ENERGY NORTHWEST

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U.S. Nuclear Regulatory Commission
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Energy Facility Site Evaluation Council
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Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397**
INDEPENDENT SPENT FUEL STORAGE INSTALLATION, DOCKET NO. 72-35
2011 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.b
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 TE Northstrom at (509) 377-8462.

Respectfully,

W. [signature] FOR BRADY SAWATZKE

BJ Sawatzke
Vice President, Nuclear Generation & Chief Nuclear Officer

Enclosure

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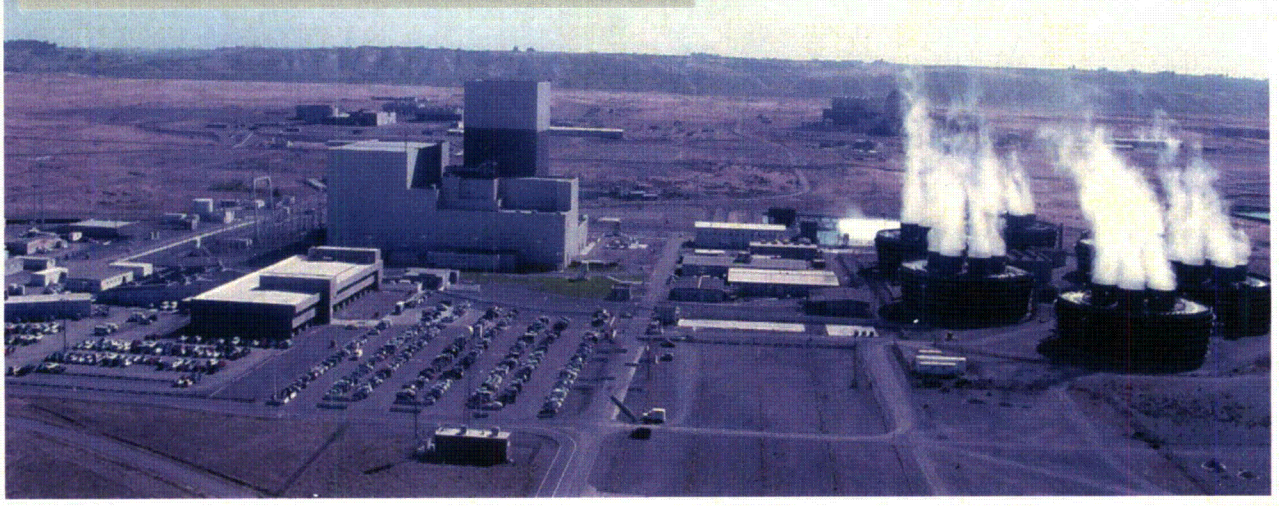
COLUMBIA GENERATING STATION

2011 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT



RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM FOR THE COLUMBIA GENERATING STATION

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RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

2011 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

For Calendar Year 2011

Preparation Date: April 2012

Submitted Date: May 2012

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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 programs results and findings for 2011.

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 and was the result of recapture of CGS effluents. All routine sample results are consistent with the results obtained from control locations, results from the preoperational period, and historical results collected since CGS began commercial operation. 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 attributable 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 2011 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. Airborne radioiodine activity identified during March and April 2011 is attributed to airborne releases from Dai-Ichi, Fukushima following the Tohoku earthquake.

Waterborne - No impact was identified at surface/drinking water locations outside the CGS controlled area. Low level tritium was identified in storm drain water and radionuclides related to CGS operation were identified in storm drain soil. All radioactivity identified at the storm drain is attributed to recapture of CGS effluents. There is some evidence that storm drain tritium may be influencing groundwater tritium at locations near the storm drain. Tritium identified in sanitary waste water is attributed to discharges made from facilities operated by the Department of Energy. Tritium activity identified in groundwater was at levels consistent with levels known to exist in Hanford groundwater. 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

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.

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.

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 offsite radiological requirements.

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

REMP: Radiological Environmental Monitoring Program.

Range: The difference between the smallest and largest results.

Restricted Area: Any area to which access is controlled for purposes of protection of individuals from exposure to radiation and 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

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

SWTF: Sanitary Waste Treatment Facility. The sanitary waste processing facility for the Columbia Generating Station, the IDC, and the Department of Energy's 400 Area.

TEDA: triethylene diamine

Thermoluminescent Dosimeter (TLD): A TLD is a phosphor that stores energy from exposure to radiation and emits that energy in the form of light when heated.

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. CGS was shut down from April to September 2011 for a refueling outage and main condenser replacement.

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 K-40, Be-7, Ac-228 (present as a decay product of Ra-228), and Ra-226. Additionally, some relatively long lived anthropogenic radioisotopes, such as Sr-90 and Cs-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.[22,23]

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 Guides 4.1,[2] 4.8,[3] and the Radiological Assessment Branch Technical Position.[4] In addition, the REMP also meets the requirements of 10 CFR 72.44(d)(2) 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[5] and 4.13.[6] The REMP also adheres to the requirements of the Washington Energy Facility Site Evaluation Council,[7] the Columbia Generating Station Technical Specifications,[8] and the Offsite Dose Calculation Manual.[9] 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 2011. The Pacific Northwest National Laboratory processed the thermoluminescent dosimeters used for the REMP in 2011.

In addition to evaluating the environmental concentrations against regulatory limits, the REMP may also compare results to state standards.[10, 11] 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[12] and 10 CFR 50[13] 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 with the Washington State Energy Facility Site Evaluation Council or are self initiated 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 twelve sampling locations (referred to as 'stations') are included in the monitoring program. More than one sample type may be collected at a sample station. One hundred and three indicator and three control stations are located within a 10-mile radius of CGS. Six additional stations are located beyond the ten mile radius of the plant, two are indicator locations and four are 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. A third security fence was added to the ISFSI in 2010.

REMP monitoring of the ISFSI is performed using quarterly and annual TLDs placed at 10 different locations on the second of three security fences that surround the facility. 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 for areas within five miles 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 2011 land use census within five miles of CGS are presented in Table 4-3. No significant changes from the 2010 land use census were observed.

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 2011 were prepared for analysis at the Energy Northwest Environmental Services Laboratory located in Richland, WA. The section 4.4 subsections below give a general overview of the sampling methods used in the REMP. Generic descriptions of the REMP sample analysis methods are given in section 4.5.

4.4.1 Direct Radiation

Direct radiation dose levels are monitored with Harshaw Model 8807 thermoluminescent dosimeters (TLDs). Two sets of TLDs are placed in the field approximately three feet above the ground at each monitoring station. One set of TLDs is exchanged on a quarterly basis (Quarterly TLDs); the other is exchanged on an annual basis (Annual TLDs).

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, serves as a control for CGS TLDs. Station 119C serves as the control for Station 119B (the cooling tower 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, which are located inside the CGS site boundary at distances that range from 0.3-0.8 miles from the reactor building centerline, are referred to as the "S" stations. The next 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 air radioiodine (I-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) are considered controls, the samples collected at the 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 monitors were used in the first half of 2011 to monitor work at the DOE 618-11 burial site.

4.4.3 Water

Water sampling is performed to meet ODCM and State of Washington EFSEC requirements, 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; eleven locations (MW-3 and MW-5 through MW-14)
- Plant Discharge Water; one location (Station 27)
- Storm Drain Water; one location (Station 101)
- Sanitary Wastewater; two locations (Stations 102A and 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 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.

Station 101 is a composite sampler that collects a representative sample of water flowing into the storm drain pond located east of CGS. The main sources of water to the pond are discharges from the potable water and plant makeup water demineralizer treatment systems. Storm water runoff from the CGS site is also directed to this location. Water discharges from CGS that have been verified to meet radiological environmental discharge limits are another potential source of water to the storm drain pond. Water is collected monthly using a flow-proportional composite sampler and analyzed for gross beta, gamma emitting radionuclides, and tritium.

The Sanitary Waste Treatment Facility (SWTF) receives sanitary waste water from CGS, the IDC (ENW Industrial Development Complex), the Kootenai Building, and the DOE 400 area. Discharge standards and monitoring requirements for the SWTF are established in EFSEC Resolution No. 300.[14] Station 102A is a flow meter and composite sampler located on the DOE 400 area sewer line before it ties into the sewer lines coming from Energy Northwest facilities. Water used at the DOE 400 area is drawn from aquifers that are known to be contaminated with tritium as a result of past DOE activities on the Hanford Site, consequently, the water sampled at Station 102A has tritium concentrations normally above 2000 pCi/liter. Station 102B is a composite sampler that collects a representative sample of water flowing into the head works at the SWTF. The sample obtained here contains water from all the Energy Northwest facilities mentioned above and the DOE 400 area. Monthly samples are collected at both Stations 102A and 102B and analyzed for gross alpha, gross beta, tritium, and gamma emitting radionuclides.

Routine quarterly grab samples are taken as part of the REMP from 11 shallow groundwater 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[15] and requirements in the CGS NPDES permit.

4.4.4 Soil

Annual soil samples are collected at the indicator Stations 1, 7, 21, and 23 as required by EFSEC Resolution No. 260.[7] A sample is also collected at a control location, Station 9A (Figure 4-3). Each sample is collected from an area of approximately one square foot to a depth of approximately one inch. About two kilograms of soil are 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. 260.[7] 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 the shallow surface sediment scooped from below the waterline. Sediment samples are dried in an oven and then analyzed for gamma emitting radionuclides on a dry weight basis.

Cooling tower sediment samples are collected and analyzed whenever cooling tower sediment is added to the disposal cells (Station 119B, Figure 4-1). Disposal in the Station 119B cells is made in accordance with EFSEC Resolution No. 299.[16] Wet cooling tower sediment samples are collected and analyzed prior to transfer to the disposal cells. Following transfer, the material is allowed to dry then an additional sample is collected within 30 days of the disposal date and analyzed.

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 (Stations 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 species generally considered

edible or potentially edible (typically carp, catfish, sucker, or whitefish). The same species are collected at each location. Electro-shocking and netting is used for most fish collection. Anadromous species are usually collected at fish hatcheries.

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 were collected in 2011 from two locations. Station 36 in Franklin County serves as the indicator location and is the only known dairy within a ten mile radius of CGS. Station 9B is in the Sunnyside/Grandview area and serves as the control location.

4.4.8 Garden Produce

Samples of local garden produce are collected monthly 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 primarily collected from areas downstream of the CGS discharge where crops are irrigated with Columbia River water. The Riverview area of Pasco is the principle collection location. Vegetable and fruit samples are also collected from locations that could potentially be influenced by CGS gaseous emissions. A small garden/vegetation area supplying broadleaf samples is maintained by Environmental Service's personnel next to the SWTF and has been designated as Station 102G. A vegetation sample was also taken from a small park area near CGS (Station 103A) in 2011. 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 Sample Analyses

General descriptions of the procedures used to analyze REMP samples are provided in the following sections. The REMP TLDs were processed by Battelle at the Pacific Northwest National Laboratory (PNNL). All routine REMP field samples were analyzed by Energy Northwest Environmental Services. 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 during 2011.

4.5.1 Analysis of TLDs

The REMP TLDs are measured at the Pacific Northwest National Laboratory on a Harshaw Model 8800 hot gas reader. The reader is calibrated weekly and immediately prior to processing the environmental TLDs. The reader is calibrated with TLDs that have been given a known exposure from a Cs-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 they are 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.

4.5.2 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 at greater than 10 times the yearly mean of the control samples, gamma isotopic analysis is performed on the individual samples as required by ODCM Table 6.3.1-1 2c.

4.5.3 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 canisters. Samples 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 if needed ground. 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 tarred 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 mount and side count positions. If I-131 is 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.

4.5.4 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 done under a heat lamp. Residue mass is determined by weighing the planchet before and after mounting the sample. The planchet is counted for alpha/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.

4.5.5 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.

4.5.6 Sr-90, Fe-55 and Ni-63 in Water

No Sr-89/90, Fe-55 or Ni-63 analyses were performed in 2011. When needed, these analyses are performed under contract by Teledyne Brown Radiological Laboratory Services using standard procedures developed by this vendor for these analyses.

4.5.7 Low Level Iodine-131 in Milk and Water

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

4.6 Data Analysis Methods

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 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 a common practice in environmental analysis 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 easy 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 terms of the net mR/day exposure rate. These results are determined from the total exposure (in mR) calculated for each TLD minus the TLD background and any transit (or trip) exposure received during distribution and retrieval, and divided by the number of days the TLD was in the field. The total mR/standard quarter and mR/year values are also reported (see Tables 5-3, 5-4). All TLD results are reported in units of exposure (Roentgen) and not in units of dose (Rem).

The quarterly TLD results are compared with the annual TLD results and expressed as a ratio by dividing the sum of the quarterly results over the annual results (See Appendix A, Table A-1.1). The agreement between the two sets is usually within plus or minus ten percent (10%); occasionally fade can be more significant than expected in the annual set and the results may be lower than the sum of the quarterly data.

4.7 Changes to the Sampling Program in 2011

There were no major changes made to ODCM or EFSEC Resolution No. 260[7] mandated sampling in 2011. Sampling and analysis of shallow groundwater wells around CGS was continued as a routine part of the REMP. Garden produce sampling methodology was modified to provide more indicator samples and fewer control samples. Garden produce sampling was also expanded to provide samples from locations that could be influenced by CGS gaseous emissions. Samples from Station 91 were designated as Station 37 starting in 2011. Station 91 was a small orchard within the broader station 37 designation, referring to these samples as station 37 is consistent with standard naming designations used in the REMP. Additional garden produce sample location information is maintained in the REMP database. Efforts were made to revise the REMP sampling agreement with the State of Washington in 2011. EFSEC resolution No. 332 will replace EFSEC resolution No. 260[7] starting January 2012.

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 (6/12)[d]	1, 4-8, 9A, 21, 23, 40, 48, and 57	Continuous sampling; weekly collection.	Weekly air filter 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 and annual collection.	Radiation exposure monitoring processed on a quarterly and annual frequency.
WATERBORNE			
River/Drinking Water[h] (3/3)	26, 27 and 29	Composite aliquots[i]; monthly collection.	Monthly gamma isotopic, gross beta, and tritium. I-131[j] as required.
Storm Drain Water (0/1)	101	Composite aliquots[i], monthly collection.	Monthly gamma isotopic, tritium, and gross beta.
Sanitary Waste Treatment Facility Water (0/2)	102A, 102B	Composite aliquots[i], monthly collection.	Monthly gamma isotopic, gross beta, gross alpha, and tritium.
Ground Water (2/3)[k]	31, 32, and 52	Grab sample performed quarterly.	Quarterly gamma isotopic and tritium.
Ground Water Monitoring (0/11)[e]	MW-3, 5-14	Grab sample performed quarterly .	Quarterly gamma isotopic and tritium.
SOIL AND SEDIMENT			
Soil[f](0/5)	9A, 1, 7, 21 and 23	Grab sample performed annually.	Annual gamma isotopic. Sr-90[f] as needed.
River Sediment (1/2)[l]	33 and 34	Grab sample performed semiannually.	Semiannual gamma isotopic.
Cooling Tower Sediment Disposal Area (0/2)	119B, 119C	Grab sample of dried sediment within 30 days of disposal date.	Gamma Isotopic as needed.
INGESTION			
Milk[m] (2/2)	9B, 36	Grab sample collected semimonthly during grazing season, monthly at other times.	Gamma isotopic, I-131, Sr-90.[n]
Fish[o] (2/2)	30, 38	Grab samples collected annually.	Gamma isotopic.
Garden Produce[p] (1/4)	9C, 37, 102G , 103A[q]	Grab samples collected monthly or at time of harvest.	Gamma isotopic.

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 Resolution 260 requirements and 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 260 specifies nine. Not listed in Table 4-1 are four other air sample locations established to monitor remediation work at the DOE 618-11 burial ground. See Section 5.9.6 for details.

(e) Sampling is performed to meet NEI 07-07 guidelines and NPDES requirements.

(f) Soil samples are collected at five air-sampling locations to satisfy EFSEC Resolution 260 requirements. This resolution also requires Sr-90 analysis be performed on any indicator soil sample having gamma results greater than ten times the result for the control location. Cs-137 activity has historically been used as the gamma results parameter.

(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 260 requires 25 or more TLD stations to be located within a 10-mile radius of CGS. Other instruments, such as a pressurized ion chamber (PIC), may be used in place of or in addition to TLDs as per ODCM Table 6.3.1-1 1b. CGS REMP maintains a uRem meter for this purpose.

(h) The term "river/drinking water" is used throughout this report because the drinking water is taken from the Columbia River. Station 26, CGS makeup water intake from the Columbia River is both an upstream water sample and the drinking water sample location. Station 29 is a downstream drinking water sample. The Station 27 sample, which is drawn from the plant discharge line, is taken in place of a "downstream" water sample near but beyond the mixing zone. It reflects the radioactivity present in the plant discharge prior to any river dilution. EFSEC Resolution 260 requires two drinking water locations downstream from the plant discharge and requires sampling from the plant intake and discharge water. Only one drinking water station is now sampled after DOE closed the intake at the 300 Area (Station 28) in 1998.

(i) Composite samples are collected using automatic sampling equipment that collects an aliquot at time intervals that are short relative to the compositing period.

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

(k) EFSEC Resolution 260 requires sampling from wells used for fire protection and as backup drinking water sources.

(l) EFSEC Resolution 260 requires sediment sample collection upstream and downstream of the plant discharge.

(m) Milk samples will be obtained from farms or individual milk animals that are located in the most prevalent wind directions from CGS. EFSEC Resolution 260 requires at least three milk locations within the 10-mile radius of the plant and one in a control location, however, ENW currently has access to only one dairy within a 10-mile radius of the plant (Station 36) and one control location at 30 miles. Broadleaf vegetation can be sampled in lieu of milk if a representative milk sample is not available.

(n) ODCM Table 6.3.1-1 4k requires that if Cs-134 or Cs-137 is measured in an individual milk sample in excess of 30 pCi/liter, then a Sr-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 4i. 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. Garden produce sampling was expanded in 2011 to include produce from areas that could be affected by CGS effluents.

(q) Station 102G is a small garden/vegetation area located by the SWTF. Station 103A is a small park area located by the Kootanai building (EOF). Station 102G is maintained by REMP personnel and used to provide broad leaf vegetation samples, sampling at station 103A involves collection of broadleaf vegetation from trees and shrubs. Both stations are sampled at CGS initiative, neither station meets the ODCM criteria for a garden requiring sampling.

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		
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
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		
	101	0.22			SW
	MW-7	0.30			SGW
	MW-8	0.26			SGW
	MW-11	0.10			SGW
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	5.16	TLD		
	151 (Site 4)	0.83			TLD
	MW-12	0.12			SGW
ESE (6)	76(6S)	0.42			TLD
	31	1.06	DGW	DGW	
	32	1.27		DGW	
	51	2.14	TLD		

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)(cont.)	23	3.03		TLD, AP/AI, SO	
	34	3.32	SE	SE	
	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, SE
	102B	0.50		SFW	
	102D	0.50			SFW, SE
	102G	0.56			GP/VE
	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	
	102A	0.67		SFW	
	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)	13	1.26	TLD	TLD	
	81(11S)	0.74			TLD
	103A	0.63			VE
	90	0.62			TLD, AI/AP
	MW-5	0.43			SGW
WSW (12)	82(12S)	0.57			TLD
	14	1.26	TLD	TLD	
	9A	28.35	TLD, AP/AI	TLD, AP/AI, SO	
	9B	32.82	MI	MI	
	9C[i]	32		GP	
	89	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	0.17			TLD, AI/AP
	MW-10	0.07			SGW
NW (15)	85 (15S)	0.43			TLD
	49	1.19	TLD	TLD	
	87	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 station are given in parentheses; i.e., TLD Stations 71-86 are also referred to as 1S-16S.

(c) Distances are from GPS positions for each location as a radial distance from CGS reactor building.

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

(e) STATE - State of Washington EFSEC Resolution requirement.

(f) OTHER –Special study stations. TLD Stations 121 through 138 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. Note station 37 also refers to samples collected in Franklin County that could potentially be affected by CGS 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.

TABLE 4-3
2011 FIVE MILE LAND USE CENSUS RESULTS

SECTOR[a]	NEAREST RESIDENT[b]	GARDEN (>500 ft^2)	DAIRY ANIMALS	LIVESTOCK[b,c]
NE	4.47	none	none	none
ENE	4.01	none	none	4.96
E	4.59	none	none	4.65
ESE	4.24	none	none	4.52
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.

(c) 25 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. 2 horses and a mature goat were observed in a small fence area near a residence in the E sector. Animals were observed to be fed hay. Three horses were observed in ESE sector. There is no pasture at this location and the animals appear to be fed hay.

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	7	15
	Cs-137	7	18
	Ba-La-140	10	15
	Sr-90	1	---
Garden Produce:	Cs-134	10	60
(pCi/kg wet)	Cs-137	10	80
	I-131	12	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 I-131 LLD achieved by anion resin separation and does not represent a direct analysis of the sample media.

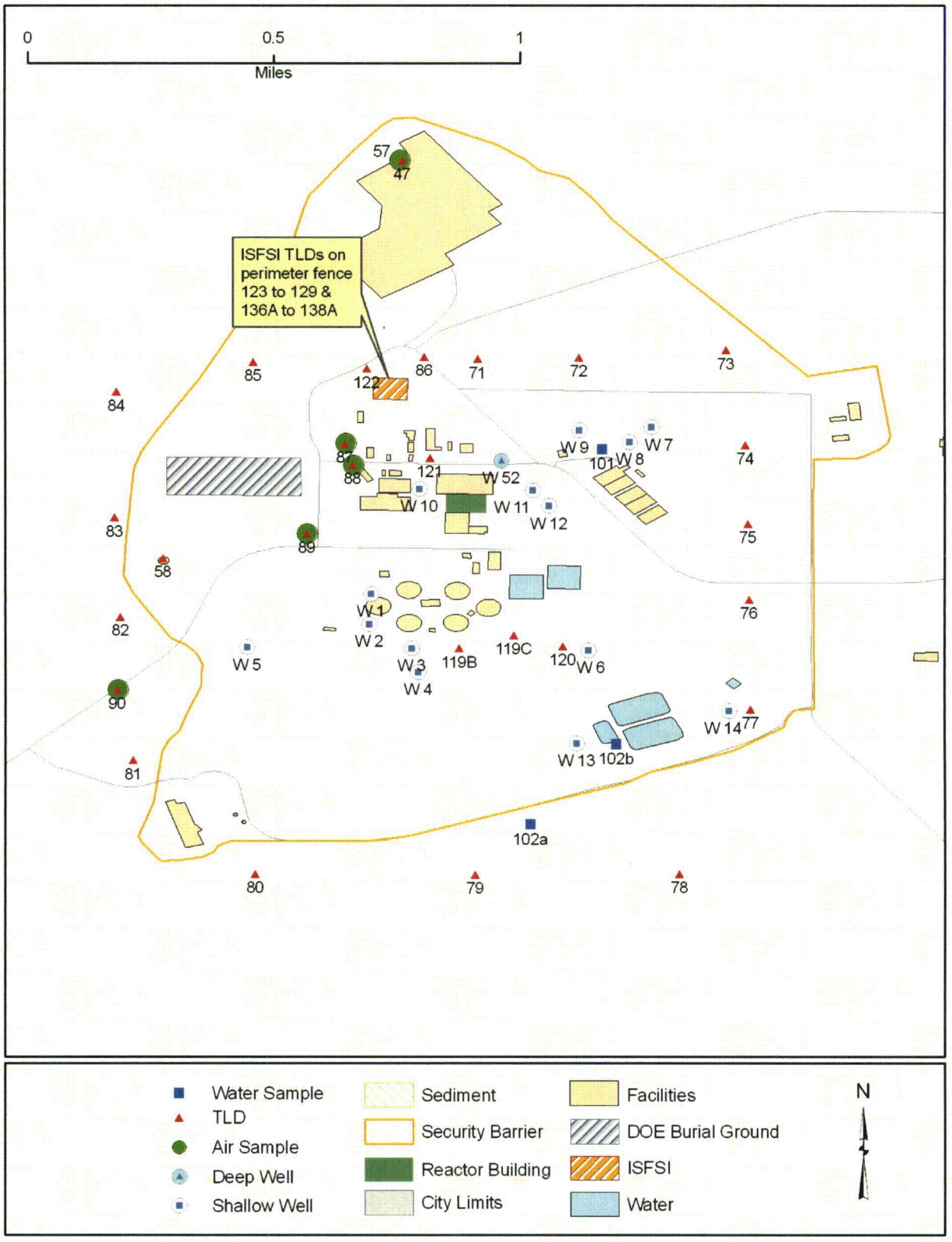

FIGURE 4-1 SELECT REMP SAMPLING LOCATIONS WITHIN 0.8 MILES OF CGS

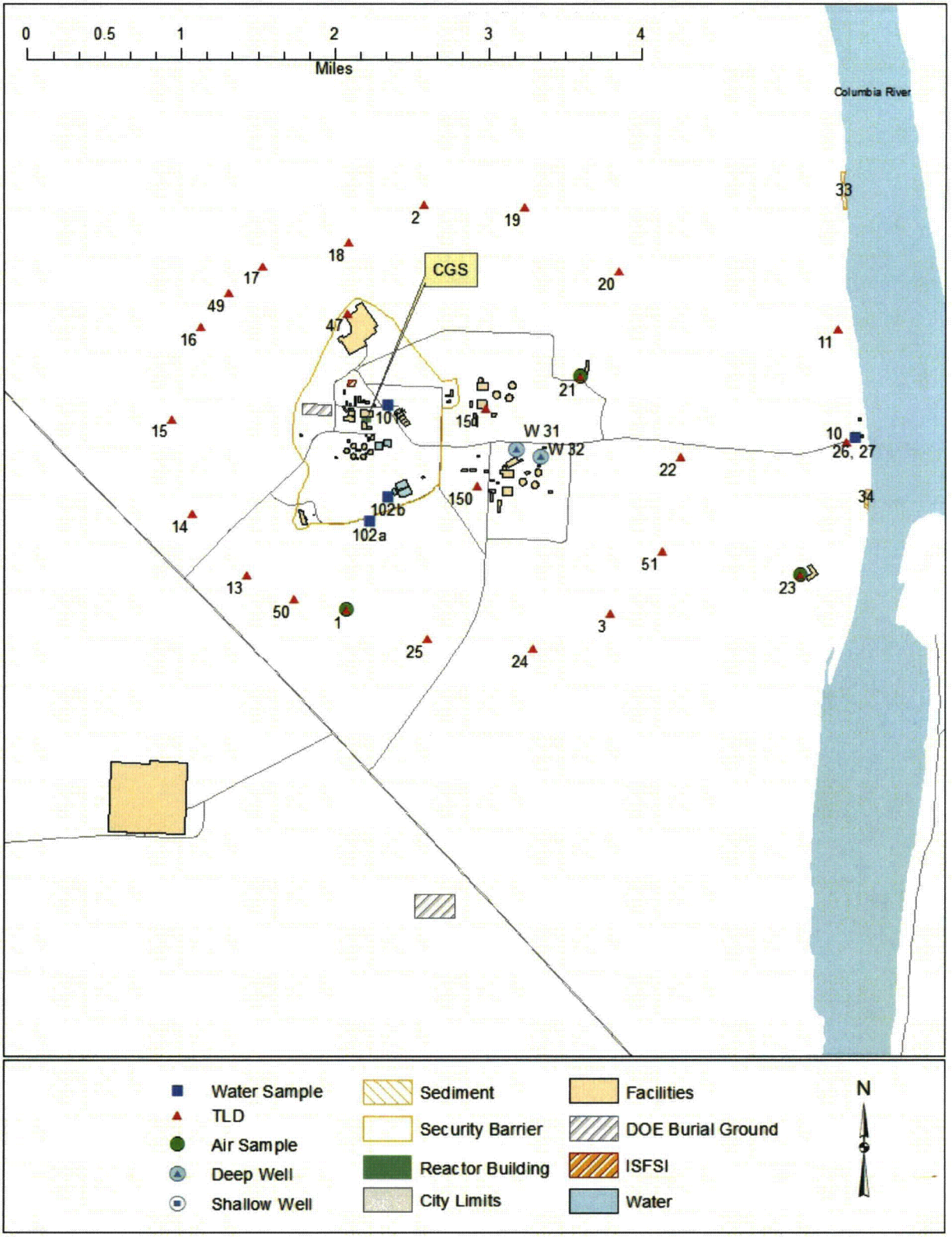

FIGURE 4-2 SELECT REMP SAMPLING LOCATIONS BETWEEN 0.8 AND 2.8 MILES

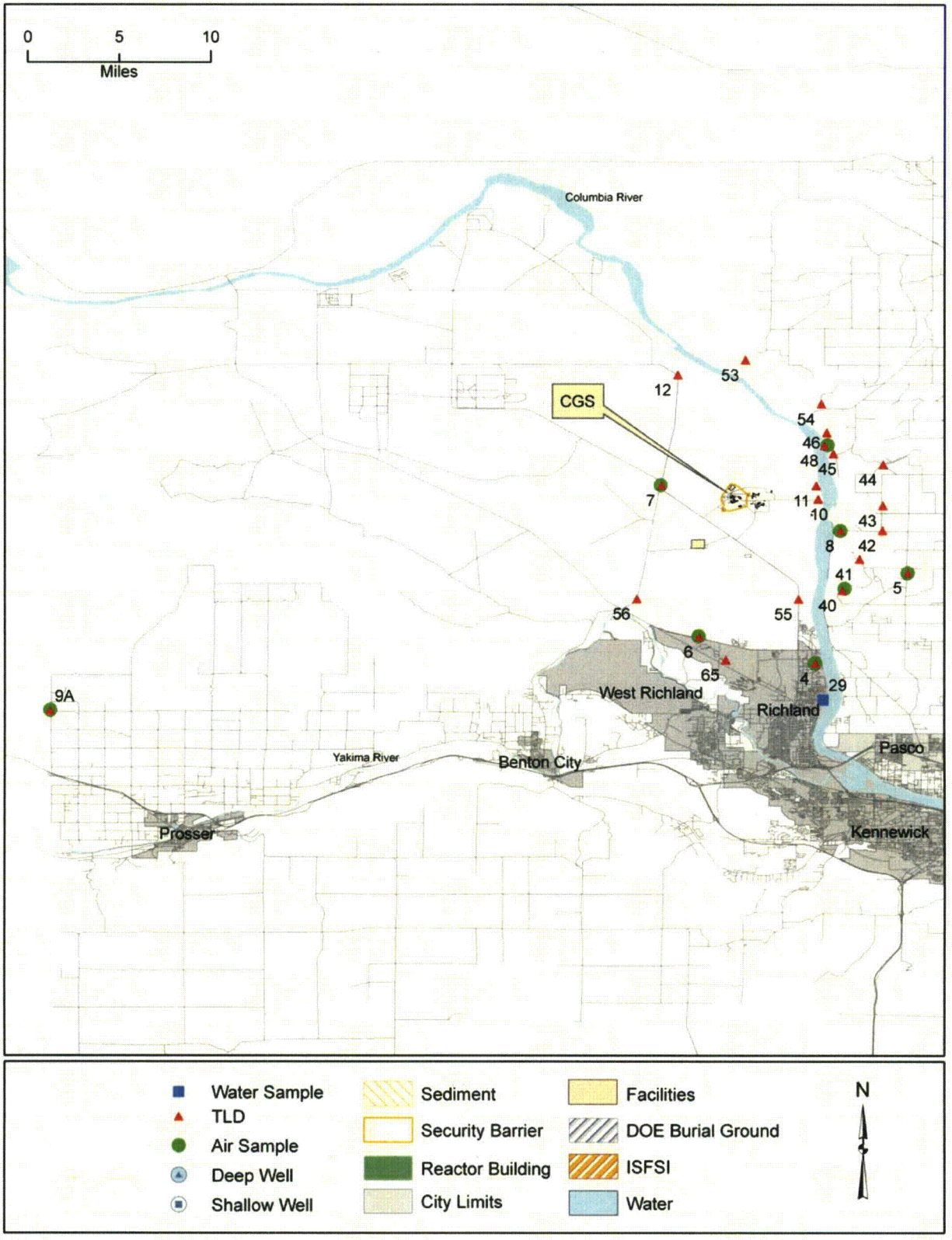

FIGURE 4-3 SELECT REMP SAMPLING LOCATIONS BEYOND 2.8 MILES

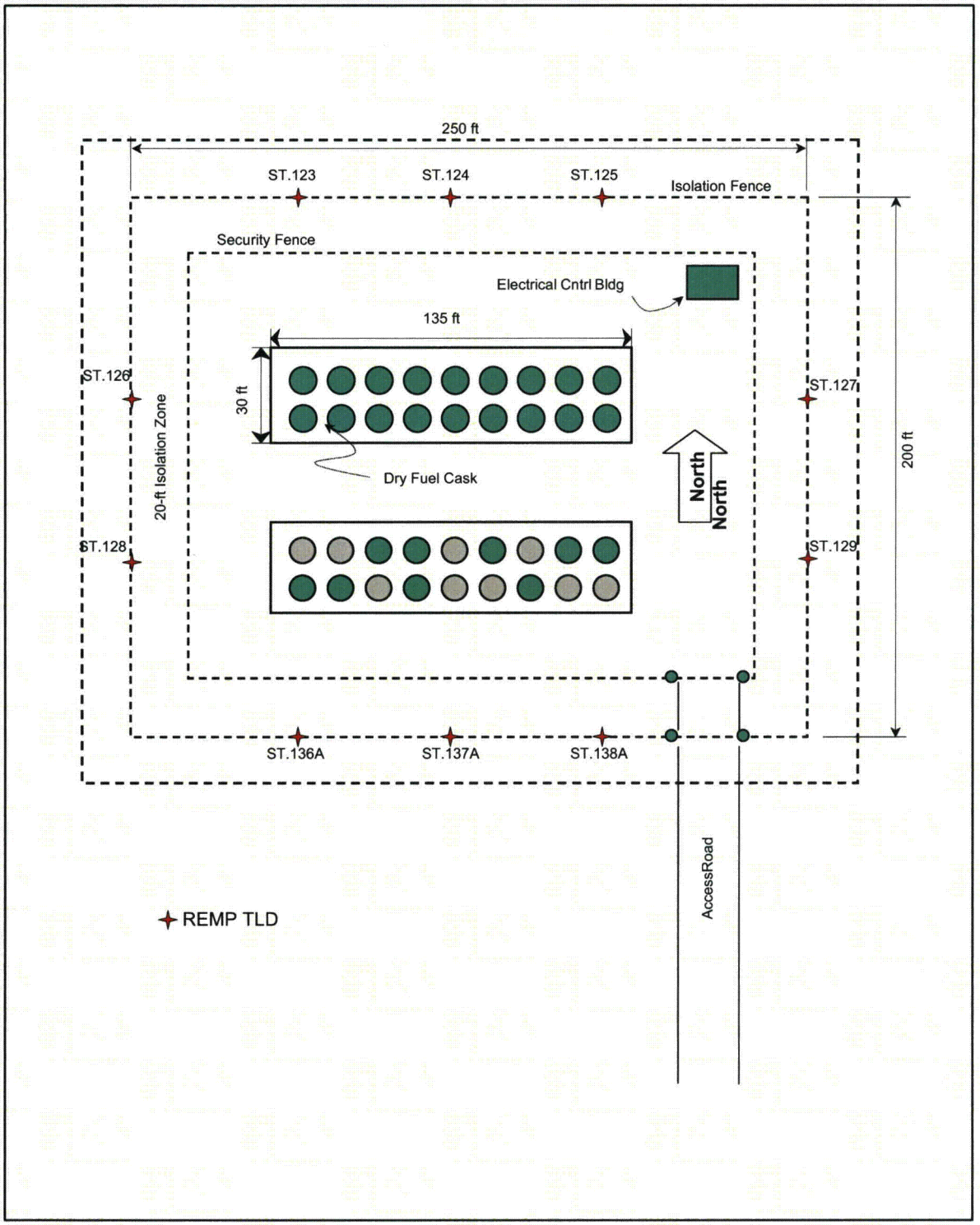

FIGURE 4-4 ISFSI TLD STATION LAYOUT

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 Battelle at the Pacific Northwest National Laboratory (PNNL). All other routine CGS REMP samples were 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 in Regulatory Guide 4.8. Results for naturally occurring radionuclides that are not related to CGS operations have not been included in the summary table. The lower limits of detection (LLDs) 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 and summarize the results in greater detail.

5.1 Direct Radiation

Direct radiation is monitored at 79 TLD locations surrounding CGS. TLDs are exchanged on a quarterly and annual 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 2011 "S" station mean quarterly TLD results separated into sixteen 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 - 2010 operational period for comparison. The 2011 results were lower than the 1984-2010 operational mean in all sectors except the NNW. The lower results, especially in the N and NNE sectors, were influenced by the extended plant shut down and the resulting lower dose rates around the turbine building. Excluding the NNW sector, the average deviation relative to the preoperational period was -3.6%; in 2010 the average was -0.85%. 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.

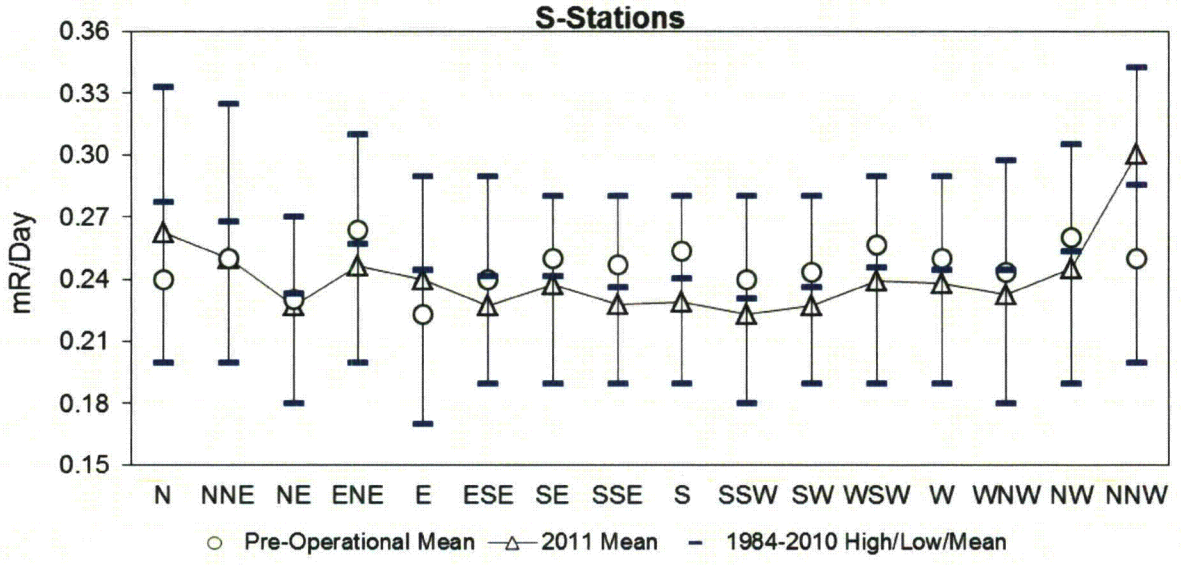

Figure 5-1 "S" Stations Quarterly TLDs 1984-2010 Hi/Low/Mean and 2011 Mean by Sector

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 1984-2010 operational period for comparison. Results for all 16 sectors were below the preoperational and long term operational means. The average deviation relative to the preoperational period was -2.8%, in 2010 the average deviation was -2.3%.

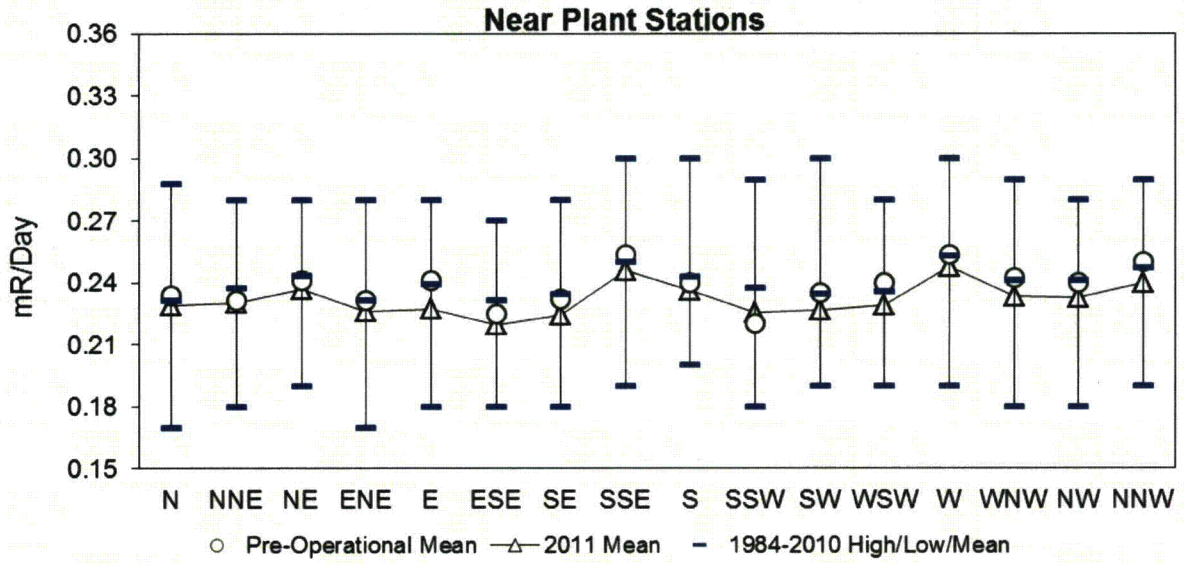

Figure 5-2 Near Plant Stations Quarterly TLDs 1984-2010 Hi/Low/Mean and 2011 Mean by Sector

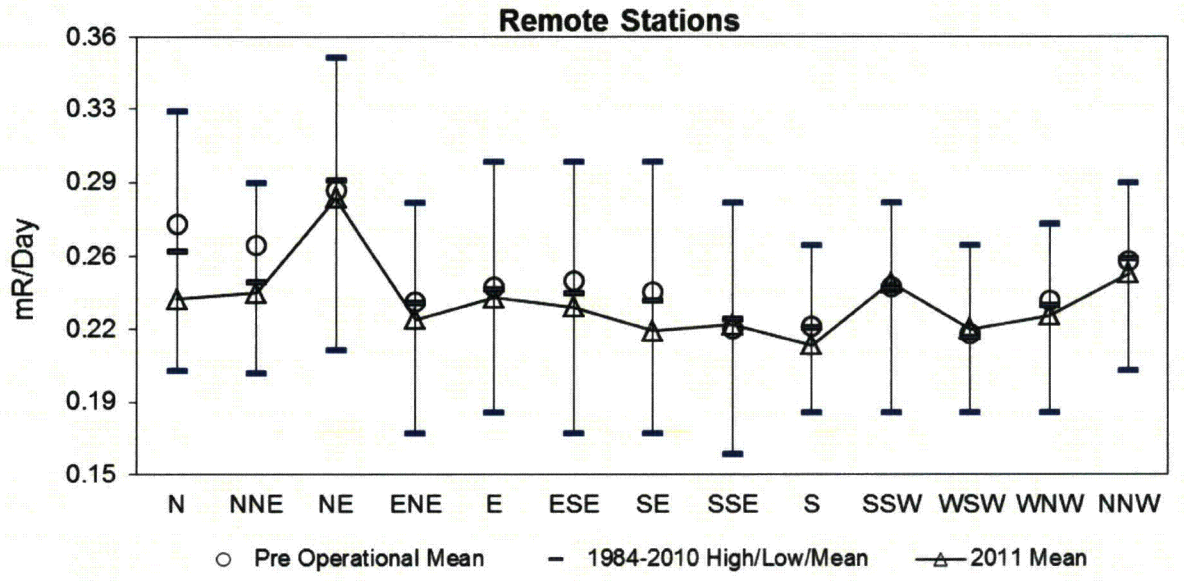

Figure 5-3 Remote Stations Quarterly TLDs 1984-2010 Hi/Low/Mean and 2011 Mean By Sector

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 1984-2010 operational period for comparison. 2011 results were lower than the pre operational mean in 10 of 13 sectors and lower than the operational period means in 11 of 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 preoperational measurement phase and is attributed to differences in the underlying rock and soil composition in this area. The 2011 average deviation relative to the preoperational period was -3.7%, the average deviation in 2010 was also -3.7%.

Offsite direct radiation monitoring results are consistent with previous years. The 2011 results indicate no measurable dose contribution due to plant operations at locations outside the CGS controlled area. Dose contributions inside the CGS controlled 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. Dose rates from locations near the turbine building were noticeably lower in the 2nd and 3rd quarters due to plant shutdown. Environmental radiation exposure rates for 2011, the preoperational phase, and the long term operational phase are summarized in Tables 5-3 and 5-4. See also Appendix A, Tables A-1.1 and B-1.1 for comparisons of the 2011 annual and summed 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 radioactive iodines on a weekly basis. Air filters are also composited and analyzed for gamma emitting nuclides quarterly.

The 2011 average particulate filter gross beta results for the five stations sampled weekly and 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 locations are within the range observed in previous years and closely follow the trend observed for the control location.

Figure 5-5 is a plot of the 2011 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). A similar trend to that seen with the near plant station was observed with all results trending closely to the control.

For both the near and remote air station results, increases above the trend line in January and December are attributed to weather induced background fluctuations. Gross beta levels typically increase during periods of inversion occurring in the winter months due to natural decay products being trapped near the surface. Gross beta results plotted over a period of several years typically show a cyclical pattern of winter increases. Gross beta results higher than the normal trend range were also observed during weeks 12, 13, and 37. The increase during weeks 12 and 13 is attributed to radioactivity from the Fukushima accident in Japan. Gamma analysis of air particulate filters, iodine cartridges, and rainwater samples during this time period identified the presence of radioiodine in the environment. Sampling results during the Fukushima accident are discussed in greater detail in section 5.9.7.

The increase seen in week 37 is believed to be due to a short term increase in Be-7 levels resulting from solar flare activity. Be-7 is produced in the upper atmosphere by the interaction of cosmic rays and Li-7. Higher gross beta readings and Be-7 levels were observed in Eastern Washington following solar flare activity on Sept 7. Control location gross beta results were observed to have increased correspondingly during all periods when indicator gross beta results were above the trend range. This further indicates that the increases are not attributable to CGS operation.

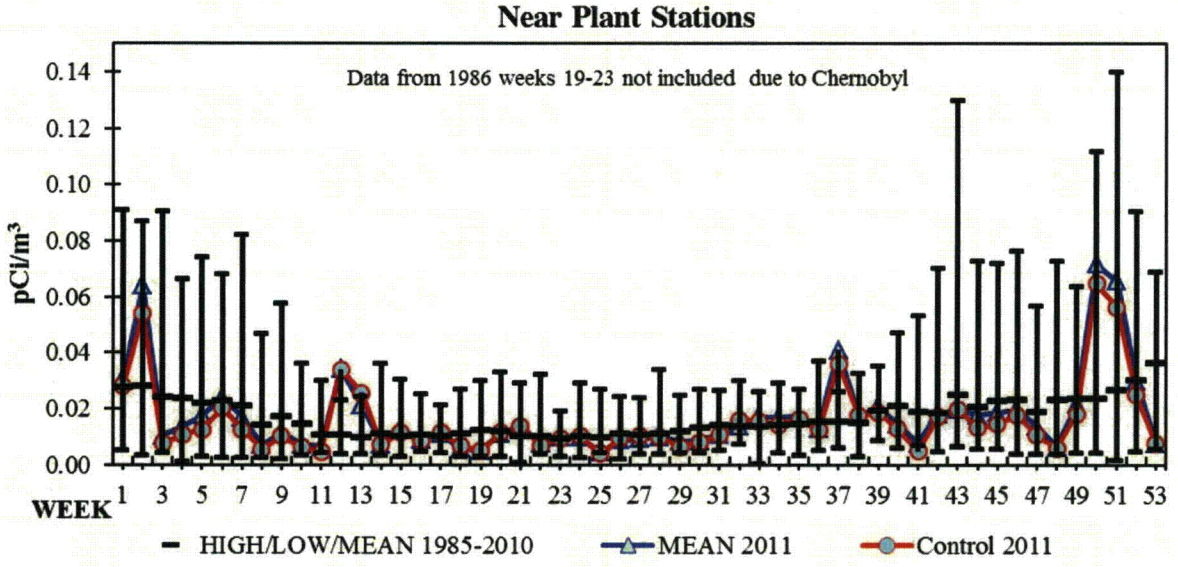

Figure 5-4 1985-2010 Weekly Hi/Low/Mean and 2011 Weekly Mean Gross Beta in Air - Near Plant Stations

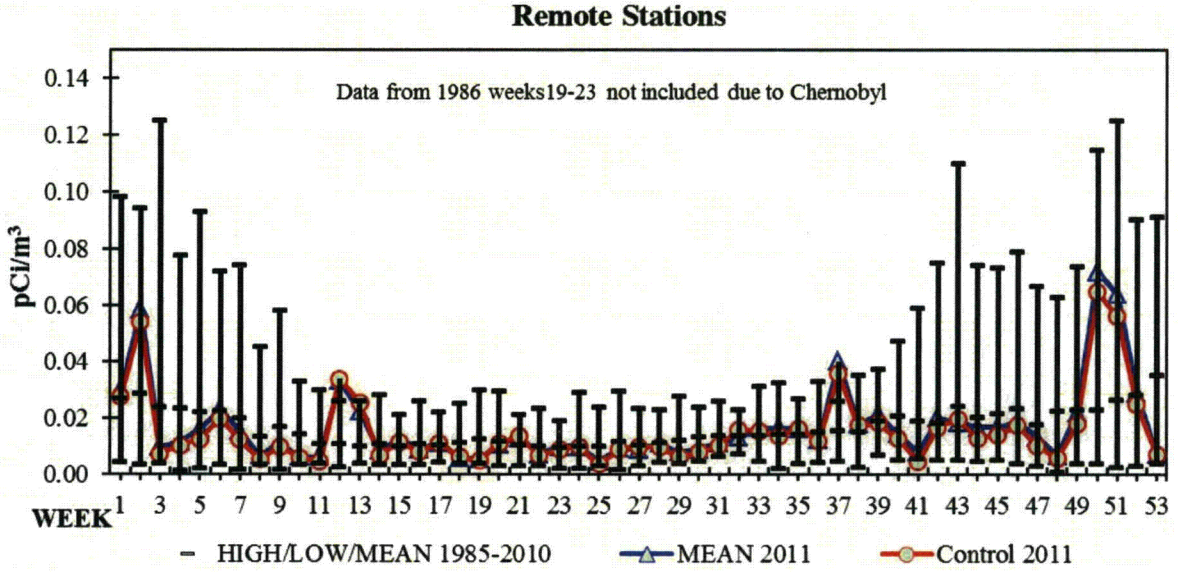

Figure 5-5 1985-2010 Weekly Hi/Low/Mean and 2011 Weekly Mean Gross Beta in Air - Remote Stations

The quarterly particulate filter gamma isotopic results identified the presence of only naturally occurring radionuclides (See Appendix A, Tables A-3.1, A-3.2). Be-7 was positively identified in all samples at both the indicator and control locations. Isotopic analysis was performed on each weekly air particulate filter for a 2 week period following the Fukushima accident. Only low level Iodine 131 was identified on these air particulate filters. See section 5.9.7 for further discussion of sample results during the Fukushima accident.

Iodine-131 was positively identified on all weekly iodine cartridge samples during the 3-15-11 to 4-12-11 time frame. The Iodine 131 activity identified is attributed to the Fukushima accident and was not the result of CGS operation. All other weekly iodine cartridge results for the year showed no indication of Iodine 131 in any of the samples (See Appendix A, Tables A-4.1, A-4.2). See section 5.9.7 for further discussion of sample results during the Fukushima accident.

Based on these results, there is no evidence of any measurable environmental radiological air quality impact that can be attributed to CGS plant operation during 2011.

5.3 Water

5.3.1 Surface Water

Composite water samples are collected from 6 surface water locations monthly and analyzed for tritium, gross beta, and gamma emitters. No plant discharge sample (Station 27) was collected in July due to Circulating Water Basin drain down and failure of the composite sampler late in the month. A plot of the 2011 gross beta results for the plant intake, plant discharge, and river/drinking water stations are shown in Figure 5-6.

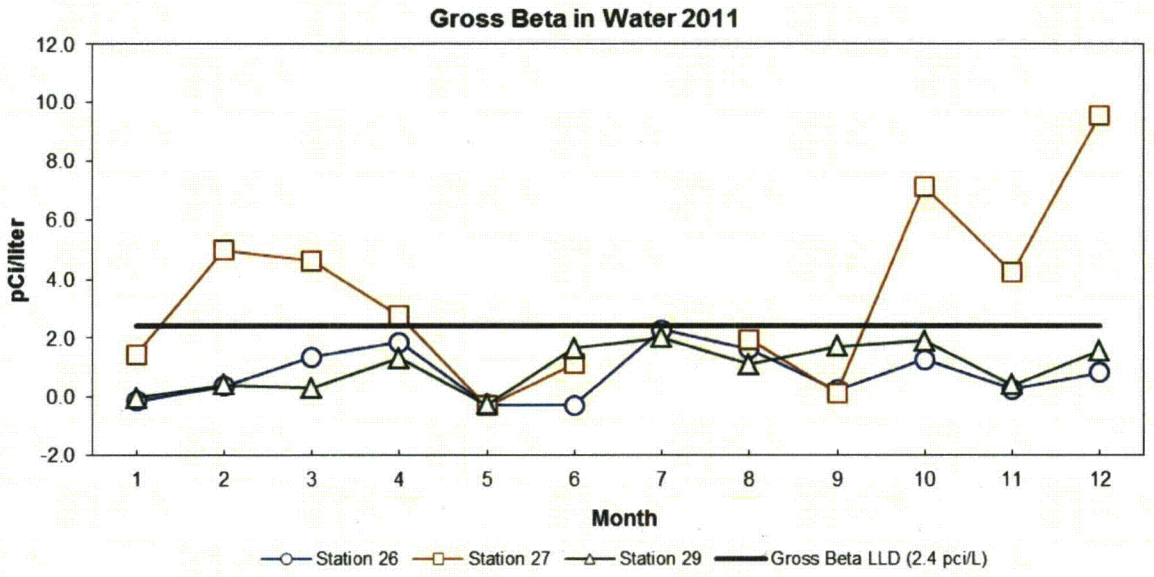

Figure 5-6 Gross Beta in River/Drinking (Stations 26 & 29) and Plant Discharge Water (Station 27) for 2011

All drinking and river water (Stations 26 and 29) gross beta results except one were below the analysis method *a priori* LLD (See Appendix A, Tables A-5.1, A-5.2). The one exception was the July Station 26 sample that was just slightly above the LLD. Gross beta levels in the plant discharge water (Station 27) were higher than the analysis level LLD during plant operational periods. This is the normal observation as natural radioactivity is concentrated in the discharge water due to evaporative loss and the scrubbing action of the cooling towers which incorporates atmospheric particulate material into the water. Historically, higher gross beta results at Station 27 have been observed during periods when CGS circulating water was maintained at higher levels of concentration. The discharge sample results are representative of the radioactivity present in plant discharge water before any mixing with river water occurs.

Tritium results for all plant intake, plant discharge, and river/drinking samples were below the analysis method *a priori* LLD. (See Appendix A, Tables A-6.1, A-6.2). This is consistent with results seen in previous years. Tritium results for the three sample locations are plotted in Figure 5-7.

Gamma spectroscopy results for all plant intake, plant discharge, and river/drinking samples showed no indication of any gamma-emitting radionuclides of interest being present (See Appendix A, Tables A-7.1, A-7.2).

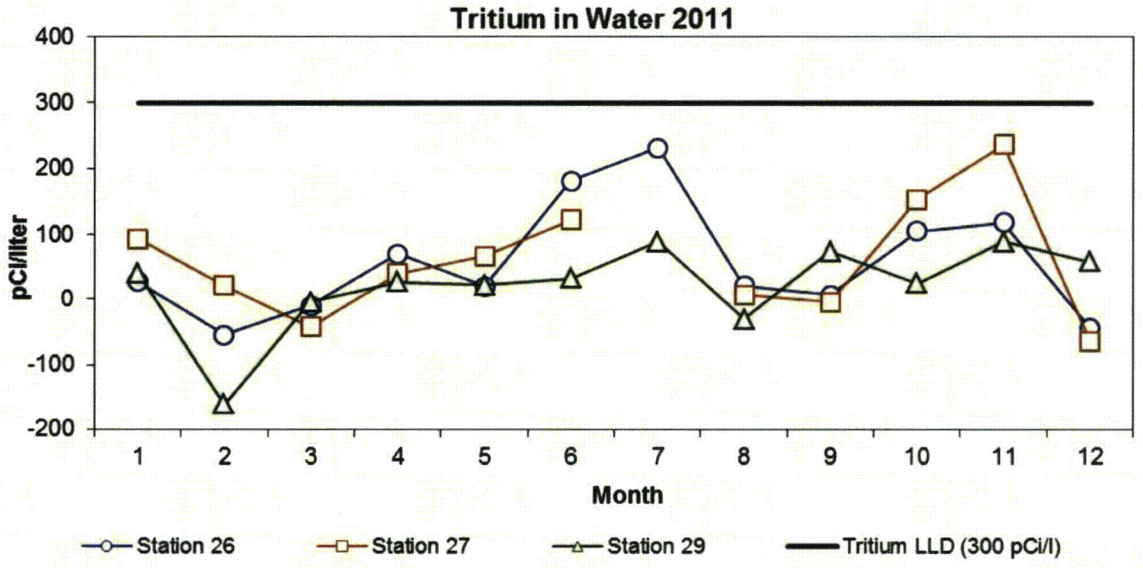

Figure 5-7 Tritium in River/Drinking (Stations 26 & 29) and Plant Discharge Water (Station 27) for 2011

There is no evidence of significant impact to the environment due to CGS plant operations in the plant intake, plant discharge, or river/drinking water results analyzed in 2011. Composite water samples are also taken from two sanitary waste sample locations and one 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. 260[7] requirements. Quarterly samples were also collected from eleven 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. No gamma emitting radionuclides of interest or tritium was identified in any of these samples (See Appendix A, Tables A-6.1, A-6.2, A-7.1, and A-7.2).

The CGS ground water monitoring program is conducted to meet the Nuclear Energy Institute (NEI) Groundwater Protection Initiative (NEI 07-07)[15] guidelines and to support NPDES licensing requirements. The eleven shallow wells allow water to be sampled from the unconfined aquifer 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.[17] 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 eleven 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 in these samples ranged from < LLD to 16,300 pCi/liter (See Appendix A, Table B-11.1). Tritium results from each well were consistent during the year and within the trend range seen during the previous year. A possible correlation between tritium levels at the CGS storm drain pond and tritium levels at two ground water monitoring locations near the storm drain pond (MW-7 and MW-8) was identified. Condition Report (CR) 251690 was written to document the observation. Tritium activity in the storm drain pond is attributed to recapture of CGS effluents, see section 5.9.1 for more discussion. No other correlations between ground water tritium and CGS operation was identified. With the exception of the MW-7 and MW-8 tritium results, there is no evidence that CGS operation made any measurable radiological impact on groundwater.

5.4 Soil

Gamma spectroscopy analysis was performed on soil samples from 5 different locations in 2011 (See Appendix A, Tables A-8.1, A-8.2). Naturally occurring radionuclides (K-40 and Bi-214) were identified in all samples and Cs-137 was identified in three of the samples. The Cs-137 levels identified were similar to those seen in the past and within the concentration range that is considered normal background in Hanford area soils.[18,19,20] No indicator locations had Cs-137 concentrations high enough above the control location to require Sr-90 analysis.[7] The soil sample results do not indicate any measurable impact from CGS plant operation. CGS also performed surface and core soil sampling at the CGS storm drain pond in 2011. See section 5.9.1 for further discussion.

5.5 River Sediment

Gamma spectroscopy results of river sediment identified naturally occurring radionuclides (K-40, Ra-226, Bi-214) and Cs-137 (See Appendix A, Tables A-9.1, 9.2). Cs-137 was detected in both the upstream (Station 33) and downstream (Station 34) samples (relative to the cooling tower discharge point). As observed in previous years, Cs-137 downstream activity was slightly higher than the activity identified upstream. The downstream Cs-137 activity levels were slightly lower than the levels identified in previous years and within the range known to be present in Hanford area sediment and soil.[19] Cs-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 do not indicate any 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 the presence of only naturally occurring radionuclides. (See Appendix A, Tables A-10.1, 10.2). These results are consistent with results seen from past years. Only one of the three control location fish species samples was obtained in 2011, see section 5.10 for further discussion.

5.7 Milk

There was no I-131 activity identified in any of the milk samples collected in 2011 (See Appendix A, Tables A-11.1, A-11.2). Gamma spectroscopy results of milk radionuclides other than I-131 did not identify the presence of any radionuclides of interest above detection limits (See Appendix A, Tables A-12.1, A-12.2). Naturally occurring K-40 was identified in all milk samples.

