		10.00		10	-12.2			2	-16.7	69	7	200					30.63	FM-15		30.55
14	2053	4		10.00		10	-12.2			2	-16.7	69	6	200					30.63	FM-15		30.55
14	2153	4		10.00		9	-12.8			2	-16.7	73	3	180					30.63	FM-15		30.54
14	2253	4		10.00		9	-12.8			3	-16.1	77	3	150					30.61	FM-15		30.53
14	2353	4		10.00		8	-13.3			2	-16.7	76	5	150					30.61	FM-15		30.53
15	0053	4		10.00		9	-12.8			1	-17.2	70	8	140					30.60	FM-15		30.52
15	0153	4		10.00		11	-11.7			3	-16.1	70	7	140					30.60	FM-15		30.52
15	0253	4		5.00	ISN	12	-11.1			5	-15.0	73	8	150					30.57	FM-15	T	30.50
15	0313	4		3.00	ISN	13	-10.6			7	-13.9	77	8	160					FM-16	T	30.49	
15	0353	4		10.00		16	-8.9			10	-12.2	77	10	190					30.54	FM-15	T	30.47
15	0453	4		10.00		16	-8.9			10	-12.2	77	16	200					30.55	FM-15		30.48
15	0553	4		10.00		15	-9.4			9	-12.8	77	10	190					30.54	FM-15		30.47
15	0653	4		10.00		16	-8.9			10	-12.2	77	13	190					30.53	FM-15		30.46
15	0753	4		10.00		16	-8.9			10	-12.2	77	13	190					30.53	FM-15		30.45
15	0853	4		10.00		17	-8.3			11	-11.7	77	14	180					30.50	FM-15		30.42
15	0953	4		10.00		18	-7.8			11	-11.7	74	15	180					30.45	FM-15		30.38
15	1053	4		10.00		21	-6.1			12	-11.1	68	20	220	29				30.44	FM-15		30.36
15	1153	4		10.00		23	-5.0			13	-10.6	65	22	220	26				30.40	FM-15		30.33
15	1253	4		10.00		25	-3.9			14	-10.0	63	16	220	29				30.35	FM-15		30.28
15	1353	4		10.00		26	-3.3			13	-10.6	57	20	210					30.30	FM-15		30.24
15	1453	4		10.00		27	-2.8			11	-11.7	51	20	210					30.24	FM-15		30.18
15	1553	4		10.00		28	-2.2			14	-10.0	56	16	220	22				30.24	FM-15		30.18
15	1653	4		10.00		28	-2.2			15	-9.4	58	11	200					30.18	FM-15		30.12
15	1753	4		10.00		30	-1.1			16	-8.9	56	10	190					30.14	FM-15		30.09
15	1853	4		10.00		31	-0.6			17	-8.3	56	14	190					30.11	FM-15		30.05
15	1953	4		10.00		32	0.0			16	-8.9	52	14	210					30.10	FM-15		30.04
15	2053	4		10.00		33	0.6			16	-8.9	49	20	220					30.08	FM-15		30.02
15	2153	4		10.00		33	0.6			19	-7.2	56	17	220	25				30.07	FM-15		30.02
15	2253	4		10.00		35	1.7			21	-6.1	57	17	230	28				30.06	FM-15		30.02
15	2353	4		3.00	ISN	33	0.6			26	-3.3	75	25	230	40				30.07	FM-15	T	30.02
16	0002	4		2.50	ISN	32	0.0			27	-2.8	82	26	230	34				FM-16	T		30.02
16	0018	4		3.00	ISN	32	0.0			27	-2.8	82	23	220	32				FM-16	T		30.02
16	0039	4		10.00		32	0.0			27	-2.8	82	23	230	31				FM-16	T		30.02
16	0053	4		10.00		32	0.0			28	-2.2	85	21	230	34				30.06	FM-15	T	30.02
16	0153	4		10.00		33	0.6			28	-2.2	82	20	230					30.07	FM-15		30.02
16	0253	4		10.00		33	0.6			28	-2.2	82	14	230					30.06	FM-15		30.02
16	0353	4		10.00		33	0.6			28	-2.2	82	17	240					30.05	FM-15		30.01
16	0453	4		10.00		34	1.1			29	-1.7	82	10	240					30.05	FM-15		30.01
16	0553	4		10.00		34	1.1			27	-2.8	75	15	250					30.06	FM-15		30.02
16	0653	4		10.00		33	0.6			28	-2.2	82	11	240					30.06	FM-15		30.02
16	0753	4		10.00		33	0.6			28	-2.2	82	7	240					30.07	FM-15		30.03
16	0853	4		8.00		33	0.6			28	-2.2	82	8	270					30.08	FM-15		30.04
16	0953	4		8.00		33	0.6			27	-2.8	78	8	260					30.08	FM-15		30.04
16	1053	4		9.00		33	0.6			27	-2.8	78	10	260					30.08	FM-15		30.04
16	1153	4		9.00		33	0.6			26	-3.3	75	13	240					30.08	FM-15		30.04
16	1253	4		10.00		34	1.1			26	-3.3	73	13	250					30.06	FM-15		30.02
16	1353	4		10.00		35	1.7			25	-3.9	67	16	240					30.04	FM-15		30.01

16	1442	4		10.00		35	1.7		25	-3.9	67	15	240	24				FM-16		30.00
16	1453	4		10.00		35	1.7		25	-3.9	67	18	220					30.03	FM-15	30.00
16	1500	4		10.00		35	1.7		26	-3.3	70	15	230					FM-16		30.00
16	1553	4		10.00		35	1.7		26	-3.3	70	18	250					30.06	FM-15	30.02
16	1653	4		10.00		34	1.1		27	-2.8	75	15	230					30.07	FM-15	30.03
16	1753	4		10.00		32	0.0		26	-3.3	79	11	230					30.07	FM-15	30.03
16	1853	4		10.00		30	-1.1		26	-3.3	85	11	220					30.09	FM-15	30.04
16	1953	4		9.00		30	-1.1		25	-3.9	82	11	230					30.11	FM-15	30.06
16	2053	4		8.00		29	-1.7		25	-3.9	85	10	230					30.12	FM-15	30.07
16	2153	4		6.00		28	-2.2		25	-3.9	88	9	230					30.12	FM-15	30.08
16	2253	4		6.00		28	-2.2		25	-3.9	88	7	230					30.14	FM-15	30.09
16	2353	4		4.00		25	-3.9		24	-4.4	96	5	260					30.15	FM-15	30.11
17	0053	4		4.00		25	-3.9		23	-5.0	92	8	220					30.16	FM-15	30.12
17	0153	4		4.00		25	-3.9		23	-5.0	92	7	240					30.17	FM-15	30.13
17	0238	4		4.00		24	-4.4		22	-5.6	91	6	280					FM-16		30.13
17	0253	4		4.00		27	-2.8		25	-3.9	92	7	340					30.18	FM-15	30.14
17	0303	4		4.00		27	-2.8		25	-3.9	92	7	330					FM-16		30.14
17	0336	4		7.00		27	-2.8		25	-3.9	92	5	010					FM-16		30.15
17	0353	4		8.00		27	-2.8		25	-3.9	92	5	020					30.20	FM-15	30.16
17	0453	4		10.00		27	-2.8		24	-4.4	89	3	040					30.22	FM-15	30.18
17	0553	4		10.00		27	-2.8		23	-5.0	85	8	040					30.25	FM-15	30.20
17	0653	4		10.00		26	-3.3		21	-6.1	81	8	030					30.28	FM-15	30.23
17	0753	4		10.00		26	-3.3		20	-6.7	78	8	030					30.31	FM-15	30.26
17	0853	4		10.00		28	-2.2		21	-6.1	75	8	050					30.33	FM-15	30.28
17	0953	4		10.00		29	-1.7		21	-6.1	72	6	070					30.34	FM-15	30.30
17	1053	4		10.00		29	-1.7		19	-7.2	66	5	110					30.36	FM-15	30.31
17	1135	4		10.00		31	-0.6		20	-6.7	64	7	090					FM-16		30.31
17	1153	4		10.00		31	-0.6		20	-6.7	64	5	VRB					30.36	FM-15	30.31
17	1253	4		10.00		32	0.0		18	-7.8	56	3	050					30.34	FM-15	30.29
17	1353	4		10.00		32	0.0		17	-8.3	54	0	000					30.34	FM-15	30.29
17	1453	4		10.00		33	0.6		19	-7.2	56	0	000					30.34	FM-15	30.29
17	1553	4		10.00		32	0.0		20	-6.7	61	11	050					30.32	FM-15	30.28
17	1653	4		10.00		31	-0.6		20	-6.7	64	13	060					30.30	FM-15	30.26
17	1753	4		10.00		28	-2.2		19	-7.2	69	14	080					30.31	FM-15	30.26
17	1853	4		10.00		27	-2.8		19	-7.2	72	11	080					30.31	FM-15	30.26
17	1953	4		10.00		26	-3.3		18	-7.8	71	10	090					30.30	FM-15	30.25
17	2053	4		10.00		26	-3.3		18	-7.8	71	10	090					30.29	FM-15	30.24
17	2153	4		10.00		26	-3.3		18	-7.8	71	9	100					30.28	FM-15	30.23
17	2253	4		10.00		27	-2.8		19	-7.2	72	10	100					30.24	FM-15	30.19
17	2353	4		10.00		27	-2.8		20	-6.7	75	8	110					30.22	FM-15	30.17
18	0053	4		10.00		28	-2.2		20	-6.7	72	13	100					30.17	FM-15	T 30.12
18	0146	4		2.50	SN	28	-2.2		22	-5.6	78	8	100					FM-16	T	30.10
18	0153	4		3.00	SN	28	-2.2		23	-5.0	81	9	100					30.15	FM-15	T 30.10
18	0205	4		2.50	SN	28	-2.2		23	-5.0	81	9	110					FM-16	0.01	30.10
18	0211	4		1.25	SN	28	-2.2		24	-4.4	85	8	110					FM-16	0.02	30.10
18	0226	4		2.00	SN	28	-2.2		25	-3.9	88	11	100					FM-16	0.03	30.07
18	0234	4		5.00	FZRA	28	-2.2		26	-3.3	92	9	090					FM-16	0.03	30.06
18	0242	4		7.00	FZRA	29	-1.7		26	-3.3	89	11	090					FM-16	0.03	30.05
18	0253	4		8.00	FZRA	29	-1.7		27	-2.8	92	10	110					30.09	FM-15	0.03
18	0308	4		7.00		30	-1.1		28	-2.2	92	8	120					FM-16	T	30.04
18	0331	4		2.00	SN	31	-0.6		29	-1.7	92	9	110					FM-16	0.01	30.01
18	0338	4		1.50	SN	31	-0.6		29	-1.7	92	9	120					FM-16	0.02	30.01
18	0345	4	20	1.00	SN	32	0.0		30	-1.1	92	10	120					FM-16	0.02	30.00
18	0353	4	16	1.00	SN	32	0.0		30	-1.1	92	8	120					30.04	FM-15	0.03
18	0419	4		1.50	SN	32	0.0		31	-0.6	96	8	120					FM-16	0.02	29.97
18	0433	4		2.00	SN	32	0.0		31	-0.6	96	10	130					FM-16	0.02	29.96
18	0440	4		1.50	SN	32	0.0		31	-0.6	96	11	120					FM-16	0.03	29.95

18	0453	4		1.75	SN	32	0.0			31	-0.6	96	9	130					29.98	FM-15	0.04	29.94	
18	0501	4		2.00	SN	32	0.0			31	-0.6	96	10	130						FM-16	0.01	29.94	
18	0515	4		3.00	SN	32	0.0			31	-0.6	96	11	130						FM-16	0.02	29.93	
18	0553	4		5.00	RA	33	0.6			32	0.0	96	10	140						29.95	FM-15	0.04	29.90
18	0653	4		5.00	RA	35	1.7			33	0.6	93	13	160						29.91	FM-15	0.03	29.86
18	0753	4		10.00		37	2.8			34	1.1	89	16	180						29.89	FM-15	T	29.85
18	0853	4		10.00		39	3.9			34	1.1	82	20	190	28					29.86	FM-15		29.82
18	0953	4		10.00		40	4.4			36	2.2	86	21	190	30					29.85	FM-15		29.82
18	1053	4		3.00	RA	40	4.4			37	2.8	89	20	200						29.86	FM-15	T	29.82
18	1104	4		2.50	RA	40	4.4			37	2.8	89	24	200	30					FM-16	T	29.81	
18	1111	4		2.50	RA	40	4.4			37	2.8	89	22	200	30					FM-16	T	29.81	
18	1123	4		3.00	RA	40	4.4			38	3.3	93	21	210						FM-16	T	29.82	
18	1134	4		2.00	RA	40	4.4			38	3.3	93	21	210	30					FM-16	T	29.82	
18	1153	4		2.00	RA	40	4.4			39	3.9	97	20	210	30					29.86	FM-15	0.01	29.82
18	1253	4		2.00		41	5.0			39	3.9	93	25	230	38					29.87	FM-15	T	29.83
18	1255	4		7.00		41	5.0			39	3.9	93	22	230	38					FM-16		29.83	
18	1341	4		6.00		39	3.9			37	2.8	93	21	240	30					FM-16		29.86	
18	1353	4		6.00		39	3.9			37	2.8	93	20	240	29					29.90	FM-15		29.86
18	1406	4		8.00		40	4.4			37	2.8	89	18	240	31					FM-16		29.86	
18	1417	4		9.00		40	4.4			36	2.2	86	21	240	31					FM-16		29.87	
18	1453	4		10.00		40	4.4			36	2.2	86	22	240	30					29.93	FM-15		29.89
18	1553	4		10.00		39	3.9			34	1.1	82	16	240	26					29.94	FM-15		29.91
18	1653	4		10.00		38	3.3			34	1.1	86	13	270						29.98	FM-15		29.95
18	1745	4		10.00		37	2.8			29	-1.7	73	20	270	24					FM-16		29.98	
18	1753	4		10.00		37	2.8			29	-1.7	73	16	260						30.03	FM-15		29.99
18	1853	4		10.00		37	2.8			28	-2.2	70	16	260						30.05	FM-15		30.01
18	1953	4		10.00		35	1.7			27	-2.8	72	14	250						30.07	FM-15		30.03
18	2053	4		10.00		35	1.7			27	-2.8	72	15	260						30.09	FM-15		30.06
18	2153	4		10.00		34	1.1			24	-4.4	67	22	260	31					30.12	FM-15		30.09
18	2253	4		10.00		32	0.0			23	-5.0	69	21	270	26					30.15	FM-15		30.11
18	2353	4		10.00		31	-0.6			22	-5.6	69	13	270						30.16	FM-15		30.13
19	0053	4		10.00		31	-0.6			22	-5.6	69	17	270						30.19	FM-15		30.15
19	0153	4		10.00		31	-0.6			23	-5.0	72	16	260						30.20	FM-15		30.16
19	0253	4		10.00		31	-0.6			22	-5.6	69	10	270						30.21	FM-15		30.17
19	0340	4		10.00		31	-0.6			22	-5.6	69	14	270						FM-16		30.18	
19	0353	4		10.00		31	-0.6			23	-5.0	72	16	280						30.22	FM-15		30.18
19	0436	4		10.00		30	-1.1			20	-6.7	66	21	270	28					FM-16		30.19	
19	0453	4		10.00		30	-1.1			19	-7.2	64	21	270	28					30.25	FM-15		30.21
19	0553	4		10.00		28	-2.2			17	-8.3	63	14	270						30.27	FM-15		30.23
19	0653	4		10.00	SN	28	-2.2			18	-7.8	66	17	260						30.29	FM-15	T	30.25
19	0753	4		5.00	SN	28	-2.2			19	-7.2	69	17	270	24					30.33	FM-15	T	30.29
19	0815	4		2.00	SN	27	-2.8			21	-6.1	78	13	280						FM-16	T	30.31	
19	0836	4		2.00	SN	27	-2.8			21	-6.1	78	13	280						FM-16	T	30.32	
19	0851	4		10.00		28	-2.2			21	-6.1	74	11	280						FM-16	T	30.33	
19	0853	4		10.00		28	-2.2			21	-6.1	75	13	280						30.38	FM-15	T	30.33
19	0946	4		2.50	FU	28	-2.2			18	-7.8	66	20	290						FM-16	T	30.36	
19	0953	4		10.00		28	-2.2			17	-8.3	63	20	300						30.40	FM-15	T	30.36
19	1035	4		1.75	SN	26	-3.3			17	-8.3	69	20	300	25					FM-16	T	30.38	
19	1044	4		3.00	SN	27	-2.8			17	-8.3	66	16	300						FM-16	T	30.38	
19	1053	4		9.00	SN	28	-2.2			16	-8.9	60	16	300						30.43	FM-15	T	30.38
19	1153	4		10.00		30	-1.1			15	-9.4	54	17	290						30.44	FM-15	T	30.39
19	1253	4		10.00		28	-2.2			14	-10.0	56	13	320						30.44	FM-15		30.39
19	1353	4		10.00		28	-2.2			14	-10.0	56	15	290						30.43	FM-15	T	30.39
19	1453	4		10.00		28	-2.2			14	-10.0	56	14	290						30.43	FM-15		30.38
19	1553	4		10.00		28	-2.2			15	-9.4	58	9	290						30.43	FM-15		30.39
19	1653	4		10.00		27	-2.8			14	-10.0	58	17	270	23					30.44	FM-15		30.39
19	1753	4		10.00		26	-3.3			13	-10.6	57	20	270	24					30.45	FM-15		30.40

