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^{222}Rn IN WATER: A COMPARISON OF TWO SAMPLE COLLECTION METHODS AND TWO SAMPLE TRANSPORT METHODS, AND THE DETERMINATION OF TEMPORAL VARIATION IN NORTH CAROLINA GROUND WATER

by

Jerome H. Hightower, III

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Approved by:

James E Watson Advisor
Dr. James E. Watson, Jr.

Reader
Dr. Douglas Crawford-Brown

Reader
Dr. S. W. Felix Fong

DISCLAIMER

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ABSTRACT

JEROME H. HIGHTOWER, III. Rn^{222} in Water: A Comparison of Two Sample Collection Methods and Two Sample Transport Methods, and the Determination of Temporal Variation in North Carolina Ground Water. (Under the direction of Dr. James E. Watson, Jr.)

The objectives of this field experiment were three-fold: first, determine whether there was a statistically significant difference between the radon concentrations of samples collected by the Environmental Protection Agency's standard method, using a syringe, and an alternative, slow-flow method; second, determine whether there was a statistically significant difference between the measured radon concentrations of samples mailed versus samples not mailed; finally, determine whether there was a temporal variation of water radon concentration over a seven month period.

The field experiment was conducted at nine sites, five private wells and four public wells, at various locations in North Carolina. The results of the analyses showed that a syringe is not necessary for sample collection, there was generally no significant radon loss due to mailing samples, and there was statistically significant evidence of temporal variations in water radon concentrations.

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INTRODUCTION

Currently the Environmental Protection Agency (EPA) is proposing a drinking water standard, a maximum contaminant level (MCL), of 300 pCi/L for Rn^{222} (radon) in public water supplies. The standard would provide protection from the risk of waterborne radon induced fatalities as the Safe Drinking Water Act protects against other harmful materials. The objectives addressed by this report, with regard to the likely radon in water promulgation, were three-fold. The first objective was to determine whether there was a statistically significant difference between the radon concentrations of samples collected by the Environmental Protection Agency's standard method, using a syringe, and an alternative, the slow-flow method. The second objective was to determine whether there was a statistically significant difference between the measured radon concentrations of samples mailed to a laboratory for analyses versus samples not mailed. And the final objective was to determine whether there was a temporal variation of water radon concentration in North Carolina ground water.

The first two objectives pertain to the determination of a safe, easy, and accurate system of collecting and sending radon-in-water samples for analysis. This determination will be helpful if the proposed MCL becomes law. Assuming the MCL becomes law, public water sources will have to be monitored, first for characterization and then for compliance. The government will not collect water samples; rather it will be up to the owners of the sources to obtain the samples and send them to a central laboratory for analysis. Therefore, the EPA will need to

establish a system so that accurate results can be obtained. A mail-in sample test kit is the probable method. Such a mail-in test system would not only benefit public water sources but also private well owners. The private owners would have the capability to sample their own wells and determine if they are within regulatory limits. However, such a test kit has not been extensively field tested. The main problems associated with the mail-in sample test kit are the establishment of a safe, easy, accurate sample collection method, and a convenient sample transport method.

The first objective addresses the problem of sample collection. The EPA has established a standard method for the collection of radon-in-water samples (US EPA 1978). However, the method requires the application of a syringe. The syringe is used to draw a water sample from a funnel which is connected, by tubing, to a spigot. Three problems associated with the use of a syringe in a mail-in sample test kit are public injury due to improper usage, the cost of supplying a syringe, and the potential loss of radon. It has been noted that radon may be lost when water is taken from the funnel under negative pressure (Blanchard 1986). Despite the potential loss of radon from the syringe the funnel-syringe method has produced accurate results, and has out performed many alternative methods (Burkhart [1]; Kinner 1991). However, the slow-flow method has shown promise as an alternative (Dusenbury 1992). This method requires slowly flowing water into a sample vial containing scintillation fluid. The method is easier, safer, and cheaper than the funnel-syringe method. The problem with the method is that it has not been extensively field tested to determine whether the method produces as accurate of results as the funnel-syringe method. Hence, the first of the three objectives of this experiment is to determine whether the slow-flow method is as

[1] Burkhart, J. F.; Gray, D.; Martin, R. D.; Warrick, B. A Comparison of Current Collection/Sampling Techniques for Waterborne Radon Analysis. 1991.

accurate as the EPA's funnel-syringe method.

Another uncertainty regarding a mail-in sample test kit is the lack of data on possible radon losses during transport. Mailing samples back to a central laboratory would be very convenient. A study conducted by B. Dusenbury (1992) at the University of North Carolina at Chapel Hill, compared the measured radon concentrations of samples transported by mail and samples transported by car. The study provided evidence that mailing has no effect on the radon concentrations of samples. The Dusenbury study conducted a number of laboratory based tests, and only two field based tests. The field based tests depict an actual sampling situation owners of public wells will likely follow. Thus, it seems only practical that to determine whether samples could be mailed from the field without significant radon loss, the experiment should be conducted in the field. The two field tests conducted by the Dusenbury study are inadequate in determining if mailing is a valid transport option; more data are needed. Therefore, the second objective of this experiment compares the measured radon concentrations of field samples transported by mail and by car. These data and the data gathered on the sample collection methods should provide the bases for conclusions on whether a mail-in sampling system is a viable option for sample collection.

The third objective of this report is to characterize the temporal trends of radon in ground water. The published literature provides little information on the temporal trends of radon in ground water. The risk due to radon in drinking water is related to the annual average radon concentration. It is necessary to determine how indicative one sample would be of the annual average radon concentration. If the sample is indicative, the owners/operators of the water supplies would only have to take one sample to characterize a site. However, if temporal trends exist one sample would not be adequate, and thus a monitoring scheme would have to

be established to estimate the annual average radon concentration. This study will try to provide some answers as to the temporal variation of radon in ground water.

The field experiment accomplished its objectives by sampling nine sites, from various locations in North Carolina, over a seven month period. The results of the sites' monitoring were statistically analyzed. The slow-flow collection method performed exceptionally well, either producing results as good as or better than the EPA's standard collection method. Also, it was found that samples could be mailed without experiencing significant radon loss. And lastly, it appears that there is temporal variation in ground water radon concentrations.

LITERATURE REVIEW

Radon, the EPA, and North Carolina

Radon is a radioactive noble gas occurring naturally from the breakdown, or radiative transformation, of uranium (^{238}U). Because radon is a noble gas, it is chemically inert. Hence, when radon gas is inhaled, it is readily exhaled. However, when radon radioactively transforms, the resultant radionuclide, a radon decay product, undergoes a phase change from a gaseous atom to a solid. When these radon decay products are inhaled, they will deposit in the lungs. These radon decay products will continue to transform, depositing their excess energy in the lungs until they are either excreted from the body or decay to stable isotopes. Thus, it is not the radon gas that causes the damage to the lungs, rather it is the radon progeny.

Radon emanates from a uranium rich geology. The radon permeates through the soil and to the atmosphere. If a home is located above such a uranium rich strata, the radon gas will concentrate in the home if there are openings into the home's environment through which the radon can enter. Likely entry points would be through cracks in a basement's walls or flooring, through cracks, vents, or openings in a sub-floor above a crawl-space, and through the home's water supply.

Radon is most likely to reach a home via a water supply if the supply is from a private well or public ground water system. Radon emanating from a uranium rich geology can dissolve and concentrate in the ground water. When water is pumped into a home, radon is likely to be released into the home's air via aeration of the water.

The potential for radon release from a home's ground water supply and the estimated lifetime risks due to radon have sparked concern for the public affected. The concern has prompted the EPA to propose a drinking water standard for radon

in public water supplies. The proposed MCL is 300 pCi of radon activity per liter of drinking water. Using the water-to-air conversion factor of 10,000 pCi/L of radon in water producing 1 pCi/L of radon in home air, this proposed MCL would result in an air concentration of 0.03 pCi/L, with an associated estimated lifetime risk of 2 fatalities per 10,000 individuals. This MCL produces a risk at a level that is comparable to or higher than other EPA regulated materials found in drinking water; however, the resulting indoor radon concentration is less than the average outdoor radon levels which are on the order of 0.2 - 0.7 pCi/L (US EPA 1991).

The primary health hazard associated with radon in water is inhalation. This is because 80% of the total estimated lifetime risk from exposure to radon in water is from inhalation. The remaining 20% is from ingesting radon from water (Federal Register 1991). The ingestion risk is however under debate because of the variability between differing risk estimates. For example, the risks from ingesting radon from water has been shown to be equal to those from inhalation (Crawford-Brown 1991). The problems with these ingestion risk estimates are the great uncertainties associated with parameters injected into the risk calculations, with the uncertainties due to little information on the effects of ingesting radon (Federal Register 1991). In any case, it is likely that when information is gathered on the effects of ingesting radon from water, the risks from ingesting radon will be lower than those from inhaling waterborne radon.

North Carolina ground water systems would be greatly affected by this MCL if adopted. North Carolina's geology is well endowed with metamorphic and granite rock. These rock types contain elevated levels of uranium. A survey of North Carolina ground water was conducted by Watson, Mabry, and Evans of the University of North Carolina at Chapel Hill (UNC-CH) (Watson 1993). The results of the survey showed that of 400 private wells sampled, 67% of these wells were above the proposed MCL. The breakdown by region showed that the 30% of

the Eastern region homes, 75% of the Central region homes, and 83% of the Western region homes had wells with radon concentrations above the proposed MCL (Watson 1993). If this MCL is promulgated, a substantial number of North Carolina's public ground water supplies, primarily in the Western and Central regions, will have to institute mitigation systems to reduce the radon concentrations to below the MCL.

Radon in Water Analysis and Sampling Method

The currently recommended techniques for radon-in-water analyses are the alpha scintillation cell (ASC) technique and the liquid scintillation counting (LSC) technique. The ASC technique requires the emanation of radon from the water to an alpha scintillation cell. The alpha particles emitted from the radon progeny interact with the zinc-sulfide on the alpha scintillation cell and produce photons which are counted with a photomultiplier tube system. The ASC technique is more sensitive than the LSC technique, but is more "labor and equipment intensive" (Kinner 1991).

The LSC technique, developed by Prichard and Gesell, is a quick and easy analysis technique (Prichard 1977). Scintillation fluid and the radon entrained in water are combined in a sample vial so that the particle radiation (alphas and betas) of the radon progeny interact with the scintillation fluid solvent. The excited solvent molecules then transfer the energy until it is transferred to a fluor molecule, where the fluor quickly de-excites producing a photon of light. A single particle of radiation (i.e., beta particle) can excite many fluor molecules producing a flash of light, in which photons are emitted in all directions.

The photons are counted using two opposing photomultiplier (PM) tubes joined by an coincidence circuit, with the remaining electronics following. The photons which interact with both PM tubes, essentially simultaneously, produces

voltage signals that are analyzed by the coincidence circuit for coincidence. If the photons are coincident, the event producing the photons, the interaction of a single particle of radiation in the scintillation fluid, is counted.

The currently recommended EPA method requires a funnel assembly and a syringe. This method requires that water slowly overflow the funnel while a syringe is used to extract a 10 mL sample and inject the sample below 10 mL of scintillation fluid in a 20 mL sample vial. The EPA method provides very good and consistent results, and has been tested against numerous other sampling methods by researchers such as Burkhart[1] and Kinner (1991). One technique that has not been studied by these researchers, but has been studied by Dusenbury (1992) is the slow-flow method.

The slow-flow method requires slowly flowing 10 mL of water into a 20 mL sample vial, already containing 10 mL of scintillation fluid. This method is easy in preparation and collection, and is inherently simpler than the funnel-syringe method because the technique does not require the application of a syringe.

The Dusenbury study, conducted at UNC-CH, compared the EPA's funnel-syringe method with the slow-flow method, primarily in a laboratory setting using a radium source and a carboy of water. The results of that laboratory experiment indicated that there were no significant differences between the two sample collection methods. Dusenbury also conducted two field measurements at wells located near Raleigh, NC. A significant difference was shown between the two sample collection methods in one of the comparisons. Dusenbury concluded that the slow-flow method is a valid alternative to the EPA's funnel-syringe method,

[1] Burkhart, J. F.; Gray, D.; Martin, R. D.; Warrick, B. A Comparison of Current Collection/Sampling Techniques for Waterborne Radon Analysis. 1991.

but recommended increasing the field study database. This report will expand this database.

Sample Transport

The only information gathered on sample transport was obtained from the Dusenbury study (Dusenbury 1992). In that study, there were no significant differences between the two transport methods, car and mail. However, the field database was small, and therefore needed expanding. This report will expand this database.

Temporal Variation of Ground Water Radon Concentrations

After an extensive literature review, the information gathered on the temporal variation of ground water radon concentrations was determined to be weak. Two research groups were found to have drawn conclusions on the stability of ground water radon concentration (Watson 1987; Farai 1992).

The Watson temporal study obtained samples quarterly for three consecutive quarters from test wells in eastern North Carolina. The resulting radon concentrations of these water samples were not dramatically different and were therefore concluded to be stable (Watson 1987). It is not believed that three sample runs were adequate to characterize the temporal variation of a site's water radon concentration.

The Farai study, in contrast to the Watson study, obtained 46 radon concentrations at one well over a one year period. The annual average radon concentration was 400 pCi/L with a standard deviation of 38 pCi/L and a maximum deviation of 57 pCi/L. The author states that the "small fluctuations" in radon concentration correlate with rainfall (Farai 1992). The study appeared to be conducted well, but was limited to a single well in Nigeria.

Information on the temporal trends of ground water will be important if the radon MCL becomes law. A sampling strategy will have to be determined, and it will need to be known how indicative one sample is of the annual average water radon concentrations of the site sampled. The information provided by these two research groups is slim and an expanded database is needed. Thus it was another task for this report to furnish this information.

MATERIALS AND METHODOLOGY

At the beginning of the research project, ground water supplies to be sampled were selected using research contacts, from previous studies conducted by UNC-CH, and with the help of the North Carolina Division of Radiation Protection (DRP). The owner of each supply identified as a potential sampling site was contacted and asked to participate in the experiment with a promise of anonymity, no cost, and a report of the site's results. All owners contacted agreed to participate and sampling began on September 25, 1993 for the western sites and October 4, 1993 for the eastern sites.

The sites sampled in the western region of North Carolina were in the Kings Mountain area, and included five sites located within a mile radius. All five sites had private wells of which some were used for drinking water and some for outdoor uses only (See Table 1 for site characterizations).

The sites sampled in the eastern region of North Carolina were located around the Raleigh area, and included four sites located within a 20 mile radius. These sites, in contrast to the western sites, were all public water supplies, two supplying a city and the other two mobile home parks (See Table 2 for site characterizations).

Experimental Design

The field experiment was designed to obtain numerous samples to provide statistical strength as well as compensate for the potential loss of samples during the mailing process. The design called for 20 samples per well per sample run, with sample runs scheduled every two to three weeks for the Eastern sites and monthly for the Western sites for the duration of a seven month period. The 20 samples collected per sample run were subdivided into four populations:

Table 1: Site Characterization for the Western North Carolina Sites

Site	Well Depth	Usage	Tank	Purge Time	Notes
A	350 ft.	Outdoor Only	10 gallon	5 min.-2 hr.*	
B	600 ft.	Drinking	Unknown	5 min.	
C	265 ft.	Outdoor Only	Unknown	5 min.-30 min.**	
D	430 ft.	Outdoor Only	>100 gallon	5 min.-30 min.**	
E	Unknown	Heating & Outdoor	None	5 min.	Geo-therm heating unit

Table Notes:

* : The well was purged for 5 minutes the first two runs, 30 minutes the third and fourth runs, and approximately 2 hours for the fifth through seventh runs.

** : The well was purged for 5 minutes the first two runs, and 30 minutes for the remaining runs.

Table 2: Site Characterization for the Eastern North Carolina Sites

Site	Well Depth	Usage	Tank	Purge Time	Notes
A	120 ft.	Drinking	>250 gallon	5 min.	
B	255 ft.	Drinking	>250 gallon	5 min.	
C	320 ft.	Drinking	>250 gallon	5 min.	
D	400 ft.	Drinking	None	5 min.	

1. Funnel-Syringe Collection followed by Mailing
2. Slow-Flow Collection followed by Mailing
3. Funnel-Syringe Collection and No Mailing
4. Slow-Flow Collection and No Mailing

These four populations supply the information for the study of effects of sampling method and sample transport on the accuracy of measurement. The seven sample runs for the western sites and 11 for the eastern sites provide a large number of observations for the sample collection method and sample transport statistical analyses, as opposed to the two sample runs conducted by the Dusenbury study, and thereby increase the strength of the inferences drawn on the results of these analyses. The numerous sample runs spaced over an extended period of time also provide the information needed to determine if there were any significant variations in ground water radon concentrations over the seven month span.

Sample Run Preparation

Sample preparation began two to three days prior to each sample run, and included preparing sample vials and mailing tubes. Twenty mL borosilicate scintillation vials with cone lids were prepared by filling them with 10 mL of E. I. Dupont New England Nuclear's High Efficiency Mineral Oil scintillation fluid. Vial lids then were hand-tightened on, and the prepared vials labeled.

The vial lids were labeled with an identifier to indicate sampling location, sampling order, sampling method, and transport method. The labeling scheme used for each site's set of 20 samples is as follows:

1. The letter "W" or "E" was first written on the cap to indicate whether the Western sites or the Eastern sites, respectively, were to be sampled on the scheduled date.

2. Next, another letter (A, B, C, etc.) was written on the cap to indicate the sample site (See Tables 1 and 2 for each site's indicator letter).
3. The samples then were numbered from 1 through 20.
4. All odd numbered samples were denoted with an "F" to signify sample collection via the funnel-syringe method, and all even numbered samples were denoted with an "S" to signify collection via the slow-flow method. This alternation of sample collection method eliminates the confounding of variation of radon concentration as a function of time during sampling.
5. Finally, alternating pairs of samples were labeled with an "M" (mailing) or not labeled (driven back to the UNC-CH radiological hygiene laboratory).

Thus, for example, a vial which was labeled with "WAFM 5" indicated that the sample was the fifth sample collected from western site A via the funnel-syringe method, and mailed back to the UNC-CH. The procedure was repeated for each site's set of twenty samples until vials for all sites to be sampled on the scheduled date were prepared.

All the vials were then weighed, to the nearest hundredths of a gram, and their weights recorded. The vials were then set aside at room temperature in the UNC-CH radiological hygiene laboratory until the day of the sampling.

Mailing tubes which carry two sample vials per tube were prepared by making sure the postage and address of the laboratory were properly affixed, as well as making sure that there was enough bubble wrap to adequately protect the vials from shattering during mailing.

Sample Collection and Mailing

After arriving at the site and having gained access to the well head spigot, the sampling equipment (funnel-assembly, 50 mL syringe, clip-board and data sheet, watch) and sample vials were situated close to the spigot for accessibility. The first sample taken was via the funnel-syringe method (See Fig. 1). The following procedure explains how a sample was taken via this method (US EPA 1978):

1. When the well started pumping, the spigot was then turned on to a moderate flow rate and allowed to run for a specified time to purge the well (See Tables 1 and 2 for site's purge time). Upon completion of the well-line purge the spigot was turned off. At this point the lid of the first sample vial was removed and the lid and vial set aside. (Note: In several instances the pump was not running at the time of sample collection. Every practical effort was made to start the pump. However, if the pump did not run, samples were taken, per these procedures, from the system's holding tank or water line.)
2. The funnel assembly, consisting of a spigot adapter connected to rubber tubing, which in turn is connected to a funnel, was attached to the well-head spigot. With the funnel held upright in one hand, the spigot was then turned on with the water entering the funnel slowly (non-turbulent).
3. When the water began to flow over the lip of the funnel, the syringe was taken into the other hand and the needle of the syringe submerged to the base of the funnel (See Fig. 1). The syringe was first primed by drawing 15 mL of water into the syringe and aspirating the contents. The needle of the syringe was again submerged to the base of the funnel and a 10 mL sample slowly drawn. After the sample was

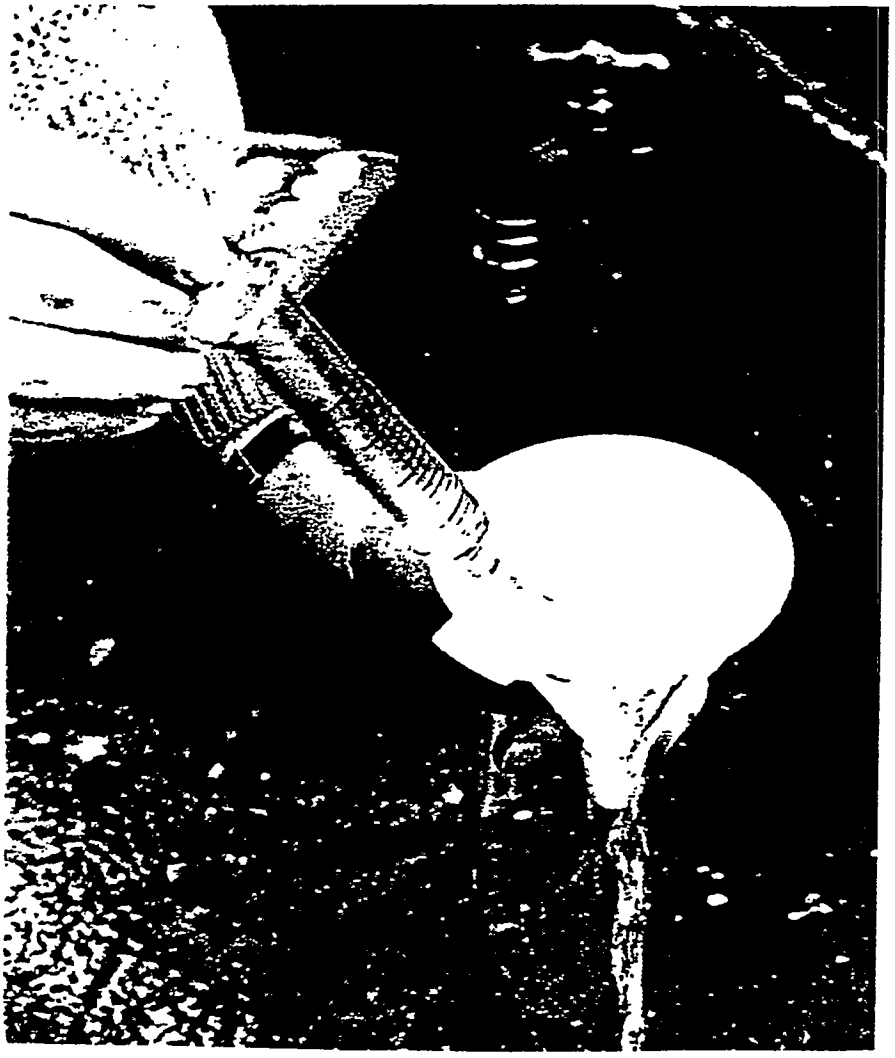


Figure 1: Collecting a sample using the funnel-syringe method.
(Source: EPA-EERF-MANUAL-78-1)

drawn, the needle of the syringe was then removed from the funnel and submerged below the scintillation fluid of the sample vial. The contents of the syringe were slowly injected into the vial (See Fig. 2).

4. Upon completion of the injection, the lid of the sample vial was quickly and securely replaced. The time the sample was collected was then recorded.

The next sample was collected by the slow-flow method. The following is the procedure followed when samples were collected by this method:

1. The lid of the appropriate sample vial was removed and the lid and vial set aside. The spigot was turned off and the funnel assembly removed.
2. The spigot was turned on but with a flow rate of approximately 0.04 gallons per minute (Note: the flow rate should be adjusted so that the water does not become aerated).
3. The edge of the sample vial was placed against the edge of the spigot--under the water stream. The water flowed from the edge of the spigot and into and along the inside wall of the vial (See Fig. 3). The vial was filled just to its neck.
4. After the vial was full, the sample vial lid was quickly and securely replaced. The time the sample was collected was then recorded.

The remaining samples were collected via these procedures, with continuous rechecking of sample vial lid identifiers for the correct method of collection.

After collection of a site's series of 20 samples was complete, all vial lids were rechecked for a secure fit, and the samples designated with an "M" were prepared for mailing. Those samples with the "M" identifier were wrapped in bubble wrap, placed within tubes, and the lids of the mailing tubes securely

Figure 2: Injecting a sample collected via the funnel-syringe method into a sample vial.
(Source: EPA-EERF-MANUAL-78-1)

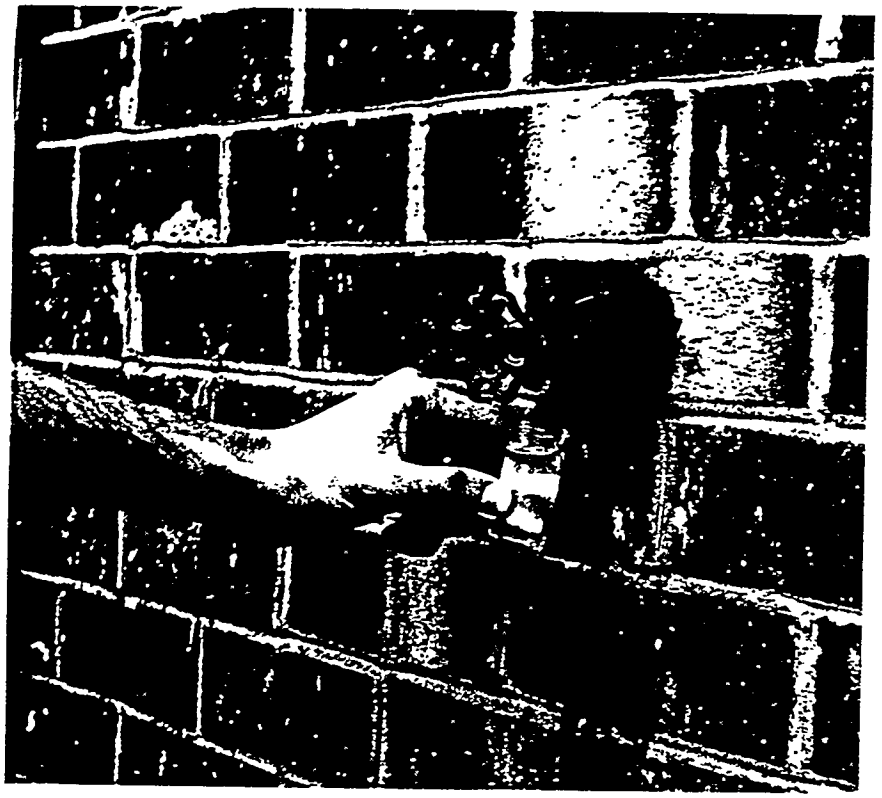


Figure 3: Collecting a sample using the slow-flow method.

fastened. The samples were then mailed from a US Mail box located near the sample sites. The remainder of the samples were driven back to the laboratory.