5.8 Garden Produce

Gamma analysis was performed on sixteen different types of fruit, vegetable, and vegetation in 2011 (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 K-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 is performed at CGS initiative. The storm drain pond and the Sanitary Waste Treatment Facility (SWTF) were incorporated into the routine sampling schedule in 1992. In 1995, the cooling tower sediment disposal area was added. TLDs were placed around 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. Discussions of the results from each of the locations are given in the following sections.

5.9.1 Storm Drain Pond (Station 101)

The storm drain pond (NPDES Outfall 002) is located approximately 1500 feet northeast of CGS. Water is sent to the pond through an 18-inch diameter pipe that discharges into a 300-foot long earthen channel that leads to a 100-foot diameter pond. The pond is a shallow, unlined percolation/evaporation basin. Water at the storm drain outfall is sampled using a flow proportional automatic sampler to collect monthly composite samples. The storm drain pond area is fenced and access is restricted.

Monthly water samples were analyzed for gamma emitting radionuclides, tritium, and gross beta. Gamma spectroscopy results did not identify the presence of any gamma emitting radionuclides of interest (See Appendix A Tables B-2.1, B-2.2). Gross beta was not positively identified in any of the monthly samples (See Appendix A, Tables B-3.1, B-3.2). Tritium was detected in six of the twelve samples (See Appendix A, Tables B-4.1, B-4.2). The samples with positive tritium activity were all from colder, wetter months which is consistent with results seen in previous years. The source of the tritium in these samples is believed to be from recapture of tritium from CGS effluents which is more likely to occur during cooler, rainier periods.

In response to an American Nuclear Insurers recommendation, vegetation, surface soil, and soil core sampling was performed at 12 locations in the storm drain pond in August 2011. Following development of a sampling plan,[21] soil core samples to a depth of 16 feet were collected by a contractor using specialized equipment. Analysis results identified the presence of low level Co-60 and Cs-137 in some of the 0-2 foot core samples. No isotopes related to CGS operation were identified in core samples below two feet. Results of surface soil samples identified the presence of Co-60, Cs-137, Zn-65, Mn-54, Co-58 and Cs-134. CR 251774 was written to document these findings. No isotopes related to CGS operation were identified in the vegetation samples. The source of the activity identified is attributed to re-capture of CGS effluents. Activity from plant effluents is recaptured in rain water and the rain water collected in the storm drain system and sent to the storm drain pond. The activity is then trapped on the surface organic layer where it can build up to measurable levels. The presence of short lived isotopes indicates that some of the activity is of more recent origins. Results and interpretation of the storm drain sampling study are to be documented in a final report that should be completed in 2012. Select soil gamma isotopic results from this study are presented in Table B- 12.1.

5.9.2 Sanitary Waste Treatment Facility (Station 102)

The Sanitary Waste Treatment Facility (SWTF) is located approximately 0.5 miles south-southeast of the CGS. The facility processes sanitary waste water from CGS, the ENW Industrial Development Complex (formerly referred to as WNP-1 and WNP-4), the Kootenai Building, and the DOE 400 Area. Station 102B receives water from all these locations; Station 102A receives water only from the DOE 400 Area. Discharge standards and monitoring requirements for the SWTF are established in EFSEC Resolution No. 300.[14]

The monthly composite gross alpha and beta results for the DOE 400 Area effluent (Station 102A) and the SWTF head works (Station 102B) were consistent with results seen in previous years. Low level gross beta was identified in all but one sample; gross alpha was not identified above the LLD in any of the samples. (See Appendix A, Tables B-5.1, B-5.2, B-6.1, B-6.2).

Gamma spectroscopy results did not identify any gamma emitting radioisotopes of interest in any monthly 102A or 102B water samples in 2011 (See Appendix A, Tables B-7.1, B-7.2).

Tritium activity was identified in all twelve 102A and ten of the twelve 102B samples (See Appendix A, Tables B-8.1, B-8.2). Tritium levels in the 102A samples were consistent indicating that the DOE 400 area obtained water from the same source throughout the year. The potable water used at the DOE 400 area was obtained from a ground water well that is known to be contaminated with tritium as a result of past DOE activities on the Hanford site.[17] Tritium concentrations in the 102B samples were also fairly consistent with all results less than 2 times the LLD for this analysis. Tritium activity coming from the DOE 400 area is the main, and probably the sole source, of the tritium in the station 102B samples. Tritium levels in all sanitary waste samples remained well below the 20,000 pCi/liter action limits of EFSEC Resolution No. 300.[14]

5.9.3 Cooling Tower Sediment Disposal Area (Station 119)

EFSEC Resolution No. 299[16] 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 cooling towers. EFSEC Resolution No. 299[16] requires direct radiation monitoring using quarterly and annual 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 to confirm that the disposal criteria outlined in the resolution have not been exceeded.

Three separate disposals of cooling tower sediment were made in 2011. Cleaning of the cooling tower upper decks and lower basins was performed in April 2011. Pre-disposal analysis of this material identified the presence of I-131 (CR 237105). The source of the I-131 is attributed to the Fukushima accident in Japan. As EFSEC Resolution No. 299 does not address disposal of material containing I-131, a one-time authorization was obtained from EFSEC prior to disposal. I-131 was not identified in the post disposal sample as sufficient time had elapsed to allow this isotope to decay. The June 2011 disposal consisted of a small quantity of material that was removed from the Circulating Water Pump House pump basin following basin drain down. The November disposal consisted of material removed from Tower 1C inner basin during baffle replacement work. All post disposal samples identified the presence of Cs-134, an isotope that has not been identified in the past in CGS cooling tower sediment. CR 242785 was written to document this observation; the source of the Cs-134 is believed to also be from the Fukushima accident in Japan. Figure 5-8 summarizes the estimated quantity of radionuclides that were placed in the disposal area in 2011. 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 should be considered a conservative estimate. Overall, an estimated 75.5 cubic meters of dry sediment was added to the disposal area in 2011.

All results were well below the disposal concentration limits specified in EFSEC Resolution No. 299.[16] Cs-137 is routinely identified in the sediment disposal samples and the Cs-137 levels identified in the 2011 samples were within the range seen in previous years. Co-60 was positively identified in one of the 2011 samples; this isotope has been identified occasionally in the past at similar levels.

	2011 Cooling Tower Sediment Disposal Data				
	Disposal Date	April 2011	June 2011	November 2011	
	Pit ID:	2007 Pit	2007 Pit	2007 Pit	
	Mass, kg	54,769	761	518	
	Density, g/cc	0.74	0.875	0.827	
Nuclide	Limit (pCi/kg)	Analytical Result (pCi/kg)	Analytical Result (pCi/kg)	Analytical Result (pCi/kg)	Total Curies
Co-60	5.00E+03	< 4.76E+01	1.31E+01	< 3.87E+01	2.73E-06
Mn-54	3.00E+04	< 3.47E+01	< 4.31E+01	< 3.82E+01	1.95E-06
Zn-65	5.00E+04	< 1.31E+02	< 1.20E+02	< 4.52E+01	7.29E-06
Cs-134	1.00E+04	1.20E+02	1.23E+02	1.08E+02	6.72E-06
Cs-137	2.00E+04	3.15E+02	3.64E+02	2.77E+02	1.77E-05
					3.64E-05

Figure 5-8 Cooling Tower Sediment Activity Levels For Disposals Made In 2011

Measurements of direct radiation at the disposal basin was taken using TLDs. Two locations were used, an indicator location next to the collection area (Station 119B) and a control location approximately 100 yards to the east (Station 119C). The mean quarterly and annual TLD results agree well with results from previous operational years. 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, 5.4 and Appendix A, Tables B-1.1, B-1.2).

5.9.4 Spray Pond Drain Field (Station 120)

There were no discharges to the Spray Pond Drain Field (NPDES Outfall 003) in 2011. The TLD results at Station 120 in 2011 are in agreement with those seen in previous operational years (See Table 5-3, 5-4 and Appendix A, Tables B-1.1, B-1.2).

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 TLD stations, 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 at the ISFSI security fence line are elevated and access to the area directly outside the fence 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 spent fuel storage casks were added to the ISFSI during 2011. As shown in Figure 5-9, exposure rates at the ISFSI fence line have followed a level to downward trend since 2008. Station 122 TLD results show a similar pattern with the long term trend for this location correlating to the overall ISFSI TLD trend but at a lower level. The Station 121 TLD results show a large decrease during the second and third quarters when the plant was shut down. This location has historically been influenced more by turbine building radiation levels than by the ISFSI (See Table 5-3, 5-4 and Appendix A, Tables B-1.1, B-1.2).

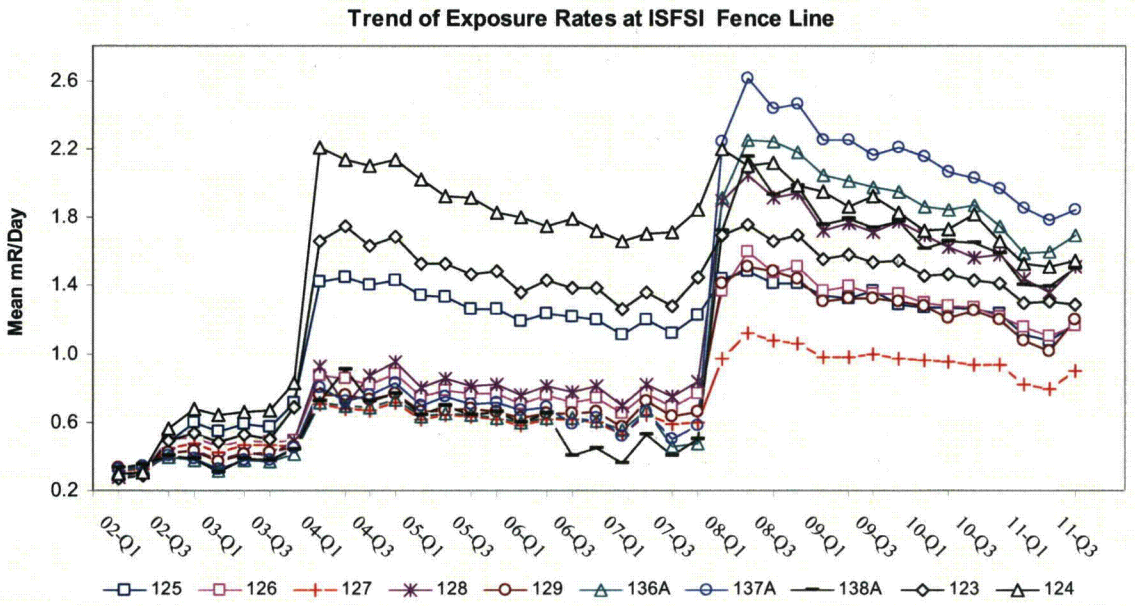

Figure 5-9 ISFSI TLD Trend at CGS

5.9.6 Additional Air Sample and TLD Locations

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). Air sampling was initiated in February to monitor during a non-intrusive testing phase. Air sampling was suspended at the end of July after the non-intrusive work was completed. Air particulate gross beta results from the four locations were similar to the gross beta results obtained from the other REMP air station locations. (See Appendix A, Tables B–13.1). Quarterly and annual TLDs were exchanged at all five locations in 2011. Three of the TLD stations (stations 87-89) had results higher than background in the first and fourth quarters due to the stations close proximity to the turbine building (See Appendix A, Table B–1.1).

5.9.7 Fukushima Impact

Analyses of the weekly iodine cartridges for the week ending March 22 identified the presence of I-131 at all locations including the control location. CGS Chemistry identified I-131 in grab samples and plant effluent samples also at this time. CR 236238, 236283, and 236316 were written to document these findings. As the level of I-131 identified was similar at all locations including the control location, and the levels identified did not correlate to distance from CGS or wind direction, the I-131 identified was not attributed to CGS operation. Information that radioisotopes including I-131 were being identified at other west coast locations was also received. To further determine if CGS could be the source of the radioiodine, CGS REMP initiated rainwater analysis and obtained rainwater samples from a number of locations in Eastern Washington. The I-131 levels identified in rainwater showed no correlation to proximity to CGS, further indicating that I-131 was ubiquitous in the environment at this time and CGS was not the source of the radioiodine. CGS REMP continued to identify I-131 on the weekly iodine cartridges until April 12 and in rainwater samples until April 26. Data obtained later from the Washington State Department of Health showed radioiodine was identified in air and rainwater samples throughout Washington State in March and April 2011.

I-131 and Cs-134 activity attributed to Fukushima was also identified in CGS cooling tower sludge during 2011; see section 5.9.3 for further discussion. The source of the radioiodine identified in the March to April time frame is credibly attributed to the trans-Pacific transport of airborne releases from Dai-Ichi, Fukushima following the March 11, 2011 Tohoku earthquake and is not related to CGS operations.

5.10 2011 Sample Deviations

A summary of REMP sample deviations encountered during 2011 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 listed deviations occurred at EFSEC and ODCM required sample locations. There were no deviations that met the above criteria for REMP sampling locations not required by EFSEC or the ODCM.

TABLE 5-1a
REMP Sample Deviations for 2011

SAMPLE MEDIA	DATE	LOCATION	CR ID	PROBLEM / COMMENTS
Air Sampler	4/21/11 to 4/23/11	Station 23	239315	Station OOS for ~ 55 hours due to BPA power outage. Station back in service when power restored. Sufficient sample volume obtained to meet LLD.
Air Sampler	6/20/11 to 7/6/11	Station 1	244086	Station OOS due to planned power outage during refueling outage. Station back in service when power restored.
Air Sampler	10/3/11 to 10/11/11	Station 23	250182	Station OOS due to BPA power outage, pump did not restart when power restored. Station back in service after pump replaced. No sample collected, LLD requirement not met.
Air Sampler	12/4/11 to 12/6/11	Station 23	253984	Station found off with GFI tripped off. Station operation restored by resetting GFI. Station OOS for ~ 45 hours. Sufficient sample volume obtained to meet LLD.
Fish	Annual	Station 38	255409	Two of three control fish species not collected during year. Collection impacted by federal ESA concerns. Initiated actions to resolve ESA concerns, identified private contractor to use as backup.
TLD	2nd quarter 2011	Station 44	243758	Both 2nd quarter and annual TLDs found missing from field location. Discussed with landowner, search made but TLDs not found. Obtained permission from landowner and relocated TLDs close by.

TABLE 5-1a (cont) REMP Sample Deviations for 2011				
SAMPLE MEDIA	DATE	LOCATION	CR ID	PROBLEM / COMMENTS
TLD	4th quarter 2011	Station 44	255230	TLD found removed from bag at field location. Search made but TLD not located. Initiated checking TLD during air filter collection.
Water	7/21/11 to 8/9/11	Station 27	244984	Circulating water blowdown reinitiated 7/21 but no sample collected by sampler. Sampler declared OOS on 7/25. FIN investigated and sampler fixed, declared operational 8/9/11.
Water	9/7/11 to 9/8/11	Station 27	248037	Sampler declared OOS based on manual test result. Investigation found sampler functional, wrong test performed. Sampler officially OOS for 36 hours but samples appear to have been collected during period.
Water	10/1/11 to 10/4/11	Station 27	249534	Sampler OOS ~ 3 days. Active full bottle alarm prevented sampling. Alarm cleared and sampling reinitiated. Alarm sensor repositioned to prevent reoccurrence.
Water	12/1/11 to 12/28/11	Station 29	254622	Check on 12/16 found no sample collected and sampler not working. Initiated grab samples on 12/19. Obtained new parts and restored sampler to operation on 12/28/11.

Table 5-1b below shows the percent time in service for the 12 air sample locations. The table shows that overall availability was greater than 99% for 10 of the 12 samplers. Stations 1 and 23 percent time in service was slightly lower due mainly to impact from planned power outages.

TABLE 5-1b CGS REMP Air Sample Percent in Service Time for 2011			
Station ID	ODCM Required	EFSEC Required	Percent Time in Service
1		x	95.7%
4	x	x	99.9%
5			99.9%
6		x	99.7%
7		x	99.8%
8	x	x	99.8%
9	x	x	99.9%
21			99.8%
23		x	96.6%
40	x	x	99.9%
48	x	x	99.8%
57	x		99.9%

TABLE 5-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

Medium: Environmental Direct Radiation (TLD) **Units: mR/period**

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	226	---	21.33 (222 / 222) (17.72-29.44)	86 NNW 0.3 miles	27.41 (4/4) (25.28-29.44)	20.07 (4/4) (19.60-20.92)	0
TLD Annual	56	---	84.35 (55 / 55) (75.82-107.66)	86 NNW 0.3 miles	107.66 (1/1)	75.95 (1/1)	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

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

Medium: ISFSI Direct Radiation (TLD) **Units: mR/period**

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	---	124.5 (40 / 40) (72.2-180.0)	137A NNW 0.24 miles	170 (4 / 4) (162.3-180.0)	--- (0 / 0)	0
TLD Annual	10	---	501.9 (10 / 10) (312.0-688.6)	137A NNW 0.24 miles	688.6 (1 / 1)	--- (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 138A

TABLE 5-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

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	633	0.01	0.0172 (580/580) (0.00357-0.0737)	4 SSE 9.57 miles	0.0176(53/53) (0.00472-0.0737)	0.0155 (53/53) (0.00383 - 0.0649)	0
I-131	633	0.07	0.0189 (44/580) (-0.00516-0.612)	23 ESE 3.03 miles	0.0214 (4/52) (-0.00482-0.612)	0.0191 (4/53) (-0.00497-0.522)	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.

I-131 identified is not attributed to CGS operation. See Sections 5.2 and 5.9.7 for discussion.

TABLE 5-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

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 / 24)[(b)]	26 E 3.19 miles	0.791 (1 / 12) (-0.277-2.28)	0.791 (1 / 12) (-0.277-2.28)	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

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

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	11	4.0	3.42 (6 / 11) (-0.297-9.56)	27 E 3.2 miles	3.42 (6 / 11) (-0.297-9.56)	---(0 / 0)	0
H-3	4	2000	--- (0/ 4)	---	---	--- (0 / 0)	0
Mn-54	11	15	--- (0 / 11)	---	---	--- (0 / 0)	0
Fe-59	11	30	--- (0 / 11)	---	---	--- (0 / 0)	0
Co-58	11	15	--- (0 / 11)	---	---	--- (0 / 0)	0
Co-60	11	15	--- (0 / 11)	---	---	--- (0 / 0)	0
Zn-65	11	30	--- (0 / 11)	---	---	--- (0 / 0)	0
Zr/Nb-95	11	15	--- (0 / 11)	---	---	--- (0 / 0)	0
Cs-134	11	15	--- (0 / 11)	---	---	--- (0 / 0)	0
Cs-137	11	18	--- (0 / 11)	---	---	--- (0 / 0)	0
Ba/La-140	11	15	--- (0 / 11)	---	---	--- (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

No ST 27 sample was obtained in July.

TABLE 5-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

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

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

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	44	2000	3534.9 (35 / 44) (105-16,300)	MW-5 SW 0.43 miles	16,100 (4 / 4) (15,700-16,300)	--- (0 / 0)	0
Mn-54	44	15	--- (0 / 44)	---	---	--- (0 / 0)	0
Fe-59	44	30	--- (0 / 44)	---	---	--- (0 / 0)	0
Co-58	44	15	--- (0 / 44)	---	---	--- (0 / 0)	0
Co-60	44	15	--- (0 / 44)	---	---	--- (0 / 0)	0
Zn-65	44	30	--- (0 / 44)	---	---	--- (0 / 0)	0
Zr/Nb-95	44	15	--- (0 / 44	---	---	--- (0 / 0)	0
Cs-134	44	15	--- (0 / 44)	---	---	--- (0 / 0)	0
Cs-137	44	18	--- (0 / 44)	---	---	--- (0 / 0)	0
Ba/La-140	44	15	--- (0 / 44)	---	---	--- (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

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

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	114 (2 / 2) (106-122)	34 ESE 3.32 Miles	114 (2 / 2) (106-122)	84.2 (2 / 2) (72.5-95.9)	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

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calender Year 2011**

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	5	60	--- (0 / 4)	---	---	--- (0 / 1)	0
Cs-134	5	60	--- (0 / 4)	---	---	--- (0 / 1)	0
Cs-137	5	80	--- (0 / 4)	---	---	--- (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, Tables A-15.1, A-15.2.

TABLE 5-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

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	11	60	--- (0 / 10)	---	---	--- (0 / 1)	0
Cs-134	11	60	--- (0 / 10)	---	---	--- (0 / 1)	0
Cs-137	11	80	--- (0 / 10)	---	---	--- (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

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

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	11	60	--- (0 / 10)	---	---	--- (0 / 1)	0
Cs-134	11	60	--- (0 / 10)	---	---	--- (0 / 1)	0
Cs-137	11	80	--- (0 / 10)	---	---	--- (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

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

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	4	130	--- (0 / 3)	---	---	--- (0 / 1)	0
Fe-59	4	260	--- (0 / 3)	---	---	--- (0 / 1)	0
Co-58	4	130	--- (0 / 3)	---	---	--- (0 / 1)	0
Co-60	4	130	--- (0 / 3)	---	---	--- (0 / 1)	0
Zn-65	4	260	--- (0 / 3)	---	---	--- (0 / 1)	0
Cs-134	4	130	--- (0 / 3)	---	---	--- (0 / 1)	0
Cs-137	4	150	--- (0 / 3)	---	---	--- (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-10.1, A-10.2. Only one control fish species was collected in 2011.

TABLE 5-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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

Benton County, Washington **Calendar Year 2011**

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	36	1.0	--- (0 / 18)	---	---	--- (0 / 18)	0
Cs-134	36	15	--- (0 / 18)	---	---	--- (0 / 18)	0
Cs-137	36	18	--- (0 / 18)	---	---	--- (0 / 18)	0
Ba/La-140	36	15	--- (0 / 18)	---	---	--- (0 / 18)	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 PREOPERATIONAL AND OPERATIONAL PERIODS

Results in mR/Standard Quarter

	Pre-Operational				Operational to 2010				2011 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	1.71	22.16	20.73	22.03	0.58	21.55
2	17.34	22.81	2.09	21.10	16.43	25.55	1.61	21.69	20.74	21.44	0.33	21.01
3	18.25	21.90	1.46	20.42	16.43	24.64	1.73	20.92	19.69	20.60	0.38	20.11
4	15.51	23.73	2.65	19.96	14.60	22.81	1.72	19.57	18.61	20.70	0.93	19.37
5	18.25	22.81	1.74	20.76	16.43	23.73	1.70	20.07	19.00	20.19	0.52	19.74
6	18.25	21.90	1.50	20.19	16.43	23.73	1.59	20.24	18.96	19.71	0.34	19.22
7	19.16	22.81	1.69	21.33	16.43	24.64	1.77	21.13	20.05	21.04	0.43	20.66
8	21.90	25.55	1.50	23.84	15.51	27.38	2.02	23.28	22.61	23.42	0.39	22.93
9	15.51	21.90	2.00	19.85	16.43	23.73	1.72	19.73	19.60	20.92	0.59	20.07
10	19.16	22.81	1.38	20.99	16.43	24.64	1.69	21.01	19.90	21.28	0.60	20.61
11	19.16	22.81	1.38	21.44	16.43	24.64	1.52	21.57	20.33	21.53	0.50	20.99
12	20.99	24.64	1.60	23.04	18.25	26.46	1.75	23.18	21.93	22.91	0.42	22.50
13	19.16	22.81	1.54	21.44	17.34	27.38	1.83	21.38	20.18	21.13	0.39	20.71
14	19.16	24.64	2.07	21.90	17.34	25.55	1.54	21.52	20.60	21.12	0.23	20.89
15	20.99	25.55	1.37	23.15	17.34	27.38	1.73	23.09	22.02	23.72	0.78	22.60
16	20.08	23.73	1.52	22.13	16.43	26.46	1.84	22.01	20.80	21.88	0.51	21.27
17	19.16	23.73	1.62	22.81	17.34	26.46	1.64	22.56	20.93	22.91	0.88	21.88
18	20.08	23.73	1.27	22.13	16.43	25.55	1.70	22.02	21.42	23.34	0.83	22.16
19	20.08	23.73	1.24	22.01	17.34	25.55	1.62	22.20	21.14	22.27	0.48	21.60
20	19.16	23.73	1.76	21.44	17.34	25.55	1.68	21.83	21.29	22.32	0.49	21.66
21	19.16	21.90	1.25	20.68	15.51	23.73	1.46	20.38	18.79	19.87	0.53	19.59
22	19.16	23.73	1.58	22.01	16.43	25.55	1.52	21.81	20.29	21.21	0.40	20.76
23	20.08	23.73	1.49	21.60	17.34	25.55	1.67	21.18	20.37	21.24	0.40	20.81
24	20.99	23.73	1.09	21.90	17.34	50.50	3.29	22.17	20.44	21.50	0.47	20.89
25	20.99	24.64	1.46	23.15	17.34	27.38	1.96	22.80	21.59	23.76	0.94	22.41
40	17.34	21.90	1.70	19.94	15.51	24.64	1.77	20.13	17.72	19.91	0.90	18.77
41	20.08	25.55	2.00	23.73	17.34	27.38	2.07	22.51	19.86	22.68	1.17	21.20
42	20.08	23.73	1.61	22.36	17.34	26.46	1.97	22.07	20.35	21.28	0.41	20.68
43	20.99	24.64	1.49	23.12	16.43	27.38	2.19	22.64	21.48	23.06	0.64	22.27
44	19.16	22.81	1.34	21.12	15.51	24.64	1.99	20.84	19.91	20.08	0.12	20.00
45	19.16	22.81	1.37	21.25	16.43	25.55	1.84	21.25	19.50	21.21	0.71	20.28
46	22.81	28.29	2.10	26.10	19.16	31.94	2.20	26.54	24.85	27.00	0.96	25.78
47	17.34	20.99	1.73	19.85	15.51	26.28	1.75	20.27	19.08	20.83	0.78	19.71
49	21.90	21.90	-	21.90	16.43	25.55	1.59	21.98	20.94	21.71	0.37	21.24
50	20.08	20.08	-	20.08	16.43	26.46	1.79	21.67	20.18	21.01	0.38	20.60
51	19.16	21.90	1.18	20.53	16.43	24.64	1.66	21.15	19.57	20.81	0.53	20.07
53	24.64	24.64	-	24.64	18.25	29.57	2.05	23.49	20.64	22.09	0.78	21.38
54	23.73	23.73	-	23.73	18.18	26.46	2.04	22.11	20.80	23.14	1.05	21.67
55	20.99	20.99	-	20.99	16.43	25.55	1.54	21.46	20.63	21.68	0.48	21.13
56	21.90	21.90	-	21.90	16.43	25.55	1.79	21.88	20.98	23.18	0.92	22.10
58	-	-	-	-	18.52	20.53	0.68	19.36	18.07	19.76	0.70	18.96
65	-	-	-	-	17.73	22.72	1.25	19.94	18.62	20.77	1.00	19.54

TABLE 5-3 (cont)
QUARTERLY TLD DATA SUMMARY WITH COMPARISON TO PREOPERATIONAL AND OPERATIONAL PERIODS

Results in mR/Standard Quarter

	Pre-Operational				Operational to 2010				2011 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	2.47	25.33	20.88	27.09	3.07	23.94
72(2S)	21.90	23.73	0.91	22.81	18.25	29.65	1.98	24.41	20.80	24.32	1.77	22.79
73(3S)	20.08	21.90	0.91	20.99	16.43	24.64	1.58	21.30	19.44	21.68	0.94	20.72
74(4S)	23.73	24.64	0.53	24.03	18.25	28.29	1.92	23.43	21.63	23.33	0.92	22.46
75(5S)	19.16	21.90	1.39	20.38	15.51	26.46	1.91	22.30	21.03	23.54	1.13	21.86
76(6S)	20.99	22.81	0.91	21.90	17.34	26.46	1.70	22.06	19.89	22.30	1.07	20.75
77(7S)	21.90	23.73	0.91	22.81	17.34	25.55	1.64	22.05	20.95	21.99	0.48	21.66
78(8S)	21.90	23.73	1.05	22.51	17.34	25.55	1.61	21.56	20.35	21.53	0.53	20.77
79(9S)	22.81	23.73	0.53	23.12	17.34	25.55	1.67	21.92	20.33	21.41	0.48	20.92
80(10S)	20.99	22.81	0.91	21.90	16.43	25.55	1.79	21.04	19.92	21.32	0.64	20.36
81(11S)	20.08	23.73	1.90	22.20	17.34	25.55	1.55	21.57	20.20	21.52	0.60	20.73
82(12S)	21.90	24.64	1.39	23.42	17.34	26.46	1.59	22.44	20.96	22.40	0.63	21.84
83(13S)	21.90	23.73	0.91	22.81	17.34	26.46	1.89	22.34	20.96	22.35	0.74	21.69
84(14S)	20.99	22.81	1.05	22.20	16.43	27.17	1.79	22.33	20.50	22.35	0.79	21.23
85(15S)	21.90	24.64	1.58	23.73	17.34	27.83	1.92	23.12	21.29	24.05	1.17	22.38
86(16S)	21.90	23.73	0.91	22.81	18.25	31.28	2.64	26.05	25.28	29.44	1.97	27.41
87	-	-	-	-	22.78	33.28	3.91	29.44	19.34	32.14	6.83	25.33
88	-	-	-	-	24.53	31.67	2.36	28.65	17.05	27.58	5.46	21.80
89	-	-	-	-	23.22	29.38	1.94	26.88	19.25	27.75	4.78	23.58
90	-	-	-	-	18.37	19.71	0.47	18.98	18.67	20.48	0.82	19.30
119B	-	-	-	-	19.36	25.64	1.46	22.19	19.24	22.91	1.92	21.11
119Ctrl	-	-	-	-	19.53	26.55	1.41	21.83	19.55	23.18	1.72	21.48
120East	-	-	-	-	19.78	31.12	1.90	22.47	21.42	23.60	1.00	22.33
121 (ISFSI)	-	-	-	-	20.81	130.27	22.57	78.06	19.52	95.26	41.20	56.21
122 (ISFSI)	-	-	-	-	19.62	42.49	7.59	30.32	32.97	37.28	2.41	35.16
123 (ISFSI)	-	-	-	-	24.99	160.33	42.46	116.75	117.82	128.85	5.31	120.90
124 (ISFSI)	-	-	-	-	26.89	201.05	53.91	146.37	138.03	151.47	6.15	142.42
125 (ISFSI)	-	-	-	-	26.46	135.52	32.55	102.58	98.15	112.47	6.33	104.88
126 (ISFSI)	-	-	-	-	26.00	145.68	34.29	80.98	100.68	111.38	4.38	105.88
127 (ISFSI)	-	-	-	-	28.97	102.08	20.95	63.59	72.21	85.29	5.97	78.56
128 (ISFSI)	-	-	-	-	25.64	187.25	51.05	93.23	124.27	144.25	8.64	134.34
129 (ISFSI)	-	-	-	-	30.16	138.08	34.98	75.23	92.63	109.73	8.43	102.58
136A (ISFSI)	-	-	-	-	28.99	205.64	64.85	91.36	145.25	159.67	7.03	151.18
137A (ISFSI)	-	-	-	-	29.47	238.74	74.06	100.79	162.34	179.99	7.33	170.01
138A (ISFSI)	-	-	-	-	28.28	196.68	56.66	84.49	127.14	144.54	8.22	134.08
Site 1	-	-	-	-	11.92	20.19	1.64	18.01	18.16	19.40	0.53	18.68
Site 4	-	-	-	-	17.02	32.44	3.31	19.05	18.22	18.74	0.25	18.53

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.

TABLE 5-4
ANNUAL TLD DATA SUMMARY WITH COMPARISON TO PREOPERATIONAL AND OPERATIONAL PERIODS

Results in mR per Year

	Pre-Operational				1984-2010 Operational				2011
Station	Min	Max	Std Dev	MEAN	Min	Max	Std Dev	MEAN	Result
1	85.4	98.7	9.4	92.0	73.0	102.2	7.0	83.4	84.1
2	83.4	84.5	0.8	84.0	73.0	98.2	6.1	82.3	83.3
3	81.9	85.7	2.7	83.8	71.0	94.2	6.4	78.2	78.6
4	74.5	100.5	18.4	87.5	65.7	87.2	5.5	75.0	76.9
5	81.3	93.6	8.7	87.5	68.6	88.3	5.4	75.9	79.0
6	79.8	84.0	2.9	81.9	69.4	90.5	5.9	76.3	78.0
7	84.3	86.6	1.7	85.4	71.6	97.1	6.2	80.8	82.9
8	94.6	98.6	2.8	96.6	80.3	108.0	7.4	89.9	90.7
9	78.0	81.6	2.5	79.8	69.0	92.0	5.7	76.0	76.0
10	82.0	86.7	3.3	84.4	69.4	93.8	5.0	80.1	78.6
11	83.0	88.3	3.7	85.6	73.0	99.3	6.4	82.0	81.7
12	92.3	94.2	1.3	93.2	80.3	102.6	5.3	87.9	88.5
13	85.4	88.0	1.8	86.7	76.7	97.5	5.6	82.8	84.2
14	84.5	86.2	1.2	85.4	69.4	97.1	6.3	81.3	82.7
15	84.0	94.8	7.7	89.4	76.7	104.0	7.1	88.3	88.1
16	89.6	91.8	1.6	90.7	76.7	101.5	6.4	84.7	85.4
17	85.6	91.5	4.2	88.5	76.7	101.8	6.2	85.7	86.8
18	86.5	97.6	7.9	92.1	76.7	101.5	6.0	85.7	84.8
19	-	-	-	85.6	76.7	104.0	5.9	84.8	83.3
20	85.4	90.0	3.3	87.7	74.8	101.8	6.4	83.6	82.8
21	79.7	84.2	3.2	82.0	69.4	91.3	5.8	77.3	78.8
22	84.8	88.1	2.3	86.4	75.0	97.1	6.1	82.1	82.7
23	83.5	87.1	2.5	85.3	72.6	94.9	6.2	80.0	83.7
24	85.3	88.0	1.9	86.6	74.3	100.0	6.9	82.3	84.1
25	90.6	95.4	3.4	93.0	76.7	104.0	7.2	87.6	94.0
40	-	-	-	76.5	68.1	91.3	6.0	75.3	75.8
41	94.9	97.5	1.8	96.2	75.2	102.2	7.8	85.1	84.6
42	-	-	-	85.8	75.9	104.0	7.3	83.3	82.7
43	-	-	-	88.2	71.2	107.7	9.2	84.2	84.7
44	83.5	89.5	4.3	86.5	71.9	94.2	6.4	79.3	N/A
45	82.5	86.1	2.5	84.3	72.6	96.4	5.7	80.5	79.2
46	102.4	107.5	3.6	105.0	94.9	123.4	7.3	103.0	99.8
47	-	-	-	80.4	69.4	95.3	6.4	78.3	79.8
49	-	-	-	-	76.7	100.7	6.0	83.0	85.5
50	-	-	-	-	73.0	100.0	7.1	81.2	82.6
51	-	-	-	-	72.1	97.5	6.5	80.2	83.3
53	-	-	-	-	77.7	104.0	6.7	89.6	86.3
54	-	-	-	-	75.8	100.4	7.0	84.9	82.1
55	-	-	-	-	73.0	96.4	5.9	80.3	82.7
56	-	-	-	-	71.2	101.5	6.6	84.3	85.5
58	-	-	-	-	80.5	80.5	-	80.5	74.0
65	-	-	-	-	71.3	86.5	4.1	75.9	76.1

TABLE 5-4 (cont)
ANNUAL TLD DATA SUMMARY WITH COMPARISON TO PREOPERATIONAL AND OPERATIONAL PERIODS

Results in mR per Year

	Pre-Operational				1984-2010 Operational				2011
Station	Min	Max	Std Dev	MEAN	Min	Max	Std Dev	MEAN	Result
71(1S)	-	-	-	88.0	84.0	112.1	7.5	98.0	95.7
72(2S)	-	-	-	91.5	84.0	111.0	6.5	93.8	91.8
73(3S)	-	-	-	83.7	73.0	94.9	5.7	80.5	80.5
74(4S)	-	-	-	89.0	80.3	106.2	6.0	90.0	87.3
75(5S)	-	-	-	86.3	73.0	100.7	6.4	84.7	82.9
76(6S)	-	-	-	88.3	76.7	101.5	5.3	84.7	84.5
77(7S)	-	-	-	89.9	73.0	99.3	5.8	84.0	84.2
78(8S)	-	-	-	89.9	73.0	97.7	6.2	82.7	81.5
79(9S)	-	-	-	92.0	73.0	101.1	6.0	83.1	83.2
80(10S)	-	-	-	85.3	69.4	97.1	6.7	80.5	82.7
81(11S)	-	-	-	82.7	72.2	96.4	6.5	81.0	81.5
82(12S)	-	-	-	89.8	74.8	101.5	6.6	84.9	83.6
83(13S)	-	-	-	91.1	76.7	99.6	6.4	86.2	84.9
84(14S)	-	-	-	84.1	76.0	99.3	6.1	84.7	84.5
85(15S)	-	-	-	92.1	80.3	105.9	5.8	89.9	88.4
86(16S)	-	-	-	87.8	87.6	119.8	9.6	101.2	107.7
87					107.2	127.7	14.5	117.5	98.7
88					108.9	109.7	0.6	109.3	86.8
89					111.2	112.7	1.0	112.0	93.8
90					73.5	77.3	2.6	75.4	76.0
119B	-	-	-	-	75.9	107.7	8.3	82.7	84.9
119Ctrl	-	-	-	-	77.7	101.8	6.7	85.7	82.4
120East	-	-	-	-	78.1	112.8	9.5	87.6	84.5
121 (ISFSI)	-	-	-	-	177.8	377.8	65.2	307.7	225.7
122 (ISFSI)	-	-	-	-	76.3	164.5	34.7	119.5	141.3
123 (ISFSI)	-	-	-	-	126.2	627.9	184.0	476.4	504.5
124 (ISFSI)	-	-	-	-	128.7	714.2	219.7	561.4	566.0
125 (ISFSI)	-	-	-	-	119.6	520.1	141.4	406.3	426.9
126 (ISFSI)	-	-	-	-	123.1	524.9	143.7	322.6	421.8
127 (ISFSI)	-	-	-	-	120.6	373.8	89.3	253.1	312.0
128 (ISFSI)	-	-	-	-	113.0	667.7	202.8	363.9	545.9
129 (ISFSI)	-	-	-	-	121.8	481.0	141.0	292.3	405.5
136A (ISFSI)	-	-	-	-	119.3	763.7	258.9	361.8	597.9
137A (ISFSI)	-	-	-	-	124.4	865.2	300.9	402.2	688.6
138A (ISFSI)	-	-	-	-	122.7	688.0	229.1	331.0	550.1
Site 1	-	-	-	-	68.6	78.1	3.7	72.6	74.5
Site 4	-	-	-	-	46.4	74.3	11.3	66.1	71.3

Table 5-4 Notes:

The preoperational period was from 1982-1983. Only one annual preoperational exchange was made at some locations. Stations 49-56 were first monitored during the Fourth Quarter of 1983. Stations 65 was added in 1997. Stations 119B, 119Ctrl, and 120 were added in 1995. Stations 121 and 122 were added in 1998 to gather baseline data for the ISFSI. Stations 123-129 and 136A-138A were added in the 2nd Quarter of 2002. Stations Site 1 and 4 were added in 2006. Stations 87 - 90 were added in 2009 and station 58 in 2010 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[5] and 10 CFR 50 Appendix B[13]. The contractors used for sample analysis, Energy Northwest Environmental Services and Battelle PNNL, maintain quality control programs to ensure that analytical results are accurate, precise, and defensible. 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 Energy Northwest REMP TLDs covers the preparation, transportation, deployment, collection, storage, processing, and evaluation.

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 TLD set while they are being transported to and from the vendor and also while they are being deployed and collected 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 are prepared by Battelle at the Pacific Northwest National Laboratory and serve as indicators that the 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 2011 reader QC dosimeter results indicated satisfactory agreement for all periods. The 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 and annual spikes receive a target exposure of 88 mR. Evaluation of the 2011 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 are 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: QC and background 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 and end of batch performance checks are normally performed.
- Gamma Spectrometers: 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 periodically.
- Liquid Scintillation Counter: Background and performance checks are performed daily when in use. A QC check in the same matrix as the samples is performed and trended. A low level check standard is analyzed with each batch of samples analyzed.

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 was analyzed with each batch. In most cases, a charcoal cartridge of the same type used for sample collection but spiked with Ba-133 is used. The 356 keV peak of Ba-133 serves as a proxy for the 364 keV peak of I-131.

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

Aqueous Samples – In most cases, samples collected from the control locations were analyzed as blanks. A known-addition sample was 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 are typically analyzed with each batch. A replicate sample was 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 both RAD and MRAD proficiency testing studies provided by Environmental Resource Associates (ERA) during 2011. The Laboratory's intercomparision program was further supplemented by additional cross check media provided by ERA. The Laboratory's intercomparison program results for 2011 are shown in Table 6-2. Participation in the ERA studies serves to meet the intercomparision 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 Problems Identified by Laboratory Quality Control Program

The results of the fall 2011 I-131 in milk proficiency sample (RAD 86) were significantly below the acceptance limits. Investigation found no calculation, reporting, or instrumentation errors. No anomalies during preparation were noted or identified. A second I-131 in milk proficiency sample (RAD 87) was obtained and prepared by the same individual using the same procedure. Results of the RAD 87 sample were in good agreement with the known value. The cause of the low RAD 86 result was not identified. The Laboratory initiated counting the I-131 source material before it is added to the milk media and also counting the waste milk after extraction in order to help identify any potential issues before reporting results. All other Laboratory intercomparison program results were within acceptable limits.

TABLE 6-1
2011 ENVIRONMENTAL SPIKED DOSIMETER RESULTS

PERIOD	SPIKE ID	KNOWN EXPOSURE (mR)	REPORTED EXPOSURE (mR)	BIAS (%)
1st Quarter	ENW Spike	22	22.0	0.0%
	ENW Spike	22	21.6	-1.8%
	ENW Spike	22	21.8	-0.9%
	PNNL Avg. Reader	100	97.1	-2.9%
2nd Quarter	ENW Spike	22	20.9	-5.0%
	ENW Spike	22	21.7	-1.3%
	ENW Spike	22	21.1	-4.1%
	PNNL Avg. Reader	100	98.5	-1.5%
3rd Quarter	ENW Spike	22	21.6	-1.8%
	ENW Spike	22	22.8	3.6%
	ENW Spike	22	21.6	-1.8%
	PNNL Avg. Reader	100	100.9	0.9%
4th Quarter	ENW Spike	22	21.6	-1.8%
	ENW Spike	22	22.9	4.1%
	ENW Spike	22	22.2	0.9%
	PNNL Avg. Reader	100	101.2	1.2%
Annual	ENW Spike	88	88.8	0.9%
	ENW Spike	88	87.8	-0.2%
	ENW Spike	88	86.5	-1.7%
	PNNL Avg. Reader	100	100	0.0%

TABLE 6-2
ENW REMP PROGRAM CROSS CHECK PERFORMANCE RESULTS

ERA MRAD-14 Results Spring 2011					
Standard/Analyte	**Units**	**Reported Value**	**Assigned Value**	**Acceptance Limits**	**Performance Evaluation**
Air Filter Radionuclides					
Americium-241	pCi/Filter	69.4	62.5	36.6 - 85.7	Acceptable
Cesium-134	pCi/Filter	247.6	279	182 - 345	Acceptable
Cesium-137	pCi/Filter	372.8	312	234 - 410	Acceptable
Cobalt-60	pCi/Filter	422.3	390	302 - 487	Acceptable
Manganese-54	pCi/Filter	< 7	0		Acceptable
Zinc-65	pCi/Filter	357	279	193 - 386	Acceptable
Air Filter Gross Alpha/Beta					
Gross Alpha	pCi/Filter	84	74.3	38.5 - 112	Acceptable
Gross Beta	pCi/Filter	62	69.5	42.8 - 102	Acceptable
Water Radionuclides					
Americium-241	pCi/L	134	135	92.5 - 182	Acceptable
Cesium-134	pCi/L	209	231	171 - 265	Acceptable
Cesium-137	pCi/L	421	417	354 - 500	Acceptable
Cobalt-60	pCi/L	402	411	358 - 486	Acceptable
Manganese-54	pCi/L	< 7	0		Acceptable
Zinc-65	pCi/L	125	111	94.1 - 138	Acceptable
Water Gross Alpha/Beta					
Gross Alpha	pCi/L	103	112	49.7 - 166	Acceptable
Gross Beta	pCi/L	75	99.8	58.4 - 146	Acceptable
Water Tritium					
Tritium	pCi/L	14851	15200	9900 - 22500	Acceptable
Soil Radionuclides					
Actinium-228	pCi/kg	1230	1490	958 - 2100	Acceptable
Americium-241	pCi/kg	770	914	546 - 1170	Acceptable
Bismuth-212	pCi/kg	817	1400	368 - 2090	Acceptable
Bismuth-214	pCi/kg	812	725	445 - 1040	Acceptable
Cesium-134	pCi/kg	2423	2450	1580 - 2950	Acceptable
Cesium-137	pCi/kg	2096	1920	1470 - 2490	Acceptable
Cobalt-60	pCi/kg	2337	2220	1620 - 2980	Acceptable
Lead-212	pCi/kg	1146	1440	931 - 2030	Acceptable
Lead-214	pCi/kg	800	805	482 - 1200	Acceptable
Manganese-54	pCi/kg	< 55	0		Acceptable
Potassium-40	pCi/kg	10912	11500	8320 - 15600	Acceptable
Zinc-65	pCi/kg	2175	1990	1580 - 2670	Acceptable

TABLE 6-2
ENW REMP PROGRAM CROSS CHECK PERFORMANCE RESULTS

ERA MRAD-15 Results Fall 2011					
Standard/Analyte	**Units**	**Reported Value**	**Assigned Value**	**Acceptance Limits**	**Performance Evaluation**
Air Filter Radionuclides					
Americium-241	pCi/Filter	81	76	44.5 - 104	Acceptable
Cesium-134	pCi/Filter	375	429	279 - 531	Acceptable
Cesium-137	pCi/Filter	566	486	365 - 638	Acceptable
Cobalt-60	pCi/Filter	550	524	405 - 655	Acceptable
Manganese-54	pCi/Filter	< 5	< 50.0	0.00 - 50.0	Acceptable
Zinc-65	pCi/Filter	585	464	321 - 643	Acceptable
Air Filter Gross Alpha/Beta					
Gross Alpha	pCi/Filter	61.9	58.4	30.3 - 87.8	Acceptable
Gross Beta	pCi/Filter	40.4	48.9	30.1 - 71.4	Acceptable
Water Radionuclides					
Americium-241	pCi/L	129	135	92.5 - 182	Acceptable
Cesium-134	pCi/L	291	323	239 - 371	Acceptable
Cesium-137	pCi/L	431	421	358 - 504	Acceptable
Cobalt-60	pCi/L	470	486	423 - 574	Acceptable
Manganese-54	pCi/L	< 7	< 100	0.00 - 100	Acceptable
Zinc-65	pCi/L	335	315	267 - 393	Acceptable
Water Gross Alpha/Beta					
Gross Alpha	pCi/L	74.1	68.9	30.6 - 102	Acceptable
Gross Beta	pCi/L	40.3	51.7	30.2 - 75.8	Acceptable
Water Tritium					
Tritium	pCi/L	21484	21300	13900 - 31500	Acceptable
Soil Radionuclides					
Actinium-228	pCi/kg	1394	1350	866 - 1900	Acceptable
Americium-241	pCi/kg	1437	1210	723 - 1550	Acceptable
Bismuth-212	pCi/kg	890	1400	368 - 2090	Acceptable
Bismuth-214	pCi/kg	1423	1420	872 - 2040	Acceptable
Cesium-134	pCi/kg	4120	4120	2650 - 4960	Acceptable
Cesium-137	pCi/kg	5008	4660	3560 - 6050	Acceptable
Cobalt-60	pCi/kg	5678	5350	3890 - 7180	Acceptable
Lead-212	pCi/kg	1327	1310	845 - 1840	Acceptable
Lead-214	pCi/kg	1532	1380	826 - 2050	Acceptable
Manganese-54	pCi/kg	< 60	< 1000	0.00 - 1000	Acceptable
Potassium-40	pCi/kg	10813	12500	9060 - 16900	Acceptable
Zinc-65	pCi/kg	4246	3760	2980 - 5040	Acceptable

TABLE 6-2
ENW REMP PROGRAM CROSS CHECK PERFORMANCE RESULTS

2011 ERA Crosscheck Result I-131 Charcoal Cartridge						
Sample ID	**Analysis**	**Units**	**Result**	**Ref Value**	**Acceptance Limits**	**Performance Evaluation**
03151105A	I-131	pCi	268.8	216	136 – 315	Acceptable
09151103A	I-131	pCi	468.3	408	314 - 538	Acceptable

2011 ERA RAD Results I-131 in Milk						
Sample ID	**Analysis**	**Units**	**Result**	**Ref Value**	**Acceptance Limits**	**Performance Evaluation**
RAD-86	I-131	pCi/L	5.9	26.0	21.6 – 30.7	Not Acceptable
RAD-87	I-131	pCi/L	25.1	27.5	22.9 – 32.3	Acceptable

7.0 REFERENCES

7.0 REFERENCES

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22. Nuclear Regulatory Commission Fact Sheet "Fact Sheet on Radiation Monitoring at Nuclear Power Plants and the "Tooth Fairy" Issue", NRC Library, www.nrc.gov/reading-rm/doc-collections/fact-sheets/.

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8.0 ERRATA

8.0 ERRATA

Revisions to the Columbia Generating Station's 2010 Annual Radiological Environmental Operating Report are listed below.

In Figure 4-1, the locations of stations 87 and 88 are reversed. The locations for these two stations are shown correctly in Figure 4-1 of this report.

In Figure 4-2, the graph is skewed in the east west direction resulting in the scale indication being incorrect for stations predominately east or west of the plant. The scale indication in Figure 4-2 of this report is correct for all indicated station.

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APPENDIX A

2011 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT COLUMBIA GENERATING STATION

DATA TABLES A and B

Covers Sample Collection Period Starting January 2011 Through December 2011

RADIOLOGICAL
ENVIRONMENTAL
MONITORING PROGRAM

Prepared by:

Energy Northwest - Environmental Services Staff
Richland, WA

APPENDIX A - TABLE OF CONTENTS
TABLE A: ROUTINE RESULTS

APPENDIX A - TABLE OF CONTENTS

TABLE B: SPECIAL INTEREST SAMPLE RESULTS

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 standard 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

2011 QUARTERLY & ANNUAL TLD RESULTS

Results in milli-Roentgen (mR)

Station ID	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Quarterly Sum	Annual TLD Result	Ratio Quarterly Sum / Annual
1	21.54	21.90	20.73	22.03	86.20	84.08	1.03
2	21.44	20.74	21.12	20.76	84.06	83.30	1.01
3	20.18	19.69	19.97	20.60	80.44	78.63	1.02
4	19.33	18.85	18.61	20.70	77.50	76.87	1.01
5	19.80	19.98	19.00	20.19	78.96	78.97	1.00
6	19.20	19.02	18.96	19.71	76.88	77.96	0.99
7	20.72	20.05	20.84	21.04	82.64	82.93	1.00
8	22.62	22.61	23.07	23.42	91.73	90.72	1.01
9	20.92	19.60	20.02	19.74	80.28	75.95	1.06
10	20.90	19.90	20.37	21.28	82.46	78.63	1.05
11	21.53	20.33	21.15	20.96	83.97	81.75	1.03
12	22.46	21.93	22.91	22.71	90.01	88.45	1.02
13	21.13	20.18	20.72	20.83	82.86	84.16	0.98
14	20.83	20.60	21.01	21.12	83.56	82.70	1.01
15	22.14	22.53	22.02	23.72	90.40	88.12	1.03
16	20.92	20.80	21.49	21.88	85.10	85.36	1.00
17	20.93	21.44	22.26	22.91	87.53	86.78	1.01
18	21.42	21.85	22.03	23.34	88.63	84.83	1.04
19	21.50	21.51	21.14	22.27	86.41	83.25	1.04
20	21.30	21.29	21.74	22.32	86.65	82.80	1.05
21	19.86	18.79	19.87	19.83	78.36	78.79	0.99
22	20.61	20.29	20.93	21.21	83.04	82.70	1.00
23	20.58	21.06	20.37	21.24	83.25	83.73	0.99
24	21.03	20.60	20.44	21.50	83.57	84.15	0.99
25	21.59	22.32	21.99	23.76	89.66	94.02	0.95
40	18.85	18.61	17.72	19.91	75.09	75.82	0.99
41	20.91	21.35	19.86	22.68	84.81	84.56	1.00
42	20.35	20.49	20.61	21.28	82.74	82.67	1.00
43	22.26	21.48	22.26	23.06	89.07	84.75	1.05
44	19.91	N/A	20.08	N/A	N/A	N/A	N/A
45	20.07	20.32	19.50	21.21	81.10	79.23	1.02
46	24.85	25.19	26.08	27.00	103.12	99.81	1.03
47	19.62	19.31	19.08	20.83	78.84	79.76	0.99
49	20.95	21.34	20.94	21.71	84.95	85.46	0.99
50	20.39	20.82	20.18	21.01	82.41	82.63	1.00
51	19.98	19.57	19.91	20.81	80.28	83.31	0.96
53	22.02	20.79	20.64	22.09	85.53	86.29	0.99
54	21.08	21.66	20.80	23.14	86.68	82.11	1.06
55	21.68	20.63	20.83	21.37	84.52	82.69	1.02
56	21.91	22.34	20.98	23.18	88.41	85.54	1.03
65	19.93	18.62	18.83	20.77	78.15	76.09	1.03
71	26.01	21.78	20.88	27.09	95.77	95.70	1.00
72	24.24	20.80	21.81	24.32	91.17	91.81	0.99

1st Q 12/29/10 to 3/30/11 - 2nd Q 3/30/11 to 6/29/11 - 3rd Q 6/29/11 to 9/28/11 - 4th Q 9/28/11 to 12/29/11

TABLE A-1.1

2011 QUARTERLY & ANNUAL TLD RESULTS

Results in milli-Roentgen (mR)

Station ID	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Quarterly Sum	Annual TLD Result	Ratio Quarterly Sum / Annual
73	21.01	19.44	20.75	21.68	82.88	80.54	1.03
74	23.33	21.63	21.71	23.19	89.86	87.27	1.03
75	21.45	21.45	21.03	23.54	87.46	82.86	1.06
76	22.30	20.29	20.53	19.89	83.01	84.54	0.98
77	21.91	20.95	21.79	21.99	86.65	84.22	1.03
78	20.74	20.47	20.35	21.53	83.09	81.46	1.02
79	20.75	20.33	21.20	21.41	83.68	83.17	1.01
80	19.92	20.09	20.10	21.32	81.43	82.70	0.98
81	20.87	20.20	20.33	21.52	82.92	81.54	1.02
82	22.40	20.96	21.84	22.15	87.36	83.61	1.04
83	22.35	20.96	21.14	22.31	86.76	84.95	1.02
84	20.93	21.12	20.50	22.35	84.90	84.50	1.00
85	22.06	22.12	21.29	24.05	89.52	88.45	1.01
86	29.44	25.28	26.22	28.69	109.62	107.66	1.02

TABLE A-1.2

2011 QUARTERLY & ANNUAL TLD RESULTS- SUMMARY

Results in milli-Roentgen (mR)

Location	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
Quarterly Indicator TLDs	21.33	17.72	29.44	222	222
Quarterly Control TLDs	20.07	19.60	20.92	4	4
Annual Indicator TLDs	84.35	75.82	107.66	55	55
Annual Control TLDs	75.95	75.95	75.95	1	1

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
12/28/10 - 01/04/11	2.90E-02	1.03E-03	2.80E-02	1.01E-03	2.94E-02	1.04E-03
01/04/11 - 01/11/11	6.46E-02	1.55E-03	5.92E-02	1.49E-03	5.47E-02	1.44E-03
01/11/11 - 01/18/11	1.14E-02	6.65E-04	1.01E-02	6.32E-04	9.39E-03	6.08E-04
01/18/11 - 01/25/11	1.40E-02	7.20E-04	1.28E-02	7.03E-04	1.03E-02	6.37E-04
01/25/11 - 02/01/11	1.68E-02	7.77E-04	1.81E-02	8.00E-04	1.54E-02	7.27E-04
02/01/11 - 02/08/11	2.34E-02	9.35E-04	2.40E-02	9.37E-04	2.05E-02	8.72E-04
02/08/11 - 02/15/11	1.67E-02	8.11E-04	1.65E-02	7.94E-04	1.46E-02	7.49E-04
02/15/11 - 02/22/11	7.48E-03	5.62E-04	5.78E-03	5.13E-04	7.59E-03	5.53E-04
02/22/11 - 03/01/11	1.01E-02	6.33E-04	1.09E-02	6.65E-04	1.04E-02	6.36E-04
03/01/11 - 03/08/11	7.79E-03	5.65E-04	5.97E-03	5.17E-04	5.54E-03	4.86E-04
03/08/11 - 03/15/11	5.07E-03	5.31E-04	5.34E-03	5.17E-04	5.97E-03	5.60E-04
03/15/11 - 03/22/11	3.81E-02	1.21E-03	3.69E-02	1.20E-03	3.64E-02	1.16E-03
03/22/11 - 03/29/11	2.23E-02	9.22E-04	2.58E-02	9.98E-04	2.18E-02	9.06E-04
03/29/11 - 04/05/11	7.86E-03	5.66E-04	1.10E-02	6.70E-04	8.56E-03	5.85E-04
04/05/11 - 04/12/11	1.36E-02	7.27E-04	1.16E-02	6.79E-04	1.39E-02	7.15E-04
04/12/11 - 04/19/11	9.30E-03	6.33E-04	8.43E-03	6.04E-04	8.22E-03	5.74E-04
04/19/11 - 04/26/11	1.08E-02	6.63E-04	1.13E-02	6.68E-04	1.17E-02	6.64E-04
04/26/11 - 05/03/11	5.12E-03	4.73E-04	6.26E-03	5.08E-04	5.41E-03	4.74E-04
05/03/11 - 05/10/11	6.56E-03	5.37E-04	6.09E-03	5.11E-04	4.68E-03	4.52E-04
05/10/11 - 05/17/11	1.15E-02	6.99E-04	1.06E-02	6.42E-04	1.05E-02	6.37E-04
05/17/11 - 05/24/11	1.39E-02	7.21E-04	1.37E-02	7.42E-04	1.18E-02	6.78E-04
05/24/11 - 05/31/11	7.24E-03	5.65E-04	7.18E-03	5.59E-04	7.08E-03	5.45E-04
05/31/11 - 06/07/11	1.03E-02	6.49E-04	9.33E-03	6.13E-04	1.01E-02	6.23E-04
06/07/11 - 06/14/11	8.61E-03	6.10E-04	1.07E-02	6.55E-04	1.03E-02	6.33E-04
06/14/11 - 06/21/11	4.21E-03	4.47E-04	4.72E-03	4.59E-04	4.01E-03	4.19E-04
06/22/11 - 06/28/11	NVS		9.42E-03	6.34E-04	8.86E-03	5.95E-04
06/28/11 - 07/05/11	NVS		8.87E-03	6.12E-04	1.00E-02	6.21E-04
07/05/11 - 07/12/11	8.34E-03	6.44E-04	1.26E-02	7.01E-04	1.12E-02	6.41E-04
07/12/11 - 07/19/11	7.00E-03	5.38E-04	8.19E-03	5.82E-04	7.96E-03	5.69E-04
07/19/11 - 07/26/11	7.88E-03	5.70E-04	9.43E-03	6.04E-04	8.67E-03	6.01E-04
07/26/11 - 08/02/11	1.12E-02	6.87E-04	1.42E-02	7.80E-04	1.13E-02	6.66E-04
08/02/11 - 08/09/11	1.40E-02	7.55E-04	1.33E-02	7.25E-04	1.40E-02	7.23E-04
08/09/11 - 08/16/11	1.73E-02	8.08E-04	1.71E-02	8.04E-04	1.58E-02	7.72E-04
08/16/11 - 08/23/11	1.63E-02	8.17E-04	1.76E-02	8.32E-04	1.63E-02	8.03E-04
08/23/11 - 08/30/11	1.75E-02	8.38E-04	1.54E-02	7.70E-04	1.65E-02	7.98E-04
08/30/11 - 09/06/11	1.22E-02	7.24E-04	1.27E-02	7.24E-04	1.21E-02	7.04E-04
09/06/11 - 09/13/11	3.97E-02	1.27E-03	4.08E-02	1.26E-03	3.75E-02	1.20E-03
09/13/11 - 09/20/11	1.66E-02	8.25E-04	1.85E-02	8.45E-04	1.83E-02	8.36E-04
09/20/11 - 09/27/11	1.94E-02	8.52E-04	2.27E-02	9.15E-04	2.14E-02	8.78E-04
09/27/11 - 10/04/11	1.39E-02	7.47E-04	1.48E-02	7.64E-04	1.44E-02	7.71E-04
10/04/11 - 10/11/11	7.62E-03	5.90E-04	8.99E-03	6.12E-04	7.48E-03	5.83E-04
10/11/11 - 10/18/11	1.80E-02	8.22E-04	1.96E-02	8.54E-04	2.04E-02	8.68E-04
10/18/11 - 10/25/11	1.86E-02	8.37E-04	1.86E-02	8.43E-04	1.90E-02	8.46E-04
10/25/11 - 11/01/11	1.80E-02	8.29E-04	1.67E-02	8.11E-04	1.66E-02	7.93E-04
11/01/11 - 11/08/11	1.81E-02	8.33E-04	1.79E-02	8.39E-04	1.68E-02	7.99E-04
11/08/11 - 11/15/11	1.88E-02	8.54E-04	2.15E-02	9.30E-04	1.69E-02	8.14E-04
11/15/11 - 11/22/11	1.23E-02	7.10E-04	1.25E-02	7.18E-04	1.37E-02	7.51E-04
11/22/11 - 11/29/11	5.82E-03	5.26E-04	6.31E-03	5.50E-04	6.63E-03	5.55E-04
11/29/11 - 12/06/11	2.24E-02	9.15E-04	2.27E-02	9.31E-04	2.11E-02	8.91E-04
12/06/11 - 12/13/11	7.34E-02	1.67E-03	7.37E-02	1.72E-03	7.18E-02	1.67E-03
12/13/11 - 12/20/11	6.24E-02	1.54E-03	7.12E-02	1.70E-03	5.87E-02	1.51E-03
12/20/11 - 12/27/11	2.97E-02	1.04E-03	3.05E-02	1.09E-03	2.73E-02	1.02E-03
12/27/11 - 01/03/12	7.17E-03	5.45E-04	6.68E-03	5.50E-04	8.02E-03	5.93E-04

NVS = Valid sample not obtained due to sampler failure.

