IEMA

Illinois Emergency Management Agency

Environmental Monitoring Program for Nuclear Power Stations Report for Calendar Year 2014

August 2015

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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 environmental monitoring for the presence of radionuclides around Illinois' six operating nuclear power stations and maintains a monitoring program in the environs of Zion Nuclear Power Station, which ceased operation in 1997 and is currently undergoing decommissioning.

IEMA's 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) testing of samples for radionuclides; and 3) evaluation of test results on both an individual and long-term basis.

Federal regulations establish standards for protection against ionizing radiation resulting 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) 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 2014, 898 samples were collected, tested, and evaluated. Sample types monitored by IEMA include water, sediment, soil, air, vegetation, fish, and environmental dosimetry.

In 2014, 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.

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 a baseline of ambient gamma radiation levels within a ten-mile radius of each nuclear power station, and other background reference locations across the state.

In 2014, all test results for environmental dosimetry were consistent with established background levels, except for higher readings near the spent fuel storage casks in Zion, which were expected.

In parallel with environmental monitoring, IEMA operates a state-of-the-art Remote Monitoring System (RMS) at all six operating plants. The 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 capable of identifying and measuring the presence of radioactive materials leaving each nuclear power station through the effluent stack, and the GDN is capable of measuring radiation in the surrounding environment. Our environmental monitoring independently confirms that the

environs around the Illinois nuclear power stations are save and protective of public health, safety and the environment. 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 2014

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 over all 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 environmental monitoring for the presence of radionuclides around Illinois' six operating nuclear power stations. IEMA also maintains a monitoring program in the environs of Zion Nuclear Power Station, which ceased operation in 1997 and is currently undergoing decommissioning.

In addition to "traditional" environmental monitoring through sample collection and analysis, IEMA has deployed a Remote Monitoring System (RMS) around each nuclear power facility. 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 the surrounding environment. The one-of-a-kind RMS 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 24/7. IEMA has developed software to continually monitor and analyze the RMS data and provide notification of unusual occurrences to on-call IEMA personnel.

This report details IEMA's Environmental Monitoring program, including data from the Remote Monitoring System, for the period January 2014 through December 2014 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 ingestion from drinking water and foodstuffs, and external gamma radiation from noble gases. IEMA has identified sampling locations that provide sample types appropriate to determine if a public health or environmental radiological impact is detected in the environs of the nuclear power stations due to their operation. In addition, test results establish baseline data that can be used to perform exposure assessments if necessary and to compare environmental radioactivity measurements in the event of a significant release of radioactivity anywhere in the world.

IEMA collects samples from designated sampling locations on a routine basis. IEMA tests these samples for the presence of radionuclides. Test results are evaluated on both an individual and long-term basis.

Sample matrices monitored by IEMA include surface and public drinking water, sediment from nearby waterways, soil, air, vegetation, fish, and environmental dosimetry. In 2014, 898 samples were collected, tested, and evaluated.

Program Update

In previous years, IEMA relied on a contractor for collection of the vast majority of samples taken in the environs of nuclear power stations. Following the Fukushima incident, IEMA commenced the process of moving toward independent sample collection. Since then, IEMA has developed and refined independent sampling plans in the environs of the six operating nuclear power stations and the one nuclear power station undergoing decommissioning. These sampling plans address all sample types with the exceptions of milk, and IEMA collected samples in accordance with these plans throughout 2014.

In late 2013, IEMA established Sangchris Lake State Park as a Background Reference Site and developed a corresponding sampling plan. This site was chosen due its distance from nuclear power stations and its close proximity to Springfield. In addition to Sangchris Lake State Park, the Springfield office at Knotts Street is a Background Reference Site for air sampling. Test results for samples collected at both Background Reference Sites can be found in Appendix H.

Results at a Glance

Federal regulations establish standards for protection against ionizing radiation resulting from activities conducted under US 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 2014, 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. 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 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 2014, all test results for environmental dosimetry were consistent with established background levels, except for higher readings near the spent fuel storage casks in Zion, which were expected.

Analysis of Data

Negative numbers in the tables of this report are the values reported by the IEMA Radiochemistry Laboratory. Each batch of samples is counted with a sample blank to determine a background for each analytical instrument and each type of medium being analyzed. That background reading is then subtracted from the analytical result. When the sample has very little radioactivity, subtracting background values may actually result in a negative number.

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 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. The MDCs for each analytical method are not included in this report.

Understanding a Test Result with a Confidence Interval

Test results in this report contain columns of information labeled Result and Error. Error is actually the Uncertainty. This is a standard method for reporting laboratory analysis results, and it allows the reader to look at factors that may affect the results, or may put the results into perspective.

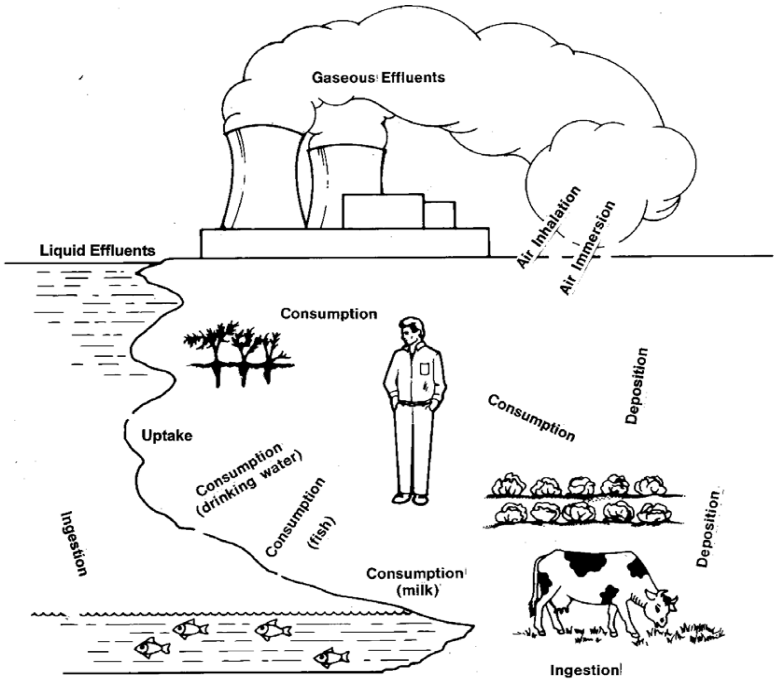
What does a tritium result of 519 ± 99.5 pCi/L, with 95% confidence, mean? First, the unit, pCi/L, is used to measure the amount of tritium, in picocuries (pCi), present in one liter (L) of water. Thus, the result tells us the analysis found that the sample contains 519 picocuries of tritium per liter. However, all measurements have some uncertainty associated with them – some range of values which the analysis, if repeated, could reasonably be expected to be the result. In this case, the uncertainty is ± 99.5 pCi/L. If repeated, the analysis could

reasonably be expected to return values as low as 519 – 99.5 = 419.5 pCi/L and as high as 519 + 99.5 = 618.5 pCi/L. The statement "with 95% confidence" tells us just how certain we can be about that range of values. In this case, there is a 95% probability that the sample contains between 419.5 and 618.5 picocuries of tritium per liter of water.

Radiation Exposure Pathways to Humans

Samples collected for the IEMA environmental monitoring program reflect the critical pathways that radionuclides could be transported to and ingested 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 discharge 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 tests samples from these bodies of water and from public drinking systems that draw their water from them.

Plant operations can also impact ground water; therefore, IEMA also analyzes samples collected from wells in and around the nuclear power stations. Ground water samples are collected and analyzed quarterly. For all water samples, typically 3-4 liters are collected per quarter. Water samples are screened for gross alpha and gross beta activity, and are

submitted for gamma spectroscopy analysis including, but not limited to, reactor-produced and naturally-occurring radionuclides such as H-3 (tritium), Ba-140, Be-7, Co-58, Co-60, Cs-134, Cs-137, Fe-59, I-131, K-40, Mn-54, Nb-95, Zn-65, and Zr-95.

Tritium (H-3) is a normal component of the effluent stream of nuclear power plants. Liquid effluents from the nuclear power stations are released to waterways under permit from the Illinois Environmental Protection Agency (IEPA). Water samples are analyzed for tritium and the results are compared to the US EPA drinking water standard of 20,000 pCi/L.

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 fall. All soils are submitted for gamma spectroscopy analysis including, but not limited to reactor-produced and naturally-occurring radionuclides such as Ac-228, Ba-140, Bi-212, Bi-214, Co-58, Co-60, Cs-134, Cs-137, Fe-59, K-40, Mn-54, Nb-95, Pa-234m, Pb-210, Pb-212, Pb-214, Ra-226, Th-234, Tl-208, U-235, Zn-65, and Zr-95. It should be noted that as a remnant of atmospheric nuclear weapons testing, Cs-137 is routinely observed in soil and sediment at concentrations of 0.1-0.2 pCi/g.

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 sediments are submitted for gamma spectroscopy analysis including, but not limited to, reactor-produced and naturally-occurring radionuclides such as Ac-228, Ba-140, Bi-212, Bi-214, Co-58, Co-60, Cs-134, Cs-137, Fe-59, K-40, Mn-54, Nb-95, Pa-234m, Pb-210, Pb-212, Pb-214, Ra-226, Th-234, Tl-208, U-235, Zn-65, and Zr-95. Again, it should be noted that as a remnant of atmospheric nuclear weapons testing, Cs-137 is routinely observed in sediment and soil at concentrations of 0.1-0.2 pCi/g.

Fish Samples

Fish are excellent bio accumulators of radionuclides. Fish samples were collected from rivers, near nuclear power station discharge points. At each location, two different species of fish were collected and are referenced as a "top-feeders" and a "bottom-feeders." Edible portions of the fish were harvested and analyzed. Like sediments, fish samples were analyzed for reactor-produced and naturally-occurring radionuclides using gamma spectroscopy including, but not limited to, radionuclides such as Ba-140, Be-7, Co-58, Co-60, Cs-134, Cs-137, Fe-59, I-131, K-40, Mn-54, Nb-95, Zn-65, and Zr-95. The results showed no concentrations of reactor-produced radionuclides above background levels in any of the sampled fish.

Vegetation Samples

Radionuclides released into the atmosphere would be expected to deposit on the ground downwind from the nuclear power station, and are transported to the root system of plants when it rains. Plants may take up or metabolize radioactive materials in the soil. Vegetation samples were collected from the area around each station in the late summer or fall. All vegetation samples submitted for gamma spectroscopy analysis including, but not limited to, reactor-produced and naturally-occurring radionuclides such as Ba-140, Be-7, Co-58, Co-60, Cs-134, Cs-137, Fe-59, I-131, K-40, Mn-54, Nb-95, Zn-65, and Zr-95.

Air Samples

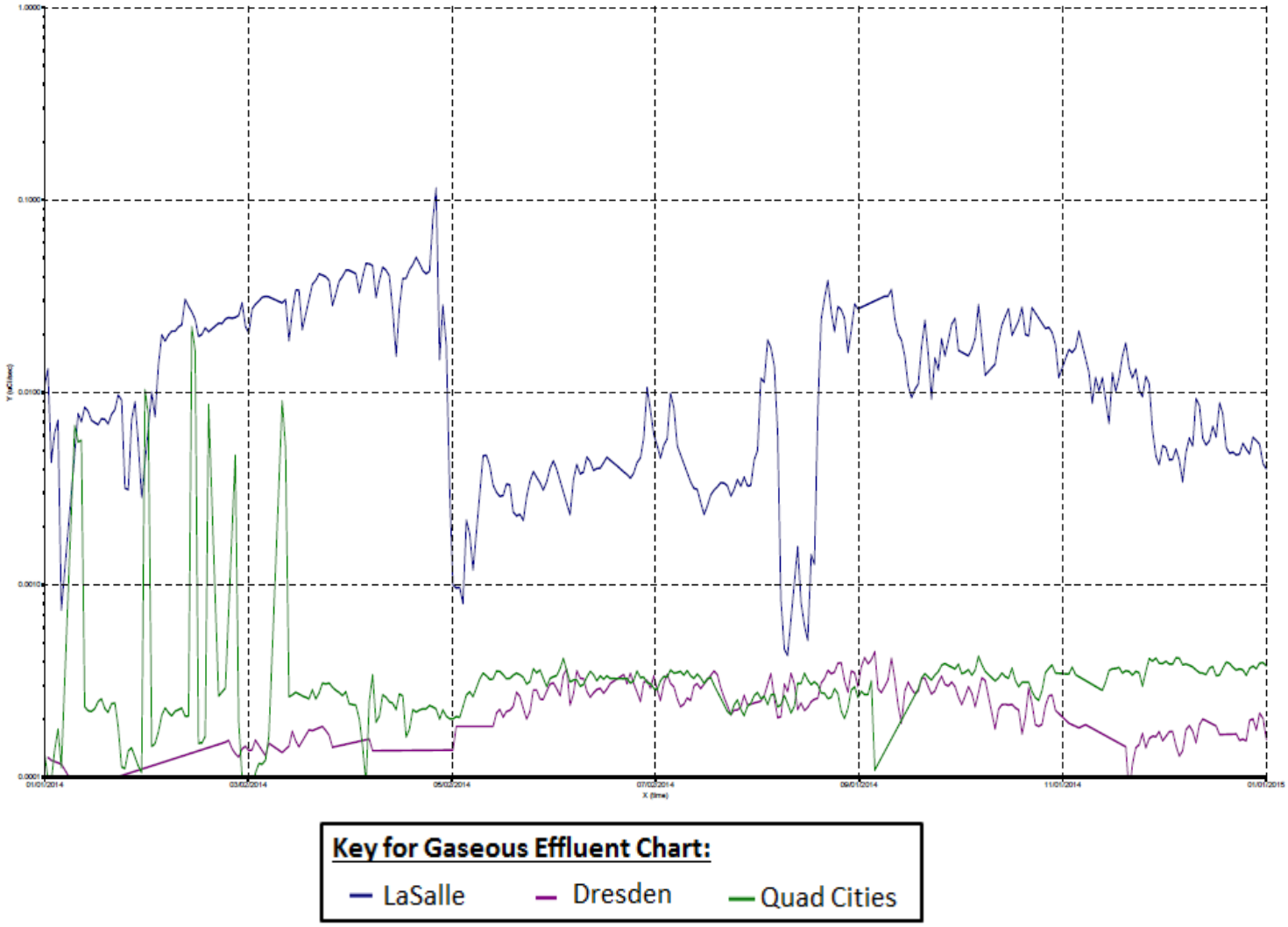
The Zion Nuclear Power Station permanently ceased operation in February 1998, and has been storing spent fuel on site. Due to decommissioning activities, IEMA maintains a network of air monitoring stations around the Zion Station. Air samples are collected continuously, with the air filters being changed and analyzed weekly. The air filters are analyzed for gross alpha and beta through gas proportional counting. Both Zion and the Springfield Background site also collect one air sample weekly on a charcoal cartridge. Cartridges are submitted for gamma spectroscopy analysis including, but not limited to reactor-produced and naturally-occurring radionuclides such as Be-7, Cs-137, I-131, K-40, Te-132, and Xe-131m. Appendix G includes the results of the air cartridge and filter analyses for Zion in 2014, and Appendix H includes comparative results for Background Reference Sites.

Gaseous Effluent Monitoring System

IEMA continuously monitors gaseous effluents from all operating nuclear power stations with the Gaseous Effluent Monitoring System (GEMS). The GEMS 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 releases under emergency conditions.

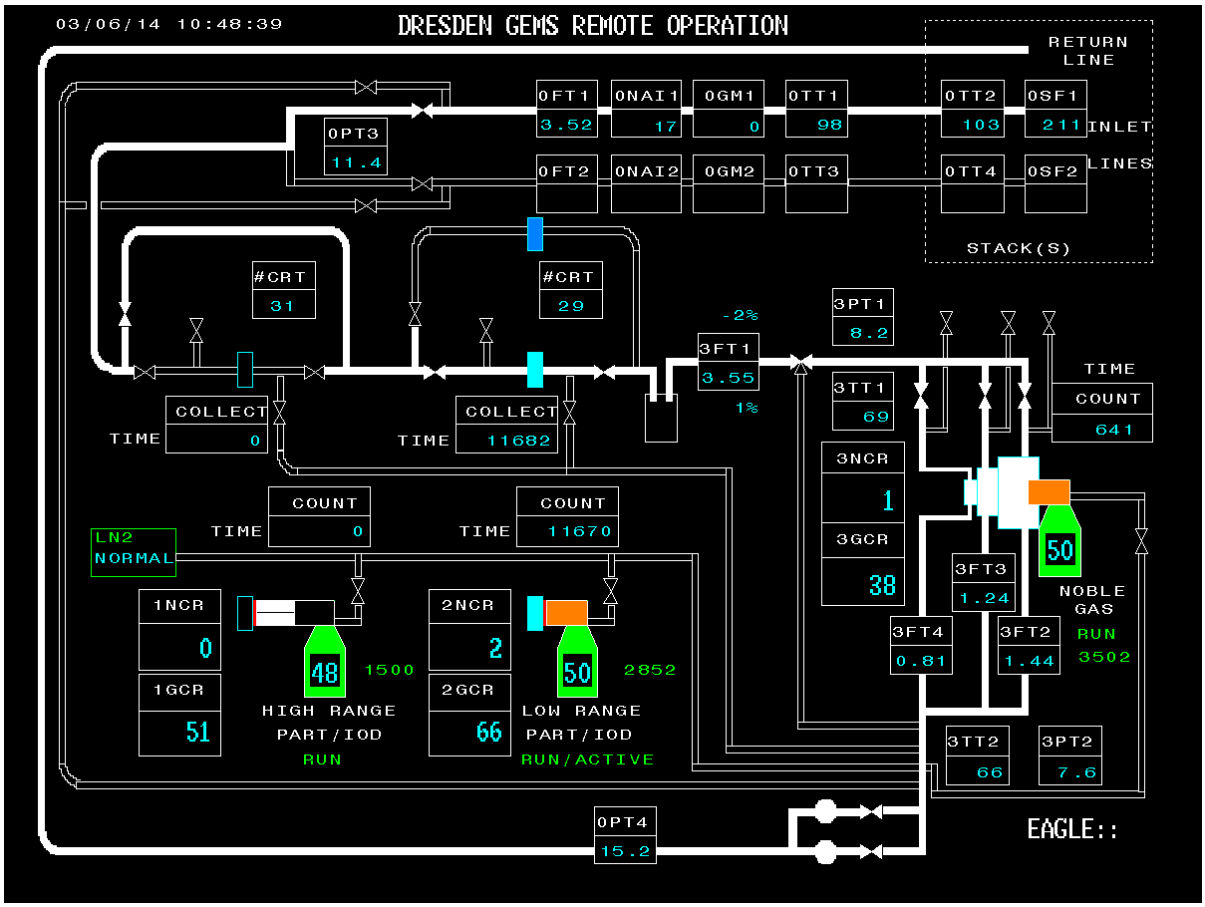
Figure 2 shows a compilation graph of gaseous effluent particulate and iodine release rates from Illinois nuclear power stations in 2014. The graph depicts the daily average effluent release rates in microcuries per second (μCi/sec). Particulate and iodine releases from Braidwood, Byron, and Clinton were indistinguishable from background. **Figure 2** illustrates releases from LaSalle, Dresden, and Quad Cities Nuclear Power Stations. Although measureable, these releases of radioactivity were well within regulatory limits. Release rates of noble gases were also found to be indistinguishable from background, and therefore not graphically represented in this report.

Figure 2. Gaseous Effluent Particulate and Iodine Release Rates from Illinois Nuclear Plants in 2014



The GEMS can be controlled remotely during nuclear power plant emergencies to provide flexibility in sampling. The screen shown in **Figure 3** below details the remote operation data for the Dresden Nuclear Station GEMS equipment.

Figure 3. Computer Display of GEMS Data



The GEMS equipment shown in **Figures 4A** and **3B** below were originally designed by SAIC, and re-designed by IEMA personnel. The re-designed units were, built, installed, and are currently maintained by IEMA personnel.

Figures 4A and B. Photos of GEMS Equipment

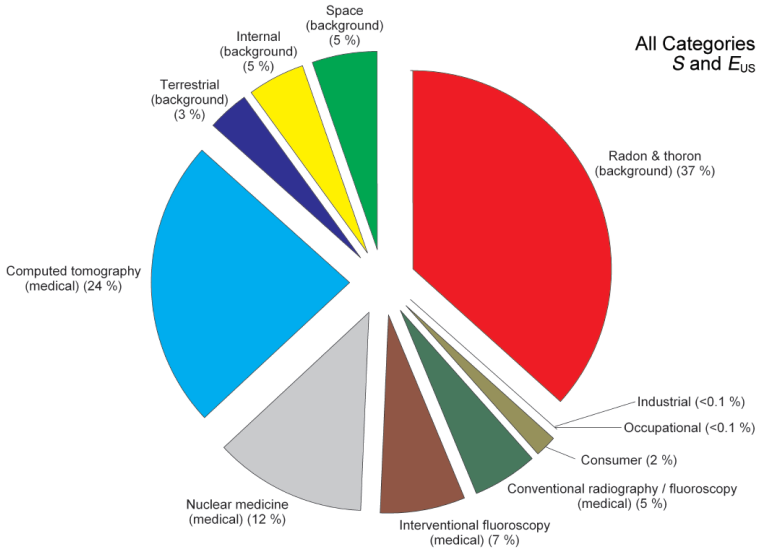
Ambient Gamma Monitoring

IEMA maintains a network of 515 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. IEMA performs the analysis of the dosimeters. While the dosimeters are used to monitor for small changes in ambient background levels of gamma radiation that could result from nuclear power station activities, they also play another important role. In the event of a significant off-site release from a nuclear plant the environmental dosimeters would be collected, read, and used to determine the extent and magnitude of the release, along with an estimate of the radiation dose that may have been received by the general public.

Results tables for environmental dosimeters analyzed during 2014 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 that would have been accrued by an individual 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). Approximately 8% of that exposure is from Terrestrial and Cosmic radiation (background radiation), and equals approximately 49.6 millirem per year.

Figure 5. Sources of Radiation Exposure to Man



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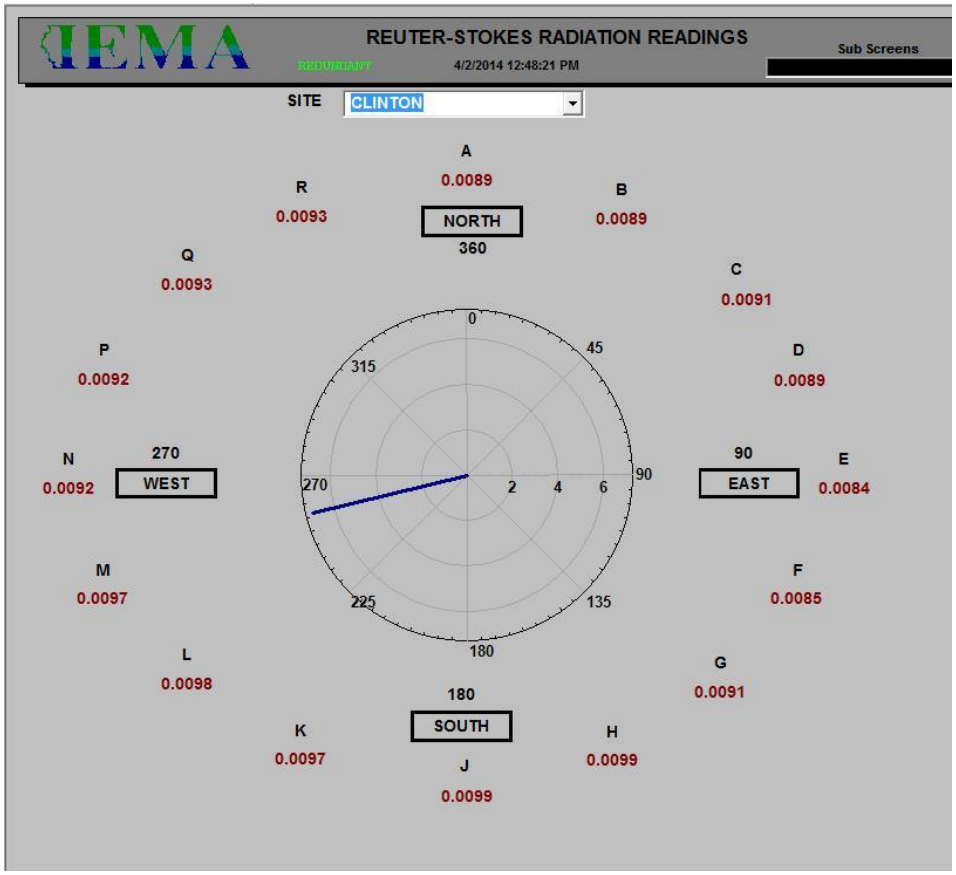
Gamma Detection Network

In addition to placing dosimeters around the nuclear power stations, IEMA manages the Gamma Detection Network (GDN). The Gamma Detection Network (GDN) 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 at 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 R/hr. Shown in **Figure 6** is an analytical display for the Clinton Nuclear Station with meteorological and GDN radiation information, which would be utilized by IEMA Health Physicists to evaluate environmental impacts of a release. **Figure 7** is a photo of a typical GDN field installation.

Graphic representations of GDN data collected during 2014 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 6. Display of Gamma Detection Network around Clinton Nuclear Station



The Gamma Detection Network provides real-time radiation measurements in millirem per hour (mRem/hr), 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 7. Typical IEMA GDN Field Installation

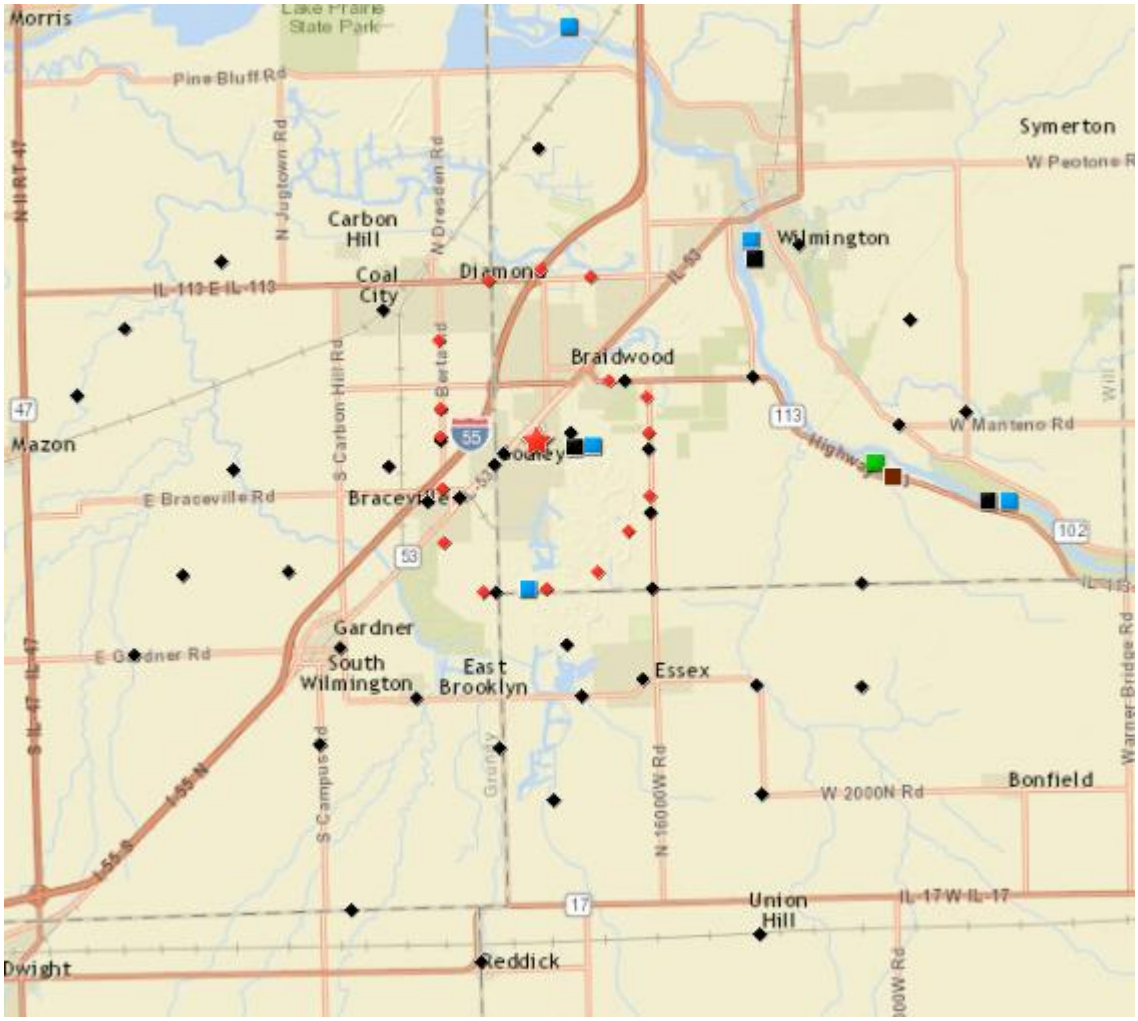
Braidwood Nuclear Power Station

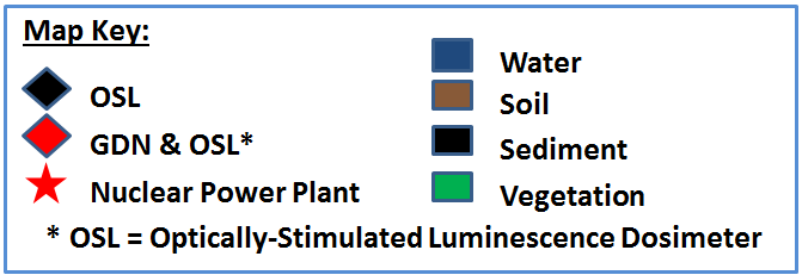
Braidwood Station is located in Will County in northern Illinois, approximately 15 miles south-southwest of Joliet, Illinois. This station utilizes two pressurized water reactors to generate electricity for Exelon. Unit 1 began operation in 1987 and Unit 2 in 1988.

Liquid effluents from the Braidwood Station are released in controlled batches to the Kankakee River. In 2005, it was discovered that a leak in the line that transported effluents to the Kankakee River had allowed for the unlicensed release of effluents to groundwater. As a result, tritium (H-3) was found in ground water and a pond outside the boundaries of the plant. As part of its efforts to identify releases and prevent future exposure to the public, IEMA continues to sample water from public waterways, and analyzes samples to detect any further spread of the plume.

Figure 8 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 8** 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 8. Overview of IEMA's Monitoring Locations for Braidwood





Dresden Nuclear Power Station

Dresden Station is located in Grundy County in northern Illinois, approximately 12 miles southwest of Joliet, Illinois at the confluence of the Des Plaines and Kankakee rivers where they form the Illinois River. This station utilizes two boiling water reactors to generate electricity for Exelon.

On June 9, 2014, IEMA received a notification from Exelon Generation Company, LLC (Exelon) stating that they had discovered elevated levels of tritium at the discharge of the plant between the time period of 4/2/2014 to 6/7/2014. Exelon stated that no greater than 0.1 curies were discharged from the site. Liquid effluents from the Dresden Station are released to the Illinois River.

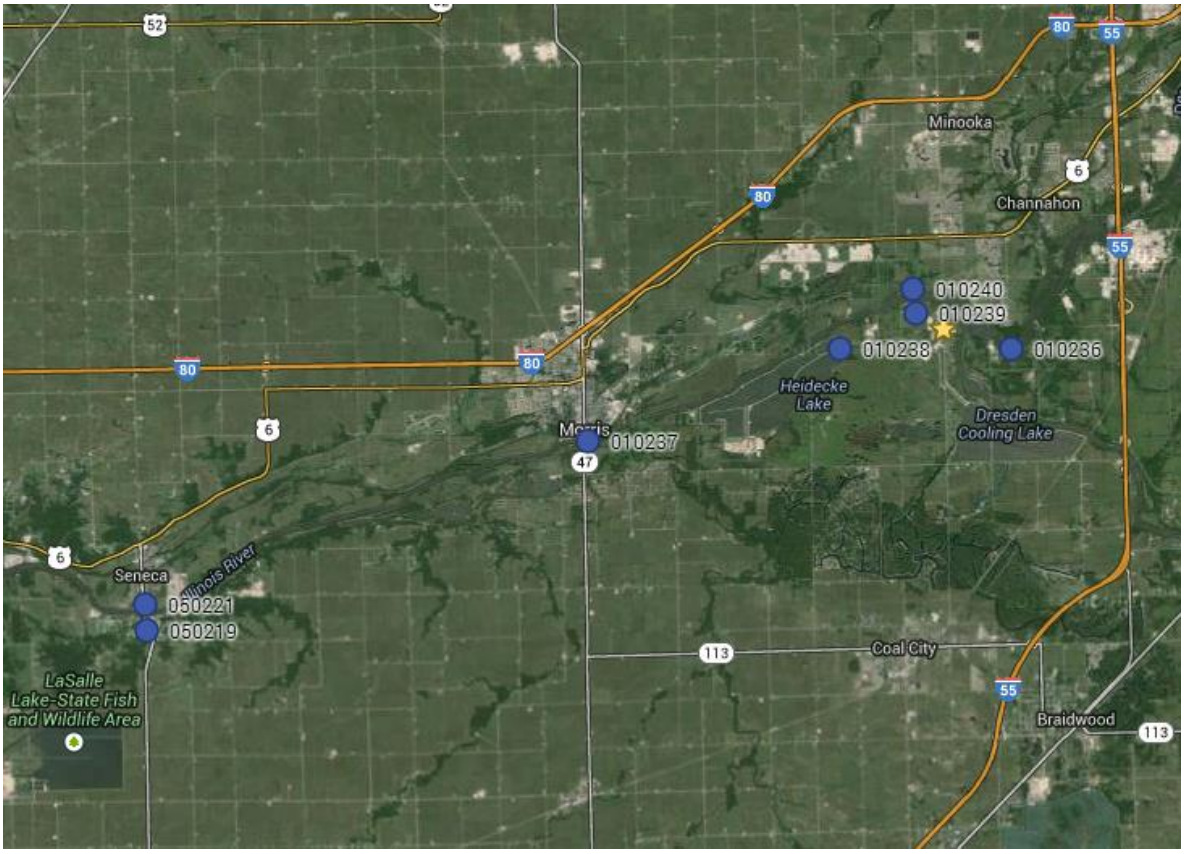
As a result of the notifications from Exelon, IEMA staff collected water samples from established IEMA monitoring locations around the Dresden facility on June 11, 2014. Coincidentally, IEMA staff had collected routine water samples from those same locations on June 5, 2014, which happened to be during the duration of the release from Dresden.

All samples were analyzed by IEMA's Radiochemistry Laboratory in Springfield. For samples collected during and after the duration of the release, IEMA observed no measurable increases in radiation near the Dresden Nuclear Power Station. Results for all samples collected were below the U.S. Environmental Protection Agency (US EPA) drinking water standard for tritium, which is 20,000 picocuries per liter (pCi/L).

Figure 9 is a map showing the location of the Dresden Nuclear Power Station (yellow star), and IEMA's water sampling locations around the plant. **Figure 10** is an overview of all

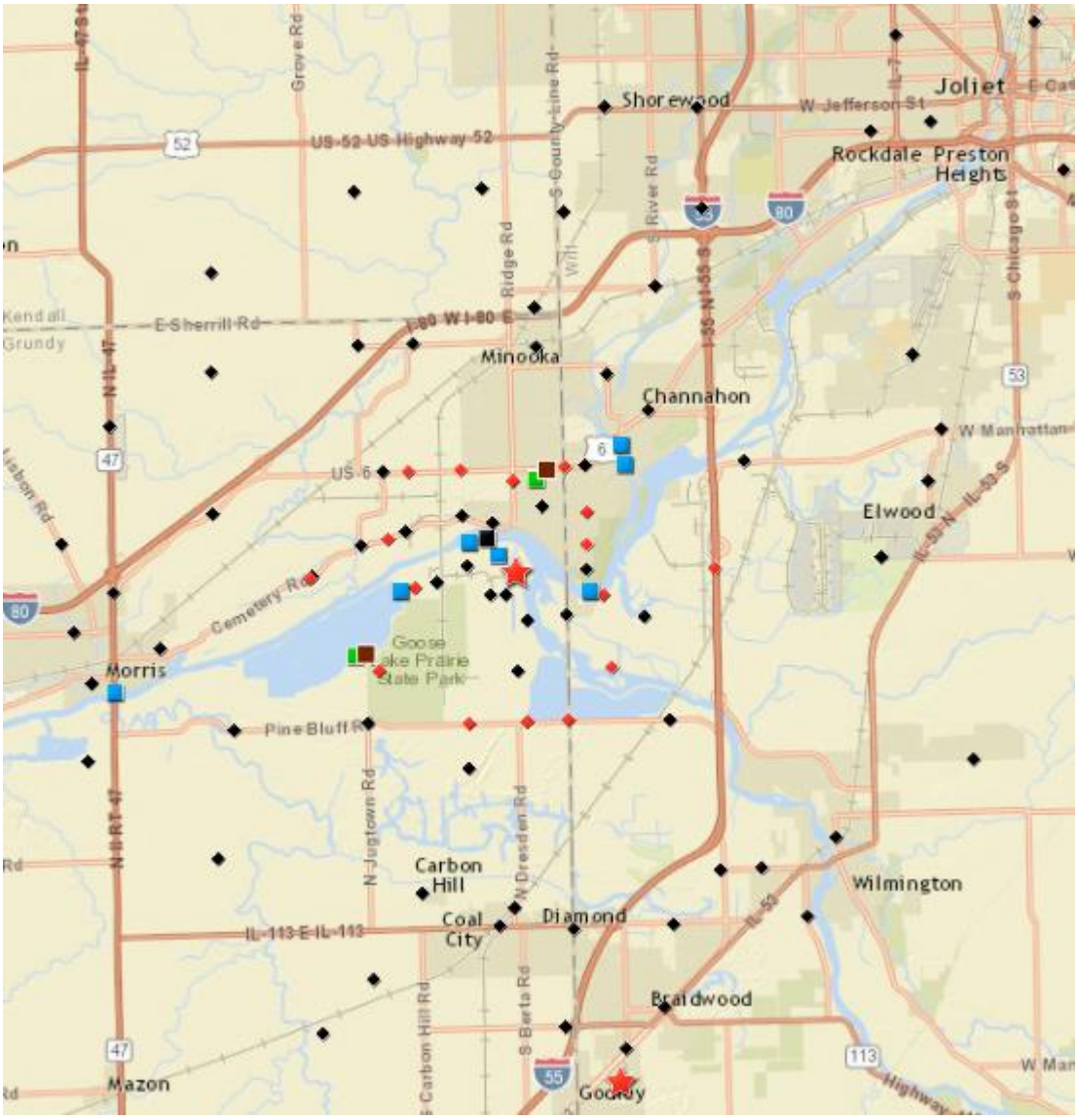
sampling locations in the vicinity of the Dresden Nuclear Power Station (yellow star). The second yellow star near the bottom of **Figure 10** is the Braidwood Nuclear Power Station.

Figure 9. Overview of IEMA's Water Monitoring Locations for Dresden



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

Figure 10. Overview of IEMA Monitoring Locations for Dresden



Map Key:

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

* OSL = Optically-Stimulated Luminescence Dosimeter

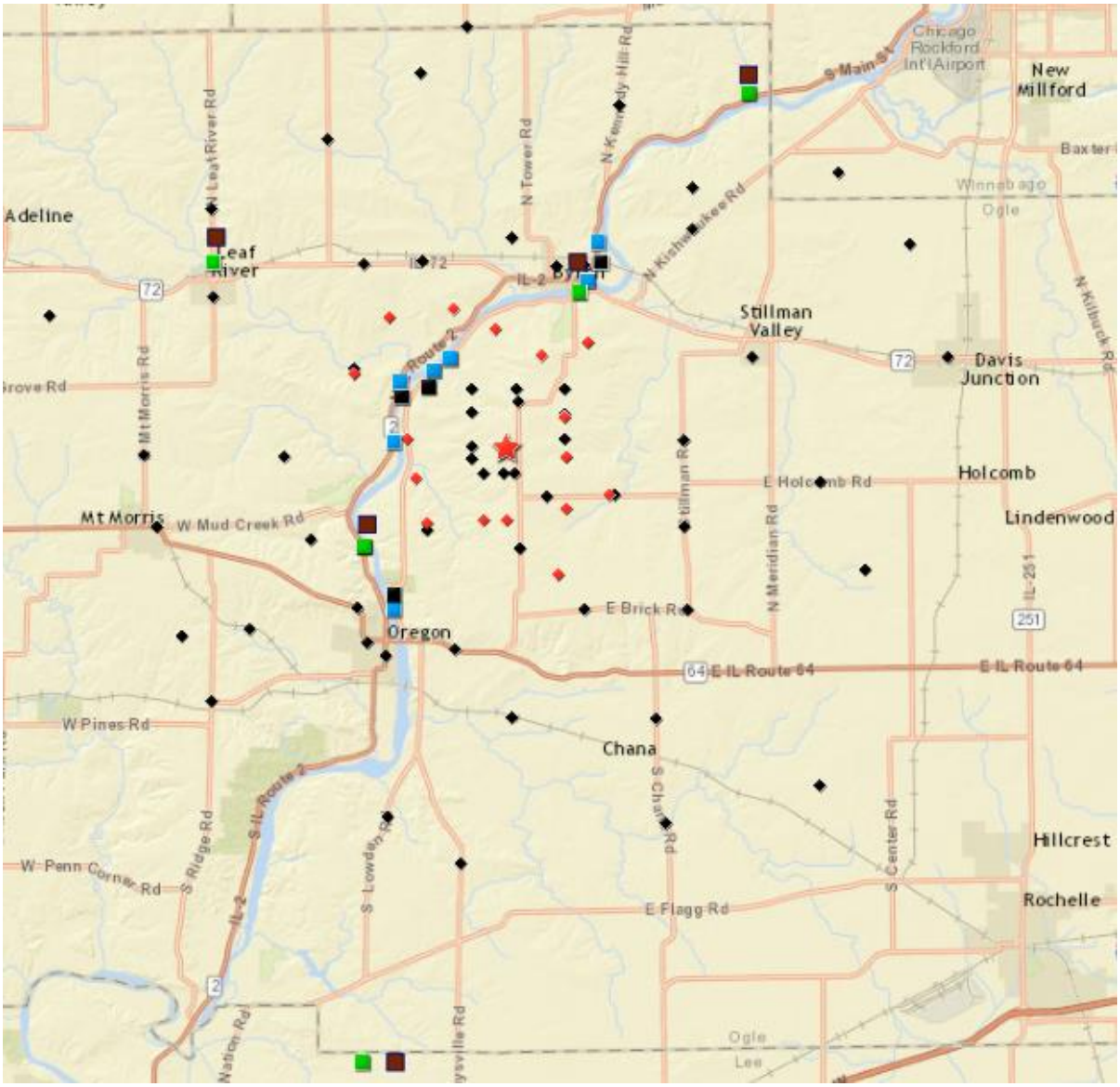
Byron Nuclear Power Station

Byron Station is located in Ogle County in northern Illinois, approximately seventeen miles southwest of Rockford, Illinois. This station utilizes two pressurized water reactors to generate electricity for Exelon. Unit 1 began operation in February 1985 and Unit 2 in January 1987.

Liquid effluents from the Byron Station are released to the Rock River.

Figure 11 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 11. Overview of IEMA Monitoring Locations for Byron



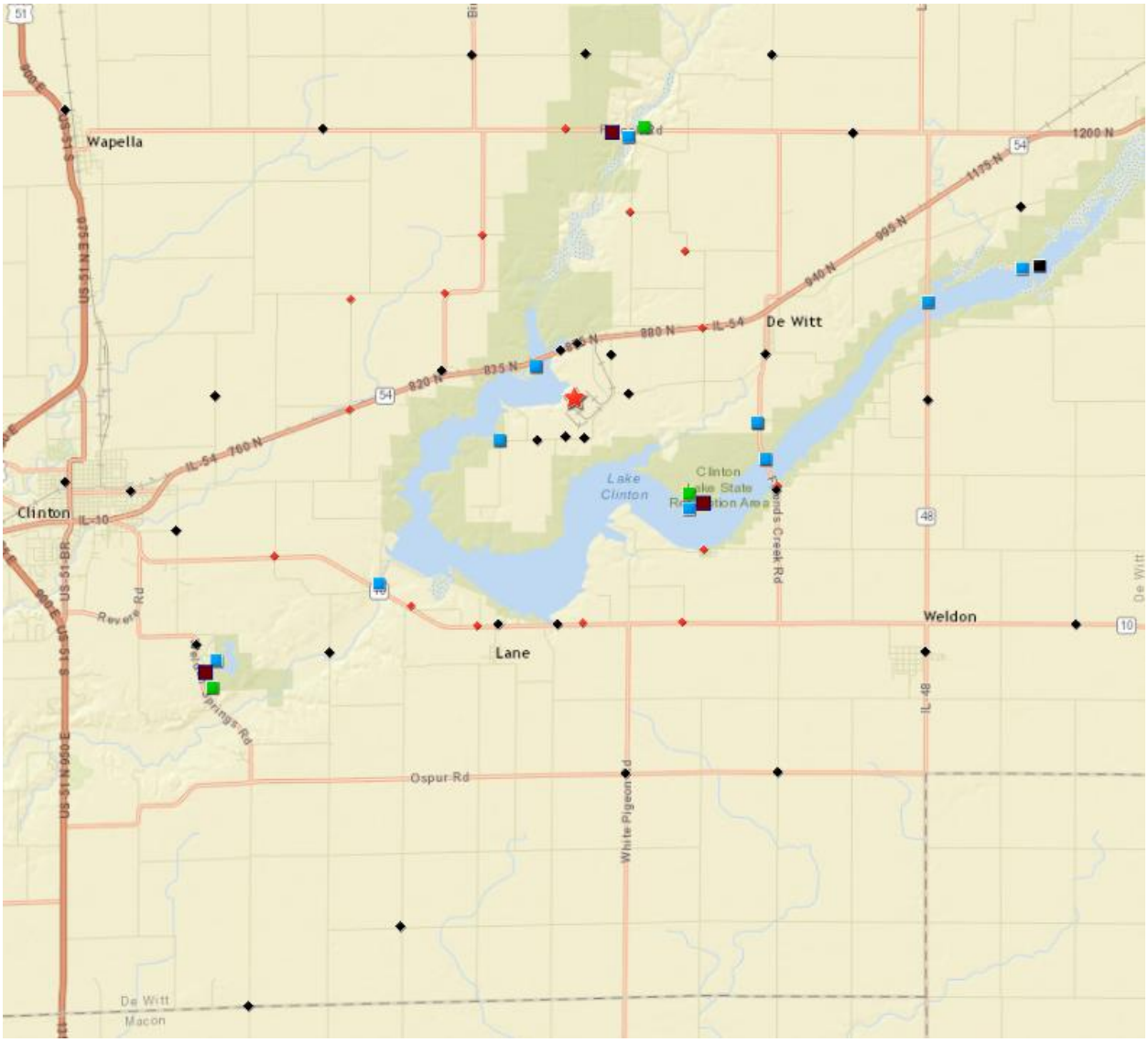
Clinton Nuclear Power Station

Clinton Station is located in DeWitt County, approximately six miles east of the city of Clinton in central Illinois. The station has one boiling water reactor used to generate electricity for Exelon.

Liquid effluents from the Clinton Station are released into the eastern arm of Clinton Lake, a 4,900-acre man-made cooling lake. Outflow from Lake Clinton falls into Salt Creek, a tributary of the Sangamon River.

Figure 12 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 12. Overview of IEMA Monitoring Locations for Clinton



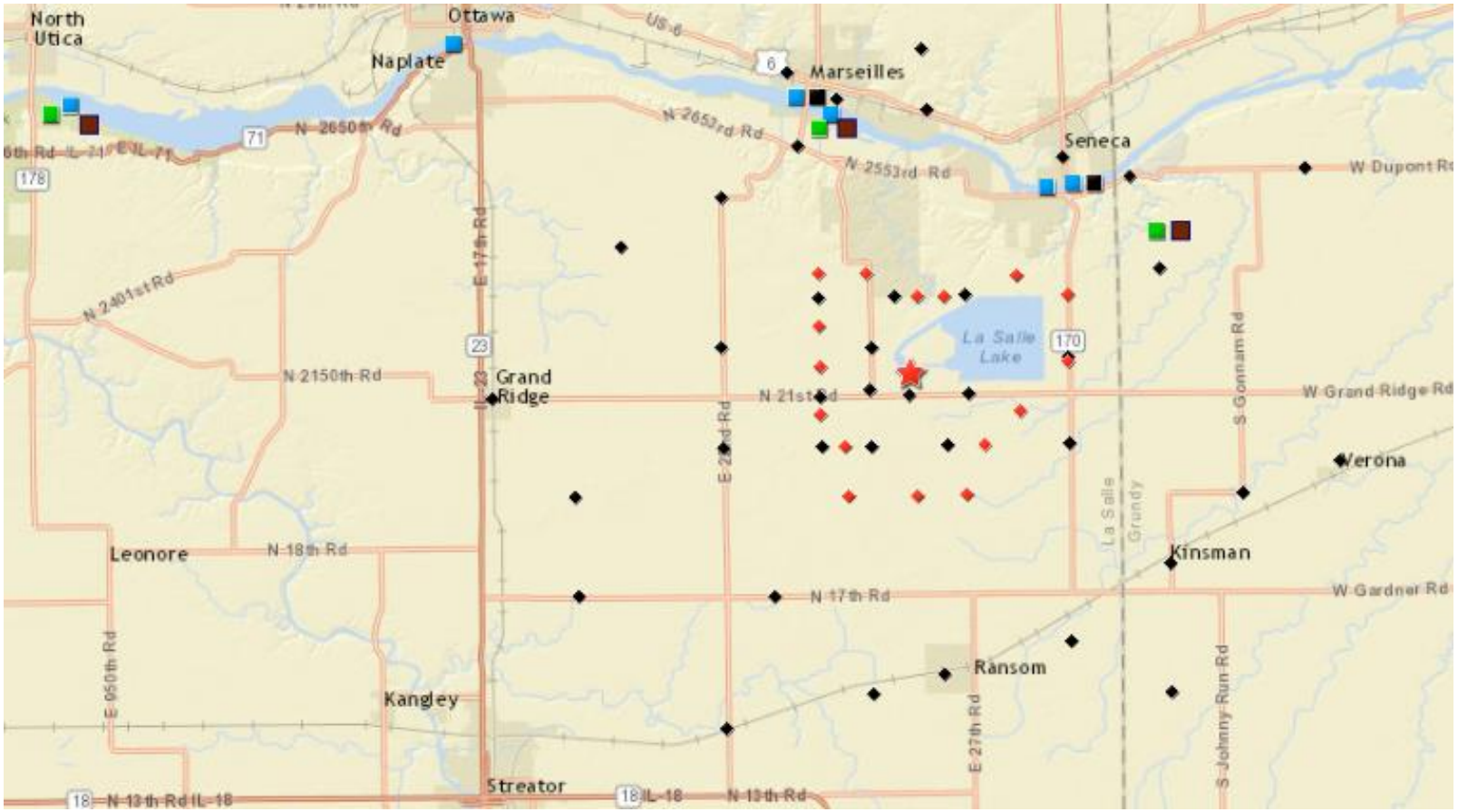
LaSalle Nuclear Power Station

LaSalle Station is located in LaSalle County, near Marseilles in northern Illinois. This station has two boiling water reactors used to generate electricity for Exelon. Unit 1 began operation in March 1982 and Unit 2 in late December of 1983.

Liquid effluents from the LaSalle Station are released to the LaSalle cooling lake 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.

Figure 13 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 13. Overview of IEMA Monitoring Locations for LaSalle



Map Key:

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

* OSL = Optically-Stimulated Luminescence Dosimeter

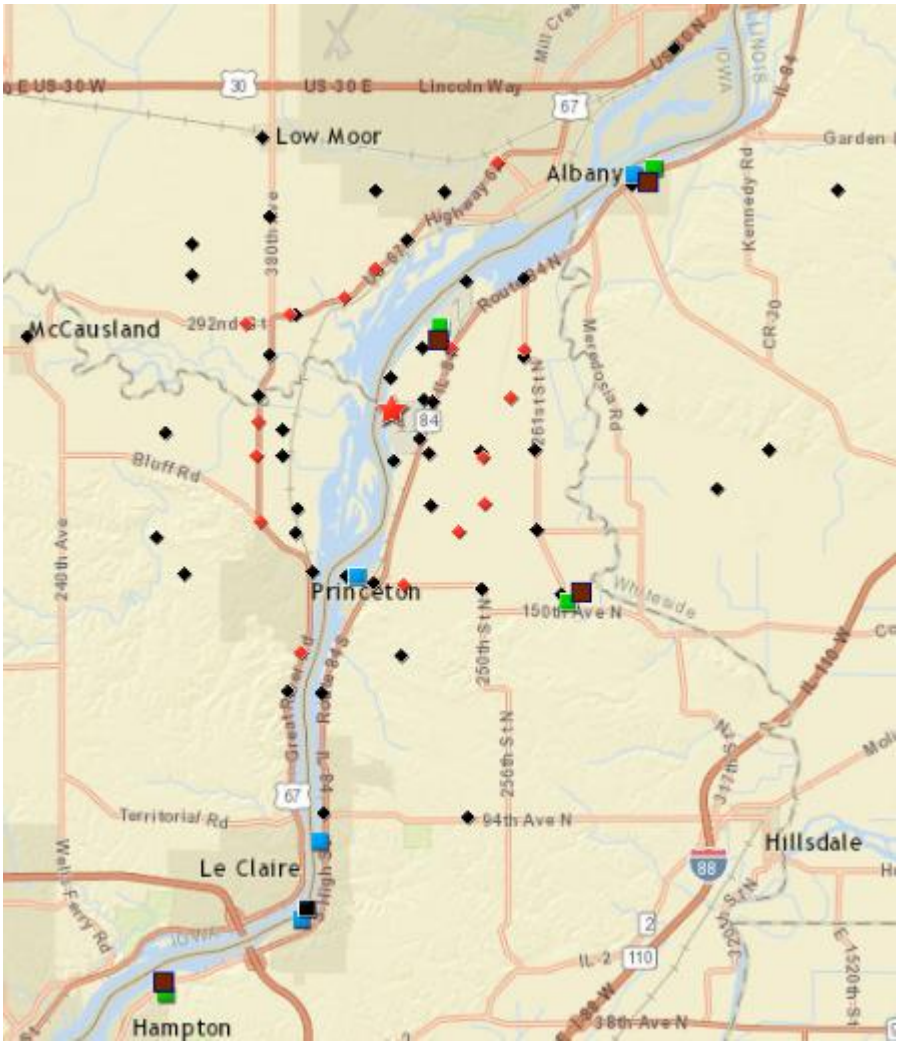
Quad Cities Nuclear Power Station

Quad Cities Station is located in Rock Island County in northwestern Illinois, approximately 20 miles northeast of Moline, Illinois. This station utilizes two boiling water reactors to generate electricity for Exelon.