Sample Analysis and Radon Concentration Calculation

Upon returning to the UNC-CH radiological hygiene lab, the samples transported by car were set aside at room temperature until the mailed samples arrived. Generally, the bulk of the mailed samples arrived two days after the sample run. However, when the mailed samples took longer to arrive, the mailed and non-mailed samples were counted separately. All of the samples were wiped clean, shaken for 15 seconds, arranged in the order sampled, and post-weighed, with the weights recorded. The vials were then transferred to Packard TRI-CARB® liquid scintillation counter (LSC) 10 sample cassettes, with the first sample occupying the seventh position of the first cassette, and the remainder arranged normally thereafter.

The first four, of the six open positions, of the first cassette were for four blanks, 10 mL of distilled water and 10 mL of scintillation fluid. The four blanks served a two-fold purpose. The first was a measure of the LSC's background. The second was to provide a time delay for the radon daughters to enter into secular equilibrium with the radon gas. The remaining two positions on the first sample cassette were for the 714 pCi and 952 pCi radon standards. These standards were used every time samples were analyzed with the LSC as calibration sources, providing data that were used in converting the LSC's output in counts per minute (cpm) to pCi.

The number 12 program selector was inserted into the leading cassette, and all the cassettes were placed into the liquid scintillation counter. The LSC's number 12 program was then set-up. The number 12 program set-up entailed making sure all program selections were defined as shown in Fig. 4. The program

Figure 4: Packard TRI-CARB® Program Number 12 Settings
(Source: Packard Instrument Company. The TRI-CARB 300C and 300CD Liquid Scintillation System - Operation Manual. No. 169-2196-Rev. B. USA, 1980.)

PROGRAM # = 12 COPY PROGRAM # ? [1-15] NO[0] = **0**

TERMINATORS: MINUTES? [0.10-999.99] = **50**
2σ%[0.1-10] OFF[0] A = **1** B = **2** C = **1**

RADIONUCLIDE ? 3H[1] 14C[2] 32P[3] 3H/14C [4]
3H/32P[5] 125I[6] MANUAL[7] = **7**

REGION A ? [0-2000] LL = **0** KeV UL = **2000** KeV
REGION B ? [0-2000] LL = **5** KeV UL = **1850** KeV
REGION C ? [0-2000] LL = **0** KeV UL = **5** KeV

QIP? ES: NO[0] YES[1] = **1** AEC ? NO[0] YES[1] = **0**
SCR? A/B[1] B/A[2] A/C[3] C/A[4] B/C[5] C/B[6] = **1**

#VIALS/STD[1-9] = **1** #VIALS/SMPL[1-9] = **1** #COUNTS/VIAL[1-99] = **1**

BKG? FV[0] MANUAL[1] = **1** A?[0-999] = **0** B?[0-999] = **0** C?[0-999] = **0**

% OF STANDARD? NO[0] YES[1] = **0**

LOW CPM REJECT;[0-999] A = **0** B = **0** C = **0**

DIVIDE FACTOR? [0.001-9999] K = **1**

DATA MODE? CPM[0] DPM[1] = **0**

was set-up so that the counts that fell within region B were the counts used in the sample activity calculations. Counts which fell outside this region were considered noise. Each sample was set up to be counted for a maximum of 50 minutes or until the 2σ% terminator was met, whichever was less. After the program was set-up, the LSC counting sequence was initiated, and the date and time recorded.

After the samples were counted, the results, in cpm, were not indicative of the radon concentration the day the samples were collected. This is due to radon's half-life. Every 3.82 days, half of the radon present in a given volume, will radioactively transform. Thus, in order to determine the radon concentration present on the day samples were collected, a back calculation is required using the inverse of the radioactive decay law. The equation as applied to this situation is as follows:

$$C\ (pCi/L) = \frac{(GCR\text{-}BCR)\ cpm \times (1000\ mL/L)}{(Volume)\ mL \times (CF)\ cpm/pCi} \times \exp.\ [T \times (0.693/3.82\ days)],$$

where:

- "C" denotes the water sample radon concentration, in pCi/L, on the day the samples were taken.
- "(GCR-BCR)" denotes the net count rate, in cpm, determined by subtracting the background count rate, BCR, from the gross count rate, GCR, where the GCR and BCR are the count rates from the LSC region B.
- "Volume" denotes the volume of the sample collected, in mL, which was determined by taking the difference in mass of the pre-weighed and post-weighed sample, and dividing it by the density of water, 1 gram/mL.

- "CF" denotes the calibration factor, in cpm/pCi, and was determined by taking the net count rates, in cpm, of the radon standards and dividing them by the activity, in pCi's, of the standards. The resulting two calibration factors, the 714 pCi and 952 pCi calibration factor, were then averaged to produce an overall calibration factor which was used in the equation. The calibration factor averaged approximately 10 cpm/pCi throughout the experiment.
- "T" denotes the elapsed time, in days, from the point a sample was taken to the mid-point of that sample's LSC counting interval.

The formula was used in conjunction with a computer spreadsheet software program to calculate the water sample radon concentrations quickly.

RESULTS

The results of the sample analysis are shown in Figures 5 through 13. The average radon concentrations displayed in the figures were measured by the LSC and corrected for radon decay. The total number of field samples collected was 1400. However, 44 of those 1400 samples were not analyzed because the samples were either damaged or lost; and of those 44 samples, 43 were damaged or lost during the mailing. Therefore, 93.7% of the samples mailed went on to be measured by the LSC.

The sample analysis results are displayed in a histogram format, with the average radon concentration shown versus sample run. Within each sample run, the average radon concentration of each of the four sample populations is displayed:

1. Funnel-Syringe Collection and Non-mailed,
2. Funnel-Syringe Collection and Mailed,
3. Slow-Flow Collection and Non-mailed,
4. Slow-Flow Collection and Mailed.

Then by compiling the results of all the sample runs of a site, the site's temporal trend over the seven month sampling period is displayed. (Note: when no results are displayed for a sample run, no data were taken. See APPENDIX A for reason no data were taken.)

Qualitative Analysis of the Eastern North Carolina Sites

First, the results of different sample runs for each site were investigated to determine if there were any apparent trends between the sample populations of the site's sample runs. The only trend noticed when comparing the differing sample runs within a site's results, was the tendency for the slow-flow collected

Figure 5: Eastern Site A Results

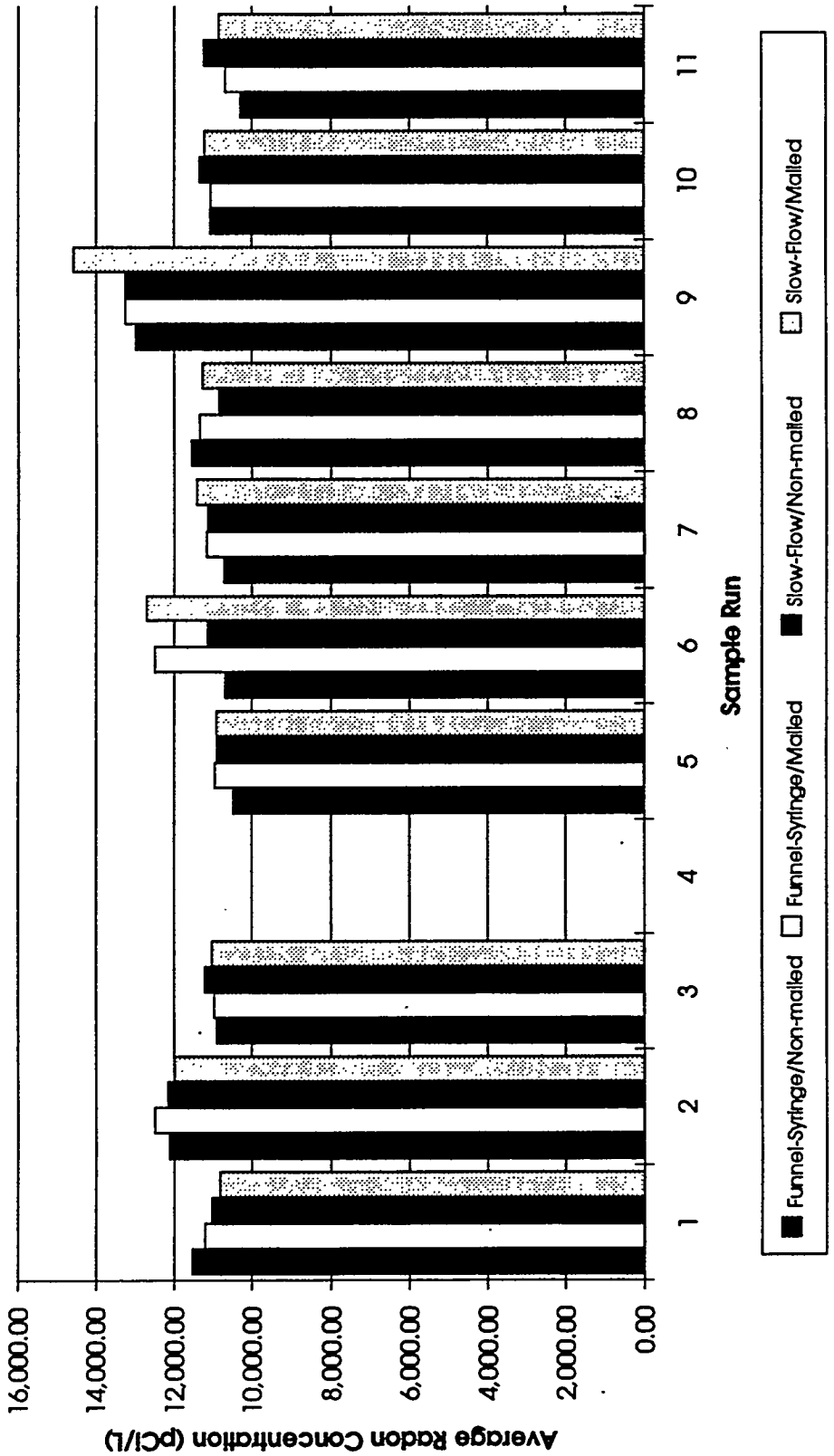


Figure 6: Eastern Site B Results

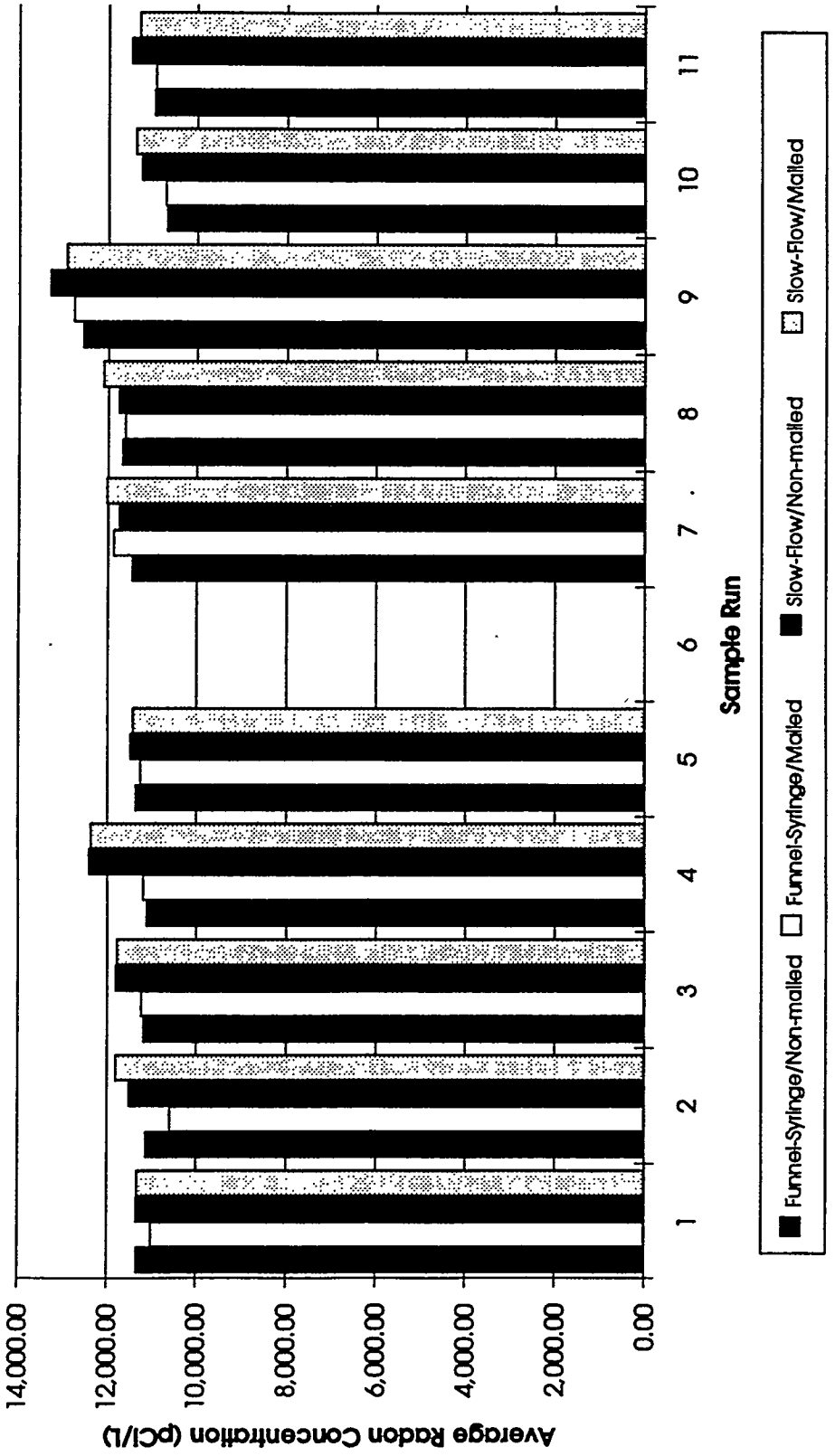


Figure 7: Eastern Site C Results

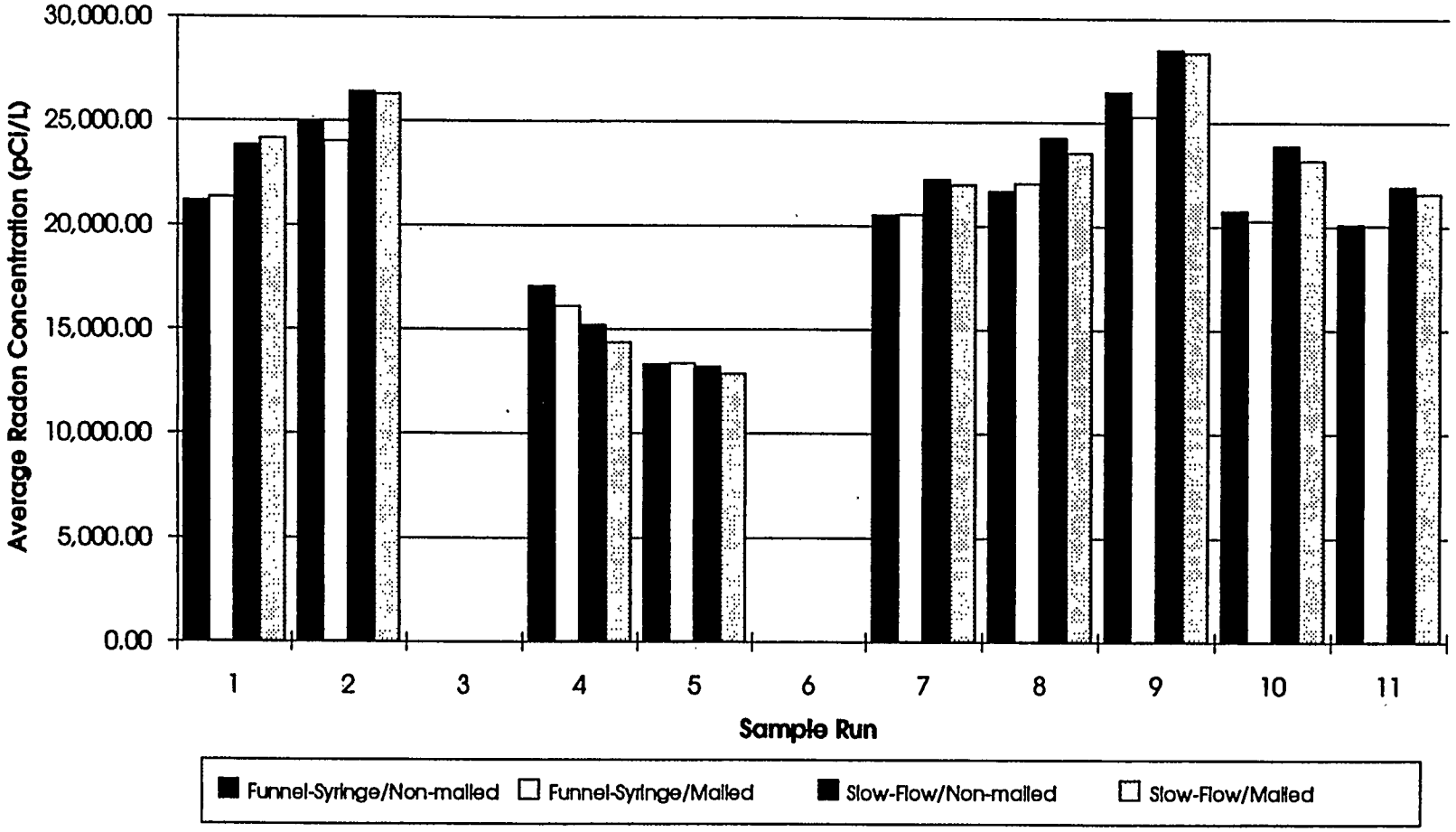
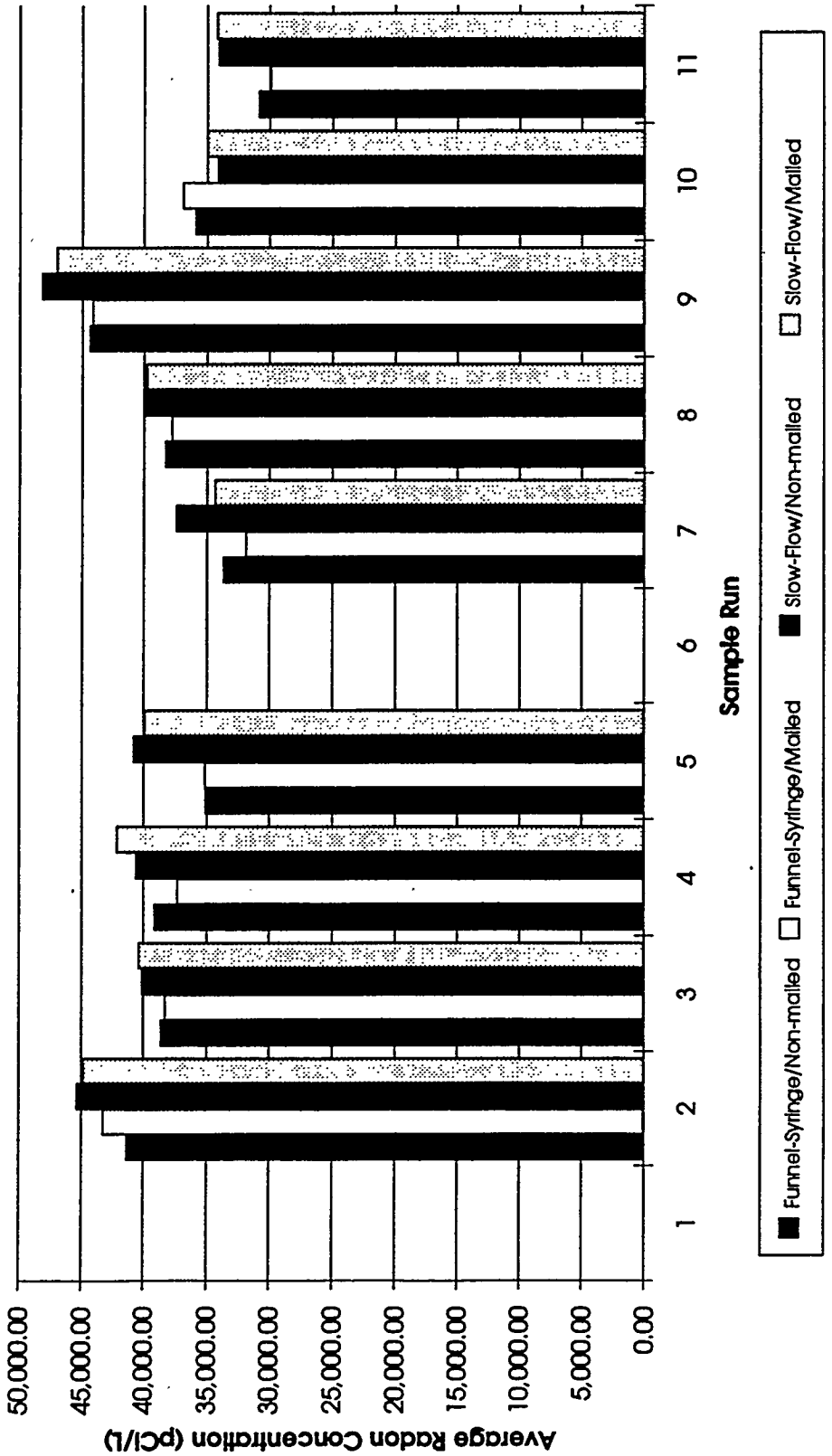


Figure 8: Eastern Site D Results



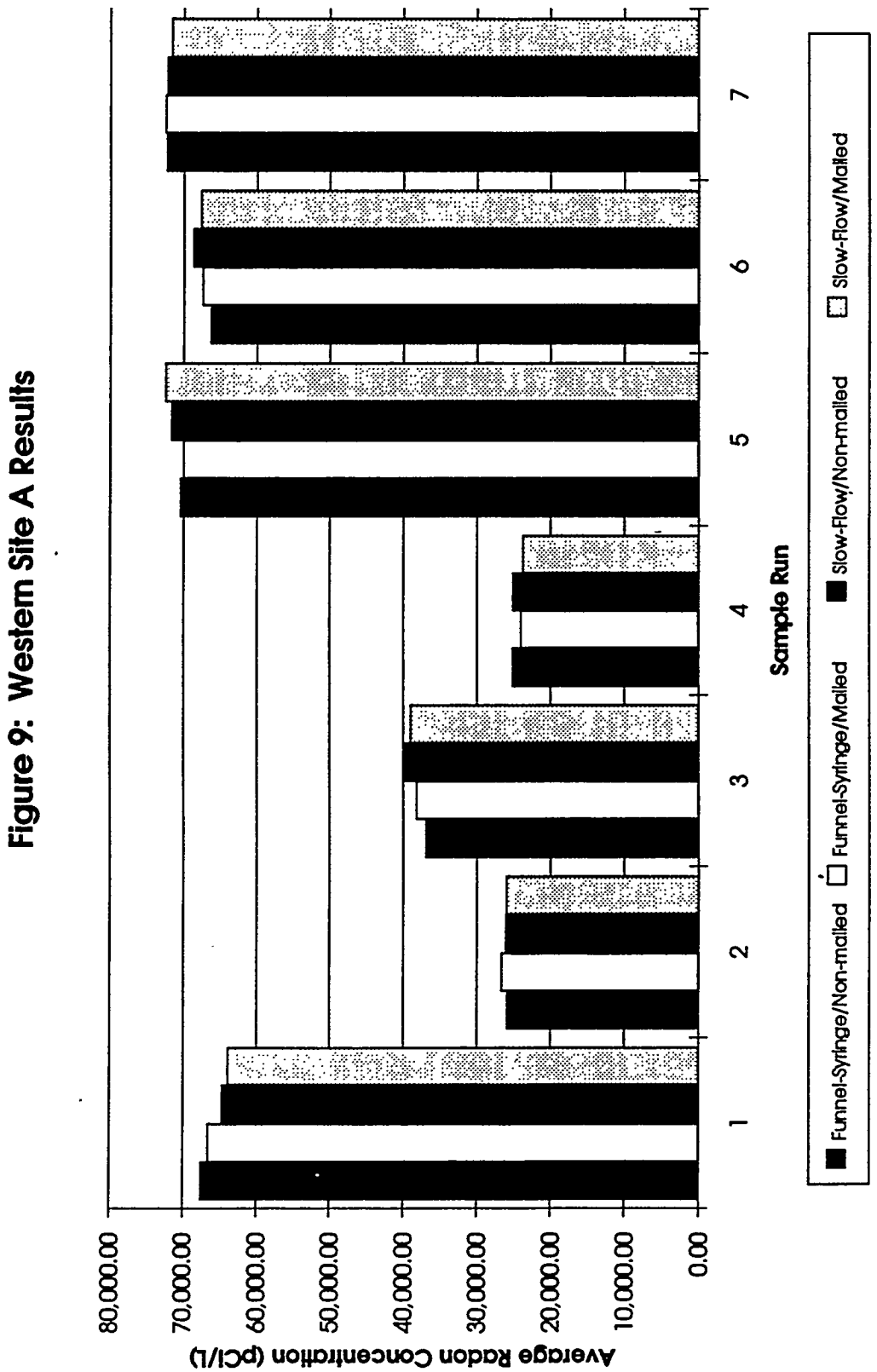


Figure 9: Western Site A Results
Average Radon Concentration (pCi/L)
80,000.00
70,000.00
60,000.00
50,000.00
40,000.00
30,000.00
20,000.00
10,000.00
0.00
1
2
3
4
5
6
7
Sample Run
Funnel-Syringe/Non-mailed
Funnel-Syringe/Mailed
Slow-Flow/Non-mailed
Slow-Flow/Mailed