19	1853	4		10.00		24	-4.4			12	-11.1	60	13	280					30.46	FM-15		30.41
19	1953	4		10.00		23	-5.0			12	-11.1	63	10	270					30.48	FM-15		30.42
19	2053	4		10.00		22	-5.6			11	-11.7	63	15	280					30.49	FM-15		30.43
19	2153	4		10.00		22	-5.6			10	-12.2	60	14	270					30.49	FM-15		30.44
19	2253	4		10.00		21	-6.1			10	-12.2	62	14	270					30.50	FM-15		30.44
19	2353	4		10.00		20	-6.7			9	-12.8	62	8	280					30.49	FM-15		30.44
20	0053	4		10.00		19	-7.2			9	-12.8	65	8	280					30.49	FM-15		30.44
20	0153	4		10.00		19	-7.2			10	-12.2	68	9	260					30.49	FM-15		30.43
20	0253	4		10.00		19	-7.2			10	-12.2	68	10	270					30.49	FM-15		30.43
20	0353	4	4.00	ISN		21	-6.1			13	-10.6	71	8	300					30.48	FM-15	T	30.43
20	0453	4		10.00		20	-6.7			10	-12.2	65	10	290					30.49	FM-15	T	30.43
20	0553	4		10.00		19	-7.2			10	-12.2	68	9	310					30.49	FM-15		30.44
20	0653	4		10.00		16	-8.9			9	-12.8	74	9	280					30.51	FM-15		30.45
20	0753	4		10.00		19	-7.2			12	-11.1	74	8	270					30.53	FM-15		30.47
20	0853	4		10.00		22	-5.6			12	-11.1	66	14	320					30.55	FM-15		30.49
20	0953	4		10.00		22	-5.6			8	-13.3	55	15	330					30.56	FM-15	T	30.50
20	1053	4	10.00	ISN		22	-5.6			11	-11.7	63	11	310					30.57	FM-15	T	30.51
20	1153	4		10.00		23	-5.0			8	-13.3	53	13	310					30.58	FM-15	T	30.51
20	1253	4		9.00		23	-5.0			7	-13.9	50	13	300					30.55	FM-15		30.49
20	1353	4		10.00		24	-4.4			10	-12.2	55	10	300					30.54	FM-15	T	30.48
20	1453	4		9.00		23	-5.0			11	-11.7	60	15	310					30.54	FM-15		30.48
20	1553	4		10.00		23	-5.0			10	-12.2	57	10	300					30.54	FM-15	T	30.48
20	1653	4		10.00		22	-5.6			8	-13.3	55	11	280	21				30.54	FM-15		30.48
20	1753	4		10.00		22	-5.6			5	-15.0	48	15	290					30.55	FM-15		30.48
20	1853	4		10.00		21	-6.1			10	-12.2	62	11	270					30.56	FM-15	T	30.50
20	1953	4		10.00		21	-6.1			7	-13.9	54	13	280					30.57	FM-15		30.51
20	2053	4		10.00		20	-6.7			7	-13.9	57	14	300					30.57	FM-15		30.51
20	2153	4		10.00		19	-7.2			7	-13.9	59	10	300					30.59	FM-15		30.53
20	2253	4		10.00		18	-7.8			7	-13.9	62	11	300					30.59	FM-15		30.53
20	2353	4		10.00		17	-8.3			8	-13.3	68	10	290					30.58	FM-15		30.52
21	0053	4		10.00		16	-8.9			9	-12.8	74	6	250					30.58	FM-15		30.52
21	0153	4		10.00		15	-9.4			8	-13.3	74	8	260					30.57	FM-15		30.51
21	0253	4		10.00		14	-10.0			8	-13.3	77	7	230					30.57	FM-15		30.50
21	0353	4		10.00		15	-9.4			9	-12.8	77	8	240					30.55	FM-15		30.49
21	0453	4		10.00		16	-8.9			9	-12.8	74	13	240					30.55	FM-15		30.48
21	0553	4		10.00		17	-8.3			8	-13.3	68	10	240					30.55	FM-15		30.49
21	0653	4		10.00		16	-8.9			7	-13.9	67	10	230					30.54	FM-15		30.48
21	0753	4		10.00		18	-7.8			8	-13.3	65	11	240					30.54	FM-15		30.48
21	0853	4		10.00		21	-6.1			9	-12.8	59	18	250					30.54	FM-15		30.48
21	0953	4		10.00		25	-3.9			8	-13.3	48	18	240					30.53	FM-15		30.47
21	1053	4		10.00		27	-2.8			4	-15.6	37	21	230					30.51	FM-15		30.45
21	1153	4		10.00		30	-1.1			9	-12.8	41	21	240	29				30.50	FM-15		30.45
21	1253	4		10.00		30	-1.1			13	-10.6	49	23	230	29				30.48	FM-15		30.42
21	1353	4		10.00		30	-1.1			14	-10.0	51	24	230	34				30.45	FM-15		30.39
21	1453	4		10.00		30	-1.1			16	-8.9	56	28	230	34				30.43	FM-15		30.37
21	1553	4		10.00		30	-1.1			16	-8.9	56	25	240	34				30.41	FM-15		30.35
21	1653	4		10.00		28	-2.2			17	-8.3	63	24	230	34				30.38	FM-15		30.32
21	1753	4		10.00		27	-2.8			17	-8.3	66	17	230	32				30.36	FM-15		30.30
21	1853	4		10.00		28	-2.2			16	-8.9	60	22	230	31				30.35	FM-15		30.29
21	1953	4		10.00		29	-1.7			17	-8.3	61	25	230	32				30.32	FM-15		30.27
21	2053	4		10.00		30	-1.1			16	-8.9	56	29	230	40				30.29	FM-15		30.24
21	2153	4		10.00		31	-0.6			17	-8.3	56	25	230	40				30.26	FM-15		30.21
21	2253	4		10.00		31	-0.6			18	-7.8	59	28	230	37				30.24	FM-15		30.19
21	2353	4		10.00		31	-0.6			19	-7.2	61	23	240	33				30.24	FM-15		30.20
22	0053	4		10.00		31	-0.6			20	-6.7	64	29	240	36				30.25	FM-15		30.20
22	0153	4		10.00		30	-1.1			20	-6.7	66	20	240	31				30.27	FM-15		30.22
22	0253	4		10.00		30	-1.1			19	-7.2	64	25	240	31				30.25	FM-15		30.20

22	0353	4		10.00		30	-1.1			19	-7.2	64	22	240	29				30.24	FM-15		30.19
22	0453	4		10.00		29	-1.7			19	-7.2	66	15	240	23				30.24	FM-15		30.19
22	0553	4		10.00		29	-1.7			18	-7.8	63	17	240					30.25	FM-15		30.20
22	0653	4		10.00		28	-2.2			18	-7.8	66	13	240					30.26	FM-15		30.21
22	0753	4		10.00		30	-1.1			20	-6.7	66	16	240					30.25	FM-15		30.21
22	0853	4		10.00		32	0.0			21	-6.1	64	17	240					30.25	FM-15		30.21
22	0953	4		10.00		35	1.7			22	-5.6	59	20	250					30.25	FM-15		30.21
22	1053	4		10.00		34	1.1			23	-5.0	64	21	230	25				30.25	FM-15		30.21
22	1100	4		10.00		35	1.7			24	-4.4	64	21	220	25					FM-16		30.21
22	1153	4		10.00		36	2.2			24	-4.4	62	21	230	25				30.25	FM-15		30.21
22	1253	4		10.00		35	1.7			24	-4.4	64	18	230	31				30.22	FM-15		30.17
22	1353	4		10.00		35	1.7			25	-3.9	67	28	230	34				30.20	FM-15		30.16
22	1439	4		10.00		36	2.2			23	-5.0	59	28	240	37					FM-16		30.15
22	1453	4		10.00		36	2.2			23	-5.0	59	24	220	34				30.19	FM-15		30.14
22	1553	4		10.00		37	2.8			22	-5.6	54	23	230	34				30.18	FM-15		30.14
22	1653	4		10.00		37	2.8			21	-6.1	52	23	230	33				30.17	FM-15		30.13
22	1753	4		10.00		35	1.7			23	-5.0	61	17	240	26				30.18	FM-15		30.14
22	1853	4		10.00		36	2.2			22	-5.6	57	18	240					30.19	FM-15		30.14
22	1953	4		10.00		35	1.7			23	-5.0	61	14	240					30.18	FM-15		30.14
22	2053	4		10.00		37	2.8			23	-5.0	57	17	240					30.16	FM-15		30.12
22	2153	4		10.00		37	2.8			23	-5.0	57	14	230					30.16	FM-15		30.12
22	2253	4		10.00		34	1.1			24	-4.4	67	11	220					30.16	FM-15		30.12
22	2353	4		10.00		33	0.6			26	-3.3	75	13	220					30.16	FM-15		30.12
23	0053	4		10.00		34	1.1			25	-3.9	70	14	230					30.16	FM-15		30.12
23	0153	4		10.00		34	1.1			25	-3.9	70	15	220					30.15	FM-15		30.11
23	0253	4		10.00		34	1.1			24	-4.4	67	15	220					30.14	FM-15		30.10
23	0353	4		10.00		34	1.1			24	-4.4	67	14	220					30.14	FM-15		30.10
23	0453	4		10.00		33	0.6			25	-3.9	72	14	220					30.14	FM-15		30.09
23	0553	4		10.00		33	0.6			25	-3.9	72	14	210					30.13	FM-15		30.09
23	0653	4		10.00		33	0.6			24	-4.4	70	10	220					30.12	FM-15		30.08
23	0753	4		10.00		35	1.7			23	-5.0	61	15	210					30.12	FM-15		30.08
23	0853	4		10.00		36	2.2			21	-6.1	55	15	220					30.12	FM-15		30.09
23	0953	4		10.00		40	4.4			20	-6.7	45	17	210					30.10	FM-15		30.07
23	1053	4		10.00		42	5.6			19	-7.2	40	18	220	25				30.09	FM-15		30.06
23	1153	4		10.00		44	6.7			21	-6.1	40	17	220	28				30.08	FM-15		30.05
23	1253	4		10.00		43	6.1			20	-6.7	40	22	220	28				30.05	FM-15		30.01
23	1353	4		10.00		44	6.7			19	-7.2	37	16	230					30.03	FM-15		29.99
23	1453	4		10.00		46	7.8			20	-6.7	35	20	220					30.00	FM-15		29.97
23	1553	4		10.00		46	7.8			18	-7.8	32	17	230					29.98	FM-15		29.95
23	1653	4		10.00		46	7.8			19	-7.2	34	14	210					29.96	FM-15		29.93
23	1753	4		10.00		42	5.6			21	-6.1	43	10	200					29.96	FM-15		29.93
23	1853	4		10.00		40	4.4			23	-5.0	51	14	230					29.97	FM-15		29.94
23	1953	4		10.00		39	3.9			23	-5.0	53	15	230					29.97	FM-15		29.93
23	2053	4		10.00		40	4.4			22	-5.6	49	15	210					29.96	FM-15		29.92
23	2153	4		10.00		37	2.8			21	-6.1	52	7	210					29.97	FM-15		29.93
23	2253	4		10.00		38	3.3			22	-5.6	52	9	220					29.95	FM-15		29.92
23	2353	4		10.00		40	4.4			23	-5.0	51	15	220					29.93	FM-15		29.90
24	0053	4		10.00		42	5.6			23	-5.0	47	18	230	30				29.93	FM-15		29.90
24	0153	4		10.00		41	5.0			24	-4.4	51	21	230	28				29.92	FM-15		29.90
24	0253	4		10.00		40	4.4			25	-3.9	55	16	230					29.91	FM-15		29.88
24	0353	4		10.00		39	3.9			26	-3.3	60	17	230					29.91	FM-15		29.88
24	0453	4		10.00		38	3.3			27	-2.8	65	13	220					29.91	FM-15		29.89
24	0553	4		10.00		37	2.8			27	-2.8	67	11	230					29.92	FM-15		29.89
24	0653	4		10.00		37	2.8			27	-2.8	67	10	210					29.93	FM-15		29.90
24	0753	4		10.00		38	3.3			29	-1.7	70	9	210					29.95	FM-15		29.92
24	0853	4		10.00		42	5.6			29	-1.7	60	16	220	21				29.96	FM-15		29.93
24	0953	4		10.00		45	7.2			31	-0.6	58	16	230					29.96	FM-15		29.93