Liquid effluents from the Quad Cities Station are released to the adjacent Mississippi River.

Figure 14 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 14. Overview of IEMA Monitoring Locations for Quad Cities



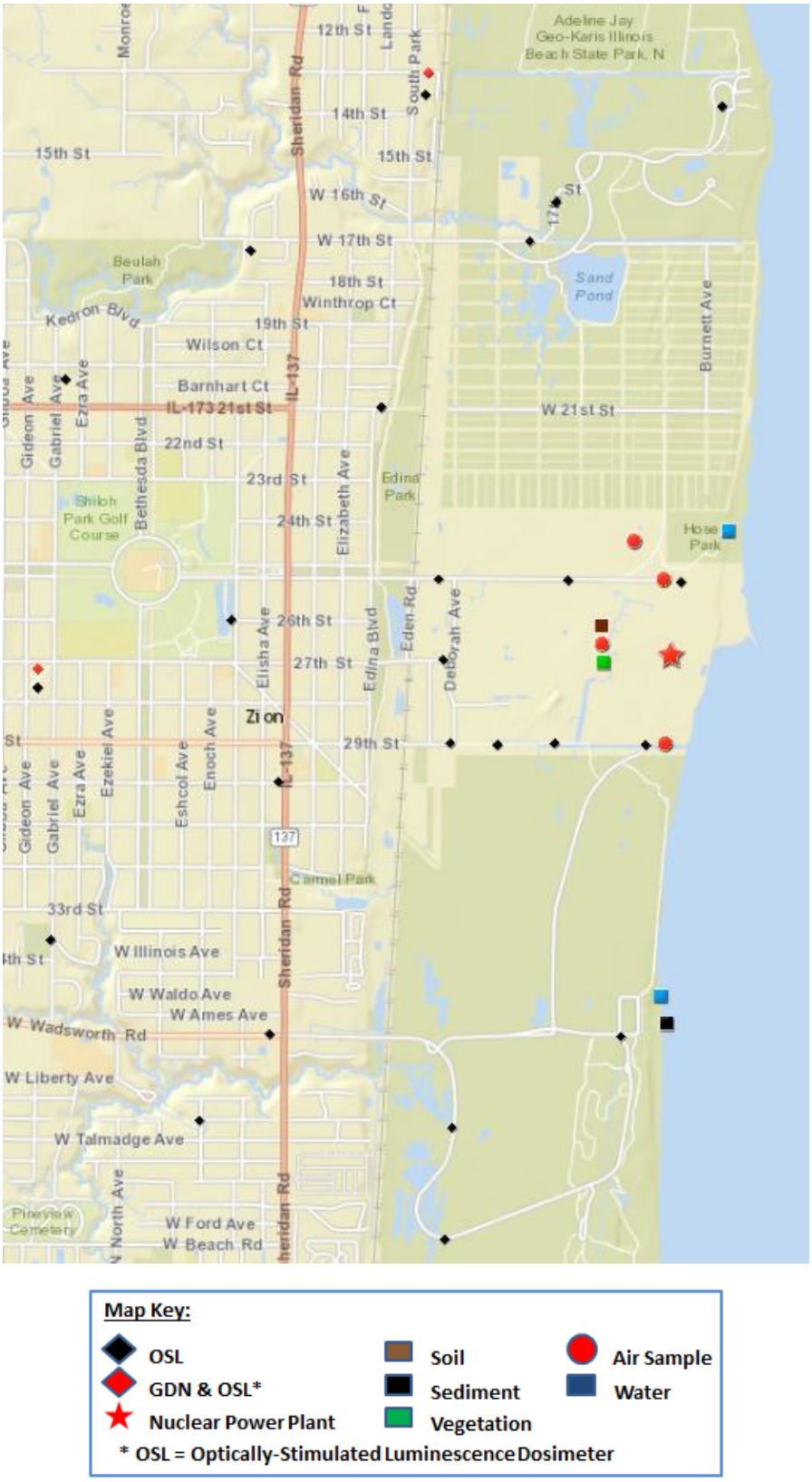
Zion Nuclear Power Station

Zion Station is located next to Lake Michigan in Zion, Illinois 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 2014, the plant remained in SAFSTOR status allowing the facility to be safely stored, decontaminated, and decommissioned to levels that permit release for unrestricted use. In December 2014, ZionSolutons began the process of transferring spent fuel assemblies from the fuel pool into dry cask storage at the on-site the Independent Spent Fuel Storage Installation (ISFSI).

Liquid effluents from the Zion Station were released to Lake Michigan at a point near Zion Beach during the time the Zion Station was operational.

Figure 14 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 15. Overview of IEMA Monitoring Locations for Zion



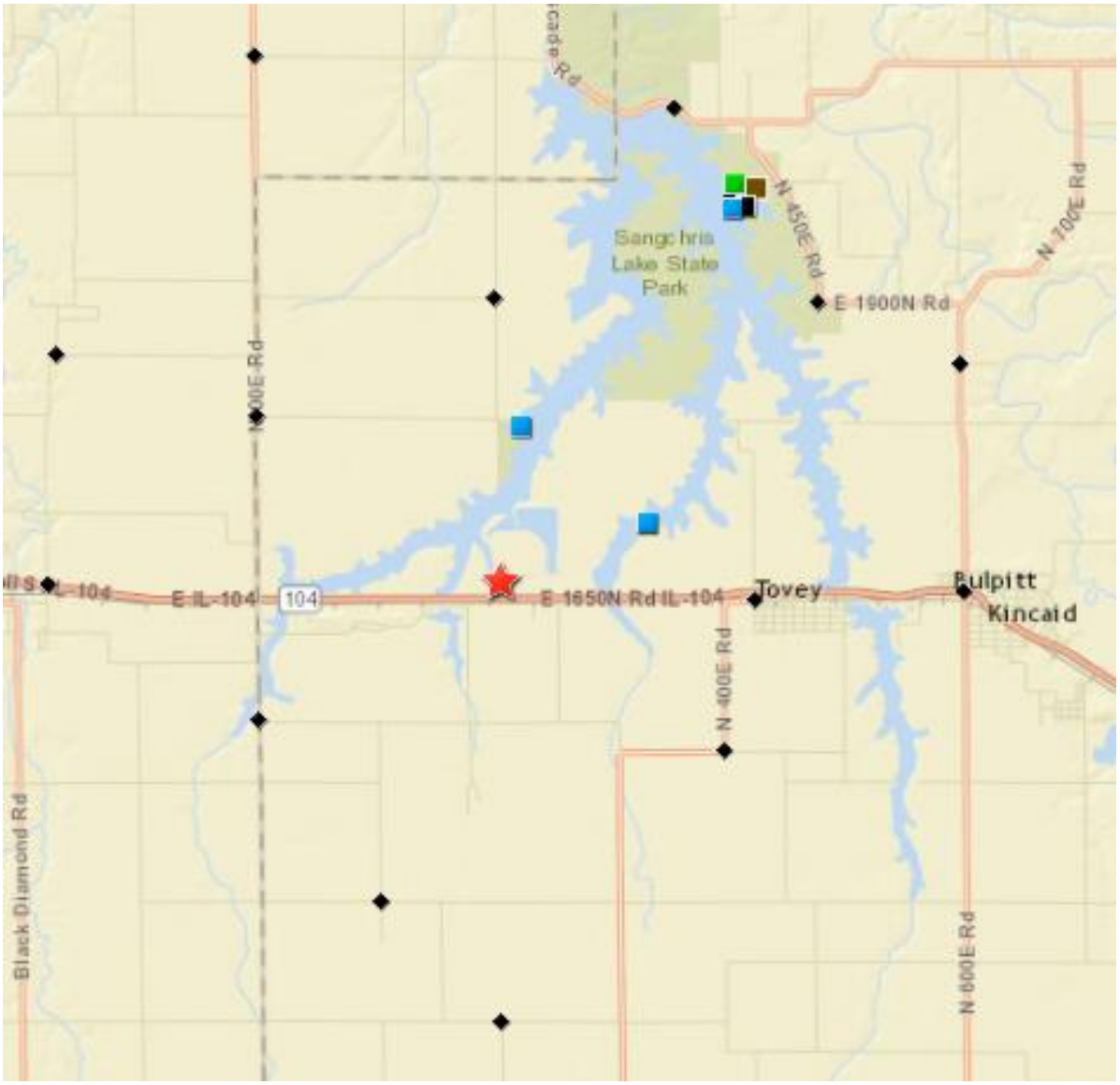
Background Sampling Locations

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 the nuclear power station.

Since we routinely take air samples around the Zion facility, we have also established a Background Sampling Location for air samples. A continuous air sampling station is location near the IEMA Laboratory in Springfield, and samples are exchanged weekly, similar to the air samplers in the vicinity of Zion.

Figure 16 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 16. Overview of IEMA Monitoring Locations for Sangchris Lake State Park



Map Key:

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

* OSL = Optically-Stimulated Luminescence Dosimeter

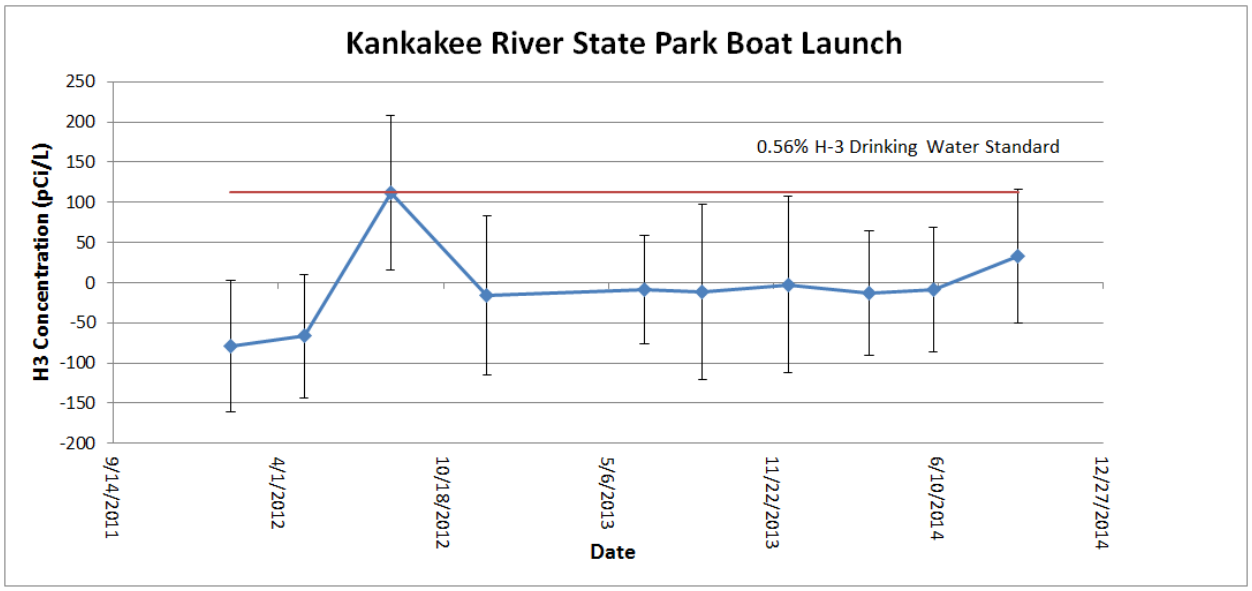
Appendix A
Braidwood Sample Results

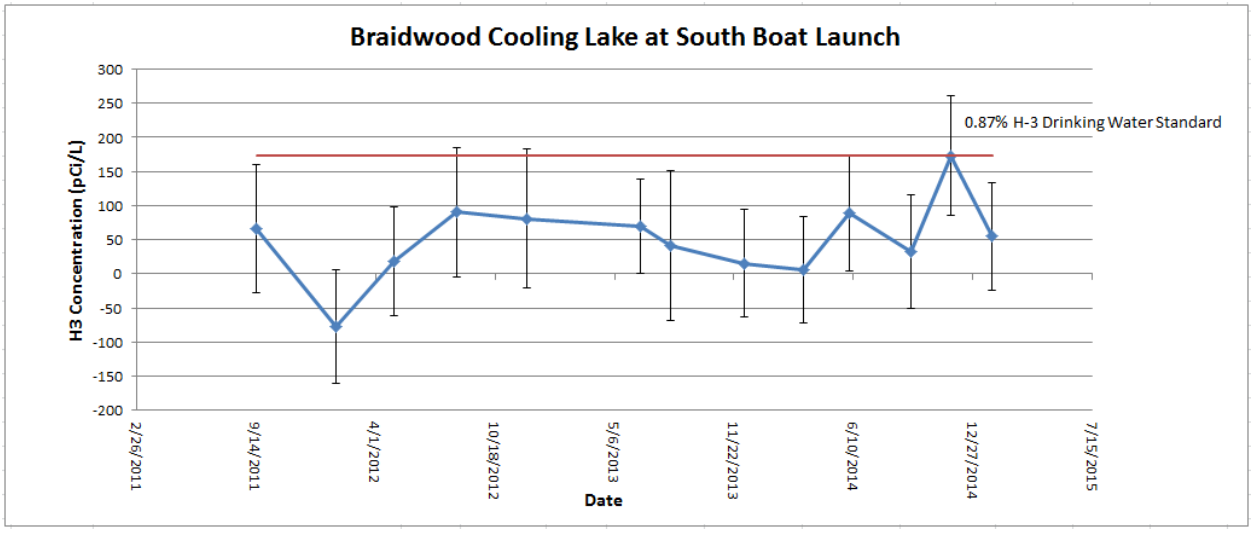
Table A-1. Tritium in Water Sample Results for Braidwood Area
Results are in picocuries per liter (pCi/L)

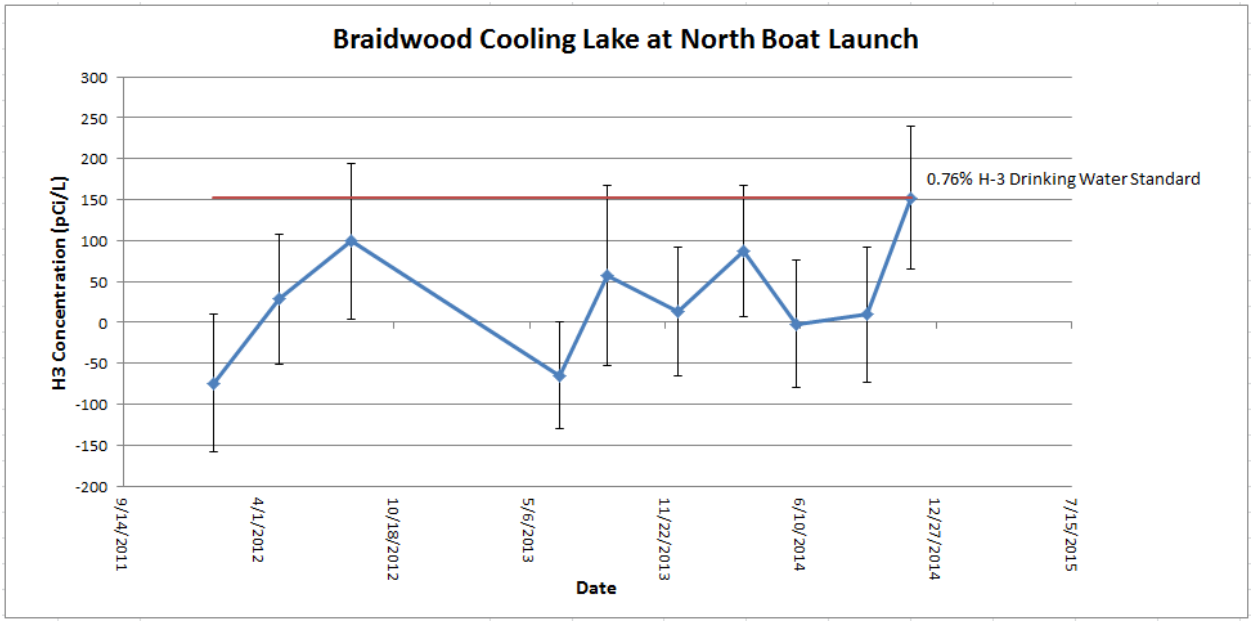
Location	Date	Result		Error
BD-51 (PW-015) Fatlan Well	4/9/2014	-87.3	±	75.6
BD-51 (PW-015) Fatlan Well	7/22/2014	-18.8	±	82.7
BD-51 (PW-015) Fatlan Well	10/13/2014	236	±	107
Braidwood Cooling Lake at north boat launch	3/18/2014	87.1	±	80.1
Braidwood Cooling Lake at north boat launch	6/4/2014	-2.19	±	78.2
Braidwood Cooling Lake at north boat launch	9/15/2014	9.33	±	83
Braidwood Cooling Lake at north boat launch	11/20/2014	152	±	87.1
Braidwood Cooling Lake at S. boat launch	3/18/2014	6.53	±	77.9
Braidwood Cooling Lake at S. boat launch	6/4/2014	88.8	±	85.3
Braidwood Cooling Lake at S. boat launch	9/15/2014	32.6	±	83.6
Braidwood Cooling Lake at S. boat launch	11/20/2014	173	±	87.6
DS-02	6/12/2014	106	±	86.7
DS-02	9/17/2014	21.7	±	110
DS-02	11/7/2014	28.3	±	91.2
Kankakee R. at Des Plaines Cons Area Boat Launch	6/4/2014	-39.4	±	77.2
Kankakee R. at Des Plaines Cons Area Boat Launch	9/15/2014	49	±	84.1
Kankakee R. at Kankakee River State Park boat launch	3/18/2014	-13.1	±	77.4
Kankakee R. at Kankakee River State Park boat launch	6/4/2014	-8.76	±	78
Kankakee R. at Kankakee River State Park boat launch	9/15/2014	32.6	±	83.6
Kankakee R. at Wilmington Island Park-S. end of island above dam	3/18/2014	56.6	±	79.3
Kankakee R. at Wilmington Island Park-S. end of island above dam	6/4/2014	-28.5	±	77.5
Kankakee R. at Wilmington Island Park-S. end of island above dam	9/15/2014	56	±	84.3
Kankakee R. at Wilmington Island Park-S. end of island above dam	11/20/2014	105	±	85.9
MW-04	5/10/2014	556	±	97.9
MW-04	9/12/2014	553	±	98.3
MW-04	9/24/2014	529	±	97.6
MW-04	11/4/2014	645	±	99.6
MW-103	6/3/2014	75.4	±	85.7
MW-109 D	6/6/2014	163	±	87.9
MW-109 D	9/17/2014	137	±	88.3
MW-109 D	11/7/2014	104	±	86.8
MW-111 DR	6/24/2014	61.2	±	85.2
MW-111 DR	9/18/2014	99.8	±	87.3
MW-111 DR	11/7/2014	87.5	±	86.3
MW-112 D	6/13/2014	2.35	±	83.6
MW-112 D	9/18/2014	34.8	±	85.6
MW-112 D	11/7/2014	106	±	86.8
MW-130 D	6/6/2014	137	±	87.3
MW-130 D	9/17/2014	39.5	±	85.8
MW-130 D	11/7/2014	94.4	±	86.5

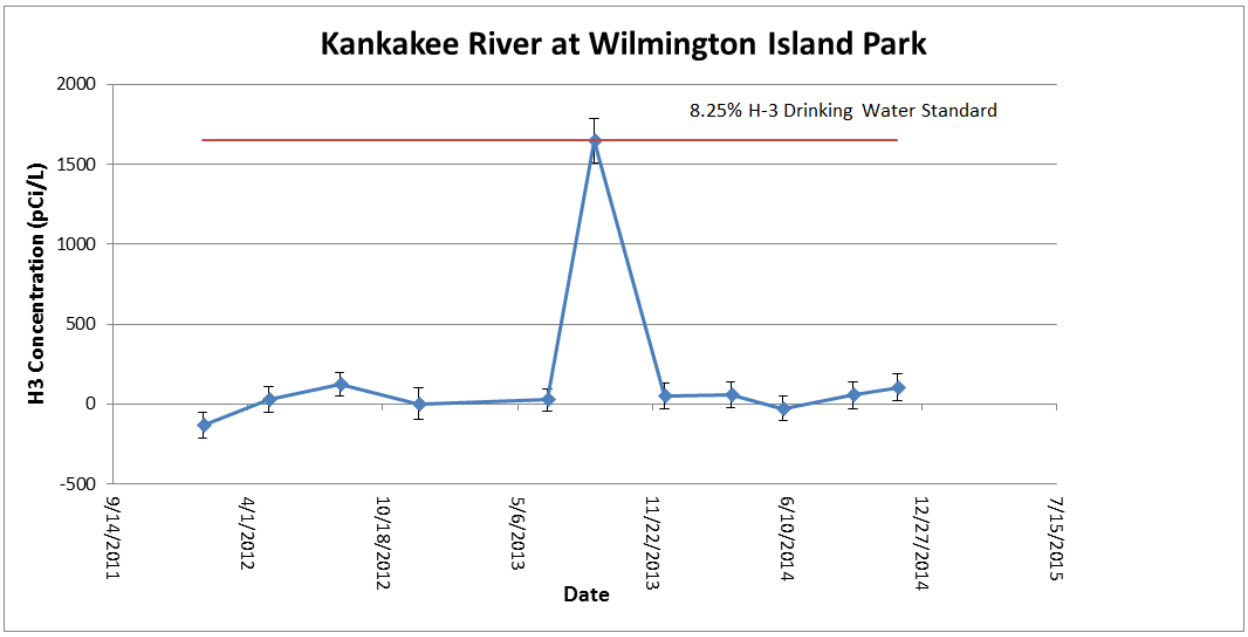
Location	Date	Result		Error
MW-131 D	6/12/2014	82.4	±	85.8
MW-131 D	9/18/2014	109	±	87.5
MW-131 D	11/7/2014	122	±	87.2
MW-134 D	6/3/2014	-4.72	±	83.6
MW-134 D	9/18/2014	2.32	±	84.8
MW-134 D	11/19/2014	73	±	92.2
PW-006	1/31/2014	8.82	±	79
PW-006	4/9/2014	-37.1	±	76.9
PW-006	7/22/2014	-46.9	±	81.9
PW-006	10/13/2014	141	±	105
PW-006 A	4/9/2014	-37.1	±	76.9
PW-006 A	7/22/2014	63.3	±	84.9
PW-006 A	10/13/2014	58.3	±	103
PW-006P	1/31/2014	6.62	±	78.9
PW-006P	4/9/2014	-17.5	±	77.5
PW-006P	7/22/2014	61	±	84.8
PW-006P	10/13/2014	55.9	±	103
PW-011	1/31/2014	-46.3	±	77.5
PW-011	4/9/2014	-19.6	±	77.4
PW-011	7/22/2014	2.34	±	83.3
PW-011	10/13/2014	51	±	103
PW-013	1/31/2014	-90.4	±	76.3
PW-013	4/9/2014	34.5	±	111
PW-013	7/22/2014	19.7	±	78.8
PW-013	10/13/2014	51.0	±	103.0
PW-016	4/9/2014	58.9	±	79.5
PW-016	7/22/2014	79.7	±	85.3
PW-016	10/13/2014	119.0	±	104.0
SW-005	1/31/2014	99.2	±	81.4
SW-005	4/9/2014	-23.0	±	109.0
SW-005	7/22/2014	37.3	±	79.3
SW-005	10/13/2014	200.0	±	84.3

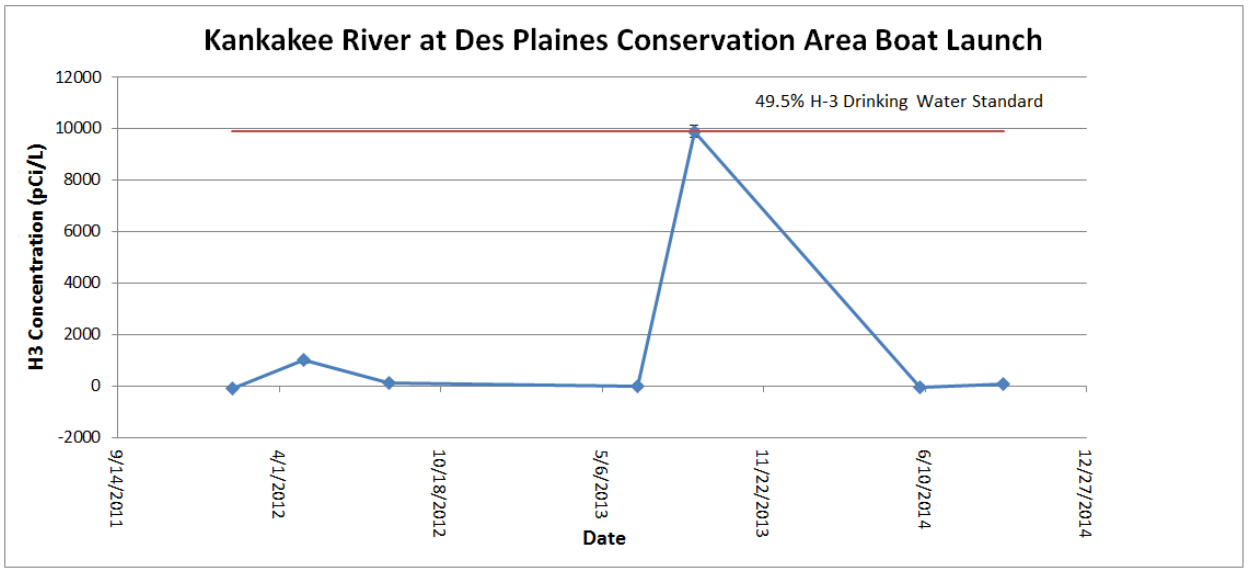
Tables A-2. Trending Graphs for Water from the Braidwood Area
(Highest results on graphs indicate percentage of US EPA Drinking Water Standard)

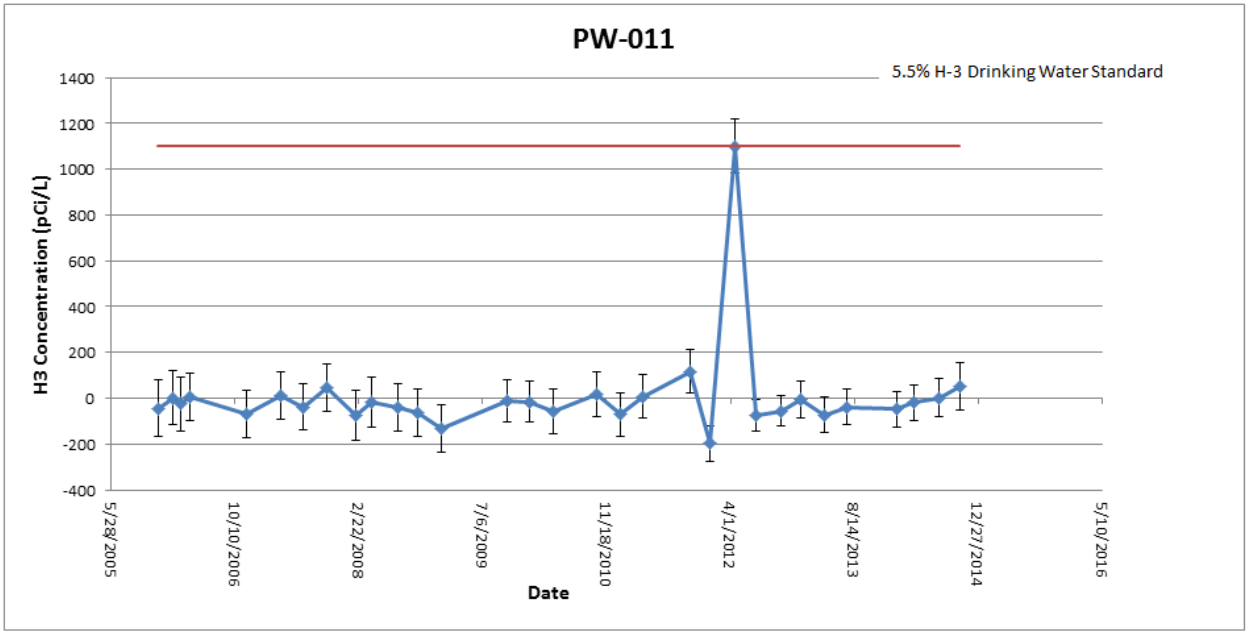


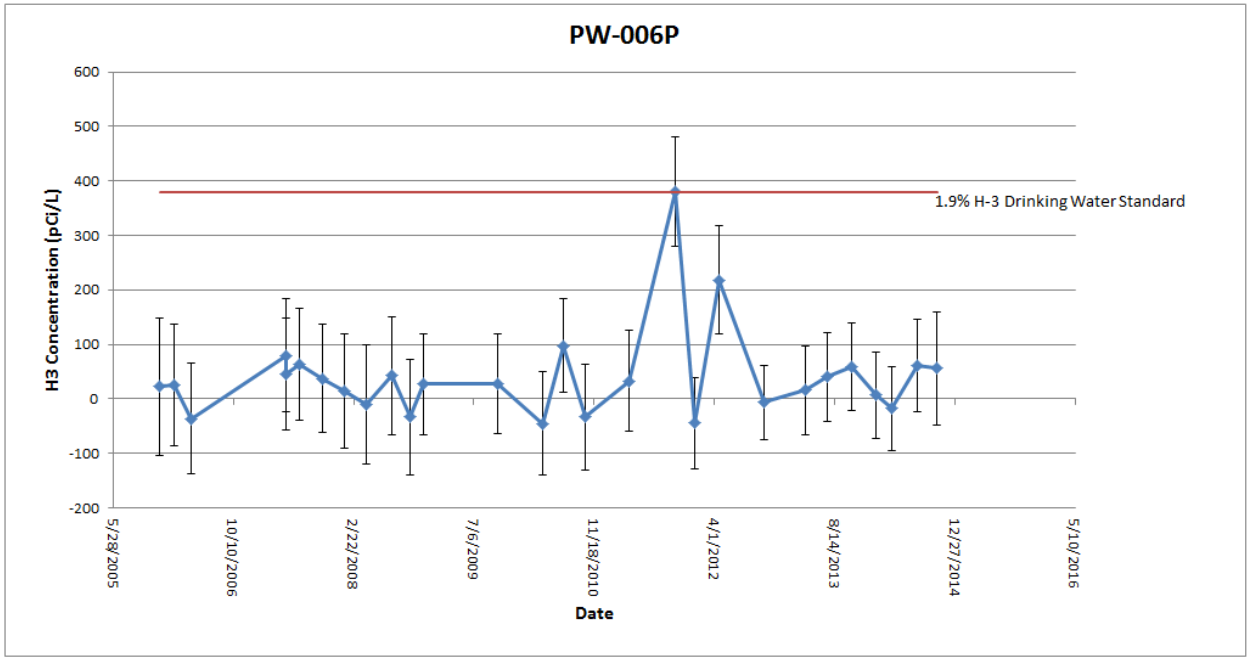


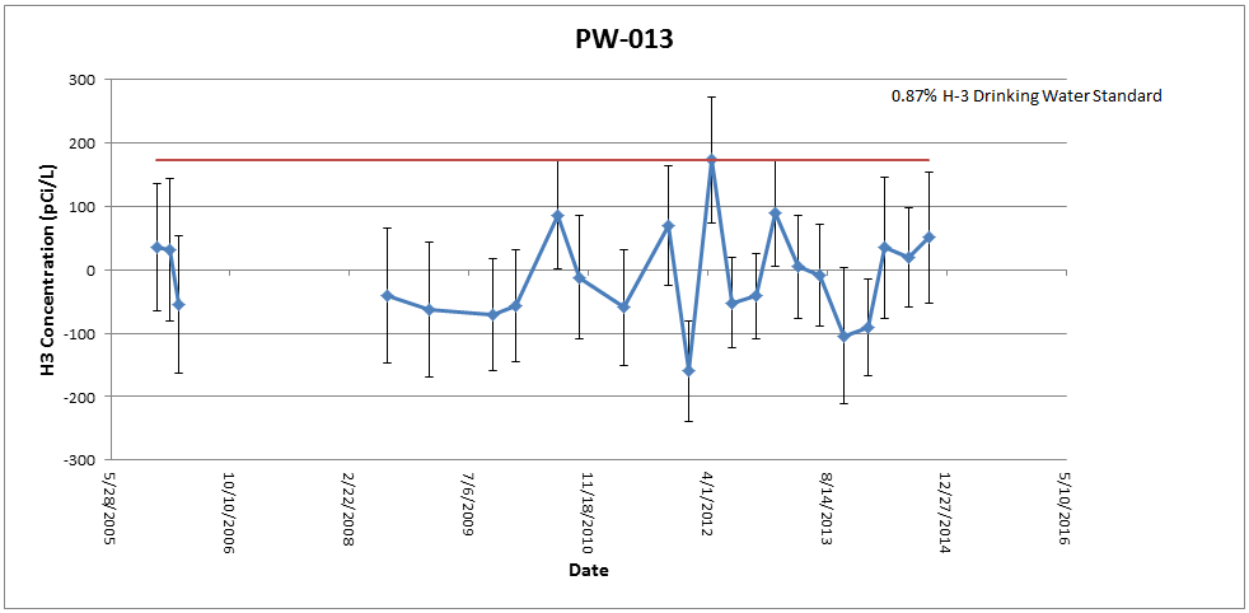

Braidwood Cooling Lake at North Boat Launch
H3 Concentration (pCi/L)
300
250
200
150
100
50
0
-50
-100
-150
-200
0.76% H-3 Drinking Water Standard
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
Date

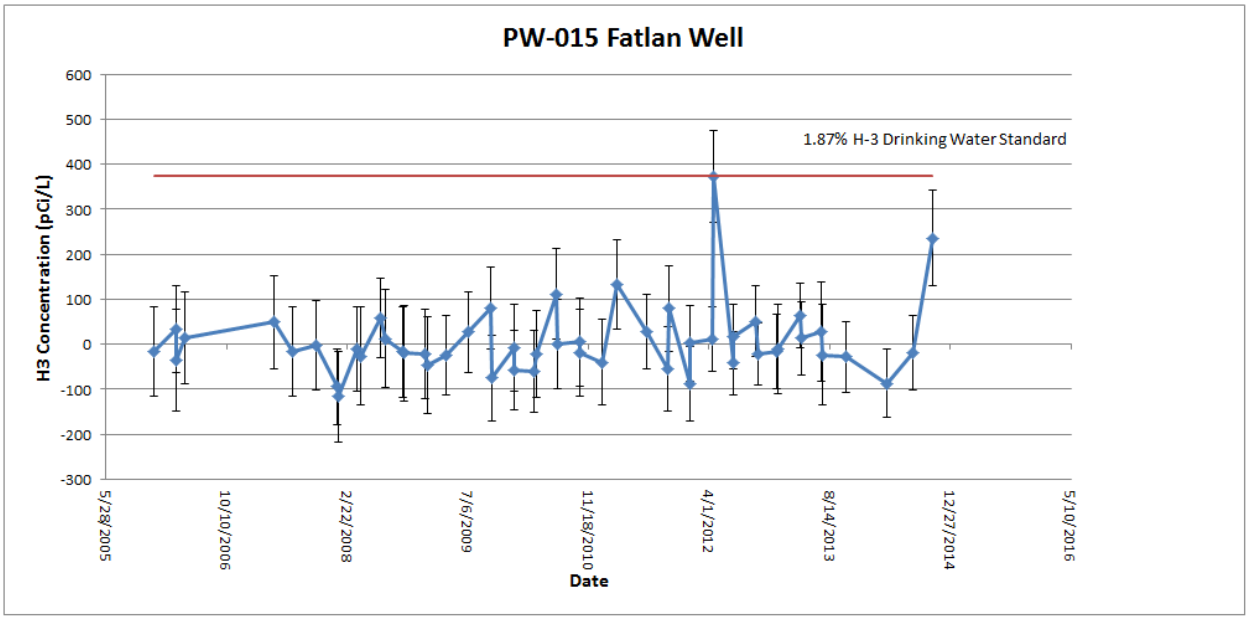

Kankakee River at Wilmington Island Park
H3 Concentration (pCi/L)
2000
1500
1000
500
0
-500
8.25% H-3 Drinking Water Standard
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
Date

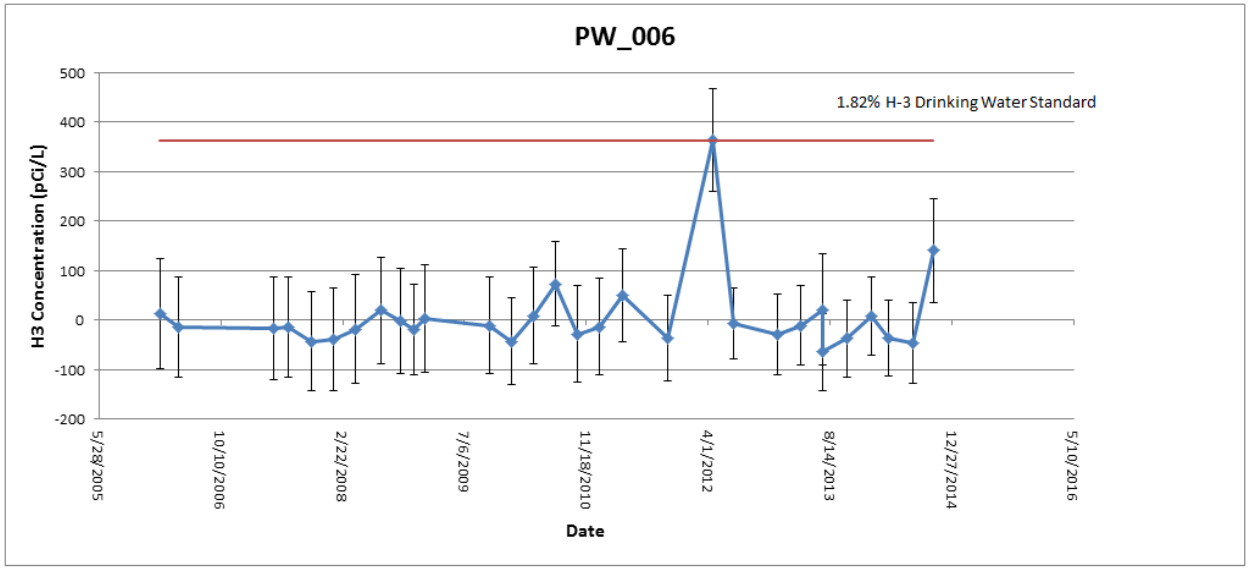

Kankakee River at Des Plaines Conservation Area Boat Launch
49.5% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
12000
10000
8000
6000
4000
2000
0
-2000
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
Date

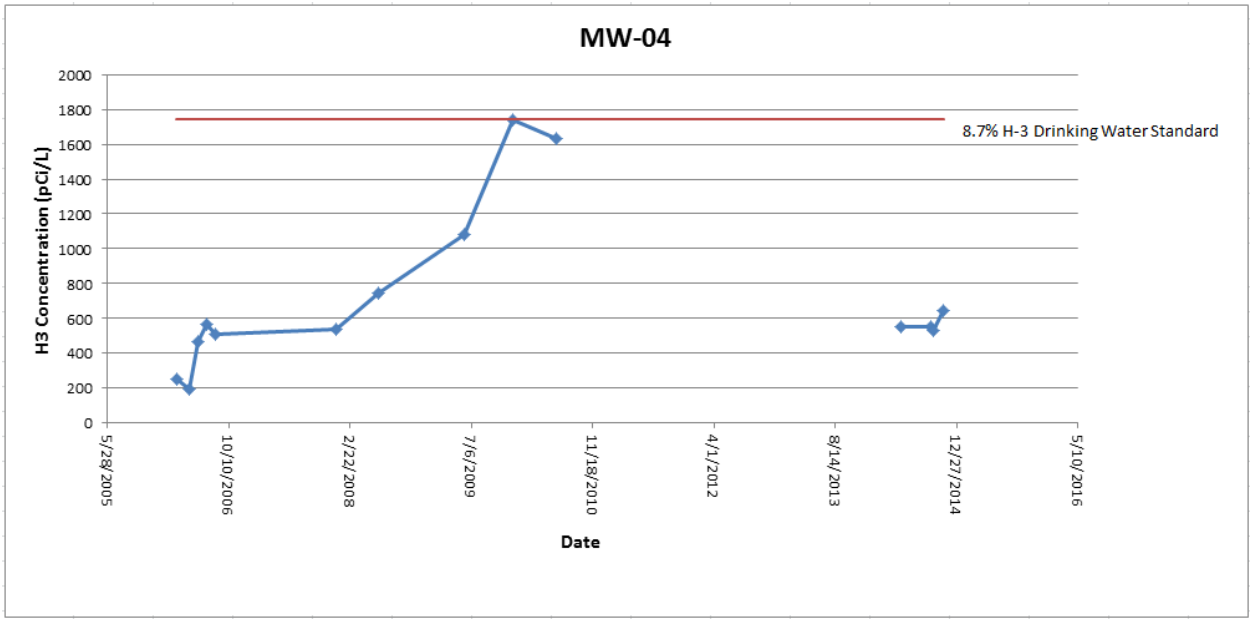

PW-011
5.5% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
1400
1200
1000
800
600
400
200
0
-200
-400
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

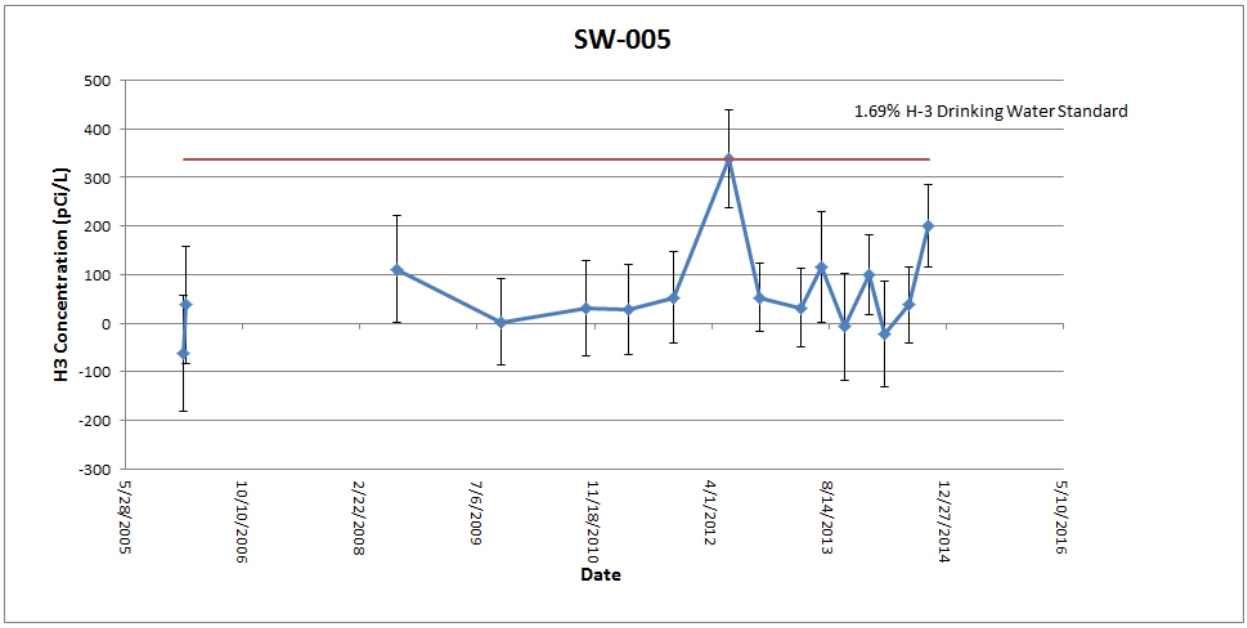

PW-006P
600
500
400
300
200
100
0
-100
-200
H3 Concentration (pCi/L)
1.9% H-3 Drinking Water Standard
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

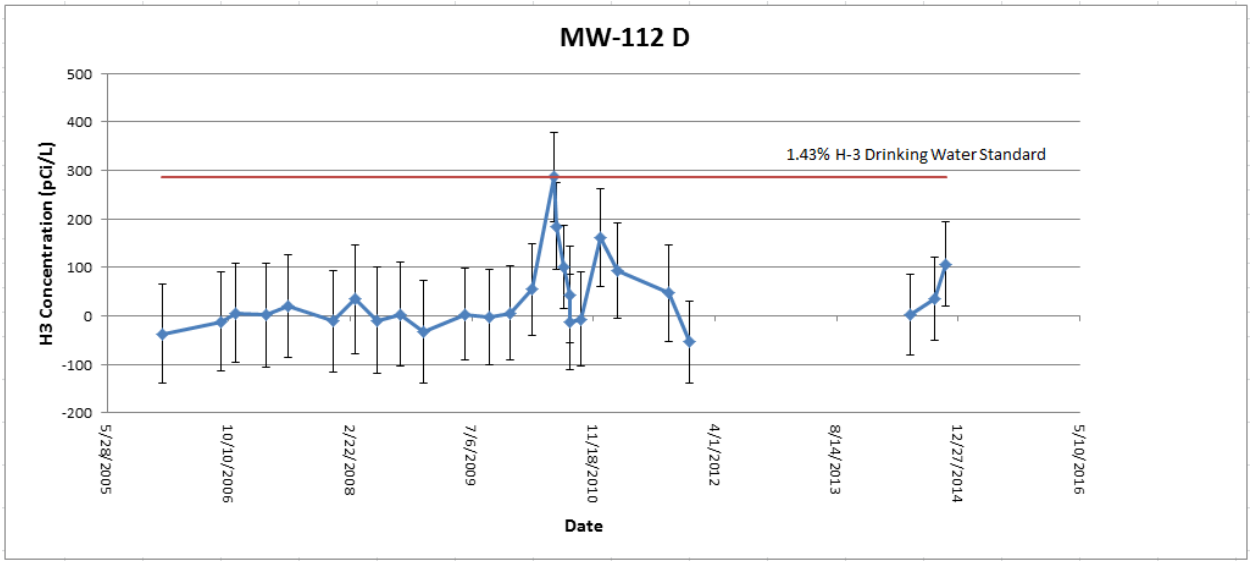

PW-013
300
200
100
0
-100
-200
-300
H3 Concentration (pCi/L)
0.87% H-3 Drinking Water Standard
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

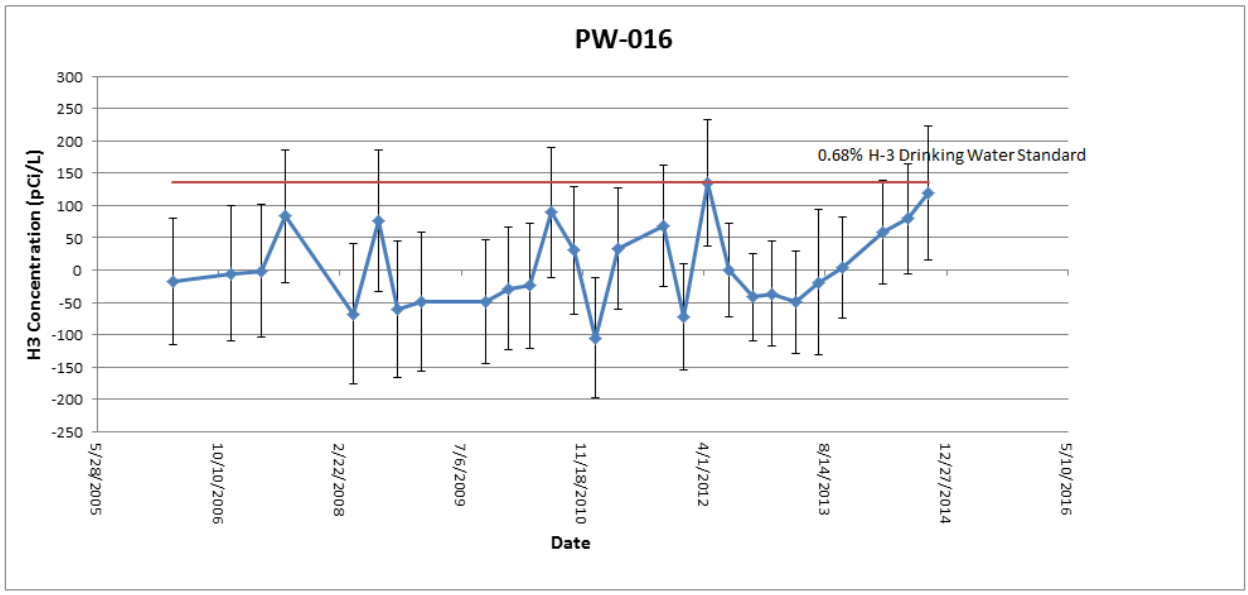

PW-015 Fatlan Well
1.87% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
600
500
400
300
200
100
0
-100
-200
-300
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

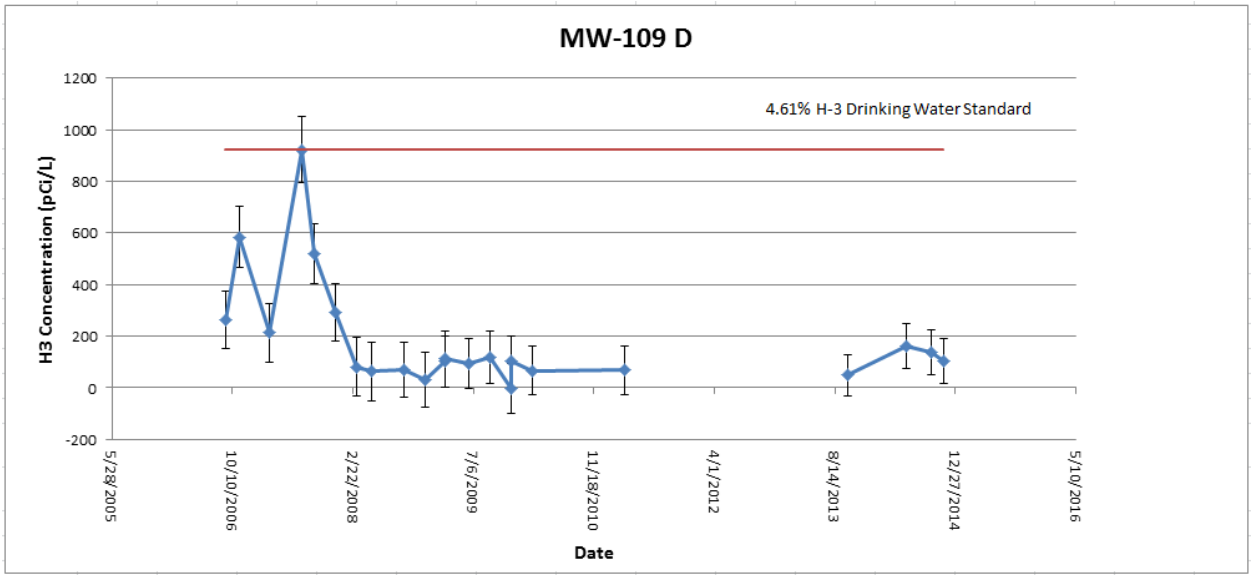

PW_006
1.82% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
500
400
300
200
100
0
-100
-200
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

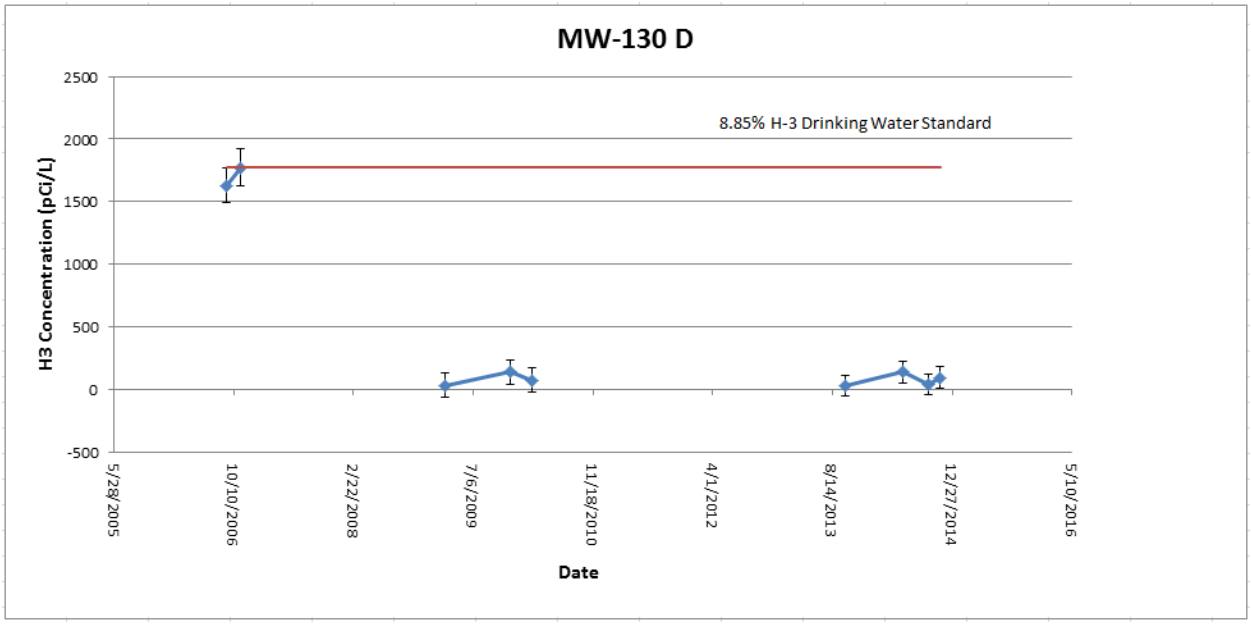

MW-04
H3 Concentration (pCi/L)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
8.7% H-3 Drinking Water Standard
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

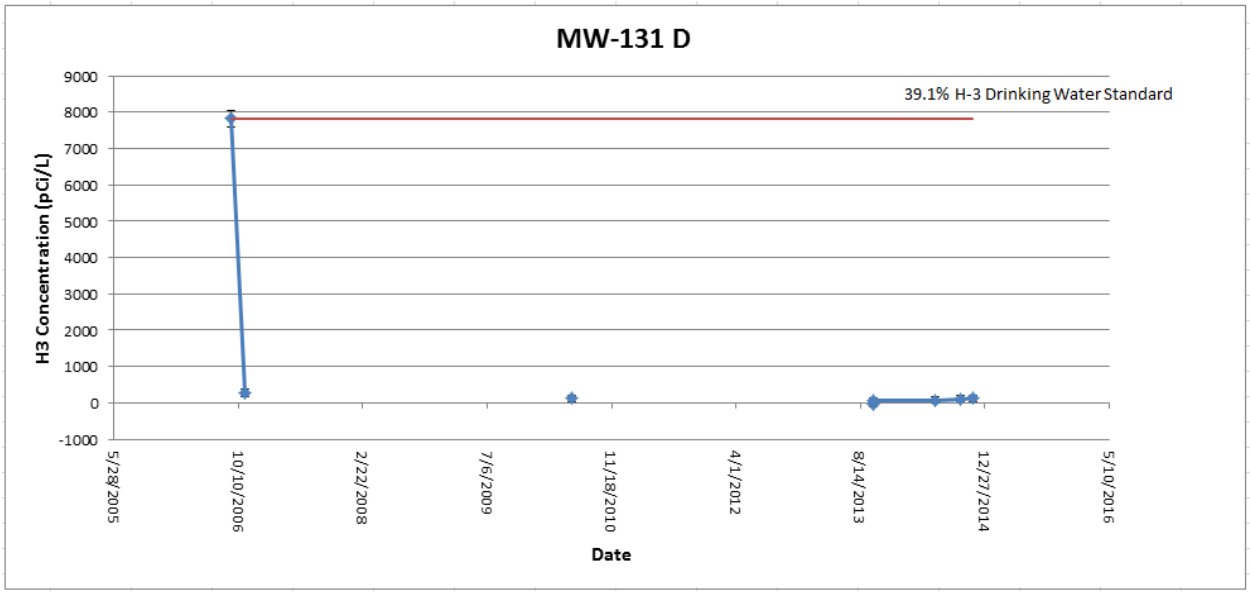

SW-005
H3 Concentration (pCi/L)
500
400
300
200
100
0
-100
-200
-300
1.69% H-3 Drinking Water Standard
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

