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May 10, 2016
GO2-16-073
DIC 1316.11

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Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**
INDEPENDENT SPENT FUEL STORAGE INSTALLATION, DOCKET NO. 72-35
2015 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

References:
1. Columbia Generating Station Technical Specification 5.6.1
2. Independent Spent Fuel Storage Installation Technical Specification 5.4.c
3. EFSEC Resolution No. 332, February 21, 2012

Dear Sir or Madam:

In accordance with the requirements of References 1-3, the subject report is submitted as an enclosure to this letter. If you have questions regarding this information, please contact KL Kunzweiler at (509) 377-4358.

Respectfully,

WG Hettel
Vice President, Operations

Enclosure

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COLUMBIA GENERATING STATION

2015 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR THE COLUMBIA GENERATING STATION

ENERGY NORTHWEST
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COLUMBIA GENERATING STATION

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

2015 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

For Calendar Year 2015

Preparation Date: April 2016

Submitted Date: May 2016

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1.0 EXECUTIVE SUMMARY

1.0 EXECUTIVE SUMMARY

The primary purpose of the Energy Northwest Radiological Environmental Monitoring Program (REMP) is to evaluate the radiological impact that Columbia Generating Station (CGS) operation may have on the environment. Sampling is performed as specified in the Offsite Dose Calculation Manual (ODCM) and agreements made with the State of Washington Energy Facility Site Evaluation Council (EFSEC). Additional sampling is also performed to meet Nuclear Energy Institute (NEI) guidelines or as an Energy Northwest initiative. The program also serves to validate CGS effluent measurements and exposure pathway models and to provide a documented, historical record of CGS impact on the environment. This report serves to document and communicate the program results and findings for calendar year 2015.

A variety of environmental samples are routinely collected and analyzed by the REMP. The types of samples collected include air, water, soil, sediment, milk, fish, and garden produce. Additionally, the program continuously monitors direct radiation at numerous locations surrounding CGS. Analysis results are trended and compared to results from control locations, results obtained in previous operational and pre-operational periods, and regulatory limits.

The results contained in this report show that all identified radiological impact to the environment attributable to CGS operation was limited to areas within the CGS controlled area. All routine sample results were consistent with the results obtained from control locations, results from the preoperational period, and historical results collected since CGS began commercial operation. All activity identified within the controlled area is attributed to rain-washout (recapture) of gaseous activity exiting the plant vent system via an approved and monitored effluent pathway. All radioactive material identified outside the CGS controlled area was of natural origin or known to be present in the environment around CGS in the quantities identified. No radioactive material related to CGS operation was identified beyond the CGS controlled area. The results are consistent with and verify CGS effluent measurements and modeling of the exposure pathways. Below is a summary of the 2015 results by exposure pathway:

Direct Radiation - No impact was identified at locations beyond the CGS controlled area. Within the controlled area, the only impact identified was at locations known to be influenced by the Independent Spent Fuel Storage Installation (ISFSI) or radiation from the turbine building during operation.

Airborne - No impact due to CGS operation was identified. The radionuclide activity identified in soil samples was consistent with activity levels known to exist in Hanford area soils.

Waterborne - No impact was identified at surface/drinking water locations outside the CGS controlled area. Low level tritium activity attributed to recapture of CGS effluents was identified in storm drain water; this water was directed to lined evaporation ponds in 2015 and does not have a pathway to groundwater. Radionuclides related to CGS operation were identified at low levels in evaporation pond and cooling tower sediment. The source of this activity is attributed to recapture and concentration of CGS effluent activity. Tritium activity identified in groundwater samples was at levels historically observed and consistent with levels known to exist in Hanford groundwater. No evidence that CGS operation contributed to groundwater tritium levels was identified. Radionuclide activity identified in river sediment is consistent with activity levels known to exist in Hanford area sediment and soils.

Ingestion - No impact was identified in any of the food sample results.

2.0 DEFINITIONS

2.0 DEFINITIONS

a priori: refers to a "before the fact" limit that represent the capabilities of a measurement system and not a limit for a particular measurement.

a posteriori: refers to an "after the fact" limit determined for a particular measurement and not a limit for a measurement system.

Airborne Activity Sampling: Continuous sampling of air through the collection of particulates and radionuclides on filter media. Periodic soil samples are collected for gamma isotopic analysis to provide information on deposition to the soil from airborne releases.

Alpha Particle (α): A charged particle emitted from the nucleus of an atom having a mass and charge equal in magnitude of a helium nucleus.

Becquerel (Bq): One disintegration per second. One picocurie (pCi) equals 0.037 becquerel.

Beta Particle (β): Charged particle emitted from the nucleus of an atom with a mass and charge equal in magnitude to that of an electron.

Blank Sample: A sample of the same media as the field sample being analyzed but without any radionuclide(s) being measured. It enables correction for the inherent sample background.

CGS: Columbia Generating Station, formerly referred to as WNP-2.

CGS Controlled Area: The area within a 1.2 mile radius of the CGS reactor building and a narrow corridor extending from CGS east to the Columbia River.

CGS Protected Area: The area within the security fence surrounding CGS. Access to this area requires a security badge or escort.

Composite Sample: A series of single collected portions (aliquots) analyzed as one sample. The aliquots making up the sample are collected at time intervals that are very short compared to the composite period.

Control Station: A sampling station in a location not likely to be affected by plant effluents due to its distance and/or direction from the Columbia Generating Station.

Counting Error: An estimate of the two-sigma uncertainty associated with the sample results based on respective count times.

$$+ / - 2\sqrt{(SampleCPM/CountTime + BkgCPM/CountTime)}$$

Curie (Ci): A measure of radioactivity; equal to 3.7 x 10^{10} disintegrations per second, or 2.22 x 10^{12} disintegrations per minute.

Direct Radiation Monitoring: The measurement of radiation dose at various distances from the plant is assessed using thermoluminescent dosimeters and pressurized ionization chambers.

DOE: U.S. Department of Energy.

DOH: Washington State Department of Health.

EFSEC: Energy Facility Site Evaluation Council.

HEDP: Hanford External Dosimetry Program. Supplier of environmental TLDs for the CGS REMP

FFTF: Fast Flux Test Facility. This facility is referred to as the DOE 400 area throughout this report.

Flow Proportional Sampling: Sample collection volume or frequency determined as a function of the flow rate of the water being sampled.

Grab Sample: A single discrete sample drawn at one point in time.

IDC: Energy Northwest Industrial Development Complex, formerly referred to as the WNP-1 and WNP-4 sites.

Indicator Station: A sampling location that is likely to be affected by plant effluents due to its proximity and/or direction from the Columbia Generating Station.

Ingestion Pathway Monitoring: The ingestion pathway includes milk, fish, and garden produce. Also sampled (under special circumstances) are other media such as vegetation and animal products such as eggs and meat when additional information about particular radionuclides is needed.

ISFSI: Independent Spent Fuel Storage Installation.

Lower Limit of Detection (LLD): The smallest concentration of radioactive material in a sample that will yield a net count (above system background) that will be detected with 95% probability with a 5% probability of a false conclusion that a blank observation represents "real" signal.

Mean: The average, i.e., the sum of results divided by the number of results.

Microcurie: 3.7 x 10^4 disintegrations per second, or 2.22 x10^6 disintegrations per minute.

Milliroentgen (mR): 1/1000 Roentgen; a unit of exposure to X or gamma radiation.

MDA: Minimum Detectable Activity.

MDC: Minimum Detectable Concentration.

NEI: Nuclear Energy Institute

NIST: National Institute of Standards and Technology.

NPDES: National Pollutant Discharge Elimination System.

NRC: U.S. Nuclear Regulatory Commission.

ODCM: Offsite Dose Calculation Manual. Licensing document that contains the NRC mandated effluent and offsite radiological monitoring requirements.

Picocurie (pCi): 1 x 10^{-12} Curie or one millionth of a microcurie. 1 picocurie equal 0.037 becquerel or 2.22 disintegrations per minute

Protected Area: The fenced area immediately surrounding CGS. Access to the protected area requires a security badge or escort.

Radioiodine: Radioisotopes of iodine. For commercial nuclear reactors, iodine-131 to iodine-135 are the principle radioiodines of concern. Due to its longer half-life, iodine-131 is the most probable radioiodine identifiable in the environment.

REMP: Radiological Environmental Monitoring Program.

Range: The difference between the smallest and largest results.

Restricted Area: Any area where access is controlled for the purpose of protecting individuals from exposure to radiation or radioactive materials.

Roentgen: Unit of exposure to ionizing radiation in air.

Site Certification Agreement (SCA): The initial Columbia Generating Station licensing agreement with the State of Washington. The REMP sampling commitments in the SCA have been modified by EFSEC agreements.

Spiked Sample: A sample that has had a known quantity of radionuclide(s) added for the purposes of assessing analytical performance.

Standard Deviation: A measure of the scatter of a set of observations (or samples) around their mean value. Indicated by "σ".

Standard Error of the Mean: An estimate of the uncertainty associated with the mean of observation (or sample) averages. Also known as the standard deviation.

$$SE = \sqrt{\frac{S^2}{n}}$$

where S^2, the variance is

$$S_m^2 = \frac{1}{(n-1)} \sum^n (Xi - X)^2$$

SWTF: Sanitary Waste Treatment Facility. The sanitary waste processing facility for the Columbia Generating Station and other ENW facility near the CGS site.

TEDA: triethylene diamine. A compound used in charcoal cartridge filters to collect radioiodine.

Thermoluminescent Dosimeter (TLD): A device used to measure the amount of exposure to radiation. A crystal phosphor that stores energy proportional to the amount of exposure; the exposure level is determined by heating the crystal and reading the amount of emitted light.

3.0 INTRODUCTION

3.0 INTRODUCTION

3.1 Site Description

The Columbia Generating Station (CGS) is a 1230 MWe commercial nuclear power plant that achieved initial criticality on January 19, 1984. The plant is located in a sparsely populated shrub-steppe region within the Department of Energy (DOE) Hanford Site in southeastern Washington. The plant is approximately three miles west of the Columbia River and is surrounded on all sides by uninhabited desert land. The nearest large population centers are Richland, Pasco and Kennewick, which are 12 miles south, 18 miles southeast, and 21 miles southeast, respectively. The nearest privately owned lands are located approximately four miles east-northeast of the plant, across the Columbia River. The site has a bimodal wind pattern with winds primarily from the northwest and south. [1] The primary region of focus for REMP sampling is the farming region east of the plant.

Naturally occurring radionuclides exist in detectable quantities throughout the world and are seen in many of the samples collected for the REMP. Some examples of naturally occurring radionuclides that are frequently seen in samples are potassium-40, beryllium-7, actinium-228 (present as a decay product of radium-228), and radium-226. Additionally, some relatively long lived anthropogenic radioisotopes, such as strontium-90 and cesium-137, are also seen in some REMP samples; these radionuclides exist in measurable quantities throughout the world as a result of fallout from atmospheric nuclear weapons testing.[2, 3]

Due to the location of CGS on the Hanford Site, there are other sources of reactor produced radionuclides in close proximity to the plant. CGS is unique in the U.S. commercial nuclear power industry in this respect. Hanford related radionuclides, most notably tritium, are identified in some CGS REMP samples. Though the presence of these radionuclides in the vicinity of CGS are not necessarily reflective of CGS activity, changes in the levels of these radionuclides are monitored to assess any contribution that CGS may be making to the established background. The DOE has an active REMP program for the Hanford Site that overlaps the CGS REMP.

3.2 Program Background

The CGS REMP is designed to conform to the Nuclear Regulatory Commission (NRC) Regulatory Guide 4.1,[4] NUREG 1302,[5] and the 1979 NRC Branch Technical Position.[6] In addition, the REMP also meets the requirements of 10 CFR 72.44(d)(2)[24] for coverage of the ISFSI.

The quality assurance aspects of the sampling program and the thermoluminescent dosimetry are conducted in accordance with Regulatory Guides 4.15[7] and 4.13.[8] The REMP also adheres to the requirements of the State of Washington Energy Facility Site Evaluation Council (EFSEC),[9] CGS Technical Specifications,[10] and the CGS Offsite Dose Calculation Manual (ODCM).[11] These requirements cover the environmental sampling and sample analysis aspects of the program, and also the reporting and quality assurance requirements.

The preoperational phase of the program, which lasted from March 1978 until initial criticality in January 1984, provided a baseline of background environmental data. Variability in the background levels of radioactivity over time is due to differences in geologic composition, meteorological conditions, decay of nuclear testing fallout material in the environment, and seasonal changes. Variability in results may also have been introduced by changing analytical contractors and the use of different correction factors over the years.

The Energy Northwest Environmental Services Laboratory performed all routine REMP sampling and analyses in 2015. Thermoluminescent dosimeters (TLDs) used in the REMP were processed by the Hanford External Dosimetry Program (HEDP) operated by Mission Support Alliance (MSA).

In addition to evaluating the environmental concentrations against regulatory limits, the REMP may also compare results to state standards.[12, 13] The results may also be evaluated by comparing them to similar measurements made during the preoperational and previous operational periods and to the detection capabilities associated with the current methods of analysis.

3.3 Program Objectives

The REMP provides an independent mechanism for determining the levels of radioactivity in the plant environs in order to empirically quantify and qualify any radiological effect plant operation may be making on the environment. The program serves to ensure that any accumulation of radionuclides in the environment resulting from station operation will be identified promptly and before they become significant or exceed established limits.

While in-plant monitoring programs are used to ensure that 10 CFR 20[14] and 10 CFR 50[15] criteria for releases of radioactive effluents are met, the REMP further verifies that the measured concentrations of radioactive material and levels of radiation observed in the environment are not higher than expected based on CGS effluent measurements and modeling of the exposure pathways.

4.0 PROGRAM DESCRIPTION

4.0 PROGRAM DESCRIPTION

The ODCM contains the CGS licensing based sampling requirements for the REMP. Additional sampling requirements are specified in Resolutions or Council Orders issued by the State of Washington Energy Facility Site Evaluation Council (EFSEC). Some sampling is also performed as a CGS initiative in response to site specific or industry wide concerns. The sampling plan presented in Table 4-1 gives an overview of the REMP sampling routine, a summary of the sample locations, the specified collection frequency, and the types of analyses to be performed. The methods of sampling and sampling frequencies utilized in the program are mostly dictated by regulatory requirements. Factors such as nuclide half-lives and the major exposure pathways for the radionuclides potentially released from the plant have been taken into account in determining the sampling methodology.

4.1 Sample Locations

One hundred and eleven sampling locations (referred to as 'stations') were included in the monitoring program during 2015. More than one sample type may be collected at a sample station. One hundred and two indicator and three control stations were located within a 10-mile radius of CGS. Six additional stations were located beyond the ten mile radius of the plant, two were indicator locations and four were control locations. Sample stations are listed in Tables 4-1 and 4-2. Most station locations are shown in Figures 4-1 to 4-4.

The locations of most sample stations have been selected on the basis of an exposure pathway analysis. The exposure pathway analysis was based on factors such as weather patterns, anticipated emissions, likely receptors, and land use in the surrounding areas. Samples collected from stations located in areas that potentially could be influenced by CGS operation are used as indicators. Samples collected from locations that are not likely to be influenced by CGS operation serve as controls. Results from indicator stations are compared to the results from control stations and results obtained during the previous operational and preoperational years of the program in order to assess the impact CGS operation may be having on the environment.

4.2 Independent Spent Fuel Storage Installation (ISFSI)

The Independent Spent Fuel Storage Installation (ISFSI) is a fenced, secured area constructed to provide a storage location for spent nuclear fuel. The spent fuel is stored in HI-STORM dry storage casks which are placed on concrete pads inside the facility. The pads are 30-feet wide by 135-feet long and each pad can hold up to 18 casks. The ISFSI is located approximately 500 meters north-northwest of the reactor building. Three security fences surround the ISFSI facility.

Direct radiation monitoring of the ISFSI is performed using TLDs placed at 10 different locations on the second of three security fences that surround the facility. The TLDs are exchanged quarterly. In addition, two other TLD stations, Station 121 located approximately 200 meters north of the turbine building and Station 122 located approximately 100 meters north of the ISFSI, were installed to monitor ISFSI direct radiation. Figure 4-1 shows the ISFSI location in relation to CGS and the position of the 2 additional TLD locations. Figure 4-4 shows the location of the 10 TLD stations located around the ISFSI. This arrangement of TLDs in conjunction with the radiological surveys conducted by the CGS Radiation Protection Department serve as the radiological monitoring program for the ISFSI.

4.3 Land Use Census

A land use census covering the areas within a five mile radius of CGS is performed annually. The objective of the land use census is to identify the locations of the nearest milk animal, residence, and garden greater than 500 ft^2 producing broadleaf vegetation. This information is used to determine whether any site located during the census has a calculated dose or dose commitment greater than the sites currently monitored for the same exposure pathway. If a new location with a higher dose commitment was found, routine sampling of that dose pathway would be initiated at that new site. The results of the 2015 five miles land use census are presented in Table 4-3.

4.4 Sampling Methods

Energy Northwest personnel collect environmental samples in accordance with the program plan outlined in Table 4-1. Methods of sample collection and TLD handling are specified in REMP specific procedures. All routine REMP samples collected in 2015 were prepared for analysis at the Energy Northwest Environmental Services Laboratory located in Richland, WA. A general overview of the sampling methods used in the REMP are given below. Generic descriptions of the REMP sample analysis methods are given in section 4.6.

4.4.1 Direct Radiation

Direct radiation dose levels are monitored with Harshaw Model 8807 thermoluminescent dosimeters (TLDs). The TLDs are placed in the field between three and five feet above the ground. TLDs are wrapped in aluminum foil and sealed in plastic bags to prevent damage. TLDs are exchanged on a quarterly basis.

The locations of the TLD stations are listed in Table 4-2 and are shown in Figures 4-1 through 4-4. Station 9A near Sunnyside, WA serves as the environmental TLD control location. Station 119C serves as the control for Station 119B (the cooling system sediment disposal basin). The remaining TLDs deployed in the field serve as indicator TLDs.

The TLDs are arranged in a series of rings that encircle CGS. The innermost ring of TLD stations, referred to as the "S" stations, are located inside the CGS site boundary at distances that range from 0.3-0.8 miles from the reactor building centerline. The second ring of TLDs, referred to as the "near plant" stations, are located at distances ranging from 0.9 to 2.1 miles from the reactor building. The outer ring of TLDs are located at distances that range from a little under three miles to around ten miles. A MicroRem dose rate meter is available as a backup device and to take real time readings as needed.

4.4.2 Airborne - Particulate/Iodine

Weekly air particulate and radioiodine (iodine -131) samples are obtained through the use of low volume (1.5 cfm), constant flow-rate sampling units located at 12 locations. The samples collected at Station 9A (Figure 4-3) serve as controls, the samples collected at all other locations (Figures 4-1, 4-2, and 4-3) are indicators. Air particulate samples are collected using 47mm diameter glass fiber filters, air iodine samples are collected using Radeco CP-100 TEDA impregnated charcoal cartridges. The air particulate filter and charcoal cartridge are placed in tandem, particulate filter first, in a holder that attaches to the air inlet of the sampler unit. The sampler units are placed in ventilated metal weatherproof housings mounted on elevated platforms at each air sample location. The filter media are changed weekly. Four additional air sample monitor locations are available to monitor work at the DOE 618-11 burial site if needed.

4.4.3 Water

Water sampling is performed to meet ODCM and State of Washington EFSEC requirements, to comply with NEI guidelines, or as a CGS initiative. REMP water sampling can be categorized as follows:

- Intake-River/Drinking Water; two locations (Stations 26 and 29)
- Deep Groundwater; three locations (Stations 52, 31 and 32)
- Shallow Groundwater; nine locations (MW-3, 5, 6 and MW-9 through MW-14)
- Plant Discharge Water; one location (Station 27)
- Storm Drain Water; one location (Station 101B)
- Sanitary Wastewater; one location (Station 102B)

The sample at Station 26 is obtained using a composite sampler that draws water from the plant intake water system (TMU). The source of this water is the Columbia River. The station serves as a control location, as it is upstream of the plant discharge location, and also as a drinking water location as drinking water for CGS comes from this source. Station 29 is a composite sampler located at the City of Richland Water Treatment Plant located 11 miles downstream of the plant discharge. Station 29 is an indicator station for both river and drinking water.

The ODCM requirement for a downstream water sample "near but beyond the mixing zone" is conservatively met by Station 27, a composite sampler that collects water from the cooling tower discharge line just prior to final discharge into the Columbia River. This sample reflects the radioactivity present in the plant discharge prior to any river dilution, rather than the concentrations that would be found after dilution in the mixing zone. Composite samples from Stations 26, 27, and 29 are collected monthly and analyzed for gamma emitting radionuclides, gross beta, and tritium.

Three drinking water wells on Energy Northwest property are used to provide deep groundwater samples. These wells are greater than 400 feet deep and provide samples from the confined aquifer under CGS. Station 52 is a deep well located 0.1 mile north of the CGS reactor building. Station 31 and 32 are deep wells at the IDC (ENW Industrial Development Complex) located 1.2 miles down gradient from CGS. Water from Station 52 can be used as a backup source for drinking water and fire protection. The IDC wells supply water for drinking and fire protection at the IDC site. All of these wells are considered indicator locations. Quarterly grab samples are collected from each well and analyzed for gamma emitting radionuclides and tritium.

The composite sampler at Station 101B collects samples of wastewater discharged to two evaporation ponds located on the CGS site. The water collected is storm drain, air wash, and non- radioactive system wastewater originating from within the CGS protected area. Samples are collected monthly on a flow proportional basis and analyzed for gross beta, gamma emitting radionuclides, and tritium. Sampling and analysis requirements for Station 101B are given in EFSEC Resolution 332[9] and EFSEC Council Order 874.[23] Process wastewater originating outside of the CGS protected area is typically discharged to three additional evaporation ponds; the water discharged to these ponds is not sampled by the Station 101B composite sampler. Annual grab samples are collected from these three evaporation ponds and analyzed for gamma emitting radionuclides and tritium as specified by EFSEC Council Order 874.[23]

The Sanitary Waste Treatment Facility (SWTF) receives sanitary waste water from CGS, the IDC (ENW Industrial Development Complex), and the Kootenai Building. Discharge standards and monitoring requirements for the SWTF are established in EFSEC Resolution No. 300.[16] The Station 102B composite sampler collects a representative sample of water flowing into the head works at the SWTF. Monthly samples are collected and analyzed for gross alpha, gross beta, tritium, and gamma emitting radionuclides. Transfer of sanitary waste water from the DOE 400 area to the SWTF was terminated in December 2013.

Routine quarterly grab samples are taken as part of the REMP from nine shallow ground water monitoring wells surrounding CGS. The monitoring well locations are shown in Figure 4-1. The shallow groundwater wells are all less than 100 feet deep and allow samples to be obtained from the unconfined aquifer under CGS. None of the wells are used for drinking water. Sampling from these locations is performed to meet NEI 07-07 guidelines[17] and requirements in the CGS NPDES permit.

4.4.4 Soil

Annual soil samples are a requirement of EFSEC Resolution No. 332.[9] For 2015, two soil samples were collected from locations near CGS, two samples from farmland in Franklin County east of CGS, and one sample from a control location near Sunnyside, WA. Each sample was collected from an area of approximately one square foot to a depth of approximately one inch. About two kilograms of soil was collected for each sample. Soil samples are analyzed for gamma activity on a dry weight basis.

4.4.5 Sediment

River sediment samples are collected semiannually as required by the ODCM and EFSEC Resolution No. 332.[9] The upstream sediment sample location (Station 33) is approximately two miles upriver from the plant discharge. The downstream sample (Station 34) is collected approximately one mile downstream from the plant discharge. Each sample consists of approximately two kilograms of shallow surface sediment scooped from areas known to be underwater during high water periods and where the potential for sediment accumulation is likely. Sediment samples are dried in an oven and then analyzed for gamma emitting radionuclides on a dry weight basis.

Cooling system sediment samples are collected and analyzed whenever cooling system sediment is added to the disposal cells (Station 119B, Figure 4-1). Disposal of cooling system sediment is made in accordance with EFSEC Resolution No. 299.[18] Pre-disposal samples are collected and analyzed prior to transfer to ensure the material will be within the limits specified in the EFSEC resolution. Following transfer, the material is allowed to dry and a post-disposal sample is collected and analyzed.

Sediment samples from the two evaporation ponds that receive wastewater originating from within the CGS protected area (ponds 3 and 4) are collected annually and analyzed for gamma emitting radionuclides. This sampling and analysis is performed to meet EFSEC Council Order 874[23] requirements. Sediment samples from the other three evaporation ponds may be collected as a CGS initiative as conditions allow.

4.4.6 Fish

Annual fish sampling is usually performed in the fall. Fish samples collected from the Columbia River (Station 30) serve as indicator samples, whereas fish collected on the Snake River (Station 38) serve as control samples. Only edible portions of the fish are used to prepare the samples for analysis. Fish samples are analyzed for gamma emitting radionuclides on a wet weight basis. Three species of fish are

collected; an anadromous species (salmon or steelhead), and two other resident species generally considered edible or potentially edible (typically carp, bass, perch, walleye, sucker, or whitefish). The same species are collected at each location. Anadromous species are typically obtained from local fish hatcheries through arrangements made with the State of Washington Department of Fish and Wildlife. Resident species have been collected using traditional hook and line fishing for the past three years.

4.4.7 Milk

Milk samples are collected monthly during the fall and winter months (October through March). During the spring and summer months when cows are more likely to be grazing or on fresh feed, milk samples are collected twice per month. Raw milk samples are collected within a few hours of milking and the samples are normally prepared and analyzed within four days. Milk samples are collected from both an indicator and control location. Station 36 in Franklin County serves as the indicator location and is the only known dairy within a ten mile radius of CGS. Control milk samples were collected from three different dairies in the lower Yakima Valley in 2015.

4.4.8 Garden Produce

Samples of local garden produce are collected during the growing season when the produce is readily available. Three types of garden produce are typically collected; root crops, fruits, and leafy vegetables. Control samples (Station 9C) are usually obtained from the lower Yakima Valley. Indicator samples (Station 37) are collected from areas downstream of the CGS discharge where crops are irrigated with Columbia River water or from locations that potentially could be impacted by CGS gaseous emissions. The Riverview area of Pasco is the principle collection location for fruit and root crops. Collection of leafy vegetables is primarily made from gardens and farms located east of CGS. Vegetation samples may also be collected from locations closer to CGS; however none were collected in 2015. Garden and vegetable samples are typically puréed in a food processor and then analyzed for gamma emitting radionuclides on a wet weight basis. Only edible portions are used for analysis.

4.5 Split Sample Program

In addition to the sample analyses performed by the Energy Northwest Environmental Services laboratory, a number of the samples collected are split and independently analyzed by the Washington State Department of Health (WaDOH). CGS REMP personnel typically collects these samples, ships a representative portion to the WaDOH laboratory, then separately analyzes another portion of the sample. For media such as air particulates or TLDs where sample splitting is not feasible, the WaDOH co-locates a TLD or air sampler at the sample location. The following split samples are typically provided: Monthly surface water samples from three locations, annual ground water samples from three locations, weekly air iodine and particulate filters from two locations, bi-annual vegetable samples from one location, monthly indicator milk samples from one location, quarterly control milk samples from one location, annual resident fish from one location, annual soil samples from five locations, annual sediment samples from two locations.

4.6 Sample Analyses

General descriptions of the procedures used to analyze REMP samples are provided in the following sections. All REMP TLDs in 2015 were processed at the Hanford External Dosimetry Program (HEDP) laboratory located in Richland, WA. The HEDP is operated by Mission Support Alliance (MSA). All routine REMP field samples were collected and analyzed by Energy Northwest Environmental Services personnel. Samples are normally collected and analyzed within a short time period to ensure required

detection sensitivities are met and to provide timely results. Sample count times are conservatively calculated to ensure required *a priori* LLDs are achieved. Table 4-4 lists the ODCM required LLDs and the nominal target LLD used in the Energy Northwest REMP program.

4.6.1 Analysis of TLDs

REMP TLDs are analyzed on a Harshaw Model 8800 hot gas reader. The reader is calibrated immediately prior to processing the environmental TLDs. The reader is calibrated with TLDs that have been given a known exposure from a cesium-137 source. Each group of environmental TLDs is processed with blank (freshly annealed) TLDs and spiked TLDs that have been given a known exposure. Exposure received by the field TLDs during transport is monitored with a set of 'trip' control dosimeters that accompany the field dosimeters to and from the field locations and while in storage. Another set of TLDs, the building controls, are used to determine the exposure of the TLDs at the storage location. The TLD exposure during transport to and from the field was determined from the difference between the building control results and the trip control results.

4.6.2 Gross Beta Activity on Air Particulate Filters

Air particulate filters are counted directly in a gas flow proportional counter after a delay of several days to allow for the decay of radon and its progeny. Samples were counted using a Protean WPC-9550 instrument which allows automated sample counting and simultaneous alpha/beta determination. If gross beta activity is identified significantly above the mean of the control, gamma isotopic analysis is performed on the individual samples.

4.6.3 Measurement of Gamma Emitting Radionuclides

Gamma isotopic analysis allows identification and quantification of gamma-emitting radionuclides that may be attributable to CGS effluents. Shielded, high purity germanium (HPGe) detectors are used to assay environmental samples for gamma emitting radionuclides. All samples are counted in standardized, calibrated geometries.

- **Liquids** – Measured aliquots of the liquid samples are poured into appropriately sized Marinelli beakers or plastic container. Sample results are corrected for decay during the collection period if applicable. Results are reported in pCi/liter.

- **Solids** – Soil, sludge, and sediment samples are dried and ground as needed. Foodstuff, biota (fish), and vegetation, are chopped finely or pureed and then analyzed wet (no drying is done). For foodstuff (including fish), only the edible portion of the sample is used. Sample aliquots are placed in tared containers and weighed. Results are reported in pCi/kg.

- **Charcoal Cartridges** – Typically four charcoal cartridges are counted simultaneously using a cartridge holding jig that positions the cartridges in a standardized geometry to the side of the detector. Detector calibration files are maintained for both face count and side count positions. If radioiodines are identified in the assay of a group, each charcoal cartridge in the group is assayed separately. Results are corrected for decay during the sample collection period. Results are reported in pCi/m^3.

- **Air Particulate Filters** – At the end of each quarter, air particulate filters are composited on a station by station basis. The filters are stacked in a Petri dish and analyzed by gamma spectroscopy. Results are reported in pCi/m^3 and represent the total quarterly gamma activity collected at each station. Results are decay corrected to the midpoint of the sample collection period. If a radionuclide related to CGS operation is positively identified, the filters are separated and counted individually.

4.6.4 Gross Alpha and Gross Beta Activity in Water

A measured aliquot of each sample is evaporated to a small volume then quantitatively transferred to a ribbed, stainless steel planchet. Final evaporation is normally done under a heat lamp. Residue mass is determined by weighing the planchet before and after mounting the sample. The planchet is counted for gross alpha and beta activity using a Protean WPC-9550 automatic gas flow proportional counter which allows automated sample counting and simultaneous alpha/beta determination. Results are corrected for sample self-absorption using the sample residue mass values. Results are reported in pCi/liter.

4.6.5 Tritium in Water

The sample is distilled, then 8.0mL of the distillate is mixed with 12.0mL of scintillation cocktail. The sample mixture is analyzed on a Packard Tri-Carb 2900TR automatic liquid scintillation counter. Results are reported in pCi/liter.

4.6.6 Low Level Radioiodine in Milk and Water

Four liters of sample are first equilibrated with stable iodide carrier. Anion exchange resin is then added and mixed for a period sufficient to allow any iodine present in the sample to be captured by the resin. The resin is then isolated from the liquid sample and transferred to a small counting container. The radioiodine content is determined by gamma spectroscopy analysis. Results are reported in pCi/liter.

4.6.7 Carbon-14

Carbon-14 levels in the environment around CGS are evaluated by comparison of carbon-14 content in apples obtained from local orchards to apples obtained from control locations. Apple samples are dried in a food dehydrator; both wet and dry sample mass measurements are taken. The analysis method used involves sample oxidation, capture of the resulting carbon dioxide, then liquid scintillation counting. Final results are calculated on a wet weight basis. Sample analysis is performed by an outside laboratory.

4.6.8 Strontium-89/90, Iron-55, and Nickel-63

These “hard to detect” analytes are not routinely analyzed as part of the CGS REMP. When needed, these analyses are performed under contract by Teledyne- Brown Environmental Services Laboratory located in Knoxville, TN using the vendor’s standard analysis procedures.

4.7 Data Analysis Methods

Counting results for low level samples are often within the counting error of the background determination; consequently results for these samples can be positive or negative values. Though most REMP analytical results are below the detection limit, an actual calculated value has been reported. In some cases the reported value is zero or a negative number. Reporting results in this manner is the

preferred practice for low level environmental analyses as it gives an indication of positive or negative biases that may be present and prevents loss of individual results inherent in the use of "less than" (<) values. Also reported in most cases are the *a posteriori* MDA values. A nuclide is flagged as positively identified if its calculated value is greater than the MDA. A listing of the Energy Northwest nominal target LLDs (*a priori)* for each sample type is provided in Table 4-4; the ODCM required LLDs are also included for a comparison.

Data is trended following analysis for many of the sample types analyzed. For analyses such as gross beta on air particulate filters where results are normally above the detection limit, indicator results are plotted with the control results for better comparison. Analysis results that are normally below detection limits are plotted against historical data to monitor if trends may be evident.

Thermoluminescent dosimeter (TLD) data is presented in both units of mR/day and mR/standard quarter. TLD results in mR/day are calculated by taking the total exposure (in mR) determined for each TLD, correcting for storage background and any transit (or trip) exposure received during distribution and retrieval, then dividing by the number of days the TLD was in the field. The mR/standard quarter values are calculated by multiplying the mR/day value by 91.25 days (365/4). All TLD results are reported in units of exposure (Roentgen) and not in units of dose (Rem).

4.8 Changes to the Sampling Program in 2015

The following is a synopsis of changes made to the sampling program in 2015. There were no changes made to ODCM or EFSEC Resolution No. 332[9] required sampling and analysis in 2015.

The storm drain water composite sampler (Station 101) was moved to a new location in November 2014. The sampler was re-designated as Station 101B in order to differentiate the results for the two different discharge locations. Station-101 will remain the historic reference for samples collected at the discharge to the CGS storm drain pond; Station 101B will be the reference for samples collected at the discharge to evaporation ponds 3 and 4.

A new control milk sampling location was established in October 2015. In August 2015 it was found that the dairy that had been used as the control milk location had terminated dairy operations. A milk sample from a temporary location was obtained in September. In October, a new control location was identified and established as the new control milk location. Reference CR 335039.

TLD Station 13 was moved approximately 40 paces west of its historic location in January 2015. GPS readings had shown that the historic location was actually in the SSW sector and not in the SW sector as required by the ODCM. The move places the TLD station in the SW sector in order to comply with the ODCM requirement. Reference CR 316186.

No samples from ground water monitoring well MW-8 were obtained in 2015 due to lack of water in the well. Ground water levels at this location were known to be falling and have now fallen below the well depth.

Water and sediment grab samples were obtained from the CGS evaporation ponds in 2015. The samples were collected in order to comply with EFSEC Council Order 874[23] requirements. The analysis results for these samples are included in this report.

TABLE 4-1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SAMPLING PLAN

SAMPLE TYPE[a]	SAMPLE STATION [b] NUMBER	SAMPLE METHOD AND COLLECTION FREQUENCY[c]	TYPE AND FREQUENCY OF ANALYSIS
AIRBORNE			
Particulates and Radioiodine[d] (6/12)	1, 4-8, 9A, 21, 23, 40, 48, and 57	Continuous sampling; weekly collection.	Weekly air filters gross beta and iodine cartridge gamma isotopic. Quarterly air filter composite gamma isotopic.
DIRECT RADIATION			
TLD[g] (34/79)	1-8, 9A, 10-25, 40-47, 49-51, 53-56, 58, 65, 71-90, 119B, 119C, 120-129, 136A-138A, 150-151.	Continuous monitoring, quarterly collection.	Radiation exposure monitoring processed on a quarterly frequency.
WATERBORNE			
River/Drinking Water[h] (3/3)	26, 27 and 29	Composite aliquots[i]; monthly collection.	Monthly gamma isotopic, gross beta, and tritium. Iodine-131[j] as required.
Storm Drain Water[s] (0/1)	101B	Composite aliquots[i], monthly collection.	Monthly gamma isotopic, tritium, and gross beta.
Sanitary Waste Treatment Facility Water[r] (0/1)	102B	Composite aliquots[i], monthly collection.	Monthly gamma isotopic, gross beta, gross alpha, and tritium.
Ground Water[k] (2/3)	31, 32, and 52	Grab sample performed quarterly.	Quarterly gamma isotopic and tritium.
Ground Water Monitoring[e] (0/9)	MW-3, 5, 6, 9-14	Grab sample performed quarterly.	Quarterly gamma isotopic and tritium.
Evaporation Pond Water[q] (0/3)	EVP-1A, 1B, 2	Grab sample performed annually	Annual gamma isotopic and tritium.
SOIL AND SEDIMENT			
Soil[f] (0/5)	7, 8, 9A, 23, 48	Grab sample performed annually.	Annual gamma isotopic. Strontium-90[f] as required.
River Sediment[l] (1/2)	33 and 34	Grab sample performed semiannually.	Semiannual gamma isotopic.
Cooling System Sediment Disposal Area[t] (0/2)	119B, 119C	Grab sample of dried sediment within 30 days of disposal date.	Gamma Isotopic. After disposal.
Evaporation Pond Sediment[q] (0/2)	EVP-3, 4	Grab sample performed annually	Annual gamma isotopic
INGESTION			
Milk[m] (2/2)	9B, 36	Grab sample collected semimonthly during grazing season, monthly at other times.	Gamma isotopic, Iodine-131 each sample. Strontium-90.[n] as required
Fish[o] (2/2)	30, 38	Grab samples collected annually.	Gamma isotopic each sample.
Garden Produce[p] (1/2)	9C, 37	Grab samples collected monthly or at time of harvest.	Gamma isotopic each sample.

TABLE 4-1 FOOTNOTES:

(a) The fraction in parentheses for each sample type indicates the ratio of ODCM-required sample locations to the total number of sample locations currently being monitored in the surveillance program. Additional sampling is performed to meet EFSEC requirements or as an ENW initiative.

(b) The underlined sample location designates a control station.

(c) Sample collection is performed at a frequency specified in the ODCM and EFSEC resolutions. Some sampling referenced in Table 4-1 is performed at CGS initiative. Sample deviations are permitted if samples are unobtainable due to hazardous conditions, seasonal availability, malfunction of automatic sampling equipment, or other legitimate reasons.

(d) The ODCM specifies six air sample locations and EFSEC Resolution 332 specifies nine. Two of the air sample stations are maintained at CGS initiative and are not requirements of either the ODCM or EFSEC Resolution 332.

(e) Shallow ground water sampling is performed to meet NEI 07-07 guidelines and NPDES requirements.

(f) Soil samples are collected from five locations to satisfy EFSEC Resolution 332 requirements. Two samples are collected from locations near CGS, two from locations in Franklin County, and one collected from a control location. Sample locations listed in Table 4-1 are the locations sampled in 2015. EFSEC 332 requires strontium-90 analysis be performed if gamma analysis results are greater than a specified threshold.

(g) TLD Stations 71-86 are not included among the 34 TLD stations required by the ODCM. Alternate designations for these stations are 1S-16S. EFSEC Resolution 332 requires 25 or more TLD stations to be located within a 10-mile radius of CGS.

(h) The term "river/drinking water" is used as Columbia River water is also used as a source of drinking water. Station 26 samples CGS makeup water drawn from the Columbia River. This sample is both a control upstream water sample and a drinking water sample. Station 29 is a downstream drinking water sample location. Station 27 samples plant discharge water immediately before discharge to the Columbia River. EFSEC Resolution 332 requires samples from at least one downstream drinking water location and samples from the plant intake and discharge water systems.

(i) Composite samples are collected using automatic sampling equipment that collect samples on a flow proportional or timed interval basis. When timed interval sampling is used, the interval period is short (e.g. hourly) relative to the compositing period (e.g. monthly).

(j) When the dose calculated via ODCM methodology for consumption of water exceeds 1 mrem per year, low level iodine-131 analyses are performed on the drinking water samples.

(k) Sampling from these locations fulfills ODCM table 6.3.1-1 3b requirements. EFSEC Resolution 332 requires sampling from at least one deep well used for fire protection and/or as a backup drinking water source.

(l) Downstream sampling fulfills ODCM table 6.3.1-1 3d requirements. EFSEC Resolution 332 requires annual sediment samples upstream and downstream of the plant discharge.

(m) ODCM table 6.3.1-1 4a milk collection requirements cannot strictly be met due to the lack of milking animals near CGS. Milk samples are collected from the nearest dairy potentially impacted by CGS operation and also from a control location at the frequency specified in the ODCM. EFSEC Resolution 332 specifies sampling from at least one milk location within the 10-mile radius of CGS and also from a control location.

(n) ODCM table 6.3.1-1 (k) requires that if cesium-134 or cesium-137 is measured in an individual milk sample in excess of 30 pCi/1iter, then a strontium-90 analysis will also be performed.

(o) Station 30 is the Columbia River and station 38 is the Snake River. If an impact is indicated, sampling will be conducted semiannually per ODCM table 6.3.1-1 (i). There are no species fished commercially in the Hanford Reach of the Columbia River. The most recreationally important species in the area are anadromous, which ascend rivers from the ocean for breeding. Anadromous fish species are normally obtained from hatcheries; Snake River samples are obtained from the Lyons Ferry Fish Hatchery, and Columbia River samples are obtained at the Ringold Fish Hatchery.

(p) Garden produce is obtained from farms or gardens that use Columbia River water for irrigation. One sample of a root crop, leafy vegetable, and a fruit is typically collected each sample period, when available. EFSEC Resolution 332 further specifies fruit and vegetable sampling from locations potentially impacted by CGS gaseous emissions.

(q) Annual sediment sampling from Evaporation Ponds 3 and 4 and annual water sampling from Evaporation Ponds 1A, 1B, and 2 are specified in EFSEC Council Order 874.

(r) Sample requirements for the Sanitary Waste Treatment Facility are specified in EFSEC Resolution 300.

(s) Monthly Station 101B sampling is specified in EFSEC Resolution 332 and EFSEC Council Order 874.

(t) Disposal, sampling, and monitoring of cooling system sediment is specified in EFSEC Resolution 299.

TABLE 4-2
REMP SAMPLE STATIONS AND REQUIREMENTS

SECTOR[a]	STATION NUMBER[b]	DISTANCE MILES[c]	ODCM[d]	STATE[e]	OTHER[f]
N (1)	52	0.07	DGW	DGW	
	71(1S)	0.28			TLD
	47	0.70		TLD	
	57	0.70	AP/AI		
	18	1.16	TLD	TLD	
	53	7.54	TLD		
NNE (2)	72(2S)	0.32			TLD
	2	1.45	TLD	TLD	
	54	6.08	TLD		
	EVP-1A	0.31		Dis W	
NE (3)	73(3S)	0.54			TLD
	19	1.74	TLD	TLD	
	48	4.59	AP/AI	AP/AI	
	46	4.99	TLD		
	MW-9	0.22			SGW
	EVP-1B	0.25		Dis W	
	EVP-2	0.35		Dis W	
	EVP-3	0.43		SE	
ENE (4)	74(4S)	0.38			TLD
	21	1.45		TLD, SO	AP/AI
	20	1.93	TLD	TLD	
	11	3.16		TLD	
	33	3.44		SE	
	45	4.45	TLD		
	44	5.90	TLD		
	101B	0.22		Dis W	
	MW-11	0.10			SGW
	EVP-4	0.60		SE	
E (5)	75(5S)	0.37			TLD
	22	2.08	TLD		
	10	3.16	TLD	TLD	
	26	3.19	SW, DW	SW	
	27	3.19	SW	Dis W	
	30[g]	3.5	FI	FI	
	43	5.63	TLD		
	151 (Site 4)	0.83			TLD
	MW-12	0.12			SGW

TABLE 4-2 (cont.)
REMP SAMPLE STATIONS AND REQUIREMENTS

SECTOR[a]	STATION NUMBER[b]	DISTANCE MILES[c]	ODCM[d]	STATE[e]	OTHER[f]
ESE (6)	76(6S)	0.42			TLD
	31	1.06	DGW		
	32	1.27	DGW		
	51	2.14	TLD		
	34	3.32	SE	SE	
	23	3.03		TLD, AP/AI, SO	
	8	4.39	TLD, AP/AI	TLD, AP/AI	
	42	5.85	TLD		
	36	7.33	MI	MI	
	5	7.72	TLD		AP/AI
	38[g]	26	FI	FI	
	150 (Site 1)	0.90			TLD
SE (7)	77(7S)	0.57			TLD
	24	1.87	TLD	TLD	
	3	2.06		TLD	
	41	5.79	TLD		
	40	6.51	TLD, AP/AI	AP/AI	
	MW-14	0.58			SGW
SSE (8)	119C	0.28		TLD	
	120	0.32			TLD
	102B	0.50		SFW	
	78(8S)	0.81			TLD
	25	1.50	TLD	TLD	
	55	6.05	TLD		
	4	9.57	TLD, AP/AI	TLD, AP/AI	
	29	11.57	DW	DW	
	37[h]	16	GP	GP	
	MW-6	0.33			SGW
	MW-13	0.52			SGW
S (9)	119B	0.31		TLD, SE	
	79(9S)	0.76			TLD
	1	1.25	TLD	TLD, AP/AI, SO	
	6	7.72	TLD	TLD, AP/AI	
	65	8.87			TLD
SSW (10)	80(10S)	0.83			TLD
	50	1.26	TLD	TLD	
	56	6.65	TLD		
	MW-3	0.31			SGW

TABLE 4-2 (cont.)
REMP SAMPLE STATIONS AND REQUIREMENTS

SECTOR[a]	STATION NUMBER[b]	DISTANCE MILES[c]	ODCM[d]	STATE[e]	OTHER[f]
SW (11)	81(11S)	0.74			TLD
	90[j]	0.62			TLD, AI/AP
	MW-5	0.43			SGW
	13	1.26	TLD	TLD	
WSW (12)	82(12S)	0.57			TLD
	14	1.26	TLD	TLD	
	9A	28.35	TLD, AP/AI	TLD, AP/AI, SO	
	9B[k]	32.82	MI	MI	
	9C[i]	32		GP	
	89[j]	0.23			TLD, AI/AP
	58	0.44			TLD
W (13)	83(13S)	0.52			TLD
	15	1.24	TLD	TLD	
WNW (14)	84(14S)	0.55			TLD
	16	1.21	TLD	TLD	
	7	2.83	TLD	TLD, AP/AI, SO	
	88[j]	0.17			TLD, AI/AP
	MW-10	0.07			SGW
NW (15)	85 (15S)	0.43			TLD
	49	1.19	TLD	TLD	
	87[j]	0.20			TLD, AI/AP
NNW (16)	121	0.12			TLD
	122	0.31			TLD
	123	0.29			TLD
	124	0.28			TLD
	125	0.28			TLD
	126	0.28			TLD
	127	0.26			TLD
	128	0.25			TLD
	129	0.17			TLD
	136A	0.29			TLD
	137A	0.24			TLD
	138A	0.17			TLD
	86 (16S)	0.31			TLD
	17	1.19	TLD	TLD	
	12	6.74		TLD	

TABLE 4-2 (cont.)
REMP SAMPLE STATIONS AND REQUIREMENTS

TABLE 4-2 SAMPLE TYPE KEY

AP/AI - Air Particulate/Air Iodine
Dis W - Discharge Water
GP - Garden/Orchard Produce
MI - Milk
SFW - Sanitation Facility Water
SW - Surface Water
VE – Vegetation
DW - Drinking Water
FI - Fish
DGW - Deep Ground Water
SE - Sediment
SO - Soil
TLD - Thermoluminescent Dosimeter
SGW – Shallow Ground Water

TABLE 4-2 FOOTNOTES:

(a) The area in the vicinity of CGS is separated into 16 sectors for reporting purposes. The 16 sectors cover 360 degrees in equal 22.5 degree sections, beginning with sector 1 (N) at 348.75 to 11.25 degrees and continuing clockwise through sector 16 (NNW).

(b) Alternate designations for some sample stations are given in parentheses; i.e., TLD Stations 71-86 are also referred to as 1S-16S.

(c) Distance and sector indications are relative to the center of the CGS reactor building and were determined using GPS coordinate readings. Distance and sector indication for the Evaporation Ponds is to the center of each pond.

(d) ODCM - Offsite Dose Calculation Manual Table 6.3.1-1 requirement.

(e) STATE - State of Washington EFSEC requirement. Station 102B is an EFSEC Resolution 300 requirement. Stations 119B and 119C are EFSEC Resolution 299 requirements. Sampling at Evaporation Ponds 1A, 1B, 2, 3, and 4 is specified in EFSEC Council Order 874. All other State required samples are specified in EFSEC Resolution 332.

(f) OTHER –Special study stations. TLD Stations 121 through 129 and 136A through 138A satisfy ISFSI monitoring requirements 10CFR72.44(d)(2). Sampling at MW locations performed to meet NEI 07-07 guidelines and NPDES requirements.

(g) Station 30 is the Columbia River at the vicinity of the plant discharge. Actual distance of fish collection locations from plant are variable, distance listed is approximation. Station 38 is the Snake River. Control resident fish are typically collected at variable locations in area below Ice Harbor Dam, distance listed is approximation. Control anadromous fish are typically collected at Lyons Ferry Fish Hatchery.

(h) Fruit and Vegetable indicator samples are typically collected from farms and gardens in the Riverview area of Pasco. Distance listed here is general distance of Riverview area to CGS. Station 37 designation is also used for any samples collected in Franklin County that could potentially be affected by CGS liquid or gaseous effluents.

(i) Station 9C is the designation given for control fruits and vegetables. Distance listed is general distance to the Sunnyside-Grandview area where the majority of the control fruits and vegetables are obtained.

(j) Stations 87-90 were installed at CGS initiative to monitor remediation work at the DOE 618-11 burial ground. Samples were collected for a three week period in 2015 from Stations 87 and 88 during a dirt removal operation near the 618-11 burial ground. See Section 5.9.6 for further discussion.

(k) Station 9B refers to the control milk sampling location. In August 2015, the control milk location at 32.82 miles WSW terminated operation. A new control milk location was established in October at a location 23.24 miles SW. Indication in Table 4-2 is for the control milk location used through August 2015.

TABLE 4-3
2015 FIVE MILE LAND USE CENSUS RESULTS

SECTOR[a]	NEAREST RESIDENT[b]	GARDEN[d] (>500 ft^2)	DAIRY ANIMALS	LIVESTOCK[b,c]
NE	4.50	4.63	none	4.63
ENE	3.88	none	none	4.95
E	4.64	none	none	4.64
ESE	4.26	none	none	4.49
SE	none	none	none	none

FOOTNOTES

(a) Within a five-mile radius of the plant, only the five sectors listed above contain activities related to land use census requirements. The other eleven sectors lay fully within the federally owned Hanford Site. Only those sectors containing potential land use census activities are presented here.

(b) Estimated distances in miles from CGS Reactor Building based on GPS readings. Actual locations are same as identified in previous years, distance values may differ from those reported in past due to updated GPS data.

(c) 20 to 30 beef cattle were identified in a pasture in the ENE sector. The western edge of the pasture is just within the 5 mile radius. Additional feed appears to be provided at this location. Chickens were observed at a residence in the E sector. A single horse was observed in the NE sector and 2 horses were observed in the ESE. There is little pasture at either of these locations and the animals appear to be fed mostly hay.

(d) The garden identified in the NE sector is located approximately 200 yards from the Station 48 air sampler and is irrigated using water from a local spring. The CGS REMP obtained broad leaf vegetables from this location in 2015. In addition to the garden, commercial agriculture is extensively practiced in some parts of the sectors identified in Table 4-3. Agricultural activities observed were primarily apple and soft fruit orchards, corn, alfalfa, and grape vineyards.

TABLE 4-4
COMPARISON OF LABORATORY NOMINAL LOWER LIMITS OF DETECTION WITH OFFSITE DOSE CALCULATION MANUAL REQUIREMENTS

MEDIA (UNITS)	ANALYSIS	ENERGY NORTHWEST LLDs[a]	ODCM REQUIRED LLDs
Air	Gross Beta	0.002	0.01
(pCi/m^3)	Cs-134	0.001	0.05
	Cs-137	0.001	0.06
	I-131	0.03	0.07
Water:	Gross Beta	2.4	4
(pCi/liter)	Tritium	300	2000[b]
	Sr-90	1	---
	Ni-63	5	---
	Fe-55	200	---
	I-131[c]	1	---
	Mn-54	7	15
	Fe-59	10	30
	Co-58	7	15
	Co-60	7	15
	Zn-65	10	30
	Zr-Nb-95	7	15
	Cs-134	7	15
	Cs-137	7	18
	Ba-La-140	10	15
Soil/Sediment:	Mn-54	20	---
(pCi/kg dry)	Co-60	20	---
	Zn-65	30	---
	Cs-134	20	150
	Cs-137	20	180
	Sr-90	10	---
Fish:	Mn-54	25	130
(pCi/kg wet)	Fe-59	100	260
	Co-58	35	130
	Co-60	25	130
	Zn-65	50	260
	Cs-134	30	130
	Cs-137	25	150
Milk:	I-31[c]	0.5	1
(pCi/liter)	Cs-134	8	15
	Cs-137	8	18
	Ba-La-140	10	15
	Sr-90	1	---
Garden Produce:	Cs-134	20	60
(pCi/kg wet)	Cs-137	20	80
	I-131	20	60

[a] These are the nominal target LLDs (a priori) for analyses performed in the Energy Northwest Environmental Services Laboratory and are based on conservative assumptions. These calculations included corrections for decay during the collection period and delay prior to analysis using factors that are normally encountered for the different media types. Actual LLDs (a posteriori) may be higher or lower for specific samples.
[b] If no drinking water pathway exists, a value of 3,000 pCi/liter may be used.
[c] This ENW Iodine-131 LLD achieved by anion resin separation and does not represent a direct analysis of the sample media.

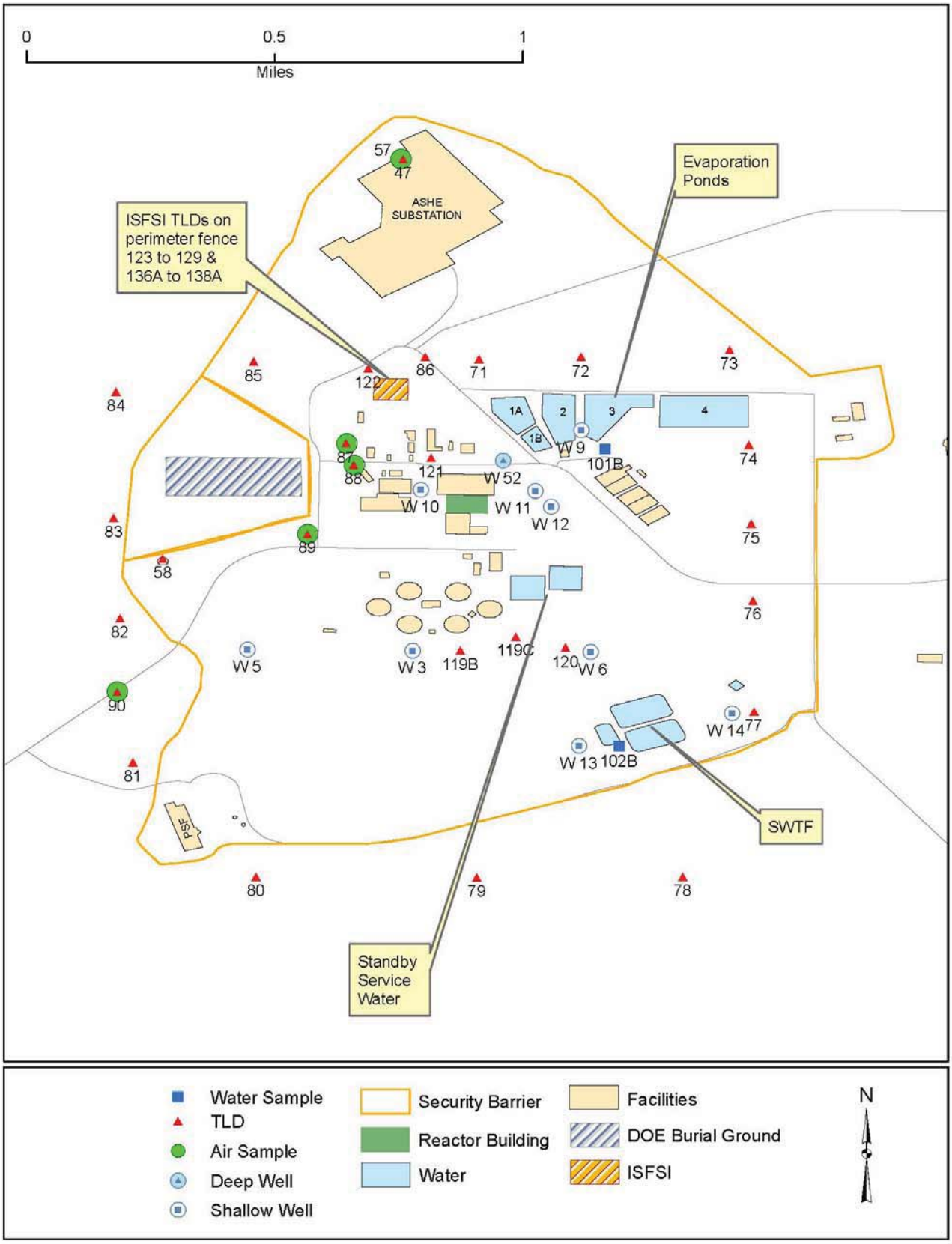

FIGURE 4-1 SELECT REMP SAMPLING LOCATIONS WITHIN 0.8 MILES OF CGS

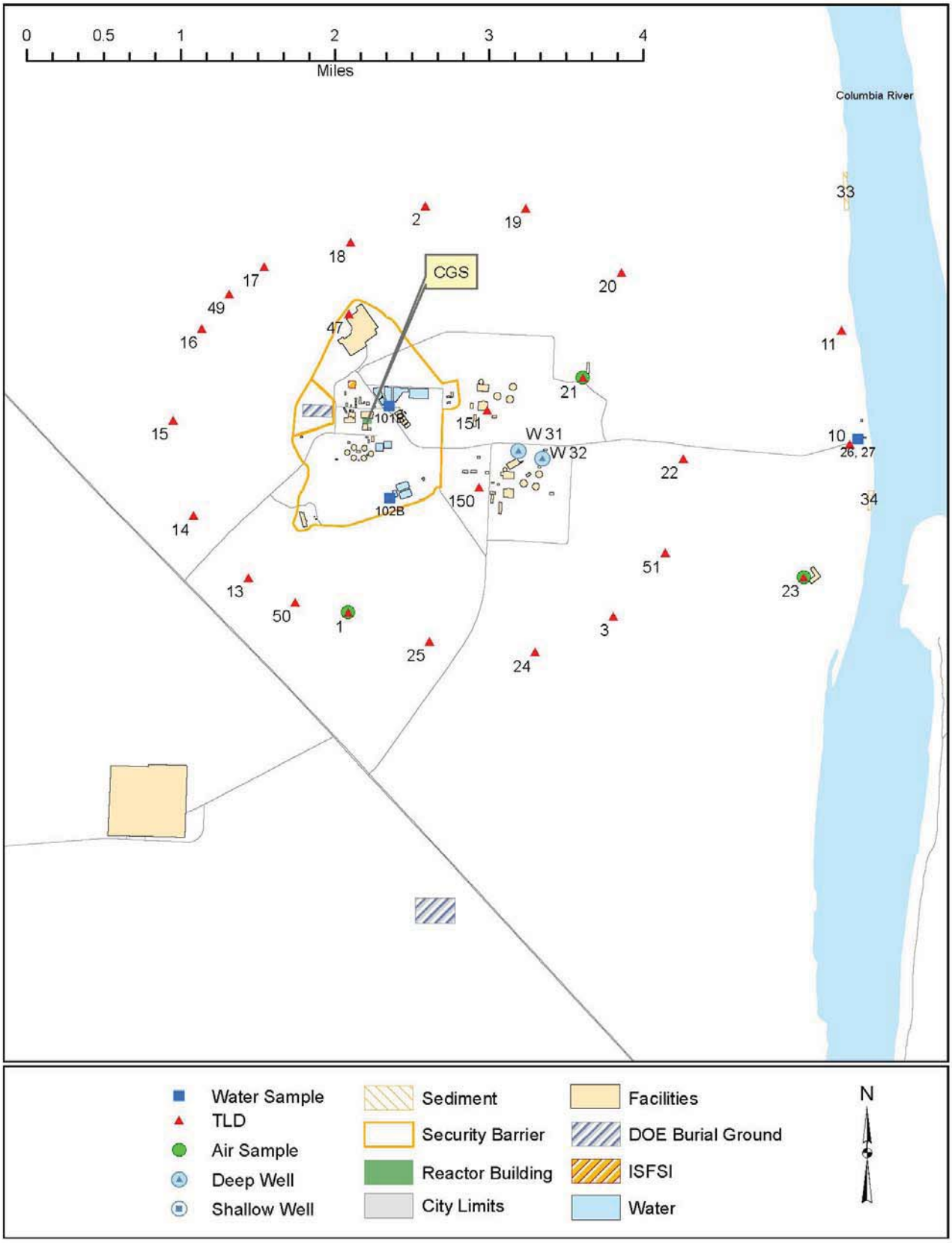

FIGURE 4-2 SELECT REMP SAMPLING LOCATIONS BETWEEN 0.8 AND 2.8 MILES

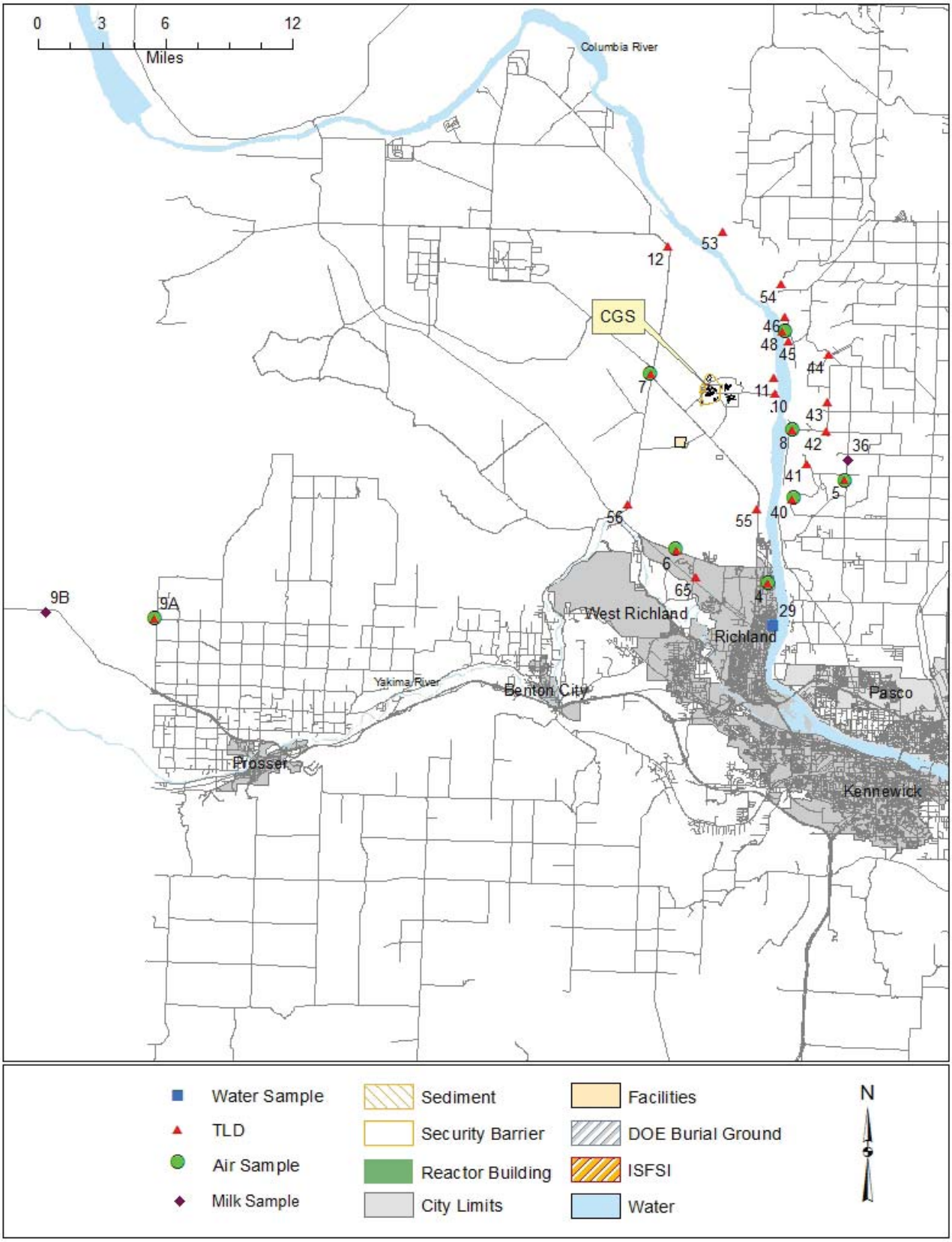

FIGURE 4-3 SELECT REMP SAMPLING LOCATIONS BEYOND 2.8 MILES

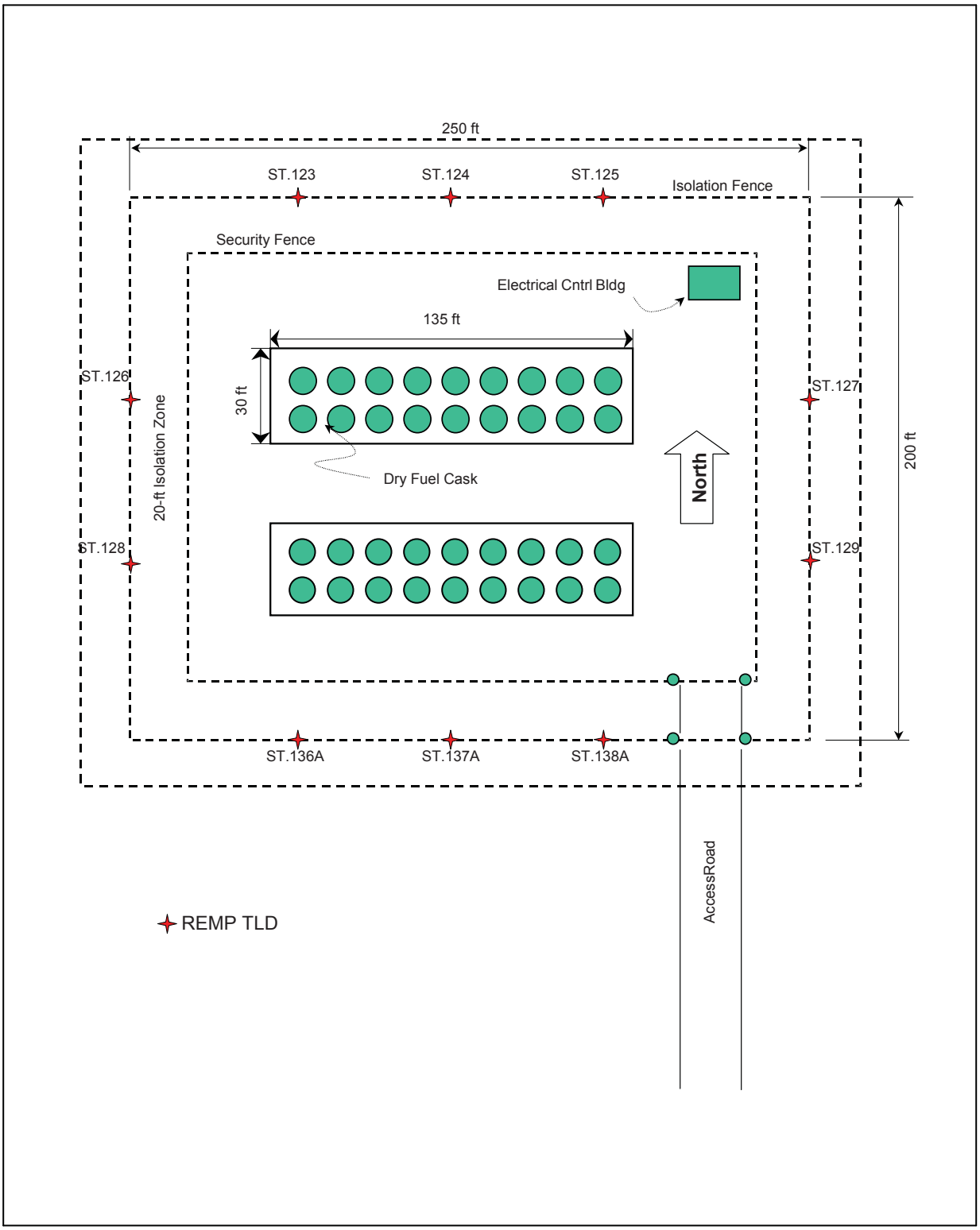

FIGURE 4-4 ISFSI TLD STATION LAYOUT

5.0 RESULTS AND DISCUSSION

5.0 RESULTS AND DISCUSSION

The Columbia Generating Station environmental TLDs were collected by Energy Northwest Environmental Services personnel and analyzed by the Hanford External Dosimetry Program (HEDP) operated by Mission Support Alliance (MSA). All other CGS REMP samples were collected and analyzed by the Energy Northwest Environmental Services Laboratory located in Richland, WA. Table 5-2 provides a summary of the ODCM required REMP sample and CGS groundwater monitoring analysis results in the format specified by the NRC.[5,6] Results for naturally occurring radionuclides that are not related to CGS operations have not been included in the summary table. The lower limit of detection (LLD) values listed in Table 5-2 are the ODCM required detection limits and are not the method detection limits listed in Table 4-4. Analytical results for all REMP samples are presented in Appendix A of this volume.