Average MDA for analyses listed in Table A-2.1 was 9.04E-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
12/28/10 - 01/04/11	2.86E-02	1.02E-03	3.08E-02	1.06E-03	3.10E-02	1.06E-03
01/04/11 - 01/11/11	6.15E-02	1.52E-03	6.54E-02	1.56E-03	6.15E-02	1.53E-03
01/11/11 - 01/18/11	9.32E-03	6.08E-04	1.00E-02	6.27E-04	9.39E-03	6.07E-04
01/18/11 - 01/25/11	1.21E-02	6.85E-04	1.39E-02	7.10E-04	1.16E-02	6.72E-04
01/25/11 - 02/01/11	1.58E-02	7.43E-04	1.79E-02	7.96E-04	1.61E-02	7.46E-04
02/01/11 - 02/08/11	2.49E-02	9.51E-04	2.53E-02	9.48E-04	2.34E-02	9.39E-04
02/08/11 - 02/15/11	1.59E-02	7.64E-04	1.66E-02	7.83E-04	1.61E-02	7.82E-04
02/15/11 - 02/22/11	6.38E-03	5.20E-04	6.82E-03	5.21E-04	6.78E-03	5.42E-04
02/22/11 - 03/01/11	1.01E-02	6.38E-04	1.18E-02	6.64E-04	1.30E-02	7.17E-04
03/01/11 - 03/08/11	6.04E-03	5.10E-04	8.45E-03	5.71E-04	7.11E-03	5.45E-04
03/08/11 - 03/15/11	6.56E-03	5.75E-04	6.29E-03	5.42E-04	7.49E-03	5.88E-04
03/15/11 - 03/22/11	3.28E-02	1.11E-03	3.49E-02	1.15E-03	2.87E-02	1.04E-03
03/22/11 - 03/29/11	2.24E-02	9.19E-04	2.22E-02	9.11E-04	2.28E-02	9.23E-04
03/29/11 - 04/05/11	8.35E-03	5.72E-04	6.47E-03	5.23E-04	7.63E-03	5.75E-04
04/05/11 - 04/12/11	1.41E-02	7.44E-04	1.10E-02	6.54E-04	1.24E-02	7.02E-04
04/12/11 - 04/19/11	1.01E-02	6.38E-04	9.49E-03	6.23E-04	9.04E-03	6.10E-04
04/19/11 - 04/26/11	1.18E-02	6.84E-04	1.01E-02	6.52E-04	9.45E-03	6.15E-04
04/26/11 - 05/03/11	6.23E-03	5.11E-04	6.71E-03	5.20E-04	5.99E-03	5.05E-04
05/03/11 - 05/10/11	5.18E-03	4.86E-04	4.51E-03	4.49E-04	5.08E-03	4.93E-04
05/10/11 - 05/17/11	1.14E-02	6.76E-04	1.15E-02	6.57E-04	1.07E-02	6.45E-04
05/17/11 - 05/24/11	1.36E-02	7.32E-04	1.38E-02	7.16E-04	1.44E-02	7.46E-04
05/24/11 - 05/31/11	7.30E-03	5.82E-04	8.28E-03	6.00E-04	8.61E-03	5.96E-04
05/31/11 - 06/07/11	1.07E-02	6.81E-04	1.02E-02	6.46E-04	9.58E-03	6.15E-04
06/07/11 - 06/14/11	9.69E-03	6.35E-04	1.10E-02	6.78E-04	9.40E-03	6.11E-04
06/14/11 - 06/21/11	4.12E-03	4.40E-04	4.44E-03	4.59E-04	5.43E-03	4.76E-04
06/22/11 - 06/28/11	9.49E-03	6.16E-04	8.84E-03	6.22E-04	9.90E-03	6.34E-04
06/28/11 - 07/05/11	9.83E-03	6.39E-04	1.02E-02	6.27E-04	9.57E-03	6.13E-04
07/05/11 - 07/12/11	1.13E-02	6.67E-04	1.11E-02	6.31E-04	1.00E-02	6.20E-04
07/12/11 - 07/19/11	7.73E-03	5.73E-04	8.11E-03	5.77E-04	8.56E-03	5.89E-04
07/19/11 - 07/26/11	9.75E-03	6.28E-04	9.24E-03	6.11E-04	1.03E-02	6.46E-04
07/26/11 - 08/02/11	1.14E-02	7.08E-04	1.13E-02	6.74E-04	1.05E-02	6.53E-04
08/02/11 - 08/09/11	1.16E-02	6.90E-04	1.25E-02	6.81E-04	1.45E-02	7.50E-04
08/09/11 - 08/16/11	1.78E-02	8.14E-04	1.75E-02	8.09E-04	1.73E-02	8.02E-04
08/16/11 - 08/23/11	1.65E-02	8.12E-04	1.87E-02	8.59E-04	1.77E-02	8.31E-04
08/23/11 - 08/30/11	1.72E-02	8.10E-04	1.77E-02	8.37E-04	1.66E-02	8.07E-04
08/30/11 - 09/06/11	1.37E-02	7.56E-04	1.47E-02	7.81E-04	1.15E-02	6.88E-04
09/06/11 - 09/13/11	4.23E-02	1.30E-03	4.39E-02	1.33E-03	3.93E-02	1.22E-03
09/13/11 - 09/20/11	1.89E-02	8.61E-04	1.90E-02	8.41E-04	1.61E-02	7.86E-04
09/20/11 - 09/27/11	2.21E-02	9.05E-04	2.23E-02	8.94E-04	2.18E-02	8.95E-04
09/27/11 - 10/04/11	1.53E-02	7.84E-04	1.33E-02	7.37E-04	1.44E-02	7.57E-04
10/04/11 - 10/11/11	9.07E-03	6.28E-04	8.41E-03	6.08E-04	8.61E-03	6.06E-04
10/11/11 - 10/18/11	1.99E-02	8.63E-04	1.89E-02	8.43E-04	2.04E-02	8.71E-04
10/18/11 - 10/25/11	1.86E-02	8.24E-04	2.00E-02	8.66E-04	1.78E-02	8.11E-04
10/25/11 - 11/01/11	1.70E-02	7.94E-04	1.79E-02	8.25E-04	1.72E-02	8.00E-04
11/01/11 - 11/08/11	1.69E-02	7.93E-04	1.88E-02	8.40E-04	1.70E-02	7.89E-04
11/08/11 - 11/15/11	1.99E-02	8.79E-04	2.22E-02	9.33E-04	1.92E-02	8.51E-04
11/15/11 - 11/22/11	1.28E-02	7.29E-04	1.48E-02	7.87E-04	1.37E-02	7.39E-04
11/22/11 - 11/29/11	6.83E-03	5.59E-04	6.39E-03	5.52E-04	7.92E-03	5.89E-04
11/29/11 - 12/06/11	2.22E-02	9.12E-04	2.41E-02	9.56E-04	2.36E-02	9.36E-04
12/06/11 - 12/13/11	7.32E-02	1.70E-03	7.08E-02	1.67E-03	7.10E-02	1.66E-03
12/13/11 - 12/20/11	6.43E-02	1.60E-03	6.73E-02	1.65E-03	6.39E-02	1.56E-03
12/20/11 - 12/27/11	3.04E-02	1.08E-03	3.12E-02	1.10E-03	2.80E-02	1.01E-03
12/27/11 - 01/03/12	7.66E-03	5.79E-04	7.75E-03	5.84E-04	7.46E-03	5.59E-04

NVS = Valid sample not obtained due to sampler failure.

Average MDA for analyses listed in Table A-2.1 was 9.04E-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
12/28/10 - 01/04/11	2.79E-02	1.01E-03	3.04E-02	1.05E-03	2.93E-02	1.04E-03
01/04/11 - 01/11/11	5.40E-02	1.41E-03	6.10E-02	1.50E-03	6.49E-02	1.55E-03
01/11/11 - 01/18/11	7.39E-03	5.50E-04	9.59E-03	6.14E-04	9.87E-03	6.21E-04
01/18/11 - 01/25/11	1.04E-02	6.43E-04	1.38E-02	7.21E-04	1.29E-02	6.99E-04
01/25/11 - 02/01/11	1.25E-02	6.66E-04	1.81E-02	7.94E-04	1.58E-02	7.49E-04
02/01/11 - 02/08/11	2.00E-02	8.55E-04	2.36E-02	8.98E-04	2.28E-02	9.09E-04
02/08/11 - 02/15/11	1.24E-02	6.87E-04	1.70E-02	7.83E-04	1.57E-02	7.85E-04
02/15/11 - 02/22/11	5.47E-03	4.88E-04	6.21E-03	5.04E-04	6.69E-03	5.35E-04
02/22/11 - 03/01/11	1.00E-02	6.25E-04	1.03E-02	6.25E-04	1.07E-02	6.45E-04
03/01/11 - 03/08/11	6.01E-03	5.05E-04	6.20E-03	5.03E-04	7.37E-03	5.50E-04
03/08/11 - 03/15/11	4.49E-03	4.94E-04	6.91E-03	5.59E-04	5.57E-03	5.21E-04
03/15/11 - 03/22/11	3.38E-02	1.12E-03	3.36E-02	1.10E-03	3.10E-02	1.08E-03
03/22/11 - 03/29/11	2.57E-02	9.61E-04	1.94E-02	8.54E-04	2.18E-02	9.06E-04
03/29/11 - 04/05/11	6.98E-03	5.30E-04	7.08E-03	5.43E-04	7.68E-03	5.61E-04
04/05/11 - 04/12/11	1.16E-02	6.56E-04	1.16E-02	6.68E-04	1.27E-02	7.02E-04
04/12/11 - 04/19/11	8.28E-03	5.78E-04	7.75E-03	5.70E-04	9.59E-03	6.30E-04
04/19/11 - 04/26/11	1.14E-02	6.69E-04	1.14E-02	6.71E-04	1.17E-02	8.44E-04
04/26/11 - 05/03/11	6.43E-03	5.08E-04	4.90E-03	4.60E-04	5.99E-03	5.03E-04
05/03/11 - 05/10/11	5.10E-03	4.73E-04	5.68E-03	5.02E-04	4.34E-03	4.56E-04
05/10/11 - 05/17/11	1.14E-02	6.63E-04	1.10E-02	6.64E-04	1.02E-02	6.42E-04
05/17/11 - 05/24/11	1.37E-02	7.22E-04	1.26E-02	7.12E-04	1.50E-02	7.69E-04
05/24/11 - 05/31/11	6.81E-03	5.39E-04	7.71E-03	5.79E-04	6.97E-03	5.56E-04
05/31/11 - 06/07/11	9.25E-03	6.01E-04	9.38E-03	6.12E-04	9.40E-03	6.25E-04
06/07/11 - 06/14/11	1.01E-02	6.18E-04	9.46E-03	6.28E-04	9.39E-03	6.38E-04
06/14/11 - 06/21/11	3.83E-03	4.23E-04	4.03E-03	4.29E-04	5.19E-03	4.78E-04
06/22/11 - 06/28/11	9.10E-03	6.08E-04	8.92E-03	6.14E-04	8.96E-03	6.21E-04
06/28/11 - 07/05/11	1.01E-02	6.28E-04	9.20E-03	6.15E-04	8.65E-03	5.98E-04
07/05/11 - 07/12/11	9.93E-03	6.13E-04	1.15E-02	6.57E-04	1.07E-02	6.50E-04
07/12/11 - 07/19/11	6.30E-03	5.21E-04	7.82E-03	5.74E-04	9.24E-03	6.21E-04
07/19/11 - 07/26/11	8.01E-03	5.80E-04	8.77E-03	5.98E-04	8.34E-03	5.86E-04
07/26/11 - 08/02/11	1.04E-02	6.63E-04	1.04E-02	6.54E-04	1.03E-02	6.50E-04
08/02/11 - 08/09/11	1.61E-02	7.88E-04	1.42E-02	7.36E-04	1.31E-02	7.20E-04
08/09/11 - 08/16/11	1.56E-02	7.65E-04	1.66E-02	7.88E-04	1.70E-02	7.97E-04
08/16/11 - 08/23/11	1.40E-02	7.60E-04	1.77E-02	8.35E-04	1.57E-02	7.95E-04
08/23/11 - 08/30/11	1.65E-02	7.95E-04	1.69E-02	8.03E-04	1.78E-02	8.25E-04
08/30/11 - 09/06/11	1.22E-02	7.21E-04	1.25E-02	7.18E-04	1.26E-02	7.28E-04
09/06/11 - 09/13/11	3.60E-02	1.18E-03	4.10E-02	1.26E-03	4.19E-02	1.28E-03
09/13/11 - 09/20/11	1.76E-02	8.25E-04	1.79E-02	8.33E-04	1.74E-02	8.29E-04
09/20/11 - 09/27/11	1.85E-02	8.30E-04	2.10E-02	8.83E-04	2.10E-02	8.91E-04
09/27/11 - 10/04/11	1.27E-02	7.19E-04	1.60E-02	7.92E-04	1.56E-02	8.30E-04
10/04/11 - 10/11/11	4.84E-03	4.66E-04	7.38E-03	5.78E-04	NVS	
10/11/11 - 10/18/11	1.70E-02	7.93E-04	1.88E-02	8.32E-04	1.86E-02	8.34E-04
10/18/11 - 10/25/11	2.00E-02	8.58E-04	2.02E-02	8.56E-04	2.06E-02	8.87E-04
10/25/11 - 11/01/11	1.31E-02	7.06E-04	1.73E-02	8.00E-04	1.83E-02	8.42E-04
11/01/11 - 11/08/11	1.44E-02	7.34E-04	1.98E-02	8.51E-04	1.75E-02	8.26E-04
11/08/11 - 11/15/11	1.76E-02	8.28E-04	1.79E-02	8.69E-04	2.05E-02	9.08E-04
11/15/11 - 11/22/11	1.05E-02	6.70E-04	1.40E-02	7.46E-04	1.45E-02	7.77E-04
11/22/11 - 11/29/11	5.98E-03	5.29E-04	6.73E-03	5.42E-04	6.94E-03	5.70E-04
11/29/11 - 12/06/11	1.81E-02	8.20E-04	2.42E-02	9.44E-04	1.60E-02	9.15E-04
12/06/11 - 12/13/11	6.49E-02	1.59E-03	7.32E-02	1.69E-03	7.10E-02	1.65E-03
12/13/11 - 12/20/11	5.63E-02	1.47E-03	6.74E-02	1.64E-03	6.79E-02	1.62E-03
12/20/11 - 12/27/11	2.50E-02	9.77E-04	2.77E-02	1.01E-03	3.21E-02	1.11E-03
12/27/11 - 01/03/12	7.46E-03	5.78E-04	7.24E-03	5.52E-04	8.14E-03	5.76E-04

NVS = Valid sample not obtained due to sampler failure.

Average MDA for analyses listed in Table A-2.1 was 9.04E-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
12/28/10 - 01/04/11	3.17E-02	1.08E-03	2.96E-02	1.04E-03	3.15E-02	1.07E-03
01/04/11 - 01/11/11	5.49E-02	1.43E-03	5.90E-02	1.50E-03	6.34E-02	1.52E-03
01/11/11 - 01/18/11	9.23E-03	6.05E-04	1.12E-02	6.59E-04	1.05E-02	6.27E-04
01/18/11 - 01/25/11	1.11E-02	6.60E-04	1.21E-02	6.82E-04	1.35E-02	7.08E-04
01/25/11 - 02/01/11	1.61E-02	7.39E-04	1.67E-02	7.50E-04	1.90E-02	8.07E-04
02/01/11 - 02/08/11	2.14E-02	9.13E-04	2.39E-02	9.63E-04	2.41E-02	9.47E-04
02/08/11 - 02/15/11	1.47E-02	7.64E-04	1.54E-02	7.81E-04	1.77E-02	8.49E-04
02/15/11 - 02/22/11	7.70E-03	5.59E-04	6.28E-03	5.18E-04	7.27E-03	5.42E-04
02/22/11 - 03/01/11	1.26E-02	6.95E-04	1.06E-02	6.42E-04	1.29E-02	6.98E-04
03/01/11 - 03/08/11	6.09E-03	5.02E-04	7.18E-03	5.40E-04	5.85E-03	4.90E-04
03/08/11 - 03/15/11	7.24E-03	5.80E-04	6.00E-03	5.48E-04	7.42E-03	5.90E-04
03/15/11 - 03/22/11	3.27E-02	1.10E-03	3.26E-02	1.11E-03	3.26E-02	1.14E-03
03/22/11 - 03/29/11	2.07E-02	8.77E-04	2.26E-02	9.21E-04	2.02E-02	9.03E-04
03/29/11 - 04/05/11	8.64E-03	5.89E-04	6.76E-03	5.35E-04	6.98E-03	5.63E-04
04/05/11 - 04/12/11	1.31E-02	6.97E-04	1.18E-02	6.79E-04	1.30E-02	7.33E-04
04/12/11 - 04/19/11	9.24E-03	6.17E-04	9.47E-03	6.34E-04	8.50E-03	6.21E-04
04/19/11 - 04/26/11	1.14E-02	6.70E-04	1.03E-02	6.54E-04	1.10E-02	6.55E-04
04/26/11 - 05/03/11	5.49E-03	4.88E-04	7.56E-03	5.63E-04	5.47E-03	4.81E-04
05/03/11 - 05/10/11	6.29E-03	5.23E-04	4.90E-03	4.87E-04	3.57E-03	4.29E-04
05/10/11 - 05/17/11	1.14E-02	6.80E-04	1.03E-02	6.36E-04	1.11E-02	6.68E-04
05/17/11 - 05/24/11	1.39E-02	7.27E-04	1.15E-02	6.65E-04	1.29E-02	7.19E-04
05/24/11 - 05/31/11	6.74E-03	5.42E-04	7.96E-03	5.79E-04	7.50E-03	5.75E-04
05/31/11 - 06/07/11	1.05E-02	6.42E-04	1.04E-02	6.43E-04	8.76E-03	6.10E-04
06/07/11 - 06/14/11	9.45E-03	6.13E-04	1.02E-02	6.43E-04	9.24E-03	6.28E-04
06/14/11 - 06/21/11	5.45E-03	4.78E-04	4.89E-03	4.64E-04	3.62E-03	4.14E-04
06/22/11 - 06/28/11	9.54E-03	6.29E-04	9.57E-03	6.40E-04	8.25E-03	5.98E-04
06/28/11 - 07/05/11	9.37E-03	6.08E-04	7.58E-03	5.01E-04	8.24E-03	5.90E-04
07/05/11 - 07/12/11	1.02E-02	6.30E-04	1.09E-02	6.57E-04	7.89E-03	5.57E-04
07/12/11 - 07/19/11	7.43E-03	5.56E-04	8.44E-03	5.95E-04	9.44E-03	6.19E-04
07/19/11 - 07/26/11	8.58E-03	5.99E-04	8.31E-03	6.08E-04	8.40E-03	5.89E-04
07/26/11 - 08/02/11	8.87E-03	6.09E-04	1.12E-02	6.91E-04	9.96E-03	6.40E-04
08/02/11 - 08/09/11	1.25E-02	7.00E-04	1.43E-02	7.36E-04	1.38E-02	7.33E-04
08/09/11 - 08/16/11	1.60E-02	7.73E-04	1.66E-02	7.86E-04	1.64E-02	7.85E-04
08/16/11 - 08/23/11	1.74E-02	8.36E-04	1.54E-02	7.82E-04	1.57E-02	7.78E-04
08/23/11 - 08/30/11	1.69E-02	8.19E-04	1.72E-02	8.30E-04	1.61E-02	7.70E-04
08/30/11 - 09/06/11	1.24E-02	7.27E-04	1.37E-02	7.76E-04	1.21E-02	6.90E-04
09/06/11 - 09/13/11	4.15E-02	1.27E-03	4.05E-02	1.25E-03	3.84E-02	1.20E-03
09/13/11 - 09/20/11	2.02E-02	8.88E-04	1.65E-02	8.10E-04	1.66E-02	7.89E-04
09/20/11 - 09/27/11	2.08E-02	8.94E-04	2.07E-02	8.82E-04	1.90E-02	8.25E-04
09/27/11 - 10/04/11	1.41E-02	7.70E-04	1.50E-02	7.77E-04	1.30E-02	7.27E-04
10/04/11 - 10/11/11	7.40E-03	5.61E-04	7.20E-03	5.54E-04	7.38E-03	5.65E-04
10/11/11 - 10/18/11	1.94E-02	8.41E-04	2.11E-02	8.77E-04	1.60E-02	7.70E-04
10/18/11 - 10/25/11	1.86E-02	8.22E-04	1.91E-02	8.31E-04	1.87E-02	8.24E-04
10/25/11 - 11/01/11	1.62E-02	7.77E-04	1.75E-02	8.08E-04	1.71E-02	8.00E-04
11/01/11 - 11/08/11	1.64E-02	7.84E-04	1.71E-02	7.99E-04	1.86E-02	8.20E-04
11/08/11 - 11/15/11	1.69E-02	8.07E-04	1.80E-02	8.41E-04	1.88E-02	8.40E-04
11/15/11 - 11/22/11	1.32E-02	7.32E-04	1.48E-02	7.70E-04	1.30E-02	7.15E-04
11/22/11 - 11/29/11	6.22E-03	5.38E-04	7.43E-03	5.76E-04	6.22E-03	5.25E-04
11/29/11 - 12/06/11	2.20E-02	9.10E-04	2.06E-02	8.91E-04	2.07E-02	8.60E-04
12/06/11 - 12/13/11	7.19E-02	1.69E-03	7.18E-02	1.69E-03	7.05E-02	1.64E-03
12/13/11 - 12/20/11	6.11E-02	1.56E-03	6.56E-02	1.62E-03	6.36E-02	1.56E-03
12/20/11 - 12/27/11	2.92E-02	1.07E-03	2.82E-02	1.03E-03	2.75E-02	1.00E-03
12/27/11 - 01/03/12	6.97E-03	5.59E-04	7.74E-03	5.79E-04	8.10E-03	5.69E-04

NVS = Valid sample not obtained due to sampler failure.

Average MDA for analyses listed in Table A-2.1 was 9.04E-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	1.72E-02	3.57E-03	7.37E-02	580	580
Gross Beta Controls	1.55E-02	3.83E-03	6.49E-02	53	53

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 11

Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.93E-02 ±	1.54E-02	1.01E-02
K-40		1.30E-05 ±	7.21E-03	1.37E-02
MN-54		-1.05E-04 ±	6.04E-04	9.63E-04
FE-59		-5.02E-04 ±	4.20E-03	6.73E-03
CO-60		-5.29E-06 ±	5.54E-04	9.09E-04
ZN-65		-2.85E-04 ±	1.47E-03	2.32E-03
ZRNB-95		1.92E-04 ±	9.23E-04	1.46E-03
CS-134		4.68E-04 ±	4.85E-04	6.73E-04
CS-137		3.68E-04 ±	6.21E-04	9.34E-04
BALA140		-5.47E-03 ±	2.76E-02	4.35E-02
RU-106		4.33E-04 ±	5.02E-03	8.14E-03

Location and Quarter Station 1 2nd Q 11

Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.04E-01 ±	1.84E-02	1.29E-02
K-40		-3.08E-03 ±	2.05E-02	1.56E-02
MN-54		8.41E-05 ±	5.96E-04	9.54E-04
FE-59		0.00E+00 ±	1.14E-03	1.91E-03
CO-60		0.00E+00 ±	1.90E-04	3.17E-04
ZN-65		0.00E+00 ±	1.93E-03	3.22E-03
ZRNB-95		-1.47E-04 ±	8.72E-04	1.39E-03
CS-134		-1.26E-04 ±	5.75E-04	9.17E-04
CS-137		0.00E+00 ±	5.91E-04	9.85E-04
BALA140		2.15E-03 ±	1.30E-02	2.02E-02
RU-106		-2.29E-05 ±	2.93E-03	4.80E-03

Location and Quarter Station 1 3rd Q 11

Nuclide	RQ	Activity	Error	MDA
BE-7	+	2.19E-01 ±	2.67E-02	1.07E-02
K-40		-5.60E-04 ±	1.20E-02	1.40E-02
MN-54		-4.56E-06 ±	5.56E-04	9.12E-04
FE-59		1.10E-03 ±	5.28E-03	8.32E-03
CO-60		1.56E-04 ±	4.43E-04	6.42E-04
ZN-65		-7.43E-04 ±	1.90E-03	2.91E-03
ZRNB-95		-4.04E-04 ±	1.21E-03	1.87E-03
CS-134		1.52E-04 ±	4.53E-04	6.99E-04
CS-137		5.25E-05 ±	4.27E-04	6.82E-04
BALA140		0.00E+00 ±	1.30E-02	2.16E-02
RU-106		0.00E+00 ±	7.17E-03	1.19E-02

Location and Quarter Station 1 4th Q 11

Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.58E-02 ±	1.41E-02	9.06E-03
K-40		3.62E-03 ±	6.79E-03	1.07E-02
MN-54		1.23E-05 ±	4.50E-04	7.35E-04
FE-59		0.00E+00 ±	9.45E-04	1.58E-03
CO-60		0.00E+00 ±	7.59E-04	1.27E-03
ZN-65		-2.13E-04 ±	1.13E-03	1.78E-03
ZRNB-95		0.00E+00 ±	1.61E-03	2.69E-03
CS-134		5.40E-05 ±	4.39E-04	7.08E-04
CS-137		1.02E-04 ±	4.22E-04	6.62E-04
BALA140		0.00E+00 ±	4.87E-03	8.12E-03
RU-106		5.37E-04 ±	3.70E-03	5.92E-03

Location and Quarter Station 4 1st Q 11

Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.36E-02 ±	1.66E-02	1.17E-02
K-40		-1.41E-03 ±	1.20E-02	1.46E-02
MN-54		0.00E+00 ±	6.62E-04	1.10E-03
FE-59		2.64E-04 ±	3.14E-03	5.05E-03
CO-60		-1.14E-04 ±	6.27E-04	9.93E-04
ZN-65		2.49E-04 ±	1.52E-03	2.42E-03
ZRNB-95		5.93E-04 ±	8.16E-04	1.12E-03
CS-134		2.75E-04 ±	5.03E-04	7.59E-04
CS-137		3.56E-04 ±	5.79E-04	8.61E-04
BALA140		-5.98E-03 ±	2.58E-02	4.02E-02
RU-106		-6.34E-04 ±	4.86E-03	7.82E-03

Location and Quarter Station 4 2nd Q 11

Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.01E-01 ±	1.76E-02	1.21E-02
K-40		-6.25E-03 ±	2.50E-02	9.67E-03
MN-54		-5.93E-05 ±	6.33E-04	1.03E-03
FE-59		-3.94E-04 ±	2.94E-03	4.67E-03
CO-60		1.36E-04 ±	5.90E-04	9.21E-04
ZN-65		5.23E-04 ±	1.14E-03	1.66E-03
ZRNB-95		5.27E-04 ±	7.26E-04	9.90E-04
CS-134		2.41E-04 ±	4.62E-04	6.95E-04
CS-137		2.25E-04 ±	4.26E-04	6.22E-04
BALA140		-6.77E-04 ±	1.35E-02	2.19E-02
RU-106		0.00E+00 ±	6.95E-03	1.16E-02

Location and Quarter Station 4 3rd Q 11

Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.70E-01 ±	2.42E-02	1.62E-02
K-40		2.00E-03 ±	6.93E-03	1.15E-02
MN-54		-1.10E-04 ±	6.35E-04	1.01E-03
FE-59		0.00E+00 ±	4.74E-03	7.91E-03
CO-60		0.00E+00 ±	8.43E-04	1.40E-03
ZN-65		-6.48E-04 ±	1.82E-03	2.82E-03
ZRNB-95		1.57E-04 ±	9.38E-04	1.49E-03
CS-134		3.18E-06 ±	3.40E-04	5.58E-04
CS-137		-1.01E-04 ±	4.82E-04	7.62E-04
BALA140		-2.84E-04 ±	4.00E-02	6.57E-02
RU-106		3.60E-04 ±	4.31E-03	6.98E-03

Location and Quarter Station 4 4th Q 11

Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.31E-02 ±	1.58E-02	1.17E-02
K-40		4.44E-03 ±	5.67E-03	8.49E-03
MN-54		1.37E-04 ±	5.57E-04	8.77E-04
FE-59		9.20E-04 ±	2.44E-03	3.55E-03
CO-60		0.00E+00 ±	1.62E-04	2.70E-04
ZN-65		-4.74E-04 ±	1.45E-03	2.25E-03
ZRNB-95		1.62E-04 ±	1.51E-03	2.44E-03
CS-134		-9.61E-06 ±	3.98E-04	6.51E-04
CS-137		0.00E+00 ±	7.08E-04	1.18E-03
BALA140		0.00E+00 ±	2.15E-02	3.58E-02
RU-106		-4.88E-04 ±	3.70E-03	5.92E-03

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

1st Q 12/28/10 to 3/29/11 - 2nd Q 3/29/11 to 6/28/11 - 3rd Q 6/28/11 to 9/27/11 - 4th Q 9/27/11 to 1/3/12

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 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	7.92E-02	±	1.76E-02	1.41E-02
K-40		-3.42E-03	±	2.08E-02	1.29E-02
MN-54		1.04E-05	±	5.02E-04	8.23E-04
FE-59		-7.39E-05	±	3.91E-03	6.40E-03
CO-60		0.00E+00	±	1.72E-04	2.87E-04
ZN-65		3.27E-06	±	2.73E-04	6.35E-04
ZRNB-95		-3.10E-04	±	1.10E-03	1.73E-03
CS-134		1.04E-04	±	4.95E-04	7.89E-04
CS-137		5.73E-04	±	5.97E-04	8.38E-04
BALA140		0.00E+00	±	7.90E-03	1.32E-02
RU-106		-1.15E-03	±	5.48E-03	8.73E-03

Location and Quarter Station 5 2nd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	1.11E-01	±	1.72E-02	1.08E-02
K-40		-3.83E-03	±	3.12E-02	1.40E-02
MN-54		-1.71E-04	±	5.84E-04	9.12E-04
FE-59		4.69E-04	±	2.68E-03	4.20E-03
CO-60		1.23E-05	±	5.69E-04	9.31E-04
ZN-65		0.00E+00	±	3.62E-04	6.04E-04
ZRNB-95		-3.95E-05	±	8.66E-04	1.41E-03
CS-134		1.01E-04	±	4.92E-04	7.85E-04
CS-137		3.75E-04	±	4.30E-04	5.76E-04
BALA140		2.95E-03	±	1.36E-02	2.09E-02
RU-106		-5.84E-04	±	4.60E-03	7.41E-03

Location and Quarter Station 5 3rd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	1.74E-01	±	2.39E-02	1.42E-02
K-40		3.30E-03	±	6.08E-03	9.67E-03
MN-54		-1.68E-04	±	6.24E-04	9.80E-04
FE-59		6.75E-04	±	3.95E-03	6.24E-03
CO-60		-1.97E-04	±	6.20E-04	9.53E-04
ZN-65		3.90E-05	±	1.44E-03	2.35E-03
ZRNB-95		3.19E-04	±	8.38E-04	1.26E-03
CS-134		-1.70E-04	±	5.43E-04	8.55E-04
CS-137		-7.70E-06	±	4.64E-04	7.61E-04
BALA140		-1.11E-02	±	4.27E-02	6.65E-02
RU-106		0.00E+00	±	6.14E-03	1.02E-02

Location and Quarter Station 5 4th Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	8.88E-02	±	1.59E-02	1.13E-02
K-40		4.43E-03	±	4.83E-03	6.94E-03
MN-54		2.00E-04	±	5.46E-04	8.39E-04
FE-59		-4.93E-05	±	3.24E-03	5.31E-03
CO-60		0.00E+00	±	5.45E-04	9.08E-04
ZN-65		2.60E-04	±	1.09E-03	1.68E-03
ZRNB-95		-1.60E-04	±	1.52E-03	2.46E-03
CS-134		-1.46E-05	±	4.01E-04	6.55E-04
CS-137		2.17E-04	±	4.77E-04	7.22E-04
BALA140		0.00E+00	±	4.98E-03	8.31E-03
RU-106		-9.80E-04	±	5.26E-03	8.42E-03

Location and Quarter Station 6 1st Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	8.71E-02	±	1.62E-02	1.02E-02
K-40		-9.19E-04	±	8.54E-03	1.27E-02
MN-54		1.08E-04	±	5.46E-04	8.63E-04
FE-59		-4.30E-04	±	3.29E-03	5.23E-03
CO-60		-1.51E-04	±	5.44E-04	8.35E-04
ZN-65		-1.95E-04	±	1.40E-03	2.23E-03
ZRNB-95		-8.73E-05	±	8.97E-04	1.45E-03
CS-134		-9.82E-05	±	4.02E-04	6.32E-04
CS-137		3.36E-04	±	5.33E-04	7.84E-04
BALA140		2.08E-03	±	2.39E-02	3.84E-02
RU-106		-5.08E-04	±	4.95E-03	8.01E-03

Location and Quarter Station 6 2nd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	1.05E-01	±	1.70E-02	1.00E-02
K-40		-9.06E-04	±	8.95E-03	1.33E-02
MN-54		2.78E-05	±	7.16E-04	1.17E-03
FE-59		-4.92E-04	±	3.24E-03	5.13E-03
CO-60		-3.19E-05	±	5.17E-04	8.37E-04
ZN-65		4.41E-04	±	1.20E-03	1.81E-03
ZRNB-95		3.87E-04	±	7.54E-04	1.10E-03
CS-134		5.08E-05	±	4.74E-04	7.66E-04
CS-137		1.34E-04	±	4.63E-04	7.19E-04
BALA140		7.16E-03	±	1.43E-02	2.01E-02
RU-106		7.81E-04	±	4.87E-03	7.79E-03

Location and Quarter Station 6 3rd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	1.77E-01	±	2.35E-02	1.27E-02
K-40		-2.49E-03	±	9.95E-03	6.14E-03
MN-54		1.18E-04	±	5.07E-04	7.92E-04
FE-59		-6.49E-04	±	4.74E-03	7.59E-03
CO-60		2.28E-05	±	5.25E-04	8.55E-04
ZN-65		2.41E-04	±	1.16E-03	1.80E-03
ZRNB-95		-8.74E-05	±	1.04E-03	1.68E-03
CS-134		-1.62E-06	±	5.34E-04	8.79E-04
CS-137		-3.83E-05	±	5.14E-04	8.34E-04
BALA140		0.00E+00	±	1.18E-02	1.97E-02
RU-106		7.54E-05	±	5.24E-03	8.59E-03

Location and Quarter Station 6 4th Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	8.01E-02	±	1.40E-02	8.29E-03
K-40		1.78E-03	±	6.46E-03	1.08E-02
MN-54		4.24E-05	±	4.79E-04	7.74E-04
FE-59		0.00E+00	±	9.57E-04	1.59E-03
CO-60		-9.13E-06	±	4.25E-04	6.94E-04
ZN-65		-2.12E-04	±	1.20E-03	1.91E-03
ZRNB-95		-7.66E-05	±	1.46E-03	2.38E-03
CS-134		1.79E-04	±	3.03E-04	4.28E-04
CS-137		8.32E-05	±	5.26E-04	8.43E-04
BALA140		0.00E+00	±	2.13E-02	3.54E-02
RU-106		-4.05E-06	±	4.52E-03	7.43E-03

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

1st Q 12/28/10 to 3/29/11 - 2nd Q 3/29/11 to 6/28/11 - 3rd Q 6/28/11 to 9/27/11 - 4th Q 9/27/11 to 1/3/12

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 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	7.23E-02	±	1.47E-02	9.31E-03
K-40		-2.30E-03	±	1.49E-02	1.35E-02
MN-54		1.80E-05	±	5.15E-04	8.41E-04
FE-59		0.00E+00	±	1.13E-03	1.89E-03
CO-60		-2.78E-04	±	7.28E-04	1.12E-03
ZN-65		-2.29E-04	±	1.36E-03	2.16E-03
ZRNB-95		-2.90E-04	±	1.03E-03	1.62E-03
CS-134		2.04E-04	±	4.49E-04	6.84E-04
CS-137		3.46E-04	±	4.60E-04	6.45E-04
BALA140		0.00E+00	±	7.83E-03	1.30E-02
RU-106		-1.07E-03	±	5.41E-03	8.63E-03

Location and Quarter Station 7 2nd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	1.01E-01	±	1.74E-02	1.32E-02
K-40		-1.96E-04	±	7.45E-03	1.34E-02
MN-54		-1.00E-05	±	3.61E-04	5.89E-04
FE-59		0.00E+00	±	5.45E-03	9.08E-03
CO-60		2.17E-04	±	3.69E-04	4.72E-04
ZN-65		9.86E-05	±	1.16E-03	1.87E-03
ZRNB-95		0.00E+00	±	1.33E-03	2.22E-03
CS-134		1.66E-04	±	4.25E-04	6.52E-04
CS-137		0.00E+00	±	3.19E-04	5.32E-04
BALA140		0.00E+00	±	2.46E-02	4.11E-02
RU-106		1.15E-03	±	4.49E-03	7.04E-03

Location and Quarter Station 7 3rd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	2.18E-01	±	2.51E-02	1.06E-02
K-40		2.76E-03	±	5.66E-03	9.17E-03
MN-54		1.13E-05	±	5.13E-04	8.40E-04
FE-59		-1.41E-03	±	4.91E-03	7.63E-03
CO-60		-4.74E-05	±	5.80E-04	9.38E-04
ZN-65		-3.26E-04	±	1.47E-03	2.31E-03
ZRNB-95		-2.79E-04	±	9.65E-04	1.50E-03
CS-134		0.00E+00	±	8.62E-04	1.44E-03
CS-137		-5.69E-05	±	4.44E-04	7.12E-04
BALA140		0.00E+00	±	4.97E-02	8.28E-02
RU-106		1.20E-03	±	4.88E-03	7.70E-03

Location and Quarter Station 7 4th Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	7.57E-02	±	1.46E-02	1.02E-02
K-40		-1.21E-04	±	7.47E-03	1.18E-02
MN-54		2.00E-04	±	4.42E-04	6.52E-04
FE-59		-1.00E-03	±	3.36E-03	5.16E-03
CO-60		2.05E-05	±	4.03E-04	6.54E-04
ZN-65		0.00E+00	±	3.30E-03	5.50E-03
ZRNB-95		2.82E-04	±	1.13E-03	1.74E-03
CS-134		-7.57E-05	±	4.54E-04	7.28E-04
CS-137		-1.46E-04	±	5.03E-04	7.88E-04
BALA140		-1.04E-03	±	1.53E-02	2.48E-02
RU-106		1.61E-03	±	4.57E-03	7.08E-03

Location and Quarter Station 8 1st Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	7.93E-02	±	1.58E-02	1.09E-02
K-40		-6.21E-03	±	2.48E-02	9.60E-03
MN-54		4.88E-05	±	4.84E-04	7.78E-04
FE-59		0.00E+00	±	4.28E-03	7.13E-03
CO-60		8.86E-05	±	5.20E-04	8.19E-04
ZN-65		3.05E-04	±	1.25E-03	1.94E-03
ZRNB-95		0.00E+00	±	2.36E-04	3.94E-04
CS-134		3.29E-04	±	4.73E-04	6.90E-04
CS-137		3.08E-04	±	4.88E-04	7.09E-04
BALA140		0.00E+00	±	8.32E-03	1.39E-02
RU-106		1.63E-04	±	4.74E-03	7.75E-03

Location and Quarter Station 8 2nd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	1.07E-01	±	1.80E-02	1.17E-02
K-40		-6.19E-03	±	2.48E-02	9.58E-03
MN-54		1.31E-04	±	5.30E-04	8.29E-04
FE-59		0.00E+00	±	4.01E-03	6.69E-03
CO-60		-9.23E-05	±	6.08E-04	9.68E-04
ZN-65		-3.88E-04	±	1.48E-03	2.31E-03
ZRNB-95		-2.41E-04	±	8.69E-04	1.35E-03
CS-134		1.75E-04	±	4.66E-04	7.20E-04
CS-137		-8.57E-05	±	4.73E-04	7.51E-04
BALA140		-2.67E-03	±	1.77E-02	2.80E-02
RU-106		-3.35E-04	±	5.05E-03	8.21E-03

Location and Quarter Station 8 3rd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	1.83E-01	±	2.58E-02	1.60E-02
K-40		4.52E-03	±	7.35E-03	1.14E-02
MN-54		8.82E-05	±	6.02E-04	9.64E-04
FE-59		-8.11E-04	±	4.93E-03	7.83E-03
CO-60		2.01E-04	±	6.13E-04	9.39E-04
ZN-65		0.00E+00	±	2.25E-03	3.75E-03
ZRNB-95		-1.73E-06	±	1.05E-03	1.73E-03
CS-134		1.10E-04	±	3.59E-04	5.53E-04
CS-137		2.93E-05	±	3.98E-04	6.44E-04
BALA140		0.00E+00	±	1.42E-02	2.37E-02
RU-106		-1.16E-03	±	5.01E-03	7.92E-03

Location and Quarter Station 8 4th Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	7.73E-02	±	1.21E-02	7.47E-03
K-40		-2.20E-03	±	1.09E-02	9.21E-03
MN-54		1.06E-04	±	3.05E-04	4.62E-04
FE-59		1.87E-04	±	1.98E-03	3.18E-03
CO-60		0.00E+00	±	1.14E-04	1.90E-04
ZN-65		0.00E+00	±	1.62E-03	2.70E-03
ZRNB-95		-4.71E-04	±	1.28E-03	1.99E-03
CS-134		-1.55E-05	±	3.00E-04	4.90E-04
CS-137		0.00E+00	±	4.84E-04	8.06E-04
BALA140		0.00E+00	±	3.77E-03	6.28E-03
RU-106		-7.47E-05	±	3.04E-03	4.98E-03

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 9 1st Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	7.69E-02	±	1.31E-02	8.48E-03
K-40		-1.68E-03	±	1.03E-02	9.31E-03
MN-54		0.00E+00	±	2.21E-04	3.68E-04
FE-59		3.12E-04	±	2.77E-03	4.44E-03
CO-60		4.26E-05	±	3.69E-04	5.89E-04
ZN-65		-3.49E-04	±	1.23E-03	1.93E-03
ZRNB-95		1.94E-04	±	7.02E-04	1.10E-03
CS-134		3.70E-04	±	3.65E-04	5.05E-04
CS-137		2.47E-04	±	4.18E-04	6.23E-04
BALA140		-5.97E-03	±	2.05E-02	3.16E-02
RU-106		0.00E+00	±	2.88E-03	4.81E-03

Location and Quarter Station 9 2nd Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.14E-01	±	1.84E-02	1.23E-02
K-40		8.49E-04	±	6.46E-03	1.22E-02
MN-54		4.08E-07	±	3.85E-04	6.37E-04
FE-59		0.00E+00	±	1.07E-03	1.78E-03
CO-60		1.65E-04	±	4.98E-04	7.51E-04
ZN-65		7.24E-04	±	1.29E-03	1.86E-03
ZRNB-95		-3.38E-04	±	9.94E-04	1.54E-03
CS-134		1.45E-04	±	4.38E-04	6.82E-04
CS-137		2.30E-04	±	5.43E-04	8.33E-04
BALA140		1.16E-03	±	1.41E-02	2.26E-02
RU-106		1.23E-03	±	3.60E-03	5.47E-03

Location and Quarter Station 9 3rd Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	2.07E-01	±	2.55E-02	1.18E-02
K-40		3.27E-03	±	6.88E-03	1.10E-02
MN-54		0.00E+00	±	5.90E-04	9.83E-04
FE-59		0.00E+00	±	1.37E-03	2.28E-03
CO-60		0.00E+00	±	1.74E-04	2.90E-04
ZN-65		0.00E+00	±	1.85E-03	3.08E-03
ZRNB-95		0.00E+00	±	1.22E-03	2.03E-03
CS-134		1.65E-05	±	3.20E-04	5.20E-04
CS-137		-1.13E-04	±	5.54E-04	8.82E-04
BALA140		2.93E-03	±	4.60E-02	7.45E-02
RU-106		-1.85E-03	±	5.25E-03	8.16E-03

Location and Quarter Station 9 4th Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	8.50E-02	±	1.42E-02	7.10E-03
K-40		2.38E-03	±	6.15E-03	1.01E-02
MN-54		4.44E-05	±	4.02E-04	6.43E-04
FE-59		1.24E-03	±	2.55E-03	3.60E-03
CO-60		0.00E+00	±	1.58E-04	2.63E-04
ZN-65		-4.18E-04	±	1.53E-03	2.40E-03
ZRNB-95		1.16E-04	±	1.08E-03	1.72E-03
CS-134		-1.02E-04	±	4.24E-04	6.70E-04
CS-137		-6.67E-05	±	5.21E-04	8.39E-04
BALA140		0.00E+00	±	5.17E-03	8.62E-03
RU-106		-5.71E-04	±	3.35E-03	5.30E-03

Location and Quarter Station 21 1st Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	8.62E-02	±	1.64E-02	1.10E-02
K-40		4.97E-04	±	7.68E-03	1.41E-02
MN-54		0.00E+00	±	7.50E-04	1.25E-03
FE-59		1.67E-03	±	4.09E-03	6.15E-03
CO-60		-4.59E-06	±	5.04E-04	8.27E-04
ZN-65		-3.51E-04	±	1.86E-03	2.98E-03
ZRNB-95		0.00E+00	±	6.33E-04	1.05E-03
CS-134		3.00E-04	±	5.52E-04	8.43E-04
CS-137		2.52E-04	±	4.87E-04	7.27E-04
BALA140		-1.60E-03	±	3.02E-02	4.91E-02
RU-106		2.28E-03	±	4.26E-03	6.30E-03

Location and Quarter Station 21 2nd Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.16E-01	±	1.85E-02	1.11E-02
K-40		-2.71E-04	±	7.74E-03	1.36E-02
MN-54		9.68E-05	±	6.15E-04	9.84E-04
FE-59		1.08E-03	±	3.38E-03	5.13E-03
CO-60		1.42E-05	±	5.67E-04	9.27E-04
ZN-65		2.42E-04	±	1.30E-03	2.05E-03
ZRNB-95		1.17E-04	±	8.41E-04	1.34E-03
CS-134		9.89E-05	±	4.74E-04	7.54E-04
CS-137		2.71E-04	±	4.37E-04	6.25E-04
BALA140		0.00E+00	±	6.73E-03	1.12E-02
RU-106		-1.11E-03	±	4.69E-03	7.40E-03

Location and Quarter Station 21 3rd Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.62E-01	±	2.32E-02	1.30E-02
K-40		1.86E-03	±	7.38E-03	1.23E-02
MN-54		-8.48E-06	±	4.32E-04	7.06E-04
FE-59		0.00E+00	±	5.00E-03	8.33E-03
CO-60		6.40E-05	±	5.97E-04	9.60E-04
ZN-65		-1.38E-04	±	1.25E-03	2.01E-03
ZRNB-95		-1.61E-04	±	1.18E-03	1.90E-03
CS-134		-1.40E-04	±	5.54E-04	8.81E-04
CS-137		-7.21E-05	±	4.67E-04	7.46E-04
BALA140		-6.26E-05	±	2.31E-02	3.80E-02
RU-106		0.00E+00	±	5.04E-03	8.41E-03

Location and Quarter Station 21 4th Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	8.78E-02	±	1.33E-02	8.87E-03
K-40		-5.08E-03	±	3.19E+00	9.87E-03
MN-54		2.76E-06	±	3.28E-04	5.39E-04
FE-59		0.00E+00	±	2.52E-03	4.20E-03
CO-60		-1.40E-04	±	4.08E-04	6.23E-04
ZN-65		-1.51E-04	±	8.74E-04	1.39E-03
ZRNB-95		1.64E-04	±	9.04E-04	1.43E-03
CS-134		-9.68E-05	±	3.33E-04	5.24E-04
CS-137		-8.15E-06	±	3.60E-04	5.90E-04
BALA140		0.00E+00	±	3.79E-03	6.32E-03
RU-106		0.00E+00	±	3.08E-03	5.13E-03

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

1st Q 12/28/10 to 3/29/11 - 2nd Q 3/29/11 to 6/28/11 - 3rd Q 6/28/11 to 9/27/11 - 4th Q 9/27/11 to 1/3/12

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 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	7.85E-02	±	1.56E-02	8.88E-03
K-40		-1.25E-03	±	8.21E-03	1.16E-02
MN-54		1.19E-04	±	5.00E-04	7.81E-04
FE-59		1.68E-03	±	4.46E-03	6.76E-03
CO-60		-1.25E-04	±	6.17E-04	9.73E-04
ZN-65		0.00E+00	±	2.54E-03	4.23E-03
ZRNB-95		2.68E-04	±	9.40E-04	1.46E-03
CS-134		4.69E-04	±	5.23E-04	7.48E-04
CS-137		5.30E-04	±	6.00E-04	8.56E-04
BALA140		-7.75E-03	±	3.48E-02	5.45E-02
RU-106		0.00E+00	±	6.84E-03	1.14E-02

Location and Quarter Station 23 2nd Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.08E-01	±	1.95E-02	1.41E-02
K-40		-3.73E-03	±	2.34E-02	1.35E-02
MN-54		-1.79E-04	±	6.55E-04	1.03E-03
FE-59		0.00E+00	±	1.15E-03	1.91E-03
CO-60		3.73E-04	±	6.58E-04	9.54E-04
ZN-65		-2.80E-04	±	1.56E-03	2.48E-03
ZRNB-95		-9.69E-05	±	1.06E-03	1.72E-03
CS-134		0.00E+00	±	6.93E-04	1.16E-03
CS-137		0.00E+00	±	4.58E-04	7.64E-04
BALA140		0.00E+00	±	7.01E-03	1.17E-02
RU-106		-7.79E-04	±	5.13E-03	8.23E-03

Location and Quarter Station 23 3rd Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.79E-01	±	2.63E-02	1.72E-02
K-40		3.39E-03	±	6.28E-03	9.99E-03
MN-54		-1.90E-05	±	6.74E-04	1.10E-03
FE-59		0.00E+00	±	1.39E-03	2.31E-03
CO-60		-6.00E-05	±	5.39E-04	8.63E-04
ZN-65		2.02E-04	±	9.37E-04	1.44E-03
ZRNB-95		7.10E-05	±	9.23E-04	1.49E-03
CS-134		0.00E+00	±	7.70E-04	1.28E-03
CS-137		-9.94E-05	±	4.50E-04	7.08E-04
BALA140		0.00E+00	±	1.46E-02	2.44E-02
RU-106		5.61E-05	±	4.64E-03	7.61E-03

Location and Quarter Station 23 4th Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	8.59E-02	±	1.60E-02	1.05E-02
K-40		2.64E-03	±	6.35E-03	1.04E-02
MN-54		8.34E-05	±	6.22E-04	9.99E-04
FE-59		-1.54E-03	±	4.45E-03	6.86E-03
CO-60		1.55E-04	±	5.93E-04	9.19E-04
ZN-65		-2.35E-04	±	1.32E-03	2.09E-03
ZRNB-95		7.12E-04	±	1.21E-03	1.69E-03
CS-134		6.81E-05	±	4.23E-04	6.76E-04
CS-137		-1.86E-04	±	5.40E-04	8.37E-04
BALA140		-6.69E-04	±	1.76E-02	2.87E-02
RU-106		-1.59E-04	±	4.61E-03	7.53E-03

Location and Quarter Station 40 1st Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	7.45E-02	±	1.67E-02	1.32E-02
K-40		-2.75E-04	±	8.13E-03	1.40E-02
MN-54		5.74E-05	±	5.81E-04	9.38E-04
FE-59		0.00E+00	±	1.23E-03	2.04E-03
CO-60		0.00E+00	±	1.72E-04	2.87E-04
ZN-65		-1.32E-04	±	1.34E-03	2.16E-03
ZRNB-95		1.54E-04	±	6.96E-04	1.08E-03
CS-134		4.05E-04	±	5.45E-04	8.04E-04
CS-137		4.18E-04	±	4.69E-04	6.34E-04
BALA140		-8.25E-03	±	3.32E-02	5.16E-02
RU-106		2.52E-04	±	4.20E-03	6.83E-03

Location and Quarter Station 40 2nd Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.08E-01	±	1.86E-02	1.28E-02
K-40		-6.13E-03	±	2.45E-02	9.48E-03
MN-54		-1.67E-04	±	6.72E-04	1.06E-03
FE-59		0.00E+00	±	5.64E-03	9.40E-03
CO-60		0.00E+00	±	1.71E-04	2.84E-04
ZN-65		3.17E-04	±	9.99E-04	1.49E-03
ZRNB-95		-1.03E-04	±	8.67E-04	1.39E-03
CS-134		1.75E-04	±	4.11E-04	6.25E-04
CS-137		4.39E-04	±	4.84E-04	6.58E-04
BALA140		-4.73E-03	±	2.42E-02	3.82E-02
RU-106		-1.04E-03	±	4.43E-03	6.97E-03

Location and Quarter Station 40 3rd Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	1.49E-01	±	2.36E-02	1.60E-02
K-40		2.72E-03	±	6.29E-03	1.02E-02
MN-54		4.27E-05	±	6.43E-04	1.05E-03
FE-59		-1.48E-03	±	5.09E-03	7.88E-03
CO-60		-1.81E-04	±	6.70E-04	1.04E-03
ZN-65		1.84E-04	±	9.85E-04	1.53E-03
ZRNB-95		-2.95E-04	±	1.07E-03	1.66E-03
CS-134		1.51E-06	±	4.64E-04	7.63E-04
CS-137		1.18E-04	±	4.84E-04	7.60E-04
BALA140		0.00E+00	±	6.28E-02	1.05E-01
RU-106		9.56E-05	±	4.58E-03	7.50E-03

Location and Quarter Station 40 4th Q 11

Nuclide	RQ	Activity		Error	MDA
BE-7	+	8.84E-02	±	1.24E-02	5.94E-03
K-40		3.94E-04	±	4.67E-03	9.09E-03
MN-54		0.00E+00	±	7.38E-04	1.23E-03
FE-59		-7.47E-04	±	2.43E-03	3.72E-03
CO-60		0.00E+00	±	1.16E-04	1.94E-04
ZN-65		-5.40E-05	±	1.03E-03	1.69E-03
ZRNB-95		-7.78E-06	±	1.10E-03	1.81E-03
CS-134		0.00E+00	±	4.40E-04	7.33E-04
CS-137		-2.11E-06	±	2.67E-04	4.38E-04
BALA140		4.95E-03	±	1.20E-02	1.78E-02
RU-106		-8.95E-04	±	3.39E-03	5.33E-03

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

1st Q 12/28/10 to 3/29/11 - 2nd Q 3/29/11 to 6/28/11 - 3rd Q 6/28/11 to 9/27/11 - 4th Q 9/27/11 to 1/3/12

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 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	7.48E-02	±	1.79E-02	1.41E-02
K-40		-3.30E-03	±	2.17E-02	1.37E-02
MN-54		7.76E-05	±	5.63E-04	9.02E-04
FE-59		-1.30E-03	±	4.46E-03	6.84E-03
CO-60		0.00E+00	±	5.88E-04	9.81E-04
ZN-65		-1.70E-04	±	1.13E-03	1.78E-03
ZRNB-95		-1.70E-04	±	9.19E-04	1.45E-03
CS-134		1.30E-04	±	4.13E-04	6.40E-04
CS-137		3.40E-04	±	4.81E-04	6.86E-04
BALA140		0.00E+00	±	1.44E-02	2.40E-02
RU-106		-1.78E-03	±	5.65E-03	8.88E-03

Location and Quarter Station 48 2nd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	1.17E-01	±	1.90E-02	1.25E-02
K-40		-5.71E-04	±	8.39E-03	1.35E-02
MN-54		4.55E-05	±	5.76E-04	9.34E-04
FE-59		0.00E+00	±	4.07E-03	6.78E-03
CO-60		0.00E+00	±	5.92E-04	9.87E-04
ZN-65		0.00E+00	±	1.27E-03	2.11E-03
ZRNB-95		3.27E-04	±	8.04E-04	1.21E-03
CS-134		1.47E-04	±	5.04E-04	7.93E-04
CS-137		8.12E-05	±	5.42E-04	8.69E-04
BALA140		5.41E-03	±	1.14E-02	1.44E-02
RU-106		1.17E-03	±	3.89E-03	6.00E-03

Location and Quarter Station 48 3rd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	2.04E-01	±	2.57E-02	1.29E-02
K-40		3.17E-04	±	8.01E-03	1.38E-02
MN-54		3.11E-05	±	5.60E-04	9.12E-04
FE-59		2.60E-03	±	3.98E-03	5.35E-03
CO-60		8.16E-05	±	5.73E-04	9.12E-04
ZN-65		2.29E-04	±	1.50E-03	2.39E-03
ZRNB-95		0.00E+00	±	1.05E-03	1.76E-03
CS-134		-2.75E-04	±	6.79E-04	1.07E-03
CS-137		-1.99E-04	±	6.17E-04	9.67E-04
BALA140		1.19E-02	±	5.12E-02	8.00E-02
RU-106		0.00E+00	±	5.15E-03	8.58E-03

Location and Quarter Station 48 4th Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	7.18E-02	±	1.18E-02	7.32E-03
K-40		-1.28E-04	±	4.39E-03	8.55E-03
MN-54		0.00E+00	±	3.67E-04	6.12E-04
FE-59		-6.54E-04	±	2.13E-03	3.24E-03
CO-60		-1.03E-04	±	4.25E-04	6.64E-04
ZN-65		-2.52E-04	±	1.01E-03	1.59E-03
ZRNB-95		3.08E-04	±	9.00E-04	1.37E-03
CS-134		0.00E+00	±	5.88E-04	9.80E-04
CS-137		-4.62E-06	±	3.04E-04	4.98E-04
BALA140		-7.02E-04	±	1.02E-02	1.65E-02
RU-106		6.64E-04	±	2.83E-03	4.45E-03

Location and Quarter Station 57 1st Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	7.60E-02	±	1.66E-02	1.20E-02
K-40		1.24E-03	±	5.66E-03	1.11E-02
MN-54		0.00E+00	±	4.11E-04	6.86E-04
FE-59		0.00E+00	±	1.28E-03	2.14E-03
CO-60		9.30E-05	±	5.83E-04	9.26E-04
ZN-65		3.83E-04	±	9.49E-04	1.36E-03
ZRNB-95		-9.78E-05	±	1.11E-03	1.80E-03
CS-134		3.22E-04	±	5.28E-04	7.92E-04
CS-137		2.65E-04	±	5.93E-04	9.11E-04
BALA140		0.00E+00	±	1.15E-02	1.92E-02
RU-106		3.17E-04	±	4.08E-03	6.60E-03