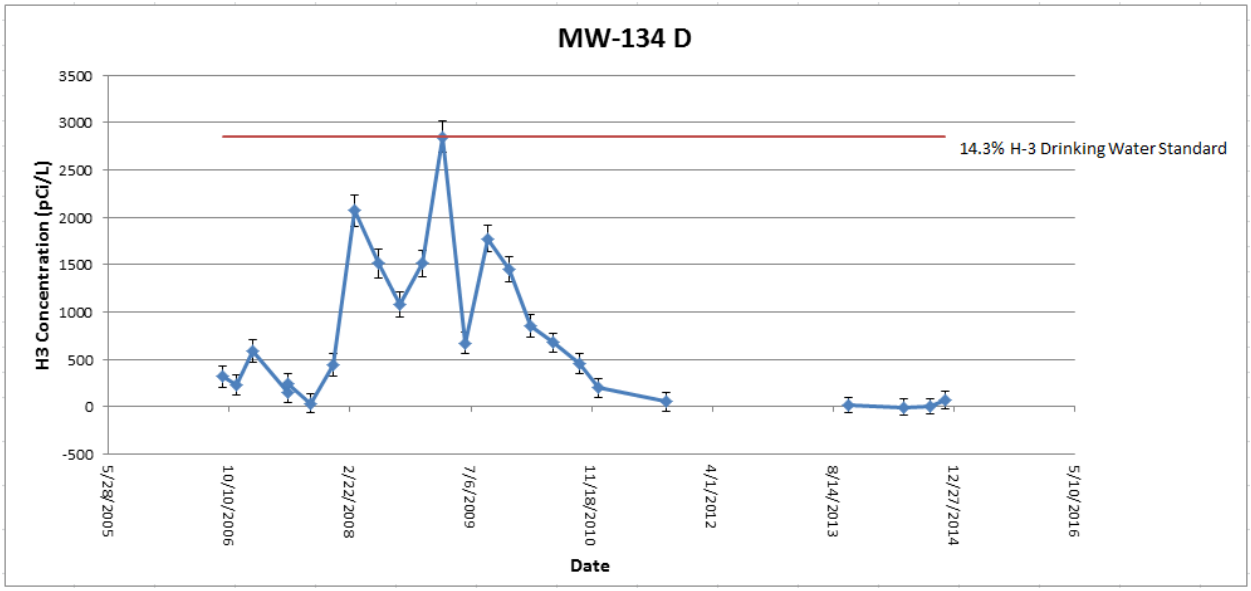

MW-112 D
H3 Concentration (pCi/L)
500
400
300
200
100
0
-100
-200
1.43% H-3 Drinking Water Standard
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

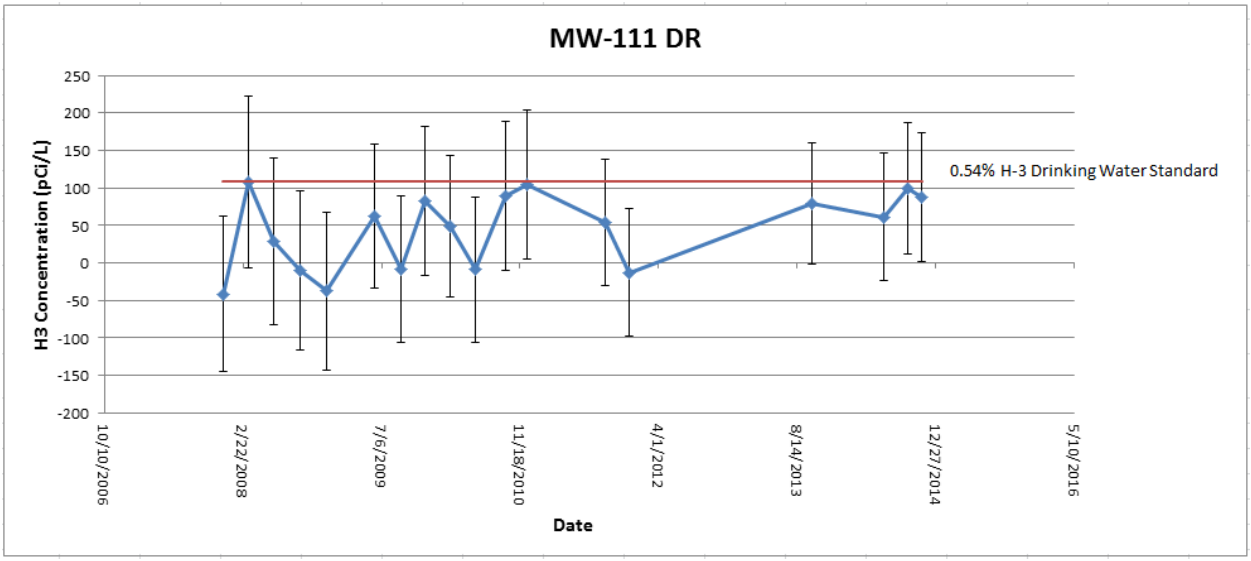

PW-016
H3 Concentration (pCi/L)
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
0.68% H-3 Drinking Water Standard
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

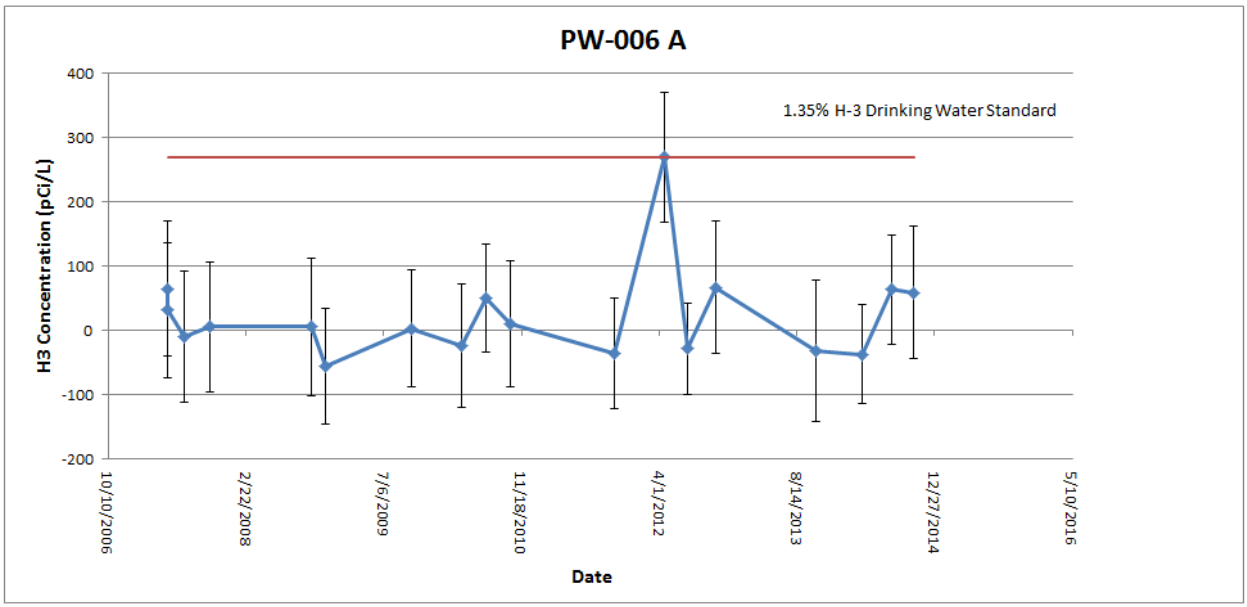

MW-109 D
4.61% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
1200
1000
800
600
400
200
0
-200
5/28/2005
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date


MW-130 D
8.85% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
2500
2000
1500
1000
500
0
-500
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
Date


MW-131 D
39.1% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
-1000
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
Date


MW-134 D
14.3% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
3500
3000
2500
2000
1500
1000
500
0
-500
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
Date


MW-111 DR
H3 Concentration (pCi/L)
250
200
150
100
50
0
-50
-100
-150
-200
0.54% H-3 Drinking Water Standard
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date


PW-006 A
H3 Concentration (pCi/L)
400
300
200
100
0
-100
-200
1.35% H-3 Drinking Water Standard
10/10/2006
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

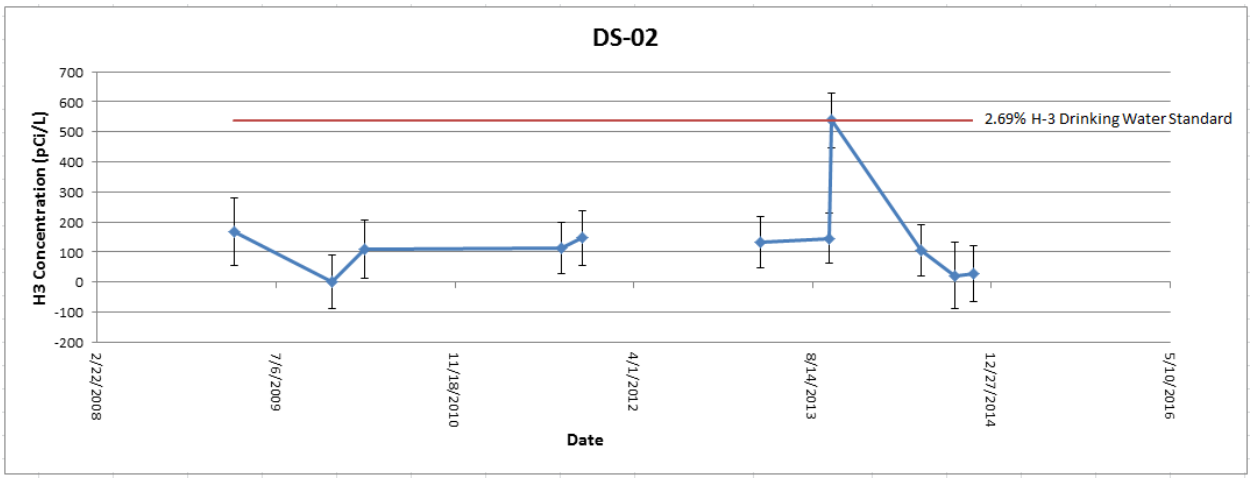

DS-02
H3 Concentration (pCi/L)
700
600
500
400
300
200
100
0
-100
-200
2.69% H-3 Drinking Water Standard
2/22/2008
7/6/2009
11/18/2010
4/1/2012
8/14/2013
12/27/2014
5/10/2016
Date

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 / Date	Alpha Result		Alpha Error	Beta Result		Beta Error
Braidwood Cooling Lake at north boat launch						
3/18/2014	1.8	±	1.4	3.9	±	2.7
6/4/2014	2.3	±	1.4	2.9	±	2.5
9/15/2014	1.2	±	1.3	6.5	±	2.8
11/20/2014	3.6	±	1.5	6.8	±	2.5
Braidwood Cooling Lake at south boat launch						
3/18/2014	2.0	±	1.4	3.8	±	2.7
6/4/2014	2.8	±	1.4	9.0	±	2.7
9/15/2014	0.6	±	1.3	4.3	±	2.7
11/20/2014	1.3	±	1.4	4.1	±	2.4
Kankakee R. at Des Plaines Cons Area Boat Launch						
6/4/2014	0.4	±	1.3	4.9	±	2.6
9/15/2014	-0.2	±	1.3	5.6	±	2.8
Kankakee R. at Kankakee River State Park boat launch						
3/18/2014	-0.1	±	1.3	1.3	±	2.6
6/4/2014	0.0	±	1.3	1.6	±	2.5
9/15/2014	-0.6	±	1.2	2.3	±	2.7
Kankakee R. at Wilmington Island Park-S. end of island above dam						
3/18/2014	0.6	±	1.4	0.6	±	2.6
6/4/2014	-0.3	±	1.3	0.8	±	2.5
9/15/2014	-0.7	±	1.2	4.2	±	2.7
11/20/2014	1.6	±	1.4	4.3	±	2.4

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 / Date	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Braidwood Cooling Lake at north boat launch																										
3/18/2014	-23.0	19.0	-4.0	13.0	-0.5	1.5	-2.7	1.6	1.3	1.3	0.6	1.2	3.6	3.7	-12.0	11.0	13.0	19.0	1.2	1.3	-0.9	1.9	-5.6	3.5	3.6	2.6
6/4/2014	40.6	21.7	6.7	11.6	0.0	1.3	-0.3	1.2	0.4	1.2	-1.0	1.0	-3.2	3.5	4.6	17.8	13.9	15.9	-0.6	1.2	-2.4	2.3	2.0	2.2	-0.8	2.7
9/15/2014	3.0	5.4	-1.8	8.3	0.1	1.0	-0.1	1.0	1.1	0.9	-0.6	0.8	-2.9	2.1	-0.7	2.3	-9.8	17.2	-1.8	1.0	-0.8	1.0	-5.2	2.3	-1.6	1.6
11/20/2014	3.0	13.0	12.5	9.9	-0.9	1.3	1.6	1.0	-0.5	1.2	-0.3	0.9	-2.1	2.8	-21.3	9.2	-1.0	15.0	1.3	1.0	-0.1	1.7	3.2	2.4	-1.9	2.4
Braidwood Cooling Lake at S. boat launch																										
3/18/2014	12.0	11.0	0.0	10.0	-0.4	1.4	1.2	1.3	-0.8	1.3	-0.3	1.0	-5.9	3.6	5.8	5.6	41.0	15.0	-1.1	1.3	-2.3	1.8	-3.0	3.0	-2.7	2.6
6/4/2014	67.7	42.3	-6.5	11.0	0.2	1.3	0.7	1.0	1.6	1.0	-0.5	1.0	3.1	3.7	-11.5	49.4	7.3	16.7	-0.1	1.0	-0.2	2.2	-1.1	2.4	1.7	2.5
9/15/2014	5.1	5.9	0.8	8.3	0.5	1.0	0.3	1.1	-0.3	1.2	0.4	1.0	-4.7	2.5	-2.0	2.4	12.1	13.8	-0.2	1.1	-1.2	1.4	-3.2	2.4	-3.8	2.0
11/20/2014	28.0	12.0	10.2	9.8	1.7	1.1	-1.4	1.2	-0.4	1.1	-0.9	1.0	0.1	2.8	6.6	8.7	21.0	11.0	-0.9	1.0	-0.4	1.6	0.6	2.0	-1.7	2.2
Kankakee R. at Des Plaines Cons Area Boat Launch																										
6/4/2014	13.4	45.5	2.4	14.1	3.0	1.5	-1.9	1.3	0.0	1.1	1.7	1.1	-6.8	4.3	17.8	57.5	41.3	14.5	-1.4	1.4	1.3	2.5	0.1	2.6	0.4	2.8
9/15/2014	6.2	7.9	-4.9	8.8	-0.5	1.3	-0.3	1.4	0.2	1.3	-0.1	1.0	-0.6	3.0	3.0	3.2	48.2	14.3	0.8	1.1	-4.6	1.6	-1.8	3.2	0.4	2.5
Kankakee R. at Kankakee River State Park boat launch																										
3/18/2014	-1.0	15.0	7.0	11.0	-0.2	1.3	0.2	1.2	-0.3	1.1	-0.9	1.0	-5.1	3.5	-5.0	10.0	44.0	14.0	0.3	1.3	0.6	1.6	0.4	2.5	-2.0	2.4
6/4/2014	4.5	37.2			-0.8	2.3	-0.3	1.8	1.7	1.5	1.4	1.6	-2.0	5.6	24.6	32.1	-37.8	25.6	-1.4	1.9	-0.2	3.1	1.2	4.1	0.2	3.8
9/15/2014	4.2	7.3	14.0	8.8	-1.0	1.2	0.9	1.1	-1.2	1.3	0.0	1.0	0.2	2.9	-0.4	2.9	25.4	14.1	-1.6	1.3	0.1	1.5	-0.4	3.0	-0.3	2.4
Kankakee R. at Wilmington Island Park-S. end of island above dam																										
3/18/2014	0.0	12.0	-8.0	9.7	0.3	1.1	0.3	0.8	0.1	1.0	-0.1	0.8	-0.5	2.5	8.1	8.8	34.0	10.0	0.3	0.9	-0.3	1.4	0.8	1.9	0.6	2.1
6/4/2014	29.0	45.7	27.8	12.7	3.2	1.7	-1.4	1.4	-1.0	1.3	-1.3	1.0	-6.3	5.4	22.4	44.5	8.1	17.0	-0.2	1.2	-1.9	3.0	-2.9	3.3	-0.6	3.4
9/15/2014	-6.5	8.3	2.6	9.6	-0.5	1.1	-1.0	1.2	-1.8	1.2	-0.3	1.0	-3.6	2.7	-4.3	3.6	81.5	13.1	-1.5	1.3	-0.8	1.4	-0.1	2.6	-1.0	2.1
11/20/2014	-6.0	12.0	0.6	7.9	-1.0	1.1	-1.5	1.1	0.6	1.0	0.6	0.9	-2.3	2.9	-6.6	6.8	34.0	18.0	-1.9	1.0	0.4	1.5	-2.8	2.3	-1.5	1.9

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

Location	AC-228		Ba-140		Bi-212		Bi-214		Co-58		Co-60		Cs-134		Cs-137		Fe-59		K-40		Mn-54	
Date	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Braidwood Cooling Lake at S. boat launch																						
6/4/2014	1.0	± 0.0	0.5	± 0.6	1.0	± 0.2	0.6	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.1	18.2	± 0.6	0.0	± 0.0
9/15/2014	1.1	± 0.1	0.0	± 0.1	1.0	± 0.3	0.7	± 0.1	0.0	± 0.0	0.0	± 0.0	0.1	± 0.0	0.0	± 0.0	0.0	± 0.0	19.4	± 1.1	0.0	± 0.0
Evans-Judge Preserve																						
6/4/2014	0.3	± 0.0	-0.8	± 0.4	0.3	± 0.1	0.2	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.2	± 0.0	0.0	± 0.0	11.8	± 0.4	0.0	± 0.0
9/15/2014	0.2	± 0.0	0.0	± 0.0	0.3	± 0.1	0.2	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.2	± 0.0	0.0	± 0.0	12.2	± 0.4	0.0	± 0.0
Wilmington Island area																						
6/4/2014	0.4	± 0.0	-0.6	± 0.6	0.3	± 0.2	0.4	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.3	± 0.0	0.0	± 0.0	11.9	± 0.5	0.0	± 0.0

Location	Nb-95		Pa-234M		Pb-210		Pb-212		Pb-214		Ra-226		Th-234		Tl-208		U-235		Zn-65		Zr-95	
Date	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Braidwood Cooling Lake at S. boat launch																						
6/4/2014	0.0	± 0.0	1.9	± 1.3	1.7	± 0.2	1.0	± 0.0	0.7	± 0.0	1.8	± 0.2	1.1	± 0.2	1.0	± 0.1	0.1	± 0.0	0.0	± 0.0	0.0	± 0.0
9/15/2014	0.0	± 0.0	2.2	± 2.3	1.9	± 0.4	1.1	± 0.1	0.9	± 0.1	1.8	± 0.4	1.2	± 0.5	1.0	± 0.1	0.1	± 0.0	0.0	± 0.0	0.0	± 0.0
Evans-Judge Preserve																						
6/4/2014	0.0	± 0.0	0.0	± 1.0	1.0	± 0.1	0.2	± 0.0	0.2	± 0.0	0.5	± 0.1	0.4	± 0.1	0.2	± 0.0	0.0	± 0.0	0.0	± 0.0	-0.1	± 0.0
9/15/2014	0.0	± 0.0	-0.1	± 0.8	0.5	± 0.2	0.2	± 0.0	0.2	± 0.0	0.5	± 0.1	-0.3	± 0.2	0.2	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
Wilmington Island area																						
6/4/2014	-0.1	± 0.0	0.1	± 1.1	6.4	± 2.0	0.5	± 0.0	0.5	± 0.0	1.3	± 0.2	0.6	± 0.4	0.4	± 0.0	0.1	± 0.0	0.0	± 0.0	-0.2	± 0.1

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

Location	Ac-228		Ba-140		Bi-212		Bi-214		Co-58		Co-60		Cs-134		Cs-137		Fe-59		K-40		Mn-54	
Date	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Braidwood Cooling Lake at N. boat launch																						
6/4/2014	0.3	± 0.0	0.1	± 0.1	0.2	± 0.1	0.2	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	12.3	± 0.4	0.0	± 0.0
11/20/2014	0.2	± 0.0	0.1	± 0.1	0.2	± 0.1	0.2	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	12.1	± 0.4	0.0	± 0.0
Kankakee R. at Kankakee River State Park boat launch																						
6/4/2014	0.3	± 0.0	0.1	± 0.1	0.4	± 0.1	0.4	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	12.6	± 0.4	0.0	± 0.0
Kankakee R. at Wilmington Island Park-S. end of island above dam																						
6/4/2014	0.9	± 0.0	0.0	± 0.2	0.5	± 0.2	1.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0	0.1	± 0.0	0.0	± 0.0	15.4	± 0.6	0.0	± 0.0

Location	Nb-95		Pa-234M		Pb-210		Pb-212		Pb-214		Ra-226		Th-234		Tl-208		U-235		Zn-65		Zr-95	
Date	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Braidwood Cooling Lake at N. boat launch																						
6/4/2014	0.0	± 0.0	1.0	± 1.0	0.5	± 0.1	0.1	± 0.0	0.2	± 0.0	0.1	± 0.1	0.3	± 0.1	0.2	± 0.0	0.0	± 0.0	0.0	± 0.0	0.0	± 0.0
11/20/2014	0.0	± 0.0	0.1	± 0.7	0.7	± 0.2	0.2	± 0.0	0.2	± 0.0	0.7	± 0.1	0.1	± 0.2	0.2	± 0.0	0.0	± 0.0	0.0	± 0.0	-0.1	± 0.0
Kankakee R. at Kankakee River State Park boat launch																						
6/4/2014	0.0	± 0.0	-0.5	± 0.9	0.7	± 0.2	0.3	± 0.0	0.4	± 0.0	0.8	± 0.1	0.5	± 0.2	0.2	± 0.0	0.0	± 0.0	-0.1	± 0.0	0.0	± 0.0
Kankakee R. at Wilmington Island Park-S. end of island above dam																						
6/4/2014	0.0	± 0.0	1.1	± 1.5	0.6	± 1.9	0.8	± 0.0	1.1	± 0.0	1.9	± 0.3	1.4	± 0.5	0.8	± 0.1	0.1	± 0.0	0.0	± 0.0	0.0	± 0.0

Table A-7. Fish Sample Results for Braidwood Area
Results are in picocuries per kilogram (pCi/kg)

Location / Date	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error
Braidwood Plant Effluent (Bottom Feeder)														
8/20/2014	55.3	110.0	0.3	63.1	-7.7	7.3	-2.6	7.0	9.5	6.3	-0.6	5.5	-18.5	21.2
Braidwood Plant Effluent (Top Feeder)														
8/20/2014	149.3	304.0	71.2	176.9	0.4	25.1	-2.3	22.2	22.5	20.4	-17.8	17.8	77.6	60.7

Location / Date	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Braidwood Plant Effluent (Bottom Feeder)												
8/20/2014	-4.4	90.4	4190.0	186.0	-0.2	7.0	1.7	10.0	1.1	16.1	0.0	13.6
Braidwood Plant Effluent (Top Feeder)												
8/20/2014	-69.2	200.7	7400.0	465.0	-9.9	21.5	11.7	34.7	-47.5	51.9	55.9	45.0

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

Location / Date	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Braidwood Cooling Lake at S. boat launch																										
6/4/2014	0.1	1.1	3.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	-1.5	1.8	22.4	0.7	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0
9/15/2014	0.1	0.5	8.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.4	10.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Evans-Judge Preserve																										
6/4/2014	-1.1	0.6	3.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	-0.5	0.7	20.2	0.7	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
9/15/2014	0.0	0.2	3.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	11.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wilmington Island area																										
6/4/2014	1.4	1.6	2.3	0.3	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.1	2.6	28.4	1.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1
9/15/2014	0.3	0.8	2.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	1.1	21.8	0.8	0.0	0.0	-0.1	0.0	0.0	0.0	0.1	0.0

Table A-9. Braidwood Gamma Detection Network Results

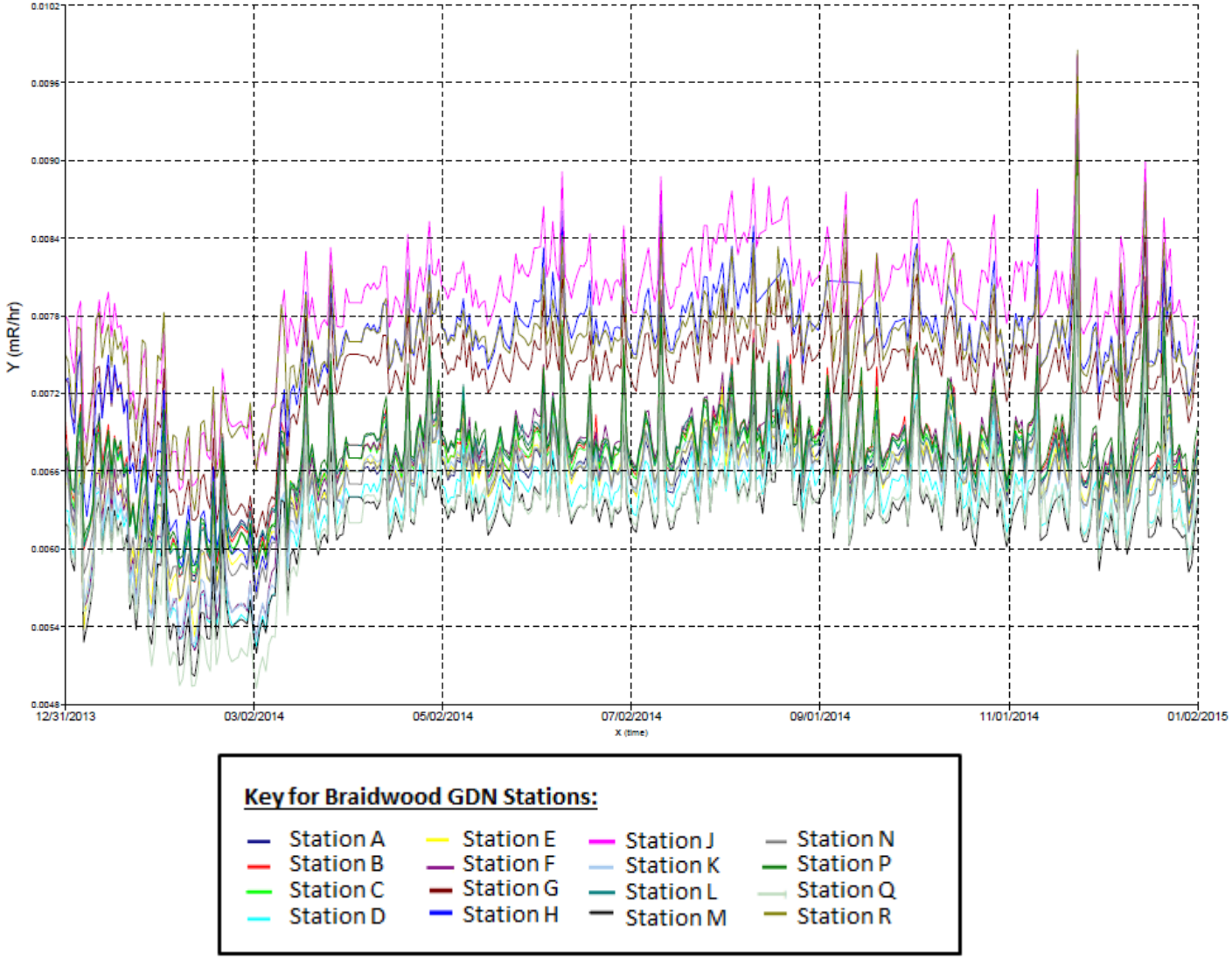


Table A-10. Summary of Ambient Gamma Results for Braidwood Area

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
BR001	0.12	0.14	0.13	0.14	47.72
BR005	0.10	0.11	0.11	0.11	38.96
BR008	0.12	0.12	0.12	0.15	46.63
BR010	0.11	0.09	0.10	0.10	35.95
BR012	0.07	0.06	0.09	0.08	26.19
BR014	0.07	0.05	0.08	0.08	25.55
BR015	0.06	0.04	0.08	0.08	23.63
BR016	0.08	0.06	0.07	0.09	27.28
BR017	0.07	0.06	0.07	0.08	24.55
BR020	0.08	0.06	0.07	0.08	27.10
BR025	0.09	0.09	0.10	0.11	35.95
BR027	0.08	0.07	0.08	0.09	29.93
BR029	0.08	0.08	0.08	0.09	29.29
BR031	0.05	0.07	0.08	0.08	25.37
BR032	0.07	0.07	0.08	0.07	26.74
BR033		0.09	0.09	0.12	35.89
BR034	0.11	0.09	0.11	0.13	40.97
BR035	0.12	0.09	0.13	0.12	42.16
BR036	0.06	0.05	0.06	0.10	24.18
BR037	0.07	0.07	0.07	0.09	27.92
BR038	0.09	0.07	0.08	0.09	30.02
BR039	0.09	0.09	0.12	0.12	38.23
BR040	0.10	0.11	0.13	0.14	43.53
BR041	0.07	0.05	0.07	0.09	25.64
BR042	0.10	0.08	0.10	0.13	38.69
BR043	0.08	0.07	0.07	0.08	26.55
BR044	0.06	0.06	0.07	0.08	24.55
BR045	0.06	0.05	0.07	0.07	23.91
BR046	0.08	0.04	0.08	0.07	24.27
BR047	0.06	0.07	0.07	0.07	24.64
BR048	0.08		0.06	0.08	25.92
BR049	0.08	0.05	0.07	0.08	25.46
BR050	0.09	0.08	0.10	0.10	33.49
BR051	0.06	0.04	0.06	0.06	19.98
BR052	0.06	0.04	0.08	0.07	22.63
BR053	0.11	0.10	0.11	0.12	39.79
BR054	0.07	0.05	0.07	0.08	25.00
BR055	0.07	0.06	0.08	0.08	26.92
BR056	0.08	0.07	0.10	0.11	32.49
BR057	0.11	0.12	0.12	0.14	44.90
BR058	0.11	0.10	0.12	0.12	41.25
BR-RSA	0.08	0.06	0.07	0.08	27.01
BR-RSB	0.05	0.05	0.06	0.08	22.54
BR-RSC	0.07	0.05	0.06	0.08	23.82
BR-RSD	0.06	0.05	0.07	0.09	24.09
BR-RSE	0.06	0.06	0.07	0.08	24.73
BR-RSF	0.06	0.05	0.06	0.07	22.63

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
BR-RSG		0.10	0.11	0.07	34.55
BR-RSH	0.10	0.09	0.11	0.08	34.31
BR-RSJ	0.11	0.10	0.14	0.08	39.06
BR-RSK	0.05	0.05	0.08	0.07	22.90
BR-RSL	0.08	0.05	0.06	0.07	23.73
BR-RSM	0.07	0.03	0.06	0.09	23.09
BR-RSN	0.07	0.07	0.07	0.07	25.46
BR-RSP	0.08	0.05	0.07	0.08	24.91
BR-RSQ	0.05	0.06	0.06	0.06	20.35
BR-RSR	0.09	0.07	0.08	0.10	30.39

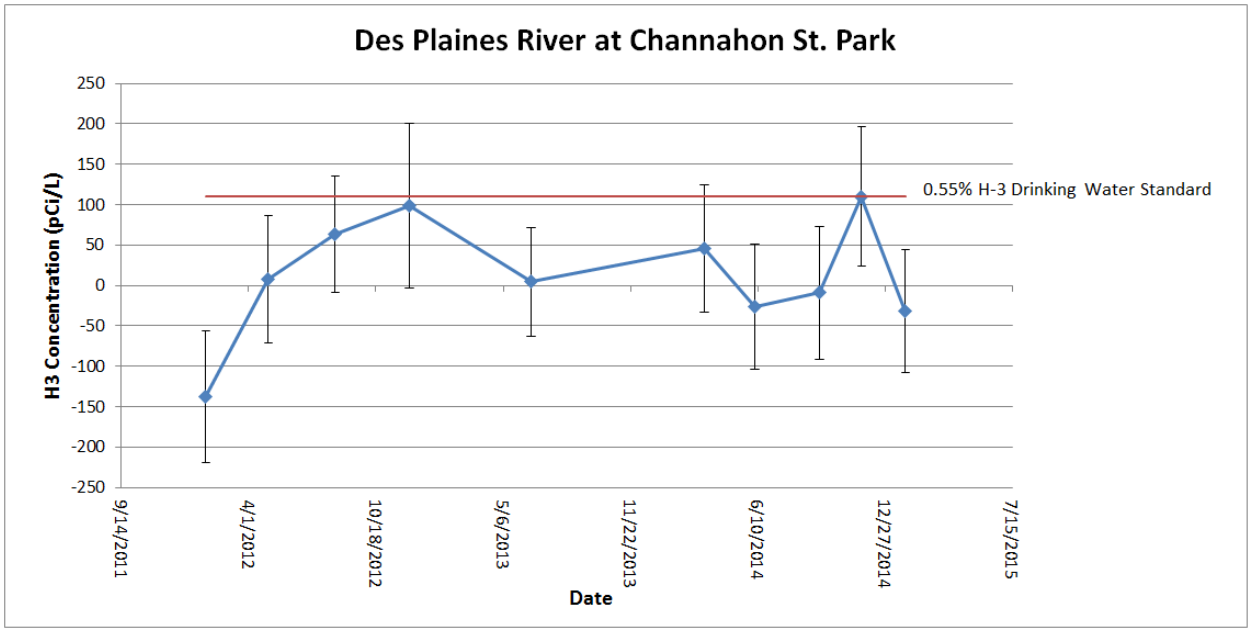
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Dose column based on averages of all available data.

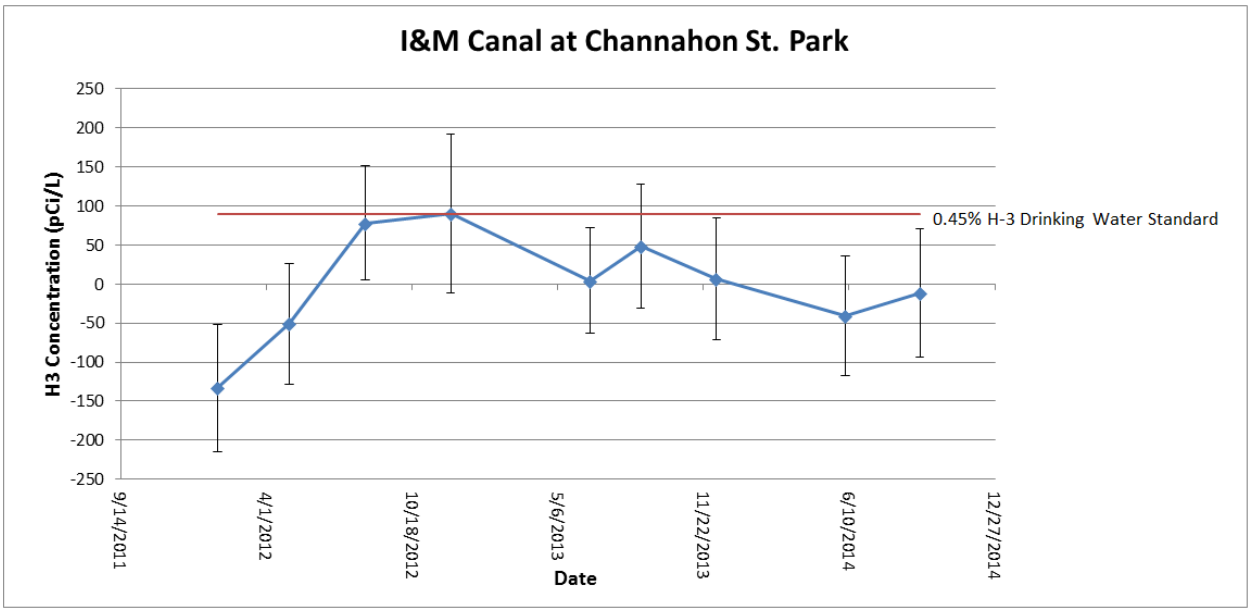
Appendix B
Dresden Sample Results

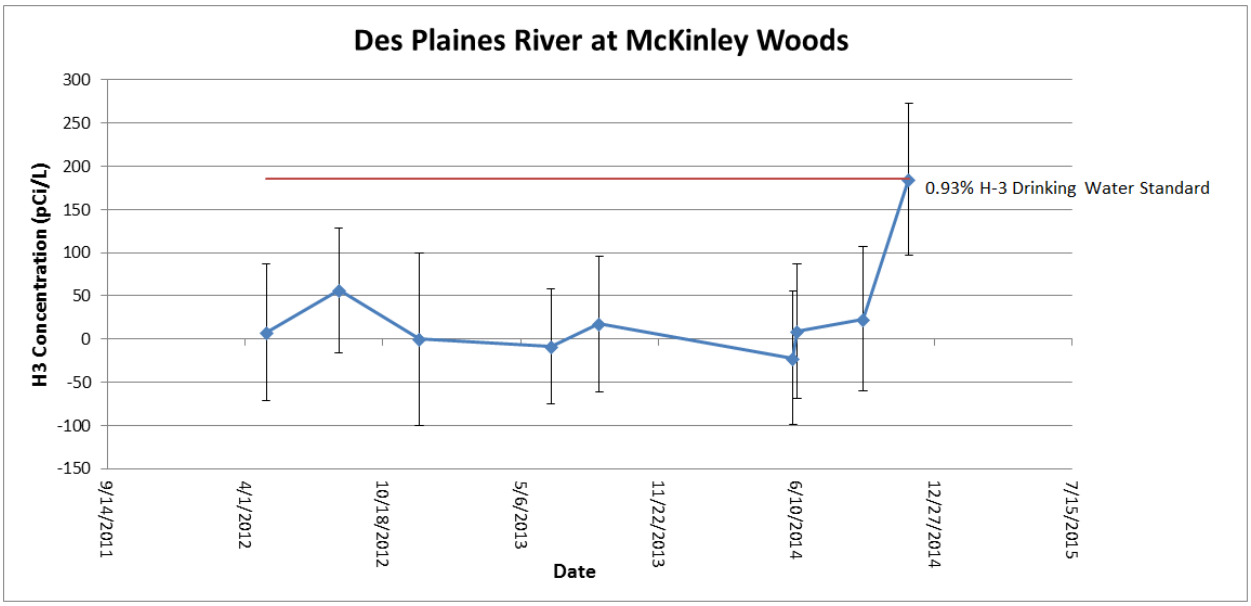
Table B-1. Tritium in Water Sample Results for Dresden Area
Results are in picocuries per liter (pCi/L)

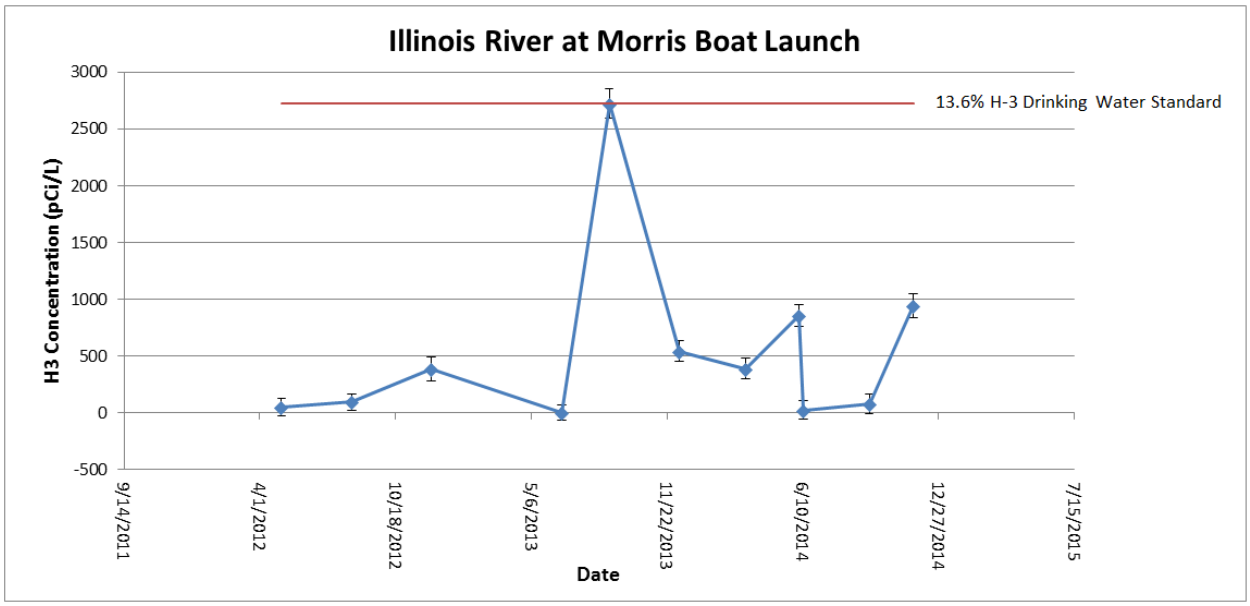
Location	Date	Result		Error
Des Plaines R. at Channahon St. Park (I&M Canal Trail)	3/18/2014	45.7	±	79.0
Des Plaines R. at Channahon St. Park (I&M Canal Trail)	6/5/2014	-26.1	±	77.0
Des Plaines R. at Channahon St. Park (I&M Canal Trail)	9/15/2014	-9.3	±	82.4
Des Plaines R. at Channahon St. Park (I&M Canal Trail)	11/20/2014	110.0	±	86.0
I&M Canal above Chann. St. Park	6/5/2014	-41.3	±	76.6
I&M Canal above Chann. St. Park	9/15/2014	-11.6	±	82.3
Des Plaines R. at McKinley Woods Will Co. Forest Preserve	6/5/2014	-21.8	±	77.1
Des Plaines R. at McKinley Woods Will Co. Forest Preserve	6/11/2014	8.7	±	77.9
Des Plaines R. at McKinley Woods Will Co. Forest Preserve	9/15/2014	23.3	±	83.3
Des Plaines R. at McKinley Woods Will Co. Forest Preserve	11/20/2014	185.0	±	87.9
Illinois R. at Morris boat launch (Rte 47 bridge)	3/18/2014	390.0	±	87.6
Illinois R. at Morris boat launch (Rte 47 bridge)	6/4/2014	855.0	±	98.1
Illinois R. at Morris boat launch (Rte 47 bridge)	6/11/2014	26.1	±	78.4
Illinois R. at Morris boat launch (Rte 47 bridge)	9/16/2014	76.8	±	84.7
Illinois R. at Morris boat launch (Rte 47 bridge)	11/20/2014	943.0	±	106.0
Heideke Lake Bank Fish area	6/4/2014	-15.2	±	77.3
Heideke Lake Bank Fish area	6/11/2014	6.5	±	77.8
Heideke Lake Bank Fish area	9/15/2014	41.9	±	83.8
Illinois R. at Dresden Island Lock and Dam	3/18/2014	316.0	±	86.0
Illinois R. at Dresden Island Lock and Dam	6/4/2014	198.0	±	82.9
Illinois R. at Dresden Island Lock and Dam	6/11/2014	602.0	±	92.5
Illinois R. at Dresden Island Lock and Dam	9/15/2014	100.0	±	85.3
Illinois R. at Dresden Island Lock and Dam	11/20/2014	1050.0	±	108.0
Well @ Dresden Island Lock & Dam	6/4/2014	30.5	±	78.5
Well @ Dresden Island Lock & Dam	6/11/2014	19.6	±	78.2
Well @ Dresden Island Lock & Dam	9/15/2014	-67.5	±	80.8

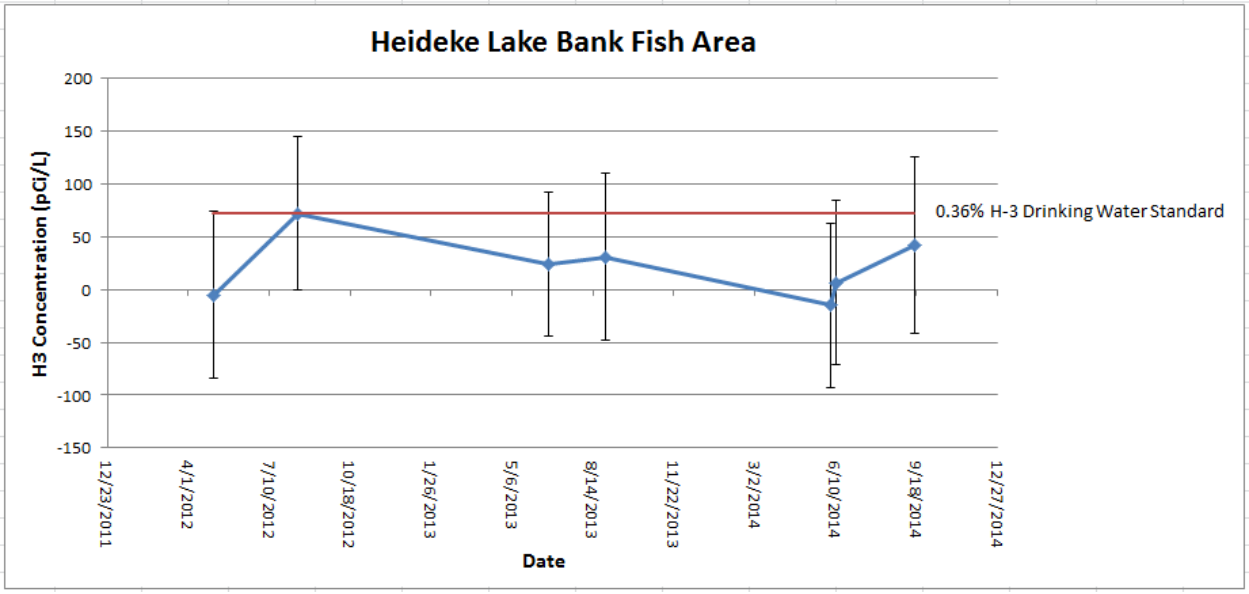
Tables B-2. Trending Graphs for Water from the Dresden Area
(Highest results on graphs indicate percentage of US EPA Drinking Water Standard)

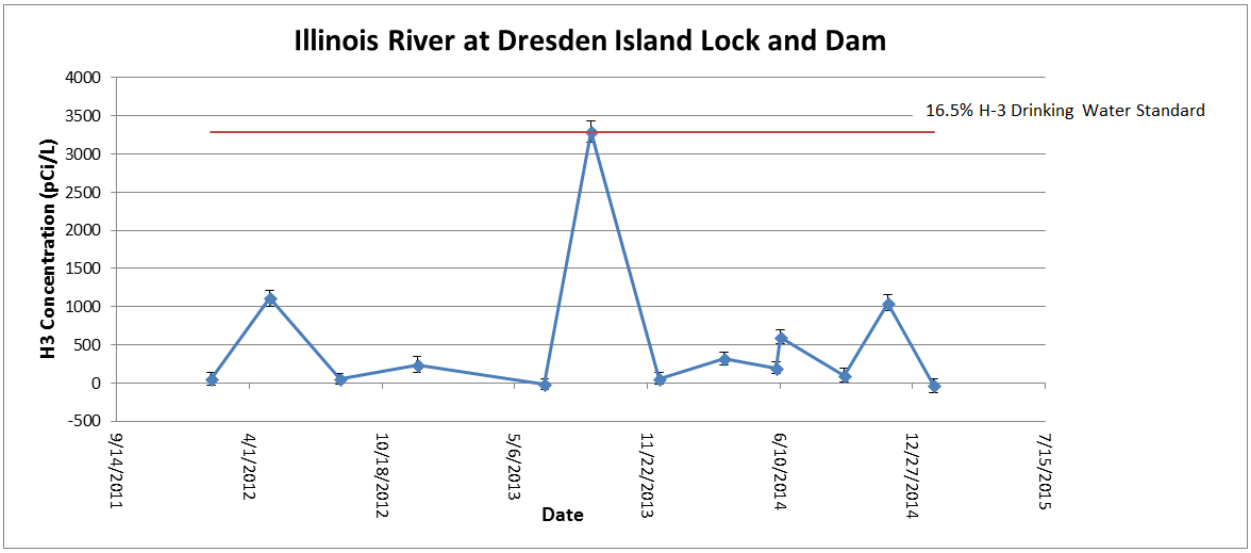





Des Plaines River at McKinley Woods
H3 Concentration (pCi/L)
300
250
200
150
100
50
0
-50
-100
-150
0.93% H-3 Drinking Water Standard
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
7/15/2015
Date


Illinois River at Morris Boat Launch
H3 Concentration (pCi/L)
3000
2500
2000
1500
1000
500
0
-500
13.6% H-3 Drinking Water 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
Date


Heideke Lake Bank Fish Area
H3 Concentration (pCi/L)
200
150
100
50
0
-50
-100
-150
0.36% H-3 Drinking Water Standard
12/23/2011
4/1/2012
7/10/2012
10/18/2012
1/26/2013
5/6/2013
8/14/2013
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
Date


Illinois River at Dresden Island Lock and Dam
H3 Concentration (pCi/L)
4000
3500
3000
2500
2000
1500
1000
500
0
-500
16.5% H-3 Drinking Water 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
Date

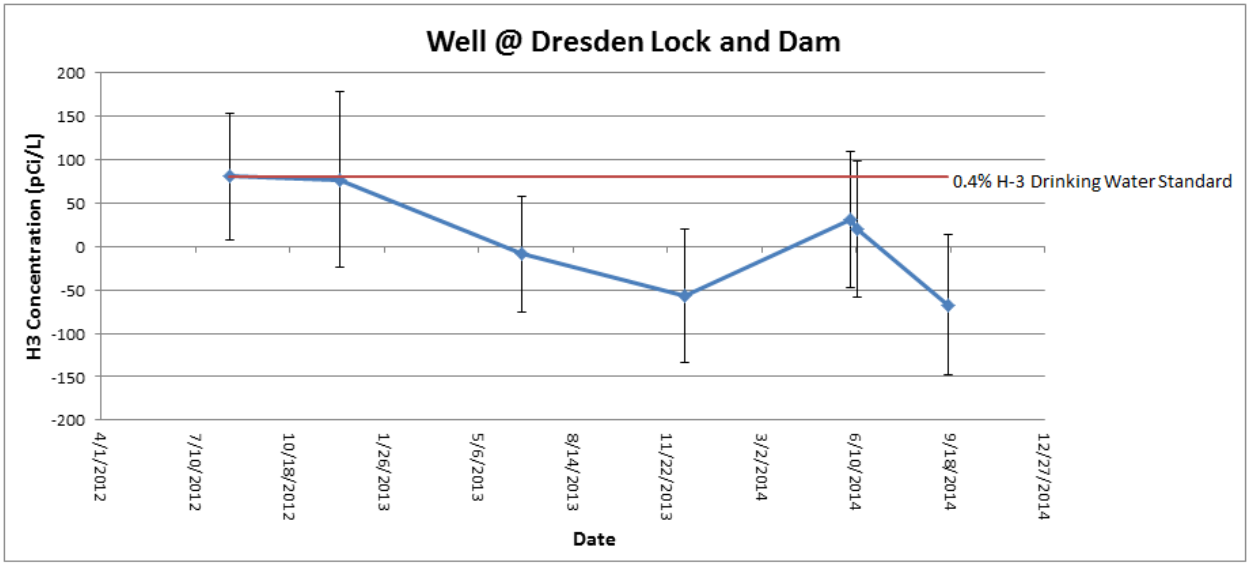


Table B-3. Sample Results for Alpha/Beta Screening of Water from the Dresden Area
Results are in picocuries per liter (pCi/L)

Location / Date	Alpha Result		Alpha Error	Beta Result		Beta Error
Des Plaines R. at Channahon St. Park (I&M Canal Trail)						
3/18/2014	1.5	±	1.4	4.7	±	2.7
6/5/2014	0.0	±	1.3	3.8	±	2.6
9/15/2014	-0.4	±	1.3	5.0	±	2.8
11/20/2014	0.8	±	1.4	9.9	±	2.6
Des Plaines R. at McKinley Woods Will Co. Forest Preserve						
6/5/2014	0.2	±	1.3	5.1	±	2.6
9/15/2014	0.7	±	1.3	4.0	±	2.7
11/20/2014	0.5	±	1.4	6.3	±	2.5
Heideke Lake Bank Fish area						
6/4/2014	0.2	±	1.3	1.6	±	2.5
9/15/2014	0.3	±	1.3	3.5	±	2.7
I&M Canal above Chann. St. Park						
6/5/2014	-0.3	±	1.3	1.4	±	2.5
9/15/2014	-0.4	±	1.3	2.4	±	2.7
Illinois R. at Dresden Island Lock and Dam						
3/18/2014	-0.4	±	1.3	0.0	±	2.6
6/4/2014	0.6	±	1.3	2.4	±	2.5
9/15/2014	-0.6	±	1.2	3.2	±	2.7
11/20/2014	0.7	±	1.4	4.4	±	2.4
Illinois R. at Morris boat launch (Rte 47 bridge)						
3/18/2014	0.0	±	1.3	1.7	±	2.6
6/4/2014	0.5	±	1.3	4.2	±	2.6
9/16/2014	-0.8	±	1.2	3.5	±	2.7
11/20/2014	0.8	±	1.4	7.3	±	2.5
Well @ Dresden Island Lock & Dam						
6/4/2014	13.3	±	1.9	14.8	±	2.8
9/15/2014	10.6	±	1.7	14.5	±	3.0