5.1 Direct Radiation

Direct radiation is monitored at 79 TLD locations surrounding CGS. TLDs are exchanged on a quarterly frequency at all locations. The 16 locations designated as "S" stations are located between 0.3 and 0.8 miles from the CGS reactor building and all are inside the property boundary, see Figure 4-1 for station locations. Figure 5-1 shows the 2015 "S" station mean quarterly TLD results separated into 16 geographical sectors around the plant. Figure 5-1 also shows the pre-operational mean and the high, low, and mean results in each sector for the 1984 - 2014 operational period for comparison. The 2015 “S” station TLD results were lower than the pre-operational mean in 10 of the 16 sectors and lower than the operational mean in 4 of the 16 sectors. TLD results from the N, NNE, and NNW sectors are slightly higher than the other “S” station locations as a result of being physically closer to the ISFSI and the CGS turbine building. TLD results for the NE sector (Station 73) have been higher than historically observed since the 4th quarter 2013. In October 2013 this station was moved 175 feet because soil from the evaporation pond excavation was being moved to this area. The higher results seen in the NE sector are attributed to an increased in natural background resulting from the large amount of dirt now piled near the TLD station.

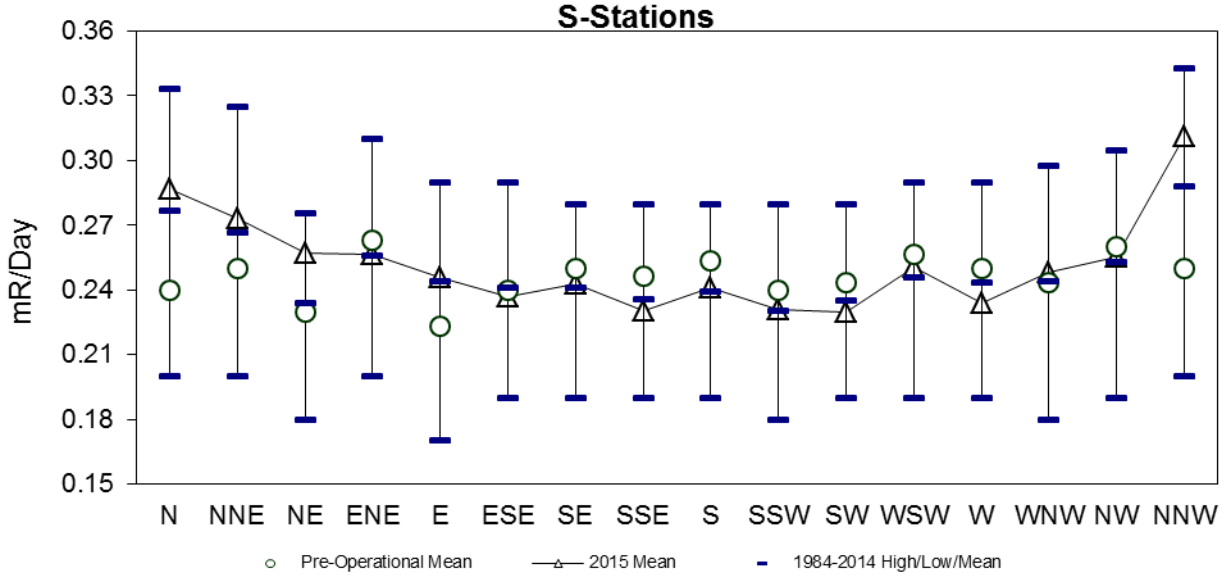

Figure 5-1 “S” Stations Quarterly TLDs 1984-2014 Hi/Low/Mean and 2015 Mean by Sector

Excluding the NNW sector, the average deviation relative to the operational period was +0.80%; in 2014 the average deviation was +0.10%. The NNW sector is the closest "S" station to the ISFSI and the higher result here is attributed to the stations close proximity to this facility.

The 19 locations designated as near plant stations are located at distances between 0.9 and 2.1 miles from the CGS reactor building, see Figure 4-2 for station locations. Figure 5-2 shows the exposure rates for the near plant TLD locations separated into sixteen geographical sectors around the plant. Figure 5-2 also shows the pre-operational mean and the high, low, and mean results in each sector for the 1984-2014 operational period for comparison. The 2015 near plant TLD results were lower than the pre-operational mean in 9 of the 16 sectors and less than the operational mean in 7 of the 16 sectors. The average deviation relative to the operational period was +0.2%, in 2014 the average deviation was -1.1%.

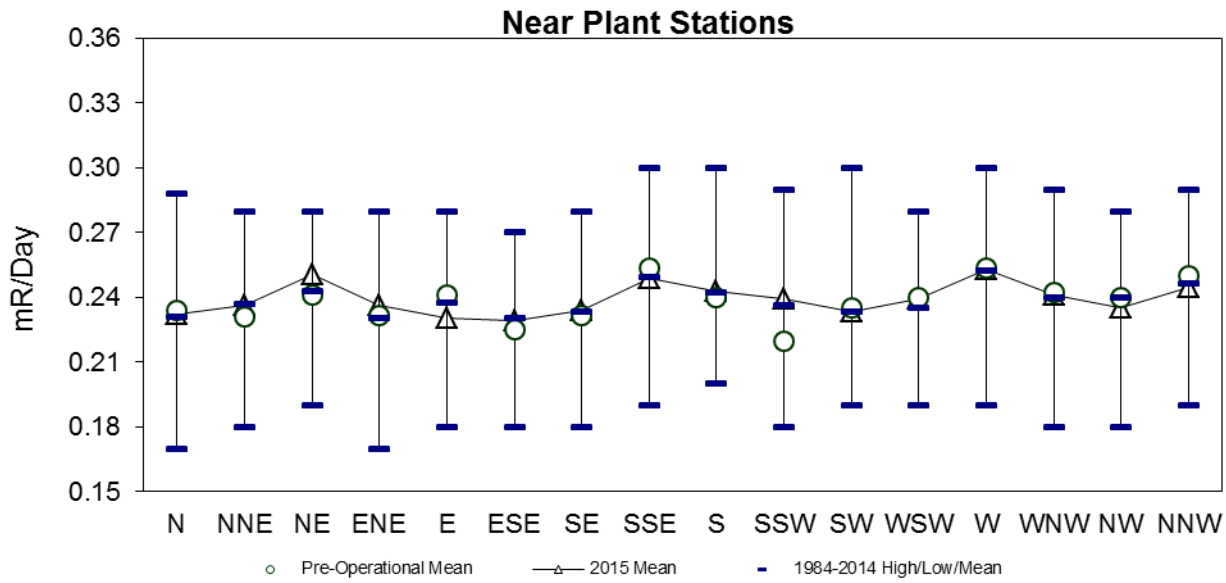

Figure 5-2 Near Plant Stations Quarterly TLDs 1984-2014 Hi/Low/Mean and 2015 Mean by Sector

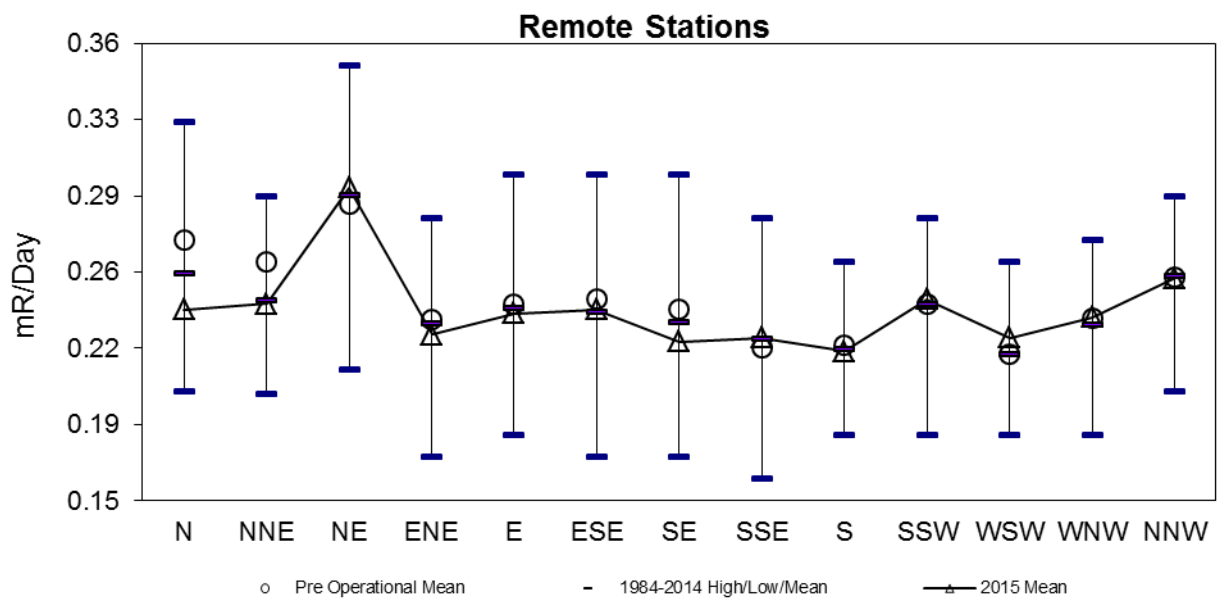

Figure 5-3 Remote Stations Quarterly TLDs 1984-2014 Hi/Low/Mean and 2015 Mean By Sector

The 22 TLD locations designated as remote locations are located between 2.83 and 28.35 miles from the CGS reactor building; see Figure 4-3 for station locations. Figure 5-3 shows the exposure rates for the remote TLD locations separated into geographical sectors around the plant. Figure 5-3 also shows the pre-operational mean and the high, low, and mean results by sector for the 1984-2014 operational period for comparison. The 2015 remote TLD results were lower than the pre-operational mean in 8 of the 13 sectors and lower than the operational mean in 7 of the 13 sectors. Station 46 in the Wahluke Reserve (NE sector) remained the remote location with the highest exposure rate. This has been the case since the pre-operational measurement phase and is attributed to differences in the underlying rock and soil composition in this area. The 2015 average deviation relative to the operational period was -0.6%; the average deviation in 2014 was -1.0%.

Offsite direct radiation monitoring results are consistent with previous years. The 2015 results indicate no observable dose contributions due to plant operations at locations outside the CGS controlled area. Dose contributions inside the CGS controlled area (but outside the protected area) are limited to those locations known to be influenced by the Independent Spent Fuel Storage Installation (ISFSI) and/or radiation from the turbine building during operation. Environmental radiation exposure rates for 2015, the pre-operational period, and the long term operational period are summarized in Table 5-3. See also Appendix A, Tables A-1.1 and B-1.1 for the 2015 quarterly TLD results. TLD results for special interest locations are discussed in further detail in Section 5.9.

5.2 Airborne Particulate/Iodine

Air samples are collected weekly from 11 sample stations located around CGS. Additionally, an air sample station located 28 miles WSW of CGS is used as a control for comparison. Air particulate filters are analyzed for gross beta and iodine cartridges for radioiodines on a weekly basis. Air filters are also composited and analyzed for gamma emitting radionuclides quarterly.

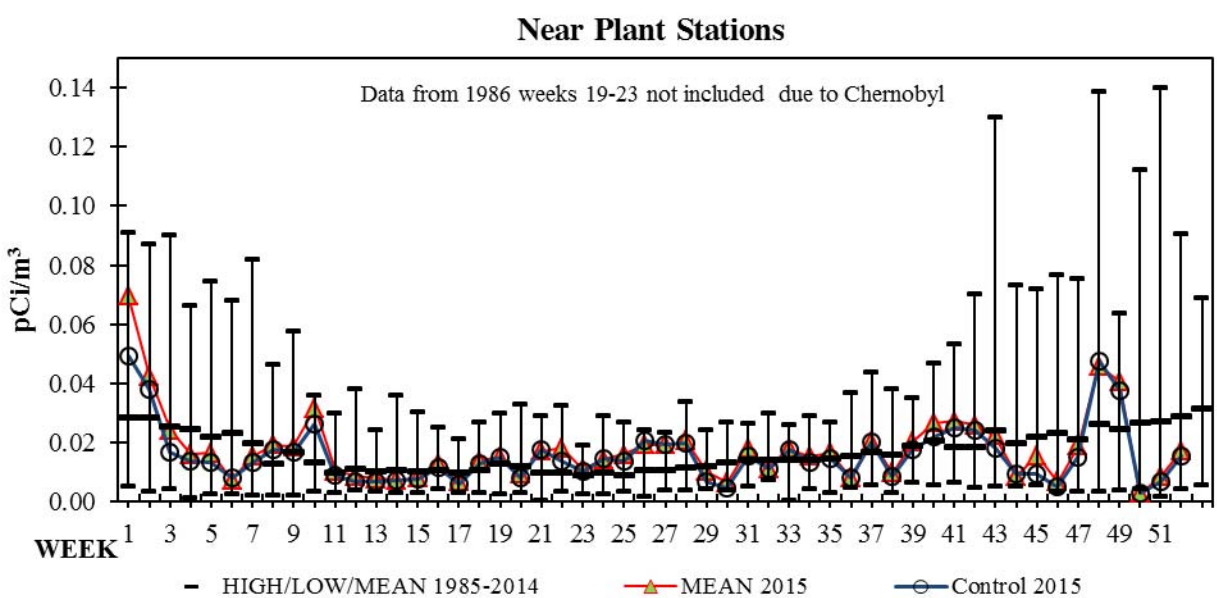

Figure 5-4 1985-2014 Weekly Hi/Low/Mean and 2015 Weekly Mean Gross Beta in Air - Near Plant Stations

The 2015 mean weekly particulate filter gross beta results for the five stations located within three miles of CGS are plotted in Figure 5-4 (See also Appendix A, Tables A-2.1, A-2.2). Results for these near plant stations are similar to results from the remote locations and closely follow the trend of the control location.

Figure 5-5 is a plot of the 2015 mean weekly particulate filter gross beta results for the 6 sample stations located between 3 and 9.6 miles from CGS (See also Appendix A, Tables A-2.1, A-2.2). Results for these remote stations are similar to results from the near plant stations and closely follow the trend of the control location. No correlation between air gross beta activity and proximity to CGS was observed.

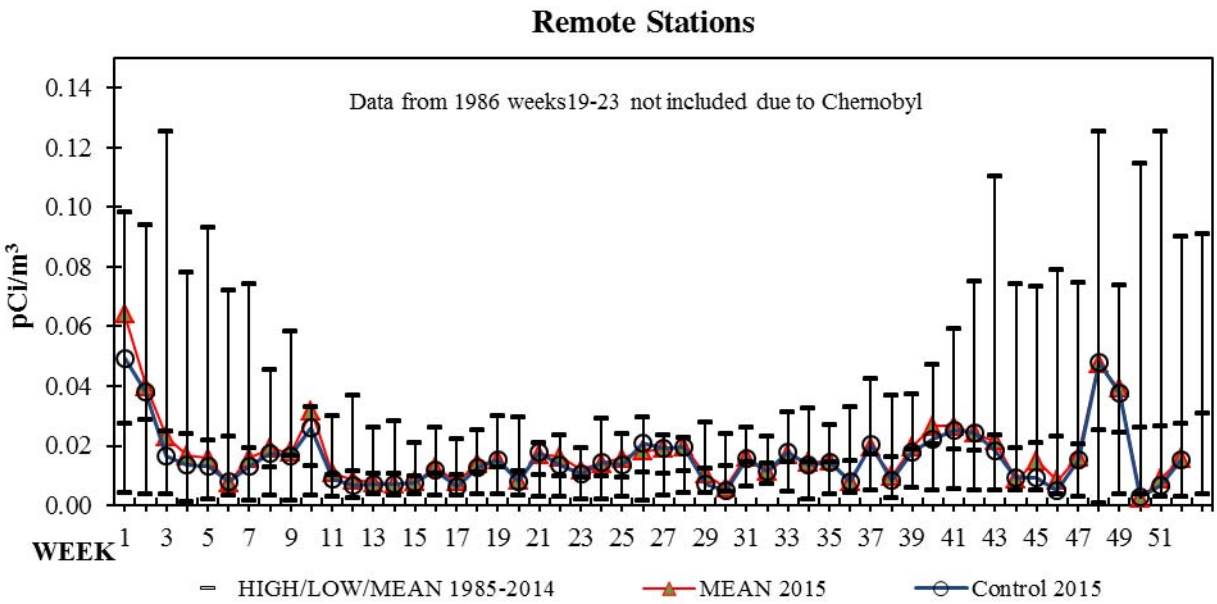

Figure 5-5 1985-2014 Weekly Hi/Low/Mean and 2015 Weekly Mean Gross Beta in Air - Remote Stations

For both near and remote air station locations, higher results and greater variability in air gross beta activity have historically been observed during fall and winter months due to weather induced background fluctuations. Gross beta levels typically increase during periods of inversion due to natural decay products being trapped near the earth surface. Gross beta results plotted over a period of several years typically show a cyclical pattern with higher results observed in the fall and winter compared to the spring and summer. Gross beta results were observed above the average trend range in January, March, November, and December. The increases observed during these periods occurred at all sample locations including the control and are attributed to weather phenomena and not the result of CGS operation. A period above the normal trend range was also observed for an 8 week period starting in week 21. This time period was characterized by above normal temperatures. The highest particulate filter gross beta results for the year occurred during week 1; weather conditions for this week were characterized by periods of fog and freezing rain, significant cloud cover, and moderate winds. Results for week 1 were also observed to be higher at the indicator locations than at the control location. This is attributed to difference in weather conditions during this week at the control location (Yakima Valley) versus condition at the indicator locations (Columbia Basin).

Quarterly gamma isotopic analysis of the air particulate filters identified only the presence of Beryllium-7; this isotope was identified in all control and indicator samples. (See Appendix A, Tables A-3.1, A-3.2). Beryllium-7 is a naturally occurring radionuclide formed in the upper atmosphere by interaction with cosmic radiation and is not a radionuclide associated with CGS operation.

The 2015 weekly iodine cartridge isotopic results showed no indication of radioiodines in any of the samples. Results for iodine-131 were in all cases below the lower limit of detection. (See Appendix A, Tables A-4.1, A-4.2). The 2015 air particulate and iodine sample results show no evidence of measurable environmental radiological air quality impact that can be attributed to CGS plant operation.

5.3 Water

5.3.1 Surface Water

Composite water samples are collected from five surface water locations monthly and analyzed for tritium, gross beta, and gamma emitting radionuclides. A plot of the 2015 gross beta results for the plant intake, plant discharge, and river/drinking water stations are shown in Figure 5-6.

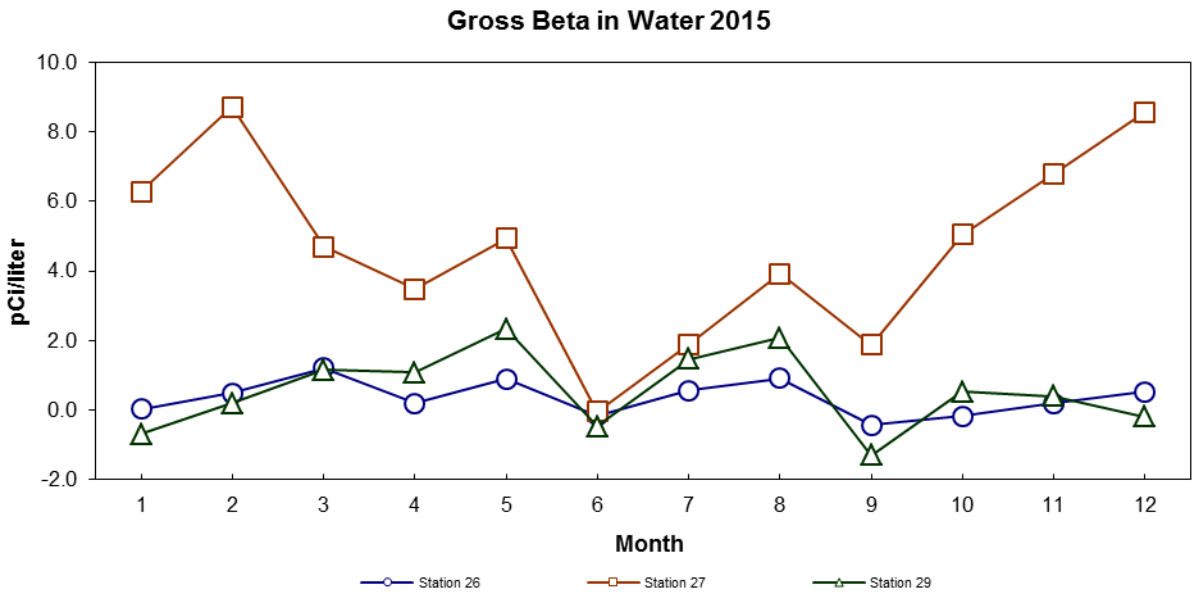

Figure 5-6 Gross Beta in River/Drinking (Stations 26 & 29) and Plant Discharge Water (Station 27) for 2015

All drinking and river water (Stations 26 and 29) gross beta results were below the analysis detection limits with the exception of the May Station 29 sample which was just above the detection limit (See Appendix A, Tables A-5.1, A-5.2) . Gross beta levels in the plant discharge water (Station 27) were above the detection limits in nine of the twelve samples. Positive results for this location are expected due to concentration of natural radioactivity in the water by evaporative loss and the scrubbing action of the cooling towers which incorporates atmospheric particulate material into the discharge water. Historically, higher gross beta results at Station 27 can be correlated to the level of calcium concentration in the CGS circulating water. The Station 27 sample results are representative of the radioactivity present in plant discharge water before any mixing with river water occurs.

Monthly tritium results for all plant intake, plant discharge, and river/drinking water samples were below the analysis method *a priori* LLD. Tritium results for the three sample locations are plotted in Figure 5-7, quarterly averages for the locations are listed in Appendix A, Tables A-6.1, A-6.2.

Gamma spectroscopy results for all plant intake, plant discharge, and river/drinking water samples identified only naturally occurring radionuclides; no gamma-emitting radionuclides related to CGS operation were positively identified in these samples. (See Appendix A, Tables A-7.1, A-7.2).

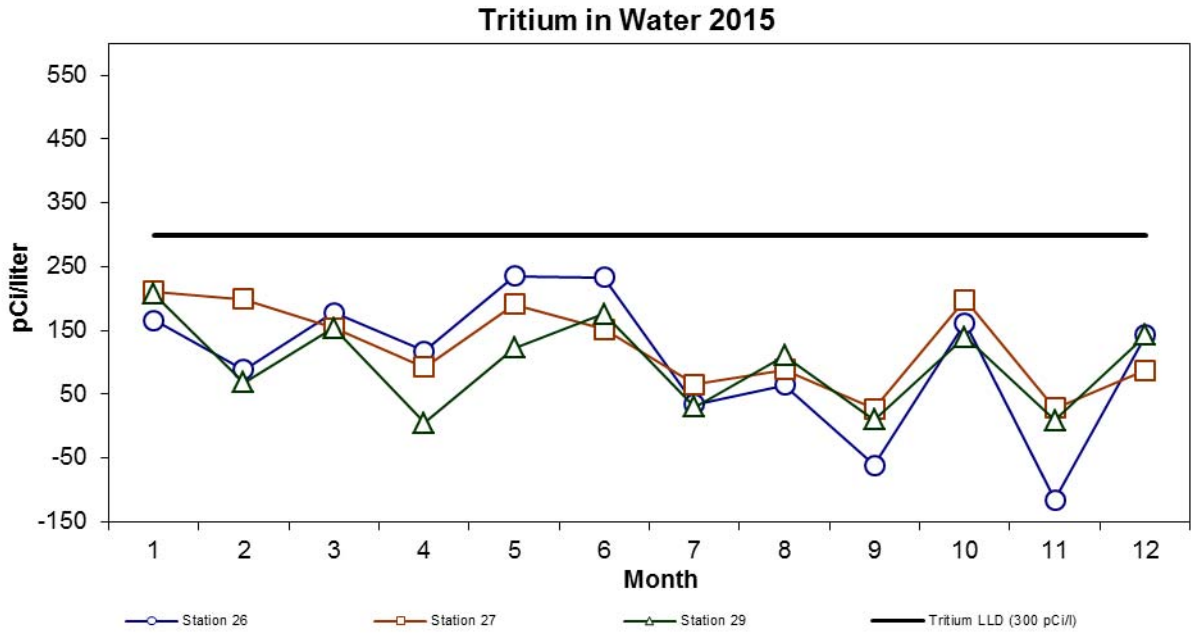

Figure 5-7 Tritium in River/Drinking (Stations 26 & 29) and Plant Discharge Water (Station 27) for 2015

Analysis results for the plant intake, plant discharge, and river/drinking water samples showed no measurable impact to the environment due to CGS plant operations in 2015. Composite water samples are also taken from a sanitary waste and storm drain location. Analysis results for these samples are discussed in further detail in Section 5.9.

5.3.2 Ground Water

Samples from 3 deep wells were collected quarterly to meet ODCM and EFSEC Resolution No. 332[9] requirements. Quarterly samples were also collected from nine shallow groundwater monitoring wells located near CGS as part of the CGS groundwater monitoring program. All well samples were analyzed for tritium and gamma emitting radionuclides. Well locations sampled are shown in Figures 4-1 and 4-2.

Analytical results for the three deep water wells were consistent with results seen in previous years. Tritium results were below detection limits and no gamma emitting radionuclides related to CGS operation were identified in any samples (See Appendix A, Tables A-6.1, A-6.2, A-7.1, and A-7.2).

The CGS groundwater monitoring program is conducted to meet the Nuclear Energy Institute (NEI) Groundwater Protection Initiative (NEI 07-07) [17] guidelines and to support NPDES requirements. Water samples from the unconfined aquifer are collected quarterly from nine shallow monitoring wells located around the CGS site. None of these monitoring wells are used as a source of drinking water. CGS is unique in the commercial nuclear power industry in that it is located in an area where the unconfined aquifer under the site is known to be contaminated with tritium as a result of past DOE activities on the Hanford Site.[19] The CGS groundwater program is intended to assess any contribution CGS may be making to the known groundwater contamination issue.

Gamma Spectroscopy results for the nine shallow monitoring wells did not identify any gamma emitting radionuclides of interest (See Appendix A, Tables B-10.1, and B-10.2). Tritium concentrations at these locations ranged from < LLD to 14,500 pCi/liter (See Appendix A, Table B-

11.1). Tritium results from each well were consistent during the year and within the trend range observed in previous years. The highest tritium concentrations were measured at MW-5 which is hydraulically up-gradient of CGS. In past years, Energy Northwest has identified a correlation between tritium levels in storm drain water (Station 101) and tritium levels at nearby well locations. No correlation could be substantiated in 2015. Samples from the wells where the correlation was observed (MW-7 and MW-8) could not be obtained due to the water level at these locations falling below the well depth. With storm drain water now discharged to a lined evaporation pond, the tritium to groundwater pathway that existed has been eliminated and the potential for CGS to impact groundwater tritium levels greatly reduced. Evaporation pond and storm drain water sampling and analysis results are discussed in greater detail in section 5.9.1. All tritium identified in the shallow monitoring well samples is attributed to past DOE activities and not CGS operation. The 2015 groundwater sample results show no evidence that CGS made a measurable radiological impact on groundwater.

5.4 Soil

Gamma spectroscopy analysis was performed on soil samples from 5 different locations in 2015 (See Appendix A, Tables A-8.1, A-8.2). Two of the samples were from locations near CGS, two were from locations east of CGS in Franklin County, and one was from a control location. Naturally occurring radionuclides (potassium- 40 and bismuth- 214) were identified in all samples. Cesium-137 was identified in two of the four indicator locations. The level of cesium-137 identified was within the range historically observed in local soil and within the range considered normal background in Hanford area soils.[20,21,22] The cesium-137 level was well below the level that would require strontium-90 analysis to be performed.[9] The soil sample results indicate no measurable impact from CGS plant operation.

5.5 River Sediment

Gamma spectroscopy results of river sediment identified naturally occurring radionuclides (potassium-40, bismuth- 214, beryllium-7) and cesium-137 (See Appendix A, Tables A-9.1, 9.2). Relative to the circulating water discharge point, cesium-137 was detected in both the downstream samples (Station 34) and the upstream samples (Station 33). The downstream cesium-137 activity levels were slightly higher than the upstream levels. All cesium-137 results were within the range identified in previous years and within the range known to be present in Hanford area sediment and soil.[21] Cesium-137 was not identified in any samples of plant cooling water discharged to the Columbia River. CGS has not made a radioactive discharge to the Columbia River since 1998. The sediment sample results indicate no measurable impact from CGS plant operation.

5.6 Fish

The gamma spectroscopy results of fish samples collected at both the indicator location (Columbia River) and the control location (Snake River) identified only the presence of naturally occurring radionuclides (See Appendix A, Tables A-10.1, 10.2). Only two of the three fish species collected from the control location were the same species as collected from the indicator location. See section 5.10 for further discussion.

5.7 Milk

No radioiodine activity was identified in any of the milk samples collected in 2015 (See Appendix A, Tables A-11.1, A-11.2). Gamma spectroscopy results of milk radionuclides other than radioiodine did not identify the presence of any radionuclides of interest. (See Appendix A, Tables A-12.1, A-12.2).

Naturally occurring potassium-40 was identified in all milk samples. One control milk sample was not obtained in August; see section 5.10 for further discussion.

5.8 Garden Produce

Gamma analysis was performed on fourteen different types of fruits and vegetables in 2015 (See Appendix A, Tables A-15.1, A-15.2, A-16.1, A-16.2, A-17.1, A-17.2). No radionuclides of interest were identified in any of the samples. Naturally occurring potassium-40 was identified in all samples.

5.9 Special Interest Stations

Sampling and analysis is performed at the locations covered in this section to comply with EFSEC requirements or as a CGS initiative. Sanitary Waste Treatment Facility (SWTF) and storm drain water sampling were incorporated into the routine sampling schedule in 1992. In 1995, the cooling tower sediment disposal area was added. TLDs were placed at the spray pond drain field (Station 120) in June 1995. TLD monitoring in the vicinity of the planned Independent Spent Fuel Storage Installation (ISFSI) was first performed in 1998 to collect background data and TLD monitoring was established on the ISFSI fence line after construction was completed in 2002. Additional air monitoring and TLDs stations were established in 2008/2009 to monitor remediation work at the DOE 618-11 burial ground west of CGS. Discussion of the results from each of these locations are given in the following sections.

5.9.1 Evaporation Pond (Station 101B)

The Station 101B composite sampler samples storm drain, air wash, and non-radioactive system wastewater originating from within the CGS protected area. Water from these sources has been directed to two lined evaporation ponds since November 2014. Wastewater originating outside the CGS protected area is typically directed to three other lined evaporation ponds that are not sampled by the Station 101B sampler. Figure 4-1 shows the location of the five evaporation ponds, Station 101B samples water flowing into ponds 3 and 4. Sampling and analysis at this location is specified in EFSEC Resolutions.[9,23] Historically, the water directed to the evaporation ponds was discharged to an unlined storm drain pond. No water was discharged to this pond in 2015 and the pond area is undergoing remediation.

Monthly composite water samples were analyzed for gamma emitting radionuclides, tritium, and gross beta. Low level cobalt-60 and elevated gross beta activity was identified in the June composite sample; the finding was documented in CR 333542. The most probable source of the activity was wastewater generated from the cleaning of the Standby Service Water pump pits. This wastewater was pumped to the evaporation ponds in May and June; sediment and biological material from the pump pit was known to contain cobalt-60 activity. Gross beta results for July and August were also noted to be above trend though no gamma emitting radionuclides of interest were identified in these samples. (See Appendix A, Tables B-2.1, B-2.2, B-3.1, B-3.2). Tritium was detected in nine of the twelve samples (See Appendix A, Tables B-4.1, B-4.2). The samples with higher tritium levels were all from colder, wetter months which is consistent with results seen in previous years. The source of the tritium in storm drain water is attributed to recapture of tritium from CGS gaseous effluents which is more likely to occur during cooler, rainier periods. The tritium concentrations identified in January and February were considerably higher than historically observed. These results were expected, however, as the water now sampled at Station 101B is no longer being diluted by non-protected area wastewater. Calculations taking into account the historic dilution volume show that the Station 101B dilution corrected tritium concentrations for January and February were within the historical trend.

Water grab samples were collected from all five ponds in March and analyzed for tritium, gross beta, and gamma emitting radionuclides. All gross beta results were below detection limits. Gamma analysis did not identify any radionuclides related to CGS operation. Tritium was identified in ponds 3 and 4 as expected; no tritium was positively identified in the ponds 1A, 1B, or 2. (See Appendix A, Tables B-12.1, B-14.1, B-15.1).

Dried sediment samples collected in the summer and fall from evaporation ponds 1B, 3, and 4 were analyzed for gamma emitting radionuclides. Samples were collected when the ponds were almost dry allowing sediment to be collected from multiple locations. Only naturally occurring radionuclides were identified in pond 1B sediment, low level cobalt-60 and cesium-137 activity was identified in both pond 3 and pond 4 sediment. (See Appendix A, Table B-13.1). These results were not unexpected as transfer of wastewater known to contain low level cobalt-60 activity was made to evaporation ponds 3 and 4 from the Standby Service Water Pump pit cleaning in May. Additionally, recapture of CGS gaseous effluents has been identified as the source of the low level cobalt-60 activity that historically has been identified in the storm drain pond soil. With storm drain water now directed to evaporation ponds 3 and 4, it was expected that radionuclides observed in CGS gaseous effluents would eventually be identified in evaporation pond sediment.

5.9.2 Sanitary Waste Treatment Facility (Station 102B)

The Sanitary Waste Treatment Facility (SWTF) is located approximately 0.5 miles south-southeast of CGS. The facility processes sanitary waste water from CGS, the ENW Industrial Development Complex (formerly referred to as WNP-1 and WNP-4), and the Kootenai Building. The Station 102B composite sampler collects wastewater as it enters the SWTF head works. Discharge standards and monitoring requirements for the SWTF are established in EFSEC Resolution No. 300.[16] No sanitary waste water from the DOE 400 area was processed at the SWTF in 2015. No SWTF water was discharged to ground in 2015.

Low level gross beta was identified in all twelve Station 102B samples. The levels identified were consistent with levels identified in previous years. Gross alpha was not positively identified in any of the Station 102B samples. (See Appendix A, Tables B-5.1, B-5.2, B-6.1, B-6.2).

Gamma spectroscopy results of the monthly Station 102B samples identified only naturally occurring radionuclides (See Appendix A, Tables B-7.1, B-7.2).

No tritium activity was positively identified in any of the Station 102B samples in 2015 (See Appendix A, Tables B-8.1, B-8.2). Tritium activity has been historically identified in the Station 102B samples but was attributed to be solely from the DOE 400 area which utilized well water known to be contaminated with tritium as the result of past DOE activities on the Hanford site.[17] With processing of DOE 400 area wastewater terminated in December 2013, the source of the tritium in the SWTF was removed. The absence of any tritium in the 2014 and 2015 SWTF samples confirms that the DOE 400 area was the sole source of tritium historically observed at the SWTF.

5.9.3 Cooling System Sediment Disposal Area (Station 119)

EFSEC Resolution No. 299[18] authorizes the onsite disposal of sediments from plant cooling systems containing low levels of radionuclides. The disposal area for these sediments is located just south of the CGS cooling towers. EFSEC Resolution No. 299[18] requires direct radiation monitoring using quarterly TLDs in the vicinity of the disposal cells and the collection and analysis of a dry composite sediment

sample from the disposal cell within thirty days following each cleaning in order to confirm that the disposal criteria outlined in the resolution have not been exceeded.

The source of the radioactivity identified in cooling tower sediment is attributed to incorporation of radionuclides present in the general environment (cesium-137) or recapture of radionuclides in CGS gaseous effluents (cobalt-60). As air is pulled through the cooling towers, atmospheric particles are incorporated into the cooling water. Algae and other biological organisms present in the cooling tower environment actively assimilate the radionuclides resulting in concentrated and measurable levels of the radionuclides in these biological materials. The material removed during cleaning and referred to as sediment is composed in large part of algae and other biological organisms that exist in the cooling tower environment.

Cleaning of the CGS cooling towers was performed in May and October 2015. The May cleaning occurred during the R-22 refueling outage; both the tower upper decks and tower basins were cleaned at this time. Disposal of the material removed during the tower cleanings resulted in an estimated 154 cubic meters of dry sediment being added to the disposal cell. Cleaning of the Standby Service Water Pump pits during the R-22 outage resulted in an additional 5.3 cubic meters of dry sediment being added to the disposal cell.

	2015 Cooling System Sediment Disposal Data				
	Disposal Date	May-15	May-15	Oct-15	
	Description:	R-22 Cleaning	SSW Pump Pit	Fall Cleaning	
	Pit ID:	2007 Pit	2007 Pit	2007 Pit	
	Mass, kg	132,920	2,975	4,020	
	Density, g/cc	0.90	0.56	0.76	
Nuclide	Limit (pCi/kg)	Analytical Result (pCi/kg)	Analytical Result (pCi/kg)	Analytical Result (pCi/kg)	Total Curies
Co-60	5.00E+03	1.55E+02	1.31E+03	1.35E+02	2.50E-05
Mn-54	3.00E+04	< 3.60E+01	<4.65E+01	<4.10E+01	5.09E-06
Zn-65	5.00E+04	<6.65E+01	<1.39E+02	<7.85E+01	9.57E-06
Cs-134	1.00E+04	<2.28E+01	<4.38E+01	< 3.78E+01	3.31E-06
Cs-137	2.00E+04	1.96E+02	<5.07E+01	1.94E+02	2.70E-05
					7.00E-05

Figure 5-8 Cooling System Sediment Activity Levels For Disposals Made In 2015

A summary of the estimated mass and radionuclide content of all transfers to the disposal cell area in 2015 is presented in Figure 5-8. For those isotopes listed in the table that were not positively identified, the MDA value obtained from the sample analysis was used in the table calculations. As such, the total activity reported is a conservative estimate.

As shown in Figure 5-8, all material transferred to the disposal cell area in 2015 was below the disposal concentration limits specified in EFSEC Resolution No. 299.[18] Cesium-137 and cobalt-60 levels in cooling tower sediment were in the range typically observed in previous years. Cesium-137 levels identified were within the range typically observed in Hanford area soils. Sediment from the Standby Service Water Pump pit cleaning contained a higher level of cobalt-60 than is typically seen in Cooling Tower sediment but below the level observed in Standby Service Water pond sediment in recent years.

Measurements of direct radiation at the disposal pit area were taken using TLDs. Two locations were used, an indicator location by the collection area (Station 119B) and a control location approximately 200 yards to the east (Station 119C). The negligible difference between the indicator and the control TLDs indicate that there was no measureable dose contribution above background due to material in the disposal cells. (See Tables 5.3 and Appendix A, Tables B-1.1).

5.9.4 Spray Pond Drain Field (Station 120)

There were no discharges to the Spray Pond Drain Field in 2015. The TLD results at Station 120 in 2015 are in agreement with those seen in previous operational years (See Table 5-3 and Appendix A, Tables B-1.1).

5.9.5 Independent Spent Fuel Storage Installation

The Independent Spent Fuel Storage Installation (ISFSI) is a fenced, secured area north northwest of CGS. Ten TLDs, Stations 123-129 and Stations 136A-138A, are located on the second of three security fences that surround the ISFSI. TLD Station 122 is just north of the ISFSI between the ISFSI and the plant access road. TLD Station 121 is located approximately 0.1 mile north of the plant between the Transformer Yard and the ISFSI. Refer to Figure 4-4 for ISFSI TLD locations.

Radiological exposure rates inside the ISFSI security fence line are elevated and access to the area requires radiological dosimetry and security notification. In addition to the TLD monitoring program, quarterly radiological surveys of the ISFSI are conducted by the CGS Radiation Protection Department.

No new spent fuel casks were added to the ISFSI in 2015. As shown in Figure 5-9, exposure rates at the ISFSI fence line show mostly a downward trend since the second quarter 2014 when spent fuel was last added to the ISFSI. The TLD stations with the highest dose rates are located on the south fence; these stations are closest in proximity to the spent fuel casks moved to the ISFSI in 2014. The increase seen at Station 137A during the fourth quarter 2014 is suspect. A spike of similar magnitude was not observed by the Washington Dept. of Health who co-locates a TLD at this location, other TLDs near Station 137A (Stations 136A and 138A) did not show a similar increase. Station 122 TLD results in 2015 show a flat trend line with no observable increase. This location is effectively shielded from the new fuel casks added to the south pad by the older casks in place on the north pad.

Station 121 TLD results showed a marked decrease during the second quarter then a return to the normal trend in the third and fourth quarters. The plant was shut down for the R-22 outage during the second quarter. Historically, this location has been influenced more by turbine building radiation levels than by the ISFSI (See Table 5-3 and Appendix A, Tables B-1.1, B-1.2).

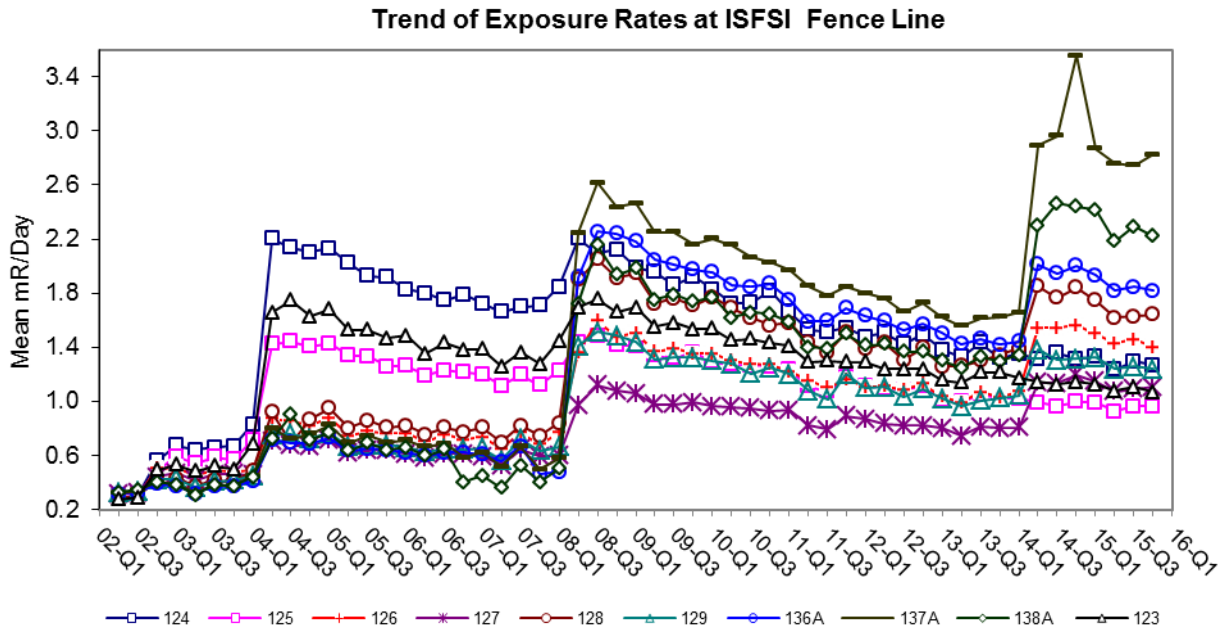

Figure 5-9 ISFSI TLD Trend at CGS

5.9.6 Miscellaneous Environmental Sample Results

Four air sample locations (Stations 87-90) and 5 TLD stations (Stations 58, 87-90) were established in 2008/2009 in order to monitor air quality and direct radiation during remediation work at the DOE 618-11 burial ground located just west of CGS (See Figure 4-1). In March 2015, DOE personnel removed dirt containing low level activity from the UPR-600-22 area located just north of the 618-11 burial ground. Air samples were collected at Station 87 and 88 the week before, during, and after the operation in order to assess any potential impact to CGS. Air particulate gross alpha and beta results were similar to results from other air sampling locations including those that would not be impacted by the dirt removal operation. Gamma isotopic results of the air filters identified only naturally occurring radionuclides. Quarterly TLDs were exchanged at all five locations in 2015. Three of the TLD stations (stations 87-89) had results higher than background due to the TLD stations close proximity to the turbine building (See Appendix A, Table B–1.1).

Apple samples from both control and indicator locations were collected in the summer and fall of 2015 and analyzed for carbon-14 content. Analyses were performed by GEL Laboratories, LLC located in Charleston, SC. Results showed higher than desired variability but in general were similar for both indicator and control samples. All results were near the range calculated to be present due solely to carbon-14 background contributions. The results do not indicate any discernable effect that could be attributed to CGS operation. (See Appendix B, Table B–17.1).

Snow samples collected from six locations on the CGS site in December 2015 and January 2016 were analyzed for tritium content as a CGS initiative. All results were below the analysis method a *priori* LLD (See Appendix A, Table B-16.1).

5.10 2015 Sample Deviations

A summary of REMP sample deviations encountered in 2015 is listed below in Table 5-1a. All known deviations from the sampling schedule (i.e. sample was not obtained) or analyses where the ODCM specified lower limit of detection was not achieved are included. For locations where composite or continuous samples are collected, any known period greater than 24 hours during which samples were not collected have been included. All locations listed in Table 5-1a are required by either the ODCM or EFSEC resolutions. Table 5-1b lists information regarding air sample station sampling requirements.

TABLE 5-1a
REMP Sample Deviations for 2015

SAMPLE MEDIA	DATE	LOCATION	CR ID	PROBLEM / COMMENTS
Air Sampler	5/15/15 to 5/16/15	Station 1	328268	Station off for 37 hours due to planned power outage during R-22. Station confirmed operational after power restored. Sufficient sample volume obtained to meet LLD.
Air Sampler	5/19/15 to 5/21/15	Station 23	329294	Station OOS for 50 hours due to blown fuse following power outage. Fuse replaced, station returned to service. Sufficient sample volume obtained to meet LLD.
Air Sampler	7/12/15 to 7/14/15	Station 40	333201	Station found off with blown fuse, estimate station OOS for 45 hours. Fuse replaced, station returned to service. Sufficient sample volume obtained to meet LLD.
Water	5/11/15 to 5/16/15	Station 27	327918	Circ water blowdown sampler found not sampling on 5/15/15; Circ water blowdown in progress at ~1300 gpm using temporary pumps. Problem determined to be due to power outage effecting CBD-LCV-1 interlock logic. Composite samplers verified to be operable on 5/16/15 after power was restored to CBD-LCV-1. Estimated OOS time was 113 hours.
Water	5/27/15 to 5/30/15	Station 27	329806	Circ water blowdown sampler declared non- functional. Determined power outage affected CBD-LCV-1 interlock logic resulting in loss of supervisory signal to sample racks. Limit switch removed restoring supervisory signal, sample rack confirmed operational. Estimated OOS time was 88 hours.
Water	12/18/15 to 12/22/15	Station 27	341831	Circ water blowdown samplers declared OOS due to counter not advancing, loss of supervisory signal. The in-service sample rack was placed into timed mode on 12/22/15 and verified to be collecting sample. Supervisory signal restored 12/31/15.
Water	12/1/15 to 12/3/15	Station 101	341277	Storm drain water sampler determined to not be collecting sample on 12/3/15. Installed temporary sampler and verified sample collected on 12/3. Issue with the installed sampler corrected and installed sampler returned to service on 12/14/15. Estimate sampler OOS for ~ 48 hours.

TABLE 5-1a (Cont.) REMP Sample Deviations for 2015				
SAMPLE MEDIA	DATE	LOCATION	CR ID	PROBLEM / COMMENTS
Milk	8/19/15	Stations 9	335039	Control milk sample location found out of business with no milking animals on premise. Attempted to obtain milk from nearby location but was not successful. Identified temporary control milk source for September sample and established new control milk location in October 2015.
Fish	Annual	Stations 30 and 38	343596	ODCM fish collection requirements not strictly meet in 2015. 3 fish species were obtained from both the control and indicator locations; however only 2 of the 3 species collected at the control location were the same species that were collected at the indicator location.

Table 5-1b below shows the percent in service time for the 12 air sample locations. The table shows that overall availability was greater than 99% for all sample locations.

TABLE 5-1b CGS REMP Air Sample Percent in Service Time for 2015			
Station ID	ODCM Required	EFSEC Required	Percent Time in Service
1		x	99.5%
4	x	x	99.9%
5			99.9%
6		x	99.9%
7		x	99.8%
8	x	x	99.9%
9	x	x	99.8%
21			99.5%
23		x	99.2%
40	x	x	99.1%
48	x	x	99.8%
57	x		99.8%

TABLE 5-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: Environmental Direct Radiation (TLD) **Units: mR/std. quarter**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD)	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
TLD Quarterly	228	---	22.0 (224 / 224) (18.8-29.7)	86 NNW 0.3 miles	28.4 (4/4) (27.5-29.7)	20.5 (4/4) (19.8-21.3)	0

a. (f) is the number of positive measurements / total measurements at specified location.

Reference Appendix A, Tables A-1.1, A-1.2

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: ISFSI Direct Radiation (TLD) **Units: mR/std. quarter**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD)	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
TLD Quarterly	40	---	143.7 (40 / 40) (84.5-261.8)	137A NNW 0.24 miles	255.4 (4 / 4) (250.2-261.8)	--- (0 / 0)	0

a. (f) is the number of positive measurements / total measurements at specified location.

Reference Appendix A, Tables B-1.1, B-1.2

ISFSI TLDs are Stations 123 to 129 and 136A to138A

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: Air Particulate/Air Radioiodine **Units: pCi/m^3**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD)[b]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
Gross Beta	624	0.01	0.0174 (572/572) (0.00171-0.0754)	57 N 0.70 miles	0.018 (52/52) (0.00343 - 0.0748)	0.0156(52/52) (0.00282 - 0.0492)	0
I-131	624	0.07	--- (0 / 572)	---	---	--- (0 / 52)	0
Cs-134	48	0.05	--- (0 / 44)	---	---	--- (0 / 4)	0
Cs-137	48	0.06	--- (0 / 44)	---	---	--- (0 / 4)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Tables A-2.1, A-2.2, Tables A-3.1, A-3.2, and Tables A- 4.1, A-4.2.

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: Water-River/Drinking **Units: pCi/L**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) [c]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
Gross Beta	24	4.0	0.547(1 / 24)[(b)] (-4.33-2.33)	29 SSE 11.6 miles	0.547(1/12) (-1.30-2.33)	--- (0 / 12)	0
H-3	8	2000	--- (0 / 8)[(b)]	---	---	--- (0 / 4)	0
Mn-54	24	15	--- (0 / 24) [(b)]	---	---	--- (0 / 12)	0
Fe-59	24	30	--- (0 / 24) [(b)]	---	---	--- (0 / 12)	0
Co-58	24	15	--- (0 / 24) [(b)]	---	---	--- (0 / 12)	0
Co-60	24	15	--- (0 / 24) [(b)]	---	---	--- (0 / 12)	0
Zn-65	24	30	--- (0 / 24) [(b)]	---	---	--- (0 / 12)	0
Zr/Nb-95	24	15	--- (0 / 24) [(b)]	---	---	--- (0 / 12)	0
Cs-134	24	15	--- (0 / 24) [(b)]	---	---	--- (0 / 12)	0
Cs-137	24	18	--- (0 / 24) [(b)]	---	---	--- (0 / 12)	0
Ba/La-140	24	15	--- (0 / 24) [(b)]	---	---	--- (0 / 12)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. This includes the control sample for this group; the control (Station 26) is also a drinking water sample.

c. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Tables A-5.1,A-5.2, Tables A-6.1, A-6.2, and Tables A-7.1, A-7.2

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: Water-Discharge **Units: pCi/L**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD)[b]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
Gross Beta	12	4.0	4.68 (9 / 12) (-0.0405-8.71)	27 E 3.2 miles	4.68 (9 / 12) (-0.0405-8.71)	---(0 / 0)	0
H-3	4	2000	--- (0/ 4)	---	---	--- (0 / 0)	0
Mn-54	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Fe-59	12	30	--- (0 / 12)	---	---	--- (0 / 0)	0
Co-58	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Co-60	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Zn-65	12	30	--- (0 / 12)	---	---	--- (0 / 0)	0
Zr/Nb-95	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Cs-134	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Cs-137	12	18	--- (0 / 12)	---	---	--- (0 / 0)	0
Ba/La-140	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Tables A-5.1,A-5.2, Tables A-6.1, A-6.2, and Tables A-7.1, A-7.2

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: Water- Deep Ground **Units: pCi/L**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD)[b]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
H-3	12	2000	--- (0 / 12)	---	---	--- (0 / 0)	0
Mn-54	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Fe-59	12	30	--- (0 / 12)	---	---	--- (0 / 0)	0
Co-58	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Co-60	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Zn-65	12	30	--- (0 / 12)	---	---	--- (0 / 0)	0
Zr/Nb-95	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Cs-134	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Cs-137	12	18	--- (0 / 12)	---	---	--- (0 / 0)	0
Ba/La-140	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Tables A-6.1, A-6.2, and Tables A-7.1, A-7.2

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: Water- Shallow Ground **Units: pCi/L**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) [b]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
H-3	36	2000	3850 (27 / 36) (151-14,500)	MW-5 SW 0.43 miles	14,325 (4 / 4) (14,100-14,500)	--- (0 / 0)	0
Mn-54	36	15	--- (0 / 36)	---	---	--- (0 / 0)	0
Fe-59	36	30	--- (0 / 36)	---	---	--- (0 / 0)	0
Co-58	36	15	--- (0 / 36)	---	---	--- (0 / 0)	0
Co-60	36	15	--- (0 / 36)	---	---	--- (0 / 0)	0
Zn-65	36	30	--- (0 / 36)	---	---	--- (0 / 0)	0
Zr/Nb-95	36	15	--- (0 / 36)	---	---	--- (0 / 0)	0
Cs-134	36	15	--- (0 / 36)	---	---	--- (0 / 0)	0
Cs-137	36	18	--- (0 / 36)	---	---	--- (0 / 0)	0
Ba/La-140	36	15	--- (0 / 36)	---	---	--- (0 / 0)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Tables B-10.1, B-10.2, and B-11.1.

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: River Sediment **Units: pCi/kg**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) [b]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
Cs-134	4	150	--- (0 / 2)	---	---	--- (0 / 2)	0
Cs-137	4	180	159 (2 / 2) (129-190)	34 ESE 3.32 Miles	159 (2 / 2) (129-190)	104 (2 / 2) (83.6-125)	0
Co-60	4	---	--- (0 / 2)	---	---	--- (0 / 2)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Tables A-9.1, A-9.2.

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calender Year 2015**

Medium: Roots **Units: pCi/kg**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) [b]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
I-131	6	60	--- (0 / 4)	---	---	--- (0/2)	0
Cs-134	6	60	--- (0 / 4)	---	---	--- (0/2)	0
Cs-137	6	80	--- (0 / 4)	---	---	--- (0/2)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Tables A-15.1, A-15.2.

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: Fruits **Units: pCi/kg**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) [b]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
I-131	8	60	--- (0 / 7)	---	---	--- (0 / 1)	0
Cs-134	8	60	--- (0 / 7)	---	---	--- (0 / 1)	0
Cs-137	8	80	--- (0 / 7)	---	---	--- (0 / 1)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Table A-16.1, A-16.2.

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: Vegetables and Vegetation **Units: pCi/kg**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD)[b]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
I-131	13	60	--- (0 / 12)	---	---	--- (0 / 1)	0
Cs-134	13	60	--- (0 / 12)	---	---	--- (0 / 1)	0
Cs-137	13	80	--- (0 / 12)	---	---	--- (0 / 1)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Table A-17.1, A-17.2.

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: Fish **Units: pCi/kg**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD)[b]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
Mn-54	6	130	--- (0 / 3)	---	---	--- (0 / 3)	0
Fe-59	6	260	--- (0 / 3)	---	---	--- (0 / 3)	0
Co-58	6	130	--- (0 / 3)	---	---	--- (0 / 3)	0
Co-60	6	130	--- (0 / 3)	---	---	--- (0 / 3)	0
Zn-65	6	260	--- (0 / 3)	---	---	--- (0 / 3)	0
Cs-134	6	130	--- (0 / 3)	---	---	--- (0 / 3)	0
Cs-137	6	150	--- (0 / 3)	---	---	--- (0 / 3)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Table A-10.1, A-10.2.