Location and Quarter Station 57 2nd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	1.26E-01	±	1.97E-02	1.24E-02
K-40		-2.78E-03	±	1.53E-02	1.29E-02
MN-54		2.03E-04	±	4.74E-04	7.02E-04
FE-59		1.74E-03	±	2.48E-03	3.00E-03
CO-60		-2.45E-05	±	6.51E-04	1.06E-03
ZN-65		-7.77E-05	±	1.40E-03	2.28E-03
ZRNB-95		2.09E-04	±	7.95E-04	1.23E-03
CS-134		1.78E-04	±	4.77E-04	7.38E-04
CS-137		2.73E-04	±	6.09E-04	9.34E-04
BALA140		0.00E+00	±	6.98E-03	1.16E-02
RU-106		1.38E-05	±	4.23E-03	6.95E-03

Location and Quarter Station 57 3rd Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	1.77E-01	±	2.42E-02	1.25E-02
K-40		3.22E-03	±	6.36E-03	1.02E-02
MN-54		1.03E-04	±	3.58E-04	5.37E-04
FE-59		7.41E-04	±	3.88E-03	6.07E-03
CO-60		5.23E-05	±	4.94E-04	7.90E-04
ZN-65		0.00E+00	±	1.83E-03	3.05E-03
ZRNB-95		3.24E-04	±	9.09E-04	1.38E-03
CS-134		1.05E-04	±	4.69E-04	7.45E-04
CS-137		1.28E-04	±	3.32E-04	4.91E-04
BALA140		1.22E-02	±	3.66E-02	5.40E-02
RU-106		1.12E-03	±	4.00E-03	6.20E-03

Location and Quarter Station 57 4th Q 11

Nuclide	RQ	Activity	±	Error	MDA
BE-7	+	8.23E-02	±	1.50E-02	1.01E-02
K-40		1.04E-03	±	5.97E-03	1.02E-02
MN-54		1.22E-04	±	4.69E-04	7.31E-04
FE-59		0.00E+00	±	4.86E-03	8.10E-03
CO-60		0.00E+00	±	5.25E-04	8.75E-04
ZN-65		-2.00E-04	±	1.31E-03	2.09E-03
ZRNB-95		-2.49E-04	±	1.39E-03	2.20E-03
CS-134		5.12E-05	±	3.43E-04	5.48E-04
CS-137		-1.70E-05	±	3.46E-04	5.63E-04
BALA140		0.00E+00	±	5.09E-03	8.49E-03
RU-106		1.06E-03	±	3.27E-03	5.00E-03

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

1st Q 12/28/10 to 3/29/11 - 2nd Q 3/29/11 to 6/28/11 - 3rd Q 6/28/11 to 9/27/11 - 4th Q 9/27/11 to 1/3/12

TABLE A-3.2

GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS - SUMMARY

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
BALA140	Ind	-4.87E-05	-1.11E-02	1.22E-02	3.13E-02	44	0
BALA140	Cntl	-4.71E-04	-5.97E-03	2.93E-03	3.43E-02	4	0
BE-7	Ind	1.13E-01	7.18E-02	2.19E-01	1.16E-02	44	44
BE-7	Cntl	1.21E-01	7.69E-02	2.07E-01	9.91E-03	4	4
CO-60	Ind	2.78E-06	-2.78E-04	3.73E-04	7.99E-04	44	0
CO-60	Cntl	5.18E-05	0.00E+00	1.65E-04	4.73E-04	4	0
CS-134	Ind	9.18E-05	-2.75E-04	4.69E-04	7.61E-04	44	0
CS-134	Cntl	1.08E-04	-1.02E-04	3.70E-04	5.94E-04	4	0
CS-137	Ind	1.27E-04	-1.99E-04	5.73E-04	7.41E-04	44	0
CS-137	Cntl	7.42E-05	-1.13E-04	2.47E-04	7.94E-04	4	0
FE-59	Ind	3.61E-05	-1.54E-03	2.60E-03	5.37E-03	44	0
FE-59	Cntl	3.87E-04	0.00E+00	1.24E-03	3.03E-03	4	0
K-40	Ind	-4.41E-04	-6.25E-03	4.52E-03	1.15E-02	44	0
K-40	Cntl	1.21E-03	-1.68E-03	3.27E-03	1.07E-02	4	0
MN-54	Ind	3.01E-05	-1.79E-04	2.03E-04	8.72E-04	44	0
MN-54	Cntl	1.12E-05	0.00E+00	4.44E-05	6.58E-04	4	0
RU-106	Ind	1.29E-05	-1.78E-03	2.28E-03	7.51E-03	44	0
RU-106	Cntl	-2.99E-04	-1.85E-03	1.23E-03	5.94E-03	4	0
ZN-65	Ind	-4.63E-05	-7.43E-04	5.23E-04	2.21E-03	44	0
ZN-65	Cntl	-1.09E-05	-4.18E-04	7.24E-04	2.32E-03	4	0
ZRNB-95	Ind	3.41E-05	-4.71E-04	7.12E-04	1.59E-03	44	0
ZRNB-95	Cntl	-6.96E-06	-3.38E-04	1.94E-04	1.60E-03	4	0

Ind = Indicator 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

Collection Period	Station 1 RQ	Activity	±	Error	MDA	Station 9 RQ	Activity	±	Error	MDA
12/28/2010 - 1/4/2011		2.34E-03	±	1.13E-02	1.81E-02		2.01E-03	±	1.02E-02	1.64E-02
1/4/2011 - 1/11/2011		-2.45E-03	±	1.12E-02	1.80E-02		-4.65E-03	±	1.15E-02	1.82E-02
1/11/2011 - 1/18/2011		-1.38E-03	±	9.48E-03	1.53E-02		1.64E-03	±	9.56E-03	1.54E-02
1/18/2011 - 1/25/2011		4.47E-03	±	9.53E-03	1.47E-02		7.74E-04	±	7.50E-03	1.21E-02
1/25/2011 - 2/1/2011		0.00E+00	±	1.03E-02	1.71E-02		-2.19E-04	±	9.33E-03	1.53E-02
2/1/2011 - 2/8/2011		1.03E-04	±	8.84E-03	1.45E-02		-2.31E-03	±	1.09E-02	1.74E-02
2/8/2011 - 2/15/2011		1.19E-03	±	1.01E-02	1.64E-02		3.12E-04	±	6.91E-03	1.13E-02
2/15/2011 - 2/22/2011		1.03E-03	±	8.19E-03	1.32E-02		-2.78E-03	±	1.02E-02	1.62E-02
2/22/2011 - 3/1/2011		-1.95E-03	±	1.10E-02	1.77E-02		4.39E-03	±	8.22E-03	1.23E-02
3/1/2011 - 3/8/2011		-1.45E-03	±	1.05E-02	1.70E-02		2.52E-03	±	9.33E-03	1.47E-02
3/8/2011 - 3/15/2011		-1.65E-04	±	1.12E-02	1.84E-02		-3.66E-04	±	1.04E-02	1.71E-02
3/15/2011 - 3/22/2011	+	5.08E-01	±	3.26E-02	1.44E-02	+	5.22E-01	±	2.79E-02	1.10E-02
3/22/2011 - 3/29/2011	+	3.54E-01	±	2.33E-02	9.93E-03	+	3.48E-01	±	2.27E-02	7.53E-03
3/29/2011 - 4/5/2011	+	7.52E-02	±	1.48E-02	1.17E-02	+	7.58E-02	±	1.62E-02	1.35E-02
4/5/2011 - 4/12/2011	+	1.95E-02	±	9.01E-03	1.10E-02	+	1.85E-02	±	1.06E-02	1.44E-02
4/12/2011 - 4/19/2011		1.04E-02	±	8.95E-03	1.28E-02		5.71E-03	±	6.69E-03	9.69E-03
4/19/2011 - 4/26/2011		0.00E+00	±	8.07E-03	1.34E-02		1.45E-02	±	1.18E-02	1.65E-02
4/26/2011 - 5/3/2011		5.99E-03	±	1.15E-02	1.77E-02		6.68E-03	±	1.05E-02	1.58E-02
5/3/2011 - 5/10/2011		3.42E-03	±	1.05E-02	1.65E-02		5.80E-03	±	9.18E-03	1.37E-02
5/10/2011 - 5/17/2011		1.65E-03	±	1.06E-02	1.70E-02		1.20E-03	±	1.10E-02	1.79E-02
5/17/2011 - 5/24/2011		1.25E-04	±	7.79E-03	1.28E-02		-1.70E-03	±	1.01E-02	1.62E-02
5/24/2011 - 5/31/2011		4.46E-03	±	8.19E-03	1.22E-02		0.00E+00	±	8.12E-03	1.35E-02
5/31/2011 - 6/7/2011		-5.05E-04	±	1.03E-02	1.68E-02		-4.21E-03	±	1.16E-02	1.82E-02
6/7/2011 - 6/14/2011		-2.33E-03	±	1.05E-02	1.67E-02		-3.29E-03	±	1.08E-02	1.71E-02
6/14/2011 - 6/21/2011		-2.74E-04	±	1.04E-02	1.71E-02		-8.73E-05	±	1.06E-02	1.74E-02
6/21/2011 - 6/28/2011		NVS					7.99E-03	±	9.88E-03	1.44E-02
6/28/2011 - 7/5/2011		NVS					2.80E-03	±	8.85E-03	1.39E-02
7/5/2011 - 7/12/2011		-3.16E-03	±	1.34E-02	2.14E-02		1.35E-03	±	8.49E-03	1.36E-02
7/12/2011 - 7/19/2011		-8.54E-04	±	9.83E-03	1.60E-02		-2.34E-03	±	1.08E-02	1.73E-02
7/19/2011 - 7/26/2011		-7.71E-04	±	1.02E-02	1.66E-02		-2.71E-03	±	1.02E-02	1.62E-02
7/26/2011 - 8/2/2011		1.69E-03	±	8.64E-03	1.38E-02		1.18E-03	±	9.69E-03	1.56E-02
8/2/2011 - 8/9/2011		5.13E-04	±	7.23E-03	1.17E-02		4.04E-05	±	1.10E-02	1.81E-02
8/9/2011 - 8/16/2011		-6.35E-05	±	1.01E-02	1.66E-02		2.77E-03	±	9.40E-03	1.48E-02
8/16/2011 - 8/23/2011		-1.71E-03	±	1.15E-02	1.86E-02		-5.34E-05	±	9.67E-03	1.59E-02
8/23/2011 - 8/30/2011		3.83E-03	±	9.04E-03	1.39E-02		1.10E-03	±	1.18E-02	1.93E-02
8/30/2011 - 9/6/2011		7.49E-04	±	7.88E-03	1.27E-02		-2.12E-03	±	1.04E-02	1.67E-02
9/6/2011 - 9/13/2011		-3.76E-03	±	1.26E-02	2.00E-02		5.29E-04	±	7.97E-03	1.30E-02
9/13/2011 - 9/20/2011		1.90E-03	±	1.08E-02	1.74E-02		-3.66E-03	±	1.10E-02	1.73E-02
9/20/2011 - 9/27/2011		4.16E-03	±	9.46E-03	1.46E-02		9.26E-04	±	7.73E-03	1.25E-02
9/27/2011 - 10/4/2011		3.95E-03	±	8.96E-03	1.37E-02		5.41E-03	±	9.85E-03	1.50E-02
10/4/2011 - 10/11/2011		-1.72E-03	±	1.11E-02	1.78E-02		1.10E-03	±	8.84E-03	1.43E-02
10/11/2011 - 10/18/2011		0.00E+00	±	1.27E-02	2.12E-02		2.84E-03	±	1.00E-02	1.58E-02
10/18/2011 - 10/25/2011		4.86E-03	±	1.02E-02	1.56E-02		-3.46E-03	±	1.18E-02	1.87E-02
10/25/2011 - 11/1/2011		6.71E-04	±	9.54E-03	1.55E-02		4.08E-03	±	8.76E-03	1.34E-02
11/1/2011 - 11/8/2011		7.63E-05	±	8.63E-03	1.42E-02		2.85E-03	±	9.90E-03	1.57E-02
11/8/2011 - 11/15/2011		6.60E-03	±	8.67E-03	1.28E-02		-5.81E-04	±	7.56E-03	1.23E-02
11/15/2011 - 11/22/2011		-1.08E-03	±	6.36E-03	1.01E-02		3.92E-03	±	7.75E-03	1.18E-02
11/22/2011 - 11/29/2011		0.00E+00	±	8.39E-03	1.40E-02		-2.05E-03	±	8.78E-03	1.40E-02
11/29/2011 - 12/6/2011		-2.50E-03	±	1.23E-02	1.98E-02		1.11E-03	±	1.16E-02	1.89E-02
12/6/2011 - 12/13/2011		5.64E-04	±	1.03E-02	1.68E-02		2.07E-03	±	9.57E-03	1.53E-02
12/13/2011 - 12/20/2011		-4.01E-03	±	1.28E-02	2.04E-02		-4.97E-03	±	1.20E-02	1.88E-02
12/20/2011 - 12/27/2011		0.00E+00	±	1.19E-02	1.98E-02		-6.68E-04	±	1.10E-02	1.80E-02
12/27/2011 - 1/3/2012		0.00E+00	±	1.10E-02	1.83E-02		5.16E-03	±	1.16E-02	1.80E-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.

Positive I-131 activity from 3/15/11 to 4/12/11 attributed to Fukushima

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

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

Collection Period	Station 4 RQ	Activity	±	Error	MDA	Station 21 Activity	±	Error	MDA
12/28/2010 - 1/4/2011		2.34E-03	±	1.13E-02	1.81E-02	2.01E-03	±	1.02E-02	1.64E-02
1/4/2011 - 1/11/2011		-2.51E-03	±	1.15E-02	1.85E-02	-4.54E-03	±	1.13E-02	1.77E-02
1/11/2011 - 1/18/2011		-1.38E-03	±	9.48E-03	1.53E-02	1.64E-03	±	9.56E-03	1.54E-02
1/18/2011 - 1/25/2011		4.61E-03	±	9.84E-03	1.52E-02	7.61E-04	±	7.38E-03	1.19E-02
1/25/2011 - 2/1/2011		0.00E+00	±	1.01E-02	1.68E-02	-2.17E-04	±	9.25E-03	1.52E-02
2/1/2011 - 2/8/2011		1.01E-04	±	8.73E-03	1.43E-02	-2.18E-03	±	1.03E-02	1.64E-02
2/8/2011 - 2/15/2011		1.15E-03	±	9.79E-03	1.58E-02	3.03E-04	±	6.69E-03	1.09E-02
2/15/2011 - 2/22/2011		1.07E-03	±	8.51E-03	1.37E-02	-2.73E-03	±	1.00E-02	1.59E-02
2/22/2011 - 3/1/2011		-2.02E-03	±	1.14E-02	1.83E-02	4.25E-03	±	7.95E-03	1.19E-02
3/1/2011 - 3/8/2011		-1.51E-03	±	1.09E-02	1.76E-02	2.48E-03	±	9.17E-03	1.45E-02
3/8/2011 - 3/15/2011		-1.53E-04	±	1.05E-02	1.72E-02	-3.48E-04	±	9.94E-03	1.63E-02
3/15/2011 - 3/22/2011	+	5.24E-01	±	2.81E-02	8.94E-03	+ 4.79E-01	±	3.05E-02	1.21E-02
3/22/2011 - 3/29/2011	+	3.57E-01	±	2.71E-02	1.04E-02	+ 3.26E-01	±	2.62E-02	1.06E-02
3/29/2011 - 4/5/2011	+	8.77E-02	±	1.23E-02	7.71E-03	+ 7.17E-02	±	1.20E-02	8.01E-03
4/5/2011 - 4/12/2011	+	2.37E-02	±	8.33E-03	7.91E-03	+ 1.68E-02	±	6.94E-03	7.96E-03
4/12/2011 - 4/19/2011		6.48E-03	±	5.30E-03	7.15E-03	6.15E-03	±	5.17E-03	7.02E-03
4/19/2011 - 4/26/2011		0.00E+00	±	1.11E-02	1.85E-02	1.45E-02	±	1.18E-02	1.65E-02
4/26/2011 - 5/3/2011		5.88E-03	±	1.13E-02	1.73E-02	6.91E-03	±	1.08E-02	1.64E-02
5/3/2011 - 5/10/2011		3.30E-03	±	1.02E-02	1.60E-02	5.99E-03	±	9.49E-03	1.42E-02
5/10/2011 - 5/17/2011		1.50E-03	±	9.62E-03	1.55E-02	1.24E-03	±	1.14E-02	1.85E-02
5/17/2011 - 5/24/2011		1.32E-04	±	8.26E-03	1.35E-02	-1.77E-03	±	1.04E-02	1.68E-02
5/24/2011 - 5/31/2011		4.44E-03	±	8.15E-03	1.22E-02	0.00E+00	±	8.42E-03	1.40E-02
5/31/2011 - 6/7/2011		-4.92E-04	±	1.01E-02	1.64E-02	-4.34E-03	±	1.19E-02	1.88E-02
6/7/2011 - 6/14/2011		-2.28E-03	±	1.02E-02	1.63E-02	-3.53E-03	±	1.16E-02	1.83E-02
6/14/2011 - 6/21/2011		-2.67E-04	±	1.01E-02	1.66E-02	-8.71E-05	±	1.06E-02	1.73E-02
6/21/2011 - 6/28/2011		-1.29E-03	±	1.06E-02	1.71E-02	8.26E-03	±	1.02E-02	1.49E-02
6/28/2011 - 7/5/2011		-8.63E-04	±	1.11E-02	1.80E-02	2.90E-03	±	9.16E-03	1.43E-02
7/5/2011 - 7/12/2011		-2.69E-03	±	1.14E-02	1.82E-02	1.38E-03	±	8.68E-03	1.39E-02
7/12/2011 - 7/19/2011		-8.69E-04	±	1.00E-02	1.62E-02	-2.40E-03	±	1.10E-02	1.77E-02
7/19/2011 - 7/26/2011		-7.47E-04	±	9.90E-03	1.61E-02	-2.67E-03	±	1.01E-02	1.60E-02
7/26/2011 - 8/2/2011		1.76E-03	±	8.98E-03	1.43E-02	1.15E-03	±	9.43E-03	1.52E-02
8/2/2011 - 8/9/2011		5.04E-04	±	7.10E-03	1.15E-02	3.96E-05	±	1.08E-02	1.78E-02
8/9/2011 - 8/16/2011		-6.32E-05	±	1.00E-02	1.65E-02	2.78E-03	±	9.41E-03	1.48E-02
8/16/2011 - 8/23/2011		-1.65E-03	±	1.10E-02	1.78E-02	-5.24E-05	±	9.48E-03	1.56E-02
8/23/2011 - 8/30/2011		3.70E-03	±	8.73E-03	1.34E-02	1.10E-03	±	1.18E-02	1.92E-02
8/30/2011 - 9/6/2011		7.25E-04	±	7.63E-03	1.23E-02	-2.07E-03	±	1.02E-02	1.63E-02
9/6/2011 - 9/13/2011		-3.58E-03	±	1.20E-02	1.91E-02	5.37E-04	±	8.10E-03	1.32E-02
9/13/2011 - 9/20/2011		1.80E-03	±	1.02E-02	1.64E-02	-3.65E-03	±	1.09E-02	1.72E-02
9/20/2011 - 9/27/2011		4.14E-03	±	9.43E-03	1.45E-02	9.31E-04	±	7.77E-03	1.25E-02
9/27/2011 - 10/4/2011		3.91E-03	±	8.88E-03	1.36E-02	5.39E-03	±	9.81E-03	1.49E-02
10/4/2011 - 10/11/2011		-1.66E-03	±	1.07E-02	1.72E-02	1.19E-03	±	9.55E-03	1.54E-02
10/11/2011 - 10/18/2011		0.00E+00	±	1.27E-02	2.12E-02	2.85E-03	±	1.00E-02	1.59E-02
10/18/2011 - 10/25/2011		4.95E-03	±	1.03E-02	1.59E-02	-3.41E-03	±	1.16E-02	1.85E-02
10/25/2011 - 11/1/2011		6.83E-04	±	9.71E-03	1.58E-02	4.06E-03	±	8.72E-03	1.33E-02
11/1/2011 - 11/8/2011		7.76E-05	±	8.77E-03	1.44E-02	2.85E-03	±	9.92E-03	1.57E-02
11/8/2011 - 11/15/2011		6.85E-03	±	9.00E-03	1.33E-02	-6.24E-04	±	8.12E-03	1.32E-02
11/15/2011 - 11/22/2011		-1.08E-03	±	6.36E-03	1.01E-02	3.79E-03	±	7.49E-03	1.14E-02
11/22/2011 - 11/29/2011		0.00E+00	±	8.69E-03	1.45E-02	-1.98E-03	±	8.49E-03	1.35E-02
11/29/2011 - 12/6/2011		-2.55E-03	±	1.25E-02	2.02E-02	1.10E-03	±	1.16E-02	1.88E-02
12/6/2011 - 12/13/2011		6.01E-04	±	1.10E-02	1.79E-02	2.05E-03	±	9.46E-03	1.51E-02
12/13/2011 - 12/20/2011		-4.28E-03	±	1.37E-02	2.18E-02	-5.06E-03	±	1.22E-02	1.91E-02
12/20/2011 - 12/27/2011		0.00E+00	±	1.27E-02	2.12E-02	-6.48E-04	±	1.07E-02	1.75E-02
12/27/2011 - 1/3/2012		0.00E+00	±	1.17E-02	1.95E-02	4.91E-03	±	1.10E-02	1.71E-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.

Positive I-131 activity from 3/15/11 to 4/12/11 attributed to Fukushima

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

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

Collection Period	Station 5 RQ	Activity	±	Error	MDA	Station 23 RQ	Activity	±	Error	MDA
12/28/2010 - 1/4/2011		2.34E-03	±	1.13E-02	1.81E-02		-6.32E-04	±	9.03E-03	1.47E-02
1/4/2011 - 1/11/2011		-2.56E-03	±	1.17E-02	1.88E-02		-4.82E-03	±	1.18E-02	1.86E-02
1/11/2011 - 1/18/2011		-1.38E-03	±	9.48E-03	1.53E-02		3.54E-03	±	9.52E-03	1.48E-02
1/18/2011 - 1/25/2011		4.61E-03	±	9.84E-03	1.52E-02		3.09E-03	±	9.28E-03	1.45E-02
1/25/2011 - 2/1/2011		0.00E+00	±	9.85E-03	1.64E-02		-1.96E-03	±	1.13E-02	1.81E-02
2/1/2011 - 2/8/2011		1.02E-04	±	8.78E-03	1.44E-02		5.97E-03	±	9.35E-03	1.40E-02
2/8/2011 - 2/15/2011		1.15E-03	±	9.79E-03	1.59E-02		3.99E-03	±	1.08E-02	1.69E-02
2/15/2011 - 2/22/2011		1.04E-03	±	8.22E-03	1.33E-02		0.00E+00	±	8.74E-03	1.46E-02
2/22/2011 - 3/1/2011		-1.95E-03	±	1.10E-02	1.77E-02		-1.35E-03	±	1.06E-02	1.72E-02
3/1/2011 - 3/8/2011		-1.44E-03	±	1.04E-02	1.68E-02		-8.03E-04	±	9.47E-03	1.54E-02
3/8/2011 - 3/15/2011		-1.66E-04	±	1.13E-02	1.86E-02		3.11E-03	±	1.01E-02	1.58E-02
3/15/2011 - 3/22/2011	+	4.91E-01	±	3.13E-02	1.29E-02	+	6.12E-01	±	3.60E-02	1.54E-02
3/22/2011 - 3/29/2011	+	3.56E-01	±	2.66E-02	1.04E-02	+	3.64E-01	±	2.67E-02	9.64E-03
3/29/2011 - 4/5/2011	+	6.61E-02	±	1.39E-02	1.16E-02	+	7.24E-02	±	1.47E-02	1.12E-02
4/5/2011 - 4/12/2011	+	2.79E-02	±	9.84E-03	9.40E-03	+	1.22E-02	±	6.33E-03	7.67E-03
4/12/2011 - 4/19/2011		6.82E-03	±	5.68E-03	7.41E-03		6.14E-03	±	7.33E-03	1.07E-02
4/19/2011 - 4/26/2011		2.65E-03	±	7.26E-03	1.13E-02		1.53E-02	±	1.64E-02	2.36E-02
4/26/2011 - 5/3/2011		5.70E-03	±	1.09E-02	1.68E-02		2.74E-03	±	9.32E-03	1.46E-02
5/3/2011 - 5/10/2011		3.19E-03	±	9.81E-03	1.54E-02		-4.00E-03	±	1.26E-02	2.00E-02
5/10/2011 - 5/17/2011		1.49E-03	±	9.58E-03	1.54E-02		1.69E-03	±	9.32E-03	1.49E-02
5/17/2011 - 5/24/2011		1.26E-04	±	7.88E-03	1.29E-02		-2.66E-03	±	1.05E-02	1.67E-02
5/24/2011 - 5/31/2011		4.31E-03	±	7.92E-03	1.18E-02		1.91E-03	±	1.01E-02	1.62E-02
5/31/2011 - 6/7/2011		-4.74E-04	±	9.68E-03	1.58E-02		1.19E-03	±	1.15E-02	1.86E-02
6/7/2011 - 6/14/2011		-2.19E-03	±	9.85E-03	1.57E-02		-4.42E-03	±	1.33E-02	2.11E-02
6/14/2011 - 6/21/2011		-2.55E-04	±	9.69E-03	1.59E-02		-4.30E-05	±	1.19E-02	1.95E-02
6/21/2011 - 6/28/2011		-1.22E-03	±	9.94E-03	1.61E-02		8.41E-03	±	1.04E-02	1.52E-02
6/28/2011 - 7/5/2011		-8.06E-04	±	1.03E-02	1.68E-02		2.90E-03	±	9.16E-03	1.43E-02
7/5/2011 - 7/12/2011		-2.53E-03	±	1.07E-02	1.71E-02		2.42E-03	±	9.77E-03	1.55E-02
7/12/2011 - 7/19/2011		-8.52E-04	±	9.81E-03	1.59E-02		1.00E-02	±	1.01E-02	1.40E-02
7/19/2011 - 7/26/2011		-7.80E-04	±	1.03E-02	1.68E-02		5.08E-03	±	1.03E-02	1.57E-02
7/26/2011 - 8/2/2011		1.59E-03	±	8.09E-03	1.29E-02		6.33E-03	±	9.56E-03	1.41E-02
8/2/2011 - 8/9/2011		4.80E-04	±	6.76E-03	1.10E-02		-3.08E-03	±	1.17E-02	1.85E-02
8/9/2011 - 8/16/2011		2.77E-03	±	9.40E-03	1.48E-02		-1.29E-03	±	9.31E-03	1.50E-02
8/16/2011 - 8/23/2011		-1.66E-03	±	1.11E-02	1.79E-02		-2.19E-03	±	1.25E-02	2.02E-02
8/23/2011 - 8/30/2011		3.70E-03	±	8.73E-03	1.34E-02		-6.10E-04	±	8.61E-03	1.40E-02
8/30/2011 - 9/6/2011		7.13E-04	±	7.50E-03	1.21E-02		1.40E-03	±	9.63E-03	1.55E-02
9/6/2011 - 9/13/2011		-3.52E-03	±	1.18E-02	1.87E-02		-3.08E-03	±	1.33E-02	2.12E-02
9/13/2011 - 9/20/2011		1.78E-03	±	1.01E-02	1.62E-02		-2.63E-04	±	1.27E-02	2.08E-02
9/20/2011 - 9/27/2011		4.21E-03	±	9.58E-03	1.48E-02		5.41E-03	±	9.77E-03	1.47E-02
9/27/2011 - 10/4/2011		4.06E-03	±	9.21E-03	1.41E-02		-1.64E-03	±	1.21E-02	1.95E-02
10/4/2011 - 10/11/2011		-1.73E-03	±	1.11E-02	1.79E-02		NVS			
10/11/2011 - 10/18/2011		0.00E+00	±	1.26E-02	2.11E-02		0.00E+00	±	1.20E-02	2.00E-02
10/18/2011 - 10/25/2011		4.86E-03	±	1.02E-02	1.56E-02		2.89E-04	±	1.02E-02	1.67E-02
10/25/2011 - 11/1/2011		6.60E-04	±	9.39E-03	1.53E-02		-9.56E-04	±	1.17E-02	1.91E-02
11/1/2011 - 11/8/2011		7.50E-05	±	8.48E-03	1.39E-02		-4.54E-04	±	1.08E-02	1.76E-02
11/8/2011 - 11/15/2011		6.60E-03	±	8.67E-03	1.28E-02		0.00E+00	±	8.84E-03	1.47E-02
11/15/2011 - 11/22/2011		3.92E-03	±	7.75E-03	1.17E-02		-2.37E-03	±	7.82E-03	1.23E-02
11/22/2011 - 11/29/2011		0.00E+00	±	8.54E-03	1.42E-02		-2.57E-04	±	8.97E-03	1.47E-02
11/29/2011 - 12/6/2011		-2.52E-03	±	1.24E-02	1.99E-02		5.42E-04	±	1.61E-02	2.63E-02
12/6/2011 - 12/13/2011		5.79E-04	±	1.06E-02	1.73E-02		-2.92E-03	±	1.10E-02	1.74E-02
12/13/2011 - 12/20/2011		-4.13E-03	±	1.32E-02	2.10E-02		-1.93E-03	±	1.33E-02	2.15E-02
12/20/2011 - 12/27/2011		0.00E+00	±	1.24E-02	2.07E-02		0.00E+00	±	1.35E-02	2.25E-02
12/27/2011 - 1/3/2012		0.00E+00	±	1.17E-02	1.95E-02		-1.03E-04	±	1.20E-02	1.98E-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.

Positive I-131 activity from 3/15/11 to 4/12/11 attributed to Fukushima

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

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

Collection Period	Station 6 RQ	Activity	±	Error	MDA	Station 40 RQ	Activity	±	Error	MDA
12/28/2010 - 1/4/2011		2.34E-03	±	1.13E-02	1.81E-02		-6.32E-04	±	9.03E-03	1.47E-02
1/4/2011 - 1/11/2011		-2.51E-03	±	1.15E-02	1.85E-02		-4.95E-03	±	1.21E-02	1.91E-02
1/11/2011 - 1/18/2011		-1.38E-03	±	9.48E-03	1.53E-02		3.54E-03	±	9.52E-03	1.48E-02
1/18/2011 - 1/25/2011		4.61E-03	±	9.84E-03	1.52E-02		3.14E-03	±	9.42E-03	1.48E-02
1/25/2011 - 2/1/2011		0.00E+00	±	9.92E-03	1.65E-02		-1.88E-03	±	1.08E-02	1.74E-02
2/1/2011 - 2/8/2011		9.99E-05	±	8.61E-03	1.41E-02		6.45E-03	±	1.01E-02	1.51E-02
2/8/2011 - 2/15/2011		1.11E-03	±	9.47E-03	1.53E-02		4.06E-03	±	1.10E-02	1.72E-02
2/15/2011 - 2/22/2011		1.04E-03	±	8.23E-03	1.33E-02		0.00E+00	±	8.76E-03	1.46E-02
2/22/2011 - 3/1/2011		-1.99E-03	±	1.12E-02	1.80E-02		-1.36E-03	±	1.06E-02	1.72E-02
3/1/2011 - 3/8/2011		-1.48E-03	±	1.07E-02	1.73E-02		-7.89E-04	±	9.31E-03	1.51E-02
3/8/2011 - 3/15/2011		-1.65E-04	±	1.12E-02	1.84E-02		3.16E-03	±	1.02E-02	1.61E-02
3/15/2011 - 3/22/2011	+	4.64E-01	±	3.06E-02	1.25E-02	+	4.31E-01	±	2.99E-02	1.32E-02
3/22/2011 - 3/29/2011	+	3.56E-01	±	2.27E-02	7.27E-03	+	3.50E-01	±	2.74E-02	1.21E-02
3/29/2011 - 4/5/2011	+	7.86E-02	±	1.19E-02	7.40E-03	+	6.11E-02	±	1.19E-02	9.43E-03
4/5/2011 - 4/12/2011	+	2.48E-02	±	8.54E-03	8.55E-03	+	2.29E-02	±	9.51E-03	1.12E-02
4/12/2011 - 4/19/2011		1.07E-02	±	8.38E-03	1.17E-02		1.30E-02	±	9.69E-03	1.36E-02
4/19/2011 - 4/26/2011		3.74E-03	±	7.80E-03	1.20E-02		1.03E-02	±	1.11E-02	1.59E-02
4/26/2011 - 5/3/2011		5.91E-03	±	1.13E-02	1.74E-02		2.75E-03	±	9.35E-03	1.47E-02
5/3/2011 - 5/10/2011		3.36E-03	±	1.03E-02	1.62E-02		-4.00E-03	±	1.26E-02	2.00E-02
5/10/2011 - 5/17/2011		1.57E-03	±	1.01E-02	1.62E-02		1.70E-03	±	9.36E-03	1.49E-02
5/17/2011 - 5/24/2011		1.30E-04	±	8.16E-03	1.34E-02		-2.56E-03	±	1.02E-02	1.61E-02
5/24/2011 - 5/31/2011		4.66E-03	±	8.57E-03	1.28E-02		1.88E-03	±	9.93E-03	1.59E-02
5/31/2011 - 6/7/2011		-5.26E-04	±	1.07E-02	1.75E-02		1.14E-03	±	1.09E-02	1.78E-02
6/7/2011 - 6/14/2011		-2.31E-03	±	1.04E-02	1.66E-02		-4.08E-03	±	1.23E-02	1.95E-02
6/14/2011 - 6/21/2011		-2.67E-04	±	1.01E-02	1.66E-02		-4.13E-05	±	1.14E-02	1.88E-02
6/21/2011 - 6/28/2011		-1.29E-03	±	1.06E-02	1.71E-02		-8.96E-05	±	7.47E-03	1.23E-02
6/28/2011 - 7/5/2011		-8.65E-04	±	1.11E-02	1.81E-02		4.23E-03	±	9.07E-03	1.38E-02
7/5/2011 - 7/12/2011		-2.68E-03	±	1.13E-02	1.81E-02		2.36E-03	±	9.55E-03	1.51E-02
7/12/2011 - 7/19/2011		-8.83E-04	±	1.02E-02	1.65E-02		9.57E-03	±	9.62E-03	1.34E-02
7/19/2011 - 7/26/2011		-7.82E-04	±	1.04E-02	1.69E-02		5.15E-03	±	1.04E-02	1.60E-02
7/26/2011 - 8/2/2011		1.74E-03	±	8.86E-03	1.41E-02		6.27E-03	±	9.46E-03	1.40E-02
8/2/2011 - 8/9/2011		5.14E-04	±	7.24E-03	1.17E-02		-3.03E-03	±	1.15E-02	1.82E-02
8/9/2011 - 8/16/2011		-6.25E-05	±	9.94E-03	1.63E-02		-1.29E-03	±	9.30E-03	1.50E-02
8/16/2011 - 8/23/2011		-1.66E-03	±	1.11E-02	1.80E-02		-2.20E-03	±	1.26E-02	2.03E-02
8/23/2011 - 8/30/2011		3.68E-03	±	8.69E-03	1.33E-02		-6.34E-04	±	8.95E-03	1.46E-02
8/30/2011 - 9/6/2011		7.37E-04	±	7.75E-03	1.25E-02		1.41E-03	±	9.67E-03	1.56E-02
9/6/2011 - 9/13/2011		-3.64E-03	±	1.22E-02	1.94E-02		-3.06E-03	±	1.32E-02	2.11E-02
9/13/2011 - 9/20/2011		1.83E-03	±	1.04E-02	1.67E-02		-2.59E-04	±	1.25E-02	2.05E-02
9/20/2011 - 9/27/2011		4.16E-03	±	9.46E-03	1.46E-02		5.50E-03	±	9.93E-03	1.50E-02
9/27/2011 - 10/4/2011		3.97E-03	±	9.02E-03	1.38E-02		-1.55E-03	±	1.15E-02	1.85E-02
10/4/2011 - 10/11/2011		-1.71E-03	±	1.10E-02	1.78E-02		-4.12E-03	±	1.18E-02	1.85E-02
10/11/2011 - 10/18/2011		0.00E+00	±	1.27E-02	2.12E-02		0.00E+00	±	1.17E-02	1.95E-02
10/18/2011 - 10/25/2011		4.71E-03	±	9.83E-03	1.51E-02		2.75E-04	±	9.70E-03	1.59E-02
10/25/2011 - 11/1/2011		6.50E-04	±	9.24E-03	1.50E-02		-9.15E-04	±	1.12E-02	1.83E-02
11/1/2011 - 11/8/2011		7.38E-05	±	8.34E-03	1.37E-02		-4.37E-04	±	1.03E-02	1.69E-02
11/8/2011 - 11/15/2011		6.62E-03	±	8.69E-03	1.28E-02		0.00E+00	±	8.40E-03	1.40E-02
11/15/2011 - 11/22/2011		-1.10E-03	±	6.47E-03	1.03E-02		-2.29E-03	±	7.55E-03	1.18E-02
11/22/2011 - 11/29/2011		0.00E+00	±	8.40E-03	1.40E-02		-2.49E-04	±	8.67E-03	1.42E-02
11/29/2011 - 12/6/2011		-2.50E-03	±	1.23E-02	1.98E-02		4.07E-04	±	1.21E-02	1.97E-02
12/6/2011 - 12/13/2011		5.92E-04	±	1.08E-02	1.77E-02		-3.06E-03	±	1.15E-02	1.83E-02
12/13/2011 - 12/20/2011		-4.21E-03	±	1.35E-02	2.14E-02		-2.02E-03	±	1.39E-02	2.25E-02
12/20/2011 - 12/27/2011		0.00E+00	±	1.25E-02	2.08E-02		0.00E+00	±	1.38E-02	2.29E-02
12/27/2011 - 1/3/2012		0.00E+00	±	1.15E-02	1.92E-02		-1.08E-04	±	1.27E-02	2.08E-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.

Positive I-131 activity from 3/15/11 to 4/12/11 attributed to Fukushima

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

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

Collection Period	Station 7 RQ	Activity	±	Error	MDA	Station 48 RQ	Activity	±	Error	MDA
12/28/2010 - 1/4/2011		2.01E-03	±	1.02E-02	1.64E-02		-6.32E-04	±	9.03E-03	1.47E-02
1/4/2011 - 1/11/2011		-4.55E-03	±	1.13E-02	1.78E-02		-5.03E-03	±	1.23E-02	1.94E-02
1/11/2011 - 1/18/2011		1.64E-03	±	9.56E-03	1.54E-02		3.54E-03	±	9.52E-03	1.48E-02
1/18/2011 - 1/25/2011		7.38E-04	±	7.16E-03	1.16E-02		3.09E-03	±	9.27E-03	1.45E-02
1/25/2011 - 2/1/2011		-2.20E-04	±	9.39E-03	1.54E-02		-1.85E-03	±	1.06E-02	1.71E-02
2/1/2011 - 2/8/2011		-2.26E-03	±	1.06E-02	1.70E-02		6.44E-03	±	1.01E-02	1.51E-02
2/8/2011 - 2/15/2011		3.08E-04	±	6.81E-03	1.11E-02		4.06E-03	±	1.10E-02	1.72E-02
2/15/2011 - 2/22/2011		-2.76E-03	±	1.01E-02	1.61E-02		0.00E+00	±	8.76E-03	1.46E-02
2/22/2011 - 3/1/2011		4.25E-03	±	7.96E-03	1.19E-02		-1.35E-03	±	1.06E-02	1.72E-02
3/1/2011 - 3/8/2011		2.49E-03	±	9.19E-03	1.45E-02		-7.90E-04	±	9.32E-03	1.51E-02
3/8/2011 - 3/15/2011		-3.53E-04	±	1.01E-02	1.65E-02		3.20E-03	±	1.03E-02	1.62E-02
3/15/2011 - 3/22/2011	+	5.44E-01	±	2.85E-02	8.86E-03	+	4.91E-01	±	2.69E-02	8.47E-03
3/22/2011 - 3/29/2011	+	3.63E-01	±	2.66E-02	9.36E-03	+	3.72E-01	±	2.41E-02	8.60E-03
3/29/2011 - 4/5/2011	+	8.55E-02	±	1.53E-02	1.09E-02	+	7.37E-02	±	1.53E-02	1.26E-02
4/5/2011 - 4/12/2011	+	2.13E-02	±	8.33E-03	8.45E-03	+	2.26E-02	±	1.00E-02	1.22E-02
4/12/2011 - 4/19/2011		7.91E-03	±	8.51E-03	1.25E-02		9.34E-03	±	8.51E-03	1.20E-02
4/19/2011 - 4/26/2011		1.52E-02	±	1.23E-02	1.72E-02		1.07E-02	±	1.14E-02	1.65E-02
4/26/2011 - 5/3/2011		6.82E-03	±	1.07E-02	1.62E-02		2.84E-03	±	9.67E-03	1.52E-02
5/3/2011 - 5/10/2011		5.70E-03	±	9.02E-03	1.34E-02		-4.14E-03	±	1.31E-02	2.07E-02
5/10/2011 - 5/17/2011		1.16E-03	±	1.06E-02	1.72E-02		1.64E-03	±	9.04E-03	1.44E-02
5/17/2011 - 5/24/2011		-1.66E-03	±	9.78E-03	1.57E-02		-2.56E-03	±	1.02E-02	1.61E-02
5/24/2011 - 5/31/2011		0.00E+00	±	8.58E-03	1.43E-02		1.88E-03	±	9.93E-03	1.59E-02
5/31/2011 - 6/7/2011		-4.48E-03	±	1.23E-02	1.94E-02		1.15E-03	±	1.11E-02	1.80E-02
6/7/2011 - 6/14/2011		-3.65E-03	±	1.19E-02	1.89E-02		-4.21E-03	±	1.27E-02	2.01E-02
6/14/2011 - 6/21/2011		-9.28E-05	±	1.12E-02	1.85E-02		-4.20E-05	±	1.16E-02	1.90E-02
6/21/2011 - 6/28/2011		-1.31E-03	±	1.07E-02	1.73E-02		-9.27E-05	±	7.74E-03	1.27E-02
6/28/2011 - 7/5/2011		-8.07E-04	±	1.03E-02	1.68E-02		4.37E-03	±	9.38E-03	1.43E-02
7/5/2011 - 7/12/2011		1.32E-03	±	8.33E-03	1.34E-02		2.44E-03	±	9.88E-03	1.56E-02
7/12/2011 - 7/19/2011		-2.36E-03	±	1.09E-02	1.74E-02		9.85E-03	±	9.91E-03	1.38E-02
7/19/2011 - 7/26/2011		-2.69E-03	±	1.02E-02	1.61E-02		5.35E-03	±	1.08E-02	1.66E-02
7/26/2011 - 8/2/2011		1.13E-03	±	9.31E-03	1.50E-02		6.62E-03	±	9.99E-03	1.48E-02
8/2/2011 - 8/9/2011		3.82E-05	±	1.05E-02	1.72E-02		-2.97E-03	±	1.13E-02	1.79E-02
8/9/2011 - 8/16/2011		-6.30E-05	±	1.00E-02	1.65E-02		-1.29E-03	±	9.31E-03	1.50E-02
8/16/2011 - 8/23/2011		-5.28E-05	±	9.56E-03	1.57E-02		-2.16E-03	±	1.23E-02	1.99E-02
8/23/2011 - 8/30/2011		1.14E-03	±	1.22E-02	1.99E-02		-6.37E-04	±	8.99E-03	1.46E-02
8/30/2011 - 9/6/2011		-2.12E-03	±	1.04E-02	1.66E-02		1.45E-03	±	1.00E-02	1.61E-02
9/6/2011 - 9/13/2011		5.56E-04	±	8.38E-03	1.36E-02		-3.01E-03	±	1.29E-02	2.07E-02
9/13/2011 - 9/20/2011		-3.54E-03	±	1.06E-02	1.67E-02		-2.63E-04	±	1.27E-02	2.08E-02
9/20/2011 - 9/27/2011		9.01E-04	±	7.52E-03	1.21E-02		5.41E-03	±	9.76E-03	1.47E-02
9/27/2011 - 10/4/2011		5.51E-03	±	1.00E-02	1.52E-02		-1.50E-03	±	1.11E-02	1.79E-02
10/4/2011 - 10/11/2011		1.18E-03	±	9.54E-03	1.54E-02		-4.11E-03	±	1.18E-02	1.85E-02
10/11/2011 - 10/18/2011		2.90E-03	±	1.02E-02	1.61E-02		0.00E+00	±	1.17E-02	1.96E-02
10/18/2011 - 10/25/2011		-3.52E-03	±	1.20E-02	1.91E-02		2.75E-04	±	9.69E-03	1.59E-02
10/25/2011 - 11/1/2011		4.16E-03	±	8.93E-03	1.36E-02		-9.16E-04	±	1.13E-02	1.83E-02
11/1/2011 - 11/8/2011		2.93E-03	±	1.02E-02	1.61E-02		-4.37E-04	±	1.03E-02	1.69E-02
11/8/2011 - 11/15/2011		-5.92E-04	±	7.69E-03	1.25E-02		0.00E+00	±	8.57E-03	1.43E-02
11/15/2011 - 11/22/2011		-1.11E-03	±	6.59E-03	1.05E-02		-2.29E-03	±	7.55E-03	1.18E-02
11/22/2011 - 11/29/2011		-2.11E-03	±	9.06E-03	1.44E-02		-2.49E-04	±	8.67E-03	1.42E-02
11/29/2011 - 12/6/2011		1.14E-03	±	1.20E-02	1.95E-02		4.14E-04	±	1.23E-02	2.01E-02
12/6/2011 - 12/13/2011		2.08E-03	±	9.61E-03	1.53E-02		-3.05E-03	±	1.14E-02	1.82E-02
12/13/2011 - 12/20/2011		-5.16E-03	±	1.24E-02	1.95E-02		-1.99E-03	±	1.37E-02	2.22E-02
12/20/2011 - 12/27/2011		-6.80E-04	±	1.12E-02	1.83E-02		0.00E+00	±	1.33E-02	2.22E-02
12/27/2011 - 1/3/2012		5.16E-03	±	1.16E-02	1.80E-02		-1.06E-04	±	1.25E-02	2.04E-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.

Positive I-131 activity from 3/15/11 to 4/12/11 attributed to Fukushima

TABLE A-4.1

GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS

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

Collection Period	Station 8 RQ	Activity	±	Error	MDA	Station 57 RQ	Activity	±	Error	MDA
12/28/2010 - 1/4/2011		2.01E-03	±	1.02E-02	1.64E-02		-6.32E-04	±	9.03E-03	1.47E-02
1/4/2011 - 1/11/2011		-4.75E-03	±	1.18E-02	1.85E-02		-4.74E-03	±	1.16E-02	1.83E-02
1/11/2011 - 1/18/2011		1.64E-03	±	9.56E-03	1.54E-02		3.42E-03	±	9.18E-03	1.43E-02
1/18/2011 - 1/25/2011		7.74E-04	±	7.50E-03	1.21E-02		3.05E-03	±	9.14E-03	1.43E-02
1/25/2011 - 2/1/2011		-2.15E-04	±	9.16E-03	1.50E-02		-1.90E-03	±	1.09E-02	1.75E-02
2/1/2011 - 2/8/2011		-2.39E-03	±	1.13E-02	1.81E-02		6.18E-03	±	9.67E-03	1.45E-02
2/8/2011 - 2/15/2011		3.18E-04	±	7.03E-03	1.15E-02		4.21E-03	±	1.14E-02	1.78E-02
2/15/2011 - 2/22/2011		-2.87E-03	±	1.05E-02	1.67E-02		0.00E+00	±	8.72E-03	1.45E-02
2/22/2011 - 3/1/2011		4.54E-03	±	8.51E-03	1.27E-02		-1.33E-03	±	1.04E-02	1.69E-02
3/1/2011 - 3/8/2011		2.60E-03	±	9.61E-03	1.52E-02		-7.77E-04	±	9.16E-03	1.49E-02
3/8/2011 - 3/15/2011		-3.60E-04	±	1.03E-02	1.68E-02		3.22E-03	±	1.04E-02	1.63E-02
3/15/2011 - 3/22/2011	+	4.83E-01	±	3.11E-02	1.24E-02	+	5.32E-01	±	2.90E-02	8.99E-03
3/22/2011 - 3/29/2011	+	3.33E-01	±	2.68E-02	1.17E-02	+	3.68E-01	±	2.98E-02	1.51E-02
3/29/2011 - 4/5/2011	+	8.03E-02	±	1.23E-02	7.76E-03	+	7.75E-02	±	1.76E-02	1.51E-02
4/5/2011 - 4/12/2011	+	2.29E-02	±	9.85E-03	1.18E-02	+	1.81E-02	±	7.58E-03	8.18E-03
4/12/2011 - 4/19/2011		7.77E-03	±	5.89E-03	8.05E-03		8.33E-03	±	8.60E-03	1.24E-02
4/19/2011 - 4/26/2011		1.44E-02	±	1.17E-02	1.64E-02		1.03E-02	±	1.11E-02	1.60E-02
4/26/2011 - 5/3/2011		7.03E-03	±	1.10E-02	1.66E-02		2.75E-03	±	9.36E-03	1.47E-02
5/3/2011 - 5/10/2011		6.19E-03	±	9.81E-03	1.46E-02		-4.07E-03	±	1.28E-02	2.03E-02
5/10/2011 - 5/17/2011		1.20E-03	±	1.10E-02	1.79E-02		1.69E-03	±	9.29E-03	1.48E-02
5/17/2011 - 5/24/2011		-1.73E-03	±	1.02E-02	1.64E-02		-2.67E-03	±	1.06E-02	1.68E-02
5/24/2011 - 5/31/2011		0.00E+00	±	8.29E-03	1.38E-02		1.95E-03	±	1.03E-02	1.65E-02
5/31/2011 - 6/7/2011		-4.26E-03	±	1.17E-02	1.84E-02		1.19E-03	±	1.15E-02	1.86E-02
6/7/2011 - 6/14/2011		-3.38E-03	±	1.11E-02	1.75E-02		-4.36E-03	±	1.31E-02	2.08E-02
6/14/2011 - 6/21/2011		-8.66E-05	±	1.05E-02	1.72E-02		-4.21E-05	±	1.16E-02	1.91E-02
6/21/2011 - 6/28/2011		8.17E-03	±	1.01E-02	1.47E-02		-9.22E-05	±	7.69E-03	1.26E-02
6/28/2011 - 7/5/2011		2.80E-03	±	8.85E-03	1.39E-02		4.37E-03	±	9.38E-03	1.43E-02
7/5/2011 - 7/12/2011		1.39E-03	±	8.77E-03	1.41E-02		2.34E-03	±	9.45E-03	1.50E-02
7/12/2011 - 7/19/2011		-2.33E-03	±	1.07E-02	1.71E-02		9.75E-03	±	9.80E-03	1.36E-02
7/19/2011 - 7/26/2011		-2.71E-03	±	1.02E-02	1.62E-02		5.12E-03	±	1.04E-02	1.59E-02
7/26/2011 - 8/2/2011		1.14E-03	±	9.35E-03	1.51E-02		6.34E-03	±	9.56E-03	1.41E-02
8/2/2011 - 8/9/2011		4.02E-05	±	1.10E-02	1.81E-02		-3.03E-03	±	1.15E-02	1.82E-02
8/9/2011 - 8/16/2011		2.78E-03	±	9.41E-03	1.48E-02		-1.30E-03	±	9.37E-03	1.51E-02
8/16/2011 - 8/23/2011		-5.23E-05	±	9.47E-03	1.55E-02		-2.12E-03	±	1.21E-02	1.95E-02
8/23/2011 - 8/30/2011		1.12E-03	±	1.21E-02	1.96E-02		-5.90E-04	±	8.33E-03	1.35E-02
8/30/2011 - 9/6/2011		-2.05E-03	±	1.01E-02	1.61E-02		1.31E-03	±	9.00E-03	1.45E-02
9/6/2011 - 9/13/2011		5.19E-04	±	7.83E-03	1.27E-02		-2.96E-03	±	1.27E-02	2.04E-02
9/13/2011 - 9/20/2011		-3.60E-03	±	1.08E-02	1.70E-02		-2.50E-04	±	1.21E-02	1.98E-02
9/20/2011 - 9/27/2011		9.30E-04	±	7.76E-03	1.25E-02		5.13E-03	±	9.26E-03	1.40E-02
9/27/2011 - 10/4/2011		5.41E-03	±	9.85E-03	1.50E-02		-1.48E-03	±	1.09E-02	1.77E-02
10/4/2011 - 10/11/2011		1.16E-03	±	9.31E-03	1.50E-02		-4.21E-03	±	1.20E-02	1.89E-02
10/11/2011 - 10/18/2011		2.88E-03	±	1.02E-02	1.61E-02		0.00E+00	±	1.18E-02	1.97E-02
10/18/2011 - 10/25/2011		-3.46E-03	±	1.18E-02	1.87E-02		2.75E-04	±	9.70E-03	1.59E-02
10/25/2011 - 11/1/2011		4.09E-03	±	8.77E-03	1.34E-02		-9.20E-04	±	1.13E-02	1.84E-02
11/1/2011 - 11/8/2011		2.84E-03	±	9.87E-03	1.56E-02		-4.29E-04	±	1.01E-02	1.66E-02
11/8/2011 - 11/15/2011		-5.65E-04	±	7.34E-03	1.19E-02		0.00E+00	±	8.27E-03	1.38E-02
11/15/2011 - 11/22/2011		3.79E-03	±	7.49E-03	1.14E-02		-2.22E-03	±	7.31E-03	1.15E-02
11/22/2011 - 11/29/2011		-2.05E-03	±	8.78E-03	1.40E-02		-2.40E-04	±	8.35E-03	1.37E-02
11/29/2011 - 12/6/2011		1.11E-03	±	1.16E-02	1.89E-02		3.86E-04	±	1.14E-02	1.87E-02
12/6/2011 - 12/13/2011		2.05E-03	±	9.44E-03	1.51E-02		-2.92E-03	±	1.10E-02	1.74E-02
12/13/2011 - 12/20/2011		-4.82E-03	±	1.16E-02	1.82E-02		-1.90E-03	±	1.31E-02	2.12E-02
12/20/2011 - 12/27/2011		-6.35E-04	±	1.05E-02	1.71E-02		0.00E+00	±	1.29E-02	2.14E-02
12/27/2011 - 1/3/2012		4.91E-03	±	1.10E-02	1.71E-02		-1.01E-04	±	1.19E-02	1.95E-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.

Positive I-131 activity from 3/15/11 to 4/12/11 attributed to Fukushima

TABLE A-4.2

GAMMA SPECTROMETRY RESULTS OF I-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	1.89E-02	-5.16E-03	6.12E-01	1.57E-02	580	44
I-131	Cntl	1.91E-02	-4.97E-03	5.22E-01	1.52E-02	53	4

Ind = Indicator Stations Cntl = Control Station
All positive results attributed to Fukushima

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
01/03/11 - 02/01/11		-1.16E-01	±	7.81E-01	2.75E+00		-2.86E-02	±	7.66E-01	2.71E+00
02/01/11 - 03/01/11		3.85E-01	±	6.70E-01	2.30E+00		4.26E-01	±	6.69E-01	2.30E+00
03/01/11 - 03/31/11		1.35E+00	±	6.90E-01	2.17E+00		3.06E-01	±	6.46E-01	2.18E+00
03/31/11 - 05/02/11		1.87E+00	±	7.36E-01	2.26E+00		1.32E+00	±	7.28E-01	2.26E+00
05/02/11 - 06/01/11		-2.50E-01	±	6.75E-01	2.35E+00		-2.61E-01	±	6.60E-01	2.35E+00
06/01/11 - 07/01/11		-2.77E-01	±	6.69E-01	2.34E+00		1.64E+00	±	7.79E-01	2.36E+00
07/01/11 - 08/01/11	+	2.28E+00	±	8.00E-01	2.27E+00		2.01E+00	±	7.59E-01	2.28E+00
08/01/11 - 09/01/11		1.63E+00	±	7.97E-01	2.47E+00		1.11E+00	±	7.72E-01	2.46E+00
09/01/11 - 10/03/11		2.42E-01	±	7.73E-01	2.61E+00		1.72E+00	±	8.47E-01	2.62E+00
10/03/11 - 11/01/11		1.28E+00	±	7.09E-01	2.18E+00		1.91E+00	±	7.81E-01	2.18E+00
11/01/11 - 12/01/11		2.69E-01	±	7.63E-01	2.63E+00		4.17E-01	±	7.96E-01	2.63E+00
12/01/11 - 01/03/12		8.29E-01	±	7.15E-01	2.37E+00		1.57E+00	±	7.66E-01	2.36E+00

Collection Period	ST 27 CW Discharge RQ	Activity	±	Error	MDA
01/03/11 - 02/01/11		1.45E+00	±	9.27E-01	3.01E+00
02/01/11 - 03/01/11	+	4.98E+00	±	9.82E-01	2.49E+00
03/01/11 - 03/31/11	+	4.62E+00	±	9.45E-01	2.38E+00
03/31/11 - 05/02/11	+	2.75E+00	±	8.07E-01	2.30E+00
05/02/11 - 06/01/11		-2.97E-01	±	6.77E-01	2.36E+00
06/01/11 - 07/01/11		1.13E+00	±	7.54E-01	2.38E+00
07/01/11 - 08/01/11		NVS			
08/01/11 - 09/01/11		1.95E+00	±	8.20E-01	2.48E+00
09/01/11 - 10/03/11		1.41E-01	±	7.55E-01	2.64E+00
10/03/11 - 11/01/11	+	7.13E+00	±	1.14E+00	2.62E+00
11/01/11 - 12/01/11	+	4.23E+00	±	1.06E+00	2.98E+00
12/01/11 - 01/03/12	+	9.56E+00	±	1.32E+00	2.85E+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	7.91E-01	-2.77E-01	2.28E+00	12	1
ST 29 Indicator	1.01E+00	-2.61E-01	2.01E+00	12	0
ST 27 Discharge	3.42E+00	-2.97E-01	9.56E+00	11	6

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

NVS = Valid sample not obtained.