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 / Date	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Des Plaines R. at Channahon St. Park (I&M Canal Trail)																										
3/18/2014	-3.0	14.0	-5.0	10.0	1.8	1.3	0.0	1.1	0.7	1.2	-1.4	0.9	-1.1	3.1	2.9	9.8	9.0	18.0	0.5	1.1	4.5	1.8	-2.2	2.4	1.5	2.5
6/5/2014	-18.7	40.7	4.7	13.0	-1.5	1.6	1.5	1.0	1.0	1.2	-0.7	1.0	0.0	3.9	54.0	51.3	65.5	12.9	-2.0	1.2	1.2	2.6	-3.0	2.8	-0.7	3.0
9/15/2014	0.1	6.4	2.4	8.8	-1.7	1.1	-0.3	1.2	1.2	1.1	1.0	1.1	-0.4	2.6	-1.3	2.4	48.5	13.4	-0.8	1.2	0.2	1.2	-0.9	2.8	1.1	1.8
11/20/2014	6.0	16.0	5.0	11.0	-2.2	1.3	0.7	1.2	1.2	1.2	-1.6	1.1	3.0	2.8	4.0	10.0	-16.0	15.0	-3.0	1.3	-0.8	1.7	2.5	2.6	-1.6	2.4
Des Plaines R. at McKinley Woods Will Co. Forest Preserve																										
6/5/2014	21.0	41.6	1.8	13.7	-0.9	1.7	0.1	1.4	-1.9	1.2	0.1	1.1	5.0	5.1	-70.7	45.4	-1.3	13.3	-2.4	1.3	-0.4	2.6	2.9	3.2	3.5	3.1
6/11/2014	0.2	30.4	-10.8	13.2	-2.1	1.6	-0.5	1.2	0.7	1.3	-1.1	1.0	-3.7	3.8	8.8	32.3	18.9	15.4	-1.8	1.3	3.6	2.4	-3.0	2.6	-1.2	2.9
9/15/2014	1.4	5.4	11.6	8.1	-1.4	1.1	0.3	1.0	0.0	1.1	-1.5	1.2	1.8	2.2	-1.5	2.3	12.0	12.6	-2.8	1.1	-0.7	1.2	-2.4	2.0	3.0	1.8
11/20/2014	7.0	12.0	18.3	9.2	0.9	1.1	0.1	0.9	0.3	1.0	0.3	0.8	-2.1	2.4	-17.1	8.9	49.0	10.0	0.8	0.9	-0.6	1.4	0.1	1.9	-1.9	2.1
Heideke Lake Bank Fish area																										
6/4/2014	-10.6	39.8	-8.3	12.4	0.6	1.3	0.4	0.9	1.1	1.0	0.0	0.8	-0.8	3.5	39.9	56.1	14.3	10.1	-1.3	1.0	2.8	2.2	-0.3	2.0	-1.5	2.7
6/11/2014	14.8	31.8	6.1	13.2	-0.6	1.5	-1.3	1.1	-0.3	1.2	-0.7	1.0	0.0	4.0	-7.7	35.3	19.2	15.8	-1.2	1.2	4.3	2.4	1.8	2.2	3.3	2.8
9/15/2014	-2.5	9.9	1.3	12.8	0.0	1.9	1.4	1.7	-0.1	1.7	1.1	1.6	3.6	3.6	-1.6	4.1	29.8	23.0	0.9	1.7	-0.8	2.0	0.8	3.5	-0.4	2.9
I&M Canal above Chann. St. Park																										
6/5/2014	-12.2	34.1	22.3	11.5	-1.4	1.4	0.5	0.9	-1.7	1.0	-1.6	0.8	-3.8	3.3	-7.0	47.9	8.6	11.1	0.0	1.1	5.4	1.9	0.9	2.1	-4.1	2.6
9/15/2014	8.7	4.7	5.9	7.4	-0.4	1.0	-2.2	0.9	-0.6	1.0	1.6	0.8	0.7	1.8	1.8	2.0	26.7	10.2	1.5	0.9	-0.4	1.0	-0.1	1.8	-0.3	1.7
Illinois R. at Dresden Island Lock and Dam																										
3/18/2014	-2.0	15.0	9.0	10.0	1.4	1.4	0.9	1.4	2.2	1.3	-0.4	1.0	1.6	3.9	9.6	7.6	52.0	14.0	0.4	1.2	0.5	2.0	1.0	3.1	3.3	2.5
6/4/2014	-7.6	18.1	19.1	10.0	0.4	1.1	0.5	0.8	2.7	0.9	1.0	0.8	-2.3	2.8	25.3	16.7	-8.5	11.6	-0.1	0.9	0.6	1.6	1.6	2.0	2.6	2.1
6/11/2014	11.8	35.6	-2.5	13.2	1.8	1.4	0.3	1.2	-0.4	1.2	-2.8	1.1	0.9	4.3	28.1	38.1	3.1	14.7	-2.5	1.3	0.1	2.2	-3.3	2.6	-3.0	2.7
9/15/2014	5.1	5.0	-1.2	7.8	0.5	0.9	-0.9	0.8	0.3	0.9	0.3	0.8	-4.1	2.1	2.9	2.2	12.4	10.9	-1.3	0.9	0.3	1.1	1.9	1.7	0.9	1.7
11/20/2014	25.0	14.0	-18.0	10.0	-0.6	1.3	1.0	1.0	-0.5	1.2	0.4	0.9	0.1	2.9	-13.2	9.9	0.0	15.0	-1.0	1.2	2.7	1.7	1.7	2.4	-1.0	2.4
Illinois R. at Morris boat launch (Rte 47 bridge)																										
3/18/2014	-5.0	10.0	3.7	8.0	0.8	1.0	0.8	1.1	-1.1	1.0	1.3	0.9	-0.9	2.8	2.7	5.3	9.0	18.0	-0.1	0.9	1.2	1.3	0.1	2.3	-1.9	2.0
6/4/2014	58.1	46.0	-2.6	14.7	0.6	1.5	0.2	1.2	-1.2	1.1	-2.8	1.1	-3.0	5.0	-53.2	61.9	44.4	14.4	0.8	1.3	0.7	2.6	4.1	2.7	-2.0	3.0
6/11/2014	14.0	32.1	11.9	13.2	-0.9	1.5	-0.9	1.5	0.8	1.4	0.8	1.1	-0.8	4.8	46.0	28.4	7.0	14.4	-0.6	1.3	-3.7	2.5	-2.4	3.5	-3.1	3.2
9/16/2014	1.7	5.8	9.0	7.9	0.4	0.9	0.3	1.1	0.4	0.9	-1.3	1.0	0.7	2.2	5.1	1.9	9.3	16.5	1.0	0.9	-1.1	1.1	2.3	2.2	1.9	1.6
11/20/2014	23.0	12.0	0.0	10.0	-1.8	1.3	0.6	1.0	1.5	1.1	1.6	1.0	-3.6	2.9	9.4	9.5	18.0	11.0	0.0	1.0	-0.5	1.6	-1.9	2.3	-2.6	2.1
Well @ Dresden Island Lock & Dam																										
6/4/2014	-44.9	42.0	18.3	11.9	0.3	1.4	0.2	0.8	0.3	1.0	-0.8	0.8	-3.2	3.4	-0.8	58.7	33.3	10.3	-0.4	1.0	-0.5	2.3	2.4	2.1	-2.3	2.5
6/11/2014	37.3	29.6	10.9	11.2	-2.1	1.4	-1.3	1.0	0.2	1.0	0.0	0.8	0.1	3.1	7.1	36.8	33.6	10.8	-2.1	0.9	-0.4	2.0	3.5	2.0	1.2	2.5
9/15/2014	6.6	5.4	-3.6	7.8	-0.1	1.0	1.2	1.2	1.9	1.0	0.1	1.1	1.4	2.1	-2.7	2.4	32.9	12.4	-0.6	1.1	0.0	1.2	1.5	2.0	2.5	1.9

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

Row Labels	Ac-228 Result	Ac-228 Error	Ba-140 Result	Ba-140 Error	Bi-212 Result	Bi-212 Error	Bi-214 Result	Bi-214 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error
Heideke Lake Boat Launch																						
6/4/2014	0.6	0.0	-0.1	0.5	0.7	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.0	0.5	0.0	0.0
9/15/2014	0.5	0.0	0.0	0.0	0.7	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	15.4	0.5	0.0	0.0
Minooka Comm HS																						
6/5/2014	1.1	0.0	0.2	0.6	0.8	0.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	16.4	0.6	0.0	0.0
9/16/2014	1.0	0.0	0.0	0.0	1.1	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	16.1	0.5	0.0	0.0

Row Labels	Nb-95 Result	Nb-95 Error	Pa-234m Result	Pa-234m Error	Pb-210 Result	Pb-210 Error	Pb-212 Result	Pb-212 Error	Pb-214 Result	Pb-214 Error	Ra-226 Result	Ra-226 Error	Th-234 Result	Th-234 Error	Tl-208 Result	Tl-208 Error	U-235 Result	U-235 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Heideke Lake Boat Launch																						
6/4/2014	0.0	0.0	2.1	1.2	1.7	0.5	0.7	0.0	0.9	0.0	1.7	0.2	0.4	0.5	0.6	0.0	0.1	0.0	0.0	0.0	-0.2	0.0
9/15/2014	0.0	0.0	0.6	1.2	1.5	0.1	0.6	0.0	0.7	0.0	1.6	0.2	0.6	0.2	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Minooka Comm HS																						
6/5/2014	0.0	0.0	0.0	1.6	1.4	0.2	1.1	0.0	1.1	0.0	2.6	0.2	1.6	0.3	0.9	0.1	0.2	0.0	0.0	0.0	0.0	0.0
9/16/2014	0.0	0.0	1.5	0.9	2.4	0.4	1.1	0.0	0.9	0.0	2.3	0.2	1.4	0.4	0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0

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

Location / Date	Ac-228 Result	Ac-228 Error	Ba-140 Result	Ba-140 Error	Bi-212 Result	Bi-212 Error	Bi-214 Result	Bi-214 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error
Dresden Lock and Dam																						
6/4/2014	1.0	0.0	-0.3	0.2	1.0	0.2	1.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	-0.1	0.0	17.6	0.6	0.0	0.0
11/20/2014	1.0	0.1	-0.3	0.3	1.0	0.3	1.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	-0.1	0.1	19.0	1.1	0.0	0.0

Location / Date	Nb-95 Result	Nb-95 Error	Pa-234m Result	Pa-234m Error	Pb-210 Result	Pb-210 Error	Pb-212 Result	Pb-212 Error	Pb-214 Result	Pb-214 Error	Ra-226 Result	Ra-226 Error	Th-234 Result	Th-234 Error	Tl-208 Result	Tl-208 Error	U-235 Result	U-235 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Dresden Lock and Dam																						
6/4/2014	0.0	0.0	0.7	1.4	2.8	0.2	1.0	0.0	1.5	0.0	2.5	0.2	1.4	0.3	0.9	0.0	0.2	0.0	0.0	0.0	0.0	0.0
11/20/2014	0.0	0.0	0.7	2.6	4.1	0.5	1.0	0.0	1.5	0.1	2.9	0.4	1.0	0.5	0.9	0.1	0.2	0.0	0.0	0.0	-0.1	0.0

Table B-7. Vegetation Sample Results for Dresden Area
Results are in picocuries per kilogram (pCi/kg)

Location	Ba-140			Be-7			Co-58			Co-60			Cs-134			Cs-137			Fe-59		
Row Labels	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
Heideke Lake Boat Launch Area																					
6/4/2014	1.9	±	1.2	3.9	±	0.4	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	-0.2	±	0.1
9/15/2014	-0.2	±	0.3	6.8	±	0.3	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.1
Minooka Community High School																					
6/5/2014	0.6	±	0.5	1.9	±	0.2	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0
9/16/2014	0.0	±	0.2	7.9	±	0.3	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0

Location	I-131			K-40			Mn-54			Nb-95			Zn-65			Zr-95		
Row Labels	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
Heideke Lake Boat Launch Area																		
6/4/2014	0.4	±	1.8	21.1	±	0.8	0.0	±	0.0	0.0	±	0.1	0.1	±	0.1	0.0	±	0.1
9/15/2014	0.0	±	0.2	13.2	±	0.6	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.1	±	0.0
Minooka Community High School																		
6/5/2014	-1.0	±	0.6	18.2	±	0.5	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0
9/16/2014	-0.2	±	0.1	14.5	±	0.5	0.0	±	0.0	0.0	±	0.0	-0.1	±	0.0	0.0	±	0.0

Table B-8. Gamma Detection Network Results for Dresden Area

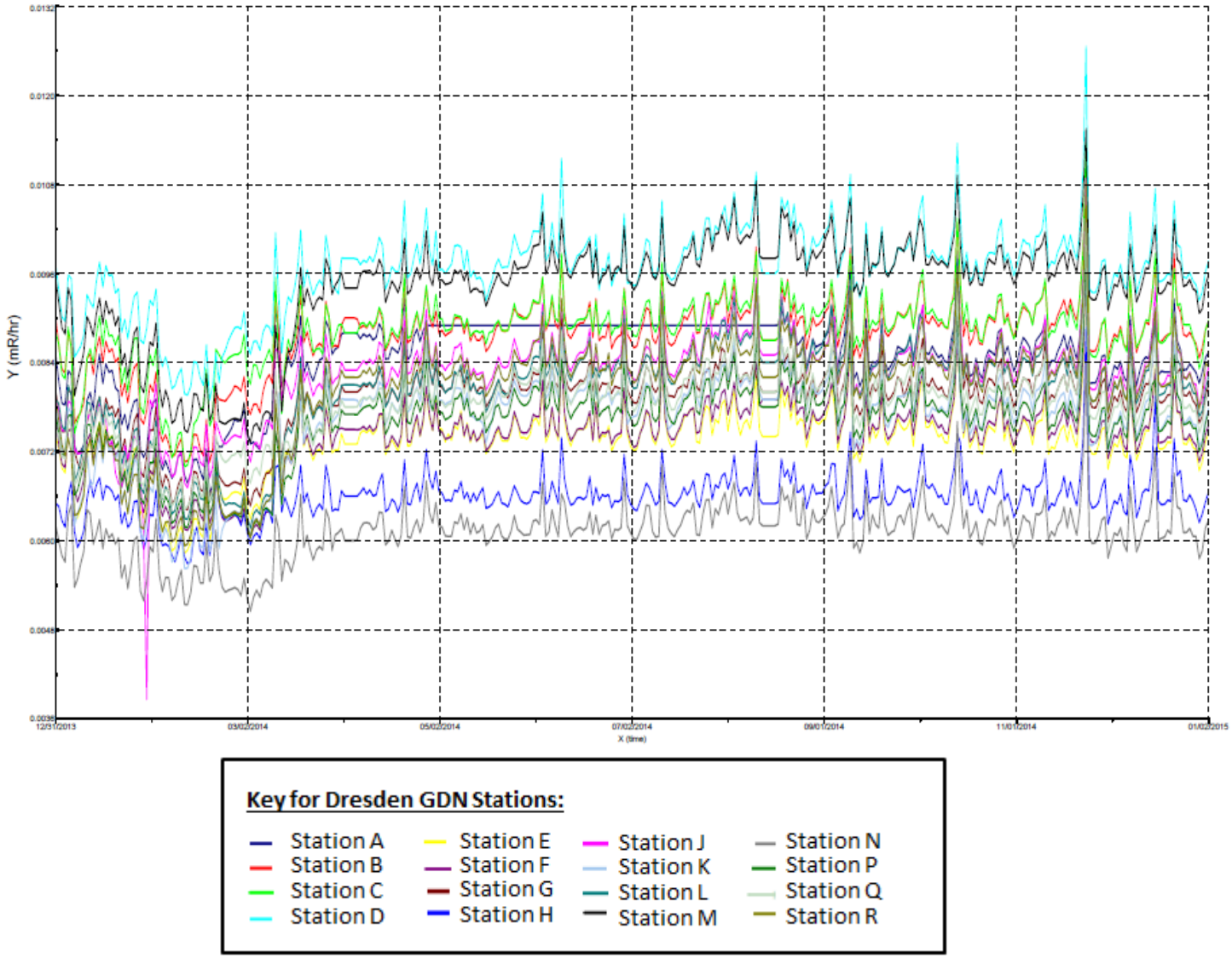


Table B-9. Summary of Ambient Gamma Results for Dresden Area

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
DR001	0.07	0.08	0.06	0.09	27.38
DR002	0.07	0.09	0.06	0.09	28.74
DR003	0.07	0.08	0.08	0.10	29.47
DR004	0.11	0.11	0.10	0.12	38.96
DR007	0.08	0.08	0.08	0.11	32.21
DR009	0.07	0.11		0.10	25.46
DR013	0.09	0.10	0.09	0.11	35.22
DR020	0.09	0.11	0.10	0.11	36.96
DR021	0.07	0.08	0.06	0.09	26.65
DR022	0.07	0.08	0.07	0.08	26.83
DR023	0.06	0.08	0.06	0.08	24.82
DR025	0.06	0.07	0.06	0.08	24.36
DR026	0.06	0.06	0.07	0.07	22.45
DR027	0.05	0.09	0.06	0.08	26.01
DR031	0.07	0.07	0.07	0.08	26.92
DR033	0.06	0.06	0.05	0.07	21.17
DR036	0.12	0.11	0.11	0.13	42.98
DR039	0.10	0.12	0.11	0.12	41.15
DR040	0.10	0.11	0.11	0.13	41.43
DR041	0.09	0.10	0.08	0.11	34.77
DR043	0.11	0.12	0.11	0.13	42.61
DR046	0.06	0.06	0.05	0.06	20.99
DR048	0.10		0.10	0.12	28.38
DR050	0.08	0.07	0.07	0.09	27.74
DR052	0.10	0.11	0.09	0.12	38.69
DR053	0.06	0.07	0.05	0.08	23.91
DR056	0.12	0.12	0.11	0.12	42.43
DR060	0.07	0.10	0.10	0.11	34.86
DR062	0.09	0.09	0.10	0.12	36.59
DR065	0.12	0.12	0.12	0.15	45.26
DR066		0.08	0.05	0.08	19.07
DR068	0.07	0.07	0.08	0.09	29.02
DR070	0.09	0.08	0.08	0.11	32.49
DR073	0.10	0.09	0.10	0.12	36.87
DR075	0.06	0.11	0.12	0.12	36.96
DR076		0.07	0.06	0.07	18.71
DR077	0.06	0.10	0.08	0.11	32.67
DR078	0.10	0.12	0.13	0.13	43.44
DR080	0.11	0.14	0.11	0.14	45.53
DR081	0.08	0.11	0.11	0.13	38.60
DR082	0.09		0.09	0.12	26.74
DR083	0.07	0.09	0.09	0.10	31.57
DR084	0.09	0.10	0.09	0.12	35.68
DR087	0.09	0.09	0.08	0.11	32.76
DR089	0.07	0.09	0.08	0.11	31.94
DR091	0.07	0.12	0.07	0.09	31.76
DR093	0.08	0.09	0.08	0.10	31.85
DR095	0.08	0.09	0.09	0.11	33.22
DR096	0.08	0.12	0.09	0.12	37.14

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
DR097	0.12	0.11	0.12	0.15	44.80
DR098	0.06	0.06	0.07	0.09	25.00
DR099	0.11	0.15	0.11	0.15	47.82
DR100	0.07	0.12	0.09	0.11	36.04
DR102	0.09	0.11	0.11	0.12	39.60
DR103	0.10	0.14	0.12	0.15	46.45
DR104	0.11	0.13	0.12	0.15	45.72
DR105	0.06	0.07	0.07	0.07	23.91
DR106	0.05	0.06	0.04	0.06	19.44
DR107	0.07	0.09	0.09	0.10	32.03
DR108	0.09	0.10	0.10	0.11	36.87
DR109	0.10	0.11	0.10	0.13	40.42
DR110	0.06	0.06	0.06	0.08	23.00
DR111	0.06	0.07	0.06	0.07	24.00
DR112	0.10	0.11	0.09	0.12	39.33
DR113	0.10	0.13	0.12	0.15	45.90
DR114	0.09	0.12	0.12	0.14	42.98
DR115	0.10	0.11	0.12	0.13	40.42
DR116	0.07	0.08	0.06	0.09	26.83
DR117	0.07	0.10	0.08	0.11	33.22
DR118	0.08	0.07	0.07	0.08	26.37
DR-RSA		0.09	0.11	0.11	27.19
DR-RSB	0.10	0.11	0.11	0.13	40.33
DR-RSC	0.11	0.10	0.11	0.13	41.61
DR-RSD	0.11	0.13	0.10	0.13	43.07
DR-RSE	0.08	0.10	0.08	0.12	33.67
DR-RSF	0.07	0.08	0.08	0.09	29.93
DR-RSG	0.08	0.08	0.07	0.09	28.74
DR-RSH	0.08	0.05	0.06	0.09	24.82
DR-RSJ	0.08	0.08	0.10	0.11	33.31
DR-RSK	0.08	0.10	0.07	0.11	32.76
DR-RSL	0.08	0.11	0.10	0.12	37.14
DR-RSM	0.11	0.14	0.11	0.14	45.63
DR-RSN	0.06	0.07	0.04	0.06	20.62
DR-RSP	0.08	0.09	0.07	0.09	29.75
DR-RSQ	0.08	0.10	0.08	0.09	31.30
DR-RSR	0.08	0.09	0.07	0.13	34.04

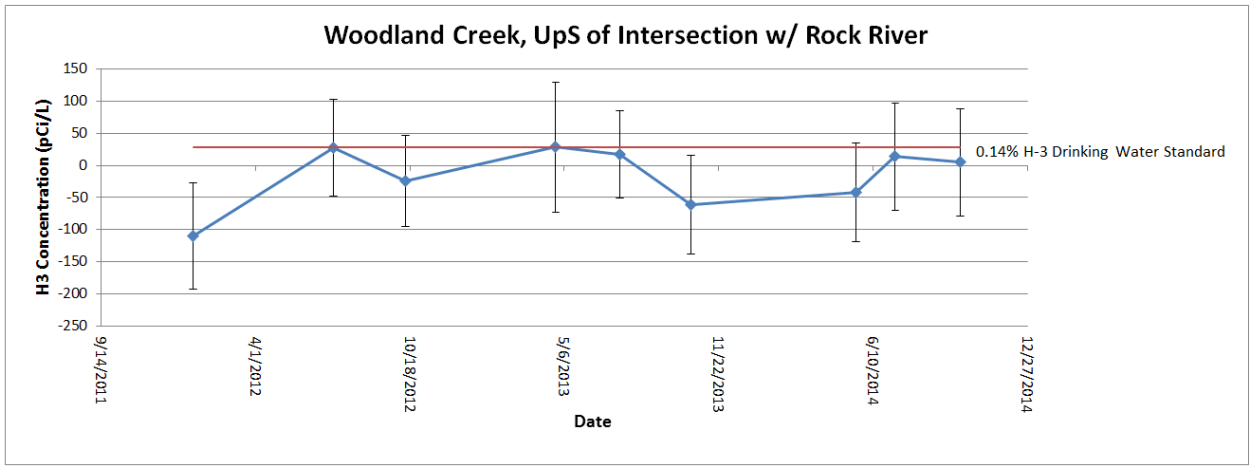
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Dose column based on averages of all available data.

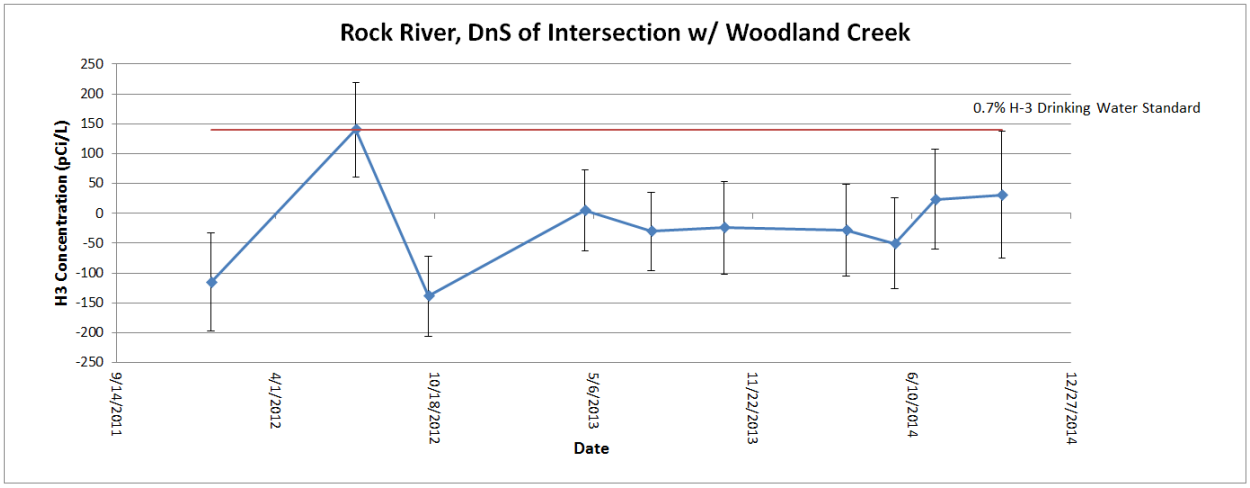
Appendix C
Byron Sample Results

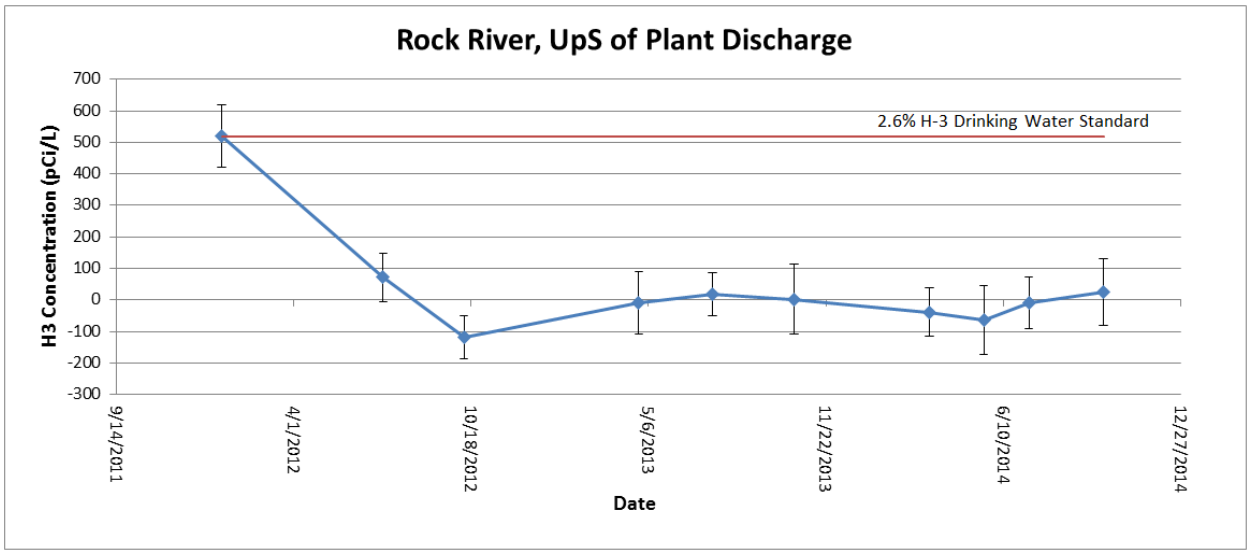
Table C-1. Tritium in Water Sample Results for Byron Area
Results are in picocuries per liter (pCi/L)

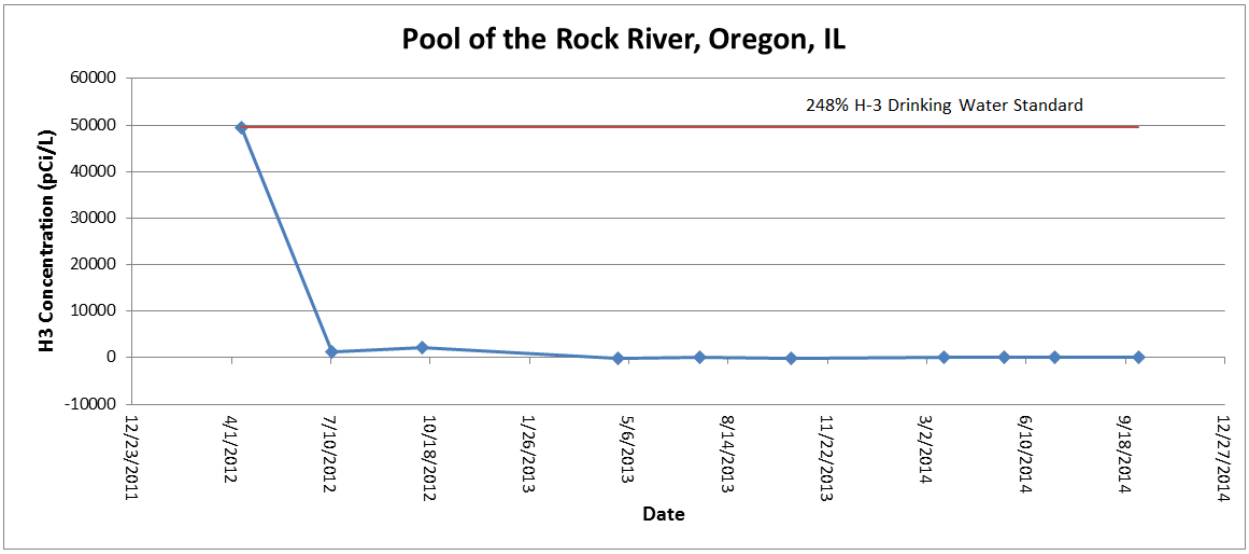
Location	Date	Result		Error
Woodland Creek, Upstream of the Intersection With Rock R. (UpS)	5/19/2014	-41.5	±	76.9
Woodland Creek, Upstream of the Intersection With Rock R. (UpS)	7/9/2014	14	±	83.3
Woodland Creek, Upstream of the Intersection With Rock R. (UpS)	10/1/2014	4.68	±	83.1
Rock R., Downstream of the Intersection With Woodland Creek (UpS)	3/19/2014	-28.4	±	77.1
Rock R., Downstream of the Intersection With Woodland Creek (UpS)	5/19/2014	-50.2	±	76.6
Rock R., Downstream of the Intersection With Woodland Creek (UpS)	7/9/2014	23.3	±	83.5
Rock R., Downstream of the Intersection With Woodland Creek (UpS)	10/1/2014	30.9	±	106
Rock R., Just UpS of the Byron Cooling Water Discharge	3/19/2014	-39.3	±	76.8
Rock R., Just UpS of the Byron Cooling Water Discharge	5/19/2014	-64.2	±	108
Rock R., Just UpS of the Byron Cooling Water Discharge	7/9/2014	-9.34	±	82.6
Rock R., Just UpS of the Byron Cooling Water Discharge	10/1/2014	26.1	±	106
Pool of the Rock R., Oregon, Illinois	3/19/2014	17.5	±	78.4
Pool of the Rock R., Oregon, Illinois	5/19/2014	-13.8	±	109
Pool of the Rock R., Oregon, Illinois	7/9/2014	2.33	±	82.9
Pool of the Rock R., Oregon, Illinois	10/1/2014	73.6	±	107
Rock R. Boat Ramp Near the Lake Louise Sample Point	3/19/2014	-26.2	±	77.2
Rock R. Boat Ramp Near the Lake Louise Sample Point	5/19/2014	-9.17	±	109
Rock R. Boat Ramp Near the Lake Louise Sample Point	7/9/2014	42	±	84
Rock R. Boat Ramp Near the Lake Louise Sample Point	10/1/2014	28.5	±	106
DnS-Public Parking West of Rock River	3/19/2014	-69.8	±	76
DnS-Public Parking West of Rock River	5/19/2014	87.1	±	111
DnS-Public Parking West of Rock River	7/9/2014	63	±	84.6
DnS-Public Parking West of Rock River	10/1/2014	102	±	108
DnS-Lowden State Park Boat Ramp West of Rock River	3/19/2014	-4.36	±	77.8
DnS-Lowden State Park Boat Ramp West of Rock River	5/19/2014	-59.6	±	108
DnS-Lowden State Park Boat Ramp West of Rock River	7/9/2014	44.4	±	84.1
DnS-Lowden State Park Boat Ramp West of Rock River	10/1/2014	114	±	108

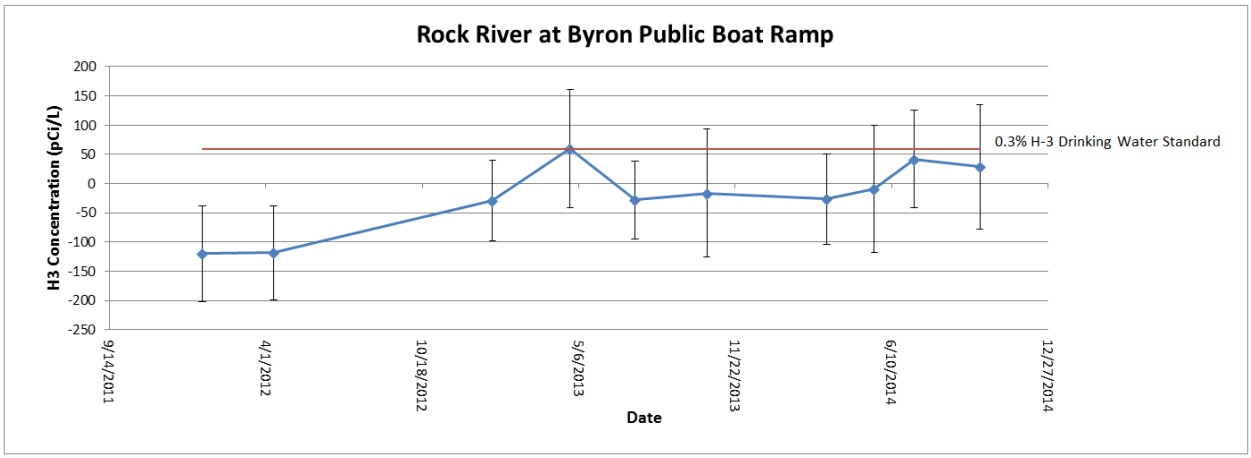
Tables C-2. Trending Graphs for Water from the Byron Area
(Highest results on graphs indicate percentage of US EPA Drinking Water Standard)

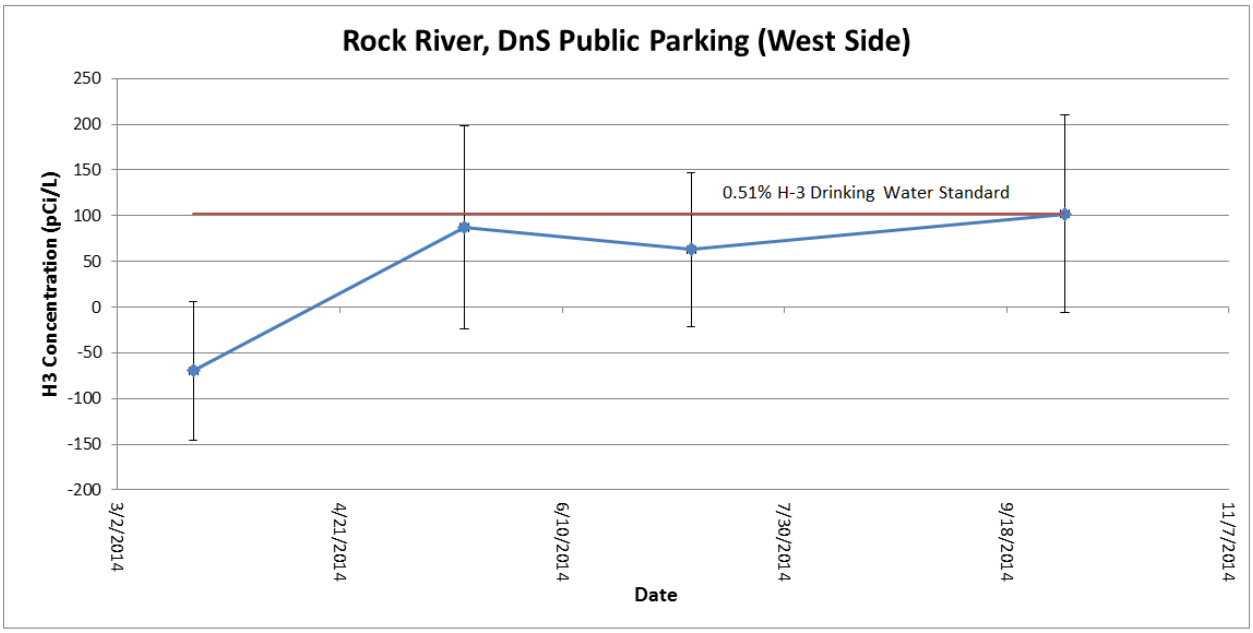







Pool of the Rock River, Oregon, IL
248% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
60000
50000
40000
30000
20000
10000
0
-10000
12/23/2011
4/1/2012
7/10/2012
10/18/2012
1/26/2013
5/6/2013
8/14/2013
11/22/2013
3/2/2014
6/10/2014
9/18/2014
12/27/2014
Date


Rock River at Byron Public Boat Ramp
0.3% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
200
150
100
50
0
-50
-100
-150
-200
-250
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
Date


Rock River, DnS Public Parking (West Side)
0.51% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
250
200
150
100
50
0
-50
-100
-150
-200
3/2/2014
4/21/2014
6/10/2014
7/30/2014
9/18/2014
11/7/2014
Date

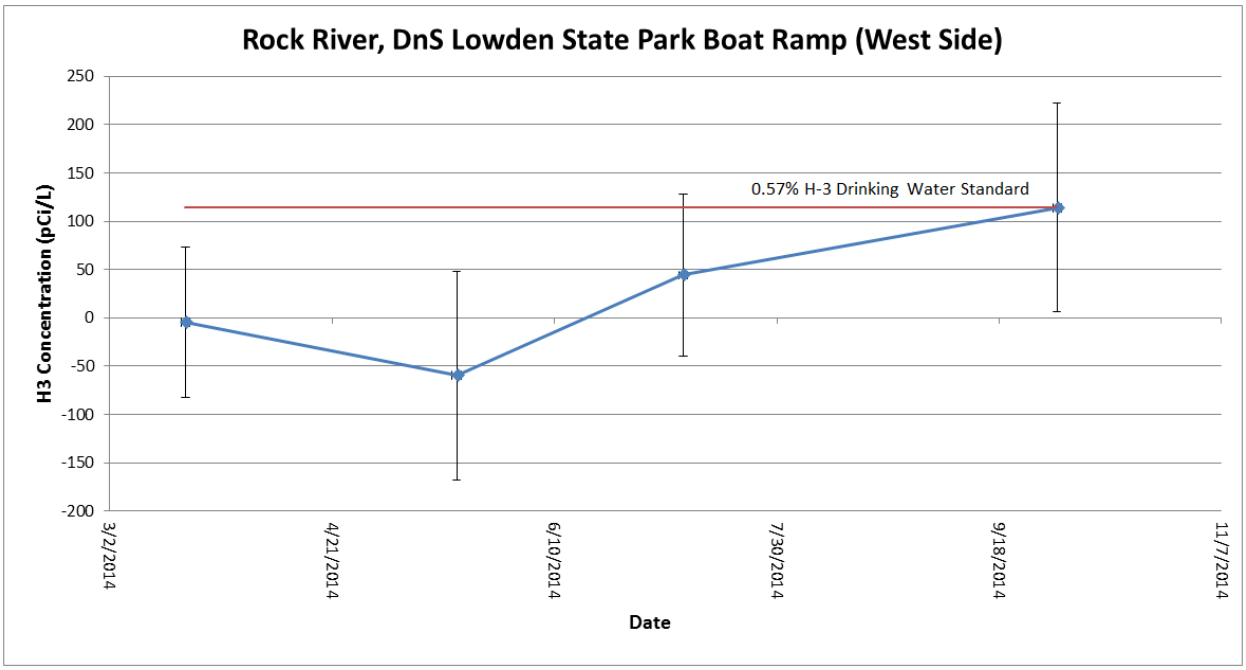

Rock River, DnS Lowden State Park Boat Ramp (West Side)
250
200
150
100
50
0
-50
-100
-150
-200
H3 Concentration (pCi/L)
0.57% H-3 Drinking Water Standard
3/2/2014
4/21/2014
6/10/2014
7/30/2014
9/18/2014
11/7/2014
Date

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

Location / Date	Alpha Result	Alpha Error	Beta Result	Beta Error
DS Lowden State Park Boat Ramp West of Rock River				
3/19/2014	-0.9	± 1.6	2.7	± 2.5
5/19/2014	0.9	± 1.5	4.8	± 2.5
7/9/2014	-1.3	± 1.3	4.1	± 2.7
10/1/2014	0.1	± 1.3	5.0	± 2.5
DS Public Parking West of Rock River				
3/19/2014	0.2	± 1.6	2.5	± 2.5
5/19/2014	0.9	± 1.5	1.7	± 2.4
7/9/2014	-0.2	± 1.3	4.1	± 2.7
10/1/2014	-0.4	± 1.3	4.5	± 2.5
Pool of the Rock R., Oregon, Illinois				
3/19/2014	0.4	± 1.6	1.5	± 2.5
5/19/2014	0.2	± 1.4	-1.0	± 2.3
7/9/2014	-0.2	± 1.3	5.5	± 2.7
10/1/2014	0.7	± 1.4	2.5	± 2.4
Rock R. Boat Ramp Near the Lake Louise Sample Point				
3/19/2014	0.6	± 1.6	6.7	± 2.6
5/19/2014	0.6	± 1.5	2.8	± 2.4
7/9/2014	0.0	± 1.4	5.8	± 2.7
10/1/2014	0.1	± 1.3	4.1	± 2.5
Rock R., Downstream of the Intersection With Woodland Creek (UpS)				
3/19/2014	0.0	± 1.3	1.6	± 2.6
5/19/2014	1.3	± 1.5	2.3	± 2.4
7/9/2014	-0.5	± 1.4	4.8	± 2.5
10/1/2014	-0.1	± 1.3	6.1	± 2.5
Rock R., Just Upstream of the Byron Cooling Water Discharge				
3/19/2014	1.1	± 1.7	5.0	± 2.5
5/19/2014	-0.2	± 1.4	-2.1	± 2.3
7/9/2014	0.7	± 1.4	2.6	± 2.6
10/1/2014	0.7	± 1.4	2.9	± 2.4
Woodland Creek, Upstream of the Intersection With Rock R. (UpS)				
5/19/2014	-0.6	± 1.4	2.1	± 2.4
7/9/2014	-0.1	± 1.4	0.7	± 2.4
10/1/2014	-0.5	± 1.3	2.5	± 2.4

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 / Date	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
DnS-Lowden State Park Boat Ramp West of Rock River																										
3/19/2014	14.0	13.0	1.3	8.6	-1.4	1.1	0.2	1.0	-1.4	1.0	0.9	0.9	-2.0	2.7	-4.8	7.2	23.0	18.0	0.0	0.9	1.9	1.4	-3.0	2.5	2.3	2.1
5/19/2014	18.0	28.0	16.0	12.0	-1.1	1.4	0.8	1.2	0.4	1.1	0.3	1.1	1.1	4.0	-19.0	28.0	26.0	15.0	-1.2	1.2	-0.4	2.0	0.5	2.9	1.7	2.4
7/9/2014	10.2	29.9	-4.1	12.6	-1.5	1.5	-0.6	1.1	1.1	1.2	0.4	0.9	8.2	3.5	-31.2	35.3	-2.2	15.2	0.0	1.1	0.8	2.3	0.6	2.5	-2.4	2.9
10/1/2014	8.0	18.9	6.5	10.4	0.7	1.4	-1.8	1.2	0.8	1.1	0.6	1.1	-5.8	3.2	0.7	15.6	25.2	11.2	1.1	1.0	0.7	1.8	-1.9	2.2	1.6	2.4
DnS-Public Parking West of Rock River																										
3/19/2014	15.0	12.0	-4.5	8.1	-0.3	1.0	0.5	1.0	-1.1	1.0	0.0	0.9	-9.1	2.9	4.6	6.9	-16.0	17.0	0.5	0.9	1.5	1.4	-2.2	2.5	0.4	1.9
5/19/2014	32.0	31.0	3.6	9.7	-2.9	1.3	0.8	1.0	-0.6	1.0	0.6	0.9	0.1	3.8	-23.0	27.0	12.0	18.0	-1.4	0.9	0.5	2.0	1.9	2.4	0.4	2.3
7/9/2014	30.1	32.2	-0.9	10.4	1.3	1.3	1.1	1.0	0.4	1.0	1.5	0.9	-3.6	3.7	-68.2	30.4	-16.2	16.8	-0.6	1.0	0.7	1.9	-2.0	2.5	-1.1	2.4
10/1/2014	12.3	12.1	5.2	10.1	-0.2	1.4	1.9	1.3	1.1	1.3	0.3	1.0	-2.5	3.3	3.3	5.3	65.6	13.6	-0.8	1.2	3.0	1.5	-0.6	3.1	2.6	2.2
Pool of the Rock R., Oregon, Illinois																										
3/19/2014	-4.0	21.0	9.0	15.0	-1.4	1.5	0.0	1.3	2.0	1.3	-2.4	1.4	0.3	3.9	2.0	13.0	66.0	14.0	1.7	1.2	1.0	2.0	-5.6	3.4	5.2	2.5
5/19/2014	27.0	41.0			0.6	2.4	-0.5	1.7	1.2	1.8	0.3	1.6	-2.3	6.2	13.0	39.0	29.0	21.0	-0.8	2.1	0.5	3.3	0.7	3.9	0.4	3.9
7/9/2014	9.9	34.1	33.0	13.3	0.3	1.7	2.2	1.4	1.2	1.3	1.1	1.0	7.0	4.3	43.5	29.0	29.0	15.1	-0.5	1.3	-0.1	2.7	-4.0	3.5	0.4	3.0
10/1/2014	-2.4	15.5	-8.8	9.9	0.2	1.2	1.0	1.0	-0.9	1.3	-2.1	1.0	-0.4	2.9	8.1	11.8	21.9	15.2	0.4	1.1	-2.5	2.0	0.0	2.3	2.3	2.3
Rock R. Boat Ramp Near the Lake Louise Sample Point																										
3/19/2014	5.0	13.0	1.6	9.0	-0.5	1.1	-0.2	0.9	-0.7	1.0	0.6	0.8	3.9	2.1	-15.0	11.0	4.0	11.0	-0.3	0.9	-3.6	1.5	-2.8	2.1	-0.2	2.0
5/19/2014	-11.8	31.7	2.0	9.5	-0.8	1.3	-1.0	1.1	-0.6	0.9	0.9	1.0	2.0	3.8	26.6	28.4	33.0	17.1	-0.3	1.0	0.9	1.9	-3.0	2.7	-3.3	2.3
7/9/2014	-7.1	31.7	4.1	12.1	0.0	1.4	-0.2	1.1	0.6	1.1	0.0	1.0	-2.1	3.3	-24.5	35.7	37.2	10.0	-0.2	1.0	0.6	2.1	-2.0	2.3	0.9	2.5
10/1/2014	8.5	17.0	15.4	10.1	0.4	1.2	0.0	0.8	0.6	1.0	-0.7	0.8	2.0	2.5	13.0	15.2	29.1	10.2	1.1	0.9	-0.4	1.7	0.3	2.0	1.4	2.1
Rock R., DnS of the Intersection With Woodland Creek (UpS)																										
3/19/2014	4.0	15.0	-2.0	11.0	1.2	1.2	1.2	1.1	0.3	1.1	1.1	1.1	1.2	3.3	-1.1	9.7	46.0	13.0	-1.1	1.2	1.7	1.7	-2.2	2.6	-1.4	2.3
5/19/2014	-10.9	32.5	0.7	10.0	2.5	1.3	1.5	1.1	0.9	1.0	0.4	0.9	-1.1	3.6	19.8	30.4	2.5	17.8	-2.1	0.9	-1.1	1.9	-0.7	2.3	3.9	2.4
7/9/2014	29.9	19.9	-1.7	9.0	0.3	1.1	0.6	1.0	0.8	1.0	0.6	0.9	-5.8	3.3	6.6	14.2	17.6	17.4	0.5	0.9	2.1	1.6	-5.2	2.5	-0.2	2.1
10/1/2014	-3.1	9.9	-2.0	7.6	-1.0	1.1	-1.0	1.0	-2.0	1.0	1.7	0.9	-0.8	2.6	1.8	4.9	1.5	16.6	0.5	0.9	1.0	1.3	-1.5	2.4	-1.3	1.9
Rock R., Just UpS of the Byron Cooling Water Discharge																										
3/19/2014	10.0	12.0	19.7	9.1	-0.3	1.1	0.3	0.9	-0.1	1.0	0.4	0.8	0.8	2.3	20.0	8.8	27.0	10.0	1.1	1.0	0.3	1.4	-0.4	1.9	-0.9	2.1
5/19/2014	43.0	24.0	7.0	11.0	-1.7	1.2	0.5	0.8	-2.0	1.0	0.9	0.8	4.0	2.8	-6.0	24.0	37.0	11.0	-0.9	1.0	-3.5	1.9	1.8	1.9	0.6	2.3
7/9/2014	-11.0	28.0	7.0	11.4	-0.3	1.2	0.9	0.9	0.8	0.9	0.6	0.8	1.4	2.9	53.2	32.3	31.0	9.4	-0.6	1.0	-0.1	2.1	-1.9	2.1	1.7	2.4
10/1/2014	-2.0	14.0	-4.6	9.9	-1.0	1.4	1.0	1.0	-0.5	1.2	0.8	1.0	2.4	2.6	-3.2	9.1	4.9	15.5	-0.4	1.2	0.8	1.7	-4.3	2.4	1.6	2.3
Woodland Creek, UpS of the Intersection With Rock R. (UpS)																										
5/19/2014	-5.9	32.1	-1.8	10.0	-0.9	1.3	0.9	1.0	-0.8	1.0	-0.4	0.9	1.2	3.8	6.4	31.5	2.5	17.7	1.2	0.9	0.8	2.0	2.3	2.5	1.1	2.3
7/9/2014	-3.4	39.9			0.5	2.5	0.5	1.7	0.6	1.8	-0.4	1.6	-0.8	5.7	-2.0	40.2	-26.0	22.1	-0.6	2.0	-0.6	3.1	1.2	4.0	3.1	3.5
10/1/2014	1.7	12.3	-5.5	10.1	-2.6	1.3	0.1	1.1	0.2	1.1	-1.4	1.1	-1.2	2.9	4.9	8.8	26.9	10.4	-1.2	1.1	-0.7	1.6	3.6	2.2	2.3	2.3

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

Location / Date	Ac-228 Result	Ac-228 Error	Ba-140 Result	Ba-140 Error	Bi-212 Result	Bi-212 Error	Bi-214 Result	Bi-214 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error
Flood Plain NE of intersection of N River & N German Church (NE Quadrant, Byron)																						
5/19/2014	0.4	0.0	-0.1	0.2	0.5	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	9.0	0.4	0.0	0.0
7/9/2014	0.5	0.0	-1.1	0.8	0.7	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	11.5	0.4	0.0	0.0
Lot SE of intersection of W Pond & N Main (NW Quadrant, Leaf River)																						
5/19/2014	0.6	0.0	-0.1	0.2	0.6	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	11.8	0.4	0.0	0.0
7/9/2014	0.7	0.0	-0.5	0.9	0.5	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	12.4	0.4	0.0	0.0
Lowden State Park (SW Quadrant)																						
5/19/2014	0.8	0.0	-0.1	0.2	0.7	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	13.1	0.4	0.0	0.0
7/9/2014	0.7	0.0	0.4	0.9	0.6	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	12.1	0.4	0.0	0.0
Nachusa Grasslands Area (UpW)																						
5/19/2014	0.6	0.0	0.0	0.2	0.4	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	9.1	0.4	0.0	0.0
7/9/2014	0.5	0.0	-0.7	0.7	0.6	0.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	9.1	0.3	0.0	0.0
Southwest of Rockford, Illinois (DnW)																						
5/19/2014	0.7	0.0	-0.3	0.2	1.2	0.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	12.2	0.5	0.0	0.0
7/9/2014	0.8	0.0	0.2	1.1	0.6	0.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.1	13.4	0.5	0.0	0.0

Location / Date	Nb-95 Result	Nb-95 Error	Pa-234m Result	Pa-234m Error	Pb-210 Result	Pb-210 Error	Pb-212 Result	Pb-212 Error	Pb-214 Result	Pb-214 Error	Ra-226 Result	Ra-226 Error	Th-234 Result	Th-234 Error	Tl-208 Result	Tl-208 Error	U-235 Result	U-235 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Flood Plain NE of intersection of N River & N German Church (NE Quadrant, Byron)																						
5/19/2014	-0.1	0.0	0.8	1.0	0.9	1.7	0.4	0.0	0.4	0.0	1.0	0.2	0.0	0.4	0.4	0.0	0.1	0.0	0.0	0.0	-0.1	0.0
7/9/2014	0.0	0.0	0.9	0.8	0.6	0.3	0.6	0.0	0.7	0.0	1.3	0.2	0.8	0.3	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Lot SE of intersection of W Pond & N Main (NW Quadrant, Leaf River)																						
5/19/2014	0.0	0.0	1.8	0.9	1.2	0.4	0.6	0.0	0.6	0.0	1.2	0.2	1.3	0.4	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0
7/9/2014	0.0	0.0	0.9	0.9	1.7	1.7	0.7	0.0	0.8	0.0	1.0	0.2	0.3	0.4	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Lowden State Park (SW Quadrant)																						
5/19/2014	0.0	0.0	0.2	1.0	0.9	0.4	0.7	0.0	0.7	0.0	1.3	0.2	1.2	0.4	0.7	0.0	0.1	0.0	0.0	0.0	0.0	0.0
7/9/2014	0.0	0.0	-0.5	1.0	1.1	0.1	0.7	0.0	0.8	0.0	1.4	0.1	0.7	0.2	0.7	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Nachusa Grasslands Area (UpW)																						
5/19/2014	0.0	0.0	1.2	1.2	1.2	0.2	0.6	0.0	0.6	0.0	1.2	0.2	0.6	0.2	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0
7/9/2014	0.0	0.0	1.2	0.7	1.5	0.3	0.6	0.0	0.6	0.0	1.1	0.2	0.6	0.3	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Southwest of Rockford, Illinois (DnW)																						
5/19/2014	-0.1	0.0	0.4	1.3	1.5	0.2	0.8	0.0	0.7	0.0	1.6	0.2	0.8	0.2	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0
7/9/2014	-0.1	0.0	0.3	1.2	1.9	0.2	0.8	0.0	0.9	0.0	1.3	0.2	1.0	0.2	0.7	0.0	0.1	0.0	0.0	0.0	0.0	0.0

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

Location / Date	Ac-228 Result	Ac-228 Error	Ba-140 Result	Ba-140 Error	Bi-212 Result	Bi-212 Error	Bi-214 Result	Bi-214 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error
Pool of The Rock R., Oregon, IL																						
5/19/2014	0.6	0.0	-0.1	0.3	0.7	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	10.2	0.4	0.0	0.0
10/1/2014	0.6	0.0	0.0	0.1	0.9	0.2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	10.8	0.4	0.0	0.0
Rock R., Just UpS of the Byron Cooling Water Discharge																						
5/19/2014	0.9	0.0	-0.2	0.3	1.1	0.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	13.6	0.5	0.0	0.0
10/1/2014	0.3	0.0	-0.1	0.1	0.4	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.4	0.3	0.0	0.0