TABLE 5-2 (cont.)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

COLUMBIA GENERATING STATION **DOCKET NO. 50-397**

Benton County, Washington **Calendar Year 2015**

Medium: Milk **Units: pCi/L**

Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) [b]	Indicator Locations Mean (f)[a] Range	Location With Highest Annual Mean		Control Locations Mean (f)[a] Range	Number of Nonroutine Measurements
				Location Information	Mean (f)[a] Range		
I-131	35	1.0	--- (0 / 18)	---	---	--- (0 / 17)	0
Cs-134	35	15	--- (0 / 18)	---	---	--- (0 / 17)	0
Cs-137	35	18	--- (0 / 18)	---	---	--- (0 / 17)	0
Ba/La-140	35	15	--- (0 / 18)	---	---	--- (0 / 17)	0

a. (f) is the number of positive measurements / total measurements at specified location.

b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.

Reference Appendix A, Tables A-11.1, A-11.2, Tables A-12.1, A-12.2.

TABLE 5-3
QUARTERLY TLD DATA SUMMARY WITH COMPARISON TO THE PREOPERATIONAL AND OPERATIONAL PERIODS

Results in mR/Standard Quarter

	Pre-Operational				Operational to 2014				2015 Operational			
Station	Min	Max	Std Dev	Mean	Min	Max	Std Dev	Mean	Min	Max	Std Dev	Mean
1	19.16	23.73	2.07	21.90	18.25	27.38	1.62	22.12	21.61	23.00	0.59	22.19
2	17.34	22.81	2.09	21.10	16.43	25.55	1.53	21.64	21.19	21.76	0.26	21.58
3	18.25	21.90	1.46	20.42	16.43	24.64	1.65	20.84	19.93	21.13	0.54	20.72
4	15.51	23.73	2.65	19.96	14.60	22.81	1.62	19.54	18.89	19.95	0.43	19.39
5	18.25	22.81	1.74	20.76	16.43	23.73	1.61	20.02	19.07	20.26	0.48	19.68
6	18.25	21.90	1.50	20.19	16.43	23.73	1.53	20.12	19.26	20.69	0.62	19.78
7	19.16	22.81	1.69	21.33	16.43	24.64	1.67	21.08	20.66	22.22	0.64	21.38
8	21.90	25.55	1.50	23.84	15.51	27.38	1.89	23.26	23.15	24.13	0.46	23.68
9	15.51	21.90	2.00	19.85	16.43	23.73	1.64	19.81	19.80	21.30	0.63	20.52
10	19.16	22.81	1.38	20.99	16.43	24.64	1.61	20.95	19.98	21.93	0.92	21.30
11	19.16	22.81	1.38	21.44	16.43	24.64	1.43	21.53	20.88	22.00	0.54	21.69
12	20.99	24.64	1.60	23.04	18.25	26.46	1.66	23.12	22.11	24.35	1.04	23.01
13	19.16	22.81	1.54	21.44	17.34	27.38	1.74	21.30	20.40	21.70	0.59	21.28
14	19.16	24.64	2.07	21.90	17.34	25.55	1.48	21.45	21.45	22.43	0.42	21.84
15	20.99	25.55	1.37	23.15	17.34	27.38	1.66	23.02	22.42	23.96	0.63	23.11
16	20.08	23.73	1.52	22.13	16.43	26.46	1.76	21.92	21.77	22.20	0.17	22.00
17	19.16	23.73	1.62	22.81	17.34	26.46	1.56	22.50	21.86	22.93	0.53	22.34
18	20.08	23.73	1.27	22.13	16.43	25.55	1.62	22.03	21.67	23.04	0.59	22.23
19	20.08	23.73	1.24	22.01	17.34	25.55	1.54	22.16	21.51	23.55	0.92	22.86
20	19.16	23.73	1.76	21.44	17.34	25.55	1.60	21.81	22.41	23.29	0.44	22.79
21	19.16	21.90	1.25	20.68	15.51	23.73	1.42	20.29	19.61	20.98	0.72	20.36
22	19.16	23.73	1.58	22.01	16.43	25.55	1.47	21.68	20.20	21.61	0.65	21.04
23	20.08	23.73	1.49	21.60	17.34	25.55	1.60	21.16	20.96	22.33	0.67	21.78
24	20.99	23.73	1.09	21.90	17.34	50.50	3.10	22.04	21.23	23.05	0.85	21.94
25	20.99	24.64	1.46	23.15	17.34	27.38	1.87	22.75	22.45	23.18	0.33	22.72
40	17.34	21.90	1.70	19.94	15.51	24.64	1.72	19.97	18.76	19.36	0.26	19.13
41	20.08	25.55	2.00	23.73	17.34	27.38	1.99	22.37	20.44	22.07	0.77	21.58
42	20.08	23.73	1.61	22.36	17.34	26.46	1.89	21.91	21.25	22.17	0.39	21.64
43	20.99	24.64	1.49	23.12	16.43	27.38	2.06	22.56	21.03	22.53	0.64	21.78
44	19.16	22.81	1.34	21.12	15.51	24.64	1.92	20.71	19.03	20.62	0.69	19.75
45	19.16	22.81	1.37	21.25	16.43	25.55	1.76	21.12	19.91	21.11	0.64	20.51
46	22.81	28.29	2.10	26.10	19.16	31.94	2.08	26.49	26.11	28.00	0.84	26.81
47	17.34	20.99	1.73	19.85	15.51	26.28	1.67	20.19	19.59	20.77	0.48	20.19
49	21.90	21.90	-	21.90	16.43	25.55	1.53	21.88	21.06	22.06	0.45	21.46
50	20.08	20.08	-	20.08	16.43	26.46	1.72	21.56	20.81	22.40	0.74	21.87
51	19.16	21.90	1.18	20.53	16.43	24.64	1.59	21.03	19.95	21.92	0.87	20.93
53	24.64	24.64	-	24.64	18.25	29.57	2.06	23.21	21.17	22.39	0.53	21.69
54	23.73	23.73	-	23.73	18.18	26.46	1.94	22.06	20.54	23.38	1.21	21.94
55	20.99	20.99	-	20.99	16.43	25.55	1.46	21.44	20.00	22.27	1.09	21.63
56	21.90	21.90	-	21.90	16.43	25.55	1.70	21.91	21.38	23.02	0.68	22.12
58	-	-	-	-	18.07	21.86	1.07	19.64	18.74	19.97	0.67	19.51
65	-	-	-	-	17.73	22.72	1.17	19.90	19.53	20.92	0.58	20.13

TABLE 5-3
QUARTERLY TLD DATA SUMMARY WITH COMPARISON TO THE PREOPERATIONAL AND OPERATIONAL PERIODS

Results in mR/Standard Quarter

	Pre-Operational				Operational to 2014				2015 Operational			
Station	Min	Max	Std Dev	Mean	Min	Max	Std Dev	Mean	Min	Max	Std Dev	Mean
71(1S)	20.08	22.81	1.58	21.90	18.25	30.39	2.40	25.27	24.65	26.86	1.01	26.16
72(2S)	21.90	23.73	0.91	22.81	18.25	29.65	1.93	24.33	24.69	25.29	0.25	24.95
73(3S)	20.08	21.90	0.91	20.99	16.43	25.15	1.59	21.34	22.75	24.01	0.53	23.46
74(4S)	23.73	24.64	0.53	24.03	18.25	28.29	1.83	23.38	22.84	23.84	0.41	23.41
75(5S)	19.16	21.90	1.39	20.38	15.51	26.46	1.81	22.28	21.73	23.43	0.72	22.42
76(6S)	20.99	22.81	0.91	21.90	17.34	26.46	1.69	22.00	18.82	22.80	1.88	21.62
77(7S)	21.90	23.73	0.91	22.81	17.34	25.55	1.56	22.00	21.32	22.71	0.60	22.15
78(8S)	21.90	23.73	1.05	22.51	17.34	25.55	1.53	21.48	20.33	21.39	0.49	21.04
79(9S)	22.81	23.73	0.53	23.12	17.34	25.55	1.60	21.83	21.07	23.05	0.81	22.01
80(10S)	20.99	22.81	0.91	21.90	16.43	25.55	1.70	21.01	20.51	21.51	0.42	21.08
81(11S)	20.08	23.73	1.90	22.20	17.34	25.55	1.50	21.47	20.29	22.03	0.74	20.98
82(12S)	21.90	24.64	1.39	23.42	17.34	26.46	1.52	22.41	22.42	23.42	0.45	22.87
83(13S)	21.90	23.73	0.91	22.81	17.34	26.46	1.83	22.23	20.50	22.01	0.63	21.36
84(14S)	20.99	22.81	1.05	22.20	16.43	27.17	1.75	22.25	22.16	23.16	0.49	22.67
85(15S)	21.90	24.64	1.58	23.73	17.34	27.83	1.83	23.09	22.91	23.56	0.28	23.30
86(16S)			0.91		18.25	31.28	2.59	26.29	27.51	29.71	0.99	28.40
87			-		19.34	34.34	4.11	28.75	24.67	31.36	2.74	27.87
88			-		17.05	31.67	3.73	25.49	22.57	25.73	1.30	24.06
89			-		19.25	29.38	2.50	25.96	23.47	28.27	2.01	26.12
90	-	-	-	-	17.53	21.02	0.77	19.00	18.58	20.18	0.70	19.51
119B	-	-	-	-	19.24	25.64	1.42	22.08	20.81	23.17	1.01	21.74
119Ctrl	-	-	-	-	19.53	26.55	1.35	21.86	21.36	22.91	0.77	22.08
120East	-	-	-	-	19.78	31.12	1.75	22.42	22.13	22.77	0.30	22.53
121 (ISFSI)	-	-	-	-	19.52	130.27	22.68	75.21	41.40	77.59	16.37	64.27
122 (ISFSI)	-	-	-	-	19.62	42.49	7.02	31.52	35.62	37.72	0.88	36.80
123 (ISFSI)	-	-	-	-	24.99	160.33	35.31	115.24	97.65	102.68	2.32	99.85
124 (ISFSI)	-	-	-	-	26.89	201.05	45.33	141.51	112.53	121.51	3.83	117.02
125 (ISFSI)	-	-	-	-	26.46	135.52	27.20	100.96	84.45	90.50	2.48	87.69
126 (ISFSI)	-	-	-	-	26.00	145.68	32.40	89.45	127.63	136.72	3.85	131.94
127 (ISFSI)	-	-	-	-	28.97	109.16	20.38	69.12	97.84	104.84	2.95	100.85
128 (ISFSI)	-	-	-	-	25.64	187.25	47.19	105.91	147.95	159.33	5.32	151.44
129 (ISFSI)	-	-	-	-	30.16	138.08	32.10	83.67	113.27	120.82	3.59	115.53
136A (ISFSI)	-	-	-	-	28.99	205.64	60.79	109.54	165.82	176.29	4.91	169.18
137A (ISFSI)	-	-	-	-	29.47	324.49	77.78	126.23	250.23	261.78	5.40	255.35
138A (ISFSI)	-	-	-	-	28.28	224.87	58.21	103.03	199.25	220.37	9.31	207.82
Site 1			-		11.92	20.19	1.31	18.26	18.17	19.30	0.48	18.66
Site 4			-		17.02	32.20	2.46	18.97	18.74	20.10	0.62	19.66

Table 5-3 Notes:

The preoperational mean is from 1982-1983 data. Station 65 was added in 1997.

Stations 119B, 119Ctrl, and 120 were added in 1995. Stations 121 and 122 were added in 1998 for the ISFSI.

Stations 123-129 and 136A-138A were added in the 2nd quarter of 2002. Stations Site 1 and Site 4 were added in 2006.

Stations 58 and 87 to 90 were added in 2008 to monitor remediation work at DOE 618-11 burial site.

6.0 QUALITY ASSURANCE AND QUALITY CONTROL

6.0 QUALITY ASSURANCE AND QUALITY CONTROL

The REMP is designed to meet the quality assurance (QA) and quality control (QC) criteria of the NRC Regulatory Guide 4.15[7] and 10 CFR 50 Appendix B[15]. The laboratories performing sample analysis, Energy Northwest Environmental Services and Hanford External Dosimetry Program (HEDP), maintain quality control programs to ensure that analytical results are accurate, precise, and defendable. The following sections summarize the quality assurance and quality control aspects of the TLD, sample collection, and sample analysis components of the REMP.

6.1 Quality Control for the Energy Northwest Environmental TLD Program

The Quality Control program for the environmental TLD program covers the preparation, transportation, deployment, collection, storage, processing, and evaluation of the environmental TLDs and is designed to meet the requirements of NRC Regulatory Guides 4.13[8] and 4.15.[7]

From the time the TLDs are annealed to the time they are placed in the field, they are stored and transported with control TLDs. Two sets of control TLDs are used, the building controls and the transportation (trip) controls. The building controls monitor the exposure that the TLDs receive while being transported to and from the TLD vendor and while in storage awaiting deployment and analysis. The trip controls accompany the field TLDs when transported to and from the vendor and also during deployment and collection in the field. The building controls and trip controls are stored in a low background lead shield while the field TLDs are deployed. If the trip control results are greater than the building control results, the difference between the two is subtracted from the field dosimeters to account for exposure during transit.

Reader QC dosimeters serve as checks that the dosimeter reader calibration is satisfactory and that the TLDs were processed correctly. These TLDs are annealed and then given a known exposure (typically 100 mR) to a cesium-137 source. The number of QC dosimeters used during each processing is generally 10% of the number of field dosimeters. Evaluation of the 2015 reader QC dosimeter results indicated satisfactory agreement for all periods. The quarterly average reader QC results are presented in Table 6-1.

TLDs designated as spikes are prepared by the Energy Northwest Radiation Protection Department by exposing the TLDs to a calibrated source to produce a known exposure. The spiked dosimeters are submitted and processed with the field dosimeters to further verify the accuracy and precision of the environmental TLD results. Quarterly spikes receive a target exposure of 22 mR. Evaluation of the 2015 spiked dosimeter results indicated satisfactory agreement for all periods. Spiked TLD results are presented in Table 6-1.

6.2 Quality Control for the Environmental Sample Program

Quality control for the environmental sample program encompasses both the sample collection and sample analysis processes. Results are reviewed for correctness, reasonableness, and data entry errors. Sample results that are suspect are normally investigated. A crosscheck program utilizing blind samples supplied by an outside vendor is maintained for all sample media routinely analyzed.

6.2.1 Sample Collection Quality Control

Duplicate samples are collected and submitted for analysis when practical. The duplicate samples are used to assess the repeatability of the sample collection process and the precision of the analytical method.

6.2.2 Laboratory Instruments Quality Control

Analytical Balances - Analytical balances used in the laboratory for sample preparations are calibrated every six months. Performance checks are performed prior to use and span the range of intended use. Performance check results are documented on the sample preparation forms and kept with the analytical results.

Analytical Instruments – Analytical instruments used for determining radioactive emissions in samples are calibrated for efficiency annually using standard reference material traceable to the National Institute of Standards and Technology (NIST). Below is a summary of the routine QC practices for the different analytical instruments.

- Gas-flow Proportional Counter: Background and performance checks are performed daily when in use. Control charts are maintained with two and three-sigma limits specified; the checks must fall within the two-sigma warning limits prior to use. Mid-batch QC and end of batch performance checks are typically performed.
- Gamma Spectrometers: Performance checked daily for efficiency, energy per channel relationship, peak resolution, and background when in use. The checks are performed and plotted for both a low and high energy peak. Efficiency checks are held within two-sigma control limits. Long duration background checks are performed quarterly. A low level batch QC check is typically analyzed with each set of samples.
- Liquid Scintillation Counter: Background and performance checks are performed daily when in use. A performance check standard of the same matrix as the samples is analyzed and results trended. A control chart with acceptance limits specified is maintained. A low level batch QC check is typically analyzed with each set of samples.

6.2.3 Sample Batch Quality Control

Sample batch analysis is normally performed with sample blanks and known-addition samples (or spiked samples) included. The type of known addition sample used is dictated by the sample media being analyzed, the primary analytes of interest, and the method being used. The following is a summary of sample batch QC activities.

Iodine-131 Cartridges - At least one known-addition sample is analyzed with each batch. A charcoal cartridge of the same type used for sample collection but spiked with barium-133 is used. The 356 keV peak of barium-133 serves as a proxy for the 364 keV peak of iodine-131. Samples from the control location serve as blanks.

Gross Beta Filters - At least one unused blank air particulate filter and at least one known-addition air particulate filter is analyzed with each batch.

Aqueous Samples – In most cases, samples collected from the control locations are analyzed as blanks. A known-addition sample is typically analyzed with each batch of samples.

Gross Alpha/Beta in Water - Blank samples were prepared from reagent grade water and analyzed with each batch of samples. One known addition sample and one replicate sample is normally analyzed with each batch.

Tritium in Water – A blank and a low level known addition sample is typically analyzed with each batch. A replicate sample is prepared and analyzed inside of each batch in most cases.

6.3 Laboratory Intercomparison Program Participation and Results

Participation in cross check intercomparison studies is mandatory for laboratories performing analyses of CGS REMP samples. Intercomparison studies provide a consistent and effective means to evaluate the accuracy and precision of analyses performed by a laboratory. Study results should fall within specified control limits. Results that fall outside the control limits are investigated and corrective action taken.

The Energy Northwest Environmental Services Laboratory participated in three proficiency testing studies involving radioactive measurements provided by Environmental Resource Associates (ERA) during 2015. The Laboratory's intercomparison program was further supplemented by additional cross check media provided by ERA. The Laboratory's intercomparison program results for 2015 are shown in Table 6-2. With one exception, all 2015 Laboratory intercomparison program results were within acceptable limits. Participation in the ERA studies serves to meet the intercomparison program requirements specified in the ODCM.

In addition to the studies noted above, the CGS REMP maintains a split sample program with the State of Washington Department of Health. Split samples are sent to a State of Washington Lab on a scheduled frequency where they are independently analyzed. This program provides an additional check on the accuracy and precision of the results reported in this document.

6.4 Laboratory Quality Control Program Problems and Improvements

The reported air filter cobalt-60 result for the spring 2015 cross check study (MRAD 22) was above the acceptance criteria. Investigation found that the problem was due to cesium-134 peak activity summing in the primary cobalt-60 peak region resulting in higher cobalt-60 activity being reported. This situation would only occur in samples with high cesium-134 activity relative to the cobalt-60 activity. This situation is not likely to be encountered in a CGS environmental air filter; review found that cesium-134 has not been identified in a CGS environmental air filter during the last 8 years. The detector calibrations used were verified to be accurate. As a preventive measure, the primary peak used for cobalt-60 quantification was changed to a peak that is not subject to interference from cesium-134. The problem and investigation is documented in AR 334171.

TABLE 6-1
2015 ENVIRONMENTAL SPIKED DOSIMETER RESULTS

PERIOD	SPIKE ID	KNOWN EXPOSURE (mR)	REPORTED EXPOSURE (mR)	BIAS (%)
1st Quarter	ENW Spike	22	21.9	-0.5%
	ENW Spike	22	22.0	0.0%
	ENW Spike	22	21.7	-1.4%
	HEDP Avg. Reader	100	98.8	-1.2%
2nd Quarter	ENW Spike	22	22.0	0.0%
	ENW Spike	22	21.3	-3.2%
	ENW Spike	22	22.4	+1.8%
	HEDP Avg. Reader	100	98.3	-1.7%
3rd Quarter	ENW Spike	22	21.6	-1.8%
	ENW Spike	22	22.2	+0.9%
	ENW Spike	22	22.1	+0.5%
	HEDP Avg. Reader	100	100.1	+0.1%
4th Quarter	ENW Spike	22	21.5	-2.3%
	ENW Spike	22	21.3	-3.2%
	ENW Spike	22	22.0	0.0%
	HEDP Avg. Reader	100	99.1	-0.9%

TABLE 6-2
ENW REMP PROGRAM CROSS CHECK PERFORMANCE RESULTS

ERA MRAD-22 Results Spring 2015					
Standard/Analyte	**Units**	**Reported Value**	**Assigned Value**	**Acceptance Limits**	**Performance Evaluation**
Air Filter Radionuclides					
Americium-241	pCi/Filter	50	49.8	30.7 - 67.4	Acceptable
Cesium-134	pCi/Filter	807	909	578 - 1130	Acceptable
Cesium-137	pCi/Filter	1390	1170	879 - 1540	Acceptable
Cobalt-60	pCi/Filter	104	79.1	61.2 - 98.8	Not Acceptable
Zinc-65	pCi/Filter	1260	986	706 - 1360	Acceptable
Air Filter Gross Alpha/Beta					
Gross Alpha	pCi/Filter	69	62.2	20.8 - 96.6	Acceptable
Gross Beta	pCi/Filter	53	58.4	36.9 - 85.1	Acceptable
Water Radionuclides					
Americium-241	pCi/L	< 50	46.0	31.0 - 61.7	Acceptable
Cesium-134	pCi/L	1130	1260	925 - 1450	Acceptable
Cesium-137	pCi/L	1400	1360	1150 - 1630	Acceptable
Cobalt-60	pCi/L	1240	1250	1090 - 1460	Acceptable
Zinc-65	pCi/L	1310	1180	984 - 1490	Acceptable
Water Gross Alpha/Beta					
Gross Alpha	pCi/L	114	119	42.2 - 184	Acceptable
Gross Beta	pCi/L	106	158	90.5 - 234	Acceptable
Water Tritium					
Tritium	pCi/L	10260	10300	6900 - 14700	Acceptable
Soil Radionuclides					
Actinium-228	pCi/kg	1300	1250	802 - 1730	Acceptable
Americium-241	pCi/kg	1570	1500	878 - 1950	Acceptable
Bismuth-212	pCi/kg	990	1780	474 - 2620	Acceptable
Bismuth-214	pCi/kg	4120	4430	2670 - 6380	Acceptable
Cesium-134	pCi/kg	6190	6390	4180 - 7680	Acceptable
Cesium-137	pCi/kg	1590	1490	1140 - 1920	Acceptable
Cobalt-60	pCi/kg	2000	1880	1270 - 2590	Acceptable
Lead-212	pCi/kg	1230	1230	806 - 1710	Acceptable
Lead-214	pCi/kg	4460	4530	2640 - 6760	Acceptable
Potassium-40	pCi/kg	10750	10700	7810 - 14400	Acceptable
Zinc-65	pCi/kg	8050	7130	5680 - 9470	Acceptable

TABLE 6-2 (Cont.)
ENW REMP PROGRAM CROSS CHECK PERFORMANCE RESULTS

ERA MRAD-23 Results Fall 2015					
Standard/Analyte	**Units**	**Reported Value**	**Assigned Value**	**Acceptance Limits**	**Performance Evaluation**
Air Filter Radionuclides					
Americium-241	pCi/Filter	36	36.8	22.7 - 49.8	Acceptable
Cesium-134	pCi/Filter	291	349	222 - 433	Acceptable
Cesium-137	pCi/Filter	682	613	461 - 805	Acceptable
Cobalt-60	pCi/Filter	523	521	403 - 651	Acceptable
Manganese-54	pCi/Filter	< 50	< 50.0	0.00 - 50.0	Acceptable
Zinc-65	pCi/Filter	859	685	491 - 946	Acceptable
Air Filter Gross Alpha/Beta					
Gross Alpha	pCi/Filter	82	77.3	25.9 - 120	Acceptable
Gross Beta	pCi/Filter	36	41.3	26.1 - 60.2	Acceptable
Water Radionuclides					
Americium-241	pCi/L	121	113	76.1 - 152	Acceptable
Cesium-134	pCi/L	676	759	557 - 872	Acceptable
Cesium-137	pCi/L	642	623	529 - 747	Acceptable
Cobalt-60	pCi/L	890	896	778 - 1050	Acceptable
Manganese-54	pCi/L	< 12	< 100	0.00 - 100	Acceptable
Zinc-65	pCi/L	783	712	594 - 898	Acceptable
Water Gross Alpha/Beta					
Gross Alpha	pCi/L	73	136	48.3 - 211	Acceptable
Gross Beta	pCi/L	33	53.7	30.7 - 79.6	Acceptable
Water Tritium					
Tritium	pCi/L	21368	21500	14400 - 30700	Acceptable
Soil Radionuclides					
Actinium-228	pCi/kg	1300	1240	795 - 1720	Acceptable
Americium-241	pCi/kg	<800	539	315 - 700	Acceptable
Bismuth-212	pCi/kg	895	1240	330 - 1820	Acceptable
Bismuth-214	pCi/kg	2780	2660	1600 - 3830	Acceptable
Cesium-134	pCi/kg	2275	2420	1580 - 2910	Acceptable
Cesium-137	pCi/kg	5245	5120	3920 - 6590	Acceptable
Cobalt-60	pCi/kg	3915	3900	2640 - 5370	Acceptable
Lead-212	pCi/kg	1150	1240	812 - 1730	Acceptable
Lead-214	pCi/kg	2955	2800	1630 - 4180	Acceptable
Manganese-54	pCi/kg	< 100	< 1000	0.00 - 1000	Acceptable
Potassium-40	pCi/kg	10530	10600	7740 - 14200	Acceptable
Zinc-65	pCi/kg	3900	3620	2880 - 4810	Acceptable

TABLE 6-2 (Cont)
ENW REMP PROGRAM CROSS CHECK PERFORMANCE RESULTS

2015 ERA Crosscheck Result Iodine-131 Charcoal Cartridge						
Sample ID	**Analysis**	**Units**	**Result**	**Ref Value**	**Acceptance Limits**	**Performance Evaluation**
11181402A	Iodine-131	pCi/Filter	209	187	144 – 247	Acceptable
11181403A	Iodine-131	pCi/Filter	417	409	315 – 540	Acceptable

2015 ERA RAD Results Iodine-131 in Milk						
Sample ID	**Analysis**	**Units**	**Result**	**Ref Value**	**Acceptance Limits**	**Performance Evaluation**
RAD-102	Iodine-131	pCi/L	23.1	25.7	21.3 – 30.3	Acceptable

7.0 REFERENCES

7.0 REFERENCES

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8.0 ERRATA

8.0 ERRATA

No corrections were identified.

APPENDIX A

2015 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT COLUMBIA GENERATING STATION

DATA TABLES A and B

Covers Sample Collection Period Starting January 2015 Through December 2015

RADIOLOGICAL
ENVIRONMENTAL
MONITORING PROGRAM

Prepared by:

Energy Northwest - Environmental Services Staff
Richland, WA

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FORWARD

Since mid-1984, the results of the REMP analyses have been presented as net results calculated from total counts minus the observed background counts of the detection method. Counting results for low level samples are often within the counting error of the background determination; consequently results can range from negative to positive values in these samples. Though most of the analytical results presented in this Appendix are below the detection limit, listing the actual calculated value, even when it is negative or below the detection limit, prevents positive biases and loss of individual results inherent in the use of "less than" (<) values. It is recommended practice to report radiological environmental data in this manner.

Most results listed in this Appendix are accompanied by a plus or minus ($\pm$) error value. In most cases the error value represents the two sigma counting uncertainty determined for that particular analysis. These error values are in the same units as the listed activity values. The two sigma error value represents the range that a recount of the same sample would be expected to fall within 95% of the time, based on the statistics encountered in the original count.

Also included in most cases are the analysis specific, minimum detectable activity (MDA) values. Though similar in concept to the LLD, these values are based on the statistics encountered in the specific sample count itself and not a blank determination. As such, they are a *a posteriori* (after the fact) determination where the LLD is a *a priori* (before the fact) determination. These values were included as they represent the level of activity that would have needed to be present in the sample for a positive identification to be made.

TABLE A-1.1

2015 QUARTERLY TLD RESULTS

Results in milli-Roentgen (mR) per Standard Quarter

Station ID	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Quarterly Sum
1	22.0	23.0	22.2	21.6	88.7
2	21.7	21.8	21.7	21.2	86.3
3	21.1	20.9	20.9	19.9	82.9
4	19.4	19.9	19.3	18.9	77.6
5	19.7	20.3	19.1	19.7	78.7
6	19.6	20.7	19.6	19.3	79.1
7	21.3	21.3	22.2	20.7	85.5
8	23.5	24.0	24.1	23.1	94.7
9	21.3	20.3	20.7	19.8	82.1
10	21.4	21.9	21.9	20.0	85.2
11	22.0	21.9	22.0	20.9	86.8
12	23.3	22.3	24.4	22.1	92.0
13	21.7	21.5	21.6	20.4	85.1
14	21.7	22.4	21.8	21.5	87.4
15	22.4	24.0	23.0	23.0	92.4
16	21.8	22.0	22.0	22.2	88.0
17	21.9	22.9	22.6	21.9	89.3
18	22.3	22.0	23.0	21.7	88.9
19	23.5	23.1	23.3	21.5	91.4
20	22.4	23.3	23.0	22.4	91.2
21	21.0	19.9	21.0	19.6	81.4
22	20.9	21.6	21.5	20.2	84.2
23	21.5	22.3	22.3	21.0	87.1
24	21.3	23.1	21.2	22.2	87.7
25	22.4	22.7	23.2	22.5	90.9
40	19.3	19.1	18.8	19.4	76.5
41	21.7	22.1	22.1	20.4	86.3
42	21.3	22.2	21.5	21.7	86.5
43	22.0	21.0	22.5	21.6	87.1
44	20.0	20.6	19.4	19.0	79.0
45	19.9	21.0	21.1	20.0	82.0
46	26.1	26.4	28.0	26.8	107.3
47	20.2	20.2	20.8	19.6	80.7
49	21.5	21.1	22.1	21.2	85.8
50	21.9	22.4	22.4	20.8	87.5
51	20.5	21.9	21.3	19.9	83.7
53	21.8	21.4	22.4	21.2	86.8
54	22.4	23.4	21.5	20.5	87.8
55	22.3	22.0	22.2	20.0	86.5
56	21.9	23.0	22.1	21.4	88.5
65	20.01	20.07	20.92	19.53	80.5
71	26.57	24.65	26.55	26.86	104.6
72	24.69	24.86	25.29	24.97	99.8

TABLE A-1.1

2015 QUARTERLY TLD RESULTS

Results in milli-Roentgen (mR) per Standard Quarter

Station ID	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Quarterly Sum
73	23.47	23.63	24.01	22.75	93.9
74	23.48	23.48	23.84	22.84	93.6
75	22.34	21.73	23.43	22.19	89.7
76	22.24	18.82	22.80	22.61	86.5
77	22.45	22.11	22.71	21.32	88.6
78	21.33	21.39	21.12	20.33	84.2
79	21.90	23.05	22.01	21.07	88.0
80	21.07	21.51	21.23	20.51	84.3
81	20.90	22.03	20.72	20.29	83.9
82	22.59	23.03	23.42	22.42	91.5
83	21.46	22.01	20.50	21.49	85.5
84	22.16	23.16	22.34	23.00	90.7
85	22.91	23.31	23.56	23.42	93.2
86	28.60	27.51	29.71	27.77	113.6

TABLE A-1.2

2015 QUARTERLY TLD RESULTS- SUMMARY

Results in milli-Roentgen (mR) per Standard Quarter

Location	Average Activity	Activity Low	Activity High	Number of Samples
Quarterly Indicator TLDs	22.0	18.8	29.7	224
Quarterly Control TLDs	20.5	19.8	21.3	4

TABLE A-2.1

GROSS BETA ON AIR PARTICULATE FILTERS

Results in pCi per Cubic Meter

Collection Period	Station 01 Result		Station 01 Error	Station 04 Result		Station 04 Error	Station 05 Result		Station 05 Error
12/30/14 - 01/06/15	6.57E-02	±	1.58E-03	6.09E-02	±	1.47E-03	6.24E-02	±	1.50E-03
01/06/15 - 01/13/15	4.02E-02	±	1.25E-03	4.13E-02	±	1.21E-03	3.56E-02	±	1.14E-03
01/13/15 - 01/20/15	2.23E-02	±	9.41E-04	2.74E-02	±	9.99E-04	2.08E-02	±	8.77E-04
01/20/15 - 01/27/15	1.68E-02	±	8.10E-04	1.69E-02	±	7.93E-04	1.57E-02	±	7.64E-04
01/27/15 - 02/03/15	1.64E-02	±	7.76E-04	1.66E-02	±	7.94E-04	1.45E-02	±	7.46E-04
02/03/15 - 02/10/15	7.85E-03	±	5.62E-04	8.30E-03	±	5.75E-04	7.38E-03	±	5.55E-04
02/10/15 - 02/17/15	1.59E-02	±	7.69E-04	1.68E-02	±	7.82E-04	1.34E-02	±	7.17E-04
02/17/15 - 02/24/15	1.94E-02	±	8.35E-04	1.88E-02	±	8.18E-04	1.86E-02	±	8.21E-04
02/24/15 - 03/03/15	1.80E-02	±	8.35E-04	1.86E-02	±	8.40E-04	1.71E-02	±	8.25E-04
03/03/15 - 03/10/15	3.13E-02	±	1.08E-03	3.25E-02	±	1.11E-03	2.95E-02	±	1.07E-03
03/10/15 - 03/17/15	9.45E-03	±	6.22E-04	1.18E-02	±	6.94E-04	1.02E-02	±	6.58E-04
03/17/15 - 03/24/15	8.43E-03	±	5.81E-04	8.46E-03	±	5.98E-04	8.12E-03	±	6.00E-04
03/24/15 - 03/31/15	7.73E-03	±	5.60E-04	6.99E-03	±	5.57E-04	8.23E-03	±	6.00E-04
03/31/15 - 04/07/15	7.60E-03	±	5.54E-04	8.49E-03	±	6.03E-04	7.59E-03	±	5.85E-04
04/07/15 - 04/14/15	7.63E-03	±	5.36E-04	8.67E-03	±	5.99E-04	8.26E-03	±	5.94E-04
04/14/15 - 04/21/15	1.31E-02	±	7.03E-04	1.12E-02	±	6.88E-04	1.20E-02	±	7.21E-04
04/21/15 - 04/28/15	7.18E-03	±	5.53E-04	6.71E-03	±	5.24E-04	7.13E-03	±	5.43E-04
04/28/15 - 05/05/15	1.41E-02	±	7.41E-04	1.62E-02	±	7.77E-04	1.21E-02	±	6.75E-04
05/05/15 - 05/12/15	1.58E-02	±	7.82E-04	1.52E-02	±	7.54E-04	1.43E-02	±	7.29E-04
05/12/15 - 05/19/15	8.62E-03	±	6.54E-04	8.17E-03	±	5.56E-04	8.78E-03	±	5.74E-04
05/19/15 - 05/26/15	1.80E-02	±	8.20E-04	1.69E-02	±	8.07E-04	1.54E-02	±	7.62E-04
05/26/15 - 06/02/15	1.83E-02	±	8.21E-04	1.68E-02	±	7.91E-04	1.66E-02	±	7.59E-04
06/02/15 - 06/09/15	1.14E-02	±	6.66E-04	1.22E-02	±	6.87E-04	1.18E-02	±	6.52E-04
06/09/15 - 06/16/15	1.52E-02	±	7.66E-04	1.38E-02	±	7.39E-04	1.24E-02	±	6.82E-04
06/16/15 - 06/23/15	1.57E-02	±	7.78E-04	1.56E-02	±	7.73E-04	1.57E-02	±	7.53E-04
06/23/15 - 06/30/15	2.02E-02	±	8.86E-04	1.77E-02	±	8.35E-04	1.69E-02	±	7.82E-04
06/30/15 - 07/07/15	1.98E-02	±	8.74E-04	1.95E-02	±	8.76E-04	1.65E-02	±	7.67E-04
07/07/15 - 07/14/15	2.13E-02	±	8.99E-04	2.01E-02	±	8.87E-04	1.85E-02	±	8.10E-04
07/14/15 - 07/21/15	8.88E-03	±	6.26E-04	1.08E-02	±	6.78E-04	1.20E-02	±	6.87E-04
07/21/15 - 07/28/15	7.40E-03	±	5.70E-04	6.32E-03	±	5.41E-04	5.45E-03	±	4.95E-04
07/28/15 - 08/04/15	1.95E-02	±	8.65E-04	1.70E-02	±	8.09E-04	1.54E-02	±	7.40E-04
08/04/15 - 08/11/15	1.20E-02	±	6.81E-04	1.12E-02	±	6.64E-04	1.08E-02	±	6.28E-04
08/11/15 - 08/18/15	1.80E-02	±	8.07E-04	1.84E-02	±	8.34E-04	1.61E-02	±	7.49E-04
08/18/15 - 08/25/15	1.51E-02	±	7.41E-04	1.47E-02	±	7.40E-04	1.31E-02	±	6.83E-04
08/25/15 - 09/01/15	1.62E-02	±	7.77E-04	1.60E-02	±	7.87E-04	1.48E-02	±	7.28E-04
09/01/15 - 09/08/15	7.79E-03	±	5.68E-04	8.15E-03	±	5.88E-04	7.24E-03	±	5.27E-04
09/08/15 - 09/15/15	1.95E-02	±	8.55E-04	1.98E-02	±	8.77E-04	1.80E-02	±	7.97E-04
09/15/15 - 09/22/15	9.10E-03	±	6.17E-04	1.07E-02	±	6.99E-04	9.88E-03	±	6.27E-04
09/22/15 - 09/29/15	1.98E-02	±	8.82E-04	2.09E-02	±	9.56E-04	1.96E-02	±	8.45E-04
09/29/15 - 10/06/15	2.73E-02	±	1.02E-03	2.61E-02	±	9.78E-04	2.66E-02	±	9.78E-04
10/06/15 - 10/13/15	2.91E-02	±	1.04E-03	2.57E-02	±	9.61E-04	2.55E-02	±	9.39E-04
10/13/15 - 10/20/15	2.42E-02	±	9.69E-04	2.36E-02	±	9.30E-04	2.26E-02	±	9.03E-04
10/20/15 - 10/27/15	2.24E-02	±	8.78E-04	2.22E-02	±	8.93E-04	1.97E-02	±	8.37E-04
10/27/15 - 11/03/15	1.06E-02	±	6.30E-04	7.96E-03	±	5.39E-04	8.53E-03	±	5.78E-04
11/03/15 - 11/10/15	1.52E-02	±	7.56E-04	1.40E-02	±	7.13E-04	1.44E-02	±	7.58E-04
11/10/15 - 11/17/15	7.20E-03	±	5.29E-04	1.01E-02	±	6.14E-04	8.21E-03	±	5.81E-04
11/17/15 - 11/24/15	1.86E-02	±	8.32E-04	2.06E-02	±	8.53E-04	2.23E-03	±	3.94E-04
11/24/15 - 12/01/15	4.62E-02	±	1.28E-03	4.95E-02	±	1.30E-03	4.68E-02	±	1.39E-03
12/01/15 - 12/08/15	3.93E-02	±	1.17E-03	4.17E-02	±	1.23E-03	3.49E-02	±	1.11E-03
12/08/15 - 12/15/15	2.43E-03	±	3.80E-04	2.32E-03	±	4.02E-04	1.71E-03	±	3.55E-04
12/15/15 - 12/22/15	7.89E-03	±	5.37E-04	9.69E-03	±	6.12E-04	8.42E-03	±	5.75E-04
12/22/15 - 12/29/15	1.58E-02	±	7.63E-04	1.44E-02	±	7.59E-04	1.40E-02	±	7.53E-04

NVS = Valid sample not obtained due to sampler failure.

Average MDA for analyses in Table A-2.1 was 8.54 E-04.

TABLE A-2.1

GROSS BETA ON AIR PARTICULATE FILTERS

Results in pCi per Cubic Meter

Collection Period	Station 06 Result		Station 06 Error	Station 07 Result		Station 07 Error	Station 08 Result		Station 08 Error
12/30/14 - 01/06/15	6.18E-02	±	1.52E-03	6.52E-02	±	1.51E-03	6.55E-02	±	1.52E-03
01/06/15 - 01/13/15	4.20E-02	±	1.26E-03	3.97E-02	±	1.18E-03	3.90E-02	±	1.17E-03
01/13/15 - 01/20/15	2.46E-02	±	9.68E-04	2.33E-02	±	9.09E-04	2.16E-02	±	8.77E-04
01/20/15 - 01/27/15	1.61E-02	±	7.89E-04	1.64E-02	±	7.83E-04	1.65E-02	±	7.75E-04
01/27/15 - 02/03/15	1.59E-02	±	7.92E-04	1.58E-02	±	7.78E-04	1.69E-02	±	7.85E-04
02/03/15 - 02/10/15	6.96E-03	±	5.49E-04	6.03E-03	±	5.09E-04	7.60E-03	±	5.59E-04
02/10/15 - 02/17/15	1.40E-02	±	7.17E-04	1.52E-02	±	7.59E-04	1.66E-02	±	7.91E-04
02/17/15 - 02/24/15	1.79E-02	±	7.97E-04	1.92E-02	±	8.36E-04	1.95E-02	±	8.34E-04
02/24/15 - 03/03/15	1.79E-02	±	8.14E-04	1.93E-02	±	8.64E-04	1.80E-02	±	8.38E-04
03/03/15 - 03/10/15	3.16E-02	±	1.08E-03	3.24E-02	±	1.11E-03	3.12E-02	±	1.08E-03
03/10/15 - 03/17/15	1.09E-02	±	6.55E-04	1.06E-02	±	6.62E-04	1.10E-02	±	6.67E-04
03/17/15 - 03/24/15	9.32E-03	±	6.23E-04	8.53E-03	±	5.98E-04	8.33E-03	±	5.92E-04
03/24/15 - 03/31/15	7.98E-03	±	5.81E-04	7.48E-03	±	5.72E-04	7.87E-03	±	5.79E-04
03/31/15 - 04/07/15	6.51E-03	±	5.35E-04	6.74E-03	±	5.45E-04	6.75E-03	±	5.51E-04
04/07/15 - 04/14/15	8.28E-03	±	5.80E-04	7.11E-03	±	5.48E-04	6.51E-03	±	5.29E-04
04/14/15 - 04/21/15	1.43E-02	±	7.51E-04	1.27E-02	±	7.24E-04	1.37E-02	±	7.47E-04
04/21/15 - 04/28/15	9.40E-03	±	6.32E-04	6.60E-03	±	5.18E-04	7.54E-03	±	5.55E-04
04/28/15 - 05/05/15	1.53E-02	±	7.56E-04	1.35E-02	±	7.10E-04	1.40E-02	±	7.25E-04
05/05/15 - 05/12/15	1.36E-02	±	7.38E-04	1.57E-02	±	7.50E-04	1.49E-02	±	7.47E-04
05/12/15 - 05/19/15	7.82E-03	±	5.53E-04	9.40E-03	±	5.83E-04	9.44E-03	±	5.93E-04
05/19/15 - 05/26/15	1.85E-02	±	8.42E-04	1.80E-02	±	8.07E-04	1.73E-02	±	8.10E-04
05/26/15 - 06/02/15	1.60E-02	±	7.80E-04	1.79E-02	±	8.12E-04	1.67E-02	±	7.62E-04
06/02/15 - 06/09/15	1.10E-02	±	6.53E-04	1.13E-02	±	6.57E-04	1.27E-02	±	6.76E-04
06/09/15 - 06/16/15	1.50E-02	±	7.68E-04	1.46E-02	±	7.43E-04	1.41E-02	±	7.12E-04
06/16/15 - 06/23/15	1.43E-02	±	7.18E-04	1.72E-02	±	8.02E-04	1.70E-02	±	7.75E-04
06/23/15 - 06/30/15	1.95E-02	±	8.66E-04	2.02E-02	±	8.82E-04	1.94E-02	±	8.36E-04
06/30/15 - 07/07/15	2.07E-02	±	9.01E-04	1.95E-02	±	8.47E-04	1.88E-02	±	7.96E-04
07/07/15 - 07/14/15	2.04E-02	±	8.84E-04	2.12E-02	±	9.21E-04	1.88E-02	±	8.41E-04
07/14/15 - 07/21/15	9.57E-03	±	6.40E-04	9.77E-03	±	5.64E-04	9.69E-03	±	6.49E-04
07/21/15 - 07/28/15	4.78E-03	±	4.84E-04	6.81E-03	±	5.20E-04	7.14E-03	±	5.69E-04
07/28/15 - 08/04/15	1.85E-02	±	8.28E-04	1.86E-02	±	7.90E-04	1.65E-02	±	7.91E-04
08/04/15 - 08/11/15	1.07E-02	±	6.42E-04	1.08E-02	±	6.42E-04	1.15E-02	±	6.59E-04
08/11/15 - 08/18/15	1.75E-02	±	7.93E-04	1.79E-02	±	7.92E-04	1.55E-02	±	7.55E-04
08/18/15 - 08/25/15	1.43E-02	±	7.11E-04	1.53E-02	±	7.18E-04	1.49E-02	±	7.21E-04
08/25/15 - 09/01/15	1.34E-02	±	7.02E-04	1.71E-02	±	7.90E-04	1.39E-02	±	7.30E-04
09/01/15 - 09/08/15	7.90E-03	±	5.46E-04	7.94E-03	±	5.50E-04	8.01E-03	±	5.66E-04
09/08/15 - 09/15/15	2.03E-02	±	8.50E-04	2.05E-02	±	8.45E-04	1.85E-02	±	8.32E-04
09/15/15 - 09/22/15	1.01E-02	±	6.33E-04	1.10E-02	±	6.41E-04	9.71E-03	±	6.34E-04
09/22/15 - 09/29/15	2.12E-02	±	8.87E-04	2.06E-02	±	8.64E-04	1.86E-02	±	8.53E-04
09/29/15 - 10/06/15	2.57E-02	±	9.63E-04	2.56E-02	±	9.46E-04	2.62E-02	±	9.99E-04
10/06/15 - 10/13/15	2.86E-02	±	1.02E-03	2.85E-02	±	9.94E-04	2.56E-02	±	9.76E-04
10/13/15 - 10/20/15	2.56E-02	±	9.61E-04	2.67E-02	±	9.72E-04	2.53E-02	±	9.78E-04
10/20/15 - 10/27/15	2.28E-02	±	8.90E-04	2.04E-02	±	8.43E-04	2.13E-02	±	8.86E-04
10/27/15 - 11/03/15	8.29E-03	±	5.61E-04	9.17E-03	±	5.99E-04	9.36E-03	±	5.96E-04
11/03/15 - 11/10/15	1.44E-02	±	7.35E-04	1.56E-02	±	7.55E-04	1.57E-02	±	7.71E-04
11/10/15 - 11/17/15	8.10E-03	±	5.53E-04	6.57E-03	±	5.08E-04	7.77E-03	±	5.46E-04
11/17/15 - 11/24/15	1.98E-02	±	8.52E-04	1.86E-02	±	8.36E-04	1.67E-02	±	8.07E-04
11/24/15 - 12/01/15	4.85E-02	±	1.33E-03	4.30E-02	±	1.25E-03	4.72E-02	±	1.33E-03
12/01/15 - 12/08/15	4.43E-02	±	1.26E-03	3.98E-02	±	1.20E-03	3.72E-02	±	1.18E-03
12/08/15 - 12/15/15	2.78E-03	±	4.04E-04	3.32E-03	±	4.20E-04	3.17E-03	±	4.31E-04
12/15/15 - 12/22/15	8.55E-03	±	5.59E-04	8.62E-03	±	5.69E-04	8.27E-03	±	5.84E-04
12/22/15 - 12/29/15	1.42E-02	±	7.27E-04	1.59E-02	±	7.80E-04	1.61E-02	±	7.69E-04

NVS = Valid sample not obtained due to sampler failure.

Average MDA for analyses in Table A-2.1 was 8.54 E-04.

TABLE A-2.1

GROSS BETA ON AIR PARTICULATE FILTERS

Results in pCi per Cubic Meter

Collection Period	Station 09 Result		Station 09 Error	Station 21 Result		Station 21 Error	Station 23 Result		Station 23 Error
12/30/14 - 01/06/15	4.92E-02	±	1.36E-03	7.45E-02	±	1.72E-03	6.86E-02	±	1.59E-03
01/06/15 - 01/13/15	3.81E-02	±	1.20E-03	4.37E-02	±	1.38E-03	4.33E-02	±	1.27E-03
01/13/15 - 01/20/15	1.67E-02	±	8.20E-04	2.51E-02	±	1.03E-03	2.55E-02	±	9.84E-04
01/20/15 - 01/27/15	1.37E-02	±	7.38E-04	1.59E-02	±	7.86E-04	1.62E-02	±	7.80E-04
01/27/15 - 02/03/15	1.33E-02	±	7.06E-04	1.71E-02	±	7.95E-04	1.78E-02	±	8.25E-04
02/03/15 - 02/10/15	8.00E-03	±	5.32E-04	7.66E-03	±	5.50E-04	7.74E-03	±	5.75E-04
02/10/15 - 02/17/15	1.33E-02	±	6.98E-04	1.49E-02	±	7.36E-04	1.57E-02	±	7.79E-04
02/17/15 - 02/24/15	1.75E-02	±	7.74E-04	1.89E-02	±	8.24E-04	1.99E-02	±	8.59E-04
02/24/15 - 03/03/15	1.67E-02	±	7.79E-04	1.84E-02	±	8.28E-04	1.86E-02	±	8.62E-04
03/03/15 - 03/10/15	2.62E-02	±	9.58E-04	3.25E-02	±	1.11E-03	3.07E-02	±	1.10E-03
03/10/15 - 03/17/15	9.06E-03	±	5.90E-04	1.11E-02	±	6.76E-04	1.04E-02	±	6.26E-04
03/17/15 - 03/24/15	6.83E-03	±	5.24E-04	9.65E-03	±	6.32E-04	8.17E-03	±	5.94E-04
03/24/15 - 03/31/15	6.96E-03	±	5.28E-04	8.29E-03	±	5.90E-04	7.62E-03	±	5.86E-04
03/31/15 - 04/07/15	7.24E-03	±	5.48E-04	6.60E-03	±	5.33E-04	8.00E-03	±	5.69E-04
04/07/15 - 04/14/15	7.64E-03	±	5.48E-04	9.98E-03	±	6.25E-04	7.14E-03	±	5.24E-04
04/14/15 - 04/21/15	1.17E-02	±	6.73E-04	1.34E-02	±	7.25E-04	1.21E-02	±	6.80E-04
04/21/15 - 04/28/15	6.07E-03	±	5.19E-04	6.38E-03	±	5.29E-04	7.25E-03	±	5.59E-04
04/28/15 - 05/05/15	1.28E-02	±	7.12E-04	1.49E-02	±	7.60E-04	1.40E-02	±	7.40E-04
05/05/15 - 05/12/15	1.53E-02	±	7.67E-04	1.48E-02	±	7.51E-04	1.50E-02	±	7.63E-04
05/12/15 - 05/19/15	8.12E-03	±	5.65E-04	1.02E-02	±	6.14E-04	9.44E-03	±	6.08E-04
05/19/15 - 05/26/15	1.77E-02	±	8.24E-04	1.90E-02	±	8.43E-04	1.40E-02	±	9.28E-04
05/26/15 - 06/02/15	1.37E-02	±	7.21E-04	1.89E-02	±	8.36E-04	1.90E-02	±	8.10E-04
06/02/15 - 06/09/15	1.04E-02	±	6.49E-04	1.12E-02	±	6.61E-04	1.08E-02	±	6.28E-04
06/09/15 - 06/16/15	1.46E-02	±	7.61E-04	1.36E-02	±	7.29E-04	1.42E-02	±	7.38E-04
06/16/15 - 06/23/15	1.36E-02	±	7.28E-04	1.61E-02	±	7.82E-04	1.54E-02	±	7.56E-04
06/23/15 - 06/30/15	2.07E-02	±	8.92E-04	1.81E-02	±	8.33E-04	1.88E-02	±	8.16E-04
06/30/15 - 07/07/15	1.93E-02	±	8.65E-04	1.75E-02	±	8.15E-04	1.86E-02	±	8.19E-04
07/07/15 - 07/14/15	1.97E-02	±	8.59E-04	2.06E-02	±	8.78E-04	2.03E-02	±	8.48E-04
07/14/15 - 07/21/15	7.03E-03	±	5.71E-04	1.03E-02	±	6.50E-04	1.08E-02	±	6.53E-04
07/21/15 - 07/28/15	4.88E-03	±	4.86E-04	5.88E-03	±	5.17E-04	6.60E-03	±	5.26E-04
07/28/15 - 08/04/15	1.57E-02	±	7.73E-04	1.67E-02	±	7.82E-04	1.74E-02	±	7.83E-04
08/04/15 - 08/11/15	1.13E-02	±	6.49E-04	1.00E-02	±	6.18E-04	1.20E-02	±	6.65E-04
08/11/15 - 08/18/15	1.78E-02	±	8.04E-04	1.74E-02	±	7.89E-04	1.85E-02	±	8.05E-04
08/18/15 - 08/25/15	1.35E-02	±	7.01E-04	1.53E-02	±	7.23E-04	1.59E-02	±	7.33E-04
08/25/15 - 09/01/15	1.46E-02	±	7.35E-04	1.69E-02	±	7.81E-04	1.62E-02	±	7.56E-04
09/01/15 - 09/08/15	7.95E-03	±	5.61E-04	7.45E-03	±	5.35E-04	7.92E-03	±	5.48E-04
09/08/15 - 09/15/15	2.05E-02	±	8.57E-04	2.05E-02	±	8.60E-04	2.05E-02	±	8.51E-04
09/15/15 - 09/22/15	8.50E-03	±	5.94E-04	9.05E-03	±	6.04E-04	1.07E-02	±	6.47E-04
09/22/15 - 09/29/15	1.79E-02	±	8.30E-04	2.01E-02	±	8.62E-04	2.10E-02	±	8.93E-04
09/29/15 - 10/06/15	2.22E-02	±	9.02E-04	2.72E-02	±	9.88E-04	2.64E-02	±	9.83E-04
10/06/15 - 10/13/15	2.52E-02	±	9.48E-04	2.57E-02	±	9.46E-04	2.66E-02	±	9.86E-04
10/13/15 - 10/20/15	2.43E-02	±	9.44E-04	2.63E-02	±	9.61E-04	2.60E-02	±	9.97E-04
10/20/15 - 10/27/15	1.82E-02	±	8.05E-04	2.46E-02	±	9.17E-04	2.26E-02	±	9.12E-04
10/27/15 - 11/03/15	9.31E-03	±	5.84E-04	7.36E-03	±	5.52E-04	7.89E-03	±	5.64E-04
11/03/15 - 11/10/15	9.39E-03	±	6.04E-04	1.66E-02	±	7.79E-04	1.46E-02	±	7.62E-04
11/10/15 - 11/17/15	5.09E-03	±	4.61E-04	6.49E-03	±	5.09E-04	7.12E-03	±	5.40E-04
11/17/15 - 11/24/15	1.51E-02	±	7.53E-04	1.96E-02	±	8.53E-04	1.71E-02	±	8.32E-04
11/24/15 - 12/01/15	4.78E-02	±	1.31E-03	4.72E-02	±	1.32E-03	4.85E-02	±	1.40E-03
12/01/15 - 12/08/15	3.75E-02	±	1.15E-03	4.36E-02	±	1.25E-03	3.88E-02	±	1.19E-03
12/08/15 - 12/15/15	2.82E-03	±	4.01E-04	2.59E-03	±	3.97E-04	2.78E-03	±	4.08E-04
12/15/15 - 12/22/15	6.92E-03	±	5.14E-04	9.00E-03	±	5.86E-04	8.17E-03	±	5.83E-04
12/22/15 - 12/29/15	1.54E-02	±	7.55E-04	1.84E-02	±	8.42E-04	1.77E-02	±	8.36E-04

NVS = Valid sample not obtained due to sampler failure.

Average MDA for analyses in Table A-2.1 was 8.54 E-04.

TABLE A-2.1

GROSS BETA ON AIR PARTICULATE FILTERS

Results in pCi per Cubic Meter

Collection Period	Station 40 Result		Station 40 Error	Station 48 Result		Station 48 Error	Station 57 Result		Station 57 Error
12/30/14 - 01/06/15	5.93E-02	±	1.51E-03	7.54E-02	±	1.69E-03	7.48E-02	±	1.71E-03
01/06/15 - 01/13/15	3.63E-02	±	1.19E-03	4.53E-02	±	1.30E-03	4.46E-02	±	1.30E-03
01/13/15 - 01/20/15	1.99E-02	±	8.89E-04	2.30E-02	±	9.44E-04	2.54E-02	±	9.83E-04
01/20/15 - 01/27/15	1.51E-02	±	7.86E-04	1.92E-02	±	8.63E-04	1.54E-02	±	7.78E-04
01/27/15 - 02/03/15	1.47E-02	±	7.41E-04	1.63E-02	±	7.80E-04	1.53E-02	±	7.88E-04
02/03/15 - 02/10/15	7.96E-03	±	5.72E-04	6.89E-03	±	5.37E-04	7.79E-03	±	5.47E-04
02/10/15 - 02/17/15	1.60E-02	±	7.78E-04	1.82E-02	±	8.20E-04	1.55E-02	±	7.31E-04
02/17/15 - 02/24/15	1.89E-02	±	8.37E-04	2.09E-02	±	8.70E-04	1.87E-02	±	7.85E-04
02/24/15 - 03/03/15	1.67E-02	±	8.24E-04	1.87E-02	±	8.54E-04	1.90E-02	±	8.25E-04
03/03/15 - 03/10/15	3.37E-02	±	1.14E-03	3.16E-02	±	1.09E-03	3.17E-02	±	1.04E-03
03/10/15 - 03/17/15	1.02E-02	±	6.62E-04	1.08E-02	±	6.64E-04	1.02E-02	±	6.12E-04
03/17/15 - 03/24/15	8.23E-03	±	5.79E-04	8.25E-03	±	5.97E-04	8.99E-03	±	5.89E-04
03/24/15 - 03/31/15	8.26E-03	±	5.77E-04	6.83E-03	±	5.61E-04	7.94E-03	±	5.66E-04
03/31/15 - 04/07/15	6.61E-03	±	5.25E-04	7.85E-03	±	5.86E-04	8.17E-03	±	5.83E-04
04/07/15 - 04/14/15	7.29E-03	±	5.34E-04	8.87E-03	±	6.00E-04	8.16E-03	±	5.83E-04
04/14/15 - 04/21/15	1.37E-02	±	7.27E-04	1.17E-02	±	6.97E-04	1.42E-02	±	7.51E-04
04/21/15 - 04/28/15	8.35E-03	±	5.98E-04	7.62E-03	±	5.54E-04	6.77E-03	±	5.32E-04
04/28/15 - 05/05/15	1.26E-02	±	6.99E-04	1.28E-02	±	6.89E-04	1.36E-02	±	7.29E-04
05/05/15 - 05/12/15	1.59E-02	±	7.88E-04	1.72E-02	±	7.97E-04	1.47E-02	±	7.55E-04
05/12/15 - 05/19/15	6.67E-03	±	5.22E-04	1.05E-02	±	6.21E-04	1.02E-02	±	6.30E-04
05/19/15 - 05/26/15	1.53E-02	±	7.81E-04	1.93E-02	±	8.43E-04	1.66E-02	±	7.99E-04
05/26/15 - 06/02/15	1.62E-02	±	7.88E-04	1.55E-02	±	7.54E-04	1.68E-02	±	7.96E-04
06/02/15 - 06/09/15	1.26E-02	±	7.02E-04	1.13E-02	±	6.57E-04	1.11E-02	±	6.44E-04
06/09/15 - 06/16/15	1.43E-02	±	7.30E-04	1.47E-02	±	7.54E-04	1.38E-02	±	7.19E-04
06/16/15 - 06/23/15	1.72E-02	±	7.86E-04	1.46E-02	±	7.35E-04	1.59E-02	±	7.64E-04
06/23/15 - 06/30/15	1.78E-02	±	8.05E-04	1.82E-02	±	8.46E-04	1.99E-02	±	8.74E-04
06/30/15 - 07/07/15	2.04E-02	±	8.54E-04	1.77E-02	±	8.11E-04	2.07E-02	±	8.78E-04
07/07/15 - 07/14/15	2.08E-02	±	9.98E-04	2.01E-02	±	8.60E-04	1.98E-02	±	8.51E-04
07/14/15 - 07/21/15	1.04E-02	±	6.38E-04	9.71E-03	±	6.39E-04	1.09E-02	±	6.71E-04
07/21/15 - 07/28/15	6.59E-03	±	5.22E-04	5.14E-03	±	4.88E-04	6.40E-03	±	5.34E-04
07/28/15 - 08/04/15	1.22E-02	±	6.52E-04	1.83E-02	±	8.15E-04	1.79E-02	±	8.08E-04
08/04/15 - 08/11/15	1.13E-02	±	6.85E-04	1.23E-02	±	6.78E-04	1.06E-02	±	6.29E-04
08/11/15 - 08/18/15	1.52E-02	±	7.47E-04	1.83E-02	±	7.82E-04	1.87E-02	±	8.23E-04
08/18/15 - 08/25/15	1.52E-02	±	7.59E-04	1.43E-02	±	6.66E-04	1.51E-02	±	7.20E-04
08/25/15 - 09/01/15	1.58E-02	±	7.72E-04	1.59E-02	±	7.72E-04	1.69E-02	±	7.83E-04
09/01/15 - 09/08/15	7.70E-03	±	5.53E-04	9.02E-03	±	6.03E-04	9.47E-03	±	5.98E-04
09/08/15 - 09/15/15	1.98E-02	±	8.59E-04	2.04E-02	±	8.72E-04	2.06E-02	±	8.71E-04
09/15/15 - 09/22/15	8.64E-03	±	6.03E-04	9.73E-03	±	6.41E-04	8.87E-03	±	6.10E-04
09/22/15 - 09/29/15	1.96E-02	±	8.79E-04	1.85E-02	±	8.66E-04	2.05E-02	±	8.82E-04
09/29/15 - 10/06/15	2.73E-02	±	1.02E-03	2.67E-02	±	1.04E-03	2.69E-02	±	9.93E-04
10/06/15 - 10/13/15	2.68E-02	±	9.89E-04	2.67E-02	±	1.00E-03	2.69E-02	±	9.91E-04
10/13/15 - 10/20/15	2.49E-02	±	9.76E-04	2.36E-02	±	9.54E-04	2.74E-02	±	1.02E-03
10/20/15 - 10/27/15	2.16E-02	±	8.92E-04	2.23E-02	±	9.14E-04	2.13E-02	±	8.75E-04
10/27/15 - 11/03/15	8.59E-03	±	5.77E-04	9.26E-03	±	6.01E-04	8.43E-03	±	5.55E-04
11/03/15 - 11/10/15	1.40E-02	±	7.40E-04	1.68E-02	±	8.13E-04	1.61E-02	±	7.59E-04
11/10/15 - 11/17/15	8.27E-03	±	5.71E-04	7.73E-03	±	5.55E-04	6.52E-03	±	5.10E-04
11/17/15 - 11/24/15	1.87E-02	±	8.48E-04	1.92E-02	±	8.60E-04	2.02E-02	±	8.59E-04
11/24/15 - 12/01/15	4.57E-02	±	1.31E-03	4.68E-02	±	1.34E-03	4.53E-02	±	1.26E-03
12/01/15 - 12/08/15	3.70E-02	±	1.17E-03	4.05E-02	±	1.24E-03	4.24E-02	±	1.26E-03
12/08/15 - 12/15/15	2.04E-03	±	3.83E-04	2.42E-03	±	4.10E-04	3.43E-03	±	4.44E-04
12/15/15 - 12/22/15	8.97E-03	±	5.97E-04	9.25E-03	±	6.08E-04	9.26E-03	±	6.08E-04
12/22/15 - 12/29/15	1.68E-02	±	8.12E-04	1.91E-02	±	8.34E-04	1.79E-02	±	8.09E-04

NVS = Valid sample not obtained due to sampler failure.

