State of Illinois
Illinois Emergency Management Agency

2016 Radiological Environmental Monitoring Report for Illinois Nuclear Power Stations

IEMA

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Executive Summary

The Illinois Emergency Management Agency (IEMA) is mandated with protecting public health and safety and the environment from the potentially harmful effects of ionizing radiation. In support of that mission, IEMA conducts radiological environmental monitoring around Illinois' six operating nuclear power stations and Zion Nuclear Power Station, which ceased operation in 1997 and is currently in the decommissioning process.

IEMA's radiological environmental monitoring program has three primary functions: 1) collection of diverse samples from carefully chosen locations on a routine basis, including simultaneous field surveillance; 2) analyzing samples for radionuclides; and 3) evaluation of test results on both an annual and historical basis.

Federal regulations establish standards for protection of the public against ionizing radiation from activities conducted under U.S. Nuclear Regulatory Commission (US NRC) licenses, such as operation of nuclear power stations. The U.S. Environmental Protection Agency (US EPA) and the Illinois Environmental Protection Agency set drinking water and Class I groundwater standards for several types of radioactive contaminants; the limit for tritium in both drinking water and Class I groundwater, 20,000 picocuries per liter, is used for comparison purposes within this report.

In 2016, 667 environmental samples were collected and analyzed for radioactivity. The samples collected by IEMA included water, sediment, soil, air, vegetation and fish. In addition, 1,720 environmental dosimeters were strategically deployed around each of the nuclear power station sites to measure direct radiation.

In 2016, all test results for samples collected as part of IEMA's environmental monitoring program for nuclear power stations were below federal safety standards and guidelines.

As expected, tritium was the only radionuclide detected above natural background attributable to nuclear power plant operations. Liquid effluent tritium is routinely released to the environment as per each station's NRC operating license. Although tritium was detected in several water samples, none of the sample results exceeded any state or federal reporting limits.

Environmental dosimetry results provide a baseline of ambient gamma radiation levels within a 10-mile radius of each nuclear power station and other background reference locations across the state.

In 2016, all test results for environmental dosimetry were consistent with historically established background levels, except for higher readings near spent fuel storage casks at Zion, which were expected due to the close proximity of some dosimeters to the casks.

In parallel with environmental monitoring, IEMA operates a state-of-the-art Remote Monitoring System (RMS) at all six operating nuclear power stations. This one-of-a-kind RMS consists of three separate subsystems: the Reactor Data Link (RDL), the Gaseous Effluent Monitoring System (GEMS) and Gamma Detection Network (GDN). The GEMS is used to measure and identify gaseous effluent radioactivity from each nuclear power station effluent stack, and the GDN is capable of measuring direct radiation in the surrounding environment. IEMA's radiological environmental monitoring program independently monitors the environs around each nuclear power station to ensure releases to the environment are not affecting public health and safety. Results from the GEMS and GDN are summarized in this report.

Illinois Emergency Management Agency

Environmental Monitoring Program for Nuclear Power Stations
Report for Calendar Year 2016

Introduction

With 11 operating reactors at six nuclear power stations, Illinois is home to more commercial nuclear power generation than any other state in the country. Although direct regulatory authority for the operation of U.S. nuclear power stations resides with the U.S. Nuclear Regulatory Commission (US NRC), the Illinois Emergency Management Agency (IEMA) is mandated with protecting public health and safety and the environment from the potentially harmful effects of ionizing radiation. In support of that mission, IEMA conducts radiological environmental monitoring in the environs of Illinois' six operating nuclear power stations. IEMA also maintains a radiological environmental monitoring program at Zion Nuclear Power Station, which ceased operation in 1997 and is currently undergoing decommissioning. Control sample locations are chosen in areas where the samples are not influenced by plant operations. Control location samples are sampled quarterly and the results are compared with indicator sample results. Control sample are taken at Sangchris Lake State Park near Kincaid, Illinois and air monitoring samples are collected in Springfield, Illinois. Sample results for control locations can be found in Appendix H.

In addition to "traditional" radiological environmental monitoring, IEMA has a Remote Monitoring System (RMS) around each nuclear power station. IEMA's RMS is an advanced, integrated computer-based system that continually monitors selected plant operational parameters at each facility and is capable of identifying and measuring the presence of radioactive materials in station effluents and direct radiation in the surrounding environment. This one-of-a-kind system consists of three separate subsystems: the Reactor Data Link (RDL), the Gaseous Effluent Monitoring System (GEMS) and the Gamma Detection Network (GDN).

Data from the RMS is collected and monitored continuously. IEMA has developed software to continually monitor and analyze RMS data, and it provides notification of unusual occurrences to on-call IEMA personnel.

This report details IEMA's radiological environmental monitoring program, including data from the RMS, for the period January 2016 through December 2016 for the six operating nuclear power stations in Illinois and the one nuclear power station undergoing decommissioning.

Program Overview

Critical pathways for potential radiation exposure to the public include direct radiation, airborne, waterborne, aquatic and ingestion. IEMA has strategically identified sampling locations that provide early indication of any potential public health and safety issues regarding Illinois nuclear power station operation. Data from the program is used to establish a baseline data set that can be used to perform exposure assessments in the event of a significant release from a nuclear power station.

IEMA collects samples from designated indicator sampling locations on a routine basis. IEMA analyzes these samples for the presence of radionuclides and the results are evaluated on both an annual and historical basis.

Sample matrices monitored by IEMA include surface water, sediment from nearby waterways, soil, air, vegetation and fish. In 2016, 667 samples were collected, analyzed and evaluated. In addition, 1,720 radiological environmental dosimeters were deployed around the nuclear power stations in Illinois.

Results at a Glance

Federal regulations establish standards for protection of the public against ionizing radiation resulting from activities conducted under U.S. NRC licenses, such as operation of nuclear power stations. The U.S. Environmental Protection Agency (US EPA) sets drinking water standards for several types of radioactive contaminants; the limit for tritium in drinking water is used for comparison purposes within this report.

In 2016, all test results for samples collected as part of IEMA's environmental monitoring program for nuclear power stations were below federal and state safety standards and guidelines. No radionuclides associated with nuclear power station operations, except for tritium, were detected in samples collected near nuclear power stations. Other radionuclides detected were naturally occurring.

As stated above, tritium was the only radionuclide detected attributable to nuclear power station operations. It was detected in several water samples. Tritium is a normal part of the effluent stream of nuclear power stations and the concentrations detected were well below the US EPA limit for tritium in drinking water.

Environmental dosimetry test results provide direct radiation levels within a 10-mile radius of each nuclear power station.

In 2016, all test results for environmental dosimetry were consistent with established historical background levels, except for higher readings near the spent fuel storage casks in Zion, which were expected due to the close proximity of some dosimeters to the casks.

Limits of Detection

All analytical methods have limitations: amounts that are just too small to be detected. The Minimum Detectable Concentration (MDC) is an "a priori" measure of that limitation – an estimate of the lower limit of detection. It is defined as the smallest quantity that an analytical method has 95% likelihood of detecting. For example, the MDC for IEMA's method for tritium in water is 200 picocuries per liter (pCi/L). Given a sample with a tritium concentration of 200 pCi/L, our laboratory would detect that tritium approximately 95 times out of 100. Samples with less than 200 pCi/L could be detected, but with less certainty. Conversely, samples with more than 200 pCi/L would be more likely to be detected, approaching 100% as concentrations increase.

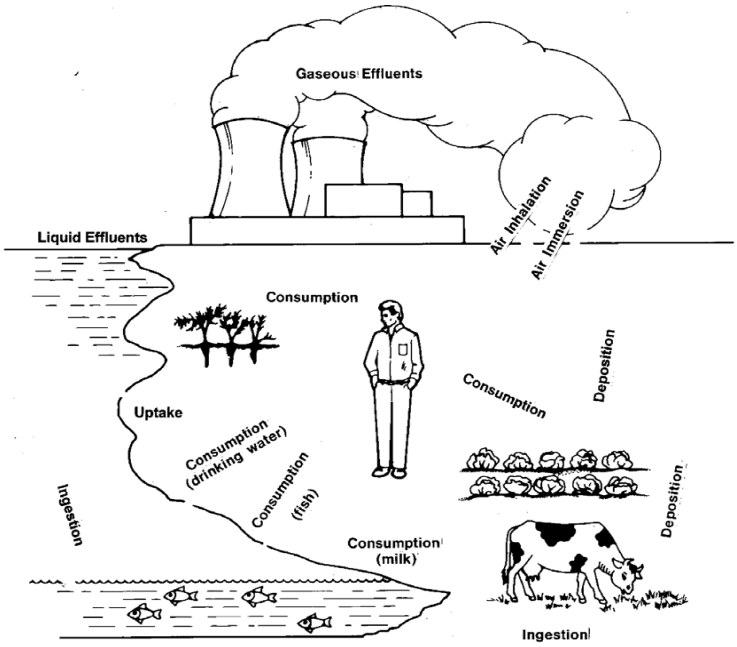
Analytical methods are chosen, in part, on their MDC. As a general rule, methods are chosen such that their MDC is less than 10% of any applicable regulatory limit.

Radiation Exposure Pathways to Humans

Samples collected for the IEMA radiological environmental monitoring program reflect critical pathways where radionuclides could be transported to and ingested and/or inhaled by the general population: water, sediments and fish from lakes and rivers downstream, and groundwater from

nearby wells. **Figure 1** depicts the different exposure pathways through which people may be exposed to radiation, or may ingest radioactive material.

Figure 1. Radiation Exposure Pathways to Humans



Water Samples

Nuclear power stations use large volumes of water and sometimes discharge a portion of this water to rivers and lakes. This discharge is regulated by the US NRC and the Illinois Environmental Protection Agency (IEPA). Impacted bodies of water include the Kankakee, Illinois, Rock and Mississippi rivers, Lake Michigan and Clinton Lake. IEMA analyzes samples from these bodies of water.

Plant operations can also impact groundwater; therefore, IEMA also analyzes samples collected from wells in and around the nuclear power stations, specifically at Braidwood due to the 2005 groundwater tritium leak. Groundwater samples are collected and analyzed quarterly. Water samples are analyzed for gross alpha, gross beta, tritium and gamma radionuclides (See Appendix J for radionuclide abbreviations).

Tritium (H-3) is the primary radionuclide released in the effluent stream of nuclear power plants. Liquid effluents from the nuclear power stations are released in accordance with the plant's U.S. NRC operating license to waterways as per the station's National Pollutant Discharge Elimination System permit, which is issued by the IEPA. Water samples are analyzed for tritium and the results are compared to the US EPA and IEPA drinking water standard of 20,000 pCi/L, which corresponds to a 4 mrem/year limiting dose.

Soil Samples

Radionuclides released into the air would be expected to eventually settle to the ground in locations downwind. IEMA analyzes soil samples collected from land around the nuclear power stations. Soil samples are collected semi-annually in the spring and the summer. Soil samples are then analyzed for

radioactivity by gamma spectroscopy. ***The soil sample results indicated no concentrations of reactor-produced radionuclides above background.***

Historically, environmental soil samples typically contain Cs-137 concentrations ranging between 0.1 – 0.2 pCi/g as a result of atmospheric nuclear weapons testing.

Sediment Samples

Radionuclides released into rivers would be expected to accumulate in sediments downstream. IEMA analyzes sediment samples that are collected from the rivers and lakes downstream of the nuclear power stations' effluent points. Sediments are collected semi-annually in the spring and fall. All sediment samples are analyzed by gamma spectroscopy. Historically, environmental sediment samples typically contain Cs-137 concentrations ranging between 0.1 – 0.2 pCi/g as a result of atmospheric nuclear weapons testing. ***The sediment sample results indicated no concentrations of reactor-produced radionuclides above background.***

Fish Samples

Fish are excellent bio-accumulators of radionuclides. Fish samples are collected from rivers, near nuclear power station discharge points. At each location, two different species of fish are collected and are referenced as top-feeders and bottom-feeders. Edible portions of the fish are harvested and analyzed by gamma spectroscopy. ***The fish sample results indicated no concentrations of reactor-produced radionuclides above background.***

Vegetation Samples

Radionuclides released to atmosphere deposit on the ground downwind from the nuclear power station and are subsequently transported to the root system of plants. Plants may take up or metabolize radioactive materials in the soil. Vegetation samples are collected in the vicinity of each power station in the late spring or summer. All vegetation samples are analyzed by gamma spectroscopy. ***The vegetation sample results indicated no concentrations of reactor produced radionuclides above background.***

Air Samples

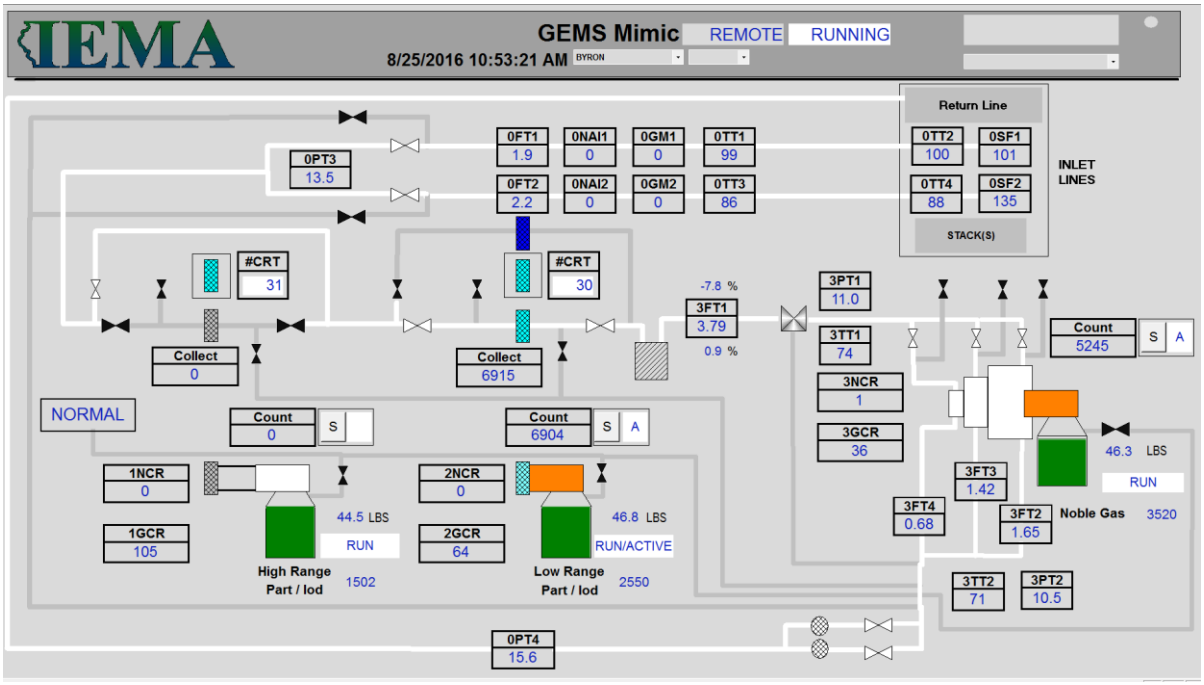
The Zion Nuclear Power Station permanently ceased operation in February 1998, and has been storing spent fuel on-site. Due to decommissioning activities, IEMA maintains a network of air monitoring stations around the Zion Station. Air samples are collected continuously, with the air filters being changed and analyzed weekly. The air filters are analyzed for gross alpha and beta by gas flow proportional counting. ***The air sample results indicated no concentrations of reactor produced radionuclides above background.***

Gaseous Effluent Monitoring System (GEMS)

IEMA continuously monitors gaseous effluents from all operating nuclear power stations with the GEMS, which provides automatic, in-line, continuous sampling of each nuclear power plant effluent stack(s). The GEMS measures and identifies particulates, noble gases and iodines over a wide range of concentrations, from background levels to potential releases of radioactive material under emergency conditions.

Figure 2 below details the remote operation data for the Dresden Nuclear Station GEMS equipment.

Figure 2. Computer Display of GEMS Data



The GEMS equipment shown in Figures 3A and 3B below were originally designed by Science Applications International Corporation (SAIC) and re-designed by IEMA personnel. The re-designed units were built, installed and are currently maintained by IEMA personnel.

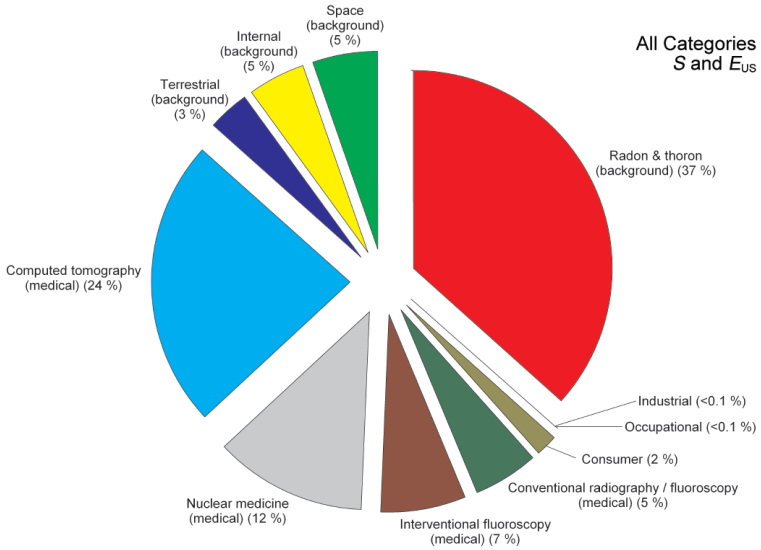
Figures 3A and B. Photos of GEMS Equipment

Ambient Gamma Monitoring

IEMA maintains a network of 415 environmental dosimeters around the six operating nuclear power stations and Zion. Unlike the environmental samples described previously, dosimeters do not provide information on what radionuclides are found in the environment. Instead, dosimeters provide a direct measurement of the total dose produced by all sources of gamma radiation, including naturally occurring radionuclides and cosmic rays, integrated over time. The dosimeters are arrayed within a 10-mile radius of each plant and are exchanged and analyzed quarterly by IEMA. The dosimeters are used to monitor ambient background levels of gamma radiation around each during normal nuclear power station operations. In addition, the environmental dosimeters can be used to determine the extent and magnitude of radiation dose to the public following a significant release of radioactivity to the public.

Results for environmental dosimeters analyzed during 2016 are included in the site-specific sections of this report. In addition to the quarterly results, which are expressed as the average millirem per day, we have used those results to calculate the approximate millirem per year an individual would receive at that location for an entire year. Those numbers can be compared to the average radiation exposure to an individual of 620 millirem per year from various sources (according to the 2009 National Council on Radiation Protection's Report 160). Approximately 8% of that exposure is from terrestrial and cosmic radiation (background radiation), and equals approximately 49.6 millirem per year. ***The ambient gamma monitoring results indicated no radiation levels statistically above background.***

Figure 4. Sources of Radiation Exposure to Man



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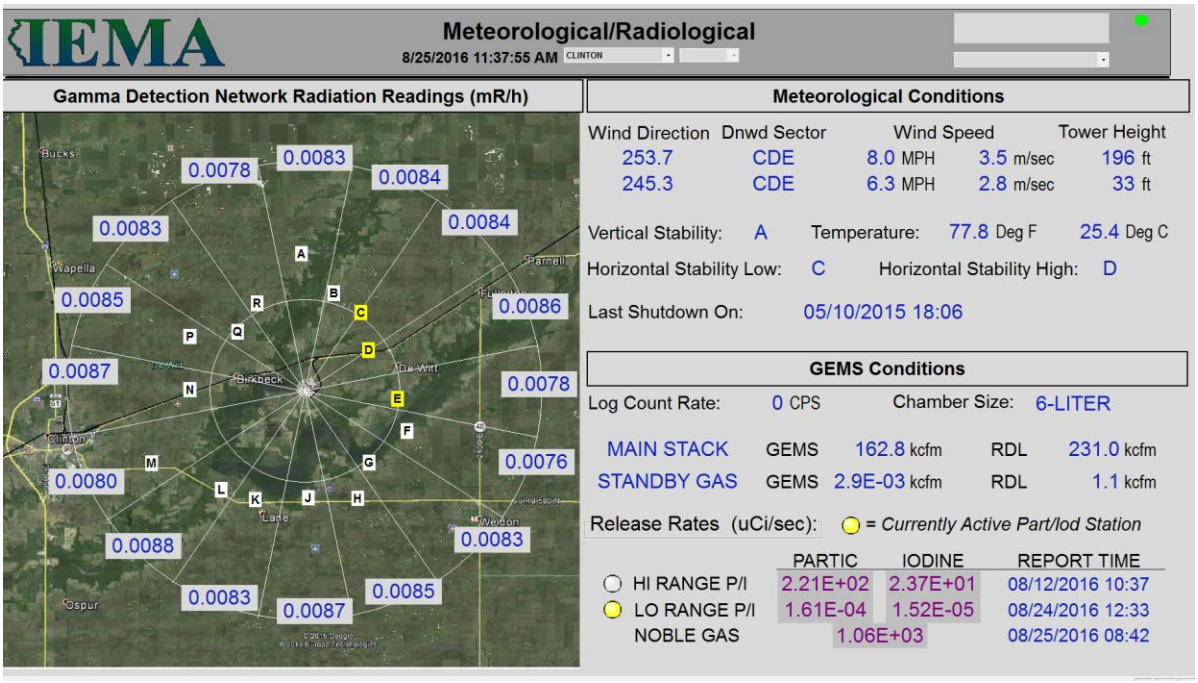
Gamma Detection Network (GDN)

In addition to placing dosimeters around the nuclear power stations, IEMA manages the GDN, which is a network of Reuter-Stokes detectors placed radially around each of the nuclear power plants to detect gamma radiation levels in the environment. Sixteen detectors surround each nuclear plant site and are located approximately 2-5 miles from the plant. Each sensor is capable of detecting gamma radiation in the range of small background levels up to 10 roentgen per hour. Shown in Figure 5 is an analytical display for the Clinton Nuclear Station with meteorological and GDN radiation information, which can be utilized by IEMA health physicists to evaluate environmental impacts of a release. Figure 6 is a photo of a typical GDN field installation.

Graphic representations of GDN data collected during 2016 from each ring of detectors around each nuclear power station are included in the site-specific Appendices of this report. Each of the 16 GDN stations is coded with a different color on the graph.

Figure 5. Display of Gamma Detection Network around Clinton Nuclear Station



The GDN provides real-time radiation measurements and the environmental dosimeters deployed around the plants are radiation measurements integrated over the period of time they are deployed in the field (typically three months).

Figure 6. Typical IEMA GDN Field Installation

Braidwood Nuclear Power Station

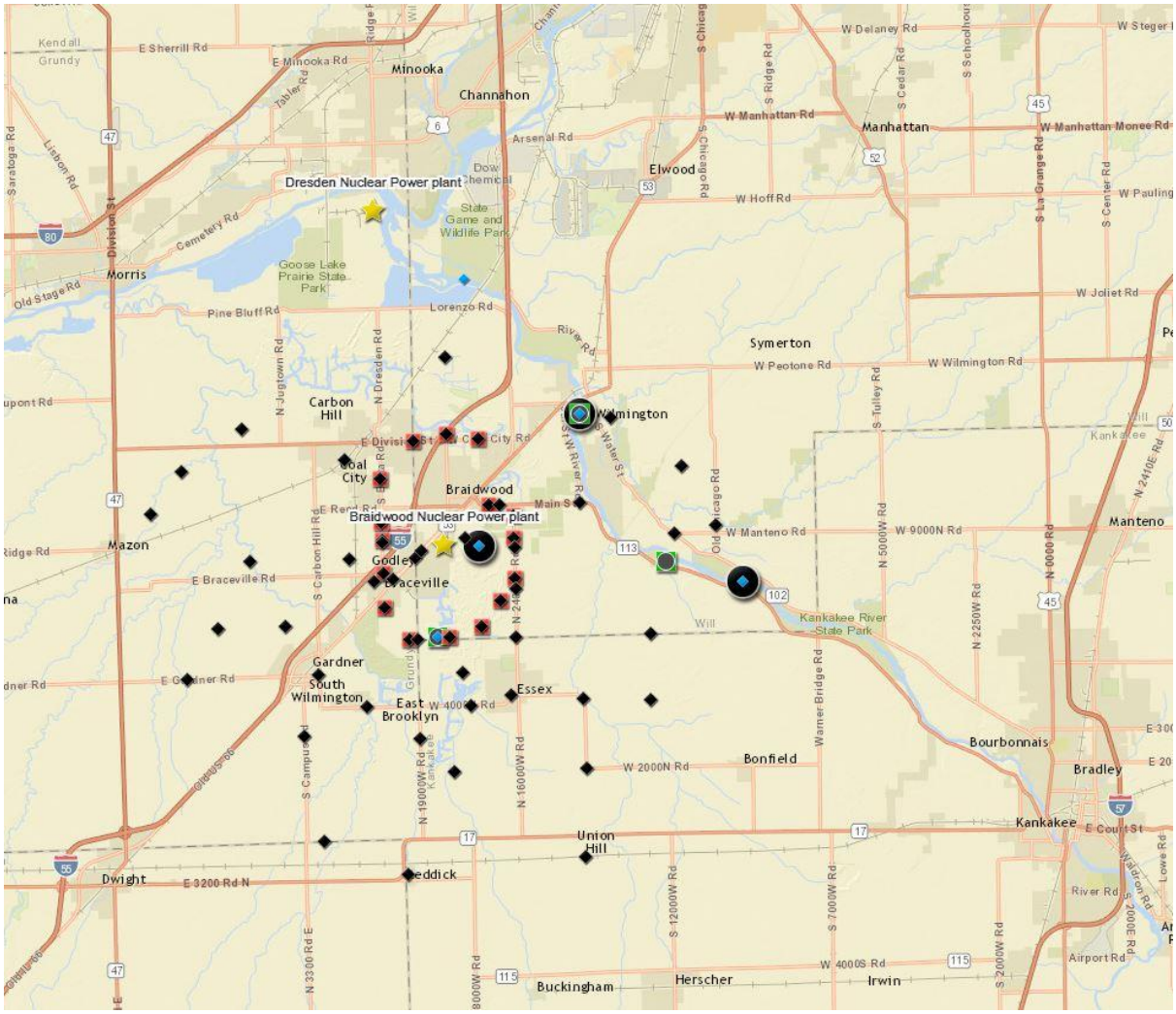
The Braidwood Station, consisting of two 3,587 MWt pressurized water reactors owned and operated by Exelon Corporation (Exelon), is located in Will County, Illinois. Unit 1 went critical on May 29, 1987. Unit 2 went critical on March 8, 1988. The site is located in northeastern Illinois, 15 miles south-southwest of Joliet, Illinois, 60 miles southwest of Chicago and southwest of the Kankakee River.

Liquid effluents from the Braidwood Station are released in controlled batches to the Kankakee River in accordance to release limits governed by the station's license with the NRC and the plant's IEPA National Pollutant Discharge Elimination System permit. As expected, surface water samples taken near the vicinity of Wilmington, Illinois were found to contain detectable levels of tritium due to liquid effluent releases from Braidwood Station.

In 2005, it was discovered that a leak in the line that transported effluents to the Kankakee River had allowed for the unpermitted release of effluents to groundwater. Subsequently, H-3 was found in ground water and a pond outside the boundaries of the plant. As a result, IEMA continues to analyze split ground water samples collected by Exelon from two locations on site by the turbine building and in F-ditch (Table A-1).

Figure 7 is an overview of all sampling locations in the vicinity of the Braidwood Nuclear Power Station (yellow star in the center). The second yellow star near the top of Figure 7 is the Dresden Nuclear Power Station. Results for all samples collected in the environs of the Braidwood Nuclear Power Station can be found in Appendix A.

Figure 7. Overview of IEMA's Monitoring Locations for Braidwood



Dresden Nuclear Power Station

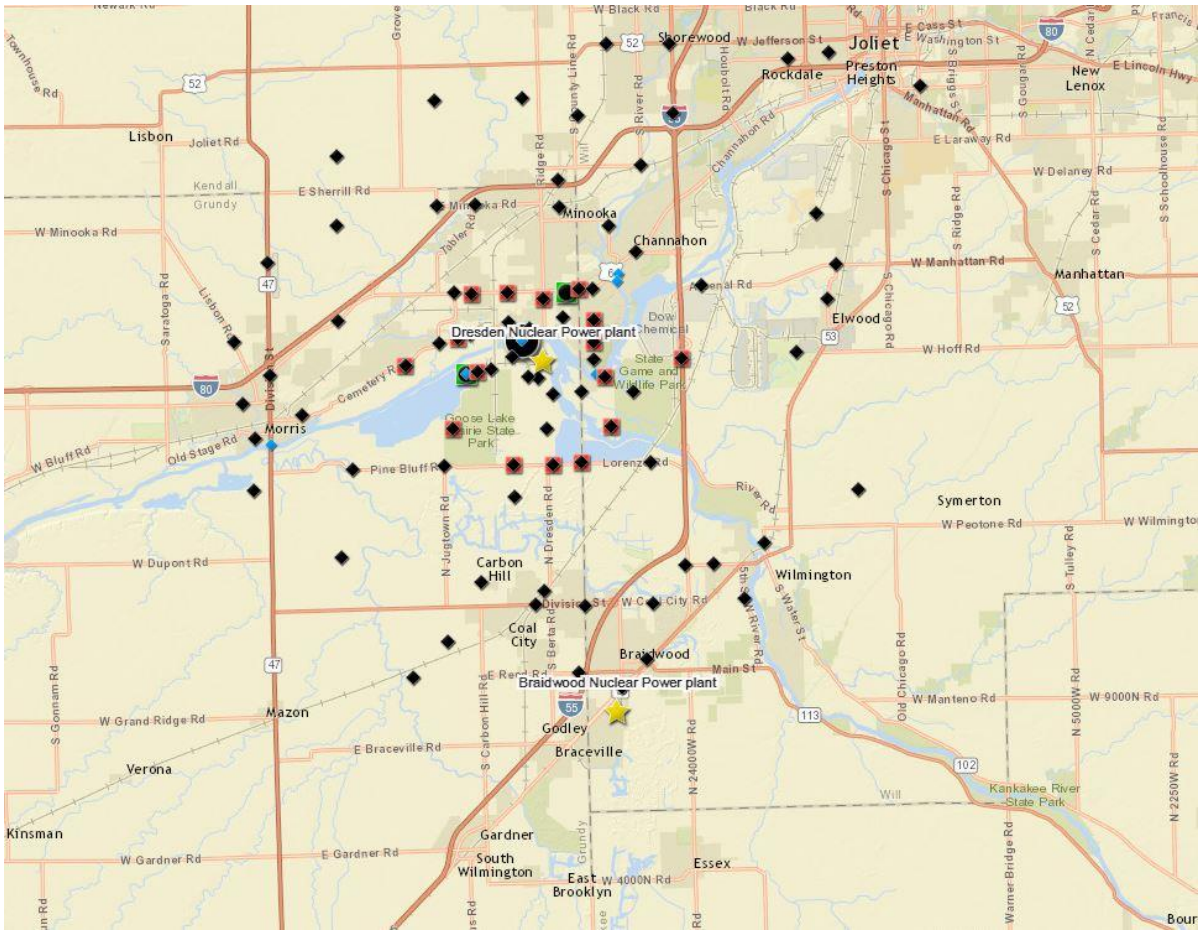
The Dresden Nuclear Power Station, consisting of one retired reactor and two operating boiling water reactors owned by Exelon, is located in Grundy County, Illinois, approximately 12 miles southwest of Joliet, Illinois at the confluence of the Des Plaines and Kankakee rivers where they form the Illinois River.

Liquid effluents from the Dresden Station are released in controlled batches to the Illinois River in accordance to release limits governed by the station's license with the NRC. No liquid batch releases of radioactive effluents were discharged during this reporting period.

Figure 8 is an overview of all sampling locations in the vicinity of the Dresden Nuclear Power Station (yellow star in the middle of the map). The second yellow star near the bottom of Figure 8 is the Braidwood Nuclear Power Station.

Results for all samples collected in the environs of the Dresden Nuclear Power Station can be found in Appendix B.

Figure 8. Overview of IEMA Monitoring Locations for Dresden



Map Key:

- OSL*
- GDN & OSL*
- Nuclear Power Plant
- Soil
- Sediment
- Vegetation
- Water

* OSL = Optically-Stimulated Luminescence Dosimeter

Sample icons are stacked to indicate multiple types of samples collected at the same location.

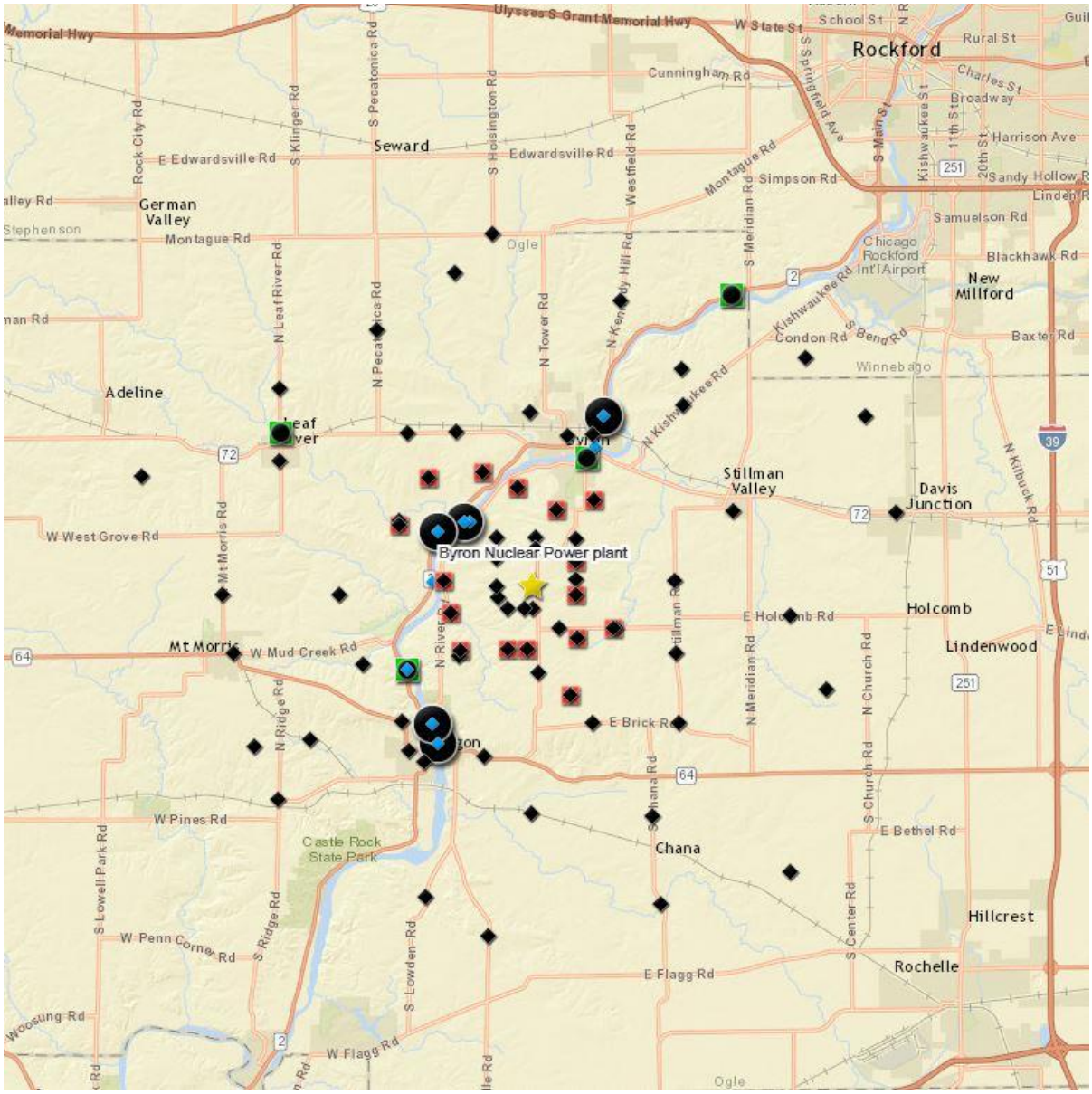
Byron Nuclear Power Station

The Byron Station, a two-unit PWR station, is located about two miles east of the Rock River and approximately three miles southwest of Byron in Ogle County, Illinois. The reactors, operated by Exelon, are designed to have capacities of 1,268 and 1,241 MW gross, respectively. Unit 1 began operation on February 2, 1985, and Unit 2 on January 9, 1987.

Liquid effluents from the Byron Station are released to the Rock River in accordance to release limits governed by the station's license with the NRC.

Figure 9 is an overview of all sampling locations in the vicinity of the Byron Nuclear Power Station (yellow star). Results for all samples collected in the environs of the Byron Nuclear Power Station can be found in Appendix C.