Location / Date	Nb-95 Result	Nb-95 Error	Pa-234m Result	Pa-234m Error	Pb-210 Result	Pb-210 Error	Pb-212 Result	Pb-212 Error	Pb-214 Result	Pb-214 Error	Ra-226 Result	Ra-226 Error	Th-234 Result	Th-234 Error	Tl-208 Result	Tl-208 Error	U-235 Result	U-235 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Pool of The Rock R., Oregon, IL																						
5/19/2014	0.0	0.0	1.7	1.1	2.1	0.2	0.7	0.0	0.7	0.0	0.9	0.2	0.4	0.2	0.5	0.0	0.1	0.0	0.0	0.0	0.0	0.0
10/1/2014	0.0	0.0	-0.4	1.2	4.1	1.4	0.6	0.0	0.7	0.0	1.3	0.2	1.3	0.4	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Rock R., Just UpS of the Byron Cooling Water Discharge																						
5/19/2014	-0.1	0.0	1.8	1.3	-3.5	2.4	0.9	0.0	0.9	0.0	1.7	0.3	0.5	0.5	0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0
10/1/2014	0.0	0.0	0.2	0.7	0.6	0.2	0.2	0.0	0.3	0.0	0.5	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table C-7. Vegetation Sample Results for Byron Area
Results are in picocuries per kilogram (pCi/kg)

Location / Date	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Flood Plain NE of intersection of N River & N German Church (NE Quadrant, Byron)																										
5/19/2014	0.4	1.8	2.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.8	3.9	21.0	0.7	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0
7/9/2014	0.3	0.3	5.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	-0.3	0.3	12.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lot SE of intersection of W Pond & N Main (NW Quadrant, Leaf River)																										
5/19/2014	3.2	1.8	6.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	2.2	3.5	28.0	0.9	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.1
7/9/2014	1.2	0.6	7.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	-0.4	0.7	15.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lowden State Park (SW Quadrant)																										
5/19/2014	1.1	1.4	5.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.1	3.6	2.6	24.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7/9/2014	0.7	0.3	3.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.3	10.3	0.4	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
Nachusa Grasslands Area (Upwind)																										
5/19/2014	0.6	1.0	5.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.9	1.9	25.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
7/9/2014	0.1	0.4	7.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	-0.5	0.3	17.2	0.7	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0
Southwest of Rockford, Illinois (Downwind)																										
5/19/2014	0.6	1.3	3.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.6	2.2	29.6	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7/9/2014	0.1	0.4	6.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.3	17.7	0.7	0.0	0.0	0.0	0.0	0.0	0.1	-0.1	0.0

Table C-8. Gamma Detection Network Results for Byron

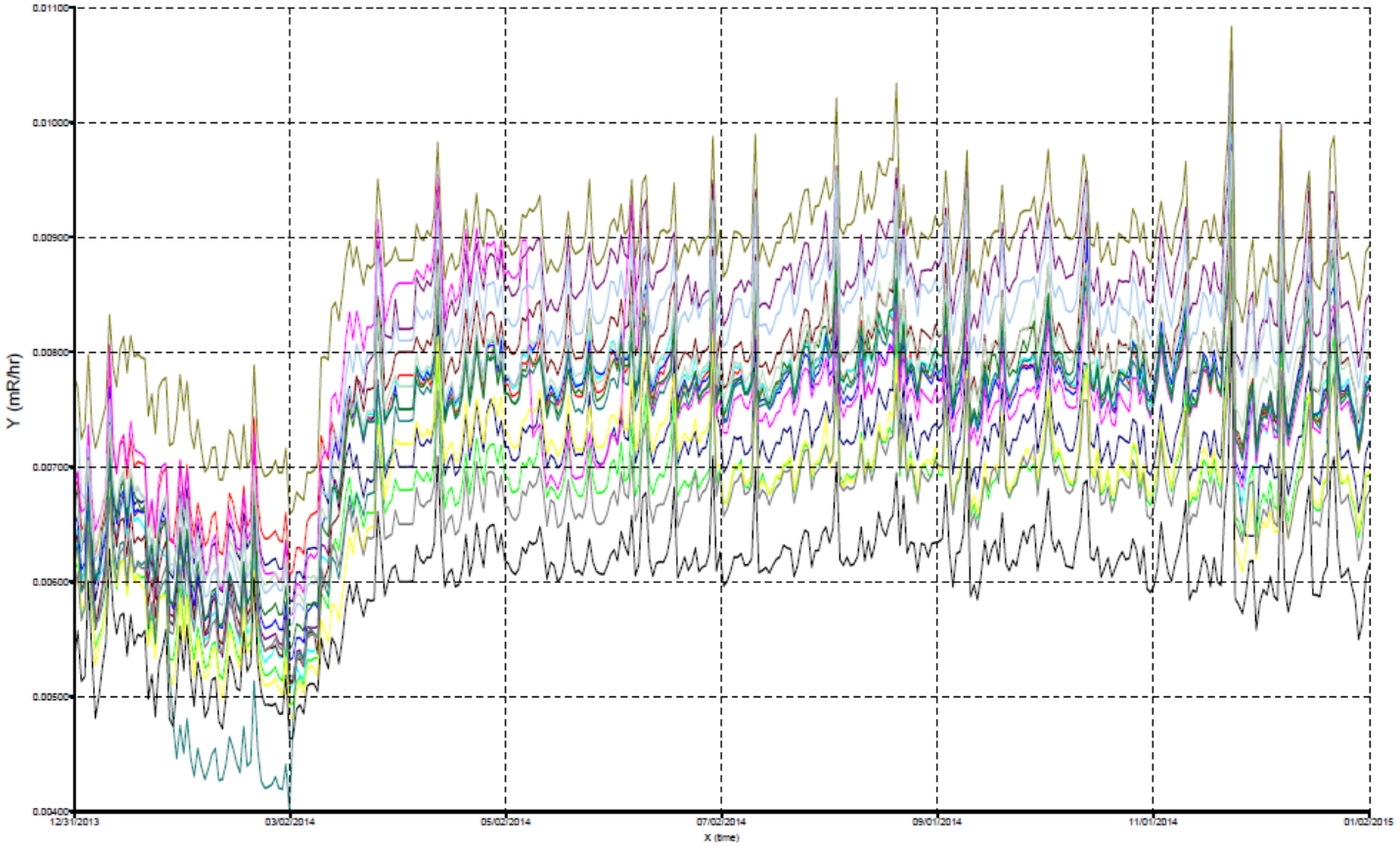


Table C-9. Summary of Ambient Gamma Results for Byron Area

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
BY001	0.05		0.08	0.10	28.96
BY003	0.07	0.08	0.06	0.06	25.00
BY004	0.06	0.08	0.08	0.09	27.65
BY005	0.07	0.08	0.10	0.08	29.75
BY006	0.07	0.07	0.09	0.08	28.65
BY007	0.06	0.08	0.07	0.07	26.55
BY008	0.07	0.09	0.08	0.08	29.02
BY011	0.05	0.07	0.08		24.21
BY013	0.09	0.09	0.10	0.09	33.67
BY014	0.06	0.06	0.06	0.10	25.37
BY015	0.09	0.08	0.10	0.10	33.49
BY018	0.06	0.07	0.07	0.09	26.19
BY020	0.07	0.11	0.11	0.11	36.04
BY022	0.08	0.10	0.11	0.10	34.68
BY023	0.08	0.10		0.10	35.16
BY026	0.07	0.07	0.08	0.09	29.38
BY027	0.08	0.11	0.10	0.10	35.41
BY029	0.07	0.10	0.09	0.10	34.22
BY030	0.08	0.09	0.11	0.09	33.95
BY033	0.09	0.09	0.12	0.10	36.68
BY034	0.06	0.08	0.08	0.08	27.65
BY035	0.07	0.07	0.07	0.08	25.73
BY037	0.07	0.07	0.08	0.08	26.55
BY040	0.09	0.11	0.11	0.10	37.23
BY041	0.07	0.10	0.08	0.08	30.30
BY044	0.06	0.07	0.09	0.09	28.11
BY045	0.06	0.08	0.09	0.08	28.56
BY049	0.06	0.07	0.07	0.08	26.37
BY050	0.07	0.13	0.11	0.11	37.32
BY051	0.07	0.08	0.07	0.08	27.10
BY052	0.08	0.09	0.09	0.09	32.67
BY053	0.09	0.09	0.09	0.10	33.31
BY055	0.08	0.10	0.12	0.12	38.14
BY056	0.08	0.10	0.09	0.10	32.76
BY057		0.10	0.11	0.10	37.11
BY058	0.09	0.10	0.10	0.10	35.22
BY059	0.06	0.10	0.10	0.09	32.21
BY060	0.06	0.10	0.12	0.09	34.49
BY061	0.09	0.11	0.10	0.12	38.23
BY062	0.08	0.09	0.10	0.10	33.49
BY063	0.09		0.09	0.11	34.92
BY064	0.10	0.11	0.10	0.10	37.05
BY065	0.07	0.08	0.07	0.11	30.57
BY066	0.06	0.08	0.10	0.10	30.84
BY067	0.09	0.09	0.08	0.09	31.57
BY068	0.08	0.09	0.10	0.09	32.94
BY069	0.07	0.10	0.09	0.10	31.76
BY070	0.07	0.08	0.10	0.11	32.12
BY071	0.07	0.06	0.08	0.07	24.82

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
BY072	0.10	0.10	0.12	0.10	38.23
BY073	0.08	0.09	0.10	0.11	34.31
BY074	0.09	0.09	0.10	0.11	34.68
BY075	0.10	0.09	0.09	0.10	33.76
BY076	0.06	0.08	0.06	0.08	26.10
BY077	0.07	0.09	0.09	0.09	30.02
BY078	0.06	0.10	0.09	0.12	33.40
BY079	0.06	0.06	0.05	0.08	22.36
BY080	0.06	0.09	0.06	0.07	25.28
BY-RSA	0.07	0.08	0.10	0.08	29.11
BY-RSB	0.09	0.09	0.10	0.08	33.40
BY-RSC	0.06	0.08	0.05	0.06	23.82
BY-RSD	0.06	0.09	0.08	0.10	29.38
BY-RSE	0.05	0.10	0.08	0.09	29.38
BY-RSF	0.10	0.09	0.09	0.11	35.68
BY-RSG	0.07	0.08	0.08	0.09	29.57
BY-RSH	0.08	0.08	0.09	0.08	29.93
BY-RSJ	0.07	0.10	0.07	0.08	29.29
BY-RSK	0.07	0.08	0.09	0.09	30.11
BY-RSL	0.06	0.09	0.10	0.08	29.47
BY-RSM	0.05	0.05	0.07	0.05	19.62
BY-RSN	0.05	0.06	0.06	0.06	20.44
BY-RSP	0.07	0.09	0.08	0.08	29.47
BY-RSQ	0.08	0.10	0.08	0.10	31.85
BY-RSR	0.10	0.11	0.11	0.10	38.42

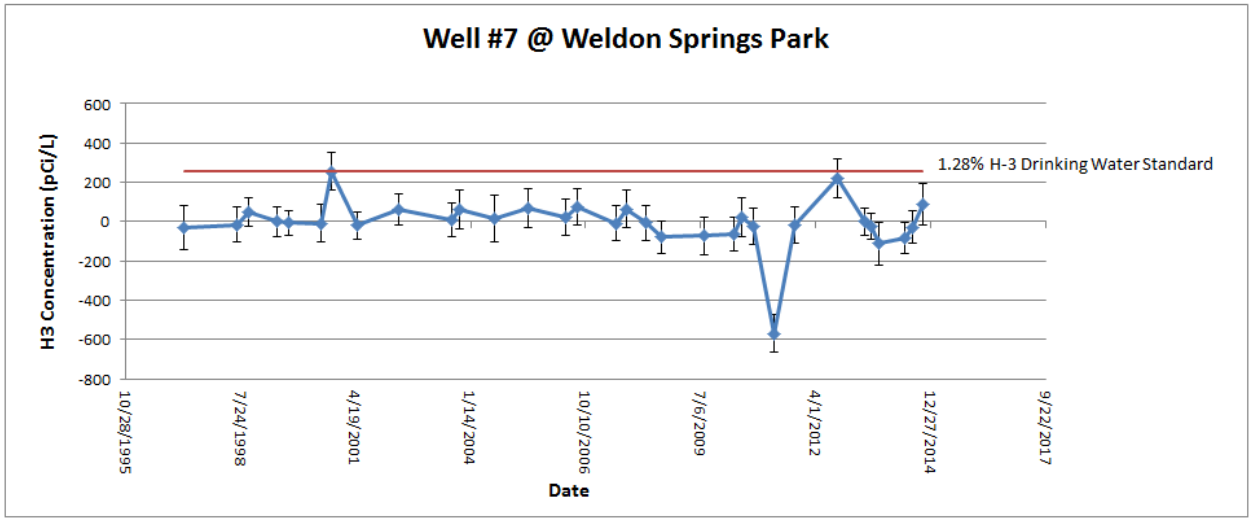
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Dose column based on averages of all available data.

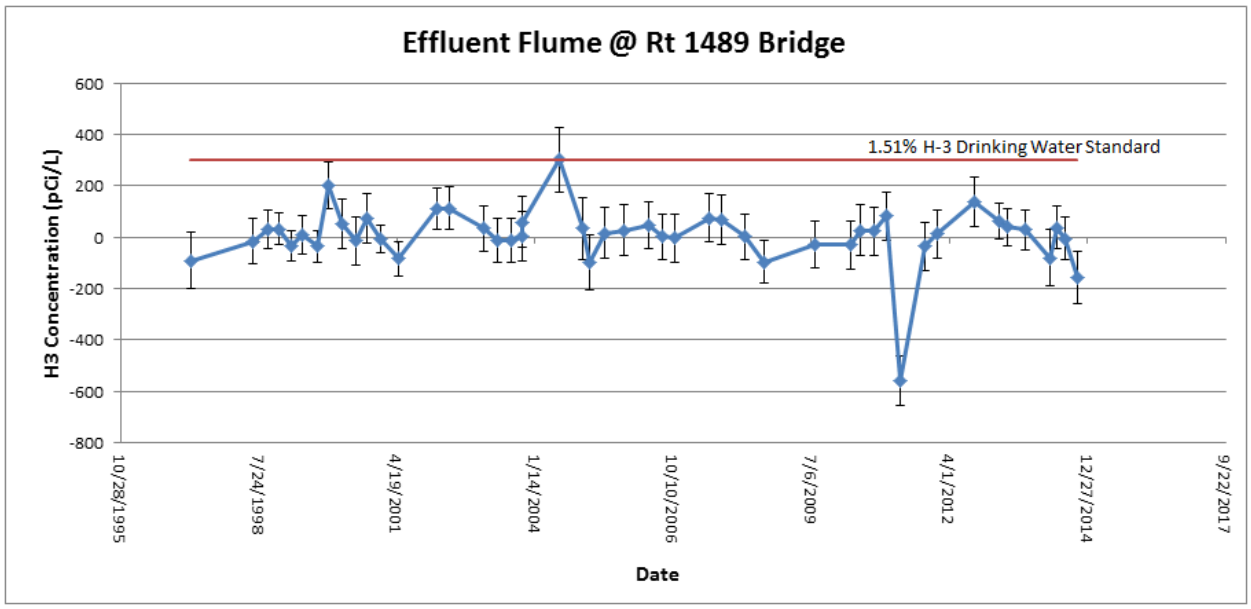
Appendix D
Clinton Sample Results

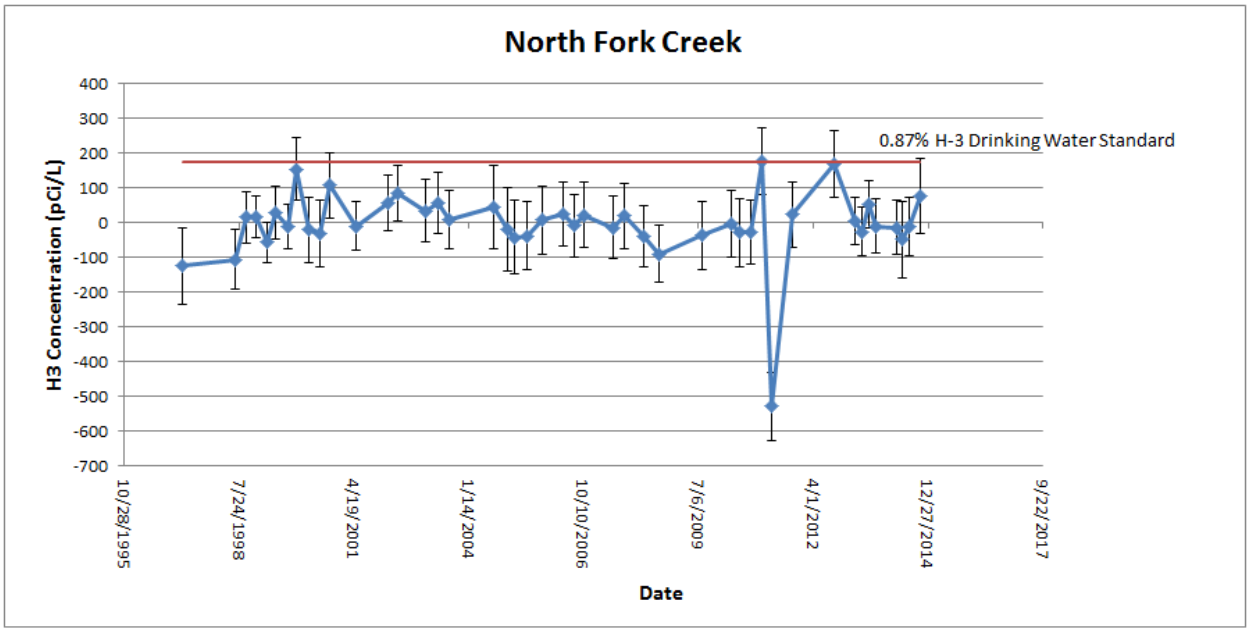
Table D-1. Tritium in Water Sample Results for Clinton Area
Results are in picocuries per liter (pCi/L)

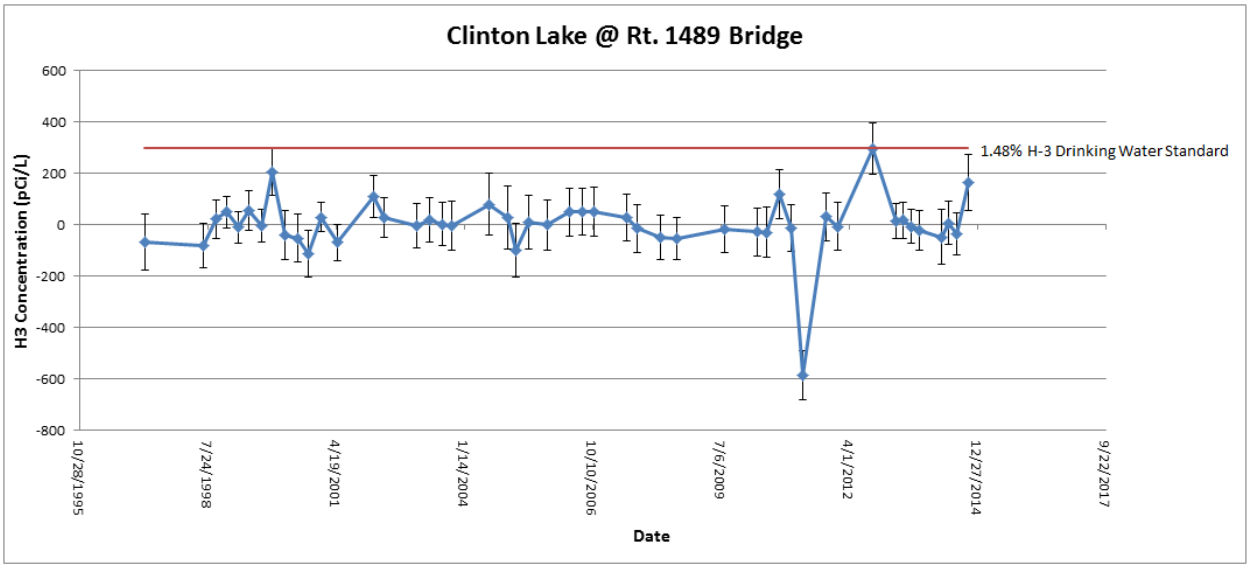
Location	Date	Result		Error
Well#7 At Weldon Springs Park	5/16/2014	-83.8	±	80.4
Well#7 At Weldon Springs Park	7/18/2014	-28.1	±	82.3
Well#7 At Weldon Springs Park	10/15/2014	87.7	±	107.0
Effluent Flume @ Bridge Rt 1489	3/26/2014	-80.1	±	108.0
Effluent Flume @ Bridge Rt 1489	5/16/2014	37.3	±	83.7
Effluent Flume @ Bridge Rt 1489	7/18/2014	-7.0	±	82.8
Effluent Flume @ Bridge Rt 1489	10/15/2014	-157.0	±	102.0
North Fork Creek	3/26/2014	-15.3	±	77.5
North Fork Creek	5/16/2014	-50.5	±	109.0
North Fork Creek	7/18/2014	-11.7	±	82.7
North Fork Creek	10/15/2014	76.0	±	107.0
Clinton Lake: Bridge Over Lake At Rte 1489	3/26/2014	-50.4	±	108.0
Clinton Lake: Bridge Over Lake At Rte 1489	5/16/2014	4.7	±	82.8
Clinton Lake: Bridge Over Lake At Rte 1489	7/18/2014	-39.8	±	81.9
Clinton Lake: Bridge Over Lake At Rte 1489	10/15/2014	162.0	±	109.0
Salt Creek DnS. From Spillway	3/26/2014	-2.3	±	109.0
Salt Creek DnS. From Spillway	5/16/2014	-16.3	±	82.2
Salt Creek DnS. From Spillway	7/18/2014	30.4	±	83.8
Salt Creek DnS. From Spillway	10/15/2014	99.8	±	108.0
Clinton Lake: Bridge Over Lake At Rte 48	3/26/2014	-48.1	±	108.0
Clinton Lake: Bridge Over Lake At Rte 48	5/16/2014	39.6	±	83.7
Clinton Lake: Bridge Over Lake At Rte 48	7/18/2014	-32.7	±	82.1
Clinton Lake: Bridge Over Lake At Rte 48	10/15/2014	87.9	±	108.0
Clinton Lake: Parnell Boat Ramp	3/26/2014	-93.9	±	107.0
Clinton Lake: Parnell Boat Ramp	5/16/2014	69.9	±	84.5
Clinton Lake: Parnell Boat Ramp	7/18/2014	44.4	±	84.2
Clinton Lake: Parnell Boat Ramp	10/15/2014	47.5	±	107.0
Clinton Lake: North Branch @ Rte 54 Bridge	3/26/2014	-32.7	±	77.1
Clinton Lake: North Branch @ Rte 54 Bridge	5/16/2014	-45.9	±	109.0
Clinton Lake: North Branch @ Rte 54 Bridge	7/18/2014	-7.0	±	82.8
Clinton Lake: North Branch @ Rte 54 Bridge	10/15/2014	-11.5	±	80.5
Mascutin Recreation Area Well	5/16/2014	-9.3	±	82.4
Mascutin Recreation Area Well	7/18/2014	-16.4	±	82.6
Mascutin Recreation Area Well	10/15/2014	19.0	±	106.0

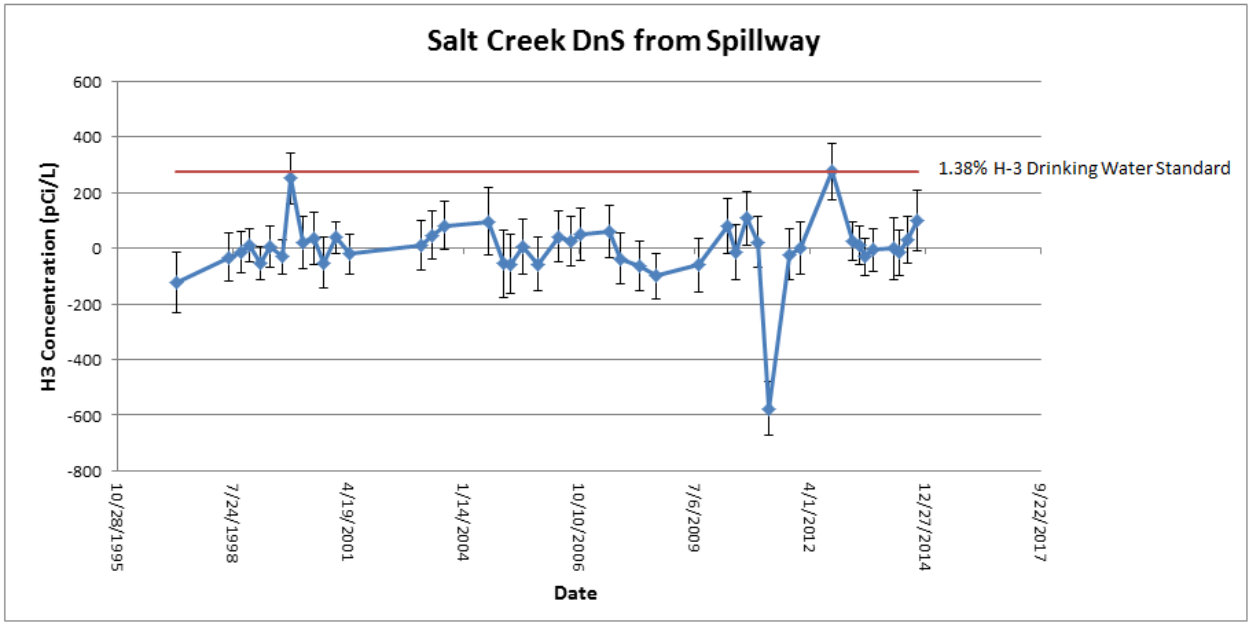
Tables D-2. Trending Graphs for Water from the Clinton Area
(Highest results on graphs indicate percentage of US EPA Drinking Water Standard)

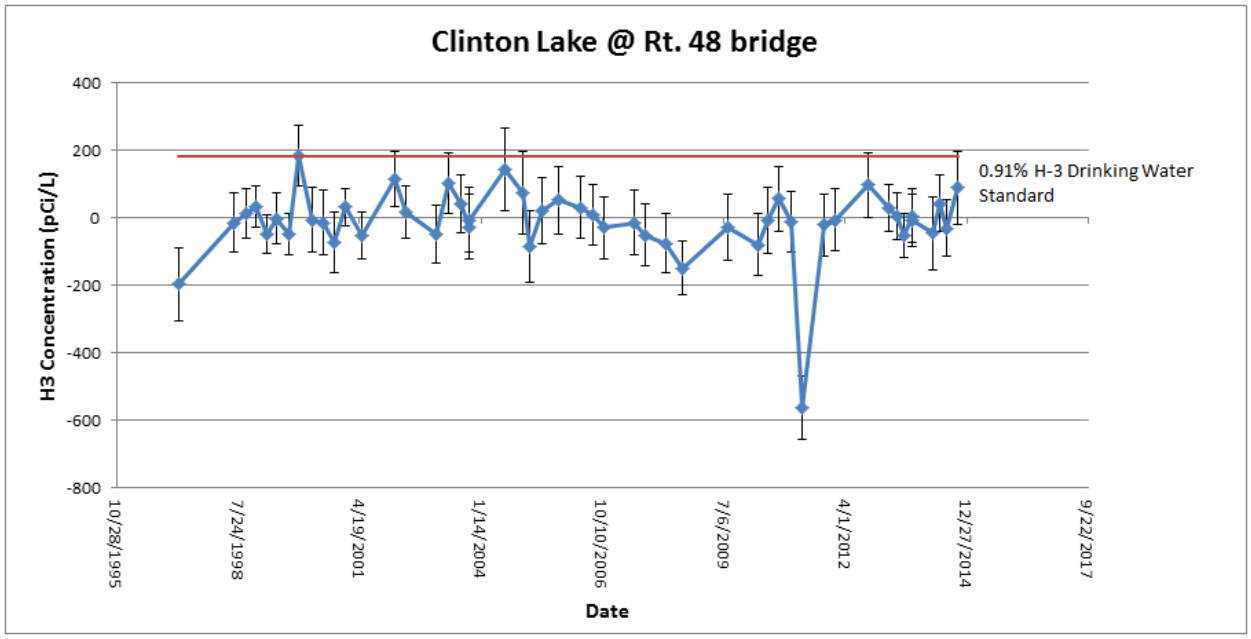


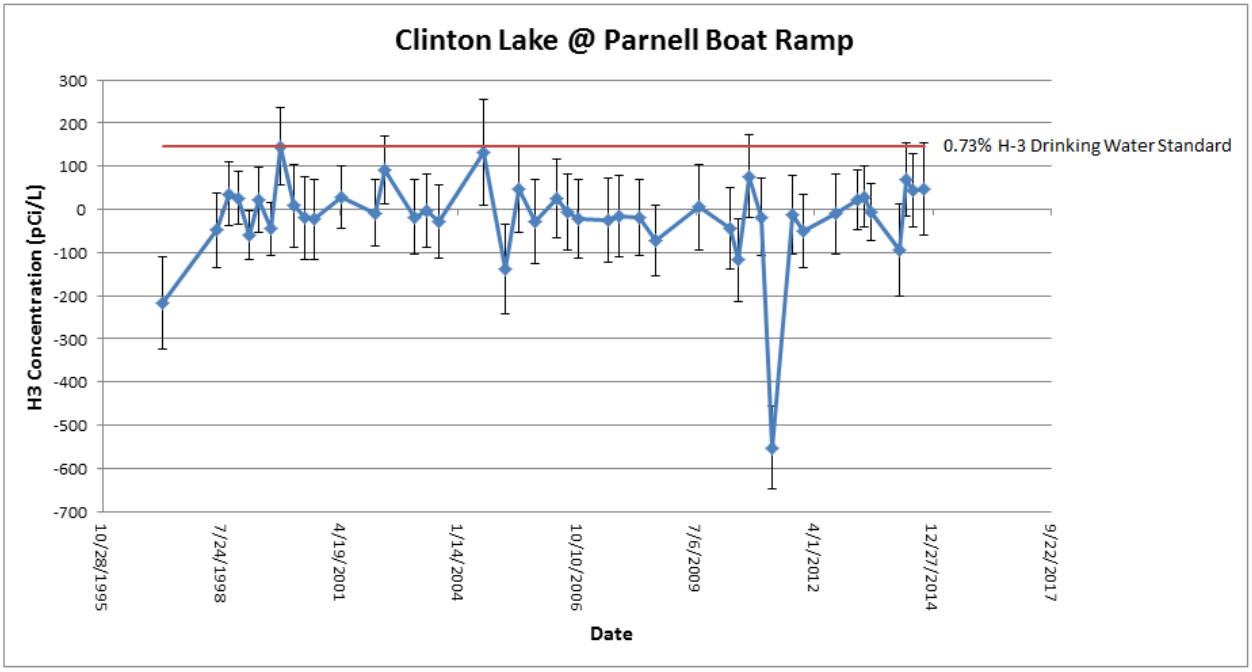


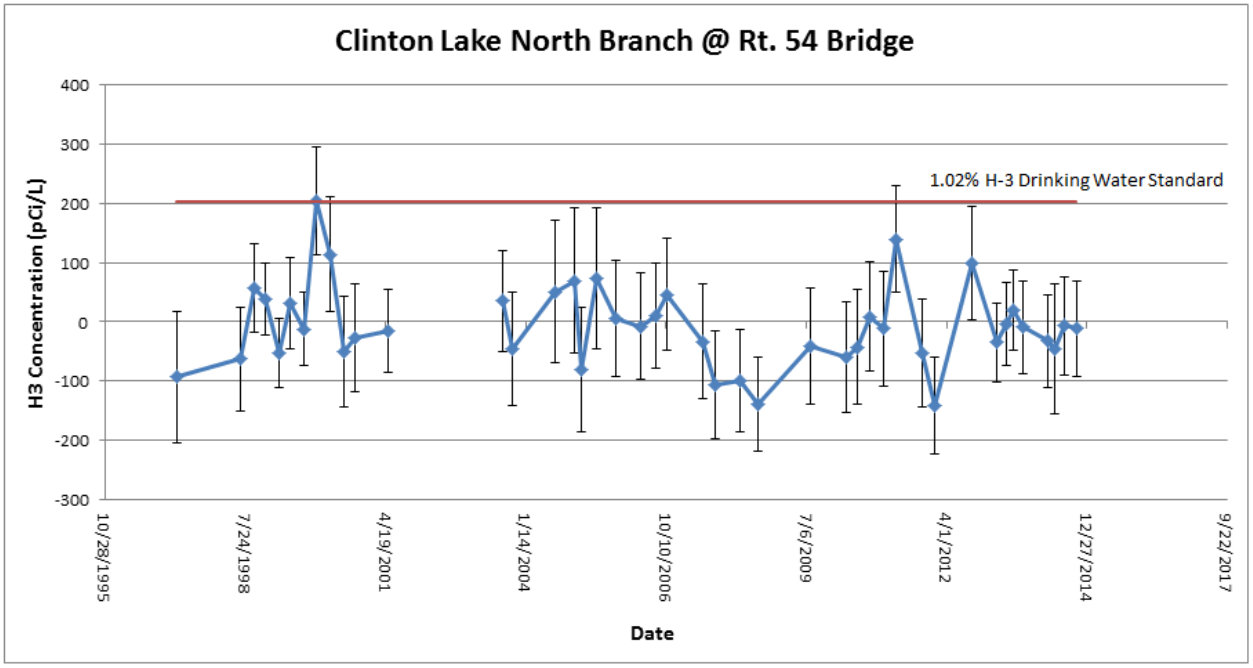

North Fork Creek
H3 Concentration (pCi/L)
400
300
200
100
0
-100
-200
-300
-400
-500
-600
-700
0.87% H-3 Drinking Water Standard
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
Date


Clinton Lake @ Rt. 1489 Bridge
H3 Concentration (pCi/L)
600
400
200
0
-200
-400
-600
-800
1.48% H-3 Drinking Water 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
Date


Salt Creek DnS from Spillway
600
400
200
0
-200
-400
-600
-800
H3 Concentration (pCi/L)
1.38% H-3 Drinking Water 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
Date


Clinton Lake @ Rt. 48 bridge
400
200
0
-200
-400
-600
-800
H3 Concentration (pCi/L)
0.91% H-3 Drinking Water 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
Date


Clinton Lake @ Parnell Boat Ramp
H3 Concentration (pCi/L)
300
200
100
0
-100
-200
-300
-400
-500
-600
-700
0.73% H-3 Drinking Water 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
Date


Clinton Lake North Branch @ Rt. 54 Bridge
H3 Concentration (pCi/L)
400
300
200
100
0
-100
-200
-300
1.02% H-3 Drinking Water 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
Date

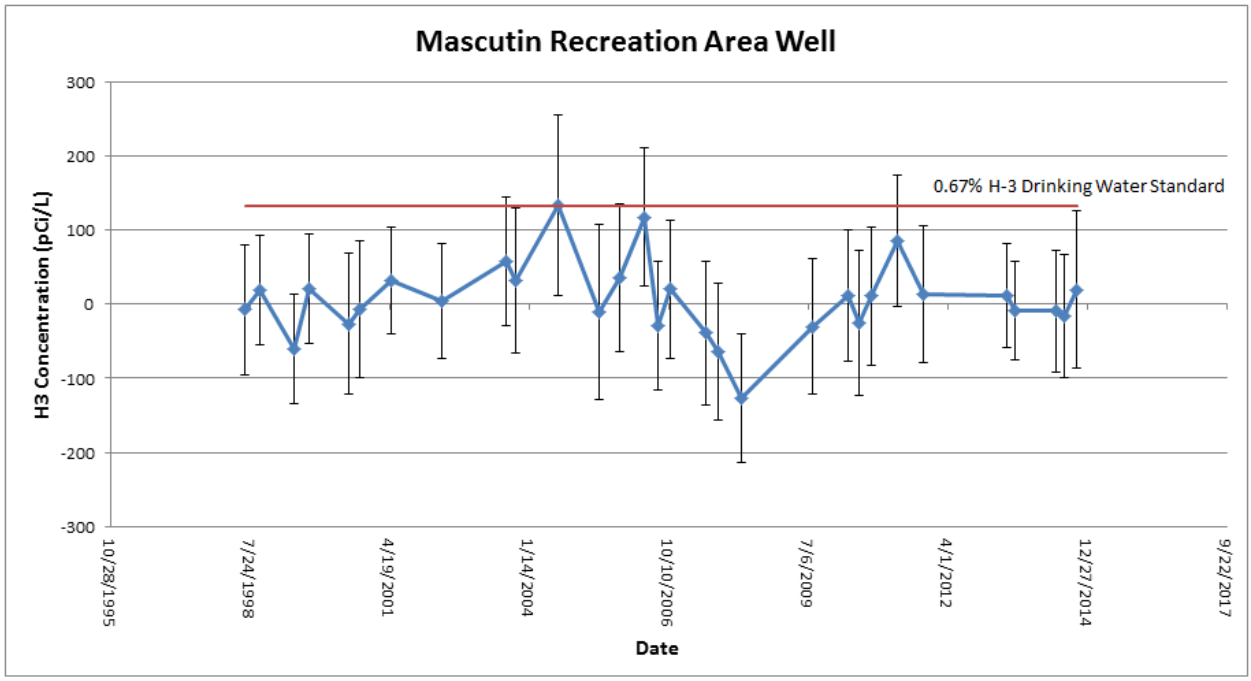

Mascutin Recreation Area Well
300
200
100
0
-100
-200
-300
H3 Concentration (pCi/L)
0.67% H-3 Drinking Water Standard
10/28/1995
7/24/1998
4/19/2001
1/14/2004
10/10/2006
7/6/2009
4/1/2012
12/27/2014
9/22/2017
Date

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

Location / Date	Alpha Result		Alpha Error	Beta Result		Beta Error
Clinton Lake: Bridge Over Lake At Rte 1489						
3/26/2014	0.4	±	1.6	2.2	±	2.5
5/16/2014	0.8	±	1.4	-0.2	±	2.4
7/18/2014	0.8	±	1.4	2.4	±	2.5
10/15/2014	-0.1	±	1.5	-0.9	±	2.4
Clinton Lake: Bridge Over Lake At Rte 48						
3/26/2014	-0.1	±	1.6	3.4	±	2.5
5/16/2014	0.5	±	1.4	-2.1	±	2.3
7/18/2014	0.0	±	1.4	2.9	±	2.6
10/15/2014	0.6	±	1.4	5.5	±	2.5
Clinton Lake: North Branch @ Rte 54 Bridge						
3/26/2014	0.1	±	1.6	4.3	±	2.5
5/16/2014	0.6	±	1.4	-0.1	±	2.4
7/18/2014	0.5	±	1.4	5.3	±	2.6
10/15/2014	0.5	±	1.5	4.0	±	2.6
Clinton Lake: Parnell Boat Ramp						
3/26/2014	0.3	±	1.6	-0.6	±	2.4
5/16/2014	0.2	±	1.4	0.6	±	2.4
7/18/2014	-1.5	±	1.3	4.7	±	2.6
10/15/2014	0.9	±	1.4	2.1	±	2.4
Effluent Flume @ Bridge Rt 1489						
3/26/2014	1.8	±	1.7	0.9	±	2.4
5/16/2014	0.2	±	1.4	-1.2	±	2.4
7/18/2014	0.4	±	1.4	4.5	±	2.7
10/15/2014	-0.5	±	1.3	6.4	±	2.5
Mascutin Recreation Area Well						
5/16/2014	1.6	±	1.5	-1.7	±	2.4
7/18/2014	0.2	±	1.4	6.0	±	2.6
10/15/2014	-0.3	±	1.5	4.7	±	2.6
North Fork Creek						
3/26/2014	0.9	±	1.6	-0.9	±	2.4
5/16/2014	2.1	±	1.5	1.5	±	2.4
7/18/2014	0.2	±	1.4	1.8	±	2.5
10/15/2014	0.7	±	1.5	2.7	±	2.5
Salt Creek DnS. From Spillway						
3/26/2014	1.4	±	1.7	2.7	±	2.5
5/16/2014	2.2	±	1.5	1.7	±	2.4
7/18/2014	-0.2	±	1.4	2.8	±	2.6
10/15/2014	0.9	±	1.4	2.2	±	2.4
Well#7 At Weldon Springs Park						
5/16/2014	-0.2	±	1.4	3.0	±	2.5
7/18/2014	-0.3	±	1.3	3.8	±	2.6
10/15/2014	0.4	±	1.3	2.2	±	2.4

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 / Date	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Clinton Lake: Bridge Over Lake At Rte 1489																										
3/26/2014	-37.0	39.0	2.0	13.0	0.0	1.4	0.3	1.0	0.5	0.9	1.4	0.9	-8.1	4.4	45.0	42.0	-6.0	17.0	-1.7	1.0	-2.2	2.2	0.6	2.3	2.8	2.5
5/16/2014	26.0	27.0	-11.0	12.0	-0.2	1.4	1.2	1.1	-0.3	1.2	0.3	1.0	2.2	3.9	-20.0	26.0	63.0	13.0	0.8	1.2	-1.0	2.0	-4.2	2.8	-0.8	2.5
7/18/2014	-71.9	57.4	1.9	15.2	1.7	1.8	-2.6	1.6	1.1	1.2	0.6	1.0	6.8	5.3	-57.7	67.7	54.9	13.7	-2.8	1.3	-3.8	3.4	-0.2	3.4	0.1	3.3
10/15/2014	11.7	32.2	3.5	12.3	-0.6	2.4	1.8	1.7	1.1	1.6	-0.3	1.6	-0.7	5.1	6.7	27.4	44.6	21.0	0.1	1.9	4.0	2.8	3.4	4.0	0.9	3.6
Clinton Lake: Bridge Over Lake At Rte 48																										
3/26/2014	49.0	33.0	-5.0	14.0	-1.9	1.4	0.0	1.2	-0.6	1.2	-0.2	1.1	3.9	4.0	-27.0	37.0	21.0	17.0	-0.8	1.3	-0.6	2.2	2.5	2.7	-0.2	2.9
5/16/2014	20.0	12.0	-9.8	9.1	-0.1	1.1	0.4	0.8	-0.4	1.0	0.4	0.8	-0.3	2.4	-5.4	8.8	12.0	13.0	-1.9	0.9	-0.6	1.5	1.2	1.9	-2.3	2.0
7/18/2014	-52.1	50.1	-12.6	13.7	1.1	1.5	1.0	1.1	-0.5	1.1	-0.7	1.1	6.8	3.7	45.5	81.3	13.4	10.9	0.2	1.1	0.3	2.6	7.4	2.0	2.7	2.7
10/15/2014	-2.2	16.5	-4.3	9.7	2.2	1.1	0.4	0.9	-0.4	1.0	-0.6	0.8	-0.3	2.6	6.8	15.3	25.1	10.6	-0.3	0.9	0.1	1.7	1.4	2.0	0.5	2.1
Clinton Lake: North Branch @ Rte 54 Bridge																										
3/26/2014	-71.0	45.0	12.0	14.0	-1.8	1.6	1.0	1.1	1.0	1.2	-0.2	1.0	0.8	4.2	43.0	57.0	22.0	16.0	1.0	1.2	-2.0	2.8	-1.1	2.6	-2.3	3.1
5/16/2014	0.0	27.0	-13.0	13.0	-1.3	1.7	1.1	1.3	0.8	1.2	0.4	1.0	2.2	4.4	-12.0	21.0	38.0	15.0	-2.7	1.4	0.5	2.2	-5.0	3.5	-1.9	3.1
7/18/2014	21.6	51.4	27.0	13.8	-1.3	1.7	0.8	1.0	0.9	1.2	1.0	0.9	-2.5	4.4	-54.7	85.7	-2.9	16.2	-0.2	1.2	5.3	2.9	-2.8	2.6	4.5	3.1
10/15/2014	-9.9	21.8	-8.1	12.1	1.0	1.3	1.4	1.3	1.2	1.2	-2.9	1.1	-1.6	3.7	18.9	18.1	-1.3	15.9	0.9	1.3	0.5	2.0	-1.4	2.8	0.5	2.6
Clinton Lake: Parnell Boat Ramp																										
3/26/2014	19.0	27.0	19.0	11.0	-2.7	1.3	1.0	0.9	-1.3	1.1	-0.2	0.8	3.8	2.9	-36.0	33.0	33.0	10.0	-1.2	1.0	1.3	2.0	1.9	2.0	2.3	2.3
5/16/2014	10.2	6.7	-13.4	8.7	0.5	1.0	0.7	0.9	0.5	1.0	-1.2	1.0	-2.5	2.5	-3.2	2.6	113.0	14.3	0.0	0.9	1.9	1.1	-0.2	2.0	0.1	1.7
7/18/2014	-15.7	84.4	8.8	26.1	2.7	3.3	0.1	2.5	-0.8	2.5	-0.2	1.9	4.1	9.0	-31.3	86.8	-24.2	24.7	-1.7	2.6	1.6	5.4	-0.6	6.8	-2.7	6.5
10/15/2014	-20.1	14.5	-6.7	8.0	0.9	1.1	0.2	1.0	0.8	1.0	-0.2	0.9	1.3	2.9	6.2	8.2	91.2	14.2	-0.2	0.9	-0.4	1.5	-2.0	2.5	-0.3	1.9
Effluent Flume @ Bridge Rt 1489																										
3/26/2014	-43.0	43.0	-19.0	14.0	-0.9	1.8	0.0	1.5	-1.7	1.3	1.0	1.0	-1.1	4.7	1.0	44.0	29.0	15.0	-2.4	1.3	1.9	2.7	-11.4	3.7	-2.8	3.6
5/16/2014	31.0	14.0	9.0	10.0	-0.6	1.3	0.7	1.0	-0.6	1.2	0.8	1.0	-0.7	3.1	-9.5	9.6	-11.0	15.0	-0.5	1.2	1.9	1.9	0.2	2.4	1.6	2.4
7/18/2014	-3.7	41.7	-10.7	14.4	-1.2	1.6	-0.1	0.9	0.8	1.2	0.1	0.9	2.5	3.9	-113.0	61.3	-30.5	13.4	0.9	1.2	3.0	2.6	-2.3	2.3	2.7	3.1
10/15/2014	-5.0	18.6	-8.7	11.1	0.7	1.2	-1.4	1.1	-0.2	1.2	0.0	1.1	-2.2	3.2	-10.6	16.0	2.5	11.6	0.5	1.0	-0.9	1.8	5.3	2.2	1.1	2.4
Mascutin Recreation Area Well																										
5/16/2014	22.0	12.0	-12.9	9.8	-0.6	1.0	-1.2	1.1	1.3	0.9	-1.6	1.0	-3.7	3.1	-6.0	6.3	-18.0	16.0	-0.1	0.9	0.1	1.5	1.5	2.4	-1.6	1.9
7/18/2014	75.4	51.4	-8.4	13.7	0.2	1.6	0.1	1.0	0.2	1.0	0.8	0.9	-1.1	4.1	-155.0	83.6	38.4	17.1	-0.2	1.1	0.8	2.3	0.6	2.2	6.2	2.4
10/15/2014	-14.7	19.1	-3.1	11.4	-0.6	1.4	-0.1	1.0	1.3	1.1	-0.4	1.0	0.2	3.3	-7.2	16.6	17.1	16.2	-0.7	1.1	4.2	1.9	-3.0	2.3	-3.2	2.6
North Fork Creek																										
3/26/2014	47.0	32.0	-14.0	13.0	0.8	1.6	-0.1	1.2	-0.9	1.2	-0.2	1.0	0.1	3.8	50.0	35.0	24.0	17.0	-0.5	1.2	0.4	2.3	3.0	2.4	-1.3	3.0
5/16/2014	2.0	22.0	-21.0	11.0	0.6	1.2	0.2	0.9	-0.3	1.0	0.3	0.9	2.1	2.9	5.0	24.0	-25.0	11.0	0.9	0.9	0.0	1.8	-0.3	1.9	1.3	2.3
7/18/2014	-20.6	55.4	-7.0	14.9	-1.2	1.6	0.8	1.2	-0.7	1.1	-1.1	1.0	1.6	4.6	-36.7	84.7	3.9	15.2	-1.2	1.3	1.3	2.7	-0.1	2.7	-1.1	3.2
10/15/2014	19.7	21.3	3.7	11.0	-2.6	1.6	-2.2	1.4	0.2	1.3	-0.2	1.1	-1.4	3.8	2.2	13.3	48.8	13.7	-0.8	1.2	-3.8	2.4	-7.1	3.5	1.3	2.6
Salt Creek DnS. From Spillway																										
3/26/2014	5.0	42.0	-33.0	18.0	-1.3	1.8	0.9	1.3	-0.3	1.4	1.1	1.3	3.8	5.0	-6.0	41.0	36.0	16.0	-1.3	1.4	0.0	2.6	2.0	3.0	1.8	3.2
5/16/2014	-8.3	6.7	14.3	8.5	2.2	0.9	-0.9	1.1	0.3	1.0	-0.3	0.9	-1.4	2.4	1.2	2.4	-17.8	16.7	-0.4	0.9	0.2	1.1	0.5	2.2	-1.0	1.8
7/18/2014	-47.6	47.7	-4.7	12.6	-1.1	1.4	1.1	0.8	0.9	1.0	-0.8	0.8	-1.5	3.6	-0.8	77.8	23.3	10.4	-0.4	1.1	-0.3	2.3	0.1	2.1	-1.6	2.6
10/15/2014	24.8	11.9	9.3	10.1	-0.7	1.2	-0.1	1.2	0.4	1.2	-0.6	1.1	0.2	3.3	1.8	7.1	-10.2	16.0	1.7	1.1	4.8	1.5	3.2	2.6	1.7	2.4
Well#7 At Weldon Springs Park																										
5/16/2014	24.0	15.0	17.0	11.0	0.1	1.2	0.7	1.2	2.9	1.1	-1.8	1.0	-2.8	3.2	3.4	9.6	50.0	12.0	1.7	1.2	-1.7	1.6	0.6	2.7	-1.4	2.1
7/18/2014	-92.4	66.5	-3.9	15.5	0.6	1.9	-0.2	1.4	1.2	1.3	-1.5	1.0	-5.1	6.0	-105.0	81.4	54.2	13.1	0.6	1.2	-0.5	3.0	1.0	3.5	-2.8	3.8
10/15/2014	29.6	21.3	5.4	11.9	0.0	1.3	0.3	1.3	-0.8	1.2	1.1	1.1	7.8	3.5	33.8	16.5	3.8	17.1	1.3	1.2	0.5	1.9	1.3	2.7	-0.4	2.5

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

Location / Date	Ac-228 Result	Ac-228 Error	Ba-140 Result	Ba-140 Error	Bi-212 Result	Bi-212 Error	Bi-214 Result	Bi-214 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error
Mascoutin Recreation Area																						
5/16/2014	0.9	0.0	-0.2	0.3	0.6	0.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.6	0.6	0.0	0.0
7/18/2014	1.1	0.0	-1.9	0.8	1.3	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	15.4	0.5	0.0	0.0
North Fork Creek																						
7/18/2014	0.8	0.0	-0.5	0.6	0.8	0.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	15.4	0.4	0.0	0.0
Weldon Springs Entrance																						
5/16/2014	0.9	0.0	-0.1	0.2	0.9	0.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	17.7	0.6	0.0	0.0
7/18/2014	1.2	0.0	0.7	0.8	1.3	0.2	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	16.2	0.5	0.0	0.0

Location / Date	Nb-95 Result	Nb-95 Error	Pa-234m Result	Pa-234m Error	Pb-210 Result	Pb-210 Error	Pb-212 Result	Pb-212 Error	Pb-214 Result	Pb-214 Error	Ra-226 Result	Ra-226 Error	Th-234 Result	Th-234 Error	Tl-208 Result	Tl-208 Error	U-235 Result	U-235 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Mascoutin Recreation Area																						
5/16/2014	0.0	0.0	1.1	1.4	3.3	2.3	0.9	0.0	1.0	0.0	1.9	0.3	0.9	0.6	0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0
7/18/2014	0.0	0.0	1.9	1.1	-1.8	2.1	1.1	0.0	1.2	0.0	2.3	0.2	1.6	0.5	1.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
North Fork Creek																						
7/18/2014	0.0	0.0	1.6	0.9	1.3	0.2	0.8	0.0	0.8	0.0	1.7	0.2	0.7	0.2	0.7	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Weldon Springs Entrance																						
5/16/2014	0.0	0.0	0.3	1.3	-1.4	2.4	0.9	0.0	1.0	0.0	2.1	0.2	1.0	0.6	0.9	0.1	0.1	0.0	0.0	0.0	0.0	0.0
7/18/2014	0.0	0.0	1.2	1.3	1.3	0.2	1.1	0.0	1.2	0.0	2.5	0.2	1.2	0.2	1.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0

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

Location / Date	Ac-228 Result	Ac-228 Error	Ba-140 Result	Ba-140 Error	Bi-212 Result	Bi-212 Error	Bi-214 Result	Bi-214 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error
Parnell Boat Ramp																						
5/16/2014	0.3	0.0	0.1	0.2	0.3	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.4	0.4	0.0	0.0
10/15/2014	0.3	0.0	-0.1	0.1	0.3	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	0.4	0.0	0.0

Location / Date	Nb-95 Result	Nb-95 Error	Pa-234m Result	Pa-234m Error	Pb-210 Result	Pb-210 Error	Pb-212 Result	Pb-212 Error	Pb-214 Result	Pb-214 Error	Ra-226 Result	Ra-226 Error	Th-234 Result	Th-234 Error	Tl-208 Result	Tl-208 Error	U-235 Result	U-235 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Parnell Boat Ramp																						
5/16/2014	0.0	0.0	0.2	1.0	0.7	0.1	0.2	0.0	0.3	0.0	0.7	0.1	0.4	0.1	0.2	0.0	0.1	0.0	0.0	0.0	-0.1	0.0
10/15/2014	0.0	0.0	-0.7	0.7	0.4	0.3	0.2	0.0	0.3	0.0	0.5	0.1	0.5	0.2	0.2	0.0	0.0	0.0	0.0	0.0	-0.1	0.0

Table D-7. Fish Sample Results for Clinton Area
Results are in picocuries per kilogram (pCi/kg)

Fish from Clinton Lake	Ba-140 Result ± Error	Be-7 Result ± Error	Co-58 Result ± Error	Co-60 Result ± Error	Cs-134 Result ± Error	Cs-137 Result ± Error	Fe-59 Result ± Error
Top Feeder	-139.0 ± 187.0	-22.4 ± 123.0	-15.7 ± 16.2	34.9 ± 11.2	3.8 ± 13.2	-9.1 ± 14.2	-14.5 ± 36.3
Bottom Feeder	-3.6 ± 147.0	-41.6 ± 98.8	-0.5 ± 14.4	-15.5 ± 14.3	-1.0 ± 12.2	-7.3 ± 10.1	-5.9 ± 37.8

Fish from Clinton Lake	I-131 Result ± Error	K-40 Result ± Error	Mn-54 Result ± Error	Nb-95 Result ± Error	Zn-65 Result ± Error	Zr-95 Result ± Error
Top Feeder	-4.9 ± 133.0	3690.0 ± 262.0	-3.8 ± 13.3	37.0 ± 20.1	37.3 ± 28.0	3.3 ± 29.3
Bottom Feeder	7.1 ± 81.0	3140.0 ± 254.0	0.9 ± 12.3	20.2 ± 17.3	6.7 ± 29.8	-18.4 ± 24.8