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	01/03/11	-	03/31/11		-1.30E+01	±	9.95E+01
		03/31/11	-	07/01/11		9.03E+01	±	1.01E+02
		07/01/11	-	11/01/11		8.63E+01	±	9.77E+01
		11/01/11	-	01/03/12		5.95E+01	±	9.92E+01
29	River/Drinking Indicator	01/03/11	-	03/31/11		-4.22E+01	±	9.75E+01
		03/31/11	-	07/01/11		2.63E+01	±	9.77E+01
		07/01/11	-	11/01/11		4.41E+01	±	9.79E+01
		11/01/11	-	01/03/12		5.72E+01	±	1.01E+02
27	Plant Discharge	01/03/11	-	03/31/11		2.35E+01	±	1.03E+02
		03/31/11	-	07/01/11		7.58E+01	±	1.01E+02
		07/01/11	-	11/01/11		1.13E+00	±	1.09E+02
		11/01/11	-	01/03/12		1.08E+02	±	1.03E+02
31	Ground Water Well 1	03/01/11				-1.62E+02	±	1.02E+02
		06/02/11				-2.08E+01	±	9.50E+01
		09/06/11				-4.90E+01	±	9.74E+01
		12/01/11				1.37E+02	±	9.94E+01
32	Ground Water Well 2	03/01/11				-9.52E+01	±	1.02E+02
		06/02/11				2.82E+00	±	7.76E+01
		09/06/11				-4.17E+01	±	9.75E+01
		12/01/11				1.42E+02	±	1.00E+02
52	Ground Water Well 3	03/01/11				-1.14E+02	±	1.03E+02
		06/01/11				-3.49E+01	±	9.51E+01
		09/01/11				2.35E+02	±	1.04E+02
		12/01/11				6.19E+00	±	1.09E+02

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	5.58E+01	-1.30E+01	9.03E+01	4	0
River/Drinking Indicator	2.13E+01	-4.22E+01	5.72E+01	4	0
Discharge Indicator	5.20E+01	1.13E+00	1.08E+02	4	0
Ground Water Indicator	4.69E-01	-1.62E+02	2.35E+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 2/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.46E+01	±	5.58E+01	5.29E+01
CR-51		7.44E+00	±	2.61E+01	4.24E+01
MN-54		1.05E+00	±	1.82E+00	2.83E+00
CO-58		-1.06E+00	±	2.43E+00	3.86E+00
FE-59		-1.28E+00	±	6.21E+00	9.97E+00
CO-60		7.19E-03	±	1.55E+00	2.55E+00
ZN-65		-2.40E+00	±	4.53E+00	7.08E+00
ZRNB-95		4.87E-01	±	3.48E+00	5.64E+00
I-131		-2.59E+00	±	8.98E+00	1.45E+01
CS-134		-1.06E+00	±	2.10E+00	3.34E+00
CS-137		2.11E-01	±	1.72E+00	2.80E+00
BALA140		1.32E-01	±	6.36E+00	1.04E+01
BI-214		1.53E-01	±	4.34E+00	8.19E+00
RA-226		-9.04E+00	±	5.22E+01	7.95E+01

Location 26 collected 3/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.62E+01	±	6.43E+01	5.56E+01
CR-51		-5.16E+00	±	2.07E+01	3.35E+01
MN-54		-5.75E-01	±	2.05E+00	3.29E+00
CO-58		1.32E+00	±	1.64E+00	2.44E+00
FE-59		-2.84E-01	±	4.54E+00	7.40E+00
CO-60		-4.64E-01	±	1.94E+00	3.10E+00
ZN-65		1.36E+00	±	3.80E+00	6.00E+00
ZRNB-95		-6.50E-01	±	2.13E+00	3.40E+00
I-131		9.31E-01	±	5.12E+00	8.32E+00
CS-134		7.43E-01	±	1.86E+00	2.98E+00
CS-137		7.00E-01	±	1.48E+00	2.30E+00
BALA140		-1.22E+00	±	5.25E+00	8.39E+00
BI-214		-1.55E+00	±	6.27E+00	8.85E+00
RA-226		-7.11E+00	±	4.84E+01	7.68E+01

Location 26 collected 3/31/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.77E+01	±	4.77E+01	5.32E+01
CR-51		1.95E-01	±	2.04E+01	3.35E+01
MN-54		1.97E-03	±	1.96E+00	3.24E+00
CO-58		1.47E-01	±	2.06E+00	3.37E+00
FE-59		2.77E+00	±	5.01E+00	7.58E+00
CO-60		2.02E-01	±	1.71E+00	2.77E+00
ZN-65		-1.26E+00	±	4.39E+00	7.02E+00
ZRNB-95		-3.71E-01	±	2.36E+00	3.84E+00
I-131		-1.95E-01	±	5.69E+00	9.33E+00
CS-134		-2.39E-01	±	2.20E+00	3.60E+00
CS-137		3.21E-01	±	2.03E+00	3.30E+00
BALA140		-4.00E-01	±	5.25E+00	8.55E+00
BI-214		6.16E-03	±	4.82E+00	8.89E+00
RA-226		-1.94E+01	±	6.12E+01	7.77E+01

Location 26 collected 5/2/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.39E+01	±	3.25E+01	4.86E+01
CR-51		-1.99E+01	±	2.61E+01	4.10E+01
MN-54		-6.87E-02	±	1.97E+00	3.22E+00
CO-58		-4.23E-01	±	2.38E+00	3.84E+00
FE-59		2.25E+00	±	6.10E+00	9.56E+00
CO-60		0.00E+00	±	2.86E+00	4.77E+00
ZN-65		2.07E+00	±	4.33E+00	6.74E+00
ZRNB-95		0.00E+00	±	1.97E+00	3.28E+00
I-131		-4.24E-01	±	5.81E+00	9.51E+00
CS-134		-4.80E-02	±	2.19E+00	3.59E+00
CS-137		-7.79E-01	±	2.24E+00	3.58E+00
BALA140		0.00E+00	±	5.89E+00	9.81E+00
BI-214		-2.13E+00	±	6.69E+00	9.63E+00
RA-226		-8.83E+00	±	5.69E+01	9.39E+01

Location 26 collected 6/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.37E+01	±	4.54E+01	5.03E+01
CR-51		2.16E+01	±	2.63E+01	4.12E+01
MN-54		-6.34E-01	±	2.29E+00	3.68E+00
CO-58		-4.38E-01	±	2.21E+00	3.56E+00
FE-59		1.80E-01	±	6.90E+00	1.13E+01
CO-60		0.00E+00	±	3.10E+00	5.17E+00
ZN-65		-1.20E+00	±	5.20E+00	8.36E+00
ZRNB-95		1.24E+00	±	2.19E+00	3.39E+00
I-131		5.60E+00	±	7.99E+00	1.25E+01
CS-134		1.32E+00	±	2.24E+00	3.53E+00
CS-137		-6.90E-03	±	2.11E+00	3.48E+00
BALA140		-2.22E+00	±	6.94E+00	1.10E+01
BI-214		1.91E+00	±	5.23E+00	9.74E+00
RA-226		-2.72E+00	±	5.21E+01	9.30E+01

Location 26 collected 7/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-5.00E+01	±	1.04E+02	5.41E+01
CR-51		-1.39E+01	±	2.80E+01	4.52E+01
MN-54		4.95E-01	±	2.01E+00	3.25E+00
CO-58		6.07E-02	±	2.15E+00	3.53E+00
FE-59		-3.46E+00	±	6.80E+00	1.07E+01
CO-60		-6.95E-01	±	2.24E+00	3.58E+00
ZN-65		-8.93E-01	±	4.01E+00	6.47E+00
ZRNB-95		4.91E-02	±	2.33E+00	3.83E+00
I-131		2.87E+00	±	8.58E+00	1.39E+01
CS-134		0.00E+00	±	3.07E+00	5.12E+00
CS-137		-5.91E-01	±	2.03E+00	3.28E+00
BALA140		-5.52E-01	±	7.01E+00	1.14E+01
BI-214		-1.38E+00	±	6.18E+00	9.04E+00
RA-226		1.31E+01	±	5.59E+01	9.79E+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

STATION 26 - River/Drinking Control

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

Location 26 collected 8/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-7.94E+00	±	3.43E+01	5.50E+01
CR-51		-9.00E+00	±	2.60E+01	4.19E+01
MN-54		-2.68E-02	±	1.89E+00	3.10E+00
CO-58		-5.76E-01	±	2.04E+00	3.25E+00
FE-59		7.45E-01	±	6.35E+00	1.03E+01
CO-60		2.14E-01	±	1.86E+00	3.01E+00
ZN-65		-1.77E+00	±	4.87E+00	7.72E+00
ZRNB-95		9.24E-02	±	2.26E+00	3.70E+00
I-131		-1.50E+00	±	6.23E+00	1.01E+01
CS-134		-1.08E+00	±	2.29E+00	3.63E+00
CS-137		6.62E-01	±	1.85E+00	2.93E+00
BALA140		0.00E+00	±	4.47E+00	7.45E+00
BI-214		7.96E-01	±	5.09E+00	9.64E+00
RA-226		-2.08E+01	±	7.17E+01	1.00E+02

Location 26 collected 9/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-4.90E+01	±	1.37E+02	7.52E+01
CR-51		-1.05E-01	±	2.83E+01	4.65E+01
MN-54		2.36E-02	±	2.59E+00	4.25E+00
CO-58		1.13E+00	±	2.98E+00	4.68E+00
FE-59		0.00E+00	±	1.14E+01	1.90E+01
CO-60		5.33E-02	±	2.40E+00	3.93E+00
ZN-65		-4.18E-01	±	5.84E+00	9.52E+00
ZRNB-95		1.66E+00	±	3.19E+00	4.95E+00
I-131		4.64E+00	±	1.41E+01	2.27E+01
CS-134		4.86E-02	±	2.38E+00	3.90E+00
CS-137		-4.19E-01	±	2.71E+00	4.38E+00
BALA140		-4.46E+00	±	1.21E+01	1.89E+01
BI-214		5.20E-01	±	6.01E+00	1.12E+01
RA-226		-3.45E+00	±	7.76E+01	1.32E+02

Location 26 collected 10/3/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.14E+01	±	5.00E+01	5.34E+01
CR-51		1.34E+01	±	2.45E+01	3.89E+01
MN-54		-8.56E-01	±	2.21E+00	3.50E+00
CO-58		-6.55E-01	±	2.25E+00	3.59E+00
FE-59		1.77E+00	±	5.85E+00	9.24E+00
CO-60		5.24E-01	±	1.75E+00	2.76E+00
ZN-65		-3.29E-02	±	4.70E+00	7.73E+00
ZRNB-95		-2.30E-02	±	2.09E+00	3.43E+00
I-131		-1.18E+00	±	5.52E+00	8.93E+00
CS-134		1.57E-01	±	1.63E+00	2.65E+00
CS-137		1.57E-01	±	1.12E+00	1.80E+00
BALA140		-2.40E+00	±	5.86E+00	9.15E+00
BI-214		-6.44E+00	±	9.70E+00	1.03E+01
RA-226		-3.73E+01	±	7.91E+01	9.31E+01

Location 26 collected 11/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.56E+01	±	5.62E+01	5.28E+01
CR-51		-5.37E+00	±	2.74E+01	4.45E+01
MN-54		-2.99E-02	±	2.01E+00	3.29E+00
CO-58		-4.46E-01	±	2.37E+00	3.83E+00
FE-59		-2.11E+00	±	7.44E+00	1.18E+01
CO-60		-2.81E-02	±	1.74E+00	2.86E+00
ZN-65		-3.13E+00	±	5.78E+00	9.06E+00
ZRNB-95		1.06E+00	±	3.92E+00	6.27E+00
I-131		0.00E+00	±	8.84E+00	1.47E+01
CS-134		5.27E-02	±	1.67E+00	2.73E+00
CS-137		-6.75E-01	±	2.20E+00	3.52E+00
BALA140		-1.02E+00	±	6.28E+00	1.01E+01
BI-214		2.10E+00	±	5.52E+00	1.06E+01
RA-226		1.64E+00	±	5.23E+01	9.60E+01

Location 26 collected 12/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.88E+01	±	4.64E+01	5.18E+01
CR-51		-9.11E+00	±	2.28E+01	3.66E+01
MN-54		0.00E+00	±	2.31E+00	3.85E+00
CO-58		-3.01E-01	±	2.07E+00	3.37E+00
FE-59		-1.05E+00	±	6.03E+00	9.72E+00
CO-60		2.09E-02	±	9.60E-01	1.57E+00
ZN-65		-1.23E+00	±	4.40E+00	7.04E+00
ZRNB-95		1.44E+00	±	3.01E+00	4.68E+00
I-131		-2.18E+00	±	6.48E+00	1.04E+01
CS-134		3.06E-01	±	8.93E-01	1.39E+00
CS-137		7.43E-01	±	1.83E+00	2.90E+00
BALA140		-1.19E+00	±	6.12E+00	9.84E+00
BI-214	+	9.61E+00	±	4.69E+00	7.83E+00
RA-226		2.80E+00	±	4.26E+01	7.67E+01

Location 26 collected 1/3/2012

Nuclide	RQ	Activity		Error	MDA
K-40		4.96E+00	±	2.83E+01	5.47E+01
CR-51		1.11E+01	±	2.50E+01	3.99E+01
MN-54		0.00E+00	±	3.14E+00	5.23E+00
CO-58		-3.10E-01	±	2.31E+00	3.74E+00
FE-59		-1.51E-01	±	5.55E+00	9.09E+00
CO-60		3.19E-01	±	1.85E+00	2.98E+00
ZN-65		-1.68E+00	±	4.36E+00	6.84E+00
ZRNB-95		1.67E+00	±	4.02E+00	6.32E+00
I-131		6.39E+00	±	9.53E+00	1.49E+01
CS-134		-1.28E+00	±	2.63E+00	4.20E+00
CS-137		9.22E-01	±	2.04E+00	3.22E+00
BALA140		-3.51E-01	±	6.74E+00	1.10E+01
BI-214		3.99E-01	±	5.71E+00	1.10E+01
RA-226		-2.39E+01	±	6.54E+01	9.15E+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

STATION 29 - River/Drinking Control

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

Location 29 collected 2/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.76E+01	±	5.05E+01	5.49E+01
CR-51		-8.36E+00	±	3.21E+01	5.21E+01
MN-54		-1.94E-01	±	1.52E+00	2.47E+00
CO-58		1.67E+00	±	2.35E+00	3.61E+00
FE-59		3.31E+00	±	6.35E+00	9.74E+00
CO-60		0.00E+00	±	2.65E+00	4.42E+00
ZN-65		1.78E+00	±	4.15E+00	6.51E+00
ZRNB-95		1.53E+00	±	2.32E+00	3.58E+00
I-131		2.71E+00	±	1.10E+01	1.77E+01
CS-134		-1.39E-04	±	1.95E+00	3.46E+00
CS-137		-3.34E-01	±	1.81E+00	2.92E+00
BALA140		3.66E+00	±	8.82E+00	1.37E+01
BI-214		-2.04E+00	±	6.69E+00	8.72E+00
RA-226		-1.82E+01	±	6.38E+01	8.18E+01

Location 29 collected 3/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.03E+01	±	5.12E+01	5.34E+01
CR-51		-9.04E+00	±	2.27E+01	3.66E+01
MN-54		1.28E+00	±	1.68E+00	2.54E+00
CO-58		-8.26E-01	±	2.26E+00	3.61E+00
FE-59		1.69E+00	±	5.28E+00	8.32E+00
CO-60		3.26E-01	±	1.86E+00	3.00E+00
ZN-65		6.56E-01	±	2.88E+00	4.58E+00
ZRNB-95		-6.49E-01	±	2.31E+00	3.71E+00
I-131		-1.88E-02	±	4.64E+00	7.61E+00
CS-134		3.94E-02	±	2.17E+00	3.56E+00
CS-137		-2.96E-01	±	1.92E+00	3.11E+00
BALA140		-8.82E-01	±	5.11E+00	8.22E+00
BI-214		-9.94E-01	±	5.69E+00	8.85E+00
RA-226		-2.44E+01	±	6.86E+01	7.89E+01

Location 29 collected 3/31/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.04E+01	±	4.93E+01	5.55E+01
CR-51		8.35E+00	±	2.45E+01	3.95E+01
MN-54		2.14E-01	±	1.75E+00	2.83E+00
CO-58		1.14E+00	±	2.20E+00	3.41E+00
FE-59		5.09E-01	±	5.85E+00	9.51E+00
CO-60		3.65E-01	±	1.95E+00	3.13E+00
ZN-65		-1.44E+00	±	4.72E+00	7.51E+00
ZRNB-95		2.47E-01	±	2.23E+00	3.63E+00
I-131		-5.09E+00	±	9.03E+00	1.44E+01
CS-134		6.15E-01	±	2.31E+00	3.74E+00
CS-137		-8.50E-02	±	1.92E+00	3.14E+00
BALA140		-8.33E-01	±	5.82E+00	9.38E+00
BI-214		-2.28E+00	±	7.19E+00	9.99E+00
RA-226		-2.26E+00	±	5.19E+01	9.31E+01

Location 29 collected 5/2/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.51E+01	±	4.84E+01	5.08E+01
CR-51		-1.34E+01	±	2.53E+01	4.03E+01
MN-54		-9.39E-01	±	2.57E+00	4.11E+00
CO-58		5.34E-01	±	2.14E+00	3.43E+00
FE-59		-2.41E+00	±	6.76E+00	1.06E+01
CO-60		-1.44E-01	±	2.01E+00	3.27E+00
ZN-65		-6.63E-01	±	4.58E+00	7.42E+00
ZRNB-95		-5.14E-01	±	2.47E+00	3.99E+00
I-131		3.14E+00	±	6.29E+00	9.97E+00
CS-134		-6.19E-01	±	2.15E+00	3.46E+00
CS-137		-2.10E-01	±	2.21E+00	3.61E+00
BALA140		1.55E+00	±	5.10E+00	8.01E+00
BI-214		2.53E-01	±	5.22E+00	9.88E+00
RA-226		-4.94E+01	±	9.80E+01	9.49E+01

Location 29 collected 6/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.91E+01	±	6.16E+01	5.40E+01
CR-51		1.86E+01	±	2.82E+01	4.47E+01
MN-54		-5.15E-01	±	1.82E+00	2.90E+00
CO-58		1.15E-01	±	1.76E+00	2.87E+00
FE-59		-1.03E+00	±	6.47E+00	1.04E+01
CO-60		0.00E+00	±	1.95E+00	3.24E+00
ZN-65		-1.43E+00	±	4.95E+00	7.91E+00
ZRNB-95		2.91E-02	±	2.38E+00	3.91E+00
I-131		-1.64E-01	±	8.23E+00	1.35E+01
CS-134		-6.86E-01	±	2.00E+00	3.20E+00
CS-137		-1.79E-02	±	2.11E+00	3.46E+00
BALA140		-2.73E+00	±	6.88E+00	1.07E+01
BI-214		-5.90E-01	±	4.76E+00	8.77E+00
RA-226		-6.39E+00	±	5.53E+01	9.40E+01

Location 29 collected 7/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-4.67E+01	±	1.31E+02	5.49E+01
CR-51		-5.69E+00	±	2.84E+01	4.62E+01
MN-54		1.83E-01	±	2.12E+00	3.45E+00
CO-58		2.83E-01	±	2.23E+00	3.62E+00
FE-59		0.00E+00	±	1.14E+01	1.90E+01
CO-60		-4.88E-02	±	2.21E+00	3.62E+00
ZN-65		1.52E+00	±	4.15E+00	6.53E+00
ZRNB-95		-9.57E-02	±	2.39E+00	3.91E+00
I-131		4.53E+00	±	7.70E+00	1.21E+01
CS-134		1.75E+00	±	2.05E+00	3.14E+00
CS-137		8.16E-02	±	1.85E+00	3.02E+00
BALA140		0.00E+00	±	7.19E+00	1.20E+01
BI-214		1.04E+00	±	4.80E+00	9.21E+00
RA-226		-2.17E+00	±	5.40E+01	9.61E+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

STATION 29 - River/Drinking Control

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

Location 29 collected 8/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.80E+01	±	4.11E+01	5.19E+01
CR-51		2.05E+00	±	2.40E+01	3.92E+01
MN-54		-1.20E-01	±	1.85E+00	3.03E+00
CO-58		4.25E-01	±	2.02E+00	3.25E+00
FE-59		-1.35E+00	±	7.19E+00	1.16E+01
CO-60		4.54E-01	±	2.16E+00	3.46E+00
ZN-65		-2.83E+00	±	6.22E+00	9.86E+00
ZRNB-95		8.81E-02	±	2.16E+00	3.53E+00
I-131		-1.58E+00	±	6.48E+00	1.05E+01
CS-134		-7.01E-01	±	2.38E+00	3.84E+00
CS-137		9.30E-01	±	2.06E+00	3.24E+00
BALA140		-1.10E+00	±	5.73E+00	9.20E+00
BI-214		7.06E-01	±	5.44E+00	1.02E+01
RA-226		-3.34E+01	±	8.03E+01	9.62E+01

Location 29 collected 9/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		7.29E+00	±	2.72E+01	5.23E+01
CR-51		-1.41E+01	±	2.95E+01	4.72E+01
MN-54		3.38E-01	±	1.93E+00	3.11E+00
CO-58		9.59E-01	±	2.03E+00	3.15E+00
FE-59		0.00E+00	±	6.88E+00	1.15E+01
CO-60		0.00E+00	±	2.83E+00	4.72E+00
ZN-65		-4.96E-01	±	5.13E+00	8.35E+00
ZRNB-95		1.92E-02	±	2.36E+00	3.88E+00
I-131		5.97E+00	±	9.10E+00	1.42E+01
CS-134		7.29E-01	±	2.39E+00	3.84E+00
CS-137		-1.01E-01	±	1.43E+00	2.34E+00
BALA140		-3.96E+00	±	8.32E+00	1.29E+01
BI-214		1.36E+00	±	5.40E+00	9.85E+00
RA-226		-1.46E+00	±	5.27E+01	9.38E+01

Location 29 collected 10/3/2011

Nuclide	RQ	Activity		Error	MDA
K-40		6.24E+00	±	2.87E+01	5.50E+01
CR-51		0.00E+00	±	2.67E+01	4.45E+01
MN-54		4.31E-01	±	2.03E+00	3.27E+00
CO-58		-7.58E-01	±	2.26E+00	3.59E+00
FE-59		-5.21E-01	±	6.09E+00	9.90E+00
CO-60		6.41E-01	±	1.95E+00	3.08E+00
ZN-65		-1.47E+00	±	5.44E+00	8.73E+00
ZRNB-95		1.10E+00	±	2.35E+00	3.69E+00
I-131		4.04E+00	±	6.71E+00	1.06E+01
CS-134		-6.69E-01	±	2.27E+00	3.66E+00
CS-137		-1.29E+00	±	2.69E+00	4.27E+00
BALA140		-6.85E-01	±	4.88E+00	7.86E+00
BI-214		-4.51E+00	±	8.38E+00	1.06E+01
RA-226		2.76E+01	±	5.16E+01	9.33E+01

Location 29 collected 11/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.21E+01	±	4.13E+01	5.28E+01
CR-51		5.32E+00	±	2.24E+01	3.63E+01
MN-54		9.90E-02	±	1.45E+00	2.36E+00
CO-58		2.48E-01	±	1.71E+00	2.76E+00
FE-59		-1.39E+00	±	6.24E+00	9.99E+00
CO-60		1.18E-01	±	1.77E+00	2.89E+00
ZN-65		0.00E+00	±	9.29E+00	1.55E+01
ZRNB-95		-2.13E+00	±	4.21E+00	6.63E+00
I-131		-1.30E+00	±	6.66E+00	1.08E+01
CS-134		-6.08E-01	±	1.56E+00	2.48E+00
CS-137		4.48E-02	±	1.73E+00	2.83E+00
BALA140		-3.02E-01	±	5.49E+00	8.96E+00
BI-214		3.90E+00	±	4.51E+00	8.08E+00
RA-226		-1.24E+01	±	5.16E+01	7.49E+01

Location 29 collected 12/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.97E+01	±	6.46E+01	5.31E+01
CR-51		-5.38E+00	±	2.23E+01	3.62E+01
MN-54		7.36E-03	±	1.64E+00	2.70E+00
CO-58		-8.19E-01	±	2.16E+00	3.43E+00
FE-59		2.54E+00	±	6.04E+00	9.44E+00
CO-60		-1.73E-01	±	1.85E+00	3.02E+00
ZN-65		-1.43E+00	±	4.09E+00	6.48E+00
ZRNB-95		4.14E-01	±	4.02E+00	6.54E+00
I-131		1.28E-01	±	6.60E+00	1.08E+01
CS-134		4.97E-01	±	1.58E+00	2.52E+00
CS-137		-5.23E-01	±	1.95E+00	3.13E+00
BALA140		-1.00E-01	±	5.71E+00	9.36E+00
BI-214		5.54E+00	±	4.87E+00	8.49E+00
RA-226		-3.49E+01	±	8.15E+01	7.70E+01

Location 29 collected 1/3/2012

Nuclide	RQ	Activity		Error	MDA
K-40		-3.87E+01	±	6.70E+01	5.18E+01
CR-51		9.63E-02	±	2.77E+01	4.55E+01
MN-54		1.63E+00	±	1.99E+00	3.08E+00
CO-58		-3.16E-01	±	2.22E+00	3.61E+00
FE-59		-3.40E+00	±	7.37E+00	1.16E+01
CO-60		2.70E-01	±	1.68E+00	2.72E+00
ZN-65		-2.71E-01	±	4.21E+00	6.88E+00
ZRNB-95		1.74E+00	±	3.81E+00	6.04E+00
I-131		-2.01E+00	±	9.36E+00	1.52E+01
CS-134		-3.70E-01	±	2.06E+00	3.36E+00
CS-137		8.30E-01	±	2.05E+00	3.28E+00
BALA140		5.59E-01	±	6.39E+00	1.04E+01
BI-214		1.17E+00	±	4.28E+00	7.95E+00
RA-226		-3.12E+01	±	8.08E+01	9.77E+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

STATION 27 - Plant Discharge Water Indicator

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

Location 27 collected 2/1/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-6.81E+00	±	3.10E+01	5.42E+01
CR-51		-2.24E+00	±	3.04E+01	4.98E+01
MN-54		7.70E-01	±	1.84E+00	2.91E+00
CO-58		9.34E-01	±	2.36E+00	3.74E+00
FE-59		1.74E-02	±	6.46E+00	1.06E+01
CO-60		-2.59E-01	±	1.96E+00	3.18E+00
ZN-65		0.00E+00	±	6.09E+00	1.01E+01
ZRNB-95		1.57E+00	±	2.49E+00	3.87E+00
I-131		1.86E+00	±	1.64E+01	2.67E+01
CS-134		6.96E-01	±	2.06E+00	3.31E+00
CS-137		7.90E-01	±	1.90E+00	3.01E+00
BALA140		-1.40E+00	±	9.34E+00	1.51E+01
BI-214		-3.48E+00	±	9.48E+00	9.27E+00
RA-226		-2.71E+01	±	7.43E+01	8.08E+01

Location 27 collected 3/1/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-3.36E+01	±	5.83E+01	5.47E+01
CR-51		-2.90E+00	±	2.25E+01	3.67E+01
MN-54		4.15E-02	±	1.70E+00	2.78E+00
CO-58		1.58E+00	±	1.77E+00	2.62E+00
FE-59		-3.47E-01	±	4.70E+00	7.65E+00
CO-60		-7.53E-03	±	1.85E+00	3.03E+00
ZN-65		-8.63E-01	±	3.68E+00	5.89E+00
ZRNB-95		5.18E-01	±	2.20E+00	3.55E+00
I-131		-1.51E+00	±	5.60E+00	9.06E+00
CS-134		8.06E-01	±	1.70E+00	2.69E+00
CS-137		0.00E+00	±	2.31E+00	3.86E+00
BALA140		-1.82E+00	±	5.13E+00	8.08E+00
BI-214		-1.41E+00	±	5.37E+00	8.04E+00
RA-226		8.63E+00	±	4.23E+01	7.58E+01

Location 27 collected 3/31/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-7.01E+00	±	3.15E+01	5.19E+01
CR-51		-3.59E+00	±	2.38E+01	3.89E+01
MN-54		0.00E+00	±	2.76E+00	4.60E+00
CO-58		4.12E-02	±	1.89E+00	3.11E+00
FE-59		-2.17E+00	±	6.21E+00	9.82E+00
CO-60		6.32E-01	±	1.78E+00	2.80E+00
ZN-65		-6.46E-01	±	4.57E+00	7.41E+00
ZRNB-95		1.62E+00	±	2.07E+00	3.15E+00
I-131		3.06E+00	±	5.95E+00	9.48E+00
CS-134		2.46E-01	±	2.01E+00	3.28E+00
CS-137		-8.32E-02	±	2.13E+00	3.49E+00
BALA140		-1.60E+00	±	5.22E+00	8.27E+00
BI-214		-2.68E+00	±	7.17E+00	9.45E+00
RA-226		2.70E+01	±	4.89E+01	8.82E+01

Location 27 collected 5/2/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-3.69E+01	±	8.51E+01	5.53E+01
CR-51		-6.19E+00	±	2.60E+01	4.22E+01
MN-54		7.45E-01	±	2.10E+00	3.34E+00
CO-58		-3.84E-01	±	2.02E+00	3.25E+00
FE-59		3.64E-01	±	5.64E+00	9.20E+00
CO-60		-3.73E-01	±	2.03E+00	3.26E+00
ZN-65		-3.59E+00	±	5.73E+00	8.91E+00
ZRNB-95		1.34E+00	±	2.36E+00	3.67E+00
I-131		-2.94E+00	±	6.62E+00	1.06E+01
CS-134		-7.71E-02	±	2.33E+00	3.82E+00
CS-137		2.14E-01	±	2.12E+00	3.45E+00
BALA140		1.33E+00	±	4.56E+00	7.14E+00
BI-214		2.10E+00	±	5.38E+00	9.94E+00
RA-226		-2.25E+01	±	7.11E+01	9.76E+01

Location 27 collected 6/1/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.75E+01	±	4.18E+01	5.29E+01
CR-51		1.39E+01	±	2.83E+01	4.53E+01
MN-54		-1.02E+00	±	2.61E+00	4.16E+00
CO-58		3.05E-01	±	2.20E+00	3.57E+00
FE-59		1.50E+00	±	6.10E+00	9.69E+00
CO-60		5.61E-01	±	1.87E+00	2.95E+00
ZN-65		-1.51E-01	±	4.13E+00	6.76E+00
ZRNB-95		-1.52E-01	±	2.16E+00	3.53E+00
I-131		-2.15E+00	±	9.45E+00	1.53E+01
CS-134		-1.26E+00	±	2.59E+00	4.13E+00
CS-137		-3.74E-01	±	2.42E+00	3.94E+00
BALA140		7.95E-01	±	6.00E+00	9.69E+00
BI-214		2.37E+00	±	5.48E+00	1.01E+01
RA-226		9.53E+00	±	5.08E+01	9.31E+01

Location 27 collected 7/1/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.63E+01	±	4.40E+01	5.56E+01
CR-51		1.43E+00	±	3.42E+01	5.62E+01
MN-54		-7.05E-01	±	2.17E+00	3.45E+00
CO-58		-8.28E-02	±	1.55E+00	2.52E+00
FE-59		1.05E+00	±	7.15E+00	1.15E+01
CO-60		3.06E-01	±	1.91E+00	3.08E+00
ZN-65		-4.34E+00	±	6.31E+00	9.81E+00
ZRNB-95		0.00E+00	±	2.64E+00	4.40E+00
I-131		-4.72E+00	±	1.44E+01	2.33E+01
CS-134		7.28E-01	±	2.05E+00	3.28E+00
CS-137		0.00E+00	±	2.47E+00	4.11E+00
BALA140		-1.62E+00	±	8.16E+00	1.31E+01
BI-214		2.47E+00	±	5.32E+00	9.82E+00
RA-226		1.09E+01	±	5.34E+01	9.68E+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

STATION 27 - Plant Discharge Water Indicator

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

Location 27 collected 8/1/2011

Nuclide	RQ	Activity		Error	MDA

No sample obtained during July collection period.

Location 27 collected 9/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.27E+01	±	3.73E+01	5.34E+01
CR-51		0.00E+00	±	3.96E+01	6.60E+01
MN-54		2.67E-01	±	1.92E+00	3.11E+00
CO-58		-4.70E-01	±	2.82E+00	4.57E+00
FE-59		0.00E+00	±	6.44E+00	1.07E+01
CO-60		-6.13E-01	±	2.27E+00	3.62E+00
ZN-65		1.04E+00	±	4.91E+00	7.89E+00
ZRNB-95		-7.52E-01	±	2.91E+00	4.67E+00
I-131		9.91E+00	±	1.42E+01	2.21E+01
CS-134		3.40E-02	±	2.30E+00	3.77E+00
CS-137		0.00E+00	±	2.90E+00	4.83E+00
BALA140		-5.14E-01	±	1.08E+01	1.76E+01
BI-214		2.85E+00	±	4.93E+00	9.21E+00
RA-226		8.86E+00	±	4.73E+01	8.80E+01

Location 27 collected 10/3/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.40E+01	±	3.74E+01	5.13E+01
CR-51		-5.77E-01	±	2.56E+01	4.20E+01
MN-54		6.01E-01	±	1.67E+00	2.62E+00
CO-58		1.97E-01	±	2.46E+00	4.02E+00
FE-59		-9.62E-01	±	6.56E+00	1.06E+01
CO-60		6.43E-01	±	2.23E+00	3.55E+00
ZN-65		-1.98E-02	±	4.94E+00	8.13E+00
ZRNB-95		3.72E-01	±	2.30E+00	3.73E+00
I-131		-4.76E-02	±	5.97E+00	9.81E+00
CS-134		3.55E-01	±	1.87E+00	3.03E+00
CS-137		2.39E-01	±	2.16E+00	3.51E+00
BALA140		-1.56E+00	±	5.66E+00	8.98E+00
BI-214		-8.36E+00	±	1.31E+01	1.08E+01
RA-226		1.95E+01	±	4.99E+01	9.14E+01

Location 27 collected 11/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-5.32E+01	±	1.03E+02	5.38E+01
CR-51		-4.55E-01	±	2.25E+01	3.70E+01
MN-54		-4.73E-01	±	1.30E+00	2.03E+00
CO-58		-2.62E-01	±	2.10E+00	3.42E+00
FE-59		6.85E-01	±	5.95E+00	9.66E+00
CO-60		1.10E+00	±	1.69E+00	2.55E+00
ZN-65		1.39E+00	±	4.23E+00	6.73E+00
ZRNB-95		-8.04E-01	±	3.60E+00	5.79E+00
I-131		2.74E+00	±	7.01E+00	1.12E+01
CS-134		-1.30E-01	±	1.81E+00	2.96E+00
CS-137		-4.94E-01	±	1.97E+00	3.17E+00
BALA140		-1.79E+00	±	6.58E+00	1.05E+01
BI-214		5.90E+00	±	4.95E+00	8.58E+00
RA-226		1.39E+01	±	4.35E+01	7.73E+01

Location 27 collected 12/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		1.00E+01	±	2.67E+01	5.18E+01
CR-51		-6.13E-01	±	2.54E+01	4.17E+01
MN-54		-6.11E-01	±	2.18E+00	3.48E+00
CO-58		1.08E-01	±	1.98E+00	3.23E+00
FE-59		0.00E+00	±	5.10E+00	8.50E+00
CO-60		2.74E-02	±	2.08E+00	3.42E+00
ZN-65		-2.62E+00	±	5.06E+00	7.89E+00
ZRNB-95		-2.43E-02	±	3.57E+00	5.87E+00
I-131		-2.71E+00	±	8.40E+00	1.35E+01
CS-134		-3.99E-01	±	2.43E+00	3.95E+00
CS-137		-1.67E-01	±	2.13E+00	3.48E+00
BALA140		-2.19E+00	±	6.96E+00	1.10E+01
BI-214		3.13E+00	±	5.88E+00	1.10E+01
RA-226		-1.64E+01	±	6.26E+01	9.47E+01

Location 27 collected 1/3/2012

Nuclide	RQ	Activity		Error	MDA
K-40		-4.00E+01	±	6.68E+01	5.34E+01
CR-51		-6.20E+00	±	2.37E+01	3.84E+01
MN-54		-6.14E-01	±	1.99E+00	3.19E+00
CO-58		9.15E-01	±	2.18E+00	3.45E+00
FE-59		-1.89E-02	±	5.48E+00	9.01E+00
CO-60		5.23E-01	±	1.94E+00	3.09E+00
ZN-65		-1.48E-01	±	4.55E+00	7.46E+00
ZRNB-95		-1.05E-01	±	3.34E+00	5.48E+00
I-131		-6.46E-01	±	9.33E+00	1.53E+01
CS-134		4.33E-02	±	1.74E+00	2.85E+00
CS-137		4.54E-02	±	1.99E+00	3.27E+00
BALA140		-1.87E+00	±	6.27E+00	9.89E+00
BI-214	+	1.09E+01	±	4.70E+00	7.70E+00
RA-226		-1.28E+01	±	5.18E+01	7.46E+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

STATION 31 - Ground Water Well #1

Results in pCi/liter

Location 31 collected 3/3/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.34E+01	±	7.60E+01	8.78E+01
CR-51		-3.19E-01	±	2.63E+01	4.32E+01
MN-54		-3.52E-01	±	2.95E+00	4.77E+00
CO-58		1.11E-01	±	3.04E+00	4.97E+00
FE-59		-3.38E-01	±	7.37E+00	1.20E+01
CO-60		8.49E-01	±	2.57E+00	3.96E+00
ZN-65		2.75E+00	±	3.54E+00	4.51E+00
ZRNB-95		0.00E+00	±	2.67E+00	4.44E+00
I-131		0.00E+00	±	4.74E+00	7.90E+00
CS-134		-1.34E+00	±	3.63E+00	5.77E+00
CS-137		2.26E+00	±	3.15E+00	4.73E+00
BALA140		-8.17E-01	±	4.23E+00	6.71E+00
BI-214	+	4.58E+01	±	1.18E+01	1.33E+01
RA-226		-1.68E+01	±	8.25E+01	1.11E+02

Location 31 collected 6/2/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-6.63E+01	±	2.77E+03	1.28E+02
CR-51		5.32E-01	±	3.65E+01	5.99E+01
MN-54		-1.33E+00	±	5.11E+00	8.20E+00
CO-58		-2.36E+00	±	4.82E+00	7.55E+00
FE-59		0.00E+00	±	1.53E+01	2.54E+01
CO-60		0.00E+00	±	4.82E+00	8.04E+00
ZN-65		6.25E+00	±	6.00E+00	7.76E+00
ZRNB-95		3.67E+00	±	3.33E+00	4.62E+00
I-131		2.55E+00	±	4.33E+00	6.81E+00
CS-134		-5.14E+00	±	6.24E+00	9.76E+00
CS-137		-3.74E+00	±	6.46E+00	1.02E+01
BALA140		5.18E-02	±	4.68E+00	7.68E+00
BI-214	+	3.29E+02	±	2.64E+01	1.62E+01
RA-226		2.14E+01	±	1.21E+02	2.08E+02

Location 31 collected 9/6/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-5.02E+01	±	1.56E+02	7.85E+01
CR-51		1.13E+00	±	2.53E+01	4.15E+01
MN-54		-4.83E-03	±	3.11E+00	5.09E+00
CO-58		-1.25E+00	±	3.16E+00	5.01E+00
FE-59		0.00E+00	±	1.30E+01	2.16E+01
CO-60		-5.81E-01	±	2.58E+00	4.10E+00
ZN-65		5.22E-01	±	4.97E+00	8.05E+00
ZRNB-95		3.08E-01	±	3.27E+00	5.34E+00
I-131		-1.92E+00	±	4.01E+00	6.43E+00
CS-134		1.69E+00	±	1.87E+00	2.72E+00
CS-137		-8.75E-01	±	3.02E+00	4.83E+00
BALA140		0.00E+00	±	3.32E+00	5.54E+00
BI-214	+	1.00E+02	±	1.19E+01	1.22E+01
RA-226		1.63E+01	±	8.54E+01	1.48E+02

Location 31 collected 12/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.17E+01	±	9.33E+01	9.21E+01
CR-51		-1.20E+01	±	3.34E+01	5.35E+01
MN-54		-1.41E-01	±	2.25E+00	3.64E+00
CO-58		1.24E+00	±	3.34E+00	5.20E+00
FE-59		1.32E+00	±	9.69E+00	1.56E+01
CO-60		0.00E+00	±	2.60E+00	4.33E+00
ZN-65		-1.43E+01	±	1.66E+01	2.57E+01
ZRNB-95		2.72E+00	±	5.32E+00	8.06E+00
I-131		1.02E+00	±	3.02E+00	4.78E+00
CS-134		1.07E+00	±	1.57E+01	2.57E+01
CS-137		-1.51E+00	±	4.15E+00	6.55E+00
BALA140		1.96E-01	±	3.82E+00	6.21E+00
BI-214	+	1.72E+02	±	1.92E+01	1.85E+01
RA-226		3.64E+01	±	1.04E+02	1.80E+02

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 32 - Ground Water Well #2

Results in pCi/liter

Location 32 collected 3/3/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.97E+00	±	4.53E+01	8.60E+01
CR-51		-1.47E+00	±	3.36E+01	5.52E+01
MN-54		-1.54E-01	±	3.53E+00	5.77E+00
CO-58		-6.08E-02	±	3.36E+00	5.52E+00
FE-59		6.33E-02	±	9.22E+00	1.51E+01
CO-60		-1.20E+00	±	3.76E+00	5.92E+00
ZN-65		-8.85E+00	±	1.14E+01	1.76E+01
ZRNB-95		-1.64E+00	±	4.27E+00	6.79E+00
I-131		-2.53E+00	±	5.53E+00	8.81E+00
CS-134		3.60E-02	±	4.47E+00	7.34E+00
CS-137		-1.52E+00	±	3.60E+00	5.65E+00
BALA140		-1.68E+00	±	6.68E+00	1.06E+01
BI-214	+	1.51E+02	±	1.72E+01	1.43E+01
RA-226		1.54E+01	±	7.96E+01	1.38E+02

Location 32 collected 6/2/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.49E+01	±	6.99E+01	8.97E+01
CR-51		-6.88E+00	±	3.89E+01	6.32E+01
MN-54		-8.38E-01	±	4.32E+00	6.95E+00
CO-58		-1.31E-02	±	3.85E+00	6.32E+00
FE-59		0.00E+00	±	2.00E+00	3.33E+00
CO-60		-4.86E-01	±	4.40E+00	7.13E+00
ZN-65		6.83E-01	±	7.02E+00	1.14E+01
ZRNB-95		-1.46E+00	±	5.12E+00	8.21E+00
I-131		2.55E+00	±	4.15E+00	6.49E+00
CS-134		9.65E-02	±	8.70E+00	1.43E+01
CS-137		-1.61E+00	±	5.03E+00	8.04E+00
BALA140		0.00E+00	±	6.26E+00	1.04E+01
BI-214	+	3.94E+02	±	2.71E+01	1.68E+01
RA-226		5.48E+01	±	1.20E+02	2.04E+02

Location 32 collected 9/6/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.90E+01	±	1.34E+02	9.09E+01
CR-51		-2.91E+01	±	3.97E+01	6.36E+01
MN-54		4.04E-01	±	4.06E+00	6.63E+00
CO-58		-1.85E+00	±	4.57E+00	7.33E+00
FE-59		-2.23E+00	±	1.02E+01	1.65E+01
CO-60		0.00E+00	±	4.71E+00	7.84E+00
ZN-65		3.90E+00	±	7.00E+00	1.09E+01
ZRNB-95		-3.88E+00	±	4.95E+00	7.78E+00
I-131		-2.53E+00	±	5.38E+00	8.68E+00
CS-134		-1.22E+00	±	1.67E+01	2.74E+01
CS-137		5.78E-01	±	2.82E+00	4.55E+00
BALA140		-1.69E+00	±	5.84E+00	9.34E+00
BI-214	+	5.00E+02	±	2.40E+01	1.43E+01
RA-226		3.77E+01	±	1.16E+02	1.96E+02

Location 32 collected 12/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.18E+01	±	8.47E+01	1.08E+02
CR-51		1.76E+00	±	4.41E+01	7.24E+01
MN-54		-2.98E+00	±	6.21E+00	9.85E+00
CO-58		-9.09E-03	±	5.06E+00	8.33E+00
FE-59		3.60E+00	±	1.08E+01	1.69E+01
CO-60		-1.21E-01	±	4.70E+00	7.70E+00
ZN-65		1.70E+00	±	5.95E+00	9.23E+00
ZRNB-95		-1.90E+00	±	8.52E+00	1.37E+01
I-131		-1.01E-01	±	4.69E+00	7.70E+00
CS-134		-1.07E+00	±	2.53E+01	4.15E+01
CS-137		-3.11E+00	±	6.34E+00	1.00E+01
BALA140		-2.79E+00	±	7.11E+00	1.12E+01
BI-214	+	6.11E+02	±	3.31E+01	1.83E+01
RA-226		-1.48E+02	±	6.29E+03	2.82E+02

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 52 - Ground Water Well #3

Results in pCi/liter

Location 52 collected 3/3/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.21E+01	±	7.77E+01	7.92E+01
CR-51		0.00E+00	±	3.08E+01	5.13E+01
MN-54		1.50E+00	±	2.70E+00	4.08E+00
CO-58		1.01E+00	±	2.22E+00	3.35E+00
FE-59		8.67E-01	±	6.28E+00	1.00E+01
CO-60		1.15E+00	±	2.65E+00	4.00E+00
ZN-65		9.87E-02	±	6.20E+00	1.02E+01
ZRNB-95		-6.81E-01	±	3.11E+00	4.97E+00
I-131		-1.37E+00	±	4.40E+00	7.03E+00
CS-134		1.54E-01	±	2.54E+00	4.14E+00
CS-137		2.15E-02	±	2.97E+00	4.87E+00
BALA140		1.47E+00	±	4.09E+00	6.20E+00
BI-214		-1.53E+00	±	8.11E+00	1.20E+01
RA-226		1.57E+01	±	6.37E+01	1.14E+02

Location 52 collected 6/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-4.11E+01	±	1.77E+02	9.14E+01
CR-51		9.13E+00	±	1.89E+01	2.92E+01
MN-54		-2.33E-02	±	3.32E+00	5.45E+00
CO-58		-3.69E-01	±	3.42E+00	5.54E+00
FE-59		-1.20E+00	±	8.35E+00	1.34E+01
CO-60		4.33E-03	±	3.74E+00	6.14E+00
ZN-65		-1.79E+00	±	8.32E+00	1.33E+01
ZRNB-95		1.47E-01	±	3.04E+00	4.96E+00
I-131		1.05E+00	±	3.11E+00	4.91E+00
CS-134		1.42E+00	±	3.10E+00	4.81E+00
CS-137		-3.89E-02	±	3.07E+00	5.04E+00
BALA140		-6.43E-01	±	4.19E+00	6.68E+00
BI-214		1.72E-01	±	7.12E+00	1.39E+01
RA-226		-5.51E+01	±	1.54E+02	1.40E+02

Location 52 collected 9/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-4.63E+01	±	1.25E+02	7.54E+01
CR-51		1.01E+01	±	2.43E+01	3.89E+01
MN-54		5.46E-02	±	2.65E+00	4.34E+00
CO-58		1.03E-01	±	1.98E+00	3.24E+00
FE-59		-1.83E+00	±	8.13E+00	1.30E+01
CO-60		8.77E-01	±	2.66E+00	4.18E+00
ZN-65		-1.61E-01	±	5.88E+00	9.64E+00
ZRNB-95		-4.92E-02	±	1.92E+00	3.14E+00
I-131		-1.34E+00	±	4.17E+00	6.70E+00
CS-134		1.84E+00	±	2.01E+00	2.96E+00
CS-137		0.00E+00	±	3.67E+00	6.11E+00
BALA140		1.96E+00	±	5.13E+00	8.02E+00
BI-214		5.99E-01	±	5.81E+00	1.09E+01
RA-226		9.64E+00	±	7.68E+01	1.35E+02

Location 52 collected 12/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.71E+01	±	8.87E+01	8.04E+01
CR-51		-1.98E+00	±	2.24E+01	3.64E+01
MN-54		-8.58E-02	±	3.01E+00	4.93E+00
CO-58		1.20E-01	±	2.58E+00	4.20E+00
FE-59		2.88E+00	±	7.42E+00	1.12E+01
CO-60		-1.06E+00	±	4.18E+00	6.62E+00
ZN-65		-4.00E+00	±	9.61E+00	1.50E+01
ZRNB-95		0.00E+00	±	2.81E+00	4.69E+00
I-131		9.49E-01	±	2.89E+00	4.57E+00
CS-134		-1.31E+00	±	3.11E+00	4.85E+00
CS-137		0.00E+00	±	2.70E+00	4.49E+00
BALA140		-7.25E-02	±	3.66E+00	5.99E+00
BI-214		4.60E+00	±	8.14E+00	1.55E+01
RA-226		1.71E+01	±	7.85E+01	1.44E+02

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	-1.14E+00	-4.46E+00	1.32E-01	1.05E+01	12	0
BALA140	Cntl	-4.03E-01	-3.96E+00	3.66E+00	1.01E+01	12	0
BI-214	Ind	3.33E-01	-6.44E+00	9.61E+00	9.58E+00	12	1
BI-214	Cntl	2.96E-01	-4.51E+00	5.54E+00	9.21E+00	12	0
CO-58	Ind	-1.30E-01	-1.06E+00	1.32E+00	3.59E+00	12	0
CO-58	Cntl	2.22E-01	-8.26E-01	1.67E+00	3.36E+00	12	0
CO-60	Ind	1.27E-02	-6.95E-01	5.24E-01	3.25E+00	12	0
CO-60	Cntl	1.51E-01	-1.73E-01	6.41E-01	3.38E+00	12	0
CR-51	Ind	-7.43E-01	-1.99E+01	2.16E+01	4.04E+01	12	0
CR-51	Cntl	-1.79E+00	-1.41E+01	1.86E+01	4.23E+01	12	0
CS-134	Ind	-8.99E-02	-1.28E+00	1.32E+00	3.39E+00	12	0
CS-134	Cntl	-1.69E-03	-7.01E-01	1.75E+00	3.36E+00	12	0
CS-137	Ind	1.04E-01	-7.79E-01	9.22E-01	3.12E+00	12	0
CS-137	Cntl	-8.09E-02	-1.29E+00	9.30E-01	3.20E+00	12	0
FE-59	Ind	-5.12E-02	-3.46E+00	2.77E+00	1.05E+01	12	0
FE-59	Cntl	-1.72E-01	-3.40E+00	3.31E+00	1.10E+01	12	0
I-131	Ind	1.03E+00	-2.59E+00	6.39E+00	1.25E+01	12	0
I-131	Cntl	8.63E-01	-5.09E+00	5.97E+00	1.23E+01	12	0
K-40	Ind	-2.61E+01	-5.00E+01	4.96E+00	5.48E+01	12	0
K-40	Cntl	-2.37E+01	-4.67E+01	7.29E+00	5.34E+01	12	0
MN-54	Ind	-5.18E-02	-8.56E-01	1.05E+00	3.56E+00	12	0
MN-54	Cntl	2.01E-01	-9.39E-01	1.63E+00	2.99E+00	12	0
RA-226	Ind	-9.58E+00	-3.73E+01	1.31E+01	9.24E+01	12	0
RA-226	Cntl	-1.57E+01	-4.94E+01	2.76E+01	8.93E+01	12	0
ZN-65	Ind	-8.83E-01	-3.13E+00	2.07E+00	7.47E+00	12	0
ZN-65	Cntl	-5.07E-01	-2.83E+00	1.78E+00	8.02E+00	12	0
ZRNB-95	Ind	5.55E-01	-6.50E-01	1.67E+00	4.39E+00	12	0
ZRNB-95	Cntl	1.48E-01	-2.13E+00	1.74E+00	4.42E+00	12	0

Ind = Indicator Stations Cntl = Control Stations

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	-2.07E+01	-5.32E+01	1.00E+01	5.35E+01	11	0
CR-51	Ind	-6.80E-01	-6.20E+00	1.39E+01	4.49E+01	11	0
MN-54	Ind	-9.13E-02	-1.02E+00	7.70E-01	3.24E+00	11	0
CO-58	Ind	2.62E-01	-4.70E-01	1.58E+00	3.41E+00	11	0
FE-59	Ind	1.17E-02	-2.17E+00	1.50E+00	9.73E+00	11	0
CO-60	Ind	2.30E-01	-6.13E-01	1.10E+00	3.14E+00	11	0
ZN-65	Ind	-9.05E-01	-4.34E+00	1.39E+00	7.91E+00	11	0
ZRNB-95	Ind	3.26E-01	-8.04E-01	1.62E+00	4.34E+00	11	0
I-131	Ind	2.60E-01	-4.72E+00	9.91E+00	1.51E+01	11	0
CS-134	Ind	9.48E-02	-1.26E+00	8.06E-01	3.37E+00	11	0
CS-137	Ind	1.55E-02	-4.94E-01	7.90E-01	3.65E+00	11	0
BALA140	Ind	-1.11E+00	-2.19E+00	1.33E+00	1.08E+01	11	0
BI-214	Ind	1.26E+00	-8.36E+00	1.09E+01	9.45E+00	11	1
RA-226	Ind	1.78E+00	-2.71E+01	2.70E+01	8.71E+01	11	0

GAMMA SPECTROMETRY RESULTS OF WATER - SUMMARY
GROUNDWATER

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-3.34E-01	-2.79E+00	1.96E+00	7.88E+00	12	0
BI-214	Ind	1.92E+02	-1.53E+00	6.11E+02	1.47E+01	12	8
CO-58	Ind	-2.78E-01	-2.36E+00	1.24E+00	5.55E+00	12	0
CO-60	Ind	-4.70E-02	-1.20E+00	1.15E+00	5.83E+00	12	0
CR-51	Ind	-2.42E+00	-2.91E+01	1.01E+01	5.07E+01	12	0
CS-134	Ind	-3.14E-01	-5.14E+00	1.84E+00	1.26E+01	12	0
CS-137	Ind	-7.95E-01	-3.74E+00	2.26E+00	6.26E+00	12	0
FE-59	Ind	2.61E-01	-2.23E+00	3.60E+00	1.45E+01	12	0
I-131	Ind	-1.40E-01	-2.53E+00	2.55E+00	6.73E+00	12	0
K-40	Ind	-3.13E+01	-6.63E+01	-1.97E+00	9.06E+01	12	0
MN-54	Ind	-3.29E-01	-2.98E+00	1.50E+00	5.81E+00	12	0
RA-226	Ind	3.76E-01	-1.48E+02	5.48E+01	1.67E+02	12	0
ZN-65	Ind	-1.10E+00	-1.43E+01	6.25E+00	1.19E+01	12	0
ZRNB-95	Ind	-2.30E-01	-3.88E+00	3.67E+00	6.39E+00	12	0

Ind = Indicator Stations Cntl = Control Stations

TABLE A-8.1

GAMMA SPECTROMETRY RESULTS OF SOIL

Results in pCi/kilogram

Location & Date		Station 1		5/17/2011	
Nuclide	RQ	Activity		Error	MDA
BE-7		1.74E+02	±	2.77E+02	4.29E+02
K-40	+	1.58E+04	±	1.24E+03	4.67E+02
CR-51		1.55E+01	±	3.43E+02	5.62E+02
MN-54		6.56E+00	±	2.78E+01	4.43E+01
CO-58		2.60E-01	±	2.83E+01	4.65E+01
FE-59		-2.89E+01	±	9.30E+01	1.47E+02
CO-60		-9.78E-01	±	3.40E+01	5.58E+01
ZN-65		1.92E+01	±	7.49E+01	1.20E+02
ZRNB-95		1.20E+00	±	2.99E+01	4.89E+01
CS-134		1.32E-01	±	2.53E+01	4.16E+01
CS-137	+	5.54E+01	±	3.59E+01	4.96E+01
BALA140		5.27E+00	±	3.55E+01	5.65E+01
BI-214	+	6.66E+02	±	1.04E+02	9.60E+01
RA-226		1.06E+03	±	9.48E+02	1.52E+03

Location & Date		Station 7		5/17/2011	
Nuclide	RQ	Activity		Error	MDA
BE-7		0.00E+00	±	2.84E+02	4.73E+02
K-40	+	1.56E+04	±	1.20E+03	4.51E+02
CR-51		1.03E+02	±	2.49E+02	3.96E+02
MN-54		-6.03E+00	±	2.99E+01	4.80E+01
CO-58		-9.02E+00	±	2.94E+01	4.66E+01
FE-59		-6.01E+00	±	7.09E+01	1.15E+02
CO-60		6.23E-01	±	3.25E+01	5.34E+01
ZN-65		3.76E+01	±	6.95E+01	1.07E+02
ZRNB-95		3.16E+01	±	2.71E+01	3.79E+01
CS-134		-2.73E+00	±	2.46E+01	4.00E+01
CS-137	+	5.73E+01	±	3.47E+01	4.77E+01
BALA140		-6.63E+00	±	4.55E+01	7.31E+01
BI-214	+	4.34E+02	±	8.58E+01	8.97E+01
RA-226		6.64E+02	±	8.73E+02	1.43E+03

Location & Date		Station 9a		5/17/2011	
Nuclide	RQ	Activity		Error	MDA
BE-7	+	5.41E+02	±	2.98E+02	3.95E+02
K-40	+	1.24E+04	±	1.19E+03	4.59E+02
CR-51		1.39E+02	±	2.33E+02	3.58E+02
MN-54		1.33E+01	±	3.53E+01	5.55E+01
CO-58		1.65E+01	±	2.85E+01	4.27E+01
FE-59		5.88E+00	±	7.47E+01	1.21E+02
CO-60		-1.66E+00	±	3.92E+01	6.41E+01
ZN-65		-4.62E+01	±	9.19E+01	1.43E+02
ZRNB-95		9.70E+00	±	2.92E+01	4.58E+01
CS-134		1.15E+01	±	2.78E+01	4.34E+01
CS-137		2.14E+01	±	3.70E+01	5.68E+01
BALA140		-2.28E+00	±	5.31E+01	8.66E+01
BI-214	+	4.54E+02	±	9.96E+01	1.06E+02
RA-226		1.19E+03	±	9.67E+02	1.55E+03

Location & Date		Station 21		5/17/2011	
Nuclide	RQ	Activity		Error	MDA
BE-7		2.38E+02	±	2.15E+02	3.14E+02
K-40	+	1.56E+04	±	1.11E+03	3.58E+02
CR-51		-4.83E+01	±	1.97E+02	3.16E+02
MN-54		2.31E-01	±	2.25E+01	3.70E+01
CO-58		-8.20E+00	±	2.65E+01	4.20E+01
FE-59		4.25E+01	±	7.34E+01	1.11E+02
CO-60		3.35E-01	±	2.83E+01	4.64E+01
ZN-65		-3.57E+01	±	7.68E+01	1.21E+02
ZRNB-95		-1.21E+01	±	3.26E+01	5.19E+01
CS-134		-2.10E+00	±	2.93E+01	4.79E+01
CS-137		2.47E+01	±	2.76E+01	4.10E+01
BALA140		1.37E+00	±	3.63E+01	5.92E+01
BI-214	+	3.34E+02	±	8.15E+01	9.99E+01
RA-226		1.04E+03	±	8.11E+02	1.29E+03

Location & Date		Station 23		5/17/2011	
Nuclide	RQ	Activity		Error	MDA
BE-7		3.55E+01	±	2.41E+02	3.91E+02
K-40	+	1.54E+04	±	1.18E+03	3.99E+02
CR-51		1.24E+02	±	2.57E+02	4.07E+02
MN-54		-1.39E+00	±	3.06E+01	5.01E+01
CO-58		1.43E-01	±	2.52E+01	4.14E+01
FE-59		1.85E+01	±	8.05E+01	1.28E+02
CO-60		-1.45E+01	±	3.91E+01	6.17E+01
ZN-65		5.36E-01	±	7.13E+01	1.17E+02
ZRNB-95		-2.53E+00	±	2.87E+01	4.66E+01
CS-134		1.11E+01	±	2.68E+01	4.22E+01
CS-137	+	8.68E+01	±	3.41E+01	3.24E+01
BALA140		-9.43E+00	±	4.51E+01	7.15E+01
BI-214	+	4.48E+02	±	8.79E+01	9.21E+01
RA-226		1.27E+03	±	8.64E+02	1.37E+03

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	-2.35E+00	-9.43E+00	5.27E+00	6.51E+01	4	0
BALA140	Cntl	-2.28E+00	-2.28E+00	-2.28E+00	8.66E+01	1	0
BE-7	Ind	1.12E+02	0.00E+00	2.38E+02	4.02E+02	4	0
BE-7	Cntl	5.41E+02	5.41E+02	5.41E+02	3.95E+02	1	1
BI-214	Ind	4.70E+02	3.34E+02	6.66E+02	9.44E+01	4	4
BI-214	Cntl	4.54E+02	4.54E+02	4.54E+02	1.06E+02	1	1
CO-58	Ind	-4.20E+00	-9.02E+00	2.60E-01	4.41E+01	4	0
CO-58	Cntl	1.65E+01	1.65E+01	1.65E+01	4.27E+01	1	0
CO-60	Ind	-3.62E+00	-1.45E+01	6.23E-01	5.43E+01	4	0
CO-60	Cntl	-1.66E+00	-1.66E+00	-1.66E+00	6.41E+01	1	0
CR-51	Ind	4.86E+01	-4.83E+01	1.24E+02	4.21E+02	4	0
CR-51	Cntl	1.39E+02	1.39E+02	1.39E+02	3.58E+02	1	0
CS-134	Ind	1.61E+00	-2.73E+00	1.11E+01	4.29E+01	4	0
CS-134	Cntl	1.15E+01	1.15E+01	1.15E+01	4.34E+01	1	0
CS-137	Ind	5.61E+01	2.47E+01	8.68E+01	4.27E+01	4	3
CS-137	Cntl	2.14E+01	2.14E+01	2.14E+01	5.68E+01	1	0
FE-59	Ind	6.51E+00	-2.89E+01	4.25E+01	1.25E+02	4	0
FE-59	Cntl	5.88E+00	5.88E+00	5.88E+00	1.21E+02	1	0
K-40	Ind	1.56E+04	1.54E+04	1.58E+04	4.19E+02	4	4
K-40	Cntl	1.24E+04	1.24E+04	1.24E+04	4.59E+02	1	1
MN-54	Ind	-1.59E-01	-6.03E+00	6.56E+00	4.48E+01	4	0
MN-54	Cntl	1.33E+01	1.33E+01	1.33E+01	5.55E+01	1	0
RA-226	Ind	1.01E+03	6.64E+02	1.27E+03	1.40E+03	4	0
RA-226	Cntl	1.19E+03	1.19E+03	1.19E+03	1.55E+03	1	0
ZN-65	Ind	5.42E+00	-3.57E+01	3.76E+01	1.16E+02	4	0
ZN-65	Cntl	-4.62E+01	-4.62E+01	-4.62E+01	1.43E+02	1	0
ZRNB-95	Ind	4.55E+00	-1.21E+01	3.16E+01	4.63E+01	4	0
ZRNB-95	Cntl	9.70E+00	9.70E+00	9.70E+00	4.58E+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		4/22/2011		Location & Date		Station 33		10/17/2011	
Nuclide	RQ	Activity	±	Error	MDA	Nuclide	RQ	Activity	±	Error	MDA
BE-7		-3.84E+01	±	3.14E+02	5.10E+02	BE-7		8.00E+01	±	2.29E+02	3.64E+02
K-40	+	1.77E+04	±	1.45E+03	5.73E+02	K-40	+	1.44E+04	±	1.05E+03	3.55E+02
CR-51		6.68E+01	±	4.83E+02	7.87E+02	CR-51		-1.92E+00	±	2.30E+02	3.79E+02
MN-54		-2.57E+00	±	3.86E+01	6.29E+01	MN-54		-7.90E+00	±	2.76E+01	4.41E+01
CO-58		-5.96E+00	±	3.98E+01	6.43E+01	CO-58		5.30E+00	±	2.62E+01	4.22E+01
FE-59		2.50E+00	±	9.68E+01	1.59E+02	FE-59		3.11E+01	±	7.07E+01	1.09E+02
CO-60		5.97E+00	±	4.08E+01	6.58E+01	CO-60		4.59E+00	±	3.10E+01	5.02E+01
ZN-65		4.98E+01	±	5.43E+01	7.23E+01	ZN-65		1.18E+01	±	3.71E+01	5.91E+01
ZRNB-95		-6.03E-01	±	4.87E+01	7.99E+01	ZRNB-95		3.14E+01	±	2.80E+01	4.05E+01
CS-134		2.12E+00	±	3.82E+01	6.25E+01	CS-134		1.88E+01	±	2.23E+01	3.35E+01
CS-137	+	9.59E+01	±	5.03E+01	6.87E+01	CS-137	+	7.25E+01	±	3.55E+01	4.85E+01
BALA140		0.00E+00	±	2.57E+01	4.28E+01	BALA140		-5.50E+00	±	3.91E+01	6.27E+01
BI-214	+	6.62E+02	±	1.26E+02	1.38E+02	BI-214	+	6.67E+02	±	1.14E+02	9.77E+01
RA-226		1.07E+03	±	1.15E+03	1.87E+03	RA-226		4.76E+02	±	8.24E+02	1.35E+03