Figure 9. Overview of IEMA Monitoring Locations for Byron



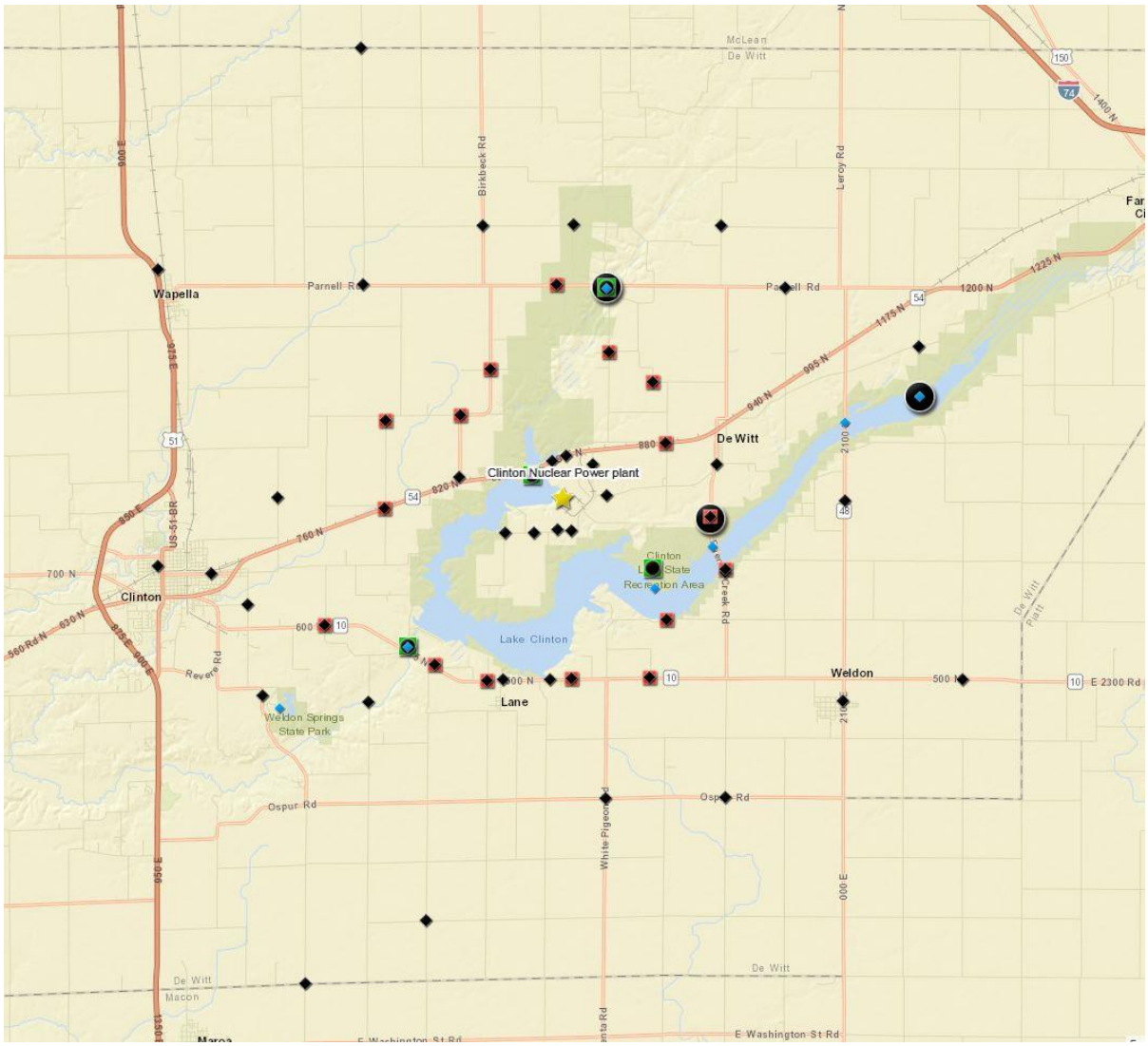
Clinton Nuclear Power Station

The Clinton Power Station (CPS), consisting of one approximately 1,140 MW gross electrical power output boiling water reactor, is located in Harp Township, Dewitt County, Illinois. The site is located approximately six miles east of the city of Clinton, Illinois. CPS is owned and operated by Exelon and became operational in 1987. Unit 1 went critical on February 15, 1987. The site encloses approximately 13,730 acres of property not owned by Exelon. The plant is situated on approximately 150 acres. The cooling water discharge flume – which discharges to the eastern arm of the lake – occupies an additional 130 acres.

Liquid effluents from the Clinton Station are released into the eastern arm of Clinton Lake, a 4,900-acre man-made cooling lake, in accordance to release limits governed by the station's license with the NRC. No liquid batch releases of radioactive effluents were discharged during this reporting period. The outflow from Clinton Lake falls into Salt Creek, a tributary of the Sangamon River.

Figure 10 is an overview of all sampling locations in the vicinity of the Clinton Nuclear Power Station (yellow star). Results for all samples collected in the environs of the Clinton Nuclear Power Station can be found in Appendix D.

Figure 10. Overview of IEMA Monitoring Locations for Clinton



Map Key:

- OSL*
- GDN & OSL*
- Nuclear Power Plant
- Soil
- Sediment
- Vegetation
- Water

* OSL = Optically-Stimulated Luminescence Dosimeter

Sample icons are stacked to indicate multiple types of samples collected at the same location.

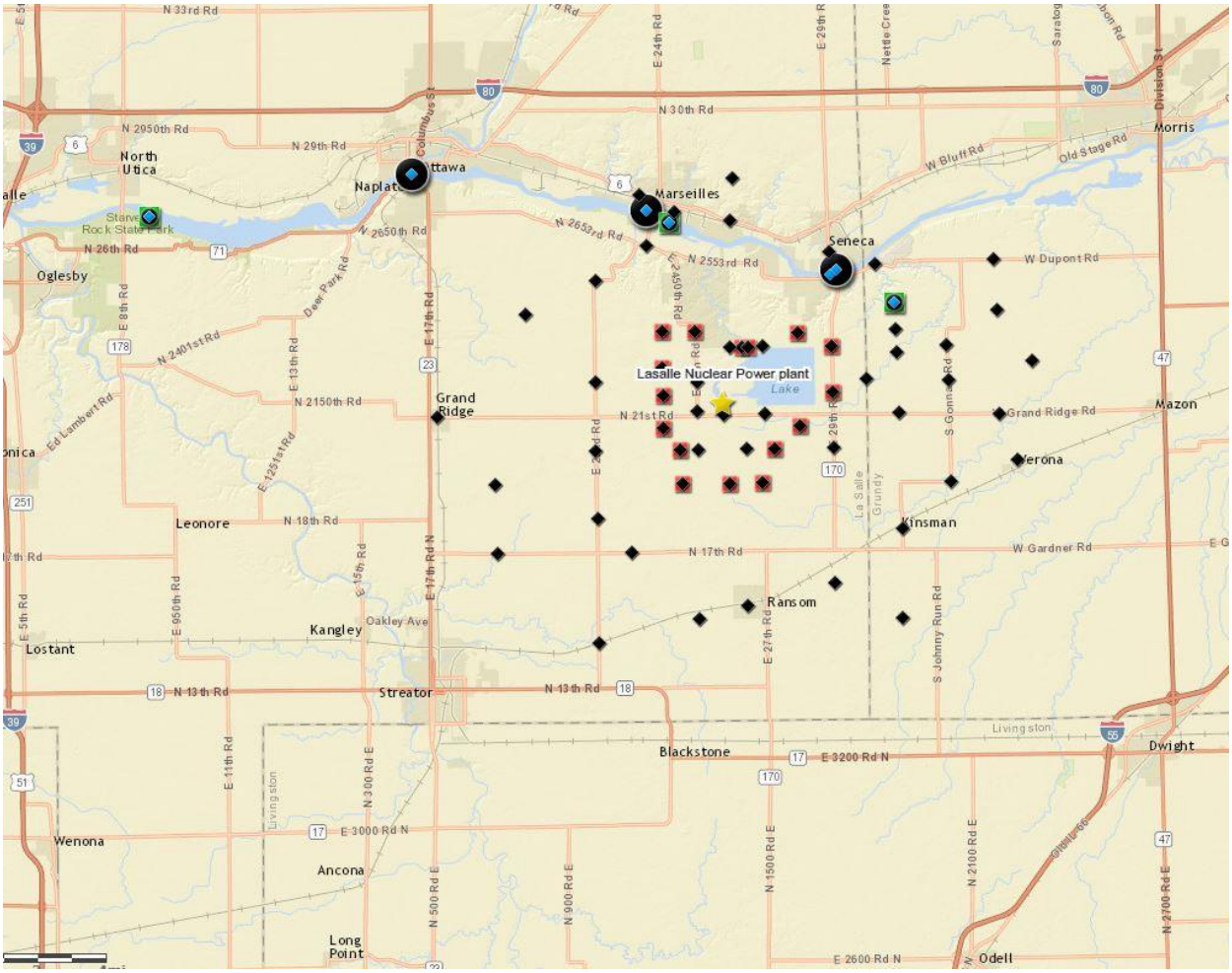
LaSalle Nuclear Power Station

The LaSalle County Station consists of two boiling water reactors, each rated for 3,546 MWt. Both units are owned and operated by Exelon and are located in LaSalle County, Illinois. Unit 1 went critical on March 16, 1982. Unit 2 went critical on December 2, 1983. The site is located in northern Illinois, approximately 75 miles southwest of Chicago, Illinois.

Liquid effluents from the LaSalle Station are released to the LaSalle cooling lake in accordance to release limits governed by the station's license with the NRC, and from there to the Illinois River at a point 3.5 miles north of the station. However, the discharge point is approximately 20 miles downriver of the Dresden Nuclear Power Station. Effectively, samples taken downstream of Dresden station are upstream controls for the LaSalle station. No liquid batch releases were discharged during this reporting period.

Figure 11 is an overview of all sampling locations in the vicinity of the LaSalle Nuclear Power Station (yellow star). Results for all samples collected in the environs of the LaSalle Nuclear Power Station can be found in Appendix E.

Figure 11. Overview of IEMA Monitoring Locations for LaSalle



Map Key:

- OSL*
- GDN & OSL*
- Nuclear Power Plant
- Soil
- Sediment
- Vegetation
- Water

* OSL = Optically-Stimulated Luminescence Dosimeter

Sample icons are stacked to indicate multiple types of samples collected at the same location.

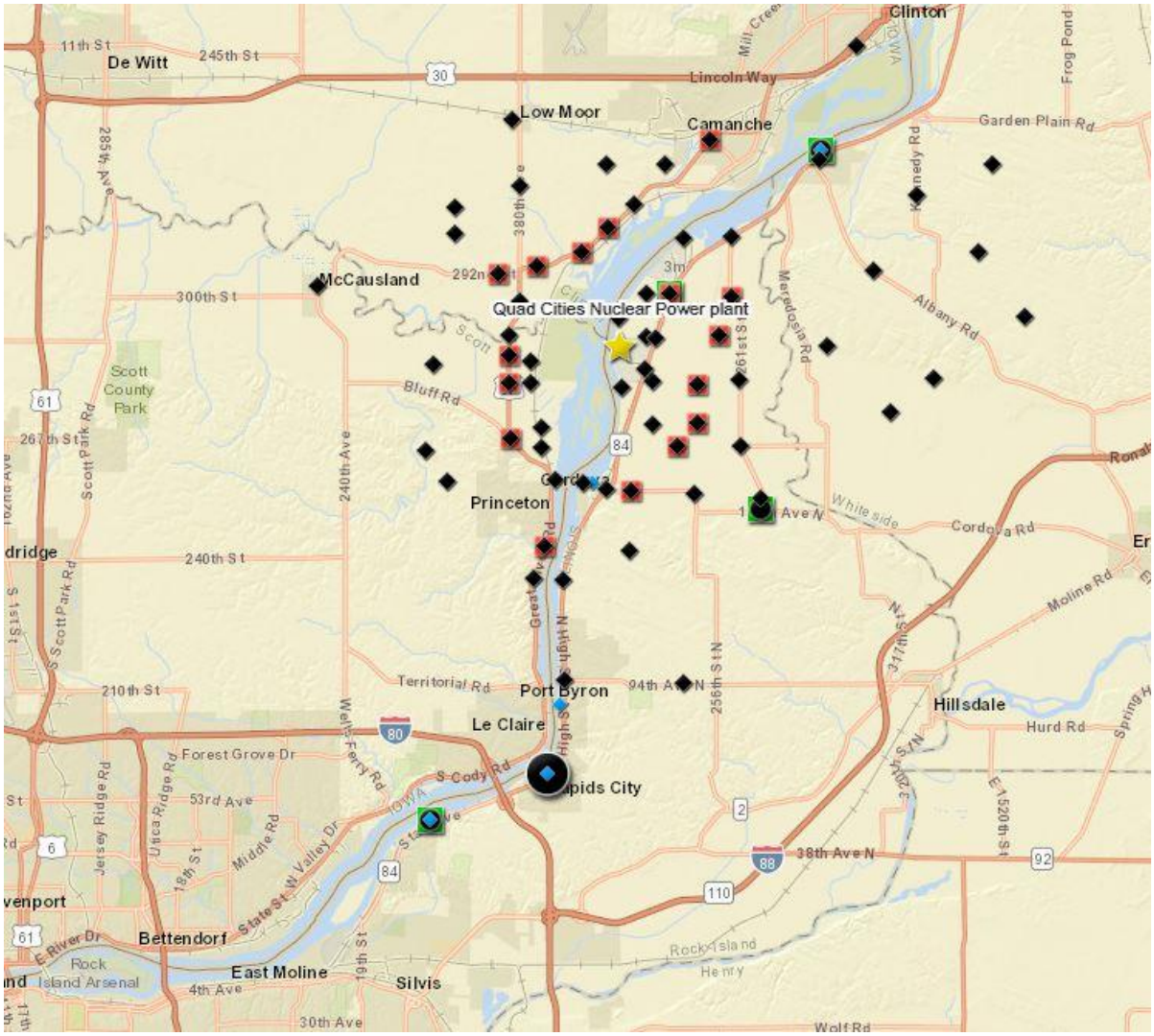
Quad Cities Nuclear Power Station

The Quad Cities Nuclear Power Station, consisting of two 2,957 MWt boiling water reactors owned and operated by Exelon, is located in Cordova, Illinois along the Mississippi River. Unit 1 went critical on March 16, 1972. Unit 2 went critical on December 2, 1973. The site is located in northwestern Illinois, approximately 182 miles west of Chicago.

Liquid effluents from the Quad Cities Station are released to the adjacent Mississippi River in accordance to release limits governed by the station's license with the NRC. No liquid batch releases of radioactive effluents were discharged during this reporting period.

Figure 12 is an overview of all sampling locations in the vicinity of the Quad Cities Nuclear Power Station (yellow star). Results for all samples collected in the environs of the Quad Cities Nuclear Power Station can be found in Appendix F.

Figure 12. Overview of IEMA Monitoring Locations for Quad Cities



Map Key:

- OSL*
- GDN & OSL*
- Nuclear Power Plant
- Soil
- Sediment
- Vegetation
- Water

* OSL = Optically-Stimulated Luminescence Dosimeter

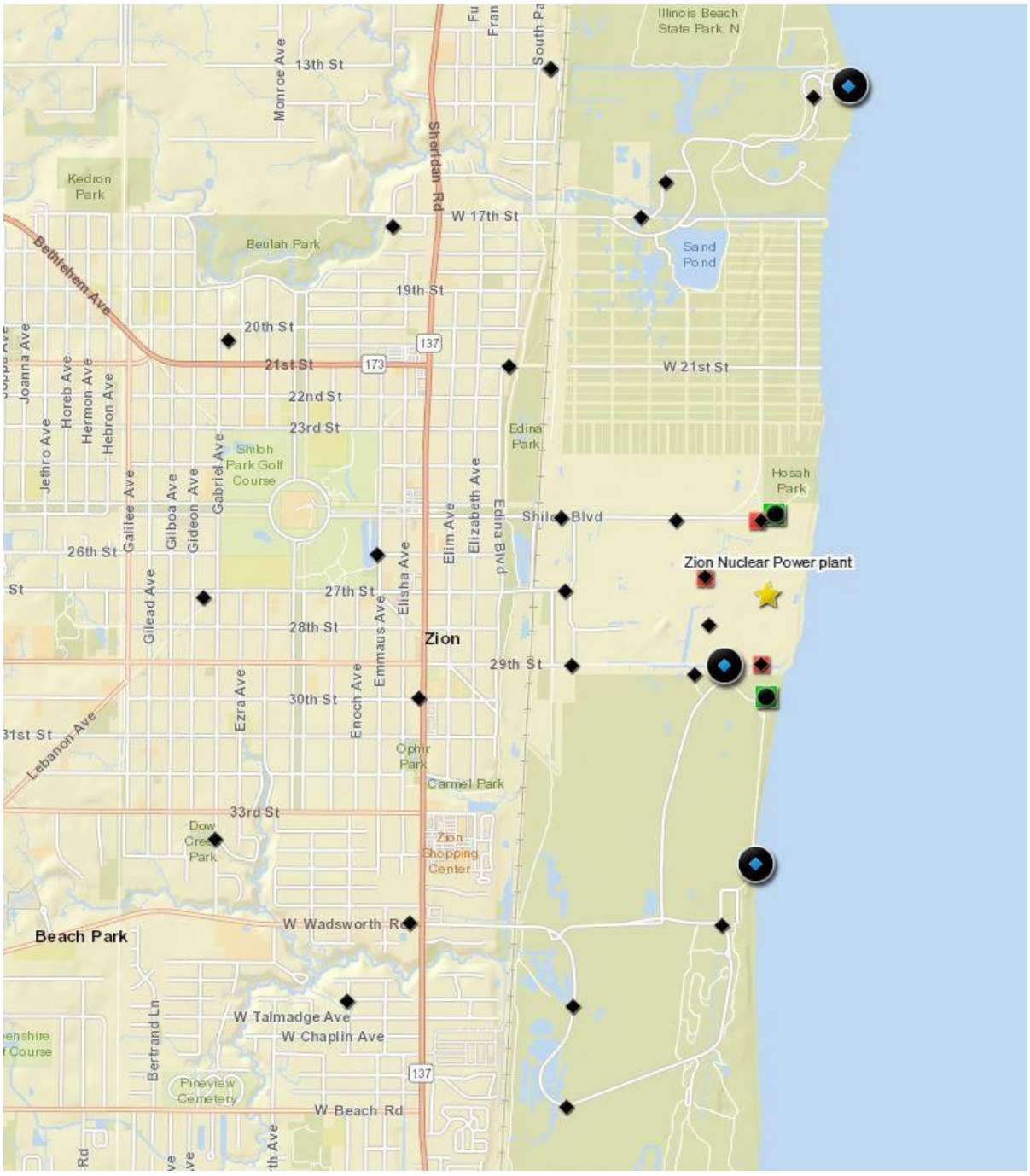
Sample icons are stacked to indicate multiple types of samples collected at the same location.

Zion Nuclear Power Station

Zion Station is located next to Lake Michigan in Zion approximately 40 miles north of Chicago. Prior to 1998, the station utilized two pressurized water reactors to generate electricity. The plant ceased operation permanently in February 1998 and was defueled soon thereafter. In September 2010, the facility license was transferred from Exelon to ZionSolutions for the express purpose of expediting the decommissioning of the site. In 2016, the plant continued decommissioning to levels that permit release for unrestricted use. Decommissioning efforts progressed during 2016 and remain on schedule for a 2019 end date. The site continues to store 61 dry casks that store spent nuclear fuel as well as four dry casks that contain greater than Class C waste. These 65 casks are stored on the on-site Independent Spent Fuel Storage Installation (ISFSI), which falls within IEMA's environmental monitoring area for Zion.

Figure 13 is an overview of all sampling locations in the vicinity of the Zion Nuclear Power Station (yellow star). Results for all samples collected in the environs of the Zion Nuclear Power Station can be found in Appendix G.

Figure 13. Overview of IEMA Monitoring Locations for Zion



Map Key:

- Nuclear Power Plant
- OSL*
- Air Sampler
- Vegetation
- Soil
- Sediment
- Water

* OSL = Optically-Stimulated Luminescence Dosimeter

Sample icons are stacked to indicate multiple types of samples collected at the same location.

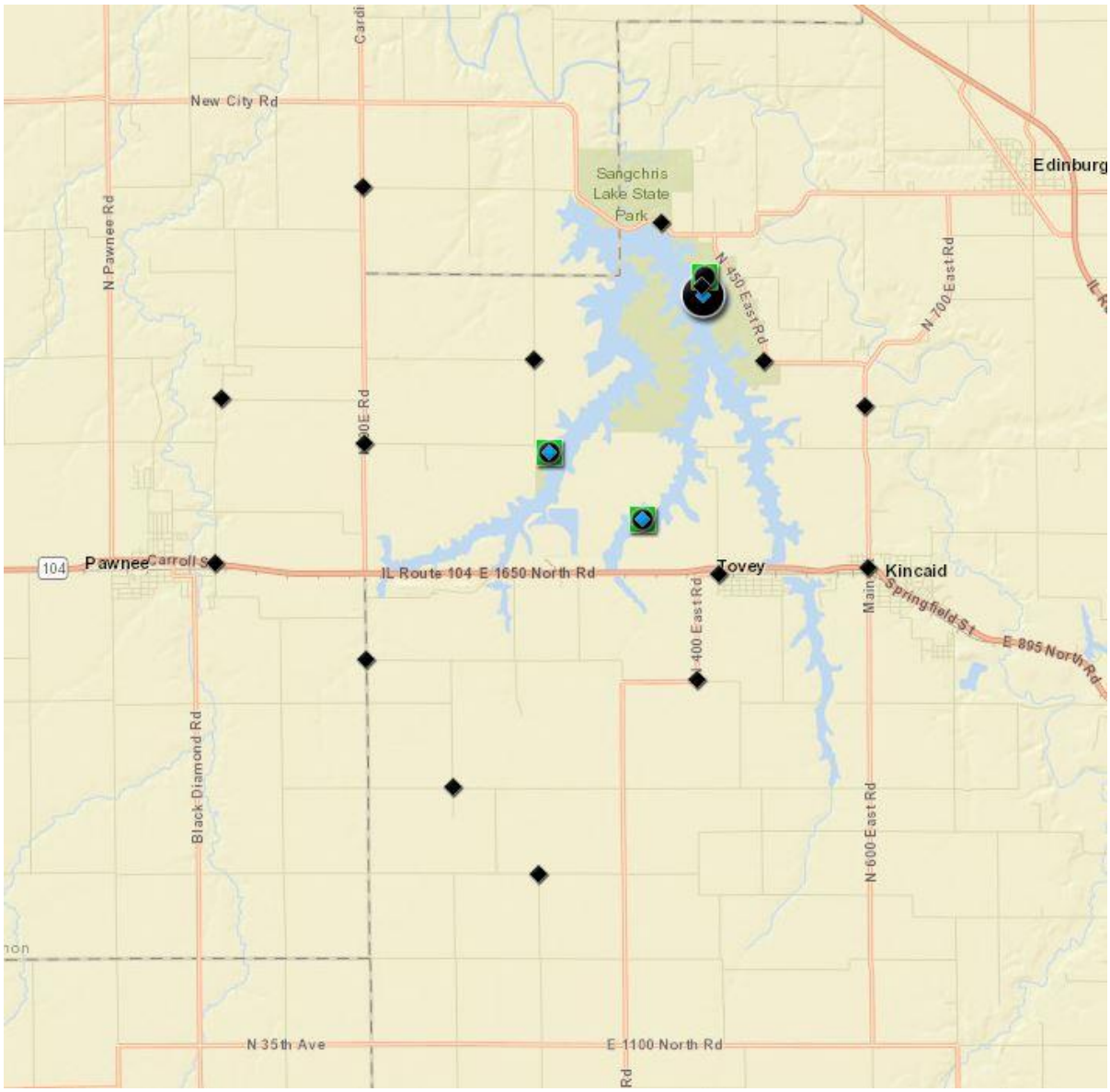
Background Sampling Locations

IEMA has established the environs of Sangchris Lake State Park, a cooling lake for a coal-fired power station, as a Background Sampling Location. To establish "background" radiation levels, water, soil, sediment, vegetation and fish samples are collected. In addition, there is an array of environmental dosimeters around the power plant, similar to what can be found around each nuclear power station.

IEMA routinely collects air samples around the Zion facility; therefore, a background sampling location for air samples has been established. A continuous air sampling station is located near the IEMA laboratory in Springfield, and samples are exchanged weekly, similar to the air samplers in the vicinity of Zion.

Figure 14 is an overview of all sampling locations in the vicinity of Sangchris Lake State Park. Results for background samples can be found in Appendix H.

Figure 14. Overview of IEMA Monitoring Locations for Sangchris Lake State Park



Map Key:

- OSL
- Power Plant
- Water
- Soil
- Sediment
- Vegetation

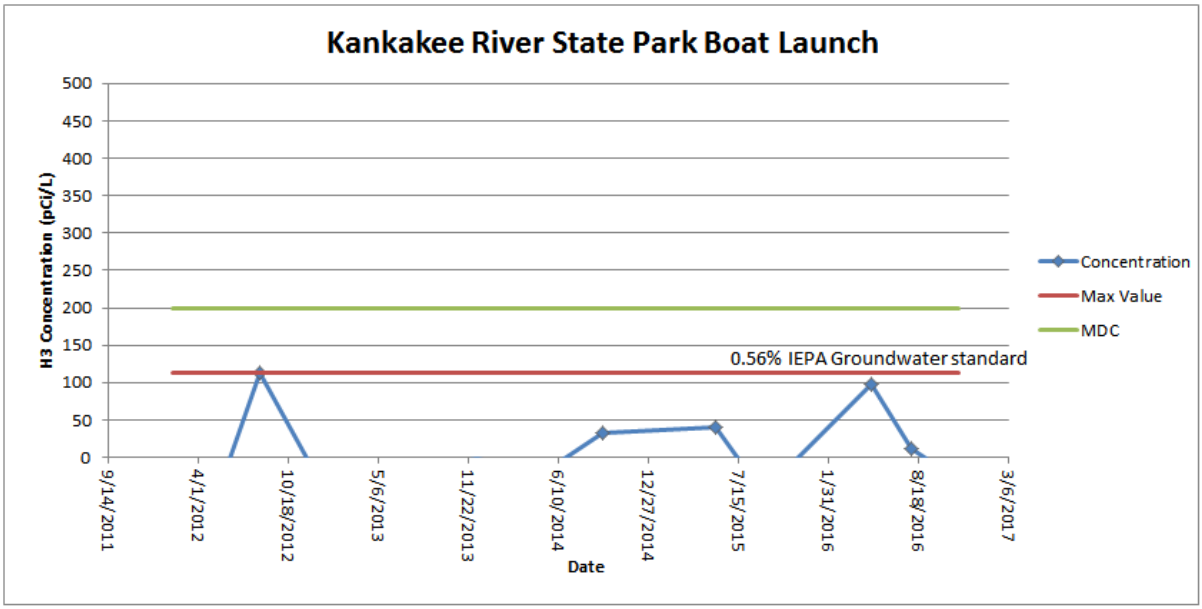
* OSL = Optically-Stimulated Luminescence Dosimeter

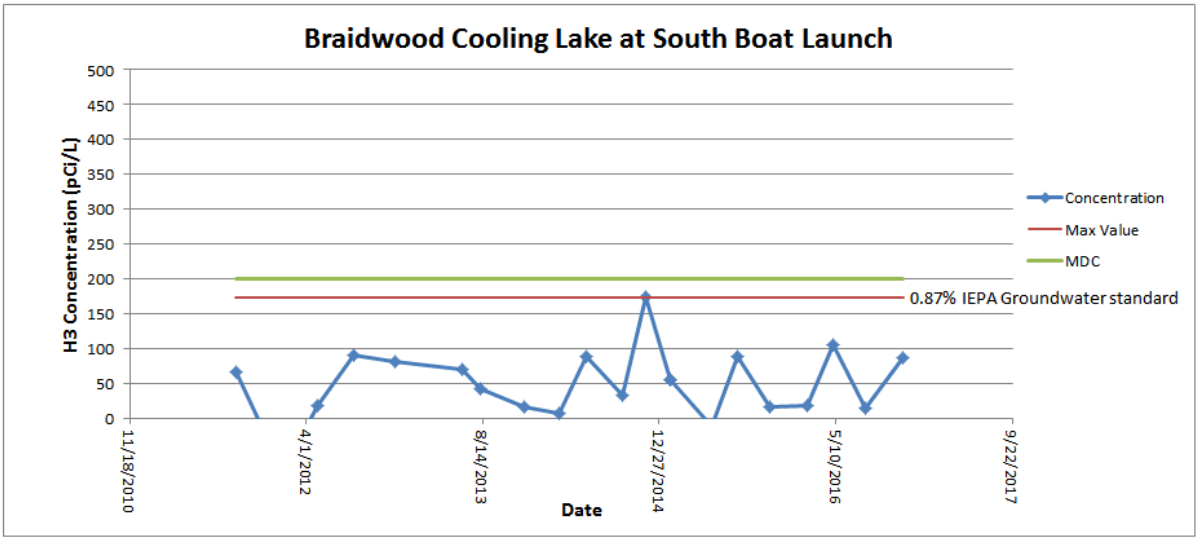
Appendix A
Braidwood Sample Results

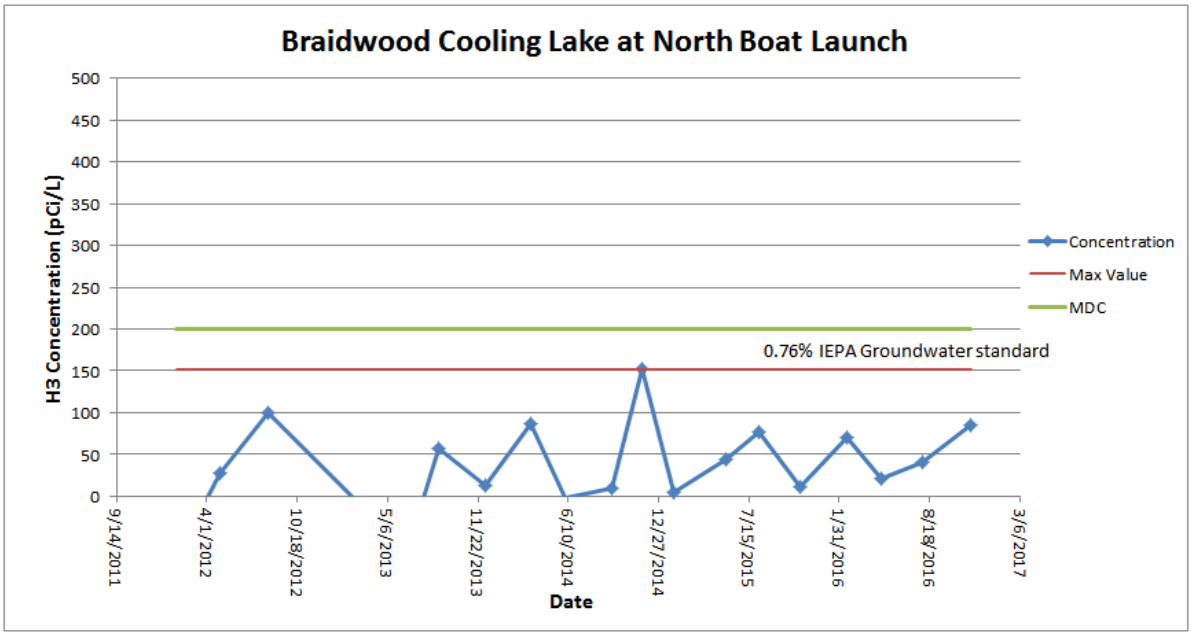
Table A-1. Tritium in Water Sample Results for Braidwood Area
Results are in picocuries per liter (pCi/L)

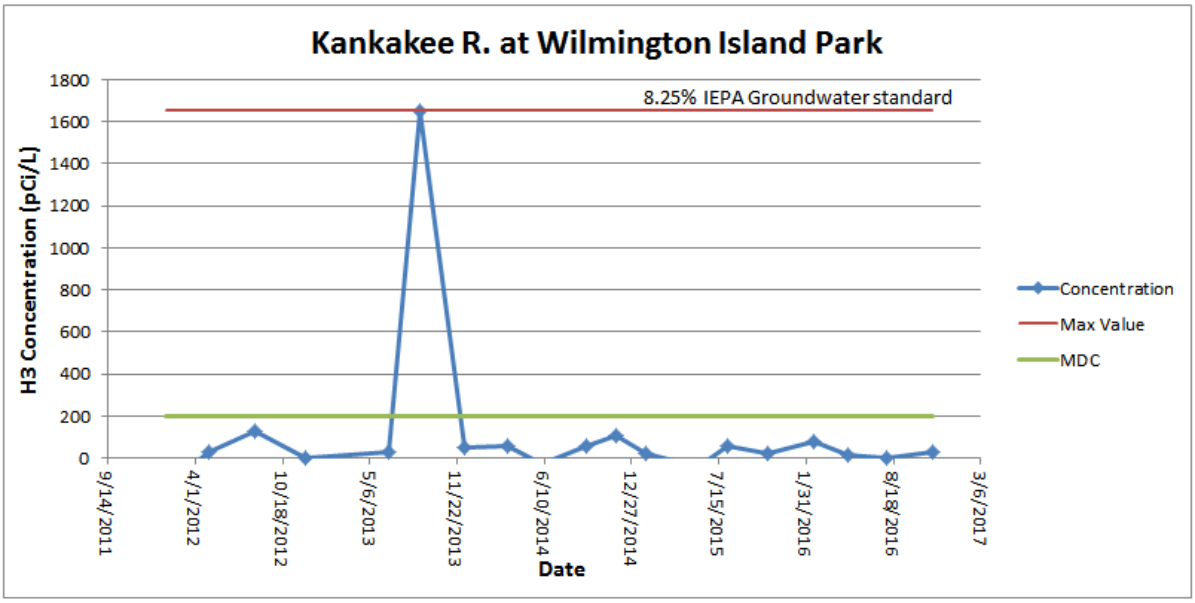
Location	H-3	
Date	Result	MDC
DS-2		
3/16/2016	<MDC	200
5/5/2016	<MDC	200
9/22/2016	<MDC	200
10/8/2016	<MDC	200
MW-4		
2/29/2016	1020	200
6/8/2016	948	200
9/21/2016	664	200
10/12/2016	588	200
Braidwood Cooling Lake (N)		
2/18/2016	<MDC	200
5/4/2016	<MDC	200
8/2/2016	<MDC	200
11/17/2016	<MDC	200
Braidwood Cooling Lake (S)		
2/18/2016	<MDC	200
5/4/2016	<MDC	200
8/2/2016	<MDC	200
11/17/2016	<MDC	200
Kankakee River at Des Plaines Conservation Area Boat Launch		
5/4/2016	<MDC	200
8/2/2016	<MDC	200
Kankakee River at Kankakee River State Park Boat Launch		
5/4/2016	<MDC	200
8/2/2016	<MDC	200
11/14/2016	<MDC	200
Kankakee River at Wilmington Island Park		
2/18/2016	<MDC	200
5/4/2016	<MDC	200
8/2/2016	<MDC	200
11/14/2016	<MDC	200

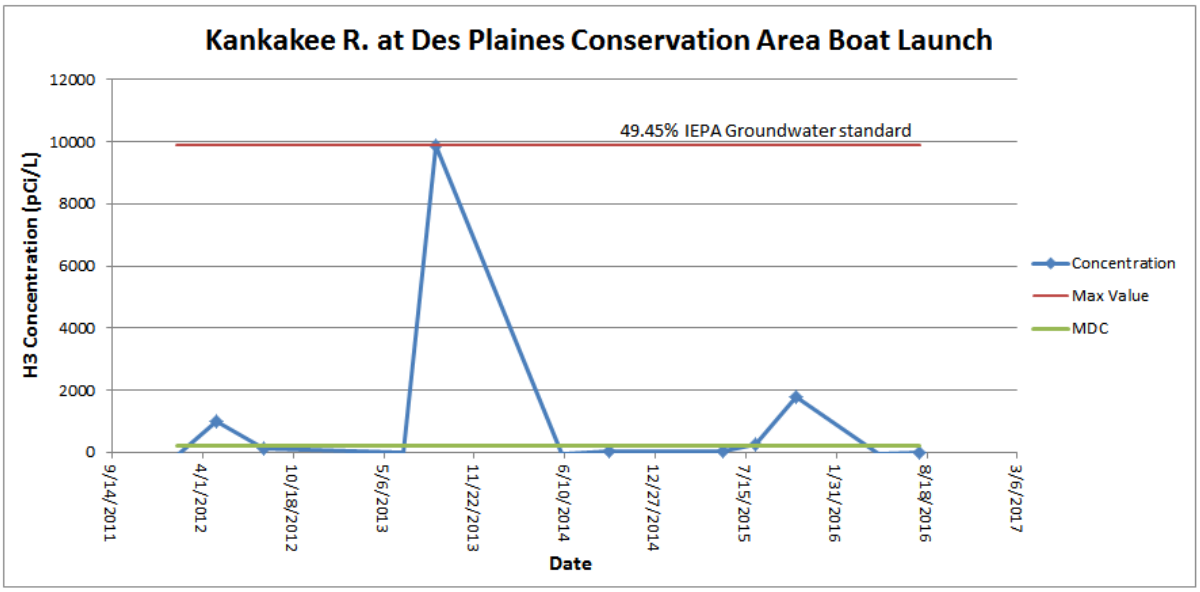
Tables A-2. Trending Graphs for Water from the Braidwood Area
(Max value compared to IEPA Class I groundwater standard of 20,000 pCi/L)

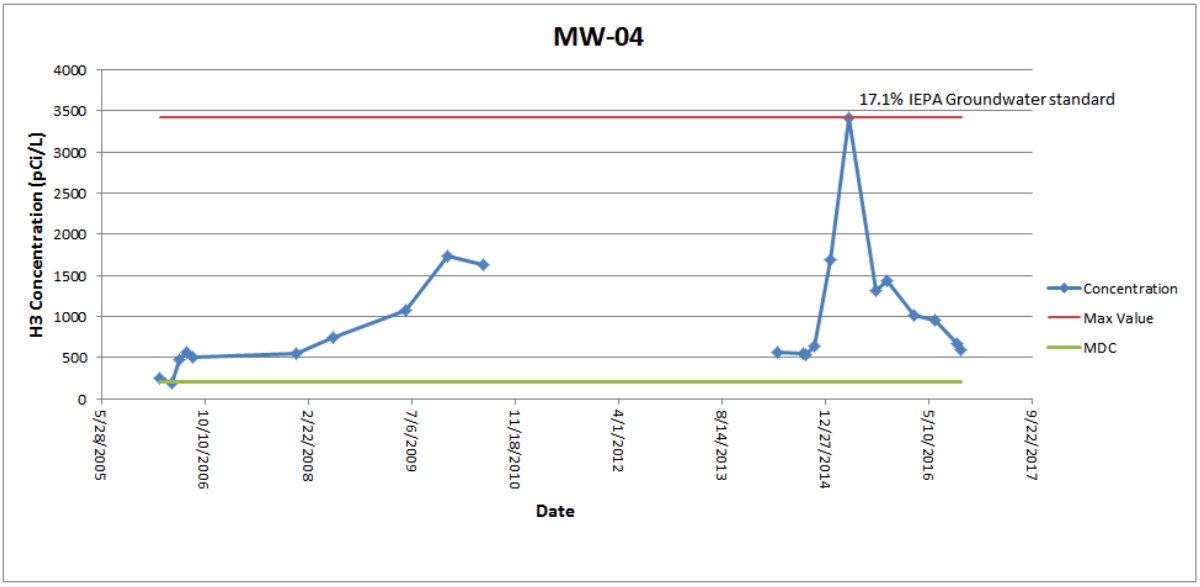





Braidwood Cooling Lake at North Boat Launch
H3 Concentration (pCi/L)
500
450
400
350
300
250
200
150
100
50
0
0.76% IEPA Groundwater standard
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC


Kankakee R. at Wilmington Island Park
H3 Concentration (pCi/L)
1800
1600
1400
1200
1000
800
600
400
200
0
8.25% IEPA Groundwater standard
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC


Kankakee R. at Des Plaines Conservation Area Boat Launch
49.45% IEPA Groundwater standard
H3 Concentration (pCi/L)
12000
10000
8000
6000
4000
2000
0
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC


MW-04
17.1% IEPA Groundwater standard
H3 Concentration (pCi/L)
4000
3500
3000
2500
2000
1500
1000
500
0
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
Date
Concentration
Max Value
MDC

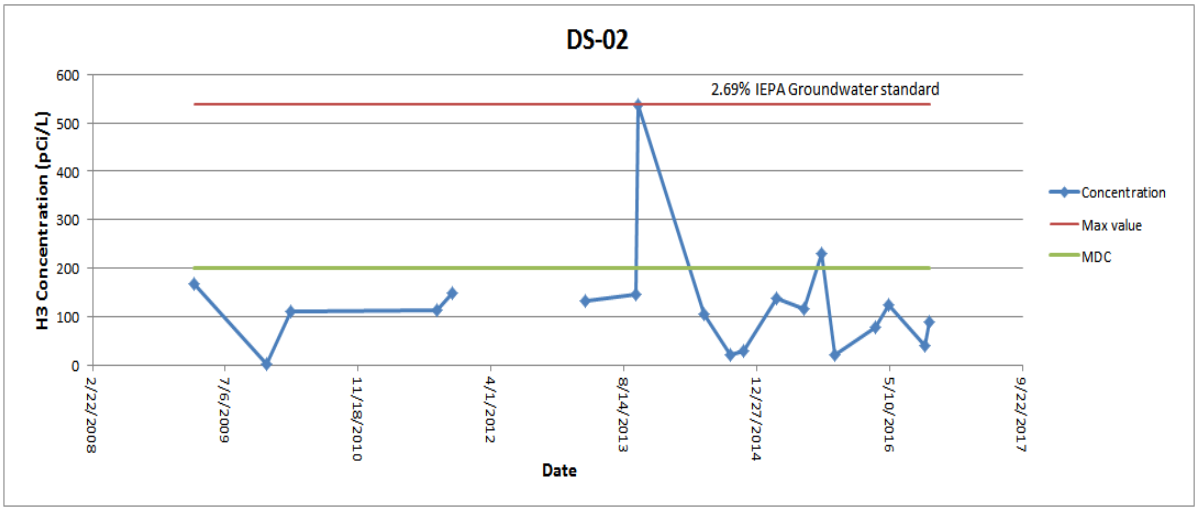

DS-02
2.69% IEPA Groundwater standard
H3 Concentration (pCi/L)
600
500
400
300
200
100
0
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
9/22/2017
Date
Concentration
Max value
MDC

Table A-3. Sample Results for Gross Alpha/Beta Screening of Water from the Braidwood Area
Results are in picocuries per liter (pCi/L)

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Braidwood Cooling Lake (N)				
2/18/2016	<MDC	2.16	9.21	4.13
5/4/2016	2.89	2.16	8.18	4.13
8/2/2016	<MDC	2.16	<MDC	4.13
11/17/2016	<MDC	2.16	5.77	4.13
Braidwood Cooling Lake (S)				
2/18/2016	<MDC	2.16	8.83	4.13
5/4/2016	2.25	2.16	6.17	4.13
8/2/2016	<MDC	2.16	5.02	4.13
11/17/2016	<MDC	2.16	6.44	4.13
Kankakee River at Des Plaines Conservation Area Boat Launch				
5/4/2016	<MDC	2.16	<MDC	4.13
8/2/2016	<MDC	2.16	<MDC	4.13
Kankakee River at Kankakee River State Park Boat Launch				
5/4/2016	<MDC	2.16	<MDC	4.13
8/2/2016	<MDC	2.16	<MDC	4.13
11/14/2016	<MDC	2.16	<MDC	4.13
Kankakee River at Wilmington Island Park				
2/18/2016	<MDC	2.16	4.45	4.13
5/4/2016	<MDC	2.16	<MDC	4.13
8/2/2016	<MDC	2.16	<MDC	4.13
11/14/2016	<MDC	2.16	<MDC	4.13

Table A-4. Gamma Spectroscopy Sample Results for Other Radionuclides in Water from the Braidwood Area
Results are in picocuries per liter (pCi/L)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Braidwood Cooling Lake (N)																						
2/18/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
5/4/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
8/2/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
11/17/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
Braidwood Cooling Lake (S)																						
2/18/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
5/4/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
8/2/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
11/17/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
Kankakee River at Des Plaines Conservation Area Boat Launch																						
5/4/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
8/2/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
Kankakee River at Kankakee River State Park Boat Launch																						
5/4/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
8/2/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
11/14/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
Kankakee River at Wilmington Island Park																						
2/18/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
5/4/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
8/2/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3
11/14/2016	<MDC	185.0	<MDC	5.3	<MDC	4.5	<MDC	4.0	<MDC	3.9	<MDC	16.3	<MDC	288.0	<MDC	4.2	<MDC	9.5	<MDC	8.7	<MDC	10.3

Table A-5. Total Strontium Results in Water Samples from the Braidwood Area
Results are in picocuries per liter (pCi/L)

Location	Date	Nuclide	Result	MDC
Braidwood Cooling Lake (S)	5/4/2016	Strontium	<MDC	1.3
Kankakee River at Des Plaines Conservation Area Boat Launch	5/4/2016	Strontium	<MDC	1.3

Table A-6. Soil Sample Results for Braidwood Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Braidwood Cooling Lake (S)																				
5/4/2016	<MDC	1.31	<MDC	0.04	<MDC	0.03	<MDC	0.03	<MDC	0.03	<MDC	0.13	<MDC	0.04	<MDC	0.08	<MDC	0.08	<MDC	0.11
8/2/2016	<MDC	1.31	<MDC	0.04	<MDC	0.03	<MDC	0.03	<MDC	0.03	<MDC	0.13	<MDC	0.04	<MDC	0.08	<MDC	0.08	<MDC	0.11
Kankakee River at Kankakee River State Park Boat Launch																				
5/4/2016	<MDC	1.31	<MDC	0.04	<MDC	0.03	<MDC	0.03	0.07	0.03	<MDC	0.13	<MDC	0.04	<MDC	0.08	<MDC	0.08	<MDC	0.11
8/2/2016	<MDC	1.31	<MDC	0.04	<MDC	0.03	<MDC	0.03	0.08	0.03	<MDC	0.13	<MDC	0.04	<MDC	0.08	<MDC	0.08	<MDC	0.11
Kankakee River at Wilmington Island Park																				
5/4/2016	<MDC	1.31	<MDC	0.04	<MDC	0.03	<MDC	0.03	0.08	0.03	<MDC	0.13	<MDC	0.04	<MDC	0.08	<MDC	0.08	<MDC	0.11
8/2/2016	<MDC	1.31	<MDC	0.04	<MDC	0.03	<MDC	0.03	0.18	0.03	<MDC	0.13	<MDC	0.04	<MDC	0.08	<MDC	0.08	<MDC	0.11

Table A-7. Sediment Sample Results for Braidwood Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Braidwood Cooling Lake (N)																				
5/4/2016	<MDC	1.06	<MDC	0.04	<MDC	0.03	<MDC	0.02	<MDC	0.03	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.08
8/2/2016	<MDC	1.06	<MDC	0.04	<MDC	0.03	<MDC	0.02	<MDC	0.03	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.08
Kankakee River at Kankakee River State Park Boat Launch																				
5/4/2016	<MDC	1.06	<MDC	0.04	<MDC	0.03	<MDC	0.02	<MDC	0.03	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.08
8/2/2016	<MDC	1.06	<MDC	0.04	<MDC	0.03	<MDC	0.02	0.07	0.03	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.08
Kankakee River at Wilmington Island Park																				
5/4/2016	<MDC	1.06	<MDC	0.04	<MDC	0.03	<MDC	0.02	0.10	0.03	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.08
8/2/2016	<MDC	1.06	<MDC	0.04	<MDC	0.03	0.04	0.02	0.08	0.03	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.08

Table A-8. Vegetation Sample Results for Braidwood Area
Results are in picocuries per gram (pCi/kg)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Braidwood Cooling Lake (S)																						
5/4/2016	<MDC	3.70	<MDC	0.14	<MDC	0.09	<MDC	0.10	<MDC	0.08	<MDC	0.40	<MDC	4.10	<MDC	0.10	<MDC	0.20	<MDC	0.28	<MDC	0.24
8/2/2016	<MDC	3.70	<MDC	0.14	<MDC	0.09	<MDC	0.10	<MDC	0.08	<MDC	0.40	<MDC	4.10	<MDC	0.10	<MDC	0.20	<MDC	0.28	<MDC	0.24
Kankakee River at Kankakee River State Park Boat Launch																						
5/4/2016	<MDC	3.70	<MDC	0.14	<MDC	0.09	<MDC	0.10	<MDC	0.08	<MDC	0.40	<MDC	4.10	<MDC	0.10	<MDC	0.20	<MDC	0.28	<MDC	0.24
8/2/2016	<MDC	3.70	<MDC	0.14	<MDC	0.09	<MDC	0.10	<MDC	0.08	<MDC	0.40	<MDC	4.10	<MDC	0.10	<MDC	0.20	<MDC	0.28	<MDC	0.24
Kankakee River at Wilmington Island Park																						
5/4/2016	<MDC	3.70	<MDC	0.14	<MDC	0.09	<MDC	0.10	<MDC	0.08	<MDC	0.40	<MDC	4.10	<MDC	0.10	<MDC	0.20	<MDC	0.28	<MDC	0.24
8/2/2016	<MDC	3.70	<MDC	0.14	<MDC	0.09	<MDC	0.10	<MDC	0.08	<MDC	0.40	<MDC	4.10	<MDC	0.10	<MDC	0.20	<MDC	0.28	<MDC	0.24

Table A-9. Braidwood Gamma Detection Network Results

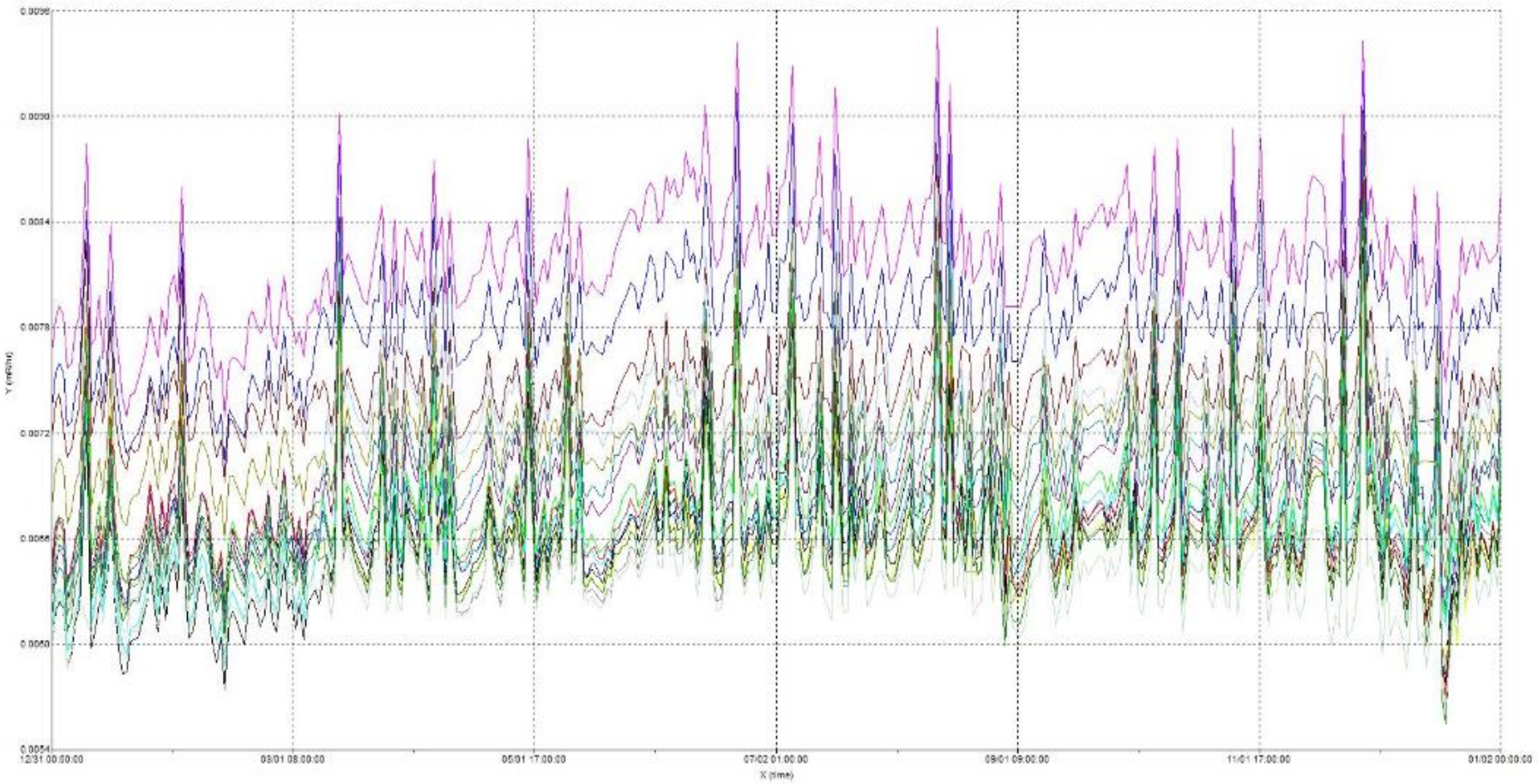


Table A-10. Summary of Ambient Gamma Results for Braidwood Area

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
BR001	0.13	0.12	0.14	0.12	45.63
BR005	0.09	0.11	0.13	0.10	39.24
BR008	0.11	0.11	0.13	0.12	43.44
BR010		0.11	0.11	0.08	37.11
BR012	0.07	0.06	0.08	0.07	25.55
BR014	0.06	0.07	0.09	0.06	25.82
BR015	0.06	0.06	0.07	0.05	21.44
BR016	0.08	0.07	0.09	0.07	27.92
BR017	0.07		0.07	0.05	22.63
BR020	0.07	0.07	0.08	0.06	25.46
BR025	0.08	0.08	0.10	0.08	30.66
BR027	0.08	0.08	0.09	0.06	28.74
BR029	0.08	0.06	0.08	0.08	26.65
BR031	0.06	0.08	0.08	0.07	26.01
BR032	0.07	0.06	0.09	0.05	24.18
BR033	0.07	0.08	0.09	0.08	29.02
BR034	0.11	0.11	0.13	0.10	39.88
BR035	0.12		0.13	0.10	42.46
BR036	0.06	0.06	0.07	0.05	21.72
BR037	0.07	0.07	0.10	0.08	29.84
BR038	0.09	0.07	0.09	0.06	29.11
BR039	0.11	0.11	0.12	0.11	40.61
BR040	0.14	0.11	0.13	0.11	44.35
BR041	0.08	0.06	0.09	0.06	26.10
BR042	0.10	0.10		0.10	36.01
BR043	0.06	0.06	0.07		23.73
BR044	0.06	0.07	0.08	0.06	24.18
BR045	0.06	0.06	0.08	0.07	23.45
BR046	0.06	0.07		0.06	21.78
BR047	0.07	0.07	0.08		25.55
BR048	0.07	0.05	0.08	0.06	23.91
BR049		0.07	0.08	0.06	25.19
BR050	0.08	0.08	0.10	0.07	30.57
BR051	0.06		0.08	0.05	23.48
BR052	0.06	0.08	0.09	0.05	25.37
BR053	0.10	0.09	0.14	0.10	38.96
BR054	0.05	0.06	0.07	0.05	21.44
BR055	0.08	0.07	0.07	0.06	25.28
BR056	0.07	0.09	0.09	0.09	30.66
BR057	0.10	0.12		0.11	39.54
BR058	0.11		0.11	0.11	40.27

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
BR-RSA	0.06	0.05	0.08	0.07	24.00
BR-RSB	0.07	0.08	0.07	0.07	26.28
BR-RSC	0.06	0.08	0.07	0.05	23.18
BR-RSD	0.07	0.06	0.08	0.05	24.64
BR-RSE	0.06	0.06	0.08	0.07	23.73
BR-RSF	0.05	0.06	0.08	0.08	23.82
BR-RSG	0.09	0.08	0.09	0.08	29.66
BR-RSH	0.08	0.08	0.12	0.08	32.76
BR-RSJ	0.08	0.09	0.12	0.10	35.59
BR-RSK	0.05	0.06	0.08	0.06	22.63
BR-RSL	0.07	0.06	0.09	0.06	25.55
BR-RSM	0.06	0.06	0.08	0.05	22.27
BR-RSN	0.06	0.06	0.07	0.06	22.81
BR-RSP	0.07	0.07	0.08	0.06	24.73
BR-RSQ	0.05	0.04	0.07	0.05	19.44
BR-RSR		0.09	0.10	0.09	33.09

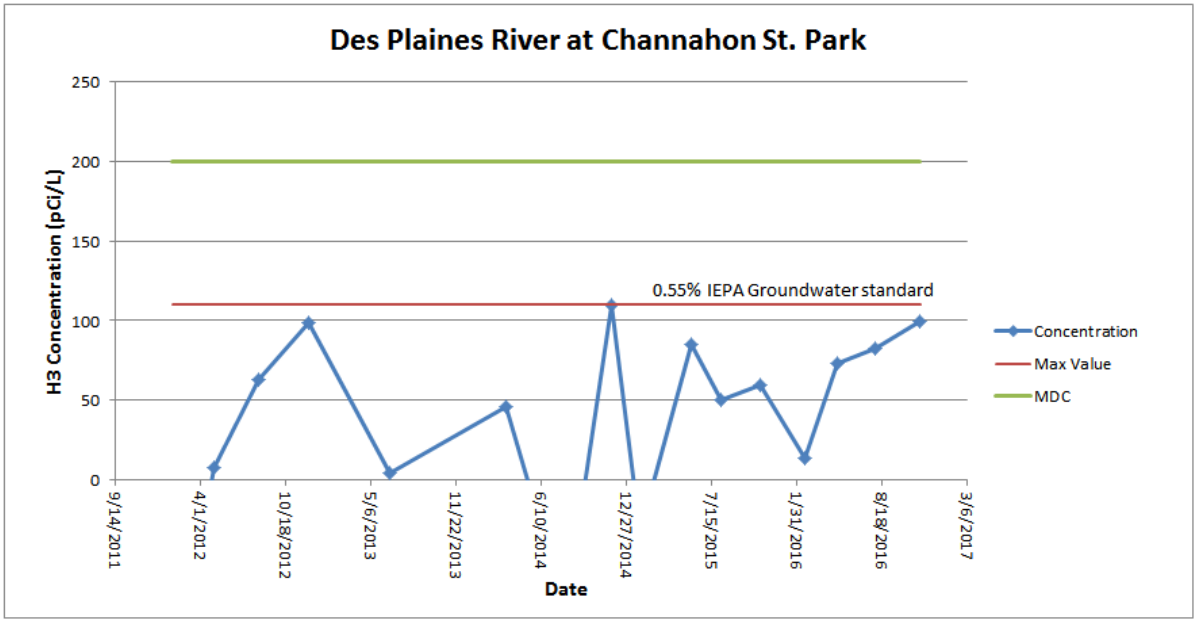
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Exposure column based on averages of all available data.

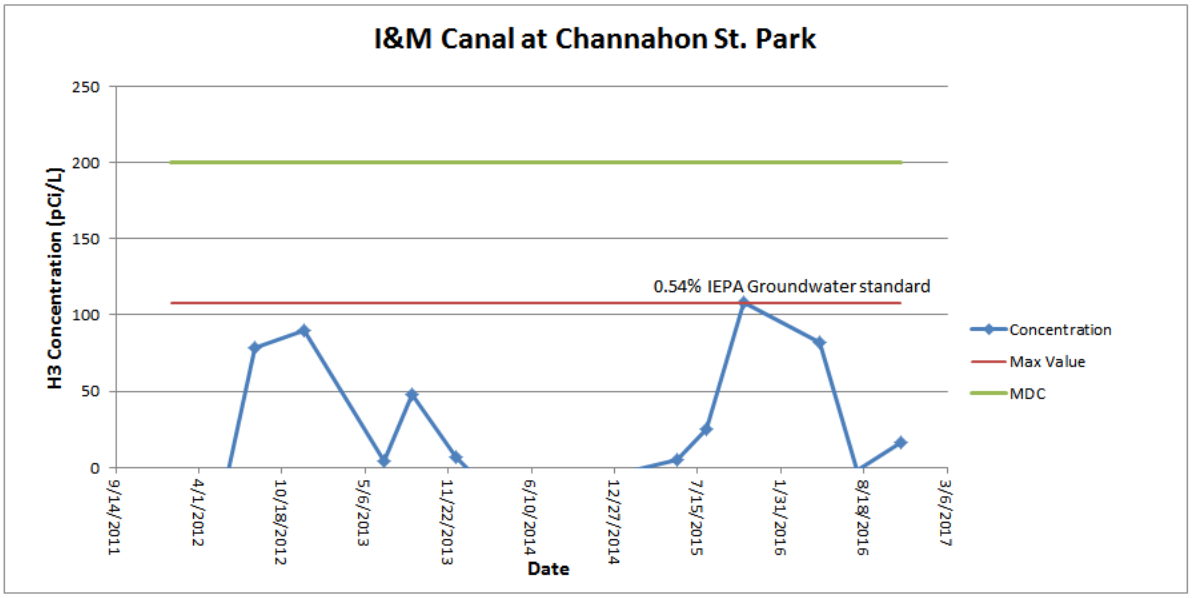
Appendix B
Dresden Sample Results

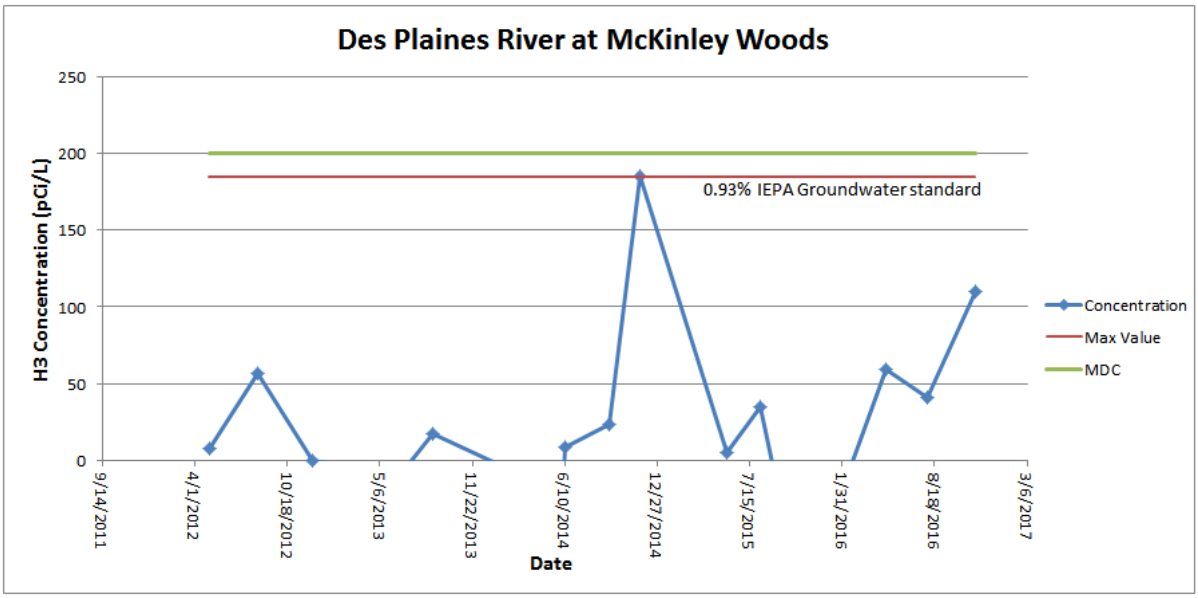
Table B-1. Tritium in Water Sample Results for Dresden Area
Results are in picocuries per liter (pCi/L)

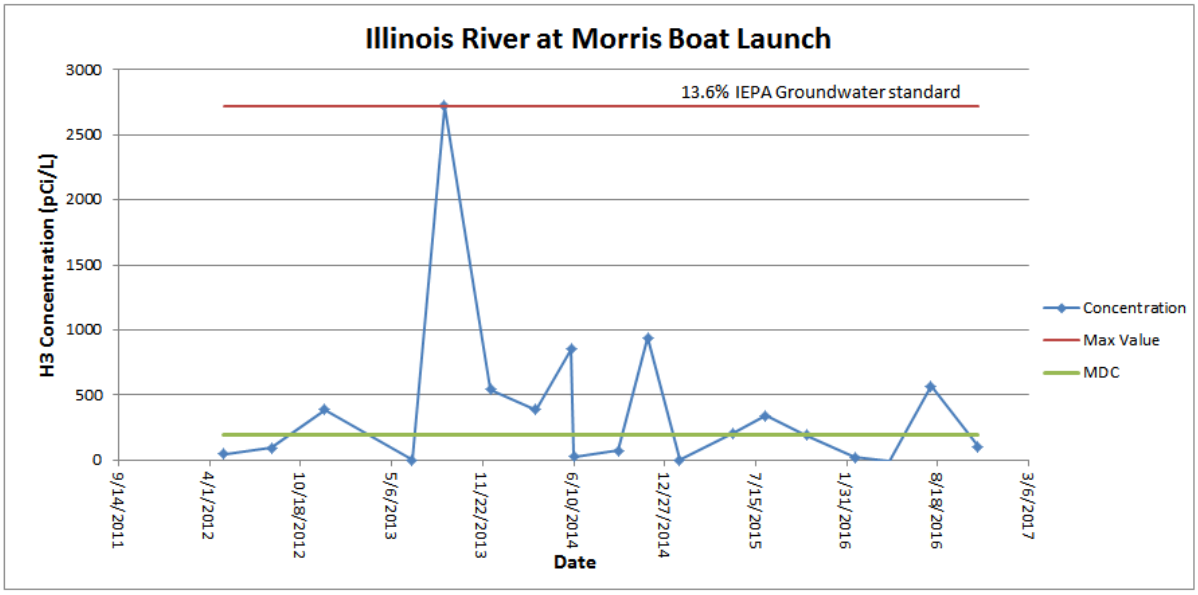
Location	H-3	
Date	Result	MDC
Des Plaines River at Channahon		
2/18/2016	<MDC	200
5/4/2016	<MDC	200
8/2/2016	<MDC	200
11/14/2016	<MDC	200
Des Plaines River at McKinley Woods		
5/4/2016	<MDC	200
8/2/2016	<MDC	200
11/14/2016	<MDC	200
Heideke Lake		
5/4/2016	<MDC	200
8/2/2016	<MDC	200
I & M Canal at Channahon		
5/4/2016	<MDC	200
8/2/2016	<MDC	200
11/14/2016	<MDC	200
Illinois River at Dresden Lock & Dam		
2/18/2016	<MDC	200
5/4/2016	<MDC	200
8/2/2016	524	200
11/14/2016	<MDC	200
Illinois River at Morris		
2/18/2016	<MDC	200
5/4/2016	<MDC	200
8/2/2016	570	200
11/14/2016	<MDC	200
Well at Dresden Lock & Dam		
2/18/2016	<MDC	200
5/4/2016	<MDC	200
8/2/2016	<MDC	200
11/14/2016	<MDC	200

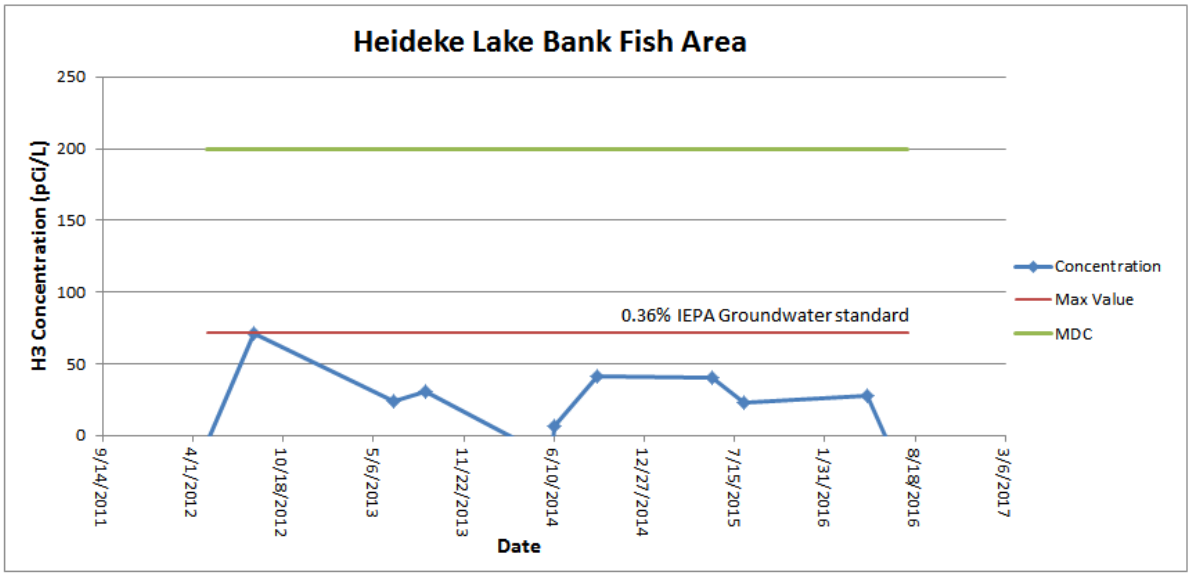
Tables B-2. Trending Graphs for Water from the Dresden Area
(Max value compared to IEPA Class I groundwater standard of 20,000 pCi/L)

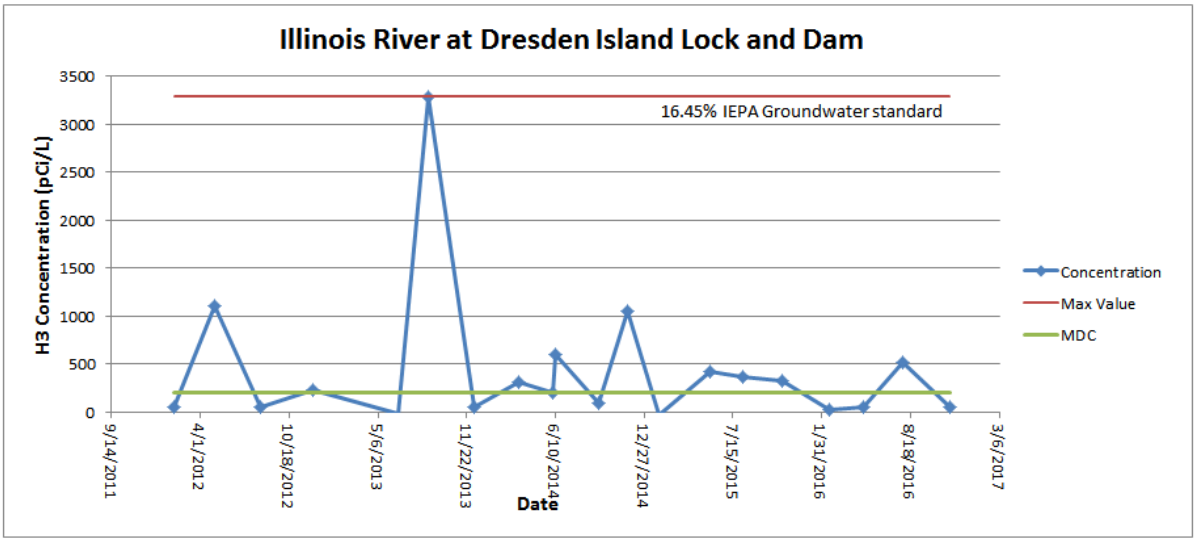





Des Plaines River at McKinley Woods
H3 Concentration (pCi/L)
250
200
150
100
50
0
0.93% IEPA Groundwater standard
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC


Illinois River at Morris Boat Launch
H3 Concentration (pCi/L)
3000
2500
2000
1500
1000
500
0
13.6% IEPA Groundwater standard
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC


Heideke Lake Bank Fish Area
H3 Concentration (pCi/L)
250
200
150
100
50
0
0.36% IEPA Groundwater standard
Concentration
Max Value
MDC
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date


Illinois River at Dresden Island Lock and Dam
H3 Concentration (pCi/L)
3500
3000
2500
2000
1500
1000
500
0
16.45% IEPA Groundwater standard
Concentration
Max Value
MDC
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date

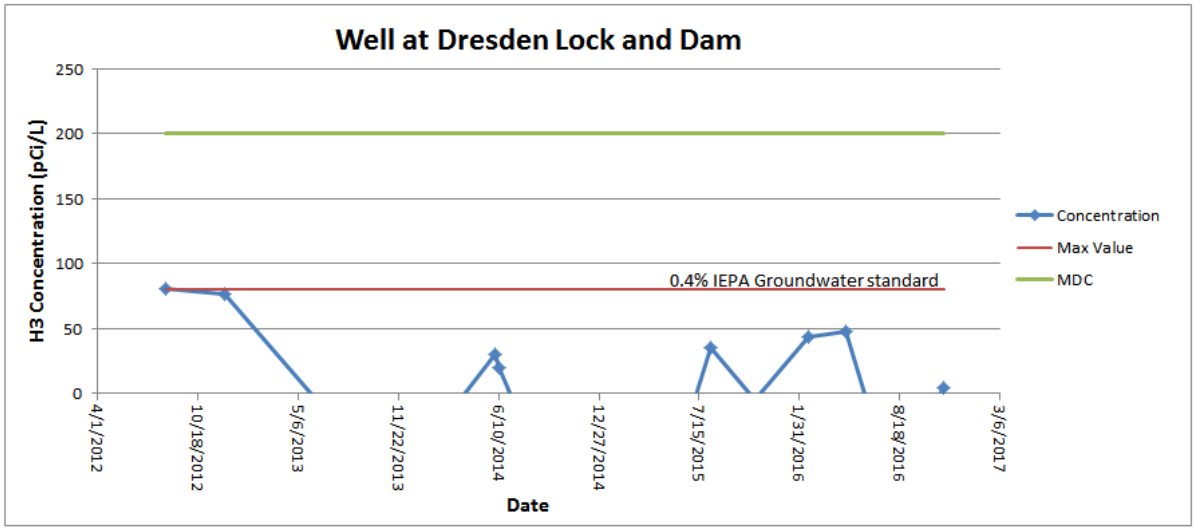

Well at Dresden Lock and Dam
H3 Concentration (pCi/L)
250
200
150
100
50
0
0.4% IEPA Groundwater standard
Concentration
Max Value
MDC
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date

Table B-3. Sample Results for Alpha/Beta Screening of Water from the Dresden Area
Results are in picocuries per liter (pCi/L)

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Des Plaines River at Channahon				
2/18/2016	<MDC	2.2	6.5	4.1
5/4/2016	<MDC	2.2	4.6	4.1
8/2/2016	<MDC	2.2	<MDC	4.1
11/14/2016	<MDC	2.2	6.5	4.1
Des Plaines River at McKinley Woods				
5/4/2016	<MDC	2.2	4.3	4.1
8/2/2016	<MDC	2.2	<MDC	4.1
11/14/2016	<MDC	2.2	6.8	4.1
Heideke Lake				
5/4/2016	<MDC	2.2	4.4	4.1
8/2/2016	<MDC	2.2	<MDC	4.1
I & M Canal at Channahon				
5/4/2016	<MDC	2.2	4.9	4.1
8/2/2016	<MDC	2.2	<MDC	4.1
11/14/2016	<MDC	2.2	4.5	4.1
Illinois River at Dresden Lock & Dam				
2/18/2016	<MDC	2.2	5.0	4.1
5/4/2016	<MDC	2.2	<MDC	4.1
8/2/2016	<MDC	2.2	<MDC	4.1
11/14/2016	<MDC	2.2	<MDC	4.1
Illinois River at Morris				
2/18/2016	<MDC	2.2	6.3	4.1
5/4/2016	<MDC	2.2	6.0	4.1
8/2/2016	<MDC	2.2	4.3	4.1
11/14/2016	<MDC	2.2	5.5	4.1
Well at Dresden Lock & Dam				
2/18/2016	12.8	2.2	17.1	4.1
3/11/2016	10.1	2.2	16.5	4.1
5/4/2016	10.9	2.2	16.6	4.1
8/2/2016	15.3	2.2	15.4	4.1
11/14/2016	4.6	2.2	14.2	4.1

Table B-4. Gamma Spectroscopy Sample Results for Other Radionuclides in Water from the Dresden Area
Results are in picocuries per liter (pCi/L)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Des Plaines River at Channahon																						
2/18/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
5/4/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
8/2/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
11/14/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
Des Plaines River at McKinley Woods																						
5/4/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
8/2/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
11/14/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
Heideke Lake																						
5/4/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
8/2/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
I & M Canal at Channahon																						
5/4/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
8/2/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
11/14/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
Illinois River at Dresden Lock & Dam																						
2/18/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
5/4/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
8/2/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
11/14/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
Illinois River at Morris																						
2/18/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
5/4/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
8/2/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
11/14/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
Well at Dresden Lock & Dam																						
2/18/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
5/4/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
8/2/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1
11/14/2016	<MDC	234	<MDC	8.2	<MDC	4.8	<MDC	4.2	<MDC	3.6	<MDC	16	<MDC	420	<MDC	4.1	<MDC	10	<MDC	9.8	<MDC	11.1

Table B-5. Total Strontium Results for Water Samples Collected in the Dresden Area
Results are in picocuries per liter (pCi/L)

Location	Date	Nuclide	Result	MDC
Illinois River at Dresden Lock & Dam	5/4/2016	Strontium	<MDC	1.5
Illinois River at Morris	5/4/2016	Strontium	<MDC	1.5

Table B-6. Soil Sample Results for Dresden Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Heideke Lake																				
5/4/2016	<MDC	1.06	<MDC	0.04	<MDC	0.03	<MDC	0.03	0.05	0.05	<MDC	0.12	<MDC	0.04	<MDC	0.08	<MDC	0.08	<MDC	0.11
8/2/2016	<MDC	1.06	<MDC	0.04	<MDC	0.03	<MDC	0.03	0.06	0.05	<MDC	0.12	<MDC	0.04	<MDC	0.08	<MDC	0.08	<MDC	0.11
Minooka Community High School																				
5/4/2016	<MDC	1.06	<MDC	0.04	<MDC	0.03	<MDC	0.03	<MDC	0.05	<MDC	0.12	<MDC	0.04	<MDC	0.08	<MDC	0.08	<MDC	0.11