Figure 10: Western Site B Results

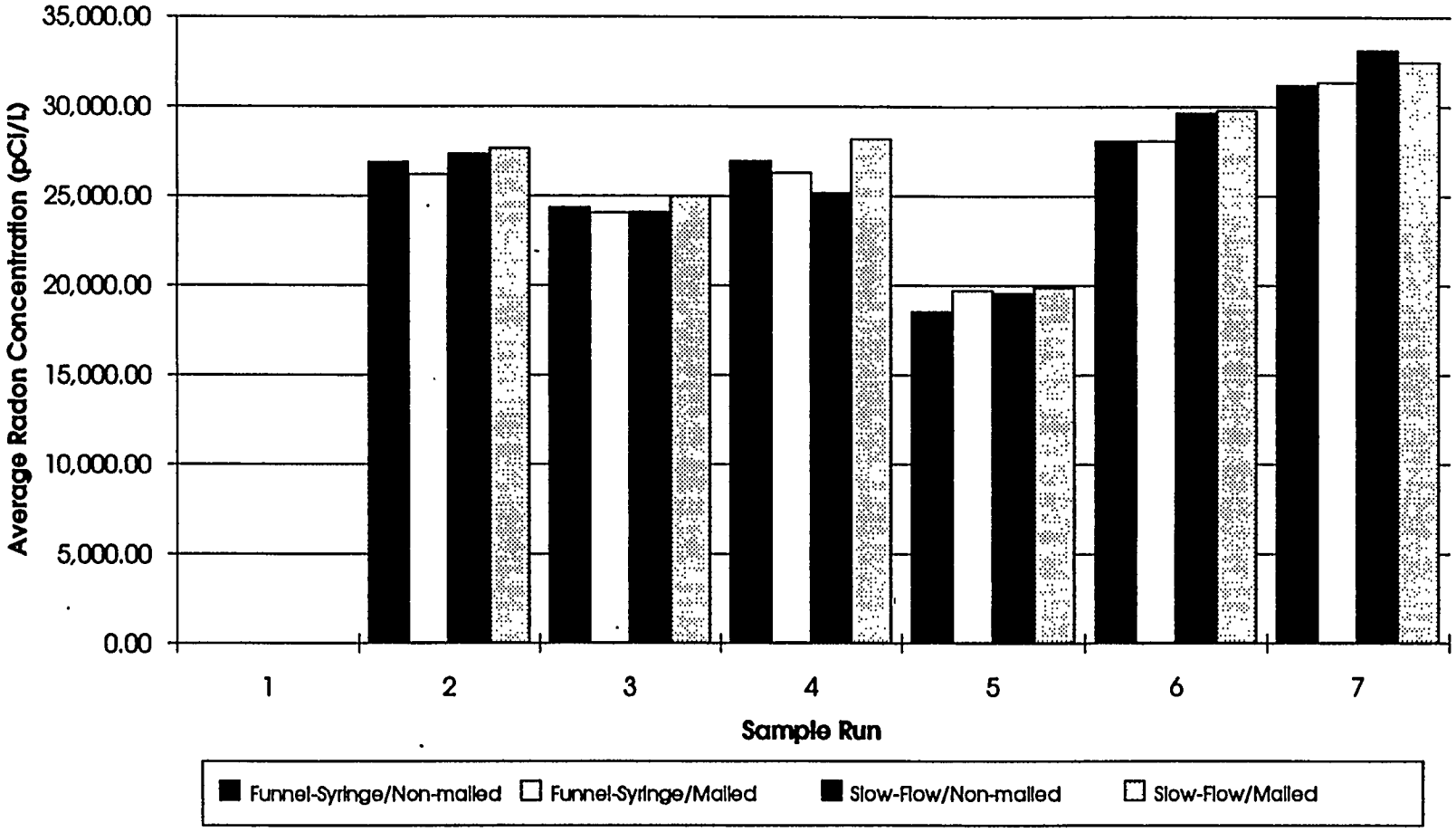


Figure 11: Western Site C Results

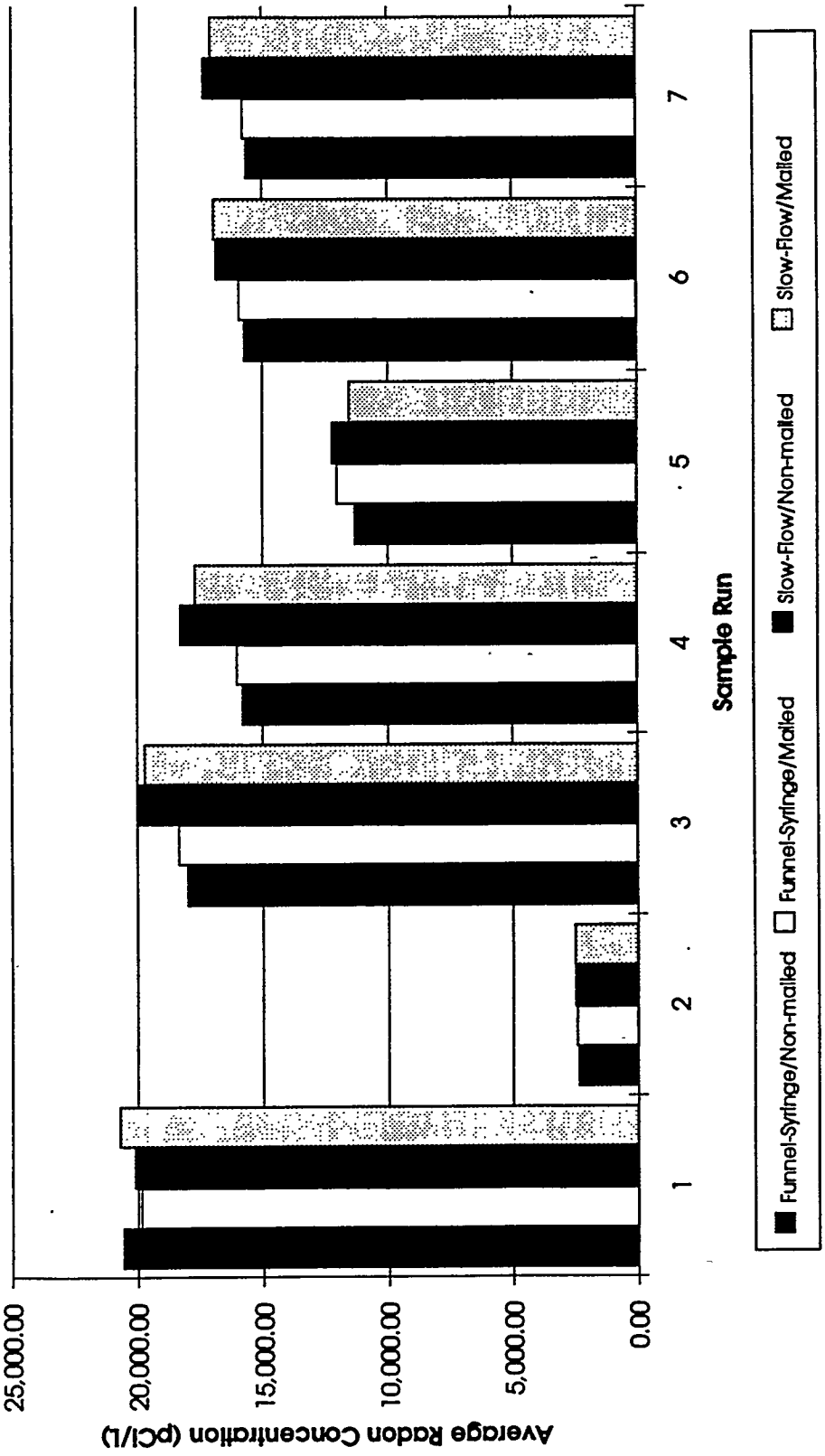


Figure 12: Western Site D Results

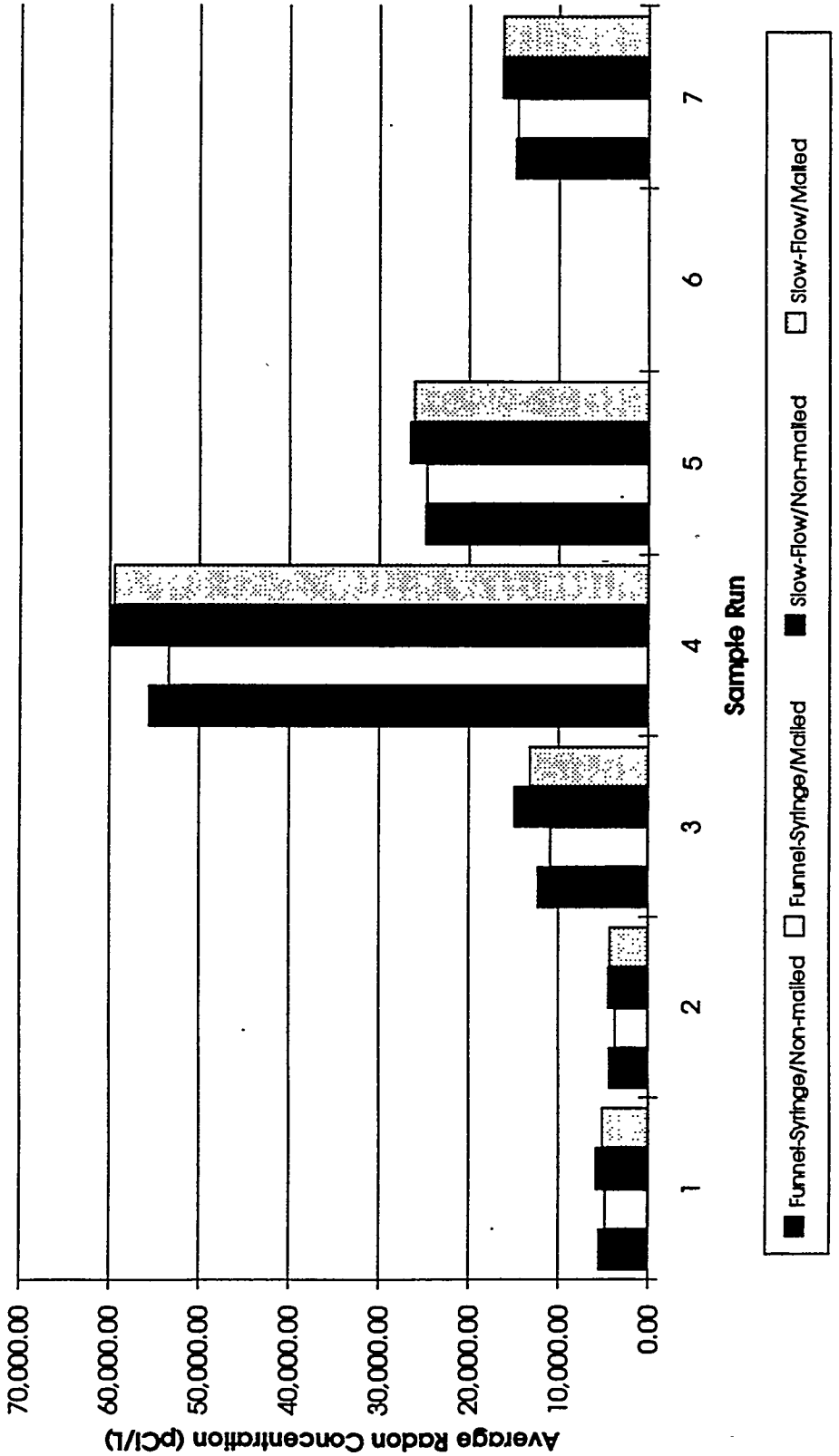
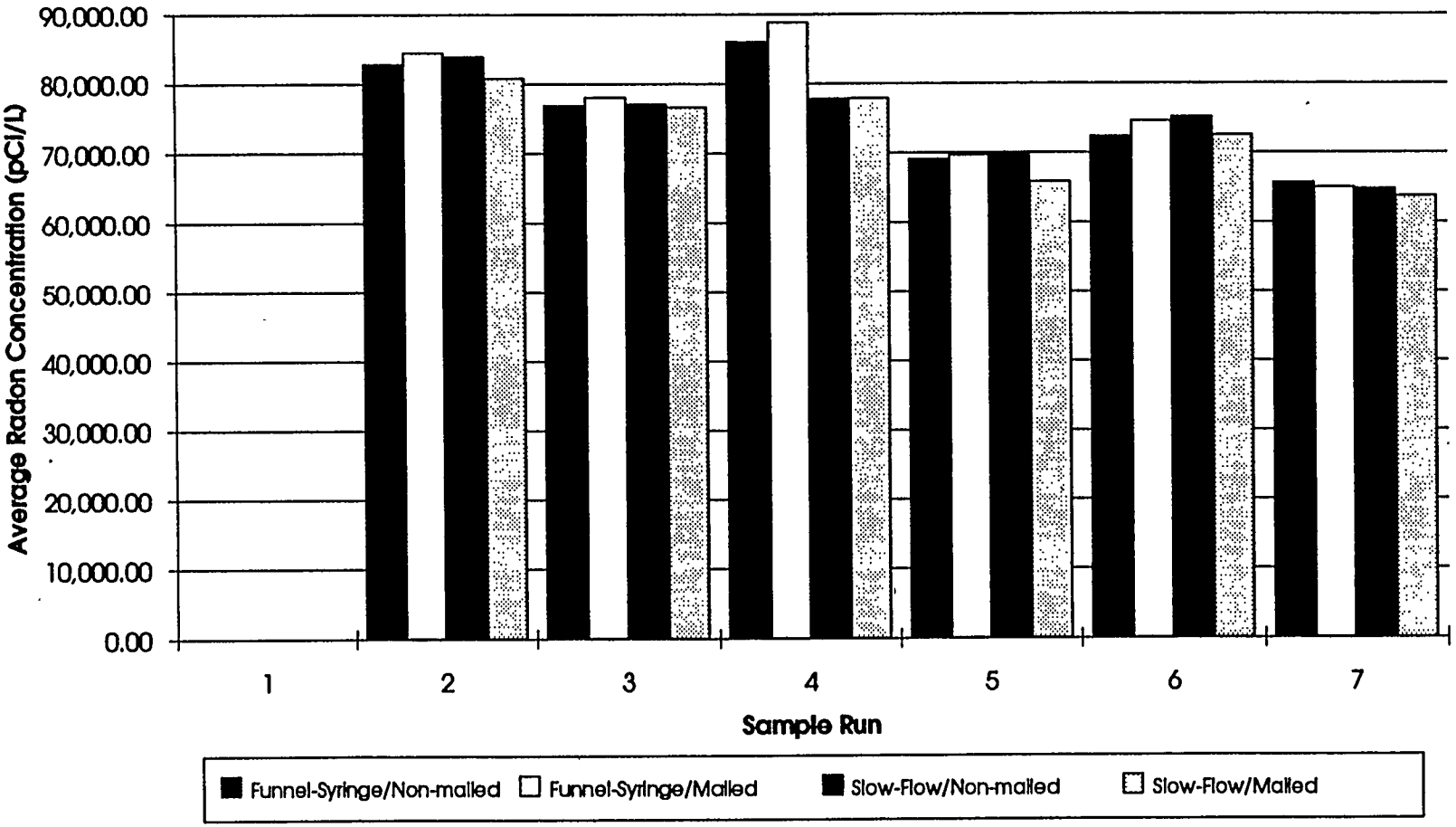


Figure 13: Western Site E Results



population samples to have greater radon concentrations than the funnel-syringe collected population samples. This indicated that the slow-flow collection method has the tendency to collect more radon than the EPA sample collection method.

Next, the results for the eastern sites were investigated for temporal variations of radon in ground water. It is believed that the temporal variations noticed in the data for sites C and D are not from fluctuations in the ground water radon concentrations, rather it is believed to be due to variable conditions prior to sample collection. These variable conditions are in part due to intermittent usage of the source and time of day samples were collected.

Generally when samples were collected from sites C and D, the time was between 8 and 10 AM. During sample collection the pumps were either on or off. On most occasions the pumps were not running, and of these occasions it was frequently observed by records located at the site that the pump had not been running for a minimum of 1 to 3 hours. The wells were rather large, because these sites were part of a city water system, and the pumps could not be turned on to obtain a fresh ground water sample, an indicative sample. Therefore samples were collected of the water standing within the well. It is believed that some of the radon present in the standing water had decayed and/or emanated. Granted radon loss via radioactive decay would be minimal if the true period the pump was off was 1 to 3 hours (1 to 2%). However, the true period the pump was off is unknown, and radon loss could have been much more substantial. For instance, if the true period the pump had not been running prior to sample collection ranged between 8 to 12 hours, the radon loss due to radioactive decay would range between 6 to 9%. Coupling the results of sample collected when the pumps had not been in operation for an unknown period of time and those samples collected while the pump had been running, or just completed running, a temporal trend is likely to be noticed. Hence, the temporal variation in the water radon

concentration was probably due to the variable conditions prior to sampling, with the loss of radon when the pump had been off for a period of time.

The results obtained for sites A and B tend to confirm this hypothesis that the variation of radon is due to variable water usage. The results at these two sites are variable, but definitely more stable than at sites C and D. With the wells at sites A and B, there was indeed more change over of water within the system; the systems are smaller, and the samples were taken later in the day, between 12:00 and 3:00 p.m. Generally when samples were taken, the pumps were either on or had just finished pumping as sample collection began. This allowed collection of a sample that was more indicative of ground water. In those cases when the pump had not turned over for a while, indicated by the holding tank gauge, the pump was turned on. These systems were small enough that the pumps were turned on by either waiting, removing some of the water from the holding tank, or a combination of both. Therefore, some change over took place prior to sample collection and a more indicative sample was taken.

The temporal trend of water radon concentrations at sites A and B are relatively constant, except for run 9. The results from sample run 9 depart from the relatively constant trend, indicating a definite variation. Interestingly, this elevated water radon concentration occurred at all four sites during sample run 9.

Qualitative Analysis of the Western North Carolina Sites

As with the eastern sites, each site's sample runs were investigated for variation between the four populations. Likewise, the only trend noticed was the tendency for the slow-flow collected populations to be greater than the funnel-syringe collected populations.

The western sites, in contrast to the eastern sites, are all private wells. A number of interesting observations were made throughout the experiment. The

first involved the usage of the water. Several sites, A, C, and D, used their water strictly out of doors. When the first sample was taken, the weather was warm and the owners indicated that the water was used for watering their grass. Blindly following the purge-line procedure outlined in the Dusenbury Master's report, samples were collected after a well line purge of one to five minutes. The results seemed to be reasonable because the owner of site A indicated that his water radon concentration was approximately 60,000 pCi/L. The purge-line procedure was continued into the second run, but this time the water radon concentrations for sites A and C were dramatically lower. Between the first and second runs the weather had turned colder. Because of the colder weather, the owners no longer used their well water to water their grass. The water had been standing in the well, and thus the radon either decayed and/or emanated from the system. Site D remained constant during these first two runs, but its overall trend will be discussed later. Blindly following the purge procedure outlined in the Dusenbury report was an oversight because Dusenbury was measuring mobile home park well systems that had a higher turn over rate than these private wells which were used only for outdoor purposes. A longer purge time of 30 minutes was initiated for the third run with the consent of owners. The results showed that the extended purge time was adequate for site C, however only a minor elevation in water radon levels was noticed for sites A and D. The 30 minute well purge was continued for the fourth run which resulted in a similar radon concentration for C, a lower radon concentration for A, and a spike, approximately 6 times the water radon level of the third run, for site D. The wells were still not being purged long enough to obtain an indicative sample. On sample run five, site A was purged for over two hours. Because permission was not obtained to purge sites C and D for a longer period of time, the 30 minute purge time was continued for the remainder of the experiment. The necessary purge time for site A was determined by calculating

the quantity of water standing in the shaft and the flow rate from the spigot, 3.5 gallons per minute. The extended purge time also allowed for a sub-study to determine the radon concentration as a function of water withdrawn from the well (See APPENDIX E). Using the 2 hour purge time at site A for the final three sample runs resulted in average radon concentrations comparable to that of the first sample run. The results from site C were variable, especially run 5. The overall temporal trend of site C indicates that the well was not purged long enough. Likewise, site D's overall trend indicates the well was also an extreme case of variable usage and the collection of standing water in the well.

The owners of sites B and E used their ground water much more often than sites A, C, and D, and thus more turnover took place in their wells. Because there was much more turnover in these two wells, a purge line procedure of 5 minutes was instituted and remained constant throughout the experiment.

Temporal trends existed at these two sites and once again variable usage is believed to have played a part in the fluctuations noticed in the results. The main fluctuation noticed in temporal trend of site B is at sample run 5. The dip in radon concentration is due to the collection of water standing in the well. This is known because the owners of site B were absent from their home for several days prior to sample run 5. Since the owners were not home there was no turnover in the well and thus the radon within the well decayed and/or emanated.

Site E used their water source in their heating unit, a geo-therm unit, and for an outdoor supply. The geo-therm is a dual unit with one unit supplying heat to the upper elevation of the home and the second unit for the lower elevation. Between sample runs 4 and 5, the geo-therm unit supplying the upper elevation of the home broke down and the owners replaced this unit with a gas heating unit. The geo-therm unit supplying the lower elevation continued in operation. This change over between heating units, is coincident with the decline in radon

concentration. Therefore the decline in radon concentration is believed to be due to the reduced service of the well.

To determine if there are significant differences between the four populations under investigation, and if there are significant temporal variations, statistical tests were run on the results. These tests are explained, and the results shown and discussed in the next section.

STATISTICAL ANALYSES

The Wilcoxon Signed Rank Test (WSR) and the paired t test were used to determine if there were statistically significant differences between the two sample collection methods and also between the two sample transport methods. The Analysis of Variance Test (ANOVA) was used to determine if there was a temporal variation in the water radon concentrations of the sites studied.

Sample Collection and Sample Transport Method Analyses

Wilcoxon Signed Rank Test:

The WSR test is a non-parametric, or distribution-free, test. This test makes no assumptions on state of nature. This test is not as strong statistically as a parametric test, such as the paired t test, however it does provide a good preliminary test prior to a parametric analysis. The WSR test was used as a preliminary test. The results of the test were used in conjunction with the paired t test to formulate conclusions and recommendations.

The WSR test is for paired data and makes the assumption of independence of the n pairs of observations. The hypothesis tested is that the pair differences come from a population having a median of zero.

The test is performed by pairing the data and determining the difference. Any difference equaling zero is considered a tie and the pair is no longer part of the test. The differences are assumed absolute and then ranked. Ranks are assigned by giving the smallest difference a "1" and the largest difference "n." The ranks are then separated into columns of positive and negative ranks, depending on the sign of the rank's difference. The respective ranks are summed.

Generally, by convention, the sum of the positive ranks is the sample test statistic. This statistic is then compared to the critical values. The critical values

are the upper and lower levels of confidence based on the degree of confidence and number of pairs, not including tied pairs. If the sample test statistic is within the range of the two critical values, the hypothesis is accepted. However, if the sample test statistic is either equal to the critical values or falls outside the range of the critical values, the hypothesis is not accepted.

For an example on how this test was conduced in this report see Table 3. The data in this table are for a comparison of the eastern site A funnel-syringe/non-mailed results with the site's mailed results. The data were paired and the differences taken. No ties occurred, therefore 10 pairs was used in the analysis. The differences were then ranked, assuming the differences were absolute values. As you can see pair # 10, with a difference of +20, was ranked "1," followed by pair # 3 with rank "2," and ultimately to pair # 6 which was ranked "10." These ranks were separated according to the sign of the difference and the positive and negative ranks summed.

The critical values used in this report were based on a 95% degree of confidence, and in this case with a value of n equaling 10 pairs. Comparing the sample test statistic, 9, to the critical values, 8 & 47, obtained from Remington (1985), the hypothesis was accepted. Thereby indicating no significant difference between eastern site A's non-mailed/funnel-syringe sample results and the site's non-mailed/slow-flow sample results.

Paired t Test:

The paired t test is a parametric test utilizing the underlying t distribution. The t distribution is used in this case because the population variances of the sample populations tested are unknown. The test's hypothesis states that the mean difference equal zero. The test assumes that a random sample of n paired differences is from a normally distributed population of differences. Paired means and not random samples were used in this analysis. By pairing the means it is an

Table 3: Wilcoxon Signed Rank Test Example

Sample Run	Funnel–Syringe (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Non–mailed	Mailed				
1	11,545.98	11,208.07	338	5	5	
2	12,112.91	12,485.22	−372	−6		6
3	10,906.29	10,970.09	−64	−2		2
4	---	---	---			
5	10,483.49	10,961.36	−478	−9		9
6	10,693.03	12,485.35	−1792	−10		10
7	10,716.10	11,164.46	−448	−8		8
8	11,556.86	11,342.27	215	3	3	
9	12,973.37	13,256.35	−283	−4		4
10	11,080.47	11,060.43	20	1	1	
11	10,307.63	10,697.17	−390	−7		7

Number of Pairs:	10	Sample Test Statistic (T+):	9	T+: 9	T−: 46
Alpha Error:	5% (2–sided)	T+ Statistic:	8,47		
d.f.:	9	Significant:	NO		

obvious violation of the assumption, however it has been noted that violation of the test's assumptions is not "sufficient reason to reject one of the classical procedures" (Remington 1985). The paired t test was used, and is believed that by using the means rather than individual results the test would be statistically stronger. Therefore the results obtained from this test will be used primarily in the conclusion and recommendations.

The test is performed by pairing the data and taking the difference. The differences are then averaged resulting in the "mean difference," or "sample mean difference." The sample standard deviation of the differences is then calculated using the following formula:

$$s_d = \{[n \sum x_i^2 - (\sum x_i)^2]/[n (n - 1)]\} \text{ , where}$$

"s_d" is the sample standard deviation of the differences, "n" is the number of pairs, and "x_i" is the difference of the i-th pair. The sample standard deviation of the differences is then divided by the square root of the number of pairs:

$$s_d / (n)^{½}.$$

The sample test statistic is then found by the following:

$$t = (\text{sample mean difference} - \mu_d) / (s_d / (n)^{½}), \text{ where}$$

μ_d is population mean difference which equals zero, based on hypothesis; thus, the sample test statistic is as follows:

$$t = (\text{sample mean difference}) / (s_d / (n)^{½}).$$

The sample test statistic is then compared to the critical values. The critical values are symmetrical about the mean and are based on the level of confidence and degrees of freedom, n-1, in the test. Similar to the WSR test, if the sample test statistic falls within the range of the critical values the hypothesis is accepted, otherwise the hypothesis is rejected.