Station 34 Downstream Indicator

Location & Date		Station 34		5/5/2011		Location & Date		Station 34		10/17/2011	
Nuclide	RQ	Activity	±	Error	MDA	Nuclide	RQ	Activity	±	Error	MDA
BE-7		1.03E+02	±	2.64E+02	4.16E+02	BE-7		9.98E+01	±	2.16E+02	3.39E+02
K-40	+	1.67E+04	±	1.40E+03	5.42E+02	K-40	+	1.41E+04	±	1.04E+03	3.15E+02
CR-51		-1.35E+02	±	3.48E+02	5.56E+02	CR-51		-4.27E+01	±	2.61E+02	4.25E+02
MN-54		1.77E+01	±	3.45E+01	5.32E+01	MN-54		1.11E+01	±	2.82E+01	4.45E+01
CO-58		1.20E-01	±	3.50E+01	5.75E+01	CO-58		-3.48E+00	±	2.56E+01	4.15E+01
FE-59		-1.51E+01	±	1.01E+02	1.63E+02	FE-59		-2.68E+01	±	9.72E+01	1.55E+02
CO-60		0.00E+00	±	4.79E+01	7.98E+01	CO-60		1.16E+01	±	3.09E+01	4.87E+01
ZN-65		4.82E+01	±	7.11E+01	1.05E+02	ZN-65		7.65E+00	±	3.87E+01	6.14E+01
ZRNB-95		1.22E+01	±	3.76E+01	5.95E+01	ZRNB-95		-1.40E+01	±	3.67E+01	5.84E+01
CS-134		1.32E+00	±	2.42E+01	3.95E+01	CS-134		4.12E+00	±	5.23E+01	8.57E+01
CS-137	+	1.22E+02	±	5.05E+01	6.46E+01	CS-137	+	1.06E+02	±	4.25E+01	4.62E+01
BALA140		1.12E+01	±	4.42E+01	6.87E+01	BALA140		-1.12E+01	±	4.99E+01	7.94E+01
BI-214	+	5.51E+02	±	1.13E+02	1.22E+02	BI-214	+	8.35E+02	±	1.01E+02	8.10E+01
RA-226	+	1.73E+03	±	1.01E+03	1.58E+03	RA-226		1.35E+03	±	8.74E+02	1.38E+03

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

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	3.51E-02	-1.12E+01	1.12E+01	7.41E+01	2	0
BALA140	Cntl	-2.75E+00	-5.50E+00	0.00E+00	5.27E+01	2	0
BE-7	Ind	1.01E+02	9.98E+01	1.03E+02	3.78E+02	2	0
BE-7	Cntl	2.08E+01	-3.84E+01	8.00E+01	4.37E+02	2	0
BI-214	Ind	6.93E+02	5.51E+02	8.35E+02	1.01E+02	2	2
BI-214	Cntl	6.65E+02	6.62E+02	6.67E+02	1.18E+02	2	2
CO-58	Ind	-1.68E+00	-3.48E+00	1.20E-01	4.95E+01	2	0
CO-58	Cntl	-3.31E-01	-5.96E+00	5.30E+00	5.32E+01	2	0
CO-60	Ind	5.82E+00	0.00E+00	1.16E+01	6.42E+01	2	0
CO-60	Cntl	5.28E+00	4.59E+00	5.97E+00	5.80E+01	2	0
CR-51	Ind	-8.91E+01	-1.35E+02	-4.27E+01	4.90E+02	2	0
CR-51	Cntl	3.24E+01	-1.92E+00	6.68E+01	5.83E+02	2	0
CS-134	Ind	2.72E+00	1.32E+00	4.12E+00	6.26E+01	2	0
CS-134	Cntl	1.05E+01	2.12E+00	1.88E+01	4.80E+01	2	0
CS-137	Ind	1.14E+02	1.06E+02	1.22E+02	5.54E+01	2	2
CS-137	Cntl	8.42E+01	7.25E+01	9.59E+01	5.86E+01	2	2
FE-59	Ind	-2.10E+01	-2.68E+01	-1.51E+01	1.59E+02	2	0
FE-59	Cntl	1.68E+01	2.50E+00	3.11E+01	1.34E+02	2	0
K-40	Ind	1.54E+04	1.41E+04	1.67E+04	4.29E+02	2	2
K-40	Cntl	1.60E+04	1.44E+04	1.77E+04	4.64E+02	2	2
MN-54	Ind	1.44E+01	1.11E+01	1.77E+01	4.89E+01	2	0
MN-54	Cntl	-5.23E+00	-7.90E+00	-2.57E+00	5.35E+01	2	0
RA-226	Ind	1.54E+03	1.35E+03	1.73E+03	1.48E+03	2	1
RA-226	Cntl	7.71E+02	4.76E+02	1.07E+03	1.61E+03	2	0
ZN-65	Ind	2.79E+01	7.65E+00	4.82E+01	8.33E+01	2	0
ZN-65	Cntl	3.08E+01	1.18E+01	4.98E+01	6.57E+01	2	0
ZRNB-95	Ind	-8.61E-01	-1.40E+01	1.22E+01	5.90E+01	2	0
ZRNB-95	Cntl	1.54E+01	-6.03E-01	3.14E+01	6.02E+01	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
Steelhead	10/10/11	K-40	+	3.12E+03	±	4.45E+02	3.06E+02
Station 30		MN-54		-4.90E+00	±	1.32E+01	2.04E+01
Indicator		CO-58		-7.99E+00	±	2.15E+01	3.36E+01
		FE-59		-1.48E+01	±	6.56E+01	1.04E+02
		CO-60		1.47E+00	±	1.62E+01	2.63E+01
		ZN-65		0.00E+00	±	6.98E+01	1.16E+02
		ZRNB-95		0.00E+00	±	3.14E+01	5.24E+01
		CS-134		-5.43E-01	±	1.23E+01	2.02E+01
		CS-137		3.98E+00	±	1.20E+01	1.86E+01
		Bi-214		4.48E+01	±	3.33E+01	5.66E+01
Sucker	10/20/11	K-40	+	2.66E+03	±	3.99E+02	2.86E+02
Station 30		MN-54		0.00E+00	±	1.67E+01	2.78E+01
Indicator		CO-58		0.00E+00	±	2.05E+01	3.41E+01
		FE-59		-4.22E-01	±	5.42E+01	8.90E+01
		CO-60		6.56E+00	±	1.62E+01	2.49E+01
		ZN-65		-1.15E+00	±	3.36E+01	5.50E+01
		ZRNB-95		-1.21E+01	±	3.89E+01	6.15E+01
		CS-134		0.00E+00	±	2.64E+01	4.41E+01
		CS-137		-1.32E-02	±	1.37E+01	2.25E+01
		Bi-214		-3.65E+01	±	9.24E+01	7.08E+01
White Fish	12/02/11	K-40	+	2.92E+03	±	3.27E+02	2.26E+02
Station 30		MN-54		-1.45E+00	±	1.02E+01	1.65E+01
Indicator		CO-58		1.95E-01	±	1.14E+01	1.87E+01
		FE-59		-1.29E+01	±	4.84E+01	7.66E+01
		CO-60		-1.77E+00	±	1.29E+01	2.09E+01
		ZN-65		-4.45E-01	±	3.34E+01	5.48E+01
		ZRNB-95		-3.48E+00	±	2.34E+01	3.77E+01
		CS-134		-2.18E+00	±	1.09E+01	1.76E+01
		CS-137		3.91E-01	±	1.21E+01	1.98E+01
		Bi-214		6.61E-01	±	2.49E+01	4.98E+01
Steelhead	10/10/11	K-40	+	3.28E+03	±	4.38E+02	2.71E+02
Station 38		MN-54		2.27E+00	±	9.87E+00	1.54E+01
Control		CO-58		-2.15E-01	±	1.63E+01	2.68E+01
		FE-59		-1.40E+01	±	6.61E+01	1.05E+02
		CO-60		-6.37E+00	±	1.63E+01	2.52E+01
		ZN-65		-6.51E+00	±	3.79E+01	6.09E+01
		ZRNB-95		-1.25E+01	±	3.75E+01	5.89E+01
		CS-134		-6.97E+00	±	1.61E+01	2.53E+01
		CS-137		-1.29E+00	±	1.46E+01	2.38E+01
		Bi-214		-7.35E+00	±	4.14E+01	6.24E+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	3.01E+00	-3.65E+01	4.48E+01	5.90E+01	3	0
Bi-214	Cntl	-7.35E+00	-7.35E+00	-7.35E+00	6.24E+01	1	0
CO-58	Ind	-2.60E+00	-7.99E+00	1.95E-01	2.88E+01	3	0
CO-58	Cntl	-2.15E-01	-2.15E-01	-2.15E-01	2.68E+01	1	0
CO-60	Ind	2.09E+00	-1.77E+00	6.56E+00	2.41E+01	3	0
CO-60	Cntl	-6.37E+00	-6.37E+00	-6.37E+00	2.52E+01	1	0
CS-134	Ind	-9.09E-01	-2.18E+00	0.00E+00	2.73E+01	3	0
CS-134	Cntl	-6.97E+00	-6.97E+00	-6.97E+00	2.53E+01	1	0
CS-137	Ind	1.45E+00	-1.32E-02	3.98E+00	2.03E+01	3	0
CS-137	Cntl	-1.29E+00	-1.29E+00	-1.29E+00	2.38E+01	1	0
FE-59	Ind	-9.38E+00	-1.48E+01	-4.22E-01	8.97E+01	3	0
FE-59	Cntl	-1.40E+01	-1.40E+01	-1.40E+01	1.05E+02	1	0
K-40	Ind	2.90E+03	2.66E+03	3.12E+03	2.72E+02	3	3
K-40	Cntl	3.28E+03	3.28E+03	3.28E+03	2.71E+02	1	1
MN-54	Ind	-2.12E+00	-4.90E+00	0.00E+00	2.16E+01	3	0
MN-54	Cntl	2.27E+00	2.27E+00	2.27E+00	1.54E+01	1	0
ZN-65	Ind	-5.33E-01	-1.15E+00	0.00E+00	7.54E+01	3	0
ZN-65	Cntl	-6.51E+00	-6.51E+00	-6.51E+00	6.09E+01	1	0
ZRNB-95	Ind	-5.18E+00	-1.21E+01	0.00E+00	5.05E+01	3	0
ZRNB-95	Cntl	-1.25E+01	-1.25E+01	-1.25E+01	5.89E+01	1	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
01/11/11		9.12E-02 ±	2.08E-01	3.36E-01		7.85E-02 ±	1.93E-01	3.12E-01
02/08/11		3.30E-02 ±	2.15E-01	3.52E-01		-2.04E-04 ±	1.97E-01	3.20E-01
03/08/11		-5.90E-02 ±	2.17E-01	3.53E-01		-5.58E-02 ±	2.09E-01	3.40E-01
04/05/11		6.52E-02 ±	1.80E-01	2.92E-01		2.87E-01 ±	2.00E-01	3.14E-01
04/26/11		1.31E-01 ±	1.74E-01	2.79E-01		2.32E-03 ±	1.51E-01	2.48E-01
05/10/11		-5.72E-02 ±	2.26E-01	3.68E-01		5.18E-03 ±	1.95E-01	3.20E-01
05/24/11		-1.44E-02 ±	2.18E-01	3.58E-01		-9.63E-02 ±	2.01E-01	3.25E-01
06/07/11		1.95E-02 ±	2.15E-01	3.52E-01		-3.00E-03 ±	1.93E-01	3.17E-01
06/21/11		-7.53E-02 ±	2.21E-01	3.59E-01		1.21E-02 ±	2.17E-01	3.56E-01
07/12/11		4.36E-03 ±	2.29E-01	3.76E-01		-1.41E-03 ±	2.07E-01	3.40E-01
07/26/11		5.80E-02 ±	1.97E-01	3.20E-01		-1.21E-01 ±	2.21E-01	3.57E-01
08/09/11		9.63E-03 ±	2.27E-01	3.72E-01		5.63E-03 ±	2.20E-01	3.62E-01
08/23/11		-5.37E-03 ±	2.12E-01	3.47E-01		3.54E-03 ±	1.89E-01	3.10E-01
09/06/11		-3.04E-02 ±	2.33E-01	3.82E-01		1.35E-01 ±	2.06E-01	3.31E-01
09/20/11		-9.18E-02 ±	2.01E-01	3.26E-01		-1.51E-01 ±	2.24E-01	3.60E-01
10/11/11		3.28E-02 ±	1.71E-01	2.79E-01		0.00E+00 ±	1.85E-01	3.08E-01
11/08/11		4.27E-03 ±	2.16E-01	3.55E-01		-2.22E-02 ±	1.78E-01	2.92E-01
12/06/11		4.55E-02 ±	1.70E-01	2.77E-01		-9.13E-02 ±	2.06E-01	3.34E-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	-7.36E-04	-1.51E-01	2.87E-01	3.25E-01	18	0
Control - St 9b	8.96E-03	-9.18E-02	1.31E-01	3.38E-01	18	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 9b - CONTROL

Results in pCi per liter

Collection Date: 1/11/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		2.33E-02	±	3.72E+00	6.11E+00
CO-60		4.21E-01	±	3.42E+00	5.54E+00
ZN-65		8.58E-01	±	6.58E+00	1.07E+01
MN-54		1.50E+00	±	2.77E+00	4.30E+00
CS-134		-1.28E+00	±	2.72E+00	4.29E+00
CS-137		3.84E-01	±	2.75E+00	4.45E+00
BALA140		3.19E-01	±	3.68E+00	5.98E+00
K-40	+	1.42E+03	±	1.17E+02	7.42E+01
FE-59		-3.89E+00	±	9.83E+00	1.56E+01
RA-226		9.33E+00	±	8.11E+01	1.42E+02
ZRNB-95		2.80E+00	±	3.00E+00	4.50E+00
BE-7		0.00E+00	±	2.38E+01	3.96E+01

Collection Date: 2/8/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		3.32E-01	±	2.91E+00	4.72E+00
CO-60		8.32E-01	±	3.61E+00	5.76E+00
ZN-65		3.38E+00	±	6.90E+00	1.06E+01
MN-54		0.00E+00	±	4.34E+00	7.24E+00
CS-134		-7.86E-01	±	3.25E+00	5.23E+00
CS-137		-6.00E-01	±	3.07E+00	4.93E+00
BALA140		0.00E+00	±	1.04E+00	1.73E+00
K-40	+	1.45E+03	±	1.31E+02	7.57E+01
FE-59		-8.19E-01	±	9.07E+00	1.47E+01
RA-226		-4.69E+01	±	1.67E+02	1.22E+02
ZRNB-95		1.21E+00	±	3.09E+00	4.85E+00
BE-7		-6.26E+00	±	2.39E+01	3.81E+01

Collection Date: 3/8/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.01E+00	±	3.22E+00	5.12E+00
CO-60		3.39E-02	±	3.72E+00	6.11E+00
ZN-65		-3.36E+00	±	9.39E+00	1.49E+01
MN-54		6.75E-01	±	2.77E+00	4.39E+00
CS-134		2.88E-01	±	3.18E+00	5.19E+00
CS-137		-3.28E-01	±	3.03E+00	4.92E+00
BALA140		1.06E+00	±	2.96E+00	4.40E+00
K-40	+	1.53E+03	±	1.32E+02	7.17E+01
FE-59		-1.14E+00	±	8.39E+00	1.35E+01
RA-226		1.22E+01	±	6.71E+01	1.19E+02
ZRNB-95		0.00E+00	±	2.25E+00	3.75E+00
BE-7		1.31E+01	±	2.26E+01	3.47E+01

Collection Date: 4/5/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		3.95E+00	±	4.24E+00	6.33E+00
CO-60		4.43E-01	±	4.12E+00	6.68E+00
ZN-65		-1.45E+00	±	8.81E+00	1.42E+01
MN-54		0.00E+00	±	2.58E+00	4.29E+00
CS-134		5.88E-02	±	3.32E+00	5.44E+00
CS-137		0.00E+00	±	4.54E+00	7.57E+00
BALA140		0.00E+00	±	8.01E+00	1.34E+01
K-40	+	1.41E+03	±	1.45E+02	8.47E+01
FE-59		6.34E-01	±	1.01E+01	1.64E+01
RA-226		-3.45E+01	±	1.37E+02	1.59E+02
ZRNB-95		0.00E+00	±	3.28E+00	5.47E+00
BE-7		1.00E+01	±	2.65E+01	4.16E+01

Collection Date: 4/26/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		1.04E+00	±	3.22E+00	5.13E+00
CO-60		1.95E+00	±	4.05E+00	6.27E+00
ZN-65		-1.24E+00	±	6.80E+00	1.09E+01
MN-54		6.34E-01	±	2.84E+00	4.52E+00
CS-134		-1.10E+00	±	3.26E+00	5.19E+00
CS-137		4.13E-01	±	2.93E+00	4.72E+00
BALA140		0.00E+00	±	9.89E-01	1.65E+00
K-40	+	1.41E+03	±	1.25E+02	6.79E+01
FE-59		8.84E-02	±	8.28E+00	1.36E+01
RA-226		1.81E+01	±	7.35E+01	1.28E+02
ZRNB-95		1.73E+00	±	3.03E+00	4.63E+00
BE-7		2.50E+00	±	2.46E+01	4.01E+01

Collection Date: 5/10/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		1.12E-01	±	3.15E+00	5.16E+00
CO-60		-2.12E-02	±	4.11E+00	6.75E+00
ZN-65		7.55E-01	±	7.20E+00	1.16E+01
MN-54		-5.74E-01	±	2.92E+00	4.65E+00
CS-134		1.03E-01	±	2.55E+00	4.16E+00
CS-137		9.74E-01	±	4.49E+00	7.21E+00
BALA140		0.00E+00	±	4.64E+00	7.73E+00
K-40	+	1.32E+03	±	1.36E+02	7.79E+01
FE-59		-4.93E-01	±	9.69E+00	1.58E+01
RA-226		-1.19E+01	±	9.38E+01	1.48E+02
ZRNB-95		-4.08E-01	±	3.64E+00	5.90E+00
BE-7		1.86E+01	±	2.54E+01	3.80E+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: 5/24/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		1.38E+00	±	3.83E+00	6.07E+00
CO-60		1.37E+00	±	4.04E+00	6.31E+00
ZN-65		-2.80E+00	±	9.16E+00	1.45E+01
MN-54		3.46E-02	±	3.31E+00	5.43E+00
CS-134		1.06E+00	±	3.32E+00	5.26E+00
CS-137		-1.61E+00	±	4.92E+00	7.83E+00
BALA140		0.00E+00	±	6.56E+00	1.09E+01
K-40	+	1.43E+03	±	1.43E+02	8.12E+01
FE-59		2.57E-01	±	9.33E+00	1.53E+01
RA-226		-2.66E+01	±	1.11E+02	1.46E+02
ZRNB-95		5.52E-01	±	3.45E+00	5.55E+00
BE-7		2.71E+00	±	2.69E+01	4.38E+01

Collection Date: 6/7/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-6.87E-01	±	3.74E+00	6.02E+00
CO-60		0.00E+00	±	5.54E+00	9.23E+00
ZN-65		-1.67E+00	±	8.38E+00	1.34E+01
MN-54		2.32E+00	±	3.32E+00	4.91E+00
CS-134		-1.08E+00	±	3.69E+00	5.88E+00
CS-137		-1.67E+00	±	4.46E+00	7.04E+00
BALA140		0.00E+00	±	4.65E+00	7.75E+00
K-40	+	1.61E+03	±	1.48E+02	7.29E+01
FE-59		2.23E+00	±	7.81E+00	1.21E+01
RA-226		-4.24E+01	±	1.26E+02	1.38E+02
ZRNB-95		-4.57E-01	±	3.78E+00	6.12E+00
BE-7		6.04E+00	±	2.68E+01	4.29E+01

Collection Date: 6/21/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.35E+00	±	3.90E+00	6.19E+00
CO-60		0.00E+00	±	4.77E+00	7.94E+00
ZN-65		-1.18E+00	±	9.55E+00	1.55E+01
MN-54		9.71E-01	±	3.28E+00	5.16E+00
CS-134		-2.47E+00	±	4.43E+00	6.93E+00
CS-137		1.80E+00	±	3.39E+00	5.17E+00
BALA140		-2.12E-01	±	4.01E+00	6.52E+00
K-40	+	1.53E+03	±	1.48E+02	7.95E+01
FE-59		3.07E-01	±	9.77E+00	1.60E+01
RA-226		-2.51E+01	±	1.08E+02	1.45E+02
ZRNB-95		-2.41E-01	±	4.02E+00	6.56E+00
BE-7		1.12E-01	±	2.36E+01	3.88E+01

Collection Date: 7/12/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		1.33E-01	±	3.41E+00	5.58E+00
CO-60		1.45E+00	±	4.01E+00	6.23E+00
ZN-65		1.28E+00	±	8.42E+00	1.36E+01
MN-54		5.59E-02	±	3.33E+00	5.45E+00
CS-134		3.07E+00	±	3.87E+00	5.86E+00
CS-137		0.00E+00	±	5.09E+00	8.49E+00
BALA140		0.00E+00	±	4.89E+00	8.15E+00
K-40	+	1.54E+03	±	1.48E+02	7.90E+01
FE-59		4.94E-01	±	1.09E+01	1.78E+01
RA-226		-1.63E+01	±	9.07E+01	1.38E+02
ZRNB-95		-4.83E-01	±	3.73E+00	6.04E+00
BE-7		5.48E+00	±	2.14E+01	3.39E+01

Collection Date: 7/26/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.08E+00	±	4.45E+00	7.16E+00
CO-60		7.29E-01	±	4.71E+00	7.59E+00
ZN-65		1.76E+00	±	8.79E+00	1.41E+01
MN-54		4.54E-01	±	3.50E+00	5.66E+00
CS-134		-4.83E-01	±	3.59E+00	5.82E+00
CS-137		-7.22E-01	±	4.23E+00	6.83E+00
BALA140		-1.02E-01	±	3.37E+00	5.50E+00
K-40	+	1.53E+03	±	1.44E+02	7.17E+01
FE-59		1.11E+00	±	1.00E+01	1.62E+01
RA-226		-1.50E+01	±	9.85E+01	1.49E+02
ZRNB-95		5.30E-01	±	3.47E+00	5.59E+00
BE-7		-1.96E+00	±	2.56E+01	4.17E+01

Collection Date: 8/9/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.04E+00	±	4.69E+00	7.57E+00
CO-60		0.00E+00	±	6.31E+00	1.05E+01
ZN-65		2.31E+00	±	9.11E+00	1.45E+01
MN-54		2.46E-01	±	3.36E+00	5.47E+00
CS-134		0.00E+00	±	5.34E+00	8.90E+00
CS-137		-1.94E-01	±	3.46E+00	5.65E+00
BALA140		-1.21E+00	±	4.87E+00	7.68E+00
K-40	+	1.51E+03	±	1.47E+02	7.90E+01
FE-59		6.17E-01	±	1.02E+01	1.66E+01
RA-226		1.78E+01	±	7.75E+01	1.42E+02
ZRNB-95		4.41E-01	±	3.39E+00	5.47E+00
BE-7		-5.13E-01	±	2.42E+01	3.97E+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: 8/23/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		2.22E-01	±	3.51E+00	5.72E+00
CO-60		1.61E+00	±	4.29E+00	6.69E+00
ZN-65		-5.59E-01	±	7.29E+00	1.18E+01
MN-54		-1.23E+00	±	3.68E+00	5.79E+00
CS-134		-2.07E+00	±	4.04E+00	6.32E+00
CS-137		1.36E+00	±	3.46E+00	5.40E+00
BALA140		4.02E-02	±	3.69E+00	6.06E+00
K-40	+	1.53E+03	±	1.44E+02	7.20E+01
FE-59		3.51E+00	±	9.86E+00	1.53E+01
RA-226		7.52E+00	±	8.73E+01	1.57E+02
ZRNB-95		-8.94E-01	±	4.03E+00	6.47E+00
BE-7		-5.24E+00	±	2.73E+01	4.40E+01

Collection Date: 9/6/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		1.66E+00	±	3.57E+00	5.56E+00
CO-60		8.27E-01	±	3.24E+00	5.07E+00
ZN-65		0.00E+00	±	1.35E+01	2.24E+01
MN-54		3.56E-01	±	2.45E+00	3.92E+00
CS-134		-6.61E-02	±	3.15E+00	5.16E+00
CS-137		-1.20E+00	±	3.99E+00	6.33E+00
BALA140		-1.06E+00	±	4.47E+00	7.03E+00
K-40	+	1.50E+03	±	1.46E+02	7.93E+01
FE-59		2.16E+00	±	1.07E+01	1.71E+01
RA-226		-3.53E+00	±	8.12E+01	1.44E+02
ZRNB-95		5.21E-02	±	3.69E+00	6.06E+00
BE-7		1.24E+01	±	2.91E+01	4.56E+01

Collection Date: 9/20/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.33E+00	±	4.00E+00	6.41E+00
CO-60		1.52E+00	±	3.48E+00	5.37E+00
ZN-65		3.26E-01	±	5.94E+00	9.68E+00
MN-54		-1.79E+00	±	3.69E+00	5.77E+00
CS-134		1.25E+00	±	3.06E+00	4.83E+00
CS-137		1.24E-01	±	3.11E+00	5.10E+00
BALA140		0.00E+00	±	4.05E+00	6.76E+00
K-40	+	1.52E+03	±	1.36E+02	8.12E+01
FE-59		-1.00E+00	±	8.39E+00	1.36E+01
RA-226		-7.14E+00	±	7.48E+01	1.18E+02
ZRNB-95		-2.25E-01	±	2.91E+00	4.73E+00
BE-7		7.77E+00	±	2.33E+01	3.70E+01

Collection Date: 10/11/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-7.93E-01	±	3.33E+00	5.36E+00
CO-60		8.29E-02	±	3.99E+00	6.54E+00
ZN-65		0.00E+00	±	1.08E+01	1.81E+01
MN-54		9.78E-01	±	2.61E+00	4.07E+00
CS-134		1.29E+00	±	2.49E+00	3.85E+00
CS-137		-1.24E+00	±	3.39E+00	5.36E+00
BALA140		-5.47E-01	±	3.80E+00	6.10E+00
K-40	+	1.46E+03	±	1.28E+02	7.58E+01
FE-59		7.51E-02	±	7.60E+00	1.25E+01
RA-226		-1.89E+01	±	8.74E+01	1.12E+02
ZRNB-95		4.82E-01	±	3.07E+00	4.96E+00
BE-7		3.56E+00	±	2.17E+01	3.50E+01

Collection Date: 11/8/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		2.12E+00	±	3.39E+00	5.16E+00
CO-60		8.15E-02	±	4.92E+00	8.07E+00
ZN-65		-3.24E+00	±	9.73E+00	1.54E+01
MN-54		6.57E-01	±	3.03E+00	4.82E+00
CS-134		-6.33E-02	±	2.74E+00	4.50E+00
CS-137		-1.35E+00	±	4.17E+00	6.61E+00
BALA140		-1.87E-01	±	4.56E+00	7.45E+00
K-40	+	1.54E+03	±	1.42E+02	6.56E+01
FE-59		9.68E-01	±	9.80E+00	1.59E+01
RA-226		-2.82E+01	±	1.23E+02	1.58E+02
ZRNB-95		1.58E+00	±	5.74E+00	9.07E+00
BE-7		-6.04E+00	±	2.73E+01	4.38E+01

Collection Date: 12/6/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		2.56E+00	±	3.04E+00	4.55E+00
CO-60		-1.35E+00	±	4.38E+00	6.96E+00
ZN-65		6.61E-01	±	7.26E+00	1.18E+01
MN-54		2.99E-01	±	3.04E+00	4.93E+00
CS-134		-8.50E-01	±	2.94E+00	4.69E+00
CS-137		2.03E+00	±	3.39E+00	5.19E+00
BALA140		0.00E+00	±	9.32E-01	1.55E+00
K-40	+	1.47E+03	±	1.32E+02	7.72E+01
FE-59		2.80E+00	±	7.13E+00	1.09E+01
RA-226		-4.56E+00	±	7.92E+01	1.29E+02
ZRNB-95		2.00E+00	±	4.40E+00	6.74E+00
BE-7		0.00E+00	±	2.14E+01	3.57E+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: 1/11/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		1.85E+00	±	3.56E+00	5.66E+00
CO-60		-4.02E-01	±	3.68E+00	5.98E+00
ZN-65		3.50E-01	±	6.18E+00	1.01E+01
MN-54		1.66E+00	±	2.93E+00	4.55E+00
CS-134		-1.86E-01	±	2.60E+00	4.25E+00
CS-137		6.13E-01	±	3.06E+00	4.94E+00
BALA140		-7.15E-01	±	3.93E+00	6.32E+00
K-40	+	1.48E+03	±	1.22E+02	7.84E+01
FE-59		-8.69E-01	±	9.00E+00	1.46E+01
RA-226		-5.80E+01	±	1.68E+02	1.43E+02
ZRNB-95		3.40E-01	±	2.98E+00	4.85E+00
BE-7		-1.11E+00	±	2.73E+01	4.48E+01

Collection Date: 2/8/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.62E+00	±	3.86E+00	6.12E+00
CO-60		-4.81E-01	±	4.05E+00	6.56E+00
ZN-65		-2.34E+00	±	8.30E+00	1.32E+01
MN-54		3.77E-01	±	3.10E+00	5.01E+00
CS-134		-1.85E+00	±	3.59E+00	5.64E+00
CS-137		7.48E-01	±	3.17E+00	5.06E+00
BALA140		2.30E+00	±	3.61E+00	5.09E+00
K-40	+	1.45E+03	±	1.31E+02	7.75E+01
FE-59		-3.45E+00	±	1.08E+01	1.71E+01
RA-226		-2.09E+00	±	6.97E+01	1.20E+02
ZRNB-95		-7.63E-01	±	3.22E+00	5.16E+00
BE-7		-1.54E+00	±	2.25E+01	3.68E+01

Collection Date: 3/8/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.98E-01	±	3.32E+00	5.42E+00
CO-60		-7.78E-01	±	2.67E+00	4.16E+00
ZN-65		-6.59E-01	±	8.61E+00	1.40E+01
MN-54		-4.26E-02	±	2.80E+00	4.59E+00
CS-134		8.96E-01	±	2.88E+00	4.59E+00
CS-137		8.03E-01	±	2.81E+00	4.45E+00
BALA140		0.00E+00	±	4.42E+00	7.37E+00
K-40	+	1.36E+03	±	1.25E+02	7.13E+01
FE-59		1.86E+00	±	7.66E+00	1.21E+01
RA-226		5.39E+00	±	5.89E+01	1.08E+02
ZRNB-95		5.24E-02	±	2.86E+00	4.70E+00
BE-7		0.00E+00	±	2.74E+01	4.57E+01

Collection Date: 4/5/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		1.15E+00	±	3.29E+00	5.18E+00
CO-60		1.07E-01	±	3.54E+00	5.78E+00
ZN-65		-1.68E+00	±	8.94E+00	1.44E+01
MN-54		-1.18E+00	±	4.04E+00	6.43E+00
CS-134		-6.50E-01	±	3.50E+00	5.64E+00
CS-137		-8.19E-01	±	4.20E+00	6.75E+00
BALA140		1.78E+00	±	4.10E+00	6.15E+00
K-40	+	1.38E+03	±	1.41E+02	8.15E+01
FE-59		3.42E+00	±	9.04E+00	1.39E+01
RA-226		9.98E+00	±	7.83E+01	1.43E+02
ZRNB-95		-1.20E+00	±	3.60E+00	5.68E+00
BE-7		6.51E-01	±	2.54E+01	4.16E+01

Collection Date: 4/26/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		1.51E+00	±	3.47E+00	5.48E+00
CO-60		2.42E-02	±	3.71E+00	6.10E+00
ZN-65		7.15E-01	±	7.16E+00	1.16E+01
MN-54		-3.12E-01	±	3.13E+00	5.08E+00
CS-134		-8.81E-01	±	2.94E+00	4.69E+00
CS-137		-8.64E-01	±	3.38E+00	5.40E+00
BALA140		7.47E-02	±	3.73E+00	6.12E+00
K-40	+	1.38E+03	±	1.29E+02	8.01E+01
FE-59		-6.12E-01	±	8.80E+00	1.43E+01
RA-226		-1.37E+01	±	9.29E+01	1.29E+02
ZRNB-95		1.55E+00	±	2.83E+00	4.32E+00
BE-7		-2.27E+00	±	2.37E+01	3.87E+01

Collection Date: 5/10/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-2.36E-01	±	4.10E+00	6.70E+00
CO-60		-1.62E+00	±	5.28E+00	8.38E+00
ZN-65		2.03E+00	±	8.16E+00	1.30E+01
MN-54		1.14E+00	±	3.65E+00	5.75E+00
CS-134		1.80E+00	±	3.41E+00	5.28E+00
CS-137		5.25E-01	±	3.87E+00	6.26E+00
BALA140		0.00E+00	±	4.61E+00	7.68E+00
K-40	+	1.41E+03	±	1.40E+02	7.35E+01
FE-59		-3.47E+00	±	1.10E+01	1.74E+01
RA-226		-3.45E+01	±	1.19E+02	1.42E+02
ZRNB-95		-2.06E-01	±	3.58E+00	5.84E+00
BE-7		1.16E+01	±	2.27E+01	3.47E+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: 5/24/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.04E-01	±	3.89E+00	6.38E+00
CO-60		2.50E+00	±	4.39E+00	6.65E+00
ZN-65		-3.71E+00	±	9.33E+00	1.46E+01
MN-54		7.70E-01	±	3.39E+00	5.40E+00
CS-134		-1.17E+00	±	3.81E+00	6.07E+00
CS-137		2.25E-01	±	2.86E+00	4.64E+00
BALA140		3.59E-02	±	4.25E+00	6.98E+00
K-40	+	1.49E+03	±	1.42E+02	7.22E+01
FE-59		-1.75E-01	±	9.17E+00	1.50E+01
RA-226		5.32E+01	±	8.33E+01	1.47E+02
ZRNB-95		-7.02E-01	±	3.65E+00	5.87E+00
BE-7		-5.36E+00	±	2.46E+01	3.93E+01

Collection Date: 6/7/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		1.44E+00	±	3.39E+00	5.29E+00
CO-60		-1.52E+00	±	4.60E+00	7.24E+00
ZN-65		-2.66E+00	±	9.33E+00	1.48E+01
MN-54		6.69E-01	±	3.51E+00	5.63E+00
CS-134		-1.22E-01	±	1.93E+00	3.13E+00
CS-137		-1.14E-02	±	3.08E+00	5.05E+00
BALA140		-1.97E+00	±	5.24E+00	8.10E+00
K-40	+	1.39E+03	±	1.40E+02	7.76E+01
FE-59		-2.64E+00	±	1.10E+01	1.75E+01
RA-226		6.30E+00	±	7.55E+01	1.40E+02
ZRNB-95		7.78E-02	±	2.91E+00	4.76E+00
BE-7		4.96E+00	±	1.91E+01	3.01E+01

Collection Date: 6/21/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.73E+00	±	4.48E+00	7.11E+00
CO-60		5.74E-01	±	4.61E+00	7.47E+00
ZN-65		0.00E+00	±	2.03E+01	3.39E+01
MN-54		2.71E-01	±	3.62E+00	5.89E+00
CS-134		-7.30E-04	±	3.07E+00	5.03E+00
CS-137		-1.79E+00	±	4.00E+00	6.23E+00
BALA140		2.48E-01	±	3.86E+00	6.26E+00
K-40	+	1.44E+03	±	1.40E+02	7.28E+01
FE-59		-3.89E-01	±	1.08E+01	1.77E+01
RA-226		-9.06E+00	±	8.73E+01	1.44E+02
ZRNB-95		1.24E-02	±	3.41E+00	5.60E+00
BE-7		1.42E+00	±	2.72E+01	4.44E+01

Collection Date: 7/12/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		8.16E-02	±	3.96E+00	6.51E+00
CO-60		-1.17E+00	±	4.79E+00	7.64E+00
ZN-65		7.64E-01	±	8.38E+00	1.36E+01
MN-54		7.25E-01	±	3.28E+00	5.22E+00
CS-134		-4.91E-01	±	3.42E+00	5.53E+00
CS-137		0.00E+00	±	4.43E+00	7.39E+00
BALA140		0.00E+00	±	1.17E+00	1.94E+00
K-40	+	1.38E+03	±	1.42E+02	8.23E+01
FE-59		-2.58E+00	±	1.06E+01	1.69E+01
RA-226		-1.85E+01	±	9.64E+01	1.42E+02
ZRNB-95		6.13E-02	±	2.77E+00	4.54E+00
BE-7		-6.43E+00	±	2.47E+01	3.93E+01

Collection Date: 7/26/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		0.00E+00	±	5.03E+00	8.39E+00
CO-60		2.21E+00	±	2.69E+00	3.55E+00
ZN-65		-1.71E+00	±	9.33E+00	1.50E+01
MN-54		-2.97E-01	±	3.19E+00	5.18E+00
CS-134		1.68E+00	±	3.15E+00	4.84E+00
CS-137		-3.88E-01	±	3.70E+00	6.00E+00
BALA140		-1.12E+00	±	4.58E+00	7.20E+00
K-40	+	1.58E+03	±	1.49E+02	7.87E+01
FE-59		7.66E-01	±	1.02E+01	1.65E+01
RA-226		-1.01E+01	±	8.77E+01	1.43E+02
ZRNB-95		0.00E+00	±	4.91E+00	8.18E+00
BE-7		6.75E-02	±	2.67E+01	4.39E+01

Collection Date: 8/9/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.08E+00	±	4.59E+00	7.39E+00
CO-60		-1.78E-02	±	4.32E+00	7.11E+00
ZN-65		-1.65E+00	±	8.18E+00	1.31E+01
MN-54		7.27E-01	±	3.31E+00	5.27E+00
CS-134		-8.97E-01	±	3.62E+00	5.81E+00
CS-137		3.60E-01	±	3.62E+00	5.88E+00
BALA140		-1.78E+00	±	5.44E+00	8.50E+00
K-40	+	1.42E+03	±	1.40E+02	7.35E+01
FE-59		1.06E+00	±	9.27E+00	1.50E+01
RA-226		5.40E+00	±	8.80E+01	1.58E+02
ZRNB-95		1.21E+00	±	2.93E+00	4.50E+00
BE-7		-7.28E+00	±	2.67E+01	4.25E+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: 8/23/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-7.48E-01	±	4.07E+00	6.56E+00
CO-60		-5.95E-01	±	4.27E+00	6.88E+00
ZN-65		1.17E+00	±	9.89E+00	1.60E+01
MN-54		1.76E+00	±	3.12E+00	4.69E+00
CS-134		5.54E-01	±	3.44E+00	5.56E+00
CS-137		1.77E+00	±	3.68E+00	5.67E+00
BALA140		0.00E+00	±	4.85E+00	8.09E+00
K-40	+	1.44E+03	±	1.38E+02	6.72E+01
FE-59		-2.39E+00	±	1.06E+01	1.69E+01
RA-226		-5.87E+01	±	1.93E+02	1.59E+02
ZRNB-95		1.28E-01	±	3.83E+00	6.28E+00
BE-7		-9.24E+00	±	2.98E+01	4.74E+01

Collection Date: 9/6/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-1.39E+00	±	4.44E+00	7.09E+00
CO-60		-2.25E-01	±	3.47E+00	5.64E+00
ZN-65		-4.00E-01	±	9.69E+00	1.59E+01
MN-54		-7.11E-01	±	3.37E+00	5.38E+00
CS-134		-9.14E-01	±	3.87E+00	6.22E+00
CS-137		-6.71E-01	±	3.94E+00	6.35E+00
BALA140		3.43E-01	±	2.79E+00	4.43E+00
K-40	+	1.50E+03	±	1.41E+02	6.72E+01
FE-59		-1.26E+00	±	1.08E+01	1.74E+01
RA-226		-5.97E+00	±	8.65E+01	1.47E+02
ZRNB-95		-7.47E-02	±	3.01E+00	4.93E+00
BE-7		-4.17E-01	±	2.59E+01	4.24E+01

Collection Date: 9/20/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		0.00E+00	±	5.63E+00	9.39E+00
CO-60		-6.52E-01	±	4.15E+00	6.68E+00
ZN-65		-2.33E+00	±	8.94E+00	1.42E+01
MN-54		4.88E-01	±	2.88E+00	4.61E+00
CS-134		-1.06E+00	±	3.31E+00	5.25E+00
CS-137		-3.12E-01	±	3.83E+00	6.24E+00
BALA140		1.16E+00	±	3.76E+00	5.76E+00
K-40	+	1.29E+03	±	1.35E+02	7.51E+01
FE-59		8.60E-01	±	9.95E+00	1.61E+01
RA-226		-1.54E+01	±	9.15E+01	1.42E+02
ZRNB-95		-1.11E+00	±	3.60E+00	5.69E+00
BE-7		1.00E+01	±	2.40E+01	3.74E+01

Collection Date: 10/11/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		9.73E-01	±	3.69E+00	5.90E+00
CO-60		2.60E-01	±	4.67E+00	7.62E+00
ZN-65		-8.81E-01	±	8.37E+00	1.36E+01
MN-54		-5.18E-01	±	3.60E+00	5.80E+00
CS-134		9.78E-01	±	3.74E+00	5.99E+00
CS-137		6.44E-02	±	3.60E+00	5.91E+00
BALA140		1.46E+00	±	3.27E+00	4.75E+00
K-40	+	1.37E+03	±	1.36E+02	7.05E+01
FE-59		0.00E+00	±	5.64E+00	9.40E+00
RA-226		-2.39E+01	±	1.09E+02	1.50E+02
ZRNB-95		2.05E+00	±	3.40E+00	5.14E+00
BE-7		7.58E+00	±	2.65E+01	4.22E+01

Collection Date: 11/8/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-7.07E-01	±	3.63E+00	5.87E+00
CO-60		4.02E-01	±	3.72E+00	6.03E+00
ZN-65		2.04E-01	±	8.05E+00	1.32E+01
MN-54		9.28E-01	±	2.90E+00	4.57E+00
CS-134		-9.83E-01	±	3.37E+00	5.39E+00
CS-137		0.00E+00	±	4.07E+00	6.78E+00
BALA140		-1.32E+00	±	4.23E+00	6.61E+00
K-40	+	1.41E+03	±	1.27E+02	7.16E+01
FE-59		1.26E-01	±	7.46E+00	1.22E+01
RA-226		3.23E+01	±	6.41E+01	1.13E+02
ZRNB-95		3.64E+00	±	5.04E+00	7.50E+00
BE-7		1.52E+01	±	1.98E+01	2.93E+01

Collection Date: 12/6/2011

Nuclide	RQ	Activity	±	Error	MDA
BA-133		-5.59E-01	±	3.80E+00	6.15E+00
CO-60		1.52E+00	±	4.08E+00	6.34E+00
ZN-65		0.00E+00	±	1.35E+01	2.24E+01
MN-54		-1.04E-02	±	3.88E+00	6.39E+00
CS-134		0.00E+00	±	6.42E+00	1.07E+01
CS-137		-7.48E-02	±	3.38E+00	5.54E+00
BALA140		-1.69E-01	±	3.57E+00	5.80E+00
K-40	+	1.31E+03	±	1.37E+02	7.65E+01
FE-59		-1.43E-01	±	9.90E+00	1.62E+01
RA-226		5.89E+00	±	8.26E+01	1.51E+02
ZRNB-95		4.39E-01	±	6.17E+00	1.00E+01
BE-7		-7.49E+00	±	2.78E+01	4.43E+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	-7.56E-02	-1.73E+00	1.85E+00	6.14E+00	18	0
BA-133	Cntl	3.46E-01	-1.35E+00	3.95E+00	5.47E+00	18	0
BALA140	Ind	1.74E-02	-1.97E+00	2.30E+00	5.95E+00	18	0
BALA140	Cntl	-1.05E-01	-1.21E+00	1.06E+00	6.12E+00	18	0
BE-7	Ind	5.73E-01	-9.24E+00	1.52E+01	3.81E+01	18	0
BE-7	Cntl	3.46E+00	-6.26E+00	1.86E+01	3.76E+01	18	0
CO-60	Ind	7.76E-03	-1.62E+00	2.50E+00	6.09E+00	18	0
CO-60	Cntl	5.54E-01	-1.35E+00	1.95E+00	6.51E+00	18	0
CS-134	Ind	-1.83E-01	-1.85E+00	1.80E+00	5.24E+00	18	0
CS-134	Cntl	-1.74E-01	-2.47E+00	3.07E+00	5.13E+00	18	0
CS-137	Ind	1.05E-02	-1.79E+00	1.77E+00	5.50E+00	18	0
CS-137	Cntl	-1.02E-01	-1.67E+00	2.03E+00	5.73E+00	18	0
FE-59	Ind	-5.50E-01	-3.47E+00	3.42E+00	1.46E+01	18	0
FE-59	Cntl	4.39E-01	-3.89E+00	3.51E+00	1.42E+01	18	0
K-40	Ind	1.42E+03	1.29E+03	1.58E+03	7.09E+01	18	18
K-40	Cntl	1.49E+03	1.32E+03	1.61E+03	7.19E+01	18	18
MN-54	Ind	3.58E-01	-1.18E+00	1.76E+00	5.02E+00	18	0
MN-54	Cntl	3.10E-01	-1.79E+00	2.32E+00	4.78E+00	18	0
RA-226	Ind	-7.30E+00	-5.87E+01	5.32E+01	1.33E+02	18	0
RA-226	Cntl	-1.20E+01	-4.69E+01	1.81E+01	1.31E+02	18	0
ZN-65	Ind	-7.10E-01	-3.71E+00	2.03E+00	1.46E+01	18	0
ZN-65	Cntl	-2.31E-01	-3.36E+00	3.38E+00	1.30E+01	18	0
ZRNB-95	Ind	3.05E-01	-1.20E+00	3.64E+00	5.45E+00	18	0
ZRNB-95	Cntl	4.82E-01	-8.94E-01	2.80E+00	5.39E+00	18	0

Ind = Indicator Stations Cntl = Control Stations

TABLE A-15.1

GAMMA SPECTROMETRY RESULTS OF ROOTS

Results in pCi/ kilogram (wet)

Station 37 is Indicator - Station 9c is Control

Station 37 Potato collected 7/20/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	3.52E+03	±	3.50E+02	1.41E+02
MN-54		2.03E+00	±	5.96E+00	9.14E+00
CO-58		-3.27E-01	±	4.90E+00	7.94E+00
FE-59		-7.61E-02	±	2.67E+01	4.39E+01
CO-60		-3.88E+00	±	1.25E+01	1.98E+01
ZN-65		-3.31E-02	±	1.55E+01	2.54E+01
ZRNB-95		1.56E+00	±	6.72E+00	1.06E+01
I-131		-6.22E-02	±	5.04E+00	8.27E+00
CS-134		-5.78E-02	±	5.48E+00	9.00E+00
CS-137		0.00E+00	±	7.10E+00	1.18E+01
BALA140		0.00E+00	±	2.86E+00	4.76E+00

Station 37 Potato collected 9/13/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	3.82E+03	±	2.91E+02	9.54E+01
MN-54		-1.72E+00	±	5.54E+00	8.71E+00
CO-58		6.88E-01	±	5.55E+00	8.96E+00
FE-59		-3.32E+00	±	1.69E+01	2.69E+01
CO-60		4.88E-01	±	7.79E+00	1.27E+01
ZN-65		4.56E+00	±	1.40E+01	2.19E+01
ZRNB-95		1.84E+00	±	5.15E+00	8.03E+00
I-131		2.40E+00	±	4.54E+00	6.95E+00
CS-134		-2.24E+00	±	6.07E+00	9.59E+00
CS-137		-1.28E+00	±	5.67E+00	9.03E+00
BALA140		0.00E+00	±	1.89E+00	3.15E+00

Station 37 Onion collected 8/16/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	9.89E+02	±	1.91E+02	1.58E+02
MN-54		0.00E+00	±	7.28E+00	1.21E+01
CO-58		-8.07E-02	±	6.48E+00	1.06E+01
FE-59		6.57E+00	±	1.46E+01	2.13E+01
CO-60		0.00E+00	±	6.79E+00	1.13E+01
ZN-65		-5.22E+00	±	1.95E+01	3.08E+01
ZRNB-95		-2.17E+00	±	7.12E+00	1.12E+01
I-131		0.00E+00	±	4.58E+00	7.63E+00
CS-134		0.00E+00	±	9.81E+00	1.63E+01
CS-137		0.00E+00	±	7.20E+00	1.20E+01
BALA140		-4.76E-01	±	9.70E+00	1.58E+01

Station 9c Potato collected 8/12/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	4.88E+03	±	3.38E+02	9.52E+01
MN-54		-6.86E-04	±	5.17E+00	8.44E+00
CO-58		-1.58E+00	±	6.42E+00	1.02E+01
FE-59		1.59E+00	±	1.89E+01	3.06E+01
CO-60		9.31E-01	±	9.28E+00	1.51E+01
ZN-65		1.66E-01	±	1.60E+01	2.63E+01
ZRNB-95		1.71E+00	±	5.34E+00	8.34E+00
I-131		4.91E-01	±	5.56E+00	9.03E+00
CS-134		-3.43E-01	±	5.03E+00	8.19E+00
CS-137		2.57E+00	±	5.51E+00	8.39E+00
BALA140		-1.79E+00	±	7.64E+00	1.19E+01

Station 37 Potato collected 8/23/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	4.11E+03	±	4.01E+02	1.56E+02
MN-54		1.32E+00	±	7.17E+00	1.14E+01
CO-58		-2.38E+00	±	8.80E+00	1.39E+01
FE-59		1.50E+01	±	2.47E+01	3.60E+01
CO-60		1.23E+00	±	1.33E+01	2.17E+01
ZN-65		-6.27E+00	±	2.18E+01	3.43E+01
ZRNB-95		3.38E+00	±	8.05E+00	1.23E+01
I-131		-7.30E-01	±	6.59E+00	1.07E+01
CS-134		0.00E+00	±	1.03E+01	1.71E+01
CS-137		0.00E+00	±	8.06E+00	1.34E+01
BALA140		0.00E+00	±	1.49E+01	2.49E+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 ROOTS- SUMMARY

Results in pCi/ kilogram (wet)

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-1.19E-01	-4.76E-01	0.00E+00	1.21E+01	4	0
BALA140	Cntl	-1.79E+00	-1.79E+00	-1.79E+00	1.19E+01	1	0
CO-58	Ind	-5.24E-01	-2.38E+00	6.88E-01	1.03E+01	4	0
CO-58	Cntl	-1.58E+00	-1.58E+00	-1.58E+00	1.02E+01	1	0
CO-60	Ind	-5.41E-01	-3.88E+00	1.23E+00	1.64E+01	4	0
CO-60	Cntl	9.31E-01	9.31E-01	9.31E-01	1.51E+01	1	0
CS-134	Ind	-5.74E-01	-2.24E+00	0.00E+00	1.30E+01	4	0
CS-134	Cntl	-3.43E-01	-3.43E-01	-3.43E-01	8.19E+00	1	0
CS-137	Ind	-3.20E-01	-1.28E+00	0.00E+00	1.16E+01	4	0
CS-137	Cntl	2.57E+00	2.57E+00	2.57E+00	8.39E+00	1	0
FE-59	Ind	4.56E+00	-3.32E+00	1.50E+01	3.20E+01	4	0
FE-59	Cntl	1.59E+00	1.59E+00	1.59E+00	3.06E+01	1	0
I-131	Ind	4.01E-01	-7.30E-01	2.40E+00	8.38E+00	4	0
I-131	Cntl	4.91E-01	4.91E-01	4.91E-01	9.03E+00	1	0
K-40	Ind	3.11E+03	9.89E+02	4.11E+03	1.38E+02	4	4
K-40	Cntl	4.88E+03	4.88E+03	4.88E+03	9.52E+01	1	1
MN-54	Ind	4.07E-01	-1.72E+00	2.03E+00	1.03E+01	4	0
MN-54	Cntl	-6.86E-04	-6.86E-04	-6.86E-04	8.44E+00	1	0
ZN-65	Ind	-1.74E+00	-6.27E+00	4.56E+00	2.81E+01	4	0
ZN-65	Cntl	1.66E-01	1.66E-01	1.66E-01	2.63E+01	1	0
ZRNB-95	Ind	1.15E+00	-2.17E+00	3.38E+00	1.05E+01	4	0
ZRNB-95	Cntl	1.71E+00	1.71E+00	1.71E+00	8.34E+00	1	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 Cherries collected 6/30/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.24E+03	±	2.92E+02	1.57E+02
MN-54		-1.02E+00	±	7.30E+00	1.17E+01
CO-58		-8.33E-01	±	6.34E+00	1.02E+01
FE-59		0.00E+00	±	2.49E+01	4.15E+01
CO-60		5.04E-02	±	1.01E+01	1.66E+01
ZN-65		-3.20E+00	±	1.82E+01	2.90E+01
ZRNB-95		0.00E+00	±	7.53E+00	1.26E+01
I-131		-1.36E+00	±	7.09E+00	1.14E+01
CS-134		0.00E+00	±	8.78E+00	1.46E+01
CS-137		5.31E-02	±	7.35E+00	1.21E+01
BALA140		1.01E+00	±	7.52E+00	1.19E+01

Station 37 Peaches collected 8/23/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.89E+03	±	2.88E+02	2.77E+02
MN-54		-1.32E+00	±	1.21E+01	1.97E+01
CO-58		-3.04E+00	±	1.11E+01	1.77E+01
FE-59		6.06E+00	±	2.68E+01	4.28E+01
CO-60		6.79E-01	±	1.13E+01	1.85E+01
ZN-65		-6.05E+00	±	2.48E+01	3.99E+01
ZRNB-95		2.32E-01	±	1.03E+01	1.70E+01
I-131		1.13E+01	±	1.80E+01	2.84E+01
CS-134		2.17E+00	±	8.46E+00	1.36E+01
CS-137		-1.08E+00	±	1.11E+01	1.82E+01
BALA140		0.00E+00	±	3.02E+01	5.04E+01

Station 37 Cherries collected 7/5/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.16E+03	±	2.59E+02	1.11E+02
MN-54		-1.57E+00	±	6.89E+00	1.09E+01
CO-58		1.32E+00	±	6.34E+00	1.01E+01
FE-59		4.21E+00	±	1.87E+01	2.95E+01
CO-60		-2.05E-01	±	7.71E+00	1.26E+01
ZN-65		-2.98E+00	±	1.49E+01	2.37E+01
ZRNB-95		-8.92E-01	±	6.39E+00	1.03E+01
I-131		-2.21E+00	±	6.49E+00	1.03E+01
CS-134		0.00E+00	±	1.05E+01	1.75E+01
CS-137		-4.92E-01	±	6.57E+00	1.07E+01
BALA140		-2.39E+00	±	9.37E+00	1.46E+01

Station 37 Apples collected 9/9/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.38E+03	±	2.07E+02	1.25E+02
MN-54		3.23E+00	±	5.36E+00	7.74E+00
CO-58		-8.78E-01	±	6.63E+00	1.07E+01
FE-59		0.00E+00	±	1.29E+01	2.15E+01
CO-60		1.31E+00	±	7.42E+00	1.18E+01
ZN-65		-4.95E-01	±	1.96E+01	3.22E+01
ZRNB-95		1.00E+00	±	6.52E+00	1.05E+01
I-131		1.20E+00	±	5.96E+00	9.50E+00
CS-134		-6.35E-01	±	4.24E+00	6.77E+00
CS-137		7.60E-03	±	7.02E+00	1.16E+01
BALA140		2.03E+00	±	8.43E+00	1.31E+01

Station 37 Peaches collected 7/23/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.57E+03	±	2.61E+02	1.68E+02
MN-54		0.00E+00	±	1.05E+01	1.74E+01
CO-58		-1.93E+00	±	7.46E+00	1.17E+01
FE-59		-2.52E+00	±	2.04E+01	3.25E+01
CO-60		1.19E+00	±	7.03E+00	1.11E+01
ZN-65		7.44E+00	±	1.55E+01	2.28E+01
ZRNB-95		0.00E+00	±	1.00E+01	1.67E+01
I-131		1.80E+00	±	8.31E+00	1.32E+01
CS-134		3.60E-01	±	6.75E+00	1.10E+01
CS-137		2.25E+00	±	7.75E+00	1.21E+01
BALA140		0.00E+00	±	3.96E+00	6.59E+00

Station 37 Peaches collected 9/9/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.57E+03	±	2.88E+02	1.34E+02
MN-54		4.04E-01	±	8.47E+00	1.38E+01
CO-58		-1.01E+00	±	6.71E+00	1.08E+01
FE-59		2.03E+00	±	1.81E+01	2.91E+01
CO-60		8.92E-01	±	8.51E+00	1.37E+01
ZN-65		-2.16E-01	±	2.14E+01	3.51E+01
ZRNB-95		2.23E+00	±	6.58E+00	1.02E+01
I-131		3.96E+00	±	6.74E+00	1.01E+01
CS-134		-1.00E+00	±	6.46E+00	1.04E+01
CS-137		-1.46E+00	±	7.31E+00	1.17E+01
BALA140		-3.70E-01	±	7.47E+00	1.21E+01

Station 37 Cantalope collected 8/23/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.98E+03	±	2.67E+02	1.39E+02
MN-54		3.49E+00	±	5.22E+00	7.20E+00
CO-58		-1.21E+00	±	6.77E+00	1.08E+01
FE-59		-5.43E-01	±	2.06E+01	3.38E+01
CO-60		1.59E-01	±	8.31E+00	1.36E+01
ZN-65		1.97E+00	±	1.53E+01	2.46E+01
ZRNB-95		-2.81E+00	±	7.04E+00	1.08E+01
I-131		-1.42E+00	±	6.59E+00	1.05E+01
CS-134		-1.50E-02	±	5.36E+00	8.81E+00
CS-137		8.24E-01	±	5.59E+00	8.91E+00
BALA140		2.67E-02	±	8.59E+00	1.41E+01

Station 37 Red Grapes collected 9/29/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.61E+03	±	2.78E+02	1.06E+02
MN-54		7.55E-01	±	6.47E+00	1.04E+01
CO-58		-5.38E-01	±	6.92E+00	1.12E+01
FE-59		-1.38E+00	±	1.88E+01	3.04E+01
CO-60		-3.30E-02	±	9.60E+00	1.58E+01
ZN-65		-6.07E+00	±	1.76E+01	2.76E+01
ZRNB-95		2.86E+00	±	5.27E+00	7.72E+00
I-131		-2.29E+00	±	8.66E+00	1.38E+01
CS-134		-1.78E+00	±	6.28E+00	9.95E+00
CS-137		2.57E+00	±	5.06E+00	7.45E+00
BALA140		-2.43E+00	±	1.00E+01	1.55E+01

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

TABLE A-16.1

GAMMA SPECTROMETRY RESULTS OF FRUITS

Results in pCi/ kilogram (wet)