Table B-7. Sediment Sample Results for Dresden Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Des Plaines River at Channahon																				
5/4/2016	<MDC	0.76	<MDC	0.03	<MDC	0.02	<MDC	0.02	0.05	0.02	<MDC	0.09	<MDC	0.02	<MDC	0.05	<MDC	0.05	<MDC	0.06
8/2/2016	<MDC	0.76	<MDC	0.03	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.09	<MDC	0.02	<MDC	0.05	<MDC	0.05	<MDC	0.06

Table B-8. Vegetation Sample Results for Dresden Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Heideke Lake																						
5/4/2016	<MDC	3.7	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.3	<MDC	4.3	<MDC	0.1	<MDC	0.2	<MDC	0.2	<MDC	0.2
8/2/2016	<MDC	3.7	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.3	<MDC	4.3	<MDC	0.1	<MDC	0.2	<MDC	0.2	<MDC	0.2
Minooka Community High School																						
5/4/2016	<MDC	3.7	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.3	<MDC	4.3	<MDC	0.1	<MDC	0.2	<MDC	0.2	<MDC	0.2

Table B-9. Fish Sample Results for Dresden Area
Results are in picocuries per kilogram (pCi/kg)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Illinois River (bottom feeder fish)																						
8/16/2016	<MDC	53000	<MDC	86	<MDC	37	<MDC	33	<MDC	29.1	<MDC	390	<MDC	570000	<MDC	37	<MDC	300	<MDC	99	<MDC	189
Illinois River (top feeder fish)																						
8/16/2016	<MDC	53000	<MDC	86	<MDC	37	<MDC	33	<MDC	29.1	<MDC	390	<MDC	570000	<MDC	37	<MDC	300	<MDC	99	<MDC	189

Table B-10. Gamma Detection Network Results for Dresden Area

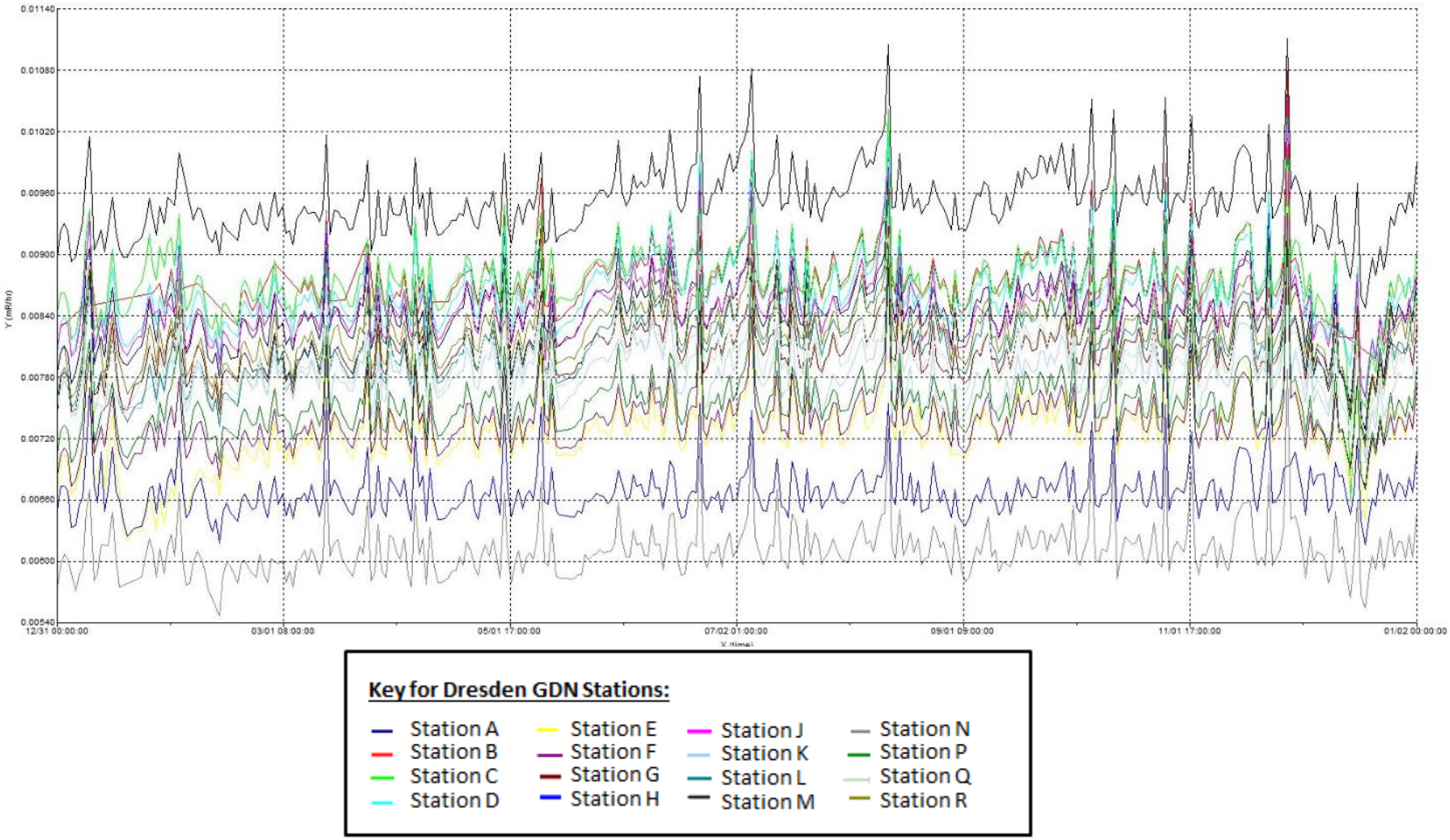


Table B-11. Summary of Ambient Gamma Results for Dresden Area

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
DR001	0.06	0.06	0.07	0.06	21.81
DR002	0.05	0.06	0.09	0.07	23.82
DR003	0.08	0.06	0.09	0.08	27.74
DR004	0.09	0.09	0.10	0.10	34.86
DR007	0.08	0.06	0.09	0.07	26.55
DR009	0.08	0.06	0.09	0.08	27.92
DR013	0.09	0.08	0.09	0.07	30.48
DR020	0.09	0.08	0.11	0.08	32.94
DR021	0.07	0.05	0.10	0.07	26.46
DR022	0.07	0.06		0.07	23.60
DR023	0.06	0.07	0.07	0.06	23.45
DR025	0.06	0.06	0.07	0.06	22.27
DR026	0.06	0.06	0.09	0.06	24.46
DR027	0.09	0.06	0.10	0.07	28.74
DR031	0.08	0.07	0.08	0.08	29.02
DR033	0.06	0.04	0.07	0.04	18.98
DR036	0.08	0.09	0.11	0.10	33.40
DR039	0.11		0.13	0.11	42.83
DR040	0.12	0.09	0.11	0.11	38.33
DR041	0.08	0.07	0.10	0.09	31.39
DR043		0.11	0.12	0.12	41.98
DR046	0.05	0.05		0.06	19.95
DR048	0.11	0.08	0.12	0.09	36.77
DR050	0.07	0.07	0.08	0.08	27.56
DR052	0.10	0.09	0.13	0.10	37.60
DR053	0.06	0.06	0.07	0.04	20.44
DR056	0.10	0.10			37.23
DR060	0.08	0.08	0.12	0.08	32.21
DR062	0.09	0.09	0.12	0.09	34.22
DR065	0.11	0.09	0.12	0.10	38.42
DR066	0.07	0.06	0.09	0.06	24.73
DR068	0.08	0.08	0.09	0.08	31.21
DR070	0.09	0.08	0.10	0.08	32.67
DR073	0.08	0.08	0.10	0.09	32.03
DR075	0.09	0.08	0.10	0.09	33.49
DR076	0.08	0.06	0.09		26.65
DR077	0.06	0.07	0.10	0.08	28.38
DR078	0.10	0.09	0.12	0.10	37.69
DR080	0.11	0.11	0.12	0.11	40.33
DR081	0.09	0.08	0.11	0.09	33.40
DR082	0.10	0.10	0.14	0.11	41.52
DR083	0.08	0.08	0.10	0.10	32.39
DR084	0.08	0.09	0.10	0.10	34.04
DR087	0.08	0.09	0.11		34.55
DR089	0.07	0.09	0.10	0.08	31.03

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
DR091	0.07	0.07	0.07	0.08	26.10
DR093	0.06	0.08	0.10	0.08	28.74
DR095	0.09	0.09	0.11	0.08	33.03
DR096	0.09	0.10	0.10	0.08	34.40
DR097	0.10	0.10	0.13	0.11	40.79
DR098	0.06	0.07	0.08	0.06	24.18
DR099	0.11		0.13		43.44
DR100	0.08	0.08	0.10	0.09	31.85
DR102	0.10	0.11	0.14	0.10	41.25
DR103	0.11	0.12	0.14	0.14	45.72
DR104	0.10	0.10	0.13	0.13	41.61
DR105	0.06	0.06	0.08	0.07	23.91
DR106	0.06	0.06	0.06	0.05	20.26
DR107	0.08	0.08	0.10	0.08	31.12
DR108	0.09	0.10	0.11		36.99
DR109	0.12	0.09	0.11	0.11	38.78
DR110	0.05	0.06	0.07	0.05	21.44
DR111	0.06	0.07	0.08	0.06	23.91
DR112	0.10	0.08	0.11	0.11	35.86
DR113	0.10	0.12	0.13	0.11	41.52
DR114	0.11	0.11	0.14	0.12	43.89
DR115	0.10	0.10	0.12	0.12	38.60
DR116	0.07	0.06	0.07	0.07	24.64
DR117	0.09	0.09	0.10	0.08	32.30
DR118	0.06	0.06	0.10	0.08	27.74
DR-RSA	0.08	0.08	0.10	0.09	32.30
DR-RSB	0.09	0.10	0.11	0.11	36.68
DR-RSC	0.09	0.10	0.12	0.09	36.32
DR-RSD	0.11	0.10	0.13	0.12	41.25
DR-RSE	0.07	0.09	0.10	0.08	30.66
DR-RSF	0.07	0.06	0.08	0.07	25.92
DR-RSG	0.06	0.08	0.09	0.07	27.28
DR-RSH	0.06		0.06	0.07	23.73
DR-RSJ	0.08	0.07	0.11	0.08	30.93
DR-RSK	0.08	0.07	0.11	0.07	30.39
DR-RSL	0.08	0.09	0.09	0.08	31.12
DR-RSM	0.12	0.11	0.14	0.13	45.63
DR-RSN	0.06	0.05	0.07	0.05	20.99
DR-RSP	0.07	0.07	0.07	0.08	26.46
DR-RSQ	0.08	0.08	0.10	0.09	32.03
DR-RSR	0.09	0.08	0.10	0.08	32.21

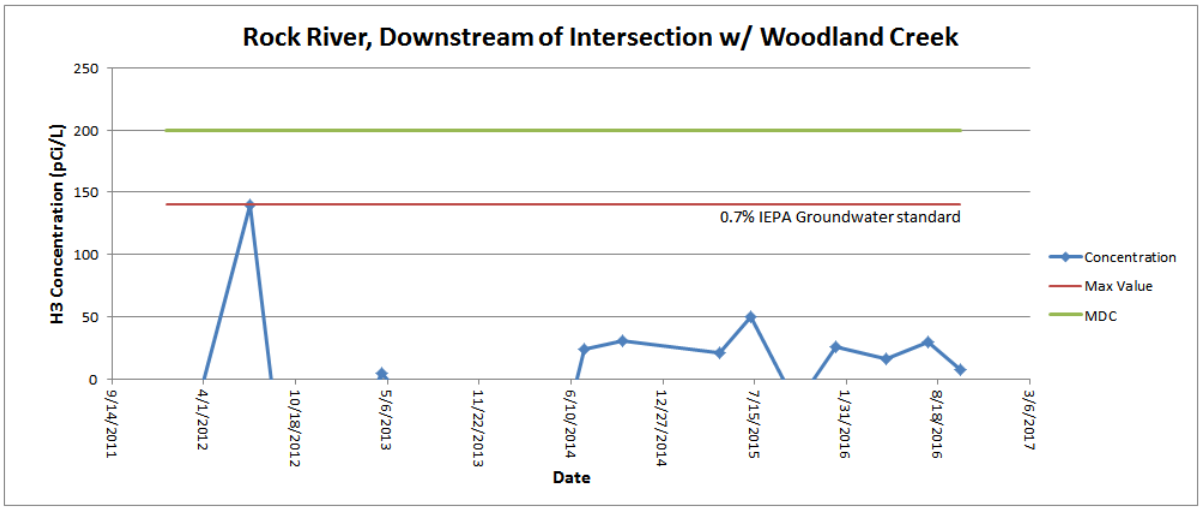
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Exposure column based on averages of all available data.

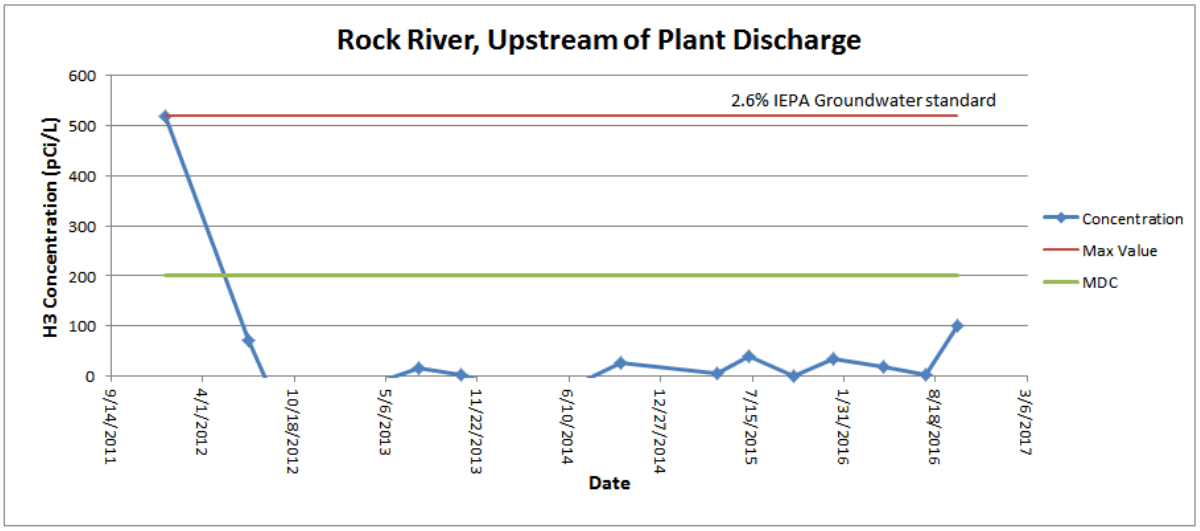
Appendix C
Byron Sample Results

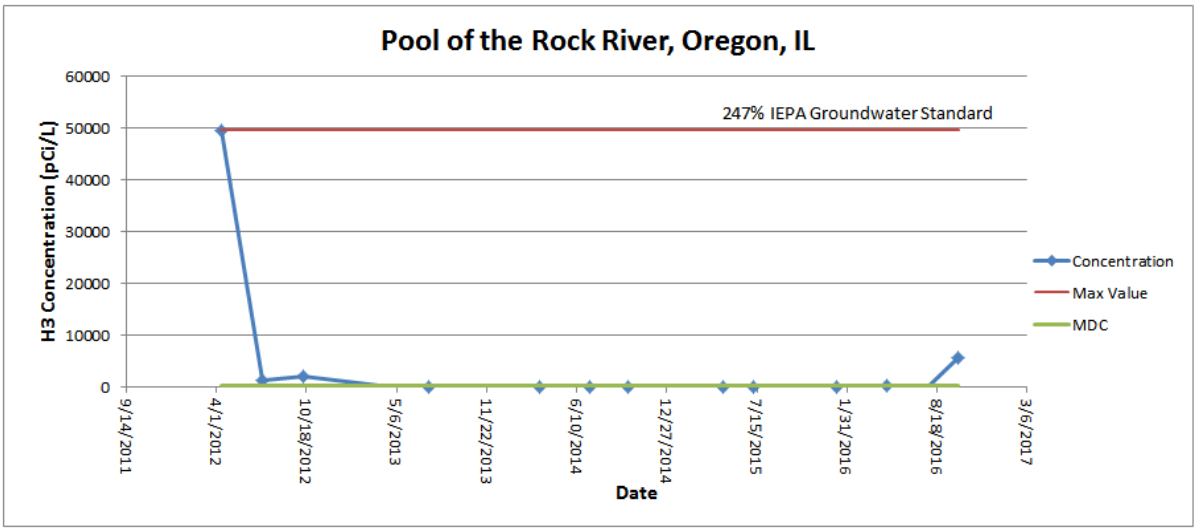
Table C-1. Tritium in Water Sample Results for Byron Area
Results are in picocuries per liter (pCi/L)

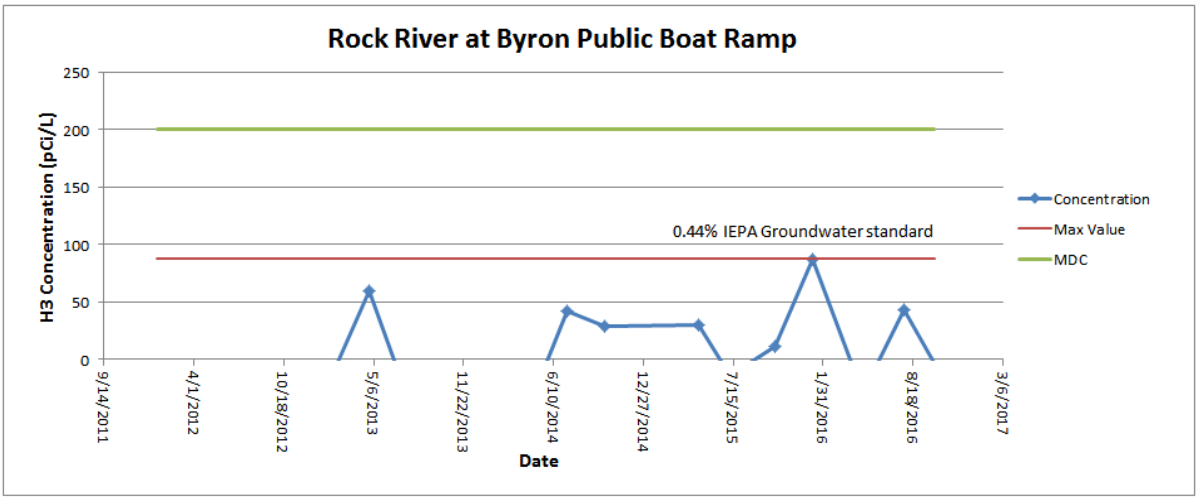
Location	H-3	
Date	Result	MDC
Lowden State Park Boat Ramp		
1/7/2016	<MDC	200
4/28/2016	<MDC	200
7/28/2016	<MDC	200
10/5/2016	<MDC	200
Oregon Park East		
1/7/2016	<MDC	200
4/28/2016	<MDC	200
7/28/2016	<MDC	200
10/5/2016	4210	200
Pool of the Rock River, Oregon		
1/7/2016	<MDC	200
4/28/2016	<MDC	200
7/28/2016	<MDC	200
10/5/2016	5530	200
Public Parking W. of Rock River		
1/7/2016	<MDC	200
4/28/2016	<MDC	200
7/28/2016	<MDC	200
10/5/2016	<MDC	200
Rock River Byron Boat Ramp		
1/7/2016	<MDC	200
4/28/2016	<MDC	200
7/28/2016	<MDC	200
10/5/2016	<MDC	200
Rock River, UpS of the Byron Cooling Water Discharge		
1/7/2016	<MDC	200
4/28/2016	<MDC	200
7/28/2016	<MDC	200
10/5/2016	<MDC	200
Rock River, DnS of Woodland Creek		
1/7/2016	<MDC	200
4/28/2016	<MDC	200
7/28/2016	<MDC	200
10/5/2016	<MDC	200

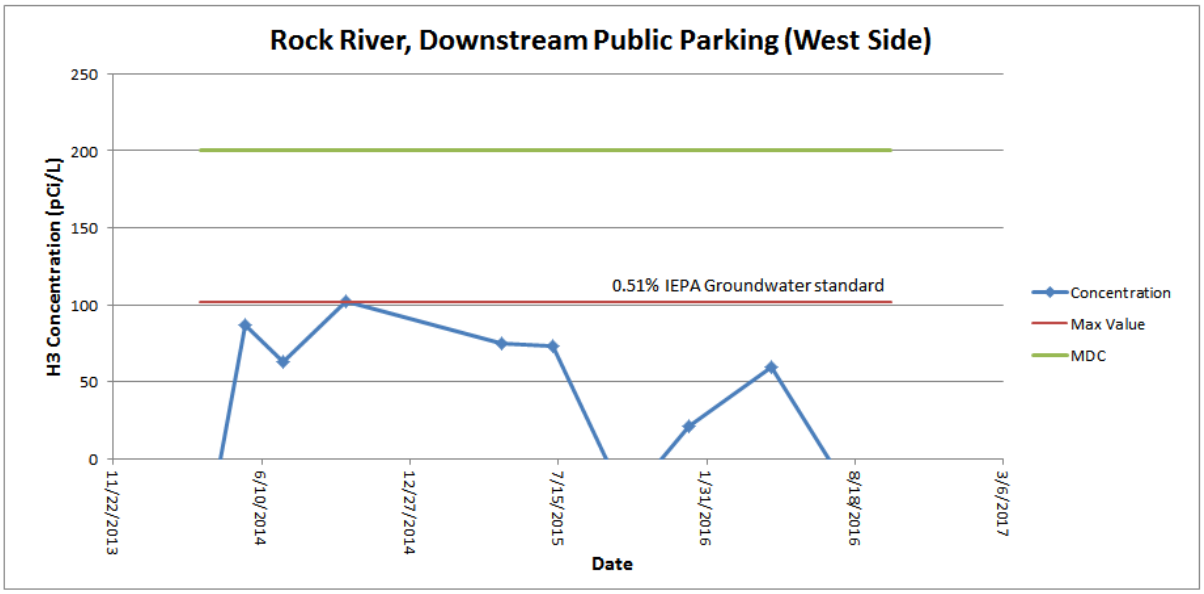
Tables C-2. Trending Graphs for Water from the Byron Area
(Max value compared to IEPA Class I groundwater standard of 20,000 pCi/L)

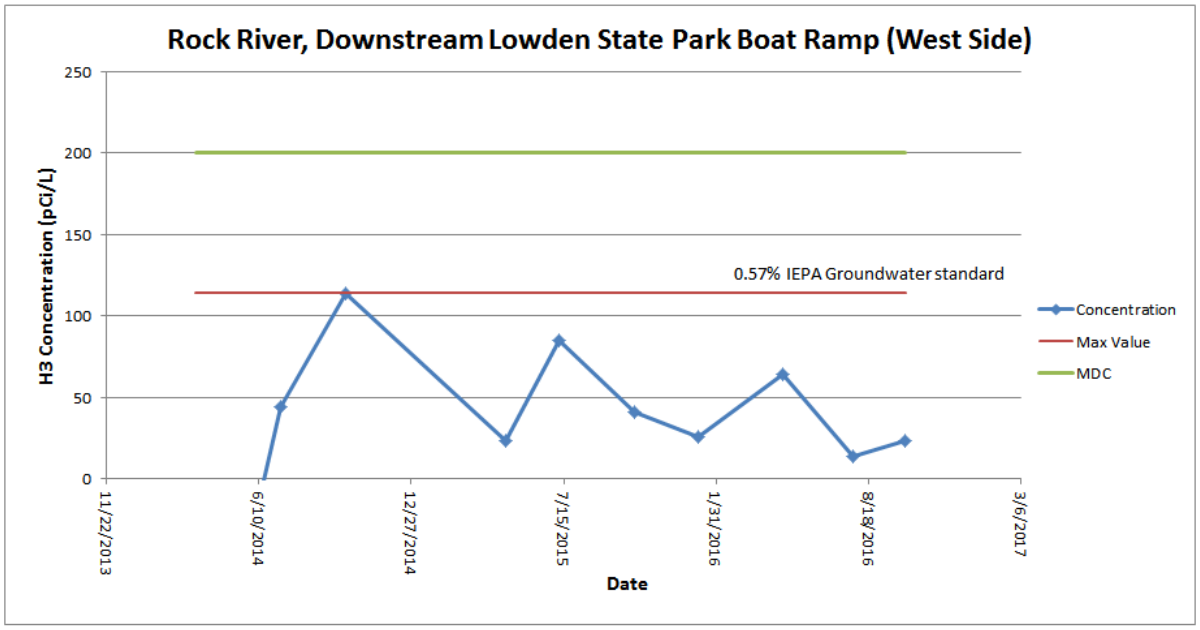





Pool of the Rock River, Oregon, IL
60000
50000
40000
30000
20000
10000
0
H3 Concentration (pCi/L)
247% IEPA Groundwater Standard
Concentration
Max Value
MDC
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date


Rock River at Byron Public Boat Ramp
250
200
150
100
50
0
H3 Concentration (pCi/L)
0.44% IEPA Groundwater standard
Concentration
Max Value
MDC
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date


Rock River, Downstream Public Parking (West Side)
H3 Concentration (pCi/L)
250
200
150
100
50
0
0.51% IEPA Groundwater standard
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC


Rock River, Downstream Lowden State Park Boat Ramp (West Side)
H3 Concentration (pCi/L)
250
200
150
100
50
0
0.57% IEPA Groundwater standard
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC

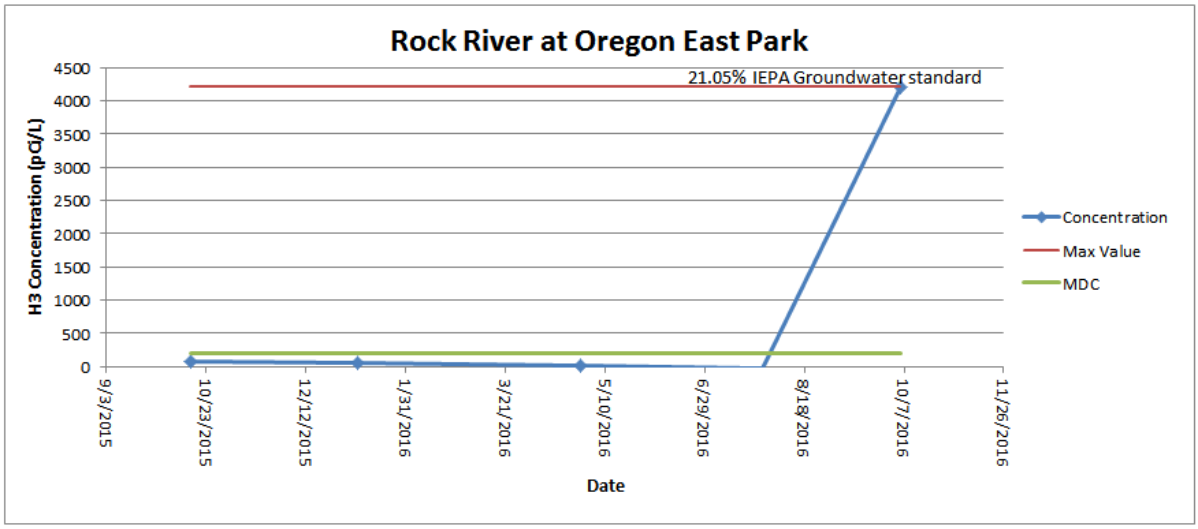

Rock River at Oregon East Park
21.05% IEPA Groundwater standard
H3 Concentration (pCi/L)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
9/3/2015
10/23/2015
12/12/2015
1/31/2016
3/21/2016
5/10/2016
6/29/2016
8/18/2016
10/7/2016
11/26/2016
Date
Concentration
Max Value
MDC

Table C-3. Sample Results for Alpha/Beta Screening of Water from the Byron Area
Results are in picocuries per liter (pCi/L)

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Lowden State Park Boat Ramp				
1/7/2016	<MDC	2.2	<MDC	4.2
4/28/2016	<MDC	2.2	<MDC	4.2
7/28/2016	<MDC	2.2	<MDC	4.2
10/5/2016	<MDC	2.2	<MDC	4.2
Oregon Park East				
1/7/2016	<MDC	2.2	<MDC	4.2
4/28/2016	<MDC	2.2	<MDC	4.2
7/28/2016	<MDC	2.2	<MDC	4.2
10/5/2016	<MDC	2.2	<MDC	4.2
Pool of the Rock River, Oregon				
1/7/2016	<MDC	2.2	<MDC	4.2
4/28/2016	<MDC	2.2	<MDC	4.2
7/28/2016	<MDC	2.2	<MDC	4.2
10/5/2016	<MDC	2.2	<MDC	4.2
Public Parking W. of Rock River				
1/7/2016	<MDC	2.2	<MDC	4.2
4/28/2016	<MDC	2.2	<MDC	4.2
7/28/2016	<MDC	2.2	<MDC	4.2
10/5/2016	<MDC	2.2	<MDC	4.2
Rock River Byron Boat Ramp				
1/7/2016	<MDC	2.2	<MDC	4.2
4/28/2016	<MDC	2.2	4.8	4.2
7/28/2016	<MDC	2.2	<MDC	4.2
10/5/2016	<MDC	2.2	<MDC	4.2
Rock River, UpS of the Byron Cooling Water Discharge				
1/7/2016	<MDC	2.2	<MDC	4.2
4/28/2016	<MDC	2.2	<MDC	4.2
7/28/2016	<MDC	2.2	<MDC	4.2
10/5/2016	<MDC	2.2	<MDC	4.2
Rock River, DnS of Woodland Creek				
1/7/2016	<MDC	2.2	<MDC	4.2
4/28/2016	<MDC	2.2	<MDC	4.2
7/28/2016	<MDC	2.2	<MDC	4.2
10/5/2016	<MDC	2.2	<MDC	4.2

Table C-4. Gamma Spectroscopy Sample Results for Other Radionuclides in Water from the Byron Area
Results are in picocuries per liter (pCi/L)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Lowden State Park Boat Ramp																						
1/7/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
4/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
7/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
10/5/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
Oregon Park East																						
1/7/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
4/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
7/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
10/5/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
Pool of the Rock River, Oregon																						
1/7/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
4/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
7/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
10/5/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
Public Parking W. of Rock River																						
1/7/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
4/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
7/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
10/5/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
Rock River Byron Boat Ramp																						
1/7/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
4/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
7/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
10/5/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
Rock River, UpS of the Byron Cooling Water Discharge																						
1/7/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
4/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
7/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
10/5/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
Rock River, DnS of Woodland Creek																						
1/7/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
4/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
7/28/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3
10/5/2016	<MDC	211	<MDC	6.3	<MDC	4.5	<MDC	4.2	<MDC	3.8	<MDC	16	<MDC	296	<MDC	4	<MDC	9.6	<MDC	10.4	<MDC	11.3

Table C-5. Total Strontium Results in Water Samples Collected in the Byron Area
Results in picocuries per liter (pCi/L)

Location	Date	Nuclide	Result	MDC
Public Parking W. of Rock River	4/28/2016	Strontium	<MDC	1.3
Lowden State Park boat ramp	4/28/2016	Strontium	<MDC	1.3

Table C-6. Soil Sample Results for Byron Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Lot SE of intersection of W Pond & N Main (Leaf River)																				
4/28/2016	<MDC	1.35	<MDC	0.04	<MDC	0.03	<MDC	0.02	0.12	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.10
7/28/2016	<MDC	1.35	<MDC	0.04	<MDC	0.03	<MDC	0.02	0.10	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.10
Lowden State Park																				
7/28/2016	<MDC	1.35	<MDC	0.04	<MDC	0.03	<MDC	0.02	0.18	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.10
Lowden State Park Boat Ramp																				
4/28/2016	<MDC	1.35	<MDC	0.04	<MDC	0.03	<MDC	0.02	0.20	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.10
Southwest of Rockford																				
4/28/2016	<MDC	1.35	<MDC	0.04	<MDC	0.03	<MDC	0.02	0.28	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.10
7/28/2016	<MDC	1.35	<MDC	0.04	<MDC	0.03	<MDC	0.02	0.28	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.07	<MDC	0.07	<MDC	0.10

Table C-7. Sediment Sample Results for Byron Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Oregon Park East																				
4/28/2016	<MDC	0.75	<MDC	0.03	<MDC	0.03	<MDC	0.02	<MDC	0.05	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.07	<MDC	0.09
7/28/2016	<MDC	0.75	<MDC	0.03	<MDC	0.03	<MDC	0.02	<MDC	0.05	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.07	<MDC	0.09
Rock River, UpS of the Byron Cooling Water Discharge																				
4/28/2016	<MDC	0.75	<MDC	0.03	<MDC	0.03	<MDC	0.02	0.10	0.05	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.07	<MDC	0.09
7/28/2016	<MDC	0.75	<MDC	0.03	<MDC	0.03	<MDC	0.02	<MDC	0.05	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.07	<MDC	0.09

Table C-8. Vegetation Sample Results for Byron Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Lot SE of intersection of W Pond & N Main (Leaf River)																						
4/28/2016	<MDC	8.0	<MDC	0.2	<MDC	0.1	<MDC	0.2	<MDC	0.2	<MDC	0.6	<MDC	13.6	<MDC	0.2	<MDC	0.4	<MDC	0.3	<MDC	0.4
7/28/2016	<MDC	8.0	<MDC	0.2	<MDC	0.1	<MDC	0.2	<MDC	0.2	<MDC	0.6	<MDC	13.6	<MDC	0.2	<MDC	0.4	<MDC	0.3	<MDC	0.4
Lowden State Park																						
7/28/2016	<MDC	8.0	<MDC	0.2	<MDC	0.1	<MDC	0.2	<MDC	0.2	<MDC	0.6	<MDC	13.6	<MDC	0.2	<MDC	0.4	<MDC	0.3	<MDC	0.4
Lowden State Park Boat Ramp																						
4/28/2016	<MDC	8.0	<MDC	0.2	<MDC	0.1	<MDC	0.2	<MDC	0.2	<MDC	0.6	<MDC	13.6	<MDC	0.2	<MDC	0.4	<MDC	0.3	<MDC	0.4
Southwest of Rockford																						
4/28/2016	<MDC	8.0	<MDC	0.2	<MDC	0.1	<MDC	0.2	<MDC	0.2	<MDC	0.6	<MDC	13.6	<MDC	0.2	<MDC	0.4	<MDC	0.3	<MDC	0.4
7/28/2016	<MDC	8.0	<MDC	0.2	<MDC	0.1	<MDC	0.2	<MDC	0.2	<MDC	0.6	<MDC	13.6	<MDC	0.2	<MDC	0.4	<MDC	0.3	<MDC	0.4

Table C-9. Gamma Detection Network Results for Byron

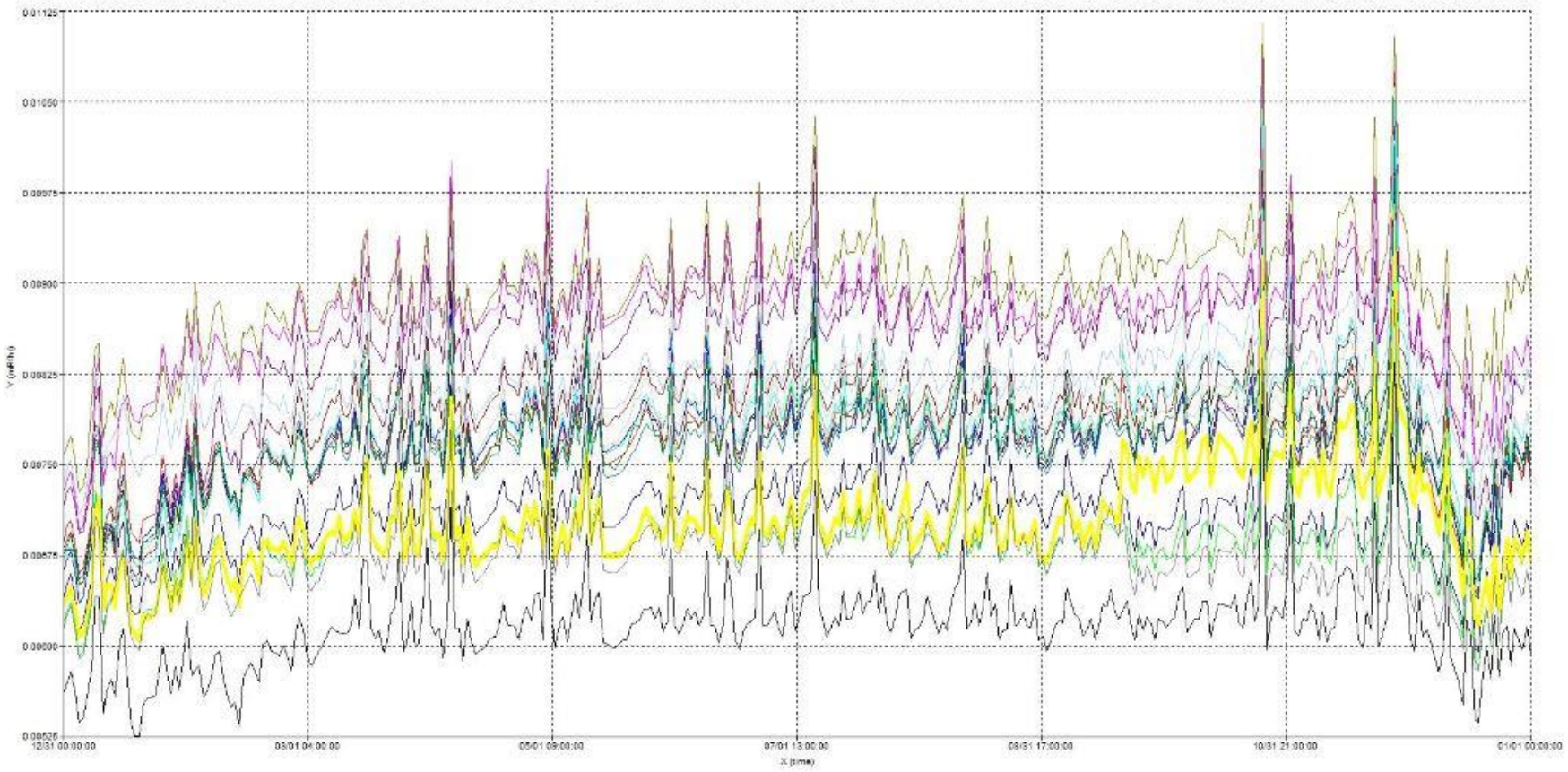


Table C-10. Summary of Ambient Gamma Results for Byron Area

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
BY001	0.08	0.09	0.10	0.09	31.66
BY003	0.06	0.07	0.07	0.06	24.36
BY004	0.07	0.08	0.08	0.08	28.01
BY005	0.07	0.09	0.09	0.08	29.93
BY006	0.08	0.10	0.07	0.08	29.93
BY007	0.07	0.07	0.06	0.08	26.10
BY008	0.08	0.09	0.07	0.09	30.48
BY011	0.08	0.07	0.07	0.08	27.65
BY013	0.10	0.11	0.12	0.09	37.96
BY014	0.07	0.09	0.07	0.08	27.38
BY015	0.08		0.11	0.11	35.41
BY018	0.07	0.07	0.07	0.08	25.37
BY020	0.09	0.12	0.10	0.10	37.41
BY022	0.09	0.09	0.10	0.10	35.41
BY023	0.08	0.11	0.09	0.08	32.85
BY026	0.07	0.08	0.10	0.09	31.48
BY027	0.10		0.12	0.11	40.52
BY029	0.08	0.09	0.10	0.09	32.39
BY030	0.07	0.08	0.11	0.10	32.67
BY033	0.09	0.11	0.09	0.10	36.59
BY034	0.07	0.10	0.09	0.08	30.11
BY035	0.07	0.08		0.06	25.43
BY037	0.07	0.08		0.07	26.16
BY040	0.11	0.13	0.12	0.12	42.52
BY041	0.08	0.10	0.07	0.08	29.47
BY044	0.07	0.08	0.07	0.08	27.65
BY045	0.08	0.09	0.09	0.07	29.47
BY049	0.06	0.08	0.09	0.08	27.83
BY050	0.10	0.10	0.11	0.10	37.69
BY051	0.06	0.08	0.09	0.07	26.92
BY052	0.08	0.08	0.09	0.09	31.48
BY053	0.09	0.09	0.08	0.10	33.49
BY055	0.09	0.13	0.11	0.10	39.15
BY056	0.09	0.08	0.09	0.10	32.39
BY057	0.09	0.10	0.11	0.10	35.41
BY058	0.08	0.09	0.08	0.10	32.30
BY059	0.08	0.10	0.11	0.09	34.77
BY060	0.08	0.10	0.09	0.10	34.31
BY061	0.11	0.10	0.13	0.11	41.52
BY062	0.09	0.11	0.10	0.11	35.95
BY063	0.10	0.12	0.10	0.10	38.51
BY064	0.10	0.09	0.10	0.12	38.60
BY065	0.09	0.11	0.09	0.10	35.77
BY066	0.07	0.10	0.09	0.10	32.76