24	1053	4		10.00		45	7.2			31	-0.6	58	14	250					29.96	FM-15		29.93
24	1153	4		10.00		46	7.8			32	0.0	58	14	240					29.96	FM-15		29.93
24	1253	4		10.00		46	7.8			33	0.6	61	15	220					29.93	FM-15		29.91
24	1353	4		10.00		46	7.8			33	0.6	61	15	240					29.92	FM-15		29.90
24	1453	4		10.00		46	7.8			34	1.1	63	10	230					29.92	FM-15		29.89
24	1553	4		10.00		46	7.8			35	1.7	66	9	240					29.90	FM-15		29.87
24	1653	4		10.00		45	7.2			34	1.1	66	8	230					29.92	FM-15		29.89
24	1753	4		10.00		43	6.1			33	0.6	68	6	210					29.94	FM-15		29.91
24	1853	4		10.00		40	4.4			32	0.0	73	5	160					29.94	FM-15		29.91
24	1953	4		10.00		39	3.9			32	0.0	76	3	160					29.94	FM-15		29.91
24	2053	4		9.00		38	3.3			32	0.0	79	3	200					29.94	FM-15		29.91
24	2153	4		9.00		37	2.8			32	0.0	82	0	000					29.93	FM-15		29.91
24	2253	4		8.00		36	2.2			31	-0.6	82	0	000					29.92	FM-15		29.89
24	2353	4		8.00		37	2.8			32	0.0	82	8	050					29.91	FM-15		29.88
25	0053	4		8.00		36	2.2			32	0.0	86	5	060					29.92	FM-15		29.89
25	0153	4		10.00		38	3.3			31	-0.6	76	9	060					29.91	FM-15		29.88
25	0253	4		10.00	RA	37	2.8			30	-1.1	76	8	020					29.91	FM-15	T	29.88
25	0353	4		10.00	RA	36	2.2			31	-0.6	82	6	020					29.93	FM-15	0.01	29.90
25	0424	4		6.00	RA	34	1.1			30	-1.1	85	8	060					FM-16	0.01	29.89	
25	0453	4		8.00	RA	34	1.1			31	-0.6	89	9	070					29.92	FM-15	0.02	29.89
25	0503	4		8.00	RA	34	1.1			31	-0.6	89	8	070					FM-16	T	29.90	
25	0550	4		7.00	RA	34	1.1			30	-1.1	87	8	050					FM-16	T	29.90	
25	0553	4		7.00	RA	34	1.1			31	-0.6	89	7	040					29.93	FM-15	T	29.90
25	0653	4		6.00	RA	34	1.1			32	0.0	92	10	050					29.93	FM-15	T	29.89
25	0753	4		6.00	RA	34	1.1			32	0.0	92	8	050					29.94	FM-15	0.01	29.91
25	0853	4		8.00	RA	34	1.1			32	0.0	92	11	050					29.95	FM-15	T	29.91
25	0953	4		6.00	RA	34	1.1			33	0.6	97	9	050					29.95	FM-15	T	29.92
25	1000	4		7.00	RA	34	1.1			33	0.6	97	13	050					FM-16	T	29.92	
25	1053	4		8.00	RA	34	1.1			33	0.6	97	9	060					29.96	FM-15	T	29.92
25	1100	4		8.00	RA	34	1.1			33	0.6	97	11	060					FM-16	T	29.92	
25	1153	4		8.00	RA	35	1.7			33	0.6	93	13	070					29.96	FM-15	T	29.92
25	1213	4		10.00	RA	35	1.7			33	0.6	93	13	060					FM-16	T	29.92	
25	1233	4		10.00	RA	35	1.7			34	1.1	96	10	070					FM-16	T	29.91	
25	1253	4		10.00	RA	35	1.7			34	1.1	96	13	070					29.95	FM-15	T	29.91
25	1335	4		10.00	RA	36	2.2			34	1.1	93	11	070					FM-16	T	29.90	
25	1353	4		10.00	RA	36	2.2			34	1.1	93	14	070					29.92	FM-15	T	29.88
25	1402	4		10.00	RA	36	2.2			34	1.1	93	13	060					FM-16	T	29.88	
25	1453	4		10.00	RA	36	2.2			34	1.1	93	13	050					29.93	FM-15	T	29.89
25	1553	4		10.00	RA	35	1.7			33	0.6	93	9	040					29.94	FM-15	T	29.90
25	1653	4		7.00		34	1.1			33	0.6	97	11	040					29.95	FM-15	T	29.91
25	1705	4		6.00		34	1.1			32	0.0	92	13	040					FM-16		29.91	
25	1734	4		9.00		35	1.7			33	0.6	93	11	060					FM-16		29.91	
25	1753	4		10.00		35	1.7			32	0.0	89	9	050					29.96	FM-15		29.92
25	1853	4		10.00		35	1.7			32	0.0	89	7	030					29.99	FM-15		29.95
25	1953	4		10.00		35	1.7			31	-0.6	85	6	070					29.99	FM-15		29.95
25	2053	4		10.00		35	1.7			31	-0.6	85	8	060					29.98	FM-15		29.94
25	2153	4		10.00		35	1.7			31	-0.6	85	6	050					30.00	FM-15		29.96
25	2253	4		10.00		35	1.7			30	-1.1	82	7	060					30.00	FM-15		29.96
25	2353	4		10.00		35	1.7			29	-1.7	78	11	050					29.98	FM-15		29.95
26	0053	4		10.00		35	1.7			28	-2.2	76	11	060					29.99	FM-15		29.95
26	0153	4		10.00		34	1.1			28	-2.2	79	13	060					29.98	FM-15		29.94
26	0253	4		10.00		34	1.1			27	-2.8	75	10	050					29.98	FM-15		29.94
26	0334	4		4.00	SN	33	0.6			28	-2.2	82	10	050					FM-16	T	29.93	
26	0353	4		7.00	SN	33	0.6			28	-2.2	82	9	050					29.97	FM-15	T	29.93
26	0453	4		4.00	SN	33	0.6			28	-2.2	82	13	060					29.97	FM-15	T	29.93
26	0532	4		9.00		32	0.0			28	-2.2	85	14	060					FM-16	T	29.92	
26	0553	4		10.00		32	0.0			28	-2.2	85	15	060	23				29.96	FM-15	T	29.92

26	0653	4		10.00	SN	32	0.0			28	-2.2	85	13	050					29.95	FM-15	T	29.91
26	0705	4		9.00	SN	32	0.0			29	-1.7	88	13	060						FM-16	T	29.91
26	0742	4		2.50	SN	32	0.0			29	-1.7	88	13	050						FM-16	T	29.91
26	0751	4		1.75	SN	30	-1.1			28	-2.2	93	11	050						FM-16	0.01	29.92
26	0753	4		1.75	SN	31	-0.6			29	-1.7	92	13	050					29.96	FM-15	0.01	29.92
26	0813	4		1.50	SN	31	-0.6			29	-1.7	92	13	050						FM-16	T	29.91
26	0829	4		1.25	SN	31	-0.6			29	-1.7	92	15	060						FM-16	T	29.91
26	0844	4		1.25	SN	32	0.0			30	-1.1	92	13	050						FM-16	T	29.91
26	0853	4		1.25	SN	32	0.0			30	-1.1	92	11	050					29.94	FM-15	T	29.90
26	0857	4		2.50	SN	32	0.0			30	-1.1	92	15	050						FM-16	T	29.90
26	0953	4		5.00	SN	32	0.0			30	-1.1	92	13	060					29.92	FM-15	0.01	29.88
26	1044	4		2.00		32	0.0			30	-1.1	92	10	060						FM-16	T	29.88
26	1053	4		2.00		32	0.0			30	-1.1	92	11	070					29.92	FM-15	T	29.88
26	1153	4		2.50	SN	32	0.0			30	-1.1	92	11	070					29.89	FM-15	0.01	29.85
26	1229	4		3.00	SN	33	0.6			31	-0.6	92	13	060						FM-16	T	29.82
26	1253	4		5.00		33	0.6			31	-0.6	92	11	070					29.85	FM-15	T	29.81
26	1255	4		3.00		34	1.1			30	-1.1	87	14	070						FM-15		29.81
26	1335	4		4.00		33	0.6			31	-0.6	92	15	060						FM-16		29.78
26	1353	4		4.00		32	0.0			31	-0.6	96	13	060					29.81	FM-15		29.77
26	1421	4		2.50		32	0.0			31	-0.6	96	13	070						FM-16		29.75
26	1451	4		1.75		34	1.1			32	0.0	93	11	070						FM-16		29.74
26	1453	4		1.75		33	0.6			32	0.0	96	10	070					29.78	FM-15		29.74
26	1536	4		1.25		33	0.6			32	0.0	96	11	060						FM-16		29.73
26	1553	4		1.25		33	0.6			32	0.0	96	11	060					29.78	FM-15		29.74
26	1628	4		1.50	RA	33	0.6			32	0.0	96	13	060						FM-16	0.01	29.72
26	1653	4		2.00	RA	32	0.0			31	-0.6	96	13	060					29.74	FM-15	0.02	29.70
26	1736	4		5.00	RA	32	0.0			31	-0.6	96	13	060						FM-16	0.03	29.68
26	1753	4		6.00	RA	32	0.0			31	-0.6	96	13	070					29.72	FM-15	0.03	29.68
26	1853	4		7.00	RA	32	0.0			31	-0.6	96	10	070					29.67	FM-15	0.03	29.63
26	1916	4		7.00	RA	33	0.6			32	0.0	96	9	080						FM-16	0.01	29.63
26	1953	4		5.00	RA	33	0.6			32	0.0	96	7	060					29.65	FM-15	0.04	29.61
26	2053	4		4.00	RA	33	0.6			32	0.0	96	6	010					29.61	FM-15		29.57
26	2102	4		5.00	RA	33	0.6			32	0.0	96	7	010						FM-16	0.01	29.56
26	2153	4		6.00	RA	32	0.0			31	-0.6	96	8	350		9	+0.09	29.58	FM-15	0.09	29.54	
26	2212	4		5.00	RA	32	0.0			31	-0.6	96	8	350						FM-16	0.02	29.53
26	2239	4		1.75	SN	32	0.0			31	-0.6	96	7	350						FM-16	0.06	29.53
26	2250	4		1.25	SN	32	0.0			30	-1.1	93	6	360						FM-16	0.08	29.53
26	2253	4		1.25	SN	32	0.0			31	-0.6	96	7	360					29.57	FM-15	0.08	29.53
26	2301	4		1.75	SN	32	0.0			31	-0.6	96	8	350						FM-16	0.01	29.52
26	2317	4		1.50	SN	32	0.0			31	-0.6	96	10	340						FM-16	0.02	29.52
26	2327	4		1.25	SN	32	0.0			30	-1.1	92	10	350						FM-16	0.03	29.51
26	2345	4		1.00	SN	31	-0.6			30	-1.1	96	11	320						FM-16	0.05	29.51
26	2353	4		1.00	SN	30	-1.1			29	-1.7	96	13	330					29.55	FM-15	0.06	29.51
27	0009	4		1.00	SN	29	-1.7			28	-2.2	96	14	330						FM-16	0.01	29.50
27	0021	4		1.25	SN	29	-1.7			28	-2.2	96	14	320						FM-16	0.01	29.50
27	0053	4		0.75	SN	29	-1.7			27	-2.8	92	14	310		9	+0.04	29.52	FM-15	0.03	29.49	
27	0118	4		1.00	SN	28	-2.2			26	-3.3	92	11	310						FM-16	T	29.49
27	0132	4		1.25	SN	27	-2.8			25	-3.9	92	15	290						FM-16	T	29.51
27	0153	4		1.00	SN	27	-2.8			25	-3.9	92	14	290					29.55	FM-15	T	29.51
27	0156	4		0.75	SN	27	-2.8			25	-3.9	92	13	290						FM-16	T	29.51
27	0206	4		1.00	SN	27	-2.8			25	-3.9	92	11	290						FM-16	0.01	29.50
27	0214	4		1.25	SN	27	-2.8			25	-3.9	92	15	290						FM-16	0.01	29.49
27	0253	4		1.25	SN	26	-3.3			24	-4.4	92	18	270					29.53	FM-15	0.01	29.49
27	0301	4		1.50	SN	26	-3.3			24	-4.4	92	17	280						FM-16	T	29.49
27	0307	4		1.25	SN	26	-3.3			24	-4.4	92	15	270						FM-16	T	29.49
27	0329	4		1.50	SN	26	-3.3			24	-4.4	92	13	270						FM-16	T	29.48
27	0353	4		1.50	SN	25	-3.9			23	-5.0	92	20	270	26	9	+0.02	29.53	FM-15	T	29.48	