Station 37 is Indicator - Station 9c is Control

Station 37 White Grapes collected 9/29/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.60E+03	±	2.92E+02	1.30E+02
MN-54		1.27E+00	±	6.76E+00	1.08E+01
CO-58		4.29E-01	±	5.28E+00	8.53E+00
FE-59		-1.13E+01	±	2.85E+01	4.44E+01
CO-60		0.00E+00	±	9.04E+00	1.51E+01
ZN-65		-5.31E+00	±	2.06E+01	3.27E+01
ZRNB-95		-2.02E+00	±	6.90E+00	1.08E+01
I-131		-3.95E+00	±	9.96E+00	1.57E+01
CS-134		1.42E+00	±	5.56E+00	8.76E+00
CS-137		1.87E+00	±	5.21E+00	7.92E+00
BALA140		0.00E+00	±	3.40E+00	5.67E+00

Station 37 Apples collected 9/29/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	1.11E+03	±	2.20E+02	1.62E+02
MN-54		-8.51E-02	±	6.05E+00	9.92E+00
CO-58		2.10E+00	±	6.03E+00	9.15E+00
FE-59		-6.28E+00	±	2.15E+01	3.33E+01
CO-60		1.03E+00	±	7.34E+00	1.17E+01
ZN-65		6.00E+00	±	1.70E+01	2.62E+01
ZRNB-95		0.00E+00	±	6.82E+00	1.14E+01
I-131		3.63E-01	±	8.92E+00	1.46E+01
CS-134		-7.88E-01	±	7.10E+00	1.15E+01
CS-137		9.11E-01	±	6.28E+00	1.00E+01
BALA140		0.00E+00	±	4.11E+00	6.85E+00

Station 9c Nectarines collected 8/12/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.54E+03	±	2.53E+02	1.91E+02
MN-54		8.18E-01	±	9.35E+00	1.53E+01
CO-58		1.59E+00	±	7.63E+00	1.23E+01
FE-59		-3.35E+00	±	2.21E+01	3.58E+01
CO-60		-1.84E-01	±	9.58E+00	1.57E+01
ZN-65		-4.54E+00	±	1.93E+01	3.10E+01
ZRNB-95		-4.60E+00	±	9.49E+00	1.50E+01
I-131		-1.46E+00	±	1.07E+01	1.75E+01
CS-134		-4.84E+00	±	1.02E+01	1.62E+01
CS-137		-1.44E+00	±	8.66E+00	1.40E+01
BALA140		6.58E-01	±	8.25E+00	1.34E+01

Station 37 Apples collected 10/4/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	9.94E+02	±	2.02E+02	1.45E+02
MN-54		4.37E+00	±	5.84E+00	8.00E+00
CO-58		-2.39E+00	±	8.16E+00	1.28E+01
FE-59		0.00E+00	±	4.01E+01	6.69E+01
CO-60		1.84E-01	±	8.48E+00	1.39E+01
ZN-65		0.00E+00	±	4.09E+00	6.81E+00
ZRNB-95		9.25E-01	±	5.49E+00	8.70E+00
I-131		1.88E+00	±	6.14E+00	9.68E+00
CS-134		-8.17E-02	±	5.80E+00	9.51E+00
CS-137		3.31E-02	±	6.86E+00	1.13E+01
BALA140		-2.50E-01	±	6.50E+00	1.05E+01

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	-2.15E-01	-2.43E+00	2.03E+00	1.47E+01	11	0
BALA140	Cntl	6.58E-01	6.58E-01	6.58E-01	1.34E+01	1	0
CO-58	Ind	-7.25E-01	-3.04E+00	2.10E+00	1.12E+01	11	0
CO-58	Cntl	1.59E+00	1.59E+00	1.59E+00	1.23E+01	1	0
CO-60	Ind	4.78E-01	-2.05E-01	1.31E+00	1.40E+01	11	0
CO-60	Cntl	-1.84E-01	-1.84E-01	-1.84E-01	1.57E+01	1	0
CS-134	Ind	-3.17E-02	-1.78E+00	2.17E+00	1.11E+01	11	0
CS-134	Cntl	-4.84E+00	-4.84E+00	-4.84E+00	1.62E+01	1	0
CS-137	Ind	4.99E-01	-1.46E+00	2.57E+00	1.11E+01	11	0
CS-137	Cntl	-1.44E+00	-1.44E+00	-1.44E+00	1.40E+01	1	0
FE-59	Ind	-8.85E-01	-1.13E+01	6.06E+00	3.69E+01	11	0
FE-59	Cntl	-3.35E+00	-3.35E+00	-3.35E+00	3.58E+01	1	0
I-131	Ind	8.46E-01	-3.95E+00	1.13E+01	1.34E+01	11	0
I-131	Cntl	-1.46E+00	-1.46E+00	-1.46E+00	1.75E+01	1	0
K-40	Ind	1.92E+03	9.94E+02	2.61E+03	1.50E+02	11	11
K-40	Cntl	2.54E+03	2.54E+03	2.54E+03	1.91E+02	1	1
MN-54	Ind	1.05E+00	-1.57E+00	4.37E+00	1.16E+01	10	0
MN-54	Cntl	8.18E-01	8.18E-01	8.18E-01	1.53E+01	1	0
ZN-65	Ind	-8.10E-01	-6.07E+00	7.44E+00	2.73E+01	11	0
ZN-65	Cntl	-4.54E+00	-4.54E+00	-4.54E+00	3.10E+01	1	0
ZRNB-95	Ind	1.39E-01	-2.81E+00	2.86E+00	1.15E+01	11	0
ZRNB-95	Cntl	-4.60E+00	-4.60E+00	-4.60E+00	1.50E+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 9c is Control

Station 37 Asparagus collected 5/3/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	2.40E+03	±	2.98E+02	1.32E+02
MN-54		2.91E-01	±	6.57E+00	1.07E+01
CO-58		-2.02E+00	±	6.80E+00	1.06E+01
FE-59		7.87E+00	±	1.43E+01	1.96E+01
CO-60		3.00E+00	±	9.19E+00	1.42E+01
ZN-65		-2.81E+00	±	2.09E+01	3.36E+01
ZRNB-95		2.98E-02	±	7.64E+00	1.26E+01
I-131		-2.54E-02	±	4.97E+00	8.16E+00
CS-134		-1.03E-01	±	7.08E+00	1.16E+01
CS-137		0.00E+00	±	1.08E+01	1.81E+01
BALA140		0.00E+00	±	4.17E+00	6.95E+00

Station 37 Green Bean collected 7/5/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	2.83E+03	±	3.39E+02	1.45E+02
MN-54		-1.94E-01	±	7.18E+00	1.17E+01
CO-58		1.86E+00	±	6.41E+00	9.86E+00
FE-59		-4.44E+00	±	2.63E+01	4.19E+01
CO-60		-3.45E+00	±	9.81E+00	1.51E+01
ZN-65		-5.09E+00	±	2.27E+01	3.60E+01
ZRNB-95		1.42E-01	±	7.21E+00	1.18E+01
I-131		0.00E+00	±	8.47E+00	1.41E+01
CS-134		3.22E+00	±	6.54E+00	9.83E+00
CS-137		0.00E+00	±	8.40E+00	1.40E+01
BALA140		0.00E+00	±	3.45E+00	5.75E+00

Station 37 Asparagus collected 5/17/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	2.67E+03	±	2.82E+02	1.19E+02
MN-54		1.43E+00	±	5.20E+00	8.06E+00
CO-58		5.18E+00	±	6.83E+00	9.87E+00
FE-59		-3.42E+00	±	2.20E+01	3.53E+01
CO-60		-9.87E-01	±	7.24E+00	1.16E+01
ZN-65		2.84E-01	±	1.66E+01	2.72E+01
ZRNB-95		1.52E+00	±	5.69E+00	8.91E+00
I-131		0.00E+00	±	7.59E+00	1.27E+01
CS-134		-3.22E+00	±	8.21E+00	1.29E+01
CS-137		0.00E+00	±	7.77E+00	1.30E+01
BALA140		4.54E+00	±	7.56E+00	1.06E+01

Station 37 Cabbage collected 7/20/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	2.29E+03	±	3.23E+02	1.96E+02
MN-54		2.73E+00	±	7.89E+00	1.21E+01
CO-58		1.19E+00	±	8.14E+00	1.30E+01
FE-59		-5.89E-01	±	2.84E+01	4.65E+01
CO-60		3.83E+00	±	9.81E+00	1.49E+01
ZN-65		-2.23E+00	±	1.91E+01	3.06E+01
ZRNB-95		-2.43E-02	±	6.02E+00	9.90E+00
I-131		0.00E+00	±	1.01E+01	1.68E+01
CS-134		-1.08E-01	±	8.26E+00	1.36E+01
CS-137		-6.64E-01	±	7.65E+00	1.24E+01
BALA140		0.00E+00	±	3.61E+00	6.02E+00

Station 37 Broad Leaf Vegtable collected 6/3/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	4.38E+03	±	5.75E+02	3.33E+02
MN-54		6.14E+00	±	1.31E+01	1.97E+01
CO-58		2.62E-02	±	1.09E+01	1.78E+01
FE-59		2.39E-01	±	3.71E+01	6.08E+01
CO-60		-5.82E+00	±	2.06E+01	3.24E+01
ZN-65		-9.19E+00	±	3.80E+01	6.01E+01
ZRNB-95		4.79E+00	±	1.26E+01	1.93E+01
I-131		-1.03E+00	±	1.11E+01	1.79E+01
CS-134		0.00E+00	±	2.12E+01	3.54E+01
CS-137		-3.62E+00	±	1.77E+01	2.84E+01
BALA140		-4.30E+00	±	1.61E+01	2.46E+01

Station 37 Broad Leaf Vegtable collected 8/12/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	5.46E+03	±	4.77E+02	2.11E+02
MN-54		-2.96E+00	±	1.07E+01	1.69E+01
CO-58		-2.45E-01	±	8.28E+00	1.35E+01
FE-59		-5.33E+00	±	3.13E+01	5.01E+01
CO-60		-2.74E-02	±	1.20E+01	1.98E+01
ZN-65		6.95E+00	±	2.24E+01	3.51E+01
ZRNB-95		5.32E+00	±	9.66E+00	1.46E+01
I-131		0.00E+00	±	1.12E+01	1.87E+01
CS-134		5.88E+00	±	8.24E+00	1.22E+01
CS-137		3.37E-01	±	7.69E+00	1.25E+01
BALA140		0.00E+00	±	3.70E+00	6.16E+00

Station 37 Broad Leaf Vegtable collected 6/17/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	3.89E+03	±	6.65E+02	4.33E+02
MN-54		0.00E+00	±	2.51E+01	4.18E+01
CO-58		1.25E+00	±	2.10E+01	3.41E+01
FE-59		0.00E+00	±	6.12E+01	1.02E+02
CO-60		0.00E+00	±	3.32E+01	5.53E+01
ZN-65		1.18E+00	±	3.41E+01	5.55E+01
ZRNB-95		7.95E+00	±	1.92E+01	2.91E+01
I-131		2.55E+00	±	1.70E+01	2.73E+01
CS-134		-5.26E+00	±	2.81E+01	4.52E+01
CS-137		8.86E-01	±	2.62E+01	4.28E+01
BALA140		-3.01E+00	±	2.71E+01	4.34E+01

Station 37 Corn collected 8/16/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40	+	2.38E+03	±	2.90E+02	2.49E+02
MN-54		6.00E+00	±	1.19E+01	1.87E+01
CO-58		-1.91E+00	±	9.30E+00	1.50E+01
FE-59		3.42E+00	±	2.40E+01	3.87E+01
CO-60		4.62E+00	±	9.42E+00	1.45E+01
ZN-65		2.30E+00	±	2.33E+01	3.80E+01
ZRNB-95		-1.02E+00	±	8.52E+00	1.38E+01
I-131		-6.92E+00	±	1.24E+01	1.96E+01
CS-134		-2.10E-01	±	1.30E+01	2.14E+01
CS-137		8.46E-02	±	1.06E+01	1.74E+01
BALA140		-4.80E+00	±	1.17E+01	1.82E+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 9c is Control

Station 37 Green Bean collected 9/13/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	3.02E+03	±	3.14E+02	1.46E+02
MN-54		-2.32E+00	±	8.20E+00	1.30E+01
CO-58		0.00E+00	±	3.56E+00	5.94E+00
FE-59		6.23E-01	±	2.13E+01	3.48E+01
CO-60		-1.91E+00	±	9.13E+00	1.45E+01
ZN-65		-7.37E+00	±	2.31E+01	3.66E+01
ZRNB-95		2.90E+00	±	6.42E+00	9.75E+00
I-131		1.44E-01	±	5.37E+00	8.79E+00
CS-134		-3.99E+00	±	8.92E+00	1.40E+01
CS-137		1.02E+00	±	7.20E+00	1.16E+01
BALA140		0.00E+00	±	2.66E+00	4.44E+00

Station 37 Broad Leaf Vegtable collected 9/23/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	4.82E+03	±	6.71E+02	3.59E+02
MN-54		1.14E+01	±	1.68E+01	2.41E+01
CO-58		6.19E+00	±	1.73E+01	2.66E+01
FE-59		1.39E+01	±	5.05E+01	7.83E+01
CO-60		9.20E-01	±	2.10E+01	3.42E+01
ZN-65		-7.96E+00	±	4.53E+01	7.23E+01
ZRNB-95		3.41E-01	±	1.43E+01	2.34E+01
I-131		7.23E+00	±	2.09E+01	3.28E+01
CS-134		-3.23E-01	±	1.35E+01	2.21E+01
CS-137		-2.16E+00	±	1.66E+01	2.67E+01
BALA140		7.75E+00	±	2.62E+01	3.99E+01

Station 9c Broad Leaf Vegtable collected 8/12/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	4.65E+03	±	4.95E+02	2.10E+02
MN-54		3.00E+00	±	1.15E+01	1.81E+01
CO-58		3.89E+00	±	9.91E+00	1.50E+01
FE-59		-6.52E+00	±	4.01E+01	6.43E+01
CO-60		1.16E+01	±	1.59E+01	2.31E+01
ZN-65		-3.98E+00	±	2.73E+01	4.39E+01
ZRNB-95		1.06E-01	±	1.03E+01	1.69E+01
I-131		5.17E+00	±	1.16E+01	1.79E+01
CS-134		0.00E+00	±	1.97E+01	3.29E+01
CS-137		4.37E-01	±	1.00E+01	1.63E+01
BALA140		0.00E+00	±	4.99E+00	8.32E+00

Station 103a Broad Leaf Vegtable collected 5/19/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	5.46E+03	±	5.39E+02	4.18E+02
MN-54		-8.07E-01	±	1.44E+01	2.35E+01
CO-58		-2.24E+00	±	1.77E+01	2.88E+01
FE-59		4.36E+01	±	4.31E+01	6.23E+01
CO-60		1.11E+01	±	1.98E+01	3.06E+01
ZN-65		1.03E+00	±	4.58E+01	7.51E+01
ZRNB-95		-9.59E+00	±	1.98E+01	3.13E+01
I-131		4.16E+00	±	1.86E+01	3.01E+01
CS-134		2.01E-01	±	1.96E+01	3.22E+01
CS-137		-1.11E+01	±	2.21E+01	3.50E+01
BALA140		1.79E+00	±	1.82E+01	2.96E+01

Station 102g Cabbage collected 8/18/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	4.35E+03	±	3.94E+02	1.57E+02
MN-54		8.00E-01	±	7.72E+00	1.25E+01
CO-58		1.72E-01	±	7.37E+00	1.21E+01
FE-59		-3.71E+00	±	2.58E+01	4.14E+01
CO-60		-4.94E+00	±	1.25E+01	1.95E+01
ZN-65		1.55E-01	±	1.72E+01	2.82E+01
ZRNB-95		-1.20E+00	±	7.34E+00	1.18E+01
I-131		2.76E+00	±	6.23E+00	9.56E+00
CS-134		-2.70E+00	±	7.91E+00	1.24E+01
CS-137		-3.12E-01	±	9.08E+00	1.49E+01
BALA140		0.00E+00	±	1.25E+01	2.08E+01

Station 102g Horseradish collected 9/19/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	4.04E+03	±	5.76E+02	3.14E+02
MN-54		-1.94E-01	±	1.55E+01	2.54E+01
CO-58		1.05E+00	±	1.26E+01	2.03E+01
FE-59		2.00E+01	±	4.81E+01	7.29E+01
CO-60		-3.19E-01	±	1.82E+01	2.99E+01
ZN-65		-1.19E+01	±	4.43E+01	7.01E+01
ZRNB-95		3.26E+00	±	1.77E+01	2.83E+01
I-131		1.19E-01	±	1.48E+01	2.44E+01
CS-134		-4.41E+00	±	1.37E+01	2.15E+01
CS-137		-1.09E-01	±	1.50E+01	2.46E+01
BALA140		0.00E+00	±	7.31E+00	1.22E+01

Station 102g Tomato Leafs collected 9/19/2011

Nuclide	RQ	Activity		Error	MDA
K-40	+	2.81E+03	±	5.34E+02	3.66E+02
MN-54		4.26E-01	±	1.68E+01	2.74E+01
CO-58		1.09E+00	±	1.88E+01	3.06E+01
FE-59		0.00E+00	±	5.64E+01	9.40E+01
CO-60		9.59E+00	±	1.80E+01	2.59E+01
ZN-65		1.42E+00	±	4.68E+01	7.66E+01
ZRNB-95		4.71E+00	±	1.87E+01	2.94E+01
I-131		-4.10E+00	±	2.66E+01	4.28E+01
CS-134		0.00E+00	±	2.36E+01	3.93E+01
CS-137		-5.48E+00	±	1.98E+01	3.12E+01
BALA140		0.00E+00	±	6.49E+01	1.08E+02

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	1.41E-01	-4.80E+00	7.75E+00	2.40E+01	14	0
BALA140	Cntl	0.00E+00	0.00E+00	0.00E+00	8.32E+00	1	0
CO-58	Ind	8.29E-01	-2.24E+00	6.19E+00	1.77E+01	14	0
CO-58	Cntl	3.89E+00	3.89E+00	3.89E+00	1.50E+01	1	0
CO-60	Ind	1.11E+00	-5.82E+00	1.11E+01	2.37E+01	14	0
CO-60	Cntl	1.16E+01	1.16E+01	1.16E+01	2.31E+01	1	0
CS-134	Ind	-7.87E-01	-5.26E+00	5.88E+00	2.17E+01	14	0
CS-134	Cntl	0.00E+00	0.00E+00	0.00E+00	3.29E+01	1	0
CS-137	Ind	-1.51E+00	-1.11E+01	1.02E+00	2.16E+01	14	0
CS-137	Cntl	4.37E-01	4.37E-01	4.37E-01	1.63E+01	1	0
FE-59	Ind	5.16E+00	-5.33E+00	4.36E+01	5.56E+01	14	0
FE-59	Cntl	-6.52E+00	-6.52E+00	-6.52E+00	6.43E+01	1	0
I-131	Ind	3.48E-01	-6.92E+00	7.23E+00	2.03E+01	14	0
I-131	Cntl	5.17E+00	5.17E+00	5.17E+00	1.79E+01	1	0
K-40	Ind	3.63E+03	2.29E+03	5.46E+03	2.56E+02	14	14
K-40	Cntl	4.65E+03	4.65E+03	4.65E+03	2.10E+02	1	1
MN-54	Ind	1.62E+00	-2.96E+00	1.14E+01	1.90E+01	14	0
MN-54	Cntl	3.00E+00	3.00E+00	3.00E+00	1.81E+01	1	0
ZN-65	Ind	-2.37E+00	-1.19E+01	6.95E+00	4.82E+01	14	0
ZN-65	Cntl	-3.98E+00	-3.98E+00	-3.98E+00	4.39E+01	1	0
ZRNB-95	Ind	1.37E+00	-9.59E+00	7.95E+00	1.81E+01	14	0
ZRNB-95	Cntl	1.06E-01	1.06E-01	1.06E-01	1.69E+01	1	0

Ind= Indicator Stations Cntl= Control Stations

TABLE B-1.1

2011 QUARTERLY & ANNUAL SPECIAL INTEREST TLD RESULTS

Results in milli-Roentgen (mR)

Station ID	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Quarterly Sum	Annual	Ratio Quarterly Sum / Annual
58	19.19	18.07	18.83	19.76	75.9	74.0	1.02
87	32.14	19.56	19.34	30.29	101.3	98.7	1.03
88	27.58	17.05	17.24	25.34	87.2	86.8	1.00
89	27.69	19.63	19.25	27.75	94.3	93.8	1.01
90	20.48	18.85	18.67	19.21	77.2	76.0	1.02
119B	22.91	19.24	19.67	22.62	84.4	84.9	0.99
119C	22.65	19.55	20.52	23.18	85.9	82.4	1.04
120 (East)	22.66	21.64	21.42	23.60	89.3	84.5	1.06
121	95.26	21.73	19.52	88.33	224.8	225.7	1.00
122	37.28	32.97	33.18	37.22	140.7	141.3	1.00
123	128.85	118.08	118.86	117.82	483.6	504.5	0.96
124	151.47	139.33	138.03	140.84	569.7	566.0	1.01
125	112.47	101.55	98.15	107.36	419.5	426.9	0.98
126	111.38	105.47	100.68	105.98	423.5	421.8	1.00
127	85.29	75.11	72.21	81.61	314.2	312.0	1.01
128	144.25	130.95	124.27	137.88	537.4	545.9	0.98
129	109.43	98.53	92.63	109.73	410.3	405.5	1.01
136A	159.67	145.25	145.55	154.26	604.7	597.9	1.01
137A	179.99	169.03	162.34	168.67	680.0	688.6	0.99
138A	144.54	127.93	127.14	136.71	536.3	550.1	0.97
150 (Site 1)	18.74	18.16	18.44	19.40	74.7	74.5	1.00
151 (Site 4)	18.45	18.22	18.73	18.74	74.1	71.3	1.04

TABLE B-1.2

2011 QUARTERLY & ANNUAL SPECIAL INTEREST TLD RESULTS- SUMMARY

Results in milli-Roentgen (mR)

Location	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
ST 119 Quarterly Ind	21.1	19.2	22.9	4	4
ST 119 Quarterly Cntl	21.5	19.6	23.2	4	4
ST 120 Quarterly Ind	22.3	21.4	23.6	4	4
ISFSI Quarterly Ind	124.5	72.2	180.0	40	40
ISFSI Annual Ind	501.9	312.0	688.6	10	10
SITE 1 & 4 Quarterly Ind	18.6	18.2	19.4	8	8

1st Q 12/29/10 to 3/30/11 - 2nd Q 3/30/11 to 6/29/11 - 3rd Q 6/29/11 to 9/28/11 - 4th Q 9/28/11 to 12/29/11

Ind = Indicator Station Cntl = Control Station

Stations 123 through 138A are locationed on the 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.

TABLE B-2.1

GAMMA SPECTROMETRY RESULTS OF STORM DRAIN WATER

STATION 101

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

Location 101 collected 2/2/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-2.74E+01	±	5.15E+01	5.56E+01
CR-51		2.13E+00	±	2.91E+01	4.77E+01
MN-54		-9.55E-01	±	2.20E+00	3.50E+00
CO-58		-1.36E-02	±	2.38E+00	3.91E+00
FE-59		2.17E+00	±	5.41E+00	8.36E+00
CO-60		2.04E-01	±	1.98E+00	3.21E+00
ZN-65		-1.40E+00	±	4.76E+00	7.62E+00
ZRNB-95		1.27E+00	±	2.62E+00	4.15E+00
I-131		1.05E+01	±	1.22E+01	1.88E+01
CS-134		5.10E-02	±	2.06E+00	3.38E+00
CS-137		-8.42E-01	±	2.04E+00	3.24E+00
BALA140		-1.78E-01	±	9.31E+00	1.53E+01
BI-214		4.60E+00	±	5.43E+00	9.44E+00
RA-226		-1.63E+01	±	5.87E+01	7.87E+01

Location 101 collected 3/1/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-2.85E+01	±	5.21E+01	5.52E+01
CR-51		5.23E+00	±	2.59E+01	4.21E+01
MN-54		1.01E+00	±	1.78E+00	2.77E+00
CO-58		-5.46E-01	±	2.26E+00	3.63E+00
FE-59		-2.25E+00	±	7.06E+00	1.12E+01
CO-60		6.67E-01	±	1.91E+00	3.01E+00
ZN-65		-5.68E-01	±	4.39E+00	7.12E+00
ZRNB-95		1.32E+00	±	2.29E+00	3.58E+00
I-131		-3.88E+00	±	1.02E+01	1.65E+01
CS-134		-5.88E-01	±	1.94E+00	3.12E+00
CS-137		2.96E-01	±	2.01E+00	3.27E+00
BALA140		2.91E+00	±	6.22E+00	9.60E+00
BI-214		-1.23E+00	±	5.36E+00	8.21E+00
RA-226		5.38E+00	±	4.36E+01	7.80E+01

Location 101 collected 4/5/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.34E+01	±	3.50E+01	5.35E+01
CR-51		5.41E-01	±	2.31E+01	3.79E+01
MN-54		1.66E+00	±	1.88E+00	2.84E+00
CO-58		-6.20E-01	±	2.19E+00	3.50E+00
FE-59		8.30E-01	±	5.25E+00	8.45E+00
CO-60		4.76E-01	±	1.75E+00	2.79E+00
ZN-65		-1.59E-01	±	3.50E+00	5.72E+00
ZRNB-95		1.22E-01	±	2.08E+00	3.40E+00
I-131		4.10E+00	±	7.89E+00	1.26E+01
CS-134		2.36E-01	±	2.06E+00	3.36E+00
CS-137		2.70E-01	±	1.87E+00	3.04E+00
BALA140		0.00E+00	±	8.63E+00	1.44E+01
BI-214		-5.73E-02	±	4.87E+00	8.89E+00
RA-226		-1.78E+01	±	6.09E+01	7.91E+01

Location 101 collected 5/2/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-2.96E+01	±	6.07E+01	5.32E+01
CR-51		1.60E+00	±	2.26E+01	3.70E+01
MN-54		1.76E-03	±	1.99E+00	3.28E+00
CO-58		-8.78E-02	±	2.04E+00	3.33E+00
FE-59		4.94E-01	±	5.66E+00	9.20E+00
CO-60		-3.49E-01	±	1.85E+00	2.97E+00
ZN-65		2.31E+00	±	4.25E+00	6.55E+00
ZRNB-95		8.54E-01	±	2.04E+00	3.21E+00
I-131		1.46E+00	±	5.76E+00	9.31E+00
CS-134		-7.12E-01	±	2.47E+00	3.99E+00
CS-137		-3.30E-01	±	2.00E+00	3.24E+00
BALA140		-1.43E+00	±	5.65E+00	9.01E+00
BI-214		-1.82E-01	±	5.37E+00	9.93E+00
RA-226		1.27E+00	±	5.14E+01	9.44E+01

Location 101 collected 6/3/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-6.85E+01	±	1.42E+03	5.74E+01
CR-51		-1.09E+01	±	2.75E+01	4.41E+01
MN-54		-2.03E-01	±	2.16E+00	3.52E+00
CO-58		-4.20E-02	±	2.16E+00	3.54E+00
FE-59		2.64E+00	±	5.96E+00	9.17E+00
CO-60		-4.67E-01	±	2.18E+00	3.50E+00
ZN-65		9.78E-01	±	4.68E+00	7.52E+00
ZRNB-95		-2.27E-02	±	2.26E+00	3.71E+00
I-131		-1.03E+00	±	9.86E+00	1.61E+01
CS-134		1.29E+00	±	1.81E+00	2.79E+00
CS-137		5.40E-02	±	2.46E+00	4.04E+00
BALA140		-7.25E-01	±	6.83E+00	1.11E+01
BI-214		-1.86E-01	±	4.81E+00	9.16E+00
RA-226		1.48E+00	±	4.87E+01	9.04E+01

Location 101 collected 7/1/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-2.09E+01	±	4.93E+01	5.49E+01
CR-51		1.91E+01	±	2.31E+01	3.58E+01
MN-54		3.92E-01	±	2.10E+00	3.40E+00
CO-58		-2.41E-03	±	2.11E+00	3.46E+00
FE-59		-1.45E+00	±	7.08E+00	1.14E+01
CO-60		4.55E-01	±	1.95E+00	3.12E+00
ZN-65		4.13E-01	±	4.02E+00	6.53E+00
ZRNB-95		-8.47E-01	±	2.49E+00	3.97E+00
I-131		4.45E-01	±	9.85E+00	1.61E+01
CS-134		1.58E+00	±	1.92E+00	2.94E+00
CS-137		-4.38E-01	±	2.08E+00	3.36E+00
BALA140		-1.05E+00	±	6.47E+00	1.04E+01
BI-214		2.97E+00	±	5.20E+00	9.61E+00
RA-226		4.99E+01	±	5.24E+01	9.28E+01

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 101

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

Location 101 collected 8/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.31E+01	±	4.05E+01	5.58E+01
CR-51		5.62E+00	±	2.60E+01	4.23E+01
MN-54		-4.88E-02	±	1.72E+00	2.82E+00
CO-58		-1.09E-01	±	2.40E+00	3.93E+00
FE-59		1.91E+00	±	5.86E+00	9.21E+00
CO-60		-2.89E-02	±	2.07E+00	3.40E+00
ZN-65		2.67E+00	±	4.56E+00	7.02E+00
ZRNB-95		9.61E-01	±	2.23E+00	3.52E+00
I-131		3.44E+00	±	6.01E+00	9.45E+00
CS-134		8.55E-01	±	2.20E+00	3.51E+00
CS-137		-3.22E-01	±	2.05E+00	3.32E+00
BALA140		-1.81E+00	±	5.83E+00	9.21E+00
BI-214		1.22E+00	±	5.23E+00	9.80E+00
RA-226		1.44E+00	±	5.19E+01	9.52E+01

Location 101 collected 9/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.83E+01	±	4.33E+01	5.01E+01
CR-51		-3.49E-01	±	2.62E+01	4.30E+01
MN-54		4.73E-03	±	1.68E+00	2.76E+00
CO-58		-2.75E-01	±	2.38E+00	3.86E+00
FE-59		5.04E-02	±	6.15E+00	1.01E+01
CO-60		-8.51E-01	±	2.23E+00	3.50E+00
ZN-65		-1.71E+00	±	4.69E+00	7.41E+00
ZRNB-95		0.00E+00	±	2.74E+00	4.56E+00
I-131		-6.00E-01	±	1.05E+01	1.72E+01
CS-134		-7.42E-01	±	2.42E+00	3.90E+00
CS-137		-1.14E+00	±	2.50E+00	3.97E+00
BALA140		0.00E+00	±	2.15E+00	3.59E+00
BI-214		4.27E+00	±	5.57E+00	9.85E+00
RA-226		-5.03E+00	±	5.56E+01	9.41E+01

Location 101 collected 10/3/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.80E+01	±	4.93E+01	5.39E+01
CR-51		-6.51E+00	±	2.19E+01	3.54E+01
MN-54		-1.66E-01	±	2.02E+00	3.30E+00
CO-58		0.00E+00	±	1.92E+00	3.20E+00
FE-59		-9.12E-01	±	5.33E+00	8.57E+00
CO-60		1.89E+00	±	1.92E+00	2.79E+00
ZN-65		2.00E-01	±	5.21E+00	8.55E+00
ZRNB-95		-8.56E-01	±	2.21E+00	3.51E+00
I-131		2.05E-01	±	5.40E+00	8.85E+00
CS-134		1.27E-01	±	1.81E+00	2.96E+00
CS-137		6.95E-03	±	1.88E+00	3.09E+00
BALA140		-9.05E-01	±	4.78E+00	7.67E+00
BI-214		1.66E+00	±	4.50E+00	8.28E+00
RA-226		-3.23E+00	±	4.58E+01	7.78E+01

Location 101 collected 11/2/2011

Nuclide	RQ	Activity		Error	MDA
K-40		2.10E+00	±	2.72E+01	5.36E+01
CR-51		-1.55E+01	±	2.49E+01	3.95E+01
MN-54		-4.51E-01	±	2.03E+00	3.27E+00
CO-58		-8.04E-01	±	2.40E+00	3.82E+00
FE-59		-1.33E-01	±	5.89E+00	9.65E+00
CO-60		1.66E-02	±	1.98E+00	3.25E+00
ZN-65		-2.31E-01	±	4.78E+00	7.82E+00
ZRNB-95		-4.51E-01	±	2.35E+00	3.80E+00
I-131		-3.67E+00	±	6.68E+00	1.06E+01
CS-134		4.20E-01	±	2.05E+00	3.31E+00
CS-137		-6.15E-02	±	2.27E+00	3.72E+00
BALA140		-1.44E+00	±	5.70E+00	9.08E+00
BI-214		-1.42E+00	±	6.09E+00	1.05E+01
RA-226		-2.16E+01	±	6.48E+01	9.27E+01

Location 101 collected 12/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.03E+01	±	3.57E+01	5.32E+01
CR-51		-5.62E-01	±	2.54E+01	4.18E+01
MN-54		9.69E-01	±	2.06E+00	3.23E+00
CO-58		6.05E-01	±	2.17E+00	3.47E+00
FE-59		2.22E+00	±	5.76E+00	8.96E+00
CO-60		2.72E-01	±	1.80E+00	2.90E+00
ZN-65		0.00E+00	±	7.04E+00	1.17E+01
ZRNB-95		6.76E-01	±	4.06E+00	6.56E+00
I-131		-8.91E-01	±	7.17E+00	1.17E+01
CS-134		1.17E+00	±	2.11E+00	3.32E+00
CS-137		-8.58E-01	±	2.17E+00	3.43E+00
BALA140		-1.39E+00	±	6.41E+00	1.03E+01
BI-214		2.62E+00	±	5.43E+00	1.04E+01
RA-226		1.26E+01	±	4.91E+01	9.07E+01

Location 101 collected 1/5/2012

Nuclide	RQ	Activity		Error	MDA
K-40		-3.31E+01	±	5.89E+01	5.51E+01
CR-51		-1.45E-01	±	2.19E+01	3.60E+01
MN-54		-2.59E-02	±	1.57E+00	2.57E+00
CO-58		0.00E+00	±	2.50E+00	4.17E+00
FE-59		0.00E+00	±	9.48E+00	1.58E+01
CO-60		5.96E-01	±	1.95E+00	3.11E+00
ZN-65		1.23E+00	±	4.02E+00	6.39E+00
ZRNB-95		-8.57E-01	±	3.72E+00	5.99E+00
I-131		1.64E+00	±	7.83E+00	1.27E+01
CS-134		-2.89E-01	±	1.83E+00	2.98E+00
CS-137		-1.04E+00	±	2.28E+00	3.63E+00
BALA140		-1.99E-01	±	6.00E+00	9.83E+00
BI-214	+	1.43E+01	±	5.00E+00	7.88E+00
RA-226		2.31E+00	±	3.94E+01	7.18E+01

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 101

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	-2.41E+01	-6.85E+01	2.10E+00	5.43E+01	12	0
CR-51	1.95E-02	-1.55E+01	1.91E+01	4.02E+01	12	0
MN-54	1.83E-01	-9.55E-01	1.66E+00	3.10E+00	12	0
CO-58	-1.58E-01	-8.04E-01	6.05E-01	3.65E+00	12	0
FE-59	4.64E-01	-2.25E+00	2.64E+00	1.00E+01	12	0
CO-60	2.40E-01	-8.51E-01	1.89E+00	3.13E+00	12	0
ZN-65	3.10E-01	-1.71E+00	2.67E+00	7.50E+00	12	0
ZRNB-95	1.81E-01	-8.57E-01	1.32E+00	4.16E+00	12	0
I-131	9.77E-01	-3.88E+00	1.05E+01	1.33E+01	12	0
CS-134	2.84E-01	-7.42E-01	1.58E+00	3.30E+00	12	0
CS-137	-3.68E-01	-1.14E+00	2.96E-01	3.45E+00	12	0
BALA140	-5.17E-01	-1.81E+00	2.91E+00	9.95E+00	12	0
BI-214	2.38E+00	-1.42E+00	1.43E+01	9.33E+00	12	1
RA-226	8.69E-01	-2.16E+01	4.99E+01	8.63E+01	12	0

TABLE B-3.1

GROSS BETA IN STORM DRAIN WATER

Results in pCi per liter

Location	Collection Period	RQ	Activity		Error	MDA
ST-101	01/03/11 - 02/02/11		6.11E-01	±	8.45E-01	2.85E+00
	02/02/11 - 03/01/11		1.62E+00	±	7.86E-01	2.38E+00
	03/01/11 - 04/05/11		-5.98E-02	±	6.88E-01	2.34E+00
	04/05/11 - 05/02/11		4.95E-01	±	6.72E-01	2.29E+00
	05/02/11 - 06/03/11		5.56E-01	±	7.30E-01	2.37E+00
	06/03/11 - 07/01/11		8.05E-01	±	7.65E-01	2.41E+00
	07/01/11 - 08/01/11		3.65E-01	±	6.72E-01	2.30E+00
	08/01/11 - 09/01/11		5.84E-01	±	7.81E-01	2.53E+00
	09/01/11 - 10/03/11		3.82E-01	±	7.99E-01	2.66E+00
	10/03/11 - 11/02/11		3.38E-01	±	6.72E-01	2.24E+00
	11/02/11 - 12/01/11		-1.61E+00	±	9.08E-01	2.71E+00
	12/01/11 - 01/05/12		1.31E+00	±	7.92E-01	2.41E+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
4.50E-01	-1.61E+00	1.62E+00	12	0

TABLE B-4.1

TRITIUM IN STORM DRAIN WATER

Results in pCi per liter

Location	Collection Period	RQ	Activity		Error
ST-101	01/03/11 - 02/02/11	+	2.25E+03	±	1.46E+02
	02/02/11 - 03/01/11	+	2.53E+03	±	1.59E+02
	03/01/11 - 04/05/11	+	8.41E+02	±	1.23E+02
	04/05/11 - 05/02/11		6.25E+01	±	9.93E+01
	05/02/11 - 06/03/11		1.61E+02	±	1.01E+02
	06/03/11 - 07/05/11		8.73E+01	±	9.77E+01
	07/05/11 - 08/01/11		1.80E+02	±	9.72E+01
	08/01/11 - 09/01/11		8.05E+01	±	1.01E+02
	09/01/11 - 10/03/11		7.55E+01	±	1.06E+02
	10/03/11 - 11/02/11	+	7.25E+02	±	1.18E+02
	11/02/11 - 12/01/11	+	6.59E+02	±	1.14E+02
	12/01/11 - 01/05/12	+	7.83E+02	±	1.21E+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
7.02E+02	6.25E+01	2.53E+03	12	6

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

Collection Period	ST 102A				ST 102B			
	RQ	Activity	Error	MDA	RQ	Activity	Error	MDA
01/03/11 - 02/02/11		-1.18E+00 ±	1.59E+00	5.90E+00		-2.87E+00 ±	2.46E+00	8.61E+00
02/02/11 - 03/01/11		-3.35E-16 ±	1.04E+00	4.63E+00		-2.98E-16 ±	9.24E-01	4.11E+00
03/01/11 - 04/05/11		-6.40E-01 ±	9.18E-01	3.51E+00		1.34E+00 ±	1.71E+00	6.44E+00
04/05/11 - 05/02/11		1.44E+00 ±	9.84E-01	3.30E+00		1.53E+00 ±	1.71E+00	6.52E+00
05/02/11 - 06/03/11		-1.34E+00 ±	1.09E+00	3.85E+00		-4.82E-01 ±	1.33E+00	5.54E+00
06/03/11 - 07/01/11		-2.28E-01 ±	7.71E-01	3.39E+00		2.05E-01 ±	1.35E+00	6.12E+00
07/01/11 - 08/01/11		-1.10E-16 ±	4.81E-01	2.37E+00		2.04E+00 ±	1.38E+00	4.59E+00
08/01/11 - 09/01/11		-1.11E-01 ±	8.08E-01	3.58E+00		2.73E-01 ±	1.02E+00	4.40E+00
09/01/11 - 10/03/11		-1.04E-01 ±	9.46E-01	3.99E+00		-1.62E-01 ±	1.48E+00	6.23E+00
10/03/11 - 11/02/11		3.94E-01 ±	7.10E-01	2.93E+00		3.43E+00 ±	1.47E+00	4.09E+00
11/02/11 - 12/01/11		2.40E+00 ±	1.38E+00	4.47E+00		1.49E+00 ±	1.89E+00	6.95E+00
12/01/11 - 01/05/12		1.81E-01 ±	9.77E-01	3.95E+00		2.55E+00 ±	1.90E+00	6.51E+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 102A	6.82E-02	-1.34E+00	2.40E+00	12	0
ST 102B	7.79E-01	-2.87E+00	3.43E+00	12	0

TABLE B-6.1

GROSS BETA IN SANITARY WASTE TREATMENT WATER

Results in pCi per liter

Collection Period	ST 102A				ST 102B			
	RQ	Activity	Error	MDA	RQ	Activity	Error	MDA
01/03/11 - 02/02/11	+	5.11E+00 ±	1.27E+00	3.62E+00	+	2.13E+01 ±	1.93E+00	3.80E+00
02/02/11 - 03/01/11	+	5.09E+00 ±	1.13E+00	3.05E+00	+	1.72E+01 ±	1.62E+00	3.00E+00
03/01/11 - 04/05/11	+	5.00E+00 ±	9.14E-01	2.26E+00	+	1.30E+01 ±	1.32E+00	2.45E+00
04/05/11 - 05/02/11	+	5.32E+00 ±	1.12E+00	2.90E+00	+	3.00E+01 ±	2.16E+00	3.34E+00
05/02/11 - 06/03/11	+	5.70E+00 ±	1.16E+00	3.02E+00	+	1.69E+01 ±	1.66E+00	3.18E+00
06/03/11 - 07/01/11	+	3.07E+00 ±	1.02E+00	3.06E+00	+	1.52E+01 ±	1.76E+00	3.72E+00
07/01/11 - 08/01/11	+	3.84E+00 ±	8.64E-01	2.34E+00	+	1.84E+01 ±	1.71E+00	3.11E+00
08/01/11 - 09/01/11		1.12E+00 ±	9.44E-01	3.18E+00	+	1.55E+01 ±	1.61E+00	3.28E+00
09/01/11 - 10/03/11	+	3.05E+00 ±	9.29E-01	2.75E+00	+	1.43E+01 ±	1.43E+00	2.92E+00
10/03/11 - 11/02/11	+	5.90E+00 ±	9.63E-01	2.29E+00	+	1.25E+01 ±	1.29E+00	2.39E+00
11/02/11 - 12/01/11	+	3.23E+00 ±	9.64E-01	2.74E+00	+	1.78E+01 ±	1.55E+00	2.91E+00
12/01/11 - 01/05/12	+	3.95E+00 ±	9.04E-01	2.45E+00	+	1.26E+01 ±	1.33E+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 102A	4.20E+00	1.12E+00	5.90E+00	12	11
ST 102B	1.71E+01	1.25E+01	3.00E+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 102A

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

Location 102a collected 2/2/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.50E+01	±	3.51E+01	5.26E+01
CR-51		-7.59E+00	±	2.58E+01	4.18E+01
MN-54		-4.49E-02	±	1.84E+00	3.02E+00
CO-58		-1.12E+00	±	2.28E+00	3.59E+00
FE-59		-9.55E-01	±	6.13E+00	9.90E+00
CO-60		4.08E-04	±	1.85E+00	3.13E+00
ZN-65		-1.27E+00	±	4.28E+00	6.83E+00
ZRNB-95		-8.06E-01	±	2.41E+00	3.85E+00
I-131		1.07E+00	±	5.79E+00	9.38E+00
CS-134		-6.64E-01	±	1.92E+00	3.08E+00
CS-137		1.32E+00	±	1.85E+00	2.85E+00
BALA140		2.11E+00	±	4.84E+00	7.41E+00
BI-214		-4.72E-01	±	4.93E+00	8.50E+00
RA-226		-1.98E+01	±	6.34E+01	7.94E+01

Location 102a collected 3/1/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-4.38E+01	±	7.56E+01	5.41E+01
CR-51		5.97E+00	±	2.53E+01	4.10E+01
MN-54		7.03E-01	±	1.82E+00	2.88E+00
CO-58		4.12E-01	±	2.03E+00	3.27E+00
FE-59		2.10E+00	±	5.66E+00	8.87E+00
CO-60		7.39E-01	±	1.78E+00	2.78E+00
ZN-65		-1.96E+00	±	4.68E+00	7.39E+00
ZRNB-95		1.42E+00	±	2.18E+00	3.37E+00
I-131		1.86E+00	±	7.20E+00	1.16E+01
CS-134		-3.54E-01	±	1.73E+00	2.79E+00
CS-137		-6.50E-01	±	2.17E+00	3.49E+00
BALA140		-1.02E+00	±	6.26E+00	1.01E+01
BI-214		-9.78E-01	±	5.36E+00	8.48E+00
RA-226		-1.15E+01	±	5.09E+01	7.51E+01

Location 102a collected 4/5/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-9.52E+00	±	3.56E+01	5.48E+01
CR-51		1.34E+00	±	2.17E+01	3.56E+01
MN-54		-3.84E-01	±	2.15E+00	3.48E+00
CO-58		-6.02E-01	±	2.75E+00	4.45E+00
FE-59		1.76E+00	±	6.20E+00	9.81E+00
CO-60		-1.10E-01	±	1.89E+00	3.09E+00
ZN-65		-4.99E-01	±	4.46E+00	7.25E+00
ZRNB-95		2.20E+00	±	2.44E+00	3.67E+00
I-131		-3.16E-01	±	8.20E+00	1.35E+01
CS-134		-9.82E-01	±	2.29E+00	3.66E+00
CS-137		-3.59E-01	±	2.16E+00	3.49E+00
BALA140		1.96E-01	±	6.13E+00	1.00E+01
BI-214		-6.54E-01	±	5.78E+00	1.00E+01
RA-226		7.74E+00	±	4.76E+01	8.84E+01

Location 102a collected 5/2/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-2.23E+01	±	5.22E+01	5.55E+01
CR-51		-3.40E+00	±	2.36E+01	3.85E+01
MN-54		5.55E-02	±	2.01E+00	3.29E+00
CO-58		-4.52E-01	±	2.06E+00	3.30E+00
FE-59		-1.44E+00	±	5.96E+00	9.49E+00
CO-60		5.87E-01	±	2.07E+00	3.29E+00
ZN-65		-2.59E-01	±	4.74E+00	7.75E+00
ZRNB-95		-1.63E-01	±	2.36E+00	3.86E+00
I-131		-3.22E+00	±	6.38E+00	1.01E+01
CS-134		-1.61E+00	±	2.43E+00	3.81E+00
CS-137		8.25E-01	±	2.08E+00	3.29E+00
BALA140		-1.28E+00	±	5.89E+00	9.44E+00
BI-214		3.86E+00	±	5.37E+00	9.76E+00
RA-226		-5.86E+00	±	5.26E+01	9.09E+01

Location 102a collected 6/3/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.06E+01	±	3.36E+01	5.19E+01
CR-51		-2.48E-01	±	2.75E+01	4.52E+01
MN-54		-7.37E-01	±	2.23E+00	3.55E+00
CO-58		1.62E+00	±	2.14E+00	3.21E+00
FE-59		3.98E+00	±	6.71E+00	1.01E+01
CO-60		5.15E-01	±	1.92E+00	3.05E+00
ZN-65		-1.16E+00	±	4.84E+00	7.75E+00
ZRNB-95		-2.95E-02	±	2.35E+00	3.86E+00
I-131		2.46E+00	±	1.18E+01	1.90E+01
CS-134		-1.19E+00	±	2.28E+00	3.62E+00
CS-137		-4.51E-01	±	2.11E+00	3.41E+00
BALA140		-1.21E+00	±	8.96E+00	1.45E+01
BI-214		-3.89E-01	±	5.29E+00	9.62E+00
RA-226		1.93E+01	±	4.98E+01	9.09E+01

Location 102a collected 7/1/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.95E+01	±	4.77E+01	5.52E+01
CR-51		1.65E+01	±	2.68E+01	4.25E+01
MN-54		8.95E-01	±	2.45E+00	3.90E+00
CO-58		-3.36E-01	±	2.33E+00	3.78E+00
FE-59		-3.17E-02	±	6.75E+00	1.11E+01
CO-60		6.03E-01	±	1.86E+00	2.92E+00
ZN-65		3.20E-01	±	2.98E+00	4.81E+00
ZRNB-95		1.61E+00	±	2.46E+00	3.81E+00
I-131		-2.83E+00	±	8.89E+00	1.43E+01
CS-134		-1.19E+00	±	2.62E+00	4.18E+00
CS-137		-6.15E-01	±	2.18E+00	3.49E+00
BALA140		9.85E-02	±	6.94E+00	1.14E+01
BI-214		-1.90E+00	±	6.69E+00	9.85E+00
RA-226		-1.97E+01	±	6.75E+01	9.64E+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 102A

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

Location 102a collected 8/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.68E+01	±	6.24E+01	5.68E+01
CR-51		1.45E+01	±	2.59E+01	4.11E+01
MN-54		-2.64E-01	±	2.15E+00	3.49E+00
CO-58		-9.60E-01	±	2.49E+00	3.95E+00
FE-59		4.38E+00	±	6.54E+00	9.86E+00
CO-60		-1.30E-01	±	2.17E+00	3.55E+00
ZN-65		-1.69E+00	±	5.02E+00	7.99E+00
ZRNB-95		-2.97E-01	±	2.56E+00	4.17E+00
I-131		7.59E-01	±	7.07E+00	1.15E+01
CS-134		2.33E-01	±	2.50E+00	4.09E+00
CS-137		-5.88E-01	±	2.30E+00	3.71E+00
BALA140		-1.24E+00	±	5.86E+00	9.36E+00
BI-214		3.72E-01	±	5.42E+00	1.01E+01
RA-226		-1.07E+01	±	5.88E+01	9.46E+01

Location 102a collected 9/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		6.96E+00	±	2.71E+01	5.27E+01
CR-51		-5.76E-01	±	2.47E+01	4.06E+01
MN-54		-6.35E-02	±	2.13E+00	3.50E+00
CO-58		-1.72E+00	±	2.70E+00	4.18E+00
FE-59		-2.11E-01	±	6.90E+00	1.13E+01
CO-60		1.07E+00	±	1.95E+00	2.98E+00
ZN-65		-2.84E-01	±	4.11E+00	6.70E+00
ZRNB-95		0.00E+00	±	3.99E+00	6.64E+00
I-131		8.93E+00	±	1.30E+01	2.03E+01
CS-134		-5.55E-02	±	2.54E+00	4.17E+00
CS-137		2.57E-01	±	2.04E+00	3.31E+00
BALA140		0.00E+00	±	7.27E+00	1.21E+01
BI-214		2.02E+00	±	5.47E+00	1.05E+01
RA-226		-1.12E+01	±	5.96E+01	9.59E+01

Location 102a collected 10/3/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.31E+01	±	5.34E+01	5.37E+01
CR-51		2.54E+01	±	2.49E+01	3.83E+01
MN-54		-6.71E-01	±	2.56E+00	4.13E+00
CO-58		2.77E-01	±	2.18E+00	3.54E+00
FE-59		1.87E+00	±	5.88E+00	9.25E+00
CO-60		-2.96E-02	±	2.03E+00	3.34E+00
ZN-65		1.47E+00	±	3.94E+00	6.17E+00
ZRNB-95		1.83E+00	±	2.34E+00	3.55E+00
I-131		1.49E+00	±	7.51E+00	1.22E+01
CS-134		-9.90E-01	±	2.23E+00	3.55E+00
CS-137		1.47E+00	±	2.14E+00	3.29E+00
BALA140		4.77E-01	±	5.65E+00	9.18E+00
BI-214		-3.79E+00	±	7.97E+00	1.08E+01
RA-226		5.33E+00	±	5.32E+01	9.72E+01

Location 102a collected 11/2/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.15E+01	±	5.58E+01	5.51E+01
CR-51		-2.20E+00	±	2.14E+01	3.49E+01
MN-54		3.36E-01	±	1.82E+00	2.94E+00
CO-58		3.19E-01	±	1.77E+00	2.85E+00
FE-59		1.17E+00	±	5.93E+00	9.52E+00
CO-60		4.72E-01	±	1.66E+00	2.64E+00
ZN-65		7.41E-01	±	3.06E+00	4.86E+00
ZRNB-95		5.11E-01	±	3.98E+00	6.48E+00
I-131		3.24E-01	±	5.80E+00	9.51E+00
CS-134		-3.75E-01	±	2.08E+00	3.37E+00
CS-137		-9.47E-04	±	1.84E+00	3.06E+00
BALA140		0.00E+00	±	3.76E+00	6.26E+00
BI-214		3.38E+00	±	5.05E+00	8.95E+00
RA-226		-4.52E+00	±	4.65E+01	7.73E+01

Location 102a collected 12/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-7.55E+00	±	2.96E+01	4.97E+01
CR-51		1.15E+00	±	2.38E+01	3.90E+01
MN-54		0.00E+00	±	2.41E+00	4.01E+00
CO-58		-4.68E-01	±	2.49E+00	4.03E+00
FE-59		-2.01E+00	±	6.12E+00	9.62E+00
CO-60		-1.31E-02	±	1.67E+00	2.75E+00
ZN-65		-1.57E+00	±	5.17E+00	8.25E+00
ZRNB-95		-2.06E-01	±	3.92E+00	6.41E+00
I-131		4.66E+00	±	8.26E+00	1.31E+01
CS-134		-1.51E-01	±	4.24E+00	6.97E+00
CS-137		-6.56E-01	±	2.23E+00	3.57E+00
BALA140		-1.08E+00	±	6.12E+00	9.82E+00
BI-214		1.33E+00	±	5.54E+00	1.07E+01
RA-226		-1.25E+01	±	6.07E+01	9.60E+01

Location 102a collected 1/5/2012

Nuclide	RQ	Activity		Error	MDA
K-40		-2.31E+01	±	4.49E+01	5.43E+01
CR-51		1.08E+01	±	2.20E+01	3.51E+01
MN-54		-2.85E-01	±	1.75E+00	2.83E+00
CO-58		3.26E-01	±	1.58E+00	2.53E+00
FE-59		-2.28E-01	±	5.97E+00	9.77E+00
CO-60		-1.65E-01	±	1.70E+00	2.75E+00
ZN-65		0.00E+00	±	6.51E+00	1.09E+01
ZRNB-95		1.73E+00	±	3.30E+00	5.13E+00
I-131		9.49E-01	±	8.50E+00	1.39E+01
CS-134		-2.29E-01	±	1.89E+00	3.08E+00
CS-137		-2.03E-01	±	1.64E+00	2.67E+00
BALA140		-3.61E-01	±	5.70E+00	9.29E+00
BI-214		3.09E+00	±	4.53E+00	8.17E+00
RA-226		-6.78E+00	±	4.66E+01	7.48E+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 2/2/2011

Nuclide	RQ	Activity		Error	MDA
K-40		4.89E+00	±	2.81E+01	5.54E+01
CR-51		-1.30E+01	±	2.48E+01	3.97E+01
MN-54		0.00E+00	±	2.13E+00	3.55E+00
CO-58		0.00E+00	±	2.59E+00	4.31E+00
FE-59		-6.79E-03	±	6.30E+00	1.04E+01
CO-60		7.07E-02	±	1.85E+00	3.03E+00
ZN-65		5.85E-01	±	3.04E+00	4.86E+00
ZRNB-95		0.00E+00	±	2.61E+00	4.35E+00
I-131		-2.88E+00	±	7.59E+00	1.21E+01
CS-134		-2.55E-01	±	2.02E+00	3.29E+00
CS-137		-7.21E-01	±	2.08E+00	3.33E+00
BALA140		-9.59E-01	±	6.97E+00	1.13E+01
BI-214		3.01E+00	±	5.01E+00	8.92E+00
RA-226		-2.06E+01	±	6.66E+01	8.17E+01

Location 102b collected 3/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.79E+01	±	3.95E+01	5.43E+01
CR-51		-8.76E-01	±	2.01E+01	3.29E+01
MN-54		1.64E+00	±	1.66E+00	2.44E+00
CO-58		1.40E+00	±	1.83E+00	2.77E+00
FE-59		1.24E+00	±	5.06E+00	8.04E+00
CO-60		-8.91E-01	±	2.16E+00	3.41E+00
ZN-65		-2.31E+00	±	4.95E+00	7.81E+00
ZRNB-95		-3.52E-01	±	2.27E+00	3.69E+00
I-131		1.72E+00	±	5.68E+00	9.17E+00
CS-134		-1.07E+00	±	2.31E+00	3.70E+00
CS-137		-1.50E-01	±	1.59E+00	2.59E+00
BALA140		-1.46E+00	±	5.32E+00	8.46E+00
BI-214		-2.03E+00	±	7.29E+00	9.31E+00
RA-226		-2.42E+01	±	7.07E+01	8.11E+01

Location 102b collected 4/5/2011

Nuclide	RQ	Activity		Error	MDA
K-40		1.01E+01	±	2.80E+01	5.41E+01
CR-51		-7.89E-02	±	2.79E+01	4.58E+01
MN-54		-2.32E-03	±	2.18E+00	3.57E+00
CO-58		2.63E-02	±	2.08E+00	3.42E+00
FE-59		-4.90E-01	±	6.01E+00	9.78E+00
CO-60		-5.87E-02	±	2.15E+00	3.53E+00
ZN-65		-2.94E-01	±	3.31E+00	5.37E+00
ZRNB-95		6.65E-01	±	2.38E+00	3.81E+00
I-131		3.05E+00	±	7.88E+00	1.26E+01
CS-134		9.79E-02	±	2.34E+00	3.84E+00
CS-137		9.09E-03	±	1.97E+00	3.24E+00
BALA140		-1.01E-01	±	5.11E+00	8.37E+00
BI-214		1.06E+00	±	4.87E+00	9.30E+00
RA-226		3.54E+01	±	4.94E+01	8.92E+01

Location 102b collected 5/2/2011

Nuclide	RQ	Activity		Error	MDA
K-40		3.62E+01	±	3.15E+01	5.58E+01
CR-51		-1.46E+00	±	2.36E+01	3.86E+01
MN-54		-9.88E-01	±	2.36E+00	3.74E+00
CO-58		1.00E-01	±	2.11E+00	3.46E+00
FE-59		-1.66E+00	±	6.98E+00	1.12E+01
CO-60		1.19E+00	±	1.77E+00	2.62E+00
ZN-65		-1.43E+00	±	5.23E+00	8.38E+00
ZRNB-95		1.26E+00	±	1.85E+00	2.79E+00
I-131		2.81E+00	±	5.85E+00	9.27E+00
CS-134		-5.75E-01	±	2.26E+00	3.65E+00
CS-137		3.92E-01	±	2.20E+00	3.56E+00
BALA140		1.69E+00	±	3.74E+00	5.59E+00
BI-214		-3.26E-01	±	5.53E+00	1.00E+01
RA-226		5.16E-01	±	5.09E+01	9.37E+01

Location 102b collected 6/3/2011

Nuclide	RQ	Activity		Error	MDA
K-40		2.34E+00	±	2.73E+01	5.40E+01
CR-51		2.66E-01	±	2.93E+01	4.81E+01
MN-54		8.96E-01	±	2.02E+00	3.17E+00
CO-58		-4.90E-01	±	2.58E+00	4.17E+00
FE-59		3.67E+00	±	6.25E+00	9.39E+00
CO-60		1.62E-02	±	1.90E+00	3.12E+00
ZN-65		-2.96E+00	±	5.69E+00	8.92E+00
ZRNB-95		1.96E+00	±	2.43E+00	3.66E+00
I-131		0.00E+00	±	1.44E+01	2.41E+01
CS-134		1.00E+00	±	1.94E+00	3.05E+00
CS-137		-3.32E-01	±	2.31E+00	3.75E+00
BALA140		-1.95E-01	±	8.36E+00	1.37E+01
BI-214		-1.14E+00	±	5.34E+00	9.02E+00
RA-226		2.95E+01	±	5.13E+01	9.24E+01

Location 102b collected 7/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		9.33E+00	±	2.81E+01	5.42E+01
CR-51		2.22E+00	±	2.73E+01	4.47E+01
MN-54		6.73E-02	±	2.18E+00	3.57E+00
CO-58		4.29E-01	±	2.13E+00	3.43E+00
FE-59		5.25E-01	±	7.05E+00	1.15E+01
CO-60		4.56E-02	±	1.40E+00	2.29E+00
ZN-65		-1.50E+00	±	4.84E+00	7.71E+00
ZRNB-95		9.33E-01	±	2.58E+00	4.10E+00
I-131		-6.83E-01	±	1.26E+01	2.06E+01
CS-134		-1.74E+00	±	2.62E+00	4.14E+00
CS-137		0.00E+00	±	2.27E+00	3.78E+00
BALA140		-2.03E+00	±	8.12E+00	1.29E+01
BI-214		1.64E+00	±	5.23E+00	9.77E+00
RA-226		8.92E+00	±	5.28E+01	9.59E+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 8/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		7.27E+00	±	2.57E+01	5.12E+01
CR-51		7.40E+00	±	2.27E+01	3.64E+01
MN-54		-6.73E-01	±	2.07E+00	3.29E+00
CO-58		-2.55E-02	±	1.91E+00	3.14E+00
FE-59		-3.23E+00	±	7.25E+00	1.13E+01
CO-60		6.63E-01	±	1.63E+00	2.51E+00
ZN-65		-1.33E+00	±	5.07E+00	8.12E+00
ZRNB-95		6.74E-01	±	2.25E+00	3.60E+00
I-131		1.91E+00	±	6.53E+00	1.05E+01
CS-134		-2.86E-02	±	1.98E+00	3.25E+00
CS-137		-8.48E-01	±	2.29E+00	3.65E+00
BALA140		7.08E-01	±	5.35E+00	8.63E+00
BI-214		3.72E-01	±	5.28E+00	9.95E+00
RA-226		4.10E+01	±	5.45E+01	9.65E+01