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
BY067	0.08	0.10	0.09	0.09	33.22
BY068	0.09	0.10	0.08	0.09	32.76
BY069		0.11	0.10	0.10	36.50
BY070	0.09	0.10	0.11	0.09	35.86
BY071	0.07	0.08	0.08	0.08	27.74
BY072	0.09	0.11	0.11	0.11	38.60
BY073	0.10	0.11	0.08	0.09	33.76
BY074	0.09		0.09	0.09	32.85
BY075	0.08	0.11	0.09	0.10	34.22
BY076	0.07	0.08	0.08	0.28	45.90
BY077	0.08	0.11	0.09		33.95
BY078	0.10		0.09	0.08	31.88
BY079	0.07	0.07	0.05	0.07	23.63
BY080	0.06	0.06	0.07	0.07	23.45
BY-RSA	0.06	0.07	0.06	0.08	25.46
BY-RSB	0.08	0.10	0.08	0.09	30.66
BY-RSC	0.06	0.07	0.07	0.08	25.09
BY-RSD	0.08	0.10	0.08	0.09	31.66
BY-RSE	0.08	0.09	0.07	0.08	28.38
BY-RSF	0.08	0.11	0.11	0.10	35.95
BY-RSG	0.08	0.10	0.08	0.07	30.48
BY-RSH	0.07	0.09	0.08	0.09	29.66
BY-RSJ	0.08	0.09	0.08	0.10	31.76
BY-RSK	0.09	0.10	0.09	0.09	33.95
BY-RSL			0.08	0.09	31.03
BY-RSM	0.05	0.06	0.04	0.05	18.34
BY-RSN	0.06	0.06	0.06	0.06	22.17
BY-RSP	0.08	0.09	0.09	0.08	30.30
BY-RSQ		0.10	0.09	0.09	33.22
BY-RSR	0.10	0.11	0.12	0.12	40.52

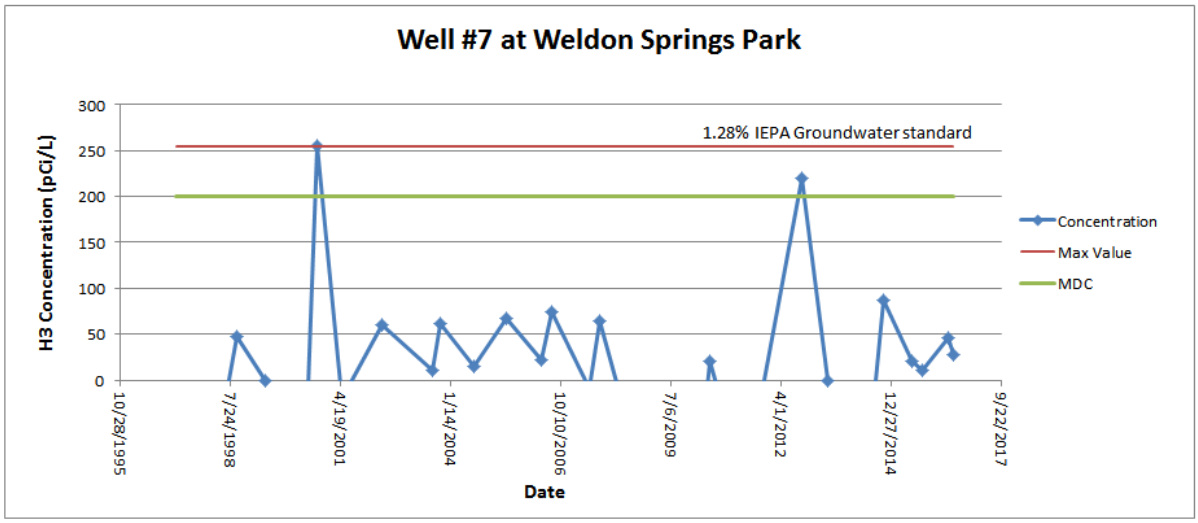
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Exposure column based on averages of all available data.

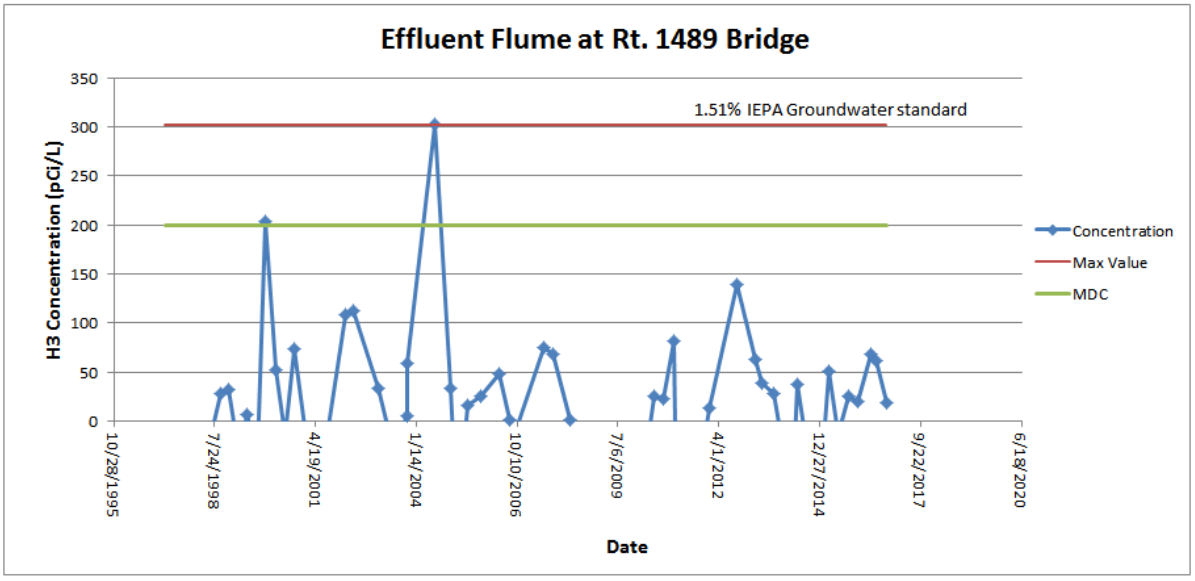
Appendix D
Clinton Sample Results

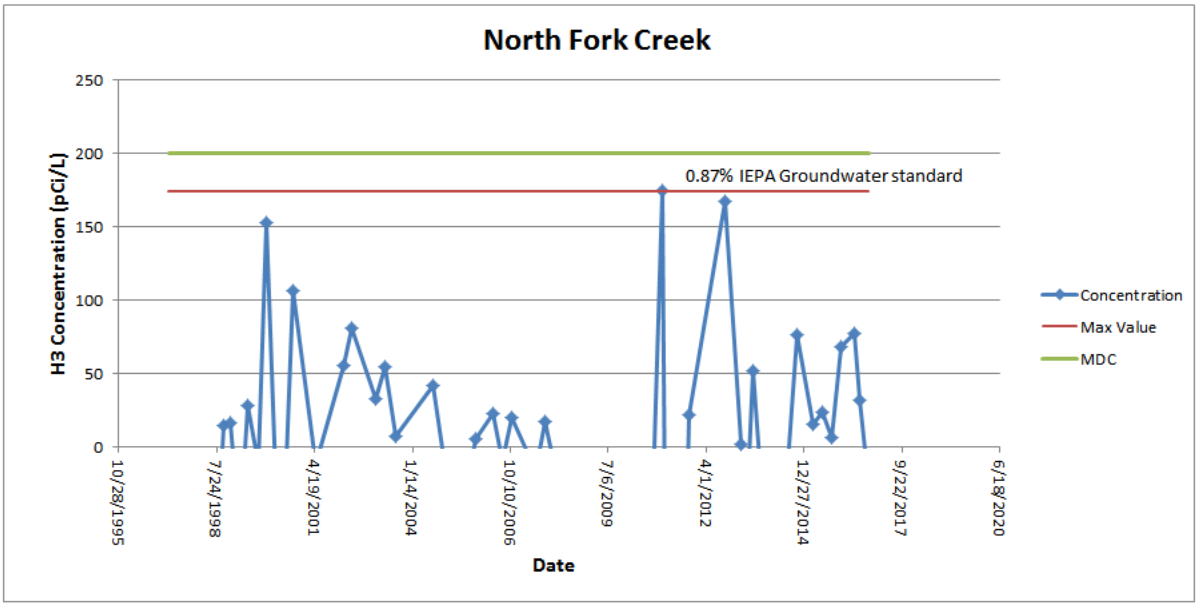
Table D-1. Tritium in Water Sample Results for Clinton Area
Results are in picocuries per liter (pCi/L)

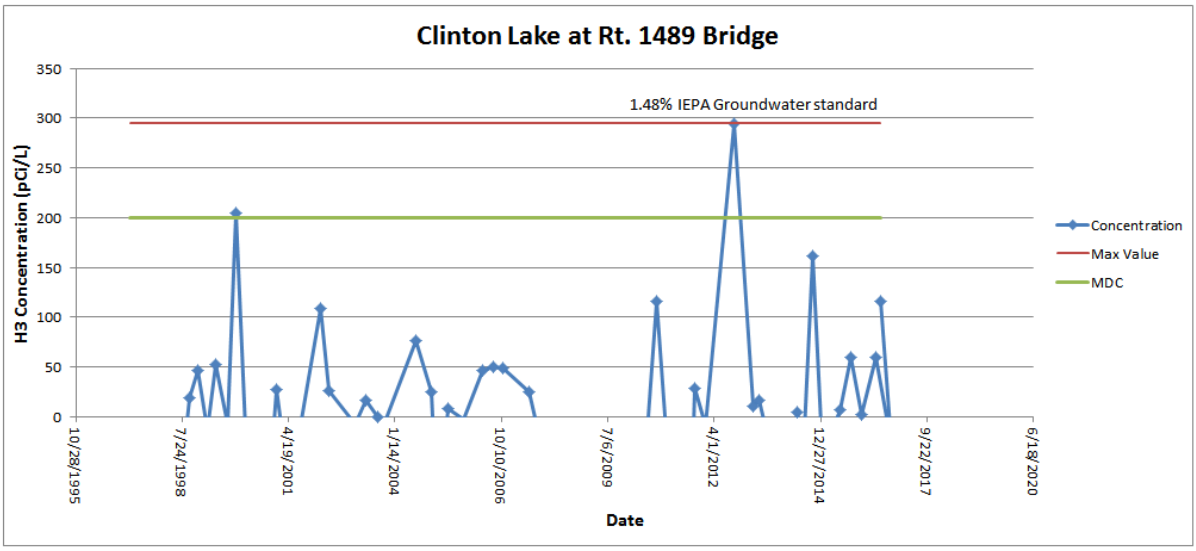
Location	H-3	
Date	Result	MDC
Bridge over Lake at Route 1489		
1/13/2016	<MDC	200.0
5/24/2016	<MDC	200.0
7/12/2016	<MDC	200.0
10/18/2016	<MDC	200.0
Bridge over Lake at Route 48		
1/13/2016	<MDC	200.0
5/24/2016	<MDC	200.0
7/12/2016	<MDC	200.0
10/18/2016	<MDC	200.0
Effluent Flume at Route 1489 bridge		
1/13/2016	<MDC	200.0
5/24/2016	<MDC	200.0
7/12/2016	<MDC	200.0
10/18/2016	<MDC	200.0
Mascutin Recreation Area (Restaurant)		
5/24/2016	<MDC	200.0
7/12/2016	<MDC	200.0
North Branch at Route 54 Bridge		
1/13/2016	<MDC	200.0
5/24/2016	<MDC	200.0
7/12/2016	<MDC	200.0
10/18/2016	<MDC	200.0
North Fork Creek		
1/13/2016	<MDC	200.0
5/24/2016	<MDC	200.0
7/12/2016	<MDC	200.0
10/18/2016	<MDC	200.0
Parnell Boat Ramp		
5/24/2016	<MDC	200.0
7/12/2016	<MDC	200.0
10/18/2016	<MDC	200.0
Salt Creek DnS From Spillway		
1/13/2016	<MDC	200.0
5/24/2016	<MDC	200.0
7/12/2016	<MDC	200.0
10/18/2016	<MDC	200.0
Well #7 at Weldon Springs Park		
5/24/2016	<MDC	200.0
7/12/2016	<MDC	200.0

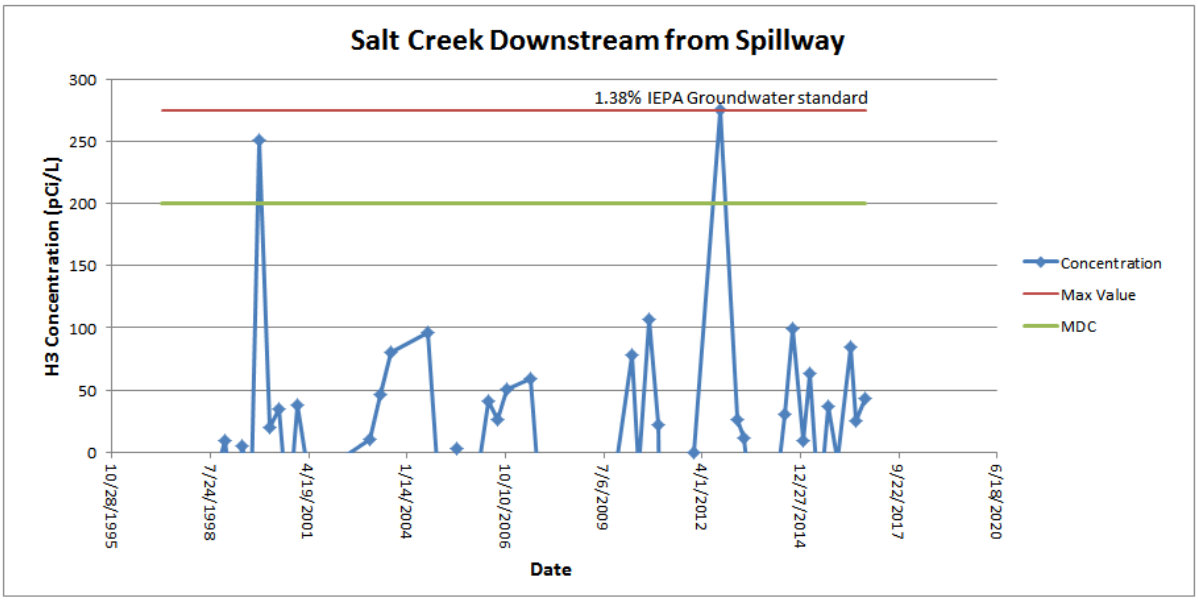
Tables D-2. Trending Graphs for Water from the Clinton Area
(Max value compared to IEPA Class I groundwater standard of 20,000 pCi/L)

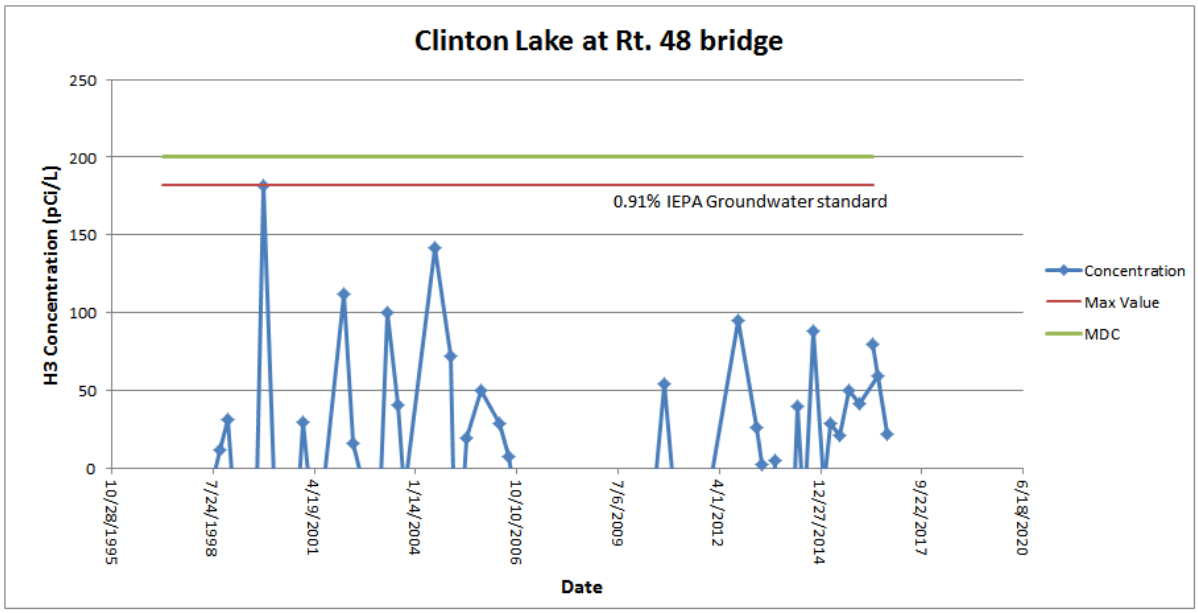


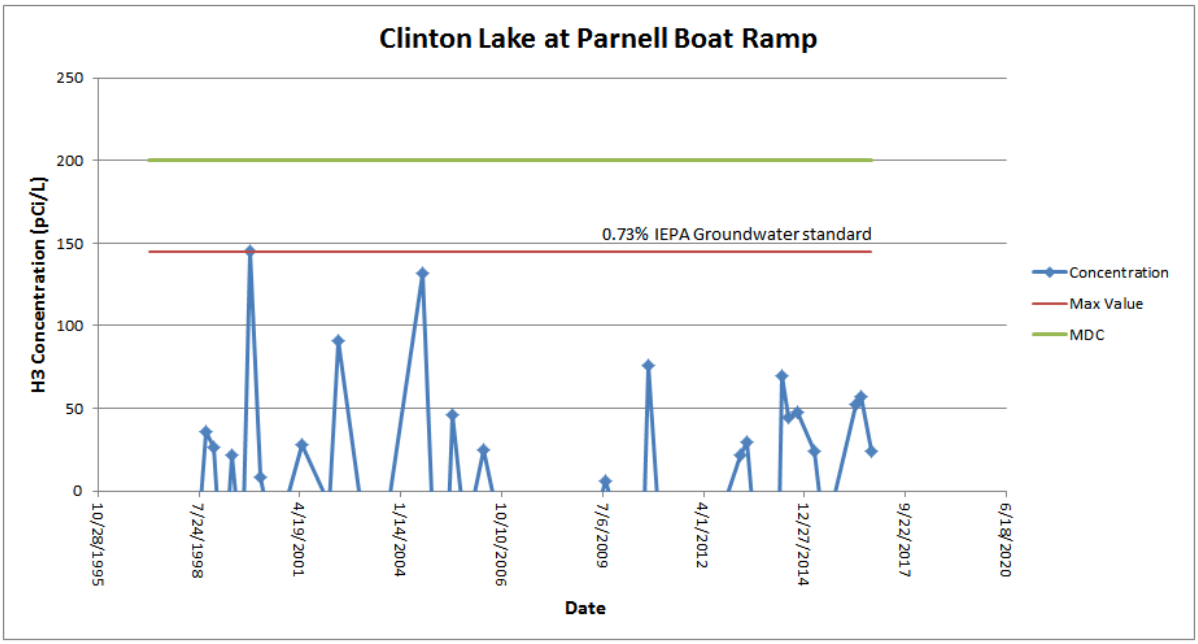


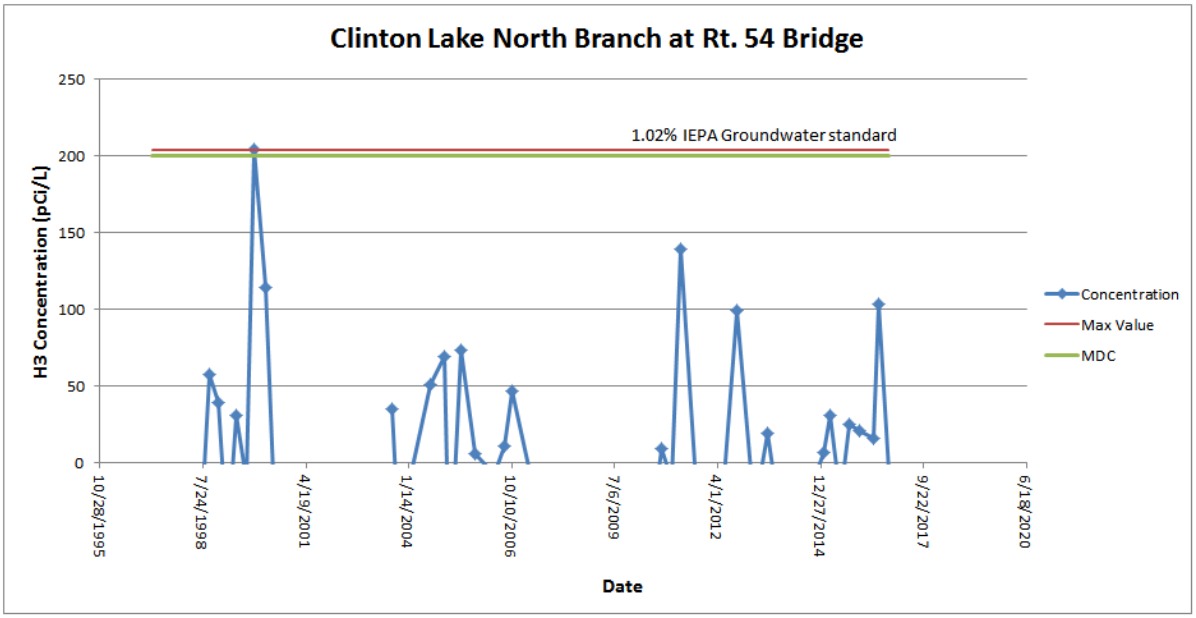

North Fork Creek
H3 Concentration (pCi/L)
250
200
150
100
50
0
0.87% IEPA Groundwater standard
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
6/18/2020
Date
Concentration
Max Value
MDC


Clinton Lake at Rt. 1489 Bridge
H3 Concentration (pCi/L)
350
300
250
200
150
100
50
0
1.48% IEPA Groundwater standard
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
6/18/2020
Date
Concentration
Max Value
MDC


Salt Creek Downstream from Spillway
1.38% IEPA Groundwater standard
H3 Concentration (pCi/L)
300
250
200
150
100
50
0
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
6/18/2020
Date
Concentration
Max Value
MDC


Clinton Lake at Rt. 48 bridge
0.91% IEPA Groundwater standard
H3 Concentration (pCi/L)
250
200
150
100
50
0
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
6/18/2020
Date
Concentration
Max Value
MDC


Clinton Lake at Parnell Boat Ramp
H3 Concentration (pCi/L)
250
200
150
100
50
0
0.73% IEPA Groundwater standard
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
6/18/2020
Date
Concentration
Max Value
MDC


Clinton Lake North Branch at Rt. 54 Bridge
H3 Concentration (pCi/L)
250
200
150
100
50
0
1.02% IEPA Groundwater standard
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
6/18/2020
Date
Concentration
Max Value
MDC

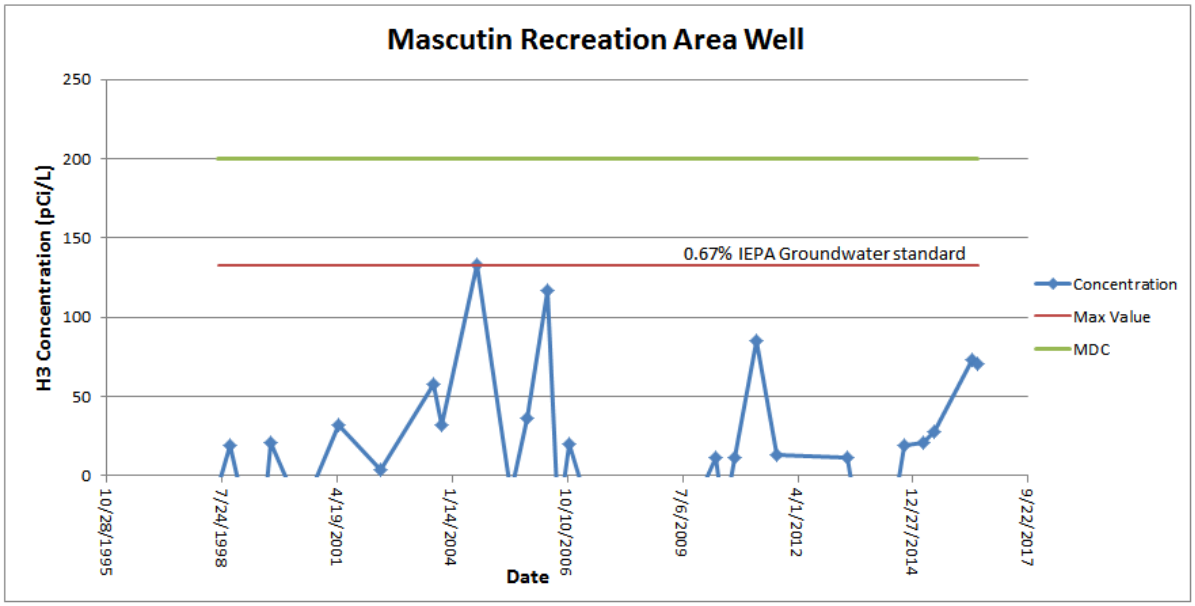

Mascutin Recreation Area Well
H3 Concentration (pCi/L)
250
200
150
100
50
0
0.67% IEPA Groundwater standard
Concentration
Max Value
MDC
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
Date

Table D-3. Sample Results for Alpha/Beta Screening of Water from the Clinton Area
Results are in picocuries per liter (pCi/L)

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Bridge Over Lake at Route 1489				
1/13/2016	<MDC	2.2	<MDC	3.9
5/24/2016	<MDC	2.2	<MDC	3.9
7/12/2016	<MDC	2.2	<MDC	3.9
10/18/2016	<MDC	2.2	<MDC	3.9
Bridge Over Lake at Route 48				
1/13/2016	<MDC	2.2	<MDC	3.9
5/24/2016	<MDC	2.2	<MDC	3.9
7/12/2016	<MDC	2.2	<MDC	3.9
10/18/2016	<MDC	2.2	<MDC	3.9
Effluent Flume at Route 1489 bridge				
1/13/2016	<MDC	2.2	<MDC	3.9
5/24/2016	<MDC	2.2	<MDC	3.9
7/12/2016	<MDC	2.2	<MDC	3.9
10/18/2016	<MDC	2.2	<MDC	3.9
Mascutin Recreation Area (Restaurant)				
5/24/2016	<MDC	2.2	<MDC	3.9
7/12/2016	<MDC	2.2	<MDC	3.9
North Branch at Route 54 Bridge				
1/13/2016	<MDC	2.2	<MDC	3.9
5/24/2016	<MDC	2.2	<MDC	3.9
7/12/2016	<MDC	2.2	<MDC	3.9
10/18/2016	<MDC	2.2	<MDC	3.9
North Fork Creek				
1/13/2016	<MDC	2.2	<MDC	3.9
5/24/2016	<MDC	2.2	<MDC	3.9
7/12/2016	<MDC	2.2	<MDC	3.9
10/18/2016	<MDC	2.2	<MDC	3.9
Parnell Boat Ramp				
5/24/2016	<MDC	2.2	<MDC	3.9
7/12/2016	<MDC	2.2	<MDC	3.9
10/18/2016	<MDC	2.2	<MDC	3.9
Salt Creek DnS From Spillway				
1/13/2016	<MDC	2.2	<MDC	3.9
5/24/2016	<MDC	2.2	<MDC	3.9
7/12/2016	<MDC	2.2	<MDC	3.9
10/18/2016	<MDC	2.2	<MDC	3.9
Well #7 at Weldon Springs Park				
5/24/2016	<MDC	2.2	<MDC	3.9
7/12/2016	<MDC	2.2	<MDC	3.9

Table D-4. Gamma Spectroscopy Sample Results for Other Radionuclides in Water from the Clinton Area
Results are in picocuries per liter (pCi/L)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Bridge Over Lake at Route 1489																						
1/13/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
5/24/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
7/12/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
10/18/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
Bridge Over Lake at Route 48																						
1/13/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
5/24/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
7/12/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
10/18/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
Effluent Flume at Bridge Route 1489																						
1/13/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
5/24/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
7/12/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
10/18/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
Mascutin Recreation Area (Restaurant)																						
5/24/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
7/12/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
North Branch at Route 54 Bridge																						
1/13/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
5/24/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
7/12/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
10/18/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
North Fork Creek																						
1/13/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
5/24/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
7/12/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
10/18/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
Parnell Boat Ramp																						
5/24/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
7/12/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
10/18/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
Salt Creek DnS From Spillway																						
1/13/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
5/24/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
7/12/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
10/18/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
Well#7 at Weldon Springs Park																						
5/24/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6
7/12/2016	<MDC	142	<MDC	5.5	<MDC	4.4	<MDC	4.2	<MDC	3.8	<MDC	15	<MDC	173	<MDC	4	<MDC	8.5	<MDC	9.8	<MDC	9.6

Table D-5. Total Strontium Results for Water Samples Collected in the Clinton Area
Results are in picocuries per liter (pCi/L)

Location	Date	Nuclide	Result	MDC
Bridge over Lake at Route 48	1/13/2016	Strontium	<MDC	1.4
Effluent Flume at Bridge Route 1489	1/13/2016	Strontium	<MDC	1.4

Table D-6. Soil Sample Results for Clinton Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Mascoutin Recreation Area																				
5/24/2016	<MDC	0.38	<MDC	0.03	<MDC	0.03	<MDC	0.03	0.05	0.04	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.08	<MDC	0.08
7/12/2016	<MDC	0.38	<MDC	0.03	<MDC	0.03	<MDC	0.03	<MDC	0.04	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.08	<MDC	0.08
North Branch at Route 54 Bridge																				
5/26/2016	<MDC	0.38	<MDC	0.03	<MDC	0.03	<MDC	0.03	0.04	0.04	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.08	<MDC	0.08
7/12/2016	<MDC	0.38	<MDC	0.03	<MDC	0.03	<MDC	0.03	0.06	0.04	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.08	<MDC	0.08
North Fork Creek																				
5/24/2016	<MDC	0.38	<MDC	0.03	<MDC	0.03	<MDC	0.03	<MDC	0.04	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.08	<MDC	0.08
7/12/2016	<MDC	0.38	<MDC	0.03	<MDC	0.03	<MDC	0.03	0.09	0.04	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.08	<MDC	0.08
Weldon Springs Entrance																				
5/24/2016	<MDC	0.38	<MDC	0.03	<MDC	0.03	<MDC	0.03	0.10	0.04	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.08	<MDC	0.08
7/12/2016	<MDC	0.38	<MDC	0.03	<MDC	0.03	<MDC	0.03	<MDC	0.04	<MDC	0.09	<MDC	0.03	<MDC	0.05	<MDC	0.08	<MDC	0.08

Table D-7. Sediment Sample Results for Clinton Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Effluent Flume at Route 1489																				
7/12/2016	<MDC	0.29	<MDC	0.02	<MDC	0.03	<MDC	0.02	<MDC	0.03	<MDC	0.07	<MDC	0.03	<MDC	0.04	<MDC	0.07	<MDC	0.07
North Fork Creek																				
5/24/2016	<MDC	0.29	<MDC	0.02	<MDC	0.03	<MDC	0.02	0.06	0.03	<MDC	0.07	<MDC	0.03	<MDC	0.04	<MDC	0.07	<MDC	0.07
7/12/2016	<MDC	0.29	<MDC	0.02	<MDC	0.03	<MDC	0.02	0.05	0.03	<MDC	0.07	<MDC	0.03	<MDC	0.04	<MDC	0.07	<MDC	0.07
Parnell Boat Ramp																				
5/24/2016	<MDC	0.29	<MDC	0.02	<MDC	0.03	<MDC	0.02	<MDC	0.03	<MDC	0.07	<MDC	0.03	<MDC	0.04	<MDC	0.07	<MDC	0.07
7/12/2016	<MDC	0.29	<MDC	0.02	<MDC	0.03	<MDC	0.02	<MDC	0.03	<MDC	0.07	<MDC	0.03	<MDC	0.04	<MDC	0.07	<MDC	0.07

Table D-8. Fish Sample Results for Clinton Area
Results are in picocuries per kilogram (pCi/kg)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Clinton Lake (bottom feeder)																						
4/13/2016	<MDC	530	<MDC	36	<MDC	35	<MDC	34	<MDC	27.5	<MDC	92	<MDC	350	<MDC	32	<MDC	54	<MDC	79	<MDC	75
Clinton Lake (top feeder)																						
4/13/2016	<MDC	530	<MDC	36	<MDC	35	<MDC	34	<MDC	27.5	<MDC	92	<MDC	350	<MDC	32	<MDC	54	<MDC	79	<MDC	75

Table D-9. Vegetation Sample Results for Clinton Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Mascoutin Recreation Area																						
5/24/2016	<MDC	3.3	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.5	<MDC	3.3	<MDC	0.2	<MDC	0.3	<MDC	0.3	<MDC	0.4
7/12/2016	<MDC	3.3	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.5	<MDC	3.3	<MDC	0.2	<MDC	0.3	<MDC	0.3	<MDC	0.4
North Branch at Route 54 Bridge																						
5/24/2016	<MDC	3.3	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.5	<MDC	3.3	<MDC	0.2	<MDC	0.3	<MDC	0.3	<MDC	0.4
7/12/2016	<MDC	3.3	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.5	<MDC	3.3	<MDC	0.2	<MDC	0.3	<MDC	0.3	<MDC	0.4
North Fork Creek																						
5/24/2016	<MDC	3.3	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.5	<MDC	3.3	<MDC	0.2	<MDC	0.3	<MDC	0.3	<MDC	0.4
7/12/2016	<MDC	3.3	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.5	<MDC	3.3	<MDC	0.2	<MDC	0.3	<MDC	0.3	<MDC	0.4
Weldon Springs Entrance																						
5/24/2016	<MDC	3.3	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.5	<MDC	3.3	<MDC	0.2	<MDC	0.3	<MDC	0.3	<MDC	0.4
7/12/2016	<MDC	3.3	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.2	<MDC	0.5	<MDC	3.3	<MDC	0.2	<MDC	0.3	<MDC	0.3	<MDC	0.4