27	0405	4		1.25	SN		25	-3.9			23	-5.0	92	14	270						FM-16	T	29.49	
27	0408	4		1.50	SN		25	-3.9			23	-5.0	92	17	260	25					FM-16	T	29.49	
27	0441	4		1.25	SN		24	-4.4			21	-6.1	88	22	260	26					FM-16	T	29.51	
27	0453	4		1.25	SN		24	-4.4			21	-6.1	88	18	260						29.56	FM-15	T	29.51
27	0504	4		1.00	SN		23	-5.0			20	-6.7	88	21	270	29					FM-16	T	29.51	
27	0512	4	14	1.00	SN		23	-5.0			20	-6.7	88	18	270	29					FM-16	T	29.52	
27	0553	4	13	1.00	SN		22	-5.6			19	-7.2	89	22	260	30					29.58	FM-15	T	29.53
27	0605	4	13	0.75	SN		22	-5.6			19	-7.2	89	22	270	32					FM-16	T	29.54	
27	0643	4	11	1.00	SN		22	-5.6			19	-7.2	89	23	260						FM-16	T	29.55	
27	0653	4	11	1.00	SN		22	-5.6			19	-7.2	89	17	260	29	9	+0.07	29.60	FM-15	T	29.55		
27	0750	4	9	0.25	FG SN		21	-6.1			19	-7.2	93	24	260						FM-16	T	29.57	
27	0753	4	9	0.50	FG SN		22	-5.6			19	-7.2	89	24	270	30					29.62	FM-15	T	29.57
27	0853	4	13	0.50	FG SN		23	-5.0			19	-7.2	85	25	270	39					29.63	FM-15	T	29.58
27	0902	4		1.00	SN		23	-5.0			19	-7.2	85	30	270	39					FM-16	T	29.58	
27	0909	4		4.00	SN		23	-5.0			18	-7.8	81	28	270	41					FM-16	T	29.59	
27	0934	4		4.00	SN		23	-5.0			18	-7.8	81	30	270	41					FM-16	T	29.59	
27	0953	4		7.00			23	-5.0			17	-8.3	78	28	260	38					29.64	FM-15	T	29.60
27	1053	4		7.00			23	-5.0			16	-8.9	74	28	270	44					29.65	FM-15		29.61
27	1153	4		7.00			23	-5.0			16	-8.9	74	31	260	45					29.66	FM-15	T	29.61
27	1250	4		1.25			25	-3.9			16	-8.9	69	37	260	47					FM-16			29.61
27	1253	4		2.00			23	-5.0			17	-8.3	78	33	260	47					29.66	FM-15		29.61
27	1353	4		2.00			24	-4.4			16	-8.9	71	29	270	39					29.67	FM-15		29.62
27	1400	4		1.75			24	-4.4			16	-8.9	71	30	260	39					FM-16			29.62
27	1424	4		0.75			23	-5.0			17	-8.3	78	28	250	44					FM-16			29.63
27	1448	4		1.25			25	-3.9			18	-7.8	74	36	250	46					FM-16	T		29.63
27	1449	4		1.00	SN		25	-3.9			18	-7.8	74	34	250	46					FM-16	T		29.63
27	1453	4		0.50	SN		24	-4.4			18	-7.8	77	36	260	46					29.69	FM-15	T	29.64
27	1459	4		0.75	SN		24	-4.4			17	-8.3	75	32	260	44					FM-16	T		29.63
27	1503	4		1.25	SN		24	-4.4			17	-8.3	75	28	260	39					FM-16	T		29.63
27	1506	4		2.00	SN		24	-4.4			17	-8.3	75	28	260	41					FM-16	T		29.64
27	1553	4		5.00	SN		24	-4.4			15	-9.4	68	28	250	44					29.70	FM-15	T	29.65
27	1630	4		1.25	SN		23	-5.0			17	-8.3	78	32	260	41					FM-16	T		29.66
27	1635	4		0.75	SN		22	-5.6			16	-8.9	78	30	250	41					FM-16	T		29.66
27	1639	4		1.00	SN		22	-5.6			16	-8.9	78	28	250	37					FM-16	T		29.66
27	1643	4		0.75	SN		22	-5.6			17	-8.3	82	23	250	37					FM-16	T		29.66
27	1653	4		1.00	SN		23	-5.0			17	-8.3	78	31	260	44					29.71	FM-15	T	29.66
27	1657	4		1.50			23	-5.0			16	-8.9	74	29	260	41					FM-16	T		29.66
27	1707	4		1.25			22	-5.6			15	-9.4	75	36	260	44					FM-16	T		29.66
27	1722	4		1.75			22	-5.6			14	-10.0	71	29	250	44					FM-16	T		29.66
27	1730	4		2.50			22	-5.6			14	-10.0	71	31	260	44					FM-16	T		29.67
27	1749	4		1.25			21	-6.1			14	-10.0	74	38	250	47					FM-16	T		29.68
27	1753	4		0.75			21	-6.1			14	-10.0	74	31	250	47					29.73	FM-15	T	29.68
27	1759	4		1.25			21	-6.1			14	-10.0	74	26	250	40					FM-16			29.68
27	1801	4		2.00			21	-6.1			13	-10.6	71	25	250	40					FM-16			29.68
27	1809	4		4.00			21	-6.1			13	-10.6	71	32	240	44					FM-16			29.68
27	1817	4		2.50			21	-6.1			13	-10.6	71	31	250	45					FM-16			29.68
27	1853	4		2.50	FU		21	-6.1			12	-11.1	68	25	250	37					29.75	FM-15	T	29.69
27	1908	4		6.00			21	-6.1			13	-10.6	71	25	250	41					FM-16			29.69
27	1953	4		6.00			21	-6.1			13	-10.6	71	26	250	37					29.75	FM-15		29.69
27	2053	4		6.00			21	-6.1			11	-11.7	65	25	250	37					29.75	FM-15		29.70
27	2153	4		6.00			20	-6.7			11	-11.7	68	25	250	37					29.75	FM-15		29.70
27	2253	4		10.00			20	-6.7			10	-12.2	65	24	250	33					29.75	FM-15		29.70
27	2353	4		7.00			20	-6.7			11	-11.7	68	31	250	39					29.76	FM-15		29.70
28	0053	4		8.00			20	-6.7			12	-11.1	71	26	250	37					29.76	FM-15		29.71
28	0153	4		10.00			19	-7.2			11	-11.7	68	26	250	38					29.76	FM-15		29.71
28	0253	4		10.00			19	-7.2			10	-12.2	68	20	240	39					29.76	FM-15		29.71
28	0353	4		10.00			19	-7.2												29.77	FM-15		29.71	

28	0453	4		10.00		19	-7.2			10	-12.2	68	24	240	36				29.76	FM-15		29.71
28	0553	4		10.00		19	-7.2			10	-12.2	68	24	250	37				29.77	FM-15		29.71
28	0653	4		10.00		20	-6.7			10	-12.2	65	25	250	36				29.77	FM-15		29.71
28	0753	4		10.00		20	-6.7			10	-12.2	65	21	250	29				29.78	FM-15		29.73
28	0853	4		10.00		20	-6.7			10	-12.2	65	24	250	31				29.79	FM-15		29.73
28	0953	4		10.00		21	-6.1			10	-12.2	62	25	260	34				29.78	FM-15		29.73
28	1053	4		10.00		23	-5.0			11	-11.7	60	23	260	36				29.77	FM-15		29.72
28	1153	4		10.00		23	-5.0			11	-11.7	60	30	260	37				29.78	FM-15		29.72
28	1253	4		10.00		24	-4.4			11	-11.7	57	28	240	38				29.77	FM-15		29.72
28	1353	4		10.00		23	-5.0			10	-12.2	57	26	250	36				29.77	FM-15		29.71
28	1453	4		10.00		24	-4.4			11	-11.7	57	25	250	33				29.78	FM-15		29.72
28	1553	4		10.00		24	-4.4			11	-11.7	57	26	240	37				29.78	FM-15		29.73
28	1653	4		10.00		24	-4.4			12	-11.1	60	25	250	32				29.79	FM-15		29.74
28	1753	4		10.00		23	-5.0			12	-11.1	63	21	240	31				29.81	FM-15		29.75
28	1853	4		10.00		23	-5.0			13	-10.6	65	23	250	33				29.82	FM-15		29.77
28	1953	4		10.00		23	-5.0			13	-10.6	65	26	250	33				29.83	FM-15		29.77
28	2053	4		10.00		23	-5.0			14	-10.0	68	24	250	34				29.83	FM-15		29.78
28	2153	4		5.00	SN	23	-5.0			15	-9.4	72	23	250	32				29.83	FM-15	T	29.78
28	2249	4		3.00	SN	23	-5.0			16	-8.9	74	24	260	30				FM-16	T		29.78
28	2253	4		3.00	SN	23	-5.0			16	-8.9	74	17	260	30				29.83	FM-15	T	29.78
28	2322	4		1.75	SN	22	-5.6			17	-8.3	82	14	290	24				FM-16	T		29.78
28	2326	4	17	1.00	SN	22	-5.6			17	-8.3	82	15	290					FM-16	T		29.78
28	2330	4		0.50	FG SN	21	-6.1			17	-8.3	85	13	310				FM-16	T		29.79	
28	2341	4		0.50	FG SN	21	-6.1			17	-8.3	85	10	300				FM-16	T		29.79	
28	2351	4	8	0.75	SN	19	-7.2			18	-7.8	93	11	300				FM-16	T		29.79	
28	2353	4	9	0.75	SN	20	-6.7			17	-8.3	89	14	300				29.84	FM-15	T	29.79	
29	0010	4	10	1.00	SN	20	-6.7			17	-8.3	89	10	310				FM-16	T		29.79	
29	0050	4	10	0.75	SN	19	-7.2			16	-8.9	86	9	310				FM-16	0.01		29.79	
29	0053	4		1.00	SN	19	-7.2			16	-8.9	88	10	310				29.85	FM-15	0.01	29.79	
29	0101	4		1.50	SN	19	-7.2			16	-8.9	88	16	310	21			FM-16	T		29.80	
29	0104	4		2.00	SN	19	-7.2			15	-9.4	84	15	310				FM-16	T		29.80	
29	0124	4		3.00	SN	19	-7.2			13	-10.6	77	14	310				FM-16	T		29.80	
29	0133	4		2.00	SN	19	-7.2			13	-10.6	77	16	310				FM-16	T		29.80	
29	0153	4		2.00	SN	18	-7.8			13	-10.6	81	15	310				29.86	FM-15	T	29.80	
29	0217	4		5.00	SN	18	-7.8			12	-11.1	77	17	320				FM-16	T		29.80	
29	0226	4		3.00	SN	18	-7.8			11	-11.7	74	21	320				FM-16	T		29.80	
29	0251	4		3.00	SN	18	-7.8			10	-12.2	73	13	300				FM-16	T		29.81	
29	0253	4		2.50	SN	18	-7.8			11	-11.7	74	17	310				29.86	FM-15	T	29.81	
29	0300	4		1.25	SN	18	-7.8			11	-11.7	74	17	310	24			FM-16	T		29.81	
29	0308	4	18	1.00	SN	17	-8.3			12	-11.1	80	14	310	24			FM-16	T		29.81	
29	0313	4		1.50	SN	17	-8.3			12	-11.1	80	11	300				FM-16	T		29.81	
29	0341	4		3.00	SN	17	-8.3			12	-11.1	80	13	300				FM-16	T		29.81	
29	0353	4		1.75	SN	17	-8.3			11	-11.7	77	14	300				29.87	FM-15	T	29.81	
29	0413	4		3.00	SN	17	-8.3			12	-11.1	80	13	330				FM-16	T		29.82	
29	0420	4		7.00	SN	17	-8.3			12	-11.1	80	9	330				FM-16	T		29.82	
29	0428	4		5.00	SN	16	-8.9			12	-11.1	84	11	330				FM-16	T		29.83	
29	0441	4		1.75	SN	15	-9.4			11	-11.7	84	13	340				FM-16	T		29.83	
29	0453	4		2.00	SN	15	-9.4			11	-11.7	84	9	340				29.90	FM-15	T	29.84	
29	0511	4		3.00	SN	14	-10.0			11	-11.7	88	7	340				FM-16	T		29.85	
29	0553	4		7.00	SN	14	-10.0			10	-12.2	84	6	290				29.92	FM-15	T	29.86	
29	0620	4		2.50	SN	15	-9.4			9	-12.8	77	10	290				FM-16	T		29.88	
29	0645	4		3.00	SN	14	-10.0			8	-13.3	77	7	300				FM-16	T		29.89	
29	0653	4		3.00	SN	12	-11.1			8	-13.3	84	7	300				29.95	FM-15	T	29.89	
29	0753	4		2.00	SN	13	-10.6			9	-12.8	84	9	260				29.98	FM-15	T	29.92	
29	0754	4		2.00	SN	13	-10.6			9	-12.8	84	9	270				FM-16	T		29.92	
29	0853	4		5.00		13	-10.6			12	-11.1	96	6	330				30.00	FM-15	T	29.93	
29	0953	4		5.00	SN	15	-9.4			8	-13.3	74	9	320				30.01	FM-15	T	29.95	

29	1053	4		5.00	SN		16	-8.9			8	-13.3	71	13	300					30.02	FM-15	T	29.96
29	1100	4		9.00	SN		16	-8.9			7	-13.9	67	11	310						FM-16	T	29.96
29	1153	4		9.00	SN		17	-8.3			9	-12.8	70	7	290					30.03	FM-15	T	29.97
29	1253	4		3.00	SN		19	-7.2			10	-12.2	68	20	290	24				30.03	FM-15	T	29.97
29	1256	4		1.75	SN		19	-7.2			11	-11.7	71	18	290					FM-16	T	29.97	
29	1312	4		3.00	SN		19	-7.2			12	-11.1	74	20	290					FM-16	T	29.96	
29	1326	4		2.50	SN		20	-6.7			11	-11.7	68	23	300	32				FM-16	T	29.97	
29	1353	4		2.50	SN		19	-7.2			11	-11.7	71	20	290					30.03	FM-15	T	29.98
29	1412	4		1.75	SN		19	-7.2			11	-11.7	71	18	290					FM-16	T	29.98	
29	1418	4		1.00	SN		19	-7.2			12	-11.1	74	14	300					FM-16	T	29.98	
29	1428	4		0.75	SN		19	-7.2			13	-10.6	77	13	310					FM-16	T	29.98	
29	1446	4	14	0.50	SN		19	-7.2			14	-10.0	81	13	290					FM-16	T	29.99	
29	1453	4	11	0.25	SN		19	-7.2			14	-10.0	81	13	290					30.05	FM-15	T	29.99
29	1506	4	8	0.25	FG SN		18	-7.8			15	-9.4	88	11	290					FM-16	T	29.99	
29	1527	4	9	0.50	FG SN		19	-7.2			16	-8.9	88	8	280					FM-16	0.01	29.99	
29	1533	4	11	0.75	SN		19	-7.2			16	-8.9	88	8	280					FM-16	0.01	29.99	
29	1542	4	15	1.00	SN		19	-7.2			15	-9.4	84	9	270					FM-16	0.01	29.99	
29	1547	4		1.50	SN		19	-7.2			16	-8.9	86	10	270					FM-16	0.01	29.99	
29	1553	4		1.50	SN		19	-7.2			15	-9.4	84	8	280					30.06	FM-15	0.01	29.99
29	1653	4		1.50	SN		21	-6.1			16	-8.9	81	7	250					30.06	FM-15	T	30.00
29	1708	4		2.00	SN		21	-6.1			17	-8.3	85	7	250					FM-16	T	30.00	
29	1720	4		5.00	SN		21	-6.1			18	-7.8	88	6	240					FM-16	T	30.00	
29	1753	4		10.00			21	-6.1			16	-8.9	81	8	260					30.08	FM-15	T	30.01
29	1853	4		10.00			22	-5.6			14	-10.0	71	15	270					30.10	FM-15		30.04
29	1953	4		10.00			22	-5.6			13	-10.6	68	15	270					30.12	FM-15		30.06
29	2053	4		10.00			21	-6.1			12	-11.1	68	15	260					30.14	FM-15		30.08
29	2153	4		10.00			19	-7.2			11	-11.7	71	10	260					30.15	FM-15		30.09
29	2253	4		10.00			17	-8.3			10	-12.2	74	5	220					30.15	FM-15		30.09
29	2353	4		10.00			14	-10.0			9	-12.8	80	0	000					30.16	FM-15		30.09

**Local Climatological Data**  
**Hourly Precipitation**  
**February 2020**

Generated on 02/10/2021

Date	For Hour (LST) Ending at																							Date			
	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	NOON	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	MID			
01	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	T	T	T	0.02	0.01	0.01	0.01	T	01			
02	T	T	T	M	M	M	M	M	T	0.01	0.01	0.02	0.01	T	0.02	0.02	T	0.01	T	0.02	T	T	T	T	02		
03	T	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	03		
04	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	04		
05	M	M	M	M	M	M	M	M	T	T	T	M	M	M	M	M	M	M	M	M	M	M	M	M	05		
06	0.04	0.03	0.01	T	0.01	T	T	T	T	T	T	M	T	0.01	T	T	M	M	T	0.01	0.02	0.02	T	0.01	06		
07	0.01	0.01	T	T	T	T	0.01	0.03	0.01	0.01	0.01	T	0.01	T	T	T	T	M	M	M	M	M	M	M	M	07	
08	M	M	M	M	M	M	M	M	T	T	T	T	M	T	M	M	M	M	M	M	M	M	M	M	M	08	
09	M	M	M	M	M	M	M	M	T	M	0.01	T	M	M	M	M	M	M	M	T	T	0.01	0.01	0.01	09		
10	T	0.01	T	M	M	0.01	T	T	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	10	
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	T	M	11	
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	02	12
13	0.01	0.01	M	M	0.02	0.01	T	M	T	0.02	T	T	T	0.01	T	0.01	0.01	T	T	T	T	T	T	T	T	13	
14	T	T	M	T	T	T	T	T	T	T	T	T	M	M	M	M	M	M	M	M	M	M	M	M	M	14	
15	M	M	T	T	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	T	15	
16	T	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	16	
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	17	
18	T	T	0.03	0.03	0.04	0.04	0.03	T	M	M	T	0.01	T	M	M	M	M	M	M	M	M	M	M	M	M	18	
19	M	M	M	M	M	M	T	T	T	T	T	M	T	M	M	M	M	M	M	M	M	M	M	M	M	19	
20	M	M	M	T	T	M	M	M	M	T	T	T	M	T	M	T	M	T	M	T	M	M	M	M	M	20	
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	21	
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	22	
23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	23	
24	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	24	
25	M	M	T	0.01	0.02	T	T	0.01	T	T	T	T	T	T	T	T	T	M	M	M	M	M	M	M	M	25	
26	M	M	M	T	T	T	T	0.01	T	0.01	T	0.01	M	M	M	M	0.02	0.03	0.03	0.04	M	0.09	0.08	0.06	26		
27	0.03	T	0.01	T	T	T	T	T	T	M	T	M	M	T	T	T	T	T	T	M	M	M	M	M	M	27	
28	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	T	T	T	28	
29	0.01	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	0.01	T	T	M	M	M	M	M	29	

## Maximum Short Duration Precipitation

Time Period (Minutes)	5	10	15	20	30	45	60	80	100	120	150	180
Precipitation (inches)												
Ending Date Time (yyyy-mm-dd hh:mm)												

Hourly, daily, and monthly totals on the Daily Summary page and the Hourly Precipitation Table are shown as reported by the instrumentation at the site. However, NWS does not edit hourly values for its ASOS sites, but may edit the daily and monthly totals for selected sites which will be reflected on the Daily Summary page.