Average MDA for analyses in Table A-2.1 was 8.54 E-04.

TABLE A-2.2

GROSS BETA ON AIR PARTICULATE FILTERS - SUMMARY

Results in pCi per cubic meter

LOCATION	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
Gross Beta Indicators	1.74E-02	1.71E-03	7.54E-02	572	572
Gross Beta Controls	1.56E-02	2.82E-03	4.92E-02	52	52

TABLE A-3.1

GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter Station 1 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	8.50E-02	±	1.33E-02	8.31E-03
K-40		1.08E-03	±	4.42E-03	8.56E-03
MN-54		-1.87E-04	±	5.29E-04	8.26E-04
FE-59		-4.96E-04	±	1.97E-03	3.01E-03
CO-60		-5.77E-05	±	1.54E-03	7.51E-04
ZN-65		-3.87E-04	±	1.10E-03	1.70E-03
ZRNB-95		0.00E+00	±	1.30E-03	2.14E-03
CS-134		-3.06E-05	±	2.87E-04	4.62E-04
CS-137		0.00E+00	±	4.99E-04	8.20E-04
BALA140		0.00E+00	±	3.66E-03	6.01E-03
RU-106		-1.23E-03	±	3.89E-03	6.10E-03

Location and Quarter Station 1 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.40E-01	±	1.76E-02	8.27E-03
K-40		-2.22E-04	±	5.60E-03	9.92E-03
MN-54		9.01E-05	±	4.32E-04	6.83E-04
FE-59		0.00E+00	±	3.42E-03	5.63E-03
CO-60		-9.92E-05	±	2.44E-02	7.67E-04
ZN-65		4.52E-04	±	8.46E-04	1.19E-03
ZRNB-95		0.00E+00	±	8.85E-04	1.45E-03
CS-134		-2.43E-06	±	2.52E-04	4.13E-04
CS-137		0.00E+00	±	5.94E-04	9.77E-04
BALA140		0.00E+00	±	8.21E-03	1.35E-02
RU-106		6.17E-04	±	3.13E-03	4.95E-03

Location and Quarter Station 1 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.24E-01	±	1.44E-02	6.92E-03
K-40		-4.80E-03	±	1.07E-01	1.18E-02
MN-54		1.01E-04	±	3.26E-04	4.96E-04
FE-59		0.00E+00	±	3.49E-03	5.74E-03
CO-60		7.83E-05	±	3.52E-04	5.91E-04
ZN-65		2.60E-04	±	7.67E-04	1.15E-03
ZRNB-95		0.00E+00	±	9.93E-04	1.63E-03
CS-134		5.02E-05	±	3.33E-04	5.34E-04
CS-137		-1.34E-06	±	2.92E-04	4.79E-04
BALA140		4.65E-03	±	5.01E-03	6.15E-03
RU-106		-7.45E-04	±	2.92E-03	4.55E-03

Location and Quarter Station 1 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	5.91E-02	±	1.18E-02	8.27E-03
K-40		0.00E+00	±	6.74E-03	1.11E-02
MN-54		0.00E+00	±	4.02E-04	6.60E-04
FE-59		0.00E+00	±	2.88E-03	4.73E-03
CO-60		4.42E-05	±	2.17E-04	4.55E-04
ZN-65		-4.74E-05	±	1.64E-03	1.88E-03
ZRNB-95		0.00E+00	±	1.31E-03	2.16E-03
CS-134		-8.76E-05	±	5.34E-04	6.45E-04
CS-137		-7.42E-05	±	5.35E-04	6.59E-04
BALA140		0.00E+00	±	2.02E-02	3.32E-02
RU-106		6.79E-04	±	4.90E-03	6.03E-03

Location and Quarter Station 4 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.01E-01	±	1.76E-02	1.01E-02
K-40		1.61E-03	±	6.82E-03	1.15E-02
MN-54		2.47E-04	±	4.52E-04	6.47E-04
FE-59		0.00E+00	±	1.02E-03	1.68E-03
CO-60		1.48E-04	±	5.06E-04	7.71E-04
ZN-65		6.06E-06	±	1.27E-03	2.09E-03
ZRNB-95		0.00E+00	±	2.13E-03	3.50E-03
CS-134		-3.08E-05	±	4.24E-04	6.89E-04
CS-137		0.00E+00	±	4.30E-04	7.06E-04
BALA140		-1.83E-03	±	1.38E-02	2.19E-02
RU-106		0.00E+00	±	6.30E-03	1.04E-02

Location and Quarter Station 4 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.39E-01	±	1.72E-02	7.50E-03
K-40		-6.23E-04	±	6.04E-03	9.41E-03
MN-54		-6.73E-05	±	4.64E-04	7.44E-04
FE-59		1.08E-04	±	2.59E-03	4.20E-03
CO-60		-1.05E-04	±	2.85E-02	6.60E-04
ZN-65		-4.66E-04	±	1.42E-03	2.22E-03
ZRNB-95		0.00E+00	±	3.35E-04	5.50E-04
CS-134		2.61E-05	±	4.00E-04	6.52E-04
CS-137		-7.94E-06	±	3.94E-04	6.46E-04
BALA140		0.00E+00	±	8.20E-03	1.35E-02
RU-106		-8.99E-04	±	3.23E-03	5.04E-03

Location and Quarter Station 4 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.39E-01	±	1.59E-02	8.26E-03
K-40		1.19E-03	±	4.51E-03	8.73E-03
MN-54		1.56E-04	±	4.52E-04	6.99E-04
FE-59		6.22E-04	±	2.31E-03	3.56E-03
CO-60		-2.65E-04	±	1.04E-03	7.39E-04
ZN-65		-3.55E-04	±	1.41E-03	2.23E-03
ZRNB-95		2.47E-05	±	1.36E-03	2.24E-03
CS-134		2.28E-04	±	2.85E-04	3.90E-04
CS-137		1.23E-04	±	3.35E-04	5.10E-04
BALA140		5.61E-04	±	7.74E-03	1.25E-02
RU-106		-1.34E-04	±	3.13E-03	5.11E-03

Location and Quarter Station 4 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	6.57E-02	±	1.22E-02	8.02E-03
K-40		1.29E-03	±	6.12E-03	8.46E-03
MN-54		-1.79E-05	±	4.44E-04	5.64E-04
FE-59		0.00E+00	±	2.41E-03	3.97E-03
CO-60		1.13E-04	±	6.12E-04	6.99E-04
ZN-65		-9.51E-05	±	1.11E-03	1.33E-03
ZRNB-95		4.65E-04	±	1.35E-03	1.63E-03
CS-134		1.88E-04	±	3.94E-04	4.88E-04
CS-137		-2.98E-05	±	2.84E-04	3.66E-04
BALA140		5.67E-03	±	6.54E-03	8.78E-03
RU-106		0.00E+00	±	3.82E-03	6.27E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/30/14 to 3/31/15 - 2nd Q 3/31/15 to 6/30/15 - 3rd Q 6/30/15 to 9/29/15 - 4th Q 9/29/15 to 12/29/15

TABLE A-3.1

GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter Station 5 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	9.49E-02	±	1.69E-02	9.63E-03
K-40		1.61E-03	±	6.17E-03	1.05E-02
MN-54		2.01E-05	±	4.87E-04	7.94E-04
FE-59		1.90E-04	±	2.03E-03	3.23E-03
CO-60		1.92E-04	±	4.68E-04	6.79E-04
ZN-65		0.00E+00	±	3.16E-03	5.20E-03
ZRNB-95		-2.70E-04	±	1.34E-03	2.11E-03
CS-134		-3.25E-05	±	3.98E-04	6.45E-04
CS-137		2.27E-04	±	4.84E-04	7.25E-04
BALA140		0.00E+00	±	2.13E-02	3.50E-02
RU-106		-2.56E-04	±	2.97E-03	4.76E-03

Location and Quarter Station 5 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.47E-01	±	1.75E-02	7.34E-03
K-40		-1.17E-03	±	6.85E-03	8.78E-03
MN-54		1.49E-04	±	3.58E-04	5.35E-04
FE-59		-6.78E-04	±	2.95E-03	4.59E-03
CO-60		-1.53E-04	±	1.75E-03	6.60E-04
ZN-65		1.57E-04	±	9.57E-04	1.52E-03
ZRNB-95		-7.02E-05	±	1.14E-03	1.85E-03
CS-134		7.37E-05	±	3.14E-04	4.96E-04
CS-137		-1.11E-04	±	3.51E-04	5.45E-04
BALA140		-3.11E-03	±	2.08E-02	3.27E-02
RU-106		5.44E-04	±	3.05E-03	4.84E-03

Location and Quarter Station 5 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.35E-01	±	1.42E-02	5.21E-03
K-40		2.99E-03	±	5.66E-03	9.72E-03
MN-54		1.29E-04	±	3.26E-04	4.90E-04
FE-59		0.00E+00	±	2.35E-03	3.87E-03
CO-60		-1.59E-04	±	1.38E-03	5.86E-04
ZN-65		-2.52E-04	±	1.06E-03	1.67E-03
ZRNB-95		1.49E-04	±	8.83E-04	1.40E-03
CS-134		2.73E-06	±	3.07E-04	5.04E-04
CS-137		9.84E-05	±	2.53E-04	3.76E-04
BALA140		0.00E+00	±	2.61E-03	4.28E-03
RU-106		-3.49E-04	±	2.51E-03	4.00E-03

Location and Quarter Station 5 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	5.54E-02	±	1.18E-02	9.01E-03
K-40		4.52E-03	±	5.22E-03	5.04E-03
MN-54		2.63E-04	±	3.27E-04	3.34E-04
FE-59		-1.46E-04	±	2.42E-03	2.88E-03
CO-60		0.00E+00	±	5.34E-04	8.78E-04
ZN-65		5.37E-04	±	9.18E-04	9.62E-04
ZRNB-95		-3.53E-04	±	1.56E-03	1.93E-03
CS-134		1.54E-04	±	4.34E-04	5.48E-04
CS-137		0.00E+00	±	3.96E-04	6.51E-04
BALA140		0.00E+00	±	1.77E-02	2.90E-02
RU-106		0.00E+00	±	3.91E-03	6.43E-03

Location and Quarter Station 6 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	8.97E-02	±	1.51E-02	6.52E-03
K-40		-2.46E-03	±	9.84E-03	6.06E-03
MN-54		1.54E-04	±	4.25E-04	6.35E-04
FE-59		4.40E-04	±	2.55E-03	3.98E-03
CO-60		0.00E+00	±	1.77E-04	2.90E-04
ZN-65		-5.85E-04	±	1.80E-03	2.81E-03
ZRNB-95		3.18E-04	±	1.49E-03	2.35E-03
CS-134		0.00E+00	±	5.88E-04	9.67E-04
CS-137		0.00E+00	±	4.35E-04	7.15E-04
BALA140		0.00E+00	±	5.22E-03	8.57E-03
RU-106		0.00E+00	±	2.79E-03	4.58E-03

Location and Quarter Station 6 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.46E-01	±	1.87E-02	1.01E-02
K-40		-1.21E-03	±	8.95E-03	1.08E-02
MN-54		0.00E+00	±	4.62E-04	7.60E-04
FE-59		0.00E+00	±	9.92E-04	1.63E-03
CO-60		7.64E-05	±	3.43E-04	5.78E-04
ZN-65		1.34E-04	±	1.12E-03	1.80E-03
ZRNB-95		-3.81E-04	±	1.52E-03	2.40E-03
CS-134		-3.73E-05	±	3.53E-04	5.70E-04
CS-137		6.20E-05	±	3.16E-04	4.98E-04
BALA140		0.00E+00	±	8.62E-03	1.42E-02
RU-106		4.66E-05	±	3.01E-03	4.93E-03

Location and Quarter Station 6 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.51E-01	±	1.56E-02	6.89E-03
K-40		1.93E-03	±	4.17E-03	7.86E-03
MN-54		0.00E+00	±	5.04E-04	8.28E-04
FE-59		0.00E+00	±	6.79E-04	1.12E-03
CO-60		-2.21E-04	±	1.36E-03	8.41E-04
ZN-65		-1.50E-05	±	8.69E-04	1.42E-03
ZRNB-95		-2.95E-04	±	1.04E-03	1.62E-03
CS-134		-2.10E-04	±	4.69E-04	7.33E-04
CS-137		4.28E-05	±	3.62E-04	5.83E-04
BALA140		1.85E-03	±	7.91E-03	1.22E-02
RU-106		0.00E+00	±	2.18E-03	3.58E-03

Location and Quarter Station 6 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	5.54E-02	±	1.16E-02	2.71E-02
K-40		1.67E-03	±	4.52E-03	1.05E-02
MN-54		1.77E-05	±	4.40E-04	2.05E-03
FE-59		0.00E+00	±	8.02E-03	1.32E-02
CO-60		2.84E-04	±	3.05E-04	7.10E-04
ZN-65		-1.42E-04	±	1.35E-03	2.10E-03
ZRNB-95		6.84E-05	±	1.47E-03	5.13E-03
CS-134		3.73E-05	±	4.38E-04	1.02E-03
CS-137		2.81E-04	±	2.67E-04	6.21E-04
BALA140		0.00E+00	±	5.34E-02	8.78E-02
RU-106		2.70E-03	±	1.71E-03	3.99E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/30/14 to 3/31/15 - 2nd Q 3/31/15 to 6/30/15 - 3rd Q 6/30/15 to 9/29/15 - 4th Q 9/29/15 to 12/29/15

TABLE A-3.1

GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter Station 7 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	8.86E-02	±	1.57E-02	8.11E-03
K-40		2.38E-03	±	5.82E-03	9.60E-03
MN-54		1.99E-04	±	6.18E-04	9.61E-04
FE-59		-8.10E-04	±	3.83E-03	6.03E-03
CO-60		0.00E+00	±	1.75E-04	2.88E-04
ZN-65		3.97E-05	±	1.06E-03	1.73E-03
ZRNB-95		0.00E+00	±	2.16E-03	3.55E-03
CS-134		-1.48E-04	±	5.46E-04	8.65E-04
CS-137		-1.18E-04	±	5.63E-04	8.95E-04
BALA140		5.67E-03	±	9.17E-03	1.07E-02
RU-106		1.10E-03	±	4.69E-03	7.40E-03

Location and Quarter Station 7 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.45E-01	±	1.90E-02	1.19E-02
K-40		-1.08E-03	±	5.44E-03	7.92E-03
MN-54		0.00E+00	±	1.07E-04	1.76E-04
FE-59		0.00E+00	±	4.74E-03	7.79E-03
CO-60		-5.74E-05	±	1.30E-03	6.44E-04
ZN-65		0.00E+00	±	1.31E-03	2.16E-03
ZRNB-95		-2.53E-04	±	1.27E-03	2.02E-03
CS-134		7.65E-05	±	3.65E-04	5.81E-04
CS-137		-3.59E-05	±	3.22E-04	5.18E-04
BALA140		0.00E+00	±	8.11E-03	1.33E-02
RU-106		-7.84E-04	±	3.42E-03	5.41E-03

Location and Quarter Station 7 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.46E-01	±	1.52E-02	7.24E-03
K-40		-4.47E-03	±	9.95E-02	1.09E-02
MN-54		-1.40E-04	±	4.64E-04	7.28E-04
FE-59		-2.82E-04	±	2.03E-03	3.23E-03
CO-60		5.63E-06	±	4.53E-04	7.76E-04
ZN-65		-7.69E-04	±	1.57E-03	2.43E-03
ZRNB-95		0.00E+00	±	9.34E-04	1.53E-03
CS-134		-9.51E-05	±	3.75E-04	5.96E-04
CS-137		-1.11E-04	±	3.59E-04	5.60E-04
BALA140		-2.03E-03	±	8.55E-03	1.33E-02
RU-106		-7.86E-04	±	3.28E-03	5.19E-03

Location and Quarter Station 7 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	6.13E-02	±	1.21E-02	2.81E-02
K-40		3.67E-03	±	6.45E-03	1.50E-02
MN-54		1.78E-05	±	4.41E-04	2.06E-03
FE-59		0.00E+00	±	8.04E-03	1.32E-02
CO-60		3.36E-04	±	2.54E-04	5.93E-04
ZN-65		-1.89E-04	±	1.12E-03	1.31E-03
ZRNB-95		6.51E-04	±	1.16E-03	2.69E-03
CS-134		-1.25E-04	±	4.18E-04	1.95E-04
CS-137		-5.92E-05	±	4.85E-04	5.65E-04
BALA140		-4.42E-03	±	2.53E-02	2.53E-02
RU-106		0.00E+00	±	7.68E-03	1.26E-02

Location and Quarter Station 8 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	9.39E-02	±	1.57E-02	7.01E-03
K-40		4.25E-03	±	6.90E-03	1.07E-02
MN-54		1.00E-05	±	5.39E-04	8.83E-04
FE-59		-8.99E-04	±	3.53E-03	5.49E-03
CO-60		0.00E+00	±	1.73E-04	2.85E-04
ZN-65		5.90E-04	±	1.31E-03	1.95E-03
ZRNB-95		-1.19E-04	±	1.14E-03	1.83E-03
CS-134		5.63E-05	±	4.29E-04	6.89E-04
CS-137		0.00E+00	±	4.27E-04	7.02E-04
BALA140		0.00E+00	±	5.15E-03	8.46E-03
RU-106		1.63E-03	±	3.93E-03	5.92E-03

Location and Quarter Station 8 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.71E-01	±	1.86E-02	6.70E-03
K-40		-2.08E-04	±	5.28E-03	9.44E-03
MN-54		-8.47E-05	±	3.78E-04	5.94E-04
FE-59		-7.31E-04	±	3.12E-03	4.87E-03
CO-60		4.72E-05	±	3.12E-04	5.38E-04
ZN-65		3.16E-04	±	9.04E-04	1.37E-03
ZRNB-95		0.00E+00	±	1.69E-03	2.78E-03
CS-134		-9.16E-05	±	3.71E-04	5.89E-04
CS-137		-1.01E-04	±	3.30E-04	5.11E-04
BALA140		0.00E+00	±	3.40E-02	5.59E-02
RU-106		6.20E-04	±	2.90E-03	4.57E-03

Location and Quarter Station 8 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.62E-01	±	1.62E-02	7.12E-03
K-40		1.48E-03	±	4.94E-03	9.13E-03
MN-54		1.29E-04	±	3.15E-04	4.68E-04
FE-59		1.04E-03	±	1.03E-03	1.12E-03
CO-60		7.23E-05	±	4.41E-04	7.37E-04
ZN-65		6.18E-05	±	7.36E-04	1.18E-03
ZRNB-95		0.00E+00	±	9.85E-04	1.62E-03
CS-134		-1.73E-04	±	4.29E-04	6.70E-04
CS-137		1.63E-04	±	3.68E-04	5.59E-04
BALA140		-2.19E-03	±	8.52E-03	1.32E-02
RU-106		1.30E-03	±	2.77E-03	4.11E-03

Location and Quarter Station 8 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	5.97E-02	±	1.17E-02	1.61E-02
K-40		4.55E-03	±	5.25E-03	1.33E-02
MN-54		7.39E-05	±	6.52E-04	1.54E-03
FE-59		0.00E+00	±	6.87E-03	1.13E-02
CO-60		5.99E-04	±	3.46E-04	9.86E-04
ZN-65		0.00E+00	±	1.86E-03	3.06E-03
ZRNB-95		9.62E-04	±	6.41E-04	2.11E-03
CS-134		0.00E+00	±	7.62E-04	1.25E-03
CS-137		4.61E-05	±	3.59E-04	1.00E-03
BALA140		0.00E+00	±	3.89E-02	6.39E-02
RU-106		1.41E-03	±	2.91E-03	8.22E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/30/14 to 3/31/15 - 2nd Q 3/31/15 to 6/30/15 - 3rd Q 6/30/15 to 9/29/15 - 4th Q 9/29/15 to 12/29/15

TABLE A-3.1

GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter Station 9 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	9.75E-02	±	1.31E-02	6.18E-03
K-40		4.15E-03	±	4.58E-03	7.71E-03
MN-54		8.05E-05	±	3.40E-04	5.30E-04
FE-59		0.00E+00	±	3.75E-03	6.17E-03
CO-60		7.83E-05	±	3.70E-04	6.16E-04
ZN-65		4.01E-04	±	7.25E-04	1.00E-03
ZRNB-95		4.08E-04	±	9.88E-04	1.48E-03
CS-134		-2.48E-05	±	3.14E-04	5.09E-04
CS-137		-1.10E-04	±	3.95E-04	6.21E-04
BALA140		2.28E-03	±	8.55E-03	1.29E-02
RU-106		4.91E-04	±	2.99E-03	4.77E-03

Location and Quarter Station 9 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.39E-01	±	1.80E-02	9.94E-03
K-40		1.01E-03	±	4.51E-03	8.78E-03
MN-54		1.18E-05	±	4.27E-04	6.97E-04
FE-59		1.10E-03	±	1.97E-03	2.54E-03
CO-60		-1.57E-05	±	6.09E-04	7.81E-04
ZN-65		-1.31E-04	±	1.04E-03	1.67E-03
ZRNB-95		-1.79E-04	±	1.32E-03	2.11E-03
CS-134		3.87E-05	±	3.25E-04	5.23E-04
CS-137		-7.50E-05	±	3.64E-04	5.76E-04
BALA140		4.39E-03	±	6.02E-03	1.40E-02
RU-106		-5.12E-04	±	3.99E-03	6.43E-03

Location and Quarter Station 9 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.36E-01	±	1.49E-02	6.46E-03
K-40		-4.72E-03	±	1.05E-01	1.16E-02
MN-54		1.13E-04	±	2.51E-04	3.56E-04
FE-59		5.90E-05	±	1.53E-03	2.48E-03
CO-60		-3.01E-06	±	5.03E-04	8.16E-04
ZN-65		-1.28E-04	±	1.03E-03	1.66E-03
ZRNB-95		-7.07E-04	±	1.39E-03	2.12E-03
CS-134		-5.75E-05	±	3.60E-04	5.78E-04
CS-137		-9.13E-06	±	2.61E-04	4.26E-04
BALA140		5.89E-05	±	6.77E-03	1.11E-02
RU-106		4.88E-04	±	3.31E-03	5.30E-03

Location and Quarter Station 9 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	7.25E-02	±	1.25E-02	1.37E-02
K-40		7.24E-03	±	6.29E-03	1.28E-02
MN-54		1.48E-04	±	3.39E-04	9.12E-04
FE-59		0.00E+00	±	5.38E-03	8.85E-03
CO-60		2.40E-04	±	2.15E-04	9.49E-04
ZN-65		6.14E-04	±	1.06E-03	2.50E-03
ZRNB-95		0.00E+00	±	2.75E-03	4.51E-03
CS-134		9.97E-05	±	4.08E-04	8.82E-04
CS-137		1.04E-04	±	4.21E-04	9.62E-04
BALA140		3.49E-03	±	2.21E-02	5.19E-02
RU-106		-9.48E-04	±	5.78E-03	1.15E-02

Location and Quarter Station 21 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	9.60E-02	±	1.76E-02	1.03E-02
K-40		-2.51E-03	±	1.00E-02	6.19E-03
MN-54		0.00E+00	±	3.31E-04	5.44E-04
FE-59		-7.13E-04	±	3.80E-03	6.01E-03
CO-60		-2.14E-04	±	6.53E-04	1.00E-03
ZN-65		-2.33E-04	±	1.49E-03	2.37E-03
ZRNB-95		1.41E-05	±	1.46E-03	2.40E-03
CS-134		-1.33E-05	±	4.42E-04	7.23E-04
CS-137		0.00E+00	±	3.14E-04	5.16E-04
BALA140		0.00E+00	±	2.26E-02	3.72E-02
RU-106		8.66E-04	±	4.18E-03	6.60E-03

Location and Quarter Station 21 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.51E-01	±	1.88E-02	1.02E-02
K-40		-2.13E-03	±	1.13E-02	9.41E-03
MN-54		-3.17E-06	±	4.03E-04	6.62E-04
FE-59		0.00E+00	±	9.58E-04	1.57E-03
CO-60		-1.70E-05	±	6.15E-04	7.62E-04
ZN-65		-3.89E-04	±	1.14E-03	1.76E-03
ZRNB-95		-1.23E-04	±	1.23E-03	1.98E-03
CS-134		-1.37E-04	±	4.22E-04	6.65E-04
CS-137		2.61E-06	±	3.45E-04	5.66E-04
BALA140		7.14E-04	±	2.19E-02	3.57E-02
RU-106		-1.40E-04	±	3.35E-03	5.46E-03

Location and Quarter Station 21 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.45E-01	±	1.54E-02	5.87E-03
K-40		1.41E-03	±	4.42E-03	8.35E-03
MN-54		1.09E-05	±	3.31E-04	5.41E-04
FE-59		-1.15E-04	±	2.12E-03	3.44E-03
CO-60		-7.03E-05	±	2.07E-03	7.00E-04
ZN-65		-8.49E-05	±	7.72E-04	1.23E-03
ZRNB-95		1.20E-04	±	9.23E-04	1.48E-03
CS-134		0.00E+00	±	2.61E-04	4.29E-04
CS-137		-8.18E-05	±	2.91E-04	4.49E-04
BALA140		0.00E+00	±	3.35E-03	5.50E-03
RU-106		3.65E-06	±	2.85E-03	4.69E-03

Location and Quarter Station 21 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	5.46E-02	±	1.10E-02	1.52E-02
K-40		7.78E-03	±	5.69E-03	1.29E-02
MN-54		3.65E-04	±	3.43E-04	9.20E-04
FE-59		7.22E-04	±	2.53E-03	7.65E-03
CO-60		-3.23E-05	±	6.00E-04	1.54E-03
ZN-65		4.77E-05	±	1.36E-03	3.34E-03
ZRNB-95		0.00E+00	±	2.64E-03	4.34E-03
CS-134		1.26E-04	±	4.21E-04	1.01E-03
CS-137		-1.49E-04	±	4.99E-04	1.20E-03
BALA140		0.00E+00	±	4.85E-02	7.98E-02
RU-106		-2.05E-03	±	5.60E-03	1.27E-02

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-3.1

GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter Station 23 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	7.88E-02	±	1.29E-02	8.16E-03
K-40		2.34E-03	±	4.40E-03	8.16E-03
MN-54		-2.54E-05	±	3.58E-04	5.80E-04
FE-59		0.00E+00	±	2.79E-03	4.59E-03
CO-60		1.54E-04	±	4.84E-04	7.79E-04
ZN-65		0.00E+00	±	1.84E-03	3.03E-03
ZRNB-95		-3.11E-04	±	1.04E-03	1.60E-03
CS-134		3.14E-05	±	3.69E-04	5.98E-04
CS-137		1.57E-06	±	2.29E-04	3.76E-04
BALA140		-3.55E-03	±	1.65E-02	2.61E-02
RU-106		0.00E+00	±	3.38E-03	5.56E-03

Location and Quarter Station 23 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.40E-01	±	1.77E-02	9.25E-03
K-40		1.61E-03	±	4.73E-03	8.83E-03
MN-54		-1.44E-04	±	4.50E-04	6.98E-04
FE-59		-3.39E-04	±	3.46E-03	5.57E-03
CO-60		-1.02E-04	±	4.08E-04	3.18E-04
ZN-65		-7.40E-04	±	1.54E-03	2.36E-03
ZRNB-95		-3.03E-04	±	1.42E-03	2.25E-03
CS-134		8.69E-05	±	3.14E-04	4.91E-04
CS-137		4.68E-05	±	2.79E-04	4.41E-04
BALA140		0.00E+00	±	8.64E-03	1.42E-02
RU-106		-2.86E-05	±	3.12E-03	5.12E-03

Location and Quarter Station 23 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.37E-01	±	1.50E-02	6.20E-03
K-40		-6.06E-04	±	6.66E-03	9.84E-03
MN-54		-8.74E-05	±	4.43E-04	7.05E-04
FE-59		-9.37E-06	±	1.80E-03	2.96E-03
CO-60		-1.69E-04	±	1.62E-03	7.32E-04
ZN-65		2.91E-04	±	1.00E-03	1.56E-03
ZRNB-95		1.73E-04	±	8.66E-04	1.36E-03
CS-134		-1.03E-04	±	3.70E-04	5.84E-04
CS-137		-1.37E-04	±	3.78E-04	5.84E-04
BALA140		-1.89E-03	±	8.26E-03	1.27E-02
RU-106		-9.58E-04	±	2.84E-03	4.37E-03

Location and Quarter Station 23 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	6.32E-02	±	1.29E-02	1.59E-02
K-40		4.23E-04	±	8.79E-03	1.97E-02
MN-54		0.00E+00	±	8.31E-04	1.37E-03
FE-59		1.97E-03	±	3.38E-03	8.01E-03
CO-60		6.75E-05	±	7.69E-04	1.61E-03
ZN-65		1.25E-03	±	1.22E-03	2.64E-03
ZRNB-95		2.73E-04	±	1.66E-03	3.64E-03
CS-134		3.94E-05	±	5.56E-04	1.12E-03
CS-137		-1.40E-04	±	6.68E-04	1.33E-03
BALA140		0.00E+00	±	5.09E-02	8.37E-02
RU-106		2.00E-03	±	4.78E-03	1.01E-02

Location and Quarter Station 40 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	9.73E-02	±	1.66E-02	8.95E-03
K-40		5.69E-04	±	4.75E-03	8.71E-03
MN-54		-1.38E-04	±	4.66E-04	7.14E-04
FE-59		0.00E+00	±	1.07E-03	1.76E-03
CO-60		-4.31E-06	±	6.81E-04	1.12E-03
ZN-65		0.00E+00	±	1.31E-03	2.16E-03
ZRNB-95		-5.89E-04	±	1.87E-03	2.92E-03
CS-134		-3.16E-05	±	4.70E-04	7.64E-04
CS-137		-2.02E-04	±	5.96E-04	9.29E-04
BALA140		0.00E+00	±	2.27E-02	3.74E-02
RU-106		-5.18E-04	±	4.42E-03	7.10E-03

Location and Quarter Station 40 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.58E-01	±	1.96E-02	1.20E-02
K-40		1.46E-03	±	5.41E-03	9.84E-03
MN-54		1.59E-05	±	3.34E-04	5.43E-04
FE-59		-6.47E-04	±	3.47E-03	5.50E-03
CO-60		-1.01E-04	±	3.46E-03	1.31E-03
ZN-65		0.00E+00	±	1.88E-03	3.08E-03
ZRNB-95		1.63E-04	±	1.12E-03	1.78E-03
CS-134		1.77E-04	±	3.80E-04	5.83E-04
CS-137		2.74E-05	±	3.31E-04	5.36E-04
BALA140		0.00E+00	±	8.59E-03	1.41E-02
RU-106		-5.36E-04	±	2.76E-03	4.36E-03

Location and Quarter Station 40 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.30E-01	±	1.57E-02	8.48E-03
K-40		3.99E-03	±	5.79E-03	9.74E-03
MN-54		-1.32E-04	±	4.49E-04	7.01E-04
FE-59		-4.11E-04	±	2.15E-03	3.36E-03
CO-60		6.08E-05	±	3.97E-04	6.70E-04
ZN-65		-2.72E-04	±	1.25E-03	1.99E-03
ZRNB-95		-3.04E-04	±	1.06E-03	1.65E-03
CS-134		1.74E-04	±	2.44E-04	3.34E-04
CS-137		2.26E-04	±	3.02E-04	4.12E-04
BALA140		0.00E+00	±	3.59E-03	5.90E-03
RU-106		-9.45E-04	±	4.09E-03	6.51E-03

Location and Quarter Station 40 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	6.32E-02	±	1.19E-02	7.54E-03
K-40		5.73E-03	±	8.22E-03	8.83E-03
MN-54		4.58E-04	±	4.56E-04	4.79E-04
FE-59		0.00E+00	±	4.02E-03	6.61E-03
CO-60		2.59E-04	±	4.92E-04	5.13E-04
ZN-65		0.00E+00	±	8.39E-04	1.38E-03
ZRNB-95		2.71E-04	±	1.38E-03	1.71E-03
CS-134		-6.51E-05	±	5.21E-04	6.80E-04
CS-137		1.54E-04	±	4.30E-04	5.37E-04
BALA140		-2.76E-03	±	2.74E-02	3.10E-02
RU-106		0.00E+00	±	4.49E-03	7.39E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/30/14 to 3/31/15 - 2nd Q 3/31/15 to 6/30/15 - 3rd Q 6/30/15 to 9/29/15 - 4th Q 9/29/15 to 12/29/15

TABLE A-3.1

GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter Station 48 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	8.24E-02	±	1.32E-02	8.77E-03
K-40		-6.25E-04	±	5.58E-03	8.97E-03
MN-54		2.39E-04	±	3.63E-04	5.09E-04
FE-59		0.00E+00	±	2.78E-03	4.57E-03
CO-60		-1.03E-04	±	9.36E-02	7.08E-04
ZN-65		-3.05E-04	±	9.72E-04	1.49E-03
ZRNB-95		0.00E+00	±	7.66E-04	1.26E-03
CS-134		-1.02E-04	±	3.67E-04	5.79E-04
CS-137		8.63E-05	±	3.20E-04	4.98E-04
BALA140		0.00E+00	±	3.92E-03	6.45E-03
RU-106		5.90E-06	±	3.07E-03	5.05E-03

Location and Quarter Station 48 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.71E-01	±	1.97E-02	1.02E-02
K-40		2.66E-03	±	5.51E-03	9.66E-03
MN-54		4.41E-05	±	2.75E-04	4.31E-04
FE-59		0.00E+00	±	9.53E-04	1.57E-03
CO-60		-2.71E-04	±	1.07E-03	8.11E-04
ZN-65		-9.18E-05	±	9.41E-04	1.51E-03
ZRNB-95		-4.76E-04	±	1.53E-03	2.39E-03
CS-134		6.06E-05	±	2.80E-04	4.41E-04
CS-137		7.96E-05	±	3.15E-04	4.91E-04
BALA140		0.00E+00	±	8.62E-03	1.42E-02
RU-106		-2.02E-05	±	2.93E-03	4.81E-03

Location and Quarter Station 48 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.32E-01	±	1.51E-02	7.02E-03
K-40		5.75E-04	±	4.03E-03	8.06E-03
MN-54		-2.41E-06	±	3.33E-04	5.47E-04
FE-59		0.00E+00	±	7.21E-04	1.19E-03
CO-60		-1.02E-04	±	4.07E-04	3.28E-04
ZN-65		-2.26E-04	±	1.03E-03	1.63E-03
ZRNB-95		0.00E+00	±	7.18E-04	1.18E-03
CS-134		-3.92E-06	±	2.68E-04	4.40E-04
CS-137		-4.97E-07	±	3.28E-04	5.37E-04
BALA140		0.00E+00	±	3.48E-03	5.73E-03
RU-106		-4.01E-04	±	3.28E-03	5.29E-03

Location and Quarter Station 48 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	6.35E-02	±	1.29E-02	9.11E-03
K-40		1.35E-03	±	6.41E-03	8.87E-03
MN-54		-5.64E-05	±	4.72E-04	5.93E-04
FE-59		7.58E-04	±	2.65E-03	2.99E-03
CO-60		1.10E-04	±	4.65E-04	5.18E-04
ZN-65		2.50E-04	±	8.75E-04	9.86E-04
ZRNB-95		0.00E+00	±	1.36E-03	2.23E-03
CS-134		2.24E-04	±	3.37E-04	3.97E-04
CS-137		0.00E+00	±	4.96E-04	8.15E-04
BALA140		0.00E+00	±	1.91E-02	3.14E-02
RU-106		-1.57E-03	±	5.17E-03	6.59E-03

Location and Quarter Station 57 1st Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	9.31E-02	±	1.54E-02	7.34E-03
K-40		-2.26E-03	±	2.17E-01	1.05E-02
MN-54		1.08E-04	±	5.53E-04	8.77E-04
FE-59		0.00E+00	±	3.69E-03	6.06E-03
CO-60		0.00E+00	±	1.71E-04	2.80E-04
ZN-65		5.73E-04	±	1.24E-03	1.82E-03
ZRNB-95		1.55E-04	±	1.06E-03	1.67E-03
CS-134		-6.59E-05	±	3.71E-04	5.89E-04
CS-137		-1.56E-04	±	4.74E-04	7.32E-04
BALA140		0.00E+00	±	2.16E-02	3.54E-02
RU-106		4.45E-05	±	4.85E-03	7.97E-03

Location and Quarter Station 57 2nd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.64E-01	±	1.96E-02	1.05E-02
K-40		-8.23E-05	±	5.24E-03	9.80E-03
MN-54		0.00E+00	±	5.88E-04	9.66E-04
FE-59		0.00E+00	±	3.46E-03	5.69E-03
CO-60		-1.02E-04	±	4.08E-04	3.18E-04
ZN-65		-4.60E-04	±	1.34E-03	2.08E-03
ZRNB-95		0.00E+00	±	1.22E-03	2.01E-03
CS-134		-9.42E-06	±	4.32E-04	7.08E-04
CS-137		-3.09E-06	±	3.61E-04	5.93E-04
BALA140		2.21E-03	±	1.80E-02	2.83E-02
RU-106		6.46E-04	±	3.68E-03	5.87E-03

Location and Quarter Station 57 3rd Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.55E-01	±	1.59E-02	5.81E-03
K-40		-4.87E-03	±	1.81E-01	9.58E-03
MN-54		-8.74E-05	±	3.53E-04	5.50E-04
FE-59		0.00E+00	±	7.29E-04	1.20E-03
CO-60		-1.03E-04	±	2.16E-03	9.15E-04
ZN-65		-8.83E-05	±	1.08E-03	1.75E-03
ZRNB-95		-2.73E-05	±	8.85E-04	1.45E-03
CS-134		-2.52E-06	±	3.14E-04	5.16E-04
CS-137		0.00E+00	±	3.06E-04	5.03E-04
BALA140		0.00E+00	±	3.53E-03	5.80E-03
RU-106		-1.00E-04	±	3.16E-03	5.17E-03

Location and Quarter Station 57 4th Q 2015

Nuclide	RQ	Activity		Error	MDA
BE-7	+	5.83E-02	±	1.12E-02	7.79E-03
K-40		2.26E-03	±	6.31E-03	9.84E-03
MN-54		0.00E+00	±	5.07E-04	8.34E-04
FE-59		0.00E+00	±	2.96E-03	4.86E-03
CO-60		0.00E+00	±	6.87E-04	1.13E-03
ZN-65		4.80E-05	±	1.36E-03	1.90E-03
ZRNB-95		8.59E-04	±	9.60E-04	1.24E-03
CS-134		-2.53E-05	±	4.11E-04	6.08E-04
CS-137		8.99E-05	±	4.08E-04	6.04E-04
BALA140		0.00E+00	±	2.17E-02	3.57E-02
RU-106		9.62E-04	±	2.08E-03	3.14E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/30/14 to 3/31/15 - 2nd Q 3/31/15 to 6/30/15 - 3rd Q 6/30/15 to 9/29/15 - 4th Q 9/29/15 to 12/29/15

TABLE A-3.2

GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS - SUMMARY

Results in pCi/cubic meter, results decay corrected to mid point of the sample collection period

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Cntl	2.56E-03	5.89E-05	4.39E-03	2.25E-02	4	0
BALA140	Ind	-1.06E-05	-4.42E-03	5.67E-03	2.48E-02	44	0
BE-7	Cntl	1.11E-01	7.25E-02	1.39E-01	9.07E-03	4	4
BE-7	Ind	1.11E-01	5.46E-02	1.71E-01	9.64E-03	44	44
CO-60	Cntl	7.49E-05	-1.57E-05	2.40E-04	7.90E-04	4	0
CO-60	Ind	3.17E-06	-2.71E-04	5.99E-04	7.17E-04	44	0
CS-134	Cntl	1.40E-05	-5.75E-05	9.97E-05	6.23E-04	4	0
CS-134	Ind	4.35E-06	-2.10E-04	2.28E-04	6.24E-04	44	0
CS-137	Cntl	-2.26E-05	-1.10E-04	1.04E-04	6.46E-04	4	0
CS-137	Ind	5.42E-06	-2.02E-04	2.81E-04	6.33E-04	44	0
FE-59	Cntl	2.90E-04	0.00E+00	1.10E-03	5.01E-03	4	0
FE-59	Ind	-9.83E-06	-8.99E-04	1.97E-03	4.66E-03	44	0
K-40	Cntl	1.92E-03	-4.72E-03	7.24E-03	1.02E-02	4	0
K-40	Ind	8.42E-04	-4.87E-03	7.78E-03	9.79E-03	44	0
MN-54	Cntl	8.83E-05	1.18E-05	1.48E-04	6.24E-04	4	0
MN-54	Ind	4.14E-05	-1.87E-04	4.58E-04	7.48E-04	44	0
RU-106	Cntl	-1.20E-04	-9.48E-04	4.91E-04	7.00E-03	4	0
RU-106	Ind	6.20E-05	-2.05E-03	2.70E-03	5.97E-03	44	0
ZN-65	Cntl	1.89E-04	-1.31E-04	6.14E-04	1.71E-03	4	0
ZN-65	Ind	-2.69E-05	-7.69E-04	1.25E-03	1.97E-03	44	0
ZRNB-95	Cntl	-1.19E-04	-7.07E-04	4.08E-04	2.56E-03	4	0
ZRNB-95	Ind	1.80E-05	-5.89E-04	9.62E-04	2.11E-03	44	0

Ind = Indication Stations Cntl = Control Stations

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

Results in pCi/cubic meter, corrected for decay during collection period

		Station 1					Station 9				
Collection Period		RQ	Activity		Error	MDA	RQ	Activity		Error	MDA
12/30/2014 -	1/6/2015		-1.19E-03	±	7.96E-03	1.28E-02		7.62E-03	±	7.13E-03	9.51E-03
1/6/2015 -	1/13/2015		-2.54E-03	±	1.12E-02	1.79E-02		-3.68E-04	±	1.07E-02	1.75E-02
1/13/2015 -	1/20/2015		7.12E-04	±	8.35E-03	1.36E-02		-2.60E-03	±	9.41E-03	1.49E-02
1/20/2015 -	1/27/2015		3.57E-03	±	7.42E-03	1.12E-02		4.91E-04	±	7.64E-03	1.24E-02
1/27/2015 -	2/3/2015		3.23E-03	±	6.86E-03	1.04E-02		-1.07E-03	±	7.14E-03	1.15E-02
2/3/2015 -	2/10/2015		2.61E-04	±	6.45E-03	1.05E-02		-2.25E-04	±	6.64E-03	1.09E-02
2/10/2015 -	2/17/2015		5.23E-03	±	8.83E-03	1.34E-02		1.35E-03	±	8.03E-03	1.29E-02
2/17/2015 -	2/24/2015		1.42E-03	±	8.24E-03	1.32E-02		0.00E+00	±	7.46E-03	1.23E-02
2/24/2015 -	3/3/2015		3.98E-04	±	7.53E-03	1.23E-02		-5.90E-04	±	6.31E-03	1.02E-02
3/3/2015 -	3/10/2015		0.00E+00	±	9.65E-03	1.59E-02		-3.25E-06	±	7.93E-03	1.30E-02
3/10/2015 -	3/17/2015		3.62E-03	±	7.16E-03	1.08E-02		-1.36E-03	±	9.15E-03	1.48E-02
3/17/2015 -	3/24/2015		-8.44E-04	±	6.86E-03	1.11E-02		1.48E-04	±	7.08E-03	1.16E-02
3/24/2015 -	3/31/2015		2.54E-03	±	7.20E-03	1.12E-02		2.39E-04	±	6.65E-03	1.09E-02
3/31/2015 -	4/7/2015		-2.18E-03	±	8.69E-03	1.38E-02		0.00E+00	±	1.02E-02	1.68E-02
4/7/2015 -	4/14/2015		-6.76E-04	±	7.29E-03	1.18E-02		-3.16E-04	±	6.98E-03	1.14E-02
4/14/2015 -	4/21/2015		2.26E-03	±	7.28E-03	1.14E-02		5.01E-03	±	7.49E-03	1.10E-02
4/21/2015 -	4/28/2015		0.00E+00	±	1.21E-02	1.98E-02		6.90E-06	±	7.27E-03	1.20E-02
4/28/2015 -	5/5/2015		-1.57E-03	±	8.46E-03	1.36E-02		0.00E+00	±	9.86E-03	1.62E-02
5/5/2015 -	5/12/2015		3.08E-03	±	6.62E-03	9.99E-03		-3.07E-04	±	6.37E-03	1.04E-02
5/12/2015 -	5/19/2015		0.00E+00	±	1.21E-02	2.00E-02		2.57E-03	±	8.39E-03	1.32E-02
5/19/2015 -	5/26/2015		-9.85E-04	±	6.86E-03	1.10E-02		-4.97E-05	±	6.83E-03	1.12E-02
5/26/2015 -	6/2/2015		-2.30E-04	±	7.23E-03	1.18E-02		2.54E-03	±	6.86E-03	1.06E-02
6/2/2015 -	6/9/2015		-1.70E-03	±	6.87E-03	1.08E-02		-1.22E-04	±	6.28E-03	1.03E-02
6/9/2015 -	6/16/2015		4.30E-03	±	8.13E-03	1.23E-02		-2.94E-03	±	8.57E-03	1.34E-02
6/16/2015 -	6/23/2015		3.29E-03	±	7.07E-03	1.07E-02		9.29E-04	±	7.03E-03	1.13E-02
6/23/2015 -	6/30/2015		0.00E+00	±	7.48E-03	1.23E-02		-4.02E-03	±	1.04E-02	1.63E-02
6/30/2015 -	7/7/2015		-3.96E-03	±	9.44E-03	1.47E-02		-1.68E-05	±	6.71E-03	1.10E-02
7/7/2015 -	7/14/2015		-7.79E-04	±	8.76E-03	1.42E-02		-3.93E-06	±	6.06E-03	9.89E-03
7/14/2015 -	7/21/2015		-1.47E-03	±	8.28E-03	1.33E-02		0.00E+00	±	1.22E-02	2.00E-02
7/21/2015 -	7/28/2015		-7.04E-05	±	8.36E-03	1.37E-02		1.36E-03	±	6.66E-03	1.06E-02
7/28/2015 -	8/4/2015		-2.65E-04	±	7.27E-03	1.19E-02		1.39E-03	±	8.43E-03	1.36E-02
8/4/2015 -	8/11/2015		-1.09E-03	±	8.05E-03	1.30E-02		4.17E-05	±	7.02E-03	1.15E-02
8/11/2015 -	8/18/2015		1.44E-03	±	7.72E-03	1.24E-02		6.07E-04	±	6.39E-03	1.03E-02
8/18/2015 -	8/25/2015		3.64E-05	±	7.68E-03	1.26E-02		-4.57E-05	±	7.06E-03	1.16E-02
8/25/2015 -	9/1/2015		-5.72E-04	±	7.79E-03	1.27E-02		-1.62E-04	±	5.67E-03	9.27E-03
9/1/2015 -	9/8/2015		-4.67E-05	±	8.00E-03	1.31E-02		6.25E-04	±	8.32E-03	1.35E-02
9/8/2015 -	9/15/2015		-5.17E-04	±	7.43E-03	1.21E-02		0.00E+00	±	8.29E-03	1.36E-02
9/15/2015 -	9/22/2015		5.21E-03	±	7.68E-03	1.13E-02		-2.40E-04	±	7.30E-03	1.19E-02
9/22/2015 -	9/29/2015		0.00E+00	±	1.18E-02	1.94E-02		3.28E-04	±	8.10E-03	1.32E-02
9/29/2015 -	10/6/2015		-1.32E-04	±	8.06E-03	1.32E-02		-6.15E-05	±	6.52E-03	1.07E-02
10/6/2015 -	10/13/2015		0.00E+00	±	1.03E-02	1.70E-02		-1.97E-03	±	7.57E-03	1.20E-02
10/13/2015 -	10/20/2015		0.00E+00	±	8.10E-03	1.33E-02		6.79E-04	±	6.96E-03	1.13E-02
10/20/2015 -	10/27/2015		-2.46E-04	±	7.02E-03	1.15E-02		-1.28E-03	±	7.60E-03	1.22E-02
10/27/2015 -	11/3/2015		2.94E-03	±	1.22E-02	1.62E-02		0.00E+00	±	1.11E-02	1.83E-02
11/3/2015 -	11/10/2015		-4.27E-03	±	1.13E-02	1.54E-02		-4.50E-04	±	1.08E-02	1.52E-02
11/10/2015 -	11/17/2015		1.78E-03	±	8.58E-03	1.18E-02		0.00E+00	±	1.02E-02	1.67E-02
11/17/2015 -	11/24/2015		2.42E-03	±	9.21E-03	1.26E-02		-2.97E-03	±	9.31E-03	1.27E-02
11/24/2015 -	12/1/2015		2.20E-03	±	1.07E-02	1.49E-02		0.00E+00	±	1.03E-02	1.69E-02
12/1/2015 -	12/8/2015		-2.64E-04	±	8.79E-03	1.24E-02		1.79E-03	±	8.64E-03	1.19E-02
12/8/2015 -	12/15/2015		-5.94E-03	±	1.52E-02	2.00E-02		5.66E-03	±	1.10E-02	1.40E-02
12/15/2015 -	12/22/2015		-4.89E-03	±	1.60E-02	2.13E-02		-7.77E-03	±	1.73E-02	2.27E-02
12/22/2015 -	12/29/2015		-4.13E-03	±	1.16E-02	1.58E-02		-7.57E-04	±	1.00E-02	1.41E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifer. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

Results in pCi/cubic meter, corrected for decay during collection period

		Station 4					Station 21				
Collection Period		RQ	Activity		Error	MDA	RQ	Activity		Error	MDA
12/30/2014 -	1/6/2015		-1.11E-03	±	7.45E-03	1.20E-02		7.90E-03	±	7.38E-03	9.85E-03
1/6/2015 -	1/13/2015		-2.34E-03	±	1.03E-02	1.65E-02		-4.22E-04	±	1.23E-02	2.01E-02
1/13/2015 -	1/20/2015		6.62E-04	±	7.76E-03	1.26E-02		-2.82E-03	±	1.02E-02	1.61E-02
1/20/2015 -	1/27/2015		3.41E-03	±	7.08E-03	1.07E-02		4.89E-04	±	7.60E-03	1.24E-02
1/27/2015 -	2/3/2015		3.32E-03	±	7.06E-03	1.07E-02		-1.07E-03	±	7.18E-03	1.15E-02
2/3/2015 -	2/10/2015		2.61E-04	±	6.45E-03	1.05E-02		-2.47E-04	±	7.30E-03	1.19E-02
2/10/2015 -	2/17/2015		5.12E-03	±	8.65E-03	1.31E-02		1.37E-03	±	8.14E-03	1.31E-02
2/17/2015 -	2/24/2015		1.40E-03	±	8.12E-03	1.30E-02		0.00E+00	±	7.86E-03	1.29E-02
2/24/2015 -	3/3/2015		3.91E-04	±	7.40E-03	1.21E-02		-6.06E-04	±	6.47E-03	1.05E-02
3/3/2015 -	3/10/2015		0.00E+00	±	9.83E-03	1.62E-02		-3.54E-06	±	8.63E-03	1.41E-02
3/10/2015 -	3/17/2015		3.70E-03	±	7.32E-03	1.10E-02		-1.47E-03	±	9.85E-03	1.59E-02
3/17/2015 -	3/24/2015		-8.81E-04	±	7.16E-03	1.15E-02		1.59E-04	±	7.60E-03	1.25E-02
3/24/2015 -	3/31/2015		2.67E-03	±	7.59E-03	1.18E-02		2.55E-04	±	7.12E-03	1.16E-02
3/31/2015 -	4/7/2015		-2.33E-03	±	9.31E-03	1.48E-02		0.00E+00	±	1.09E-02	1.79E-02
4/7/2015 -	4/14/2015		-7.50E-04	±	8.09E-03	1.31E-02		-3.39E-04	±	7.48E-03	1.22E-02
4/14/2015 -	4/21/2015		2.46E-03	±	7.94E-03	1.24E-02		5.17E-03	±	7.71E-03	1.14E-02
4/21/2015 -	4/28/2015		0.00E+00	±	1.15E-02	1.89E-02		6.91E-06	±	7.27E-03	1.20E-02
4/28/2015 -	5/5/2015		-1.51E-03	±	8.17E-03	1.31E-02		0.00E+00	±	9.83E-03	1.62E-02
5/5/2015 -	5/12/2015		2.98E-03	±	6.41E-03	9.66E-03		-3.03E-04	±	6.29E-03	1.02E-02
5/12/2015 -	5/19/2015		0.00E+00	±	9.53E-03	1.57E-02		2.48E-03	±	8.10E-03	1.27E-02
5/19/2015 -	5/26/2015		-1.00E-03	±	6.98E-03	1.12E-02		-4.89E-05	±	6.72E-03	1.10E-02
5/26/2015 -	6/2/2015		-2.30E-04	±	7.23E-03	1.18E-02		2.50E-03	±	6.76E-03	1.04E-02
6/2/2015 -	6/9/2015		-1.70E-03	±	6.87E-03	1.08E-02		-1.19E-04	±	6.14E-03	1.01E-02
6/9/2015 -	6/16/2015		4.38E-03	±	8.28E-03	1.26E-02		-2.90E-03	±	8.44E-03	1.32E-02
6/16/2015 -	6/23/2015		3.28E-03	±	7.05E-03	1.07E-02		9.29E-04	±	7.03E-03	1.13E-02
6/23/2015 -	6/30/2015		0.00E+00	±	7.46E-03	1.23E-02		-4.00E-03	±	1.03E-02	1.63E-02
6/30/2015 -	7/7/2015		-4.03E-03	±	9.60E-03	1.50E-02		-1.65E-05	±	6.60E-03	1.08E-02
7/7/2015 -	7/14/2015		-7.99E-04	±	8.98E-03	1.46E-02		-3.95E-06	±	6.09E-03	9.94E-03
7/14/2015 -	7/21/2015		-1.46E-03	±	8.26E-03	1.32E-02		0.00E+00	±	1.17E-02	1.93E-02
7/21/2015 -	7/28/2015		-7.16E-05	±	8.51E-03	1.40E-02		1.36E-03	±	6.66E-03	1.06E-02
7/28/2015 -	8/4/2015		-2.65E-04	±	7.27E-03	1.19E-02		1.34E-03	±	8.12E-03	1.31E-02
8/4/2015 -	8/11/2015		-1.10E-03	±	8.07E-03	1.30E-02		4.19E-05	±	7.05E-03	1.16E-02
8/11/2015 -	8/18/2015		1.51E-03	±	8.10E-03	1.30E-02		5.96E-04	±	6.27E-03	1.01E-02
8/18/2015 -	8/25/2015		3.71E-05	±	7.84E-03	1.29E-02		-4.38E-05	±	6.76E-03	1.11E-02
8/25/2015 -	9/1/2015		-5.92E-04	±	8.06E-03	1.31E-02		-1.58E-04	±	5.54E-03	9.06E-03
9/1/2015 -	9/8/2015		-4.82E-05	±	8.26E-03	1.36E-02		6.08E-04	±	8.10E-03	1.32E-02
9/8/2015 -	9/15/2015		-5.37E-04	±	7.71E-03	1.25E-02		0.00E+00	±	8.31E-03	1.37E-02
9/15/2015 -	9/22/2015		5.75E-03	±	8.47E-03	1.25E-02		-2.37E-04	±	7.19E-03	1.18E-02
9/22/2015 -	9/29/2015		0.00E+00	±	1.31E-02	2.15E-02		3.16E-04	±	7.81E-03	1.28E-02
9/29/2015 -	10/6/2015		-1.27E-04	±	7.79E-03	1.28E-02		-6.04E-05	±	6.41E-03	1.05E-02
10/6/2015 -	10/13/2015		0.00E+00	±	1.00E-02	1.64E-02		-1.91E-03	±	7.35E-03	1.16E-02
10/13/2015 -	10/20/2015		0.00E+00	±	7.70E-03	1.27E-02		6.54E-04	±	6.70E-03	1.09E-02
10/20/2015 -	10/27/2015		-2.56E-04	±	7.29E-03	1.19E-02		-1.23E-03	±	7.31E-03	1.17E-02
10/27/2015 -	11/3/2015		2.78E-03	±	1.15E-02	1.53E-02		0.00E+00	±	1.20E-02	1.97E-02
11/3/2015 -	11/10/2015		-4.13E-03	±	1.09E-02	1.49E-02		-4.49E-04	±	1.08E-02	1.52E-02
11/10/2015 -	11/17/2015		1.79E-03	±	8.64E-03	1.19E-02		0.00E+00	±	1.03E-02	1.69E-02
11/17/2015 -	11/24/2015		2.33E-03	±	8.86E-03	1.21E-02		-3.00E-03	±	9.42E-03	1.28E-02
11/24/2015 -	12/1/2015		2.13E-03	±	1.04E-02	1.45E-02		0.00E+00	±	1.06E-02	1.75E-02
12/1/2015 -	12/8/2015		-2.76E-04	±	9.21E-03	1.30E-02		1.82E-03	±	8.76E-03	1.21E-02
12/8/2015 -	12/15/2015		-6.48E-03	±	1.65E-02	2.19E-02		5.75E-03	±	1.11E-02	1.43E-02
12/15/2015 -	12/22/2015		-5.24E-03	±	1.71E-02	2.28E-02		-7.92E-03	±	1.76E-02	2.32E-02
12/22/2015 -	12/29/2015		-4.42E-03	±	1.24E-02	1.69E-02		-7.96E-04	±	1.05E-02	1.48E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifer. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

Results in pCi/cubic meter, corrected for decay during collection period

		Station 5					Station 23				
Collection Period		RQ	Activity		Error	MDA	RQ	Activity		Error	MDA
12/30/2014 -	1/6/2015		-1.12E-03	±	7.52E-03	1.21E-02		1.36E-03	±	7.15E-03	1.14E-02
1/6/2015 -	1/13/2015		-2.39E-03	±	1.05E-02	1.68E-02		-2.52E-03	±	1.34E-02	2.16E-02
1/13/2015 -	1/20/2015		6.65E-04	±	7.80E-03	1.27E-02		-3.88E-05	±	9.12E-03	1.50E-02
1/20/2015 -	1/27/2015		3.39E-03	±	7.04E-03	1.07E-02		-2.98E-03	±	8.45E-03	1.32E-02
1/27/2015 -	2/3/2015		3.33E-03	±	7.07E-03	1.07E-02		1.74E-03	±	5.24E-03	7.96E-03
2/3/2015 -	2/10/2015		2.66E-04	±	6.57E-03	1.07E-02		8.14E-05	±	6.53E-03	1.07E-02
2/10/2015 -	2/17/2015		5.32E-03	±	8.98E-03	1.36E-02		-3.45E-03	±	8.82E-03	1.37E-02
2/17/2015 -	2/24/2015		1.43E-03	±	8.31E-03	1.33E-02		-4.97E-03	±	1.21E-02	1.91E-02
2/24/2015 -	3/3/2015		4.07E-04	±	7.72E-03	1.26E-02		-1.65E-03	±	9.13E-03	1.47E-02
3/3/2015 -	3/10/2015		0.00E+00	±	9.98E-03	1.64E-02		-1.82E-03	±	8.27E-03	1.32E-02
3/10/2015 -	3/17/2015		3.79E-03	±	7.51E-03	1.13E-02		5.99E-05	±	8.72E-03	1.43E-02
3/17/2015 -	3/24/2015		-9.06E-04	±	7.36E-03	1.19E-02		1.18E-03	±	7.77E-03	1.25E-02
3/24/2015 -	3/31/2015		2.71E-03	±	7.70E-03	1.20E-02		2.13E-03	±	8.95E-03	1.42E-02
3/31/2015 -	4/7/2015		-2.38E-03	±	9.49E-03	1.51E-02		3.06E-04	±	7.91E-03	1.29E-02
4/7/2015 -	4/14/2015		-7.64E-04	±	8.24E-03	1.34E-02		2.32E-04	±	6.53E-03	1.07E-02
4/14/2015 -	4/21/2015		2.51E-03	±	8.09E-03	1.27E-02		-2.11E-03	±	8.16E-03	1.29E-02
4/21/2015 -	4/28/2015		0.00E+00	±	1.17E-02	1.92E-02		-2.12E-03	±	7.83E-03	1.24E-02
4/28/2015 -	5/5/2015		-1.48E-03	±	8.02E-03	1.29E-02		8.65E-04	±	7.16E-03	1.15E-02
5/5/2015 -	5/12/2015		2.93E-03	±	6.31E-03	9.51E-03		3.64E-04	±	6.60E-03	1.07E-02
5/12/2015 -	5/19/2015		0.00E+00	±	9.53E-03	1.57E-02		-1.31E-04	±	6.39E-03	1.05E-02
5/19/2015 -	5/26/2015		-9.73E-04	±	6.77E-03	1.09E-02		-2.69E-03	±	1.27E-02	2.03E-02
5/26/2015 -	6/2/2015		-2.15E-04	±	6.75E-03	1.10E-02		-2.62E-03	±	8.81E-03	1.40E-02
6/2/2015 -	6/9/2015		-1.59E-03	±	6.42E-03	1.01E-02		-6.15E-04	±	7.36E-03	1.19E-02
6/9/2015 -	6/16/2015		4.09E-03	±	7.72E-03	1.17E-02		-1.93E-03	±	9.35E-03	1.50E-02
6/16/2015 -	6/23/2015		3.12E-03	±	6.71E-03	1.02E-02		1.98E-03	±	8.08E-03	1.28E-02
6/23/2015 -	6/30/2015		0.00E+00	±	6.90E-03	1.13E-02		-4.52E-04	±	6.77E-03	1.10E-02
6/30/2015 -	7/7/2015		-3.62E-03	±	8.63E-03	1.34E-02		-1.28E-05	±	7.17E-03	1.18E-02
7/7/2015 -	7/14/2015		-7.29E-04	±	8.20E-03	1.33E-02		0.00E+00	±	8.91E-03	1.46E-02
7/14/2015 -	7/21/2015		-1.38E-03	±	7.76E-03	1.24E-02		-1.26E-03	±	8.94E-03	1.44E-02
7/21/2015 -	7/28/2015		-6.82E-05	±	8.10E-03	1.33E-02		3.36E-03	±	6.15E-03	9.07E-03
7/28/2015 -	8/4/2015		-2.43E-04	±	6.68E-03	1.09E-02		3.75E-04	±	7.14E-03	1.16E-02
8/4/2015 -	8/11/2015		-1.02E-03	±	7.47E-03	1.20E-02		-5.78E-04	±	6.59E-03	1.07E-02
8/11/2015 -	8/18/2015		1.37E-03	±	7.35E-03	1.18E-02		6.86E-05	±	8.11E-03	1.33E-02
8/18/2015 -	8/25/2015		3.51E-05	±	7.41E-03	1.22E-02		2.07E-03	±	6.71E-03	1.05E-02
8/25/2015 -	9/1/2015		-5.45E-04	±	7.43E-03	1.21E-02		2.23E-04	±	7.57E-03	1.24E-02
9/1/2015 -	9/8/2015		-4.37E-05	±	7.49E-03	1.23E-02		-2.36E-04	±	8.02E-03	1.31E-02
9/8/2015 -	9/15/2015		-4.83E-04	±	6.94E-03	1.13E-02		1.06E-03	±	7.50E-03	1.21E-02
9/15/2015 -	9/22/2015		5.03E-03	±	7.41E-03	1.09E-02		-1.18E-03	±	7.96E-03	1.28E-02
9/22/2015 -	9/29/2015		0.00E+00	±	1.11E-02	1.82E-02		3.43E-03	±	8.35E-03	1.29E-02
9/29/2015 -	10/6/2015		-1.25E-04	±	7.68E-03	1.26E-02		4.75E-03	±	8.31E-03	1.25E-02
10/6/2015 -	10/13/2015		0.00E+00	±	9.66E-03	1.59E-02		-2.27E-03	±	9.02E-03	1.43E-02
10/13/2015 -	10/20/2015		0.00E+00	±	7.54E-03	1.24E-02		0.00E+00	±	1.28E-02	2.11E-02
10/20/2015 -	10/27/2015		-2.54E-04	±	7.26E-03	1.19E-02		3.87E-03	±	9.99E-03	1.56E-02
10/27/2015 -	11/3/2015		2.99E-03	±	1.24E-02	1.65E-02		1.07E-02	±	1.11E-02	1.31E-02
11/3/2015 -	11/10/2015		-4.50E-03	±	1.19E-02	1.62E-02		3.77E-03	±	1.01E-02	1.36E-02
11/10/2015 -	11/17/2015		1.90E-03	±	9.14E-03	1.26E-02		-7.59E-04	±	1.00E-02	1.41E-02
11/17/2015 -	11/24/2015		2.58E-03	±	9.82E-03	1.35E-02		4.41E-03	±	1.03E-02	1.38E-02
11/24/2015 -	12/1/2015		2.59E-03	±	1.27E-02	1.76E-02		-1.52E-03	±	1.03E-02	1.43E-02
12/1/2015 -	12/8/2015		-2.67E-04	±	8.89E-03	1.25E-02		-4.47E-03	±	1.12E-02	1.52E-02
12/8/2015 -	12/15/2015		-6.06E-03	±	1.55E-02	2.04E-02		-2.88E-03	±	1.53E-02	2.06E-02
12/15/2015 -	12/22/2015		-5.23E-03	±	1.71E-02	2.28E-02		1.08E-03	±	1.32E-02	1.78E-02
12/22/2015 -	12/29/2015		-4.41E-03	±	1.23E-02	1.68E-02		3.79E-03	±	9.49E-03	1.27E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifer. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