Table D-10. Gamma Detection Network Results for Clinton

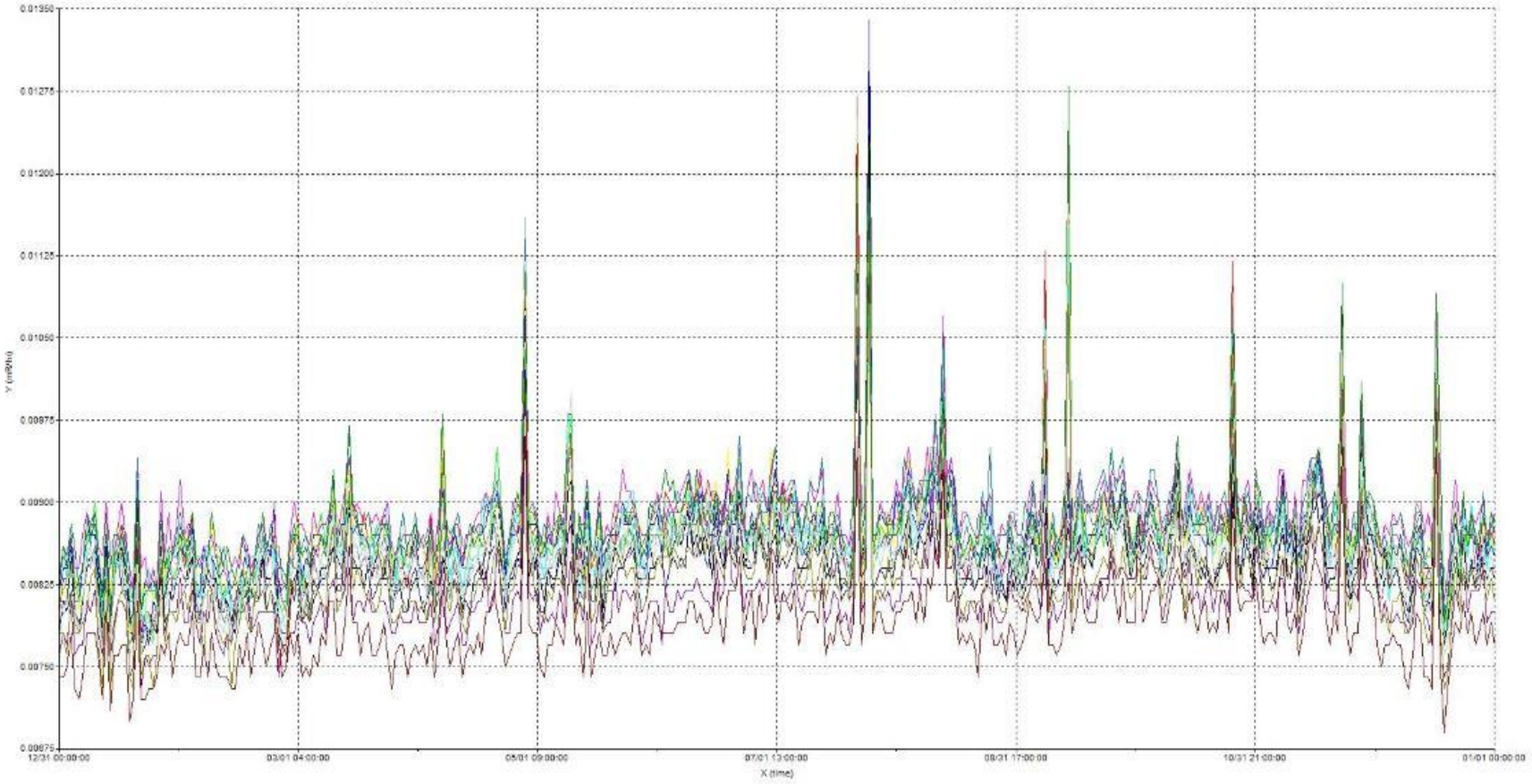


Table D-11. Summary of Ambient Gamma Results for Clinton Area

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
CP001	0.10	0.10	0.11	0.09	36.87
CP003	0.08	0.10	0.10	0.08	33.40
CP006	0.07	0.08	0.10	0.08	29.93
CP009	0.07	0.09	0.09	0.08	30.75
CP011	0.09	0.12	0.11	0.11	38.69
CP013	0.07	0.08	0.09	0.06	27.47
CP016	0.09	0.11	0.14	0.10	39.24
CP018	0.10	0.12	0.13	0.10	41.06
CP019	0.10	0.11	0.11	0.11	39.24
CP022	0.08	0.11	0.13	0.04	33.40
CP025	0.10		0.12	0.11	40.76
CP027	0.08	0.09	0.11		34.43
CP028	0.08	0.11	0.13	0.09	37.32
CP031	0.09	0.11	0.12	0.09	36.68
CP032	0.09	0.11	0.12		38.57
CP033	0.08	0.07	0.09	0.08	29.29
CP034	0.08	0.11	0.12	0.10	37.41
CP035	0.09	0.09	0.10		33.34
CP036	0.09	0.10	0.13	0.10	37.78
CP037	0.10	0.12	0.13	0.10	39.79
CP038	0.09	0.10	0.11	0.07	33.67
CP039	0.10	0.12	0.13	0.11	41.79
CP040	0.09	0.13	0.11	0.09	38.05
CP041	0.08	0.12	0.11	0.10	37.05
CP042	0.10	0.11	0.11	0.09	37.60
CP043	0.10	0.09	0.11	0.09	35.13
CP044	0.10	0.12	0.10	0.10	38.87
CP045	0.09	0.12	0.12	0.09	38.05
CP046	0.12	0.12	0.12	0.09	41.88
CP047	0.10	0.13	0.13	0.10	42.16
CP048	0.11	0.10	0.13	0.10	39.51
CP049	0.08	0.10	0.10	0.10	34.77
CP050	0.11	0.12	0.12	0.09	39.42
CP051	0.10	0.11	0.10	0.09	36.50

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
CP-RSA	0.10	0.10	0.13		39.06
CP-RSB	0.10	0.11	0.10	0.08	34.68
CP-RSC	0.09	0.09	0.13	0.08	35.31
CP-RSD	0.09	0.11	0.13	0.10	38.87
CP-RSE	0.08	0.10	0.12	0.08	34.04
CP-RSF	0.07	0.08	0.09	0.09	30.66
CP-RSG	0.09	0.10	0.11	0.08	33.31
CP-RSH	0.10	0.12	0.11	0.10	38.33
CP-RSJ	0.10	0.12	0.11		40.27
CP-RSK	0.10	0.09	0.12	0.10	37.78
CP-RSL	0.09	0.11	0.11	0.10	36.41
CP-RSM	0.09	0.10	0.12	0.09	35.95
CP-RSN	0.09	0.10	0.12	0.10	37.60
CP-RSP	0.09	0.10	0.10	0.08	33.12
CP-RSQ	0.08	0.09	0.12	0.08	32.67
CP-RSR	0.09	0.10	0.11	0.09	34.77

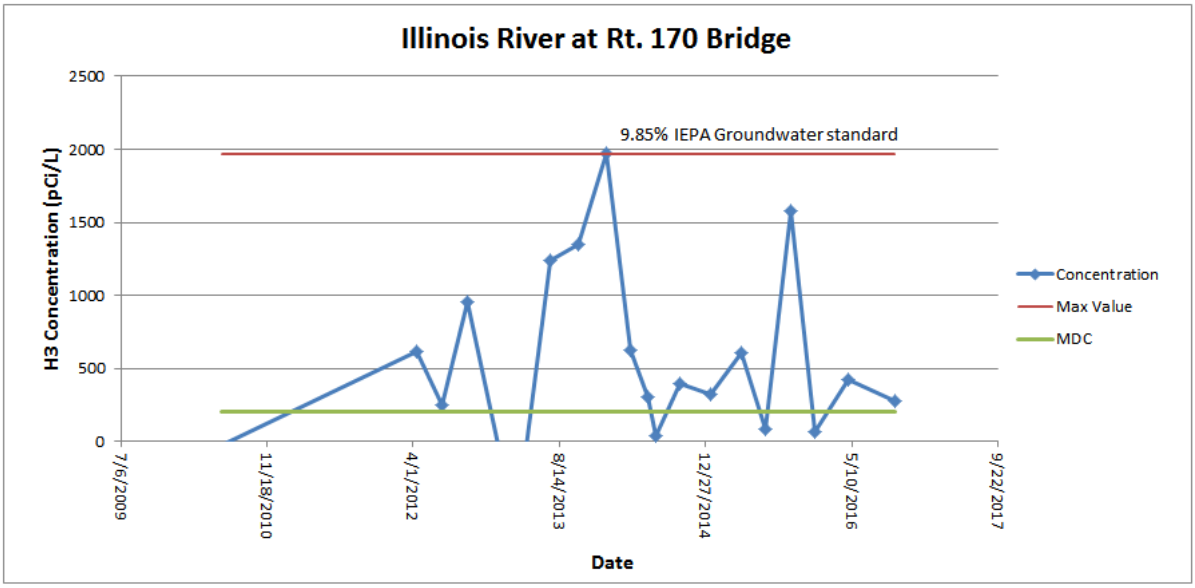
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Exposure column based on averages of all available data.

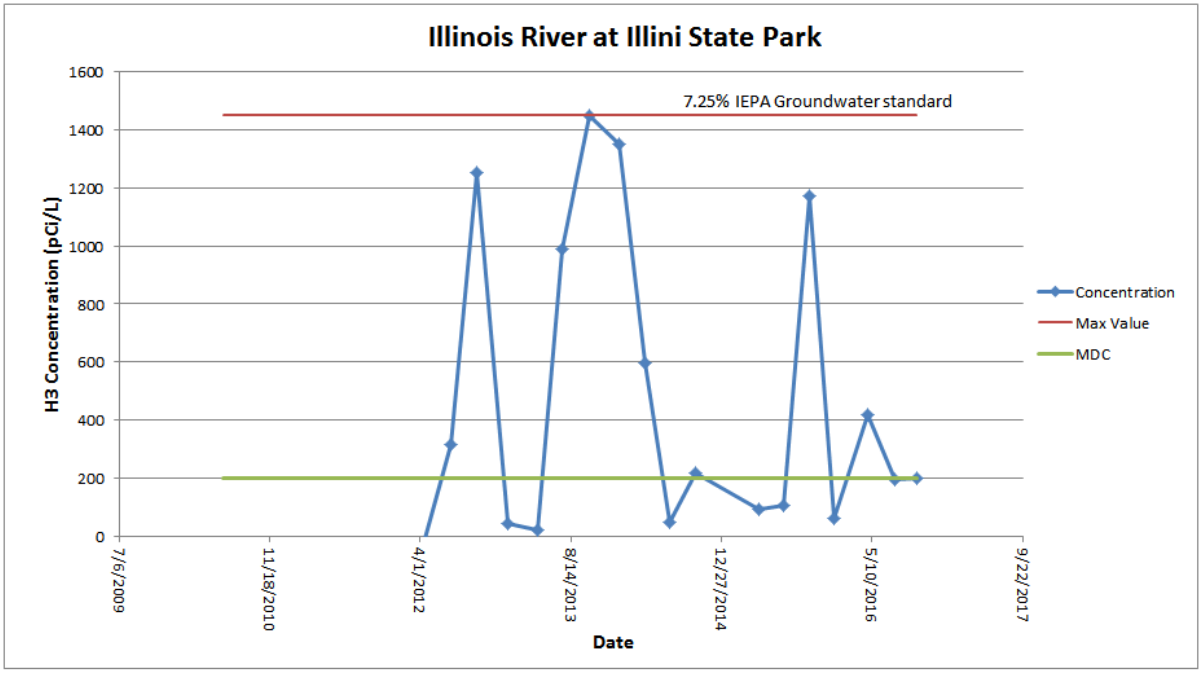
Appendix E
LaSalle Sample Results

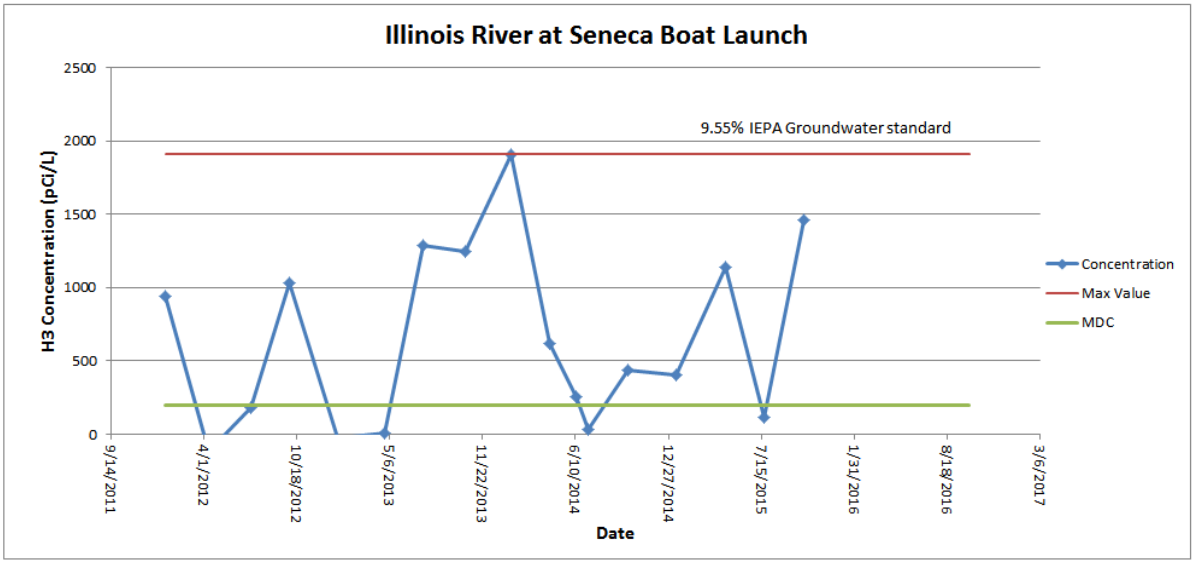
Table E-1. Tritium in Water Sample Results for LaSalle Area
Results are in picocuries per liter (pCi/L)

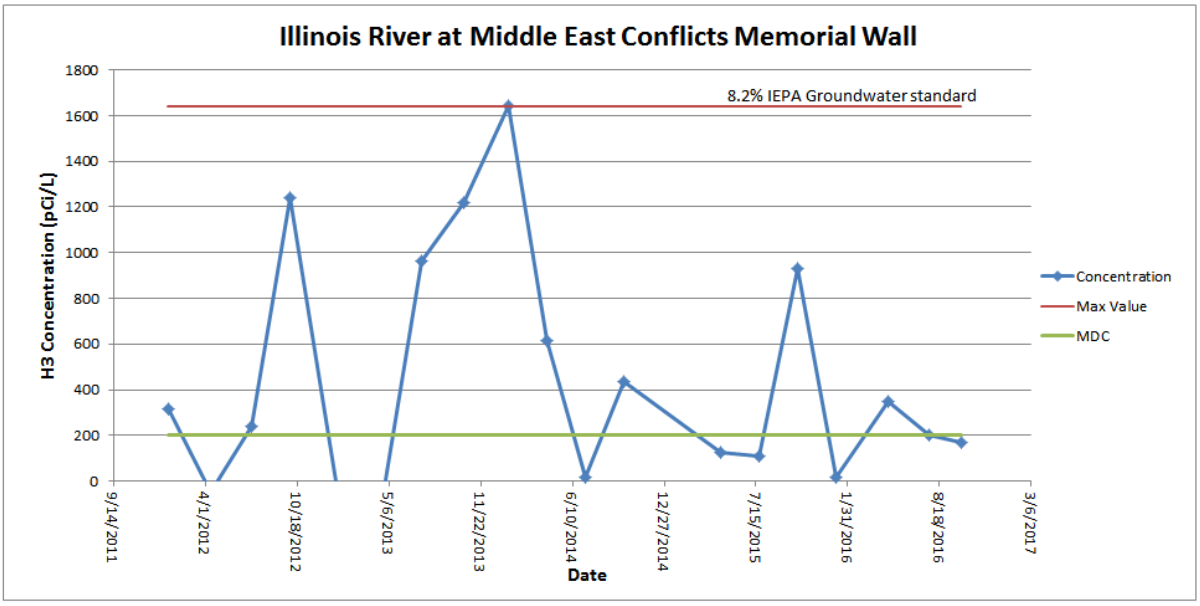
Location	H-3	
Date	Result	MDC
Illinois River at Allen Park, South Ottawa		
1/6/2016	<MDC	200.0
4/27/2016	411.0	200.0
7/27/2016	<MDC	200.0
10/4/2016	<MDC	200.0
Hog Run Creek near LS-49		
4/27/2016	<MDC	200.0
7/27/2016	<MDC	200.0
10/4/2016	<MDC	200.0
Illinois River at Illini State Park		
1/6/2016	<MDC	200.0
4/27/2016	418.0	200.0
7/27/2016	<MDC	200.0
10/4/2016	<MDC	200.0
Illinois River near Route 170 Bridge		
1/6/2016	<MDC	200.0
4/27/2016	424.0	200.0
10/4/2016	276.0	200.0
Illinois River at Middle East Conflicts Wall Memorial, Marseilles		
1/6/2016	<MDC	200.0
4/27/2016	350.0	200.0
7/27/2016	<MDC	200.0
10/4/2016	<MDC	200.0
Seneca, Illinois Boat Launch		
1/6/2016	<MDC	200.0
4/27/2016	395.0	200.0
7/27/2016	294.0	200.0
10/4/2016	<MDC	200.0
Illinois River at Starved Rock State Park		
7/27/2016	217.0	200.0
10/4/2016	1120.0	200.0
Waupecan Creek near LS-5		
4/27/2016	<MDC	200.0
7/27/2016	<MDC	200.0
10/4/2016	<MDC	200.0
Wolf Creek near LS-18		
4/27/2016	<MDC	200.0
7/27/2016	<MDC	200.0
10/4/2016	<MDC	200.0

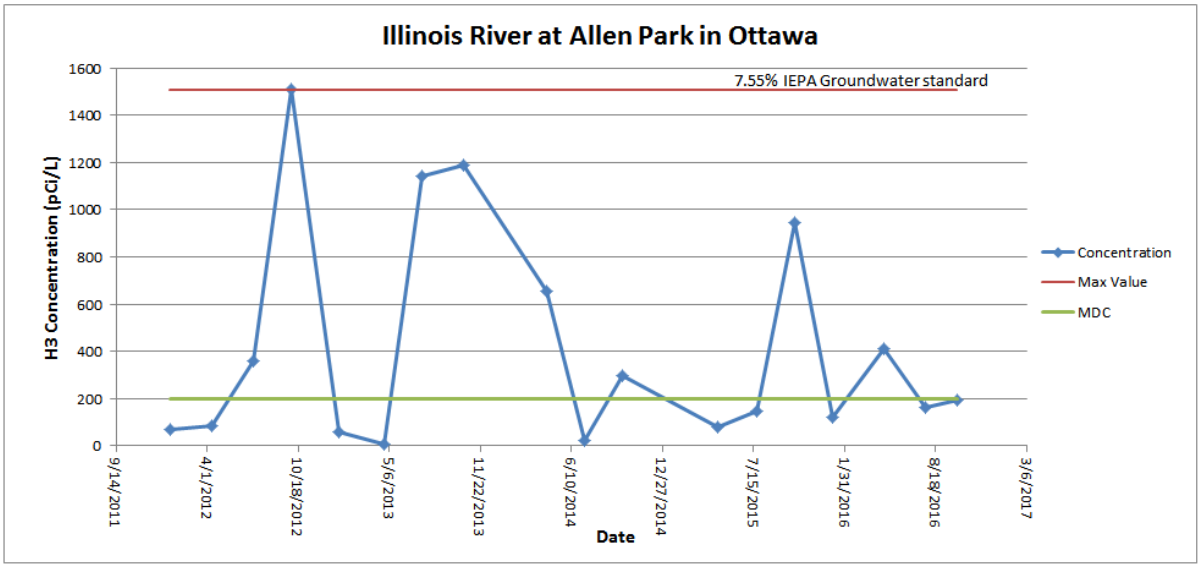
Tables E-2. Trending Graphs for Water from the LaSalle Area
(Max value compared to IEPA Class I groundwater standard of 20,000 pCi/L)

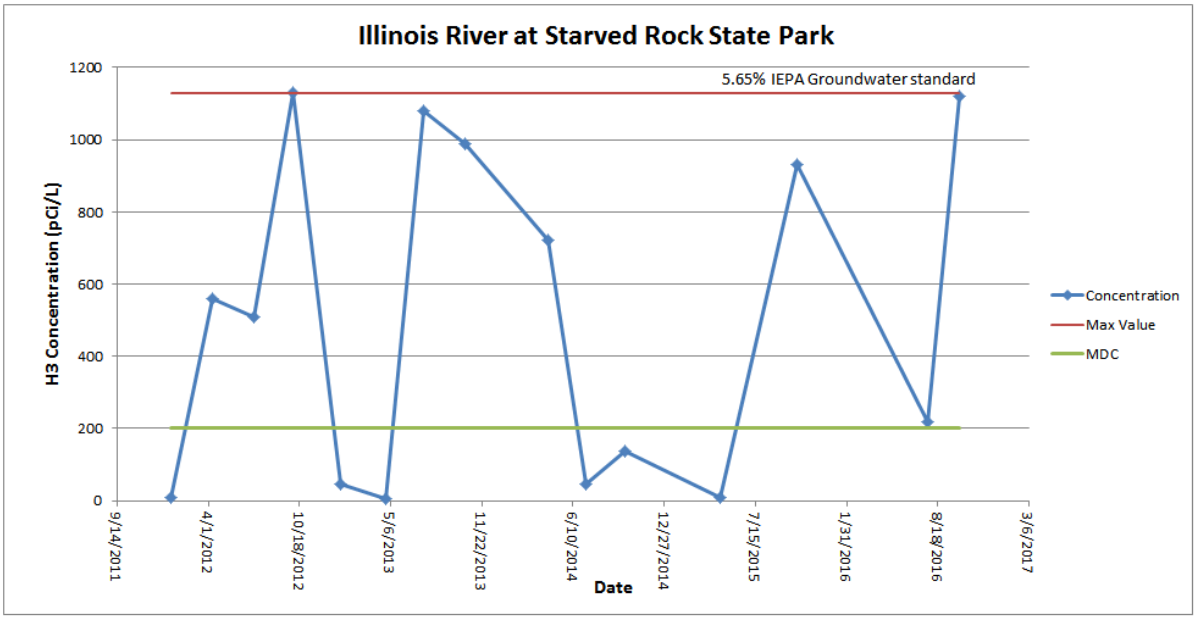


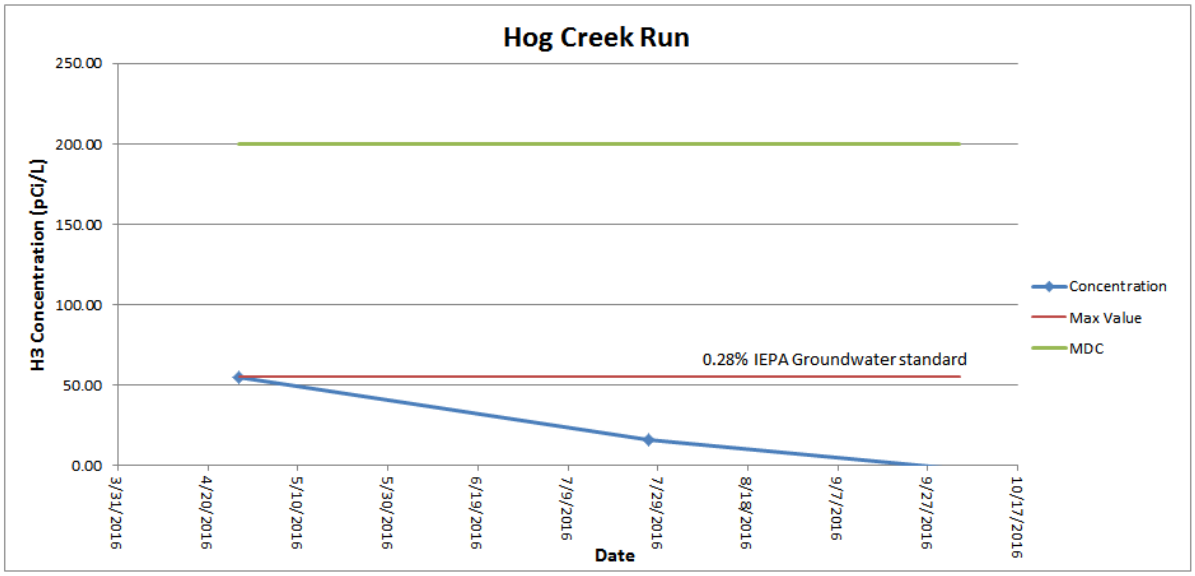


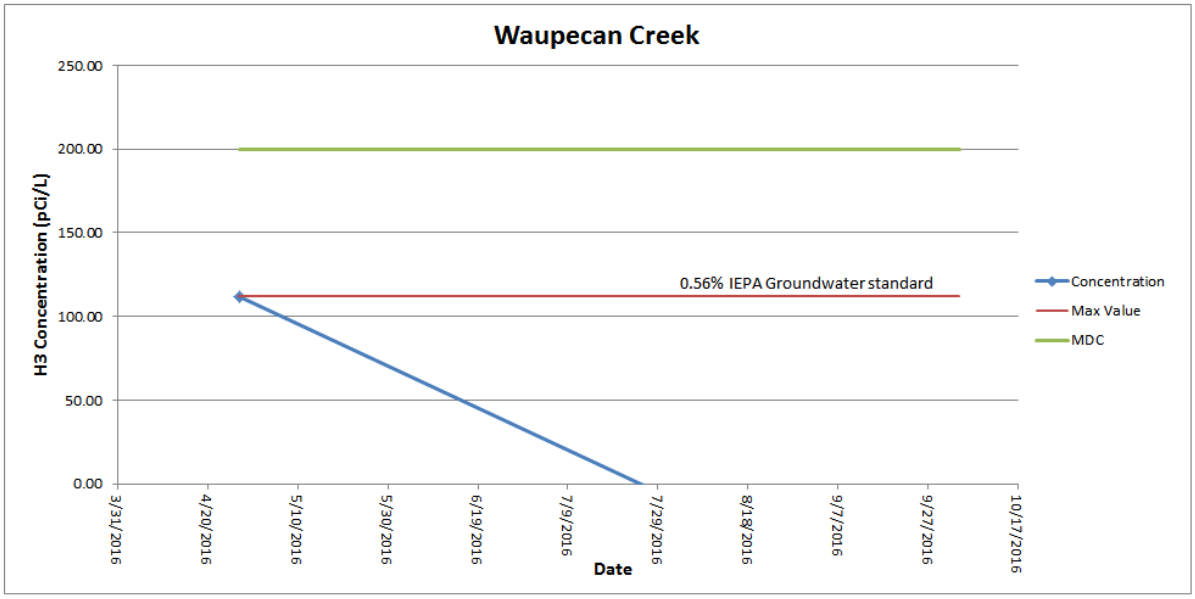

Illinois River at Seneca Boat Launch
9.55% IEPA Groundwater standard
H3 Concentration (pCi/L)
2500
2000
1500
1000
500
0
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC


Illinois River at Middle East Conflicts Memorial Wall
8.2% IEPA Groundwater standard
H3 Concentration (pCi/L)
1800
1600
1400
1200
1000
800
600
400
200
0
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC


Illinois River at Allen Park in Ottawa
7.55% IEPA Groundwater standard
H3 Concentration (pCi/L)
1600
1400
1200
1000
800
600
400
200
0
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC


Illinois River at Starved Rock State Park
5.65% IEPA Groundwater standard
H3 Concentration (pCi/L)
1200
1000
800
600
400
200
0
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC


Hog Creek Run
250.00
200.00
150.00
100.00
50.00
0.00
H3 Concentration (pCi/L)
0.28% IEPA Groundwater standard
Concentration
Max Value
MDC
3/31/2016
4/20/2016
5/10/2016
5/30/2016
6/19/2016
7/9/2016
7/29/2016
8/18/2016
9/7/2016
9/27/2016
10/17/2016
Date


Waupecan Creek
250.00
200.00
150.00
100.00
50.00
0.00
H3 Concentration (pCi/L)
0.56% IEPA Groundwater standard
Concentration
Max Value
MDC
3/31/2016
4/20/2016
5/10/2016
5/30/2016
6/19/2016
7/9/2016
7/29/2016
8/18/2016
9/7/2016
9/27/2016
10/17/2016
Date

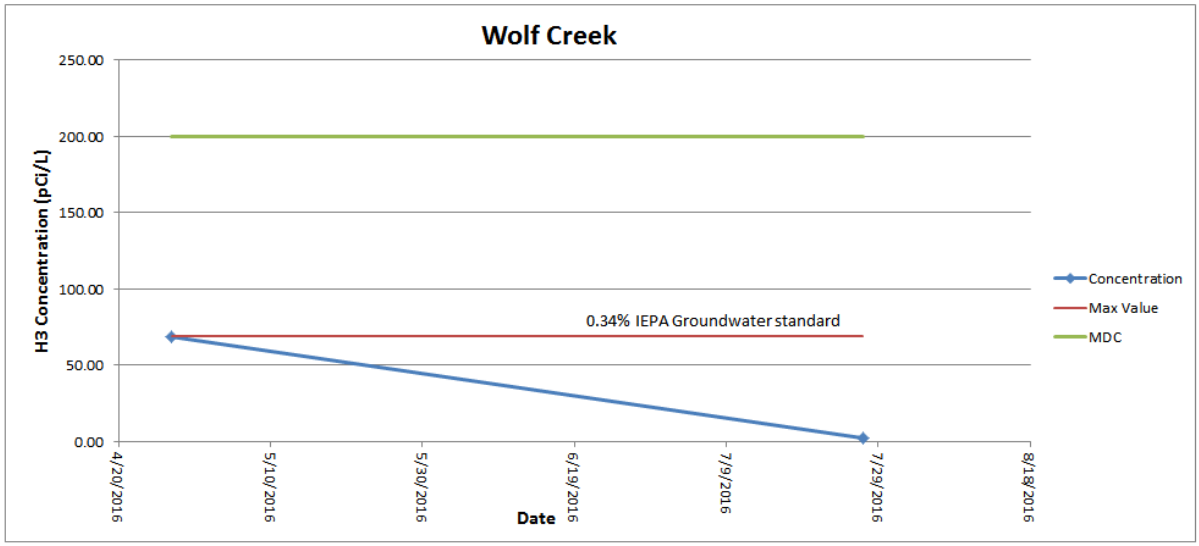

Wolf Creek
250.00
200.00
150.00
100.00
50.00
0.00
H3 Concentration (pCi/L)
0.34% IEPA Groundwater standard
4/20/2016
5/10/2016
5/30/2016
6/19/2016
7/9/2016
7/29/2016
8/18/2016
Date
Concentration
Max Value
MDC

Table E-3. Sample Results for Alpha/Beta Screening of Water from the LaSalle Area
Results are in picocuries per liter (pCi/L)

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Illinois River at Allen Park, South Ottawa				
1/6/2016	<MDC	2.2	<MDC	4.2
4/27/2016	<MDC	2.2	<MDC	4.2
7/27/2016	<MDC	2.2	<MDC	4.2
10/4/2016	<MDC	2.2	<MDC	4.2
Hog Run Creek near LS-49				
4/27/2016	<MDC	2.2	<MDC	4.2
7/27/2016	<MDC	2.2	<MDC	4.2
10/4/2016	<MDC	2.2	<MDC	4.2
Illinois River at Illini State Park				
1/6/2016	2.2	2.2	4.7	4.2
4/27/2016	<MDC	2.2	5.6	4.2
7/27/2016	<MDC	2.2	<MDC	4.2
10/4/2016	<MDC	2.2	4.9	4.2
Illinois River near Route 170 Bridge				
1/6/2016	<MDC	2.2	<MDC	4.2
4/27/2016	<MDC	2.2	5.4	4.2
10/4/2016	<MDC	2.2	<MDC	4.2
Illinois River at Middle East Conflicts Wall Memorial, Marseilles				
1/6/2016	<MDC	2.2	4.8	4.2
4/27/2016	<MDC	2.2	<MDC	4.2
7/27/2016	<MDC	2.2	<MDC	4.2
10/4/2016	<MDC	2.2	<MDC	4.2
Seneca, Illinois Boat Launch				
1/6/2016	<MDC	2.2	<MDC	4.2
4/27/2016	<MDC	2.2	4.9	4.2
7/27/2016	<MDC	2.2	<MDC	4.2
10/4/2016	<MDC	2.2	<MDC	4.2
Illinois River at Starved Rock State Park				
7/27/2016	<MDC	2.2	<MDC	4.2
10/4/2016	<MDC	2.2	<MDC	4.2
Waupecan Creek near LS-5				
4/27/2016	2.2	2.2	<MDC	4.2
7/27/2016	<MDC	2.2	<MDC	4.2
10/4/2016	<MDC	2.2	<MDC	4.2
Wolf Creek near LS-18				
4/27/2016	<MDC	2.2	<MDC	4.2
7/27/2016	<MDC	2.2	<MDC	4.2
10/4/2016	<MDC	2.2	<MDC	4.2

Table E-4. Gamma Spectroscopy Sample Results for Other Radionuclides in Water from the LaSalle Area
Results are in picocuries per liter (pCi/L)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Illinois River at Allen Park, South Ottawa																						
1/6/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
4/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
7/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
10/4/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
Hog Run Creek near LS-49																						
4/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
7/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
10/4/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
Illinois River at Illini State Park																						
1/6/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
4/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
7/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
10/4/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
Illinois River near Route 170 Bridge																						
1/6/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
4/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
10/4/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
Illinois River at Middle East Conflicts Wall Memorial, Marseilles																						
1/6/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
4/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
7/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
10/4/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
Seneca, Illinois Boat Launch																						
1/6/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
4/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
7/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
10/4/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
Illinois River at Starved Rock State Park																						
7/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
10/4/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
Waupecan Creek near LS-5																						
4/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
7/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
10/4/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
Wolf Creek near LS-18																						
4/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
7/27/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8
10/4/2016	<MDC	168	<MDC	5.3	<MDC	4.7	<MDC	4.4	<MDC	3.9	<MDC	13.6	<MDC	236	<MDC	3.9	<MDC	8.7	<MDC	8.6	<MDC	9.8

Table E-5. Total Strontium Results for Water Samples Collected in the LaSalle Area
Results are in picocuries per liter (pCi/L)

Location	Date	Nuclide	Result	MDC
Illinois River at Illini State Park	4/27/2016	Strontium	0.6	1.3
Illinois River near Route 170 Bridge	4/27/2016	Strontium	0.5	1.3

Table E-6. Soil Sample Results for LaSalle Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Illini State Park																				
4/27/2016	<MDC	0.58	<MDC	0.04	<MDC	0.04	<MDC	0.03	0.23	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.06	<MDC	0.08	<MDC	0.09
7/27/2016	<MDC	0.58	<MDC	0.04	<MDC	0.04	<MDC	0.03	0.12	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.06	<MDC	0.08	<MDC	0.09
Lot off of Kinsman Road																				
4/27/2016	<MDC	0.58	<MDC	0.04	<MDC	0.04	<MDC	0.03	0.18	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.06	<MDC	0.08	<MDC	0.09
7/27/2016	<MDC	0.58	<MDC	0.04	<MDC	0.04	<MDC	0.03	0.14	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.06	<MDC	0.08	<MDC	0.09
Wolf Creek near LS-18																				
4/27/2016	<MDC	0.58	<MDC	0.04	<MDC	0.04	<MDC	0.03	0.15	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.06	<MDC	0.08	<MDC	0.09
7/27/2016	<MDC	0.58	<MDC	0.04	<MDC	0.04	<MDC	0.03	0.11	0.04	<MDC	0.11	<MDC	0.03	<MDC	0.06	<MDC	0.08	<MDC	0.09

Table E-7. Sediment Sample Results for LaSalle Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Allen Park, South Ottawa																				
4/27/2016	<MDC	0.69	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.07	<MDC	0.02	<MDC	0.04	<MDC	0.05	<MDC	0.06
7/27/2016	<MDC	0.69	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.07	<MDC	0.02	<MDC	0.04	<MDC	0.05	<MDC	0.06
Middle East Conflicts Wall Memorial, Marseilles																				
4/27/2016	<MDC	0.69	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.07	<MDC	0.02	<MDC	0.04	<MDC	0.05	<MDC	0.06
Seneca, Illinois Boat Launch																				
4/27/2016	<MDC	0.69	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.07	<MDC	0.02	<MDC	0.04	<MDC	0.05	<MDC	0.06
7/27/2016	<MDC	0.69	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.07	<MDC	0.02	<MDC	0.04	<MDC	0.05	<MDC	0.06
Waupecan Creek near LS-5																				
4/27/2016	<MDC	0.69	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.02	<MDC	0.07	<MDC	0.02	<MDC	0.04	<MDC	0.05	<MDC	0.06

Table E-8. Vegetation Sample Results for LaSalle Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Hog Run Creek near LS-49																						
4/27/2016	<MDC	2.6	<MDC	0.2	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.4	<MDC	2.0	<MDC	0.1	<MDC	0.2	<MDC	0.3	<MDC	0.3
7/27/2016	<MDC	2.6	<MDC	0.2	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.4	<MDC	2.0	<MDC	0.1	<MDC	0.2	<MDC	0.3	<MDC	0.3
Illini State Park																						
4/27/2016	<MDC	2.6	<MDC	0.2	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.4	<MDC	2.0	<MDC	0.1	<MDC	0.2	<MDC	0.3	<MDC	0.3
7/27/2016	<MDC	2.6	<MDC	0.2	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.4	<MDC	2.0	<MDC	0.1	<MDC	0.2	<MDC	0.3	<MDC	0.3
Lot off of Kinsman Road																						
4/27/2016	<MDC	2.6	<MDC	0.2	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.4	<MDC	2.0	<MDC	0.1	<MDC	0.2	<MDC	0.3	<MDC	0.3
7/27/2016	<MDC	2.6	<MDC	0.2	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.4	<MDC	2.0	<MDC	0.1	<MDC	0.2	<MDC	0.3	<MDC	0.3
Wolf Creek near LS-18																						
4/27/2016	<MDC	2.6	<MDC	0.2	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.4	<MDC	2.0	<MDC	0.1	<MDC	0.2	<MDC	0.3	<MDC	0.3
7/27/2016	<MDC	2.6	<MDC	0.2	<MDC	0.1	<MDC	0.1	<MDC	0.1	<MDC	0.4	<MDC	2.0	<MDC	0.1	<MDC	0.2	<MDC	0.3	<MDC	0.3