T = Trace  
 s = Suspect  
 \* = Erroneous  
 blank = No precipitation observed  
 M = Missing

# Local Climatological Data

## Daily Summary

### March 2020

Generated on 02/10/2021

Degree Days			Number of days with...									
Monthly		Season-to-date		Temperature				Precipitation		Snow	Weather	
Departure	Total	Departure		Max		Min		>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
-175				>=90°	<=32°	<=32°	<=0°					
0				0	1	19	0	14	10			

### **Station Augmentation**

Name: N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

**Local Climatological Data**  
**Daily Summary**  
**April 2020**

Generated on 02/10/2021

Date	Temperature (F)								Degree Days (base 65F)		Sun (LST)		Weather				Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH				
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type				TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir	Direction = Degrees	
1	2	3	4	5	6	7	8	9	10	11	12	13				14	15	16	17	18	19	20	21	22	23		
01	49	33	41	3.8	57	26	35	24	0	0556	1843					0.00			29.31	29.97	9.2	22	050	17	040		
02	55	32	44	6.4	50	26	37	21	0	0555	1844					0.00			29.33	29.99	11.4	25	290	20	340		
03	49	36	43	5.0	77	34	39	22	0	0553	1845	RA BR				0.03			29.34	29.99	8.8	22	330	17	340		
04	53	39	46	7.5	85	41	43	19	0	0551	1847	BR				0.00			29.39	30.05	4.5	10	340	8	320		
05	50	35	43	4.1	74	36	41	22	0	0550	1848					0.01			29.42	30.09	6.3	21	330	16	320		
06	56	28	42	2.6	62	29	37	23	0	0548	1849					0.00			29.47	30.09	5.7	19	210	15	200		
07	62	33	48	8.2	63	33	41	17	0	0546	1850	TS RA BR				0.19			29.23	29.84	4.7	24	360	18	080		
08	56	39	48	7.7	85	42	44	17	0	0544	1851	BR				0.00			28.99	29.81	7.4	24	210	22	220		
09	49	32	41	0.3	77	33	38	24	0	0543	1852	RA SN FG BR				0.51			28.77	29.59	15.9	39	320	31	320		
10	44	30	37	-4.2	63	25	32	28	0	0541	1854	SN				T			28.97	29.67	21.0	40	280	33	290		
11	44	26	35	-6.6	64	25	32	30	0	0539	1855					0.00			29.28	29.97	11.8	29	290	21	300		
12	64	34	49	6.9	51	33	43	16	0	0538	1856	RA				T			29.26	29.88	8.1	20	190	15	230		
13	61	38	50	7.4	80	44	47	15	0	0536	1857	RA BR				0.65			28.84	29.53	17.1	48	270	38	270		
14	43	28	36	-7.0	56	22	31	29	0	0534	1858					0.00			29.41	30.08	15.1	39	260	30	230		
15	42	25	34	-9.5	61	21	29	31	0	0533	1859	SN BR				T			29.34	30.02	11.7	30	250	24	250		
16	40	21*	31	-12.9	65	20	28	34	0	0531	1901	SN				T			29.49	30.18	12.2	37	280	31	270		
17	40	25	33	-11.4	74	25	30	32	0	0529	1902	SN BR				0.03			29.47	30.12	7.4	22	230	17	220		
18	46	28	37	-7.8	73	30	35	28	0	0528	1903	BR				0.00			29.26	29.92	10.6	33	250	25	240		
19	50	32	41	-4.3	73	35	39	24	0	0526	1904	RA				0.18			29.10	29.75	16.0	44	230	33	240		
20	48	25	37	-8.7	65	26	33	28	0	0525	1905					0.00			29.12	29.75	4.6	17	200	14	170		
21	49	29	39	-7.1	61	25	33	26	0	0523	1906	RA SN BR UP HZ				0.09			28.92	29.60	21.8	45	280	35	290		
22	42	27	35	-11.6	62	21	29	30	0	0521	1907	SN BR				0.05			29.31	30.00	13.7	30	290	24	280		
23	41	29	35	-12.0	74	28	33	30	0	0520	1909	RA UP				0.03			29.32	29.96	10.0	21	080	16	080		
24	49	37	43	-4.4	57	27	36	22	0	0518	1910					0.00			29.18	29.86	9.9	23	060	18	070		
25	60	28	44	-3.8	49	26	38	21	0	0517	1911	RA				T			29.37	30.03	9.2	25	030	21	030		
26	46	40	43	-5.2	91	39	41	22	0	0515	1912	RA BR				0.52			29.31	29.97	14.4	37	050	28	050		
27	58	39	49	0.4	56	31	40	16	0	0514	1913					0.00			29.46	30.12	7.9	25	030	20	020		
28	61	36	49	0.0	63	36	43	16	0	0513	1914	RA				0.01			29.41	30.06	6.5	18	170	14	080		
29	69*	44	57	7.6	63	45	51	8	0	0511	1916	RA				0.07			29.21	29.82	11.5	31	130	23	140		
30	60	45	53	3.2	87	50	52	12	0	0510	1917	RA BR				0.63			29.02	29.65	7.9	25	130	18	210		
51.2	32.4	41.8								Monthly Averages   Totals				3.00			29.24	29.91	10.7								
-4.5	-3.4	-4.0												0.09													

## Number of days with...

Month	Total	Departure	Total	Departure	Max	Min	Precipitation	Snow	Weather
-------	-------	-----------	-------	-----------	-----	-----	---------------	------	---------

Heating	694	115			>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
Cooling	0	-2			0	0	16	0	14	6			

## Greatest...

Date	24-Hr...	
N/A	Precip	Snowfall

Maximum	30.26	17	0743	0.70	
Minimum	29.25	13	0953	29-30	

## Station Augmentation

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

## Local Climatological Data Daily Summary May 2020

Generated on 02/10/2021

Degree Days			Number of days with...									
Monthly		Season-to-date		Temperature				Precipitation		Snow	Weather	
Departure	Total	Departure		Max		Min		>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
89				>=90°	<=32°	<=32°	<=0°					
32				1	0	7	0	13	7			

## Station Augmentation

Name: N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

**Local Climatological Data**  
**Daily Summary**  
**June 2020**

Generated on 02/10/2021

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather				Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH					
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type				TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir	Direction = Degrees	
1	2	3	4	5	6	7	8	9	10	11	12	13				14	15	16	17	18	19	20	21	22	23		
01	68	46	57	-3.0	59	42	50	8	0	0439	1949					T			29.54	30.18	10.6	31	220	24	210		
02	75	54	65	4.7	68	52	57	0	0	0438	1950	TS RA FG BR				0.88			29.26	29.86	12.3	30	220	24	220		
03	77	56	67	6.4	82	60	62	0	2	0438	1951	TS RA BR				0.11			29.00	29.66	8.3	24	260	20	250		
04	82	54	68	7.0	73	59	63	0	3	0437	1951					0.00			29.15	29.78	9.2	26	220	21	220		
05	81	61	71	9.7	76	63	66	0	6	0437	1952	BR				0.00			29.20	29.81	9.2	22	220	17	220		
06	76	59	68	6.3	59	53	59	0	3	0437	1953					T			29.24	29.88	9.7	24	210	20	240		
07	69	53	61	-1.0	60	47	54	4	0	0436	1953					0.00			29.41	30.06	5.6	21	340	15	350		
08	75	51	63	0.6	58	49	55	2	0	0436	1954					0.00			29.42	30.05	3.6	15	340	12	350		
09	86	58	72	9.3	57	57	63	0	7	0436	1954					0.00			29.27	29.88	5.1	23	130	13	230		
10	90*	67	79	15.9	67	67	71	0	14	0436	1955	TS RA BR				0.39			29.10	29.69	11.5	63	280	45	270		
11	72	60	66	2.6	65	55	60	0	1	0436	1956					T			29.25	29.91	19.1	41	240	31	240		
12	66	49	58	-5.8	59	45	52	7	0	0436	1956					0.00			29.51	30.16	11.9	29	320	22	310		
13	64	46	55	-9.1	54	37	46	10	0	0436	1957					0.00			29.66	30.33	7.4	20	360	16	010		
14	66	43*	55	-9.5	57	40	48	10	0	0436	1957					0.00			29.76	30.42	9.0	25	040	20	060		
15	73	45	59	-5.8	52	42	51	6	0	0436	1957					0.00			29.78	30.42	8.5	23	050	18	030		
16	78	44	61	-4.2	55	46	54	4	0	0436	1958					0.00			29.72	30.35	5.3	19	030	15	030		
17	82	52	67	1.5	54	51	59	0	2	0436	1958					0.00			29.59	30.21	5.5	19	020	15	020		
18	85	59	72	6.2	54	55	63	0	7	0436	1958					0.00			29.46	30.06	6.2	21	030	17	040		
19	84	65	75	8.8	61	59	65	0	10	0436	1959					0.00			29.39	30.01	7.4	19	220	13	220		
20	86	63	75	8.5	67	62	67	0	10	0436	1959					0.00			29.38	29.98	5.6	19	210	13	210		
21	88	65	77	10.2	60	61	67	0	12	0436	1959					0.00			29.29	29.89	7.7	19	210	14	230		
22	87	68	78	10.9	75	66	69	0	13	0437	1959	TS RA BR				0.03			29.24	29.86	7.0	28	110	21	120		
23	82	65	74	6.6	80	65	67	0	9	0437	1959	TS RA BR				0.22			29.03	29.63	12.2	39	190	32	190		
24	72	60	66	-1.7	66	53	58	0	1	0437	1959					0.00			29.09	29.74	16.0	34	230	25	220		
25	78	56	67	-1.0	67	55	60	0	2	0438	1959					0.00			29.26	29.90	9.3	26	220	21	220		
26	81	61	71	2.7	60	55	62	0	6	0438	1959					0.00			29.29	29.90	10.5	28	220	23	230		
27	79	65	72	3.5	81	65	67	0	7	0438	1959	RA BR				0.24			29.11	29.71	11.2	30	230	24	230		
28	82	64	73	4.2	74	63	66	0	8	0439	1959	TS RA BR				0.39			29.13	29.76	7.4	20	290	14	330		
29	86	61	74	5.0	59	59	65	0	9	0439	1959	BR				0.00			29.28	29.91	3.7	16	030	13	300		
30	82	63	73	3.7	66	61	65	0	8	0440	1959					T			29.34	29.97	7.4	24	080	17	030		
	78.4	57.1	67.8									Monthly Averages   Totals				2.26			29.34	29.97	8.7						
	1.8	0.9	1.4													-0.84											

## Degree Days

Monthly		Season-to-date		Temperature				Precipitation		Snow		Weather	
Total	Departure	Total	Departure	Max		Min		>=0.1"		>=1"		T-Storms	Heavy Fog
Heating	52	-13		>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"			
Cooling	135	29		1	0	0	0	7	6				

## Date of 5-sec to 3-sec wind equipment change

N/A		Sea Level Pressure		24-Hr...	Snow Depth
		Maximum	Minimum	Date	
		30.47	29.53	15	0851
				0.99	
				02-03	

## Station Augmentation

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

# Local Climatological Data

## Daily Summary

### July 2020

Generated on 02/10/2021

Degree Days			Number of days with...									
Monthly		Season-to-date		Temperature				Precipitation		Snow	Weather	
Departure	Total	Departure		Max		Min		>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
-8	0			>=90°	<=32°	<=32°	<=0°					
134				8	0	0	0	8	5			