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

Location / Date	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error
Mascoutin Recreation Area														
5/16/2014	0.0	0.0	2.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7/18/2014	0.8	0.6	7.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
North Fork Creek														
7/18/2014	1.6	1.7	6.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.1
Weldon Springs Entrance														
5/16/2014	-0.5	0.4	7.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
7/18/2014	-1.0	2.7	7.8	1.1	0.0	0.1	0.0	0.1	0.2	0.1	-0.1	0.1	0.0	0.2

Location / Date	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Mascoutin Recreation Area												
5/16/2014	0.0	0.0	26.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7/18/2014	0.7	0.8	13.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North Fork Creek												
7/18/2014	-0.4	2.7	12.4	0.7	0.0	0.0	0.0	0.1	0.1	0.1	-0.1	0.1
Weldon Springs Entrance												
5/16/2014	-0.6	0.4	24.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7/18/2014	1.3	3.4	14.5	1.2	-0.1	0.1	-0.3	0.2	0.0	0.1	-0.1	0.2

Table D-9. Gamma Detection Network Results for Clinton

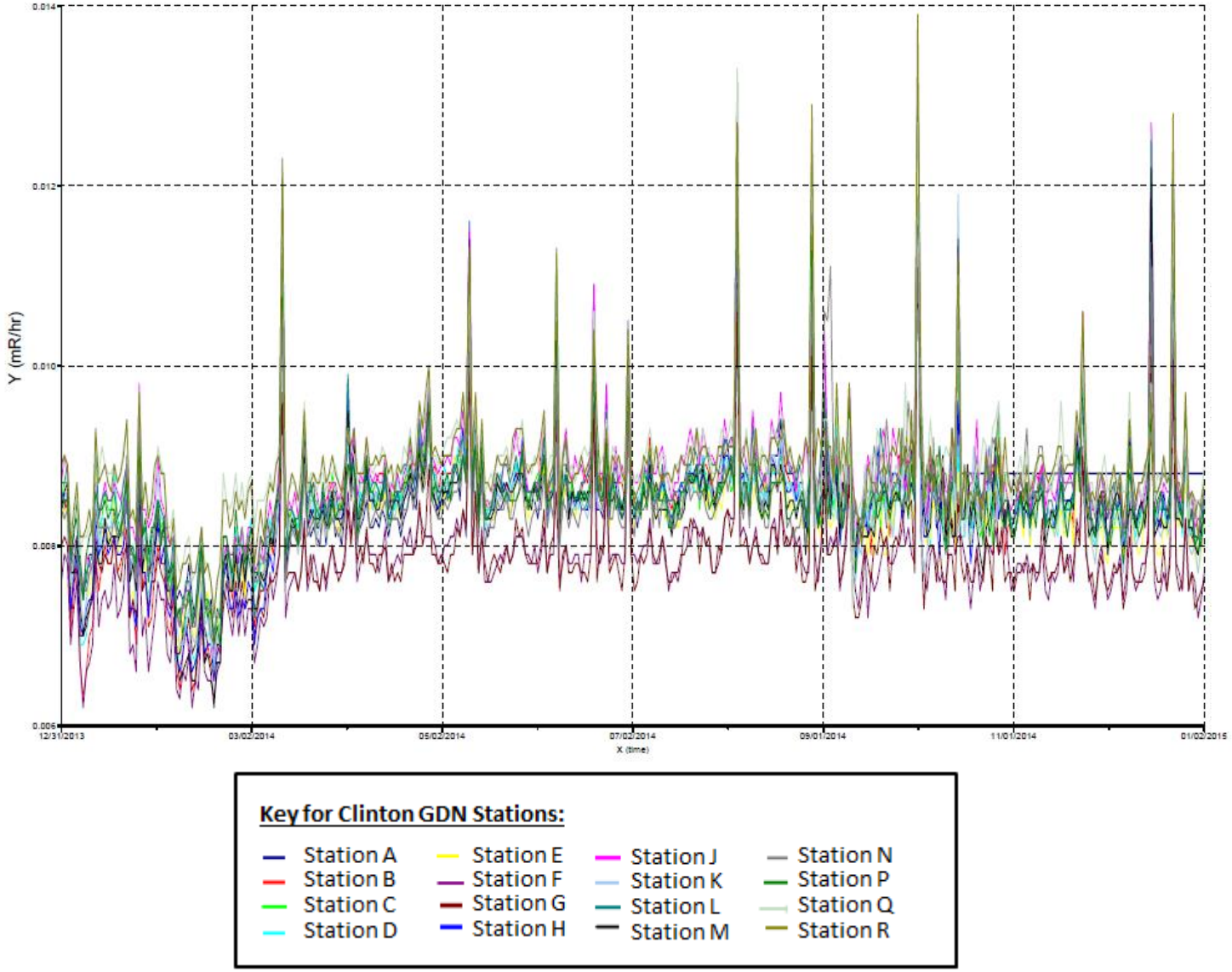


Table D-10. Summary of Ambient Gamma Results for Clinton Area

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
CP001		0.11	0.13	0.12	44.29
CP003	0.10	0.10	0.13	0.10	39.51
CP006	0.08	0.08	0.11	0.09	33.40
CP009	0.09	0.10	0.10	0.10	35.50
CP011		0.12	0.13	0.13	46.60
CP013	0.08	0.09	0.11	0.11	35.22
CP016	0.11	0.13	0.14	0.14	46.90
CP018	0.12	0.14	0.13	0.14	47.63
CP019	0.12	0.11	0.13	0.12	43.44
CP022	0.11	0.11	0.12	0.13	42.07
CP025	0.10	0.14	0.15	0.12	45.99
CP027	0.09	0.11		0.10	36.14
CP028	0.10	0.12	0.12	0.12	41.98
CP031	0.10	0.12	0.12	0.10	39.88
CP032	0.10	0.13	0.13	0.11	42.71
CP033	0.08	0.10	0.11	0.09	33.12
CP034	0.11	0.11	0.13	0.11	41.79
CP035	0.08	0.09	0.11	0.10	34.22
CP036	0.11	0.12	0.12	0.13	43.25
CP037	0.12	0.12	0.14	0.14	48.27
CP038	0.10	0.11	0.11	0.11	39.79
CP039	0.11	0.12	0.15	0.13	45.90
CP040	0.10	0.12	0.11	0.11	40.61
CP041	0.10	0.12	0.14	0.13	44.80
CP042	0.09	0.11	0.12	0.12	40.33
CP043	0.10	0.13	0.11	0.11	40.88
CP044	0.11	0.12	0.12	0.13	43.98
CP045	0.11	0.14	0.13	0.11	43.80
CP046	0.09	0.13	0.12	0.12	41.79
CP047	0.11	0.12	0.13	0.13	45.90
CP048	0.11	0.13	0.13	0.12	44.62
CP049		0.11		0.11	26.16
CP050	0.09	0.11	0.12	0.12	39.97
CP051	0.10	0.12	0.13	0.11	41.88
CP-RSA	0.09	0.12	0.12	0.12	40.70
CP-RSB	0.10	0.12	0.12	0.11	40.97
CP-RSC	0.09	0.10	0.12	0.12	38.87
CP-RSD	0.10	0.14	0.12	0.12	42.52
CP-RSE	0.08	0.09	0.12	0.12	37.23
CP-RSF			0.12	0.10	40.15
CP-RSG	0.08	0.11	0.11	0.10	37.05
CP-RSH	0.10	0.13	0.12	0.14	44.26
CP-RSJ	0.09	0.12	0.13	0.11	41.43
CP-RSK	0.09	0.11	0.11	0.09	36.50

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
CP-RSL	0.09	0.12	0.13	0.12	42.07
CP-RSM	0.09	0.11	0.10	0.11	37.32
CP-RSN	0.12	0.13	0.13	0.12	45.26
CP-RSP	0.12	0.13	0.13	0.14	47.27
CP-RSQ	0.11	0.12	0.11	0.12	41.34
CP-RSR	0.09	0.10	0.13	0.10	38.14

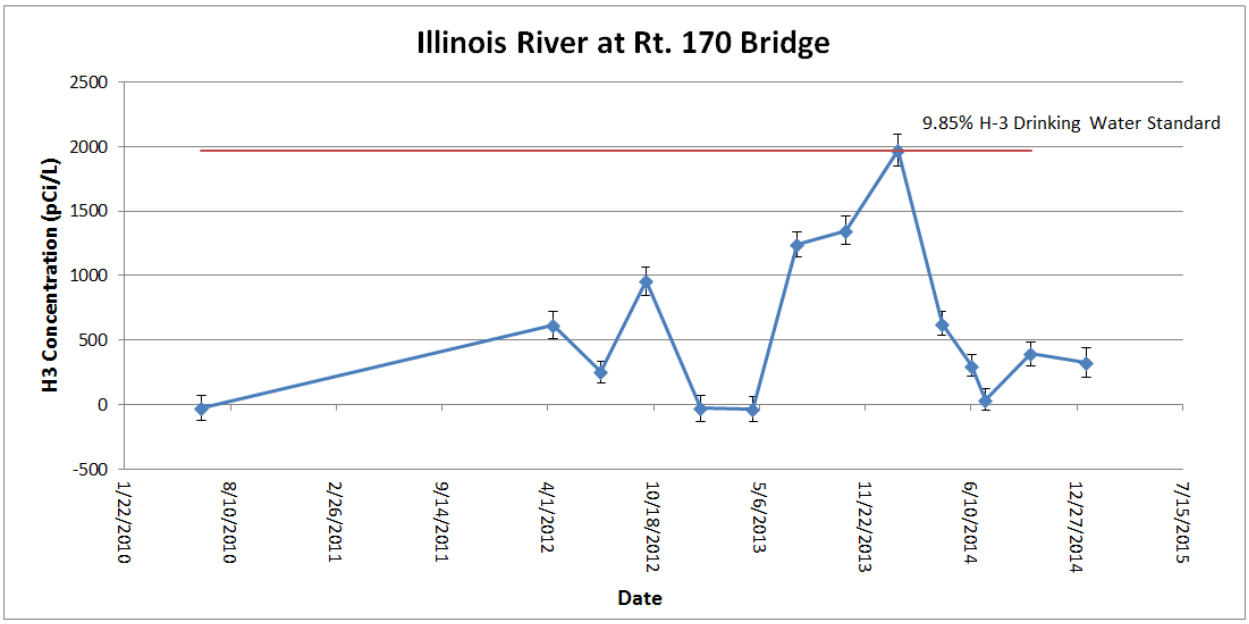
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Dose column based on averages of all available data.

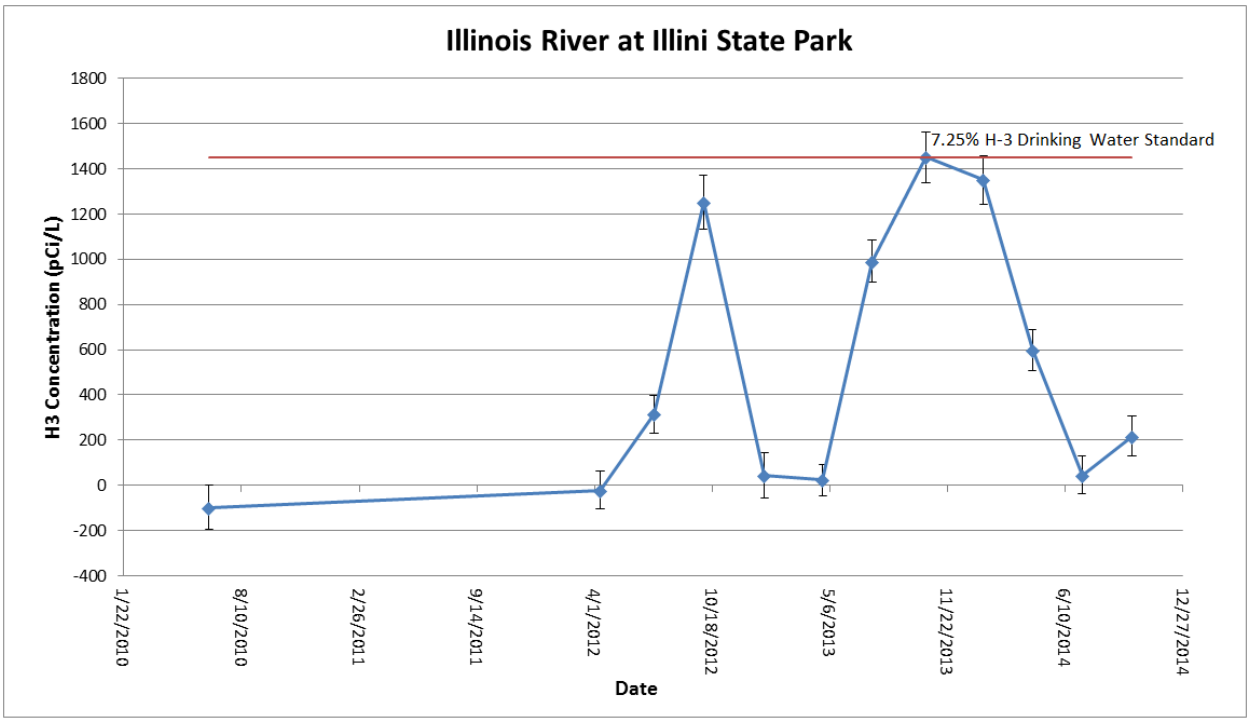
Appendix E
LaSalle Sample Results

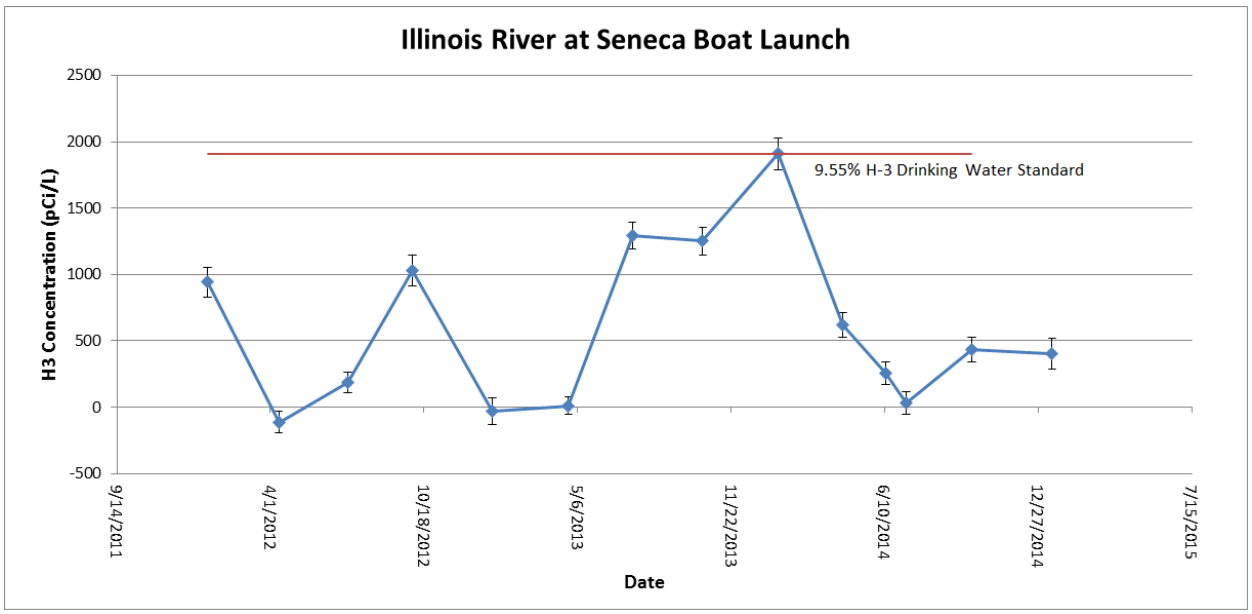
Table E-1. Tritium in Water Sample Results for LaSalle Area
Results are in picocuries per liter (pCi/L)

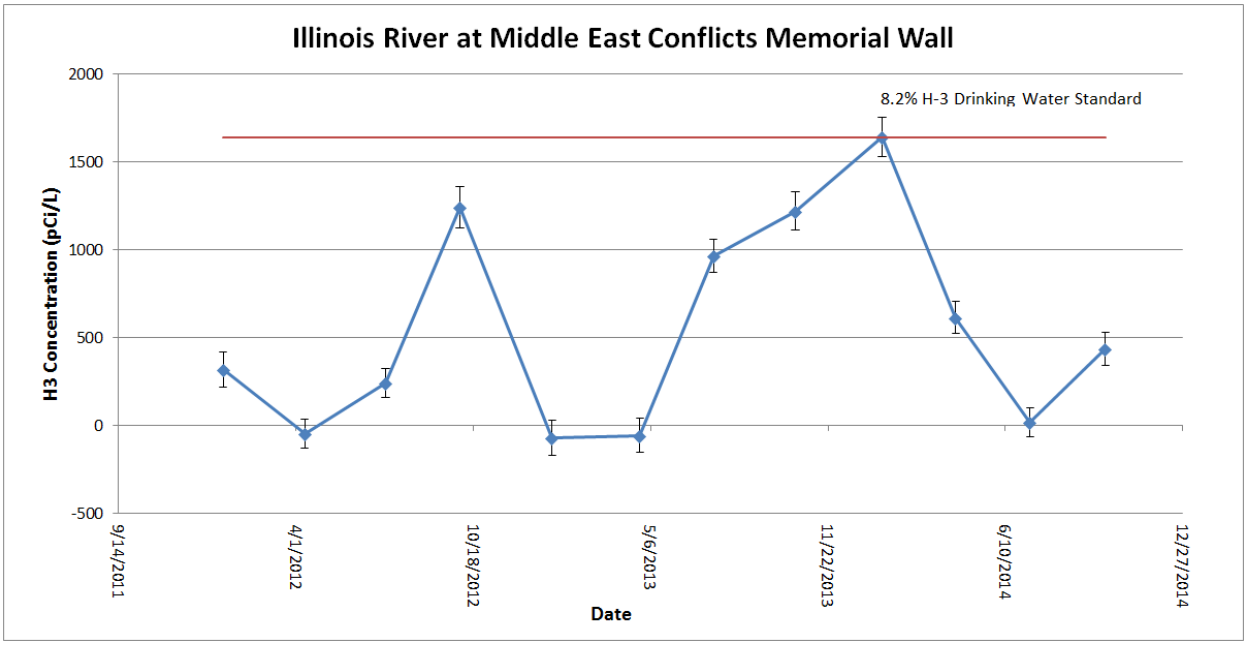
Location	Date	Result		Error
Allen Park, South Ottawa, Illinois (DnS)	4/16/2014	657.0	±	93.7
Allen Park, South Ottawa, Illinois (DnS)	7/9/2014	23.4	±	83.6
Allen Park, South Ottawa, Illinois (DnS)	10/1/2014	297.0	±	90.7
Illinois R. at Illini State Park River Access	1/22/2014	1350.0	±	108.0
Illinois R. at Illini State Park River Access	4/15/2014	598.0	±	92.4
Illinois R. at Illini State Park River Access	7/8/2014	46.7	±	84.2
Illinois R. at Illini State Park River Access	10/1/2014	217.0	±	88.7
Illinois R. near Rt. 170 Bridge	1/22/2014	1970.0	±	120.0
Illinois R. near Rt. 170 Bridge	4/16/2014	629.0	±	93.1
Illinois R. near Rt. 170 Bridge	6/11/2014	302.0	±	85.4
Illinois R. near Rt. 170 Bridge	7/8/2014	37.4	±	83.9
Illinois R. near Rt. 170 Bridge	10/1/2014	393.0	±	93.0
Middle East Conflicts Wall Memorial, Marseilles (DnS)	1/22/2014	1640.0	±	114.0
Middle East Conflicts Wall Memorial, Marseilles (DnS)	4/15/2014	614.0	±	92.8
Middle East Conflicts Wall Memorial, Marseilles (DnS)	7/8/2014	16.4	±	83.4
Middle East Conflicts Wall Memorial, Marseilles (DnS)	10/1/2014	433.0	±	94.0
Seneca, Illinois Boat Launch (UpS)	1/22/2014	1910.0	±	119.0
Seneca, Illinois Boat Launch (UpS)	4/16/2014	618.0	±	92.9
Seneca, Illinois Boat Launch (UpS)	6/11/2014	254.0	±	84.2
Seneca, Illinois Boat Launch (UpS)	7/8/2014	32.7	±	83.8
Seneca, Illinois Boat Launch (UpS)	10/1/2014	433.0	±	94.0
Starved Rock State Park, Illinois R. (DnS)	4/16/2014	720.0	±	95.1
Starved Rock State Park, Illinois R. (DnS)	7/9/2014	46.7	±	84.2
Starved Rock State Park, Illinois R. (DnS)	10/1/2014	138.0	±	86.7

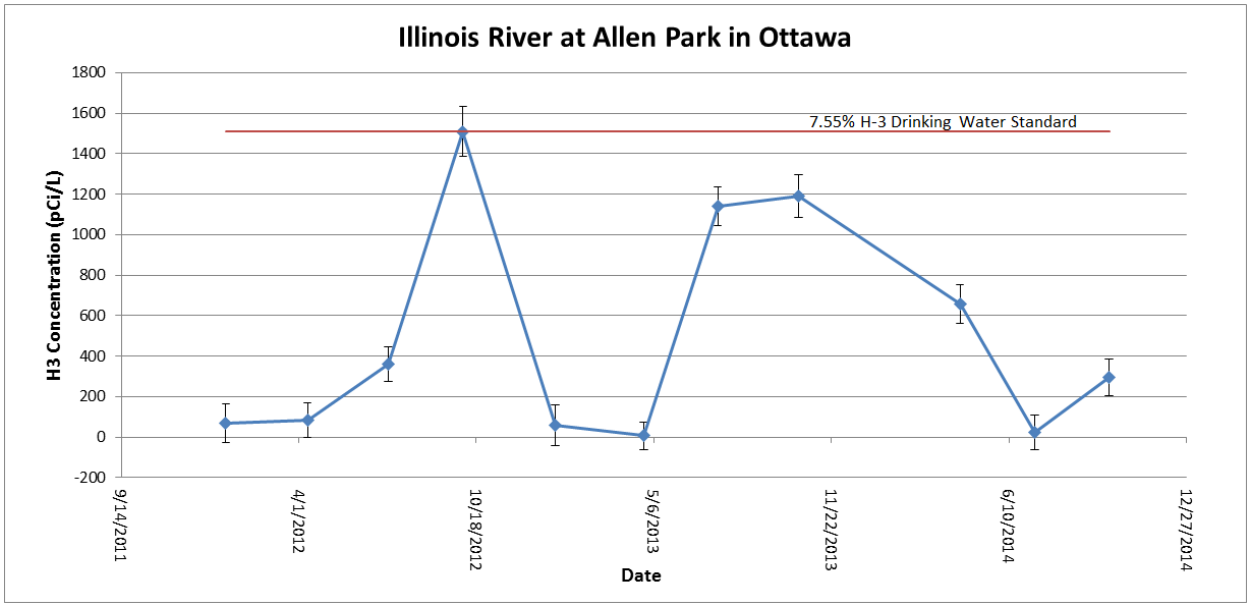
Tables E-2. Trending Graphs for Water from the LaSalle Area
(Highest results on graphs indicate percentage of US EPA Drinking Water Standard)






Illinois River at Seneca Boat Launch
2500
2000
1500
1000
500
0
-500
H3 Concentration (pCi/L)
9.55% H-3 Drinking Water 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
Date


Illinois River at Middle East Conflicts Memorial Wall
2000
1500
1000
500
0
-500
H3 Concentration (pCi/L)
8.2% H-3 Drinking Water Standard
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
Date


Illinois River at Allen Park in Ottawa
7.55% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
1800
1600
1400
1200
1000
800
600
400
200
0
-200
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
Date

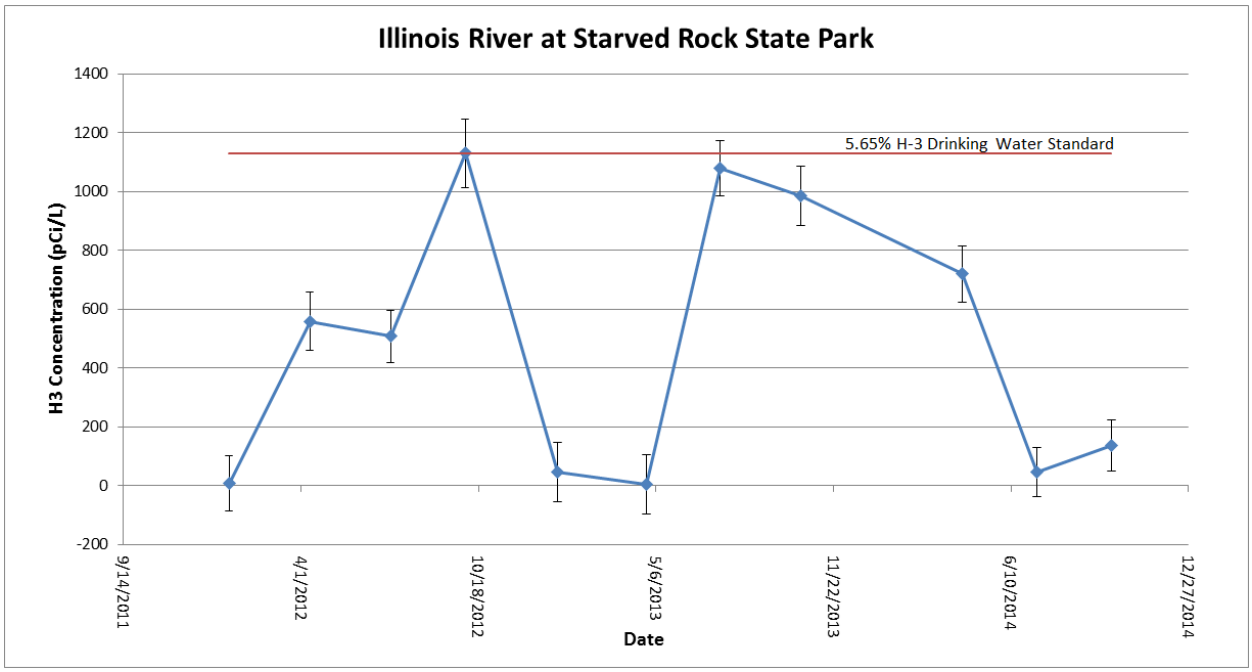

Illinois River at Starved Rock State Park
5.65% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
1400
1200
1000
800
600
400
200
0
-200
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
Date

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

Location Date	Alpha Result		Error	Beta Result		Error
Allen Park, South Ottawa, Illinois (DnS)						
4/16/2014	1.7	±	1.4	5.6	±	2.8
7/9/2014	0.8	±	1.4	5.5	±	2.7
10/1/2014	1.5	±	1.4	3.8	±	2.5
Illinois R. at Illini State Park River Access						
1/22/2014	0.6	±	1.7	8.8	±	2.7
4/15/2014	0.8	±	1.3	2.3	±	2.7
7/8/2014	-0.4	±	1.3	2.2	±	2.6
10/1/2014	1.6	±	1.4	6.7	±	2.5
Illinois R. near Rt. 170 Bridge						
1/22/2014	1.5	±	1.7	6.4	±	2.7
4/16/2014	0.7	±	1.3	1.4	±	2.7
7/8/2014	1.1	±	1.4	7.0	±	2.7
10/1/2014	1.9	±	1.4	3.1	±	2.4
Middle East Conflicts Wall Memorial, Marseilles (DnS)						
1/22/2014	2.4	±	1.7	9.1	±	2.7
4/15/2014	0.1	±	1.3	-1.9	±	2.6
7/8/2014	0.9	±	1.4	6.1	±	2.7
10/1/2014	1.7	±	1.4	4.9	±	2.5
Seneca, Illinois Boat Launch (UpS)						
1/22/2014	2.2	±	1.7	7.4	±	2.7
4/16/2014	1.1	±	1.3	1.0	±	2.6
7/8/2014	-0.8	±	1.3	5.3	±	2.7
10/1/2014	0.5	±	1.4	6.6	±	2.5
Starved Rock State Park, Illinois R. (DnS)						
4/16/2014	1.2	±	1.3	2.1	±	2.7
7/9/2014	1.8	±	1.4	5.9	±	2.7
10/1/2014	0.4	±	1.3	4.8	±	2.5

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 / Date	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Allen Park, South Ottawa, Illinois (DnS)																										
4/16/2014	11.0	11.0	-8.9	9.4	-0.3	1.0	0.7	0.8	1.8	0.9	1.0	0.8	-1.8	2.4	6.2	7.8	-26.0	11.0	-1.4	1.0	-0.7	1.3	1.2	1.9	-2.5	2.1
7/9/2014	36.5	33.9	6.5	10.2	1.1	1.2	-0.4	1.0	1.3	1.1	0.8	0.9	2.4	3.9	28.2	34.7	20.7	17.0	1.4	0.9	0.7	2.0	1.1	2.3	-1.6	2.6
10/1/2014	-3.0	10.0	7.8	9.4	-0.9	1.3	0.5	1.0	0.8	1.1	0.2	1.1	5.7	2.6	10.3	6.5	23.0	10.0	-1.4	1.0	0.6	1.5	0.2	2.1	0.8	2.2
Illinois R. at Illini State Park River Access																										
1/22/2014	-6.3	19.8			1.1	2.1	0.6	1.8	-1.6	1.8	-0.7	1.6	3.7	4.7	-0.9	12.0	-4.9	24.1	0.3	2.0	-0.7	2.4	1.6	4.2	-0.6	3.4
4/15/2014	30.0	15.0	4.0	10.0	1.1	1.2	0.5	1.1	1.9	1.0	-0.2	1.1	-2.5	3.2	5.5	9.8	21.0	15.0	-1.6	1.2	0.8	1.7	5.4	2.4	-3.0	2.5
7/8/2014	15.5	35.3	-6.1	13.7	0.9	1.5	-0.3	1.3	-2.3	1.2	0.7	1.1	2.5	4.5	48.0	41.2	37.8	12.7	2.2	1.2	4.9	2.3	3.3	2.6	0.5	2.7
10/1/2014	3.0	10.0	-4.2	9.2	-0.3	1.1	-1.8	0.9	1.4	1.0	0.1	0.8	1.4	2.1	8.0	6.3	-13.8	9.5	-2.2	1.0	-0.7	1.5	2.1	1.9	1.7	1.9
Illinois R. near Rt. 170 Bridge																										
1/22/2014	-32.2	19.7	-0.6	14.0	-4.2	1.7	0.0	1.4	0.7	1.4	-0.5	1.3	1.7	3.5	18.4	11.1	8.4	14.7	-0.7	1.4	1.6	1.8	-4.9	3.3	1.6	2.7
4/16/2014	38.0	18.0	6.0	14.0	-0.6	1.6	0.0	1.2	-0.5	1.3	0.1	1.3	-2.2	3.8	-6.0	11.0	-3.0	18.0	-0.4	1.3	-2.7	2.0	-5.6	3.5	5.1	2.6
6/11/2014	21.1	48.5	21.9	14.5	-1.2	1.7	2.2	1.3	0.0	1.3	1.9	1.1	0.3	5.7	-42.7	55.2	29.9	12.5	0.9	1.3	1.4	2.8	0.1	3.5	0.6	3.1
7/8/2014	47.8	31.3	-4.5	10.0	-0.8	1.3	1.2	1.0	1.4	1.0	-0.3	1.0	-0.7	3.6	39.6	32.3	119.0	14.0	0.8	1.0	-4.1	2.0	1.0	2.3	0.2	2.4
10/1/2014	-7.0	13.0	-6.0	10.0	-0.7	1.3	-0.5	1.2	1.2	1.1	1.7	0.9	5.9	3.0	-5.8	7.3	54.0	13.0	0.8	1.2	-2.6	1.7	-1.4	2.7	-1.6	2.1
Middle East Conflicts Wall Memorial, Marseilles (DnS)																										
1/22/2014	-2.2	8.7	-7.5	9.6	-1.1	1.3	-0.2	1.3	-0.6	1.3	0.8	1.0	-11.5	3.8	1.5	4.1	6.2	13.6	1.5	1.1	2.3	1.5	-7.9	3.2	1.5	2.1
4/15/2014	8.0	11.0	-23.0	10.0	-0.3	1.4	-0.9	1.3	-2.1	1.5	-0.2	1.0	0.8	3.6	3.2	4.9	35.0	14.0	-0.4	1.2	-1.1	1.8	2.5	2.9	0.5	2.6
7/8/2014	-45.0	31.9	-17.4	11.7	-1.5	1.3	0.7	0.9	-0.4	1.0	0.0	0.8	-3.3	3.2	-14.3	38.8	24.9	10.8	-1.1	1.0	-2.7	2.2	5.6	1.8	2.0	2.4
10/1/2014	13.8	9.0	-6.4	7.6	0.1	1.0	1.1	1.0	-0.2	1.0	-0.6	0.9	3.0	2.5	-7.7	4.6	-1.0	17.0	-1.3	0.9	0.1	1.3	1.1	2.2	-0.1	1.9
Seneca, Illinois Boat Launch (UpS)																										
1/22/2014	4.0	24.1			0.3	2.3	0.4	1.9	1.3	1.7	-1.4	1.7	-2.3	5.1	-9.7	16.1	51.3	22.2	-0.2	2.0	0.8	2.7	-0.6	4.0	-2.0	3.4
4/16/2014	13.6	8.4	2.4	8.9	0.7	1.0	0.5	1.0	2.0	0.9	0.1	0.9	-1.3	2.7	6.9	3.8	-1.0	16.0	0.0	0.9	0.2	1.3	-5.1	2.5	1.1	1.8
6/11/2014	2.6	32.7	-27.0	12.8	-2.4	1.6	-1.8	1.1	-0.2	1.1	-0.7	1.0	0.5	3.8	45.8	38.0	41.5	14.5	-0.1	1.1	8.2	2.2	-1.5	2.5	0.8	2.8
7/8/2014	-55.2	36.2	1.6	10.1	-0.8	1.3	0.6	1.2	2.9	0.9	0.3	0.9	-4.5	4.1	-31.8	38.4	-25.4	18.1	-0.4	0.9	-1.4	2.1	-2.1	2.5	-1.9	2.4
10/1/2014	-17.0	19.0	5.0	12.0	0.0	2.2	1.6	1.6	0.6	1.6	-1.2	1.7	4.6	4.3	3.0	11.0	2.0	25.0	0.2	1.9	0.1	2.4	0.4	4.1	0.1	3.5
Starved Rock State Park, Illinois R. (DnS)																										
4/16/2014	-0.5	7.0	7.5	9.0	1.0	1.1	0.9	1.2	-0.4	1.1	-1.2	1.1	0.8	2.7	-0.5	3.0	53.0	13.0	-0.7	1.2	0.8	1.3	-1.5	2.5	0.1	1.9
7/9/2014	15.4	30.6	-5.6	12.6	0.8	1.3	0.2	1.2	0.2	1.1	-0.2	1.0	-2.9	3.4	-22.1	36.9	19.6	10.7	0.1	1.0	-1.8	2.1	0.9	2.1	-4.8	2.6
10/1/2014	-11.0	11.0	16.2	9.7	-1.4	1.2	-0.6	1.1	-0.4	1.2	0.4	0.9	3.4	2.6	2.1	6.8	-7.0	15.0	-0.6	1.1	-1.0	1.6	-6.2	2.6	-1.6	2.2

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

Location / Date	Ac-228 Result	Ac-228 Error	Ba-140 Result	Ba-140 Error	Bi-212 Result	Bi-212 Error	Bi-214 Result	Bi-214 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error
House off of Kinsman Road (SE Quadrant)																						
5/20/2014	0.9	0.0	-1.1	1.3	1.1	0.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	-0.1	0.1	15.0	0.5	0.0	0.0
Illini State Park (NW Quadrant)																						
5/20/2014	0.8	0.1	-0.5	1.5	0.5	0.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	-0.1	0.1	17.9	0.6	0.0	0.0
7/8/2014	0.9	0.0	3.3	1.3	0.9	0.2	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	19.4	0.6	0.0	0.0
Lot off of Kinsman Road (NE Quadrant)																						
5/20/2014	0.8	0.0	-0.3	0.2	1.0	0.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	17.5	0.6	0.0	0.0
7/8/2014	1.1	0.0	-0.7	1.1	1.0	0.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1	0.0	17.5	0.5	0.0	0.0
Starved Rock State Park, (Upwind)																						
5/20/2014	0.7	0.0	0.9	1.1	0.6	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	15.0	0.5	0.0	0.0
7/9/2014	0.6	0.0	-0.5	0.5	0.4	0.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	-0.1	0.0	12.5	0.4	0.0	0.0

Location / Date	Nb-95 Result	Nb-95 Error	Pa-234m Result	Pa-234m Error	Pb-210 Result	Pb-210 Error	Pb-212 Result	Pb-212 Error	Pb-214 Result	Pb-214 Error	Ra-226 Result	Ra-226 Error	Th-234 Result	Th-234 Error	Tl-208 Result	Tl-208 Error	U-235 Result	U-235 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
House off of Kinsman Road (SE Quadrant)																						
5/20/2014	0.0	0.0	1.4	1.5	1.3	2.5	0.8	0.0	0.9	0.0	2.4	0.3	1.6	0.6	0.8	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Illini State Park (NW Quadrant)																						
5/20/2014	0.1	0.1	-0.6	1.6	1.5	2.6	0.8	0.0	1.4	0.0	3.2	0.3	0.9	0.6	0.8	0.1	0.2	0.0	0.0	0.0	0.0	0.0
7/8/2014	0.0	0.0	2.3	1.3	3.7	2.2	0.9	0.0	1.6	0.0	2.7	0.2	2.3	0.6	0.9	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Lot off of Kinsman Road (NE Quadrant)																						
5/20/2014	0.0	0.0	1.2	1.4	1.5	2.5	0.9	0.0	1.0	0.0	1.8	0.3	2.8	0.6	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0
7/8/2014	0.0	0.0	1.6	1.0	1.4	0.2	1.0	0.0	1.2	0.0	2.5	0.2	1.4	0.3	1.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Starved Rock State Park, (Upwind)																						
5/20/2014	0.1	0.0	2.6	1.1	2.1	0.5	0.7	0.0	0.9	0.0	2.0	0.2	1.5	0.4	0.6	0.0	0.1	0.0	0.0	0.0	0.0	0.0
7/9/2014	0.0	0.0	0.0	1.0	1.4	0.4	0.5	0.0	0.8	0.0	1.3	0.2	1.4	0.4	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0

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

Location	Ac-228		Ba-140		Bi-212		Bi-214		Co-58		Co-60		Cs-134		Cs-137		Fe-59		K-40		Mn-54	
Date	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Allen Park, South Ottawa, Illinois (DnS)																						
4/16/2014	0.4 ±	0.0	0.1 ±	0.1	0.6 ±	0.1	0.6 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	10.2 ±	0.4	0.0 ±	0.0
10/1/2014	0.4 ±	0.0	0.0 ±	0.1	0.5 ±	0.1	0.5 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	11.9 ±	0.4	0.0 ±	0.0
Seneca, Illinois Boat Launch (UpS)																						
4/16/2014	0.3 ±	0.0	0.1 ±	0.1	0.4 ±	0.1	0.2 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	8.7 ±	0.4	0.0 ±	0.0
10/1/2014	0.4 ±	0.0	0.1 ±	0.1	0.4 ±	0.1	0.4 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	10.6 ±	0.4	0.0 ±	0.0

Location	Nb-95		Pa-234m		Pb-210		Pb-212		Pb-214		Ra-226		Th-234		Tl-208		U-235		Zn-65		Zr-95	
Date	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Allen Park, South Ottawa, Illinois (DnS)																						
4/16/2014	0.0 ±	0.0	-0.6 ±	1.2	0.6 ±	0.1	0.4 ±	0.0	0.6 ±	0.0	1.0 ±	0.2	0.7 ±	0.1	0.3 ±	0.0	0.1 ±	0.0	0.0 ±	0.0	-0.1 ±	0.0
10/1/2014	0.0 ±	0.0	1.3 ±	0.8	0.3 ±	0.2	0.4 ±	0.0	0.6 ±	0.0	1.0 ±	0.1	0.6 ±	0.2	0.3 ±	0.0	0.1 ±	0.0	0.0 ±	0.0	-0.1 ±	0.0
Seneca, Illinois Boat Launch (UpS)																						
4/16/2014	0.0 ±	0.0	1.6 ±	1.0	-0.9 ±	9.0	0.2 ±	0.0	0.3 ±	0.0	0.3 ±	0.1	0.0 ±	0.6	0.2 ±	0.0	0.0 ±	0.0	-0.1 ±	0.0	-0.1 ±	0.0
10/1/2014	0.0 ±	0.0	-0.1 ±	0.9	0.5 ±	0.1	0.4 ±	0.0	0.4 ±	0.0	0.7 ±	0.1	0.5 ±	0.1	0.3 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0

Table E-7. Vegetation Sample Results for LaSalle Area
Results are in picocuries per kilogram (pCi/kg)

Location	Ba-140		Be-7		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		K-40		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
House off of Kinsman Road (SE Quadrant)																										
5/20/2014	-0.9 ±	0.8	5.4 ±	0.3	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.1	-0.6 ±	1.1	19.0 ±	0.6	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0
Illini State Park (NW Quadrant)																										
5/20/2014	-6.0 ±	2.2	7.9 ±	0.9	-0.1 ±	0.1	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	-0.2 ±	0.2	-1.5 ±	3.2	16.1 ±	1.4	0.0 ±	0.0	-0.1 ±	0.1	0.0 ±	0.1	0.0 ±	0.1
7/8/2014	-0.2 ±	0.3	1.9 ±	0.2	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.1	0.1 ±	0.3	16.4 ±	0.6	0.0 ±	0.0	-0.1 ±	0.0	0.0 ±	0.0	0.0 ±	0.0
Lot off of Kinsman Road (NE Quadrant)																										
5/20/2014	1.1 ±	0.8	4.0 ±	0.3	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.1	0.6 ±	1.1	25.0 ±	0.8	0.0 ±	0.0	0.1 ±	0.0	0.0 ±	0.0	0.1 ±	0.0
7/8/2014	0.3 ±	0.4	4.8 ±	0.3	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	-0.1 ±	0.1	-0.6 ±	0.3	17.0 ±	0.7	0.0 ±	0.0	0.0 ±	0.0	-0.1 ±	0.1	0.1 ±	0.0
Starved Rock State Park, (Upwind)																										
5/20/2014	0.7 ±	0.9	4.1 ±	0.3	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	-0.1 ±	0.1	-0.3 ±	1.2	37.7 ±	1.1	0.0 ±	0.0	0.0 ±	0.0	0.1 ±	0.0	0.1 ±	0.1
7/9/2014	-0.1 ±	0.4	3.2 ±	0.2	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.0	0.0 ±	0.1	0.1 ±	0.3	19.9 ±	0.7	0.0 ±	0.0	0.1 ±	0.0	0.0 ±	0.0	0.0 ±	0.0

Table E-8. Gamma Detection Network Results for LaSalle

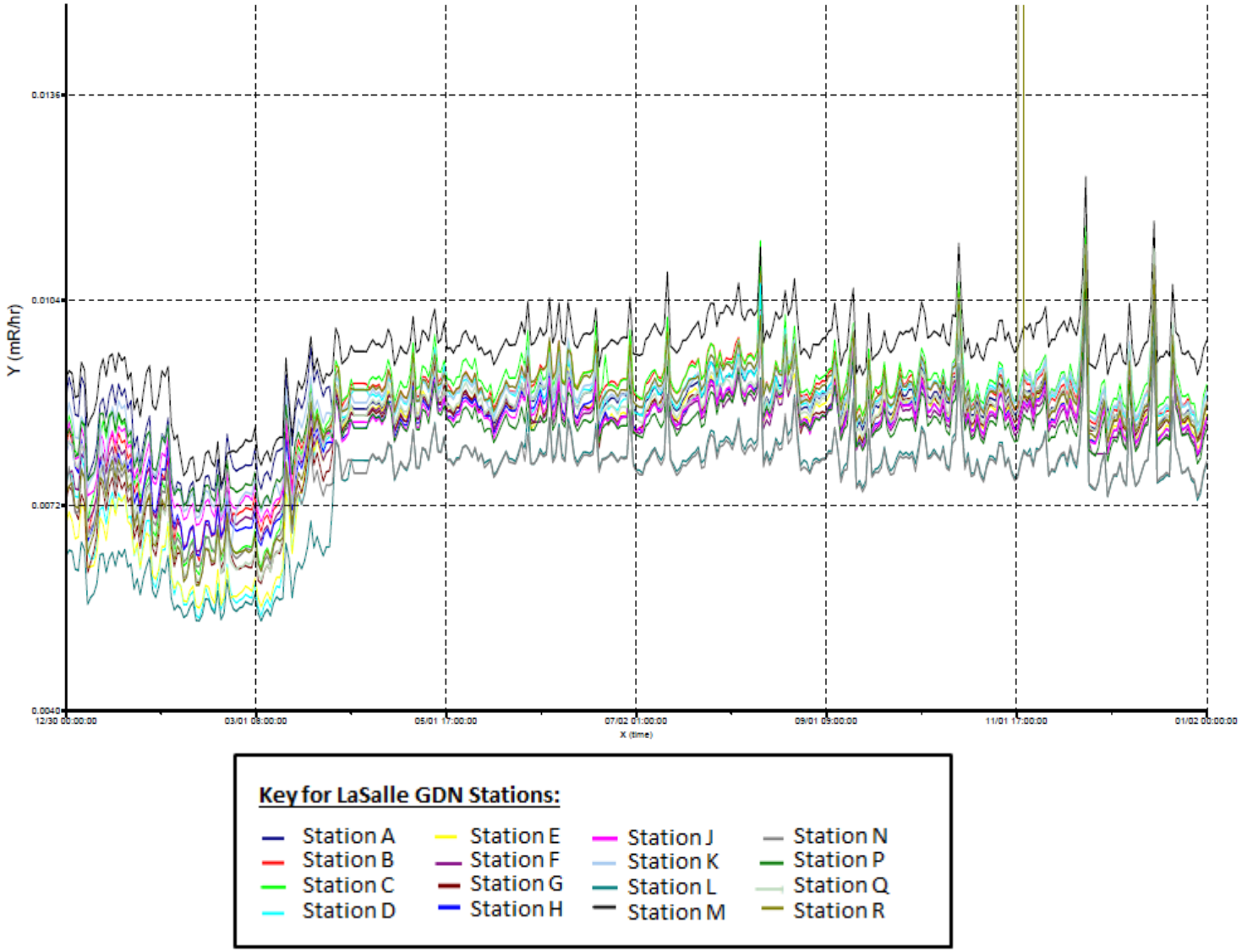


Table E-9. Summary of Ambient Gamma Results for LaSalle Area

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
LS001	0.09	0.14	0.13	0.12	43.53
LS002	0.10	0.13	0.12	0.12	42.61
LS003	0.10	0.13	0.13	0.13	44.07
LS004	0.09		0.13	0.13	42.34
LS005	0.07	0.11	0.12	0.10	35.86
LS007	0.09	0.12	0.13	0.12	42.16
LS009	0.08	0.11	0.10	0.09	34.04
LS011	0.09	0.12	0.11	0.10	37.96
LS012	0.08	0.09	0.10	0.09	32.76
LS014	0.08		0.12	0.09	34.68
LS015	0.07	0.14	0.13	0.12	42.16
LS016	0.05	0.10	0.10	0.08	30.57
LS017	0.10		0.14	0.13	43.80
LS018	0.10	0.12	0.11	0.11	40.52
LS019	0.10	0.10	0.13	0.11	39.69
LS021	0.07	0.11	0.09	0.10	33.12
LS022	0.08				
LS023	0.08	0.12	0.13	0.11	39.79
LS024	0.10		0.11	0.10	37.72
LS025	0.10	0.12	0.12	0.11	39.69
LS027	0.08	0.11	0.11	0.10	36.68
LS030	0.08	0.11	0.11	0.11	36.96
LS031	0.08		0.10	0.09	32.97
LS034	0.06	0.08	0.10	0.08	28.74
LS035	0.07				25.55
LS036	0.10	0.14	0.13	0.12	44.07
LS037	0.09	0.11	0.13	0.12	40.97
LS038	0.08	0.13	0.12	0.10	38.60
LS039	0.08	0.11	0.10	0.10	35.31
LS040	0.07	0.11	0.12	0.10	36.32
LS041	0.09	0.12	0.13	0.12	42.25
LS042	0.10	0.12	0.14	0.12	43.25
LS043	0.09		0.12	0.11	39.18
LS044	0.08				27.74
LS045	0.07				26.65
LS046	0.10	0.12	0.14	0.11	43.98
LS047	0.08	0.12	0.10	0.11	36.87
LS048	0.08	0.11	0.11	0.10	36.96
LS049		0.11	0.14	0.10	42.83
LS050		0.10	0.10	0.10	36.99
LS051		0.14	0.13	0.13	48.18
LS052		0.09	0.09	0.12	37.23
LS053		0.10	0.12	0.11	39.79
LS054		0.10	0.09	0.08	32.49
LS055		0.14	0.12	0.12	46.60
LS056		0.10	0.10	0.09	35.41
LS057		0.11	0.13	0.11	42.46

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
LS-RSA	0.09	0.12	0.11	0.10	38.87
LS-RSB	0.10	0.12	0.11	0.11	40.52
LS-RSC	0.09	0.13	0.12	0.12	42.34
LS-RSD	0.06	0.12	0.10	0.10	34.22
LS-RSE	0.04	0.10	0.11	0.10	31.03
LS-RSF	0.09	0.12	0.12	0.11	40.06
LS-RSG		0.10	0.10	0.10	37.35
LS-RSH	0.08	0.12	0.09	0.11	37.23
LS-RSJ	0.08	0.12	0.11	0.11	38.51
LS-RSK	0.09	0.12	0.14	0.11	41.61
LS-RSL	0.08	0.11	0.11	0.11	38.14
LS-RSM	0.11	0.15	0.16	0.16	51.56
LS-RSN	0.08	0.11	0.09	0.11	35.59
LS-RSP	0.09	0.12	0.12	0.13	41.88
LS-RSQ	0.08	0.12	0.10	0.11	37.14
LS-RSR	0.09	0.13	0.14	0.13	44.99

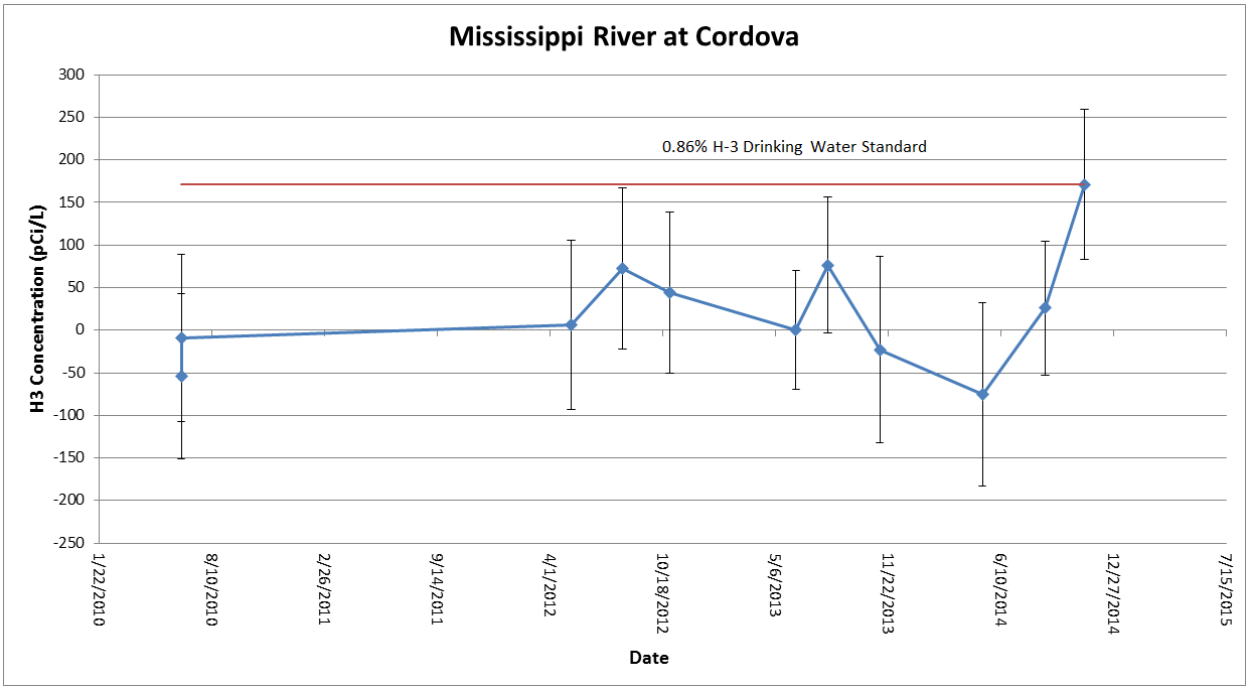
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Dose column based on averages of all available data.