Table E-9. Gamma Detection Network Results for LaSalle

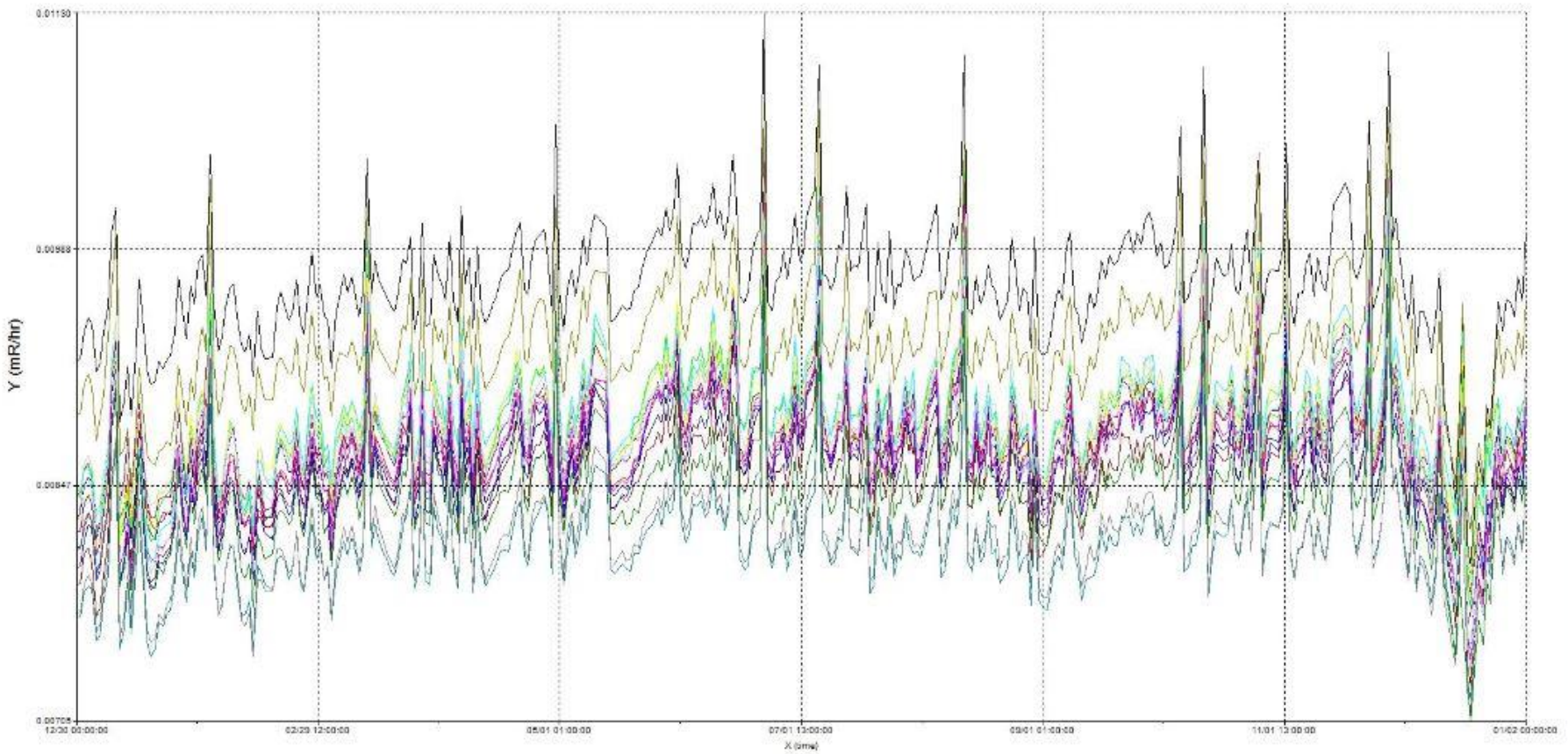


Table E-10. Summary of Ambient Gamma Results for LaSalle Area

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
LS001	0.10	0.11	0.10	0.10	37.78
LS002	0.09	0.12	0.10	0.10	37.32
LS003	0.10	0.11	0.11	0.10	37.78
LS004	0.11	0.11	0.11	0.13	41.70
LS005	0.10	0.11	0.11	0.10	37.41
LS007	0.11		0.12	0.10	39.91
LS009	0.09	0.09	0.09	0.11	34.04
LS011	0.10	0.11	0.12	0.10	38.42
LS012	0.09	0.08	0.10	0.08	30.93
LS014	0.09	0.11	0.11	0.08	36.32
LS015		0.13	0.12	0.11	43.07
LS016	0.08		0.09	0.08	30.54
LS017	0.11	0.15	0.12	0.11	44.99
LS018	0.11	0.12	0.12	0.11	41.15
LS019	0.09	0.12	0.11	0.10	38.05
LS021	0.07	0.09	0.10	0.09	32.58
LS023	0.10		0.12	0.10	39.30
LS024	0.11		0.13	0.10	41.49
LS025	0.11	0.10	0.12	0.09	38.51
LS027	0.08	0.10	0.08		31.27
LS030	0.09	0.12	0.12	0.10	39.42
LS031	0.08	0.08	0.07	0.09	28.65
LS034	0.07	0.09	0.07	0.06	27.19
LS036	0.10	0.13	0.13	0.12	43.34
LS037	0.11	0.11	0.12	0.10	39.79
LS038	0.10	0.12	0.11	0.11	40.06
LS039	0.08	0.09	0.09		31.27
LS040	0.09	0.10	0.11	0.09	34.58
LS041	0.09	0.13	0.11	0.12	39.88
LS042	0.10	0.14	0.12	0.13	44.99
LS043	0.11	0.12	0.11	0.12	40.88
LS046		0.14	0.12	0.11	44.53
LS047	0.10	0.12	0.10	0.10	39.15
LS048	0.09	0.10	0.12	0.10	37.23
LS049	0.10		0.10	0.12	39.42
LS050	0.09	0.09		0.09	32.97
LS051	0.11		0.10	0.13	40.64
LS052		0.10	0.11	0.11	38.08
LS053	0.10	0.12	0.10	0.10	37.96
LS054	0.09	0.10	0.09	0.08	33.12
LS055	0.11	0.14	0.10	0.10	42.16
LS056	0.08	0.10	0.09	0.09	32.03
LS057	0.09	0.11	0.11	0.13	39.69

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
LS-RSA	0.09	0.11	0.10	0.09	36.41
LS-RSB	0.09	0.12	0.12	0.11	39.15
LS-RSC	0.10	0.14	0.12	0.11	41.79
LS-RSD	0.10	0.10	0.11	0.10	38.51
LS-RSE	0.09	0.10	0.11	0.10	36.04
LS-RSF	0.10	0.13	0.12	0.11	41.34
LS-RSG	0.09	0.10	0.10	0.10	35.13
LS-RSH	0.10	0.11	0.10	0.11	38.05
LS-RSJ	0.08	0.11	0.11	0.11	37.60
LS-RSK	0.11	0.13	0.12	0.10	41.70
LS-RSL	0.09	0.10	0.13	0.10	37.96
LS-RSM	0.12	0.14	0.13	0.14	48.36
LS-RSN	0.11	0.10	0.09	0.11	37.69
LS-RSP	0.11	0.11	0.14	0.11	42.43
LS-RSQ	0.10	0.10	0.11	0.10	36.77
LS-RSR	0.10	0.12	0.12	0.11	40.61

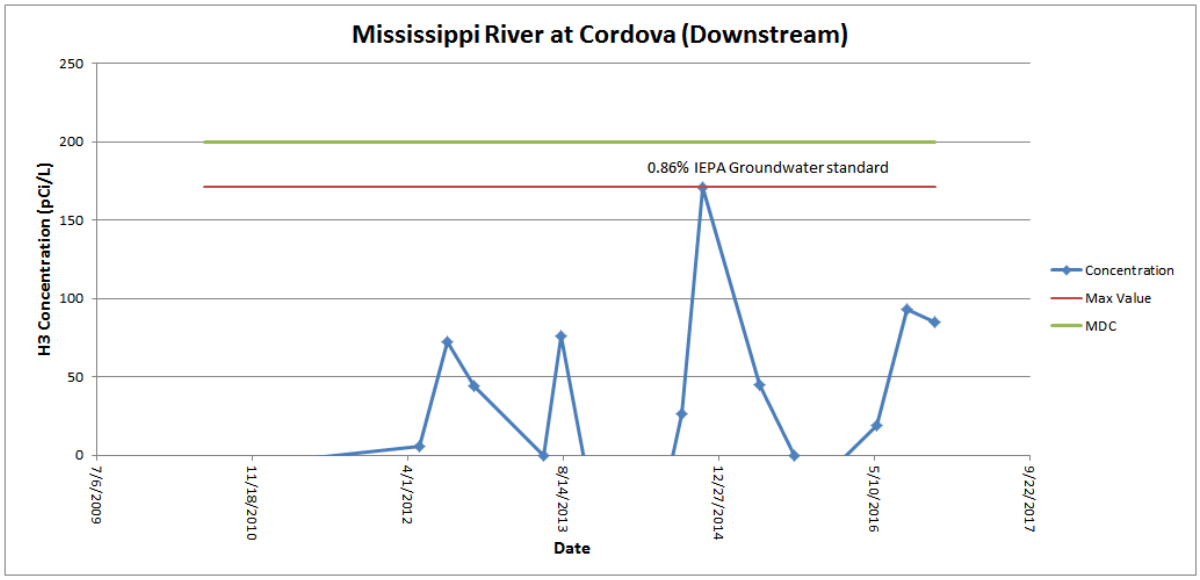
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Exposure column based on averages of all available data.

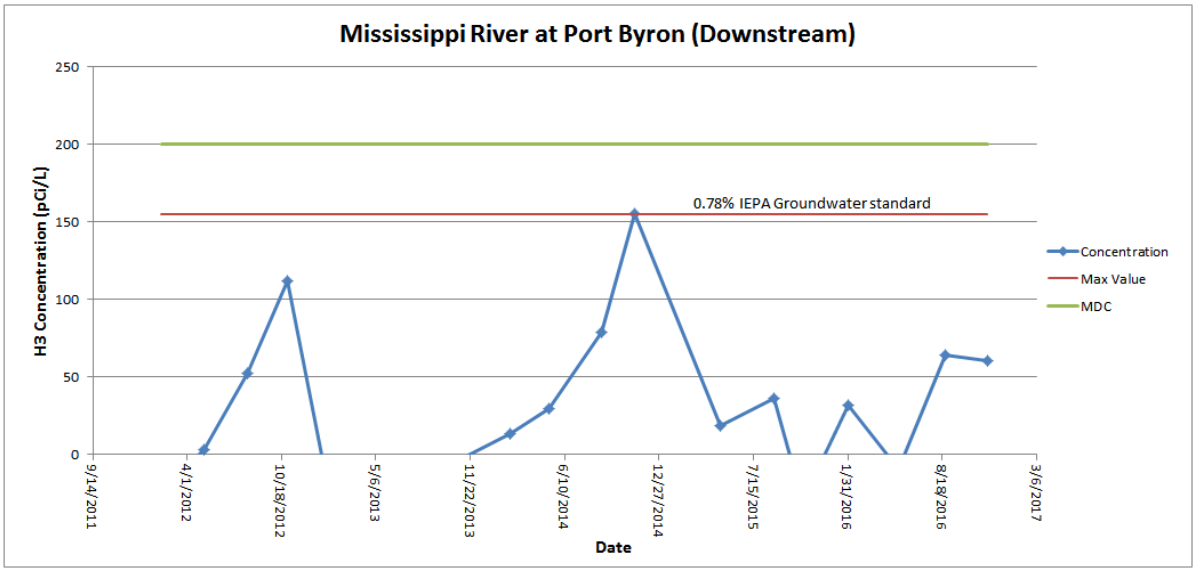
Appendix F
Quad Cities Sample Results

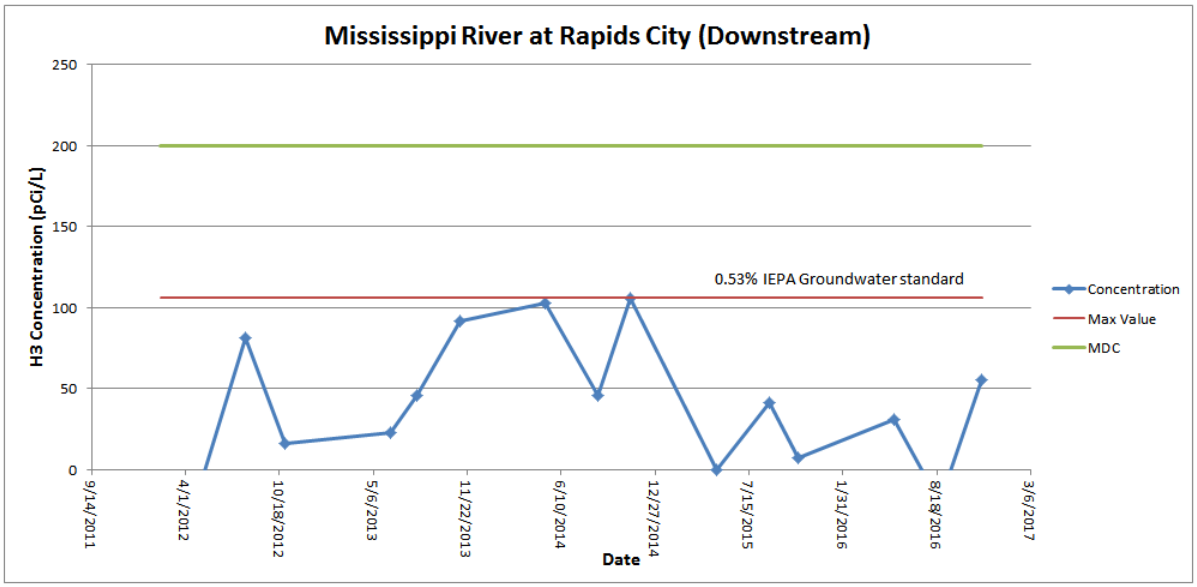
Table F-1. Tritium in Water Sample Results for Quad Cities Area
Results are in picocuries per liter (pCi/L)

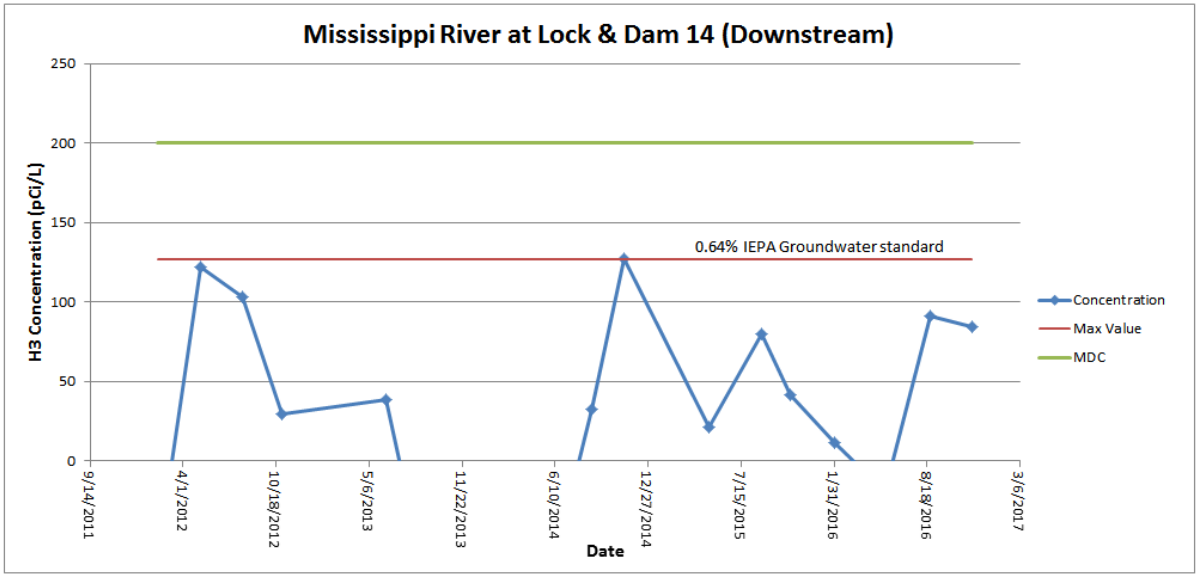
Location	H-3	
Date	Result	MDC
Mississippi River at Albany		
5/18/2016	<MDC	200
8/24/2016	<MDC	200
11/22/2016	<MDC	200
Mississippi River at Cordova		
5/18/2016	<MDC	200
8/24/2016	<MDC	200
11/22/2016	<MDC	200
Mississippi River at Lock & Dam 14		
2/1/2016	<MDC	200
5/18/2016	<MDC	200
8/24/2016	<MDC	200
11/22/2016	<MDC	200
Mississippi River at Port Byron		
2/1/2016	<MDC	200
5/18/2016	<MDC	200
8/24/2016	<MDC	200
11/22/2016	<MDC	200
Mississippi River at Rapid City		
5/18/2016	<MDC	200
8/24/2016	<MDC	200
11/22/2016	<MDC	200

Tables F-2. Trending Graphs for Water from the Quad Cities Area
(Max value compared to IEPA Class I groundwater standard of 20,000 pCi/L)






Mississippi River at Rapids City (Downstream)
H3 Concentration (pCi/L)
250
200
150
100
50
0
0.53% IEPA Groundwater standard
Concentration
Max Value
MDC
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date


Mississippi River at Lock & Dam 14 (Downstream)
H3 Concentration (pCi/L)
250
200
150
100
50
0
0.64% IEPA Groundwater standard
Concentration
Max Value
MDC
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date

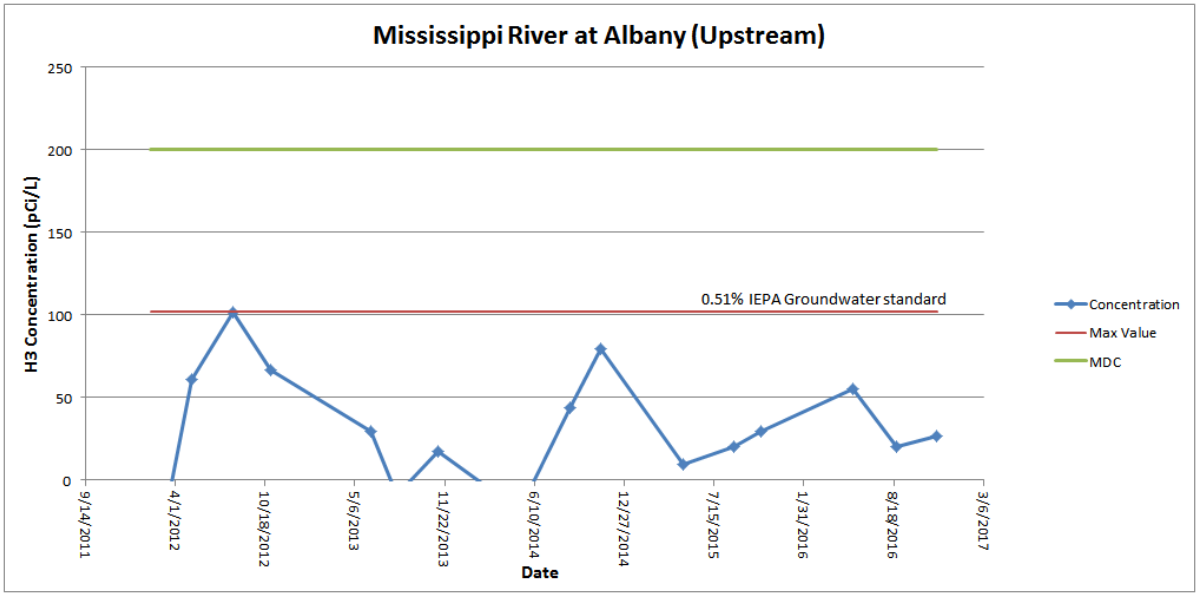

Mississippi River at Albany (Upstream)
250
200
150
100
50
0
H3 Concentration (pCi/L)
0.51% IEPA Groundwater standard
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC

Table F-3. Sample Results for Alpha/Beta Screening of Water from the Quad Cities Area
Results are in picocuries per liter (pCi/L)

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Mississippi River at Albany				
5/18/2016	<MDC	2.2	4.2	4.1
8/24/2016	<MDC	2.2	<MDC	4.1
11/22/2016	<MDC	2.2	<MDC	4.1
Mississippi River at Cordova				
5/18/2016	<MDC	2.2	<MDC	4.1
8/24/2016	<MDC	2.2	<MDC	4.1
11/22/2016	<MDC	2.2	<MDC	4.1
Mississippi River at Lock & Dam 14				
2/1/2016	<MDC	2.2	<MDC	4.1
5/18/2016	<MDC	2.2	<MDC	4.1
8/24/2016	<MDC	2.2	<MDC	4.1
11/22/2016	2.6	2.2	5.3	4.1
Mississippi River at Port Byron				
2/1/2016	<MDC	2.2	<MDC	4.1
5/18/2016	<MDC	2.2	<MDC	4.1
8/24/2016	<MDC	2.2	<MDC	4.1
11/22/2016	<MDC	2.2	<MDC	4.1
Mississippi River at Rapid City				
5/18/2016	<MDC	2.2	<MDC	4.1
8/24/2016	<MDC	2.2	<MDC	4.1
11/22/2016	<MDC	2.2	4.2	4.1

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Table F-4. Gamma Spectroscopy Sample Results for Other Radionuclides in Water from the Quad Cities Area
Results are in picocuries per liter (pCi/L)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Mississippi River at Albany																						
5/18/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
8/24/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
11/22/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
Mississippi River at Cordova																						
5/18/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
8/24/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
11/22/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
Mississippi River at Lock & Dam 14																						
2/1/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
5/18/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
8/24/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
11/22/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
Mississippi River at Port Byron																						
2/1/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
5/18/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
8/24/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
11/22/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
Mississippi Riverat Rapid City																						
5/18/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
8/24/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4
11/22/2016	<MDC	171.0	<MDC	5.5	<MDC	4.4	<MDC	4.4	<MDC	4.0	<MDC	17.1	<MDC	254.0	<MDC	4.1	<MDC	8.6	<MDC	9.5	<MDC	10.4

Table F-5. Total Strontium Results for Water Samples Collected in the Quad Cities Area
Results in picocuries per liter (pCi/L)

Location	Date	Nuclide	Result	MDC
Mississippi River at Cordova	5/18/2016	Strontium	<MDC	1.3
Mississippi River at Rapid City	5/18/2016	Strontium	<MDC	1.3

Table F-6. Soil Sample Results for Quad Cities Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Corner of 150th and 266th																				
5/18/2016	<MDC	0.35	<MDC	0.02	<MDC	0.02	<MDC	0.02	0.14	0.03	<MDC	0.07	<MDC	0.02	<MDC	0.04	<MDC	0.05	<MDC	0.06
8/24/2016	<MDC	0.35	<MDC	0.02	<MDC	0.02	<MDC	0.02	0.20	0.03	<MDC	0.07	<MDC	0.02	<MDC	0.04	<MDC	0.05	<MDC	0.06
Near RS-C																				
5/18/2016	<MDC	0.35	<MDC	0.02	<MDC	0.02	<MDC	0.02	0.08	0.03	<MDC	0.07	<MDC	0.02	<MDC	0.04	<MDC	0.05	<MDC	0.06
8/24/2016	<MDC	0.35	<MDC	0.02	<MDC	0.02	<MDC	0.02	0.10	0.03	<MDC	0.07	<MDC	0.02	<MDC	0.04	<MDC	0.05	<MDC	0.06

Table F-7. Sediment Sample Results for Quad Cities Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Mississippi Riverat Rapid City																				
5/18/2016	<MDC	0.22	<MDC	0.02	<MDC	0.02	<MDC	0.01	<MDC	0.02	<MDC	0.05	<MDC	0.02	<MDC	0.03	<MDC	0.04	<MDC	0.05

Table F-8. Fish Sample Results for Quad Cities Area
Results are in picocuries per kilogram (pCi/kg)

Location	BA-140		Co-58		CO-60		CS-134		CS-137		FE-59		I-131		MN-54		NB-95		Zn-65		ZR-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Mississippi River (bottom feeder)																						
6/9/2016	<MDC	123	<MDC	26	<MDC	34	<MDC	32	<MDC	26.7	<MDC	65	<MDC	31.4	<MDC	28.9	<MDC	29	<MDC	68	<MDC	52
Mississippi River (top feeder)																						
6/9/2016	<MDC	123	<MDC	26	<MDC	34	<MDC	32	<MDC	26.7	<MDC	65	<MDC	31.4	<MDC	28.9	<MDC	29	<MDC	68	<MDC	52

Table F-9. Vegetation Sample Results for Quad Cities Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Corner of 150th and 266th																						
5/18/2016	<MDC	1.13	<MDC	0.07	<MDC	0.06	<MDC	0.06	<MDC	0.06	<MDC	0.18	<MDC	1.02	<MDC	0.06	<MDC	0.11	<MDC	0.14	<MDC	0.14
8/24/2016	<MDC	1.13	<MDC	0.07	<MDC	0.06	<MDC	0.06	<MDC	0.06	<MDC	0.18	<MDC	1.02	<MDC	0.06	<MDC	0.11	<MDC	0.14	<MDC	0.14
Near RS-C																						
5/18/2016	<MDC	1.13	<MDC	0.07	<MDC	0.06	<MDC	0.06	<MDC	0.06	<MDC	0.18	<MDC	1.02	<MDC	0.06	<MDC	0.11	<MDC	0.14	<MDC	0.14
8/24/2016	<MDC	1.13	<MDC	0.07	<MDC	0.06	<MDC	0.06	<MDC	0.06	<MDC	0.18	<MDC	1.02	<MDC	0.06	<MDC	0.11	<MDC	0.14	<MDC	0.14

Table F-10. Gamma Detection Network Results for Quad Cities

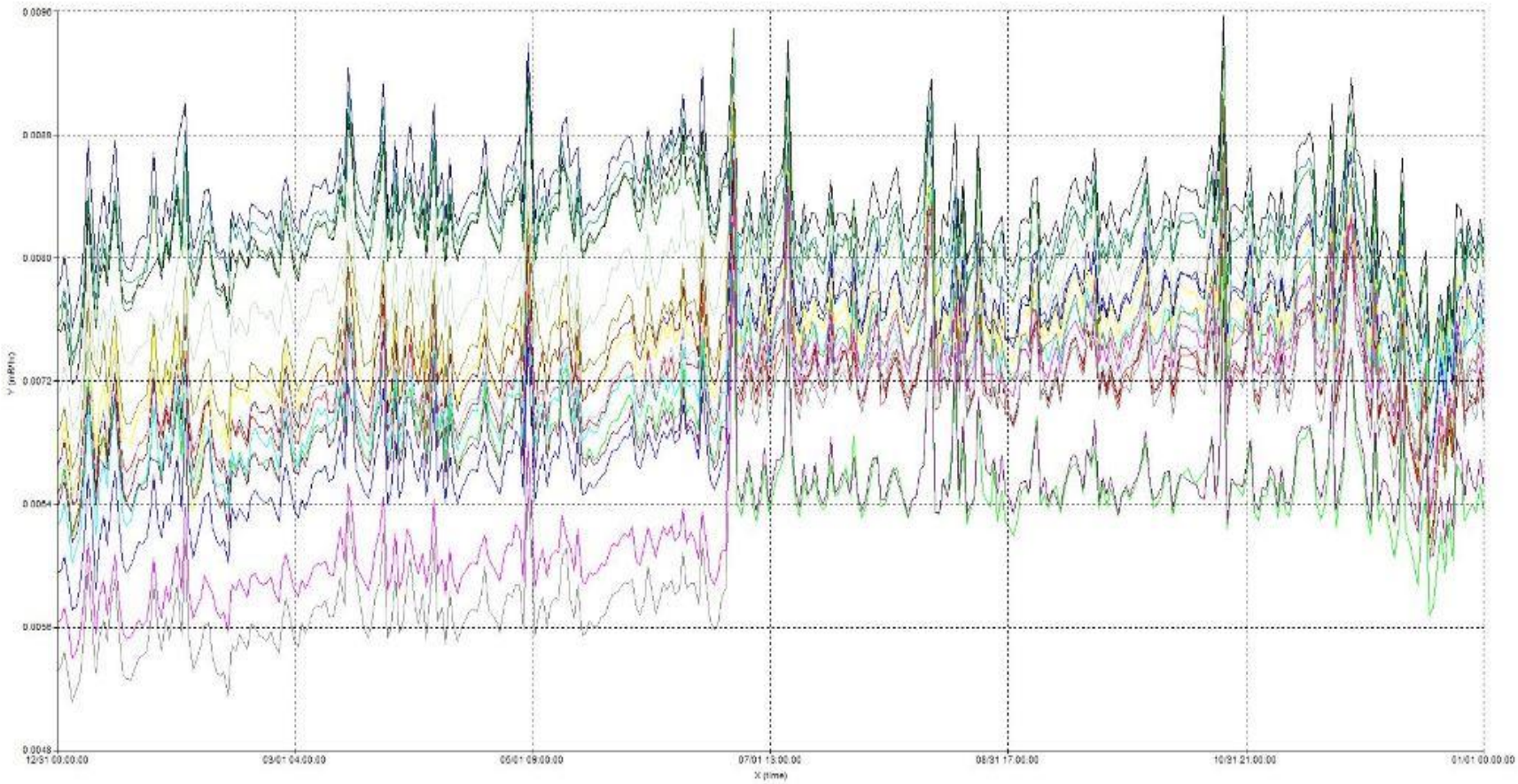


Table F-11. Summary of Ambient Gamma Results for Quad Cities Area

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
QC001	0.10	0.09	0.09	0.10	34.22
QC004	0.08	0.08	0.10	0.08	30.11
QC007	0.08	0.08	0.09	0.09	32.30
QC010	0.06	0.06	0.07	0.06	22.54
QC011	0.06	0.05	0.05	0.05	18.71
QC012	0.06	0.06	0.07	0.05	21.72
QC014	0.05	0.06	0.07	0.06	21.81
QC016	0.05	0.05	0.07	0.06	20.62
QC018	0.11	0.10	0.10	0.09	37.05
QC025	0.09	0.09	0.10	0.09	33.76
QC026			0.11	0.12	42.71
QC027	0.08	0.08	0.11	0.07	29.93
QC028	0.06	0.06	0.08	0.08	24.82
QC029	0.09	0.08	0.09	0.07	29.93
QC031	0.07	0.08	0.07	0.07	27.19
QC032	0.07	0.07	0.07	0.07	25.28
QC033	0.08	0.07	0.06	0.07	25.82
QC034	0.06	0.07	0.07	0.07	24.36
QC036	0.08	0.08	0.10	0.08	30.75
QC037	0.06	0.06	0.08	0.07	25.19
QC038	0.07	0.07	0.09	0.07	26.46
QC039	0.06	0.06	0.07	0.07	23.36
QC040	0.09	0.09	0.11	0.10	35.50
QC041	0.08	0.09	0.09	0.06	28.65
QC042	0.08	0.07	0.10	0.07	30.20
QC043	0.07	0.06	0.08	0.08	27.01
QC044	0.07	0.08	0.10	0.08	29.47
QC045	0.09	0.06	0.07	0.07	26.55
QC046		0.08	0.09	0.09	31.03
QC049	0.09	0.07	0.08	0.08	28.38
QC050	0.08	0.06	0.08	0.05	25.37
QC051	0.07	0.07	0.09	0.08	28.93
QC052	0.08	0.09	0.10	0.09	31.57
QC053	0.06	0.06	0.06	0.05	21.17
QC054	0.08	0.08	0.07	0.09	28.93
QC055	0.07	0.07	0.08	0.07	27.19
QC056	0.05	0.05	0.06	0.06	20.71
QC057	0.07	0.07	0.08	0.05	24.00
QC058	0.08	0.07	0.08	0.07	27.47
QC059	0.08	0.08	0.09	0.09	30.75
QC060	0.07	0.09	0.07	0.07	27.38
QC061	0.07	0.07	0.10	0.09	29.11
QC062	0.10	0.10	0.11	0.10	38.14
QC063	0.08	0.08	0.09	0.07	29.11
QC064	0.07	0.08	0.08	0.07	27.74

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
QC065	0.07	0.08	0.08	0.10	30.57
QC066	0.10	0.10	0.10	0.10	36.59
QC067	0.10	0.09	0.10	0.10	35.31
QC068		0.10	0.11	0.09	37.35
QC-RSA	0.07	0.09		0.09	29.44
QC-RSB	0.08	0.08	0.09	0.09	30.30
QC-RSC	0.06	0.07	0.07	0.07	24.64
QC-RSD	0.07	0.08	0.08	0.07	26.65
QC-RSE	0.07	0.09	0.09	0.11	32.94
QC-RSF	0.07	0.06	0.08	0.06	24.00
QC-RSG	0.07	0.08	0.08	0.08	28.74
QC-RSH	0.09	0.10	0.09	0.07	31.03
QC-RSJ	0.08	0.09	0.10	0.09	32.85
QC-RSK	0.07	0.08	0.09	0.07	27.92
QC-RSL	0.10	0.11	0.09	0.08	34.95
QC-RSM	0.09	0.09	0.10	0.09	33.76
QC-RSN	0.06	0.08	0.08	0.06	24.46
QC-RSP	0.08	0.11	0.10	0.08	33.58
QC-RSQ	0.07	0.10	0.11	0.10	34.68
QC-RSR	0.07	0.08	0.08	0.05	25.82

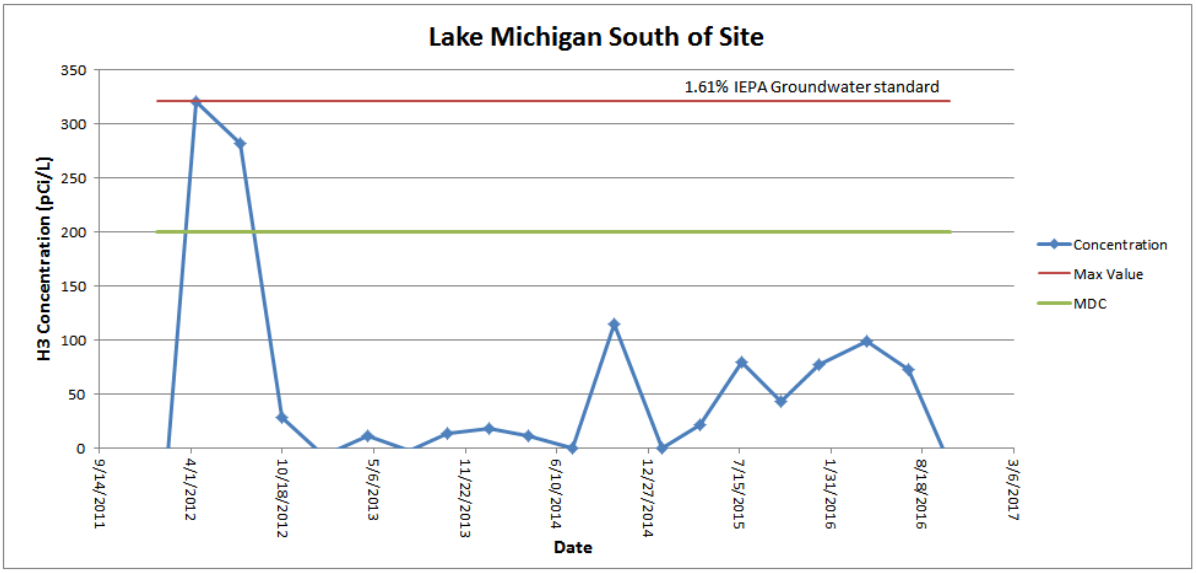
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Exposure column based on averages of all available data.