## Station Augmentation

Name: N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

**Local Climatological Data**  
**Daily Summary**  
**August 2020**

Generated on 02/10/2021

Date	Temperature (F)							Degree Days (base 65F)		Sun (LST)		Weather				Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH					
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type				TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir	Direction = Degrees	
1	2	3	4	5	6	7	8	9	10	11	12	13				14	15	16	17	18	19	20	21	22	23		
01	88	60	74	2.9	68	60	65	0	9	0507	1936	RA BR				0.05			29.29	29.90	5.3	24	200	20	190		
02	81	67	74	3.0	84	67	69	0	9	0508	1935	TS RA FG BR HZ				0.62			29.08	29.71	16.8	48	220	35	210		
03	82	62	72	1.0	74	62	66	0	7	0509	1934	RA				T			29.33	29.96	7.2	22	270	17	270		
04	77	63	70	-1.0	85	64	66	0	5	0510	1933	TS RA BR				0.19			29.23	29.85	5.6	28	340	21	330		
05	75	57	66	-4.9	66	53	58	0	1	0511	1931					0.00			29.38	30.03	10.6	28	240	22	240		
06	78	54	66	-4.9	62	51	58	0	1	0512	1930					0.00			29.49	30.13	3.9	14	040	12	030		
07	79	59	69	-1.8	61	55	61	0	4	0513	1929					T			29.49	30.13	5.1	17	030	14	050		
08	83	60	72	1.2	61	56	62	0	7	0515	1927					0.00			29.51	30.13	3.4	19	360	14	220		
09	84	65	75	4.2	69	64	68	0	10	0516	1926					0.00			29.43	30.04	12.4	30	210	22	220		
10	90*	72	81	10.3	66	67	71	0	16	0517	1924					0.00			29.34	29.95	10.2	26	230	21	220		
11				79	67	69				0518	1923	RA							29.24	29.71	16.1	33	210	25	220		
12				58	56	63				0519	1922	RA				T			29.44	29.79	3.6	14	020	10	360		
13	89	60	75	4.4	57	57	64	0	10	0520	1920					0.00			29.48	30.10	5.9	22	020	18	030		
14	86	63	75	4.5	57	57	64	0	10	0521	1919					0.00			29.44	30.06	10.3	29	080	22	070		
15	88	64	76	5.5	69	62	66	0	11	0522	1917	TS RA BR				0.86			29.35	29.96	6.7	32	220	25	240		
16	80	64	72	1.6	76	62	65	0	7	0523	1916	RA				T			29.31	29.92	5.4	20	250	15	240		
17	78	58	68	-2.3	83	60	62	0	3	0524	1914	RA FG BR				0.42			29.28	29.90	6.2	37	290	26	310		
18				69	61	65				0525	1913					0.00			29.27	29.93	11.6	21	320	21	320		
19				60	57	63				0527	1911					0.00			29.39	29.88	5.7	19	330	14	310		
20	78	50*	64	-6.1	61	51	57	1	0	0528	1909					0.00			29.39	30.00	7.5	25	210	20	220		
21	83	62	73	3.0	68	61	65	0	8	0529	1908					0.00			29.28	29.91	8.8	24	210	18	210		
22	86	63	75	5.1	68	63	67	0	10	0530	1906					0.00			29.29	29.93	6.8	21	220	16	220		
23	87	65	76	6.2	66	63	68	0	11	0531	1905					0.00			29.36	29.98	7.4	20	200	16	200		
24	87	68	78	8.3	72	67	71	0	13	0532	1903	TS				T			29.33	29.93	11.0	30	240	23	230		
25	81	66	74	4.4	66	60	65	0	9	0533	1901	TS RA				0.14			29.26	29.90	10.6	46	270	37	280		
26				68	61	66				0534	1900	BR RA				0.00			29.38	29.97	6.2	14	040	12	260		
27				74	72	74				0535	1858	TS RA BR							29.10	29.76		23	260	23	260		
28				64	62	67				0536	1856					0.00			29.21	29.82	5.7	12	320	12	320		
29				71	64	68				0538	1855					0.00			28.90	29.84		29	290	21	290		
30										0539	1853					0.00			29.24			17	330	17	330		
31										0540	1851					0.00			29.33		9.3	24	120	18	190		

## Monthly Averages | Totals

## Departure from Normal (1981-2010)

## Number of days with...

Degree Days		Season-to-date		Temperature				Precipitation		Snow		Weather			
Total	Monthly	Total	Departure	Max		Min		>=0.01"		>=0.1"		>=1"		T-Storms	Heavy Fog
Heating				>=90°	<=32°	<=32°	<=0°								
Cooling															

## Date of 5-sec to 3-sec wind equipment change

## Sea Level Pressure

## Greatest...

N/A

Date

Time

24-Hr...

Precip

Snowfall

Snow Depth

Date

## Station Augmentation

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

**Local Climatological Data**  
**Daily Summary**  
**September 2020**

Generated on 02/10/2021

Date	Temperature (F)								Degree Days (base 65F)		Sun (LST)		Weather				Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH				
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type				TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir	Direction = Degrees	
1	2	3	4	5	6	7	8	9	10	11	12	13				14	15	16	17	18	19	20	21	22	23		
01										0541	1849					0.00			29.32		10.2	17	220	17	220		
02										0542	1848					0.00						28	220	22	230		
03	82*	56	69	0.9				0	4	0543	1846	RA				T			29.13		11.2	32	210	25	230		
04	75	53	64	-3.9				1	0	0544	1844					0.00			29.35		10.2	32	300	22	270		
05	73	53	63	-4.6				2	0	0545	1842					0.00			29.52		9.6	27	240	21	240		
06	74	46	60	-7.4				5	0	0546	1841					0.00			29.51		4.6	16	200	14	230		
07	73	63	68	0.9				0	3	0547	1839	TS				0.00			29.20		16.9	51	190	39	190		
08	71	59	65	-1.9				0	0	0548	1837					0.00			29.49		9.4	21	030	17	060		
09	77	59	68	1.4				0	3	0550	1835	FG BR HZ				0.00			29.59		6.1	15	360	12	050		
10	69	58	64	-2.3				1	0	0551	1833	FG BR				0.00			29.62		6.2	16	020	14	010		
11	62	46	54	-12.0				11	0	0552	1832	BR				T			29.68		8.2	19	030	16	030		
12	79	45	62	-3.7				3	0	0553	1830					0.00			29.52		8.1	23	190	18	190		
13	76	56	66	0.7				0	1	0554	1828	RA BR				0.57			29.31		13.1	29	230	23	220		
14	62	46	54	-11.0				11	0	0555	1826					0.00			29.63		7.9	23	030	18	340		
15	64	41	53	-11.7				12	0	0556	1824	BR				0.00			29.66		5.9	19s	220s	14	210		
16	71	56	64	-0.3				1	0	0557	1823					0.00			29.39		13.9	33	220	28	220		
17	70	54	62	-1.9				3	0	0558	1821					0.00			29.40		9.5	21	030	16	010		
18	61	45	53	-10.6				12	0	0559	1819					0.00			29.55		9.5	27s	040s	21	040		
19	59	39	49	-14.2				16	0	0601	1817					0.00			29.75		6.3	25	080	15	060		
20	63	39	51	-11.8				14	0	0602	1815					0.00			29.88		6.5	23	100	16	060		
21	68	38*	53	-9.4				12	0	0603	1814					0.00			29.86		5.3	17	050	14	050		
22	70	39	55	-7.1				10	0	0604	1812					0.00			29.52		6.2	20	230	16	230		
23	78	50	64	2.3				1	0	0605	1810					0.00			29.31		9.2	25	220	21	220		
24	77	54	66	4.7				0	1	0606	1808	FG BR				0.00			29.31		8.6	24	220	20	220		
25	78	57	68	7.1				0	3	0607	1806	BR				0.00			29.39		4.6	14	220	10	240		
26	79	53	66	5.5				0	1	0608	1805					0.00			29.31		9.0	26	210	20	220		
27	80	62	71	10.9				0	6	0609	1803					0.00			29.18		13.9	41	220	32	220		
28	80	61	71	11.3				0	6	0611	1801	RA BR				0.01			29.07		10.9	36	260	29	260		
29	64	53	59	-0.2				6	0	0612	1759	RA BR				0.20			29.15		9.9	27s	270s	21	270		
30	61	50	56	-2.8				9	0	0613	1757	TS RA BR				0.32			28.97		13.9	48	230	35	230		
71.3	51.1	61.2										Monthly Averages   Totals				1.10s			29.44		9.2						
-0.8	-1.7	-1.3														-2.57s											

Degree Days

Monthly		Season-to-date		Temperature				Precipitation		Snow		Weather	
Total	Departure	Total	Departure	Max		Min		>=0.1"		>=1"		T-Storms	Heavy Fog
Heating	133	11		>=90°	<=32°	<=32°	<=0°	>=0.01"	>=0.1"	>=1"			
Cooling	27	-18						4		3			

Date of 5-sec to 3-sec wind equipment change

Sea Level Pressure				Date	Time	24-Hr...		Greatest...		
				Maximum	30.60	20	0951	Precip	Snowfall	Snow Depth
				Minimum	29.53	30	1649	0.57		Date
								13-13		
Station Augmentation										

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

# Local Climatological Data

## Daily Summary

### October 2020

Degree Days			Number of days with...									
Monthly	Season-to-date		Temperature				Precipitation		Snow	Weather		
Departure	Total	Departure	Max		Min		>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog	
20			>=90°	<=32°	<=32°	<=0°						
-5							16s	10s				
Wind equipment change			Sea Level Pressure				Greatest...					
A						Date	Time	24-Hr...			Snow Depth	
	Maximum		30.51		31	0953	Precip	Snowfall				
	Minimum		29.59		07	1045	0.57s	Date				

## **Station Augmentation**

Name: N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

**Local Climatological Data**  
**Daily Summary**  
**November 2020**

Generated on 02/10/2021

Date	Temperature (F)								Degree Days (base 65F)		Sun (LST)		Weather				Precipitation (in)			Pressure (inHg)		Wind	Maximum Wind Speed = MPH						
	Max	Min	Avg	Dep	ARH	ADP	AWB	Heat	Cool	Rise	Set	Weather Type				TLC	Snow Fall	Snow Depth	Avg Stn	Avg SL	Avg Speed	Peak Speed	Peak Dir	Sust. Speed	Sust. Dir	Direction = Degrees			
1	2	3	4	5	6	7	8	9	10	11	12	13				14	15	16	17	18	19	20	21	22	23				
01	51	33	42	-5.1				23	0	0651	1707	RA SN BR				0.32			29.16		19.6	46	270	37	280				
02	44	31	38	-8.8				27	0	0653	1705	RA SN BR UP				0.01			29.28		23.0	45	250	36	250				
03	46	32	39	-7.4				26	0	0654	1704					0.00			29.36		8.3	38	280	26	270				
04	67	35	51	4.9				14	0	0655	1703					0.00			29.52		16.1	43	220	31	220				
05	65	53	59	13.3				6	0	0657	1702					0.00			29.53		15.2	40	220	31	230				
06	64	51	58	12.6				7	0	0658	1700					0.00			29.54		14.8	30	240	23	230				
07	65	48	57	12.0				8	0	0659	1659					0.00			29.59		11.5	24	210	20	220				
08	71	38	55	10.4				10	0	0700	1658					0.00			29.67		3.0	12	220	10	230				
09	75	40	58	13.7				7	0	0702	1657	BR				0.00			29.60		2.1	15	210	13	200				
10	75*	47	61	17.1				4	0	0703	1656					0.00			29.37		9.2	26	220	21	230				
11	66	38	52	8.5				13	0	0704	1655	RA BR				0.24			29.23		12.1	34s	230s	26	230				
12	50	31	41	-2.1				24	0	0706	1654					0.00			29.49		5.6	16	020	14	030				
13	51	30	41	-1.8				24	0	0707	1653					T			29.34		9.2	26	290	21	280				
14	44	28	36	-6.4				29	0	0708	1652					0.00			29.52		6.9	16	220	13	220				
15	56	35	46	4.0				19	0	0709	1651	RA BR				0.25			29.03		21.5	63	240	46	250				
16	43	36	40	-1.6				25	0	0711	1650					0.00			29.21		18.4	48	250	36	250				
17	37	28	33	-8.2				32	0	0712	1649	SN				T			29.41		16.5	41	280	29	320				
18	34	25*	30	-10.9				35	0	0713	1649					0.00			29.82		7.3	31	290	24	300				
19	61	34	48	7.5				17	0	0714	1648					0.00			29.52		19.7	42	210	31	230				
20	60	45	53	12.9				12	0	0716	1647					0.00			29.49		20.9	49	240	37	240				
21	45	35	40	0.3				25	0	0717	1646					0.00			29.78		6.7	16	300	13	310				
22	37	32	35	-4.3				30	0	0718	1646	RA SN FG BR				0.77			29.61		9.6	25	310	21	310				
23	40	29	35	-3.9				30	0	0719	1645	SN				T			29.46		11.9	24	300	21	310				
24	37	32	35	-3.5				30	0	0721	1645	SN BR				T			29.65		7.9	21	320	17	320				
25	51	32	42	3.8				23	0	0722	1644	RA BR				0.17			29.39		8.5	20	210	16	180				
26	52	45	49	11.2				16	0	0723	1644	RA BR				0.04			29.23		10.7	26	230	20	230				
27	47	41	44	6.6				21	0	0724	1643	RA				T			29.40		8.9	21	240	17	240				
28	44	38	41	4.0				24	0	0725	1643					0.00			29.36		14.3	31	230	25	230				
29	50	39	45	8.3				20	0	0726	1642					0.00			29.35		13.0	31	220	26	220				
30	42	35	39	2.7				26	0	0727	1642	RA SN BR UP				0.71			28.98		9.8	29	020	23	020				
	52.3	36.5	44.4									Monthly Averages   Totals				2.51s			29.43	30.09	12.1								
	4.3	4.7	4.5									Departure from Normal (1981-2010)				-0.99s													

## Degree Days

## Number of days with...

Degree Days		Number of days with...													
Monthly		Season-to-date		Temperature				Precipitation		Snow		Weather			
Total	Departure	Total	Departure	Max		Min		>=0.01"		>=0.1"		>=1"	T-Storms	Heavy Fog	
Heating	616	-137		>=90°		<=32°		<=0°		>=0.01"		>=0.1"			
Cooling	0	0		0		0		11	0	7s		5s			

## Date of 5-sec to 3-sec wind equipment change

				Date	Time	24-Hr...		Snow Depth	
				Maximum	30.59	18	1115	Precip	Snowfall
				Minimum	29.32	15	1509	0.77	Date
						22-23			

## Station Augmentation

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

# Local Climatological Data

## Daily Summary

### December 2020

Generated on 02/10/2021

Degree Days			Number of days with...									
Monthly		Season-to-date		Temperature				Precipitation		Snow	Weather	
	Departure	Total	Departure	Max		Min		>=0.01"	>=0.1"	>=1"	T-Storms	Heavy Fog
	-106			>=90°	<=32°	<=32°	<=0°					
	0			0	8	27	0	12	7			

## Station Augmentation

Name:N/A Lat: N/A Lon: N/A Elevation: N/A Distance: N/A Elements: N/A Equipment: N/A

## **Attachment F**

### **2020 NIAGARA FALLS STORAGE SITE**

- **Radon Flux Monitoring Results**
- **Site Map**
- **Biased Radon Flux Prior to Topsoil Restoration**
- **Biased Radon Flux After Topsoil Restoration**
- **Location of Annual and Monthly Radon Flux Samples**
- **Census Data**