Results in pCi/cubic meter, corrected for decay during collection period

		Station 6					Station 40				
Collection Period		RQ	Activity		Error	MDA	RQ	Activity		Error	MDA
12/30/2014 -	1/6/2015		-1.17E-03	±	7.83E-03	1.26E-02		1.45E-03	±	7.59E-03	1.21E-02
1/6/2015 -	1/13/2015		-2.46E-03	±	1.08E-02	1.73E-02		-2.64E-03	±	1.40E-02	2.26E-02
1/13/2015 -	1/20/2015		6.86E-04	±	8.05E-03	1.31E-02		-4.02E-05	±	9.44E-03	1.55E-02
1/20/2015 -	1/27/2015		3.53E-03	±	7.34E-03	1.11E-02		-3.21E-03	±	9.12E-03	1.43E-02
1/27/2015 -	2/3/2015		3.44E-03	±	7.32E-03	1.11E-02		1.70E-03	±	5.10E-03	7.76E-03
2/3/2015 -	2/10/2015		2.75E-04	±	6.80E-03	1.11E-02		7.87E-05	±	6.32E-03	1.04E-02
2/10/2015 -	2/17/2015		5.12E-03	±	8.65E-03	1.31E-02		-3.39E-03	±	8.67E-03	1.35E-02
2/17/2015 -	2/24/2015		1.40E-03	±	8.12E-03	1.30E-02		-4.92E-03	±	1.20E-02	1.89E-02
2/24/2015 -	3/3/2015		3.83E-04	±	7.26E-03	1.18E-02		-1.66E-03	±	9.19E-03	1.47E-02
3/3/2015 -	3/10/2015		0.00E+00	±	9.50E-03	1.56E-02		-1.79E-03	±	8.11E-03	1.29E-02
3/10/2015 -	3/17/2015		3.56E-03	±	7.04E-03	1.06E-02		6.68E-05	±	9.71E-03	1.59E-02
3/17/2015 -	3/24/2015		-8.86E-04	±	7.19E-03	1.16E-02		1.12E-03	±	7.40E-03	1.19E-02
3/24/2015 -	3/31/2015		2.63E-03	±	7.46E-03	1.16E-02		1.95E-03	±	8.20E-03	1.30E-02
3/31/2015 -	4/7/2015		-2.29E-03	±	9.15E-03	1.46E-02		3.07E-04	±	7.92E-03	1.29E-02
4/7/2015 -	4/14/2015		-7.37E-04	±	7.95E-03	1.29E-02		2.33E-04	±	6.55E-03	1.07E-02
4/14/2015 -	4/21/2015		2.37E-03	±	7.66E-03	1.20E-02		-2.15E-03	±	8.30E-03	1.32E-02
4/21/2015 -	4/28/2015		0.00E+00	±	1.25E-02	2.06E-02		-2.13E-03	±	7.86E-03	1.24E-02
4/28/2015 -	5/5/2015		-1.51E-03	±	8.19E-03	1.31E-02		8.46E-04	±	7.01E-03	1.13E-02
5/5/2015 -	5/12/2015		3.14E-03	±	6.75E-03	1.02E-02		3.65E-04	±	6.61E-03	1.08E-02
5/12/2015 -	5/19/2015		0.00E+00	±	9.69E-03	1.59E-02		-1.30E-04	±	6.34E-03	1.04E-02
5/19/2015 -	5/26/2015		-1.00E-03	±	6.98E-03	1.12E-02		-1.83E-03	±	8.68E-03	1.38E-02
5/26/2015 -	6/2/2015		-2.34E-04	±	7.35E-03	1.20E-02		-2.88E-03	±	9.69E-03	1.54E-02
6/2/2015 -	6/9/2015		-1.70E-03	±	6.87E-03	1.08E-02		-6.69E-04	±	8.01E-03	1.30E-02
6/9/2015 -	6/16/2015		4.38E-03	±	8.27E-03	1.26E-02		-1.90E-03	±	9.18E-03	1.47E-02
6/16/2015 -	6/23/2015		3.07E-03	±	6.59E-03	9.99E-03		1.95E-03	±	7.93E-03	1.26E-02
6/23/2015 -	6/30/2015		0.00E+00	±	7.35E-03	1.21E-02		-4.61E-04	±	6.91E-03	1.12E-02
6/30/2015 -	7/7/2015		-4.03E-03	±	9.60E-03	1.50E-02		-1.28E-05	±	7.14E-03	1.17E-02
7/7/2015 -	7/14/2015		-7.83E-04	±	8.81E-03	1.43E-02		0.00E+00	±	1.19E-02	1.96E-02
7/14/2015 -	7/21/2015		-1.44E-03	±	8.12E-03	1.30E-02		-1.25E-03	±	8.83E-03	1.43E-02
7/21/2015 -	7/28/2015		-7.04E-05	±	8.36E-03	1.37E-02		3.31E-03	±	6.05E-03	8.93E-03
7/28/2015 -	8/4/2015		-2.55E-04	±	7.00E-03	1.14E-02		3.64E-04	±	6.93E-03	1.13E-02
8/4/2015 -	8/11/2015		-1.08E-03	±	7.94E-03	1.28E-02		-6.35E-04	±	7.24E-03	1.17E-02
8/11/2015 -	8/18/2015		1.42E-03	±	7.59E-03	1.22E-02		7.16E-05	±	8.46E-03	1.39E-02
8/18/2015 -	8/25/2015		3.54E-05	±	7.48E-03	1.23E-02		2.31E-03	±	7.48E-03	1.17E-02
8/25/2015 -	9/1/2015		-5.54E-04	±	7.55E-03	1.23E-02		2.36E-04	±	8.00E-03	1.31E-02
9/1/2015 -	9/8/2015		-4.35E-05	±	7.46E-03	1.22E-02		-2.43E-04	±	8.29E-03	1.36E-02
9/8/2015 -	9/15/2015		-4.93E-04	±	7.08E-03	1.15E-02		1.11E-03	±	7.89E-03	1.27E-02
9/15/2015 -	9/22/2015		5.08E-03	±	7.48E-03	1.10E-02		-1.21E-03	±	8.19E-03	1.32E-02
9/22/2015 -	9/29/2015		0.00E+00	±	1.13E-02	1.86E-02		3.53E-03	±	8.57E-03	1.33E-02
9/29/2015 -	10/6/2015		-1.25E-04	±	7.67E-03	1.26E-02		4.92E-03	±	8.60E-03	1.30E-02
10/6/2015 -	10/13/2015		0.00E+00	±	1.00E-02	1.65E-02		-2.28E-03	±	9.06E-03	1.44E-02
10/13/2015 -	10/20/2015		0.00E+00	±	7.56E-03	1.24E-02		0.00E+00	±	1.29E-02	2.12E-02
10/20/2015 -	10/27/2015		-2.50E-04	±	7.14E-03	1.17E-02		3.90E-03	±	1.01E-02	1.57E-02
10/27/2015 -	11/3/2015		2.88E-03	±	1.20E-02	1.59E-02		1.05E-02	±	1.08E-02	1.28E-02
11/3/2015 -	11/10/2015		-4.27E-03	±	1.13E-02	1.54E-02		3.70E-03	±	9.89E-03	1.34E-02
11/10/2015 -	11/17/2015		1.76E-03	±	8.50E-03	1.17E-02		-7.41E-04	±	9.81E-03	1.38E-02
11/17/2015 -	11/24/2015		2.40E-03	±	9.14E-03	1.25E-02		4.23E-03	±	9.85E-03	1.32E-02
11/24/2015 -	12/1/2015		2.28E-03	±	1.11E-02	1.54E-02		-1.42E-03	±	9.62E-03	1.34E-02
12/1/2015 -	12/8/2015		-2.72E-04	±	9.06E-03	1.28E-02		-4.54E-03	±	1.13E-02	1.54E-02
12/8/2015 -	12/15/2015		-6.15E-03	±	1.57E-02	2.08E-02		-2.94E-03	±	1.56E-02	2.10E-02
12/15/2015 -	12/22/2015		-4.91E-03	±	1.60E-02	2.14E-02		1.03E-03	±	1.26E-02	1.70E-02
12/22/2015 -	12/29/2015		-4.12E-03	±	1.15E-02	1.57E-02		3.78E-03	±	9.46E-03	1.27E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifer. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

Results in pCi/cubic meter, corrected for decay during collection period

		Station 7					Station 48				
Collection Period		RQ	Activity		Error	MDA	RQ	Activity		Error	MDA
12/30/2014 -	1/6/2015		7.02E-03	±	6.56E-03	8.76E-03		1.39E-03	±	7.28E-03	1.16E-02
1/6/2015 -	1/13/2015		-3.39E-04	±	9.84E-03	1.61E-02		-2.53E-03	±	1.34E-02	2.16E-02
1/13/2015 -	1/20/2015		-2.35E-03	±	8.50E-03	1.35E-02		-3.94E-05	±	9.28E-03	1.52E-02
1/20/2015 -	1/27/2015		4.73E-04	±	7.35E-03	1.20E-02		-3.10E-03	±	8.79E-03	1.38E-02
1/27/2015 -	2/3/2015		-1.10E-03	±	7.39E-03	1.19E-02		1.70E-03	±	5.10E-03	7.76E-03
2/3/2015 -	2/10/2015		-2.56E-04	±	7.55E-03	1.23E-02		7.74E-05	±	6.21E-03	1.02E-02
2/10/2015 -	2/17/2015		1.42E-03	±	8.45E-03	1.36E-02		-3.33E-03	±	8.52E-03	1.33E-02
2/17/2015 -	2/24/2015		0.00E+00	±	7.93E-03	1.30E-02		-4.84E-03	±	1.18E-02	1.86E-02
2/24/2015 -	3/3/2015		-6.31E-04	±	6.75E-03	1.09E-02		-1.60E-03	±	8.87E-03	1.42E-02
3/3/2015 -	3/10/2015		-3.53E-06	±	8.63E-03	1.41E-02		-1.75E-03	±	7.96E-03	1.27E-02
3/10/2015 -	3/17/2015		-1.47E-03	±	9.89E-03	1.60E-02		6.45E-05	±	9.38E-03	1.54E-02
3/17/2015 -	3/24/2015		1.59E-04	±	7.60E-03	1.25E-02		1.18E-03	±	7.79E-03	1.25E-02
3/24/2015 -	3/31/2015		2.60E-04	±	7.24E-03	1.18E-02		2.09E-03	±	8.77E-03	1.39E-02
3/31/2015 -	4/7/2015		0.00E+00	±	1.11E-02	1.82E-02		3.29E-04	±	8.50E-03	1.39E-02
4/7/2015 -	4/14/2015		-3.44E-04	±	7.61E-03	1.24E-02		2.49E-04	±	7.01E-03	1.15E-02
4/14/2015 -	4/21/2015		5.39E-03	±	8.04E-03	1.19E-02		-2.26E-03	±	8.74E-03	1.39E-02
4/21/2015 -	4/28/2015		6.56E-06	±	6.91E-03	1.14E-02		-1.99E-03	±	7.35E-03	1.16E-02
4/28/2015 -	5/5/2015		0.00E+00	±	9.38E-03	1.54E-02		8.17E-04	±	6.77E-03	1.09E-02
5/5/2015 -	5/12/2015		-2.87E-04	±	5.96E-03	9.71E-03		3.54E-04	±	6.41E-03	1.04E-02
5/12/2015 -	5/19/2015		2.40E-03	±	7.84E-03	1.23E-02		-1.25E-04	±	6.12E-03	1.00E-02
5/19/2015 -	5/26/2015		-4.73E-05	±	6.49E-03	1.07E-02		-1.74E-03	±	8.25E-03	1.32E-02
5/26/2015 -	6/2/2015		2.50E-03	±	6.75E-03	1.04E-02		-2.74E-03	±	9.22E-03	1.46E-02
6/2/2015 -	6/9/2015		-1.17E-04	±	6.05E-03	9.92E-03		-6.47E-04	±	7.74E-03	1.26E-02
6/9/2015 -	6/16/2015		-2.84E-03	±	8.27E-03	1.30E-02		-1.96E-03	±	9.49E-03	1.52E-02
6/16/2015 -	6/23/2015		9.13E-04	±	6.91E-03	1.11E-02		1.98E-03	±	8.08E-03	1.28E-02
6/23/2015 -	6/30/2015		-4.02E-03	±	1.04E-02	1.63E-02		-4.99E-04	±	7.49E-03	1.22E-02
6/30/2015 -	7/7/2015		-1.60E-05	±	6.38E-03	1.05E-02		-1.32E-05	±	7.37E-03	1.21E-02
7/7/2015 -	7/14/2015		-4.21E-06	±	6.50E-03	1.06E-02		0.00E+00	±	9.25E-03	1.52E-02
7/14/2015 -	7/21/2015		0.00E+00	±	9.48E-03	1.56E-02		-1.31E-03	±	9.29E-03	1.50E-02
7/21/2015 -	7/28/2015		1.23E-03	±	6.02E-03	9.55E-03		3.43E-03	±	6.28E-03	9.25E-03
7/28/2015 -	8/4/2015		1.24E-03	±	7.53E-03	1.21E-02		3.87E-04	±	7.36E-03	1.20E-02
8/4/2015 -	8/11/2015		4.17E-05	±	7.02E-03	1.15E-02		-5.38E-04	±	6.14E-03	9.94E-03
8/11/2015 -	8/18/2015		5.88E-04	±	6.19E-03	1.00E-02		6.59E-05	±	7.79E-03	1.28E-02
8/18/2015 -	8/25/2015		-4.32E-05	±	6.66E-03	1.09E-02		1.88E-03	±	6.11E-03	9.58E-03
8/25/2015 -	9/1/2015		-1.61E-04	±	5.63E-03	9.21E-03		2.36E-04	±	8.00E-03	1.31E-02
9/1/2015 -	9/8/2015		6.05E-04	±	8.06E-03	1.31E-02		-2.51E-04	±	8.56E-03	1.40E-02
9/8/2015 -	9/15/2015		0.00E+00	±	8.02E-03	1.32E-02		1.11E-03	±	7.87E-03	1.27E-02
9/15/2015 -	9/22/2015		-2.29E-04	±	6.96E-03	1.14E-02		-1.24E-03	±	8.43E-03	1.36E-02
9/22/2015 -	9/29/2015		3.12E-04	±	7.71E-03	1.26E-02		3.61E-03	±	8.78E-03	1.36E-02
9/29/2015 -	10/6/2015		-5.85E-05	±	6.21E-03	1.02E-02		5.19E-03	±	9.08E-03	1.37E-02
10/6/2015 -	10/13/2015		-1.91E-03	±	7.34E-03	1.16E-02		-2.34E-03	±	9.31E-03	1.48E-02
10/13/2015 -	10/20/2015		6.57E-04	±	6.73E-03	1.09E-02		0.00E+00	±	1.30E-02	2.14E-02
10/20/2015 -	10/27/2015		-1.25E-03	±	7.44E-03	1.19E-02		3.97E-03	±	1.02E-02	1.59E-02
10/27/2015 -	11/3/2015		0.00E+00	±	1.18E-02	1.95E-02		1.07E-02	±	1.11E-02	1.31E-02
11/3/2015 -	11/10/2015		-4.49E-04	±	1.08E-02	1.52E-02		3.77E-03	±	1.01E-02	1.36E-02
11/10/2015 -	11/17/2015		0.00E+00	±	1.02E-02	1.67E-02		-7.41E-04	±	9.80E-03	1.37E-02
11/17/2015 -	11/24/2015		-3.02E-03	±	9.46E-03	1.29E-02		4.23E-03	±	9.85E-03	1.32E-02
11/24/2015 -	12/1/2015		0.00E+00	±	1.04E-02	1.71E-02		-1.45E-03	±	9.79E-03	1.36E-02
12/1/2015 -	12/8/2015		1.83E-03	±	8.80E-03	1.21E-02		-4.62E-03	±	1.15E-02	1.56E-02
12/8/2015 -	12/15/2015		5.64E-03	±	1.09E-02	1.40E-02		-2.99E-03	±	1.59E-02	2.14E-02
12/15/2015 -	12/22/2015		-7.77E-03	±	1.73E-02	2.27E-02		1.05E-03	±	1.28E-02	1.74E-02
12/22/2015 -	12/29/2015		-7.86E-04	±	1.04E-02	1.46E-02		3.52E-03	±	8.83E-03	1.18E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifer. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

Results in pCi/cubic meter, corrected for decay during collection period

		Station 8					Station 57				
Collection Period		RQ	Activity		Error	MDA	RQ	Activity		Error	MDA
12/30/2014 -	1/6/2015		7.02E-03	±	6.56E-03	8.76E-03		1.43E-03	±	7.53E-03	1.20E-02
1/6/2015 -	1/13/2015		-3.39E-04	±	9.85E-03	1.61E-02		-2.57E-03	±	1.37E-02	2.20E-02
1/13/2015 -	1/20/2015		-2.35E-03	±	8.50E-03	1.35E-02		-3.88E-05	±	9.12E-03	1.50E-02
1/20/2015 -	1/27/2015		4.59E-04	±	7.13E-03	1.16E-02		-3.11E-03	±	8.84E-03	1.38E-02
1/27/2015 -	2/3/2015		-1.06E-03	±	7.11E-03	1.14E-02		1.82E-03	±	5.47E-03	8.32E-03
2/3/2015 -	2/10/2015		-2.56E-04	±	7.56E-03	1.24E-02		7.35E-05	±	5.90E-03	9.68E-03
2/10/2015 -	2/17/2015		1.42E-03	±	8.45E-03	1.36E-02		-3.07E-03	±	7.85E-03	1.22E-02
2/17/2015 -	2/24/2015		0.00E+00	±	7.77E-03	1.28E-02		-4.43E-03	±	1.08E-02	1.70E-02
2/24/2015 -	3/3/2015		-6.31E-04	±	6.75E-03	1.09E-02		-1.49E-03	±	8.24E-03	1.32E-02
3/3/2015 -	3/10/2015		-3.47E-06	±	8.46E-03	1.39E-02		-1.59E-03	±	7.22E-03	1.15E-02
3/10/2015 -	3/17/2015		-1.46E-03	±	9.80E-03	1.58E-02		5.81E-05	±	8.45E-03	1.39E-02
3/17/2015 -	3/24/2015		1.59E-04	±	7.57E-03	1.24E-02		1.09E-03	±	7.20E-03	1.16E-02
3/24/2015 -	3/31/2015		2.55E-04	±	7.10E-03	1.16E-02		1.92E-03	±	8.07E-03	1.28E-02
3/31/2015 -	4/7/2015		0.00E+00	±	1.13E-02	1.85E-02		3.17E-04	±	8.20E-03	1.34E-02
4/7/2015 -	4/14/2015		-3.44E-04	±	7.61E-03	1.24E-02		2.53E-04	±	7.14E-03	1.17E-02
4/14/2015 -	4/21/2015		5.36E-03	±	7.99E-03	1.18E-02		-2.23E-03	±	8.61E-03	1.37E-02
4/21/2015 -	4/28/2015		6.70E-06	±	7.05E-03	1.16E-02		-2.05E-03	±	7.57E-03	1.19E-02
4/28/2015 -	5/5/2015		0.00E+00	±	9.49E-03	1.56E-02		8.65E-04	±	7.16E-03	1.15E-02
5/5/2015 -	5/12/2015		-2.98E-04	±	6.18E-03	1.01E-02		3.64E-04	±	6.60E-03	1.07E-02
5/12/2015 -	5/19/2015		2.47E-03	±	8.08E-03	1.27E-02		-1.32E-04	±	6.47E-03	1.06E-02
5/19/2015 -	5/26/2015		-4.91E-05	±	6.74E-03	1.11E-02		-1.79E-03	±	8.47E-03	1.35E-02
5/26/2015 -	6/2/2015		2.37E-03	±	6.41E-03	9.88E-03		-2.84E-03	±	9.55E-03	1.51E-02
6/2/2015 -	6/9/2015		-1.11E-04	±	5.74E-03	9.40E-03		-6.26E-04	±	7.49E-03	1.22E-02
6/9/2015 -	6/16/2015		-2.71E-03	±	7.89E-03	1.24E-02		-1.90E-03	±	9.19E-03	1.47E-02
6/16/2015 -	6/23/2015		8.68E-04	±	6.57E-03	1.06E-02		1.98E-03	±	8.06E-03	1.28E-02
6/23/2015 -	6/30/2015		-3.76E-03	±	9.73E-03	1.53E-02		-4.91E-04	±	7.36E-03	1.20E-02
6/30/2015 -	7/7/2015		-1.46E-05	±	5.85E-03	9.59E-03		-1.33E-05	±	7.43E-03	1.22E-02
7/7/2015 -	7/14/2015		-3.95E-06	±	6.09E-03	9.94E-03		0.00E+00	±	9.20E-03	1.51E-02
7/14/2015 -	7/21/2015		0.00E+00	±	1.22E-02	2.01E-02		-1.31E-03	±	9.26E-03	1.49E-02
7/21/2015 -	7/28/2015		1.39E-03	±	6.80E-03	1.08E-02		3.48E-03	±	6.36E-03	9.38E-03
7/28/2015 -	8/4/2015		1.39E-03	±	8.41E-03	1.35E-02		3.88E-04	±	7.38E-03	1.20E-02
8/4/2015 -	8/11/2015		4.22E-05	±	7.10E-03	1.17E-02		-5.76E-04	±	6.58E-03	1.06E-02
8/11/2015 -	8/18/2015		6.07E-04	±	6.39E-03	1.03E-02		7.09E-05	±	8.38E-03	1.38E-02
8/18/2015 -	8/25/2015		-4.46E-05	±	6.88E-03	1.13E-02		2.11E-03	±	6.84E-03	1.07E-02
8/25/2015 -	9/1/2015		-1.64E-04	±	5.76E-03	9.42E-03		2.29E-04	±	7.78E-03	1.27E-02
9/1/2015 -	9/8/2015		6.35E-04	±	8.46E-03	1.38E-02		-2.42E-04	±	8.25E-03	1.35E-02
9/8/2015 -	9/15/2015		0.00E+00	±	8.58E-03	1.41E-02		1.10E-03	±	7.78E-03	1.25E-02
9/15/2015 -	9/22/2015		-2.45E-04	±	7.45E-03	1.22E-02		-1.21E-03	±	8.19E-03	1.32E-02
9/22/2015 -	9/29/2015		3.32E-04	±	8.21E-03	1.34E-02		3.41E-03	±	8.29E-03	1.28E-02
9/29/2015 -	10/6/2015		-6.36E-05	±	6.75E-03	1.11E-02		4.75E-03	±	8.31E-03	1.25E-02
10/6/2015 -	10/13/2015		-2.03E-03	±	7.83E-03	1.24E-02		-2.27E-03	±	9.02E-03	1.43E-02
10/13/2015 -	10/20/2015		7.00E-04	±	7.17E-03	1.16E-02		0.00E+00	±	1.28E-02	2.11E-02
10/20/2015 -	10/27/2015		-1.32E-03	±	7.86E-03	1.26E-02		3.80E-03	±	9.79E-03	1.52E-02
10/27/2015 -	11/3/2015		0.00E+00	±	1.15E-02	1.89E-02		9.91E-03	±	1.02E-02	1.21E-02
11/3/2015 -	11/10/2015		-4.65E-04	±	1.12E-02	1.57E-02		3.46E-03	±	9.24E-03	1.25E-02
11/10/2015 -	11/17/2015		0.00E+00	±	1.03E-02	1.70E-02		-7.22E-04	±	9.55E-03	1.34E-02
11/17/2015 -	11/24/2015		-3.08E-03	±	9.67E-03	1.32E-02		4.04E-03	±	9.42E-03	1.27E-02
11/24/2015 -	12/1/2015		0.00E+00	±	1.08E-02	1.78E-02		-1.31E-03	±	8.86E-03	1.23E-02
12/1/2015 -	12/8/2015		1.92E-03	±	9.23E-03	1.27E-02		-4.55E-03	±	1.14E-02	1.54E-02
12/8/2015 -	12/15/2015		5.96E-03	±	1.15E-02	1.48E-02		-2.98E-03	±	1.58E-02	2.13E-02
12/15/2015 -	12/22/2015		-8.47E-03	±	1.88E-02	2.48E-02		1.05E-03	±	1.28E-02	1.74E-02
12/22/2015 -	12/29/2015		-7.57E-04	±	1.00E-02	1.40E-02		3.54E-03	±	8.87E-03	1.19E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifer. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.2

GAMMA SPECTROMETRY RESULTS OF IODINE 131 ON CHARCOAL FILTERS - SUMMARY

Results in pCi per cubic meter, corrected for decay during collection period

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
I-131	Ind	1.39E-04	-8.47E-03	1.07E-02	1.34E-02	572	0
I-131	Cntl	7.11E-05	-7.77E-03	7.62E-03	1.30E-02	52	0

Ind = Indicator Stations Cntl = Control Station

TABLE A-5.1

GROSS BETA IN WATER

Results in pCi per liter

Collection Period	ST 26 River/Drinking Cntl RQ	Activity		Error	MDA	ST 29 River/Drinking Ind RQ	Activity		Error	MDA
12/30/14 - 01/29/15		2.33E-02	±	6.50E-01	2.36E+00		-6.85E-01	±	7.16E-01	2.36E+00
01/29/15 - 03/02/15		4.86E-01	±	6.91E-01	2.39E+00		2.00E-01	±	6.66E-01	2.38E+00
03/02/15 - 04/01/15		1.20E+00	±	7.48E-01	2.40E+00		1.15E+00	±	7.37E-01	2.41E+00
04/01/15 - 05/01/15		1.99E-01	±	5.98E-01	2.10E+00		1.07E+00	±	6.52E-01	2.11E+00
05/01/15 - 06/01/15		8.97E-01	±	6.40E-01	2.11E+00	+	2.33E+00	±	7.32E-01	2.11E+00
06/01/15 - 06/30/15		-1.56E-01	±	7.34E-01	2.62E+00		-4.77E-01	±	7.57E-01	2.62E+00
07/01/15 - 07/30/15		5.70E-01	±	7.02E-01	2.41E+00		1.47E+00	±	7.52E-01	2.40E+00
07/30/15 - 08/31/15		9.20E-01	±	5.90E-01	1.93E+00		2.07E+00	±	6.74E-01	1.93E+00
08/31/15 - 10/01/15		-4.33E-01	±	7.58E-01	2.64E+00		-1.30E+00	±	8.04E-01	2.64E+00
10/01/15 - 11/02/15		-1.65E-01	±	6.74E-01	2.42E+00		5.23E-01	±	6.92E-01	2.40E+00
11/02/15 - 12/01/15		1.88E-01	±	6.47E-01	2.31E+00		4.04E-01	±	6.61E-01	2.32E+00
12/01/15 - 12/30/15		5.33E-01	±	6.69E-01	2.31E+00		-1.98E-01	±	6.60E-01	2.32E+00

Collection Period	ST 27 CW Discharge RQ	Activity		Error	MDA
12/30/14 - 01/29/15	+	6.29E+00	±	1.14E+00	2.84E+00
01/29/15 - 03/02/15	+	8.71E+00	±	1.29E+00	2.97E+00
03/02/15 - 04/01/15	+	4.69E+00	±	1.04E+00	2.75E+00
04/01/15 - 05/01/15	+	3.48E+00	±	8.88E-01	2.41E+00
05/01/15 - 06/01/15	+	4.93E+00	±	9.69E-01	2.39E+00
06/01/15 - 06/30/15		-4.05E-02	±	9.94E-01	3.47E+00
07/01/15 - 07/30/15		1.90E+00	±	8.48E-01	2.62E+00
07/30/15 - 08/31/15	+	3.92E+00	±	8.61E-01	2.14E+00
08/31/15 - 10/01/15		1.87E+00	±	8.88E-01	2.82E+00
10/01/15 - 11/02/15	+	5.05E+00	±	1.13E+00	3.06E+00
11/02/15 - 12/01/15	+	6.81E+00	±	1.14E+00	2.80E+00
12/01/15 - 12/30/15	+	8.56E+00	±	1.26E+00	2.88E+00

TABLE A-5.2

GROSS BETA IN WATER - SUMMARY

Results in pCi per liter

Location	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
ST 26 Control	3.55E-01	-4.33E-01	1.20E+00	12	0
ST 29 Indicator	5.47E-01	-1.30E+00	2.33E+00	12	1
ST 27 Discharge	4.68E+00	-4.05E-02	8.71E+00	12	9

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-6.1

TRITIUM IN WATER

Results in pCi per liter, MDA for all samples is 300 pCi/l

Location	Description	Collection Period	RQ	Activity		Error
26	River/Drinking Control	12/30/14 - 04/01/15		1.44E+02	±	8.47E+01
		04/01/15 - 06/30/15		1.95E+02	±	9.01E+01
		06/30/15 - 10/01/15		1.26E+01	±	8.95E+01
		10/01/15 - 12/30/15		6.31E+01	±	8.91E+01
29	River/Drinking Indicator	12/30/14 - 04/01/15		1.43E+02	±	8.46E+01
		04/01/15 - 06/30/15		1.01E+02	±	8.47E+01
		06/30/15 - 10/01/15		5.03E+01	±	8.99E+01
		10/01/15 - 12/30/15		9.74E+01	±	8.94E+01
27	Plant Discharge	12/30/14 - 04/01/15		1.88E+02	±	8.70E+01
		04/01/15 - 06/30/15		1.45E+02	±	8.91E+01
		06/30/15 - 10/01/15		6.02E+01	±	9.01E+01
		10/01/15 - 12/30/15		1.05E+02	±	9.05E+01
31	Ground Water Well 1	03/18/15		2.18E+02	±	8.68E+01
		06/03/15		1.11E+02	±	8.94E+01
		09/16/15		-6.81E+01	±	9.16E+01
		12/11/15		-1.02E+02	±	8.83E+01
32	Ground Water Well 2	03/18/15		1.74E+02	±	8.53E+01
		06/03/15		7.21E+01	±	8.87E+01
		09/16/15		-3.32E+01	±	9.26E+01
		12/09/15		9.01E+00	±	8.25E+01
52	Ground Water Well 3	03/18/15		2.12E+02	±	8.67E+01
		06/03/15		1.08E+02	±	8.87E+01
		09/17/15		-1.05E+02	±	9.26E+01
		12/09/15		6.02E+01	±	9.10E+01

TABLE A-6.2

TRITIUM IN WATER - Summary

Results in pCi per liter

Location Description	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
River/Drinking Control	1.04E+02	1.26E+01	1.95E+02	4	0
River/Drinking Indicator	9.80E+01	5.03E+01	1.43E+02	4	0
Discharge Indicator	1.25E+02	6.02E+01	1.88E+02	4	0
Ground Water Indicator	5.46E+01	-1.05E+02	2.18E+02	12	0

Quarterly tritium values reported for ST-26, 27, and 29 are average of monthly analysis values.
RQ=Results Qualifier. If blank, result is less than detection limit. If "+", result is above the detection limit.

Table A-7.1

GAMMA SPECTROMETRY RESULTS OF WATER

STATION 26 - River/Drinking Control

Results in pCi/liter, corrected for decay during collection period

Location 26 collected 1/29/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.16E+01	±	6.07E+01	5.78E+01
CR-51		1.20E+01	±	2.30E+01	3.64E+01
MN-54		1.43E+00	±	2.24E+00	3.46E+00
CO-58		5.24E-03	±	2.16E+00	3.57E+00
FE-59		-8.77E-02	±	5.29E+00	8.68E+00
CO-60		-3.64E-02	±	1.79E+00	2.94E+00
ZN-65		-2.14E+00	±	5.50E+00	8.73E+00
ZRNB-95		1.40E+00	±	3.86E+00	6.10E+00
I-131		-1.03E+00	±	9.01E+00	1.47E+01
CS-134		-1.34E+00	±	2.29E+00	3.60E+00
CS-137		-8.76E-01	±	2.44E+00	3.90E+00
BALA140		7.66E-01	±	6.19E+00	1.00E+01
BI-214		4.79E+00	±	5.42E+00	9.50E+00

Location 26 collected 3/2/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.41E+01	±	8.75E+01	5.61E+01
CR-51		1.92E+00	±	2.21E+01	3.60E+01
MN-54		-1.90E-01	±	2.26E+00	3.69E+00
CO-58		-6.96E-01	±	2.47E+00	3.94E+00
FE-59		2.86E-01	±	6.64E+00	1.09E+01
CO-60		-7.40E-02	±	2.15E+00	3.47E+00
ZN-65		1.29E+00	±	4.41E+00	6.97E+00
ZRNB-95		-1.07E+00	±	4.28E+00	6.85E+00
I-131		3.66E-01	±	5.96E+00	9.75E+00
CS-134		-5.61E-01	±	2.17E+00	3.49E+00
CS-137		-6.14E-01	±	2.31E+00	3.70E+00
BALA140		3.43E+00	±	5.30E+00	7.72E+00
BI-214		9.46E+00	±	5.74E+00	9.58E+00

Location 26 collected 4/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.65E+01	±	7.18E+01	5.86E+01
CR-51		1.53E+01	±	2.22E+01	3.46E+01
MN-54		1.87E-01	±	1.98E+00	3.23E+00
CO-58		-9.89E-01	±	2.67E+00	4.25E+00
FE-59		-1.67E+00	±	7.10E+00	1.13E+01
CO-60		7.24E-01	±	2.00E+00	3.14E+00
ZN-65		1.90E-01	±	4.77E+00	7.80E+00
ZRNB-95		0.00E+00	±	5.79E+00	9.53E+00
I-131		2.42E+00	±	1.02E+01	1.65E+01
CS-134		9.18E-02	±	2.24E+00	3.66E+00
CS-137		0.00E+00	±	2.80E+00	4.60E+00
BALA140		-5.04E-01	±	7.42E+00	1.21E+01
BI-214		-9.07E-02	±	5.30E+00	9.65E+00

Location 26 collected 5/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.50E+01	±	4.02E+01	5.75E+01
CR-51		1.37E+00	±	2.58E+01	4.23E+01
MN-54		4.78E-01	±	2.06E+00	3.31E+00
CO-58		-6.43E-01	±	2.29E+00	3.66E+00
FE-59		1.32E+00	±	5.74E+00	9.13E+00
CO-60		3.54E-01	±	1.95E+00	3.12E+00
ZN-65		1.44E-01	±	4.55E+00	7.46E+00
ZRNB-95		1.56E+00	±	4.26E+00	6.77E+00
I-131		0.00E+00	±	8.84E+00	1.45E+01
CS-134		-2.08E+00	±	2.78E+00	4.37E+00
CS-137		4.61E-01	±	2.09E+00	3.36E+00
BALA140		-1.53E+00	±	6.11E+00	9.71E+00
BI-214		4.89E+00	±	5.42E+00	9.48E+00

Location 26 collected 6/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.04E+01	±	5.03E+01	5.36E+01
CR-51		-8.58E+00	±	2.96E+01	4.79E+01
MN-54		1.12E+00	±	2.06E+00	3.19E+00
CO-58		-4.08E-02	±	1.94E+00	3.18E+00
FE-59		0.00E+00	±	9.69E+00	1.59E+01
CO-60		1.33E+00	±	1.40E+00	2.77E+00
ZN-65		1.96E+00	±	3.21E+00	4.73E+00
ZRNB-95		7.33E-01	±	3.92E+00	6.32E+00
I-131		-2.09E+00	±	1.05E+01	1.70E+01
CS-134		8.97E-01	±	2.04E+00	3.23E+00
CS-137		-1.10E-01	±	1.61E+00	2.62E+00
BALA140		-2.73E+00	±	8.57E+00	1.35E+01
BI-214		1.68E-03	±	4.57E+00	8.70E+00

Location 26 collected 6/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.19E+01	±	3.25E+01	5.06E+01
CR-51		9.69E+00	±	4.51E+01	7.34E+01
MN-54		3.90E-01	±	2.08E+00	3.37E+00
CO-58		0.00E+00	±	2.81E+00	4.62E+00
FE-59		3.34E+00	±	7.64E+00	1.19E+01
CO-60		2.99E-01	±	1.91E+00	3.09E+00
ZN-65		-8.28E-01	±	4.14E+00	6.67E+00
ZRNB-95		-1.03E+00	±	5.26E+00	8.52E+00
I-131		-1.39E+00	±	5.09E+01	8.36E+01
CS-134		-5.85E-01	±	2.08E+00	3.35E+00
CS-137		-2.16E-01	±	1.77E+00	2.88E+00
BALA140		-1.25E+00	±	1.82E+01	2.96E+01
BI-214		-6.95E-01	±	5.32E+00	8.70E+00

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

Table A-7.1

GAMMA SPECTROMETRY RESULTS OF WATER

STATION 26 - River/Drinking Control

Results in pCi/liter, corrected for decay during collection period

Location 26 collected 7/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.31E+01	±	3.72E+01	5.14E+01
CR-51		-9.19E+00	±	2.51E+01	4.03E+01
MN-54		3.29E-01	±	2.07E+00	3.35E+00
CO-58		9.02E-01	±	1.74E+00	2.66E+00
FE-59		-1.11E+00	±	5.53E+00	8.81E+00
CO-60		3.99E-01	±	2.08E+00	3.60E+00
ZN-65		4.52E-01	±	4.42E+00	7.19E+00
ZRNB-95		-7.36E-02	±	3.91E+00	6.42E+00
I-131		-4.19E+00	±	8.96E+00	1.43E+01
CS-134		-8.46E-01	±	2.21E+00	3.54E+00
CS-137		-5.78E-01	±	2.30E+00	3.71E+00
BALA140		6.38E-01	±	6.43E+00	1.04E+01
BI-214		-1.67E+00	±	6.50E+00	9.18E+00

Location 26 collected 8/31/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-4.83E+01	±	1.03E+02	5.81E+01
CR-51		1.46E+01	±	2.28E+01	3.58E+01
MN-54		-4.95E-01	±	2.21E+00	3.56E+00
CO-58		5.41E-01	±	1.93E+00	3.06E+00
FE-59		-2.17E-01	±	5.81E+00	9.51E+00
CO-60		-1.83E-01	±	1.97E+00	3.20E+00
ZN-65		6.74E-01	±	4.88E+00	7.91E+00
ZRNB-95		9.58E-01	±	3.46E+00	5.51E+00
I-131		3.51E+00	±	5.71E+00	8.91E+00
CS-134		7.69E-02	±	2.07E+00	3.40E+00
CS-137		9.36E-01	±	1.94E+00	3.04E+00
BALA140		-1.56E+00	±	5.70E+00	9.02E+00
BI-214		3.80E+00	±	5.35E+00	9.51E+00

Location 26 collected 10/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.22E+01	±	3.77E+01	5.27E+01
CR-51		9.30E-01	±	2.28E+01	3.73E+01
MN-54		1.10E-01	±	1.95E+00	3.19E+00
CO-58		1.09E+00	±	2.11E+00	3.25E+00
FE-59		-1.08E-02	±	6.27E+00	1.03E+01
CO-60		-1.22E-01	±	2.81E+00	4.11E+00
ZN-65		-3.01E-01	±	4.09E+00	6.66E+00
ZRNB-95		-8.11E-02	±	3.50E+00	5.73E+00
I-131		-4.85E+00	±	8.82E+00	1.40E+01
CS-134		3.57E-01	±	2.14E+00	3.47E+00
CS-137		-7.33E-01	±	2.32E+00	3.71E+00
BALA140		-2.90E+00	±	6.93E+00	1.08E+01
BI-214		2.74E+00	±	5.10E+00	9.23E+00

Location 26 collected 11/2/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	3.44E+01	5.65E+01
CR-51		1.27E+01	±	3.21E+01	4.15E+01
MN-54		0.00E+00	±	2.61E+00	4.29E+00
CO-58		-1.91E+00	±	4.05E+00	4.89E+00
FE-59		2.55E+00	±	9.28E+00	1.06E+01
CO-60		1.52E+00	±	2.63E+00	2.83E+00
ZN-65		-3.38E+00	±	8.23E+00	9.45E+00
ZRNB-95		-1.25E+00	±	6.84E+00	8.40E+00
I-131		4.74E+00	±	1.39E+01	1.81E+01
CS-134		-4.78E-01	±	3.13E+00	3.97E+00
CS-137		6.41E-02	±	2.75E+00	3.42E+00
BALA140		-3.92E+00	±	1.20E+01	1.31E+01
BI-214		0.00E+00	±	6.63E+00	1.09E+01

Location 26 collected 12/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	3.60E+01	5.92E+01
CR-51		2.36E+00	±	2.37E+01	3.39E+01
MN-54		-1.35E+00	±	2.99E+00	3.82E+00
CO-58		7.45E-01	±	2.34E+00	2.99E+00
FE-59		3.44E+00	±	7.75E+00	8.93E+00
CO-60		1.71E+00	±	3.01E+00	3.44E+00
ZN-65		-1.02E+00	±	6.83E+00	8.40E+00
ZRNB-95		7.01E-01	±	5.17E+00	6.75E+00
I-131		-1.56E+00	±	6.78E+00	9.47E+00
CS-134		-1.78E+00	±	2.76E+00	3.63E+00
CS-137		-1.39E+00	±	3.29E+00	4.23E+00
BALA140		1.63E+00	±	5.68E+00	6.43E+00
BI-214		7.68E+00	±	6.76E+00	9.37E+00

Location 26 collected 12/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	7.01E+01	±	3.55E+01	3.43E+01
CR-51		-8.91E+00	±	3.47E+01	4.52E+01
MN-54		3.84E-01	±	2.79E+00	3.43E+00
CO-58		1.48E+00	±	3.13E+00	3.75E+00
FE-59		0.00E+00	±	9.03E+00	1.49E+01
CO-60		0.00E+00	±	2.85E+00	4.69E+00
ZN-65		1.51E+00	±	5.75E+00	6.62E+00
ZRNB-95		-8.03E-01	±	6.56E+00	8.09E+00
I-131		-7.87E+00	±	1.25E+01	1.60E+01
CS-134		7.01E-01	±	2.75E+00	3.47E+00
CS-137		-1.49E+00	±	3.45E+00	4.18E+00
BALA140		0.00E+00	±	7.73E+00	1.27E+01
BI-214	+	1.73E+01	±	7.60E+00	9.39E+00

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

Table A-7.1

GAMMA SPECTROMETRY RESULTS OF WATER

STATION 29 - River/Drinking Indicator

Results in pCi/liter, corrected for decay during collection period

Location 29 collected 1/29/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-7.03E+00	±	3.38E+01	5.42E+01
CR-51		-5.97E+00	±	2.50E+01	4.04E+01
MN-54		-4.82E-01	±	2.10E+00	3.38E+00
CO-58		5.23E-01	±	2.25E+00	3.61E+00
FE-59		2.07E+00	±	6.35E+00	9.96E+00
CO-60		6.50E-02	±	2.28E+00	3.98E+00
ZN-65		-1.55E+00	±	4.89E+00	7.76E+00
ZRNB-95		3.24E+00	±	4.10E+00	6.17E+00
I-131		-7.01E+00	±	9.80E+00	1.54E+01
CS-134		1.01E+00	±	1.96E+00	3.08E+00
CS-137		-5.76E-01	±	2.09E+00	3.34E+00
BALA140		-1.89E+00	±	7.26E+00	1.15E+01
BI-214		-8.14E-01	±	5.24E+00	8.73E+00

Location 29 collected 3/2/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.50E+01	±	6.59E+01	5.74E+01
CR-51		1.20E+01	±	2.49E+01	3.98E+01
MN-54		8.22E-01	±	1.94E+00	3.05E+00
CO-58		-9.17E-01	±	2.62E+00	4.18E+00
FE-59		-5.01E-03	±	5.78E+00	9.47E+00
CO-60		-8.25E-01	±	2.22E+00	3.50E+00
ZN-65		-2.09E-01	±	4.39E+00	7.17E+00
ZRNB-95		4.43E-01	±	3.93E+00	6.38E+00
I-131		-1.19E+00	±	6.50E+00	1.06E+01
CS-134		-3.84E-01	±	2.21E+00	3.58E+00
CS-137		-3.52E-03	±	1.99E+00	3.27E+00
BALA140		1.11E+00	±	5.43E+00	8.68E+00
BI-214		6.05E+00	±	5.38E+00	9.32E+00

Location 29 collected 4/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.35E+01	±	4.70E+01	5.92E+01
CR-51		-5.46E+00	±	2.70E+01	4.39E+01
MN-54		-1.19E+00	±	2.28E+00	3.57E+00
CO-58		-6.71E-01	±	2.18E+00	3.45E+00
FE-59		7.52E-01	±	7.01E+00	1.14E+01
CO-60		-1.84E+00	±	1.17E+01	3.81E+00
ZN-65		1.20E+00	±	4.83E+00	7.73E+00
ZRNB-95		6.06E-01	±	3.96E+00	6.40E+00
I-131		-1.66E+00	±	8.14E+00	1.32E+01
CS-134		1.27E+00	±	2.07E+00	3.24E+00
CS-137		-2.75E-01	±	2.14E+00	3.47E+00
BALA140		1.95E+00	±	6.13E+00	9.53E+00
BI-214		1.06E+00	±	5.10E+00	9.39E+00

Location 29 collected 5/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.70E+01	±	4.16E+01	5.72E+01
CR-51		3.56E+00	±	2.87E+01	4.68E+01
MN-54		-4.18E-01	±	1.91E+00	3.06E+00
CO-58		-4.58E-01	±	2.51E+00	4.05E+00
FE-59		0.00E+00	±	5.04E+00	8.30E+00
CO-60		3.79E-01	±	1.55E+00	2.45E+00
ZN-65		-2.99E-01	±	4.46E+00	7.27E+00
ZRNB-95		4.15E-01	±	3.94E+00	6.41E+00
I-131		5.11E+00	±	7.64E+00	1.19E+01
CS-134		-7.99E-01	±	2.06E+00	3.29E+00
CS-137		2.58E-01	±	1.76E+00	2.85E+00
BALA140		0.00E+00	±	9.32E+00	1.53E+01
BI-214		-5.93E-01	±	5.76E+00	9.62E+00

Location 29 collected 6/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.59E+01	±	6.06E+01	5.35E+01
CR-51		1.78E+00	±	2.37E+01	3.87E+01
MN-54		8.66E-01	±	2.08E+00	3.27E+00
CO-58		7.30E-01	±	2.07E+00	3.26E+00
FE-59		-3.05E-01	±	6.71E+00	1.10E+01
CO-60		-3.32E-01	±	3.49E+00	3.70E+00
ZN-65		4.54E-01	±	4.49E+00	7.30E+00
ZRNB-95		-4.73E-01	±	4.30E+00	7.00E+00
I-131		2.84E+00	±	5.80E+00	9.18E+00
CS-134		-4.79E-01	±	2.33E+00	3.77E+00
CS-137		8.73E-01	±	1.74E+00	2.69E+00
BALA140		0.00E+00	±	1.26E+00	2.07E+00
BI-214		6.03E-01	±	5.39E+00	9.86E+00

Location 29 collected 7/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.67E+01	±	4.24E+01	4.99E+01
CR-51		1.54E+01	±	3.59E+01	5.76E+01
MN-54		1.33E-01	±	2.03E+00	3.31E+00
CO-58		8.55E-01	±	2.08E+00	3.26E+00
FE-59		-5.29E-02	±	5.87E+00	9.63E+00
CO-60		8.36E-01	±	1.63E+00	2.51E+00
ZN-65		-5.50E-01	±	4.23E+00	6.87E+00
ZRNB-95		-1.75E+00	±	4.93E+00	7.87E+00
I-131		2.42E+01	±	4.34E+01	6.90E+01
CS-134		-5.79E-01	±	1.84E+00	2.96E+00
CS-137		-7.64E-03	±	1.58E+00	2.60E+00
BALA140		-4.56E+00	±	1.70E+01	2.70E+01
BI-214		-1.25E+00	±	5.29E+00	8.04E+00

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

Table A-7.1

GAMMA SPECTROMETRY RESULTS OF WATER

STATION 29 - River/Drinking Indicator

Results in pCi/liter, corrected for decay during collection period

Location 29 collected 7/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.31E+01	±	4.93E+01	5.80E+01
CR-51		1.11E+01	±	2.77E+01	4.45E+01
MN-54		4.80E-02	±	1.97E+00	3.23E+00
CO-58		7.07E-01	±	2.27E+00	3.62E+00
FE-59		0.00E+00	±	6.93E+00	1.14E+01
CO-60		0.00E+00	±	2.92E+00	4.80E+00
ZN-65		1.73E-01	±	4.90E+00	8.03E+00
ZRNB-95		-1.49E+00	±	4.58E+00	7.31E+00
I-131		4.91E-02	±	8.43E+00	1.39E+01
CS-134		1.64E-01	±	4.16E+00	6.84E+00
CS-137		-6.47E-01	±	2.27E+00	3.64E+00
BALA140		1.50E-01	±	5.60E+00	9.16E+00
BI-214		5.13E+00	±	5.38E+00	9.41E+00

Location 29 collected 8/31/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.56E+01	±	6.96E+01	5.84E+01
CR-51		-1.03E+01	±	2.85E+01	4.59E+01
MN-54		-5.50E-01	±	2.21E+00	3.55E+00
CO-58		-2.87E-01	±	2.34E+00	3.80E+00
FE-59		-1.32E+00	±	6.37E+00	1.02E+01
CO-60		-2.37E-01	±	1.79E+00	2.89E+00
ZN-65		-2.27E+00	±	5.43E+00	8.58E+00
ZRNB-95		1.35E+00	±	4.08E+00	6.49E+00
I-131		-1.66E+00	±	8.90E+00	1.45E+01
CS-134		-9.69E-01	±	2.54E+00	4.07E+00
CS-137		1.71E-01	±	2.15E+00	3.51E+00
BALA140		-1.22E+00	±	6.04E+00	9.68E+00
BI-214		1.06E+00	±	5.02E+00	9.25E+00

Location 29 collected 10/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-4.21E+01	±	7.89E+01	5.49E+01
CR-51		8.46E-01	±	2.36E+01	3.87E+01
MN-54		1.57E-02	±	2.04E+00	3.35E+00
CO-58		-5.56E-01	±	2.14E+00	3.43E+00
FE-59		-1.42E-01	±	5.26E+00	8.62E+00
CO-60		6.82E-01	±	1.95E+00	3.06E+00
ZN-65		0.00E+00	±	8.51E+00	1.40E+01
ZRNB-95		-9.23E-01	±	4.08E+00	6.58E+00
I-131		3.98E+00	±	7.07E+00	1.11E+01
CS-134		-8.73E-01	±	2.10E+00	3.35E+00
CS-137		6.72E-01	±	2.28E+00	3.66E+00
BALA140		-1.45E+00	±	5.72E+00	9.09E+00
BI-214		6.12E+00	±	5.04E+00	8.73E+00

Location 29 collected 11/2/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	3.33E+01	5.48E+01
CR-51		3.44E+00	±	3.69E+01	4.85E+01
MN-54		1.50E+00	±	2.89E+00	3.46E+00
CO-58		-1.39E+00	±	3.73E+00	4.52E+00
FE-59		3.80E+00	±	8.74E+00	9.84E+00
CO-60		2.68E-01	±	3.04E+00	3.47E+00
ZN-65		1.94E+00	±	7.27E+00	8.40E+00
ZRNB-95		2.10E+00	±	5.72E+00	6.92E+00
I-131		-1.88E-01	±	1.51E+01	1.99E+01
CS-134		-1.08E+00	±	3.00E+00	3.77E+00
CS-137		-1.72E+00	±	3.62E+00	4.38E+00
BALA140		-3.07E+00	±	1.25E+01	1.37E+01
BI-214		2.51E+00	±	7.33E+00	1.00E+01

Location 29 collected 12/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	3.74E+01	6.15E+01
CR-51		0.00E+00	±	2.62E+01	4.31E+01
MN-54		-7.63E-01	±	3.09E+00	3.78E+00
CO-58		9.22E-02	±	3.05E+00	3.78E+00
FE-59		0.00E+00	±	5.84E+00	9.61E+00
CO-60		0.00E+00	±	2.43E+00	3.99E+00
ZN-65		2.50E+00	±	6.15E+00	7.01E+00
ZRNB-95		-2.97E+00	±	6.80E+00	8.24E+00
I-131		-1.54E+00	±	8.31E+00	1.09E+01
CS-134		2.20E+00	±	2.47E+00	2.97E+00
CS-137		1.28E-01	±	3.45E+00	4.28E+00
BALA140		-2.42E+00	±	9.70E+00	1.07E+01
BI-214	+	1.68E+01	±	7.31E+00	8.99E+00

Location 29 collected 12/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	6.37E+01	±	3.29E+01	3.13E+01
CR-51		2.19E+01	±	3.12E+01	3.98E+01
MN-54		-1.71E+00	±	3.85E+00	4.67E+00
CO-58		1.54E-01	±	2.80E+00	3.46E+00
FE-59		-1.02E+00	±	1.07E+01	1.26E+01
CO-60		-1.03E+00	±	3.97E+00	4.47E+00
ZN-65		-1.02E+00	±	7.14E+00	8.32E+00
ZRNB-95		1.66E+00	±	6.50E+00	7.95E+00
I-131		-4.60E+00	±	1.27E+01	1.65E+01
CS-134		6.88E-01	±	3.03E+00	3.83E+00
CS-137		6.41E-02	±	2.75E+00	3.41E+00
BALA140		3.05E+00	±	8.79E+00	9.51E+00
BI-214		3.81E+00	±	7.29E+00	9.92E+00

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

Table A-7.1

GAMMA SPECTROMETRY RESULTS OF WATER

STATION 27 - Plant Discharge Water Indicator

Results in pCi/liter, corrected for decay during collection period

Location 27 collected 1/29/2015

Nuclide	RQ	Activity		Error	MDA
K-40		3.87E+00	±	2.66E+01	5.26E+01
CR-51		8.18E+00	±	2.26E+01	3.63E+01
MN-54		0.00E+00	±	2.85E+00	4.69E+00
CO-58		-5.29E-01	±	2.23E+00	3.57E+00
FE-59		-7.55E-01	±	6.66E+00	1.08E+01
CO-60		2.31E+00	±	2.22E+00	3.22E+00
ZN-65		-4.32E-01	±	4.67E+00	7.60E+00
ZRNB-95		-1.32E+00	±	3.34E+00	5.22E+00
I-131		-2.63E+00	±	7.78E+00	1.25E+01
CS-134		1.09E+00	±	1.97E+00	3.08E+00
CS-137		-5.39E-02	±	2.06E+00	3.37E+00
BALA140		1.31E+00	±	5.73E+00	9.10E+00
BI-214		3.86E+00	±	5.24E+00	9.33E+00

Location 27 collected 3/2/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.80E+01	±	3.79E+01	5.37E+01
CR-51		-1.94E+01	±	2.74E+01	4.34E+01
MN-54		0.00E+00	±	2.45E+00	4.03E+00
CO-58		-8.79E-01	±	2.46E+00	3.92E+00
FE-59		7.00E-02	±	6.01E+00	9.86E+00
CO-60		-8.97E-02	±	2.07E+00	3.39E+00
ZN-65		0.00E+00	±	8.10E+00	1.33E+01
ZRNB-95		1.18E+00	±	3.63E+00	5.75E+00
I-131		-2.00E+00	±	6.86E+00	1.11E+01
CS-134		-1.52E+00	±	2.73E+00	4.34E+00
CS-137		-3.17E-01	±	1.84E+00	2.96E+00
BALA140		-2.03E+00	±	5.61E+00	8.79E+00
BI-214		2.44E+00	±	5.45E+00	9.77E+00

Location 27 collected 4/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.15E+01	±	4.31E+01	5.50E+01
CR-51		2.04E+01	±	2.92E+01	4.60E+01
MN-54		1.44E+00	±	2.04E+00	3.11E+00
CO-58		-1.30E-01	±	2.27E+00	3.72E+00
FE-59		1.96E+00	±	7.39E+00	1.18E+01
CO-60		-1.10E+00	±	2.42E+00	3.79E+00
ZN-65		-1.52E-01	±	4.56E+00	7.48E+00
ZRNB-95		7.03E-01	±	2.65E+00	4.17E+00
I-131		2.88E+00	±	1.01E+01	1.62E+01
CS-134		-1.60E+00	±	2.69E+00	4.26E+00
CS-137		1.33E+00	±	2.21E+00	3.43E+00
BALA140		-4.07E-02	±	6.73E+00	1.11E+01
BI-214		2.55E+00	±	5.14E+00	9.29E+00

Location 27 collected 5/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.07E+01	±	5.31E+01	5.50E+01
CR-51		-1.13E+01	±	2.50E+01	3.99E+01
MN-54		4.12E-01	±	2.10E+00	3.38E+00
CO-58		5.28E-02	±	1.47E+00	2.41E+00
FE-59		-9.49E-01	±	5.85E+00	9.39E+00
CO-60		-2.76E-01	±	2.94E+00	3.46E+00
ZN-65		5.76E-03	±	3.88E+00	6.38E+00
ZRNB-95		2.10E+00	±	3.95E+00	6.12E+00
I-131		3.13E-01	±	7.52E+00	1.23E+01
CS-134		7.82E-01	±	2.01E+00	3.21E+00
CS-137		1.18E+00	±	2.05E+00	3.17E+00
BALA140		0.00E+00	±	8.75E+00	1.44E+01
BI-214		2.18E+00	±	4.86E+00	8.93E+00

Location 27 collected 6/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.91E+01	±	5.19E+01	5.60E+01
CR-51		1.03E+00	±	2.40E+01	3.94E+01
MN-54		0.00E+00	±	2.16E+00	3.56E+00
CO-58		1.14E+00	±	1.97E+00	3.00E+00
FE-59		2.36E+00	±	6.01E+00	9.32E+00
CO-60		3.52E-02	±	7.77E-02	2.21E+00
ZN-65		1.28E-02	±	4.18E+00	6.87E+00
ZRNB-95		-2.83E-02	±	3.89E+00	6.39E+00
I-131		0.00E+00	±	8.12E+00	1.34E+01
CS-134		6.29E-01	±	2.32E+00	3.74E+00
CS-137		6.09E-01	±	1.93E+00	3.06E+00
BALA140		8.08E-01	±	5.43E+00	8.73E+00
BI-214		-2.46E+00	±	8.56E+00	1.01E+01

Location 27 collected 6/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.13E+01	±	3.11E+01	3.13E+01
CR-51		4.93E+00	±	1.35E+01	2.18E+01
MN-54		4.72E-01	±	1.27E+00	2.05E+00
CO-58		7.37E-01	±	1.13E+00	1.78E+00
FE-59		1.71E+00	±	3.69E+00	5.84E+00
CO-60		-4.15E-01	±	2.48E+00	2.27E+00
ZN-65		-2.55E-01	±	2.64E+00	4.31E+00
ZRNB-95		5.84E-01	±	2.71E+00	4.41E+00
I-131		-3.71E+00	±	7.96E+00	1.29E+01
CS-134		2.39E-01	±	1.01E+00	1.65E+00
CS-137		3.22E-03	±	1.30E+00	2.14E+00
BALA140		-8.76E-01	±	4.39E+00	7.09E+00
BI-214		1.50E+00	±	3.02E+00	5.48E+00

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

Table A-7.1

GAMMA SPECTROMETRY RESULTS OF WATER

STATION 27 - Plant Discharge Water Indicator

Results in pCi/liter, corrected for decay during collection period

Location 27 collected 7/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.49E+01	±	6.24E+01	5.58E+01
CR-51		8.77E+00	±	2.72E+01	4.39E+01
MN-54		1.68E+00	±	2.15E+00	3.27E+00
CO-58		2.05E+00	±	2.35E+00	3.52E+00
FE-59		-1.14E-02	±	6.35E+00	1.04E+01
CO-60		-5.81E-01	±	2.50E+00	4.02E+00
ZN-65		0.00E+00	±	5.80E+00	9.53E+00
ZRNB-95		-1.13E+00	±	4.04E+00	6.46E+00
I-131		-4.72E+00	±	9.75E+00	1.56E+01
CS-134		-1.74E+00	±	2.63E+00	4.15E+00
CS-137		1.34E+00	±	2.24E+00	3.49E+00
BALA140		1.72E+00	±	5.79E+00	9.09E+00
BI-214		3.59E+00	±	5.16E+00	9.22E+00