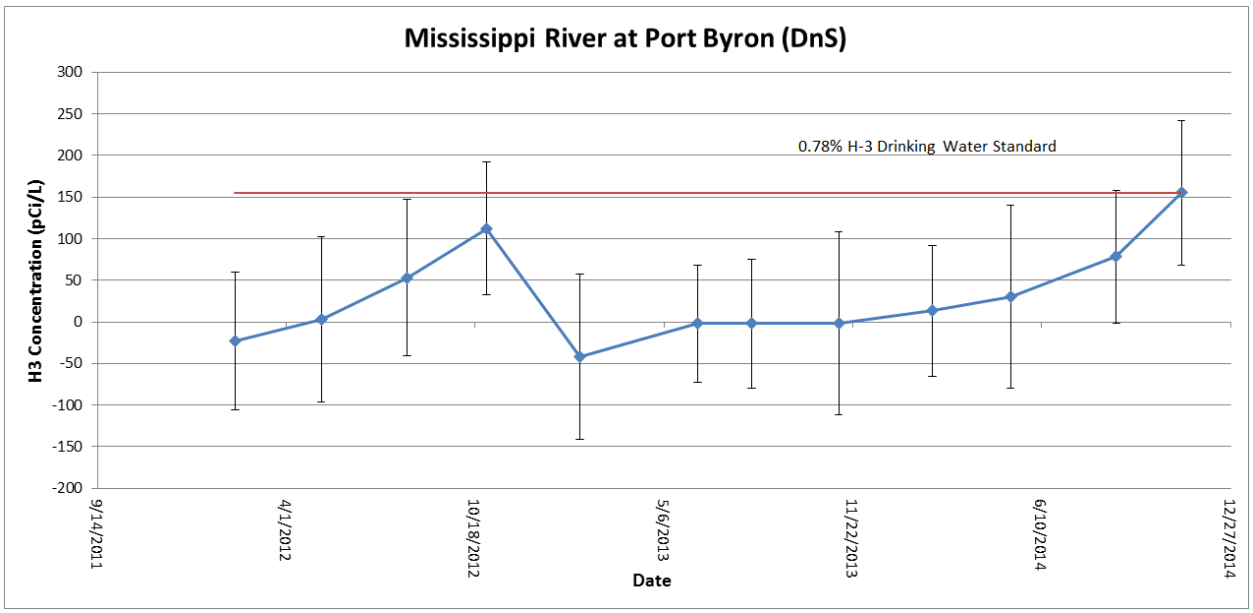
Appendix F
Quad Cities Sample Results

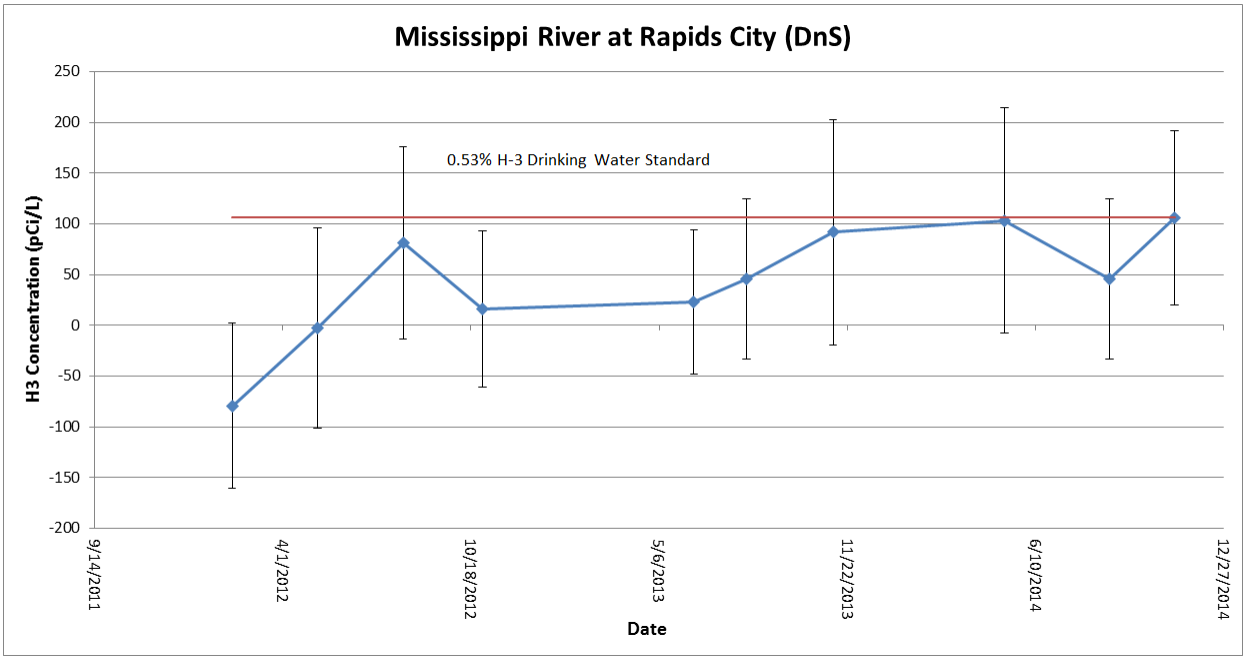
Table F-1. Tritium in Water Sample Results for Quad Cities Area
Results are in picocuries per liter (pCi/L)

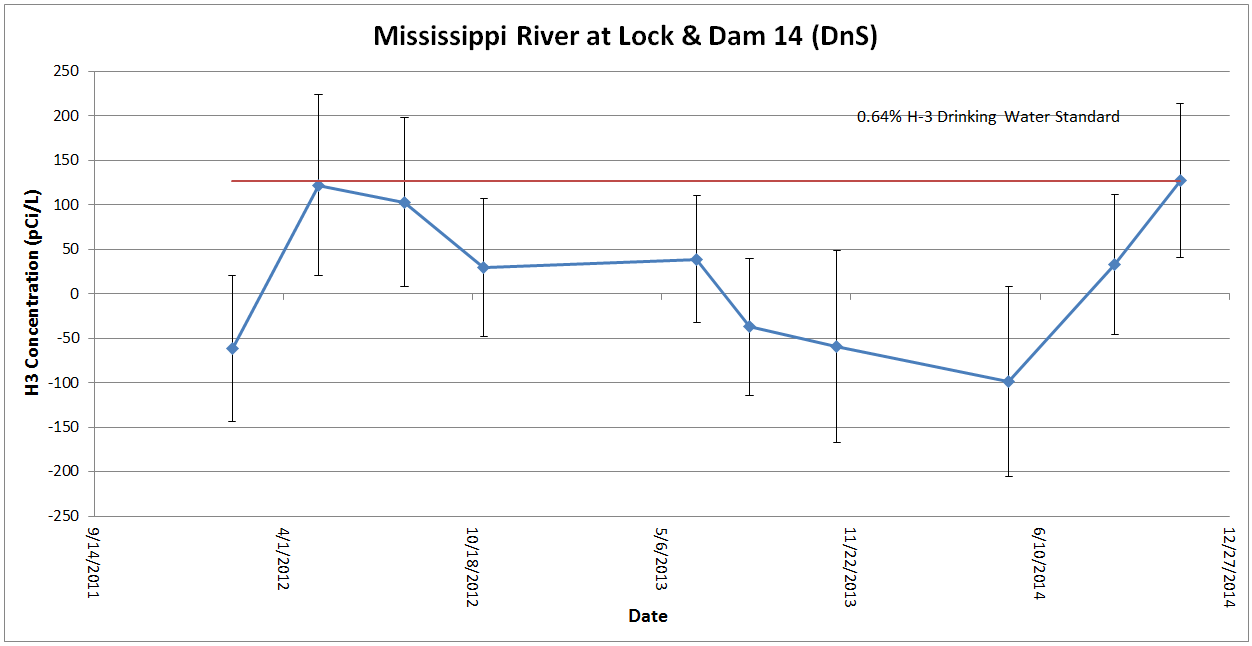
Location	Date	Result		Error
Mississippi R. at Cordova (reference Q-33)	5/8/2014	-75.6	±	108.0
Mississippi R. at Cordova (reference Q-33)	8/14/2014	26.2	±	78.6
Mississippi R. at Cordova (reference Q-33)	11/5/2014	171.0	±	87.8
Mississippi R. Downstream @ Lock&Dam 14	5/8/2014	-98.5	±	107.0
Mississippi R. Downstream @ Lock&Dam 14	8/28/2014	32.7	±	78.8
Mississippi R. Downstream @ Lock&Dam 14	11/5/2014	127.0	±	86.6
Mississippi R. Downstream @ Port Byron	2/14/2014	13.1	±	78.4
Mississippi R. Downstream @ Port Byron	5/8/2014	29.8	±	110.0
Mississippi R. Downstream @ Port Byron	8/28/2014	78.5	±	80.0
Mississippi R. Downstream @ Port Byron	11/5/2014	155.0	±	87.3
Mississippi R. Downstream @ Rapids City	5/8/2014	103.0	±	111.0
Mississippi R. Downstream @ Rapids City	8/28/2014	45.8	±	79.1
Mississippi R. Downstream @ Rapids City	11/5/2014	106.0	±	86.1
Mississippi R. Upstream @ Albany	5/8/2014	-18.3	±	109.0
Mississippi R. Upstream @ Albany	8/28/2014	43.6	±	79.0
Mississippi R. Upstream @ Albany	11/5/2014	79.7	±	85.4

Tables F-2. Trending Graphs for Water from the Quad Cities Area
(Highest results on graphs indicate percentage of US EPA Drinking Water Standard)




Mississippi River at Port Byron (DnS)
0.78% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
300
250
200
150
100
50
0
-50
-100
-150
-200
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
Date


Mississippi River at Rapids City (DnS)
0.53% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
250
200
150
100
50
0
-50
-100
-150
-200
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
Date


Mississippi River at Lock & Dam 14 (DnS)
0.64% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
250
200
150
100
50
0
-50
-100
-150
-200
-250
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
Date

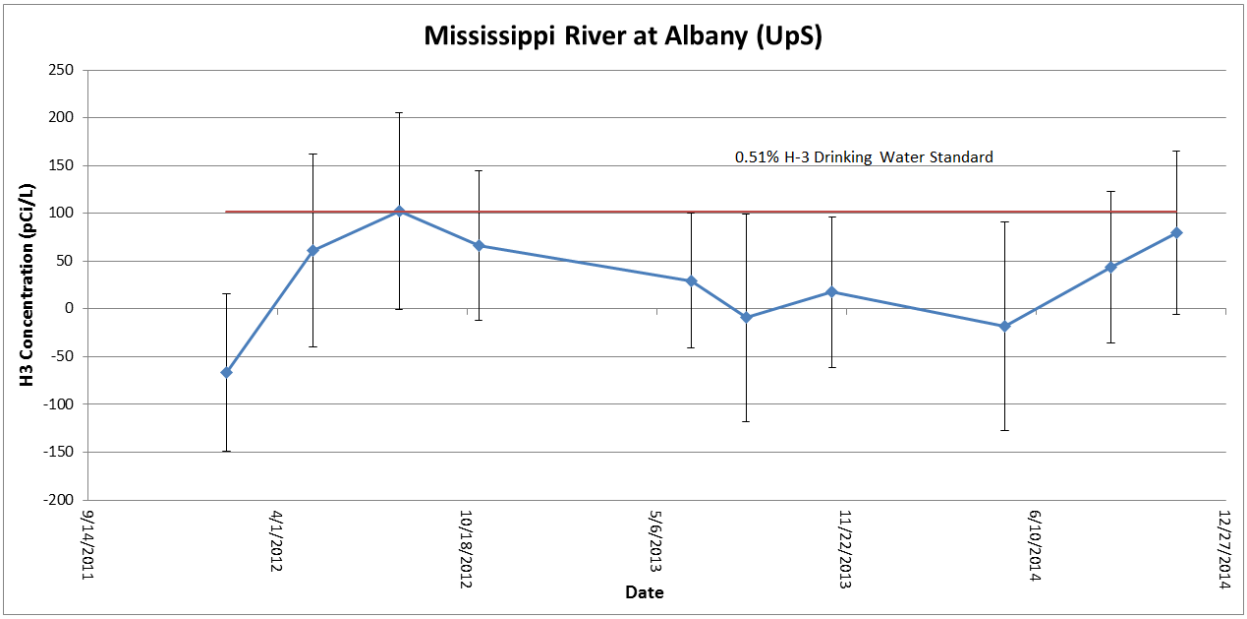

Mississippi River at Albany (UpS)
0.51% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
250
200
150
100
50
0
-50
-100
-150
-200
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
Date

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		Error	Result		Error
Mississippi R. at Cordova (reference Q-33)						
5/8/2014	-0.8	±	1.4	3.0	±	2.5
8/28/2014	-0.2	±	1.4	3.5	±	2.6
11/5/2014	-0.9	±	1.4	6.4	±	2.6
Mississippi R. Downstream @ Lock&Dam 14						
5/8/2014	-0.8	±	1.4	2.9	±	2.5
8/28/2014	-0.7	±	1.3	6.5	±	2.6
11/5/2014	-1.5	±	1.4	5.0	±	2.6
Mississippi R. Downstream @ Port Byron						
2/14/2014	-1.2	±	1.2	-0.2	±	2.7
5/8/2014	-1.5	±	1.3	-2.0	±	2.3
8/28/2014	-1.3	±	1.3	3.6	±	2.6
11/5/2014	-1.2	±	1.4	4.6	±	2.6
Mississippi R. Downstream @ Rapids City						
5/8/2014	0.2	±	1.4	3.4	±	2.5
8/28/2014	-0.2	±	1.4	5.5	±	2.6
11/5/2014	-0.4	±	1.4	2.4	±	2.5
Mississippi R. Upstream @ Albany						
5/8/2014	-1.3	±	1.3	-1.9	±	2.4
8/28/2014	-0.7	±	1.3	6.5	±	2.6
11/5/2014	-0.4	±	1.4	3.7	±	2.5

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		Be-7		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131		K-40		Mn-54		Nb-95		Zn-65		Zr-95	
Date	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Mississippi R. at Cordova (reference Q-33)																										
5/8/2014	17.0 ±	22.0	10.0 ±	11.0	-2.5 ±	1.3	0.9 ±	1.1	1.2 ±	1.1	-0.3 ±	1.1	0.4 ±	3.7	37.0 ±	18.0	18.0 ±	16.0	1.4 ±	1.2	1.7 ±	1.9	0.8 ±	2.6	1.2 ±	2.3
8/28/2014	10.8 ±	8.8	6.2 ±	7.4	0.8 ±	0.9	0.3 ±	1.1	0.0 ±	0.9	-0.1 ±	0.9	-1.4 ±	2.7	-2.9 ±	4.1	-10.0 ±	17.0	-0.3 ±	0.9	0.6 ±	1.2	-1.3 ±	2.3	2.7 ±	1.8
11/5/2014	-26.0 ±	22.0	19.0 ±	11.0	-0.3 ±	1.4	1.9 ±	1.0	0.8 ±	1.1	-3.0 ±	1.0	-5.4 ±	3.5	5.0 ±	20.0	23.0 ±	14.0	0.7 ±	1.1	-1.0 ±	2.1	-0.2 ±	2.2	1.7 ±	2.6
Mississippi R. Downstream @ Lock&Dam 14																										
5/8/2014	67.0 ±	21.0	-1.0 ±	12.0	-0.9 ±	1.5	2.1 ±	1.0	0.2 ±	1.2	-0.5 ±	1.1	2.3 ±	3.1	-54.0 ±	19.0	-2.0 ±	15.0	-2.9 ±	1.2	1.2 ±	2.1	1.9 ±	2.2	1.7 ±	2.5
8/28/2014	5.8 ±	15.9	-4.1 ±	12.2	0.7 ±	2.0	1.1 ±	1.6	-0.4 ±	1.8	0.0 ±	1.6	-1.5 ±	4.4	4.1 ±	8.3	54.0 ±	22.5	0.3 ±	1.8	2.5 ±	2.1	2.6 ±	3.8	-1.4 ±	3.3
11/5/2014	-15.0 ±	36.0	-1.0 ±	12.0	-1.0 ±	2.5	1.1 ±	1.7	2.9 ±	1.6	-1.2 ±	1.7	0.5 ±	5.3	-20.0 ±	34.0	30.0 ±	22.0	-1.1 ±	1.9	0.2 ±	2.9	-1.6 ±	4.2	1.2 ±	3.8
Mississippi R. Downstream @ Port Byron																										
2/14/2014	67.0 ±	58.0	-18.0 ±	20.0	-1.7 ±	1.7	0.0 ±	1.3	0.5 ±	1.4	1.5 ±	1.3	-0.9 ±	5.4	52.0 ±	70.0	53.0 ±	15.0	-1.2 ±	1.5	4.3 ±	2.7	4.7 ±	3.1	3.2 ±	3.4
5/8/2014	-9.0 ±	11.0	14.1 ±	9.0	0.1 ±	1.0	-0.4 ±	1.0	0.4 ±	0.9	-0.3 ±	0.9	-1.2 ±	2.5	-0.4 ±	5.0	1.0 ±	17.0	-1.5 ±	0.9	-0.4 ±	1.3	-5.0 ±	2.5	2.0 ±	1.8
8/28/2014	25.8 ±	8.5	18.6 ±	9.3	0.8 ±	1.2	0.7 ±	1.1	-0.2 ±	1.2	0.2 ±	0.9	2.2 ±	2.4	3.3 ±	4.9	16.9 ±	16.4	0.0 ±	1.1	1.6 ±	1.5	0.6 ±	2.3	-1.9 ±	2.2
11/5/2014	9.0 ±	21.0	-12.0 ±	11.0	1.6 ±	1.3	1.7 ±	1.0	-0.2 ±	1.1	0.1 ±	1.1	-0.7 ±	3.1	9.0 ±	20.0	24.0 ±	10.0	-0.1 ±	1.0	1.9 ±	1.8	7.3 ±	1.9	-1.4 ±	2.3
Mississippi R. Downstream @ Rapids City																										
5/8/2014	-49.0 ±	19.0	21.0 ±	10.0	-1.6 ±	1.2	0.3 ±	0.9	-0.5 ±	1.0	-1.5 ±	0.9	-3.1 ±	2.8	-2.0 ±	16.0	14.0 ±	11.0	-0.6 ±	0.9	-0.9 ±	1.7	-1.9 ±	2.3	-7.4 ±	2.4
8/28/2014	-12.4 ±	8.9	5.3 ±	8.7	-0.8 ±	1.2	0.9 ±	0.8	-0.8 ±	0.9	0.8 ±	0.8	0.0 ±	2.1	-1.0 ±	4.7	7.4 ±	15.6	0.6 ±	1.0	0.5 ±	1.1	1.8 ±	2.1	0.0 ±	1.8
11/5/2014	-14.0 ±	19.0	17.0 ±	10.0	-0.3 ±	1.2	-0.3 ±	0.9	-0.6 ±	1.0	1.5 ±	0.8	3.6 ±	2.7	-11.0 ±	19.0	17.0 ±	11.0	0.3 ±	0.9	-2.8 ±	1.7	3.1 ±	2.0	-0.5 ±	2.2
Mississippi R. Upstream @ Albany																										
5/8/2014	13.9 ±	9.0	17.8 ±	8.6	-0.2 ±	1.0	0.7 ±	0.9	-0.7 ±	1.0	-0.7 ±	0.9	1.9 ±	2.0	4.0 ±	5.2	28.0 ±	10.0	-1.7 ±	1.0	-0.9 ±	1.4	2.5 ±	1.9	1.2 ±	2.0
8/28/2014	-3.4 ±	14.0	2.9 ±	12.2	0.4 ±	2.0	-0.6 ±	1.7	0.4 ±	1.7	0.3 ±	1.6	3.6 ±	4.0	-0.6 ±	7.8	-21.1 ±	24.4	-0.5 ±	1.8	0.3 ±	2.2	0.5 ±	3.8	-0.6 ±	3.0
11/5/2014	16.0 ±	50.0	10.0 ±	12.0	-0.7 ±	2.6	-0.3 ±	1.8	0.2 ±	1.8	0.9 ±	1.6	-2.0 ±	6.1	8.0 ±	53.0	44.0 ±	24.0	0.1 ±	1.9	1.2 ±	3.5	-1.0 ±	4.1	-5.1 ±	4.2

Table F-5. Soil Sample Results for Quad Cities Area
Results are in picocuries per gram (pCi/g)

Location	Ac-228			Ba-140			Bi-212			Bi-214			Co-58			Co-60			Cs-134			Cs-137			Fe-59			K-40			Mn-54		
Date	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
Downwind @ Albany																																	
41767.0	0.4	±	0.0	-0.4	±	0.2	0.3	±	0.1	0.4	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.2	±	0.0	0.0	±	0.0	8.5	±	0.4	0.0	±	0.0
41879.0	0.5	±	0.0	0.0	±	0.1	0.7	±	0.1	0.8	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.3	±	0.0	0.1	±	0.0	9.5	±	0.4	0.0	±	0.0
Quad Cities Intersection 150th Ave N & 266th St. N																																	
41767.0	0.5	±	0.0	-0.2	±	0.2	0.4	±	0.1	0.5	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.2	±	0.0	0.0	±	0.0	12.8	±	0.5	0.0	±	0.0
41879.0	0.6	±	0.0	-0.1	±	0.1	0.7	±	0.1	0.4	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.2	±	0.0	0.0	±	0.0	12.9	±	0.4	0.0	±	0.0
Quad Cities Near RSC																																	
41767.0	0.3	±	0.0	0.0	±	0.2	0.4	±	0.1	0.3	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.5	±	0.0	0.0	±	0.0	9.8	±	0.4	0.0	±	0.0
41879.0	0.3	±	0.0	-0.1	±	0.2	0.3	±	0.2	0.3	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.2	±	0.0	0.0	±	0.0	10.4	±	0.7	0.0	±	0.0
Upwind @ Lock&Dam 14																																	
41879.0	0.8		0.0	0.0		0.1	0.7		0.1	0.6		0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.2		0.0	0.0		0.0	12.2		0.4	0.0		0.0

Location	Nb-95			Pa-234m			Pb-210			Pb-212			Pb-214			Ra-226			Th-234			Tl-208			U-235			Zn-65			Zr-95		
Date	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
Downwind @ Albany																																	
41767.0	0.0	±	0.0	0.8	±	1.1	4.6	±	1.6	0.2	±	0.0	0.4	±	0.0	1.0	±	0.1	0.6	±	0.4	0.3	±	0.0	0.1	±	0.0	0.0	±	0.0	-0.1	±	0.0
41879.0	-0.1	±	0.0	0.8	±	1.0	1.9	±	0.1	0.5	±	0.0	0.8	±	0.0	1.4	±	0.2	0.8	±	0.2	0.5	±	0.0	0.1	±	0.0	0.0	±	0.0	-0.1	±	0.0
Quad Cities Intersection 150th Ave N & 266th St. N																																	
41767.0	0.0	±	0.0	-0.2	±	1.2	1.9	±	1.8	0.5	±	0.0	0.4	±	0.0	0.7	±	0.2	0.6	±	0.4	0.5	±	0.0	0.0	±	0.0	-0.1	±	0.0	-0.1	±	0.0
41879.0	0.0	±	0.0	0.8	±	0.7	1.3	±	0.3	0.6	±	0.0	0.5	±	0.0	0.8	±	0.2	0.6	±	0.3	0.5	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0
Quad Cities Near RSC																																	
41767.0	0.0	±	0.0	0.1	±	1.0	3.9	±	1.7	0.2	±	0.0	0.3	±	0.0	0.6	±	0.2	1.0	±	0.4	0.3	±	0.0	0.0	±	0.0	0.0	±	0.0	-0.1	±	0.0
41879.0	0.0	±	0.0	0.5	±	1.6	0.4	±	0.2	0.3	±	0.0	0.3	±	0.0	0.5	±	0.2	0.1	±	0.3	0.3	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0
Upwind @ Lock&Dam 14																																	
41879.0	0.0	±	0.0	3.0	±	0.8	1.4	±	0.1	0.8	±	0.0	0.7	±	0.0	1.2	±	0.2	0.5	±	0.1	0.7	±	0.0	0.1	±	0.0	0.0	±	0.0	0.0	±	0.0

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

Loc	Date	Nuclide	Result		Error
Mississippi R. downstream @ Rapid City	11/5/2014	Ac-228	0.2	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Ba-140	-0.1	±	0.2
Mississippi R. downstream @ Rapid City	11/5/2014	Bi-212	0.3	±	0.1
Mississippi R. downstream @ Rapid City	11/5/2014	Bi-214	0.3	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Co-58	0.0	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Co-60	0.0	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Cs-134	0.0	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Cs-137	0.0	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Fe-59	0.0	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	K-40	7.9	±	0.3
Mississippi R. downstream @ Rapid City	11/5/2014	Mn-54	0.0	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Nb-95	0.0	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Pa-234m	0.2	±	0.7
Mississippi R. downstream @ Rapid City	11/5/2014	Pb-210	1.7	±	1.0
Mississippi R. downstream @ Rapid City	11/5/2014	Pb-212	0.3	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Pb-214	0.3	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Ra-226	0.5	±	0.1
Mississippi R. downstream @ Rapid City	11/5/2014	Th-234	0.4	±	0.3
Mississippi R. downstream @ Rapid City	11/5/2014	Tl-208	0.3	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	U-235	0.0	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Zn-65	-0.1	±	0.0
Mississippi R. downstream @ Rapid City	11/5/2014	Zr-95	0.0	±	0.0

Table F-7. Fish Sample Results for Quad Cities Area
Results are in picocuries per kilogram (pCi/kg)

Location / Date	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error
Quad Cities Plant Effluent (Bottom Feeder)														
8/28/2014	-72.6	139.0	-76.9	127.0	12.9	16.2	-13.2	21.3	2.2	17.5	40.0	14.2	19.3	48.2
Quad Cities Plant Effluent (Top Feeder)														
8/28/2014	71.5	55.3	-27.4	55.5	-2.3	6.1	-5.9	6.6	-1.3	6.4	2.9	5.5	-10.8	17.2

Location / Date	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Quad Cities Plant Effluent (Bottom Feeder)												
8/28/2014	26.5	59.1	3140.0	312.0	-10.6	16.4	2.7	21.9	-8.2	49.0	-7.3	33.0
Quad Cities Plant Effluent (Top Feeder)												
8/28/2014	26.5	30.4	4010.0	178.0	-4.0	6.3	-2.5	8.1	8.6	14.4	-9.0	11.6

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

Row Labels	Ba-140 Result	Ba-140 Error	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Downwind @ Albany																										
5/8/2014	1.1	1.4	13.8	1.2	0.0	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.2	-0.3	1.5	11.0	1.3	0.1	0.1	0.3	0.1	0.0	0.2	-0.2	0.2
8/28/2014	-0.1	0.2	6.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.1	0.1	6.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Quad Cities Intersection 150th Ave N & 266th St. N																										
5/8/2014	-0.2	0.1	11.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	4.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8/24/2014	0.2	1.0	8.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.6	1.3	10.4	0.6	0.0	0.0	-0.1	0.0	0.1	0.1	0.0	0.0
Quad Cities Near RS-C																										
5/8/2014	0.5	0.3	14.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	13.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8/28/2014	0.5	1.1	5.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	1.8	9.1	0.5	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1
Upwind @ Lock&Dam 14																										
8/28/2014	0.0	0.2	7.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	-0.1	0.2	13.1	0.6	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0

Table F-9. Gamma Detection Network Results for Quad Cities

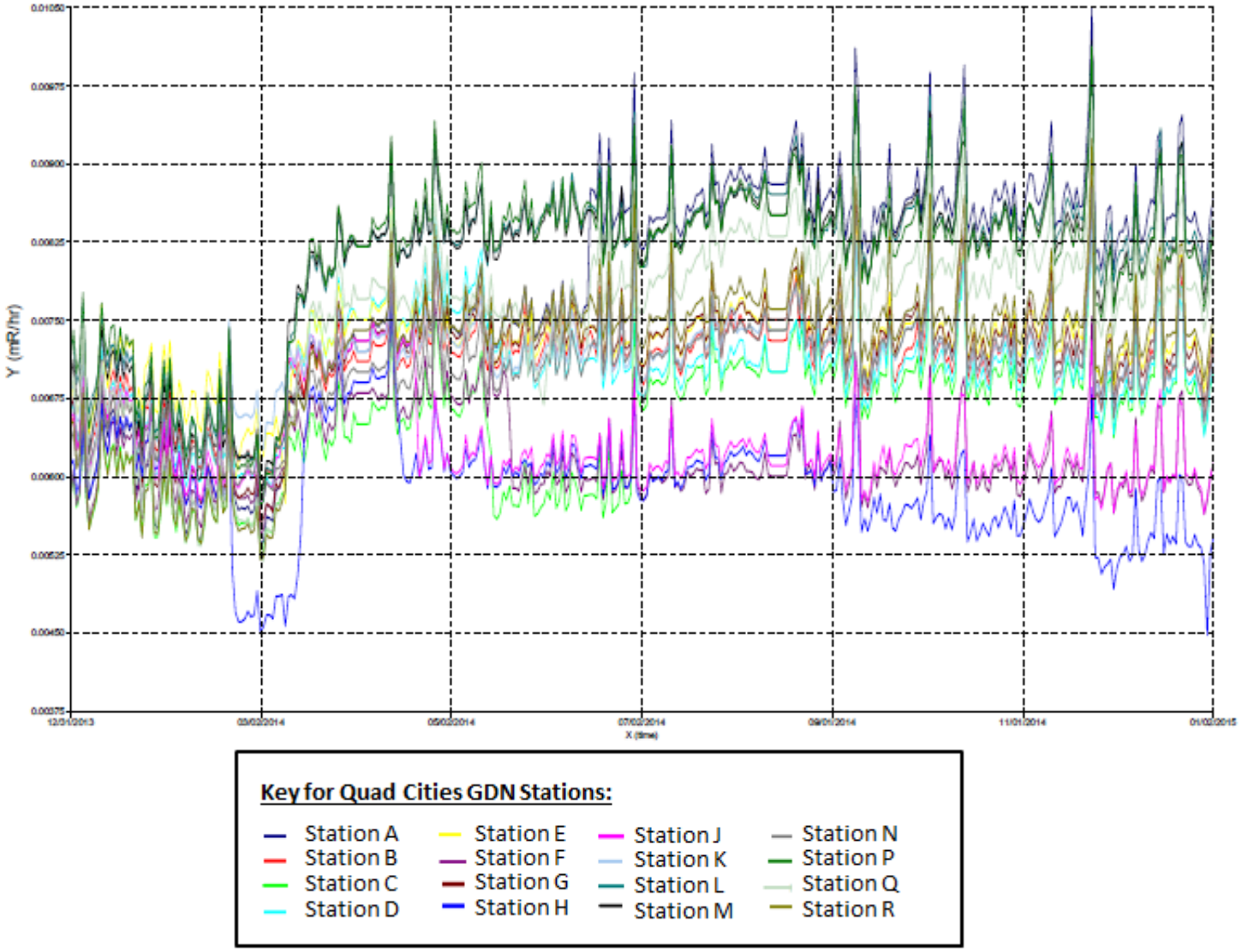


Table F-10. Summary of Ambient Gamma Results for Quad Cities Area

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
QC001	0.09	0.13	0.09	0.10	37.41
QC004	0.07	0.10	0.10	0.09	32.30
QC007	0.07	0.10	0.11	0.09	34.04
QC010	0.06	0.08	0.09	0.06	26.37
QC011	0.05	0.07	0.06	0.05	20.90
QC012	0.06	0.09	0.07	0.06	25.46
QC014	0.05	0.08	0.06		23.12
QC016	0.06	0.07	0.07	0.05	23.54
QC018	0.12	0.13	0.13	0.11	44.62
QC025	0.07	0.10	0.09	0.08	31.94
QC026	0.08	0.11	0.10	0.08	33.22
QC027	0.07	0.10	0.07		29.93
QC028	0.07	0.09	0.09	0.07	29.38
QC029	0.07	0.08	0.10	0.08	30.66
QC031	0.07	0.09	0.08	0.08	28.93
QC032	0.06	0.08	0.07	0.08	26.19
QC033	0.07	0.09	0.08	0.06	27.28
QC034	0.07	0.08	0.08	0.07	27.83
QC036	0.07	0.10	0.11	0.08	32.94
QC037	0.07	0.09	0.07	0.06	26.37
QC038	0.07	0.09	0.10	0.08	30.57
QC039	0.07	0.10	0.09	0.06	28.56
QC040	0.09	0.10	0.11	0.10	36.96
QC041	0.08	0.10	0.10	0.07	31.57
QC042	0.09	0.11	0.10	0.08	33.95
QC043	0.07	0.08	0.09	0.07	28.20
QC044	0.08	0.09	0.09	0.09	31.76
QC045	0.07	0.09	0.08	0.09	30.02
QC046	0.08	0.11	0.10	0.08	32.76
QC049	0.07	0.08	0.08	0.08	28.29
QC050	0.07	0.09	0.08	0.08	29.66
QC051	0.07	0.10	0.10	0.08	30.93
QC052	0.09	0.12	0.11	0.09	38.33
QC053		0.08		0.05	23.725
QC054	0.08	0.11	0.09	0.07	31.21
QC055	0.06	0.10	0.10	0.09	32.21
QC056	0.06	0.07	0.08	0.07	24.73
QC057	0.06	0.08	0.08	0.07	27.28
QC058	0.05	0.08	0.09	0.08	27.83
QC059	0.07	0.10	0.10	0.10	32.58
QC060	0.09	0.09	0.08	0.07	30.30
QC061	0.07	0.10	0.09	0.07	29.29
QC062	0.09	0.12	0.12	0.10	39.88
QC063	0.06	0.10	0.08	0.08	28.93
QC064	0.07	0.08	0.09	0.07	27.92
QC065	0.07	0.11	0.10	0.08	33.03

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
QC066	0.08	0.10	0.10	0.10	34.77
QC067	0.10	0.11	0.11	0.09	37.60
QC068	0.08	0.13	0.11	0.11	38.42
QC-RSA	0.08	0.10	0.09	0.08	32.12
QC-RSB	0.06	0.11	0.10	0.08	31.66
QC-RSC	0.07	0.08	0.08	0.07	26.55
QC-RSD	0.05	0.09	0.08	0.08	27.83
QC-RSE	0.08	0.10	0.10	0.09	33.76
QC-RSF	0.06	0.09	0.07	0.08	26.74
QC-RSG	0.07	0.09	0.08	0.08	29.47
QC-RSH	0.08	0.10	0.10	0.09	33.95
QC-RSJ	0.07	0.11	0.10	0.09	32.94
QC-RSK	0.07	0.09	0.09	0.08	30.75
QC-RSL	0.09	0.12	0.12	0.10	38.23
QC-RSM	0.09	0.12	0.07	0.10	33.67
QC-RSN	0.07	0.09	0.07	0.07	28.20
QC-RSP	0.08	0.10	0.09	0.07	31.85
QC-RSQ	0.08	0.10	0.09	0.09	32.30
QC-RSR	0.06	0.09	0.08	0.08	28.29

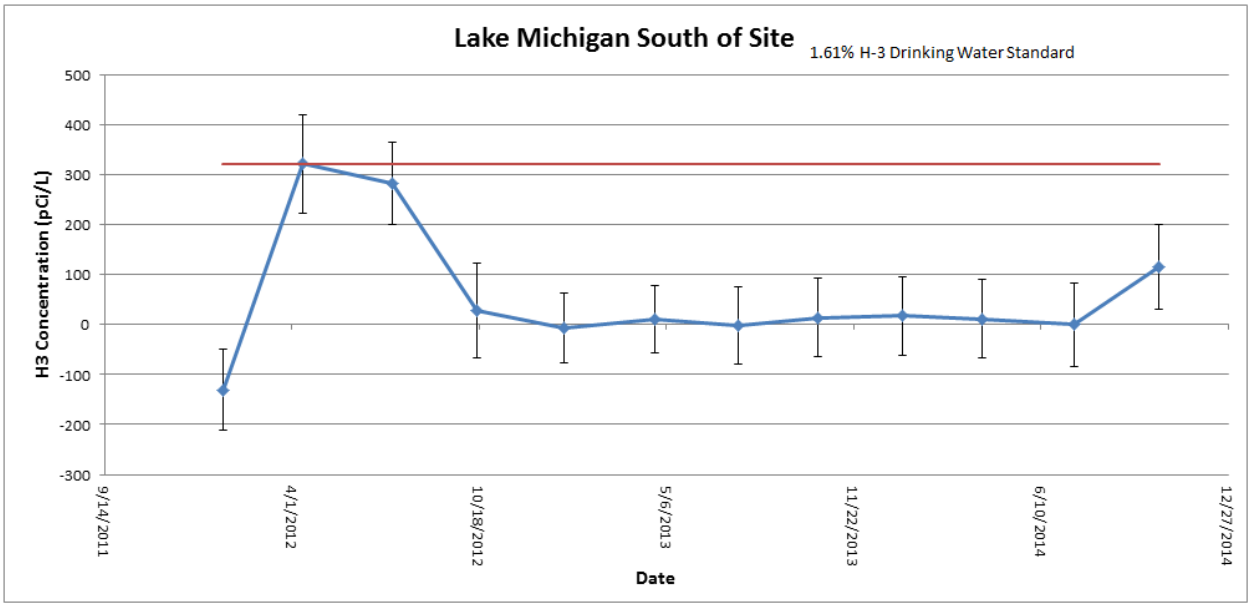
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Dose column based on averages of all available data.

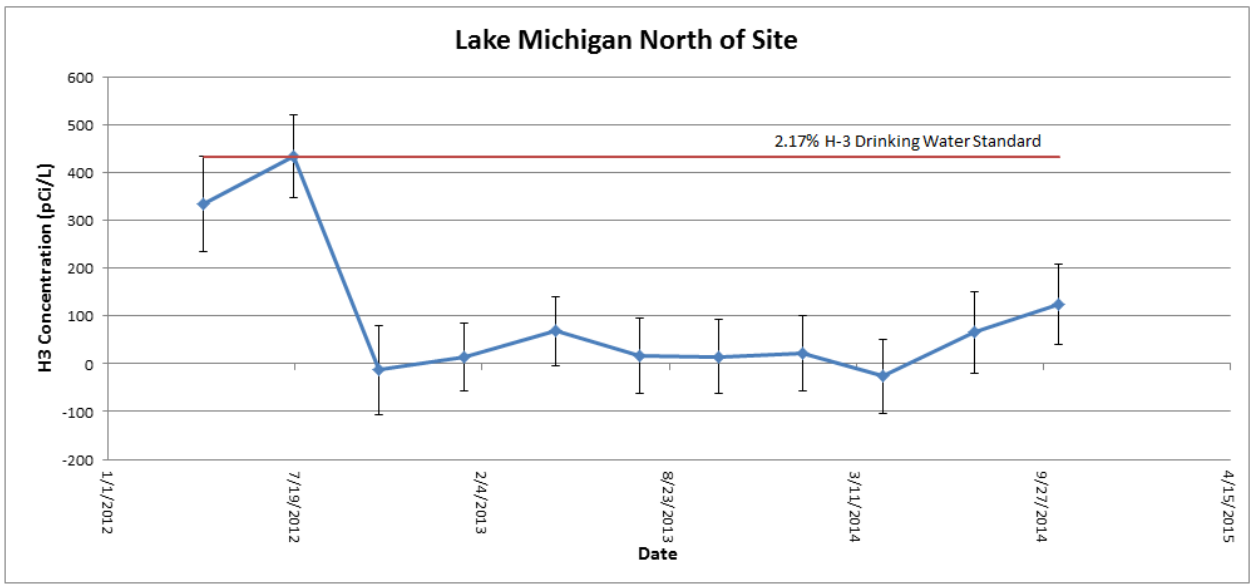
Appendix G
Zion Sample Results

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

Location	Date	Result		Error
Lake Michigan S. of Zion site	1/13/2014	17.5	±	78.4
Lake Michigan S. of Zion site	4/8/2014	10.9	±	78.3
Lake Michigan S. of Zion site	7/15/2014	0	±	83.1
Lake Michigan S. of Zion site	10/14/2014	115	±	83.9
Lake Michigan N. of Zion site	1/13/2014	21.8	±	78.5
Lake Michigan N. of Zion site	4/8/2014	-26.2	±	77.3
Lake Michigan N. of Zion site	7/15/2014	65.5	±	84.8
Lake Michigan N. of Zion site	10/14/2014	124	±	84.1
Z-25 LakeMichigan Sector J @ State Park	4/8/2014	-21.8	±	77.4
Z-25 LakeMichigan Sector J @ State Park	7/15/2014	84.2	±	85.3
Z-25 LakeMichigan Sector J @ State Park	10/14/2014	101	±	83.5

Tables G-2. Trending Graphs for Water from the Braidwood Area
(Highest results on graphs indicate percentage of US EPA Drinking Water Standard)




Lake Michigan North of Site
2.17% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
600
500
400
300
200
100
0
-100
-200
1/1/2012
7/19/2012
2/4/2013
8/23/2013
3/11/2014
9/27/2014
4/15/2015
Date

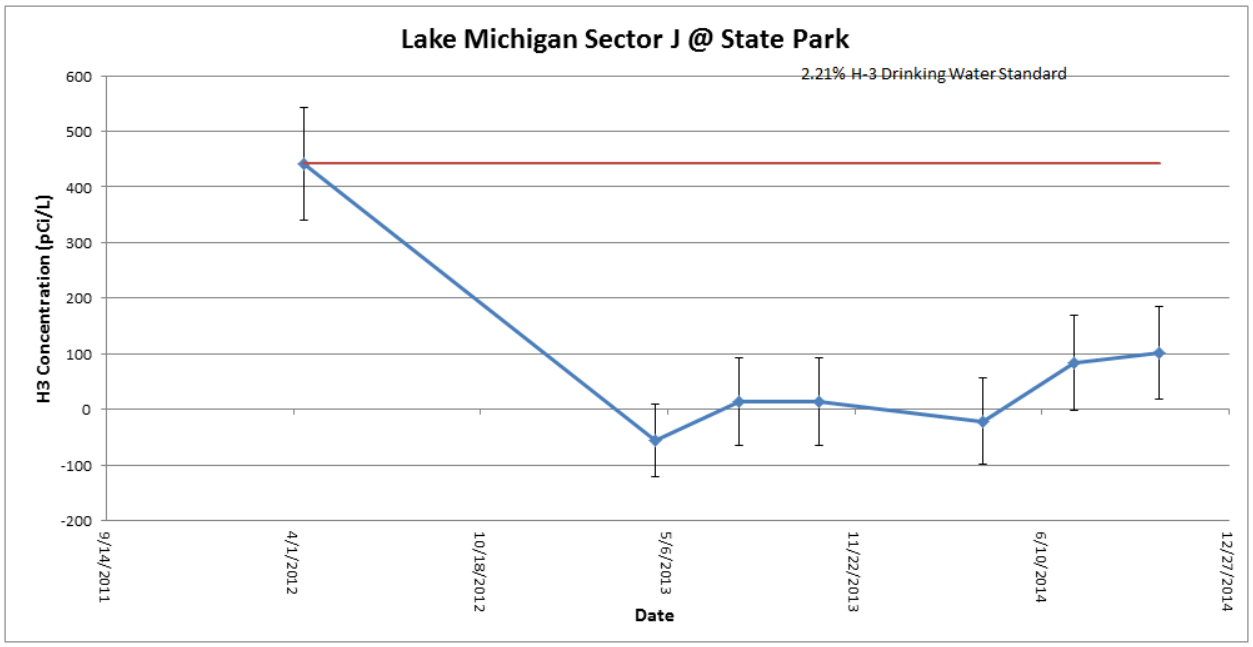

Lake Michigan Sector J @ State Park
2.21% H-3 Drinking Water Standard
H3 Concentration (pCi/L)
600
500
400
300
200
100
0
-100
-200
9/14/2011
4/1/2012
10/18/2012
5/6/2013
11/22/2013
6/10/2014
12/27/2014
Date

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

Location / Date	Alpha Result		Alpha Error	Beta Result		Beta Error
Lake Michigan N. of Zion site						
1/13/2014	1.6	±	1.3	5.4	±	2.4
4/8/2014	0.4	±	1.3	-3.2	±	2.5
7/15/2014	0.3	±	1.4	5.7	±	2.7
10/14/2014	0.0	±	1.5	3.4	±	2.5
Lake Michigan S. of Zion site						
1/13/2014	1.7	±	1.3	5.0	±	2.4
4/8/2014	0.3	±	1.3	-0.8	±	2.6
7/15/2014	0.7	±	1.4	1.6	±	2.6
10/14/2014	0.3	±	1.5	1.8	±	2.5
Z-25 LakeMichigan Sector J @ State Park						
4/8/2014	-1.9	±	1.2	4.3	±	2.7
7/15/2014	-3.7	±	1.2	4.7	±	2.7
10/14/2014	-2.5	±	1.3	4.3	±	2.6

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 / Date	Ba-140 Result	±	Error	Be-7 Result	±	Error	Co-58 Result	±	Error	Co-60 Result	±	Error	Cs-134 Result	±	Error	Cs-137 Result	±	Error	Fe-59 Result	±	Error
Lake Michigan N. of Zion site																					
1/13/2014	-18.8	±	16.9	-14.9	±	10.1	-0.6	±	1.2	-0.8	±	1.0	-0.5	±	1.1	0.2	±	0.9	-3.5	±	2.7
4/8/2014	-31.0	±	54.0	-30.0	±	15.0	-1.9	±	1.5	0.8	±	1.2	0.6	±	1.2	-3.2	±	1.1	-1.5	±	4.4
10/14/2014	-6.0	±	20.6	-5.4	±	11.7	1.1	±	1.3	0.4	±	1.2	0.1	±	1.1	1.8	±	1.1	-4.7	±	3.2
Lake Michigan S. of Zion site																					
1/13/2014	-55.4	±	26.4	-3.4	±	12.8	-0.5	±	1.3	-0.3	±	1.2	0.8	±	1.2	0.4	±	1.1	0.5	±	4.0
4/8/2014	5.0	±	52.0	-24.0	±	15.0	0.9	±	1.7	-2.2	±	1.1	1.7	±	1.2	0.0	±	1.0	0.8	±	4.1
10/14/2014	1.6	±	19.4	-5.9	±	10.5	0.7	±	1.2	0.0	±	0.9	-1.5	±	1.0	0.1	±	0.8	0.0	±	2.8
Z-25 LakeMichigan Sector J @ State Park																					
4/8/2014	-24.0	±	58.0	1.0	±	15.0	1.8	±	1.7	-0.3	±	1.5	-1.4	±	1.4	-2.2	±	1.1	3.9	±	4.8
10/14/2014	4.2	±	12.2	12.0	±	7.6	-0.6	±	1.1	2.3	±	0.9	-0.7	±	0.9	-0.9	±	0.9	1.2	±	2.8

Location / Date	I-131 Result	±	Error	K-40 Result	±	Error	Mn-54 Result	±	Error	Nb-95 Result	±	Error	Zn-65 Result	±	Error	Zr-95 Result	±	Error
Lake Michigan N. of Zion site																		
1/13/2014	5.7	±	13.7	15.4	±	11.4	-0.9	±	0.9	-1.8	±	1.8	-1.6	±	2.0	0.6	±	2.3
4/8/2014	149.0	±	74.0	3.0	±	16.0	-2.0	±	1.4	4.7	±	2.3	0.4	±	2.7	1.0	±	3.2
10/14/2014	7.6	±	18.0	2.0	±	12.1	-0.3	±	1.0	0.2	±	2.0	-0.5	±	2.2	0.9	±	2.6
Lake Michigan S. of Zion site																		
1/13/2014	41.4	±	22.5	18.5	±	16.8	-1.7	±	1.4	-5.5	±	2.2	-2.1	±	2.8	-2.0	±	2.7
4/8/2014	75.0	±	76.0	44.0	±	13.0	-0.4	±	1.2	-2.8	±	3.0	-1.3	±	2.5	4.4	±	2.9
10/14/2014	13.4	±	18.4	28.9	±	9.9	0.5	±	0.9	2.8	±	1.7	0.2	±	2.2	-0.7	±	0.8
Z-25 LakeMichigan Sector J @ State Park																		
4/8/2014	94.0	±	57.0	15.0	±	14.0	2.0	±	1.2	-0.8	±	3.1	-4.8	±	3.6	-0.2	±	3.2
10/14/2014	6.7	±	6.2	-6.0	±	16.0	-0.2	±	0.9	3.8	±	1.4	0.5	±	2.3	-0.7	±	2.0

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

Location / Date	Ac-228 Result	Ac-228 Error	Ba-140 Result	Ba-140 Error	Bi-212 Result	Bi-212 Error	Bi-214 Result	Bi-214 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error
Zion North of Site, Near ZN-67																						
4/8/2014	0.3	0.0	-0.1	0.2	0.2	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.4	0.0	0.0
7/15/2014	0.3	0.0	0.7	0.7	0.4	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	9.3	0.6	0.0	0.0

Location / Date	Nb-95 Result	Nb-95 Error	Pa-234m Result	Pa-234m Error	Pb-210 Result	Pb-210 Error	Pb-212 Result	Pb-212 Error	Pb-214 Result	Pb-214 Error	Ra-226 Result	Ra-226 Error	Th-234 Result	Th-234 Error	Tl-208 Result	Tl-208 Error	U-235 Result	U-235 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Zion North of Site, Near ZN-67																						
4/8/2014	0.0	0.0	1.5	0.8	0.9	0.2	0.3	0.0	0.4	0.0	0.7	0.1	0.5	0.1	0.2	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
7/15/2014	0.0	0.0	0.3	1.3	0.9	0.2	0.3	0.0	0.3	0.0	0.6	0.2	0.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0	-0.1	0.0

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

Location / Date	Ac-228 Result	Ac-228 Error	Ba-140 Result	Ba-140 Error	Bi-212 Result	Bi-212 Error	Bi-214 Result	Bi-214 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error
Lake Michigan N. of Zion Site																						
4/8/2014	0.2	0.0	0.2	0.1	0.2	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.3	0.0	0.0
Lake Michigan S. of Zion site																						
4/8/2014	0.2	0.0	-0.1	0.1	0.2	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	0.3	0.0	0.0
Z-25 LakeMichigan Sector J @ State Park																						
4/8/2014	0.2	0.0	0.0	0.1	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	0.3	0.0	0.0

Location / Date	Nb-95 Result	Nb-95 Error	Pa-234m Result	Pa-234m Error	Pb-210 Result	Pb-210 Error	Pb-212 Result	Pb-212 Error	Pb-214 Result	Pb-214 Error	Ra-226 Result	Ra-226 Error	Th-234 Result	Th-234 Error	Tl-208 Result	Tl-208 Error	U-235 Result	U-235 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Lake Michigan N. of Zion Site																						
4/8/2014	0.0	0.0	0.3	0.9	-0.4	7.9	0.2	0.0	0.3	0.0	0.7	0.1	-0.3	0.6	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
Lake Michigan S. of Zion site																						
4/8/2014	0.0	0.0	-0.5	0.8	0.2	0.1	0.3	0.0	0.3	0.0	0.6	0.1	0.4	0.1	0.2	0.0	0.0	0.0	0.0	0.0	-0.1	0.0
Z-25 LakeMichigan Sector J @ State Park																						
4/8/2014	0.0	0.0	-1.1	1.0	-15.5	9.5	0.2	0.0	0.3	0.0	0.3	0.1	0.9	0.6	0.2	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0

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

Location	BA-140			Be-7			Co-58			CO-60			CS-134			CS-137			FE-59		
Date	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
Zion North of Site, Near ZN-67																					
4/8/2014	0.4	±	0.5	8.7	±	0.2	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0
7/15/2014	-0.6	±	0.6	2.8	±	0.3	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.1	±	0.1

Location	I-131			K-40			MN-54			NB-95			Zn-65			ZR-95		
Date	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
Zion North of Site, Near ZN-67																		
4/8/2014	1.7	±	1.1	0.6	±	0.1	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0
7/15/2014	-0.1	±	0.7	8.0	±	0.5	0.0	±	0.0	0.0	±	0.0	0.0	±	0.0	0.0	±	0.1

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

Location	Alpha			Beta		
Date	Result		Error	Result		Error
Air Pump North of Plant Entrance by RR						
1/13/2014	1.3	±	0.5	26.5	±	1.6
1/21/2014	1.4	±	0.7	28.0	±	2.2
1/29/2014	1.4	±	0.7	15.7	±	1.9
2/4/2014	1.2	±	0.8	24.4	±	2.6
2/11/2014	0.1	±	0.6	21.6	±	2.3
2/18/2014	0.7	±	0.7	30.8	±	2.6
2/25/2014	1.2	±	0.7	26.8	±	2.4
3/4/2014	1.7	±	0.8	28.7	±	2.4
3/11/2014	0.5	±	0.7	22.1	±	2.3
3/18/2014	0.7	±	0.7	20.8	±	2.2
4/1/2014	0.9	±	0.4	20.8	±	1.4
4/8/2014	1.1	±	0.7	19.9	±	2.2
4/14/2014	1.1	±	0.8	18.1	±	2.4
4/22/2014	0.8	±	0.6	20.6	±	2.0
4/28/2014	0.2	±	0.7	14.1	±	2.3
5/5/2014	0.1	±	0.6	11.0	±	2.0
5/20/2014	1.7	±	0.4	13.2	±	1.0
5/27/2014	2.2	±	0.8	21.4	±	2.2
6/3/2014	0.4	±	0.6	14.2	±	2.0
6/10/2014	0.5	±	0.6	12.9	±	1.6
6/17/2014	1.2	±	0.7	13.2	±	1.7
6/24/2014	2.2	±	0.7	7.2	±	1.3
7/1/2014	0.7	±	0.7	17.4	±	2.1
7/8/2014	1.7	±	0.7	12.7	±	1.6
7/15/2014	1.7	±	0.7	11.9	±	1.5
7/22/2014	3.2	±	0.9	20.8	±	1.8
7/29/2014	3.1	±	0.9	22.1	±	2.3
8/5/2014	4.6	±	1.1	30.8	±	2.6
8/12/2014	3.1	±	0.9	19.2	±	2.3
8/19/2014	2.9	±	0.9	19.1	±	2.2
8/26/2014	3.6	±	0.9	28.6	±	2.5
9/2/2014	3.0	±	0.9	24.8	±	2.4
9/9/2014	2.4	±	0.8	25.4	±	2.4
9/16/2014	2.4	±	0.8	16.6	±	2.1
9/23/2014	2.8	±	0.9	28.1	±	2.5
9/30/2014	2.2	±	0.8	32.9	±	2.6
10/7/2014	1.6	±	0.8	18.5	±	2.3
10/14/2014	2.1	±	0.8	19.3	±	2.2
10/21/2014	0.6	±	0.5	9.0	±	1.4
10/28/2014	2.9	±	0.9	28.4	±	2.5
11/5/2014	1.4	±	0.6	16.5	±	1.9
11/12/2014	2.1	±	0.8	20.6	±	2.2
11/18/2014	2.2	±	0.9	23.1	±	2.6
11/24/2014	2.6	±	0.9	25.6	±	2.7
12/1/2014	1.1	±	0.7	35.9	±	2.7
12/9/2014	1.3	±	0.7	40.5	±	2.6
12/16/2014	2.8	±	0.9	36.4	±	2.7
12/30/2014	2.0	±	0.5	26.4	±	1.5

Location	Alpha			Beta		
Date	Result		Error	Result		Error
North of Site (RS_E)						
1/13/2014	1.3	±	0.5	29.4	±	1.6
1/21/2014	1.1	±	0.7	25.6	±	2.1
1/29/2014	1.1	±	0.6	16.7	±	1.9
2/4/2014	1.0	±	0.8	23.7	±	2.6
2/11/2014	0.4	±	0.7	25.9	±	2.4
2/18/2014	0.2	±	0.7	31.2	±	2.6
2/25/2014	0.6	±	0.7	26.7	±	2.4
3/4/2014	1.3	±	0.8	34.8	±	2.6
3/11/2014	1.1	±	0.8	22.5	±	2.3
3/18/2014	0.9	±	0.7	23.9	±	2.3
4/1/2014	1.8	±	0.5	22.3	±	1.4
4/8/2014	0.8	±	0.7	21.4	±	2.3
4/14/2014	1.0	±	0.8	18.1	±	2.5
4/22/2014	1.1	±	0.6	21.8	±	2.1
4/28/2014	1.3	±	0.8	14.8	±	2.4
5/5/2014	0.3	±	0.6	9.3	±	2.0
5/20/2014	1.9	±	0.5	12.0	±	1.0
5/27/2014	1.8	±	0.8	20.8	±	2.2
6/3/2014	0.6	±	0.6	14.7	±	2.0
6/10/2014	1.8	±	0.7	12.3	±	1.5
6/17/2014	1.1	±	0.7	13.6	±	1.7
6/24/2014	1.8	±	0.7	8.5	±	1.4
7/1/2014	0.3	±	0.6	18.1	±	2.1
7/8/2014	1.6	±	0.7	14.7	±	1.6
7/15/2014	1.9	±	0.7	12.1	±	1.5
7/22/2014	3.1	±	0.8	20.4	±	1.8
7/29/2014	3.8	±	0.9	20.5	±	2.3
8/5/2014	4.0	±	1.0	29.4	±	2.5
8/12/2014	3.5	±	0.9	18.7	±	2.3
8/19/2014	2.6	±	0.8	18.5	±	2.2
8/26/2014	3.7	±	1.0	30.8	±	2.6
9/2/2014	3.3	±	0.9	26.8	±	2.4
9/9/2014	3.6	±	0.9	28.6	±	2.4
9/16/2014	2.6	±	0.8	18.4	±	2.2
9/23/2014	2.7	±	0.9	30.0	±	2.5
9/30/2014	3.0	±	0.9	29.2	±	2.5
10/7/2014	1.2	±	0.7	18.9	±	2.3
10/14/2014	2.5	±	0.8	21.0	±	2.2
10/21/2014	0.7	±	0.5	10.5	±	1.4
10/28/2014	2.6	±	0.8	25.5	±	2.5
11/5/2014	1.8	±	0.7	18.6	±	2.0
11/12/2014	1.4	±	0.7	20.5	±	2.2
11/18/2014	1.4	±	0.8	28.9	±	2.7
11/24/2014	1.8	±	0.8	26.7	±	2.7
12/1/2014	0.5	±	0.6	37.8	±	2.7
12/9/2014	1.6	±	0.7	43.5	±	2.6
12/16/2014	3.5	±	0.9	42.0	±	2.8
12/30/2014	2.1	±	0.5	25.7	±	1.5