For an example of this test see Table 4. Again, eastern site A's funnel-syringe/non-mailed versus mailed data set were used. The differences of the 10

Table 4: Paired t Test Example

Sample Run	Funnel–Syringe (pCi/L)		Difference	Deviation
	Non–mailed	Mailed		
1	11,545.98	11,208.07	337.91	–663.37
2	12,112.91	12,485.22	–372.31	46.85
3	10,906.29	10,970.09	–63.80	–261.66
4	– – –	– – –	– – –	– – –
5	10,483.49	10,961.36	–477.87	152.41
6	10,693.03	12,485.35	–1792.32	1466.86
7	10,716.10	11,164.46	–448.36	122.90
8	11,556.86	11,342.27	214.59	–540.05
9	12,973.37	13,256.35	–282.98	–42.48
10	11,080.47	11,060.43	20.04	–345.50
11	10,307.63	10,697.17	–389.54	64.08

Number of Pairs:	10	Alpha Error:	5% (2–sided)
Mean Difference:	–325.46	d.f.:	9
Standard Deviation of Differences:	588.56	t Statistic (+/–):	2.2622
Sample Test Statistic (t):	–1.75	Significant:	NO

pairs were determined and the results averaged, with a value of -325.46. The sample standard deviation was then calculated resulting in a value of 588.56. Using these two values, along with the number of pairs, the sample test statistic was calculated to be -1.75. Using a confidence of 95%, and the sample having 9 degrees of freedom, the critical values were found to be ±2.2622. The sample test statistic falls within these critical values, therefore the hypothesis is accepted and no significance is noted.

Discussion of Results:

The results for the WSR test are shown in Table 5, and the results of the Paired t test are shown in Table 6. In the comparison of measured radon concentrations in samples collected by the funnel-syringe method and the slow-flow method, using both the WSR and paired t tests, the results revealed a large number of statistically significant differences. Focusing on the results of the paired t test, 10 of the 18 analyses were statistically significant. However, when analyzed on which side the results were significant, 9 of the 10 results were on the side of slow-flow method (slow-flow results were greater than the funnel-syringe results). And of the 8 non-significant results, 6 results tended toward the side of the slow-flow method. This suggests that the slow-flow method out performed the EPA's standard funnel-syringe method.

The reason the slow-flow method proved to be a better sample collection method is likely because of the simplicity of the sample collection. The water merely drains from the spigot into the vial where the water is essentially capped upon entering by the less dense scintillation fluid. The funnel-syringe method requires first an extraction of the water with a syringe and then injection of the sample into the vial. The intermediate step with the syringe is the likely cause for the lower concentrations in the 9 significant results. It has been noted that the syringe, because of the negative pressure used to pull the sample in, may extract

Table 5: Wilcoxon Signed Rank Statistical Analysis – Effects of Sampling Method and Sample Transport

Site	Funnel–Syringe: N–mail vs. Mail	Slow–Flow: N–mail vs. Mail	Non–Mailed: F–S vs. S–Flow	Mailed: F–S vs. S–Flow
Eastern North Carolina				
A	NO	NO	NO	NO
B	NO	NO	YES	YES
C	NO	NO	NO	NO
D	NO	NO	YES	YES
Western North Carolina				
A	NO	NO	NO	NO
B	NO	NO	NO	YES
C	NO	NO	YES	YES
D	YES	YES	YES	YES
E	NO	NO	NO	YES

Table Notes:
1. "No" denotes no statistical difference; "Yes" denotes statistical difference.
2. See Appendix B for statistical calculations, including the test statistics and critical values.

Table 6: Paired t Statistical Analysis – Effects of Sampling Method and Sample Transport

Site	Funnel–Syringe: N–mail vs. Mail	Slow–Flow: N–mail vs. Mail	Non–Mailed: F–S vs. S–Flow	Mailed: F–S vs. S–Flow
Eastern North Carolina				
A	NO	NO	NO	NO
B	NO	NO	YES	YES
C	NO	YES	YES	YES
D	NO	NO	YES	YES
Western North Carolina				
A	NO	NO	NO	NO
B	NO	NO	NO	YES
C	NO	NO	YES	YES
D	NO	NO	NO	NO
E	NO	YES	NO	YES

Table Notes:

1. "No" denotes no statistical difference; "Yes" denotes statistical difference.
2. See Appendix C for statistical calculations, including the test statistics and critical values.

the radon from the water and reduce the water radon concentration injected into the scintillation vial (Blanchard 1985).

The one significant event on the side of the funnel-syringe method (funnel-syringe results greater) occurred on western site E's mailed/funnel-syringe vs. slow-flow analysis. This result, with a sample statistic of 2.60 and a critical value of 2.57, is questionable because the effect of mailing on these samples probably confounded the results. The other site E analyses, non-mailed/funnel-syringe vs. slow-flow, had a sample statistic of 0.48 for the same critical value. It was noted that mailing had a significant influence at this site. It may be that this mailing influence confounded the mailed/funnel-syringe vs. slow-flow analysis.

The percentage sample standard deviations were determined for the data collected using both the funnel-syringe and slow-flow collection methods. Table 7 shows that the percentage sample standard deviations of the slow-flow results are slightly lower than that of the funnel-syringe results. Again, this shows that the slow-flow method performed very well during the study.

In the comparison of the results of the sample transport method, two significant results of the 18 analyses were obtained using the WSR test. Both significant results were obtained for the same site, western site D, the funnel-syringe/non-mailed versus mailed analysis and the slow-flow/non-mailed vs. mailed analysis. Two statistically significant results were also obtained using the paired t test. However, the significant results were for two different sites, eastern site C's slow-flow/non-mailed vs. mailed analysis and western site E's slow-flow/non-mailed vs. mailed analysis. The paired t test is a stronger statistical test, focusing on how tightly the differences fall around the mean difference, and therefore will be used as the primary test from which to draw conclusions concerning sample transport.

Table 7: Percentage Sample Standard Deviation from the Mean

Site	Funnel–Syringe / Non–mailed	Funnel–Syringe / Mailed	Slow–Flow / Non–mailed	Slow–Flow / Mailed
Eastern North Carolina				
A	5.94%	8.01%	4.19%	4.81%
B	4.55%	5.36%	3.80%	4.14%
C	5.85%	7.54%	4.38%	4.34%
D	5.73%	6.45%	6.15%	5.87%
Average	5.52%	6.84%	4.63%	4.79%
Overall Average		**6.18%**		**4.71%**
Western North Carolina				
A	3.15%	4.38%	3.14%	3.81%
B	4.63%	6.73%	7.37%	4.69%
C	5.65%	7.75%	6.93%	4.84%
D	16.79%	20.94%	17.87%	16.68%
E	6.41%	5.33%	7.15%	7.25%
Average	7.33%	9.03%	8.50%	7.45%
Overall Average		**8.18%**		**7.97%**

Both significant results of the paired t test were significant on the side of non-mailing (non-mailed results greater), indicating in those two cases that the samples experienced statistically significant loss in radon during mailing. The eastern site C test statistic was 2.81 with a critical value of 2.306. The overall percent difference between the sample populations slow-flow/non-mailed and mailed was 1.6%. The western site E test statistic was 2.70 with a critical value of 2.571. And, this site's overall percent difference for the slow-flow/non-mailed and mailed sample populations was 2.5%. In the majority of the other 16 analyses, the sample test statistics had the tendency of either being close to the median difference or falling on the side of mailing (mailed results were greater). This suggests that in most cases the effect of mailing did not influence the measured radon concentrations of the samples. The two significant events may be the result of improper handling of the samples prior to mailing. Despite these two significant events it is believed that mailing does not produce significant radon loss during transport.

Temporal Variation Analysis of Water Radon Concentrations

Analysis of Variance:

The ANOVA test was conducted four times, for each of the four populations sampled, per site. Having conducted the test this way, the test's assumptions of independent observations and homoscedasticity (samples having equal variances) were followed. The test's hypothesis states that all the means are equal. That is, for a population under analysis the means of the sample runs are statistically equal.

The ANOVA test is complex and an example is the easiest way to explain the procedure is with an example; therefore see Table 8, the ANOVA analysis for eastern site A's funnel-syringe/non-mailed samples.

Table 8: Analysis of Variance Test Example

Sample Run	Avg. Radon Conc. (pCi/L)	Sample Std. Dev. (pCi/L)	Sample Variance	Number of Samples	Squares Within (i)	Squares Between (i)
Funnel–Syringe / Non–mailed						
1	11,545.98	1,309.26	1.714E+06	5	6,856,646.99	475,451.03
2	12,112.91	1,327.78	1.763E+06	5	7,051,998.91	3,830,724.19
3	10,906.29	493.78	2.438E+05	5	975,274.75	548,874.65
4	------	------	------	------	------	------
5	10,483.49	484.37	2.346E+05	5	938,457.19	2,843,507.50
6	10,693.03	228.88	5.239E+04	5	209,544.22	1,482,853.22
7	10,716.10	164.69	2.712E+04	5	108,491.18	1,359,879.05
8	11,556.86	1,491.71	2.225E+06	5	8,900,794.90	509,593.24
9	12,973.37	454.65	2.067E+05	5	826,826.49	15,064,261.82
10	11,080.47	336.59	1.133E+05	5	453,171.31	123,469.61
11	10,307.63	495.49	2.455E+05	5	982,041.36	4,324,341.90
Mean Average:	11,237.61	MS (within):	682581.18			
Total Samples:	50	MS (between):	3395884	Significant:	YES	
F Statistic:	F(9,40) 2.12	Variance Ratio:	4.9750625			

The second and third columns of information, "average radon concentration" and "sample standard deviation" respectively, were computed following the radon decay correction of the LSC sample analysis (See APPENDIX A). The sample run's average radon concentrations were determined by taking the average of the radon concentrations of the samples from each sample run collected under the population funnel-syringe/non-mailed. These averages were then averaged to form the "mean average" for all sample runs, which equals 11,237.61 pCi/L in this example. Each sample run's "sample standard deviations" (column 3) was then calculated, using a formula similar to that used in the paired t test, and then squared to determine each sample run's "sample variance," found in column 4. The "number of samples," this case 5 samples per population, then were recorded. These data then were used to determine the sum of squares between and within. The sum of squares within was determined using the following formula:

$$SS_{within} = [\Sigma (n_i - 1) s_i^2] / [\Sigma (n_i - 1)], \text{ where}$$

"n_i" is the number of samples per i-th sample run and "s_i^2" is the sample variance of the i-th sample run. And the sum of squares between was determined using:

$$SS_{between} = [\Sigma (n_i) (x_i - x_m)^2] / (r - 1), \text{ where}$$

"x_i" is the average radon concentration of the i-th sample run and "x_m" is the mean average. The mean squares within and between are then determined by dividing the sum of squares with their respective degrees of freedom:

$$MS_{within} = SS_{within} / [\Sigma (n_i - 1)],$$

$$MS_{between} = SS_{between} / (r - 1), \text{ where}$$

"r" is the number of rows, sample runs, used in the analysis--in this case 10. The "variance ratio" then was determined by dividing the mean squares between, equaling 3,395,884 in this example, by the mean squares within, equaling 682,581.18. The variance ratio, 4.97, then was compared to the test statistic, F statistic, which was found to be 2.12 at 95% confidence. As with the t

distribution, the F statistic is symmetrical about the mean, and the variance ratio must fall within the critical value's range. In this example the variance ratio fell outside the critical value's range, and thus the hypothesis was not accepted, indicating that the means were not statistically equal.

Discussion of Results:

The results of the ANOVA statistical analysis are shown in Table 9. In the qualitative analysis of the eastern and western sites it was observed that there were obvious temporal variations in the ground water radon concentrations. These observations were substantiated by the results of the statistical tests. All of the results were significant. The western sites results were not surprising because of the variation in usage, and difficulties in obtaining representative samples due to inadequate purging of the well. Also not surprising were the results of eastern sites C and D; the variability in the radon concentrations of both sites was due to variable conditions prior to sample collection. However, the statistical significance observed in eastern sites A and B was somewhat surprising. These two sites consistently allowed for the most representative samples to be collected in this project. It is therefore believed, based on the results of eastern sites A and B, that there are temporal variations in water radon concentrations.

Table 9: Analysis of Variance Statistical Test – Temporal Variation Analysis

Site	Funnel–Syringe: N–mail vs. Mail	Slow–Flow: N–mail vs. Mail	Non–mailed: F–S vs. S–Flow	Mailed: F–S vs. S–Flow
Eastern North Carolina				
A	YES	YES	YES	YES
B	YES	YES	YES	YES
C	YES	YES	YES	YES
D	YES	YES	YES	YES
Western North Carolina				
A	YES	YES	YES	YES
B	YES	YES	YES	YES
C	YES	YES	YES	YES
D	YES	YES	YES	YES
E	YES	YES	YES	YES

Table Notes:

1. "No" denotes no statistical difference; "Yes" denotes statistical difference.
2. See Appendix D for statistical calculations, including the test statistics and critical values.

CONCLUSIONS AND RECOMMENDATIONS

On the basis of the results of the statistical analyses, it is reasonable to concluded the following:

- the slow-flow sample collection method is an acceptable alternative to the EPA standard method;
- samples transported by mail to a central laboratory are not likely to experience significant radon losses;
- temporal variations of water radon concentration exist.

There were a few limitations within this experiment. The first limitation dealt with the radon concentrations of the sites sampled. That is, the water radon concentrations sampled at all nine sites within this experiment were substantially higher than the proposed MCL. The limitation is directed at the temporal variation study because temporal variations will most heavily influence a site with a ground water radon concentration around the MCL.

A second limitation within this experiment was the duration of the temporal variation study. The seven month study provides only seven-twelfths of the data needed to produce a proper conclusion regarding the sites' annual average radon concentrations. The question this study addressed is "how indicative will the results of one sample be when compared to the annual average radon concentration?" While a conclusion was made concerning the existence temporal variations, it should be noted that the conclusion does not provide a complete answer to the question above; rather, the conclusion merely suggests that one sample may not be indicative.

The final limitation noted within this experiment dealt with the collection of unindicative ground water samples. That is, on many occasions during the

experiment, several of the wells were not adequately purged to obtain an indicative ground water sample.

These limitations give rise to several recommendations. The first recommendation being that another set of field experiments take place for the determination of temporal variation. This second temporal variation study should be conducted at water radon concentrations around the proposed MCL (200 - 1,000 pCi/L), and assuring that the sample wells are adequately purged prior to sample collection (See APPENDIX E). The results of such experiments would provide information directly applicable to the proposed MCL.

It is also recommended that the temporal variation study be conducted for a year, with samples collected monthly. Again, this will provide the data that will determine if one grab sample is indicative of the annual average radon concentration, or what sampling strategy should be used.

And lastly, it is recommended that each site's results of the temporal variation study be correlated to the precipitation levels of the respective site's region. Such a correlation was noted to have existed in Farai's study of Nigeria's ground water radon concentrations (Farai 1992). (See APPENDIX E for Well Profile recommendations.)

Despite the limitations of this experiment, the data acquired provide information that is not available in the published literature. As a result of this study, it is believed that a mail-in radon-in-water test kit could be instituted to provide safe, easy, and accurate results. On the basis of the results of the sample collection method analysis, the EPA may want to consider further study of the slow-flow method and possibly switch sample collection techniques. As for the temporal variation of radon in ground water, continued study is necessary prior to adopting a sampling schedule to estimate the annual average radon concentration.

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APPENDIX A:

Sampling Method, Sample Transport, and Temporal Variation Data and Results

Table A–A–1: Western Sites' Results from Sample Run #1

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	67,502.08	1,189.66	66,560.40	3,493.75
	C	20,579.53	303.20	19,865.72	1,176.13
	D	5,497.86	93.20	4,821.35	308.44
Slow–Flow	A	64,614.18	1,054.51	63,872.94	1,065.65
	C	20,125.47	1,204.04	20,729.68	712.55
	D	5,840.92	83.94	5,155.83	100.57

Table Notes:

1. Sample vials were not pre–weighed before samples were collected.
2. Samples were collected on September 26, 1993.
3. Western Site B was not accessible on this date.

Table A–A–2: Western Site A–Raw Data from Sample Run #1

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
AFM 1	25.78	11:32:45 AM	35.31	2.61	211.00	3831.42
AFM 2	25.78	11:34:10 AM	35.67	2.36	214.00	4250.00
AFM 3	25.78	11:34:50 AM	35.57	2.36	217.00	4240.25
AFM 4	25.78	11:35:30 AM	35.76	2.29	220.00	4384.28
AFM 5	25.78	11:39:21 AM	35.76	2.16	224.00	4636.57
ASM 6	25.78	11:39:51 AM	37.04	2.14	227.00	4682.24
ASM 7	25.78	11:40:15 AM	37.82	1.99	230.00	5040.70
ASM 8	25.78	11:40:35 AM	36.29	2.29	233.00	4369.87
ASM 9	25.78	11:40:50 AM	35.18	2.63	236.00	3804.94
ASM 10	25.78	11:41:28 AM	37.79	1.98	239.00	5072.22
AF 11	25.78	11:44:50 AM	35.81	1.90	211.00	5265.26
AF 12	25.78	11:45:30 AM	35.65	1.89	213.00	5307.94
AF 13	25.78	11:46:27 AM	35.75	1.90	216.00	5266.84
AF 14	25.78	11:47:40 AM	35.68	1.92	219.00	5219.27
AF 15	25.78	11:50:23 AM	35.63	1.86	222.00	5389.78
AS 16	25.78	11:50:45 AM	37.89	1.60	224.00	6263.75
AS 17	25.78	11:51:00 AM	36.51	1.81	227.00	5542.54
AS 18	25.78	11:51:19 AM	36.14	1.90	230.00	5292.63
AS 19	25.78	11:51:39 AM	37.77	1.68	233.00	5954.17
AS 20	25.78	11:53:30 AM	37.55	1.69	235.00	5953.25
Calibration Information for Non–mailed Samples						
Blank 1	25.78	–	35.76	50.00	51.00	35.30
Blank 2	25.78	–	35.88	50.00	102.00	34.30
Blank 3	25.78	–	35.67	50.00	153.00	33.20
Blank 4	25.78	–	35.69	50.00	204.00	36.48
714 pCi STD.	–	–	–	1.38	206.00	7246.38
952 pCi STD.	–	–	–	1.06	208.00	9446.23
Calibration Information for Mailed Samples						
Blank 1	25.78	–	35.76	50.00	50.00	35.30
Blank 2	25.78	–	35.88	50.00	101.00	34.30
Blank 3	25.78	–	35.67	50.00	152.00	33.20
Blank 4	25.78	–	35.69	50.00	203.00	36.48
714 pCi STD.	–	–	–	1.39	205.00	7219.42
952 pCi STD.	–	–	–	1.06	207.00	9502.83

Table Notes:

1. Samples were collected on September 26, 1993.
2. Non–mailed samples were counted on September 27, 1993 at 4:46:30 PM.
3. Mailed Samples were counted on September 28, 1993 at 5:46:30 PM.

Table A–A–3: Western Site C–Raw Data from Sample Run #1

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
CFM 1	25.78	01:40:54 PM	35.89	8.70	758.00	1149.43
CFM 2	25.78	01:41:43 PM	35.86	7.91	767.00	1264.35
CFM 3	25.78	01:42:10 PM	35.83	7.68	776.00	1303.52
CFM 4	25.78	01:42:53 PM	36.01	7.84	784.00	1275.51
CFM 5	25.78	01:43:50 PM	35.76	7.59	793.00	1317.52
CSM 6	25.78	01:45:18 PM	38.97	5.57	799.00	1797.31
CSM 7	25.78	01:45:44 PM	35.89	7.78	808.00	1286.25
CSM 8	25.78	01:46:01 PM	37.08	6.76	816.00	1479.59
CSM 9	25.78	01:46:20 PM	36.09	7.66	824.00	1305.74
CSM 10	25.78	01:46:40 PM	38.76	6.12	831.00	1635.29
CF 11	25.78	01:48:40 PM	35.71	6.45	753.00	1553.02
CF 12	25.78	01:49:24 PM	35.52	6.70	760.00	1494.33
CF 13	25.78	01:50:04 PM	35.60	6.39	767.00	1565.88
CF 14	25.78	01:52:33 PM	35.67	6.43	775.00	1556.77
CF 15	25.78	01:53:00 PM	35.71	6.45	782.00	1550.70
CS 16	25.78	01:53:07 PM	38.07	5.94	789.00	1683.67
CS 17	25.78	01:53:26 PM	38.62	5.05	795.00	1981.58
CS 18	25.78	01:54:00 PM	37.17	5.74	802.00	1743.55
CS 19	25.78	01:54:15 PM	39.09	4.70	807.00	2131.06
CS 20	25.78	01:54:29 PM	37.03	5.74	814.00	1745.12
Calibration Information for Non–mailed Samples						
Blank 1	25.78	–	35.76	50.00	51.00	35.30
Blank 2	25.78	–	35.88	50.00	102.00	34.30
Blank 3	25.78	–	35.67	50.00	153.00	33.20
Blank 4	25.78	–	35.69	50.00	204.00	36.48
714 pCi STD.	–	–	–	1.38	206.00	7246.38
952 pCi STD.	–	–	–	1.06	208.00	9446.23
Calibration Information for Mailed Samples						
Blank 1	25.78	–	35.76	50.00	50.00	35.30
Blank 2	25.78	–	35.88	50.00	101.00	34.30
Blank 3	25.78	–	35.67	50.00	152.00	33.20
Blank 4	25.78	–	35.69	50.00	203.00	36.48
714 pCi STD.	–	–	–	1.39	205.00	7219.42
952 pCi STD.	–	–	–	1.06	207.00	9502.83

Table Notes:

1. Samples were collected on September 26, 1993.
2. Non–mailed samples were counted on September 27, 1993 at 4:46:30 PM.
3. Mailed Samples were counted on September 28, 1993 at 5:46:30 PM.

Table A–A–4: Western Site D–Raw Data from Sample Run #1

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
DFM 1	25.78	02:11:07 PM	35.61	33.55	866.00	298.12
DFM 2	25.78	02:12:02 PM	35.48	31.63	898.00	316.19
DFM 3	25.78	02:12:41 PM	36.01	28.81	928.00	347.14
DFM 4	25.78	02:13:20 PM	35.68	29.80	959.00	335.57
DFM 5	25.78	02:14:00 PM	LOST	0.00	0.00	0.00
DSM 6	25.78	02:15:00 PM	LOST	0.00	0.00	0.00
DSM 7	25.78	02:17:20 PM	35.87	28.90	989.00	346.19
DSM 8	25.78	02:17:36 PM	35.27	30.26	1020.00	330.60
DSM 9	25.78	02:17:53 PM	35.02	32.18	1053.00	310.78
DSM 10	25.78	02:20:11 PM	36.17	27.95	1082.00	357.85
DF 11	25.78	02:22:02 PM	35.78	23.02	838.00	434.40
DF 12	25.78	02:22:46 PM	35.76	22.51	861.00	444.38
DF 13	25.78	02:23:18 PM	35.97	22.38	885.00	446.87
DF 14	25.78	02:23:56 PM	35.71	23.22	909.00	430.75
DF 15	25.78	02:26:50 PM	35.49	23.00	933.00	434.78
DS 16	25.78	02:27:00 PM	37.02	19.18	953.00	521.38
DS 17	25.78	02:28:00 PM	37.63	18.98	973.00	527.24
DS 18	25.78	02:28:38 PM	36.61	20.17	994.00	495.93
DS 19	25.78	02:28:56 PM	37.10	19.45	1014.00	514.14
DS 20	25.78	02:31:29 PM	36.11	21.10	1036.00	474.17
Calibration Information for Non–mailed Samples						
Blank 1	25.78	–	35.76	50.00	51.00	35.30
Blank 2	25.78	–	35.88	50.00	102.00	34.30
Blank 3	25.78	–	35.67	50.00	153.00	33.20
Blank 4	25.78	–	35.69	50.00	204.00	36.48
714 pCi STD.	–	–	–	1.38	206.00	7246.38
952 pCi STD.	–	–	–	1.06	208.00	9446.23
Calibration Information for Mailed Samples						
Blank 1	25.78	–	35.76	50.00	50.00	35.30
Blank 2	25.78	–	35.88	50.00	101.00	34.30
Blank 3	25.78	–	35.67	50.00	152.00	33.20
Blank 4	25.78	–	35.69	50.00	203.00	36.48
714 pCi STD.	–	–	–	1.39	205.00	7219.42
952 pCi STD.	–	–	–	1.06	207.00	9502.83

Table Notes:

1. Samples were collected on September 26, 1993.
2. Non–mailed samples were counted on September 27, 1993 at 4:46:30 PM.
3. Mailed Samples were counted on September 28, 1993 at 5:46:30 PM.

Table A–B–1: Eastern Sites' Results from Sample Run #1

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	11,545.98	1,309.26	11,208.07	619.04
	B	11,330.29	946.09	11,009.58	641.24
	C	21,202.20	974.52	21,368.54	1,675.76
Slow–flow	A	11,038.11	632.43	10,825.80	131.88
	B	11,332.35	1,065.23	11,317.98	898.36
	C	23,828.99	588.55	24,167.56	456.62

Table Notes:
1. Samples were collected on October 4, 1993.

Table A–B–2: Eastern Site A–Raw Data from Sample Run #1

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
AFM	1	26.02	10:31:00 AM	LOST	0.00	0.00	0.00
ASM	2	25.75	10:32:40 AM	LOST	0.00	0.00	0.00
AF	3	25.73	10:34:06 AM	35.78	9.65	219.00	1036.89
AS	4	25.93	10:40:06 AM	37.49	8.03	228.00	1245.58
AFM	5	25.80	10:41:30 AM	35.95	13.04	285.00	767.33
ASM	6	25.85	10:41:47 AM	36.52	12.91	299.00	774.59
AF	7	25.99	10:43:39 AM	36.10	9.47	238.00	1056.92
AS	8	25.82	10:44:00 AM	35.62	10.34	249.00	967.70
AFM	9	25.90	10:54:11 AM	35.92	12.17	312.00	821.69
ASM	10	25.83	10:54:30 AM	35.19	14.39	327.00	695.00
AF	11	25.87	10:55:44 AM	35.80	9.65	260.00	1036.27
AS	12	25.87	10:56:00 AM	38.46	7.80	269.00	1282.05
AFM	13	25.87	10:57:10 AM	35.80	13.95	342.00	716.99
ASM	14	25.79	11:01:18 AM	36.29	13.01	356.00	768.72
AF	15	25.83	11:02:45 AM	35.73	10.32	280.00	969.09
AS	16	25.83	11:03:02 AM	35.94	10.31	291.00	970.22
AFM	17	25.84	11:04:08 AM	35.85	13.31	371.00	751.47
ASM	18	25.75	11:04:28 AM	36.73	12.32	384.00	812.50
AF	19	25.72	11:15:15 AM	35.59	7.92	300.00	1263.01
AS	20	25.78	11:28:30 AM	38.03	7.51	308.00	1331.56
Calibration Information for Non–mailed Samples							
Blank 1		25.59	–	36.26	50.00	51.00	33.34
Blank 2		25.69	–	35.89	50.00	102.00	31.96
Blank 3		25.73	–	36.27	50.00	153.00	34.00
Blank 4		25.88	–	36.76	50.00	204.00	34.18
714 pCi STD.		–	–	–	1.39	206.00	7245.32
952 pCi STD.		–	–	–	1.05	208.00	9575.24
Calibration Information for Mailed Samples							
Blank 1		25.59	–	36.26	50.00	51.00	33.12
Blank 2		25.69	–	35.89	50.00	103.00	34.48
Blank 3		25.73	–	36.27	50.00	153.00	33.66
Blank 4		25.88	–	36.76	50.00	204.00	34.18
714 pCi STD.		–	–	–	1.39	207.00	7252.52
952 pCi STD.		–	–	–	1.07	209.00	9403.74

Table Notes:

1. Samples were collected on October 4, 1993.
2. Non–mailed samples were counted on October 4, 1993 at 8:47:15 PM.
3. Mailed samples were counted on October 6, 1993 at 1:57:26 PM.