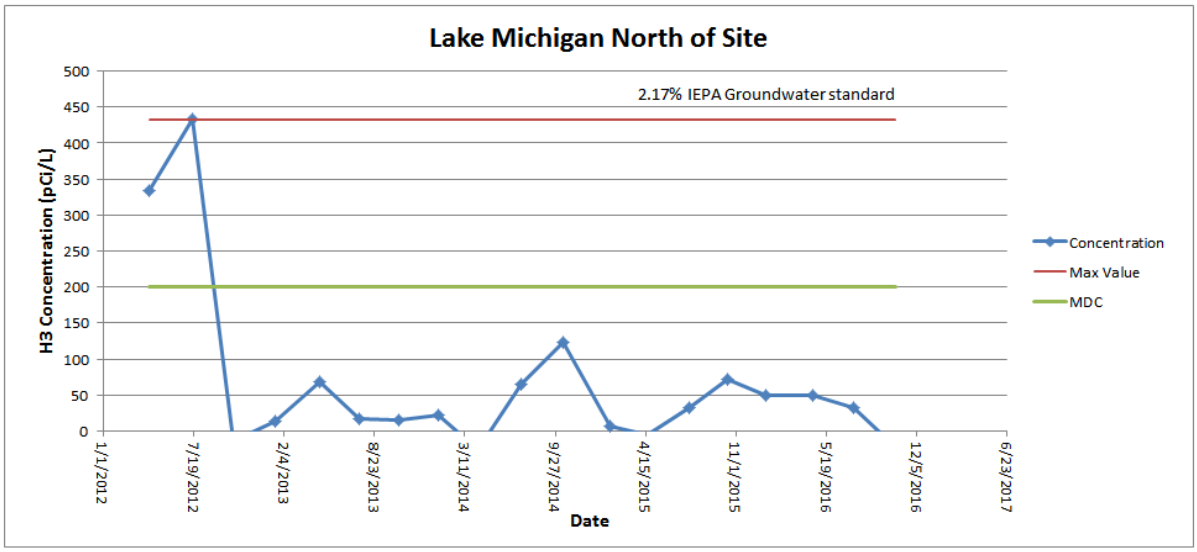
Appendix G
Zion Sample Results

Table G-1. Tritium in Water Sample Results for Zion Area
Results are in picocuries per liter (pCi/L)

Location	H-3	
Date	Result	MDC
Lake Michigan N. of site		
1/5/2016	<MDC	200
4/19/2016	<MDC	200
7/19/2016	<MDC	200
10/18/2016	<MDC	200
Lake Michigan S. of site		
1/5/2016	<MDC	200
4/19/2016	<MDC	200
7/19/2016	<MDC	200
10/18/2016	<MDC	200
Z-25 outlet to Lake Michigan		
1/5/2016	<MDC	200
4/19/2016	<MDC	200
7/19/2016	<MDC	200
10/18/2016	<MDC	200

Tables G-2. Trending Graphs for Water from the Zion Area
(Max value compared to IEPA Class I groundwater standard of 20,000 pCi/L)




Lake Michigan North of Site
2.17% IEPA Groundwater standard
H3 Concentration (pCi/L)
500
450
400
350
300
250
200
150
100
50
0
1/1/2012
7/19/2012
2/4/2013
8/23/2013
3/11/2014
9/27/2014
4/15/2015
11/1/2015
5/19/2016
12/5/2016
6/23/2017
Date
Concentration
Max Value
MDC

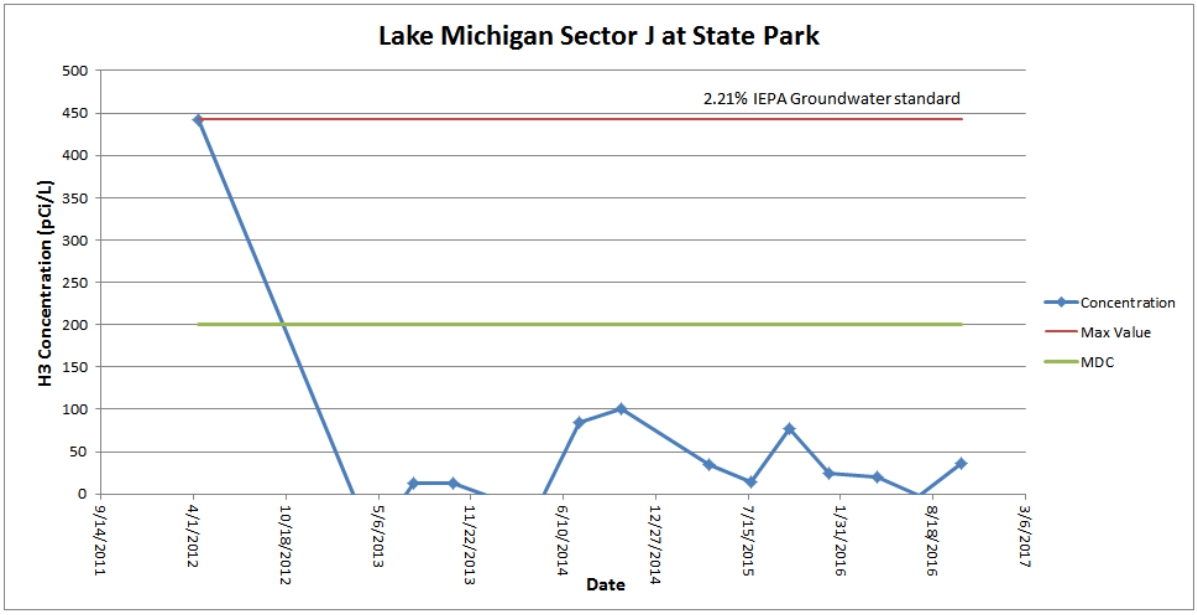

Lake Michigan Sector J at State Park
2.21% IEPA Groundwater standard
H3 Concentration (pCi/L)
500
450
400
350
300
250
200
150
100
50
0
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
1/31/2016
8/18/2016
3/6/2017
Date
Concentration
Max Value
MDC

Table G-3. Sample Results for Alpha/Beta Screening of Water from the Zion Area
Results are in picocuries per liter (pCi/L)

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Lake Michigan N. of site				
1/5/2016	<MDC	2.2	<MDC	3.9
4/19/2016	<MDC	2.2	<MDC	3.9
7/19/2016	<MDC	2.2	<MDC	3.9
10/18/2016	<MDC	2.2	<MDC	3.9
Lake Michigan S. of site				
1/5/2016	<MDC	2.2	<MDC	3.9
4/19/2016	<MDC	2.2	<MDC	3.9
7/19/2016	<MDC	2.2	<MDC	3.9
10/18/2016	<MDC	2.2	<MDC	3.9
Z-25 outlet to Lake Michigan				
1/5/2016	<MDC	2.2	<MDC	3.9
4/19/2016	<MDC	2.2	<MDC	3.9
7/19/2016	<MDC	2.2	4.0	3.9
10/18/2016	<MDC	2.2	6.7	3.9

Table G-4. Gamma Spectroscopy Sample Results for Other Radionuclides in Water from the Zion Area
Results are in picocuries per liter (pCi/L)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Lake Michigan N. of site																						
1/5/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
4/19/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
7/19/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
10/18/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
Lake Michigan S. of site																						
1/5/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
4/19/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
7/19/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
10/18/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
Z-25 outlet to Lake Michigan																						
1/5/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
4/19/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
7/19/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7
10/18/2016	<MDC	104.0	<MDC	4.9	<MDC	4.2	<MDC	4.0	<MDC	4.0	<MDC	11.9	<MDC	106.0	<MDC	4.2	<MDC	7.2	<MDC	9.3	<MDC	9.7

Table G-5. Soil Sample Results for Zion Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Near Zn-67 across road																				
4/19/2016	<MDC	0.62	<MDC	0.03	<MDC	0.03	<MDC	0.02	0.05	0.03	<MDC	0.09	<MDC	0.03	<MDC	0.06	<MDC	0.06	<MDC	0.09
7/19/2016	<MDC	0.62	<MDC	0.03	<MDC	0.03	<MDC	0.02	<MDC	0.03	<MDC	0.09	<MDC	0.03	<MDC	0.06	<MDC	0.06	<MDC	0.09
Samples Co-Located with RS-JC																				
4/19/2016	<MDC	0.62	<MDC	0.03	<MDC	0.03	<MDC	0.02	0.08	0.03	<MDC	0.09	<MDC	0.03	<MDC	0.06	<MDC	0.06	<MDC	0.09
7/19/2016	<MDC	0.62	<MDC	0.03	<MDC	0.03	<MDC	0.02	0.17	0.03	<MDC	0.09	<MDC	0.03	<MDC	0.06	<MDC	0.06	<MDC	0.09

Table G-6. Sediment Sample Results for Zion Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Lake Michigan N. of site																				
4/19/2016	<MDC	0.21	<MDC	0.02	<MDC	0.02	<MDC	0.01	<MDC	0.02	<MDC	0.05	<MDC	0.02	<MDC	0.03	<MDC	0.04	<MDC	0.05
7/19/2016	<MDC	0.21	<MDC	0.02	<MDC	0.02	<MDC	0.01	<MDC	0.02	<MDC	0.05	<MDC	0.02	<MDC	0.03	<MDC	0.04	<MDC	0.05
Lake Michigan S. of site																				
7/19/2016	<MDC	0.21	<MDC	0.02	<MDC	0.02	<MDC	0.01	<MDC	0.02	<MDC	0.05	<MDC	0.02	<MDC	0.03	<MDC	0.04	<MDC	0.05
Z-25 outlet to Lake Michigan																				
4/19/2016	<MDC	0.21	<MDC	0.02	<MDC	0.02	<MDC	0.01	0.08	0.02	<MDC	0.05	<MDC	0.02	<MDC	0.03	<MDC	0.04	<MDC	0.05
7/19/2016	<MDC	0.21	<MDC	0.02	<MDC	0.02	<MDC	0.01	0.04	0.02	<MDC	0.05	<MDC	0.02	<MDC	0.03	<MDC	0.04	<MDC	0.05

Table G-7. Vegetation Sample Results for Zion Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Near Zn-67 across road																						
4/19/2016	<MDC	1.07	<MDC	0.06	<MDC	0.05	<MDC	0.05	<MDC	0.05	<MDC	0.15	<MDC	0.92	<MDC	0.05	<MDC	0.09	<MDC	0.11	<MDC	0.11
7/19/2016	<MDC	1.07	<MDC	0.06	<MDC	0.05	<MDC	0.05	<MDC	0.05	<MDC	0.15	<MDC	0.92	<MDC	0.05	<MDC	0.09	<MDC	0.11	<MDC	0.11
Samples Co-Located with RS-JC																						
4/19/2016	<MDC	1.07	<MDC	0.06	<MDC	0.05	<MDC	0.05	<MDC	0.05	<MDC	0.15	<MDC	0.92	<MDC	0.05	<MDC	0.09	<MDC	0.11	<MDC	0.11
7/19/2016	<MDC	1.07	<MDC	0.06	<MDC	0.05	<MDC	0.05	<MDC	0.05	<MDC	0.15	<MDC	0.92	<MDC	0.05	<MDC	0.09	<MDC	0.11	<MDC	0.11

Table G-8. Alpha / Beta Screening Results for Air Samples in the Zion Area
Results are in femtocuries per cubic meter (fCi/m^3)

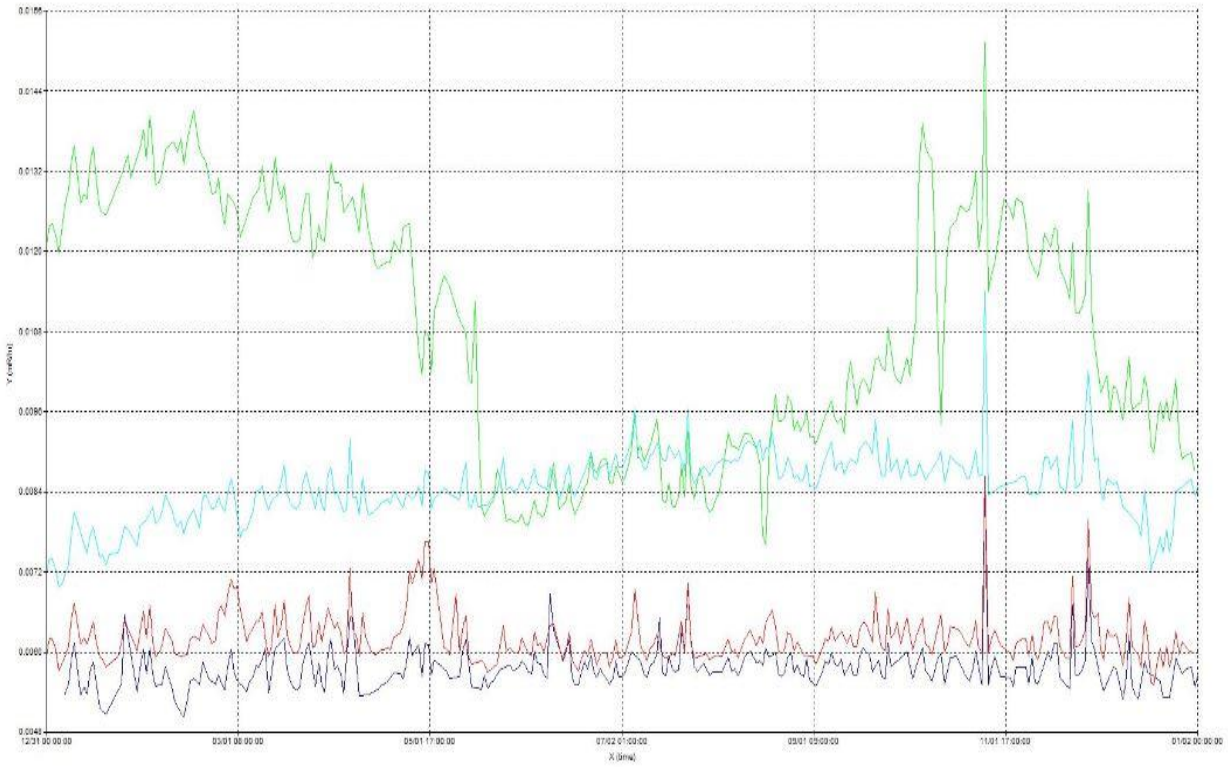
Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Air Pump co-located with RS-F				
1/5/2016	4.43	1.45	30.82	4.66
1/12/2016	<MDC	1.45	29.11	4.66
1/19/2016	3.51	1.45	37.76	4.66
1/26/2016	1.48	1.45	25.41	4.66
2/2/2016	2.36	1.45	29.47	4.66
2/9/2016	<MDC	1.45	23.5	4.66
2/16/2016	2.19	1.45	19	4.66
2/23/2016	2.01	1.45	20.57	4.66
3/1/2016	2.34	1.45	23.37	4.66
3/8/2016	1.62	1.45	20.45	4.66
3/15/2016	2.03	1.45	19.71	4.66
3/22/2016	<MDC	1.45	15.97	4.66
3/29/2016	1.69	1.45	17.6	4.66
4/5/2016	1.57	1.45	20.45	4.66
4/12/2016	1.97	1.45	19.23	4.66
4/19/2016	1.9	1.45	25.23	4.66
4/26/2016	1.87	1.45	19.71	4.66
5/3/2016	<MDC	1.45	14.13	4.66
5/10/2016	<MDC	1.45	15.88	4.66
5/16/2016	<MDC	1.45	12.77	4.66
5/24/2016	3.04	1.45	19.56	4.66
5/31/2016	3.97	1.45	21.97	4.66
6/7/2016	2.71	1.45	19.7	4.66
6/14/2016	1.87	1.45	18.1	4.66
6/21/2016	2.84	1.45	19.33	4.66
7/5/2016	1.64	1.45	16.91	4.66
7/19/2016	1.92	1.45	21.84	4.66
7/26/2016	2.09	1.45	22.68	4.66
8/2/2016	2.08	1.45	22.7	4.66
8/9/2016	<MDC	1.45	22.89	4.66
8/16/2016	1.54	1.45	29.94	4.66
8/23/2016	<MDC	1.45	25.76	4.66
8/30/2016	2.79	1.45	24.78	4.66
9/6/2016	3.42	1.45	22.71	4.66
9/12/2016	1.76	1.45	18.7	4.66
9/20/2016	1.89	1.45	31.27	4.66
9/27/2016	<MDC	1.45	29.11	4.66
10/11/2016	4.76	1.45	29.61	4.66
10/18/2016	1.48	1.45	29.56	4.66
10/25/2016	2.74	1.45	21.2	4.66
11/1/2016	2.92	1.45	22.22	4.66
11/7/2016	3.65	1.45	43.63	4.66
11/15/2016	2.58	1.45	31.04	4.66
11/21/2016	4.51	1.45	53.67	4.66
11/28/2016	2.25	1.45	37.13	4.66
12/6/2016	3.61	1.45	25.25	4.66
12/20/2016	3.72	1.45	28.27	4.66

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Air Pump co-located with RS-J				
1/5/2016	3.35	1.45	31.99	4.66
1/12/2016	<MDC	1.45	27.47	4.66
1/19/2016	2.99	1.45	36.26	4.66
1/26/2016	1.68	1.45	25.14	4.66
2/2/2016	2.28	1.45	29.8	4.66
2/9/2016	<MDC	1.45	24.19	4.66
2/16/2016	2.68	1.45	20.18	4.66
2/23/2016	1.99	1.45	18.26	4.66
3/1/2016	2.24	1.45	20.73	4.66
3/8/2016	1.83	1.45	18.6	4.66
3/15/2016	1.65	1.45	19.19	4.66
3/22/2016	<MDC	1.45	17.83	4.66
3/29/2016	2.73	1.45	17.98	4.66
4/5/2016	1.55	1.45	20.25	4.66
4/12/2016	2.05	1.45	17.63	4.66
4/19/2016	2.31	1.45	22.78	4.66
4/26/2016	<MDC	1.45	20.98	4.66
5/3/2016	1.72	1.45	19.12	4.66
5/10/2016	<MDC	1.45	15.27	4.66
5/16/2016	<MDC	1.45	12.32	4.66
5/24/2016	3.68	1.45	21.53	4.66
5/31/2016	4.18	1.45	23.84	4.66
6/7/2016	3.28	1.45	19.93	4.66
6/14/2016	2.12	1.45	15.84	4.66
6/21/2016	3.1	1.45	24.37	4.66
7/5/2016	1.98	1.45	18.58	4.66
7/19/2016	1.74	1.45	21.25	4.66
7/26/2016	1.75	1.45	27.49	4.66
8/2/2016	1.72	1.45	22.77	4.66
8/9/2016	1.45	1.45	26.8	4.66
8/16/2016	<MDC	1.45	30.86	4.66
8/23/2016	<MDC	1.45	29.18	4.66
8/30/2016	2.3	1.45	24.39	4.66
9/6/2016	4.02	1.45	22.38	4.66
9/12/2016	1.82	1.45	19.83	4.66
9/20/2016	<MDC	1.45	35.15	4.66
9/27/2016	<MDC	1.45	25.91	4.66
10/11/2016	5.49	1.45	29.38	4.66
10/18/2016	<MDC	1.45	30.24	4.66
10/25/2016	3.05	1.45	21.03	4.66
11/1/2016	2.93	1.45	21.17	4.66
11/7/2016	2.99	1.45	43.04	4.66
11/15/2016	2.15	1.45	29.82	4.66
11/21/2016	4.18	1.45	50.66	4.66
11/28/2016	2.38	1.45	29.55	4.66
12/6/2016	3.17	1.45	27.3	4.66
12/20/2016	4.13	1.45	27.66	4.66

Table G-8 (Continued). Alpha / Beta Screening Results for Air Samples in the Zion Area
Results are in femtocuries per cubic meter (fCi/m^3)

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Air Station N. of Plant entrance at RR				
1/5/2016	4.21	1.45	32.37	4.66
1/12/2016	<MDC	1.45	25.21	4.66
1/19/2016	3.48	1.45	34.53	4.66
1/26/2016	1.85	1.45	26.93	4.66
2/2/2016	2.06	1.45	30.7	4.66
2/9/2016	<MDC	1.45	23.68	4.66
2/16/2016	1.98	1.45	19.59	4.66
2/23/2016	2.69	1.45	21.96	4.66
3/1/2016	2.35	1.45	22.78	4.66
3/8/2016	3.33	1.45	18.44	4.66
3/15/2016	1.79	1.45	19.32	4.66
3/22/2016	1.55	1.45	15.81	4.66
3/29/2016	1.97	1.45	19.89	4.66
4/5/2016	2.06	1.45	23.32	4.66
4/12/2016	2.07	1.45	22.53	4.66
4/19/2016	1.97	1.45	21.13	4.66
4/26/2016	2	1.45	22.46	4.66
5/3/2016	<MDC	1.45	20.28	4.66
5/10/2016	<MDC	1.45	15.16	4.66
5/16/2016	<MDC	1.45	13.75	4.66
5/24/2016	2.81	1.45	21.85	4.66
5/31/2016	2.83	1.45	24.29	4.66
6/7/2016	2.95	1.45	21.38	4.66
6/14/2016	2.47	1.45	18.52	4.66
6/21/2016	2.04	1.45	20.87	4.66
7/5/2016	<MDC	1.45	19.62	4.66
7/19/2016	1.95	1.45	21.12	4.66
7/26/2016	2.92	1.45	28.24	4.66
8/2/2016	2.25	1.45	21.27	4.66
8/9/2016	2.01	1.45	24.04	4.66
8/16/2016	<MDC	1.45	31.77	4.66
8/23/2016	<MDC	1.45	27.15	4.66
8/30/2016	2.97	1.45	27.24	4.66
9/6/2016	3.45	1.45	24.98	4.66
9/12/2016	1.61	1.45	24.88	4.66
9/20/2016	1.57	1.45	32.54	4.66
9/27/2016	<MDC	1.45	28.35	4.66
10/11/2016	5.05	1.45	31.35	4.66
10/18/2016	1.93	1.45	32.07	4.66
10/25/2016	2.94	1.45	18.93	4.66
11/1/2016	3.25	1.45	22.07	4.66
11/7/2016	3.69	1.45	39.96	4.66
11/15/2016	1.6	1.45	30.37	4.66
11/21/2016	5.21	1.45	52.12	4.66
11/28/2016	2.36	1.45	30.83	4.66
12/6/2016	4.16	1.45	28.49	4.66
12/20/2016	3.66	1.45	31.08	4.66

Table G-9. Gamma Detection Network Results for Zion



Key for Zion GDN Stations:

- **Station A**
- **Station B**
- **Station C**
- **Station D**

Table G-10. Summary of Ambient Gamma Results for Zion Area

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
ZN039	0.06	0.07	0.08	0.07	26.10
ZN040	0.06	0.08	0.10	0.07	28.29
ZN045	0.06	0.04	0.08	0.07	22.45
ZN065	0.05	0.06	0.09	0.06	24.00
ZN066	0.08	0.09	0.11	0.09	33.95
ZN067	0.05	0.05	0.06	0.05	18.16
ZN068	0.08	0.07	0.08	0.09	28.65
ZN069	0.07	0.07	0.07	0.09	27.10
ZN070	0.05	0.08	0.06	0.08	23.54
ZN071	0.09	0.10	0.08	0.10	33.95
ZN072	0.06	0.06	0.07	0.07	22.63
ZN073	0.06	0.06	0.07	0.07	24.18
ZN074	0.07	0.06	0.07	0.06	22.72
ZN075	0.08	0.10	0.11	0.13	38.51
ZN076	0.07	0.09	0.10	0.09	31.85
ZN077	0.09	0.10	0.10	0.09	34.31
ZN078		0.09	0.10	0.08	31.63
ZN079	0.08	0.11	0.10	0.10	35.50
ZN080	0.08	0.10	0.10	0.08	33.49
ZN081	0.09	0.09	0.10	0.10	35.13
ZN082	0.06	0.07	0.06	0.05	21.44
ZN084	0.05		0.06	0.08	24.09
ZN-RSJC	0.17	0.10	0.12	0.15	49.46
ZN-RSNC	0.06	0.07	0.06	0.06	22.36

The elevated dose rates for the location ZN-RSJC is due to its proximity to the Independent Spent Fuel Storage Installation (ISFSI). Location ZN-RSJC is located just south of the fuel pad. Though annual exposure rate for this location is elevated, it is below regulated limits stipulated in Zion Solutions license and the area has limited public access.

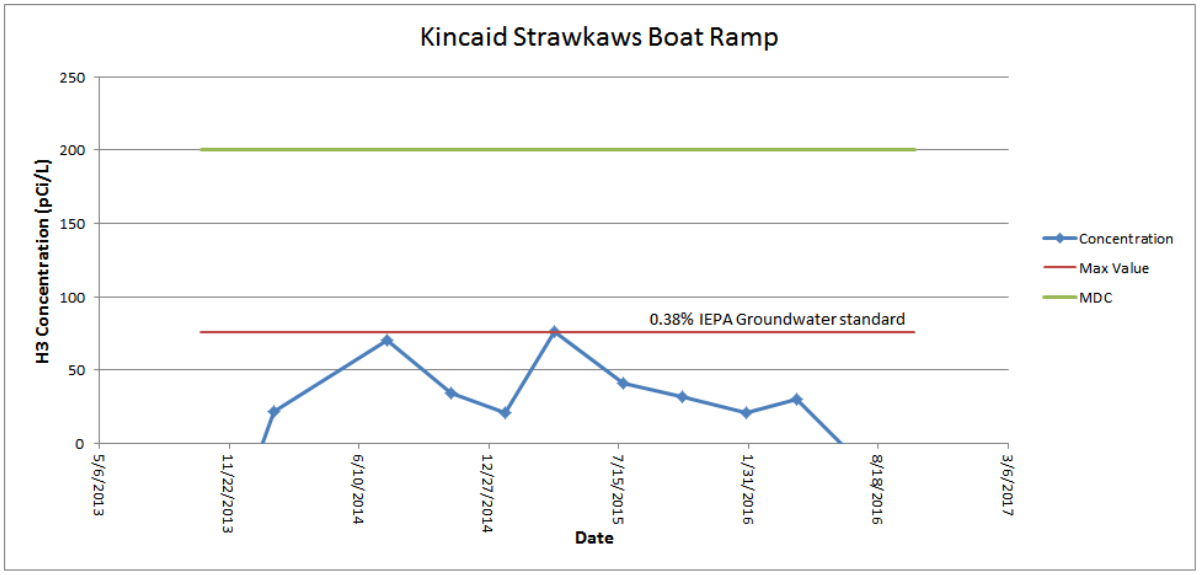
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Exposure column based on averages of all available data.

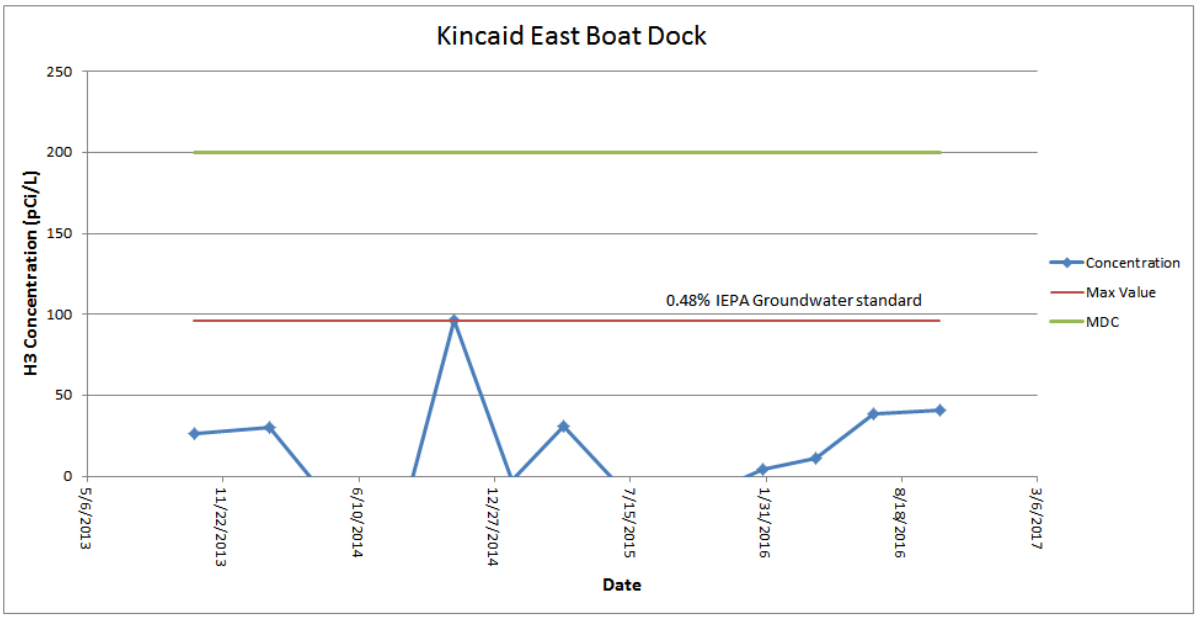
Appendix H
Background Reference Site Results

Table H-1. Tritium in Water Sample Results for Background Reference Area
Results are in picocuries per liter (pCi/L)

Location	H-3	
Date	Result	MDC
East Boat Dock		
1/27/2016	<MDC	200
4/14/2016	<MDC	200
7/7/2016	<MDC	200
10/13/2016	<MDC	200
Strawkaws Boat Ramp		
1/27/2016	<MDC	200
4/14/2016	<MDC	200
7/7/2016	<MDC	200
10/13/2016	<MDC	200
West Boat Ramp		
1/27/2016	<MDC	200
4/14/2016	<MDC	200
7/7/2016	<MDC	200
10/13/2016	<MDC	200

Tables H-2. Trending Graphs for Water from the Background Reference Area
(Max value compared to IEPA Class I groundwater standard of 20,000 pCi/L)





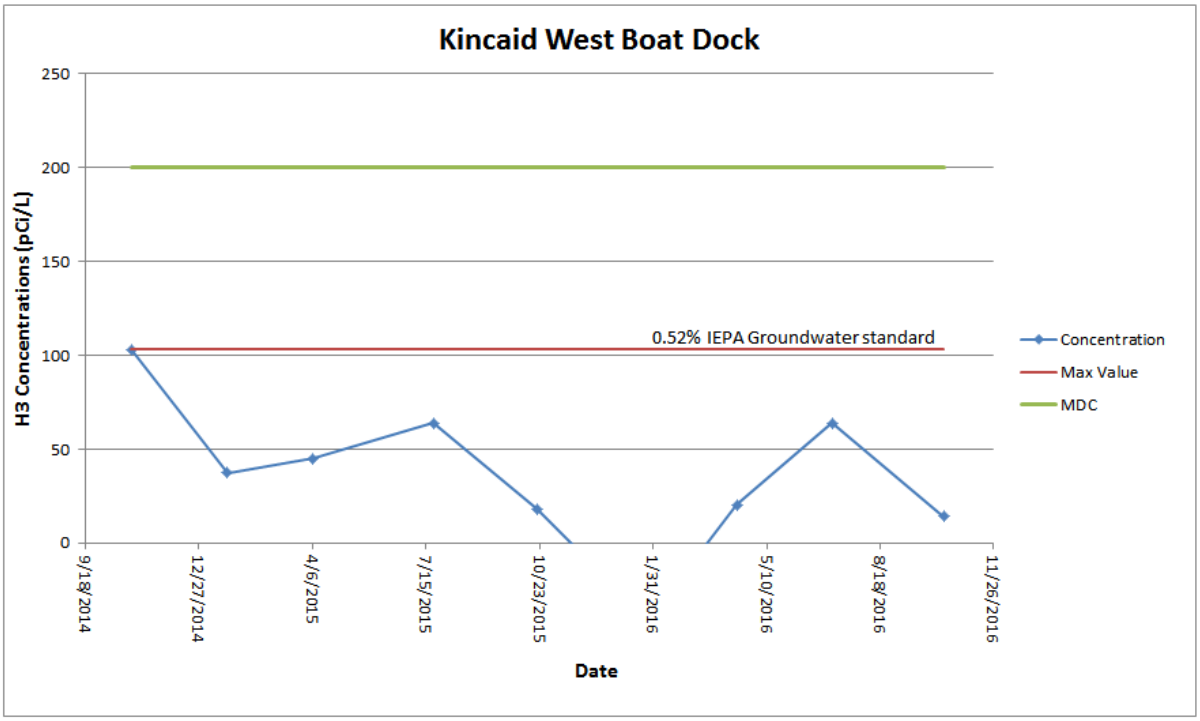


Table H-2. Sample Results for Alpha/Beta Screening of Water from the Background Reference Area
Results are in picocuries per liter (pCi/L)

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
East Boat Dock				
1/27/2016	<MDC	2.1	<MDC	4.1
4/14/2016	<MDC	2.1	<MDC	4.1
7/7/2016	<MDC	2.1	<MDC	4.1
10/13/2016	<MDC	2.1	<MDC	4.1
Strawkaws Boat Ramp				
1/27/2016	<MDC	2.1	<MDC	4.1
4/14/2016	<MDC	2.1	<MDC	4.1
7/7/2016	<MDC	2.1	4.6	4.1
10/13/2016	<MDC	2.1	<MDC	4.1
West Boat Ramp				
1/27/2016	<MDC	2.1	<MDC	4.1
4/14/2016	<MDC	2.1	<MDC	4.1
7/7/2016	<MDC	2.1	<MDC	4.1
10/13/2016	<MDC	2.1	<MDC	4.1

Table H-3. Gamma Spectroscopy Sample Results for Other Radionuclides in Water from the Background Reference Area
Results are in picocuries per liter (pCi/L)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
East Boat Dock																						
1/27/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
4/14/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
7/7/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
10/13/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
Strawkaws Boat Ramp																						
1/27/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
4/14/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
7/7/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
10/13/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
West Boat Ramp																						
1/27/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
4/14/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
7/7/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1
10/13/2016	<MDC	191	<MDC	5.8	<MDC	4.4	<MDC	4.1	<MDC	3.7	<MDC	17.6	<MDC	283	<MDC	3.8	<MDC	10.4	<MDC	10.2	<MDC	10.1

Table H-4. Soil Sample Results for Background Reference Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
East Boat Dock																				
4/14/2016	<MDC	0.43	<MDC	0.01	<MDC	0.01	0.04	0.01	0.12	0.01	<MDC	0.03	<MDC	0.01	<MDC	0.03	<MDC	0.02	<MDC	0.03
7/7/2016	<MDC	0.43	<MDC	0.01	<MDC	0.01	<MDC	0.01	0.05	0.01	<MDC	0.03	0.01	0.01	<MDC	0.03	<MDC	0.02	<MDC	0.03
Strawkaws Boat Ramp																				
4/14/2016	<MDC	0.43	<MDC	0.01	<MDC	0.01	<MDC	0.01	0.11	0.01	<MDC	0.03	0.02	0.01	<MDC	0.03	<MDC	0.02	<MDC	0.03
7/7/2016	<MDC	0.43	<MDC	0.01	<MDC	0.01	0.05	0.01	0.05	0.01	<MDC	0.03	0.01	0.01	<MDC	0.03	<MDC	0.02	<MDC	0.03
West Boat Ramp																				
4/14/2016	<MDC	0.43	<MDC	0.01	<MDC	0.01	0.05	0.01	0.13	0.01	<MDC	0.03	<MDC	0.01	<MDC	0.03	<MDC	0.02	<MDC	0.03
7/7/2016	<MDC	0.43	<MDC	0.01	<MDC	0.01	0.04	0.01	0.03	0.01	<MDC	0.03	<MDC	0.01	<MDC	0.03	<MDC	0.02	0.05	0.03

Table H-5. Sediment Sample Results for Background Reference Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Kincaid E Boat Dock																				
4/14/2016	<MDC	0.06	<MDC	0.01	<MDC	0.01	0.04	0.01	0.02	0.01	<MDC	0.02	0.01	0.01	<MDC	0.01	<MDC	0.02	<MDC	0.01

Table H-6. Fish Sample Results for Background Reference Area
Results are in picocuries per kilogram (pCi/kg)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
Sangchris Lake (bottom feeder)																						
10/19/2016	<MDC	1570	<MDC	40	<MDC	29	<MDC	27.2	<MDC	24.5	<MDC	116	<MDC	2350	<MDC	25.9	<MDC	68	<MDC	66	<MDC	68
Sangchris Lake (top feeder)																						
10/19/2016	<MDC	1570	<MDC	40	<MDC	29	<MDC	27.2	<MDC	24.5	<MDC	116	<MDC	2350	<MDC	25.9	<MDC	68	<MDC	66	<MDC	68

Table H-7. Vegetation Sample Results for Background Reference Area
Results are in picocuries per gram (pCi/g)

Location	Ba-140		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC	Result	MDC
East Boat Dock																						
7/7/2016	<MDC	1.86	<MDC	0.1	<MDC	0.086	<MDC	0.084	<MDC	0.077	<MDC	0.242	<MDC	1.74	<MDC	0.085	<MDC	0.155	<MDC	0.175	<MDC	0.179
Strawkaws Boat Ramp																						
7/7/2016	<MDC	1.86	<MDC	0.1	<MDC	0.086	<MDC	0.084	<MDC	0.077	<MDC	0.242	<MDC	1.74	<MDC	0.085	<MDC	0.155	<MDC	0.175	<MDC	0.179
West Boat Ramp																						
7/7/2016	<MDC	1.86	<MDC	0.1	<MDC	0.086	<MDC	0.084	<MDC	0.077	<MDC	0.242	<MDC	1.74	<MDC	0.085	<MDC	0.155	<MDC	0.175	<MDC	0.179

Table H-8. Alpha / Beta Screening Results for Air Samples in the Springfield Area
Results are in picocuries per liter (pCi/L)

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Knotts Street, Springfield				
1/4/2016	6.8	3.3	46.3	8.3
1/11/2016	<MDC	3.3	18.3	8.3
1/19/2016	4.5	3.3	44.7	8.3
1/25/2016	<MDC	3.3	34.5	8.3
2/1/2016	<MDC	3.3	33.1	8.3
2/8/2016	<MDC	3.3	24.4	8.3
2/16/2016	<MDC	3.3	28.2	8.3
2/22/2016	<MDC	3.3	24.7	8.3
2/29/2016	3.4	3.3	28.8	8.3
3/7/2016	<MDC	3.3	21.9	8.3
3/14/2016	<MDC	3.3	26.3	8.3
3/21/2016	<MDC	3.3	15.9	8.3
3/28/2016	<MDC	3.3	17.3	8.3
4/4/2016	<MDC	3.3	22.0	8.3
4/11/2016	<MDC	3.3	17.8	8.3
4/18/2016	<MDC	3.3	27.6	8.3
4/25/2016	<MDC	3.3	28.9	8.3
5/2/2016	<MDC	3.3	19.8	8.3
5/9/2016	<MDC	3.3	20.1	8.3
5/16/2016	<MDC	3.3	13.7	8.3
5/23/2016	3.4	3.3	21.5	8.3
5/31/2016	3.4	3.3	21.6	8.3
6/6/2016	<MDC	3.3	24.5	8.3
6/13/2016	<MDC	3.3	20.5	8.3
6/20/2016	3.5	3.3	26.5	8.3
6/27/2016	3.5	3.3	30.6	8.3

Location	Alpha		Beta	
Date	Result	MDC	Result	MDC
Knotts Street, Springfield				
7/5/2016	<MDC	3.3	19.0	8.3
7/11/2016	<MDC	3.3	27.6	8.3
7/18/2016	<MDC	3.3	24.7	8.3
7/25/2016	<MDC	3.3	29.1	8.3
8/1/2016	<MDC	3.3	32.2	8.3
8/8/2016	<MDC	3.3	26.7	8.3
8/16/2016	<MDC	3.3	31.1	8.3
8/22/2016	<MDC	3.3	34.3	8.3
8/29/2016	3.5	3.3	22.8	8.3
9/6/2016	<MDC	3.3	28.6	8.3
9/12/2016	<MDC	3.3	17.8	8.3
9/20/2016	<MDC	3.3	38.9	8.3
9/26/2016	<MDC	3.3	58.4	8.3
10/3/2016	<MDC	3.3	14.8	8.3
10/11/2016	5.9	3.3	35.8	8.3
10/18/2016	<MDC	3.3	30.2	8.3
10/24/2016	<MDC	3.3	23.5	8.3
10/31/2016	<MDC	3.3	34.6	8.3
11/7/2016	4.3	3.3	38.0	8.3
11/14/2016	<MDC	3.3	28.6	8.3
11/21/2016	4.2	3.3	58.3	8.3
11/28/2016	<MDC	3.3	37.0	8.3
12/6/2016	<MDC	3.3	24.7	8.3
12/12/2016	4.1	3.3	30.9	8.3
12/19/2016	6.7	3.3	42.2	8.3
12/27/2016	5.7	3.3	39.7	8.3

Table H-9. Summary of Ambient Gamma Results for Background Reference Area

Location	Quarter 1 mR/day	Quarter 2 mR/day	Quarter 3 mR/day	Quarter 4 mR/day	Annual Exposure mR/year
KC-01	0.12	0.10	0.10	0.11	39.33
KC-02	0.11	0.09	0.12	0.11	39.60
KC-03	0.11	0.10	0.10	0.09	37.14
KC-04	0.12	0.09	0.11	0.11	38.78
KC-05	0.10	0.12	0.08	0.09	35.95
KC-06	0.09	0.08	0.07	0.09	30.20
KC-07	0.10	0.10	0.09	0.10	35.50
KC-08	0.09	0.10	0.10		35.41
KC-09	0.11	0.11	0.10	0.08	36.68
KC-10		0.11	0.10	0.10	37.84
KC-11	0.13	0.11	0.12	0.10	42.16
KC-12		0.12	0.12	0.10	40.64
KC-13	0.12	0.11	0.12	0.11	41.15
KC-14	0.12	0.12	0.10	0.10	40.88
KC-15	0.11	0.09	0.11	0.10	37.60

Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Exposure column based on averages of all available data.

Appendix I
Gamma Analysis Library

Ba-140
Co-58
Co-60
Cs-134
Cs-137
Fe-59
I-131
Mn-54
Nb-95
Zn-65
Zr-95

Appendix J
Radionuclide Abbreviations in this Report

Ba-140	Barium-140
Co-58	Cobalt-58
Co-60	Cobalt-60
Cs-134	Cesium-134
Cs-137	Cesium-137
Fe-59	Iron-59
I-131	Iodine-131
Mn-54	Manganese-54
Nb-95	Niobium-95
Zn-65	Zinc-65
Zr-95	Zirconium-95

Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, IL 62704

www.iema.illinois.gov

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