**Table 6a**  
**2020 Radon Flux Monitoring Results<sup>a</sup>**  
**Niagara Falls Storage Site**

NFSS Sample ID	Qualifier <sup>d</sup>	Radon-222 Flux			NFSS Sample ID	Qualifier <sup>d</sup>	Radon-222 Flux				
		(pCi/m <sup>2</sup> /s)		MDA			(pCi/m <sup>2</sup> /s)		MDA		
1		0.042	±	0.009	0.018	51	J	0.048	±	0.015	0.015
2	U	0.038	±	0.013	0.055	52	U	0.030	±	0.010	0.037
3	U	0.022	±	0.033	0.120	53	U	0.059	±	0.028	0.105
4		0.072	±	0.013	0.025	54	U	0.053	±	0.020	0.061
5	U	0.015	±	0.015	0.049	55	U	0.038	±	0.013	0.053
6	U	0.043	±	0.031	0.108	56	U	-0.003	±	0.023	0.100
7	U	0.021	±	0.016	0.051	57		0.053	±	0.012	0.025
8	U	0.002	±	0.014	0.050	58		0.037	±	0.008	0.016
9	J	0.057	±	0.019	0.057	59	U	0.057	±	0.028	0.081
10		0.058	±	0.011	0.025	60		0.036	±	0.010	0.018
10-DUP		0.051	±	0.011	0.025	60-DUP	U	0.014	±	0.012	0.046
11		0.030	±	0.008	0.029	61	U	0.038	±	0.035	0.096
12	U	0.049	±	0.017	0.052	62	U	0.041	±	0.014	0.056
13		0.053	±	0.012	0.044	63	U	0.017	±	0.027	0.096
14	J	0.064	±	0.016	0.016	64		0.019	±	0.007	0.018
15		0.071	±	0.013	0.044	65		0.030	±	0.008	0.017
16		0.086	±	0.014	0.021	66	U	0.080	±	0.028	0.094
17	J	0.103	±	0.024	0.024	67	U	0.046	±	0.022	0.078
18		0.050	±	0.013	0.042	68		0.048	±	0.010	0.035
19	U	0.025	±	0.010	0.056	69	U	0.087	±	0.033	0.089
20	U	0.078	±	0.022	0.085	70		0.113	±	0.016	0.018
20-DUP		0.116	±	0.022	0.023	70-DUP		0.082	±	0.015	0.042
21	U	0.017	±	0.019	0.059	71	U	0.010	±	0.012	0.052
22		0.111	±	0.015	0.025	72	U	0.053	±	0.027	0.123
23	U	0.032	±	0.010	0.040	73		0.073	±	0.013	0.039
24	U	0.034	±	0.029	0.122	74		0.082	±	0.014	0.021
25		0.088	±	0.015	0.025	75	J	0.150	±	0.032	0.024
26		0.044	±	0.010	0.036	76		0.073	±	0.013	0.025
27	U	0.051	±	0.026	0.100	77		0.074	±	0.013	0.021
28		0.033	±	0.009	0.024	78	J	0.128	±	0.022	0.016
29	U	0.032	±	0.014	0.057	79		0.041	±	0.009	0.018
30	J	0.081	±	0.022	0.065	80		0.049	±	0.010	0.019
30-DUP		0.074	±	0.019	0.023	80-DUP		0.039	±	0.009	0.021
31		0.066	±	0.011	0.022	81		0.041	±	0.010	0.025
32		0.064	±	0.013	0.050	82	U	0.044	±	0.032	0.097
33		0.048	±	0.011	0.032	83		0.072	±	0.015	0.047
34	U	0.025	±	0.011	0.055	84		0.054	±	0.011	0.021
35	U	0.035	±	0.030	0.127	85	U	0.039	±	0.026	0.091
36	U	0.032	±	0.010	0.039	86	U	0.025	±	0.019	0.051
37		0.073	±	0.012	0.019	87		0.075	±	0.013	0.017
38	J	0.152	±	0.029	0.024	88	J	0.111	±	0.023	0.024
39		0.065	±	0.013	0.025	89		0.049	±	0.012	0.042
40		0.057	±	0.011	0.041	90		0.067	±	0.011	0.017
40-DUP		0.068	±	0.012	0.021	90-DUP		0.055	±	0.010	0.019
41	U	0.034	±	0.010	0.042	91	U	0.017	±	0.012	0.080
42	J	0.084	±	0.016	0.016	92		0.045	±	0.010	0.025
43		0.175	±	0.021	0.025	93		0.093	±	0.019	0.016
44	U	0.045	±	0.022	0.060	94	U	0.034	±	0.012	0.036
45	U	0.035	±	0.030	0.096	95	U	-0.003	±	0.003	0.009
46	U	0.015	±	0.012	0.055	96	U	-0.009	±	0.029	0.076
47	U	0.029	±	0.011	0.048	97		0.045	±	0.012	0.024
48	U	0.001	±	0.028	0.092	98	U	0.040	±	0.021	0.120
49		0.030	±	0.008	0.018	99	U	0.002	±	0.015	0.058
50		0.038	±	0.010	0.032	100	U	0.018	±	0.010	0.041
50-DUP	U	0.020	±	0.015	0.058	100-DUP		0.085	±	0.022	0.027

**Table 6a (cont.)**  
**2020 Radon Flux Monitoring Results<sup>a</sup>**  
**Niagara Falls Storage Site**

NFSS Sample ID	Qualifier <sup>d</sup>	Radon-222 Flux			NFSS Sample ID	Qualifier <sup>d</sup>	Radon-222 Flux		
		(pCi/m <sup>2</sup> /s)		MDA			(pCi/m <sup>2</sup> /s)		MDA
101	J	0.065	± 0.014	0.019	151	J	0.092	± 0.030	0.033
102		0.075	± 0.015	0.025	152	J	0.071	± 0.016	0.030
103	J	0.049	± 0.012	0.023	153	U	0.062	± 0.038	0.123
104	J	0.071	± 0.020	0.027	154	J	0.048	± 0.012	0.030
105		0.083	± 0.016	0.020	155	U	0.001	± 0.023	0.072
106	U	0.039	± 0.012	0.047	156	U	0.053	± 0.038	0.132
107	J	0.118	± 0.027	0.029	157		0.078	± 0.017	0.042
108		0.048	± 0.013	0.029	158	J	0.050	± 0.014	0.040
109	U	0.024	± 0.011	0.056	159	J	0.082	± 0.022	0.028
110	U	0.000	± 0.039	0.114	160		0.084	± 0.017	0.022
110-DUP	U	0.028	± 0.040	0.132	160-DUP		0.062	± 0.014	0.027
111	U	0.002	± 0.018	0.058	161	U	-0.011	± 0.033	0.092
112	U	0.022	± 0.018	0.068	162	J	0.042	± 0.012	0.037
113	U	0.029	± 0.012	0.069	163	J	0.233	± 0.043	0.102
114	J	0.066	± 0.014	0.024	164		0.151	± 0.025	0.031
115	U	0.040	± 0.021	0.120	165		0.085	± 0.019	0.029
116	U	0.032	± 0.016	0.059	166	J	0.156	± 0.036	0.029
117	U	0.002	± 0.011	0.042	167		0.189	± 0.031	0.065
118	U	0.012	± 0.022	0.092	168		0.107	± 0.020	0.046
119	U	0.029	± 0.022	0.066	169	J	0.143	± 0.034	0.119
120	J	0.041	± 0.011	0.024	170		0.138	± 0.024	0.022
120-DUP	U	0.022	± 0.019	0.065	170-DUP		0.166	± 0.029	0.053
121		0.050	± 0.014	0.038	171		0.138	± 0.024	0.040
122	U	0.068	± 0.032	0.134	172	J	0.255	± 0.052	0.160
123	U	0.016	± 0.012	0.021	173	U	0.055	± 0.016	0.055
124	J	0.045	± 0.010	0.021	174	J	0.061	± 0.018	0.020
125	U	0.096	± 0.026	0.108	175		0.092	± 0.019	0.047
126		0.049	± 0.014	0.041	176	U	0.027	± 0.018	0.053
127	U	0.020	± 0.021	0.061	177	J	0.111	± 0.028	0.032
128	U	0.088	± 0.025	0.102	178	U	0.016	± 0.024	0.070
129		0.078	± 0.015	0.021	179	U	0.059	± 0.019	0.065
130	U	0.036	± 0.012	0.046	180	J	0.206	± 0.044	0.134
130-DUP		0.056	± 0.012	0.019	180-DUP		0.250	± 0.046	0.020
131	J	0.117	± 0.026	0.027	181 <sup>c</sup>	U	0.042	± 0.016	0.064
132		0.029	± 0.009	0.021	182 <sup>c</sup>	U	0.022	± 0.024	0.066
133	U	0.025	± 0.027	0.122	183 <sup>c</sup>	J	0.045	± 0.011	0.023
134		0.069	± 0.015	0.029	Average background	0.03612 (pCi/m <sup>2</sup> /s)			
135	U	0.022	± 0.019	0.066		IWCS	Value	Units	
136	U	0.028	± 0.037	0.118		Average <sup>e</sup>	0.0585	(pCi/m <sup>2</sup> /s)	
137		0.044	± 0.011	0.021		High <sup>f</sup>	0.2550	(pCi/m <sup>2</sup> /s)	
138	U	0.026	± 0.016	0.071		Low	-0.0106	(pCi/m <sup>2</sup> /s)	
139	U	0.093	± 0.033	0.114					
140	U	0.003	± 0.022	0.066					
140-DUP	U	0.026	± 0.017	0.075					
141	U	0.018	± 0.041	0.125					
142	J	0.050	± 0.013	0.039					
143	J	0.050	± 0.012	0.036					
144	U	0.030	± 0.013	0.047					
145	U	0.067	± 0.035	0.148					
146		0.083	± 0.016	0.022					
147	J	0.030	± 0.010	0.025					
148	U	0.052	± 0.038	0.141					
149		0.072	± 0.016	0.030					
150	J	0.064	± 0.013	0.023					
150-DUP		0.062	± 0.013	0.020					

**NOTE: The EPA Standard for Radon-222 Flux is 20 pCi/m<sup>2</sup>/sec**

a. Radon-222 flux was performed on July 14-15, 2020 (24 hour exposure).

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

c. Background:

181-Lewiston-Porter Central School

182-Lewiston Water Pollution Control Center

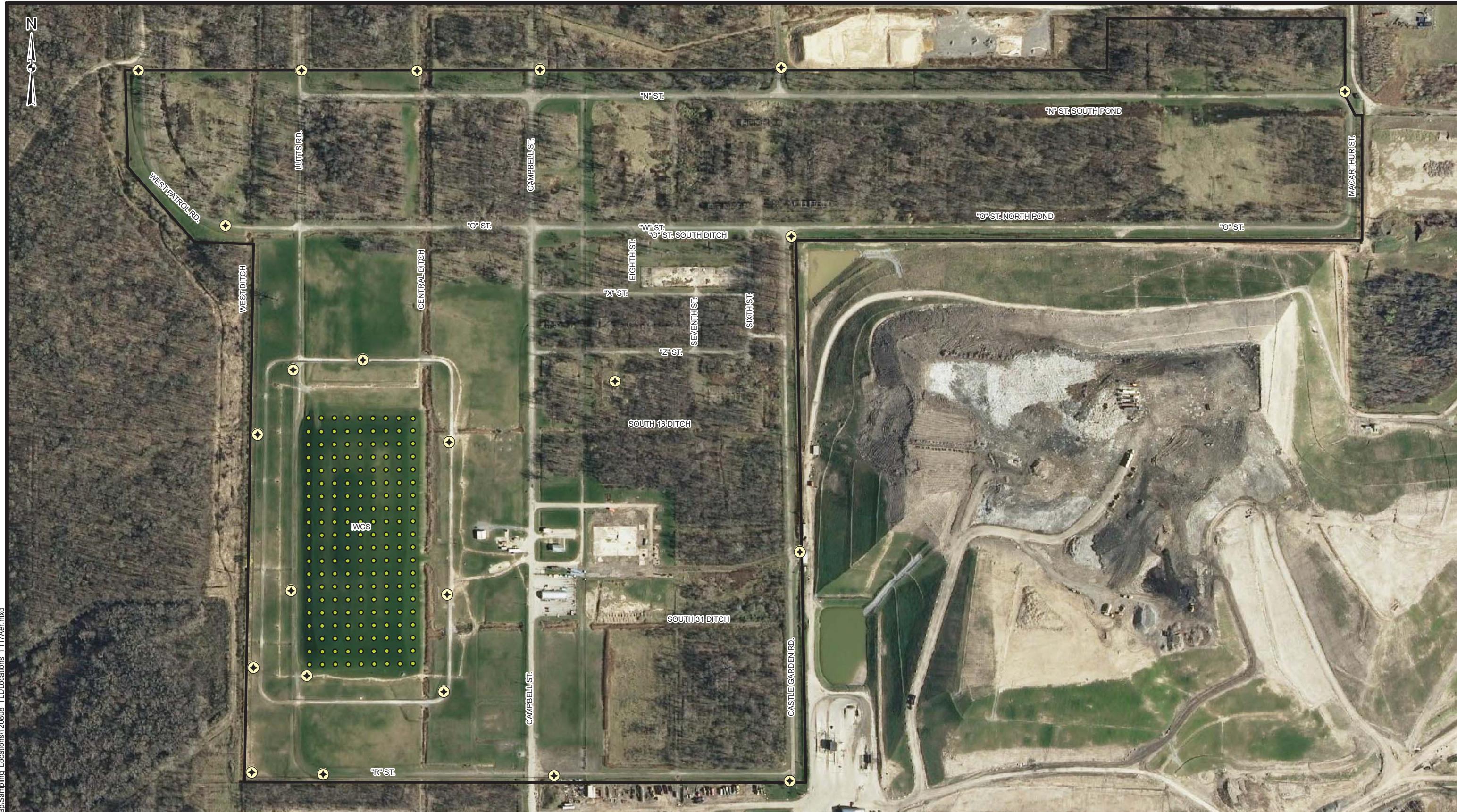
183-Balmer Rd. (CWM Secondary Gate)

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

J - indicates a estimated value when the LCS is greater than the laboratory limit or potential of method blank bias meaning findings may be biased high for both.

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

f. Highest detectable finding.