Table A–B–3: Eastern Site B–Raw Data from Sample Run #1

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
BFM 1	25.90	01:04:45 PM	BROKE	0.00	0.00	0.00
BSM 2	25.87	01:05:31 PM	35.31	14.12	399.00	708.78
BF 3	25.76	01:06:58 PM	35.89	10.15	319.00	985.62
BS 4	25.50	01:07:50 PM	35.31	10.97	331.00	911.67
BFM 5	25.81	01:09:10 PM	35.87	14.11	414.00	709.14
BSM 6	25.74	01:10:10 PM	35.58	13.96	429.00	716.83
BF 7	25.68	01:11:33 PM	35.64	10.05	342.00	995.42
BS 8	25.83	01:12:00 PM	35.63	10.17	353.00	983.78
BFM 9	25.91	01:13:15 PM	35.92	13.66	443.00	732.28
BSM 10	25.79	01:14:52 PM	36.48	13.01	457.00	769.10
BF 11	25.75	01:15:15 PM	35.87	9.37	364.00	1068.09
BS 12	25.67	01:16:28 PM	35.67	9.18	374.00	1090.30
BFM 13	25.69	01:17:46 PM	35.67	12.95	471.00	772.36
BSM 14	25.75	01:18:10 PM	35.77	12.48	485.00	801.28
BF 15	25.74	01:18:31 PM	35.77	9.11	384.00	1098.35
BS 16	25.89	01:19:00 PM	35.02	9.80	395.00	1020.82
BFM 17	25.86	01:20:17 PM	35.74	12.80	498.00	781.48
BSM 18	25.78	01:20:45 PM	35.17	12.46	512.00	802.89
BF 19	25.82	01:22:01 PM	35.75	8.53	404.00	1173.15
BS 20	25.64	01:22:25 PM	35.41	8.81	414.00	1135.87
Calibration Information for Non–mailed Samples						
Blank 1	25.59	–	36.26	50.00	51.00	33.34
Blank 2	25.69	–	35.89	50.00	102.00	31.96
Blank 3	25.73	–	36.27	50.00	153.00	34.00
Blank 4	25.88	–	36.76	50.00	204.00	34.18
714 pCi STD.	–	–	–	1.39	206.00	7245.32
952 pCi STD.	–	–	–	1.05	208.00	9575.24
Calibration Information for Mailed Samples						
Blank 1	25.59	–	36.26	50.00	51.00	33.12
Blank 2	25.69	–	35.89	50.00	103.00	34.48
Blank 3	25.73	–	36.27	50.00	153.00	33.66
Blank 4	25.88	–	36.76	50.00	204.00	34.18
714 pCi STD.	–	–	–	1.39	207.00	7252.52
952 pCi STD.	–	–	–	1.07	209.00	9403.74

Table Notes:

1. Samples were collected on October 4, 1993.
2. Non–mailed samples were counted on October 4, 1993 at 8:47:15 PM.
3. Mailed samples were counted on October 6, 1993 at 1:57:26 PM.

Table A–B–4: Eastern Site C–Raw Data from Sample Run #1

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
CFM	1	25.81	09:56:26 AM	36.02	5.34	518.00	1875.84
CSM	2	25.74	09:56:59 AM	36.88	4.91	524.00	2040.94
CF	3	25.93	09:58:46 AM	36.09	5.88	215.00	1701.53
CS	4	25.75	09:59:19 AM	36.38	5.09	221.00	1967.19
CFM	5	25.72	10:01:06 AM	35.91	6.24	531.00	1604.65
CSM	6	25.66	10:01:34 AM	36.17	5.18	537.00	1932.63
CF	7	25.83	10:03:00 AM	35.89	5.48	228.00	1826.28
CS	8	25.72	10:03:30 AM	37.24	4.47	233.00	2237.36
CFM	9	25.78	10:04:50 AM	35.93	6.53	544.00	1532.01
CSM	10	25.81	10:05:25 AM	35.50	5.62	551.00	1780.07
CF	11	25.71	10:07:11 AM	35.81	6.11	240.00	1637.97
CS	12	25.74	10:07:30 AM	36.26	5.01	246.00	1997.80
CFM	13	25.83	10:09:20 AM	35.87	6.21	558.00	1610.63
CSM	14	25.94	10:10:20 AM	36.64	4.90	564.00	2044.08
CF	15	25.72	10:11:56 AM	35.71	5.81	253.00	1722.38
CS	16	25.76	10:12:34 AM	36.66	4.72	259.00	2118.86
CFM	17	25.75	10:14:07 AM	35.69	5.92	571.00	1689.70
CSM	18	25.74	10:14:42 AM	37.18	4.73	576.00	2114.59
CF	19	25.90	10:16:12 AM	35.95	6.07	266.00	1650.08
CS	20	25.86	10:16:50 AM	37.05	4.83	271.00	2073.91
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.26	50.00	51.00	33.12
Blank 2		25.69	–	35.89	50.00	103.00	34.48
Blank 3		25.73	–	36.27	50.00	153.00	33.66
Blank 4		25.88	–	36.76	50.00	204.00	34.18
714 pCi STD.		–	–	–	1.39	207.00	7252.52
952 pCi STD.		–	–	–	1.07	209.00	9403.74

Table Notes:

1. Samples were collected on October 4, 1993.
2. Mailed and Non–mailed samples were counted on October 6, 1993 at 1:57:26 PM.

Table A–C–1: Eastern Sites' Results from Sample Run #2

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	12,112.91	1,327.78	12,485.22	1,112.09
	B	11,131.53	1,099.33	10,597.28	781.66
	C	24,928.91	2,496.94	24,039.56	2,534.66
	D	41,381.74	2,021.50	43,275.52	1,836.83
Slow–flow	A	12,144.26	597.66	11,986.20	418.85
	B	11,498.82	1,210.70	11,802.02	1,256.54
	C	26,410.11	479.65	26,292.19	381.50
	D	45,375.47	1,196.99	44,862.89	1,547.90

Table Notes:

1. Samples from Eastern Sites A, C, and D were collected on October 25, 1993.
2. Samples from Eastern Site B were collected on November 1, 1993.

Tabel A–C–2: Eastern Site A–Raw Data from Sample Run #2

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
AFM	1	25.80	01:36:53 PM	35.86	12.73	507.00	785.94
ASM	2	25.89	01:37:17 PM	36.37	13.95	522.00	717.28
AF	3	25.88	01:38:31 PM	35.93	15.46	225.00	647.28
AS	4	25.85	01:39:04 PM	34.90	16.40	243.00	609.94
AFM	5	26.00	01:40:05 PM	35.99	15.07	538.00	663.64
ASM	6	25.93	01:40:29 PM	37.37	13.69	553.00	730.61
AF	7	25.89	01:41:55 PM	35.92	15.07	259.00	663.84
AS	8	25.93	01:42:25 PM	36.78	13.95	273.00	717.06
AFM	9	25.96	01:43:18 PM	36.09	15.38	569.00	650.26
ASM	10	25.96	01:43:49 PM	36.28	15.59	586.00	641.57
AF	11	25.96	01:44:57 PM	35.99	15.76	290.00	634.52
AS	12	25.89	01:45:30 PM	36.54	14.43	306.00	693.76
AFM	13	25.90	01:46:23 PM	35.78	16.05	603.00	623.36
ASM	14	25.83	01:47:00 PM	36.68	14.25	618.00	702.53
AF	15	25.92	02:21:56 PM	36.08	12.22	319.00	818.90
AS	16	25.88	02:22:23 PM	38.06	11.32	331.00	883.83
AFM	17	25.75	02:23:56 PM	35.67	14.97	634.00	668.80
ASM	18	25.87	02:24:24 PM	37.60	13.11	648.00	763.46
AF	19	25.80	02:25:32 PM	35.86	14.93	347.00	670.40
AS	20	26.01	02:26:10 PM	36.74	13.44	361.00	744.20
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.26	50.00	51.00	33.54
Blank 2		25.69	–	35.89	50.00	103.00	33.46
Blank 3		25.73	–	36.27	50.00	154.00	34.48
Blank 4		25.88	–	36.76	50.00	205.00	33.86
714 pCi STD.		–	–	–	1.39	207.00	7196.40
952 pCi STD.		–	–	–	1.07	209.00	9397.20

Table Notes:

1. Samples were collected on October 25, 1993.
2. Mailed and Non–mailed samples were counted on October 28, 1993 at 6:42:30 AM.

Tabel A–C–3: Eastern Site B–Raw Data from Sample Run #2

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
BFM	1	25.98	11:17:08 AM	LOST	0.00	0.00	0.00
BSM	2	25.92	11:17:49 AM	LOST	0.00	0.00	0.00
BF	3	26.01	11:19:27 AM	35.91	16.79	226.00	595.71
BS	4	25.90	11:20:11 AM	38.29	13.90	241.00	719.71
BFM	5	25.92	11:21:43 AM	36.09	17.01	386.00	588.07
BSM	6	25.93	11:22:20 AM	37.11	15.47	403.00	646.61
BF	7	25.88	11:23:59 AM	35.95	16.46	259.00	607.90
BS	8	25.89	11:24:27 AM	38.26	13.43	273.00	744.90
BFM	9	25.96	11:25:56 AM	36.02	18.08	422.00	553.15
BSM	10	25.95	11:26:23 AM	36.33	15.42	438.00	649.29
BF	11	25.80	11:27:50 AM	35.85	17.08	291.00	585.71
BS	12	25.92	11:28:16 AM	37.03	14.31	306.00	698.95
BFM	13	25.86	11:29:45 AM	36.02	16.21	455.00	616.90
BSM	14	25.88	11:36:02 AM	35.46	14.62	471.00	684.06
BF	15	25.88	11:34:10 AM	35.08	16.39	324.00	610.25
BS	16	25.91	11:36:26 AM	34.78	15.33	340.00	652.51
BFM	17	25.80	11:37:20 AM	35.67	15.78	488.00	633.90
BSM	18	25.73	11:37:39 AM	36.72	12.91	501.00	775.37
BF	19	25.92	11:39:31 AM	35.98	13.80	355.00	724.86
BS	20	25.87	11:39:59 AM	36.96	12.87	368.00	777.16
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.26	50.00	51.00	33.46
Blank 2		25.69	–	35.88	50.00	103.00	33.30
Blank 3		25.73	–	36.26	50.00	153.00	33.32
Blank 4		25.88	–	36.75	50.00	204.00	33.28
714 pCi STD.		–	–	–	1.36	207.00	7397.79
952 pCi STD.		–	–	–	1.07	209.00	9385.98

Table Notes:

1. Samples were collected on October 29, 1993.
2. Mailed and Non–mailed samples were counted on November 1, 1993 at 4:54:35 PM.

Tabel A–C–4: Eastern Site C–Raw Data from Sample Run #2

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
CFM	1	25.82	11:25:03 AM	35.90	7.02	656.00	1425.93
CSM	2	25.84	11:25:45 AM	37.29	6.50	663.00	1538.92
CF	3	25.88	11:27:26 AM	35.91	7.44	370.00	1345.56
CS	4	25.76	11:27:47 AM	37.11	6.22	377.00	1610.77
CFM	5	25.87	11:29:06 AM	36.01	7.48	672.00	1337.83
CSM	6	25.45	11:29:40 AM	38.04	5.94	679.00	1684.85
CF	7	25.78	11:31:25 AM	35.53	6.79	384.00	1473.49
CS	8	25.74	11:32:03 AM	35.72	7.18	392.00	1393.59
CFM	9	25.86	11:33:08 AM	35.83	9.16	689.00	1092.47
CSM	10	25.89	11:33:42 AM	BROKE	0.00	0.00	0.00
CF	11	25.68	11:35:11 AM	35.93	8.04	401.00	1243.91
CS	12	25.84	11:35:46 AM	37.23	6.30	409.00	1588.57
CFM	13	25.76	11:37:18 AM	35.13	8.86	699.00	1129.01
CSM	14	25.83	11:38:06 AM	36.09	7.34	707.00	1363.35
CF	15	25.79	11:39:43 AM	35.90	8.32	418.00	1202.64
CS	16	25.85	11:40:10 AM	36.40	6.63	425.00	1509.65
CFM	17	25.91	11:41:50 AM	35.95	8.65	716.00	1156.88
CSM	18	25.93	11:42:20 AM	37.07	6.56	724.00	1524.85
CF	19	25.68	11:43:50 AM	35.61	7.29	434.00	1372.02
CS	20	25.81	11:44:33 AM	37.09	6.52	441.00	1536.20
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.26	50.00	51.00	33.54
Blank 2		25.69	–	35.89	50.00	103.00	33.46
Blank 3		25.73	–	36.27	50.00	154.00	34.48
Blank 4		25.88	–	36.76	50.00	205.00	33.86
714 pCi STD.		–	–	–	1.39	207.00	7196.40
952 pCi STD.		–	–	–	1.07	209.00	9397.20

Table Notes:

1. Samples were collected on October 25, 1993.
2. Mailed and Non–mailed samples were counted on October 28, 1993 at 6:42:30 AM.

Tabel A–C–5: Eastern Site D–Raw Data from Sample Run #2

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
DFM	1	25.52	11:07:03 AM	35.51	4.64	729.00	2155.60
DSM	2	25.74	10:43:45 AM	35.72	4.74	735.00	2113.50
DF	3	25.83	10:45:45 AM	35.89	4.92	447.00	2033.74
DS	4	25.83	10:46:17 AM	36.04	4.04	452.00	2481.44
DFM	5	25.75	10:49:17 AM	35.08	4.59	741.00	2179.96
DSM	6	25.83	10:49:41 AM	36.16	4.28	746.00	2337.38
DF	7	25.75	10:51:00 AM	35.80	4.37	457.00	2290.85
DS	8	25.75	10:51:29 AM	36.08	4.05	462.00	2473.83
DFM	9	25.79	10:52:44 AM	35.73	4.69	751.00	2133.05
DSM	10	25.76	10:53:19 AM	36.31	4.13	756.00	2423.37
DF	11	25.95	10:55:08 AM	36.08	4.68	468.00	2139.32
DS	12	25.54	10:56:17 AM	36.30	4.09	473.00	2448.66
DFM	13	25.70	10:57:43 AM	35.60	4.78	762.00	2094.56
DSM	14	25.78	10:58:28 AM	36.58	4.05	767.00	2469.14
DF	15	25.72	10:59:45 AM	35.72	4.72	479.00	2120.55
DS	16	25.82	11:00:52 AM	36.17	4.19	484.00	2388.54
DFM	17	25.94	11:02:23 AM	35.87	4.77	773.00	2099.37
DSM	18	25.73	11:03:03 AM	35.70	4.41	778.00	2271.43
DF	19	25.86	11:04:42 AM	35.91	4.46	489.00	2243.27
DS	20	25.90	11:05:12 AM	36.76	3.89	494.00	2571.21
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.26	50.00	51.00	33.54
Blank 2		25.69	–	35.89	50.00	103.00	33.46
Blank 3		25.73	–	36.27	50.00	154.00	34.48
Blank 4		25.88	–	36.76	50.00	205.00	33.86
714 pCi STD.		–	–	–	1.39	207.00	7196.40
952 pCi STD.		–	–	–	1.07	209.00	9397.20

Table Notes:

1. Samples were collected on October 25, 1993.
2. Mailed and Non–mailed samples were counted on October 28, 1993 at 6:42:30 AM.

Table A–D–1: Western Sites' Results from Sample Run #2

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	25,952.06	1,565.33	26,718.05	748.42
	B	26,900.28	2,230.64	26,218.46	1,811.38
	C	2,366.61	81.45	2,438.69	97.65
	D	4,341.28	639.00	3,722.49	1,460.95
	E	82,821.43	13,963.62	84,491.11	13,899.10
Slow–flow	A	26,122.23	539.01	26,001.90	603.42
	B	27,325.42	2,516.63	27,645.31	2,726.14
	C	2,485.44	73.62	2,505.11	46.03
	D	4,418.12	851.73	4,264.69	669.52
	E	83,873.31	12,267.44	80,779.93	11,497.01

Table Notes:
1. Samples were collected November 7, 1993.

Table A–D–2: Western Site A–Raw Data from Sample Run #2

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
AFM	1	25.47	11:03:30 AM	35.67	5.36	215.00	1866.42
ASM	2	25.62	11:04:05 AM	37.40	4.78	220.00	2094.56
AF	3	25.59	11:05:28 AM	35.73	5.59	227.00	1790.88
AS	4	25.64	11:06:06 AM	37.38	4.96	233.00	2017.74
AFM	5	25.63	11:07:10 AM	35.77	5.73	239.00	1745.72
ASM	6	25.60	11:07:39 AM	37.10	5.03	245.00	1991.25
AF	7	25.69	11:09:45 AM	35.91	5.48	252.00	1828.10
AS	8	25.51	11:10:30 AM	35.78	5.66	258.00	1768.02
AFM	9	25.68	11:12:10 AM	35.82	5.57	265.00	1795.87
ASM	10	25.70	11:12:35 AM	37.40	5.06	271.00	1976.88
AF	11	25.60	11:14:06 AM	35.82	5.54	277.00	1805.60
AS	12	25.54	11:14:30 AM	37.10	4.94	283.00	2025.30
AFM	13	25.68	11:16:57 AM	35.86	5.67	289.00	1764.02
ASM	14	25.59	11:17:33 AM	36.91	5.19	296.00	1928.71
AF	15	25.63	11:19:07 AM	35.79	6.11	303.00	1637.32
AS	16	25.66	11:19:44 AM	37.22	5.17	309.00	1936.36
AFM	17	25.66	11:21:16 AM	35.90	5.78	316.00	1730.80
ASM	18	25.67	11:21:49 AM	37.64	5.04	321.00	1984.52
AF	19	25.69	11:23:00 AM	35.88	6.32	329.00	1585.44
AS	20	25.65	11:23:23 AM	36.44	5.60	335.00	1786.25
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.26	50.00	51.00	35.62
Blank 2		25.69	–	35.89	50.00	102.00	34.14
Blank 3		25.73	–	36.26	50.00	153.00	32.98
Blank 4		25.88	–	36.75	50.00	204.00	33.74
714 pCi STD.		–	–	–	1.38	206.00	7286.23
952 pCi STD.		–	–	–	1.06	208.00	9504.72

Table Notes:

1. Samples were collected on November 7, 1993.
2. Mailed and Non–mailed samples were counted on November 9, 1993 at 6:02:15 PM.

Table A–D–3: Western Site B–Raw Data from Sample Run #2

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
BFM	1	25.65	11:46:26 AM	35.74	6.05	342.00	1654.05
BSM	2	25.71	11:46:56 AM	35.82	5.27	348.00	1900.19
BF	3	25.68	11:48:26 AM	35.96	5.20	355.00	1925.58
BS	4	25.57	11:49:05 AM	35.79	4.92	360.00	2033.33
BFM	5	25.57	11:50:43 AM	35.78	5.15	367.00	1942.72
BSM	6	25.58	11:51:25 AM	35.52	5.33	373.00	1881.99
BF	7	25.61	11:52:57 AM	35.78	6.11	380.00	1636.66
BS	8	25.53	11:53:18 AM	36.82	5.59	386.00	1790.70
BFM	9	25.66	11:54:39 AM	35.88	6.01	393.00	1665.22
BSM	10	25.76	11:55:18 AM	37.88	5.59	400.00	1790.52
BF	11	25.64	11:56:40 AM	35.65	5.89	406.00	1701.02
BS	12	25.51	11:57:18 AM	36.66	5.43	413.00	1843.28
BFM	13	25.66	11:58:45 AM	35.78	5.83	420.00	1716.47
BSM	14	25.61	11:59:18 AM	36.72	4.98	426.00	2010.24
BF	15	25.62	12:00:47 PM	35.84	6.07	433.00	1648.93
BS	16	25.59	12:01:29 PM	37.42	4.90	438.00	2044.29
BFM	17	25.62	12:02:52 PM	35.76	6.07	445.00	1649.75
BSM	18	25.59	12:03:30 PM	37.06	4.66	451.00	2145.92
BF	19	25.49	12:04:34 PM	35.58	5.21	457.00	1920.73
BS	20	25.60	12:05:19 PM	36.15	5.10	463.00	1961.76
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.26	50.00	51.00	35.62
Blank 2		25.69	–	35.89	50.00	102.00	34.14
Blank 3		25.73	–	36.26	50.00	153.00	32.98
Blank 4		25.88	–	36.75	50.00	204.00	33.74
714 pCi STD.		–	–	–	1.38	206.00	7286.23
952 pCi STD.		–	–	–	1.06	208.00	9504.72

Table Notes:

1. Samples were collected on November 7, 1993.
2. Mailed and Non–mailed samples were counted on November 9, 1993 at 6:02:15 PM.

Table A–D–4: Western Site C–Raw Data from Sample Run #2

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
CFM 1	25.69	01:46:49 PM	35.63	50.00	514.00	195.52
CSM 2	25.73	01:47:09 PM	38.42	42.35	557.00	236.22
CF 3	25.61	01:48:02 PM	35.73	50.00	608.00	181.90
CS 4	25.67	01:48:25 PM	38.12	45.32	655.00	220.70
CFM 5	25.70	01:49:14 PM	35.88	50.00	706.00	178.90
CSM 6	25.70	01:49:37 PM	38.02	44.72	751.00	223.61
CF 7	25.59	01:50:25 PM	35.65	50.00	802.00	172.60
CS 8	25.63	01:50:49 PM	38.06	45.38	849.00	220.36
CFM 9	25.72	01:51:40 PM	35.97	50.00	920.00	180.42
CSM 10	25.59	01:52:04 PM	38.73	44.34	965.00	225.58
CF 11	25.54	01:53:02 PM	35.71	50.00	1016.00	174.88
CS 12	25.57	01:53:28 PM	38.32	44.09	1061.00	226.81
CFM 13	25.72	01:54:29 PM	36.03	50.00	1112.00	182.66
CSM 14	25.59	01:54:46 PM	38.30	46.05	1159.00	217.16
CF 15	25.57	01:55:46 PM	35.71	50.00	1210.00	179.98
CS 16	25.64	01:56:08 PM	37.07	49.54	1260.00	201.92
CFM 17	25.59	01:57:00 PM	35.61	50.00	1311.00	173.70
CSM 18	25.67	01:57:20 PM	37.51	48.59	1361.00	205.82
CF 19	25.58	01:58:21 PM	35.70	50.00	1412.00	169.42
CS 20	25.51	01:58:42 PM	36.65	50.00	1463.00	184.22
Calibration Information for both Mailed and Non–mailed Samples						
Blank 1	25.59	–	36.26	50.00	51.00	35.62
Blank 2	25.69	–	35.89	50.00	102.00	34.14
Blank 3	25.73	–	36.26	50.00	153.00	32.98
Blank 4	25.88	–	36.75	50.00	204.00	33.74
714 pCi STD.	–	–	–	1.38	206.00	7286.23
952 pCi STD.	–	–	–	1.06	208.00	9504.72

Table Notes:

1. Samples were collected on November 7, 1993.
2. Mailed and Non–mailed samples were counted on November 9, 1993 at 6:02:15 PM.

Table A–D–5: Western Site D–Raw Data from Sample Run #2

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
DFM	1	25.54	01:15:08 PM	36.03	50.00	1514.00	108.52
DSM	2	25.67	01:15:42 AM	38.58	36.86	1551.00	271.30
DF	3	25.56	01:16:32 PM	35.74	40.90	1593.00	244.55
DS	4	25.70	01:19:21 PM	35.12	47.67	1642.00	209.78
DFM	5	25.73	01:20:23 PM	36.03	40.23	1683.00	248.60
DSM	6	25.58	01:20:49 PM	36.42	40.63	1725.00	246.12
DF	7	25.58	01:21:53 PM	35.65	41.58	1767.00	240.50
DS	8	25.68	01:22:19 PM	37.10	37.13	1805.00	269.32
DFM	9	25.78	01:25:33 PM	36.04	40.84	1847.00	244.88
DSM	10	25.68	01:25:56 PM	37.04	33.99	1882.00	294.26
DF	11	25.51	01:27:00 PM	35.72	38.07	1921.00	262.75
DS	12	25.76	01:27:25 PM	36.64	35.30	1957.00	283.34
DFM	13	25.63	01:28:13 PM	35.70	37.36	1996.00	267.77
DSM	14	25.68	01:30:42 PM	36.73	34.04	2031.00	293.77
DF	15	25.60	01:31:19 PM	36.01	35.76	2068.00	279.73
DS	16	25.58	01:31:50 PM	37.48	30.00	2099.00	333.37
DFM	17	25.66	01:33:12 PM	35.89	32.62	2132.00	306.71
DSM	18	25.58	01:33:31 PM	37.23	28.85	2162.00	346.62
DF	19	25.58	01:36:54 PM	35.65	32.46	2195.00	308.13
DS	20	25.56	01:37:27 PM	35.88	30.50	2227.00	327.90
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.26	50.00	51.00	35.62
Blank 2		25.69	–	35.89	50.00	102.00	34.14
Blank 3		25.73	–	36.26	50.00	153.00	32.98
Blank 4		25.88	–	36.75	50.00	204.00	33.74
714 pCi STD.		–	–	–	1.38	206.00	7286.23
952 pCi STD.		–	–	–	1.06	208.00	9504.72

Table Notes:

1. Samples were collected on November 7, 1993.
2. Mailed and Non–mailed samples were counted on November 9, 1993 at 6:02:15 PM.