Location 27 collected 8/31/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.50E+01	±	4.51E+01	5.58E+01
CR-51		-1.24E+01	±	2.71E+01	4.34E+01
MN-54		3.95E-01	±	1.96E+00	3.15E+00
CO-58		-6.81E-01	±	2.30E+00	3.66E+00
FE-59		2.98E+00	±	5.02E+00	7.39E+00
CO-60		9.66E-01	±	1.96E+00	3.76E+00
ZN-65		-3.82E-01	±	4.15E+00	6.74E+00
ZRNB-95		-1.75E-01	±	4.26E+00	6.97E+00
I-131		-5.77E-02	±	6.43E+00	1.06E+01
CS-134		-4.66E-01	±	2.10E+00	3.39E+00
CS-137		-1.82E-01	±	1.84E+00	2.99E+00
BALA140		-5.69E-02	±	5.65E+00	9.28E+00
BI-214		7.39E-01	±	5.23E+00	9.61E+00

Location 27 collected 10/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.39E+01	±	5.04E+01	5.80E+01
CR-51		-2.48E+00	±	2.05E+01	3.33E+01
MN-54		5.62E-01	±	2.19E+00	3.52E+00
CO-58		0.00E+00	±	2.14E+00	3.51E+00
FE-59		-1.41E+00	±	6.68E+00	1.07E+01
CO-60		5.40E-01	±	1.95E+00	3.08E+00
ZN-65		-2.33E+00	±	5.90E+00	9.38E+00
ZRNB-95		2.80E-01	±	3.44E+00	5.60E+00
I-131		-3.85E+00	±	9.43E+00	1.52E+01
CS-134		-1.88E+00	±	2.85E+00	4.51E+00
CS-137		-2.83E-01	±	2.49E+00	4.05E+00
BALA140		1.49E-01	±	5.65E+00	9.25E+00
BI-214	+	3.22E+01	±	7.69E+00	9.36E+00

Location 27 collected 11/2/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	4.19E+01	±	3.75E+01	3.96E+01
CR-51		-6.78E+00	±	3.90E+01	5.11E+01
MN-54		-2.06E+00	±	3.57E+00	4.29E+00
CO-58		2.56E-01	±	3.02E+00	3.72E+00
FE-59		1.56E+00	±	7.58E+00	8.71E+00
CO-60		5.14E-01	±	3.30E+00	3.75E+00
ZN-65		1.52E+00	±	5.81E+00	6.69E+00
ZRNB-95		3.90E+00	±	4.86E+00	5.61E+00
I-131		3.56E-01	±	1.33E+01	1.75E+01
CS-134		-2.67E+00	±	3.38E+00	4.16E+00
CS-137		7.37E-01	±	2.80E+00	3.42E+00
BALA140		-1.48E+00	±	1.19E+01	1.32E+01
BI-214		2.78E+00	±	7.15E+00	9.80E+00

Location 27 collected 12/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		9.65E+00	±	4.05E+01	5.56E+01
CR-51		-3.59E+00	±	2.38E+01	3.40E+01
MN-54		0.00E+00	±	2.39E+00	3.94E+00
CO-58		-9.23E-01	±	3.11E+00	4.01E+00
FE-59		-3.88E+00	±	1.03E+01	1.21E+01
CO-60		1.78E+00	±	2.25E+00	2.43E+00
ZN-65		0.00E+00	±	5.12E+00	8.41E+00
ZRNB-95		7.06E-01	±	5.53E+00	7.24E+00
I-131		5.25E-01	±	7.29E+00	1.03E+01
CS-134		-8.96E-01	±	2.76E+00	3.69E+00
CS-137		-1.64E+00	±	3.37E+00	4.32E+00
BALA140		3.57E+00	±	6.11E+00	6.66E+00
BI-214		6.43E+00	±	6.37E+00	8.94E+00

Location 27 collected 12/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		1.49E+00	±	3.35E+01	5.11E+01
CR-51		-1.86E+01	±	3.80E+01	4.92E+01
MN-54		5.69E-01	±	2.91E+00	3.57E+00
CO-58		0.00E+00	±	2.66E+00	4.37E+00
FE-59		2.52E+00	±	9.60E+00	1.10E+01
CO-60		1.38E+00	±	2.61E+00	2.83E+00
ZN-65		-1.68E+00	±	7.78E+00	9.04E+00
ZRNB-95		-4.73E-01	±	5.82E+00	7.20E+00
I-131		8.31E+00	±	1.15E+01	1.46E+01
CS-134		-2.40E+00	±	3.45E+00	4.28E+00
CS-137		1.92E+00	±	2.69E+00	3.16E+00
BALA140		0.00E+00	±	8.09E+00	1.33E+01
BI-214		5.80E+00	±	7.93E+00	1.06E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

Table A-7.1

GAMMA SPECTROMETRY RESULTS OF WATER

Deep Ground Water Wells - Staions 31, 32, 52

Results in pCi/liter

Location 31 collected 3/18/2015

Nuclide	RQ	Activity		Error	MDA
K-40		9.94E+00	±	5.64E+01	1.09E+02
CR-51		-2.47E+00	±	3.71E+01	6.08E+01
MN-54		4.22E-02	±	4.90E+00	8.05E+00
CO-58		5.47E-01	±	3.81E+00	6.18E+00
FE-59		0.00E+00	±	8.98E+00	1.48E+01
CO-60		7.50E-01	±	4.50E+00	7.73E+00
ZN-65		-5.15E+00	±	1.26E+01	2.00E+01
ZRNB-95		2.65E+00	±	7.71E+00	1.23E+01
I-131		-1.17E+00	±	5.13E+00	8.32E+00
CS-134		-2.40E+00	±	5.32E+00	8.50E+00
CS-137		-1.18E-01	±	5.12E+00	8.40E+00
BALA140		-8.18E-01	±	5.47E+00	8.83E+00
BI-214	+	2.42E+02	±	2.36E+01	2.17E+01

Location 31 collected 6/3/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-5.95E+01	±	1.56E+02	1.16E+02
CR-51		-1.27E+01	±	4.44E+01	7.19E+01
MN-54		5.95E-01	±	4.23E+00	6.86E+00
CO-58		-1.07E-01	±	3.73E+00	6.11E+00
FE-59		-2.06E+00	±	1.07E+01	1.71E+01
CO-60		8.10E-01	±	8.87E-01	4.44E+00
ZN-65		1.48E-01	±	7.68E+00	1.26E+01
ZRNB-95		0.00E+00	±	8.74E+00	1.44E+01
I-131		-6.32E-01	±	7.70E+00	1.26E+01
CS-134		-5.53E-01	±	4.73E+00	7.72E+00
CS-137		-2.03E+00	±	5.14E+00	8.20E+00
BALA140		9.34E-01	±	6.92E+00	1.12E+01
BI-214	+	2.53E+01	±	1.30E+01	2.13E+01

Location 31 collected 9/16/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.68E+01	±	9.83E+01	1.11E+02
CR-51		-1.82E+01	±	4.51E+01	7.25E+01
MN-54		2.68E+00	±	4.14E+00	6.37E+00
CO-58		6.63E-02	±	4.34E+00	7.12E+00
FE-59		3.15E+00	±	1.06E+01	1.67E+01
CO-60		2.50E+00	±	2.96E+00	6.91E+00
ZN-65		-3.23E+00	±	1.06E+01	1.70E+01
ZRNB-95		1.41E+00	±	6.72E+00	1.08E+01
I-131		4.42E+00	±	6.98E+00	1.09E+01
CS-134		-6.23E-03	±	4.52E+00	7.44E+00
CS-137		2.86E+00	±	3.77E+00	5.70E+00
BALA140		-1.91E+00	±	8.08E+00	1.29E+01
BI-214	+	2.10E+01	±	1.12E+01	1.88E+01

Location 31 collected 12/9/2015

Nuclide	RQ	Activity		Error	MDA
K-40		1.05E-01	±	9.30E+01	1.26E+02
CR-51		-3.30E+01	±	4.97E+01	6.84E+01
MN-54		2.06E+00	±	5.63E+00	7.03E+00
CO-58		6.71E-01	±	5.33E+00	6.76E+00
FE-59		5.47E+00	±	1.45E+01	1.70E+01
CO-60		1.19E+00	±	6.58E+00	7.83E+00
ZN-65		9.64E+00	±	1.03E+01	1.16E+01
ZRNB-95		-6.14E+00	±	1.17E+01	1.50E+01
I-131		-1.80E+00	±	6.11E+00	8.53E+00
CS-134		4.59E+00	±	5.77E+00	7.28E+00
CS-137		-1.84E+00	±	7.44E+00	9.70E+00
BALA140		4.75E+00	±	4.78E+00	4.79E+00
BI-214	+	1.55E+02	±	2.09E+01	2.13E+01

Location 32 collected 3/18/2015

Nuclide	RQ	Activity		Error	MDA
K-40		6.82E-01	±	6.27E+01	1.23E+02
CR-51		-2.42E+01	±	5.93E+01	9.61E+01
MN-54		2.87E+00	±	5.41E+00	8.58E+00
CO-58		-1.62E+00	±	5.25E+00	8.45E+00
FE-59		2.43E+00	±	1.17E+01	1.89E+01
CO-60		2.54E+00	±	4.77E+00	7.44E+00
ZN-65		-4.29E+00	±	5.22E+01	1.07E+01
ZRNB-95		1.67E+00	±	8.79E+00	1.43E+01
I-131		-2.55E+00	±	6.61E+00	1.07E+01
CS-134		1.70E+00	±	5.04E+00	8.28E+00
CS-137		2.51E+00	±	5.80E+00	9.27E+00
BALA140		-1.62E+00	±	6.23E+00	9.98E+00
BI-214	+	5.09E+02	±	3.00E+01	2.25E+01

Location 32 collected 6/3/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.48E+01	±	8.34E+01	1.13E+02
CR-51		-7.50E+00	±	5.08E+01	8.30E+01
MN-54		-8.28E-02	±	4.91E+00	8.06E+00
CO-58		-2.31E+00	±	4.98E+00	7.87E+00
FE-59		-8.65E-01	±	1.29E+01	2.11E+01
CO-60		-2.72E+00	±	8.32E+01	7.20E+00
ZN-65		-7.03E+00	±	1.28E+01	2.02E+01
ZRNB-95		2.66E-01	±	7.17E+00	1.17E+01
I-131		0.00E+00	±	1.20E+01	1.98E+01
CS-134		1.59E+00	±	4.89E+00	7.87E+00
CS-137		5.00E+00	±	4.53E+00	6.70E+00
BALA140		-3.89E+00	±	9.99E+00	1.58E+01
BI-214	+	1.87E+02	±	2.01E+01	1.96E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

Table A-7.1

GAMMA SPECTROMETRY RESULTS OF WATER

Deep Ground Water Wells - Staions 31, 32, 52

Results in pCi/liter

Location 32 collected 9/16/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-4.13E+01	±	9.51E+01	1.23E+02
CR-51		1.43E+01	±	5.59E+01	9.08E+01
MN-54		0.00E+00	±	5.82E+00	9.57E+00
CO-58		-1.49E+00	±	6.12E+00	9.91E+00
FE-59		-3.94E-01	±	1.34E+01	2.20E+01
CO-60		2.13E+00	±	4.71E+00	7.37E+00
ZN-65		1.15E+01	±	1.36E+01	1.63E+01
ZRNB-95		1.92E+00	±	6.81E+00	1.09E+01
I-131		-1.89E+00	±	1.14E+01	1.86E+01
CS-134		-5.22E+00	±	7.89E+00	1.03E+01
CS-137		1.48E-01	±	5.71E+00	9.38E+00
BALA140		-3.13E+00	±	8.78E+00	1.39E+01
BI-214	+	4.28E+02	±	2.98E+01	2.36E+01

Location 32 collected 12/9/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	7.59E+01	1.25E+02
CR-51		3.60E+01	±	6.31E+01	8.17E+01
MN-54		3.26E+00	±	6.94E+00	8.42E+00
CO-58		3.06E+00	±	6.90E+00	8.37E+00
FE-59		-3.43E+00	±	1.87E+01	2.12E+01
CO-60		-6.66E+00	±	1.05E+01	1.17E+01
ZN-65		0.00E+00	±	1.72E+01	2.83E+01
ZRNB-95		-6.90E+00	±	1.47E+01	1.79E+01
I-131		3.61E-01	±	8.37E+00	1.10E+01
CS-134		-2.38E+00	±	8.17E+00	1.03E+01
CS-137		-4.32E-01	±	7.70E+00	9.82E+00
BALA140		-1.20E+00	±	1.10E+01	1.23E+01
BI-214	+	6.05E+02	±	3.35E+01	2.38E+01

Location 52 collected 3/18/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-5.21E+01	±	1.10E+02	1.03E+02
CR-51		-8.19E+00	±	3.93E+01	6.39E+01
MN-54		1.57E+00	±	3.07E+00	4.71E+00
CO-58		-1.53E+00	±	3.89E+00	6.15E+00
FE-59		1.66E+00	±	9.36E+00	1.50E+01
CO-60		-2.71E+00	±	1.03E+02	8.48E+00
ZN-65		5.33E+00	±	8.22E+00	1.25E+01
ZRNB-95		1.57E-01	±	6.36E+00	1.04E+01
I-131		1.81E+00	±	3.56E+00	5.61E+00
CS-134		-3.40E-02	±	4.44E+00	7.29E+00
CS-137		-2.09E+00	±	4.69E+00	7.41E+00
BALA140		-1.27E-01	±	4.98E+00	8.15E+00
BI-214		1.11E+01	±	1.17E+01	2.05E+01

Location 52 collected 6/3/2015

Nuclide	RQ	Activity		Error	MDA
K-40		1.11E+00	±	5.41E+01	1.07E+02
CR-51		-1.39E+01	±	4.56E+01	7.36E+01
MN-54		-2.61E-01	±	2.79E+00	4.53E+00
CO-58		0.00E+00	±	5.17E+00	8.50E+00
FE-59		5.03E+00	±	9.09E+00	1.36E+01
CO-60		9.35E-01	±	5.86E+00	6.98E+00
ZN-65		3.13E-01	±	6.36E+00	1.04E+01
ZRNB-95		-4.02E+00	±	8.51E+00	1.34E+01
I-131		6.04E+00	±	1.13E+01	1.80E+01
CS-134		-3.57E+00	±	5.09E+00	7.99E+00
CS-137		3.32E-02	±	4.28E+00	7.03E+00
BALA140		3.45E+00	±	1.01E+01	1.59E+01
BI-214		1.23E+01	±	1.15E+01	2.00E+01

Location 52 collected 9/17/2015

Nuclide	RQ	Activity		Error	MDA
K-40		6.54E+01	±	7.74E+01	8.57E+01
CR-51		-1.94E+01	±	4.69E+01	7.52E+01
MN-54		1.38E+00	±	3.12E+00	4.84E+00
CO-58		2.70E+00	±	3.86E+00	5.85E+00
FE-59		-1.18E-01	±	1.01E+01	1.66E+01
CO-60		3.86E+00	±	6.09E+00	6.97E+00
ZN-65		8.95E-01	±	8.84E+00	1.44E+01
ZRNB-95		2.49E-01	±	6.33E+00	1.04E+01
I-131		4.33E+00	±	1.10E+01	1.77E+01
CS-134		-1.99E+00	±	4.29E+00	6.80E+00
CS-137		1.34E+00	±	4.12E+00	6.56E+00
BALA140		-1.70E+00	±	8.90E+00	1.43E+01
BI-214	+	2.55E+01	±	1.17E+01	1.91E+01

Location 52 collected 12/9/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	7.27E+01	1.20E+02
CR-51		-1.52E+01	±	5.19E+01	6.77E+01
MN-54		-3.38E+00	±	6.67E+00	8.06E+00
CO-58		-5.41E-01	±	5.88E+00	7.27E+00
FE-59		-2.51E+00	±	1.56E+01	1.77E+01
CO-60		9.28E-01	±	5.97E+00	6.77E+00
ZN-65		0.00E+00	±	1.13E+01	1.85E+01
ZRNB-95		-3.67E+00	±	1.15E+01	1.40E+01
I-131		4.65E+00	±	5.82E+00	7.37E+00
CS-134		1.47E+00	±	6.37E+00	8.06E+00
CS-137		3.70E-01	±	6.47E+00	8.25E+00
BALA140		2.59E+00	±	8.05E+00	8.80E+00
BI-214		1.91E+01	±	1.57E+01	2.09E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A - 7.2

GAMMA SPECTROMETRY RESULTS OF WATER - SUMMARY

RIVER/DRINKING WATER

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-6.95E-01	-4.56E+00	3.05E+00	1.13E+01	12	0
BALA140	Cntl	-6.61E-01	-3.92E+00	3.43E+00	1.21E+01	12	0
BI-214	Ind	3.38E+00	-1.25E+00	1.68E+01	9.27E+00	12	1
BI-214	Cntl	4.02E+00	-1.67E+00	1.73E+01	9.43E+00	12	1
CO-58	Ind	-1.01E-01	-1.39E+00	8.55E-01	3.70E+00	12	0
CO-58	Cntl	4.10E-02	-1.91E+00	1.48E+00	3.65E+00	12	0
CO-60	Ind	-1.70E-01	-1.84E+00	8.36E-01	3.55E+00	12	0
CO-60	Cntl	4.93E-01	-1.83E-01	1.71E+00	3.37E+00	12	0
CR-51	Ind	4.02E+00	-1.03E+01	2.19E+01	4.40E+01	12	0
CR-51	Cntl	3.67E+00	-9.19E+00	1.53E+01	4.21E+01	12	0
CS-134	Ind	1.50E-02	-1.08E+00	2.20E+00	3.73E+00	12	0
CS-134	Cntl	-4.61E-01	-2.08E+00	8.97E-01	3.60E+00	12	0
CS-137	Ind	-8.83E-02	-1.72E+00	8.73E-01	3.43E+00	12	0
CS-137	Cntl	-3.79E-01	-1.49E+00	9.36E-01	3.61E+00	12	0
FE-59	Ind	3.15E-01	-1.32E+00	3.80E+00	1.02E+01	12	0
FE-59	Cntl	6.53E-01	-1.67E+00	3.44E+00	1.09E+01	12	0
I-131	Ind	1.53E+00	-7.01E+00	2.42E+01	1.80E+01	12	0
I-131	Cntl	-9.94E-01	-7.87E+00	4.74E+00	1.97E+01	12	0
K-40	Ind	-1.35E+01	-4.21E+01	6.37E+01	5.42E+01	12	1
K-40	Cntl	-1.28E+01	-4.83E+01	7.01E+01	5.39E+01	12	1
MN-54	Ind	-1.44E-01	-1.71E+00	1.50E+00	3.47E+00	12	0
MN-54	Cntl	2.00E-01	-1.35E+00	1.43E+00	3.49E+00	12	0
ZN-65	Ind	3.11E-02	-2.27E+00	2.50E+00	8.20E+00	12	0
ZN-65	Cntl	-1.21E-01	-3.38E+00	1.96E+00	7.38E+00	12	0
ZRNB-95	Ind	2.60E-01	-2.97E+00	3.24E+00	7.59E+00	12	0
ZRNB-95	Cntl	6.89E-02	-1.25E+00	1.56E+00	7.16E+00	12	0

Ind = Indicator Station Cntl = Control Station

TABLE A - 7.2

GAMMA SPECTROMETRY RESULTS OF WATER - SUMMARY

PLANT DISCHARGE WATER

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
K-40	Ind	-1.35E+01	-4.21E+01	6.37E+01	5.42E+01	12	1
CR-51	Ind	4.02E+00	-1.03E+01	2.19E+01	4.40E+01	12	0
MN-54	Ind	-1.44E-01	-1.71E+00	1.50E+00	3.47E+00	12	0
CO-58	Ind	-1.01E-01	-1.39E+00	8.55E-01	3.70E+00	12	0
FE-59	Ind	3.15E-01	-1.32E+00	3.80E+00	1.02E+01	12	0
CO-60	Ind	-1.70E-01	-1.84E+00	8.36E-01	3.55E+00	12	0
ZN-65	Ind	3.11E-02	-2.27E+00	2.50E+00	8.20E+00	12	0
ZRNB-95	Ind	2.60E-01	-2.97E+00	3.24E+00	7.59E+00	12	0
I-131	Ind	1.53E+00	-7.01E+00	2.42E+01	1.80E+01	12	0
CS-134	Ind	1.50E-02	-1.08E+00	2.20E+00	3.73E+00	12	0
CS-137	Ind	-8.83E-02	-1.72E+00	8.73E-01	3.43E+00	12	0
BALA140	Ind	-6.95E-01	-4.56E+00	3.05E+00	1.13E+01	12	0
BI-214	Ind	3.38E+00	-1.25E+00	1.68E+01	9.27E+00	12	1

GAMMA SPECTROMETRY RESULTS OF WATER

Deep Ground Water Wells

Nuclide	Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
K-40	-1.14E+01	-5.95E+01	6.54E+01	1.13E+02	12	0
CR-51	-8.70E+00	-3.30E+01	3.60E+01	7.55E+01	12	0
MN-54	8.94E-01	-3.38E+00	3.26E+00	7.09E+00	12	0
CO-58	-4.70E-02	-2.31E+00	3.06E+00	7.38E+00	12	0
FE-59	6.96E-01	-3.43E+00	5.47E+00	1.76E+01	12	0
CO-60	2.97E-01	-6.66E+00	3.86E+00	7.49E+00	12	0
ZN-65	6.78E-01	-7.03E+00	1.15E+01	1.60E+01	12	0
ZRNB-95	-6.02E-01	-6.90E+00	5.33E+00	1.31E+01	12	0
I-131	1.13E+00	-2.55E+00	6.04E+00	1.24E+01	12	0
CS-134	-5.67E-01	-5.22E+00	4.59E+00	8.16E+00	12	0
CS-137	4.80E-01	-2.09E+00	5.00E+00	8.04E+00	12	0
BALA140	-2.23E-01	-3.89E+00	4.75E+00	1.14E+01	12	0
BI-214	1.87E+02	1.11E+01	6.05E+02	2.11E+01	12	9

Ind = Indicator Station Cntl = Control Station

TABLE A-8.1

GAMMA SPECTROMETRY RESULTS OF SOIL

Results in pCi/kilogram

	Location & Date	Station 7	7/14/2015	
Nuclide	**RQ**	**Activity**	**Error**	**MDA**
BE-7		1.13E+02 ±	1.63E+02	2.52E+02
K-40	+	1.35E+04 ±	8.38E+02	2.16E+02
CR-51		7.54E+01 ±	1.79E+02	2.86E+02
MN-54		-3.57E+00 ±	1.78E+01	2.87E+01
CO-58		-1.29E+00 ±	1.41E+01	2.28E+01
FE-59		2.26E+00 ±	4.92E+01	8.04E+01
CO-60		1.22E+01 ±	2.24E+01	3.52E+01
ZN-65		-2.17E+01 ±	5.21E+01	8.25E+01
ZRNB-95		-8.19E+00 ±	3.23E+01	5.16E+01
CS-134		-1.38E+00 ±	1.94E+01	3.18E+01
CS-137		1.89E+01 ±	2.30E+01	3.52E+01
BALA140		-2.65E+00 ±	2.80E+01	4.54E+01
BI-214	+	4.18E+02 ±	6.24E+01	5.97E+01

	Location & Date	Station 48	7/14/2015	
Nuclide	**RQ**	**Activity**	**Error**	**MDA**
BE-7		1.93E+02 ±	2.27E+02	3.48E+02
K-40	+	1.76E+04 ±	1.09E+03	3.35E+02
CR-51		8.17E+01 ±	2.21E+02	3.54E+02
MN-54		-1.90E+01 ±	2.74E+01	4.22E+01
CO-58		-8.61E+00 ±	2.51E+01	3.99E+01
FE-59		-2.95E+01 ±	7.48E+01	1.18E+02
CO-60		-8.90E+00 ±	3.47E+01	5.58E+01
ZN-65		-3.76E+01 ±	7.42E+01	1.17E+02
ZRNB-95		-2.66E+00 ±	3.08E+01	5.00E+01
CS-134		6.09E+00 ±	7.49E+01	1.23E+02
CS-137		-6.66E+00 ±	3.11E+01	5.03E+01
BALA140		-1.19E+01 ±	4.17E+01	6.61E+01
BI-214	+	7.63E+02 ±	1.01E+02	7.21E+01

	Location & Date	Station 9a	7/14/2015	
Nuclide	**RQ**	**Activity**	**Error**	**MDA**
BE-7		1.08E+02 ±	1.98E+02	3.12E+02
K-40	+	1.43E+04 ±	9.00E+02	2.49E+02
CR-51		3.23E+00 ±	2.08E+02	3.42E+02
MN-54		-1.01E+01 ±	2.61E+01	4.15E+01
CO-58		-3.90E+00 ±	2.22E+01	3.59E+01
FE-59		-2.82E+00 ±	5.61E+01	9.17E+01
CO-60		7.86E+00 ±	2.56E+01	4.08E+01
ZN-65		-5.00E+01 ±	7.80E+01	1.23E+02
ZRNB-95		-3.79E+00 ±	3.97E+01	6.46E+01
CS-134		1.99E+00 ±	1.84E+01	2.99E+01
CS-137		1.95E+01 ±	2.31E+01	3.50E+01
BALA140		0.00E+00 ±	6.48E+00	1.08E+01
BI-214	+	5.77E+02 ±	7.77E+01	7.19E+01

	Location & Date	Station 8	7/14/2015	
Nuclide	**RQ**	**Activity**	**Error**	**MDA**
BE-7		2.02E+02 ±	2.66E+02	4.08E+02
K-40	+	2.10E+04 ±	1.34E+03	4.22E+02
CR-51		7.18E+01 ±	3.10E+02	5.02E+02
MN-54		6.12E+00 ±	2.91E+01	4.68E+01
CO-58		-5.53E-01 ±	2.40E+01	3.93E+01
FE-59		2.97E+01 ±	7.15E+01	1.10E+02
CO-60		-9.76E-01 ±	3.69E+01	6.05E+01
ZN-65		-6.11E+01 ±	1.15E+02	1.83E+02
ZRNB-95		3.83E+01 ±	5.23E+01	7.91E+01
CS-134		-2.58E+00 ±	9.72E+01	1.60E+02
CS-137	+	1.42E+02 ±	4.46E+01	5.51E+01
BALA140		0.00E+00 ±	4.03E+01	6.71E+01
BI-214	+	8.66E+02 ±	1.15E+02	1.09E+02

	Location & Date	Station 23	7/14/2015	
Nuclide	**RQ**	**Activity**	**Error**	**MDA**
BE-7		2.03E+02 ±	2.06E+02	3.14E+02
K-40	+	1.41E+04 ±	8.87E+02	1.97E+02
CR-51		2.18E+00 ±	1.75E+02	2.88E+02
MN-54		-6.71E+00 ±	1.87E+01	2.95E+01
CO-58		-2.81E+00 ±	1.78E+01	2.87E+01
FE-59		-1.22E+00 ±	5.90E+01	9.68E+01
CO-60		8.39E+00 ±	2.39E+01	3.84E+01
ZN-65		-3.19E+01 ±	6.38E+01	1.01E+02
ZRNB-95		-3.81E+00 ±	3.69E+01	6.01E+01
CS-134		-9.39E+00 ±	2.17E+01	3.45E+01
CS-137	+	9.43E+01 ±	2.81E+01	2.33E+01
BALA140		2.11E-01 ±	1.78E+01	2.92E+01
BI-214	+	5.32E+02 ±	7.34E+01	6.74E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-8.2

GAMMA SPECTROMETRY RESULTS OF SOIL - SUMMARY

Results in pCi/kilogram

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-3.59E+00	-1.19E+01	2.11E-01	-3.59E+00	4	0
BALA140	Cntl	0.00E+00	0.00E+00	0.00E+00	1.08E+01	1	0
BE-7	Ind	1.78E+02	1.13E+02	2.03E+02	1.78E+02	4	0
BE-7	Cntl	1.08E+02	1.08E+02	1.08E+02	3.12E+02	1	0
BI-214	Ind	6.45E+02	4.18E+02	8.66E+02	6.45E+02	4	4
BI-214	Cntl	5.77E+02	5.77E+02	5.77E+02	7.19E+01	1	1
CO-58	Ind	-3.31E+00	-8.61E+00	-5.53E-01	-3.31E+00	4	0
CO-58	Cntl	-3.90E+00	-3.90E+00	-3.90E+00	3.59E+01	1	0
CO-60	Ind	2.69E+00	-8.90E+00	1.22E+01	2.69E+00	4	0
CO-60	Cntl	7.86E+00	7.86E+00	7.86E+00	4.08E+01	1	0
CR-51	Ind	5.78E+01	2.18E+00	8.17E+01	5.78E+01	4	0
CR-51	Cntl	3.23E+00	3.23E+00	3.23E+00	3.42E+02	1	0
CS-134	Ind	-1.81E+00	-9.39E+00	6.09E+00	-1.81E+00	4	0
CS-134	Cntl	1.99E+00	1.99E+00	1.99E+00	2.99E+01	1	0
CS-137	Ind	6.22E+01	-6.66E+00	1.42E+02	6.22E+01	4	2
CS-137	Cntl	1.95E+01	1.95E+01	1.95E+01	3.50E+01	1	0
FE-59	Ind	3.05E-01	-2.95E+01	2.97E+01	3.05E-01	4	0
FE-59	Cntl	-2.82E+00	-2.82E+00	-2.82E+00	9.17E+01	1	0
K-40	Ind	1.66E+04	1.35E+04	2.10E+04	1.66E+04	4	4
K-40	Cntl	1.43E+04	1.43E+04	1.43E+04	2.49E+02	1	1
MN-54	Ind	-5.78E+00	-1.90E+01	6.12E+00	-5.78E+00	4	0
MN-54	Cntl	-1.01E+01	-1.01E+01	-1.01E+01	4.15E+01	1	0
ZN-65	Ind	-3.81E+01	-6.11E+01	-2.17E+01	-3.81E+01	4	0
ZN-65	Cntl	-5.00E+01	-5.00E+01	-5.00E+01	1.23E+02	1	0
ZRNB-95	Ind	5.92E+00	-8.19E+00	3.83E+01	5.92E+00	4	0
ZRNB-95	Cntl	-3.79E+00	-3.79E+00	-3.79E+00	6.46E+01	1	0

Ind = Indicator Stations Cntl = Control Stations

TABLE A-9.1

GAMMA SPECTROMETRY RESULTS OF SEDIMENT

Results in pCi/kilogram dry material

Station 33 Upstream Control

Location & Date				Station 33	4/1/2015
Nuclide	**RQ**	**Activity**		**Error**	**MDA**
BE-7	+	4.56E+02	±	2.44E+02	3.39E+02
K-40	+	1.69E+04	±	1.09E+03	2.99E+02
CR-51		-8.59E+01	±	2.53E+02	4.07E+02
MN-54		7.84E+00	±	2.33E+01	3.70E+01
CO-58		-2.06E+00	±	2.05E+01	3.33E+01
FE-59		1.22E+00	±	4.55E+01	7.44E+01
CO-60		-1.26E+01	±	5.72E+01	5.33E+01
ZN-65		-4.97E+01	±	8.31E+01	1.31E+02
ZRNB-95		2.01E+01	±	4.36E+01	6.81E+01
CS-134		-1.78E+00	±	3.87E+01	6.35E+01
CS-137	+	1.25E+02	±	3.93E+01	3.21E+01
BALA140		0.00E+00	±	3.62E+01	6.03E+01
BI-214	+	5.63E+02	±	8.29E+01	7.79E+01

Location & Date				Station 33	10/21/2015
Nuclide	**RQ**	**Activity**		**Error**	**MDA**
BE-7		-3.19E+01	±	3.30E+02	4.47E+02
K-40	+	1.66E+04	±	1.23E+03	5.27E+02
CR-51		6.85E+00	±	3.32E+02	4.69E+02
MN-54		-4.53E+00	±	3.75E+01	4.76E+01
CO-58		-1.44E+01	±	4.29E+01	5.35E+01
FE-59		-1.82E+01	±	1.52E+02	1.77E+02
CO-60		-1.54E+01	±	5.06E+01	5.81E+01
ZN-65		-2.36E+01	±	1.08E+02	1.29E+02
ZRNB-95		-9.05E+00	±	8.44E+01	1.07E+02
CS-134		-9.13E+00	±	3.18E+01	4.10E+01
CS-137	+	8.36E+01	±	4.38E+01	4.99E+01
BALA140		-2.22E+01	±	9.65E+01	1.08E+02
BI-214	+	6.31E+02	±	1.11E+02	9.48E+01

Station 34 Downstream Indicator

Location & Date				Station 34	4/3/2015
Nuclide	**RQ**	**Activity**		**Error**	**MDA**
BE-7		2.29E+02	±	3.31E+02	5.07E+02
K-40	+	1.31E+04	±	1.29E+03	5.95E+02
CR-51		-1.07E+02	±	3.55E+02	5.71E+02
MN-54		1.27E+01	±	3.57E+01	5.61E+01
CO-58		-1.17E+01	±	3.45E+01	5.41E+01
FE-59		2.55E+01	±	1.03E+02	1.64E+02
CO-60		4.30E-01	±	3.93E+01	6.46E+01
ZN-65		-2.67E-01	±	1.06E+02	1.74E+02
ZRNB-95		3.09E+00	±	4.66E+01	7.58E+01
CS-134		-3.12E+01	±	4.96E+01	7.78E+01
CS-137	+	1.90E+02	±	5.35E+01	5.75E+01
BALA140		0.00E+00	±	5.63E+01	9.38E+01
BI-214	+	6.95E+02	±	1.29E+02	1.38E+02

Location & Date				Station 34	10/21/2015
Nuclide	**RQ**	**Activity**		**Error**	**MDA**
BE-7		3.02E+01	±	3.11E+02	3.52E+02
K-40	+	1.71E+04	±	1.07E+03	3.15E+02
CR-51		-1.99E+01	±	3.03E+02	3.66E+02
MN-54		1.58E+01	±	3.15E+01	3.20E+01
CO-58		2.11E+00	±	3.47E+01	3.65E+01
FE-59		0.00E+00	±	7.98E+01	1.33E+02
CO-60		1.02E+01	±	3.58E+01	3.46E+01
ZN-65		9.85E+00	±	7.91E+01	8.01E+01
ZRNB-95		5.12E+01	±	5.44E+01	5.48E+01
CS-134		-9.13E+00	±	3.26E+01	3.65E+01
CS-137	+	1.29E+02	±	3.13E+01	2.48E+01
BALA140		0.00E+00	±	5.45E+01	9.08E+01
BI-214	+	6.30E+02	±	9.94E+01	7.34E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-9.2

GAMMA SPECTROMETRY RESULTS OF SEDIMENT - SUMMARY

Results in pCi/kilogram dry material

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2	0
BALA140	Cntl	-1.11E+01	-2.22E+01	0.00E+00	-1.11E+01	2	0
BE-7	Ind	1.29E+02	3.02E+01	2.29E+02	1.29E+02	2	0
BE-7	Cntl	2.12E+02	-3.19E+01	4.56E+02	2.12E+02	2	1
BI-214	Ind	6.62E+02	6.30E+02	6.95E+02	6.62E+02	2	2
BI-214	Cntl	5.97E+02	5.63E+02	6.31E+02	5.97E+02	2	2
CO-58	Ind	-4.81E+00	-1.17E+01	2.11E+00	-4.81E+00	2	0
CO-58	Cntl	-8.23E+00	-1.44E+01	-2.06E+00	-8.23E+00	2	0
CO-60	Ind	5.32E+00	4.30E-01	1.02E+01	5.32E+00	2	0
CO-60	Cntl	-1.40E+01	-1.54E+01	-1.26E+01	-1.40E+01	2	0
CR-51	Ind	-6.33E+01	-1.07E+02	-1.99E+01	-6.33E+01	2	0
CR-51	Cntl	-3.95E+01	-8.59E+01	6.85E+00	-3.95E+01	2	0
CS-134	Ind	-2.02E+01	-3.12E+01	-9.13E+00	-2.02E+01	2	0
CS-134	Cntl	-5.45E+00	-9.13E+00	-1.78E+00	-5.45E+00	2	0
CS-137	Ind	1.59E+02	1.29E+02	1.90E+02	1.59E+02	2	2
CS-137	Cntl	1.04E+02	8.36E+01	1.25E+02	1.04E+02	2	2
FE-59	Ind	1.28E+01	0.00E+00	2.55E+01	1.28E+01	2	0
FE-59	Cntl	-8.51E+00	-1.82E+01	1.22E+00	-8.51E+00	2	0
K-40	Ind	1.51E+04	1.31E+04	1.71E+04	1.51E+04	2	2
K-40	Cntl	1.68E+04	1.66E+04	1.69E+04	1.68E+04	2	2
MN-54	Ind	1.42E+01	1.27E+01	1.58E+01	1.42E+01	2	0
MN-54	Cntl	1.65E+00	-4.53E+00	7.84E+00	1.65E+00	2	0
ZN-65	Ind	4.79E+00	-2.67E-01	9.85E+00	4.79E+00	2	0
ZN-65	Cntl	-3.66E+01	-4.97E+01	-2.36E+01	-3.66E+01	2	0
ZRNB-95	Ind	2.72E+01	3.09E+00	5.12E+01	2.72E+01	2	0
ZRNB-95	Cntl	5.51E+00	-9.05E+00	2.01E+01	5.51E+00	2	0

Ind = Indicator Stations Cntl = Control Stations

TABLE A-10.1

GAMMA SPECTROMETRY RESULTS OF FISH

Station 30 Columbia River - Station 38 Snake River

Results in pCi/kilogram (wet)

Location & Species	Collection Date	Nuclide	RQ	Activity		Error	MDA
Bass	09/18/15	K-40	+	3.15E+03	±	3.27E+02	2.25E+02
Station 30		MN-54		2.23E+00	±	1.11E+01	1.78E+01
Indicator		CO-58		1.68E+00	±	1.35E+01	2.18E+01
		FE-59		-1.62E+01	±	5.46E+01	8.66E+01
		CO-60		2.03E-01	±	1.20E+01	1.96E+01
		ZN-65		-1.02E+01	±	3.33E+01	5.31E+01
		ZRNB-95		-6.41E+00	±	2.87E+01	4.62E+01
		CS-134		-4.68E+00	±	1.20E+01	1.91E+01
		CS-137		3.29E+00	±	1.23E+01	1.98E+01
		Bi-214		1.25E+01	±	2.24E+01	4.06E+01
Perch	09/18/15	K-40	+	4.00E+03	±	4.78E+02	3.67E+02
Station 30		MN-54		3.55E+00	±	1.53E+01	2.43E+01
Indicator		CO-58		-9.03E+00	±	2.60E+01	4.13E+01
		FE-59		0.00E+00	±	6.80E+01	1.12E+02
		CO-60		6.08E+00	±	1.41E+01	2.15E+01
		ZN-65		-8.47E-01	±	3.63E+01	5.95E+01
		ZRNB-95		1.70E+00	±	4.11E+01	6.73E+01
		CS-134		-2.98E+00	±	1.62E+01	2.62E+01
		CS-137		0.00E+00	±	1.91E+01	3.15E+01
		Bi-214		-1.79E+01	±	7.16E+01	7.48E+01
Salmon	09/29/15	K-40	+	2.88E+03	±	3.15E+02	1.94E+02
Station 30		MN-54		-4.20E+00	±	1.12E+01	1.77E+01
Indicator		CO-58		3.50E+00	±	1.22E+01	1.94E+01
		FE-59		-1.87E+00	±	3.78E+01	6.17E+01
		CO-60		2.85E+00	±	7.74E+00	1.30E+01
		ZN-65		5.32E+00	±	2.28E+01	3.63E+01
		ZRNB-95		6.68E-01	±	2.20E+01	3.61E+01
		CS-134		-7.45E-01	±	9.00E+00	1.47E+01
		CS-137		2.79E-01	±	8.95E+00	1.47E+01
		Bi-214		9.25E-01	±	2.10E+01	3.89E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-10.1

GAMMA SPECTROMETRY RESULTS OF FISH

Station 30 Columbia River - Station 38 Snake River

Results in pCi/kilogram (wet)

Location & Species	Collection Date	Nuclide	RQ	Activity		Error	MDA
Salmon	10/06/15	K-40	+	3.13E+03	±	3.24E+02	1.96E+02
Station 38		MN-54		-4.97E-01	±	8.81E+00	1.44E+01
Control		CO-58		-2.87E+00	±	1.20E+01	1.92E+01
		FE-59		2.59E-01	±	3.42E+01	5.62E+01
		CO-60		-3.96E-01	±	1.22E+01	1.72E+01
		ZN-65		-1.47E-01	±	1.95E+01	3.20E+01
		ZRNB-95		-3.45E+00	±	1.96E+01	3.15E+01
		CS-134		-1.15E-01	±	1.00E+01	1.64E+01
		CS-137		2.09E+00	±	8.75E+00	1.40E+01
		Bi-214		1.09E+01	±	2.30E+01	4.05E+01
Bass	11/05/15	K-40	+	3.16E+03	±	3.64E+02	1.91E+02
Station 38		MN-54		5.89E+00	±	1.61E+01	1.98E+01
Control		CO-58		7.65E+00	±	2.75E+01	3.41E+01
		FE-59		-2.33E+01	±	1.58E+02	1.88E+02
		CO-60		5.68E+00	±	1.95E+01	2.23E+01
		ZN-65		2.43E+01	±	2.67E+01	2.80E+01
		ZRNB-95		7.17E+00	±	5.74E+01	7.49E+01
		CS-134		3.00E-01	±	1.53E+01	2.02E+01
		CS-137		-2.75E+00	±	1.46E+01	1.89E+01
		Bi-214		3.02E+01	±	3.60E+01	4.49E+01
Walleye	12/29/15	K-40	+	3.18E+03	±	3.86E+02	2.35E+02
Station 38		MN-54		-1.37E+00	±	1.93E+01	2.46E+01
		CO-58		-3.99E+00	±	2.11E+01	2.65E+01
		FE-59		-1.55E+01	±	6.46E+01	7.61E+01
		CO-60		0.00E+00	±	1.62E+01	2.66E+01
		ZN-65		2.02E+01	±	3.65E+01	4.27E+01
		ZRNB-95		0.00E+00	±	2.87E+01	4.72E+01
		CS-134		3.53E+00	±	1.48E+01	1.91E+01
		CS-137		3.88E+00	±	1.43E+01	1.84E+01
		Bi-214	+	5.79E+01	±	3.15E+01	3.52E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-10.2

GAMMA SPECTROMETRY RESULTS OF FISH - SUMMARY

Results in pCi/kilogram (wet)

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
Bi-214	Ind	-1.49E+00	-1.79E+01	1.25E+01	5.14E+01	3	0
Bi-214	Cntl	3.30E+01	1.09E+01	3.02E+01	4.02E+01	3	1
CO-58	Ind	-1.28E+00	-9.03E+00	3.50E+00	2.75E+01	3	0
CO-58	Cntl	2.62E-01	-3.99E+00	7.65E+00	2.66E+01	3	0
CO-60	Ind	3.05E+00	2.03E-01	6.08E+00	1.81E+01	3	0
CO-60	Cntl	1.76E+00	-3.96E-01	5.68E+00	2.20E+01	3	0
CS-134	Ind	-2.80E+00	-4.68E+00	-7.45E-01	2.00E+01	3	0
CS-134	Cntl	1.24E+00	-1.15E-01	3.00E-01	1.86E+01	3	0
CS-137	Ind	1.19E+00	0.00E+00	3.29E+00	2.20E+01	3	0
CS-137	Cntl	1.07E+00	-2.75E+00	2.09E+00	1.71E+01	3	0
FE-59	Ind	-6.04E+00	-1.62E+01	0.00E+00	8.67E+01	3	0
FE-59	Cntl	-1.29E+01	-2.33E+01	2.59E-01	1.07E+02	3	0
K-40	Ind	3.34E+03	2.88E+03	4.00E+03	2.62E+02	3	3
K-40	Cntl	3.16E+03	3.13E+03	3.16E+03	2.07E+02	3	3
MN-54	Ind	5.26E-01	-4.20E+00	3.55E+00	1.99E+01	3	0
MN-54	Cntl	1.34E+00	-1.37E+00	5.89E+00	1.96E+01	3	0
ZN-65	Ind	-1.91E+00	-1.02E+01	5.32E+00	4.97E+01	3	0
ZN-65	Cntl	1.48E+01	-1.47E-01	2.43E+01	3.42E+01	3	0
ZRNB-95	Ind	-1.35E+00	-6.41E+00	1.70E+00	4.98E+01	3	0
ZRNB-95	Cntl	1.24E+00	-3.45E+00	7.17E+00	5.12E+01	3	0

Ind = Indicator Stations Cntl = Control Stations

TABLE A-11.1

IODINE 131 IN MILK

Results in pCi/liter, decay corrected to sample collection time

Collection Date	Station 9b Control RQ	I-131 Activity		Error	I-131 MDA	Station 36 Indicator RQ	I-131 Activity		Error	I-131 MDA
01/06/15		-2.88E-02	±	1.72E-01	2.81E-01		6.32E-02	±	1.94E-01	3.16E-01
02/03/15		7.42E-03	±	2.15E-01	3.53E-01		-1.38E-01	±	2.16E-01	3.48E-01
03/10/15		-2.31E-03	±	1.86E-01	3.06E-01		-5.62E-02	±	2.13E-01	3.47E-01
04/07/15		8.54E-02	±	1.72E-01	2.78E-01		8.81E-02	±	2.06E-01	3.35E-01
04/21/15		2.58E-02	±	2.26E-01	3.70E-01		-5.65E-02	±	1.93E-01	3.14E-01
05/05/15		0.00E+00	±	1.79E-01	2.94E-01		-2.38E-02	±	1.72E-01	2.81E-01
05/19/15		3.82E-02	±	1.83E-01	2.99E-01		-2.88E-02	±	1.80E-01	2.94E-01
06/09/15		-1.69E-01	±	1.74E-01	2.75E-01		-4.49E-02	±	1.82E-01	2.96E-01
06/23/15		7.17E-02	±	1.79E-01	2.89E-01		9.19E-04	±	1.52E-01	2.50E-01
07/07/15		1.19E-01	±	3.15E-01	5.11E-01		-1.68E-03	±	1.78E-01	2.92E-01
07/21/15		5.26E-02	±	2.22E-01	3.62E-01		8.95E-02	±	1.86E-01	3.00E-01
08/04/15		-8.52E-02	±	1.95E-01	3.16E-01		-6.19E-03	±	2.25E-01	3.70E-01
08/18/15		No Sample Collected					-1.92E-02	±	1.72E-01	2.81E-01
09/08/15		7.46E-02	±	1.78E-01	2.87E-01		2.33E-03	±	2.07E-01	3.41E-01
09/22/15		-3.42E-02	±	2.24E-01	3.66E-01		1.13E-01	±	2.25E-01	3.64E-01
10/13/15		9.25E-02	±	1.82E-01	2.94E-01		1.19E-01	±	2.26E-01	3.66E-01
11/03/15		-2.36E-01	±	3.57E-01	4.78E-01		-7.41E-02	±	2.21E-01	3.10E-01
12/08/15		8.41E-02	±	3.06E-01	3.34E-01		-2.13E-01	±	3.12E-01	3.38E-01

TABLE A-11.2

IODINE 131 IN MILK - SUMMARY

Results in pCi/liter, decay corrected to sample collection time

Location	Average Activity	Activity Low	Activity High	Average MDA	Number Samples	Number Positive IDs
Indicator- St 36	-1.04E-02	-2.13E-01	1.19E-01	3.19E-01	18	0
Control - St 9b	5.64E-03	-2.36E-01	1.19E-01	3.35E-01	17	0

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-12.1

GAMMA SPECTROMETRY RESULTS OF MILK

STATION 36 - INDICATOR

Results in pCi per liter

Collection Date: 1/6/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-1.14E+00	±	3.80E+00	6.07E+00
CO-60		-1.47E+00	±	5.43E+01	7.22E+00
ZN-65		-9.83E-01	±	8.94E+00	1.45E+01
MN-54		-1.04E+00	±	3.44E+00	5.43E+00
CS-134		-5.05E-01	±	3.16E+00	5.10E+00
CS-137		-1.52E+00	±	3.70E+00	5.78E+00
BALA140		-1.09E+00	±	3.70E+00	5.69E+00
K-40	+	1.43E+03	±	1.38E+02	6.87E+01
FE-59		-2.45E+00	±	1.10E+01	1.76E+01
ZRNB-95		-6.44E-01	±	6.04E+00	9.80E+00
BE-7		-1.40E+01	±	3.06E+01	4.82E+01

Collection Date: 2/3/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-1.95E-01	±	3.96E+00	6.48E+00
CO-60		-6.36E-01	±	4.29E+00	6.92E+00
ZN-65		1.47E-01	±	8.48E+00	1.39E+01
MN-54		3.16E-02	±	3.49E+00	5.74E+00
CS-134		-1.60E+00	±	4.09E+00	6.47E+00
CS-137		-1.81E+00	±	4.63E+00	7.31E+00
BALA140		0.00E+00	±	4.82E+00	7.93E+00
K-40	+	1.30E+03	±	1.44E+02	9.37E+01
FE-59		-1.92E+00	±	1.14E+01	1.83E+01
ZRNB-95		3.92E-01	±	5.30E+00	8.62E+00
BE-7		3.89E+00	±	2.44E+01	3.93E+01

Collection Date: 3/10/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-7.11E-01	±	3.51E+00	5.64E+00
CO-60		-1.43E+00	±	7.85E+01	7.82E+00
ZN-65		-2.06E+00	±	8.62E+00	1.37E+01
MN-54		-3.01E-01	±	3.44E+00	5.59E+00
CS-134		1.77E-01	±	2.89E+00	4.71E+00
CS-137		-1.17E+00	±	4.23E+00	6.74E+00
BALA140		2.82E-01	±	3.49E+00	5.64E+00
K-40	+	1.35E+03	±	1.37E+02	7.34E+01
FE-59		-2.77E+00	±	9.62E+00	1.51E+01
ZRNB-95		-1.05E-02	±	5.69E+00	9.34E+00
BE-7		0.00E+00	±	2.57E+01	4.23E+01

Collection Date: 4/7/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-7.14E-02	±	4.88E+00	8.02E+00
CO-60		-4.44E-01	±	4.73E+00	7.69E+00
ZN-65		-5.24E+00	±	1.03E+01	1.59E+01
MN-54		5.68E-01	±	3.31E+00	5.31E+00
CS-134		-1.25E+00	±	3.48E+00	5.49E+00
CS-137		-5.59E-02	±	3.42E+00	5.62E+00
BALA140		0.00E+00	±	4.86E+00	8.00E+00
K-40	+	1.28E+03	±	1.35E+02	8.14E+01
FE-59		3.16E+00	±	9.36E+00	1.46E+01
ZRNB-95		4.37E-01	±	5.08E+00	8.24E+00
BE-7		5.60E+00	±	2.71E+01	4.35E+01

Collection Date: 4/21/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-1.06E+00	±	3.76E+00	6.01E+00
CO-60		-1.39E+00	±	1.06E+02	7.63E+00
ZN-65		7.44E-02	±	6.33E+00	1.04E+01
MN-54		1.36E-01	±	2.90E+00	4.74E+00
CS-134		1.16E+00	±	2.46E+00	3.76E+00
CS-137		1.25E+00	±	3.22E+00	5.01E+00
BALA140		-1.33E+00	±	4.14E+00	6.36E+00
K-40	+	1.12E+03	±	1.24E+02	6.92E+01
FE-59		-2.88E+00	±	9.37E+00	1.47E+01
ZRNB-95		-1.39E+00	±	6.09E+00	9.72E+00
BE-7		4.97E+00	±	2.10E+01	3.33E+01

Collection Date: 5/5/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		4.26E-02	±	4.16E+00	6.83E+00
CO-60		-6.88E-01	±	4.49E+00	7.23E+00
ZN-65		2.96E+00	±	8.37E+00	1.31E+01
MN-54		-6.05E-02	±	3.38E+00	5.54E+00
CS-134		-8.40E-02	±	3.61E+00	5.92E+00
CS-137		1.87E+00	±	3.52E+00	5.36E+00
BALA140		-6.51E-01	±	3.70E+00	5.84E+00
K-40	+	1.29E+03	±	1.36E+02	8.14E+01
FE-59		6.38E-01	±	9.45E+00	1.54E+01
ZRNB-95		7.54E-01	±	5.04E+00	8.08E+00
BE-7		3.11E+00	±	2.43E+01	3.93E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-12.1

GAMMA SPECTROMETRY RESULTS OF MILK

STATION 36 - INDICATOR

Results in pCi per liter

Collection Date: 5/19/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		2.32E+00	±	3.37E+00	5.11E+00
CO-60		-1.89E+00	±	2.27E+01	7.60E+00
ZN-65		-1.91E+00	±	8.01E+00	1.27E+01
MN-54		8.95E-01	±	3.60E+00	5.73E+00
CS-134		1.17E+00	±	3.10E+00	4.86E+00
CS-137		9.20E-02	±	3.60E+00	5.91E+00
BALA140		-6.02E-01	±	4.70E+00	7.56E+00
K-40	+	1.34E+03	±	1.37E+02	7.46E+01
FE-59		-1.25E+00	±	9.67E+00	1.56E+01
ZRNB-95		-7.56E-01	±	5.58E+00	9.00E+00
BE-7		-6.52E+00	±	2.88E+01	4.63E+01

Collection Date: 6/9/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		1.60E+00	±	3.17E+00	4.89E+00
CO-60		-2.36E+00	±	1.60E+01	8.09E+00
ZN-65		-1.93E+00	±	8.43E+00	1.34E+01
MN-54		-1.22E+00	±	3.80E+00	6.01E+00
CS-134		2.04E+00	±	3.03E+00	4.56E+00
CS-137		-2.82E-01	±	3.79E+00	6.17E+00
BALA140		0.00E+00	±	8.25E+00	1.36E+01
K-40	+	1.27E+03	±	1.33E+02	7.34E+01
FE-59		-3.03E+00	±	9.01E+00	1.40E+01
ZRNB-95		5.07E+00	±	5.61E+00	8.01E+00
BE-7		6.61E+00	±	2.42E+01	3.85E+01

Collection Date: 6/23/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		5.93E-02	±	3.29E+00	5.39E+00
CO-60		-1.88E+00	±	2.21E+01	7.33E+00
ZN-65		1.00E-01	±	8.20E+00	1.35E+01
MN-54		-7.31E-01	±	3.70E+00	5.94E+00
CS-134		5.07E-02	±	2.73E+00	4.48E+00
CS-137		0.00E+00	±	2.72E+00	4.47E+00
BALA140		-1.06E+00	±	4.70E+00	7.42E+00
K-40	+	1.20E+03	±	1.28E+02	6.88E+01
FE-59		-5.60E-01	±	9.05E+00	1.47E+01
ZRNB-95		6.27E-01	±	4.88E+00	7.86E+00
BE-7		6.65E+00	±	2.57E+01	4.11E+01

Collection Date: 7/7/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		7.26E-01	±	3.78E+00	6.10E+00
CO-60		-2.17E+00	±	1.82E+01	8.05E+00
ZN-65		1.19E+00	±	8.67E+00	1.40E+01
MN-54		-8.86E-01	±	3.53E+00	5.62E+00
CS-134		-1.18E+00	±	3.49E+00	5.54E+00
CS-137		0.00E+00	±	3.85E+00	6.33E+00
BALA140		0.00E+00	±	1.13E+00	1.85E+00
K-40	+	1.26E+03	±	1.33E+02	7.37E+01
FE-59		-7.17E-01	±	9.54E+00	1.55E+01
ZRNB-95		3.21E+00	±	5.16E+00	7.66E+00
BE-7		1.49E-01	±	2.26E+01	3.72E+01

Collection Date: 7/21/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		4.48E-02	±	4.45E+00	7.32E+00
CO-60		-4.72E-01	±	4.33E+00	7.01E+00
ZN-65		-2.28E+00	±	9.09E+00	1.45E+01
MN-54		7.27E-01	±	3.16E+00	5.02E+00
CS-134		-3.62E-02	±	2.99E+00	4.91E+00
CS-137		1.87E+00	±	3.86E+00	5.97E+00
BALA140		-2.11E+00	±	5.79E+00	9.03E+00
K-40	+	1.15E+03	±	1.27E+02	7.83E+01
FE-59		6.01E-01	±	8.65E+00	1.41E+01
ZRNB-95		1.38E+00	±	5.19E+00	8.18E+00
BE-7		1.01E+01	±	2.51E+01	3.93E+01

Collection Date: 8/4/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		2.18E-01	±	4.04E+00	6.60E+00
CO-60		1.33E-01	±	5.22E+00	8.82E+00
ZN-65		3.80E-01	±	9.33E+00	1.53E+01
MN-54		-4.40E-01	±	3.76E+00	6.07E+00
CS-134		1.25E+00	±	3.68E+00	5.80E+00
CS-137		2.75E-02	±	3.82E+00	6.28E+00
BALA140		-9.95E-01	±	4.19E+00	6.51E+00
K-40	+	1.31E+03	±	1.44E+02	6.98E+01
FE-59		-2.05E+00	±	1.16E+01	1.85E+01
ZRNB-95		-8.99E-01	±	7.17E+00	1.16E+01
BE-7		-8.69E+00	±	3.17E+01	5.05E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-12.1

GAMMA SPECTROMETRY RESULTS OF MILK

STATION 36 - INDICATOR

Results in pCi per liter

Collection Date: 8/18/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-1.02E+00	±	3.61E+00	5.76E+00
CO-60		2.41E-02	±	3.75E+00	6.46E+00
ZN-65		-1.96E+00	±	8.50E+00	1.36E+01
MN-54		-3.80E-02	±	3.50E+00	5.74E+00
CS-134		-8.50E-01	±	3.48E+00	5.58E+00
CS-137		-1.24E+00	±	3.54E+00	5.56E+00
BALA140		-4.11E-01	±	4.54E+00	7.35E+00
K-40	+	1.32E+03	±	1.32E+02	6.38E+01
FE-59		-1.25E+00	±	1.03E+01	1.67E+01
ZRNB-95		-9.27E-01	±	5.69E+00	9.15E+00
BE-7		0.00E+00	±	2.48E+01	4.08E+01

Collection Date: 9/8/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		3.23E-01	±	3.85E+00	6.28E+00
CO-60		-2.75E-01	±	3.68E+00	5.97E+00
ZN-65		-1.19E+00	±	9.18E+00	1.48E+01
MN-54		-5.68E-01	±	3.83E+00	6.19E+00
CS-134		6.26E-01	±	3.96E+00	6.41E+00
CS-137		-5.69E-01	±	3.71E+00	5.98E+00
BALA140		1.27E-01	±	3.39E+00	5.52E+00
K-40	+	1.26E+03	±	1.34E+02	7.88E+01
FE-59		-3.04E-01	±	1.03E+01	1.69E+01
ZRNB-95		1.04E+00	±	6.46E+00	1.04E+01
BE-7		1.37E+01	±	2.46E+01	3.76E+01

Collection Date: 9/22/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		1.17E+00	±	3.90E+00	6.23E+00
CO-60		1.67E+00	±	3.94E+00	6.38E+00
ZN-65		0.00E+00	±	1.41E+01	2.32E+01
MN-54		0.00E+00	±	3.73E+00	6.13E+00
CS-134		-3.66E-01	±	3.05E+00	4.94E+00
CS-137		-1.70E+00	±	3.94E+00	6.16E+00
BALA140		0.00E+00	±	7.05E+00	1.16E+01
K-40	+	1.15E+03	±	1.32E+02	8.11E+01
FE-59		0.00E+00	±	9.26E+00	1.52E+01
ZRNB-95		1.18E+00	±	5.13E+00	8.14E+00
BE-7		1.49E+01	±	2.38E+01	3.60E+01

Collection Date: 10/13/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-2.00E+00	±	4.82E+00	7.64E+00
CO-60		0.00E+00	±	9.02E-01	1.48E+00
ZN-65		5.23E-01	±	8.35E+00	1.36E+01
MN-54		-7.15E-01	±	3.50E+00	5.60E+00
CS-134		2.15E-01	±	2.79E+00	4.54E+00
CS-137		-1.70E-01	±	3.92E+00	6.42E+00
BALA140		-1.85E-01	±	4.42E+00	7.21E+00
K-40	+	1.41E+03	±	1.37E+02	7.29E+01
FE-59		-2.63E+00	±	1.02E+01	1.61E+01
ZRNB-95		0.00E+00	±	8.26E+00	1.36E+01
BE-7		-3.39E+00	±	2.72E+01	4.40E+01

Collection Date: 11/3/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		0.00E+00	±	4.49E+00	7.39E+00
CO-60		-4.72E-01	±	4.51E+00	5.37E+00
ZN-65		0.00E+00	±	1.09E+01	1.79E+01
MN-54		1.23E+00	±	4.03E+00	5.13E+00
CS-134		2.23E+00	±	3.48E+00	4.43E+00
CS-137		-1.54E+00	±	5.16E+00	6.64E+00
BALA140		0.00E+00	±	6.17E+00	1.02E+01
K-40	+	1.38E+03	±	1.47E+02	8.65E+01
FE-59		2.54E+00	±	1.06E+01	1.24E+01
ZRNB-95		3.82E-01	±	6.22E+00	8.15E+00
BE-7		-2.38E+00	±	2.98E+01	4.18E+01

Collection Date: 12/8/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		2.07E+00	±	3.90E+00	5.23E+00
CO-60		-4.71E-01	±	5.79E+00	6.93E+00
ZN-65		-1.81E+00	±	1.19E+01	1.46E+01
MN-54		-5.57E-01	±	4.46E+00	5.81E+00
CS-134		1.64E+00	±	3.75E+00	4.90E+00
CS-137		-1.98E+00	±	5.96E+00	7.67E+00
BALA140		0.00E+00	±	4.25E+00	6.98E+00
K-40	+	1.35E+03	±	1.40E+02	7.61E+01
FE-59		-5.40E+00	±	1.60E+01	1.88E+01
ZRNB-95		-2.28E+00	±	8.87E+00	1.15E+01
BE-7		2.81E+01	±	2.89E+01	3.68E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-12.1

GAMMA SPECTROMETRY RESULTS OF MILK

STATION 9b - CONTROL

Results in pCi per liter

Collection Date: 1/6/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		2.27E+00	±	3.60E+00	5.53E+00
CO-60		1.48E+00	±	3.75E+00	6.12E+00
ZN-65		-2.59E+00	±	7.73E+00	1.21E+01
MN-54		2.34E-01	±	3.42E+00	5.58E+00
CS-134		-3.36E-02	±	3.22E+00	5.28E+00
CS-137		6.85E-02	±	2.66E+00	4.35E+00
BALA140		-1.19E-01	±	3.51E+00	5.73E+00
K-40	+	1.27E+03	±	1.33E+02	7.57E+01
FE-59		1.79E+00	±	8.20E+00	1.30E+01
ZRNB-95		2.69E+00	±	4.89E+00	7.33E+00
BE-7		7.46E-01	±	2.11E+01	3.45E+01