Location 102b collected 9/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.59E+01	±	3.85E+01	5.29E+01
CR-51		-2.97E+00	±	2.80E+01	4.58E+01
MN-54		2.87E-01	±	2.04E+00	3.32E+00
CO-58		1.98E+00	±	2.33E+00	3.57E+00
FE-59		-8.24E-01	±	6.63E+00	1.08E+01
CO-60		4.46E-02	±	1.47E+00	2.40E+00
ZN-65		0.00E+00	±	5.59E+00	9.31E+00
ZRNB-95		1.44E+00	±	2.63E+00	4.17E+00
I-131		-6.22E+00	±	1.55E+01	2.51E+01
CS-134		6.95E-03	±	1.64E+00	2.69E+00
CS-137		8.51E-01	±	1.76E+00	2.78E+00
BALA140		1.04E+00	±	6.79E+00	1.09E+01
BI-214		-2.54E-01	±	4.43E+00	8.01E+00
RA-226		-1.82E+01	±	6.91E+01	9.80E+01

Location 102b collected 10/3/2011

Nuclide	RQ	Activity		Error	MDA
K-40		3.80E+00	±	2.74E+01	5.36E+01
CR-51		7.18E+00	±	2.44E+01	3.94E+01
MN-54		-2.86E-01	±	1.99E+00	3.23E+00
CO-58		-2.07E-01	±	2.10E+00	3.42E+00
FE-59		-2.03E+00	±	6.71E+00	1.06E+01
CO-60		4.42E-01	±	1.87E+00	2.97E+00
ZN-65		7.00E-01	±	4.15E+00	6.69E+00
ZRNB-95		0.00E+00	±	2.60E+00	4.34E+00
I-131		9.36E-01	±	6.67E+00	1.08E+01
CS-134		-1.23E+00	±	2.53E+00	4.03E+00
CS-137		-8.15E-01	±	2.06E+00	3.25E+00
BALA140		-5.85E-02	±	4.93E+00	8.09E+00
BI-214		-6.78E+00	±	1.08E+01	1.07E+01
RA-226		-4.70E+00	±	5.45E+01	9.50E+01

Location 102b collected 11/2/2011

Nuclide	RQ	Activity		Error	MDA
K-40		1.95E+00	±	2.82E+01	5.49E+01
CR-51		1.17E+00	±	2.84E+01	4.67E+01
MN-54		5.77E-01	±	1.75E+00	2.78E+00
CO-58		1.26E+00	±	2.11E+00	3.25E+00
FE-59		1.68E+00	±	6.01E+00	9.53E+00
CO-60		0.00E+00	±	3.13E+00	5.22E+00
ZN-65		-3.98E+00	±	5.82E+00	9.01E+00
ZRNB-95		6.14E-01	±	3.48E+00	5.61E+00
I-131		2.14E+00	±	6.13E+00	9.83E+00
CS-134		1.69E-01	±	2.20E+00	3.59E+00
CS-137		6.97E-01	±	1.84E+00	2.90E+00
BALA140		7.73E-01	±	5.42E+00	8.74E+00
BI-214		-1.55E+00	±	6.20E+00	1.05E+01
RA-226		-2.84E+01	±	7.56E+01	9.79E+01

Location 102b collected 12/1/2011

Nuclide	RQ	Activity		Error	MDA
K-40		1.19E+01	±	2.63E+01	5.10E+01
CR-51		-4.68E+00	±	2.30E+01	3.73E+01
MN-54		8.74E-02	±	2.00E+00	3.28E+00
CO-58		2.12E-01	±	2.17E+00	3.52E+00
FE-59		1.32E-01	±	5.11E+00	8.37E+00
CO-60		-5.31E-01	±	2.05E+00	3.27E+00
ZN-65		1.41E+00	±	4.86E+00	7.76E+00
ZRNB-95		-7.08E-02	±	3.51E+00	5.76E+00
I-131		-1.70E+00	±	7.99E+00	1.29E+01
CS-134		-1.07E+00	±	2.34E+00	3.73E+00
CS-137		-5.89E-01	±	1.77E+00	2.80E+00
BALA140		-2.36E+00	±	6.67E+00	1.05E+01
BI-214		5.64E+00	±	5.50E+00	1.02E+01
RA-226		-1.50E+01	±	6.01E+01	9.31E+01

Location 102b collected 1/5/2012

Nuclide	RQ	Activity		Error	MDA
K-40		-7.79E+00	±	3.18E+01	5.17E+01
CR-51		8.94E+00	±	2.70E+01	4.34E+01
MN-54		1.36E-01	±	1.72E+00	2.80E+00
CO-58		-9.34E-01	±	2.29E+00	3.61E+00
FE-59		0.00E+00	±	8.21E+00	1.37E+01
CO-60		3.35E-03	±	2.13E+00	3.49E+00
ZN-65		8.64E-01	±	4.58E+00	7.37E+00
ZRNB-95		-1.07E+00	±	4.50E+00	7.23E+00
I-131		-1.85E-02	±	9.92E+00	1.63E+01
CS-134		-1.15E-01	±	1.46E+00	2.38E+00
CS-137		-4.27E-01	±	1.82E+00	2.92E+00
BALA140		8.79E-02	±	7.34E+00	1.20E+01
BI-214		-5.93E+00	±	8.98E+00	1.01E+01
RA-226		1.37E+01	±	5.23E+01	9.54E+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

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

Location	Nuclide	Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
102A	K-40	-1.88E+01	-4.38E+01	6.96E+00	5.39E+01	12	0
	CR-51	5.13E+00	-7.59E+00	2.54E+01	3.95E+01	12	0
	MN-54	-3.84E-02	-7.37E-01	8.95E-01	3.42E+00	12	0
	CO-58	-2.25E-01	-1.72E+00	1.62E+00	3.56E+00	12	0
	FE-59	8.65E-01	-2.01E+00	4.38E+00	9.88E+00	12	0
	CO-60	2.95E-01	-1.65E-01	1.07E+00	3.02E+00	12	0
	ZN-65	-5.12E-01	-1.96E+00	1.47E+00	7.22E+00	12	0
	ZRNB-95	6.50E-01	-8.06E-01	2.20E+00	4.57E+00	12	0
	I-131	1.34E+00	-3.22E+00	8.93E+00	1.32E+01	12	0
	CS-134	-6.30E-01	-1.61E+00	2.33E-01	3.87E+00	12	0
	CS-137	2.98E-02	-6.56E-01	1.47E+00	3.30E+00	12	0
	BALA140	-2.76E-01	-1.28E+00	2.11E+00	9.91E+00	12	0
	BI-214	4.89E-01	-3.79E+00	3.86E+00	9.62E+00	12	0
	RA-226	-5.84E+00	-1.98E+01	1.93E+01	8.81E+01	12	0
102B	K-40	3.85E+00	-1.79E+01	3.62E+01	5.36E+01	12	0
	CR-51	3.42E-01	-1.30E+01	8.94E+00	4.16E+01	12	0
	MN-54	1.45E-01	-9.88E-01	1.64E+00	3.23E+00	12	0
	CO-58	3.13E-01	-9.34E-01	1.98E+00	3.50E+00	12	0
	FE-59	-8.27E-02	-3.23E+00	3.67E+00	1.04E+01	12	0
	CO-60	8.29E-02	-8.91E-01	1.19E+00	3.16E+00	12	0
	ZN-65	-8.53E-01	-3.98E+00	1.41E+00	7.61E+00	12	0
	ZRNB-95	5.04E-01	-1.07E+00	1.96E+00	4.42E+00	12	0
	I-131	8.83E-02	-6.22E+00	3.05E+00	1.44E+01	12	0
	CS-134	-4.02E-01	-1.74E+00	1.00E+00	3.45E+00	12	0
	CS-137	-1.61E-01	-8.48E-01	8.51E-01	3.21E+00	12	0
	BALA140	-2.39E-01	-2.36E+00	1.69E+00	9.93E+00	12	0
	BI-214	-5.26E-01	-6.78E+00	5.64E+00	9.66E+00	12	0
	RA-226	1.49E+00	-2.84E+01	4.10E+01	9.25E+01	12	0

TABLE B-8.1

TRITIUM IN SANITARY WASTE TREATMENT WATER

Results in pCi per liter

Location	Description	Collection Period			RQ	Activity		Error
102A	FFTF-Effluent	01/03/11	-	02/02/11	+	1.78E+03	±	1.38E+02
		02/02/11	-	03/01/11	+	1.56E+03	±	1.40E+02
		03/01/11	-	04/05/11	+	1.69E+03	±	1.41E+02
		04/05/11	-	05/02/11	+	1.97E+03	±	1.45E+02
		05/02/11	-	06/03/11	+	1.93E+03	±	1.43E+02
		06/03/11	-	07/05/11	+	1.70E+03	±	1.39E+02
		07/05/11	-	08/01/11	+	1.92E+03	±	1.38E+02
		08/01/11	-	09/01/11	+	1.70E+03	±	1.38E+02
		09/01/11	-	10/03/11	+	1.68E+03	±	1.42E+02
		10/03/11	-	11/02/11	+	1.88E+03	±	1.43E+02
		11/02/11	-	12/01/11	+	1.78E+03	±	1.39E+02
		12/01/11	-	01/05/12	+	1.66E+03	±	1.40E+02
102B	Monthly Headworks	01/03/11	-	02/02/11	+	5.47E+02	±	1.10E+02
		02/02/11	-	03/01/11	+	5.81E+02	±	1.19E+02
		03/01/11	-	04/05/11		2.69E+02	±	1.09E+02
		04/05/11	-	05/02/11	+	3.26E+02	±	1.08E+02
		05/02/11	-	06/03/11		1.75E+02	±	1.02E+02
		06/03/11	-	07/05/11	+	3.69E+02	±	1.07E+02
		07/05/11	-	08/01/11	+	5.91E+02	±	1.08E+02
		08/01/11	-	09/01/11	+	3.26E+02	±	1.06E+02
		09/01/11	-	10/03/11	+	5.29E+02	±	1.15E+02
		10/03/11	-	11/02/11	+	5.55E+02	±	1.13E+02
		11/02/11	-	12/01/11	+	5.37E+02	±	1.11E+02
		12/01/11	-	01/05/12	+	5.09E+02	±	1.15E+02

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
102A & 102B	1.11E+03	1.75E+02	1.97E+03	24	22
102A FFTF Effluent	1.77E+03	1.56E+03	1.97E+03	12	12
102B Monthly Headworks	4.43E+02	1.75E+02	5.91E+02	12	10

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

TABLE B-10.1

GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING SAMPLES

Results in pCi per liter

Station MW-3 collected 1/19/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-7.23E+00	±	5.87E+01	9.49E+01
MN-54		2.10E+00	±	3.54E+00	5.45E+00
CO-58		1.19E+00	±	3.51E+00	5.56E+00
FE-59		0.00E+00	±	1.55E+01	2.58E+01
CO-60		2.06E+00	±	3.74E+00	5.70E+00
ZN-65		-3.72E+00	±	9.61E+00	1.52E+01
ZRNB-95		-2.13E+00	±	4.53E+00	7.17E+00
I-131		-1.95E-01	±	4.27E+00	7.00E+00
CS-134		-5.20E-01	±	1.04E+01	1.71E+01
CS-137		1.62E+00	±	3.29E+00	5.11E+00
BALA140		-2.65E-02	±	4.18E+00	6.87E+00
BI-214	+	2.77E+02	±	2.08E+01	1.38E+01

Station MW-8 collected 1/19/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		8.20E+00	±	4.30E+01	8.41E+01
MN-54		3.78E-02	±	2.82E+00	4.63E+00
CO-58		3.05E-01	±	3.13E+00	5.09E+00
FE-59		0.00E+00	±	1.82E+00	3.04E+00
CO-60		-7.66E-01	±	3.01E+00	4.75E+00
ZN-65		-8.05E+00	±	1.15E+01	1.77E+01
ZRNB-95		-4.04E-02	±	2.83E+00	4.64E+00
I-131		2.51E+00	±	5.10E+00	8.04E+00
CS-134		0.00E+00	±	0.00E+00	0.00E+00
CS-137		-1.62E+00	±	3.39E+00	5.27E+00
BALA140		-2.11E-01	±	5.30E+00	8.66E+00
BI-214	+	6.65E+01	±	1.13E+01	1.23E+01

Station MW-5 collected 1/19/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-2.74E+01	±	7.40E+01	8.19E+01
MN-54		-7.75E-01	±	3.53E+00	5.66E+00
CO-58		-1.14E+00	±	3.60E+00	5.72E+00
FE-59		0.00E+00	±	6.43E+00	1.07E+01
CO-60		-2.02E-01	±	2.86E+00	4.64E+00
ZN-65		-4.23E+00	±	9.62E+00	1.51E+01
ZRNB-95		3.04E+00	±	2.89E+00	4.07E+00
I-131		0.00E+00	±	4.63E+00	7.72E+00
CS-134		-7.78E-01	±	3.05E+00	4.89E+00
CS-137		-8.89E-01	±	2.73E+00	4.29E+00
BALA140		0.00E+00	±	1.15E+00	1.92E+00
BI-214	+	0.00E+00	±	0.00E+00	0.00E+00

Station MW-9 collected 1/19/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-2.03E+01	±	7.14E+01	8.85E+01
MN-54		1.40E-03	±	2.66E+00	4.33E+00
CO-58		-6.20E-01	±	3.00E+00	4.79E+00
FE-59		-1.09E+00	±	8.40E+00	1.35E+01
CO-60		4.75E-01	±	3.28E+00	5.27E+00
ZN-65		-4.67E+00	±	9.85E+00	1.55E+01
ZRNB-95		3.42E-01	±	3.22E+00	5.22E+00
I-131		0.00E+00	±	0.00E+00	0.00E+00
CS-134		-1.33E+00	±	3.43E+00	5.44E+00
CS-137		1.05E+00	±	3.12E+00	4.92E+00
BALA140		3.84E-01	±	4.83E+00	7.82E+00
BI-214	+	4.54E+01	±	1.05E+01	1.35E+01

Station MW-6 collected 1/19/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		1.09E+01	±	4.37E+01	8.46E+01
MN-54		3.03E-01	±	2.53E+00	4.09E+00
CO-58		0.00E+00	±	3.49E+00	5.81E+00
FE-59		9.18E-01	±	6.63E+00	1.06E+01
CO-60		-9.15E-01	±	3.52E+00	5.58E+00
ZN-65		-3.85E+00	±	9.48E+00	1.50E+01
ZRNB-95		-9.86E-01	±	3.77E+00	6.03E+00
I-131		-4.61E-01	±	4.79E+00	7.81E+00
CS-134		2.61E-01	±	8.08E+00	1.33E+01
CS-137		1.76E-01	±	3.10E+00	5.07E+00
BALA140		0.00E+00	±	0.00E+00	0.00E+00
BI-214	+	9.46E+01	±	1.39E+01	1.29E+01

Station MW-10 collected 1/26/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-4.10E+01	±	1.29E+02	9.13E+01
MN-54		6.26E-01	±	3.01E+00	4.82E+00
CO-58		0.00E+00	±	3.21E+00	5.35E+00
FE-59		3.27E+00	±	5.06E+00	6.91E+00
CO-60		2.04E+00	±	3.26E+00	4.83E+00
ZN-65		-1.55E+00	±	8.66E+00	1.40E+01
ZRNB-95		0.00E+00	±	0.00E+00	0.00E+00
I-131		1.85E+00	±	2.79E+00	4.28E+00
CS-134		2.08E-02	±	4.12E+00	6.78E+00
CS-137		0.00E+00	±	4.27E+00	7.11E+00
BALA140		1.14E+00	±	3.87E+00	6.03E+00
BI-214	+	9.28E+01	±	1.34E+01	1.35E+01

Station MW-7 collected 1/19/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.49E+01	±	5.85E+01	8.44E+01
MN-54		0.00E+00	±	4.12E+00	6.86E+00
CO-58		1.41E+00	±	2.70E+00	4.10E+00
FE-59		-2.56E+00	±	1.07E+01	1.71E+01
CO-60		1.13E+00	±	2.92E+00	4.48E+00
ZN-65		-7.81E+00	±	1.25E+01	1.96E+01
ZRNB-95		3.16E-02	±	3.19E+00	5.23E+00
I-131		-1.59E+00	±	4.37E+00	6.96E+00
CS-134		5.21E-01	±	9.09E+00	1.49E+01
CS-137		0.00E+00	±	0.00E+00	0.00E+00
BALA140		9.51E-01	±	5.77E+00	9.26E+00
BI-214	+	1.18E+02	±	1.56E+01	1.34E+01

Station MW-11 collected 1/26/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.34E+01	±	5.50E+01	8.30E+01
MN-54		4.24E-02	±	3.19E+00	5.24E+00
CO-58		1.30E+00	±	3.37E+00	5.29E+00
FE-59		-6.26E-01	±	8.40E+00	1.37E+01
CO-60		2.96E-02	±	3.19E+00	5.23E+00
ZN-65		0.00E+00	±	0.00E+00	0.00E+00
ZRNB-95		4.95E-01	±	3.30E+00	5.34E+00
I-131		1.04E+00	±	3.01E+00	4.80E+00
CS-134		4.39E-02	±	4.49E+00	7.37E+00
CS-137		-1.66E+00	±	4.16E+00	6.60E+00
BALA140		1.17E-01	±	4.25E+00	6.96E+00
BI-214	+	1.70E+02	±	1.79E+01	1.40E+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 SAMPLES

Results in pCi per liter

Station MW-12 collected 1/26/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.00E+01	±	8.54E+01	8.55E+01
MN-54		-5.49E-01	±	3.29E+00	5.30E+00
CO-58		2.75E-01	±	2.17E+00	3.49E+00
FE-59		0.00E+00	±	8.69E+00	1.45E+01
CO-60		0.00E+00	±	0.00E+00	0.00E+00
ZN-65		-9.95E+00	±	1.25E+01	1.93E+01
ZRNB-95		-7.99E-01	±	4.34E+00	7.03E+00
I-131		-1.54E+00	±	3.58E+00	5.67E+00
CS-134		-2.00E+00	±	3.61E+00	5.66E+00
CS-137		-8.18E-01	±	3.76E+00	6.05E+00
BALA140		-8.54E-01	±	4.28E+00	6.80E+00
BI-214	+	1.32E+02	±	1.52E+01	1.25E+01

Station MW-13 collected 1/26/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.47E+01	±	9.37E+01	8.43E+01
MN-54		3.67E-01	±	3.19E+00	5.17E+00
CO-58		-1.36E-01	±	3.01E+00	4.93E+00
FE-59		0.00E+00	±	0.00E+00	0.00E+00
CO-60		-4.53E-01	±	3.16E+00	5.07E+00
ZN-65		-6.75E+00	±	1.09E+01	1.70E+01
ZRNB-95		-2.12E+00	±	4.28E+00	6.74E+00
I-131		1.34E+00	±	2.84E+00	4.43E+00
CS-134		-3.18E+00	±	4.69E+00	7.37E+00
CS-137		-7.28E-01	±	3.72E+00	6.00E+00
BALA140		2.60E-01	±	3.82E+00	6.21E+00
BI-214	+	1.41E+02	±	1.66E+01	1.45E+01

Station MW-14 collected 1/26/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.33E+01	±	7.22E+01	8.53E+01
MN-54		-9.26E-02	±	2.54E+00	4.15E+00
CO-58		0.00E+00	±	0.00E+00	0.00E+00
FE-59		0.00E+00	±	1.79E+00	2.98E+00
CO-60		-5.12E-01	±	3.21E+00	5.15E+00
ZN-65		-5.10E+00	±	9.54E+00	1.48E+01
ZRNB-95		-1.23E+00	±	3.77E+00	5.99E+00
I-131		7.14E-01	±	4.05E+00	6.56E+00
CS-134		-1.78E+00	±	3.18E+00	4.95E+00
CS-137		6.68E-01	±	2.97E+00	4.75E+00
BALA140		-4.94E-01	±	4.24E+00	6.81E+00
BI-214	+	5.17E+01	±	1.04E+01	1.23E+01

Station MW-3 collected 4/20/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.97E+01	±	9.58E+01	9.21E+01
MN-54		0.00E+00	±	0.00E+00	0.00E+00
CO-58		-2.73E-01	±	3.68E+00	6.00E+00
FE-59		0.00E+00	±	1.29E+01	2.16E+01
CO-60		1.71E+00	±	3.19E+00	4.81E+00
ZN-65		-1.01E+00	±	3.84E+01	6.31E+01
ZRNB-95		-2.09E+00	±	5.54E+00	8.89E+00
I-131		5.66E-01	±	3.55E+00	5.77E+00
CS-134		-2.76E+00	±	4.70E+00	7.43E+00
CS-137		-2.31E+00	±	4.63E+00	7.31E+00
BALA140		-5.60E-03	±	4.41E+00	7.23E+00
BI-214	+	3.31E+02	±	2.29E+01	1.45E+01

Station MW-5 collected 4/20/2011

Nuclide	RQ	Activity		Error	MDA
K-40		0.00E+00	±	0.00E+00	0.00E+00
MN-54		8.85E-01	±	3.18E+00	5.02E+00
CO-58		-1.55E+00	±	3.64E+00	5.66E+00
FE-59		0.00E+00	±	1.49E+01	2.49E+01
CO-60		0.00E+00	±	2.60E+00	4.33E+00
ZN-65		-1.31E+00	±	3.30E+01	5.42E+01
ZRNB-95		1.31E-01	±	3.42E+00	5.59E+00
I-131		-7.66E-01	±	3.66E+00	5.91E+00
CS-134		0.00E+00	±	1.22E+01	2.04E+01
CS-137		-1.86E+00	±	4.45E+00	6.99E+00
BALA140		3.93E-01	±	3.26E+00	5.20E+00
BI-214	+	1.62E+02	±	1.85E+01	1.62E+01

Station MW-6 collected 4/20/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.28E+01	±	1.38E+02	9.63E+01
MN-54		5.97E-01	±	3.97E+00	6.41E+00
CO-58		-1.25E+00	±	4.21E+00	6.69E+00
FE-59		-7.29E-01	±	9.35E+00	1.52E+01
CO-60		3.51E+00	±	4.12E+00	5.90E+00
ZN-65		1.31E+00	±	4.28E+01	7.04E+01
ZRNB-95		-1.07E+00	±	4.14E+00	6.62E+00
I-131		0.00E+00	±	4.42E+00	7.37E+00
CS-134		0.00E+00	±	1.44E+01	2.41E+01
CS-137		-2.75E+00	±	5.05E+00	7.89E+00
BALA140		-8.36E-01	±	6.26E+00	1.01E+01
BI-214	+	3.01E+02	±	2.52E+01	1.73E+01

Station MW-7 collected 4/20/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-8.10E+01	±	2.02E+03	8.68E+01
MN-54		-1.56E-01	±	3.25E+00	5.32E+00
CO-58		-7.80E-01	±	3.08E+00	4.91E+00
FE-59		5.30E+00	±	8.26E+00	1.22E+01
CO-60		0.00E+00	±	4.35E+00	7.25E+00
ZN-65		1.01E+00	±	3.55E+01	5.84E+01
ZRNB-95		-2.63E+00	±	4.74E+00	7.46E+00
I-131		1.30E-02	±	3.67E+00	6.03E+00
CS-134		-3.66E-01	±	3.59E+00	5.85E+00
CS-137		-1.57E-01	±	3.74E+00	6.12E+00
BALA140		3.37E-02	±	4.21E+00	6.91E+00
BI-214	+	3.08E+02	±	2.20E+01	1.48E+01

Station MW-8 collected 4/20/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.46E+01	±	8.34E+01	9.15E+01
MN-54		-1.52E+00	±	3.65E+00	5.74E+00
CO-58		-4.58E-02	±	2.66E+00	4.36E+00
FE-59		-3.07E+00	±	1.00E+01	1.58E+01
CO-60		-1.33E+00	±	4.32E+00	6.85E+00
ZN-65		6.89E+00	±	4.13E+00	3.50E+00
ZRNB-95		2.41E+00	±	2.59E+00	3.68E+00
I-131		1.42E+00	±	3.84E+00	6.15E+00
CS-134		-4.35E-01	±	4.16E+00	6.79E+00
CS-137		4.49E-01	±	3.83E+00	6.22E+00
BALA140		1.20E+00	±	4.64E+00	7.35E+00
BI-214	+	3.31E+02	±	2.39E+01	1.59E+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 SAMPLES

Results in pCi per liter

Station MW-9 collected 4/20/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.90E+01	±	8.90E+01	9.74E+01
MN-54		-1.58E+00	±	5.07E+00	8.10E+00
CO-58		-1.06E+00	±	4.13E+00	6.60E+00
FE-59		2.18E+00	±	9.66E+00	1.53E+01
CO-60		-1.14E+00	±	4.15E+00	6.56E+00
ZN-65		-8.37E+00	±	1.39E+01	2.18E+01
ZRNB-95		-3.45E+00	±	6.16E+00	9.72E+00
I-131		2.63E-01	±	5.26E+00	8.62E+00
CS-134		-1.42E+00	±	1.69E+01	2.78E+01
CS-137		-1.77E+00	±	4.61E+00	7.29E+00
BALA140		2.96E+00	±	5.15E+00	7.71E+00
BI-214	+	4.02E+02	±	2.76E+01	1.67E+01

Station MW-13 collected 4/25/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-4.51E-01	±	4.29E+01	8.43E+01
MN-54		3.91E-01	±	2.80E+00	4.49E+00
CO-58		0.00E+00	±	3.60E+00	6.00E+00
FE-59		-1.88E-01	±	9.01E+00	1.48E+01
CO-60		-1.72E-01	±	3.68E+00	6.00E+00
ZN-65		-5.83E+00	±	1.18E+01	1.84E+01
ZRNB-95		-1.13E+00	±	4.14E+00	6.60E+00
I-131		3.95E+00	±	4.57E+00	6.67E+00
CS-134		-1.55E+00	±	3.84E+00	6.06E+00
CS-137		1.29E-01	±	3.16E+00	5.16E+00
BALA140		1.52E+00	±	5.41E+00	8.37E+00
BI-214	+	3.43E+01	±	1.04E+01	1.43E+01

Station MW-10 collected 4/25/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.94E+01	±	8.75E+01	8.75E+01
MN-54		2.32E-02	±	2.44E+00	4.00E+00
CO-58		-3.75E-01	±	2.87E+00	4.63E+00
FE-59		-2.11E+00	±	8.88E+00	1.41E+01
CO-60		9.86E-01	±	2.93E+00	4.54E+00
ZN-65		-3.32E+00	±	8.42E+00	1.32E+01
ZRNB-95		-1.59E+00	±	3.70E+00	5.82E+00
I-131		-8.71E-01	±	2.87E+00	4.58E+00
CS-134		-1.46E+00	±	3.49E+00	5.53E+00
CS-137		4.81E-02	±	2.74E+00	4.49E+00
BALA140		-1.12E+00	±	3.76E+00	5.84E+00
BI-214	+	7.19E+01	±	1.36E+01	1.43E+01

Station MW-14 collected 4/25/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.76E+01	±	1.57E+02	9.30E+01
MN-54		2.79E-01	±	3.03E+00	4.91E+00
CO-58		-7.55E-01	±	3.38E+00	5.38E+00
FE-59		1.85E+00	±	8.87E+00	1.40E+01
CO-60		9.28E-01	±	3.29E+00	5.14E+00
ZN-65		5.18E-02	±	8.41E+00	1.38E+01
ZRNB-95		1.23E-01	±	4.04E+00	6.62E+00
I-131		2.14E+00	±	4.36E+00	6.69E+00
CS-134		-3.58E-01	±	8.57E+00	1.41E+01
CS-137		-1.46E+00	±	3.84E+00	6.03E+00
BALA140		0.00E+00	±	1.55E+00	2.58E+00
BI-214	+	2.37E+01	±	1.00E+01	1.52E+01

Station MW-11 collected 4/25/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.29E+01	±	6.15E+01	8.57E+01
MN-54		2.16E-02	±	3.20E+00	5.26E+00
CO-58		-1.66E+00	±	4.26E+00	6.71E+00
FE-59		-2.70E-01	±	8.66E+00	1.42E+01
CO-60		1.35E+00	±	3.67E+00	5.68E+00
ZN-65		0.00E+00	±	3.45E+01	5.74E+01
ZRNB-95		3.56E-02	±	3.70E+00	6.08E+00
I-131		1.51E+00	±	3.34E+00	5.24E+00
CS-134		-2.68E+00	±	4.64E+00	7.27E+00
CS-137		0.00E+00	±	3.78E+00	6.30E+00
BALA140		-1.59E-01	±	4.70E+00	7.68E+00
BI-214	+	1.62E+02	±	1.84E+01	1.54E+01

Station MW-3 collected 7/20/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-6.99E+00	±	5.72E+01	9.11E+01
MN-54		-1.08E+00	±	4.56E+00	7.31E+00
CO-58		2.43E-01	±	4.72E+00	7.71E+00
FE-59		-1.32E+00	±	1.03E+01	1.67E+01
CO-60		1.15E+00	±	4.00E+00	6.30E+00
ZN-65		-2.61E+00	±	5.49E+01	9.02E+01
ZRNB-95		4.87E-04	±	4.13E+00	6.91E+00
I-131		1.55E+00	±	4.31E+00	6.91E+00
CS-134		1.81E+00	±	2.90E+00	4.37E+00
CS-137		-3.22E+00	±	5.71E+00	8.96E+00
BALA140		4.36E-01	±	5.95E+00	9.69E+00
BI-214	+	4.27E+02	±	2.90E+01	1.82E+01

Station MW-12 collected 4/25/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.34E+01	±	7.00E+01	9.24E+01
MN-54		7.91E-01	±	2.74E+00	4.29E+00
CO-58		-3.49E-01	±	3.39E+00	5.50E+00
FE-59		1.71E+00	±	8.60E+00	1.37E+01
CO-60		-1.72E+00	±	4.80E+00	7.54E+00
ZN-65		-1.07E+01	±	1.36E+01	2.09E+01
ZRNB-95		-1.13E+00	±	4.26E+00	6.80E+00
I-131		-6.99E-02	±	3.66E+00	6.01E+00
CS-134		-2.12E+00	±	4.60E+00	7.28E+00
CS-137		2.05E-01	±	3.89E+00	6.36E+00
BALA140		1.19E+00	±	3.88E+00	5.96E+00
BI-214	+	1.73E+02	±	2.00E+01	1.66E+01

Station MW-5 collected 7/20/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-5.56E+00	±	5.08E+01	8.62E+01
MN-54		2.90E+00	±	3.73E+00	5.52E+00
CO-58		-6.05E-01	±	3.11E+00	4.97E+00
FE-59		0.00E+00	±	2.02E+00	3.37E+00
CO-60		-1.29E+00	±	4.37E+00	6.89E+00
ZN-65		-3.69E+00	±	1.11E+01	1.77E+01
ZRNB-95		8.18E-02	±	4.13E+00	6.78E+00
I-131		-5.83E-02	±	3.22E+00	5.28E+00
CS-134		7.10E-01	±	1.28E+01	2.10E+01
CS-137		-1.65E+00	±	4.58E+00	7.26E+00
BALA140		1.34E+00	±	4.57E+00	7.11E+00
BI-214	+	1.48E+02	±	1.74E+01	1.43E+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 SAMPLES

Results in pCi per liter

Station MW-6 collected 7/20/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-3.30E+01	±	1.43E+02	9.80E+01
MN-54		-6.94E-01	±	3.89E+00	6.27E+00
CO-58		-7.20E-01	±	3.95E+00	6.36E+00
FE-59		-2.60E+00	±	1.17E+01	1.87E+01
CO-60		4.12E-01	±	4.00E+00	6.48E+00
ZN-65		6.60E+00	±	5.74E+00	7.05E+00
ZRNB-95		0.00E+00	±	3.28E+00	5.46E+00
I-131		-1.37E+00	±	4.20E+00	6.73E+00
CS-134		-3.56E-01	±	1.75E+01	2.87E+01
CS-137		-8.08E-01	±	4.57E+00	7.37E+00
BALA140		-2.59E-01	±	4.98E+00	8.12E+00
BI-214	+	2.82E+02	±	2.39E+01	1.65E+01

Station MW-7 collected 7/20/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.75E+01	±	7.08E+01	8.64E+01
MN-54		-1.37E-02	±	3.68E+00	6.05E+00
CO-58		1.40E+00	±	3.44E+00	5.33E+00
FE-59		-1.55E+00	±	1.13E+01	1.83E+01
CO-60		1.00E+00	±	3.43E+00	5.36E+00
ZN-65		-9.62E+00	±	1.39E+01	2.16E+01
ZRNB-95		-1.80E-01	±	4.26E+00	6.97E+00
I-131		4.13E+00	±	5.50E+00	8.44E+00
CS-134		-3.42E+00	±	4.88E+00	7.58E+00
CS-137		-1.42E+00	±	4.18E+00	6.60E+00
BALA140		-1.37E+00	±	6.98E+00	1.12E+01
BI-214	+	1.66E+02	±	1.90E+01	1.50E+01

Station MW-8 collected 7/20/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.70E+01	±	6.55E+01	8.31E+01
MN-54		4.54E-02	±	3.68E+00	6.05E+00
CO-58		-8.22E-01	±	3.67E+00	5.86E+00
FE-59		1.75E+00	±	7.90E+00	1.24E+01
CO-60		6.40E-01	±	3.75E+00	6.00E+00
ZN-65		-4.73E+00	±	1.11E+00	2.59E+00
ZRNB-95		-1.69E+00	±	4.66E+00	7.38E+00
I-131		-1.22E+00	±	4.54E+00	7.25E+00
CS-134		-3.58E-01	±	9.59E+00	1.57E+01
CS-137		0.00E+00	±	4.72E+00	7.87E+00
BALA140		1.58E+00	±	4.05E+00	5.99E+00
BI-214	+	1.05E+02	±	1.52E+01	1.40E+01

Station MW-9 collected 7/20/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-6.63E+01	±	2.73E+03	1.26E+02
MN-54		-1.36E+00	±	3.96E+00	6.24E+00
CO-58		-2.44E-02	±	3.81E+00	6.26E+00
FE-59		3.30E-01	±	9.27E+00	1.52E+01
CO-60		8.03E-01	±	3.36E+00	5.29E+00
ZN-65		0.00E+00	±	2.19E+01	3.65E+01
ZRNB-95		-2.11E+00	±	4.21E+00	6.53E+00
I-131		4.44E+00	±	4.00E+00	5.54E+00
CS-134		-2.18E+00	±	4.49E+00	7.08E+00
CS-137		1.22E-01	±	3.86E+00	6.32E+00
BALA140		0.00E+00	±	1.48E+00	2.46E+00
BI-214	+	9.52E+01	±	1.71E+01	1.65E+01

Station MW-10 collected 7/27/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-3.94E+00	±	4.50E+01	8.20E+01
MN-54		-3.97E-02	±	3.39E+00	5.57E+00
CO-58		-3.23E-01	±	2.68E+00	4.31E+00
FE-59		-3.16E+00	±	8.98E+00	1.38E+01
CO-60		-7.42E-01	±	3.50E+00	5.55E+00
ZN-65		-1.47E+01	±	1.46E+01	2.22E+01
ZRNB-95		-4.64E-01	±	3.33E+00	5.36E+00
I-131		0.00E+00	±	6.00E+00	9.99E+00
CS-134		6.14E-02	±	2.39E+00	3.91E+00
CS-137		-8.31E-01	±	3.65E+00	5.83E+00
BALA140		1.32E+00	±	5.20E+00	8.13E+00
BI-214	+	3.62E+01	±	1.06E+01	1.45E+01

Station MW-11 collected 7/27/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-2.08E+01	±	8.84E+01	9.34E+01
MN-54		0.00E+00	±	4.32E+00	7.20E+00
CO-58		3.44E-01	±	3.00E+00	4.84E+00
FE-59		5.87E-02	±	8.59E+00	1.41E+01
CO-60		1.43E+00	±	3.19E+00	4.80E+00
ZN-65		-9.55E-02	±	9.56E+00	1.57E+01
ZRNB-95		-1.59E+00	±	3.93E+00	6.15E+00
I-131		-2.71E+00	±	5.77E+00	9.10E+00
CS-134		-4.28E+00	±	5.00E+00	7.68E+00
CS-137		-1.31E-01	±	3.96E+00	6.48E+00
BALA140		7.80E-01	±	6.62E+00	1.07E+01
BI-214	+	9.21E+01	±	1.41E+01	1.43E+01

Station MW-12 collected 7/27/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-1.42E+01	±	7.04E+01	9.15E+01
MN-54		9.38E-02	±	2.73E+00	4.46E+00
CO-58		-1.38E+00	±	3.85E+00	6.05E+00
FE-59		-3.10E+00	±	1.12E+01	1.76E+01
CO-60		-1.08E+00	±	3.61E+00	5.64E+00
ZN-65		-3.65E-02	±	8.26E+00	1.36E+01
ZRNB-95		-5.32E-02	±	3.52E+00	5.78E+00
I-131		2.32E+00	±	5.20E+00	8.19E+00
CS-134		-3.58E-01	±	1.02E+01	1.68E+01
CS-137		-6.46E-01	±	4.36E+00	7.06E+00
BALA140		3.05E-01	±	5.23E+00	8.51E+00
BI-214	+	6.27E+01	±	1.25E+01	1.46E+01

Station MW-13 collected 7/27/2011

Nuclide	RQ	Activity	±	Error	MDA
K-40		-2.09E+01	±	8.63E+01	9.19E+01
MN-54		-4.89E-01	±	3.42E+00	5.52E+00
CO-58		-8.14E-01	±	3.42E+00	5.44E+00
FE-59		-2.41E+00	±	8.98E+00	1.41E+01
CO-60		2.85E-01	±	3.43E+00	5.56E+00
ZN-65		-4.70E+00	±	1.18E+01	1.87E+01
ZRNB-95		-1.64E+00	±	4.70E+00	7.46E+00
I-131		-1.59E+00	±	5.22E+00	8.33E+00
CS-134		1.88E-01	±	2.83E+00	4.61E+00
CS-137		1.41E+00	±	3.16E+00	4.85E+00
BALA140		2.71E+00	±	5.50E+00	8.19E+00
BI-214	+	8.44E+01	±	1.48E+01	1.45E+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 SAMPLES

Results in pCi per liter

Station MW-14 collected 7/27/2011

Nuclide	RQ	Activity		Error	MDA
K-40		5.52E+00	±	4.40E+01	8.55E+01
MN-54		1.14E-01	±	3.02E+00	4.93E+00
CO-58		-5.49E-01	±	3.53E+00	5.68E+00
FE-59		-2.92E+00	±	1.04E+01	1.64E+01
CO-60		1.58E+00	±	4.01E+00	6.20E+00
ZN-65		-3.62E+00	±	1.04E+01	1.64E+01
ZRNB-95		1.54E-01	±	3.32E+00	5.42E+00
I-131		2.71E+00	±	4.73E+00	7.28E+00
CS-134		-1.27E+00	±	3.50E+00	5.54E+00
CS-137		-1.08E+00	±	4.17E+00	6.65E+00
BALA140		2.92E-01	±	5.51E+00	8.97E+00
BI-214	+	4.59E+01	±	1.13E+01	1.45E+01

Station MW-7 collected 10/27/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-6.31E+01	±	2.01E+03	1.06E+02
MN-54		1.26E+00	±	3.04E+00	4.67E+00
CO-58		-1.46E-02	±	3.16E+00	5.19E+00
FE-59		0.00E+00	±	5.99E+00	9.99E+00
CO-60		3.32E-01	±	2.14E+00	3.38E+00
ZN-65		-4.88E+00	±	1.14E+01	1.79E+01
ZRNB-95		-1.23E+00	±	4.02E+00	6.38E+00
I-131		1.58E-03	±	4.53E+00	7.48E+00
CS-134		4.16E-01	±	2.85E+00	4.60E+00
CS-137		-8.34E-01	±	3.46E+00	5.51E+00
BALA140		-1.44E+00	±	4.64E+00	7.11E+00
BI-214	+	2.92E+01	±	1.26E+01	1.66E+01

Station MW-3 collected 10/27/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.75E+01	±	9.50E+01	9.49E+01
MN-54		-9.10E-02	±	2.64E+00	4.31E+00
CO-58		4.74E-01	±	2.86E+00	4.60E+00
FE-59		2.48E+00	±	7.63E+00	1.18E+01
CO-60		-1.60E-01	±	2.56E+00	4.16E+00
ZN-65		-5.00E+00	±	8.64E+00	1.33E+01
ZRNB-95		-1.62E-01	±	3.05E+00	4.97E+00
I-131		1.04E+00	±	3.14E+00	4.97E+00
CS-134		-7.10E-01	±	2.98E+00	4.79E+00
CS-137		-9.44E-01	±	3.18E+00	5.04E+00
BALA140		2.05E+00	±	4.01E+00	5.89E+00
BI-214	+	4.77E+01	±	1.18E+01	1.32E+01

Station MW-8 collected 10/27/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.16E+01	±	8.24E+01	8.21E+01
MN-54		0.00E+00	±	4.36E+00	7.27E+00
CO-58		-4.06E-01	±	2.85E+00	4.59E+00
FE-59		1.91E+00	±	8.69E+00	1.38E+01
CO-60		2.03E-01	±	2.93E+00	4.77E+00
ZN-65		5.41E-01	±	3.94E+00	6.26E+00
ZRNB-95		5.83E-01	±	2.43E+00	3.84E+00
I-131		1.76E+00	±	3.54E+00	5.50E+00
CS-134		-1.67E+00	±	3.22E+00	5.03E+00
CS-137		-1.30E+00	±	3.20E+00	5.00E+00
BALA140		0.00E+00	±	1.16E+00	1.93E+00
BI-214	+	4.00E+01	±	9.55E+00	1.21E+01

Station MW-5 collected 10/27/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.12E+01	±	5.68E+01	7.68E+01
MN-54		8.48E-01	±	2.79E+00	4.40E+00
CO-58		8.14E-01	±	2.17E+00	3.32E+00
FE-59		0.00E+00	±	9.09E+00	1.51E+01
CO-60		-5.47E-02	±	3.15E+00	5.16E+00
ZN-65		-2.20E-01	±	7.73E+00	1.27E+01
ZRNB-95		9.41E-01	±	2.63E+00	4.09E+00
I-131		5.34E-01	±	2.86E+00	4.58E+00
CS-134		-7.00E-01	±	2.88E+00	4.62E+00
CS-137		2.46E-03	±	2.74E+00	4.48E+00
BALA140		1.42E-01	±	4.05E+00	6.61E+00
BI-214	+	1.22E+01	±	7.46E+00	1.21E+01

Station MW-9 collected 10/27/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.53E+01	±	9.88E+01	8.85E+01
MN-54		-3.40E-01	±	3.11E+00	5.03E+00
CO-58		-6.12E-01	±	3.33E+00	5.32E+00
FE-59		-6.44E-01	±	7.16E+00	1.15E+01
CO-60		0.00E+00	±	5.66E+00	9.43E+00
ZN-65		-7.32E+00	±	1.22E+01	1.90E+01
ZRNB-95		2.95E-01	±	3.12E+00	5.06E+00
I-131		2.12E+00	±	4.23E+00	6.55E+00
CS-134		0.00E+00	±	7.93E+00	1.32E+01
CS-137		7.03E-04	±	3.27E+00	5.44E+00
BALA140		4.69E-01	±	5.26E+00	8.50E+00
BI-214	+	3.65E+01	±	1.07E+01	1.53E+01

Station MW-6 collected 10/27/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.16E+01	±	1.16E+02	8.52E+01
MN-54		2.02E+00	±	2.67E+00	3.77E+00
CO-58		6.08E-01	±	2.91E+00	4.62E+00
FE-59		0.00E+00	±	7.94E+00	1.32E+01
CO-60		7.26E-01	±	3.13E+00	4.91E+00
ZN-65		-3.14E+00	±	9.13E+00	1.44E+01
ZRNB-95		-1.38E+00	±	4.10E+00	6.49E+00
I-131		-4.80E-02	±	3.98E+00	6.54E+00
CS-134		-3.57E-01	±	8.74E+00	1.43E+01
CS-137		-4.44E-01	±	3.72E+00	6.02E+00
BALA140		-1.21E+00	±	5.12E+00	8.02E+00
BI-214	+	2.78E+01	±	1.03E+01	1.57E+01

Station MW-10 collected 10/24/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.94E+01	±	9.27E+01	7.88E+01
MN-54		1.08E-01	±	2.73E+00	4.47E+00
CO-58		6.38E-01	±	2.76E+00	4.39E+00
FE-59		-1.02E+00	±	8.06E+00	1.30E+01
CO-60		5.16E-01	±	2.52E+00	3.98E+00
ZN-65		-2.70E+00	±	7.62E+00	1.20E+01
ZRNB-95		5.18E-01	±	2.80E+00	4.49E+00
I-131		1.39E-01	±	4.43E+00	7.26E+00
CS-134		1.90E+00	±	2.81E+00	4.28E+00
CS-137		6.39E-01	±	2.69E+00	4.27E+00
BALA140		0.00E+00	±	1.29E+00	2.14E+00
BI-214	+	2.03E+01	±	8.20E+00	1.22E+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 SAMPLES

Results in pCi per liter

Station MW-11 collected 10/24/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-2.80E+01	±	1.04E+02	8.65E+01
MN-54		-5.80E-01	±	3.59E+00	5.78E+00
CO-58		-8.59E-01	±	3.51E+00	5.58E+00
FE-59		0.00E+00	±	2.22E+00	3.70E+00
CO-60		1.11E+00	±	2.24E+00	3.18E+00
ZN-65		-4.35E+00	±	1.01E+01	1.57E+01
ZRNB-95		3.06E+00	±	3.66E+00	5.34E+00
I-131		1.39E+00	±	5.00E+00	7.97E+00
CS-134		-2.35E+00	±	3.97E+00	6.16E+00
CS-137		2.82E-02	±	3.34E+00	5.48E+00
BALA140		-1.34E+00	±	6.11E+00	9.64E+00
BI-214		1.21E+01	±	9.03E+00	1.58E+01

Station MW-13 collected 10/24/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.80E+01	±	7.55E+01	8.68E+01
MN-54		2.88E-01	±	2.99E+00	4.84E+00
CO-58		9.02E-01	±	3.24E+00	5.10E+00
FE-59		4.66E-01	±	4.76E+00	7.57E+00
CO-60		1.04E+00	±	3.18E+00	4.90E+00
ZN-65		-2.66E-02	±	6.59E+00	1.08E+01
ZRNB-95		1.59E+00	±	3.23E+00	4.91E+00
I-131		1.26E+00	±	4.56E+00	7.23E+00
CS-134		-2.22E-01	±	2.75E+00	4.48E+00
CS-137		2.19E+00	±	3.24E+00	4.80E+00
BALA140		1.79E+00	±	4.59E+00	6.79E+00
BI-214	+	2.41E+01	±	1.01E+01	1.59E+01

Station MW-12 collected 10/24/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-3.15E+01	±	8.98E+01	8.62E+01
MN-54		0.00E+00	±	3.42E+00	5.71E+00
CO-58		5.06E-01	±	2.50E+00	3.98E+00
FE-59		-1.19E+00	±	8.26E+00	1.33E+01
CO-60		1.06E-01	±	2.90E+00	4.74E+00
ZN-65		-2.18E+00	±	7.05E+00	1.11E+01
ZRNB-95		-8.28E-01	±	3.39E+00	5.42E+00
I-131		1.72E+00	±	4.41E+00	6.95E+00
CS-134		7.40E-03	±	2.98E+00	4.91E+00
CS-137		-9.06E-01	±	3.14E+00	4.98E+00
BALA140		9.48E-02	±	4.56E+00	7.47E+00
BI-214	+	3.83E+01	±	9.69E+00	1.26E+01

Station MW-14 collected 10/24/2011

Nuclide	RQ	Activity		Error	MDA
K-40		-1.79E+01	±	7.08E+01	8.35E+01
MN-54		-1.19E+00	±	3.81E+00	6.02E+00
CO-58		6.61E-01	±	3.31E+00	5.28E+00
FE-59		1.68E+00	±	8.36E+00	1.32E+01
CO-60		-5.65E-02	±	3.62E+00	5.93E+00
ZN-65		-4.67E+00	±	1.12E+01	1.76E+01
ZRNB-95		-3.42E-01	±	3.65E+00	5.93E+00
I-131		-1.89E+00	±	5.76E+00	9.16E+00
CS-134		-1.90E+00	±	4.12E+00	6.49E+00
CS-137		-1.41E+00	±	4.23E+00	6.69E+00
BALA140		-1.48E+00	±	5.66E+00	8.81E+00
BI-214	+	3.45E+01	±	1.08E+01	1.59E+01

TABLE B-10.2

GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING SAMPLES - SUMMARY

Results in pCi/liter

Nuclide	Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	2.87E-01	-1.48E+00	2.96E+00	6.91E+00	44	0
BI-214	1.43E+02	1.81E+01	4.06E+02	1.41E+01	44	44
CO-58	-1.52E-01	-2.28E+00	2.77E+00	5.29E+00	44	0
CO-60	3.88E-01	-8.55E-01	1.98E+00	5.69E+00	44	0
CS-134	-8.39E-01	-4.28E+00	1.90E+00	9.46E+00	44	0
CS-137	-3.68E-01	-2.51E+00	2.49E+00	5.93E+00	44	0
FE-59	1.14E-01	-3.04E+00	3.95E+00	1.38E+01	44	0
I-131	2.08E-01	-1.80E+00	3.89E+00	6.80E+00	44	0
K-40	-3.08E+01	-5.51E+01	3.21E+00	8.72E+01	44	0
MN-54	1.77E-02	-1.99E+00	2.06E+00	5.37E+00	44	0
ZN-65	-1.62E+00	-1.42E+01	7.88E+00	1.96E+01	44	0
ZRNB-95	-6.69E-01	-2.90E+00	3.15E+00	6.28E+00	44	0

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

TABLE B-11.1

TRITIUM IN MONITORING WELL SAMPLES

Results in pCi per liter

Location	Collection Date	RQ	Activity		Error
MW-3	01/19/11	+	1.32E+03	±	1.33E+02
	04/20/11	+	1.49E+03	±	1.33E+02
	07/20/11	+	1.47E+03	±	1.31E+02
	10/27/11	+	1.26E+03	±	1.31E+02
MW-5	01/19/11	+	1.57E+04	±	3.14E+02
	04/20/11	+	1.63E+04	±	3.18E+02
	07/20/11	+	1.60E+04	±	3.15E+02
	10/27/11	+	1.63E+04	±	3.22E+02
MW-6	01/19/11	+	4.98E+03	±	1.94E+02
	04/20/11	+	4.96E+03	±	1.93E+02
	07/20/11	+	4.93E+03	±	1.91E+02
	10/27/11	+	5.49E+03	±	2.05E+02
MW-7	01/19/11	+	3.56E+02	±	1.09E+02
	04/20/11	+	1.89E+03	±	1.41E+02
	07/20/11	+	6.37E+02	±	1.10E+02
	10/27/11		2.06E+02	±	1.06E+02
MW-8	01/19/11		1.05E+02	±	1.03E+02
	04/20/11		2.40E+02	±	1.03E+02
	07/20/11	+	3.34E+03	±	1.66E+02
	10/27/11	+	2.47E+03	±	1.55E+02
MW-9	01/19/11		2.71E+02	±	1.06E+02
	04/20/11	+	3.16E+02	±	1.06E+02
	07/20/11	+	3.46E+02	±	1.03E+02
	10/27/11		2.60E+02	±	1.06E+02
MW-10	01/26/11	+	4.07E+02	±	1.11E+02
	04/25/11	+	3.36E+02	±	1.07E+02
	07/27/11	+	3.82E+02	±	1.03E+02
	10/24/11	+	4.19E+02	±	1.10E+02
MW-11	01/26/11	+	8.06E+02	±	1.21E+02
	04/25/11	+	9.47E+02	±	1.21E+02
	07/27/11	+	9.08E+02	±	1.18E+02
	10/24/11	+	9.44E+02	±	1.22E+02
MW-12	01/26/11	+	6.98E+02	±	1.18E+02
	04/25/11	+	7.48E+02	±	1.16E+02
	07/27/11	+	5.84E+02	±	1.09E+02
	10/24/11	+	6.21E+02	±	1.15E+02
MW-13	01/26/11	+	1.18E+04	±	2.76E+02
	04/25/11	+	1.17E+04	±	2.75E+02
	07/27/11	+	1.16E+04	±	2.72E+02
	10/24/11	+	1.12E+04	±	2.73E+02
MW-14	01/26/11		1.36E+02	±	1.02E+02
	04/25/11		2.07E+02	±	1.02E+02
	07/27/11		2.04E+02	±	9.92E+01
	10/24/11		1.87E+02	±	1.05E+02

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

Table B - 12.1

GAMMA SPECTROMETRY RESULTS OF CGS STORM DRAIN POND SOIL

Surface soil sample results

All results in pCi per kilogram dry mass

Location:	SDP Location A	SDP Location B	SDP Location C	SDP Location D	SDP Location E	SDP Location F
Depth:	Surface	Surface	Surface	Surface	Surface	Surface
Date:	8/29/11 & 8/31/11	8/29/11 & 9/26/11	8/30/11	8/30/11	8/31/11 & 9/26/11	8/30/11

Nuclide	Activity	Activity	Activity	Activity	Activity	Activity
BE-7	2.91E+02	1.60E+03	7.88E+02	1.11E+03	2.28E+03	1.56E+03
K-40	2.32E+03	1.06E+04	6.92E+03	2.00E+03	2.79E+03	2.59E+03
MN-54	≤ MDA	1.30E+02	≤ MDA	≤ MDA	5.13E+01	8.85E+01
CO-58	≤ MDA	5.70E+01	≤ MDA	≤ MDA	≤ MDA	≤ MDA
FE-59	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
CO-60	3.30E+02	3.19E+03	1.16E+03	3.75E+02	1.36E+03	1.19E+03
ZN-65	≤ MDA	6.70E+02	1.09E+02	≤ MDA	2.96E+02	3.04E+02
ZRNB-95	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
CS-134	≤ MDA	4.13E+01	≤ MDA	≤ MDA	≤ MDA	2.39E+01
CS-137	2.30E+01	1.79E+02	1.38E+02	8.50E+01	9.18E+01	8.72E+01
CE-141	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
BI-214	4.19E+02	4.70E+02	3.51E+02	1.25E+02	2.56E+02	8.55E+01
RA-226	1.30E+03	4.35E+03	5.11E+03	8.69E+03	1.16E+04	1.23E+04
AC-228	5.13E+02	6.61E+02	5.91E+02	2.66E+02	4.27E+02	3.57E+02
BI-212	3.62E+02	4.88E+02	4.43E+02	2.31E+02	2.47E+02	3.56E+02
PB-212	4.08E+02	5.98E+02	6.12E+02	2.39E+02	4.12E+02	3.63E+02
PB-214	4.25E+02	4.77E+02	4.03E+02	1.65E+02	2.62E+02	1.19E+02

Location:	SDP Location G	SDP Location H	SDP Location I	SDP Location J	SDP Location K	SDP Location L
Depth:	Surface	Surface	Surface	Surface	Surface	Surface
Date:	8/30/11	9/26/11	9/26/11	8/29/11 & 9/26/11	8/29/11 & 9/26/11	9/26/11

Nuclide	Activity	Activity	Activity	Activity	Activity	Activity
BE-7	9.28E+02	2.24E+03	2.13E+03	2.33E+03	1.88E+03	4.78E+02
K-40	2.17E+03	4.88E+03	6.86E+03	5.75E+03	6.16E+03	3.48E+03
MN-54	≤ MDA	3.67E+01	8.30E+01	1.07E+02	8.03E+01	≤ MDA
CO-58	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
FE-59	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
CO-60	1.41E+03	1.29E+03	5.90E+03	4.08E+03	6.26E+03	3.82E+02
ZN-65	≤ MDA	4.89E+02	3.60E+02	5.74E+02	5.03E+02	≤ MDA
ZRNB-95	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
CS-134	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
CS-137	9.30E+01	1.24E+02	1.93E+02	1.54E+02	1.46E+02	2.00E+01
CE-141	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
BI-214	1.18E+02	3.20E+02	5.60E+02	3.07E+02	4.24E+02	4.41E+02
RA-226	9.47E+03	7.40E+03	5.13E+03	8.02E+03	5.74E+03	1.22E+03
AC-228	2.06E+02	4.57E+02	8.65E+02	6.24E+02	4.74E+02	4.49E+02
BI-212	2.07E+02	4.78E+02	4.64E+02	3.70E+02	3.81E+02	4.02E+02
PB-212	2.93E+02	4.18E+02	7.40E+02	5.33E+02	4.90E+02	4.39E+02
PB-214	1.21E+02	2.95E+02	5.78E+02	3.22E+02	4.47E+02	4.22E+02

Table B - 12.1

GAMMA SPECTROMETRY RESULTS OF CGS STORM DRAIN POND SOIL

Locations other than surface where positive activity was identified

All results in pCi per kilogram dry mass

Location:	SDP Location A	SDP Location C	SDP Location E	SDP Location G	SDP Location K	SDP Location L
Depth:	0-2 ft	0-2 ft	0-2 ft	0-2 ft	0-16"	0-16"
Date:	08/29/11	8/30/2011	8/31/11	8/31/11	8/30/2011	8/29/11

Nuclide						
BE-7	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
K-40	1.20E+04	1.59E+04	1.21E+04	1.37E+04	1.61E+04	1.25E+04
MN-54	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
CO-58	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
FE-59	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
CO-60	3.53E+02	≤ MDA	1.17E+02	1.91E+01	3.13E+01	1.32E+02
ZN-65	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
ZRNB-95	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
CS-134	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
CS-137	2.27E+02	3.47E+01	3.93E+01	2.26E+01	4.87E+01	1.62E+02
CE-141	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA	≤ MDA
BI-214	4.78E+02	5.08E+02	5.90E+02	4.50E+02	6.25E+02	5.33E+02
RA-226	1.97E+03	1.22E+03	3.44E+03	1.62E+03	1.99E+03	1.36E+03
AC-228	5.67E+02	6.45E+02	7.02E+02	5.47E+02	7.83E+02	5.43E+02
BI-212	5.04E+02	4.76E+02	6.59E+02	4.70E+02	5.92E+02	4.28E+02
PB-212	5.94E+02	6.74E+02	7.54E+02	5.90E+02	7.66E+02	5.52E+02
PB-214	5.08E+02	6.08E+02	5.74E+02	5.03E+02	6.59E+02	5.30E+02

TABLE B-13.1

GROSS BETA ON AIR PARTICULATE FILTERS - OTHER LOCATIONS

Results in pCi per Cubic Meter

Collection Period			Station 87 Result		Station 87 Error	Station 88 Result		Station 88 Error
02/22/11	-	03/01/11	9.52E-03	±	4.25E-04	1.03E-02	±	4.38E-04
03/01/11	-	04/05/11	1.28E-02	±	4.11E-04	1.28E-02	±	4.09E-04
04/05/11	-	05/03/11	1.09E-02	±	3.68E-04	8.85E-03	±	3.37E-04
05/03/11	-	06/07/11	9.46E-03	±	2.67E-04	9.09E-03	±	2.75E-04
06/28/11	-	07/05/11	8.21E-03	±	2.74E-04	8.56E-03	±	2.80E-04
07/05/11	-	08/02/11	1.05E-02	±	3.22E-04	9.09E-03	±	2.90E-04

Collection Period			Station 89 Result		Station 89 Error	Station 90 Result		Station 90 Error
01/05/10	-	02/02/10	1.07E-02	±	4.16E-04	8.94E-03	±	4.37E-04
02/02/10	-	03/02/10	1.03E-02	±	1.80E-04	1.14E-02	±	1.80E-04
03/30/10	-	04/06/10	9.35E-03	±	1.98E-04	9.73E-03	±	1.98E-04
04/06/10	-	05/04/10	9.41E-03	±	1.75E-04	9.52E-03	±	1.80E-04
05/25/10	-	06/01/10	8.37E-03	±	2.21E-04	8.75E-03	±	2.29E-04
06/01/10	-	06/29/10	9.86E-03	±	2.45E-04	9.45E-03	±	2.54E-04