Table A–D–6: Western Site E–Raw Data from Sample Run #2

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Count Rate (cpm)
EFM 1	25.59	12:49:54 PM	35.71	2.66	2230.00	3771.05
ESM 2	25.68	12:50:16 PM	35.88	2.72	2234.00	3677.57
EF 3	25.60	12:52:00 PM	36.04	2.61	2238.00	3834.87
ES 4	25.65	12:52:28 PM	37.54	2.35	2241.00	4272.77
EFM 5	25.42	12:53:40 PM	35.69	2.64	2245.00	3793.18
ESM 6	25.62	12:54:00 PM	37.34	2.29	2248.00	4370.31
EF 7	25.43	12:55:18 PM	35.91	2.66	2251.00	3760.15
ES 8	25.59	12:55:58 PM	37.34	2.27	2254.00	4412.33
EFM 9	25.49	12:57:06 PM	BROKE	0.00	0.00	0.00
ESM 10	25.67	12:57:33 PM	36.68	2.37	2258.00	4228.27
EF 11	25.59	12:59:14 PM	35.64	2.14	2261.00	4682.71
ES 12	25.59	12:59:47 PM	34.84	2.28	2264.00	4398.68
EFM 13	25.69	01:01:07 PM	35.36	2.13	2267.00	4713.15
ESM 14	25.51	01:01:31 PM	37.87	1.63	2270.00	6134.94
EF 15	25.57	01:02:39 PM	35.82	1.96	2272.00	5114.29
ES 16	25.72	01:03:05 PM	37.48	1.70	2275.00	5911.18
EFM 17	25.72	01:04:06 PM	35.91	1.98	2278.00	5051.52
ESM 18	25.56	01:04:29 PM	36.68	2.02	2281.00	4962.38
EF 19	25.61	01:05:53 PM	BROKE	0.00	0.00	0.00
ES 20	25.62	01:06:23 PM	37.50	1.99	2284.00	5043.72
Calibration Information for both Mailed and Non–mailed Samples						
Blank 1	25.59	–	36.26	50.00	51.00	35.62
Blank 2	25.69	–	35.89	50.00	102.00	34.14
Blank 3	25.73	–	36.26	50.00	153.00	32.98
Blank 4	25.88	–	36.75	50.00	204.00	33.74
714 pCi STD.	–	–	–	1.38	206.00	7286.23
952 pCi STD.	–	–	–	1.06	208.00	9504.72

Table Notes:

1. Samples were collected on November 7, 1993.
2. Mailed and Non–mailed samples were counted on November 9, 1993 at 6:02:15 PM.

Table A–E–1: Eastern Sites' Results from Sample Run #3

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	10,906.29	493.78	10,970.09	291.49
	B	11,175.68	391.52	11,229.29	567.23
	D	38,627.53	1,745.91	38,278.17	1,208.92
Slow–flow	A	11,214.55	935.71	11,031.97	279.96
	B	11,797.57	294.39	11,780.86	294.86
	D	40,097.31	3,224.85	40,375.65	2,998.89

Table Notes:
1. Samples were collected on November 22, 1993.
2. Eastern Site C was not accessible on this date.

Table A–E–2: Eastern Site A–Raw Data from Sample Run #3

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM 1	25.85	02:16:23 PM	35.94	10.89	220.00	918.64
ASM 2	25.65	02:16:56 PM	36.39	10.43	232.00	959.83
AF 3	25.77	02:17:57 PM	35.93	10.89	244.00	918.27
AS 4	25.87	02:18:19 PM	36.45	10.86	255.00	921.09
AFM 5	25.70	02:19:12 PM	LOST	0.00	0.00	0.00
ASM 6	25.76	02:19:31 PM	LOST	0.00	0.00	0.00
AF 7	25.80	02:20:22 PM	35.99	11.94	268.00	837.60
AS 8	25.76	02:20:52 PM	36.00	11.50	281.00	870.26
AFM 9	25.89	02:21:41 PM	36.05	11.01	293.00	908.63
ASM 10	25.69	02:22:15 PM	36.07	10.91	305.00	916.87
AF 11	25.87	03:12:00 PM	35.98	10.68	316.00	936.89
AS 12	25.86	03:12:17 PM	35.76	9.79	327.00	1022.06
AFM 13	25.73	03:13:11 PM	36.73	10.23	338.00	979.18
ASM 14	25.83	03:13:27 PM	36.23	10.49	349.00	954.62
AF 15	25.82	03:14:18 PM	36.08	11.15	361.00	897.49
AS 16	25.85	03:14:37 PM	35.75	11.65	374.00	859.66
AFM 17	25.69	03:15:36 PM	35.81	11.66	387.00	858.15
ASM 18	25.86	03:15:53 PM	36.60	10.84	399.00	922.97
AF 19	25.72	03:16:35 PM	35.80	11.33	411.00	883.23
AS 20	25.81	03:17:05 PM	36.91	10.09	422.00	991.67
Calibration Information for both Mailed and Non–mailed Samples						
Blank 1	25.59	–	36.27	50.00	51.00	34.98
Blank 2	25.69	–	35.91	50.00	103.00	32.98
Blank 3	25.73	–	36.28	50.00	154.00	34.14
Blank 4	25.88	–	36.77	50.00	204.00	34.46
714 pCi STD.	–	–	–	1.37	207.00	7329.93
952 pCi STD.	–	–	–	1.06	209.00	9520.75

Table Notes:

1. Samples were collected on November 22, 1993.
2. Mailed and Non–mailed samples were counted on November 23, 1993 at 8:00:45 PM.

Table A–E–3: Eastern Site B–Raw Data from Sample Run #3

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.51	12:58:42 PM	35.79	10.53	433.00	950.71
BSM	2	25.37	12:59:06 PM	BROKE	0.00	0.00	0.00
BF	3	25.46	01:00:00 PM	36.11	10.53	445.00	950.24
BS	4	25.42	01:00:30 PM	36.73	9.78	455.00	1023.01
BFM	5	25.48	01:01:10 PM	LOST	0.00	0.00	0.00
BSM	6	25.36	01:01:36 PM	LOST	0.00	0.00	0.00
BF	7	25.49	01:02:24 PM	35.63	11.20	467.00	893.21
BS	8	25.25	01:02:43 PM	35.31	10.47	479.00	955.11
BFM	9	25.73	01:03:38 PM	35.94	10.84	491.00	922.60
BSM	10	25.80	01:03:58 PM	36.07	10.77	502.00	928.60
BF	11	25.45	01:05:18 PM	36.11	10.50	514.00	953.05
BS	12	25.34	01:05:43 PM	35.84	10.38	525.00	963.39
BFM	13	25.80	01:06:38 PM	36.23	11.38	537.00	879.35
BSM	14	25.71	01:06:57 PM	36.58	9.86	548.00	1015.52
BF	15	25.45	01:07:52 PM	35.35	11.70	561.00	855.04
BS	16	25.37	01:08:10 PM	36.69	10.06	572.00	994.53
BFM	17	25.82	01:09:20 PM	35.48	12.57	585.00	795.70
BSM	18	25.71	01:09:33 PM	35.72	11.20	597.00	893.21
BF	19	25.51	01:10:53 PM	35.69	12.11	610.00	826.01
BS	20	25.86	01:11:11 PM	37.04	9.83	621.00	1017.70
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	34.98
Blank 2		25.69	–	35.91	50.00	103.00	32.98
Blank 3		25.73	–	36.28	50.00	154.00	34.14
Blank 4		25.88	–	36.77	50.00	204.00	34.46
714 pCi STD.		–	–	–	1.37	207.00	7329.93
952 pCi STD.		–	–	–	1.06	209.00	9520.75

Table Notes:

1. Samples were collected on November 22, 1993.
2. Both Mailed and Non–mailed samples were counted on November 23, 1993 at 8:00:45 PM.

Table A–E–4: Eastern Site D–Raw Data from Sample Run #3

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM	1	25.54	09:17:51 AM	35.47	3.57	842.00	2808.96
DSM	2	25.58	09:18:54 AM	36.72	3.63	846.00	2757.30
DF	3	25.52	09:21:00 AM	35.47	3.44	851.00	2914.53
DS	4	25.41	09:21:27 AM	36.35	3.09	855.00	3238.51
DFM	5	25.58	09:23:00 AM	BROKE	–	–	–
DSM	6	25.43	09:23:30 AM	35.60	3.32	859.00	3012.35
DF	7	25.60	09:24:41 AM	35.82	3.58	864.00	2799.16
DS	8	25.54	09:24:58 AM	37.98	2.74	867.00	3663.87
DFM	9	25.69	09:26:07 AM	35.86	3.74	872.00	2674.33
DSM	10	25.63	09:26:33 AM	35.72	3.36	876.00	2977.68
DF	11	25.52	09:28:04 AM	35.67	3.79	881.00	2641.69
DS	12	25.51	09:28:25 AM	35.91	3.33	885.00	3003.60
DFM	13	25.67	09:29:50 AM	35.88	3.67	890.00	2730.52
DSM	14	25.50	09:30:30 AM	36.23	3.19	894.00	3136.36
DF	15	25.42	09:31:40 AM	35.72	3.66	899.00	2735.79
DS	16	25.58	09:32:07 AM	37.00	3.05	902.00	3293.44
DFM	17	25.49	09:33:18 AM	35.80	3.66	907.00	2734.97
DSM	18	25.50	09:33:50 AM	36.83	3.06	911.00	3276.14
DF	19	25.50	09:35:00 AM	35.97	3.58	915.00	2796.37
DS	20	25.49	09:35:45 AM	35.97	3.96	920.00	2529.80
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	34.98
Blank 2		25.69	–	35.91	50.00	103.00	32.98
Blank 3		25.73	–	36.28	50.00	154.00	34.14
Blank 4		25.88	–	36.77	50.00	204.00	34.46
714 pCi STD.		–	–	–	1.37	207.00	7329.93
952 pCi STD.		–	–	–	1.06	209.00	9520.75

Table Notes:

1. Samples were collected on November 22, 1993.
2. Mailed and Non–mailed samples were counted on November 23, 1993 at 8:00:45 PM.
3. The pump was not running, therefore samples were takes from the systems water line.

Table A–F–1: Eastern Sites' Results from Sample Run #4

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	B	11,112.78	512.24	11,192.99	582.75
	C	17,085.75	935.77	16,124.66	924.99
	D	39,109.67	2,779.25	37,317.25	2,073.00
Slow–flow	B	12,403.50	216.05	12,358.80	376.19
	C	15,197.26	1,136.17	14,387.50	750.35
	D	40,632.44	4,433.76	42,159.58	144.19

Table Notes:

1. Samples were taken on December 6, 1993.
2. Eastern Site A was not accessible on this sampling date.

Table A–F–2: Eastern Site B–Raw Data from Sample Run #4

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.50	01:15:50 PM	35.95	16.43	226.00	608.89
BSM	2	25.71	01:16:08 PM	36.38	14.62	241.00	684.27
BF	3	25.76	01:16:50 PM	35.85	12.98	572.00	770.80
BS	4	25.40	01:17:05 PM	37.15	10.59	584.00	944.85
BFM	5	25.37	01:17:54 PM	35.28	17.80	260.00	561.80
BSM	6	25.42	01:18:12 PM	35.94	15.29	276.00	654.22
BF	7	25.75	01:18:58 PM	35.86	12.64	597.00	791.14
BS	8	25.35	01:19:19 PM	37.13	10.22	608.00	979.06
BFM	9	25.66	01:20:08 PM	35.74	16.94	294.00	590.50
BSM	10	25.61	01:20:28 PM	36.40	14.58	310.00	686.08
BF	11	25.34	01:22:19 PM	35.35	13.81	623.00	724.33
BS	12	25.61	01:22:50 PM	36.05	11.71	636.00	854.48
BFM	13	25.48	01:24:15 PM	35.53	19.25	330.00	519.53
BSM	14	25.54	01:24:43 PM	36.52	15.34	346.00	651.96
BF	15	25.56	01:26:00 PM	35.56	14.05	651.00	711.74
BS	16	25.55	01:26:25 PM	36.38	11.59	663.00	863.42
BFM	17	25.69	01:27:56 PM	35.71	17.25	364.00	579.71
BSM	18	25.48	01:28:28 PM	36.18	15.57	381.00	642.45
BF	19	25.58	01:29:55 PM	35.47	14.45	679.00	692.94
BS	20	25.42	01:30:35 PM	36.94	10.63	690.00	941.58
Calibration Information for Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	0.00
Blank 2		25.69	–	35.91	50.00	452.00	32.62
Blank 3		25.73	–	36.28	50.00	503.00	33.22
Blank 4		25.88	–	36.77	50.00	554.00	32.84
714 pCi STD.		–	–	–	1.37	556.00	7316.79
952 pCi STD.		–	–	–	1.08	558.00	9322.22
Calibration Information for Mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	35.36
Blank 2		25.69	–	35.91	50.00	102.00	34.42
Blank 3		25.73	–	36.28	50.00	153.00	35.48
Blank 4		25.88	–	36.77	50.00	204.00	33.36
714 pCi STD.		–	–	–	1.38	206.00	7248.55
952 pCi STD.		–	–	–	1.04	208.00	9652.88

Table Notes:

1. Samples were collected on December 6, 1993.
2. Non–mailed samples were counted on December 8, 1993 at 3:00:00 PM.
3. Mailed samples were counted on December 10, 1993 at 11:57:30 AM.
4. The first 10 samples were taken from the well; the final 10 samples were taken from the tank.

Table A–F–3: Eastern Site C–Raw Data from Sample Run #4

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	25.42	11:48:44 AM	35.54	13.93	396.00	718.59
CSM	2	25.75	11:49:15 AM	34.36	16.97	414.00	589.51
CF	3	25.83	11:50:32 AM	35.76	9.06	700.00	1103.75
CS	4	25.56	11:50:53 AM	35.65	10.37	712.00	964.32
CFM	5	25.46	11:52:26 AM	35.58	12.03	427.00	831.67
CSM	6	25.34	11:52:52 AM	34.43	15.13	443.00	660.94
CF	7	25.60	11:54:28 AM	35.73	9.40	722.00	1064.15
CS	8	25.56	11:54:56 AM	35.27	10.43	733.00	958.87
CFM	9	26.05	11:56:42 AM	36.08	12.64	456.00	791.77
CSM	10	25.53	11:57:05 AM	36.12	14.64	472.00	683.27
CF	11	25.67	11:58:51 AM	35.77	9.71	744.00	1030.59
CS	12	25.51	11:59:10 AM	35.23	11.98	757.00	834.89
CFM	13	25.86	12:00:47 PM	35.92	12.58	486.00	795.39
CSM	14	25.55	12:01:18 PM	35.28	14.54	501.00	688.03
CF	15	25.46	12:02:41 PM	35.31	8.69	767.00	1151.55
CS	16	25.43	12:02:59 PM	35.91	9.40	777.00	1064.47
CFM	17	25.43	12:04:39 PM	35.53	12.76	515.00	783.78
CSM	18	25.38	12:05:02 PM	36.04	12.97	529.00	771.32
CF	19	25.82	12:06:30 PM	35.89	9.14	787.00	1094.31
CS	20	25.80	12:07:00 PM	34.80	10.75	799.00	930.42
Calibration Information for Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	0.00
Blank 2		25.69	–	35.91	50.00	452.00	32.62
Blank 3		25.73	–	36.28	50.00	503.00	33.22
Blank 4		25.88	–	36.77	50.00	554.00	32.84
714 pCi STD.		–	–	–	1.37	556.00	7316.79
952 pCi STD.		–	–	–	1.08	558.00	9322.22
Calibration Information for Mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	35.36
Blank 2		25.69	–	35.91	50.00	102.00	34.42
Blank 3		25.73	–	36.28	50.00	153.00	35.48
Blank 4		25.88	–	36.77	50.00	204.00	33.36
714 pCi STD.		–	–	–	1.38	206.00	7248.55
952 pCi STD.		–	–	–	1.04	208.00	9652.88

Table Notes:

1. Samples were collected on December 6, 1993.
2. Non–mailed samples were counted on December 8, 1993 at 3:00:00 PM.
3. Mailed samples were counted on December 10, 1993 at 11:57:30 AM.
4. The pump was not running, therefore samples were taken from the system's tank.

Table A–F–4: Eastern Site D–Raw Data from Sample Run #4

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM 1	25.54	10:12:40 AM	35.93	5.20	535.00	1927.31
DSM 2	25.65	10:13:02 AM	36.53	4.78	540.00	2092.05
DF 3	25.45	10:14:05 AM	35.49	3.73	803.00	2681.77
DS 4	25.54	10:14:24 AM	36.53	3.47	808.00	2887.61
DFM 5	25.37	10:15:45 AM	35.25	5.81	547.00	1724.44
DSM 6	25.51	10:16:06 AM	35.81	5.04	553.00	1985.71
DF 7	25.25	10:17:14 AM	35.40	4.33	813.00	2316.63
DS 8	25.57	10:17:32 AM	35.91	3.75	818.00	2673.33
DFM 9	25.48	10:18:32 AM	35.37	5.90	560.00	1694.92
DSM 10	25.54	10:18:56 AM	35.38	5.26	566.00	1904.56
DF 11	25.52	10:20:01 AM	35.43	4.17	823.00	2398.08
DS 12	25.75	10:20:24 AM	35.50	3.97	828.00	2523.68
DFM 13	25.52	10:21:29 AM	35.44	6.27	573.00	1597.29
DSM 14	25.44	10:21:52 AM	34.99	5.42	580.00	1848.52
DF 15	25.45	10:23:10 AM	35.72	4.37	833.00	2294.51
DS 16	25.57	10:23:27 AM	37.01	3.34	837.00	2995.21
DFM 17	25.66	10:24:39 AM	35.69	6.08	587.00	1646.87
DSM 18	25.32	10:25:03 AM	36.49	4.66	592.00	2147.21
DF 19	25.78	10:26:18 AM	35.93	4.16	842.00	2404.33
DS 20	25.60	10:26:51 AM	35.87	4.87	848.00	2058.11
Calibration Information for Non–mailed Samples						
Blank 1	25.59	–	36.27	50.00	51.00	0.00
Blank 2	25.69	–	35.91	50.00	452.00	32.62
Blank 3	25.73	–	36.28	50.00	503.00	33.22
Blank 4	25.88	–	36.77	50.00	554.00	32.84
714 pCi STD.	–	–	–	1.37	556.00	7316.79
952 pCi STD.	–	–	–	1.08	558.00	9322.22
Calibration Information for Mailed Samples						
Blank 1	25.59	–	36.27	50.00	51.00	35.36
Blank 2	25.69	–	35.91	50.00	102.00	34.42
Blank 3	25.73	–	36.28	50.00	153.00	35.48
Blank 4	25.88	–	36.77	50.00	204.00	33.36
714 pCi STD.	–	–	–	1.38	206.00	7248.55
952 pCi STD.	–	–	–	1.04	208.00	9652.88

Table Notes:

1. Samples were collected on December 6, 1993.
2. Non–mailed samples were counted on December 8, 1993 at 3:00:00 PM.
3. Mailed samples were counted on December 10, 1993 at 11:57:30 AM.

Table A–G–1: Western Sites' Results from Sample Run #3

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	36,926.17	888.90	38,230.00	1,339.43
	B	24,364.40	1;312.04	24,054.49	1,301.11
	C	18,014.78	911.11	18,350.01	673.05
	D	12,292.51	7,880.17	10,898.60	6,102.89
	E	76,908.05	1,702.32	78,016.16	2,221.35
Slow–flow	A	39,848.90	946.50	39,007.36	1,040.24
	B	24,098.37	1,298.99	25,013.28	695.99
	C	19,989.30	547.14	19,704.86	258.99
	D	14,863.58	10,322.81	13,206.24	8,327.81
	E	77,030.29	1,114.84	76,630.51	2,095.77

Table Notes:

1. Samples were collected on December 12, 1993.

Table A–G–2: Western Site A–Raw Data from Sample Run #3

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	25.90	10:46:33 AM	36.09	3.82	213.00	2624.87
ASM	2	25.92	10:47:01 AM	36.80	3.60	217.00	2781.39
AF	3	25.89	10:48:09 AM	35.81	4.21	222.00	2376.01
AS	4	25.93	10:48:29 AM	38.14	3.20	226.00	3127.81
AFM	5	25.87	10:49:23 AM	36.05	4.03	231.00	2484.86
ASM	6	25.70	10:49:50 AM	37.01	3.47	236.00	2884.15
AF	7	25.84	10:50:56 AM	35.99	4.05	241.00	2469.88
AS	8	25.90	10:51:38 AM	37.31	3.33	245.00	3005.11
AFM	9	25.91	10:52:45 AM	BROKE	0.00	0.00	0.00
ASM	10	25.83	10:53:21 AM	35.78	3.93	250.00	2544.53
AF	11	25.85	10:54:18 AM	36.13	4.01	255.00	2494.51
AS	12	25.91	10:54:49 AM	36.87	3.44	259.00	2909.01
AFM	13	25.76	10:56:06 AM	35.91	3.79	264.00	2638.79
ASM	14	25.97	10:56:38 AM	37.40	3.27	268.00	3063.00
AF	15	26.01	10:57:30 AM	36.04	3.93	273.00	2545.55
AS	16	25.88	10:57:59 AM	38.47	2.93	277.00	3421.16
AFM	17	25.94	10:59:10 AM	LOST	0.00	0.00	0.00
ASM	18	25.95	10:59:30 AM	LOST	0.00	0.00	0.00
AF	19	26.09	11:00:30 AM	35.80	4.20	282.00	2382.38
AS	20	25.97	11:00:50 AM	37.42	3.36	286.00	2984.23
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	35.68
Blank 2		25.69	–	35.88	50.00	102.00	33.80
Blank 3		25.73	–	36.26	50.00	153.00	34.06
Blank 4		25.88	–	36.76	50.00	204.00	34.00
714 pCi STD.		–	–	–	1.35	206.00	7428.15
952 pCi STD.		–	–	–	1.06	208.00	9482.08

Table Notes:

1. Samples were collected on December 12, 1993.
2. Mailed and Non–mailed samples were counted on December 14, 1993 at 4:38:00 PM.

Table A–G–3: Western Site B–Raw Data from Sample Run #3

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.84	11:19:15 AM	35.42	5.98	293.00	1673.58
BSM	2	26.00	11:19:43 AM	36.33	6.03	300.00	1661.19
BF	3	25.84	11:20:45 AM	36.24	5.63	307.00	1777.62
BS	4	25.87	11:21:02 AM	35.90	6.70	314.00	1494.03
BFM	5	25.81	11:21:50 AM	35.96	6.41	322.00	1563.49
BSM	6	25.90	11:22:14 AM	34.48	6.95	329.00	1440.58
BF	7	25.71	11:23:00 AM	36.11	5.62	336.00	1782.21
BS	8	25.94	11:23:19 AM	36.43	6.08	343.00	1646.22
BFM	9	25.77	11:24:15 AM	35.73	6.54	351.00	1529.66
BSM	10	25.98	11:24:35 AM	35.87	6.15	358.00	1626.50
BF	11	25.77	11:25:26 AM	35.77	6.45	365.00	1551.01
BS	12	25.98	11:25:47 AM	35.53	6.67	372.00	1501.05
BFM	13	25.94	11:26:45 AM	36.00	6.43	380.00	1556.14
BSM	14	25.84	11:27:03 AM	36.27	5.87	387.00	1705.11
BF	15	25.91	11:28:05 AM	35.71	6.57	394.00	1524.05
BS	16	25.97	11:28:23 AM	36.37	5.70	401.00	1756.32
BFM	17	25.87	11:29:23 AM	35.95	6.20	408.00	1614.84
BSM	18	25.97	11:29:40 AM	34.18	7.09	416.00	1410.58
BF	19	25.87	11:30:31 AM	35.92	6.51	423.00	1536.41
BS	20	25.86	11:30:48 AM	35.63	6.24	431.00	1605.93
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	35.68
Blank 2		25.69	–	35.88	50.00	102.00	33.80
Blank 3		25.73	–	36.26	50.00	153.00	34.06
Blank 4		25.88	–	36.76	50.00	204.00	34.00
714 pCi STD.		–	–	–	1.35	206.00	7428.15
952 pCi STD.		–	–	–	1.06	208.00	9482.08

Table Notes:

1. Samples were collected on December 12, 1993.
2. Mailed and Non–mailed samples were counted on December 14, 1993 at 4:38:00 PM.

Table A–G–4: Western Site C–Raw Data from Sample Run #3

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	25.81	01:43:39 PM	35.89	8.00	439.00	1252.25
CSM	2	25.92	01:44:00 PM	37.28	6.60	447.00	1516.82
CF	3	25.76	01:45:02 PM	35.91	8.18	456.00	1224.21
CS	4	25.87	01:45:20 PM	36.62	6.82	464.00	1466.57
CFM	5	25.91	01:46:23 PM	35.78	8.10	473.00	1235.19
CSM	6	25.88	01:46:50 PM	36.49	7.14	481.00	1402.10
CF	7	25.84	01:47:36 PM	35.42	8.22	490.00	1217.03
CS	8	25.91	01:47:57 PM	37.57	6.32	497.00	1582.44
CFM	9	25.94	01:48:59 PM	35.92	8.03	506.00	1246.08
CSM	10	25.83	01:49:19 PM	36.46	7.22	514.00	1385.46
CF	11	25.97	01:50:23 PM	36.04	8.44	524.00	1186.49
CS	12	25.91	01:50:59 PM	36.72	6.95	532.00	1439.14
CFM	13	25.76	01:51:35 PM	35.55	8.28	541.00	1208.45
CSM	14	25.81	01:51:58 PM	35.89	7.76	549.00	1289.05
CF	15	25.92	01:52:48 PM	36.01	8.04	558.00	1245.27
CS	16	25.95	01:53:13 PM	37.88	6.50	566.00	1539.08
CFM	17	25.91	01:54:03 PM	35.88	8.83	576.00	1132.73
CSM	18	25.76	01:54:23 PM	35.98	7.55	584.00	1325.03
CF	19	25.92	01:55:15 PM	35.99	9.01	594.00	1110.43
CS	20	25.90	01:55:36 PM	36.62	7.38	602.00	1355.01
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	35.68
Blank 2		25.69	–	35.88	50.00	102.00	33.80
Blank 3		25.73	–	36.26	50.00	153.00	34.06
Blank 4		25.88	–	36.76	50.00	204.00	34.00
714 pCi STD.		–	–	–	1.35	206.00	7428.15
952 pCi STD.		–	–	–	1.06	208.00	9482.08

Table Notes:

1. Samples were collected on December 12, 1993.
2. Mailed and Non–mailed samples were counted on December 14, 1993 at 4:38:00 PM.