Collection Date: 2/3/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-4.17E-01	±	3.91E+00	6.37E+00
CO-60		-3.58E-01	±	7.82E+00	7.58E+00
ZN-65		-1.57E+00	±	8.05E+00	1.29E+01
MN-54		-1.36E-01	±	2.71E+00	4.42E+00
CS-134		-5.30E-01	±	3.33E+00	5.38E+00
CS-137		-2.96E-01	±	3.24E+00	5.27E+00
BALA140		-5.72E-01	±	4.43E+00	7.11E+00
K-40	+	1.38E+03	±	1.40E+02	7.57E+01
FE-59		5.03E-01	±	8.50E+00	1.38E+01
ZRNB-95		-8.84E-02	±	5.76E+00	9.45E+00
BE-7		-4.39E+00	±	2.54E+01	4.09E+01

Collection Date: 3/10/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-1.14E-01	±	3.50E+00	5.74E+00
CO-60		-4.54E-01	±	7.33E+00	6.18E+00
ZN-65		-4.76E-01	±	8.74E+00	1.43E+01
MN-54		-1.46E-01	±	3.14E+00	5.13E+00
CS-134		-3.50E-01	±	2.83E+00	4.59E+00
CS-137		2.71E-01	±	3.18E+00	5.16E+00
BALA140		4.83E-01	±	3.18E+00	5.02E+00
K-40	+	1.43E+03	±	1.41E+02	7.34E+01
FE-59		-2.64E+00	±	1.09E+01	1.73E+01
ZRNB-95		2.56E+00	±	5.55E+00	8.53E+00
BE-7		-5.67E+00	±	2.61E+01	4.19E+01

Collection Date: 4/7/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		1.49E-03	±	4.56E+00	7.52E+00
CO-60		4.14E-01	±	4.30E+00	6.98E+00
ZN-65		-3.57E+00	±	9.89E+00	1.56E+01
MN-54		-1.15E+00	±	3.76E+00	5.95E+00
CS-134		-1.49E-02	±	3.47E+00	5.70E+00
CS-137		-1.09E+00	±	4.16E+00	6.63E+00
BALA140		-1.51E+00	±	5.14E+00	8.05E+00
K-40	+	1.46E+03	±	1.42E+02	7.77E+01
FE-59		2.29E-02	±	8.66E+00	1.42E+01
ZRNB-95		2.91E+00	±	5.81E+00	8.88E+00
BE-7		-2.37E+00	±	2.97E+01	4.85E+01

Collection Date: 4/21/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-6.60E-01	±	3.53E+00	5.68E+00
CO-60		-1.75E+00	±	5.34E+00	8.45E+00
ZN-65		-3.72E+00	±	9.85E+00	1.55E+01
MN-54		-1.15E+00	±	3.98E+00	6.31E+00
CS-134		-5.81E-01	±	3.96E+00	6.41E+00
CS-137		9.90E-01	±	3.82E+00	6.09E+00
BALA140		2.31E+00	±	3.80E+00	5.39E+00
K-40	+	1.43E+03	±	1.41E+02	7.87E+01
FE-59		-2.99E+00	±	1.13E+01	1.80E+01
ZRNB-95		-7.62E-02	±	6.53E+00	1.07E+01
BE-7		-2.91E+00	±	2.56E+01	4.14E+01

Collection Date: 5/5/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		1.46E+00	±	4.33E+00	6.91E+00
CO-60		-1.28E+00	±	6.49E+01	1.23E+01
ZN-65		1.48E-01	±	8.29E+00	1.36E+01
MN-54		6.76E-01	±	3.34E+00	5.34E+00
CS-134		-3.98E-02	±	2.96E+00	4.85E+00
CS-137		1.19E+00	±	3.40E+00	5.33E+00
BALA140		-1.15E-02	±	3.19E+00	5.25E+00
K-40	+	1.39E+03	±	1.38E+02	7.44E+01
FE-59		-2.51E+00	±	1.05E+01	1.66E+01
ZRNB-95		0.00E+00	±	7.52E+00	1.24E+01
BE-7		1.14E+01	±	1.77E+01	2.59E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-12.1

GAMMA SPECTROMETRY RESULTS OF MILK

STATION 9b - CONTROL

Results in pCi per liter

Collection Date: 5/19/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-5.53E-01	±	3.92E+00	6.35E+00
CO-60		-1.21E+00	±	1.41E+02	7.24E+00
ZN-65		2.10E+00	±	8.13E+00	1.29E+01
MN-54		-4.89E-01	±	3.45E+00	5.57E+00
CS-134		-2.14E-02	±	2.22E+00	3.65E+00
CS-137		1.12E-02	±	3.31E+00	5.44E+00
BALA140		-1.44E+00	±	4.40E+00	6.79E+00
K-40	+	1.44E+03	±	1.42E+02	7.40E+01
FE-59		-9.73E-01	±	9.41E+00	1.52E+01
ZRNB-95		-1.43E+00	±	5.83E+00	9.26E+00
BE-7		-3.52E+00	±	2.46E+01	3.97E+01

Collection Date: 6/9/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		1.85E-01	±	3.79E+00	6.20E+00
CO-60		-1.14E+00	±	5.98E+01	6.29E+00
ZN-65		2.13E+00	±	8.51E+00	1.35E+01
MN-54		9.88E-01	±	2.84E+00	4.41E+00
CS-134		0.00E+00	±	4.19E+00	6.89E+00
CS-137		-3.53E-01	±	3.19E+00	5.17E+00
BALA140		-1.60E+00	±	4.98E+00	7.76E+00
K-40	+	1.36E+03	±	1.36E+02	6.88E+01
FE-59		-2.09E+00	±	1.12E+01	1.80E+01
ZRNB-95		9.96E-03	±	5.43E+00	8.92E+00
BE-7		-2.28E+00	±	2.44E+01	3.97E+01

Collection Date: 6/23/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		2.54E+00	±	3.88E+00	5.97E+00
CO-60		2.67E+00	±	4.22E+00	6.63E+00
ZN-65		-3.26E+00	±	9.04E+00	1.42E+01
MN-54		7.90E-01	±	3.46E+00	5.52E+00
CS-134		-1.51E+00	±	3.66E+00	5.77E+00
CS-137		-1.08E+00	±	3.63E+00	5.75E+00
BALA140		9.30E-01	±	3.63E+00	5.62E+00
K-40	+	1.34E+03	±	1.34E+02	6.81E+01
FE-59		0.00E+00	±	1.04E+01	1.71E+01
ZRNB-95		7.20E-01	±	4.89E+00	7.85E+00
BE-7		-3.14E-01	±	2.40E+01	3.93E+01

Collection Date: 7/7/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		1.86E+00	±	4.33E+00	6.85E+00
CO-60		-1.28E+00	±	5.11E+00	1.33E+00
ZN-65		2.26E+00	±	7.83E+00	1.23E+01
MN-54		-1.08E+00	±	3.47E+00	5.47E+00
CS-134		0.00E+00	±	4.17E+00	6.86E+00
CS-137		1.94E+00	±	3.06E+00	4.55E+00
BALA140		-1.46E+00	±	5.18E+00	8.12E+00
K-40	+	1.49E+03	±	1.42E+02	7.14E+01
FE-59		4.05E+00	±	9.81E+00	1.51E+01
ZRNB-95		2.34E+00	±	5.67E+00	8.79E+00
BE-7		-6.88E+00	±	2.90E+01	4.65E+01

Collection Date: 7/21/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-1.12E+00	±	4.88E+00	7.88E+00
CO-60		3.09E+00	±	4.50E+00	6.71E+00
ZN-65		0.00E+00	±	1.32E+01	2.17E+01
MN-54		-6.07E-01	±	3.80E+00	6.12E+00
CS-134		-2.84E-02	±	3.34E+00	5.48E+00
CS-137		-1.10E+00	±	3.81E+00	6.04E+00
BALA140		0.00E+00	±	4.91E+00	8.07E+00
K-40	+	1.27E+03	±	1.33E+02	7.79E+01
FE-59		-1.92E+00	±	1.11E+01	1.79E+01
ZRNB-95		-1.45E+00	±	6.60E+00	1.06E+01
BE-7		-8.10E-01	±	2.42E+01	3.95E+01

Collection Date: 8/4/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-2.22E+00	±	5.03E+00	7.97E+00
CO-60		-1.13E-02	±	4.39E+00	7.22E+00
ZN-65		-7.02E-02	±	7.96E+00	1.31E+01
MN-54		3.82E-02	±	3.17E+00	5.21E+00
CS-134		-1.86E+00	±	4.20E+00	6.62E+00
CS-137		-1.31E+00	±	3.67E+00	5.77E+00
BALA140		-1.32E+00	±	4.56E+00	7.10E+00
K-40	+	1.27E+03	±	1.35E+02	8.20E+01
FE-59		-2.15E+00	±	1.15E+01	1.85E+01
ZRNB-95		9.81E-02	±	6.58E+00	1.08E+01
BE-7		-6.49E-01	±	3.08E+01	5.06E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-12.1

GAMMA SPECTROMETRY RESULTS OF MILK

STATION 9b - CONTROL

Results in pCi per liter

Collection Date: 9/8/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-5.87E-02	±	3.96E+00	6.51E+00
CO-60		-6.98E-02	±	3.57E+00	5.84E+00
ZN-65		-2.35E+00	±	9.49E+00	1.51E+01
MN-54		-1.64E-01	±	3.42E+00	5.58E+00
CS-134		-1.04E+00	±	4.02E+00	6.45E+00
CS-137		-2.15E+00	±	4.88E+00	7.68E+00
BALA140		-1.39E+00	±	5.14E+00	8.07E+00
K-40	+	1.19E+03	±	1.34E+02	8.65E+01
FE-59		-2.86E-01	±	7.96E+00	1.30E+01
ZRNB-95		-6.20E-01	±	5.42E+00	8.76E+00
BE-7		8.63E+00	±	2.86E+01	4.54E+01

Collection Date: 9/23/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-1.40E+00	±	5.08E+00	8.17E+00
CO-60		-1.05E-02	±	3.04E+00	5.01E+00
ZN-65		-5.02E-01	±	9.48E+00	1.55E+01
MN-54		3.98E-01	±	3.40E+00	5.49E+00
CS-134		-7.93E-01	±	3.90E+00	6.29E+00
CS-137		1.23E+00	±	4.01E+00	6.36E+00
BALA140		8.29E-01	±	4.62E+00	7.36E+00
K-40	+	1.35E+03	±	1.45E+02	9.06E+01
FE-59		2.19E+00	±	9.74E+00	1.55E+01
ZRNB-95		-4.69E-01	±	5.16E+00	8.36E+00
BE-7		6.62E-02	±	2.75E+01	4.52E+01

Collection Date: 10/13/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		1.31E+00	±	3.56E+00	5.62E+00
CO-60		1.58E-01	±	4.07E+00	6.98E+00
ZN-65		-2.59E+00	±	8.36E+00	1.32E+01
MN-54		1.13E+00	±	2.87E+00	4.41E+00
CS-134		1.78E+00	±	3.18E+00	4.89E+00
CS-137		6.17E-01	±	2.66E+00	4.20E+00
BALA140		-1.04E+00	±	3.73E+00	5.76E+00
K-40	+	1.36E+03	±	1.34E+02	6.38E+01
FE-59		-4.14E+00	±	1.09E+01	1.71E+01
ZRNB-95		-4.36E-02	±	5.35E+00	8.79E+00
BE-7		-8.72E+00	±	2.91E+01	4.64E+01

Collection Date: 11/3/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-2.47E+00	±	4.99E+00	6.80E+00
CO-60		1.41E+00	±	4.64E+00	5.37E+00
ZN-65		5.62E+00	±	9.02E+00	1.03E+01
MN-54		-3.34E-01	±	3.92E+00	5.13E+00
CS-134		1.37E+00	±	3.21E+00	4.18E+00
CS-137		-8.82E-01	±	4.20E+00	5.42E+00
BALA140		0.00E+00	±	5.54E+00	9.12E+00
K-40	+	1.48E+03	±	1.43E+02	6.83E+01
FE-59		-1.80E+00	±	1.34E+01	1.59E+01
ZRNB-95		-2.48E+00	±	8.55E+00	1.10E+01
BE-7		-2.61E+00	±	2.86E+01	4.02E+01

Collection Date: 12/8/2015

Nuclide	RQ	Activity		Error	MDA
BA-133		-8.95E-01	±	4.54E+00	6.32E+00
CO-60		-9.43E-01	±	5.25E+00	6.20E+00
ZN-65		-2.18E+00	±	1.04E+01	1.27E+01
MN-54		-5.57E-01	±	4.92E+00	6.43E+00
CS-134		1.25E+00	±	3.86E+00	5.12E+00
CS-137		-5.51E-01	±	4.87E+00	6.36E+00
BALA140		0.00E+00	±	4.96E+00	8.16E+00
K-40	+	1.41E+03	±	1.43E+02	7.66E+01
FE-59		1.05E+01	±	1.43E+01	1.59E+01
ZRNB-95		2.10E+00	±	6.88E+00	8.77E+00
BE-7		0.00E+00	±	2.95E+01	4.86E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-12.2

GAMMA SPECTROMETRY RESULTS OF MILK - SUMMARY

Results in pCi per liter

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BA-133	Ind	1.32E-01	-2.00E+00	2.32E+00	5.95E+00	18	0
BA-133	Cntl	-1.67E-02	-2.47E+00	2.54E+00	6.24E+00	17	0
BALA140	Ind	-4.46E-01	-2.11E+00	2.82E-01	7.06E+00	18	0
BALA140	Cntl	-3.47E-01	-1.60E+00	2.31E+00	6.58E+00	17	0
BE-7	Ind	3.50E+00	-1.40E+01	2.81E+01	3.87E+01	18	0
BE-7	Cntl	-1.19E+00	-8.72E+00	1.14E+01	3.97E+01	17	0
CO-60	Ind	-7.90E-01	-2.36E+00	1.67E+00	6.53E+00	18	0
CO-60	Cntl	4.31E-02	-1.75E+00	3.09E+00	6.24E+00	17	0
CS-134	Ind	2.61E-01	-1.60E+00	2.23E+00	4.86E+00	18	0
CS-134	Cntl	-1.41E-01	-1.86E+00	1.78E+00	5.24E+00	17	0
CS-137	Ind	-3.85E-01	-1.98E+00	1.87E+00	5.76E+00	18	0
CS-137	Cntl	-1.47E-01	-2.15E+00	1.94E+00	5.31E+00	17	0
FE-59	Ind	-1.13E+00	-5.40E+00	3.16E+00	1.50E+01	18	0
FE-59	Cntl	-1.45E-01	-4.14E+00	1.05E+01	1.51E+01	17	0
K-40	Ind	1.29E+03	1.12E+03	1.43E+03	7.19E+01	18	18
K-40	Cntl	1.37E+03	1.19E+03	1.49E+03	7.13E+01	17	17
MN-54	Ind	-1.65E-01	-1.22E+00	1.23E+00	5.33E+00	18	0
MN-54	Cntl	-9.14E-02	-1.15E+00	1.13E+00	5.12E+00	17	0
ZN-65	Ind	-7.77E-01	-5.24E+00	2.96E+00	1.38E+01	18	0
ZN-65	Cntl	-6.24E-01	-3.72E+00	5.62E+00	1.32E+01	17	0
ZRNB-95	Ind	4.21E-01	-2.28E+00	5.07E+00	8.79E+00	18	0
ZRNB-95	Cntl	3.99E-01	-2.48E+00	2.91E+00	8.84E+00	17	0

Ind = Indicator Stations Cntl = Control Stations

TABLE A-15.1

GAMMA SPECTROMETRY RESULTS OF ROOT CROPS

Results in pCi/ kilogram (wet)

Station 37 is Indicator - Station 9c is Control

Station 37 Potato collected 7/14/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	4.46E+03	±	3.06E+02	1.20E+02
MN-54		2.40E+00	±	5.31E+00	8.19E+00
CO-58		-4.41E-01	±	5.64E+00	9.17E+00
FE-59		-8.72E+00	±	2.03E+01	3.14E+01
CO-60		-4.07E-03	±	8.02E+00	1.31E+01
ZN-65		0.00E+00	±	1.38E+01	2.28E+01
ZRNB-95		-3.34E+00	±	1.27E+01	2.03E+01
I-131		-3.39E+00	±	1.51E+01	2.43E+01
CS-134		0.00E+00	±	6.86E+00	1.13E+01
CS-137		1.66E-01	±	5.35E+00	8.75E+00
BALA140		5.37E+00	±	8.25E+00	1.07E+01

Station 37 Potato collected 8/25/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	4.25E+03	±	3.24E+02	1.18E+02
MN-54		-1.02E+00	±	6.40E+00	1.03E+01
CO-58		-2.29E-01	±	5.30E+00	8.66E+00
FE-59		1.99E-01	±	1.59E+01	2.61E+01
CO-60		1.29E+00	±	6.52E+00	1.03E+01
ZN-65		-3.85E+00	±	1.75E+01	2.81E+01
ZRNB-95		2.22E+00	±	1.05E+01	1.68E+01
I-131		-1.96E+00	±	6.36E+00	1.01E+01
CS-134		-2.54E+00	±	6.83E+00	1.08E+01
CS-137		3.05E-01	±	6.22E+00	1.02E+01
BALA140		-7.57E-01	±	6.55E+00	1.05E+01

Station 37 Potato collected 7/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	4.17E+03	±	3.30E+02	2.19E+02
MN-54		-4.74E+00	±	1.12E+01	1.79E+01
CO-58		6.12E+00	±	1.02E+01	1.59E+01
FE-59		2.65E-01	±	1.99E+01	3.27E+01
CO-60		4.17E-01	±	1.16E+01	1.90E+01
ZN-65		-6.73E+00	±	2.25E+01	3.60E+01
ZRNB-95		-5.70E+00	±	1.83E+01	2.93E+01
I-131		-4.48E+00	±	1.20E+01	1.93E+01
CS-134		-1.83E+01	±	1.52E+01	2.35E+01
CS-137		-1.95E+00	±	1.05E+01	1.71E+01
BALA140		-2.42E+00	±	1.25E+01	2.00E+01

Station 9c Onion collected 8/26/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.44E+03	±	2.35E+02	1.56E+02
MN-54		5.05E-02	±	6.82E+00	1.12E+01
CO-58		1.23E+00	±	6.53E+00	1.03E+01
FE-59		-2.36E+00	±	2.29E+01	3.69E+01
CO-60		2.23E+00	±	8.50E+00	1.32E+01
ZN-65		-1.13E+01	±	2.68E+01	4.18E+01
ZRNB-95		-9.97E-01	±	1.27E+01	2.05E+01
I-131		0.00E+00	±	1.04E+01	1.70E+01
CS-134		0.00E+00	±	1.25E+01	2.05E+01
CS-137		-2.73E-01	±	8.30E+00	1.36E+01
BALA140		3.55E+00	±	8.98E+00	1.32E+01

Station 37 Onion collected 8/11/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.46E+03	±	2.11E+02	1.27E+02
MN-54		-1.86E+00	±	7.99E+00	1.27E+01
CO-58		-1.13E+00	±	5.97E+00	9.50E+00
FE-59		-7.17E+00	±	2.06E+01	3.19E+01
CO-60		-2.05E+00	±	8.17E+00	1.29E+01
ZN-65		-4.76E+00	±	1.79E+01	2.84E+01
ZRNB-95		8.60E+00	±	1.04E+01	1.45E+01
I-131		-7.17E-02	±	5.38E+00	8.83E+00
CS-134		-2.04E+00	±	6.34E+00	9.96E+00
CS-137		2.34E+00	±	6.51E+00	1.01E+01
BALA140		-2.46E+00	±	8.45E+00	1.30E+01

Station 9c Potato collected 9/18/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	5.17E+03	±	3.73E+02	1.58E+02
MN-54		1.10E+00	±	6.22E+00	9.96E+00
CO-58		-6.49E-01	±	6.54E+00	1.06E+01
FE-59		2.17E+00	±	2.17E+01	3.52E+01
CO-60		2.67E+00	±	7.28E+00	1.12E+01
ZN-65		7.22E+00	±	1.78E+01	2.78E+01
ZRNB-95		-3.91E-01	±	1.13E+01	1.84E+01
I-131		-2.96E+00	±	8.93E+00	1.42E+01
CS-134		-4.44E-02	±	3.79E+00	6.22E+00
CS-137		2.05E+00	±	7.00E+00	1.11E+01
BALA140		0.00E+00	±	1.66E+01	2.73E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A - 15.2

GAMMA SPECTROMETRY RESULTS OF ROOT CROPS- SUMMARY

Results in pCi/ kilogram (wet)

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-6.72E-02	-2.46E+00	5.37E+00	1.35E+01	4	0
BALA140	cntl	1.77E+00	0.00E+00	3.55E+00	2.02E+01	2	0
CO-58	Ind	1.08E+00	-1.13E+00	6.12E+00	1.08E+01	4	0
CO-58	cntl	2.90E-01	-6.49E-01	1.23E+00	1.05E+01	2	0
CO-60	Ind	-8.82E-02	-2.05E+00	1.29E+00	1.38E+01	4	0
CO-60	cntl	2.45E+00	2.23E+00	2.67E+00	1.22E+01	2	0
CS-134	Ind	-5.72E+00	-1.83E+01	0.00E+00	1.39E+01	4	0
CS-134	cntl	-2.22E-02	-4.44E-02	0.00E+00	1.34E+01	2	0
CS-137	Ind	2.16E-01	-1.95E+00	2.34E+00	1.15E+01	4	0
CS-137	cntl	8.88E-01	-2.73E-01	2.05E+00	1.23E+01	2	0
FE-59	Ind	-3.86E+00	-8.72E+00	2.65E-01	3.05E+01	4	0
FE-59	cntl	-9.32E-02	-2.36E+00	2.17E+00	3.60E+01	2	0
I-131	Ind	-2.47E+00	-4.48E+00	-7.17E-02	1.56E+01	4	0
I-131	cntl	-1.48E+00	-2.96E+00	0.00E+00	1.56E+01	2	0
K-40	Ind	3.58E+03	1.46E+03	4.46E+03	1.46E+02	4	4
K-40	cntl	3.31E+03	1.44E+03	5.17E+03	1.57E+02	2	2
MN-54	Ind	-1.30E+00	-4.74E+00	2.40E+00	1.23E+01	4	0
MN-54	cntl	5.76E-01	5.05E-02	1.10E+00	1.06E+01	2	0
ZN-65	Ind	-3.84E+00	-6.73E+00	0.00E+00	2.88E+01	4	0
ZN-65	cntl	-2.05E+00	-1.13E+01	7.22E+00	3.48E+01	2	0
ZRNB-95	Ind	4.44E-01	-5.70E+00	8.60E+00	2.02E+01	4	0
ZRNB-95	cntl	-6.94E-01	-9.97E-01	-3.91E-01	1.95E+01	2	0

Ind = Indicator Stations Cntl = Control Stations

TABLE A-16.1

GAMMA SPECTROMETRY RESULTS OF FRUITS

Results in pCi/ kilogram (wet)

Station 37 is Indicator - Station 9c is Control

Station 37 Peaches collected 8/11/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.73E+03	±	2.58E+02	1.60E+02
MN-54		-1.80E+00	±	7.14E+00	1.12E+01
CO-58		-1.19E+00	±	6.09E+00	9.62E+00
FE-59		-6.76E-01	±	1.71E+01	2.79E+01
CO-60		5.32E+00	±	9.56E+00	1.42E+01
ZN-65		-3.85E+00	±	2.00E+01	3.20E+01
ZRNB-95		-3.96E+00	±	1.32E+01	2.07E+01
I-131		-3.12E+00	±	7.41E+00	1.16E+01
CS-134		6.36E-01	±	5.67E+00	9.14E+00
CS-137		2.85E-01	±	7.50E+00	1.23E+01
BALA140		1.12E+00	±	5.53E+00	8.34E+00

Station 37 red wine grapes collected 9/15/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	3.60E+03	±	2.73E+02	9.03E+01
MN-54		1.89E+00	±	5.23E+00	8.14E+00
CO-58		-8.88E-01	±	5.67E+00	9.11E+00
FE-59		6.17E-02	±	1.64E+01	2.70E+01
CO-60		3.26E-01	±	6.54E+00	1.07E+01
ZN-65		-2.47E-01	±	1.49E+01	2.45E+01
ZRNB-95		-2.21E+00	±	1.01E+01	1.61E+01
I-131		-2.88E+00	±	7.23E+00	1.13E+01
CS-134		4.23E-01	±	4.68E+00	7.60E+00
CS-137		3.24E+00	±	5.46E+00	8.22E+00
BALA140		-3.01E+00	±	9.14E+00	1.40E+01

Station 37 Apples collected 8/25/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.52E+03	±	2.41E+02	2.23E+02
MN-54		-1.06E+00	±	8.33E+00	1.35E+01
CO-58		-2.26E-01	±	8.88E+00	1.46E+01
FE-59		6.97E+00	±	2.09E+01	3.26E+01
CO-60		-2.14E+00	±	2.47E+01	1.96E+01
ZN-65		7.98E+00	±	1.98E+01	3.09E+01
ZRNB-95		9.92E+00	±	1.42E+01	2.14E+01
I-131		1.01E-01	±	1.18E+01	1.93E+01
CS-134		7.51E+00	±	9.43E+00	1.44E+01
CS-137		4.20E+00	±	7.92E+00	1.21E+01
BALA140		4.47E-01	±	8.68E+00	1.41E+01

Station 37 White wine grapes collected 9/15/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.64E+03	±	2.37E+02	9.97E+01
MN-54		2.38E+00	±	5.17E+00	7.93E+00
CO-58		-1.63E+00	±	4.83E+00	7.51E+00
FE-59		-6.07E+00	±	2.11E+01	3.35E+01
CO-60		0.00E+00	±	1.43E+00	2.35E+00
ZN-65		-4.81E+00	±	1.41E+01	2.22E+01
ZRNB-95		-1.65E+00	±	8.68E+00	1.38E+01
I-131		-2.24E+00	±	8.85E+00	1.42E+01
CS-134		-1.18E+00	±	5.23E+00	8.38E+00
CS-137		-1.74E+00	±	5.41E+00	8.49E+00
BALA140		7.08E-03	±	5.28E+00	8.69E+00

Station 37 Pears collected 9/15/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.50E+03	±	2.07E+02	1.78E+02
MN-54		-3.74E+00	±	8.24E+00	1.30E+01
CO-58		-5.21E-01	±	7.75E+00	1.27E+01
FE-59		-4.07E-01	±	1.97E+01	3.23E+01
CO-60		-2.16E+00	±	2.50E+01	1.43E+01
ZN-65		2.49E-01	±	1.70E+01	2.78E+01
ZRNB-95		-3.39E+00	±	1.29E+01	2.07E+01
I-131		5.57E+00	±	1.36E+01	2.17E+01
CS-134		-6.93E-01	±	7.06E+00	1.15E+01
CS-137		2.74E+00	±	7.56E+00	1.20E+01
BALA140		-2.94E+00	±	1.27E+01	2.02E+01

Station 37 Apples collected 9/18/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.03E+03	±	2.09E+02	1.76E+02
MN-54		5.06E-01	±	5.80E+00	9.35E+00
CO-58		-5.80E-01	±	8.34E+00	1.36E+01
FE-59		5.87E+00	±	2.12E+01	3.29E+01
CO-60		3.06E-01	±	6.34E+00	1.03E+01
ZN-65		-6.58E+00	±	1.99E+01	3.10E+01
ZRNB-95		-4.26E-01	±	1.72E+01	2.82E+01
I-131		-3.18E+00	±	1.09E+01	1.73E+01
CS-134		1.65E-01	±	6.60E+00	1.08E+01
CS-137		-6.50E-01	±	7.66E+00	1.24E+01
BALA140		0.00E+00	±	3.77E+00	6.20E+00

Station 37 Apples collected 9/15/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.44E+03	±	2.35E+02	1.49E+02
MN-54		1.98E+00	±	5.43E+00	8.13E+00
CO-58		-9.52E-01	±	7.42E+00	1.19E+01
FE-59		0.00E+00	±	3.16E+01	5.19E+01
CO-60		-1.11E+00	±	8.38E+00	1.34E+01
ZN-65		7.65E-01	±	1.70E+01	2.77E+01
ZRNB-95		-4.87E-01	±	1.31E+01	2.15E+01
I-131		0.00E+00	±	9.95E+00	1.64E+01
CS-134		2.09E+00	±	6.20E+00	9.61E+00
CS-137		0.00E+00	±	4.28E+00	7.05E+00
BALA140		0.00E+00	±	4.17E+00	6.86E+00

Station 9c Apples collected 9/18/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.27E+03	±	2.60E+02	2.35E+02
MN-54		3.55E+00	±	7.16E+00	1.05E+01
CO-58		1.02E+00	±	8.60E+00	1.38E+01
FE-59		0.00E+00	±	2.58E+01	4.24E+01
CO-60		3.17E+00	±	8.62E+00	1.29E+01
ZN-65		-4.67E+00	±	2.07E+01	3.26E+01
ZRNB-95		-3.02E-01	±	1.51E+01	2.47E+01
I-131		7.75E-01	±	9.97E+00	1.62E+01
CS-134		1.59E+00	±	6.80E+00	1.07E+01
CS-137		1.01E-01	±	7.69E+00	1.26E+01
BALA140		0.00E+00	±	4.62E+00	7.59E+00

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A - 16.2

GAMMA SPECTROMETRY RESULTS OF FRUITS- SUMMARY

Results in pCi/ kilogram (wet)

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-6.26E-01	-3.01E+00	1.12E+00	1.12E+01	7	0
BALA140	Cntl	0.00E+00	0.00E+00	0.00E+00	7.59E+00	1	0
CO-58	Ind	-8.56E-01	-1.63E+00	-2.26E-01	1.13E+01	7	0
CO-58	Cntl	1.02E+00	1.02E+00	1.02E+00	1.38E+01	1	0
CO-60	Ind	7.80E-02	-2.16E+00	5.32E+00	1.21E+01	7	0
CO-60	Cntl	3.17E+00	3.17E+00	3.17E+00	1.29E+01	1	0
CS-134	Ind	1.28E+00	-1.18E+00	7.51E+00	1.02E+01	7	0
CS-134	Cntl	1.59E+00	1.59E+00	1.59E+00	1.07E+01	1	0
CS-137	Ind	1.15E+00	-1.74E+00	4.20E+00	1.04E+01	7	0
CS-137	Cntl	1.01E-01	1.01E-01	1.01E-01	1.26E+01	1	0
FE-59	Ind	8.22E-01	-6.07E+00	6.97E+00	3.40E+01	7	0
FE-59	Cntl	0.00E+00	0.00E+00	0.00E+00	4.24E+01	1	0
I-131	Ind	-8.20E-01	-3.18E+00	5.57E+00	1.59E+01	7	0
I-131	Cntl	7.75E-01	7.75E-01	7.75E-01	1.62E+01	1	0
K-40	Ind	1.92E+03	1.03E+03	3.60E+03	1.54E+02	7	7
K-40	Cntl	1.27E+03	1.27E+03	1.27E+03	2.35E+02	1	1
MN-54	Ind	2.30E-02	-3.74E+00	2.38E+00	1.02E+01	7	0
MN-54	Cntl	3.55E+00	3.55E+00	3.55E+00	1.05E+01	1	0
ZN-65	Ind	-9.28E-01	-6.58E+00	7.98E+00	2.80E+01	7	0
ZN-65	Cntl	-4.67E+00	-4.67E+00	-4.67E+00	3.26E+01	1	0
ZRNB-95	Ind	-3.14E-01	-3.96E+00	9.92E+00	2.03E+01	7	0
ZRNB-95	Cntl	-3.02E-01	-3.02E-01	-3.02E-01	2.47E+01	1	0

Ind = Indicator Stations Cntl = Control Stations

TABLE A-17.1

GAMMA SPECTROMETRY RESULTS OF VEGETABLES

Results in pCi/ kilogram (wet)

Station 37 is Indicator - Station 9 is Control

Station 37 Asparagus collected 5/5/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.25E+03	±	3.03E+02	2.86E+02
MN-54		-1.09E+00	±	1.24E+01	2.02E+01
CO-58		-2.58E+00	±	1.16E+01	1.87E+01
FE-59		-5.99E+00	±	2.81E+01	4.51E+01
CO-60		-4.64E+00	±	1.44E+01	2.30E+01
ZN-65		1.20E+01	±	2.58E+01	4.05E+01
ZRNB-95		0.00E+00	±	1.91E+01	3.15E+01
I-131		-8.79E-01	±	1.40E+01	2.29E+01
CS-134		-1.07E+01	±	1.61E+01	2.56E+01
CS-137		1.74E+00	±	1.25E+01	2.04E+01
BALA140		0.00E+00	±	5.68E+00	9.34E+00

Station 37 Broad Leaf Vegtable collected 7/21/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	5.24E+03	±	4.58E+02	2.03E+02
MN-54		2.41E+00	±	8.42E+00	1.32E+01
CO-58		0.00E+00	±	9.90E+00	1.63E+01
FE-59		0.00E+00	±	2.30E+01	3.79E+01
CO-60		-5.26E-01	±	1.09E+01	1.78E+01
ZN-65		1.79E+00	±	2.17E+01	3.53E+01
ZRNB-95		-4.61E+00	±	1.66E+01	2.62E+01
I-131		-4.07E+00	±	1.13E+01	1.77E+01
CS-134		3.41E+00	±	6.55E+00	9.83E+00
CS-137		4.34E-01	±	8.41E+00	1.37E+01
BALA140		-3.43E-01	±	9.50E+00	1.54E+01

Station 37 Broad Leaf Vegtable collected 6/26/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	3.96E+03	±	5.05E+02	2.73E+02
MN-54		-4.95E-02	±	1.15E+01	1.89E+01
CO-58		5.27E+00	±	1.17E+01	1.76E+01
FE-59		1.62E+01	±	3.83E+01	5.78E+01
CO-60		-1.18E-01	±	1.44E+01	2.36E+01
ZN-65		-6.86E+00	±	2.82E+01	4.42E+01
ZRNB-95		8.59E+00	±	1.92E+01	2.88E+01
I-131		-5.12E+00	±	1.61E+01	2.54E+01
CS-134		-3.53E+00	±	1.14E+01	1.78E+01
CS-137		-1.05E+00	±	1.28E+01	2.07E+01
BALA140		2.84E+00	±	1.75E+01	2.76E+01

Station 37 Corn collected 7/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.35E+03	±	2.56E+02	2.19E+02
MN-54		1.58E+00	±	9.34E+00	1.51E+01
CO-58		6.90E-02	±	8.08E+00	1.33E+01
FE-59		0.00E+00	±	1.68E+01	2.76E+01
CO-60		6.03E+00	±	9.91E+00	1.53E+01
ZN-65		-1.53E+01	±	2.46E+01	3.84E+01
ZRNB-95		1.86E-01	±	1.60E+01	2.63E+01
I-131		-5.96E+00	±	1.11E+01	1.77E+01
CS-134		-6.60E+00	±	1.06E+01	1.68E+01
CS-137		-2.99E-01	±	9.23E+00	1.51E+01
BALA140		-3.60E+00	±	1.02E+01	1.59E+01

Station 37 Cabbage collected 7/14/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.38E+03	±	2.57E+02	1.18E+02
MN-54		1.94E+00	±	5.93E+00	9.19E+00
CO-58		-1.20E+00	±	6.95E+00	1.11E+01
FE-59		7.14E+00	±	2.18E+01	3.38E+01
CO-60		2.07E-02	±	7.09E+00	1.17E+01
ZN-65		5.62E+00	±	1.50E+01	2.32E+01
ZRNB-95		-1.85E+00	±	1.03E+01	1.64E+01
I-131		-2.26E+00	±	1.64E+01	2.66E+01
CS-134		1.53E+00	±	3.68E+00	5.48E+00
CS-137		-8.29E-01	±	6.23E+00	1.00E+01
BALA140		-3.71E+00	±	1.48E+01	2.30E+01

Station 37 cucumbers collected 7/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.49E+03	±	2.23E+02	1.38E+02
MN-54		-1.96E+00	±	8.44E+00	1.34E+01
CO-58		-1.24E+00	±	8.01E+00	1.29E+01
FE-59		-1.89E-01	±	1.97E+01	3.23E+01
CO-60		-5.87E-01	±	6.89E+00	1.11E+01
ZN-65		-1.21E+00	±	2.07E+01	3.37E+01
ZRNB-95		-1.45E+00	±	1.21E+01	1.95E+01
I-131		0.00E+00	±	9.18E+00	1.51E+01
CS-134		-1.69E+00	±	7.91E+00	1.27E+01
CS-137		-1.47E+00	±	6.96E+00	1.10E+01
BALA140		3.00E+00	±	1.05E+01	1.60E+01

Station 37 Brocoli collected 7/21/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	5.29E+03	±	5.11E+02	2.30E+02
MN-54		-4.08E+00	±	1.12E+01	1.74E+01
CO-58		9.96E-01	±	8.67E+00	1.39E+01
FE-59		0.00E+00	±	5.78E+01	9.51E+01
CO-60		4.57E+00	±	1.33E+01	2.06E+01
ZN-65		-1.50E-01	±	2.50E+01	4.11E+01
ZRNB-95		-4.90E-01	±	1.48E+01	2.42E+01
I-131		-3.12E+00	±	1.23E+01	1.94E+01
CS-134		-3.25E+00	±	1.11E+01	1.76E+01
CS-137		-3.54E-01	±	8.54E+00	1.39E+01
BALA140		-2.81E+00	±	1.56E+01	2.44E+01

Station 37 mint collected 7/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	6.76E+03	±	7.09E+02	6.63E+02
MN-54		1.21E+01	±	2.88E+01	4.60E+01
CO-58		-4.07E+00	±	2.81E+01	4.57E+01
FE-59		-1.34E+00	±	6.84E+01	1.12E+02
CO-60		9.66E-01	±	2.72E+01	4.46E+01
ZN-65		-2.62E+01	±	6.22E+01	9.89E+01
ZRNB-95		-3.84E+00	±	4.64E+01	7.58E+01
I-131		-2.33E+00	±	5.85E+01	9.60E+01
CS-134		-1.69E+00	±	5.21E+01	8.56E+01
CS-137		0.00E+00	±	3.66E+01	6.02E+01
BALA140		-1.18E+01	±	3.96E+01	6.29E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-17.1

GAMMA SPECTROMETRY RESULTS OF VEGETABLES

Results in pCi/ kilogram (wet)

Station 37 is Indicator - Station 9 is Control

Station 37 Broad Leaf Vegtable collected 8/11/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	3.77E+03	±	3.76E+02	1.85E+02
MN-54		2.46E+00	±	7.05E+00	1.09E+01
CO-58		2.96E+00	±	7.19E+00	1.10E+01
FE-59		5.18E+00	±	2.45E+01	3.89E+01
CO-60		6.19E+00	±	1.00E+01	1.49E+01
ZN-65		2.24E-01	±	1.70E+01	2.78E+01
ZRNB-95		2.13E+00	±	1.27E+01	2.02E+01
I-131		-6.65E-01	±	7.26E+00	1.18E+01
CS-134		-5.12E-01	±	5.93E+00	9.62E+00
CS-137		-1.13E+00	±	7.43E+00	1.19E+01
BALA140		-3.61E+00	±	1.22E+01	1.90E+01

Station 37 Broad Leaf Vegtable collected 10/6/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	3.22E+03	±	3.26E+02	1.62E+02
MN-54		-1.66E+00	±	7.82E+00	1.25E+01
CO-58		-2.90E+00	±	7.90E+00	1.23E+01
FE-59		6.10E-01	±	2.18E+01	3.56E+01
CO-60		1.30E+00	±	6.39E+00	1.00E+01
ZN-65		-1.26E-01	±	2.06E+01	3.38E+01
ZRNB-95		2.98E+00	±	1.14E+01	1.80E+01
I-131		-1.02E+00	±	7.61E+00	1.23E+01
CS-134		-2.76E-01	±	7.26E+00	1.19E+01
CS-137		2.98E+00	±	6.85E+00	1.05E+01
BALA140		2.28E+00	±	7.35E+00	1.10E+01

Station 37 Cabbage collected 9/15/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.24E+03	±	3.01E+02	1.69E+02
MN-54		0.00E+00	±	5.62E+00	9.24E+00
CO-58		1.22E+00	±	7.55E+00	1.20E+01
FE-59		4.02E+00	±	2.48E+01	3.95E+01
CO-60		0.00E+00	±	2.71E+00	4.45E+00
ZN-65		0.00E+00	±	3.65E+01	6.01E+01
ZRNB-95		2.11E-01	±	1.45E+01	2.38E+01
I-131		-3.74E+00	±	1.32E+01	2.10E+01
CS-134		0.00E+00	±	1.47E+01	2.42E+01
CS-137		-8.91E-02	±	7.67E+00	1.26E+01
BALA140		-2.13E+00	±	1.51E+01	2.41E+01

Station 37 Cabbage collected 10/6/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.99E+03	±	2.76E+02	1.67E+02
MN-54		-1.99E+00	±	8.67E+00	1.38E+01
CO-58		-1.85E+00	±	9.59E+00	1.53E+01
FE-59		-1.58E+00	±	2.56E+01	4.16E+01
CO-60		4.88E+00	±	8.72E+00	1.26E+01
ZN-65		4.01E+00	±	2.24E+01	3.59E+01
ZRNB-95		0.00E+00	±	9.28E+00	1.53E+01
I-131		3.86E+00	±	1.43E+01	2.27E+01
CS-134		0.00E+00	±	1.66E+01	2.72E+01
CS-137		0.00E+00	±	8.94E+00	1.47E+01
BALA140		-1.70E+00	±	1.30E+01	2.06E+01

Station 9c Broad Leaf Vegtable collected 9/18/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	3.27E+03	±	3.96E+02	2.06E+02
MN-54		-6.08E-01	±	8.09E+00	1.31E+01
CO-58		-1.85E+00	±	8.79E+00	1.39E+01
FE-59		0.00E+00	±	7.34E+00	1.21E+01
CO-60		-5.01E+00	±	1.24E+01	1.89E+01
ZN-65		0.00E+00	±	3.09E+01	5.08E+01
ZRNB-95		-4.91E+00	±	1.90E+01	3.01E+01
I-131		5.36E+00	±	7.76E+00	1.12E+01
CS-134		4.13E+00	±	8.71E+00	1.33E+01
CS-137		-3.37E-02	±	8.26E+00	1.36E+01
BALA140		0.00E+00	±	4.38E+00	7.20E+00

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A - 17.2

GAMMA SPECTROMETRY RESULTS OF VEGETABLES- SUMMARY

Results in pCi/ kilogram (wet)

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-1.80E+00	-1.18E+01	3.00E+00	2.24E+01	12	0
BALA140	Cntl	0.00E+00	0.00E+00	0.00E+00	7.20E+00	1	0
CO-58	Ind	-2.76E-01	-4.07E+00	5.27E+00	1.67E+01	12	0
CO-58	Cntl	-1.85E+00	-1.85E+00	-1.85E+00	1.39E+01	1	0
CO-60	Ind	1.51E+00	-4.64E+00	6.19E+00	1.75E+01	12	0
CO-60	Cntl	-5.01E+00	-5.01E+00	-5.01E+00	1.89E+01	1	0
CS-134	Ind	-1.94E+00	-1.07E+01	3.41E+00	2.20E+01	12	0
CS-134	Cntl	4.13E+00	4.13E+00	4.13E+00	1.33E+01	1	0
CS-137	Ind	-5.62E-03	-1.47E+00	2.98E+00	1.79E+01	12	0
CS-137	Cntl	-3.37E-02	-3.37E-02	-3.37E-02	1.36E+01	1	0
FE-59	Ind	2.01E+00	-5.99E+00	1.62E+01	4.98E+01	12	0
FE-59	Cntl	0.00E+00	0.00E+00	0.00E+00	1.21E+01	1	0
I-131	Ind	-2.11E+00	-5.96E+00	3.86E+00	2.57E+01	12	0
I-131	Cntl	5.36E+00	5.36E+00	5.36E+00	1.12E+01	1	0
K-40	Ind	3.41E+03	1.49E+03	6.76E+03	2.35E+02	12	12
K-40	Cntl	3.27E+03	3.27E+03	3.27E+03	2.06E+02	1	1
MN-54	Ind	8.07E-01	-4.08E+00	1.21E+01	1.66E+01	12	0
MN-54	Cntl	-6.08E-01	-6.08E-01	-6.08E-01	1.31E+01	1	0
ZN-65	Ind	-2.18E+00	-2.62E+01	1.20E+01	4.27E+01	12	0
ZN-65	Cntl	0.00E+00	0.00E+00	0.00E+00	5.08E+01	1	0
ZRNB-95	Ind	1.55E-01	-4.61E+00	8.59E+00	2.72E+01	12	0
ZRNB-95	Cntl	-4.91E+00	-4.91E+00	-4.91E+00	3.01E+01	1	0

Ind = Indicator Stations Cntl = Control Staions

TABLE B-1.1

2015 QUARTERLY SPECIAL INTEREST TLD RESULTS

Results in milli-Roentgen (mR) per Standard Quarter

Station ID	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Quarterly Sum
58	20.0	19.8	-	18.7	-
87	31.4	24.7	27.5	28.0	111.5
88	25.7	22.6	23.8	24.1	96.2
89	28.3	23.5	25.9	26.8	104.5
90	19.9	20.2	19.4	18.6	78.1
119B	23.2	20.8	21.5	21.4	87.0
119C	22.9	21.5	22.6	21.4	88.3
120 (East)	22.7	22.1	22.8	22.5	90.1
121	77.6	41.4	63.7	74.4	257.1
122	37.7	35.6	37.1	36.8	147.2
123	102.7	98.3	100.8	97.6	399.4
124	121.5	112.5	118.4	115.7	468.1
125	90.5	84.5	88.0	87.8	350.8
126	136.7	130.5	132.9	127.6	527.8
127	104.8	97.8	99.8	100.9	403.4
128	159.3	148.0	148.6	149.9	605.8
129	120.8	113.3	114.7	113.3	462.1
136A	176.3	165.8	168.6	166.0	676.7
137A	261.8	251.6	250.2	257.8	1021.4
138A	220.4	199.3	209.1	202.6	831.3
150 (Site 1)	18.5	19.3	18.2	18.7	74.6
151 (Site 4)	20.1	20.0	19.8	18.7	78.6

TABLE B-1.2

2015 QUARTERLY SPECIAL INTEREST TLD RESULTS- SUMMARY

Results in milli-Roentgen (mR) per Standard Quarter

Location	Average Activity	Activity Low	Activity High	Number of Samples
ISFSI Quarterly Ind	143.7	84.5	261.8	40
SITE 1 & 4 Quarterly Ind	19.2	18.2	20.1	8
Quarterly Control TLDs	20.5	19.8	21.3	4

Ind = Indicator Station Cntl = Control Station

Stations 123 through 138A are locationed on the middle ISFSI fence.

Stations 58 and 87 to 90 were established in 2009 to monitor exposure from remediation work at the DOE 618-11 burial site.

Station 121 results high due to location being near transformer yard. Staion 122 results influenced by ISFSI.

Quarterly Control TLD location is ST-9. See Table A-1.1

No 3rd quarter TLD result for St-58 obtained from vendor. Based on the available data (3 quarters), the normalized quarterly sum for St-58 is estimated to be 78.0 mRem.

Table B - 2.1

GAMMA SPECTROMETRY RESULTS OF STORM DRAIN WATER

STATION 101B

Results in pCi/liter, corrected for decay during collection period

Location 101B collected 1/29/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.01E+01	±	5.07E+01	5.42E+01
CR-51		-8.48E+00	±	2.62E+01	4.22E+01
MN-54		-4.49E-01	±	2.20E+00	3.55E+00
CO-58		-6.53E-01	±	2.14E+00	3.40E+00
FE-59		-1.91E+00	±	7.09E+00	1.13E+01
CO-60		-2.11E-01	±	2.72E+00	3.52E+00
ZN-65		-1.82E+00	±	5.06E+00	8.01E+00
ZRNB-95		1.55E+00	±	4.02E+00	6.34E+00
I-131		6.21E-01	±	7.32E+00	1.20E+01
CS-134		-8.92E-01	±	2.25E+00	3.59E+00
CS-137		1.17E+00	±	1.82E+00	2.78E+00
BALA140		-1.73E+00	±	6.59E+00	1.05E+01
BI-214		4.68E+00	±	5.33E+00	9.39E+00

Location 101B collected 3/2/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.95E+01	±	8.05E+01	5.95E+01
CR-51		0.00E+00	±	2.88E+01	4.74E+01
MN-54		-4.96E-01	±	2.33E+00	3.76E+00
CO-58		-9.26E-01	±	2.61E+00	4.16E+00
FE-59		2.45E+00	±	5.88E+00	9.11E+00
CO-60		-3.17E-02	±	1.95E+00	3.19E+00
ZN-65		-2.18E+00	±	5.75E+00	9.15E+00
ZRNB-95		9.98E-01	±	3.80E+00	6.07E+00
I-131		6.74E+00	±	6.88E+00	1.06E+01
CS-134		0.00E+00	±	5.16E+00	8.49E+00
CS-137		7.40E-01	±	1.95E+00	3.08E+00
BALA140		0.00E+00	±	1.80E+00	2.96E+00
BI-214	+	2.36E+01	±	6.10E+00	8.82E+00

Location 101B collected 4/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.66E+00	±	2.71E+01	5.12E+01
CR-51		3.16E+00	±	2.32E+01	3.78E+01
MN-54		0.00E+00	±	2.60E+00	4.28E+00
CO-58		7.01E-02	±	2.29E+00	3.76E+00
FE-59		-9.93E-01	±	6.78E+00	1.09E+01
CO-60		9.13E-01	±	2.31E+00	3.87E+00
ZN-65		0.00E+00	±	7.56E+00	1.24E+01
ZRNB-95		1.52E-01	±	3.56E+00	5.82E+00
I-131		5.72E+00	±	7.76E+00	1.21E+01
CS-134		-7.75E-01	±	2.29E+00	3.67E+00
CS-137		1.77E+00	±	1.92E+00	2.85E+00
BALA140		1.54E+00	±	5.30E+00	8.27E+00
BI-214		4.15E+00	±	5.30E+00	9.39E+00

Location 101B collected 5/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.08E+01	±	4.90E+01	5.25E+01
CR-51		-8.82E+00	±	2.11E+01	3.36E+01
MN-54		5.59E-01	±	2.18E+00	3.49E+00
CO-58		2.23E+00	±	2.36E+00	3.49E+00
FE-59		-3.94E-01	±	6.75E+00	1.10E+01
CO-60		1.93E+00	±	2.81E+00	3.15E+00
ZN-65		-7.38E-01	±	5.07E+00	8.20E+00
ZRNB-95		2.35E-01	±	3.92E+00	6.40E+00
I-131		-3.68E+00	±	7.97E+00	1.27E+01
CS-134		8.45E-01	±	2.16E+00	3.45E+00
CS-137		-1.49E-01	±	2.17E+00	3.54E+00
BALA140		-6.93E-02	±	5.65E+00	9.28E+00
BI-214		1.62E+00	±	5.00E+00	9.19E+00

Location 101B collected 6/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		4.13E-01	±	2.65E+01	5.30E+01
CR-51		1.49E+01	±	2.72E+01	4.32E+01
MN-54		1.48E-01	±	2.01E+00	3.28E+00
CO-58		-2.25E-01	±	2.41E+00	3.92E+00
FE-59		3.68E+00	±	7.19E+00	1.10E+01
CO-60		-1.29E+00	±	3.79E+00	4.46E+00
ZN-65		-7.45E-01	±	4.43E+00	7.13E+00
ZRNB-95		1.76E+00	±	4.11E+00	6.45E+00
I-131		2.26E-01	±	8.76E+00	1.44E+01
CS-134		-1.10E+00	±	2.13E+00	3.36E+00
CS-137		1.18E+00	±	1.75E+00	2.64E+00
BALA140		-1.95E+00	±	8.34E+00	1.33E+01
BI-214		1.47E+00	±	4.63E+00	8.67E+00

Location 101B collected 6/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.29E+01	±	5.90E+01	5.44E+01
CR-51		2.05E+01	±	3.69E+01	5.87E+01
MN-54		2.96E+00	±	2.42E+00	3.58E+00
CO-58		-9.32E-01	±	3.00E+00	4.82E+00
FE-59		3.65E+00	±	7.06E+00	1.08E+01
CO-60	+	1.56E+01	±	2.41E+00	3.18E+00
ZN-65		-2.86E+00	±	5.93E+00	9.37E+00
ZRNB-95		1.75E-01	±	4.67E+00	7.65E+00
I-131		1.68E+01	±	3.55E+01	5.68E+01
CS-134		-5.42E-02	±	2.01E+00	3.31E+00
CS-137		7.58E-01	±	2.02E+00	3.21E+00
BALA140		5.02E-01	±	1.34E+01	2.19E+01
BI-214		5.53E+00	±	5.27E+00	9.15E+00

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

Table B - 2.1

GAMMA SPECTROMETRY RESULTS OF STORM DRAIN WATER

STATION 101B

Results in pCi/liter, corrected for decay during collection period

Location 101B collected 7/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.69E+01	±	4.04E+01	5.63E+01
CR-51		1.86E+01	±	2.44E+01	3.81E+01
MN-54		0.00E+00	±	2.61E+00	4.29E+00
CO-58		0.00E+00	±	2.95E+00	4.86E+00
FE-59		1.52E+00	±	7.22E+00	1.16E+01
CO-60		-4.92E-01	±	2.21E+00	3.54E+00
ZN-65		-2.05E+00	±	5.04E+00	7.95E+00
ZRNB-95		-1.06E+00	±	4.75E+00	7.66E+00
I-131		1.62E-01	±	6.80E+00	1.12E+01
CS-134		4.18E-03	±	2.24E+00	3.67E+00
CS-137		-3.38E-01	±	2.28E+00	3.70E+00
BALA140		-3.68E-01	±	6.22E+00	1.02E+01
BI-214	+	9.73E+00	±	5.74E+00	9.55E+00

Location 101B collected 8/31/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.21E+01	±	6.16E+01	5.76E+01
CR-51		4.68E+00	±	2.31E+01	3.75E+01
MN-54		1.29E-03	±	2.15E+00	3.52E+00
CO-58		-4.14E-01	±	2.18E+00	3.52E+00
FE-59		2.06E+00	±	5.80E+00	9.08E+00
CO-60		-1.29E-01	±	2.21E+00	3.61E+00
ZN-65		-2.21E+00	±	5.17E+00	8.15E+00
ZRNB-95		-1.46E-01	±	3.41E+00	5.58E+00
I-131		-2.67E+00	±	7.33E+00	1.18E+01
CS-134		-1.39E+00	±	2.53E+00	4.01E+00
CS-137		9.62E-01	±	2.14E+00	3.37E+00
BALA140		1.10E+00	±	5.15E+00	8.22E+00
BI-214		1.21E+00	±	5.38E+00	9.77E+00

Location 101B collected 10/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.12E+01	±	3.35E+01	5.01E+01
CR-51		1.54E+01	±	2.23E+01	3.49E+01
MN-54		8.14E-01	±	1.81E+00	2.82E+00
CO-58		8.44E-01	±	2.09E+00	3.28E+00
FE-59		3.82E+00	±	6.35E+00	9.55E+00
CO-60		-9.98E-01	±	3.38E+00	3.98E+00
ZN-65		-1.75E+00	±	5.17E+00	8.21E+00
ZRNB-95		8.37E-01	±	3.68E+00	5.90E+00
I-131		1.65E+00	±	7.63E+00	1.24E+01
CS-134		-6.27E-01	±	2.15E+00	3.46E+00
CS-137		9.99E-02	±	1.98E+00	3.23E+00
BALA140		-7.54E-01	±	6.33E+00	1.02E+01
BI-214		6.57E+00	±	5.37E+00	9.26E+00

Location 101B collected 11/2/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	3.83E+01	6.31E+01
CR-51		-1.22E+01	±	3.77E+01	4.91E+01
MN-54		1.13E+00	±	2.65E+00	3.18E+00
CO-58		-1.38E-01	±	3.26E+00	4.04E+00
FE-59		-1.84E+00	±	1.18E+01	1.37E+01
CO-60		-5.36E-01	±	3.07E+00	3.47E+00
ZN-65		0.00E+00	±	5.32E+00	8.75E+00
ZRNB-95		-4.31E+00	±	7.70E+00	9.28E+00
I-131		-6.79E+00	±	1.54E+01	1.99E+01
CS-134		-5.31E-01	±	2.92E+00	3.70E+00
CS-137		2.72E-01	±	3.22E+00	3.98E+00
BALA140		0.00E+00	±	9.70E+00	1.59E+01
BI-214		3.76E-01	±	7.88E+00	1.08E+01

Location 101B collected 12/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		3.16E+01	±	3.73E+01	4.09E+01
CR-51		-2.34E-01	±	2.54E+01	3.66E+01
MN-54		-1.24E+00	±	2.82E+00	3.60E+00
CO-58		1.71E-01	±	2.51E+00	3.30E+00
FE-59		-3.63E+00	±	9.62E+00	1.13E+01
CO-60		6.40E-01	±	3.13E+00	3.71E+00
ZN-65		-3.83E-01	±	5.88E+00	7.27E+00
ZRNB-95		7.00E-01	±	4.81E+00	6.27E+00
I-131		2.11E+00	±	6.50E+00	9.02E+00
CS-134		1.45E+00	±	1.91E+00	2.43E+00
CS-137		1.44E+00	±	2.95E+00	3.76E+00
BALA140		0.00E+00	±	5.90E+00	9.70E+00
BI-214		7.02E+00	±	6.65E+00	9.26E+00

Location 101B collected 12/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		4.45E+01	±	4.24E+01	5.06E+01
CR-51		1.73E+01	±	3.19E+01	3.68E+01
MN-54		1.40E-01	±	3.39E+00	3.58E+00
CO-58		-6.17E-01	±	4.27E+00	4.48E+00
FE-59		4.72E+00	±	1.08E+01	1.04E+01
CO-60		0.00E+00	±	3.09E+00	5.09E+00
ZN-65		1.55E+00	±	6.02E+00	6.02E+00
ZRNB-95		1.89E+00	±	7.17E+00	7.74E+00
I-131		2.58E+00	±	1.13E+01	1.33E+01
CS-134		1.32E+00	±	3.40E+00	3.65E+00
CS-137		-1.95E+00	±	4.22E+00	4.52E+00
BALA140		-2.66E+00	±	1.18E+01	1.11E+01
BI-214	+	4.83E+01	±	9.28E+00	9.20E+00

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-2.2

GAMMA SPECTROMETRY RESULTS OF STORM DRAIN WATER - SUMMARY

STATION 101B

Results in pCi/liter, corrected for decay during collection period

Nuclide	Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
K-40	-8.30E+00	-3.95E+01	4.45E+01	5.36E+01	12	0
CR-51	5.40E+00	-1.22E+01	2.05E+01	4.13E+01	12	0
MN-54	2.97E-01	-1.24E+00	2.96E+00	3.58E+00	12	0
CO-58	-4.87E-02	-9.32E-01	2.23E+00	3.92E+00	12	0
FE-59	1.10E+00	-3.63E+00	4.72E+00	1.08E+01	12	0
CO-60	1.28E+00	-1.29E+00	1.56E+01	3.73E+00	12	1
ZN-65	-1.10E+00	-2.86E+00	1.55E+00	8.39E+00	12	0
ZRNB-95	1.63E-02	-4.31E+00	1.89E+00	6.96E+00	12	0
I-131	1.95E+00	-6.79E+00	1.68E+01	1.63E+01	12	0
CS-134	-1.46E-01	-1.39E+00	1.45E+00	3.90E+00	12	0
CS-137	4.96E-01	-1.95E+00	1.77E+00	3.39E+00	12	0
BALA140	-3.67E-01	-2.66E+00	1.54E+00	1.10E+01	12	0
BI-214	9.52E+00	3.76E-01	4.83E+01	9.37E+00	12	3

TABLE B-3.1

GROSS BETA IN STORM DRAIN WATER

Results in pCi per liter

Location	Collection Period	RQ	Activity		Error	MDA
ST-101B	12/30/14 - 01/29/15		-1.49E-01	±	6.55E-01	2.34E+00
	01/29/15 - 03/02/15		9.77E-01	±	7.25E-01	2.39E+00
	03/02/15 - 04/01/15		1.39E+00	±	7.76E-01	2.44E+00
	04/01/15 - 05/01/15		7.75E-01	±	6.69E-01	2.14E+00
	05/01/15 - 06/01/15	+	3.71E+00	±	9.07E-01	2.20E+00
	06/01/15 - 06/30/15	+	1.39E+01	±	1.50E+00	2.88E+00
	07/01/15 - 07/30/15	+	8.05E+00	±	1.16E+00	2.58E+00
	07/30/15 - 08/31/15	+	7.76E+00	±	1.00E+00	2.01E+00
	08/31/15 - 10/01/15		7.92E-01	±	8.01E-01	2.71E+00
	10/01/15 - 11/02/15		9.81E-01	±	7.54E-01	2.50E+00
	11/02/15 - 12/01/15		7.38E-01	±	6.80E-01	2.31E+00
	12/01/15 - 12/30/15	+	4.76E+00	±	9.75E-01	2.36E+00

TABLE B-3.2

GROSS BETA IN STORM DRAIN WATER - SUMMARY

Results in pCi per liter

Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
3.64E+00	-1.49E-01	1.39E+01	12	5

TABLE B-4.1

TRITIUM IN STORM DRAIN WATER

Results in pCi per liter

Location	Collection Period	RQ	Activity		Error
ST-101B	12/30/14 - 01/29/15	+	2.96E+04	±	4.02E+02
	01/29/15 - 03/02/15	+	2.23E+04	±	3.52E+02
	03/02/15 - 04/01/15	+	5.78E+03	±	1.91E+02
	04/01/15 - 05/01/15	+	1.04E+03	±	1.18E+02
	05/01/15 - 06/01/15	+	3.29E+02	±	9.75E+01
	06/01/15 - 06/30/15		2.51E+02	±	9.02E+01
	07/01/15 - 07/30/15		1.50E+02	±	9.04E+01
	07/30/15 - 08/31/15		2.02E+02	±	9.15E+01
	08/31/15 - 10/01/15	+	3.03E+02	±	1.05E+02
	10/01/15 - 11/02/15	+	4.01E+02	±	9.38E+01
	11/02/15 - 12/01/15	+	7.43E+02	±	1.13E+02
	12/01/15 - 12/30/15	+	3.76E+03	±	1.64E+02

TABLE B-4.2

TRITIUM IN STORM DRAIN WATER - SUMMARY

Results in pCi per liter

Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
5.41E+03	1.50E+02	2.96E+04	12	9

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-5.1

GROSS ALPHA IN SANITARY WASTE TREATMENT WATER

Results in pCi per liter

ST 102B - SWTF Headworks

Collection Period			RQ	Activity		Error	MDA
12/30/14	-	01/29/15		4.96E-01	±	1.03E+00	4.47E+00
01/29/15	-	03/02/15		-1.07E+00	±	1.58E+00	6.16E+00
03/02/15	-	03/30/15		1.28E+00	±	1.43E+00	5.47E+00
03/30/15	-	05/01/15		-6.51E-01	±	9.20E-01	3.86E+00
05/01/15	-	06/01/15		9.63E-01	±	1.14E+00	4.57E+00
06/01/15	-	06/30/15		1.97E+00	±	1.35E+00	4.52E+00
07/01/15	-	07/30/15		2.52E+00	±	1.70E+00	5.67E+00
07/30/15	-	08/31/15		2.30E+00	±	1.56E+00	5.17E+00
08/31/15	-	10/01/15		-9.55E-01	±	1.65E+00	6.40E+00
10/01/15	-	11/02/15		8.63E-01	±	1.39E+00	5.57E+00
11/02/15	-	12/01/15		1.56E-01	±	1.33E+00	5.70E+00
12/01/15	-	12/30/15		6.33E-01	±	1.43E+00	5.78E+00