Location	Alpha			Beta		
Date	Result		Error	Result		Error
South of Site (RS-J)						
1/13/2014	1.3	±	0.5	29.9	±	1.6
1/21/2014	1.1	±	0.6	28.4	±	2.2
1/29/2014	1.1	±	0.6	19.1	±	2.0
2/11/2014	0.2	±	0.6	23.1	±	2.3
2/25/2014	1.1	±	0.4	28.4	±	1.5
3/4/2014	2.1	±	0.8	34.3	±	2.5
3/11/2014	0.8	±	0.7	22.3	±	2.3
3/18/2014	0.3	±	0.6	20.5	±	2.2
4/1/2014	0.8	±	0.4	21.9	±	1.4
4/8/2014	1.2	±	0.7	20.2	±	2.2
4/14/2014	1.6	±	0.9	18.9	±	2.5
4/22/2014	1.5	±	0.7	22.1	±	2.1
4/28/2014	0.7	±	0.8	16.0	±	2.4
5/5/2014	1.1	±	0.7	11.4	±	2.0
5/20/2014	2.7	±	0.5	13.0	±	1.0
5/27/2014	1.5	±	0.7	21.0	±	2.2
6/3/2014	1.0	±	0.7	13.1	±	1.9
6/10/2014	0.7	±	0.6	14.6	±	1.6
6/17/2014	1.1	±	0.7	13.8	±	1.7
6/24/2014	2.2	±	0.7	6.8	±	1.3
7/1/2014	1.0	±	0.7	16.3	±	2.1
7/8/2014	2.3	±	0.8	11.6	±	1.6
7/15/2014	1.4	±	0.7	12.4	±	1.6
7/22/2014	2.7	±	0.8	21.8	±	1.8
7/29/2014	3.1	±	0.9	23.4	±	2.3
8/5/2014	4.7	±	1.1	31.2	±	2.6
8/12/2014	3.3	±	0.9	20.5	±	2.3
8/19/2014	3.1	±	0.9	20.4	±	2.3
8/26/2014	3.7	±	1.0	27.6	±	2.5
9/2/2014	2.5	±	0.8	22.5	±	2.3
9/9/2014	2.4	±	0.8	26.9	±	2.4
9/16/2014	2.5	±	0.8	17.4	±	2.1
9/23/2014	2.6	±	0.8	33.2	±	2.6
9/30/2014	3.0	±	0.9	34.4	±	2.6
10/7/2014	1.9	±	0.8	21.4	±	2.4
10/14/2014	2.0	±	0.7	19.3	±	2.2
10/21/2014	1.1	±	0.6	10.3	±	1.4
10/28/2014	2.7	±	0.8	26.4	±	2.5
11/5/2014	1.1	±	0.6	17.3	±	1.9
11/12/2014	0.9	±	0.6	18.3	±	2.1
11/18/2014	1.9	±	0.8	28.1	±	2.7
11/24/2014	1.7	±	0.8	27.1	±	2.7
12/1/2014	1.1	±	0.7	30.8	±	2.5
12/9/2014	2.1	±	0.8	40.8	±	2.6
12/16/2014	3.5	±	0.9	42.3	±	2.8
12/30/2014	1.5	±	0.5	27.2	±	1.5

Location	Alpha			Beta		
Date	Result		Error	Result		Error
West of Site (RS-F)						
1/13/2014	0.7	±	0.4	29.9	±	1.6
1/21/2014	0.9	±	0.6	29.7	±	2.3
1/29/2014	0.6	±	0.6	18.6	±	2.0
2/4/2014	0.2	±	0.7	28.1	±	2.7
2/11/2014	1.0	±	0.7	24.3	±	2.3
2/18/2014	0.4	±	0.7	31.2	±	2.6
2/25/2014	0.3	±	0.6	29.4	±	2.5
3/4/2014	2.5	±	0.9	35.9	±	2.6
3/11/2014	0.3	±	0.7	26.1	±	2.4
3/18/2014	0.9	±	0.7	21.8	±	2.3
4/1/2014	0.9	±	0.4	22.2	±	1.4
4/8/2014	1.1	±	0.7	19.3	±	2.3
4/14/2014	0.2	±	0.7	19.5	±	2.5
4/22/2014	0.4	±	0.5	25.1	±	2.1
4/28/2014	1.0	±	0.8	15.0	±	2.4
5/5/2014	1.6	±	0.7	10.2	±	1.9
5/20/2014	1.5	±	0.4	11.7	±	1.0
5/27/2014	2.1	±	0.8	21.9	±	2.3
6/3/2014	0.5	±	0.6	15.2	±	2.0
6/10/2014	0.9	±	1.4	16.9	±	3.3
6/17/2014	-14.4	±	28.0	-39.4	±	61.4
6/24/2014	14.7	±	33.5	36.8	±	70.0
7/1/2014	0.5	±	0.7	16.2	±	2.1
7/8/2014	1.5	±	0.7	9.9	±	1.5
7/15/2014	1.0	±	0.7	12.2	±	1.6
7/22/2014	2.6	±	0.8	21.4	±	1.8
7/29/2014	3.2	±	0.9	18.4	±	2.2
8/5/2014	4.8	±	1.1	27.5	±	2.5
8/12/2014	3.2	±	0.9	17.2	±	2.2
8/19/2014	3.7	±	0.9	17.2	±	2.2
8/26/2014	3.8	±	1.0	28.8	±	2.5
9/2/2014	2.5	±	0.8	25.2	±	2.3
9/9/2014	3.4	±	0.9	25.3	±	2.3
9/16/2014	2.8	±	0.8	19.9	±	2.2
9/23/2014	2.4	±	0.8	27.8	±	2.4
9/30/2014	3.0	±	0.9	30.0	±	2.4
10/7/2014	1.6	±	0.8	20.1	±	2.3
10/14/2014	2.3	±	0.8	23.8	±	2.3
10/21/2014	1.0	±	0.6	10.7	±	1.4
10/28/2014	3.0	±	0.9	28.9	±	2.5
11/5/2014	1.7	±	0.6	20.6	±	2.0
11/12/2014	1.1	±	0.6	18.2	±	2.1
11/18/2014	2.8	±	0.9	28.8	±	2.7
11/24/2014	0.8	±	0.7	30.8	±	2.7
12/1/2014	1.0	±	0.7	29.7	±	2.5
12/9/2014	1.3	±	0.7	42.3	±	2.6
12/16/2014	3.4	±	0.9	38.4	±	2.8
12/30/2014	1.5	±	0.5	26.1	±	1.5

Table G-9. Gamma Spectroscopy Sample Results for Other Radionuclides in Air from the Zion Area
Results are in picocuries per liter (pCi/L)

Location	Be-7			Cs-137			I-131			K-40			Te-132			Xe-131m		
Date	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
Air Pump North of Plant Entrance by RR																		
1/13/2014		±			±		-5.7	±	13.2		±			±		168.6	±	377.8
1/21/2014		±			±		0.4	±	15.3		±			±		-178.3	±	447.6
1/29/2014		±			±		-14.9	±	19.4		±			±		76.0	±	510.1
2/4/2014		±			±		-4.0	±	19.6		±			±		330.7	±	562.2
2/11/2014		±			±		16.4	±	18.4		±			±		-270.7	±	593.2
2/18/2014		±			±		2.2	±	17.9		±			±		359.7	±	504.5
2/25/2014		±			±		-13.6	±	20.5		±			±		11.5	±	620.5
3/4/2014		±			±		-3.8	±	16.2		±			±		292.1	±	516.4
3/11/2014		±			±		-6.7	±	18.9		±			±		411.2	±	539.0
3/18/2014		±			±		-8.9	±	15.7		±			±		286.6	±	463.9
4/1/2014		±			±		-2.7	±	12.1		±			±		-131.4	±	313.3
4/8/2014		±			±		14.0	±	18.3		±			±		-551.2	±	544.9
4/14/2014		±			±		3.6	±	20.7		±			±		337.2	±	568.0
4/22/2014		±			±		-0.2	±	15.0		±			±		171.8	±	421.0
4/28/2014		±			±		-4.9	±	18.6		±			±		170.2	±	567.1
5/5/2014		±			±		-12.6	±	18.3		±			±		294.3	±	512.9
5/20/2014	-140.0	±	120.0	-3.0	±	12.0	-26.0	±	23.0	410.0	±	220.0	-78.0	±	44.0	220.0	±	380.0
5/27/2014	-90.0	±	120.0	-18.0	±	17.0	6.0	±	15.0	1030.0	±	300.0	-10.0	±	20.0	140.0	±	450.0
6/3/2014	80.0	±	100.0	1.0	±	15.0	8.0	±	16.0	880.0	±	270.0	-20.0	±	24.0	640.0	±	450.0
6/10/2014	108.0	±	190.0	-18.0	±	33.0	-8.0	±	15.0	2160.0	±	600.0	-23.0	±	56.0	560.0	±	990.0
6/17/2014		±			±		19.0	±	17.0		±			±			±	
6/24/2014	110.0	±	100.0	9.0	±	13.0	-25.0	±	17.0	1260.0	±	300.0	-29.0	±	30.0	700.0	±	540.0
7/1/2014	106.0	±	97.6	-2.9	±	15.9	9.3	±	14.8	1480.0	±	320.0	45.6	±	25.9	310.0	±	361.0
7/8/2014	37.4	±	77.9	6.7	±	14.2	17.0	±	17.8	1400.0	±	296.0	-2.6	±	29.8	-305.0	±	426.0
7/15/2014	-9.3	±	81.9	12.0	±	15.5	7.2	±	17.0	1290.0	±	289.0	-19.5	±	32.2	-349.0	±	363.0
7/22/2014	96.3	±	78.7	20.4	±	14.0	-13.2	±	16.3	895.0	±	326.0	-12.6	±	20.0	311.0	±	361.0
7/29/2014	113.0	±	91.2	3.3	±	16.1	3.6	±	15.0	1160.0	±	243.0	-7.6	±	29.2	158.0	±	338.0
8/5/2014	73.0	±	91.7	-1.5	±	9.9	13.5	±	16.6	1210.0	±	316.0	23.9	±	25.1	437.0	±	393.0
8/12/2014	4.9	±	93.3	-4.6	±	15.0	13.6	±	17.4	1240.0	±	271.0	18.8	±	25.4	152.0	±	380.0
8/19/2014	-109.0	±	136.0	-4.4	±	15.6	-0.8	±	33.7	479.0	±	259.0		±		560.0	±	677.0
8/26/2014	-33.3	±	213.0	15.2	±	25.7	31.6	±	55.2	1350.0	±	436.0	127.0	±	138.0	761.0	±	1040.0
9/2/2014	499.0	±	210.0	-6.6	±	23.5	-92.7	±	68.0	1180.0	±	315.0	175.0	±	164.0	-400.0	±	1080.0
9/9/2014	-176.0	±	336.0	-13.2	±	47.8	22.2	±	52.7	1320.0	±	705.0		±		1870.0	±	1320.0
9/16/2014	317.0	±	176.0	-5.1	±	30.9	-28.9	±	39.5	698.0	±	363.0	-96.2	±	49.2	829.0	±	728.0
9/23/2014	-223.0	±	320.0	-24.1	±	47.4	-59.1	±	63.4	886.0	±	746.0		±		-483.0	±	1320.0
9/30/2014	132.0	±	112.0	-5.1	±	28.4	-40.1	±	40.6	1520.0	±	359.0	-83.9	±	46.5	-727.0	±	677.0
10/7/2014	10.8	±	147.0	-14.7	±	20.3	34.9	±	22.9	948.0	±	286.0	29.4	±	34.3	-57.2	±	569.0
10/14/2014	16.5	±	45.0	6.4	±	7.2	14.1	±	9.0	802.0	±	131.0	-17.0	±	14.3	-375.0	±	239.0
10/21/2014	-8.8	±	42.5	2.3	±	7.2	25.9	±	8.4	756.0	±	172.0	-1.6	±	14.4	-64.5	±	236.0
10/28/2014	8.3	±	48.2	5.7	±	6.5	19.5	±	11.7	939.0	±	136.0	17.4	±	28.8	38.8	±	287.0
11/5/2014	78.0	±	41.0	8.4	±	5.8	1.2	±	6.6	912.0	±	127.0	7.0	±	11.3	234.0	±	198.0
11/12/2014	86.3	±	42.5	7.8	±	6.8	5.5	±	7.4	669.0	±	166.0	0.4	±	10.0	276.0	±	207.0
11/18/2014	96.4	±	59.4	-10.5	±	9.2	-6.6	±	8.7	582.0	±	191.0	-7.5	±	10.0	-106.0	±	141.0
11/24/2014	67.3	±	43.4	10.3	±	7.3	0.0	±	10.2	430.0	±	196.0	10.2	±	14.1	-105.0	±	276.0
12/1/2014	-4.0	±	45.0	7.3	±	5.9	6.5	±	7.6	580.0	±	140.0	5.0	±	13.0	300.0	±	220.0
12/9/2014	48.0	±	42.0	1.3	±	6.6	3.7	±	7.7	760.0	±	140.0	16.0	±	16.0	-190.0	±	230.0
12/30/2014	27.0	±	25.0	2.0	±	3.2	0.1	±	5.6	570.0	±	70.0	19.0	±	13.0	0.0	±	150.0

Missing results in the Gamma Spectroscopy Results Table G-4 are due to differing gamma spectroscopy libraries at separate IEMA Laboratory locations. At the beginning of the year, the Zion air cartridges were analyzed by the IEMA Lab in West Chicago, and that library did not include the same radionuclides as the library at the IEMA Lab in Springfield.

Additionally, some samples were analyzed using the IEMA Mobile Laboratory stationed in Springfield, and that library is also slightly different from the Springfield Laboratory.

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

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
ZN039	0.05	0.08	0.06	0.06	23.00
ZN040	0.05	0.07	0.07	0.07	23.45
ZN045	0.05	0.07	0.05	0.06	20.90
ZN065	0.06	0.08	0.06	0.08	25.64
ZN066			0.10	0.10	36.14
ZN067	0.05	0.05	0.05	0.06	19.07
ZN068	0.06	0.08	0.08	0.08	26.55
ZN069	0.05	0.09	0.06	0.08	24.73
ZN070	0.05	0.08	0.05	0.07	21.99
ZN071	0.08	0.11	0.09	0.12	37.23
ZN072		0.08	0.04	0.07	23.73
ZN073	0.04	0.08	0.06	0.07	22.36
ZN074	0.04	0.06	0.06	0.06	19.07
ZN075	0.10	0.11	0.09	0.10	36.04
ZN076	0.07	0.09	0.06	0.08	26.65
ZN077	0.07	0.11	0.08	0.09	32.03
ZN078	0.07	0.10	0.08	0.10	31.03
ZN079	0.08	0.09	0.08	0.10	31.30
ZN080	0.08	0.09	0.11	0.07	31.94
ZN081	0.08	0.11	0.09	0.11	35.41
ZN082	0.05	0.06	0.04	0.07	20.35
ZN083	0.13	0.44	0.51	0.69	160.78
ZN084	0.03	0.06	0.08	0.06	21.44
ZN-RSJC	0.07	0.16	0.21	0.14	51.74
ZN-RSNC	0.04	0.07	0.05	0.05	19.07
ZN-RSRC	0.05	0.05	0.05	0.05	17.25

The higher readings for locations ZN083 and ZN-RSJC are because they are the closest to the outside storage location for the Independent Spent Fuel Storage Installation (ISFSI). Location ZN083 is on the fence outside the storage pad (Installation), and there was a gradual increase in dose as more material was placed on the pad as the year progressed. Location ZN-RSJC is around the corner and slightly further away from the storage pad than ZN083.

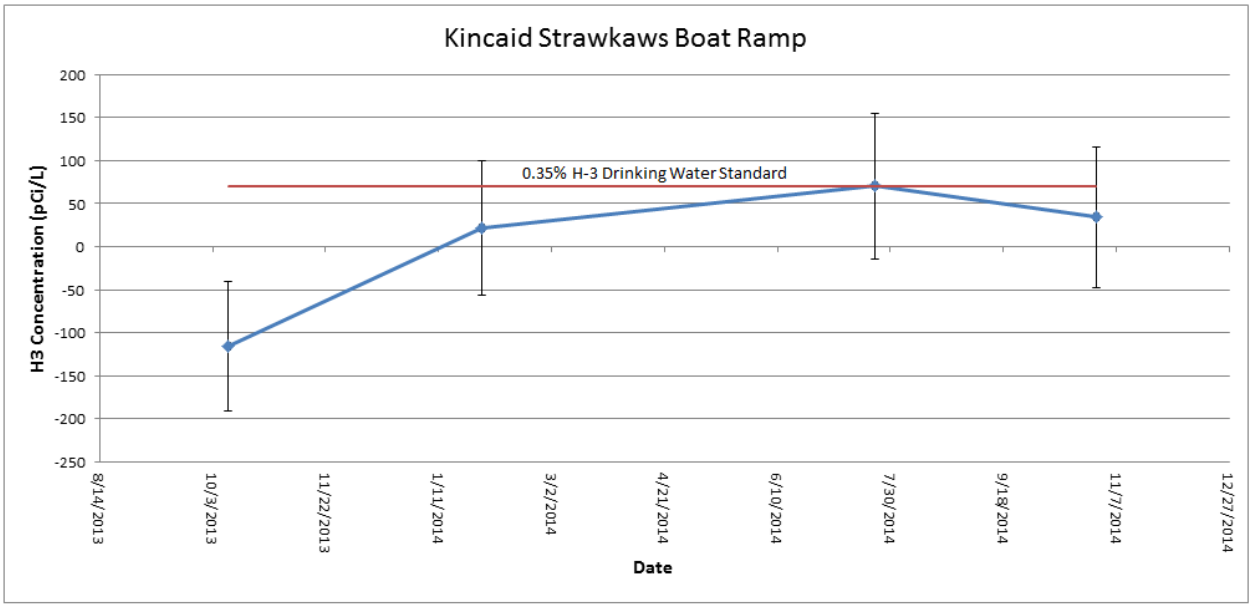
Blanks in the table indicate that dosimeters were missing at the end of the quarter.
Annual Dose column based on averages of all available data.

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	Date	Result		Error
Kincaid Strawkaws Boat Ramp	1/30/2014	21.8	±	78.4
Kincaid Strawkaws Boat Ramp	7/23/2014	70.1	±	84.8
Kincaid Strawkaws Boat Ramp	10/29/2014	34.4	±	81.5
Kincaid East Boat Dock	1/30/2014	30.5	±	78.6
Kincaid East Boat Dock	7/23/2014	-58.4	±	81.4
Kincaid East Boat Dock	10/29/2014	96.3	±	83.2
Kincaid West Boat Ramp	10/29/2014	103	±	83.4

Tables H-2. Trending Graphs for Water from the Background Reference Area
(Highest results on graphs indicate percentage of US EPA Drinking Water Standard)



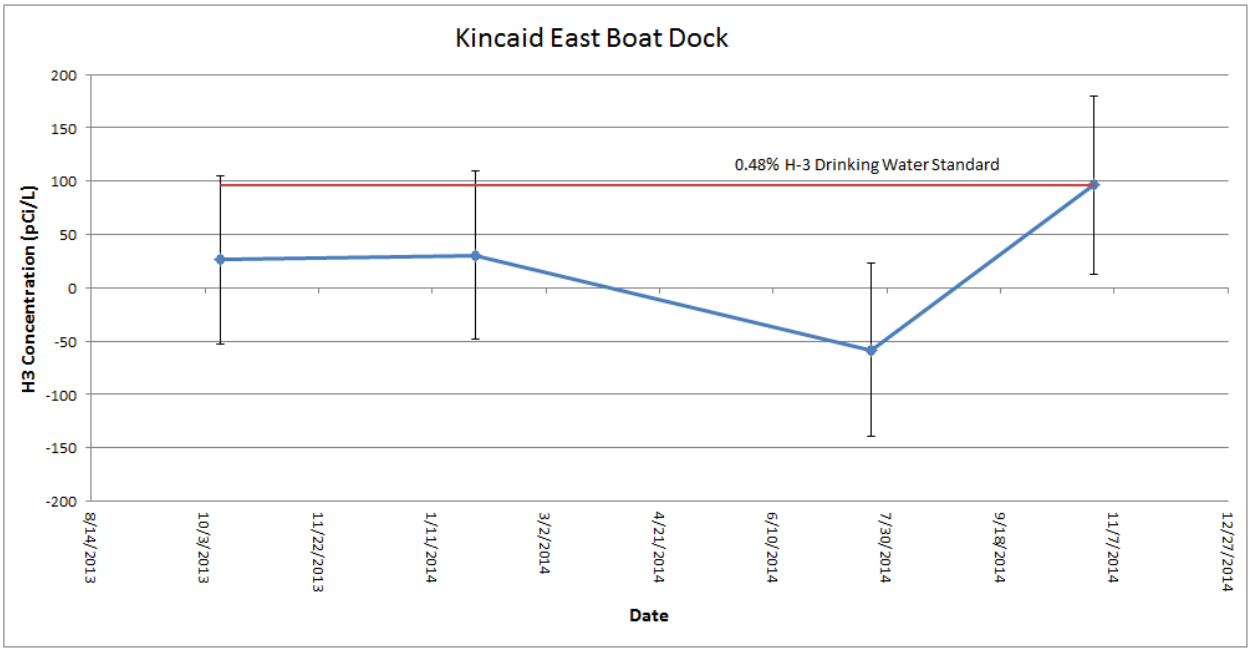


Table H-2. Sample Results for Alpha/Beta Screening of Water from the Background Reference Area
Results are in picocuries per liter (pCi/L)

Location / Date	Alpha Result	Alpha Error	Beta Result	Beta Error
Kincaid East Boat Dock				
1/30/2014	2.7 ±	1.8	6.7 ±	2.7
7/23/2014	-0.2 ±	1.3	6.1 ±	2.7
10/29/2014	1.0 ±	1.5	5.3 ±	2.6
Kincaid Strawkaws Boat Ramp				
1/30/2014	1.8 ±	1.7	5.9 ±	2.7
7/23/2014	0.1 ±	1.4	6.1 ±	2.7
10/29/2014	-0.1 ±	1.5	4.8 ±	2.6
Kincaid West Boat Ramp				
10/29/2014	0.5 ±	1.5	2.0 ±	2.5

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			Be-7			Co-58			Co-60			Cs-134			Cs-137			Fe-59		
Date	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
Kincaid East Boat Dock																					
1/30/2014	7.3	±	8.2	-2.3	±	8.6	0.9	±	1.1	2.5	±	0.9	-0.9	±	1.1	1.2	±	0.8	1.9	±	2.2
7/23/2014	-6.7	±	31.3	10.1	±	12.0	-2.4	±	1.5	0.9	±	1.0	2.2	±	1.0	-1.4	±	1.1	-1.6	±	3.7
10/29/2014	10.3	±	15.6	3.7	±	16.3	0.4	±	2.2	-0.7	±	1.9	-0.6	±	1.9	-0.2	±	1.6	2.4	±	4.2
Kincaid Strawkaws Boat Ramp																					
1/30/2014	12.2	±	7.7	-7.2	±	9.4	-2.5	±	1.3	0.6	±	1.5	-1.3	±	1.3	0.9	±	1.0	-1.7	±	3.2
7/23/2014	28.3	±	30.0	-0.9	±	12.7	0.0	±	1.3	-3.0	±	1.3	-1.1	±	1.1	-0.4	±	1.1	0.1	±	3.6
10/29/2014	0.7	±	9.9	-2.3	±	9.6	1.3	±	1.2	1.0	±	1.0	-0.8	±	1.1	0.0	±	0.9	-2.7	±	2.5
Kincaid West Boat Ramp																					
10/29/2014	5.1	±	11.0	22.5	±	10.3	1.6	±	1.2	-0.8	±	1.2	-0.7	±	1.3	-0.8	±	1.1	2.3	±	2.8

Location	I-131			K-40			Mn-54			Nb-95			Zn-65			Zr-95		
Date	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
Kincaid East Boat Dock																		
1/30/2014	3.0	±	4.8	31.9	±	10.9	-1.1	±	1.0	-1.5	±	1.3	1.2	±	2.0	3.1	±	1.9
7/23/2014	11.5	±	37.1	28.2	±	10.2	-0.4	±	1.0	-2.4	±	2.3	0.2	±	2.3	6.0	±	2.5
10/29/2014	2.4	±	9.3	4.2	±	21.4	-0.2	±	1.9	0.9	±	2.2	-0.3	±	3.6	-0.1	±	3.4
Kincaid Strawkaws Boat Ramp																		
1/30/2014	-2.2	±	2.7	29.0	±	15.0	1.1	±	1.1	0.2	±	1.5	0.6	±	3.1	4.1	±	2.2
7/23/2014	14.8	±	33.9	10.1	±	12.2	-0.9	±	1.1	1.3	±	2.2	0.0	±	2.2	5.4	±	2.6
10/29/2014	-3.4	±	5.3	52.6	±	14.2	1.2	±	1.1	1.4	±	1.4	-3.7	±	2.4	1.5	±	2.1
Kincaid West Boat Ramp																		
10/29/2014	3.9	±	5.9	-12.3	±	18.0	-0.2	±	1.3	-2.6	±	1.5	-1.5	±	2.7	-1.4	±	2.2

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

Location	Date	Nuclide	Result		Error
Kincaid East Boat Dock	7/23/2014	Ac-228	1.1	±	0.0
Kincaid East Boat Dock	7/23/2014	Ba-140	-0.3	±	0.2
Kincaid East Boat Dock	7/23/2014	Be-7	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Bi-212	1.0	±	0.1
Kincaid East Boat Dock	7/23/2014	Bi-214	1.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Co-58	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Co-60	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Cs-134	0.1	±	0.0
Kincaid East Boat Dock	7/23/2014	Cs-137	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Fe-59	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	K-40	16.3	±	0.3
Kincaid East Boat Dock	7/23/2014	Mn-54	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	NB-95	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Pa-234m	0.8	±	0.4
Kincaid East Boat Dock	7/23/2014	Pb-210	1.5	±	0.1
Kincaid East Boat Dock	7/23/2014	Pb-211	0.0	±	0.1
Kincaid East Boat Dock	7/23/2014	Pb-212	1.1	±	0.0
Kincaid East Boat Dock	7/23/2014	Pb-214	1.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Ra-226	2.2	±	0.1
Kincaid East Boat Dock	7/23/2014	Th-234	1.0	±	0.2
Kincaid East Boat Dock	7/23/2014	Tl-208	1.0	±	0.0
Kincaid East Boat Dock	7/23/2014	U-235	0.1	±	0.0
Kincaid East Boat Dock	7/23/2014	ZN-65	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	ZR-95	0.0	±	0.0

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

Location / Date	Ac-228 Result	Ac-228 Error	Ba-140 Result	Ba-140 Error	Bi-212 Result	Bi-212 Error	Bi-214 Result	Bi-214 Error	Co-57 Result	Co-57 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error
Kincaid East Boat Dock																								
10/29/2014	0.7	0.1	0.0	0.1	0.8	0.2	0.6	0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.3	0.8	0.0	0.0
Kincaid West Boat Ramp																								
10/29/2014	0.7	0.0	0.0	0.0	0.6	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.0	0.2	0.0	0.0

Location / Date	Nb-95 Result	Nb-95 Error	Pa-234m Result	Pa-234m Error	Pb-210 Result	Pb-210 Error	Pb-212 Result	Pb-212 Error	Pb-214 Result	Pb-214 Error	Th-228 Result	Th-228 Error	Th-234 Result	Th-234 Error	Tl-208 Result	Tl-208 Error	U-235 Result	U-235 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Kincaid East Boat Dock																						
10/29/2014	0.0	0.0	2.0	1.6	1.0	0.2	0.7	0.1	0.7	0.0			0.6	0.3	0.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Kincaid West Boat Ramp																						
10/29/2014	0.0	0.0	1.2	0.3	1.2	0.1	0.7	0.0	0.7	0.0	0.9	0.3	0.6	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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

Location / Date	Ba-140 Result	Ba-140 Errorr	Be-7 Result	Be-7 Error	Co-58 Result	Co-58 Error	Co-60 Result	Co-60 Error	Cs-134 Result	Cs-134 Error	Cs-137 Result	Cs-137 Error	Fe-59 Result	Fe-59 Error
Kincaid Sangchris Lake Bottom Feeder														
10/10/2014	66.7	113.0	87.1	62.9	10.2	6.5	6.0	7.3	9.8	6.1	-3.9	5.8	-21.2	19.7
Kincaid Sangchris Lake Top Feeder														
10/10/2014	-36.5	103.0	90.7	54.0	11.0	6.9	-2.4	6.5	-8.2	6.6	-5.9	5.0	-35.6	17.6

Location / Date	I-131 Result	I-131 Error	K-40 Result	K-40 Error	Mn-54 Result	Mn-54 Error	Nb-95 Result	Nb-95 Error	Zn-65 Result	Zn-65 Error	Zr-95 Result	Zr-95 Error
Kincaid Sangchris Lake Bottom Feeder												
10/10/2014	24.6	91.4	3560.0	159.0	1.8	6.6	-2.8	9.8	10.9	14.1	1.0	12.6
Kincaid Sangchris Lake Top Feeder												
10/10/2014	153.0	87.8	3930.0	149.0	13.3	5.7	21.0	10.8	-4.8	13.1	11.0	13.0

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

Location	Date	Nuclide	Result		Error
Kincaid East Boat Dock	7/23/2014	Ba-140	0.6	±	1.0
Kincaid East Boat Dock	7/23/2014	Be-7	3.5	±	0.5
Kincaid East Boat Dock	7/23/2014	Co-58	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Co-60	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Cs-134	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Cs-137	0.1	±	0.0
Kincaid East Boat Dock	7/23/2014	Fe-59	0.1	±	0.1
Kincaid East Boat Dock	7/23/2014	I-131	-0.1	±	1.1
Kincaid East Boat Dock	7/23/2014	K-40	16.5	±	0.8
Kincaid East Boat Dock	7/23/2014	Mn-54	0.0	±	0.0
Kincaid East Boat Dock	7/23/2014	Nb-95	0.1	±	0.1
Kincaid East Boat Dock	7/23/2014	Zn-65	0.0	±	0.1
Kincaid East Boat Dock	7/23/2014	Zr-95	-0.1	±	0.1

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		Error	Result		Error
Springfield Background - Knotts St.						
1/6/2014	3.1	±	1.0	35.4	±	2.6
1/13/2014	2.1	±	0.9	26.3	±	2.4
1/21/2014	2.2	±	0.8	28.1	±	2.1
1/27/2014	1.4	±	0.8	14.9	±	1.9
2/3/2014	1.2	±	0.8	23.0	±	2.3
2/10/2014	0.8	±	0.7	27.1	±	2.0
2/18/2014	1.6	±	0.7	38.1	±	2.2
2/24/2014	2.1	±	0.9	16.5	±	1.9
3/3/2014	1.5	±	0.7	32.2	±	2.2
3/10/2014	0.7	±	0.7	22.1	±	2.0
3/17/2014	1.0	±	0.6	17.0	±	1.7
3/24/2014	3.5	±	0.9	17.0	±	1.7
3/31/2014	1.6	±	0.8	26.1	±	2.5
4/7/2014	0.5	±	0.6	19.4	±	2.1
4/14/2014	3.6	±	0.9	17.5	±	1.8
4/21/2014	4.0	±	1.0	33.0	±	2.6
4/28/2014	0.7	±	0.7	21.3	±	2.2
5/5/2014	0.4	±	0.6	8.1	±	1.8
5/12/2014	0.7	±	0.7	22.8	±	2.3
5/19/2014	1.1	±	0.7	14.2	±	2.0
5/27/2014	1.8	±	0.7	20.5	±	2.1
6/2/2014	0.6	±	0.8	24.2	±	2.7
6/9/2014	1.3	±	0.7	21.9	±	1.9
6/16/2014	0.8	±	0.7	14.7	±	1.7
6/23/2014	3.8	±	0.9	19.3	±	1.8
6/30/2014	4.3	±	1.0	20.4	±	2.3

Location	Alpha			Beta		
Date	Result		Error	Result		Error
Springfield Background - Knotts St.						
7/7/2014	0.9	±	0.8	22.0	±	2.3
7/14/2014	1.5	±	0.7	19.4	±	1.8
7/21/2014	2.0	±	0.7	20.7	±	1.8
7/28/2014	4.5	±	3.1	44.6	±	7.3
8/4/2014	4.1	±	1.0	31.2	±	2.6
8/11/2014	5.6	±	1.1	45.6	±	3.0
8/18/2014	4.3	±	1.0	30.4	±	2.6
8/26/2014	4.8	±	1.0	37.0	±	2.5
9/2/2014	2.8	±	0.8	24.7	±	2.2
9/8/2014	2.5	±	0.9	22.8	±	2.6
9/15/2014	2.3	±	0.8	19.7	±	2.3
9/22/2014	3.8	±	1.0	42.6	±	2.9
9/29/2014	3.0	±	0.9	41.5	±	2.8
10/6/2014	3.5	±	0.9	27.6	±	2.5
10/14/2014	2.1	±	0.7	21.6	±	2.1
10/20/2014	1.4	±	0.7	11.3	±	1.7
10/27/2014	2.5	±	0.8	33.1	±	2.6
11/3/2014	2.0	±	0.8	20.9	±	2.3
11/10/2014	1.2	±	0.7	24.1	±	2.4
11/17/2014	1.2	±	0.7	26.8	±	2.5
11/24/2014	1.7	±	0.4	29.2	±	1.4
12/1/2014	1.4	±	0.7	41.9	±	2.8
12/8/2014	2.1	±	0.9	46.0	±	3.0
12/15/2014	3.5	±	1.0	48.4	±	3.1
12/22/2014	2.4	±	0.8	34.9	±	2.6
12/29/2014	1.4	±	0.8	26.0	±	2.5

Table H-9. Gamma Spectroscopy Sample Results for Other Radionuclides in Air from the Background Reference Area
Results are in picocuries per liter (pCi/L)

Location	Ba-140		Be-7		Co-58		Co-60		Cs-134		Cs-137		Fe-59		I-131	
Date	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Springfield Background - Knotts St.																
1/6/2014			-12.6	93.9							8.0	16.1			12.8	13.9
1/13/2014			-323.0	374.0							23.2	35.3			1.4	57.4
1/21/2014			-112.0	154.0							-52.6	25.9			-21.1	23.0
1/27/2014			85.0	96.0							-13.0	22.0			-6.0	17.0
2/3/2014			93.6	114.0							9.8	17.3			-20.9	14.1
2/10/2014			-43.9	88.7							6.5	13.5			13.5	14.0
2/18/2014			60.1	108.0							6.7	16.7			-32.0	20.8
2/24/2014			77.7	126.0							6.9	18.3			-7.6	22.6
3/3/2014			60.0	100.0							12.0	13.0			-4.0	14.0
3/10/2014			30.0	110.0							7.0	18.0			13.0	15.0
3/17/2014			-10.0	120.0							-9.0	16.0			14.0	18.0
3/24/2014			62.0	90.0							-66.0	33.0			-13.0	14.0
3/31/2014			140.0	110.0							-5.0	17.0			8.0	20.0
4/7/2014			-190.0	110.0							32.0	14.0			0.0	15.0
4/14/2014			-93.0	80.0							16.0	18.0			-11.0	15.0
4/21/2014			-19.0	88.0							-8.0	15.0			12.0	16.0
4/25/2014	225.0	477.0	40.2	8.6	0.3	0.6	0.1	0.2	0.0	0.2	-0.1	0.2	3.4	2.4	3850.0	6460.0
4/28/2014			50.0	110.0							-7.0	15.0			-4.0	18.0
5/2/2014	-151.0	791.0	8.2	4.0	-0.5	1.5	-0.2	0.6	-0.2	0.5	-0.2	0.5	-0.1	5.3	-366.0	8190.0
5/5/2014			60.0	100.0							-6.0	16.0			-15.0	13.0
5/12/2014	27.7	92.6	-100.7	144.4	0.0	0.3	-0.3	0.2	0.0	0.1	2.1	19.1	-1.0	1.3	-467.0	593.0
5/19/2014			50.0	130.0							16.0	16.0			-7.0	22.0
5/27/2014			41.0	88.0							-15.0	15.0			-33.0	15.0
6/2/2014	-12.8	43.7	98.6	124.0	0.2	0.3	-0.3	0.2	0.2	0.2	-2.2	15.1	1.5	0.9	217.0	204.0
6/9/2014	9.0	20.6	-75.2	163.2	0.2	0.2	0.2	0.2	-0.2	0.1	-6.0	19.1	0.0	0.9	45.6	78.5
6/16/2014	20.1	19.8	-141.7	136.0	-0.2	0.3	0.1	0.1	0.3	0.2	8.5	10.9	-2.1	0.9	-24.7	67.1
6/23/2014			10.0	120.0							2.0	11.0			28.0	14.0
6/30/2014	6.5	35.4	122.8	153.4	-0.8	0.9	-0.1	0.5	0.2	0.5	3.9	20.6	-2.1	2.4	-28.7	84.0
7/7/2014	4.1	9.0	96.8	84.6	-0.1	0.3	0.0	0.2	0.0	0.2	31.3	13.6	-0.2	0.8	-24.3	28.1
7/14/2014			37.6	100.0							-7.2	16.3			-16.0	14.1
7/21/2014	-1.3	94.5	-205.2	171.4	0.2	0.2	0.0	0.1	0.0	0.1	-2.7	13.1	-0.6	0.8	-338.3	922.8
7/28/2014	0.9	1.6	-344.9	152.3	0.0	0.2	0.1	0.1	0.0	0.2	18.4	22.9	0.2	0.3	15.4	21.6
8/4/2014	1.5	6.1	-16.4	105.8	0.7	0.6	0.0	0.5	0.2	0.4	-24.2	17.2	1.1	1.3	-36.9	25.7
8/11/2014	184.0	114.0	1120.0	385.5	3.5	5.6	14.4	4.0	7.9	4.4	-2.0	51.5	17.5	13.2	-189.9	161.0
8/18/2014			-468.0	398.0							-53.9	48.1			-25.3	62.6
8/25/2014	3.1	1.7	36.4	2.3	0.2	0.2	-0.1	0.1	-0.1	0.2	0.0	0.1	-0.5	0.4	0.3	1.1
8/26/2014			94.7	82.9							5.4	13.0			6.0	20.0
9/1/2014	0.5	0.9	39.7	1.7	0.2	0.1	-0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.3	-0.2	0.4

Location	Ba-140			Be-7			Co-58			Co-60			Cs-134			Cs-137			Fe-59			I-131		
Date	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
9/2/2014		±		-126.0	±	102.0		±			±			±		22.9	±	14.3		±		-14.5	±	11.9
9/8/2014		±		-286.0	±	283.0		±			±			±		-32.6	±	31.9		±		-24.7	±	31.8
9/15/2014	0.0	±	6.0	40.1	±	312.2	0.1	±	0.2	-0.1	±	0.1	0.1	±	0.1	-11.4	±	48.2	0.7	±	0.5	56.5	±	65.0
9/22/2014		±		-104.0	±	360.0		±			±			±		-36.3	±	51.0		±		-16.2	±	63.3
9/28/2014	1.0	±	5.8	36.4	±	3.3	-0.2	±	0.2	0.1	±	0.2	0.0	±	0.2	-0.2	±	0.2	0.6	±	0.6	-7.2	±	5.7
9/29/2014		±		290.0	±	200.0		±			±			±		-24.0	±	29.0		±		24.0	±	33.0
10/13/2014	-0.8	±	3.6	46.8	±	2.2	-0.1	±	0.1	-0.1	±	0.1	-0.1	±	0.1	0.0	±	0.1	-0.2	±	0.4	-3.9	±	3.3
10/14/2014		±		-30.2	±	311.0		±			±			±		29.2	±	38.7		±		-13.1	±	46.1
10/20/2014		±		72.8	±	53.8		±			±			±		12.8	±	8.3		±		-12.8	±	8.5
10/27/2014	-1.0	±	2.7	51.2	±	365.6	-0.3	±	0.2	0.1	±	0.2	0.3	±	0.2	-5.5	±	46.7	0.3	±	0.5	-18.8	±	71.0
11/3/2014		±		-401.0	±	378.0		±			±			±		-16.2	±	47.7		±		-26.3	±	57.7
11/10/2014		±		-42.6	±	46.1		±			±			±		-6.3	±	7.8		±		-1.1	±	6.6
11/17/2014	-0.1	±	2.0	41.8	±	46.7	0.3	±	0.2	0.1	±	0.2	0.1	±	0.1	-12.2	±	7.2	-0.2	±	0.4	-12.0	±	8.3
11/24/2014	0.1	±	1.3	111.0	±	2.9	-0.2	±	0.2	0.1	±	0.1	-0.1	±	0.1	0.1	±	0.1	-0.4	±	0.4	-0.1	±	0.7
12/1/2014	0.2	±	0.8	49.6	±	48.3	-0.1	±	0.1	0.2	±	0.1	0.2	±	0.1	9.1	±	7.5	0.1	±	0.3	4.3	±	8.6
12/8/2014	1.1	±	1.2	118.0	±	56.7	-0.1	±	0.2	-0.4	±	0.2	0.1	±	0.1	1.6	±	7.2	0.3	±	0.3	-5.4	±	7.7
12/15/2014	-1.0	±	0.6	106.4	±	50.2	0.1	±	0.1	0.1	±	0.1	0.0	±	0.1	-0.8	±	7.4	0.1	±	0.3	3.1	±	6.4
12/22/2014	0.9	±	3.1	-13.9	±	53.7	0.2	±	0.3	0.0	±	0.2	-0.2	±	0.3	-5.7	±	9.2	-0.9	±	0.7	-10.0	±	8.6
12/29/2014	-3.3	±	2.2	63.6	±	324.0	0.5	±	0.3	0.4	±	0.2	-0.2	±	0.3	-57.2	±	44.2	-0.4	±	0.6	-4.6	±	53.2

Missing results in the Gamma Spectroscopy Results Table H-9 are due to differing gamma spectroscopy libraries at separate IEMA Laboratory locations. Throughout the year, the Springfield air cartridges are analyzed by the IEMA Laboratory Staff in Springfield, using equipment in the permanent Laboratory facilities, or using the IEMA Mobile Laboratory stationed in Springfield. The analysis libraries for the equipment in the mobile lab and the stationary lab did not include the same radionuclides.

Table H-9 (Continued). Gamma Spectroscopy Sample Results for Other Radionuclides in Air from the Background Reference Area

Results are in picocuries per liter (pCi/L)

Location	K-40		Mn-54		Nb-95		Te-132		Xe-131m		Zn-65		Zr-95	
Date	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error	Result	Error
Springfield Background - Knotts St.														
1/6/2014	1500.0 ±	281.0	±		±		15.2 ±	21.2	87.2 ±	399.0	±		±	
1/13/2014	1100.0 ±	689.0	±		±		±		213.0 ±	1230.0	±		±	
1/21/2014	985.0 ±	301.0	±		±		-17.5 ±	25.9	340.0 ±	655.0	±		±	
1/27/2014	1470.0 ±	300.0	±		±		42.0 ±	26.0	-820.0 ±	440.0	±		±	
2/3/2014	939.0 ±	222.0	±		±		-3.0 ±	16.5	619.0 ±	451.0	±		±	
2/10/2014	1110.0 ±	306.0	±		±		-41.7 ±	18.5	-264.0 ±	420.0	±		±	
2/18/2014	655.0 ±	225.0	±		±		-16.7 ±	21.2	-253.0 ±	465.0	±		±	
2/24/2014	1150.0 ±	341.0	±		±		-26.5 ±	33.2	27.2 ±	636.0	±		±	
3/3/2014	790.0 ±	260.0	±		±		6.0 ±	17.0	-620.0 ±	440.0	±		±	
3/10/2014	580.0 ±	350.0	±		±		-10.0 ±	20.0	950.0 ±	480.0	±		±	
3/17/2014	650.0 ±	230.0	±		±		12.0 ±	18.0	550.0 ±	380.0	±		±	
3/24/2014	1410.0 ±	270.0	±		±		-17.0 ±	21.0	70.0 ±	340.0	±		±	
3/31/2014	1040.0 ±	280.0	±		±		-10.0 ±	16.0	-420.0 ±	440.0	±		±	
4/7/2014	1100.0 ±	260.0	±		±		-10.0 ±	20.0	-330.0 ±	320.0	±		±	
4/14/2014	1320.0 ±	290.0	±		±		19.0 ±	17.0	-110.0 ±	310.0	±		±	
4/21/2014	840.0 ±	270.0	±		±		-13.0 ±	22.0	-30.0 ±	370.0	±		±	
4/25/2014	-2.8 ±	2.8	0.0 ±	0.3	-1.3 ±	1.9	±		±		-0.1 ±	0.6	-1.0 ±	1.0
4/28/2014	1120.0 ±	280.0	±		±		0.0 ±	24.0	80.0 ±	500.0	±		±	
5/2/2014	1.7 ±	6.1	-0.2 ±	0.7	-0.8 ±	4.1	±		±		1.4 ±	1.5	3.0 ±	2.5
5/5/2014	1160.0 ±	290.0	±		±		-8.0 ±	18.0	640.0 ±	390.0	±		±	
5/12/2014	921.2 ±	261.6	-0.2 ±	0.1	0.5 ±	0.9	-32.0 ±	23.0	410.0 ±	480.0	0.1 ±	0.4	0.6 ±	0.6
5/19/2014	1460.0 ±	320.0	±		±		-12.0 ±	21.0	-20.0 ±	500.0	±		±	
5/27/2014	1720.0 ±	280.0	±		±		-12.0 ±	17.0	980.0 ±	340.0	±		±	
6/2/2014	1010.4 ±	252.1	0.0 ±	0.2	0.2 ±	0.7	3.0 ±	30.0	400.0 ±	510.0	0.1 ±	0.4	0.2 ±	0.6
6/9/2014	1113.7 ±	231.8	0.1 ±	0.1	0.9 ±	0.5	-30.0 ±	20.0	60.0 ±	470.0	-1.0 ±	0.4	0.3 ±	0.4
6/16/2014	883.7 ±	272.1	0.1 ±	0.2	-0.6 ±	0.6	-1.4 ±	17.5	-273.0 ±	446.0	0.6 ±	0.3	-1.0 ±	0.5
6/23/2014	1060.0 ±	290.0	±		±		1.0 ±	23.0	-750.0 ±	500.0	±		±	
6/30/2014	1099.9 ±	320.1	-0.6 ±	0.6	1.0 ±	1.3	1.5 ±	25.4	635.0 ±	475.0	0.3 ±	1.2	0.3 ±	1.3
7/7/2014	1280.4 ±	407.8	-0.1 ±	0.2	0.6 ±	0.5	7.6 ±	15.2	-521.0 ±	315.0	-0.6 ±	0.5	0.7 ±	0.5
7/14/2014	1340.0 ±	276.0	±		±		7.2 ±	19.1	-155.0 ±	330.0	±		±	
7/21/2014	738.2 ±	310.8	-0.1 ±	0.1	0.6 ±	0.6	-5.8 ±	19.4	-98.6 ±	213.0	-0.4 ±	0.2	-0.2 ±	0.4
7/28/2014	4078.3 ±	546.9	-0.2 ±	0.2	0.0 ±	0.2	-31.6 ±	28.5	-207.0 ±	536.0	0.0 ±	0.3	-0.3 ±	0.3
8/4/2014	1067.7 ±	265.8	0.2 ±	0.5	-0.5 ±	0.7	49.6 ±	27.7	7.2 ±	403.0	0.0 ±	1.1	0.9 ±	1.0
8/11/2014	840.0 ±	659.7	-4.5 ±	4.9	11.0 ±	7.6	±		-503.0 ±	1190.0	-5.0 ±	11.1	-12.5 ±	10.2
8/18/2014	800.0 ±	686.0	±		±		±		339.0 ±	1370.0	±		±	
8/25/2014	5.2 ±	2.3	-0.1 ±	0.1	0.2 ±	0.2	±		±		-0.3 ±	0.3	0.3 ±	0.3
8/26/2014	1340.0 ±	277.0	±		±		2.4 ±	29.2	432.0 ±	388.0	±		±	
9/1/2014	2.1 ±	1.5	0.0 ±	0.1	0.2 ±	0.2	±		±		-0.1 ±	0.3	0.0 ±	0.2

Location	K-40			Mn-54			Nb-95			Te-132			Xe-131m			Zn-65			Zr-95		
Date	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error	Result		Error
9/2/2014	715.0	±	253.0		±			±		-15.5	±	12.7	235.0	±	200.0		±			±	
9/8/2014	2000.0	±	547.0		±			±		26.7	±	38.1	-1130.0	±	801.0		±			±	
9/15/2014	634.3	±	508.9	-0.1	±	0.1	0.0	±	0.3		±		732.0	±	1320.0	-0.1	±	0.3	0.2	±	0.3
9/22/2014	1090.0	±	543.0		±			±			±		-169.0	±	1370.0		±			±	
9/28/2014	0.6	±	3.0	-0.2	±	0.2	0.2	±	0.4		±			±		0.1	±	0.5	-0.4	±	0.4
9/29/2014	1270.0	±	370.0		±			±		5.0	±	25.0	460.0	±	630.0		±			±	
10/13/2014	1.9	±	2.0	0.0	±	0.1	-0.1	±	0.2		±			±		-0.2	±	0.3	-0.1	±	0.3
10/14/2014	1100.0	±	594.0		±			±			±		808.0	±	1080.0		±			±	
10/20/2014	1300.0	±	166.0		±			±		8.6	±	11.1	-270.0	±	252.0		±			±	
10/27/2014	1241.3	±	661.7	0.3	±	0.2	0.0	±	0.3		±		-1.5	±	1380.0	0.2	±	0.5	0.4	±	0.4
11/3/2014	1030.0	±	672.0		±			±			±		-126.0	±	1370.0		±			±	
11/10/2014	424.0	±	158.0		±			±		-0.4	±	6.8	-29.8	±	118.0		±			±	
11/17/2014	790.1	±	136.7	0.1	±	0.1	0.2	±	0.2	-4.4	±	8.8	-302.0	±	214.0	0.1	±	0.3	0.0	±	0.3
11/24/2014	3.0	±	1.7	-0.1	±	0.1	-0.3	±	0.2		±			±		-0.3	±	0.4	0.1	±	0.3
12/1/2014	940.9	±	141.7	-0.2	±	0.1	-0.3	±	0.2	-16.0	±	13.0	280.0	±	230.0	0.2	±	0.3	-0.4	±	0.2
12/8/2014	782.7	±	161.7	-0.1	±	0.2	-0.2	±	0.2	12.8	±	9.6	20.0	±	120.0	0.4	±	0.3	0.1	±	0.3
12/15/2014	551.4	±	161.7	-0.1	±	0.1	0.1	±	0.1	2.0	±	7.0	-60.0	±	120.0	-0.4	±	0.3	0.1	±	0.2
12/22/2014	677.2	±	152.6	0.2	±	0.2	0.2	±	0.4	-6.7	±	7.0	40.0	±	110.0	0.0	±	0.5	0.4	±	0.5
12/29/2014	990.7	±	562.9	-0.1	±	0.2	0.2	±	0.3		±		900.0	±	1100.0	0.5	±	0.5	-0.6	±	0.5

Missing results in the Gamma Spectroscopy Results Table H-9 are due to differing gamma spectroscopy libraries at separate IEMA Laboratory locations. Throughout the year, the Springfield air cartridges are analyzed by the IEMA Laboratory Staff in Springfield, using equipment in the permanent Laboratory facilities, or using the IEMA Mobile Laboratory stationed in Springfield. The analysis libraries for the equipment in the mobile lab and the stationary lab did not include the same radionuclides.

Table H-10. Summary of Ambient Gamma Results for Background Reference Area

Location	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Quarter 1 mrem/day	Annual Dose mrem/year
KC-01	0.09	0.10	0.11	0.12	38.51
KC-02	0.12	0.11	0.12		42.46
KC-03		0.09			31.76
KC-04	0.10	0.11	0.11	0.13	41.25
KC-05	0.12	0.11	0.12	0.14	44.07
KC-06	0.08	0.09	0.10	0.11	33.76
KC-07	0.09	0.11	0.11	0.11	38.33
KC-08	0.11	0.11	0.11	0.11	39.51
KC-09	0.10	0.09	0.11	0.12	39.06
KC-10	0.11	0.11	0.12		40.15
KC-11	0.12	0.13	0.12	0.14	46.36
KC-12	0.11	0.10	0.11	0.14	41.25
KC-13	0.11	0.10	0.12		38.81
KC-14	0.10	0.12	0.11	0.12	41.25
KC-15	0.11	0.09	0.12	0.14	41.79

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

Appendix I
Radionuclide Abbreviations in this Report

Radionuclide Abbreviations

Ac-228	Actinium-228
Ba-140	Barium-140
Be-7	Beryllium-7
Bi-212	Bismuth-212
Bi-214	Bismuth-214
Co-58	Cobalt-58
Co-60	Cobalt-60
Cs-134	Cesium-134
Cs-137	Cesium-137
Fe-59	Iron-59
H-3	Hydrogen-3 (Tritium)
I-131	Iodine-131
K-40	Potassium-40
Mn-54	Manganese-54
Nb-95	Niobium-95
Pa-234m	Protactinium-234m
Pb-210	Lead-210
Pb-212	Lead-212
Pb-214	Lead-214
Ra-226	Radium-226
Te-132	Tellurium-132
Th-234	Thorium-234
Tl-208	Thallium-208
U-235	Uranium-235
Xe-131m	Xenon-131m
Zn-65	Zinc-65
Zr-95	Zirconium-95