Table A–G–5: Western Site D–Raw Data from Sample Run #3

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM 1	25.81	12:02:45 PM	35.73	23.78	627.00	420.65
DSM 2	25.91	12:03:07 PM	36.88	21.21	649.00	471.66
DF 3	25.80	12:03:50 PM	35.76	22.40	673.00	446.52
DS 4	25.79	12:04:12 PM	36.81	20.55	694.00	486.62
DFM 5	25.90	12:04:52 PM	36.00	22.39	717.00	446.67
DSM 6	25.74	12:05:18 PM	36.15	20.51	739.00	487.66
DF 7	25.94	12:06:05 PM	35.28	23.42	763.00	427.16
DS 8	25.84	12:06:20 PM	36.68	18.51	783.00	540.36
DFM 9	25.89	12:07:04 PM	LOST	0.00	0.00	0.00
DSM 10	25.95	12:07:19 PM	LOST	0.00	0.00	0.00
DF 11	25.86	12:08:00 PM	36.06	18.70	802.00	534.81
DS 12	25.93	12:08:12 PM	36.66	15.36	819.00	651.43
DFM 13	25.79	12:09:20 PM	35.82	13.47	833.00	742.54
DSM 14	25.84	12:09:35 PM	36.19	9.94	844.00	1006.64
DF 15	25.75	12:10:16 PM	35.73	10.45	855.00	957.13
DS 16	25.74	12:10:35 PM	35.63	7.95	864.00	1259.37
DFM 17	25.81	12:11:24 PM	35.92	8.16	873.00	1225.86
DSM 18	25.77	12:11:40 PM	36.44	6.25	881.00	1603.04
DF 19	25.90	12:12:33 PM	36.02	6.36	888.00	1572.48
DS 20	25.99	12:12:52 PM	37.52	4.59	893.00	2179.30
Calibration Information for both Mailed and Non–mailed Samples						
Blank 1	25.59	–	36.27	50.00	51.00	35.68
Blank 2	25.69	–	35.88	50.00	102.00	33.80
Blank 3	25.73	–	36.26	50.00	153.00	34.06
Blank 4	25.88	–	36.76	50.00	204.00	34.00
714 pCi STD.	–	–	–	1.35	206.00	7428.15
952 pCi STD.	–	–	–	1.06	208.00	9482.08

Table Notes:

1. Samples were collected on December 12, 1993.
2. Mailed and Non–mailed samples were counted on December 14, 1993 at 4:38:00 PM.

Table A–G–6: Western Site E–Raw Data from Sample Run #3

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
EFM 1	25.71	01:10:29 PM	35.68	1.99	896.00	5025.63
ESM 2	25.85	01:10:46 PM	37.96	1.69	899.00	5951.48
EF 3	25.97	01:11:50 PM	36.40	1.95	902.00	5132.31
ES 4	25.97	01:12:06 PM	37.90	1.77	904.00	5664.41
EFM 5	25.83	01:12:52 PM	35.92	2.04	907.00	4911.27
ESM 6	25.82	01:13:07 PM	35.32	2.28	911.00	4395.18
EF 7	25.81	01:14:00 PM	35.93	2.09	914.00	4800.00
ES 8	25.84	01:14:19 PM	35.66	2.17	917.00	4627.19
EFM 9	25.85	01:14:59 PM	35.76	2.13	920.00	4699.06
ESM 10	25.68	01:15:27 PM	33.59	2.76	924.00	3635.87
EF 11	25.91	01:16:12 PM	36.18	2.11	927.00	4754.03
ES 12	26.01	01:16:31 PM	34.66	2.47	930.00	4055.87
EFM 13	26.03	01:17:23 PM	36.27	2.07	933.00	4835.75
ESM 14	25.90	01:17:43 PM	37.30	1.85	936.00	5427.57
EF 15	25.77	01:18:30 PM	35.92	2.09	939.00	4800.96
ES 16	25.95	01:18:50 PM	38.06	1.75	941.00	5729.14
EFM 17	25.94	01:19:33 PM	35.96	2.13	944.00	4695.77
ESM 18	25.86	01:19:55 PM	36.21	2.05	947.00	4891.71
EF 19	26.05	01:20:42 PM	36.23	2.10	950.00	4761.90
ES 20	25.94	01:20:58 PM	36.28	2.00	953.00	5012.50
Calibration Information for both Mailed and Non–mailed Samples						
Blank 1	25.59	–	36.27	50.00	51.00	35.68
Blank 2	25.69	–	35.88	50.00	102.00	33.80
Blank 3	25.73	–	36.26	50.00	153.00	34.06
Blank 4	25.88	–	36.76	50.00	204.00	34.00
714 pCi STD.	–	–	–	1.35	206.00	7428.15
952 pCi STD.	–	–	–	1.06	208.00	9482.08

Table Notes:

1. Samples were collected on December 12, 1993.
2. Mailed and Non–mailed samples were counted on December 14, 1993 at 4:38:00 PM.

Table A–H–1: Eastern Sites' Results from Sample Run #5

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	10,483.49	484.37	10,961.36	1,050.69
	B	11,351.65	118.58	11,256.86	440.49
	C	13,310.21	943.74	13,383.39	1,617.88
	D	35,099.45	2,907.17	35,122.31	3,028.61
Slow–flow	A	10,905.26	195.46	10,918.24	360.30
	B	11,479.35	65.33	11,427.59	224.20
	C	13,216.65	1,089.54	12,880.19	1,038.71
	D	40,773.58	1,867.52	39,902.47	2,780.40

Table Notes:
1. Samples were collected on December 20, 1993.

Table A–H–2: Eastern Site A–Raw Data from Sample Run #5

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	25.80	02:49:33 PM	35.80	11.01	220.00	908.45
ASM	2	25.95	02:49:56 PM	39.26	9.23	230.00	1083.64
AF	3	25.92	02:51:17 PM	35.74	12.63	243.00	791.92
AS	4	25.86	02:51:33 PM	37.61	10.87	255.00	921.07
AFM	5	25.92	02:52:38 PM	36.07	13.27	269.00	753.73
ASM	6	25.80	02:52:54 PM	36.83	11.83	282.00	845.82
AF	7	25.98	02:53:50 PM	36.02	13.62	297.00	734.21
AS	8	25.96	02:54:06 PM	35.06	14.48	312.00	690.81
AFM	9	25.85	02:55:16 PM	35.71	13.15	326.00	761.06
ASM	10	25.83	02:55:32 PM	37.34	11.63	339.00	859.85
AF	11	25.95	02:56:29 PM	35.94	13.66	353.00	732.06
AS	12	26.05	02:57:12 PM	36.39	12.81	367.00	781.26
AFM	13	25.84	02:58:06 PM	35.92	13.54	382.00	738.85
ASM	14	25.92	02:58:51 PM	37.64	11.29	394.00	886.36
AF	15	25.92	02:59:43 PM	35.78	13.95	409.00	717.13
AS	16	25.87	03:00:09 PM	36.73	11.91	422.00	840.05
AFM	17	26.14	03:01:10 PM	36.18	13.91	436.00	719.05
ASM	18	25.87	03:01:31 PM	37.72	11.39	449.00	878.31
AF	19	26.03	03:02:27 PM	36.11	14.15	464.00	707.07
AS	20	25.78	03:02:43 PM	36.18	12.74	478.00	785.01
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	50.00	35.46
Blank 2		25.69	–	35.88	50.00	102.00	33.62
Blank 3		25.73	–	36.26	50.00	153.00	33.32
Blank 4		25.88	–	36.76	50.00	204.00	33.74
714 pCi STD.		–	–	–	1.34	206.00	7491.79
952 pCi STD.		–	–	–	1.05	208.00	9583.81

Table Notes:

1. Samples were collected on December 20, 1993.
2. Mailed and Non–mailed samples were counted on December 22, 1993 at 4:23:00 PM.

Table A–H–3: Eastern Site B–Raw Data from Sample Run #5

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.91	01:17:01 PM	36.03	13.57	492.00	737.14
BSM	2	25.98	01:17:22 PM	34.53	14.47	507.00	691.43
BF	3	26.09	01:18:40 PM	36.32	12.71	521.00	787.18
BS	4	25.88	01:19:04 PM	34.85	14.22	536.00	703.87
BFM	5	25.78	01:20:22 PM	35.82	12.79	550.00	782.56
BSM	6	25.92	01:20:45 PM	35.74	13.28	564.00	753.16
BF	7	25.90	01:22:07 PM	35.75	13.05	578.00	767.05
BS	8	25.77	01:22:29 PM	37.81	10.88	590.00	919.12
BFM	9	25.98	01:23:48 PM	36.02	13.12	604.00	762.20
BSM	10	25.97	01:24:14 PM	36.56	12.42	618.00	806.20
BF	11	25.77	01:25:41 PM	35.68	13.18	632.00	759.03
BS	12	26.01	01:26:04 PM	35.88	13.08	646.00	764.91
BFM	13	25.90	01:27:25 PM	35.69	13.11	660.00	763.39
BSM	14	25.97	01:27:56 PM	36.53	12.39	673.00	808.07
BF	15	25.88	01:29:18 PM	36.05	12.97	687.00	771.09
BS	16	25.90	01:29:49 PM	35.00	14.25	702.00	701.82
BFM	17	25.93	01:31:02 PM	BROKE	0.00	0.00	0.00
BSM	18	25.83	01:31:27 PM	36.38	12.70	716.00	787.48
BF	19	25.83	01:32:45 PM	36.11	13.09	730.00	764.25
BS	20	26.03	01:33:09 PM	37.05	12.01	743.00	833.56
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	50.00	35.46
Blank 2		25.69	–	35.88	50.00	102.00	33.62
Blank 3		25.73	–	36.26	50.00	153.00	33.32
Blank 4		25.88	–	36.76	50.00	204.00	33.74
714 pCi STD.		–	–	–	1.34	206.00	7491.79
952 pCi STD.		–	–	–	1.05	208.00	9583.81

Table Notes:

1. Samples were collected on December 20, 1993.
2. Mailed and Non–mailed samples were counted on December 22, 1993 at 4:23:00 PM.
3. The pump was not running, therefore samples were taken for the system's tank.

Table A–H–4: Eastern Site C–Raw Data from Sample Run #5

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	25.80	09:17:36 AM	35.92	13.76	758.00	727.11
CSM	2	25.71	09:18:00 AM	35.05	12.85	771.00	778.21
CF	3	25.86	09:19:20 AM	35.74	13.08	785.00	764.98
CS	4	25.80	09:19:50 AM	35.34	12.79	799.00	782.10
CFM	5	25.87	09:21:24 AM	35.77	12.43	812.00	804.91
CSM	6	25.80	09:21:44 AM	36.27	12.46	826.00	802.97
CF	7	25.78	09:23:13 AM	35.85	11.96	839.00	836.71
CS	8	25.83	09:23:34 AM	35.99	12.88	853.00	776.63
CFM	9	25.91	09:25:04 AM	35.66	12.38	866.00	807.84
CSM	10	25.93	09:25:30 AM	36.15	10.73	878.00	932.71
CF	11	25.97	09:27:16 AM	35.83	12.27	891.00	815.08
CS	12	25.81	09:27:33 AM	35.07	11.79	904.00	848.85
CFM	13	25.82	09:28:58 AM	35.75	10.48	915.00	954.58
CSM	14	25.69	09:29:23 AM	35.97	12.96	929.00	771.99
CF	15	25.85	09:30:54 AM	35.83	11.93	942.00	838.39
CS	16	25.91	09:31:14 AM	35.46	11.90	955.00	840.34
CFM	17	26.17	09:32:47 AM	36.03	11.30	967.00	885.04
CSM	18	25.89	09:33:07 AM	34.71	14.14	982.00	707.35
CF	19	25.82	09:35:10 AM	35.83	10.95	994.00	913.88
CS	20	25.90	09:35:29 AM	35.82	13.00	1008.00	769.31
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	50.00	35.46
Blank 2		25.69	–	35.88	50.00	102.00	33.62
Blank 3		25.73	–	36.26	50.00	153.00	33.32
Blank 4		25.88	–	36.76	50.00	204.00	33.74
714 pCi STD.		–	–	–	1.34	206.00	7491.79
952 pCi STD.		–	–	–	1.05	208.00	9583.81

Table Notes:

1. Samples were collected on December 20, 1993.
2. Mailed and Non–mailed samples were counted on December 22, 1993 at 4:23:00 PM.
3. The pump was not running, therefore samples were taken for the system's tank.

Table A–H–5: Eastern Site D–Raw Data from Sample Run #5

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM	1	25.99	09:47:45 AM	35.88	5.44	1014.00	1838.42
DSM	2	25.83	09:48:10 AM	36.94	4.01	1019.00	2497.76
DF	3	25.85	09:49:30 AM	36.07	5.33	1025.00	1876.36
DS	4	25.94	09:50:20 AM	36.24	4.27	1030.00	2345.43
DFM	5	25.98	09:51:39 AM	36.01	4.93	1036.00	2031.03
DSM	6	25.93	09:52:08 AM	36.25	4.38	1042.00	2283.33
DF	7	25.81	09:53:49 AM	35.79	4.80	1047.00	2086.67
DS	8	25.84	09:54:12 AM	36.73	3.79	1052.00	2644.85
DFM	9	26.03	09:55:19 AM	36.23	4.47	1058.00	2239.15
DSM	10	26.00	09:55:40 AM	37.68	3.37	1062.00	2968.55
DF	11	25.80	09:56:50 AM	35.88	4.42	1067.00	2266.06
DS	12	25.74	09:57:09 AM	38.22	3.16	1071.00	3165.51
DFM	13	25.83	09:58:19 AM	35.74	4.49	1077.00	2230.96
DSM	14	25.90	09:58:38 AM	36.88	3.59	1081.00	2791.09
DF	15	25.78	09:59:53 AM	35.93	4.42	1086.00	2265.61
DS	16	25.85	10:00:21 AM	34.93	4.38	1092.00	2285.39
DFM	17	25.92	10:01:32 AM	35.76	4.50	1097.00	2225.33
DSM	18	25.81	10:01:54 AM	36.50	3.83	1102.00	2615.40
DF	19	25.95	10:02:56 AM	36.03	4.59	1108.00	2182.57
DS	20	25.96	10:03:23 AM	36.45	3.84	1112.00	2605.21
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.27	50.00	50.00	35.46
Blank 2		25.69	–	35.88	50.00	102.00	33.62
Blank 3		25.73	–	36.26	50.00	153.00	33.32
Blank 4		25.88	–	36.76	50.00	204.00	33.74
714 pCi STD.		–	–	–	1.34	206.00	7491.79
952 pCi STD.		–	–	–	1.05	208.00	9583.81

Table Notes:

1. Samples were collected on December 20, 1993.
2. Mailed and Non–mailed samples were counted on December 22, 1993 at 4:23:00 PM.

Table A–I–1: Western Sites' Results from Sample Run #4

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	25,171.98	1,276.53	24,106.33	3,036.02
	B	26,974.40	1,566.87	26,305.62	2,268.03
	C	15,790.43	1,658.41	16,033.24	1,623.83
	D	55,602.01	3,759.43	53,432.40	5,854.93
	E	86,029.88	3,098.09	88,815.99	3,890.07
Slow–flow	A	25,090.19	2,112.86	23,763.67	3,348.67
	B	25,168.78	4,622.30	28,175.31	1,313.53
	C	18,286.87	1,716.04	17,706.91	1,503.58
	D	60,006.81	4,535.06	59,438.34	4,952.30
	E	77,767.78	9,119.79	77,911.84	6,649.48

Table Notes:

1. Samples were collected on January 8, 1994.

Table A–I–2: Western Site A–Raw Data from Sample Run #4

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	25.85	10:13:07 AM	36.17	10.86	220.00	921.45
ASM	2	25.82	10:13:27 AM	36.27	10.79	231.00	927.43
AF	3	25.80	10:14:15 AM	35.69	7.60	217.00	1316.45
AS	4	25.85	10:14:37 AM	35.09	8.98	227.00	1113.81
AFM	5	25.77	10:15:29 AM	35.81	9.33	242.00	1072.56
ASM	6	25.99	10:16:05 AM	38.27	8.33	251.00	1201.32
AF	7	25.80	10:16:48 AM	35.81	7.43	235.00	1345.90
AS	8	25.78	10:17:14 AM	37.82	5.97	242.00	1678.22
AFM	9	25.86	10:18:02 AM	36.14	8.65	261.00	1156.42
ASM	10	25.80	10:18:31 AM	37.65	7.19	269.00	1393.46
AF	11	25.69	10:19:24 AM	35.73	6.66	250.00	1503.45
AS	12	25.91	10:19:50 AM	38.84	5.27	256.00	1900.00
AFM	13	25.84	10:20:33 AM	35.86	8.37	278.00	1195.22
ASM	14	25.89	10:21:00 AM	36.38	8.22	287.00	1218.73
AF	15	25.91	10:21:42 AM	36.17	6.89	264.00	1452.83
AS	16	25.67	10:22:10 AM	35.43	6.97	272.00	1435.15
AFM	17	25.77	10:22:56 AM	LOST	0.00	0.00	0.00
ASM	18	25.83	10:23:44 AM	LOST	0.00	0.00	0.00
AF	19	25.94	10:24:20 AM	36.07	6.94	279.00	1441.07
AS	20	25.76	10:24:44 AM	37.71	5.86	286.00	1709.39
Calibration Information for Non–Mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	32.58
Blank 2		25.69	–	35.88	50.00	102.00	31.82
Blank 3		25.73	–	36.26	50.00	153.00	31.80
Blank 4		25.88	–	36.76	50.00	204.00	34.08
714 pCi STD.		–	–	–	1.38	206.00	7298.55
952 pCi STD.		–	–	–	1.04	208.00	9635.58
Calibration Information for Mailed Samples							
Blank 1		25.59	–	36.27	50.00	50.00	34.28
Blank 2		25.69	–	35.88	50.00	102.00	32.94
Blank 3		25.73	–	36.26	50.00	153.00	33.54
Blank 4		25.88	–	36.76	50.00	204.00	33.36
714 pCi STD.		–	–	–	1.39	206.00	7228.06
952 pCi STD.		–	–	–	1.06	208.00	9485.85

Table Notes:

1. Samples were collected on January 8, 1994.
2. Non–mailed samples were counted on January 11, 1994 at 4:17:45 PM.
3. Mailed samples were counted on January 12, 1994 at 9:38:15 PM.

Table A–I–3: Western Site B–Raw Data from Sample Run #4

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.87	10:46:21 AM	35.85	9.80	298.00	1021.12
BSM	2	25.83	10:46:38 AM	35.26	8.91	308.00	1123.46
BF	3	25.82	10:47:30 AM	35.83	6.75	294.00	1481.63
BS	4	26.00	10:47:53 AM	35.01	6.69	302.00	1495.37
BFM	5	25.85	10:48:35 AM	36.02	7.82	316.00	1278.90
BSM	6	25.86	10:48:54 AM	36.68	7.09	324.00	1412.13
BF	7	25.82	10:49:32 AM	35.74	6.44	309.00	1553.57
BS	8	25.88	10:49:49 AM	34.68	7.24	317.00	1383.43
BFM	9	25.81	10:50:33 AM	35.94	8.07	333.00	1239.78
BSM	10	25.86	10:50:51 AM	36.01	7.82	342.00	1279.03
BF	11	26.00	10:51:51 AM	35.77	6.84	325.00	1461.99
BS	12	25.91	10:52:10 AM	35.34	9.98	336.00	1002.61
BFM	13	25.88	10:52:44 AM	35.69	8.57	352.00	1167.44
BSM	14	25.86	10:52:58 AM	36.05	7.81	360.00	1282.33
BF	15	25.86	10:54:03 AM	35.85	6.40	343.00	1565.16
BS	16	25.80	10:54:19 AM	35.75	8.37	353.00	1195.46
BFM	17	25.87	10:54:59 AM	35.87	9.13	370.00	1095.73
BSM	18	25.91	10:55:18 AM	34.32	10.13	381.00	987.17
BF	19	25.75	10:55:50 AM	35.66	7.46	361.00	1342.76
BS	20	25.89	10:56:12 AM	37.02	6.09	368.00	1644.83
Calibration Information for Non–Mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	32.58
Blank 2		25.69	–	35.88	50.00	102.00	31.82
Blank 3		25.73	–	36.26	50.00	153.00	31.80
Blank 4		25.88	–	36.76	50.00	204.00	34.08
714 pCi STD.		–	–	–	1.38	206.00	7298.55
952 pCi STD.		–	–	–	1.04	208.00	9635.58
Calibration Information for Mailed Samples							
Blank 1		25.59	–	36.27	50.00	50.00	34.28
Blank 2		25.69	–	35.88	50.00	102.00	32.94
Blank 3		25.73	–	36.26	50.00	153.00	33.54
Blank 4		25.88	–	36.76	50.00	204.00	33.36
714 pCi STD.		–	–	–	1.39	206.00	7228.06
952 pCi STD.		–	–	–	1.06	208.00	9485.85

Table Notes:

1. Samples were collected on January 8, 1994.
2. Non–mailed samples were counted on January 11, 1994 at 4:17:45 PM.
3. Mailed samples were counted on January 12, 1994 at 9:38:15 PM.

Table A–I–4: Western Site C–Raw Data from Sample Run #4

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	25.73	12:43:50 PM	35.16	13.28	396.00	753.39
CSM	2	25.97	12:44:09 PM	36.73	12.27	409.00	815.32
CF	3	25.85	12:45:05 PM	35.81	11.17	380.00	895.52
CS	4	25.92	12:45:21 PM	36.01	10.29	391.00	971.82
CFM	5	25.99	12:46:00 PM	35.91	15.28	425.00	654.58
CSM	6	25.85	12:46:11 PM	35.93	13.01	439.00	768.72
CF	7	25.93	12:46:54 PM	35.91	11.94	404.00	838.27
CS	8	25.87	12:47:16 PM	35.82	10.72	416.00	933.40
CFM	9	25.81	12:48:01 PM	35.96	15.04	455.00	665.09
CSM	10	25.90	12:48:21 PM	37.36	11.37	467.00	879.60
CF	11	25.75	12:49:05 PM	35.84	11.87	429.00	842.71
CS	12	25.89	12:49:22 PM	36.26	9.94	439.00	1006.94
CFM	13	25.72	12:50:11 PM	35.73	14.48	483.00	691.23
CSM	14	25.91	12:50:26 PM	35.97	13.25	497.00	755.02
CF	15	25.95	12:51:12 PM	36.04	11.95	452.00	836.90
CS	16	25.79	12:51:38 PM	35.35	9.34	463.00	1071.52
CFM	17	25.89	12:52:36 PM	35.94	12.63	510.00	792.32
CSM	18	25.95	12:52:52 PM	36.57	10.52	522.00	950.95
CF	19	25.77	12:53:39 PM	35.86	9.56	473.00	1046.65
CS	20	25.89	12:53:53 PM	37.14	7.97	482.00	1255.21
Calibration Information for Non–Mailed Samples							
Blank 1		25.59	–	36.27	50.00	51.00	32.58
Blank 2		25.69	–	35.88	50.00	102.00	31.82
Blank 3		25.73	–	36.26	50.00	153.00	31.80
Blank 4		25.88	–	36.76	50.00	204.00	34.08
714 pCi STD.		–	–	–	1.38	206.00	7298.55
952 pCi STD.		–	–	–	1.04	208.00	9635.58
Calibration Information for Mailed Samples							
Blank 1		25.59	–	36.27	50.00	50.00	34.28
Blank 2		25.69	–	35.88	50.00	102.00	32.94
Blank 3		25.73	–	36.26	50.00	153.00	33.54
Blank 4		25.88	–	36.76	50.00	204.00	33.36
714 pCi STD.		–	–	–	1.39	206.00	7228.06
952 pCi STD.		–	–	–	1.06	208.00	9485.85

Table Notes:

1. Samples were collected on January 8, 1994.
2. Non–mailed samples were counted on January 11, 1994 at 4:17:45 PM.
3. Mailed samples were counted on January 12, 1994 at 9:38:15 PM.

Table A–I–5: Western Site D–Raw Data from Sample Run #4

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM 1	25.92	11:40:50 AM	36.10	5.15	528.00	1943.50
DSM 2	25.63	11:41:20 AM	36.71	3.98	533.00	2518.59
DF 3	25.80	11:41:56 AM	36.02	3.65	486.00	2742.19
DS 4	25.91	11:42:11 AM	36.21	3.35	491.00	2991.05
DFM 5	25.91	11:42:56 AM	35.90	4.50	538.00	2226.00
DSM 6	25.70	11:43:10 AM	36.38	3.81	543.00	2624.93
DF 7	25.98	11:43:52 AM	36.46	3.26	495.00	3070.25
DS 8	25.69	11:44:08 AM	34.99	3.47	499.00	2888.76
DFM 9	25.80	11:44:49 AM	35.93	4.28	548.00	2338.78
DSM 10	25.92	11:45:05 AM	BROKE	0.00	0.00	0.00
DF 11	25.91	11:45:47 AM	35.79	3.31	504.00	3027.49
DS 12	25.81	11:46:00 AM	35.78	3.10	508.00	3235.16
DFM 13	25.95	11:46:48 AM	35.80	4.35	553.00	2303.91
DSM 14	25.86	11:47:03 AM	36.09	3.75	558.00	2669.33
DF 15	25.91	11:47:49 AM	35.81	3.21	512.00	3115.58
DS 16	25.77	11:48:09 AM	37.28	2.58	515.00	3887.21
DFM 17	25.67	11:48:55 AM	35.78	3.83	563.00	2611.49
DSM 18	25.89	11:49:19 AM	37.38	3.17	567.00	3157.41
DF 19	25.88	11:50:00 AM	35.89	3.17	519.00	3161.51
DS 20	25.91	11:50:17 AM	35.58	2.95	523.00	3401.02
Calibration Information for Non–Mailed Samples						
Blank 1	25.59	–	36.27	50.00	51.00	32.58
Blank 2	25.69	–	35.88	50.00	102.00	31.82
Blank 3	25.73	–	36.26	50.00	153.00	31.80
Blank 4	25.88	–	36.76	50.00	204.00	34.08
714 pCi STD.	–	–	–	1.38	206.00	7298.55
952 pCi STD.	–	–	–	1.04	208.00	9635.58
Calibration Information for Mailed Samples						
Blank 1	25.59	–	36.27	50.00	50.00	34.28
Blank 2	25.69	–	35.88	50.00	102.00	32.94
Blank 3	25.73	–	36.26	50.00	153.00	33.54
Blank 4	25.88	–	36.76	50.00	204.00	33.36
714 pCi STD.	–	–	–	1.39	206.00	7228.06
952 pCi STD.	–	–	–	1.06	208.00	9485.85

Table Notes:

1. Samples were collected on January 8, 1994.
2. Non–mailed samples were counted on January 11, 1994 at 4:17:45 PM.
3. Mailed samples were counted on January 12, 1994 at 9:38:15 PM.