TABLE B-5.2

GROSS ALPHA IN SANITARY WASTE TREATMENT WATER - SUMMARY

Results in pCi per liter

Location	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
ST 102B	7.09E-01	-1.07E+00	2.52E+00	12	0

TABLE B-6.1

GROSS BETA IN SANITARY WASTE TREATMENT WATER

Results in pCi per liter

ST 102B - SWTF Headworks

Collection Period			RQ	Activity		Error	MDA
12/30/14	-	01/29/15	+	2.14E+01	±	1.63E+00	2.68E+00
01/29/15	-	03/02/15	+	2.01E+01	±	1.60E+00	2.73E+00
03/02/15	-	03/30/15	+	2.91E+01	±	2.41E+00	3.97E+00
03/30/15	-	05/01/15	+	1.79E+01	±	1.78E+00	3.27E+00
05/01/15	-	06/01/15	+	2.95E+01	±	2.11E+00	3.11E+00
06/01/15	-	06/30/15	+	1.82E+01	±	1.57E+00	2.95E+00
07/01/15	-	07/30/15	+	2.51E+01	±	2.00E+00	3.42E+00
07/30/15	-	08/31/15	+	2.17E+01	±	1.79E+00	2.72E+00
08/31/15	-	10/01/15	+	2.58E+01	±	1.90E+00	3.28E+00
10/01/15	-	11/02/15	+	1.88E+01	±	1.60E+00	2.89E+00
11/02/15	-	12/01/15	+	1.84E+01	±	1.58E+00	2.78E+00
12/01/15	-	12/30/15	+	2.15E+01	±	1.62E+00	2.62E+00

TABLE B-6.2

GROSS BETA IN SANITARY WASTE TREATMENT WATER - SUMMARY

Results in pCi per liter

Location	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
ST 102B	2.23E+01	1.79E+01	2.95E+01	12	12

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

Table B-7.1

GAMMA SPECTROMETRY RESULTS OF SANITARY WASTE TREATMENT WATER

STATION 102B

Results in pCi/liter, corrected for decay during collection period

Location 102b collected 1/29/2015

Nuclide	RQ	Activity		Error	MDA
K-40		6.08E+00	±	3.45E+01	6.93E+01
CR-51		8.46E+00	±	3.80E+01	6.20E+01
MN-54		1.07E+00	±	3.21E+00	5.21E+00
CO-58		1.07E+00	±	3.10E+00	5.01E+00
FE-59		-5.22E+00	±	8.97E+00	1.42E+01
CO-60		0.00E+00	±	3.01E+00	4.96E+00
ZN-65		4.39E-01	±	6.07E+00	9.95E+00
ZRNB-95		3.24E+00	±	5.77E+00	9.23E+00
I-131		1.91E+00	±	1.22E+01	2.00E+01
CS-134		-2.09E+00	±	3.81E+00	6.16E+00
CS-137		-1.40E-01	±	3.60E+00	5.91E+00
BALA140		-2.95E+00	±	6.86E+00	1.09E+01
BI-214		1.14E+01	±	8.01E+00	1.39E+01

Location 102b collected 3/2/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	9.76E+01	±	3.96E+01	5.85E+01
CR-51		-8.46E+00	±	3.21E+01	5.23E+01
MN-54		1.32E+00	±	2.89E+00	4.64E+00
CO-58		-4.10E-01	±	3.08E+00	5.03E+00
FE-59		6.51E+00	±	6.00E+00	8.83E+00
CO-60		3.66E-01	±	2.43E+00	4.27E+00
ZN-65		0.00E+00	±	8.48E+00	1.40E+01
ZRNB-95		2.74E+00	±	5.17E+00	8.25E+00
I-131		-1.10E-01	±	7.76E+00	1.27E+01
CS-134		3.44E-01	±	2.47E+00	4.03E+00
CS-137		-8.20E-02	±	2.29E+00	3.76E+00
BALA140		-2.66E-01	±	5.50E+00	9.01E+00
BI-214		6.61E+00	±	6.94E+00	1.24E+01

Location 102b collected 3/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		2.68E+01	±	3.35E+01	6.65E+01
CR-51		7.08E-01	±	3.62E+01	5.94E+01
MN-54		-1.28E-01	±	2.54E+00	4.17E+00
CO-58		-1.76E-01	±	2.84E+00	4.66E+00
FE-59		1.60E+00	±	6.48E+00	1.04E+01
CO-60		1.42E+00	±	2.60E+00	4.13E+00
ZN-65		-1.36E-03	±	5.40E+00	8.97E+00
ZRNB-95		1.73E+00	±	5.66E+00	9.17E+00
I-131		-2.97E-01	±	9.31E+00	1.53E+01
CS-134		-1.12E-01	±	4.98E+00	8.19E+00
CS-137		-2.57E-01	±	3.29E+00	5.39E+00
BALA140		0.00E+00	±	8.25E+00	1.36E+01
BI-214		8.31E+00	±	7.49E+00	1.32E+01

Location 102b collected 5/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		6.17E+00	±	3.38E+01	6.83E+01
CR-51		-1.18E+01	±	3.85E+01	6.27E+01
MN-54		1.82E+00	±	2.90E+00	4.63E+00
CO-58		-1.68E+00	±	3.38E+00	5.42E+00
FE-59		9.57E+00	±	7.44E+00	1.11E+01
CO-60		-6.64E-02	±	2.34E+00	3.84E+00
ZN-65		-4.15E+00	±	6.85E+00	1.09E+01
ZRNB-95		-6.34E-01	±	5.77E+00	9.43E+00
I-131		-5.14E+00	±	1.09E+01	1.76E+01
CS-134		2.24E-01	±	5.23E+00	8.59E+00
CS-137		-1.26E+00	±	3.28E+00	5.30E+00
BALA140		-1.07E+00	±	6.61E+00	1.07E+01
BI-214		9.15E+00	±	7.67E+00	1.34E+01

Location 102b collected 6/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		1.25E+01	±	3.22E+01	6.29E+01
CR-51		-7.56E+00	±	3.37E+01	5.50E+01
MN-54		-7.46E-01	±	2.91E+00	4.72E+00
CO-58		-1.09E+00	±	2.69E+00	4.31E+00
FE-59		1.53E+00	±	7.49E+00	1.21E+01
CO-60		-1.36E+00	±	7.71E+00	4.68E+00
ZN-65		7.32E-02	±	6.11E+00	1.00E+01
ZRNB-95		2.59E+00	±	5.35E+00	8.57E+00
I-131		-3.95E+00	±	9.39E+00	1.52E+01
CS-134		1.32E+00	±	3.01E+00	4.87E+00
CS-137		1.26E-01	±	3.06E+00	5.02E+00
BALA140		1.70E+00	±	5.21E+00	8.29E+00
BI-214		-1.44E+00	±	7.42E+00	1.22E+01

Location 102b collected 6/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		1.75E+01	±	3.43E+01	6.54E+01
CR-51		-5.70E+00	±	2.94E+01	4.80E+01
MN-54		2.34E+00	±	2.66E+00	4.16E+00
CO-58		-1.40E+00	±	3.10E+00	4.97E+00
FE-59		5.23E+00	±	7.73E+00	1.20E+01
CO-60		-8.23E-01	±	5.07E+00	4.83E+00
ZN-65		2.97E+00	±	5.54E+00	8.79E+00
ZRNB-95		-1.11E+00	±	5.82E+00	9.48E+00
I-131		-2.88E+00	±	1.26E+01	2.06E+01
CS-134		-6.60E-01	±	3.12E+00	5.09E+00
CS-137		0.00E+00	±	2.90E+00	4.77E+00
BALA140		-4.26E-01	±	6.51E+00	1.06E+01
BI-214		-4.83E-01	±	6.85E+00	1.22E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

Table B-7.1

GAMMA SPECTROMETRY RESULTS OF SANITARY WASTE TREATMENT WATER

STATION 102B

Results in pCi/liter, corrected for decay during collection period

Location 102b collected 7/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		3.21E+01	±	3.26E+01	6.18E+01
CR-51		2.22E+01	±	3.77E+01	6.06E+01
MN-54		0.00E+00	±	2.96E+00	4.87E+00
CO-58		2.88E-01	±	3.08E+00	5.04E+00
FE-59		4.70E+00	±	8.05E+00	1.26E+01
CO-60		2.87E-01	±	3.83E+00	4.64E+00
ZN-65		1.21E-01	±	5.62E+00	9.23E+00
ZRNB-95		-1.40E+00	±	6.09E+00	9.89E+00
I-131		-7.67E-01	±	1.80E+01	2.95E+01
CS-134		4.58E-01	±	3.00E+00	4.90E+00
CS-137		3.73E-01	±	2.74E+00	4.48E+00
BALA140		-1.64E+00	±	7.66E+00	1.23E+01
BI-214		5.19E+00	±	6.98E+00	1.25E+01

Location 102b collected 8/31/2015

Nuclide	RQ	Activity		Error	MDA
K-40		4.01E+00	±	3.54E+01	7.06E+01
CR-51		1.11E+01	±	3.54E+01	5.76E+01
MN-54		-1.93E-02	±	3.03E+00	4.98E+00
CO-58		4.13E-01	±	2.87E+00	4.69E+00
FE-59		1.13E-01	±	7.90E+00	1.30E+01
CO-60		-5.75E-01	±	2.73E+00	4.43E+00
ZN-65		0.00E+00	±	1.12E+01	1.84E+01
ZRNB-95		0.00E+00	±	5.91E+00	9.72E+00
I-131		-4.51E+00	±	9.95E+00	1.61E+01
CS-134		-2.59E-01	±	3.27E+00	5.35E+00
CS-137		1.18E+00	±	3.22E+00	5.21E+00
BALA140		-1.02E+00	±	6.59E+00	1.07E+01
BI-214		7.69E+00	±	7.55E+00	1.33E+01

Location 102b collected 10/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.39E+01	±	4.00E+01	7.01E+01
CR-51		2.08E+01	±	3.90E+01	6.31E+01
MN-54		1.34E+00	±	3.13E+00	5.04E+00
CO-58		0.00E+00	±	3.31E+00	5.44E+00
FE-59		3.26E+00	±	7.58E+00	1.21E+01
CO-60		-1.26E+00	±	2.71E+00	4.32E+00
ZN-65		-6.94E+00	±	7.67E+00	1.21E+01
ZRNB-95		2.50E-01	±	5.26E+00	8.62E+00
I-131		-4.29E+00	±	1.23E+01	2.00E+01
CS-134		-4.92E+00	±	3.76E+00	5.94E+00
CS-137		-1.65E+00	±	3.38E+00	5.45E+00
BALA140		-3.38E+00	±	7.32E+00	1.16E+01
BI-214	+	2.23E+01	±	8.00E+00	1.18E+01

Location 102b collected 11/2/2015

Nuclide	RQ	Activity		Error	MDA
K-40		5.76E+00	±	4.76E+01	6.67E+01
CR-51		-1.15E+01	±	3.99E+01	5.59E+01
MN-54		3.14E-01	±	3.19E+00	4.06E+00
CO-58		-3.11E-01	±	4.01E+00	5.12E+00
FE-59		3.03E-01	±	1.11E+01	1.34E+01
CO-60		-6.19E-01	±	3.76E+00	4.51E+00
ZN-65		-3.81E-01	±	7.50E+00	9.30E+00
ZRNB-95		2.10E+00	±	6.04E+00	7.83E+00
I-131		-2.75E+00	±	1.58E+01	2.22E+01
CS-134		1.50E+00	±	3.45E+00	4.49E+00
CS-137		1.91E+00	±	3.28E+00	4.23E+00
BALA140		-4.57E+00	±	1.32E+01	1.52E+01
BI-214		9.23E+00	±	8.33E+00	1.16E+01

Location 102b collected 12/1/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	4.19E+01	6.89E+01
CR-51		-2.99E+01	±	4.39E+01	5.70E+01
MN-54		4.23E-01	±	3.69E+00	4.57E+00
CO-58		2.30E+00	±	3.76E+00	4.56E+00
FE-59		-1.74E+00	±	1.26E+01	1.44E+01
CO-60		1.03E+00	±	4.04E+00	4.59E+00
ZN-65		-2.54E+00	±	8.38E+00	9.75E+00
ZRNB-95		6.94E+00	±	6.75E+00	8.05E+00
I-131		-2.54E+00	±	1.09E+01	1.42E+01
CS-134		1.21E+00	±	3.98E+00	5.06E+00
CS-137		2.87E-01	±	3.71E+00	4.74E+00
BALA140		8.71E-01	±	9.51E+00	1.06E+01
BI-214	+	2.59E+01	±	1.01E+01	1.28E+01

Location 102b collected 12/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		6.39E+00	±	4.72E+01	6.77E+01
CR-51		-4.64E+01	±	5.02E+01	6.49E+01
MN-54		2.92E+00	±	3.37E+00	4.05E+00
CO-58		6.29E-01	±	4.31E+00	5.32E+00
FE-59		2.59E+00	±	1.22E+01	1.39E+01
CO-60		-1.68E+00	±	4.16E+00	4.69E+00
ZN-65		9.64E-01	±	9.08E+00	1.06E+01
ZRNB-95		7.96E-01	±	7.33E+00	9.07E+00
I-131		7.75E+00	±	1.41E+01	1.83E+01
CS-134		2.76E-02	±	3.79E+00	4.85E+00
CS-137		-1.54E+00	±	3.99E+00	5.04E+00
BALA140		3.23E+00	±	9.98E+00	1.10E+01
BI-214	+	2.20E+01	±	9.29E+00	1.23E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-7.2

GAMMA SPECTROMETRY RESULTS OF SANITARY WASTE TREATMENT WATER - SUMMARY

STATION 102B

Results in pCi/liter, corrected for decay during collection period

Nuclide	Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
K-40	1.68E+01	-1.39E+01	9.76E+01	6.64E+01	12	1
CR-51	-4.85E+00	-4.64E+01	2.22E+01	5.82E+01	12	0
MN-54	8.86E-01	-7.46E-01	2.92E+00	4.59E+00	12	0
CO-58	-3.02E-02	-1.68E+00	2.30E+00	4.96E+00	12	0
FE-59	2.37E+00	-5.22E+00	9.57E+00	1.23E+01	12	0
CO-60	-2.73E-01	-1.68E+00	1.42E+00	4.49E+00	12	0
ZN-65	-7.88E-01	-6.94E+00	2.97E+00	1.10E+01	12	0
ZRNB-95	8.37E-01	-6.94E+00	6.94E+00	9.24E+00	12	0
I-131	-1.47E+00	-5.14E+00	7.75E+00	1.85E+01	12	0
CS-134	-2.46E-01	-4.92E+00	1.50E+00	5.63E+00	12	0
CS-137	-8.81E-02	-1.65E+00	1.91E+00	4.94E+00	12	0
BALA140	-7.92E-01	-4.57E+00	3.23E+00	1.12E+01	12	0
BI-214	1.05E+01	-1.44E+00	2.59E+01	1.26E+01	12	3

TABLE B-8.1

TRITIUM IN SANITARY WASTE TREATMENT WATER

Results in pCi per liter, MDA for all samples is 300 pCi/l

Location	Description	Collection Period			RQ	Activity		Error
102B	SWTF Headworks	12/30/14	-	01/29/15		2.11E+02	±	8.58E+01
		01/29/15	-	03/02/15		1.72E+02	±	8.72E+01
		03/02/15	-	04/01/15		1.53E+02	±	8.44E+01
		04/01/15	-	05/01/15		5.46E+01	±	8.98E+01
		05/01/15	-	06/01/15		2.16E+02	±	9.19E+01
		06/01/15	-	06/30/15		1.31E+02	±	8.43E+01
		07/01/15	-	07/30/15		2.20E+01	±	8.50E+01
		07/30/15	-	08/31/15		1.04E+02	±	8.81E+01
		08/31/15	-	10/01/15		1.85E+02	±	9.82E+01
		10/01/15	-	11/02/15		1.81E+02	±	8.85E+01
		11/02/15	-	12/01/15		-1.41E+01	±	9.02E+01
		12/01/15	-	12/30/15		1.20E+02	±	8.83E+01

TABLE B-8.2

TRITIUM IN SANITARY WASTE TREATMENT WATER - SUMMARY

Results in pCi per liter

Location	Description	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
102B	SWTF Headworks	1.28E+02	-1.41E+01	2.16E+02	12	0

RQ=Results Qualifier. If blank, results is leass than dectection limit. If "+", result is above the detection limit.

TABLE B-10.1

GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES

Results in pCi per liter

Station MW-3 collected 2/25/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-5.05E+01	±	1.14E+02	1.29E+02
MN-54		-3.53E+00	±	6.50E+00	1.04E+01
CO-58		-2.34E-03	±	4.94E+00	8.09E+00
FE-59		5.63E+00	±	1.21E+01	1.90E+01
CO-60		0.00E+00	±	6.14E+00	1.01E+01
ZN-65		-4.02E+00	±	7.34E+00	1.13E+01
ZRNB-95		6.44E+00	±	9.54E+00	1.50E+01
I-131		-4.14E-01	±	6.86E+00	1.13E+01
CS-134		9.64E-01	±	6.81E+00	8.66E+00
CS-137		-2.19E+00	±	6.18E+00	9.94E+00
BALA140		-5.07E-01	±	6.00E+00	9.79E+00
BI-214	+	5.06E+02	±	3.26E+01	2.49E+01

Station MW-5 collected 2/25/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-6.82E+00	±	6.47E+01	1.13E+02
MN-54		-8.39E-02	±	4.32E+00	7.08E+00
CO-58		-1.24E-01	±	4.55E+00	7.47E+00
FE-59		0.00E+00	±	7.69E+00	1.26E+01
CO-60		1.73E+00	±	6.66E+00	7.88E+00
ZN-65		0.00E+00	±	7.05E+00	1.16E+01
ZRNB-95		-2.73E+00	±	8.52E+00	1.37E+01
I-131		-1.29E+00	±	4.27E+00	6.88E+00
CS-134		-2.46E-03	±	4.81E+00	7.89E+00
CS-137		-2.94E-01	±	4.39E+00	7.18E+00
BALA140		-3.95E-01	±	5.39E+00	8.78E+00
BI-214	+	2.21E+02	±	2.07E+01	2.22E+01

Station MW-6 collected 2/25/2015

Nuclide	RQ	Activity		Error	MDA
K-40		3.58E+01	±	5.70E+01	1.06E+02
MN-54		-1.96E+00	±	5.15E+00	8.22E+00
CO-58		-2.25E-01	±	3.35E+00	5.46E+00
FE-59		1.98E+00	±	1.01E+01	1.62E+01
CO-60		1.41E+00	±	4.38E+00	7.43E+00
ZN-65		0.00E+00	±	7.24E+00	1.19E+01
ZRNB-95		-2.14E-01	±	7.52E+00	1.23E+01
I-131		-7.15E-01	±	5.03E+00	8.17E+00
CS-134		-2.79E-01	±	9.98E+00	1.64E+01
CS-137		0.00E+00	±	6.58E+00	1.08E+01
BALA140		2.28E+00	±	5.46E+00	8.39E+00
BI-214	+	1.72E+02	±	2.08E+01	2.04E+01

Station MW-9 collected 3/4/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-7.06E-01	±	6.83E+01	1.30E+02
MN-54		-2.13E+00	±	5.11E+00	8.15E+00
CO-58		-3.15E-01	±	6.32E+00	1.04E+01
FE-59		-2.52E+00	±	1.20E+01	1.94E+01
CO-60		3.76E+00	±	4.97E+00	7.59E+00
ZN-65		-2.28E+01	±	2.03E+01	3.18E+01
ZRNB-95		-2.64E+00	±	9.48E+00	1.53E+01
I-131		4.85E+00	±	6.68E+00	1.06E+01
CS-134		-6.77E-01	±	8.05E+00	1.03E+01
CS-137		-4.31E+00	±	7.69E+00	1.23E+01
BALA140		0.00E+00	±	7.43E+00	1.22E+01
BI-214	+	5.36E+02	±	3.25E+01	2.48E+01

Station MW-10 collected 3/4/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-4.41E+01	±	1.12E+02	1.12E+02
MN-54		-5.40E-02	±	4.24E+00	6.96E+00
CO-58		-1.76E+00	±	5.04E+00	8.07E+00
FE-59		0.00E+00	±	1.32E+01	2.17E+01
CO-60		1.36E+00	±	4.73E+00	8.00E+00
ZN-65		5.47E+00	±	6.40E+00	9.12E+00
ZRNB-95		-3.55E+00	±	7.87E+00	1.24E+01
I-131		0.00E+00	±	6.73E+00	1.11E+01
CS-134		-3.61E+00	±	6.30E+00	1.01E+01
CS-137		-3.68E+00	±	6.02E+00	9.50E+00
BALA140		-8.03E-02	±	5.45E+00	8.94E+00
BI-214	+	3.57E+02	±	2.73E+01	2.27E+01

Station MW-11 collected 3/4/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-4.46E+01	±	1.02E+02	1.25E+02
MN-54		0.00E+00	±	6.35E+00	1.04E+01
CO-58		-2.34E+00	±	5.48E+00	8.75E+00
FE-59		7.59E+00	±	7.48E+00	1.03E+01
CO-60		0.00E+00	±	3.69E+00	6.07E+00
ZN-65		-1.86E+01	±	1.78E+01	2.77E+01
ZRNB-95		-2.55E+00	±	8.48E+00	1.36E+01
I-131		-9.63E-01	±	6.51E+00	1.06E+01
CS-134		1.46E+00	±	7.44E+00	9.45E+00
CS-137		-3.79E+00	±	6.46E+00	1.02E+01
BALA140		9.62E-01	±	5.77E+00	9.32E+00
BI-214	+	3.68E+02	±	2.85E+01	2.41E+01

Station MW-12 collected 3/4/2015

Nuclide	RQ	Activity		Error	MDA
K-40		3.62E+01	±	7.48E+01	1.13E+02
MN-54		5.78E-02	±	2.88E+00	4.73E+00
CO-58		1.30E+00	±	3.59E+00	5.66E+00
FE-59		8.50E-01	±	3.55E+00	9.49E+00
CO-60		2.75E+00	±	4.65E+00	8.07E+00
ZN-65		6.41E+00	±	8.29E+00	1.24E+01
ZRNB-95		1.23E+00	±	4.70E+00	7.62E+00
I-131		6.00E+00	±	6.77E+00	6.99E+00
CS-134		7.91E-02	±	1.04E+00	3.93E+00
CS-137		0.00E+00	±	5.49E-01	9.02E-01
BALA140		5.26E+00	±	6.44E+00	6.06E+00
BI-214	+	4.05E+02	±	2.82E+01	2.22E+01

Station MW-13 collected 2/25/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-5.76E+01	±	1.10E+02	1.21E+02
MN-54		-1.42E+00	±	4.91E+00	7.90E+00
CO-58		-5.84E-01	±	4.75E+00	7.74E+00
FE-59		2.03E+00	±	9.58E+00	1.53E+01
CO-60		2.62E-01	±	4.53E+00	7.40E+00
ZN-65		-6.06E+00	±	1.26E+01	2.01E+01
ZRNB-95		-1.12E+00	±	8.88E+00	1.45E+01
I-131		3.49E-01	±	5.90E+00	9.67E+00
CS-134		-5.13E+00	±	7.99E+00	1.00E+01
CS-137		-3.10E+00	±	6.07E+00	9.65E+00
BALA140		-4.72E-01	±	5.49E+00	8.92E+00
BI-214	+	1.72E+02	±	2.13E+01	2.23E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-10.1

GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES

Results in pCi per liter

Station MW-14 collected 2/25/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.01E+01	±	6.26E+01	1.09E+02
MN-54		-4.88E-01	±	4.16E+00	6.77E+00
CO-58		-1.43E+00	±	5.05E+00	8.13E+00
FE-59		-3.12E+00	±	9.76E+00	1.54E+01
CO-60		9.41E-02	±	4.36E+00	7.15E+00
ZN-65		-6.82E+00	±	1.28E+01	2.03E+01
ZRNB-95		-2.54E-01	±	8.37E+00	1.37E+01
I-131		-5.37E+00	±	8.97E+00	1.43E+01
CS-134		-1.05E+00	±	6.94E+00	8.82E+00
CS-137		4.97E-01	±	5.14E+00	8.38E+00
BALA140		-1.83E+00	±	7.58E+00	1.22E+01
BI-214	+	1.42E+02	±	1.78E+01	2.12E+01

Station MW-9 collected 4/29/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.36E+01	±	8.08E+01	1.12E+02
MN-54		1.84E+00	±	4.46E+00	7.07E+00
CO-58		-1.94E+00	±	5.36E+00	8.58E+00
FE-59		-2.92E+00	±	1.21E+01	1.93E+01
CO-60		-2.30E+00	±	6.21E+01	9.09E+00
ZN-65		-1.12E+01	±	1.43E+01	2.23E+01
ZRNB-95		-3.92E+00	±	9.96E+00	1.59E+01
I-131		5.15E+00	±	5.37E+00	8.37E+00
CS-134		3.10E+00	±	4.90E+00	7.73E+00
CS-137		3.57E+00	±	4.49E+00	6.86E+00
BALA140		-4.15E-01	±	6.41E+00	1.05E+01
BI-214	+	4.43E+02	±	2.92E+01	2.26E+01

Station MW-3 collected 4/22/2015

Nuclide	RQ	Activity		Error	MDA
K-40		3.78E+01	±	6.47E+01	1.22E+02
MN-54		4.87E-01	±	4.99E+00	8.14E+00
CO-58		1.38E+00	±	4.26E+00	6.80E+00
FE-59		-2.42E+00	±	1.13E+01	1.82E+01
CO-60		0.00E+00	±	6.83E+00	1.12E+01
ZN-65		-7.69E+00	±	1.50E+01	2.39E+01
ZRNB-95		-5.05E+00	±	1.14E+01	1.83E+01
I-131		-1.05E+00	±	6.68E+00	1.09E+01
CS-134		-6.31E+00	±	8.71E+00	1.09E+01
CS-137		-2.37E+00	±	6.54E+00	1.05E+01
BALA140		1.84E+00	±	5.89E+00	9.38E+00
BI-214	+	4.25E+02	±	2.91E+01	2.36E+01

Station MW-10 collected 4/29/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-6.73E+01	±	1.19E+02	1.18E+02
MN-54		1.24E+00	±	5.17E+00	8.36E+00
CO-58		-1.94E+00	±	5.00E+00	7.99E+00
FE-59		2.01E+00	±	1.09E+01	1.76E+01
CO-60		-3.18E-01	±	4.68E+00	7.64E+00
ZN-65		0.00E+00	±	3.19E+00	5.25E+00
ZRNB-95		-5.57E+00	±	1.00E+01	1.59E+01
I-131		-2.28E+00	±	5.98E+00	9.65E+00
CS-134		-8.45E+00	±	8.45E+00	1.34E+01
CS-137		-1.38E+00	±	5.66E+00	9.15E+00
BALA140		0.00E+00	±	6.51E+00	1.07E+01
BI-214	+	2.85E+02	±	2.57E+01	2.44E+01

Station MW-5 collected 4/22/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-2.05E+01	±	7.09E+01	1.06E+02
MN-54		5.04E-01	±	3.87E+00	6.28E+00
CO-58		9.09E-01	±	4.52E+00	7.30E+00
FE-59		3.77E+00	±	9.89E+00	1.55E+01
CO-60		5.33E-02	±	4.59E+00	7.99E+00
ZN-65		3.97E+00	±	1.10E+01	1.33E+01
ZRNB-95		5.47E+00	±	7.65E+00	1.18E+01
I-131		1.03E-01	±	5.00E+00	8.20E+00
CS-134		2.94E+00	±	4.70E+00	7.40E+00
CS-137		-1.32E+00	±	4.34E+00	6.94E+00
BALA140		-1.66E+00	±	5.59E+00	8.87E+00
BI-214	+	1.74E+02	±	1.97E+01	1.99E+01

Station MW-11 collected 4/29/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-4.09E+01	±	9.63E+01	1.24E+02
MN-54		-4.07E-02	±	4.79E+00	7.88E+00
CO-58		-6.98E-01	±	5.37E+00	8.75E+00
FE-59		6.27E+00	±	1.08E+01	1.66E+01
CO-60		-5.08E-01	±	5.49E+00	8.96E+00
ZN-65		0.00E+00	±	3.27E+00	2.23E+01
ZRNB-95		6.53E+00	±	8.16E+00	1.26E+01
I-131		-1.57E-01	±	6.39E+00	1.05E+01
CS-134		-2.47E+00	±	2.26E+01	3.71E+01
CS-137		-1.34E-02	±	5.89E+00	9.68E+00
BALA140		4.87E+00	±	5.80E+00	8.65E+00
BI-214	+	3.71E+02	±	2.63E+01	2.08E+01

Station MW-6 collected 4/22/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-4.22E+01	±	1.00E+02	1.07E+02
MN-54		-1.73E+00	±	4.55E+00	7.24E+00
CO-58		3.76E-01	±	3.15E+00	5.10E+00
FE-59		-3.18E+00	±	1.14E+01	1.82E+01
CO-60		-3.13E-01	±	5.18E+00	7.32E+00
ZN-65		1.96E+00	±	6.43E+00	1.01E+01
ZRNB-95		-1.41E+00	±	7.34E+00	1.19E+01
I-131		-6.79E-02	±	6.72E+00	1.10E+01
CS-134		-1.07E+00	±	5.11E+00	8.30E+00
CS-137		-1.82E+00	±	4.99E+00	7.97E+00
BALA140		-1.54E+00	±	6.84E+00	1.09E+01
BI-214	+	1.25E+02	±	1.87E+01	2.19E+01

Station MW-12 collected 4/29/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-5.00E+01	±	1.31E+02	1.16E+02
MN-54		2.49E-02	±	3.51E+00	5.76E+00
CO-58		2.92E+00	±	4.11E+00	6.29E+00
FE-59		-4.83E-02	±	9.57E+00	1.57E+01
CO-60		1.36E+00	±	4.87E+00	8.22E+00
ZN-65		8.95E+00	±	1.25E+01	1.47E+01
ZRNB-95		4.57E+00	±	7.93E+00	1.24E+01
I-131		8.69E-01	±	6.09E+00	9.94E+00
CS-134		3.83E-01	±	3.98E+00	6.50E+00
CS-137		1.38E+00	±	5.62E+00	9.09E+00
BALA140		4.12E-01	±	6.10E+00	9.95E+00
BI-214	+	4.02E+02	±	2.84E+01	2.27E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-10.1

GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES

Results in pCi per liter

Station MW-13 collected 4/22/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.84E+01	±	8.90E+01	1.20E+02
MN-54		1.20E-01	±	5.04E+00	8.27E+00
CO-58		-8.79E-01	±	4.84E+00	7.85E+00
FE-59		4.60E+00	±	1.09E+01	1.70E+01
CO-60		1.65E+00	±	4.22E+00	6.65E+00
ZN-65		4.16E-01	±	8.03E+00	1.31E+01
ZRNB-95		3.96E+00	±	8.36E+00	1.32E+01
I-131		-4.67E+00	±	8.24E+00	1.32E+01
CS-134		-9.22E+00	±	7.75E+00	1.21E+01
CS-137		-2.39E+00	±	5.52E+00	8.81E+00
BALA140		-4.54E-01	±	6.37E+00	1.04E+01
BI-214	+	1.22E+02	±	1.79E+01	2.36E+01

Station MW-6 collected 7/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.91E+01	±	6.93E+01	1.05E+02
MN-54		-1.19E+00	±	4.38E+00	7.03E+00
CO-58		2.30E+00	±	4.00E+00	6.18E+00
FE-59		-3.29E+00	±	1.09E+01	1.73E+01
CO-60		-2.02E-01	±	5.24E+00	7.92E+00
ZN-65		-1.77E+00	±	8.63E+00	1.39E+01
ZRNB-95		-2.81E+00	±	8.12E+00	1.29E+01
I-131		7.52E-01	±	7.32E+00	1.20E+01
CS-134		-7.48E-01	±	4.60E+00	7.48E+00
CS-137		-2.22E+00	±	5.30E+00	8.44E+00
BALA140		-1.48E+00	±	7.30E+00	1.17E+01
BI-214	+	1.14E+02	±	1.71E+01	2.01E+01

Station MW-14 collected 4/22/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-8.43E+00	±	6.11E+01	1.07E+02
MN-54		-6.68E-01	±	4.01E+00	6.49E+00
CO-58		-1.90E+00	±	4.48E+00	7.09E+00
FE-59		-9.76E-02	±	1.03E+01	1.68E+01
CO-60		-4.66E-01	±	6.33E+00	7.90E+00
ZN-65		-5.65E+00	±	1.10E+01	1.73E+01
ZRNB-95		2.87E-02	±	8.19E+00	1.35E+01
I-131		-8.90E-02	±	7.19E+00	1.18E+01
CS-134		-5.59E-01	±	7.28E+00	1.19E+01
CS-137		-4.35E-02	±	4.20E+00	6.90E+00
BALA140		2.05E+00	±	5.50E+00	8.51E+00
BI-214	+	9.71E+01	±	1.54E+01	1.95E+01

Station MW-9 collected 8/5/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.95E+00	±	6.19E+01	1.13E+02
MN-54		-1.49E+00	±	5.23E+00	8.41E+00
CO-58		-2.15E+00	±	4.81E+00	7.61E+00
FE-59		0.00E+00	±	7.83E+00	1.29E+01
CO-60		-1.21E+00	±	1.21E+01	8.26E+00
ZN-65		-1.64E+01	±	1.71E+01	2.66E+01
ZRNB-95		-6.33E-01	±	8.70E+00	1.42E+01
I-131		7.47E-01	±	6.05E+00	9.89E+00
CS-134		2.43E-02	±	5.31E+00	8.72E+00
CS-137		0.00E+00	±	7.76E+00	1.28E+01
BALA140		-1.54E+00	±	5.88E+00	9.36E+00
BI-214	+	3.41E+02	±	2.55E+01	2.16E+01

Station MW-3 collected 7/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-4.54E+01	±	1.02E+02	1.25E+02
MN-54		-3.64E+00	±	6.12E+00	9.71E+00
CO-58		-2.23E+00	±	5.34E+00	8.53E+00
FE-59		6.31E+00	±	1.18E+01	1.85E+01
CO-60		-1.39E+00	±	5.16E+00	8.29E+00
ZN-65		-1.42E+01	±	1.60E+01	2.50E+01
ZRNB-95		3.75E+00	±	8.40E+00	1.33E+01
I-131		1.53E+00	±	6.35E+00	1.03E+01
CS-134		4.01E+00	±	7.21E+00	9.01E+00
CS-137		-2.57E+00	±	6.17E+00	9.89E+00
BALA140		4.60E-04	±	6.54E+00	1.04E+01
BI-214	+	4.22E+02	±	2.77E+01	2.20E+01

Station MW-10 collected 8/5/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.42E+01	±	6.92E+01	1.20E+02
MN-54		1.21E-01	±	5.09E+00	8.35E+00
CO-58		-1.86E+00	±	4.79E+00	7.63E+00
FE-59		3.37E+00	±	1.14E+01	1.83E+01
CO-60		1.65E-03	±	4.44E+00	7.32E+00
ZN-65		-2.00E+01	±	1.69E+01	2.61E+01
ZRNB-95		1.49E+00	±	7.92E+00	1.28E+01
I-131		5.28E+00	±	5.89E+00	9.19E+00
CS-134		-4.69E-01	±	6.69E+00	8.56E+00
CS-137		-5.29E+00	±	6.93E+00	1.09E+01
BALA140		2.20E+00	±	6.47E+00	1.03E+01
BI-214	+	3.18E+02	±	2.75E+01	2.43E+01

Station MW-5 collected 7/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.06E+01	±	6.27E+01	1.07E+02
MN-54		-3.75E-02	±	5.25E+00	8.62E+00
CO-58		2.37E-02	±	3.97E+00	6.52E+00
FE-59		0.00E+00	±	1.26E+01	2.07E+01
CO-60		3.06E+00	±	6.02E+00	6.95E+00
ZN-65		2.26E+00	±	9.78E+00	1.57E+01
ZRNB-95		-6.39E-01	±	9.96E+00	1.63E+01
I-131		-1.83E+00	±	5.25E+00	8.46E+00
CS-134		8.08E-01	±	5.29E+00	8.62E+00
CS-137		-2.82E-02	±	4.55E+00	7.47E+00
BALA140		-9.55E-01	±	5.25E+00	8.43E+00
BI-214	+	1.82E+02	±	2.31E+01	2.22E+01

Station MW-11 collected 8/5/2015

Nuclide	RQ	Activity		Error	MDA
K-40		1.47E+01	±	5.73E+01	1.10E+02
MN-54		-1.90E+00	±	4.43E+00	7.00E+00
CO-58		8.23E-03	±	3.63E+00	5.96E+00
FE-59		4.08E+00	±	1.03E+01	1.61E+01
CO-60		5.96E-01	±	4.31E+00	7.47E+00
ZN-65		-1.04E+01	±	1.47E+01	2.30E+01
ZRNB-95		5.06E+00	±	8.06E+00	1.25E+01
I-131		3.45E-02	±	7.22E+00	1.19E+01
CS-134		-2.59E+00	±	6.09E+00	9.79E+00
CS-137		-1.72E+00	±	4.83E+00	7.70E+00
BALA140		-2.73E+00	±	6.64E+00	1.03E+01
BI-214	+	1.64E+02	±	2.05E+01	2.14E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-10.1

GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES

Results in pCi per liter

Station MW-12 collected 8/5/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-7.44E+00	±	6.12E+01	1.15E+02
MN-54		6.35E-01	±	5.00E+00	8.14E+00
CO-58		-2.41E+00	±	5.44E+00	8.66E+00
FE-59		0.00E+00	±	1.34E+01	2.21E+01
CO-60		-1.45E+00	±	4.79E+00	7.65E+00
ZN-65		-1.47E+01	±	1.55E+01	2.41E+01
ZRNB-95		1.19E-01	±	7.19E+00	1.18E+01
I-131		3.02E+00	±	7.93E+00	1.28E+01
CS-134		-5.81E+00	±	6.76E+00	1.07E+01
CS-137		4.00E+00	±	4.96E+00	7.66E+00
BALA140		0.00E+00	±	3.25E+00	5.35E+00
BI-214	+	1.63E+02	±	2.27E+01	2.33E+01

Station MW-5 collected 10/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40		1.32E+01	±	5.34E+01	1.04E+02
MN-54		7.24E-02	±	3.26E+00	5.35E+00
CO-58		-8.46E-01	±	4.26E+00	6.88E+00
FE-59		-4.37E-01	±	9.36E+00	1.53E+01
CO-60		-1.46E+00	±	1.49E+01	8.07E+00
ZN-65		-2.34E-02	±	6.53E+00	1.07E+01
ZRNB-95		-3.01E+00	±	9.36E+00	1.50E+01
I-131		4.25E+00	±	5.33E+00	8.37E+00
CS-134		-5.41E-01	±	4.93E+00	8.05E+00
CS-137		-1.16E+00	±	4.87E+00	7.86E+00
BALA140		2.10E-02	±	5.28E+00	8.67E+00
BI-214	+	2.35E+02	±	2.13E+01	1.92E+01

Station MW-13 collected 7/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.37E+02	±	3.69E+02	1.17E+02
MN-54		-6.99E-01	±	4.52E+00	7.34E+00
CO-58		-8.31E-01	±	4.30E+00	6.95E+00
FE-59		-3.96E+00	±	1.32E+01	2.11E+01
CO-60		1.01E+00	±	4.20E+00	6.73E+00
ZN-65		-9.37E+00	±	1.31E+01	2.05E+01
ZRNB-95		-7.36E+00	±	9.99E+00	1.56E+01
I-131		-3.75E-01	±	6.39E+00	1.05E+01
CS-134		-6.65E+00	±	6.91E+00	1.09E+01
CS-137		-2.30E+00	±	5.92E+00	9.50E+00
BALA140		-2.12E+00	±	7.34E+00	1.17E+01
BI-214	+	1.33E+02	±	1.94E+01	2.13E+01

Station MW-6 collected 10/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40		2.25E+01	±	6.88E+01	9.92E+01
MN-54		1.01E+00	±	6.11E+00	7.73E+00
CO-58		2.80E+00	±	5.15E+00	6.30E+00
FE-59		0.00E+00	±	1.40E+01	2.31E+01
CO-60		4.64E+00	±	5.32E+00	5.85E+00
ZN-65		5.00E+00	±	1.06E+01	1.26E+01
ZRNB-95		2.61E+00	±	8.48E+00	1.09E+01
I-131		-7.07E+00	±	8.92E+00	1.21E+01
CS-134		-2.38E-01	±	6.02E+00	7.94E+00
CS-137		9.71E-02	±	5.87E+00	7.74E+00
BALA140		1.19E+00	±	8.25E+00	9.57E+00
BI-214	+	9.06E+01	±	1.97E+01	2.09E+01

Station MW-14 collected 7/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-5.37E+01	±	9.69E+01	1.15E+02
MN-54		-2.08E+00	±	5.20E+00	8.31E+00
CO-58		9.25E-02	±	4.98E+00	8.17E+00
FE-59		-3.71E+00	±	1.19E+01	1.89E+01
CO-60		8.64E-01	±	4.14E+00	6.66E+00
ZN-65		-9.36E+00	±	1.30E+01	2.03E+01
ZRNB-95		-7.16E-01	±	6.69E+00	1.09E+01
I-131		5.13E+00	±	9.76E+00	1.56E+01
CS-134		-2.03E-02	±	7.08E+00	1.16E+01
CS-137		-2.90E+00	±	5.73E+00	9.10E+00
BALA140		-1.37E+00	±	7.46E+00	1.20E+01
BI-214	+	6.64E+01	±	1.45E+01	2.07E+01

Station MW-9 collected 11/11/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	7.75E+01	1.27E+02
MN-54		-5.78E+00	±	8.53E+00	1.03E+01
CO-58		-1.79E-01	±	6.71E+00	8.32E+00
FE-59		7.41E-01	±	4.59E+00	2.10E+01
CO-60		5.85E+00	±	4.94E+00	6.27E+00
ZN-65		0.00E+00	±	1.65E+01	2.72E+01
ZRNB-95		6.80E+00	±	1.22E+01	1.48E+01
I-131		1.79E+00	±	7.86E+00	1.03E+01
CS-134		5.31E-01	±	7.27E+00	9.27E+00
CS-137		-8.63E-01	±	5.85E+00	9.53E+00
BALA140		4.15E+00	±	9.26E+00	9.55E+00
BI-214	+	5.24E+02	±	2.95E+01	2.20E+01

Station MW-3 collected 10/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-1.18E+01	±	7.07E+01	1.23E+02
MN-54		-4.83E+00	±	6.92E+00	1.10E+01
CO-58		-2.46E-01	±	4.62E+00	7.56E+00
FE-59		-1.14E+00	±	1.19E+01	1.94E+01
CO-60		2.55E+00	±	4.89E+00	7.65E+00
ZN-65		3.77E+00	±	1.22E+01	1.41E+01
ZRNB-95		0.00E+00	±	9.89E+00	1.63E+01
I-131		9.29E-01	±	6.88E+00	1.12E+01
CS-134		2.79E+00	±	6.71E+00	8.43E+00
CS-137		-5.36E-02	±	6.25E+00	1.03E+01
BALA140		-9.67E-01	±	6.51E+00	1.06E+01
BI-214	+	5.30E+02	±	3.12E+01	2.29E+01

Station MW-10 collected 11/11/2015

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.48E+02	±	6.58E+01	6.37E+01
MN-54		5.97E+00	±	5.21E+00	6.08E+00
CO-58		0.00E+00	±	5.27E+00	8.67E+00
FE-59		0.00E+00	±	1.25E+01	2.06E+01
CO-60		3.70E+00	±	7.11E+00	8.25E+00
ZN-65		-2.00E+00	±	1.33E+01	1.64E+01
ZRNB-95		-8.25E-01	±	1.05E+01	1.38E+01
I-131		1.98E+00	±	6.09E+00	8.50E+00
CS-134		-8.69E-01	±	6.71E+00	8.81E+00
CS-137		1.65E+00	±	6.49E+00	8.44E+00
BALA140		2.30E+00	±	7.56E+00	8.67E+00
BI-214	+	3.54E+02	±	2.59E+01	2.04E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-10.1

GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES

Results in pCi per liter

Station MW-11 collected 11/11/2015

Nuclide	RQ	Activity		Error	MDA
K-40		1.20E+01	±	8.60E+01	1.18E+02
MN-54		1.35E+00	±	6.80E+00	8.61E+00
CO-58		-4.59E+00	±	7.69E+00	9.55E+00
FE-59		9.11E-01	±	1.79E+01	2.16E+01
CO-60		3.57E+00	±	8.03E+00	9.41E+00
ZN-65		1.07E+01	±	1.25E+01	1.46E+01
ZRNB-95		4.15E+00	±	1.07E+01	1.38E+01
I-131		9.07E-01	±	6.28E+00	8.82E+00
CS-134		1.27E+00	±	6.97E+00	9.13E+00
CS-137		-5.14E+00	±	8.03E+00	1.03E+01
BALA140		0.00E+00	±	9.17E+00	1.51E+01
BI-214	+	5.65E+02	±	3.15E+01	2.18E+01

Station MW-13 collected 10/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	7.34E+01	1.21E+02
MN-54		-1.95E-01	±	6.81E+00	8.71E+00
CO-58		-1.41E+00	±	7.10E+00	8.98E+00
FE-59		-1.97E+00	±	1.71E+01	2.05E+01
CO-60		2.25E+00	±	6.67E+00	7.85E+00
ZN-65		3.91E-01	±	1.30E+01	1.61E+01
ZRNB-95		-8.24E+00	±	1.20E+01	1.53E+01
I-131		4.39E+00	±	9.12E+00	1.26E+01
CS-134		-1.59E+00	±	6.36E+00	8.29E+00
CS-137		-5.14E+00	±	8.23E+00	1.05E+01
BALA140		-3.05E+00	±	1.33E+01	1.54E+01
BI-214	+	2.87E+02	±	2.58E+01	2.22E+01

Station MW-12 collected 11/11/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	8.05E+01	1.32E+02
MN-54		-5.76E+00	±	8.43E+00	1.02E+01
CO-58		-2.40E-01	±	7.02E+00	8.71E+00
FE-59		0.00E+00	±	1.60E+01	2.63E+01
CO-60		9.28E-01	±	8.09E+00	9.22E+00
ZN-65		-5.90E+00	±	1.65E+01	1.90E+01
ZRNB-95		4.54E+00	±	1.27E+01	1.54E+01
I-131		-3.59E+00	±	8.37E+00	1.09E+01
CS-134		-3.64E+00	±	8.50E+00	1.07E+01
CS-137		-3.64E+00	±	8.28E+00	1.04E+01
BALA140		2.70E+00	±	8.44E+00	9.25E+00
BI-214	+	6.42E+02	±	3.71E+01	2.78E+01

Station MW-14 collected 10/28/2015

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	6.03E+01	9.92E+01
MN-54		8.14E-01	±	6.11E+00	7.75E+00
CO-58		2.93E+00	±	5.77E+00	7.12E+00
FE-59		7.59E+00	±	1.49E+01	1.72E+01
CO-60		9.28E-01	±	6.57E+00	7.85E+00
ZN-65		0.00E+00	±	1.01E+01	1.67E+01
ZRNB-95		1.23E+00	±	9.07E+00	1.18E+01
I-131		-1.94E+00	±	9.11E+00	1.27E+01
CS-134		0.00E+00	±	6.12E+00	1.01E+01
CS-137		0.00E+00	±	5.24E+00	8.61E+00
BALA140		0.00E+00	±	7.77E+00	1.28E+01
BI-214	+	1.09E+02	±	1.99E+01	2.08E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-10.2

GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES - SUMMARY

Results in pCi/liter

Nuclide	Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	2.41E-01	-3.05E+00	5.26E+00	1.00E+01	36	0
BI-214	2.94E+02	6.64E+01	6.42E+02	2.22E+01	36	36
CO-58	-4.47E-01	-4.59E+00	2.93E+00	7.60E+00	36	0
CO-60	9.66E-01	-2.30E+00	5.85E+00	7.84E+00	36	0
CS-134	-1.21E+00	-9.22E+00	4.01E+00	1.02E+01	36	0
CS-137	-1.35E+00	-5.29E+00	4.00E+00	8.94E+00	36	0
FE-59	8.03E-01	-3.96E+00	7.59E+00	1.79E+01	36	0
I-131	4.50E-01	-7.07E+00	6.00E+00	1.05E+01	36	0
K-40	-1.39E+01	-1.37E+02	1.48E+02	1.14E+02	36	1
MN-54	-7.07E-01	-5.78E+00	5.97E+00	7.91E+00	36	0
ZN-65	-3.82E+00	-2.28E+01	1.07E+01	1.78E+01	36	0
ZRNB-95	1.32E-01	-8.24E+00	6.80E+00	1.36E+01	36	0

TABLE B-11.1

TRITIUM IN GROUNDWATER MONITORING WELL SAMPLES

Results in pCi per liter

Location	Collection Date	RQ	Activity		Error
MW-3	02/25/15	+	1.36E+03	±	1.18E+02
	04/22/15	+	1.16E+03	±	1.16E+02
	07/28/15	+	1.18E+03	±	1.16E+02
	10/28/15	+	1.26E+03	±	1.23E+02
MW-5	02/25/15	+	1.45E+04	±	2.85E+02
	04/22/15	+	1.44E+04	±	2.85E+02
	07/28/15	+	1.43E+04	±	2.82E+02
	10/28/15	+	1.41E+04	±	2.88E+02
MW-6	02/25/15	+	5.27E+03	±	1.84E+02
	04/22/15	+	5.17E+03	±	1.84E+02
	07/28/15	+	5.18E+03	±	1.83E+02
	10/28/15	+	5.72E+03	±	1.94E+02
MW-9	03/04/15		2.56E+02	±	8.91E+01
	04/29/15		2.49E+02	±	9.28E+01
	08/05/15		2.39E+02	±	9.27E+01
	11/11/15		1.91E+02	±	9.31E+01
MW-10	03/04/15	+	4.54E+02	±	9.45E+01
	04/29/15	+	4.60E+02	±	9.74E+01
	08/05/15	+	3.01E+02	±	9.44E+01
	11/11/15		2.35E+02	±	1.00E+02
MW-11	03/04/15	+	1.11E+03	±	1.11E+02
	04/29/15	+	1.04E+03	±	1.12E+02
	08/05/15	+	1.06E+03	±	1.13E+02
	11/11/15	+	1.16E+03	±	1.17E+02
MW-12	03/04/15	+	6.88E+02	±	1.01E+02
	04/29/15	+	6.54E+02	±	1.02E+02
	08/05/15	+	6.62E+02	±	1.03E+02
	11/11/15	+	6.05E+02	±	1.10E+02
MW-13	02/25/15	+	1.13E+04	±	2.54E+02
	04/22/15	+	1.11E+04	±	2.53E+02
	07/28/15	+	1.10E+04	±	2.51E+02
	10/28/15	+	1.14E+04	±	2.61E+02
MW-14	02/25/15		2.58E+02	±	8.89E+01
	04/22/15		1.85E+02	±	9.28E+01
	07/28/15		1.77E+02	±	9.07E+01
	10/28/15		1.51E+02	±	9.56E+01

RQ=Results Qualifier. If blank, results is leass than dectection limit. If "+", result is above the detection limit.

Table B-12.1

GAMMA SPECTROMETRY RESULTS OF CGS EVAPORATION POND WATER

Results in pCi/liter

Location Evap Pond 1A collected 3/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-4.00E+01	±	8.69E+01	1.17E+02
CR-51		-4.89E+00	±	3.80E+01	6.20E+01
MN-54		9.93E-02	±	4.16E+00	6.82E+00
CO-58		-8.51E-02	±	4.10E+00	6.73E+00
FE-59		-2.77E-01	±	9.26E+00	1.52E+01
CO-60		-1.78E-01	±	4.43E+00	7.26E+00
ZN-65		-5.18E+00	±	1.07E+01	1.69E+01
ZRNB-95		7.93E+00	±	6.90E+00	1.01E+01
I-131		-2.13E-01	±	4.62E+00	7.58E+00
CS-134		-4.06E+00	±	5.81E+00	9.20E+00
CS-137		3.38E-03	±	4.41E+00	7.24E+00
BALA140		1.80E+00	±	5.03E+00	7.91E+00
BI-214		4.40E+00	±	1.18E+01	2.13E+01

Location Evap Pond 1B collected 3/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-5.94E+00	±	5.40E+01	1.01E+02
CR-51		1.17E+01	±	2.75E+01	4.37E+01
MN-54		-1.20E+00	±	4.54E+00	7.30E+00
CO-58		1.26E+00	±	3.92E+00	6.24E+00
FE-59		0.00E+00	±	4.75E+00	7.81E+00
CO-60		-3.08E+00	±	6.71E+01	7.91E+00
ZN-65		-1.11E+00	±	8.27E+00	1.34E+01
ZRNB-95		-1.49E+00	±	7.16E+00	1.15E+01
I-131		-1.95E+00	±	5.53E+00	8.89E+00
CS-134		-1.81E+00	±	4.18E+00	6.64E+00
CS-137		2.92E-01	±	3.63E+00	5.92E+00
BALA140		2.46E-01	±	5.13E+00	8.38E+00
BI-214		4.42E+00	±	1.00E+01	1.85E+01

Location Evap Pond 2 collected 3/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-3.62E+01	±	8.10E+01	1.15E+02
CR-51		-1.97E+00	±	5.82E+01	9.55E+01
MN-54		2.48E+00	±	4.08E+00	6.34E+00
CO-58		-3.82E-01	±	4.63E+00	7.55E+00
FE-59		4.21E+00	±	1.15E+01	1.81E+01
CO-60		8.47E-01	±	4.57E+00	7.38E+00
ZN-65		3.69E-01	±	9.15E+00	1.50E+01
ZRNB-95		-7.28E-01	±	8.39E+00	1.37E+01
I-131		-3.02E+00	±	7.45E+00	1.20E+01
CS-134		-7.56E+00	±	7.68E+00	1.21E+01
CS-137		3.34E-01	±	5.17E+00	8.46E+00
BALA140		-1.08E-01	±	5.49E+00	9.01E+00
BI-214	+	2.40E+02	±	2.35E+01	2.23E+01

Location Evap Pond 3 collected 3/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		4.48E+00	±	5.35E+01	1.06E+02
CR-51		2.19E+01	±	3.56E+01	5.63E+01
MN-54		-1.68E+00	±	5.19E+00	8.32E+00
CO-58		3.02E+00	±	3.74E+00	5.60E+00
FE-59		7.63E-01	±	9.96E+00	1.62E+01
CO-60		-1.54E+00	±	1.70E+01	8.41E+00
ZN-65		-2.91E-01	±	1.02E+01	1.67E+01
ZRNB-95		3.16E+00	±	8.15E+00	1.29E+01
I-131		2.88E+00	±	5.49E+00	8.70E+00
CS-134		0.00E+00	±	6.66E+00	1.10E+01
CS-137		7.91E-01	±	5.05E+00	8.21E+00
BALA140		3.86E+00	±	5.38E+00	7.88E+00
BI-214	+	1.92E+02	±	2.18E+01	2.15E+01

Location Evap Pond 4 collected 3/30/2015

Nuclide	RQ	Activity		Error	MDA
K-40		-7.22E+01	±	1.30E+02	1.20E+02
CR-51		-7.91E+00	±	4.99E+01	8.14E+01
MN-54		1.01E+00	±	3.46E+00	5.52E+00
CO-58		-1.75E+00	±	4.65E+00	7.40E+00
FE-59		0.00E+00	±	1.52E+01	2.50E+01
CO-60		-1.01E+00	±	4.44E+00	7.14E+00
ZN-65		-2.99E+00	±	1.06E+01	1.71E+01
ZRNB-95		-1.81E+00	±	8.10E+00	1.31E+01
I-131		-2.20E+00	±	8.57E+00	1.39E+01
CS-134		-8.53E-02	±	3.77E+00	6.19E+00
CS-137		-1.97E+00	±	5.07E+00	8.09E+00
BALA140		4.56E-01	±	6.96E+00	1.13E+01
BI-214		1.23E+01	±	1.30E+01	2.25E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-13.1

GAMMA SPECTROMETRY RESULTS OF CGS EVAPORATION POND SEDIMENT

Results in pCi/kilogram

Location & Date		Evap Pond 1B		7/16/2015	
Nuclide	**RQ**	**Activity**		**Error**	**MDA**
BE-7	+	9.64E+03	±	8.94E+04	3.79E+02
K-40	+	8.33E+03	±	9.54E+04	4.68E+02
CR-51		1.55E+02	±	6.60E+02	5.67E+02
MN-54		2.70E+01	±	1.02E+01	4.23E+01
CO-58		4.86E+00	±	2.62E+00	6.65E+01
FE-59		0.00E+00	±	1.17E+02	1.95E+02
CO-60		1.55E+01	±	8.33E+00	6.09E+01
ZN-65		4.29E+01	±	3.34E+01	8.55E+01
ZRNB-95		2.31E+01	±	2.06E+01	1.07E+02
CS-134		1.09E+01	±	4.47E+00	5.09E+01
CS-137		3.22E+01	±	1.86E+01	7.03E+01
BALA140		4.18E+01	±	2.60E+01	6.07E+01
BI-214	+	4.74E+02	±	5.93E+02	1.20E+02

Location & Date		Evap Pond 3		9/16/2015	
Nuclide	**RQ**	**Activity**		**Error**	**MDA**
BE-7	+	7.83E+03	±	4.46E+02	2.06E+02
K-40	+	7.78E+03	±	5.97E+02	2.89E+02
CR-51		0.00E+00	±	2.01E+02	3.35E+02
MN-54		2.03E+01	±	2.11E+01	3.20E+01
CO-58		7.34E-01	±	1.44E+01	2.35E+01
FE-59		6.21E-01	±	4.27E+01	7.00E+01
CO-60	+	4.95E+02	±	3.49E+01	1.75E+01
ZN-65		-5.09E+01	±	6.17E+01	9.62E+01
ZRNB-95		2.96E+01	±	3.15E+01	4.75E+01
CS-134		-1.34E+00	±	6.09E+01	1.00E+02
CS-137	+	3.68E+01	±	2.46E+01	3.63E+01
BALA140		-3.93E+00	±	2.05E+01	3.29E+01
BI-214	+	6.09E+02	±	7.40E+01	7.78E+01

Location & Date		Evap Pond 4		8/18/2015	
Nuclide	**RQ**	**Activity**		**Error**	**MDA**
BE-7	+	1.35E+04	±	6.77E+02	2.90E+02
K-40	+	1.15E+04	±	8.26E+02	4.05E+02
CR-51		5.00E+01	±	2.33E+02	3.78E+02
MN-54		3.98E+00	±	2.53E+01	4.10E+01
CO-58		0.00E+00	±	2.64E+01	4.39E+01
FE-59		-1.19E+00	±	5.32E+01	8.73E+01
CO-60	+	1.24E+02	±	2.42E+01	2.49E+01
ZN-65		-3.78E+01	±	6.82E+01	1.08E+02
ZRNB-95		4.31E+00	±	3.50E+01	5.67E+01
CS-134		3.36E+00	±	6.44E+01	1.06E+02
CS-137	+	4.58E+01	±	2.79E+01	4.01E+01
BALA140		-5.19E+00	±	2.97E+01	4.76E+01
BI-214	+	6.23E+02	±	1.00E+02	8.55E+01

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-14.1

GROSS BETA IN CGS EVAPIORATION POND WATER

Results in pCi per liter

Location	Collection Date	RQ	Activity		Error	MDA
Evaporation Pond 1A	03/30/15		8.59E-02	±	6.59E-01	2.39E+00
Evaporation Pond 1B	03/30/15		3.85E-01	±	6.84E-01	2.43E+00
Evaporation Pond 2	03/30/15		1.99E+00	±	7.86E-01	2.40E+00
Evaporation Pond 3	03/30/15		-1.21E-01	±	6.65E-01	2.40E+00
Evaporation Pond 4	03/30/15		1.05E+00	±	7.29E-01	2.40E+00

TABLE B-15.1

TRITIUM IN CGS EVAPORATION POND WATER

Results in pCi per liter, LLD is 300 pCi per liter

Location	Collection Date	RQ	Activity		Error
Evaporation Pond 1A	03/30/15		1.27E+02	±	8.70E+01
Evaporation Pond 1B	03/30/15		2.38E+02	±	8.89E+01
Evaporation Pond 2	03/30/15		2.47E+02	±	8.95E+01
Evaporation Pond 3	03/30/15	+	3.48E+03	±	1.58E+02
Evaporation Pond 4	03/30/15	+	2.95E+03	±	1.52E+02

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE B-16.1

TRITIUM IN SNOW

Results in pCi per liter, LLD is 300 pCi per liter

Location	Sector	Distance from CGS, miles	Collection Date	RQ	Activity		Error
ST-101	ENE	0.22	12/29/15		1.65E+02	±	9.53E+01
ST-85	NW	0.43	12/29/15		2.14E+01	±	9.20E+01
ST-119	S	0.31	12/29/15		7.71E+01	±	9.33E+01
ST-13	SSW	1.26	12/29/15		2.53E+01	±	9.45E+01
ST-80	SSW	0.83	12/29/15		1.31E+02	±	8.55E+01
ST-88	WNW	0.17	01/14/16		1.23E+02	±	9.35E+01

TABLE B-17.1

CARBON 14 IN APPLES

Results in pCi per Kg wet mass

Location	Distance from CGS, miles	Sector from CGS	Sample Type	Collection Date	RQ	Activity		Error	MDA
Naches, WA	>65	WNW	Cntl	9/27/2015	+	7.75E+02	±	2.52E+02	4.04E+02
Naches, WA	>65	WNW	Cntl	9/27/2015		3.25E+02	±	2.22E+02	3.67E+02
Naches, WA	>65	WNW	Cntl	9/27/2015		-5.94E+01	±	2.39E+02	4.04E+02
Ellensburg, WA	>65	WNW	Cntl	8/22/2015	+	1.13E+03	±	2.47E+02	3.94E+02
St-37	5.50	ESE	Ind	9/18/2015	+	8.64E+02	±	2.78E+02	4.51E+02
St-37	4.30	ESE	Ind	9/16/2015	+	6.40E+02	±	2.43E+02	3.97E+02
St-37	4.50	NE	Ind	9/30/2015	+	5.72E+02	±	2.57E+02	4.21E+02
Prosser, WA	>20	SW	Cntl	9/18/2015		1.40E+02		2.15E+02	3.60E+02

The first three sample results from location Naches,WA were a blind triplicate analysis of the same sample

Ind = Indicator location. Cntl = Control location.

RQ=Results Qualifier. If blank, results is leass than dectection limit. If "+", result is above the detection limit.