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#### Legend

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

0 175 350 700  
Feet



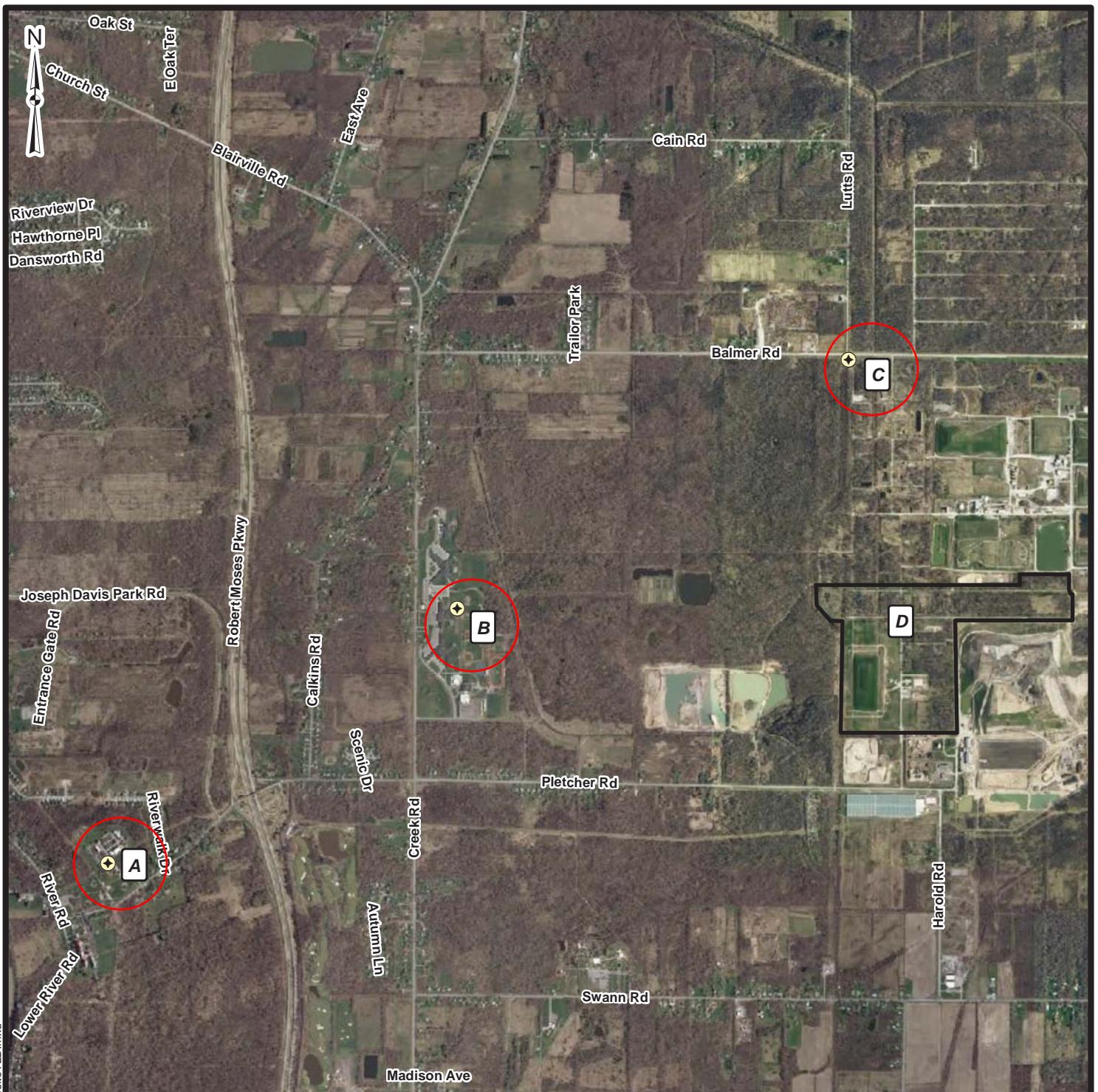
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#### TLD/RADON MONITORING AND RADON FLUX SAMPLING LOCATION MAP

NIAGARA FALLS STORAGE SITE  
LEWISTON, NEW YORK

FIGURE :



#### Environmental Monitoring Locations

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

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



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

**Table 6b**  
**2020 Biased Radon Flux Prior to Topsoil Restoration<sup>a</sup>**  
**Niagara Falls Storage Site**

NFSS Sample ID	Qualifier <sup>b</sup>	Radon-222 Flux		NFSS Sample ID	Qualifier <sup>b</sup>	Radon-222 Flux		
		(pCi/m <sup>2</sup> /s)	MDA			(pCi/m <sup>2</sup> /s)	MDA	
<b>May 06-07</b>								
B2		508.385	± 78.326	5.156	B9	51.220	± 7.628	1.085
<b>May 20-21</b>								
B2		179.378	± 22.269	2.385	B9	8.233	± 1.177	0.412
a. Radon-222 flux was performed over a 24 hour exposure				Mean <sup>c</sup>	186.804	(pCi/m <sup>2</sup> /s)		
b. Data Qualifiers:				High <sup>d</sup>	508.385	(pCi/m <sup>2</sup> /s)		
				Low	8.233	(pCi/m <sup>2</sup> /s)		

U - no analyte was detected (Non-Detect).

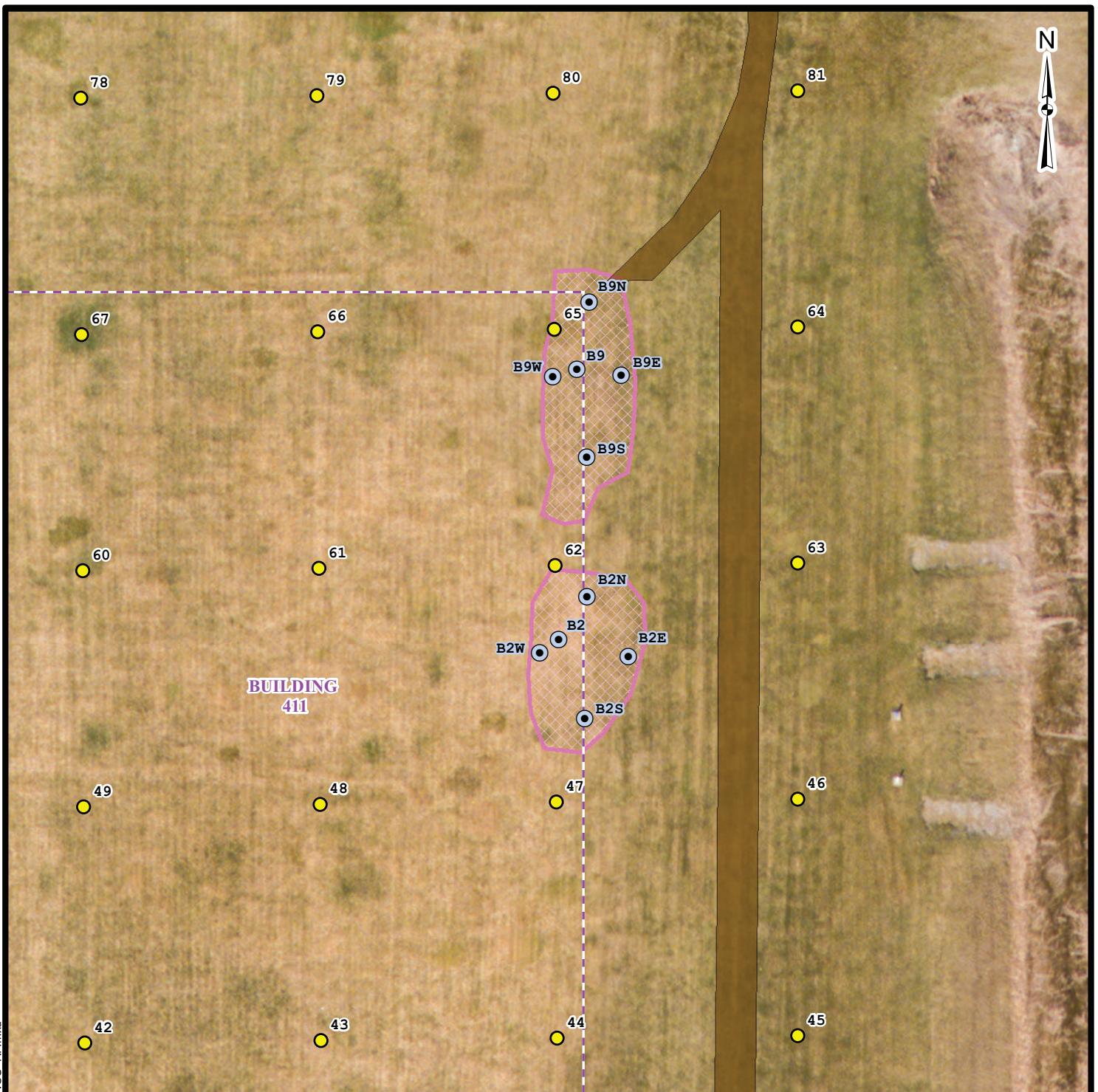
J+ - The result was an estimated quantity, but the result may be biased high.

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

d. Highest detectable finding.

**Table 6c**  
**2020 Biased Radon Flux After Topsoil Restoration<sup>a</sup>**  
**Niagara Falls Storage Site**

NFSS Sample ID	Qualifier <sup>b</sup>	Radon-222 Flux				NFSS Sample ID	Qualifier <sup>b</sup>	Radon-222 Flux			
		(pCi/m <sup>2</sup> /s)		MDA				(pCi/m <sup>2</sup> /s)		MDA	
<b>July 14-15</b>											
B2	U	0.016	±	0.014	0.063	B9	U	0.017	±	0.017	0.038
RF-B2-N	U	0.004	±	0.035	0.115	RF-B9-N	U	0.033	±	0.013	0.048
RF-B2-E	U	0.002	±	0.015	0.058	RF-B9-E	U	0.059	±	0.025	0.127
RF-B2-S	U	0.036	±	0.020	0.053	RF-B9-S	U	0.009	±	0.007	0.044
RF-B2-W	U	0.000	±	0.027	0.107	RF-B9-W	U	0.032	±	0.023	0.065
<b>August 19-20</b>											
B2	J+	0.046	±	0.019	0.025	B9	J+	0.037	±	0.015	0.015
RF-B2-N	U	0.023	±	0.018	0.050	RF-B9-N	U	0.002	±	0.012	0.032
RF-B2-E	J+	0.083	±	0.027	0.025	RF-B9-E	U	0.023	±	0.016	0.025
RF-B2-S	U	0.044	±	0.031	0.058	RF-B9-S	U	0.004	±	0.008	0.031
RF-B2-W	U	0.015	±	0.025	0.050	RF-B9-W	U	0.009	±	0.024	0.051
<b>September 09-10</b>											
B2	U	0.010	±	0.027	0.051	B9		0.025	±	0.016	0.019
RF-B2-N	U	0.041	±	0.031	0.072	RF-B9-N	U	0.008	±	0.022	0.047
RF-B2-E		0.058	±	0.021	0.019	RF-B9-E		0.065	±	0.021	0.017
RF-B2-S		0.079	±	0.042	0.067	RF-B9-S		0.030	±	0.013	0.014
RF-B2-W		0.040	±	0.018	0.017	RF-B9-W	U	0.014	±	0.028	0.050
<b>October 28-29</b>											
B2		0.064	±	0.024	0.038	B9		0.090	±	0.036	0.041
RF-B2-N	U	0.040	±	0.018	0.041	RF-B9-N		0.068	±	0.025	0.042
RF-B2-E		0.042	±	0.019	0.036	RF-B9-E		0.035	±	0.017	0.022
RF-B2-S		0.063	±	0.023	0.042	RF-B9-S		0.105	±	0.046	0.041
RF-B2-W		0.093	±	0.038	0.027	RF-B9-W	U	0.008	±	0.032	0.060
<b>November 03-04</b>											
B2	U	0.010	±	0.024	0.045	B9	U	0.038	±	0.051	0.096
RF-B2-N		0.039	±	0.019	0.033	RF-B9-N		0.028	±	0.014	0.010
RF-B2-E	U	0.029	±	0.032	0.058	RF-B9-E	U	0.017	±	0.034	0.082
RF-B2-S	U	0.022	±	0.024	0.035	RF-B9-S	U	-0.007	±	0.028	0.039
RF-B2-W		0.069	±	0.034	0.015	RF-B9-W		0.035	±	0.018	0.025



#### Legend

- Monthly Radon Flux Sample Location
- IWCS Clay Dike
- Annual Radon Flux Sample Location
- Area of Additional Topsoil Placement (2020)
- Former Building

0 15 30 60  
Feet



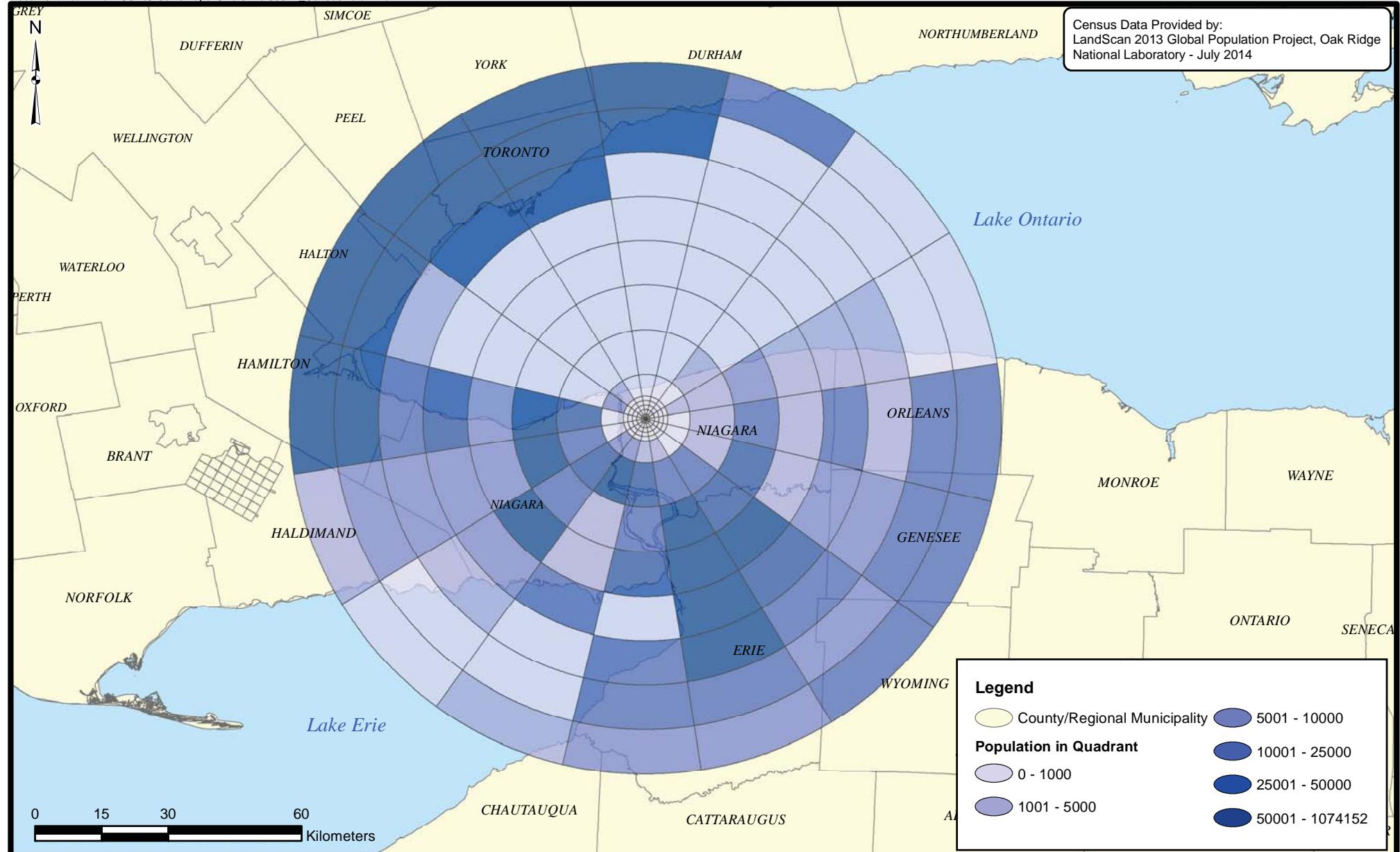
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#### LOCATION OF ANNUAL AND MONTHLY RADON FLUX SAMPLES (2020)

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NIAGARA FALLS STORAGE SITE  
LEWISTON, NEW YORK

FIGURE 1



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#### CENSUS DATA

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