Table A–I–6: Western Site E–Raw Data from Sample Run #4

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
EFM 1	25.97	11:17:50 AM	35.55	2.79	571.00	3590.68
ESM 2	25.67	11:18:10 AM	32.43	4.47	576.00	2241.61
EF 3	25.85	11:18:49 AM	35.95	2.10	526.00	4774.76
ES 4	25.85	11:19:06 AM	36.11	2.40	530.00	4179.17
EFM 5	25.81	11:19:50 AM	35.78	2.58	580.00	3876.36
ESM 6	25.80	11:20:10 AM	34.92	3.51	584.00	2849.29
EF 7	25.92	11:20:49 AM	35.85	2.24	533.00	4476.34
ES 8	25.83	11:21:46 AM	36.24	2.52	536.00	3970.63
EFM 9	25.68	11:22:07 AM	35.69	2.65	588.00	3773.96
ESM 10	25.88	11:22:27 AM	35.36	3.60	592.00	2784.72
EF 11	25.99	11:23:19 AM	35.98	2.10	539.00	4785.71
ES 12	25.94	11:23:40 AM	32.85	3.99	544.00	2513.28
EFM 13	25.94	11:25:09 AM	35.93	2.65	596.00	3783.77
ESM 14	25.89	11:25:30 AM	36.46	2.84	600.00	3523.24
EF 15	25.93	11:26:11 AM	35.98	2.27	547.00	4416.30
ES 16	25.77	11:26:36 AM	38.06	1.86	550.00	5380.65
EFM 17	25.92	11:27:26 AM	35.97	2.89	604.00	3467.82
ESM 18	25.91	11:27:40 AM	36.73	2.52	607.00	3971.83
EF 19	25.85	11:28:28 AM	35.78	2.24	553.00	4478.57
ES 20	25.99	11:28:44 AM	37.16	1.86	556.00	5399.46
Calibration Information for Non–Mailed Samples						
Blank 1	25.59	–	36.27	50.00	51.00	32.58
Blank 2	25.69	–	35.88	50.00	102.00	31.82
Blank 3	25.73	–	36.26	50.00	153.00	31.80
Blank 4	25.88	–	36.76	50.00	204.00	34.08
714 pCi STD.	–	–	–	1.38	206.00	7298.55
952 pCi STD.	–	–	–	1.04	208.00	9635.58
Calibration Information for Mailed Samples						
Blank 1	25.59	–	36.27	50.00	50.00	34.28
Blank 2	25.69	–	35.88	50.00	102.00	32.94
Blank 3	25.73	–	36.26	50.00	153.00	33.54
Blank 4	25.88	–	36.76	50.00	204.00	33.36
714 pCi STD.	–	–	–	1.39	206.00	7228.06
952 pCi STD.	–	–	–	1.06	208.00	9485.85

Table Notes:

1. Samples were collected on January 8, 1994.
2. Non–mailed samples were counted on January 11, 1994 at 4:17:45 PM.
3. Mailed samples were counted on January 12, 1994 at 9:38:15 PM.

Table A–J–1: Eastern Sites' Results from Sample Run #6

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	10,693.03	228.88	12,485.35	2,603.18
Slow–flow	A	11,137.27	268.68	12,701.59	2,206.42

Table Notes:

1. Samples were collected on January 11, 1994.
2. Eastern Sites B, C, and D were not accessible on this date.

Table A–J–2: Eastern Site A–Raw Data from Sample Run #6

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM 1	25.88	09:39:39 AM	35.85	9.50	617.00	1054.00
ASM 2	25.81	09:39:58 AM	37.83	8.14	626.00	1228.50
AF 3	25.97	09:41:05 AM	35.59	10.14	567.00	986.39
AS 4	25.91	09:41:25 AM	37.45	8.60	577.00	1165.00
AFM 5	25.91	09:42:33 AM	35.88	13.15	640.00	761.22
ASM 6	25.96	09:42:53 AM	37.00	11.11	652.00	900.54
AF 7	25.91	09:43:58 AM	35.99	9.98	588.00	1002.00
AS 8	26.01	09:44:21 AM	35.76	9.75	598.00	1026.77
AFM 9	25.87	09:45:26 AM	35.94	12.71	666.00	787.18
ASM 10	25.87	09:45:46 AM	36.60	11.24	678.00	889.95
AF 11	25.88	09:46:50 AM	35.97	10.11	609.00	989.81
AS 12	25.87	09:47:13 AM	36.11	9.32	620.00	1073.28
AFM 13	25.97	09:48:13 AM	36.12	12.51	692.00	799.36
ASM 14	25.77	09:48:36 AM	36.12	12.22	705.00	818.99
AF 15	25.88	09:49:38 AM	35.99	10.20	631.00	980.59
AS 16	25.90	09:50:07 AM	35.49	10.22	642.00	979.26
AFM 17	25.85	09:51:04 AM	35.84	8.71	715.00	1148.79
ASM 18	25.74	09:51:24 AM	35.97	8.59	724.00	1165.66
AF 19	26.07	09:52:28 AM	36.24	10.21	653.00	979.82
AS 20	25.88	09:52:43 AM	37.91	8.43	662.00	1186.24
Calibration Information for Non–Mailed Samples						
Blank 1	25.59	–	36.27	50.00	51.00	32.58
Blank 2	25.69	–	35.88	50.00	102.00	31.82
Blank 3	25.73	–	36.26	50.00	153.00	31.80
Blank 4	25.88	–	36.76	50.00	204.00	34.08
714 pCi STD.	–	–	–	1.38	206.00	7298.55
952 pCi STD.	–	–	–	1.04	208.00	9635.58
Calibration Information for Mailed Samples						
Blank 1	25.59	–	36.27	50.00	50.00	34.28
Blank 2	25.69	–	35.88	50.00	102.00	32.94
Blank 3	25.73	–	36.26	50.00	153.00	33.54
Blank 4	25.88	–	36.76	50.00	204.00	33.36
714 pCi STD.	–	–	–	1.39	206.00	7228.06
952 pCi STD.	–	–	–	1.06	208.00	9485.85

Table Notes:

1. Samples were collected on January 11, 1994.
2. Non–mailed samples were counted on January 11, 1994 at 4:17:45 PM.
3. Mailed samples were counted on January 12, 1994 at 9:38:15 PM.

Table A–K–1: Eastern Sites' Results from Sample Run #7

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	10,716.10	164.69	11,164.46	761.76
	B	11,449.69	257.54	11,863.37	1,265.20
	C	20,510.10	1,038.70	20,542.96	933.58
	D	33,712.26	4,104.10	31,863.18	3,457.53
Slow–flow	A	11,130.28	208.19	11,413.86	179.93
	B	11,734.88	245.05	12,026.50	484.71
	C	22,247.46	198.81	21,996.54	932.12
	D	37,402.37	2,613.89	34,344.46	4,827.83

Table Notes:
1. Samples from Eastern Sites B, C, and D were collected on February 1, 1994.
2. Samples from Eastern Site A were collected on February 3, 1994.

Table A–K–2: Eastern Site A–Raw Data from Sample Run #7

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	25.81	10:26:44 AM	35.78	12.35	222.00	809.72
ASM	2	25.82	10:27:26 AM	36.87	11.36	234.00	880.72
AF	3	25.89	10:28:35 AM	35.85	13.40	248.00	746.57
AS	4	25.85	10:28:52 AM	36.82	11.99	261.00	835.03
AFM	5	25.83	10:29:42 AM	LOST	0.00	0.00	0.00
ASM	6	25.86	10:30:02 AM	LOST	0.00	0.00	0.00
AF	7	25.91	10:30:57 AM	35.82	13.90	276.00	719.71
AS	8	25.85	10:31:16 AM	37.14	11.34	289.00	882.54
AFM	9	25.82	10:32:03 AM	LOST	0.00	0.00	0.00
ASM	10	25.88	10:32:24 AM	LOST	0.00	0.00	0.00
AF	11	25.87	10:33:14 AM	35.76	13.69	303.00	730.46
AS	12	25.92	10:33:33 AM	36.73	12.00	316.00	833.92
AFM	13	25.83	10:34:23 AM	LOST	0.00	0.00	0.00
ASM	14	25.68	10:34:43 AM	LOST	0.00	0.00	0.00
AF	15	25.84	10:36:12 AM	35.89	13.25	330.00	754.79
AS	16	25.79	10:36:34 AM	36.46	12.33	344.00	812.00
AFM	17	25.78	10:38:19 AM	35.75	13.75	358.00	727.27
ASM	18	25.87	10:38:42 AM	35.36	13.64	373.00	733.65
AF	19	25.93	10:39:23 AM	36.13	13.42	387.00	745.31
AS	20	25.92	10:39:43 AM	35.46	14.14	402.00	707.57
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.25	50.00	51.00	33.06
Blank 2		25.69	–	35.88	50.00	102.00	34.70
Blank 3		25.73	–	36.25	50.00	153.00	34.72
Blank 4		25.88	–	36.74	50.00	204.00	34.98
714 pCi STD.		–	–	–	1.37	207.00	7332.85
952 pCi STD.		–	–	–	1.04	209.00	9627.88

Table Notes:

1. Samples were collected on February 3, 1994.
2. Mailed and Non–mailed samples were counted on February 5, 1994 at 2:36:15 PM.

Table A–K–3: Eastern Site B–Raw Data from Sample Run #7

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.79	11:57:26 AM	35.97	14.94	418.00	669.68
BSM	2	25.85	11:57:57 AM	36.08	15.80	435.00	633.10
BF	3	25.78	11:58:53 AM	35.85	17.42	453.00	574.23
BS	4	25.88	11:59:14 AM	35.74	17.68	472.00	566.01
BFM	5	25.94	12:00:36 PM	35.81	18.09	491.00	552.85
BSM	6	25.76	12:02:12 PM	35.36	18.23	510.00	548.71
BF	7	25.74	12:03:07 PM	35.69	18.68	530.00	535.44
BS	8	25.84	12:03:29 PM	36.72	17.00	548.00	588.47
BFM	9	25.80	12:04:26 PM	35.65	19.63	568.00	509.42
BSM	10	25.80	12:04:44 PM	35.64	18.39	587.00	543.83
BF	11	25.88	12:05:43 PM	36.23	17.65	606.00	566.97
BS	12	25.96	12:05:58 PM	36.50	17.21	624.00	581.23
BFM	13	25.88	12:07:04 PM	BROKE	0.00	0.00	0.00
BSM	14	25.98	12:07:25 PM	36.97	16.27	642.00	614.63
BF	15	25.75	12:08:15 PM	36.15	18.18	661.00	550.16
BS	16	25.91	12:08:30 PM	37.18	15.87	677.00	630.25
BFM	17	25.89	12:09:24 PM	36.28	18.02	696.00	555.11
BSM	18	25.85	12:09:43 PM	36.07	17.57	715.00	569.27
BF	19	25.91	12:10:49 PM	35.85	18.69	734.00	535.63
BS	20	25.86	12:11:09 PM	36.33	17.40	753.00	574.94
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.25	50.00	51.00	33.06
Blank 2		25.69	–	35.88	50.00	102.00	34.70
Blank 3		25.73	–	36.25	50.00	153.00	34.72
Blank 4		25.88	–	36.74	50.00	204.00	34.98
714 pCi STD.		–	–	–	1.37	207.00	7332.85
952 pCi STD.		–	–	–	1.04	209.00	9627.88

Table Notes:

1. Samples were collected on February 1, 1994.
2. Mailed and Non–mailed samples were counted on February 5, 1994 at 2:36:15 PM.

Table A–K–4: Eastern Site C–Raw Data from Sample Run #7

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	25.88	09:33:00 AM	36.14	11.44	765.00	875.17
CSM	2	25.88	09:33:18 AM	37.00	9.83	776.00	1017.70
CF	3	25.85	09:34:37 AM	35.81	11.69	789.00	855.60
CS	4	25.91	09:34:54 AM	37.72	8.76	798.00	1141.89
CFM	5	25.76	09:36:31 AM	35.78	11.15	810.00	897.04
CSM	6	25.80	09:36:51 AM	36.49	9.48	821.00	1055.06
CF	7	25.83	09:38:29 AM	35.91	11.50	833.00	869.65
CS	8	25.64	09:38:45 AM	36.68	9.30	843.00	1076.24
CFM	9	25.93	09:40:21 AM	36.07	10.65	855.00	939.15
CSM	10	25.87	09:40:39 AM	36.93	9.31	865.00	1074.97
CF	11	25.88	09:41:36 AM	35.79	10.79	877.00	927.34
CS	12	25.91	09:41:56 AM	37.61	8.73	887.00	1145.93
CFM	13	25.90	09:43:15 AM	36.03	10.78	898.00	928.20
CSM	14	25.68	09:43:38 AM	36.38	9.43	909.00	1061.29
CF	15	25.89	09:44:40 AM	35.81	10.89	921.00	918.37
CS	16	25.82	09:45:06 AM	37.61	8.74	930.00	1144.85
CFM	17	25.84	09:46:05 AM	35.87	10.63	942.00	941.02
CSM	18	25.95	09:46:28 AM	BROKE	0.00	0.00	0.00
CF	19	25.85	09:47:28 AM	35.73	10.88	954.00	919.58
CS	20	25.75	09:47:43 AM	37.26	9.03	964.00	1107.86
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.25	50.00	51.00	33.06
Blank 2		25.69	–	35.88	50.00	102.00	34.70
Blank 3		25.73	–	36.25	50.00	153.00	34.72
Blank 4		25.88	–	36.74	50.00	204.00	34.98
714 pCi STD.		–	–	–	1.37	207.00	7332.85
952 pCi STD.		–	–	–	1.04	209.00	9627.88

Table Notes:

1. Samples were collected on February 1, 1994.
2. Mailed and Non–mailed samples were counted on February 5, 1994 at 2:36:15 PM.

Table A–K–5: Eastern Site D–Raw Data from Sample Run #7

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM	1	25.88	08:59:10 AM	35.57	8.61	973.00	1162.02
DSM	2	25.89	08:59:47 AM	37.40	6.42	981.00	1558.10
DF	3	25.76	09:01:28 AM	35.80	6.80	988.00	1471.32
DS	4	25.85	09:01:55 AM	37.20	5.02	994.00	1993.43
DFM	5	25.93	09:02:50 AM	35.75	8.12	1003.00	1231.65
DSM	6	25.80	09:03:30 AM	35.90	8.54	1013.00	1171.31
DF	7	25.79	09:04:29 AM	35.93	8.69	1022.00	1151.09
DS	8	25.83	09:04:47 AM	36.53	6.39	1030.00	1566.82
DFM	9	25.89	09:05:48 AM	35.93	7.57	1038.00	1322.32
DSM	10	25.86	09:06:07 AM	36.24	6.22	1045.00	1609.32
DF	11	25.80	09:07:16 AM	35.83	6.85	1053.00	1461.02
DS	12	25.79	09:07:34 AM	36.52	6.18	1060.00	1620.23
DFM	13	25.77	09:08:42 AM	35.86	6.66	1068.00	1502.25
DSM	14	25.79	09:09:06 AM	35.95	5.97	1075.00	1675.04
DF	15	25.85	09:10:21 AM	36.03	6.44	1082.00	1553.73
DS	16	25.89	09:10:40 AM	36.13	6.22	1089.00	1608.52
DFM	17	25.75	09:12:13 AM	35.82	6.65	1097.00	1505.26
DSM	18	25.81	09:12:36 AM	36.19	6.26	1104.00	1598.08
DF	19	25.81	09:14:18 AM	35.68	6.58	1111.00	1520.36
DS	20	25.85	09:14:40 AM	36.29	6.10	1119.00	1640.00
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.25	50.00	51.00	33.06
Blank 2		25.69	–	35.88	50.00	102.00	34.70
Blank 3		25.73	–	36.25	50.00	153.00	34.72
Blank 4		25.88	–	36.74	50.00	204.00	34.98
714 pCi STD.		–	–	–	1.37	207.00	7332.85
952 pCi STD.		–	–	–	1.04	209.00	9627.88

Table Notes:

1. Samples were collected on February 1, 1994.
2. Mailed and Non–mailed samples were counted on February 5, 1994 at 2:36:15 PM.

Table A–L–1: Western Sites' Results from Sample Run #5

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	70,430.48	1,074.09	69,951.07	1,082.27
	B	18,529.44	473.76	19,705.67	2,362.92
	C	11,310.00	1,515.35	12,044.64	2,302.31
	D	24,856.05	1,628.34	24,701.54	1,660.29
	E	69,065.08	1,268.17	69,709.66	1,077.55
Slow–flow	A	71,587.78	996.70	72,440.04	1,293.17
	B	19,557.13	734.68	19,888.33	769.57
	C	12,223.92	2,954.14	11,541.10	1,501.42
	D	26,545.59	1,841.81	26,108.94	1,919.72
	E	69,791.28	3,848.84	65,808.57	5,233.48

Table Notes:
1. Samples were collected on Febrary 19, 1994.

Table A–L–2: Western Site A–Raw Data from Sample Run #5

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	25.50	12:10:36 PM	35.56	4.14	213.00	2416.91
ASM	2	25.57	12:10:55 PM	37.20	3.63	218.00	2762.26
AF	3	25.57	12:11:38 PM	35.32	2.48	212.00	4032.26
AS	4	25.44	12:11:57 PM	36.75	2.13	215.00	4706.10
AFM	5	25.53	12:12:44 PM	35.74	4.17	223.00	2403.12
ASM	6	25.40	12:13:04 PM	34.96	4.22	228.00	2371.80
AF	7	25.43	12:13:51 PM	35.39	2.43	218.00	4127.57
AS	8	25.53	12:14:12 PM	37.43	2.05	221.00	4901.46
AFM	9	25.52	12:14:56 PM	35.78	4.15	233.00	2413.49
ASM	10	25.51	12:15:16 PM	37.41	3.45	238.00	2903.77
AF	11	25.66	12:16:25 PM	35.67	2.40	225.00	4175.42
AS	12	25.47	12:16:50 PM	36.58	2.14	228.00	4675.70
AFM	13	25.43	12:17:43 PM	35.34	4.40	243.00	2274.77
ASM	14	25.51	12:18:06 PM	34.87	4.46	248.00	2242.60
AF	15	25.56	12:18:41 PM	35.44	2.53	231.00	3959.29
AS	16	25.71	12:18:59 PM	35.67	2.44	235.00	4111.47
AFM	17	25.44	12:19:36 PM	35.21	4.38	254.00	2286.30
ASM	18	25.38	12:19:56 PM	35.26	4.13	259.00	2422.28
AF	19	25.40	12:20:31 PM	35.24	2.48	238.00	4032.66
AS	20	25.59	12:20:52 PM	37.11	2.05	241.00	4895.12
Calibration Information for Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	32.36
Blank 2		25.69	–	35.87	50.00	103.00	34.32
Blank 3		25.73	–	36.25	50.00	154.00	35.04
Blank 4		25.88	–	36.74	50.00	204.00	34.20
714 pCi STD.		–	–	–	1.35	207.00	7437.78
952 pCi STD.		–	–	–	1.06	209.00	9508.49
Calibration Information for Mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	33.40
Blank 2		25.69	–	35.87	50.00	102.00	33.88
Blank 3		25.73	–	36.25	50.00	153.00	33.86
Blank 4		25.88	–	36.74	50.00	204.00	33.70
714 pCi STD.		–	–	–	1.38	206.00	7264.49
952 pCi STD.		–	–	–	1.06	208.00	9474.53

Table Notes:

1. Samples were collected on February 19, 1994.
2. Non–mailed samples were counted on February 22, 1994 at 10:57:00 AM.
3. Mailed samples were counted on February 25, 1994 at 10:54:00 AM.

Table A–L–3: Western Site B–Raw Data from Sample Run #5

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.62	01:11:28 PM	35.64	12.09	272.00	827.21
BSM	2	25.49	01:11:44 PM	35.54	15.16	288.00	660.16
BF	3	25.64	01:12:23 PM	35.81	8.50	250.00	1176.71
BS	4	25.54	01:12:41 PM	35.89	7.84	259.00	1276.66
BFM	5	25.49	01:13:40 PM	35.42	15.51	304.00	645.13
BSM	6	25.38	01:13:59 PM	35.67	14.50	320.00	689.93
BF	7	25.59	01:14:41 PM	35.36	9.29	269.00	1076.53
BS	8	25.47	01:14:56 PM	34.78	9.58	280.00	1044.78
BFM	9	25.52	01:15:39 PM	35.57	15.60	336.00	641.03
BSM	10	25.51	01:15:51 PM	34.39	15.73	353.00	635.79
BF	11	25.51	01:16:39 PM	35.47	9.23	290.00	1083.42
BS	12	25.46	01:16:56 PM	35.61	8.67	300.00	1153.75
BFM	13	25.51	01:17:39 PM	35.11	15.73	370.00	635.92
BSM	14	25.54	01:17:55 PM	34.43	15.90	386.00	629.56
BF	15	25.51	01:18:40 PM	35.27	9.32	310.00	1073.50
BS	16	25.52	01:18:57 PM	35.36	8.78	320.00	1139.41
BFM	17	25.54	01:19:42 PM	35.50	15.81	403.00	632.51
BSM	18	25.43	01:19:56 PM	34.30	16.34	420.00	612.42
BF	19	25.55	01:20:33 PM	35.38	9.42	330.00	1062.63
BS	20	25.50	01:20:48 PM	36.17	8.05	339.00	1243.35
Calibration Information for Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	32.36
Blank 2		25.69	–	35.87	50.00	103.00	34.32
Blank 3		25.73	–	36.25	50.00	154.00	35.04
Blank 4		25.88	–	36.74	50.00	204.00	34.20
714 pCi STD.		–	–	–	1.35	207.00	7437.78
952 pCi STD.		–	–	–	1.06	209.00	9508.49
Calibration Information for Mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	33.40
Blank 2		25.69	–	35.87	50.00	102.00	33.88
Blank 3		25.73	–	36.25	50.00	153.00	33.86
Blank 4		25.88	–	36.74	50.00	204.00	33.70
714 pCi STD.		–	–	–	1.38	206.00	7264.49
952 pCi STD.		–	–	–	1.06	208.00	9474.53

Table Notes:

1. Samples were collected on February 19, 1994.
2. Non–mailed samples were counted on February 22, 1994 at 10:57:00 AM.
3. Mailed samples were counted on February 25, 1994 at 10:54:00 AM.

Table A–L–4: Western Site C–Raw Data from Sample Run #5

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	25.22	02:50:12 PM	35.21	17.94	439.00	557.58
CSM	2	25.53	02:50:25 PM	37.11	17.60	458.00	568.24
CF	3	25.59	02:50:58 PM	35.82	11.71	352.00	855.00
CS	4	25.62	02:51:16 PM	36.47	12.43	365.00	804.59
CFM	5	25.56	02:51:48 PM	36.02	22.19	481.00	450.74
CSM	6	25.53	02:52:04 PM	37.44	20.59	502.00	485.67
CF	7	25.50	02:52:38 PM	36.10	13.43	379.00	744.90
CS	8	25.53	02:52:50 PM	36.57	13.60	394.00	735.66
CFM	9	25.46	02:53:28 PM	35.51	25.58	529.00	391.13
CSM	10	25.48	02:53:41 PM	37.12	22.42	552.00	446.07
CF	11	25.46	02:54:19 PM	35.63	15.34	410.00	652.15
CS	12	25.50	02:54:32 PM	35.36	16.22	427.00	616.83
CFM	13	25.52	02:55:10 PM	35.60	26.32	580.00	379.94
CSM	14	25.48	02:55:26 PM	35.53	26.80	607.00	373.40
CF	15	25.60	02:56:00 PM	35.81	15.47	444.00	646.41
CS	16	25.58	02:56:15 PM	35.50	16.23	461.00	616.27
CFM	17	25.43	02:56:57 PM	35.39	27.34	636.00	365.87
CSM	18	25.52	02:57:14 PM	35.26	27.81	664.00	359.65
CF	19	25.43	02:57:49 PM	35.36	16.47	478.00	607.41
CS	20	25.50	02:58:03 PM	36.29	9.09	488.00	1100.22
Calibration Information for Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	32.36
Blank 2		25.69	–	35.87	50.00	103.00	34.32
Blank 3		25.73	–	36.25	50.00	154.00	35.04
Blank 4		25.88	–	36.74	50.00	204.00	34.20
714 pCi STD.		–	–	–	1.35	207.00	7437.78
952 pCi STD.		–	–	–	1.06	209.00	9508.49
Calibration Information for Mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	33.40
Blank 2		25.69	–	35.87	50.00	102.00	33.88
Blank 3		25.73	–	36.25	50.00	153.00	33.86
Blank 4		25.88	–	36.74	50.00	204.00	33.70
714 pCi STD.		–	–	–	1.38	206.00	7264.49
952 pCi STD.		–	–	–	1.06	208.00	9474.53

Table Notes:

1. Samples were collected on February 19, 1994.
2. Non–mailed samples were counted on February 22, 1994 at 10:57:00 AM.
3. Mailed samples were counted on February 25, 1994 at 10:54:00 AM.

Table A–L–5: Western Site D–Raw Data from Sample Run #5

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM 1	25.44	02:31:18 PM	35.34	13.40	679.00	746.27
DSM 2	25.42	02:31:35 PM	34.05	14.70	694.00	680.41
DF 3	25.50	02:32:19 PM	35.65	7.43	497.00	1346.84
DS 4	25.50	02:32:32 PM	35.71	6.90	505.00	1451.45
DFM 5	25.48	02:33:16 PM	35.61	12.46	708.00	803.37
DSM 6	25.43	02:33:29 PM	35.80	11.72	721.00	853.24
DF 7	25.45	02:34:17 PM	35.73	6.97	513.00	1436.15
DS 8	25.46	02:34:29 PM	36.82	6.06	520.00	1651.98
DFM 9	25.59	02:35:11 PM	35.72	12.42	734.00	805.88
DSM 10	25.32	02:35:24 PM	36.19	10.83	746.00	923.45
DF 11	25.37	02:36:03 PM	35.28	7.09	528.00	1412.41
DS 12	25.50	02:36:15 PM	34.40	7.30	536.00	1371.23
DFM 13	25.52	02:36:54 PM	35.70	11.51	758.00	869.16
DSM 14	25.39	02:37:06 PM	34.37	12.11	771.00	826.18
DF 15	25.47	02:37:44 PM	35.78	6.38	543.00	1568.81
DS 16	25.48	02:38:10 PM	35.31	6.36	550.00	1574.84
DFM 17	25.52	02:39:00 PM	35.07	11.97	784.00	835.51
DSM 18	25.39	02:39:22 PM	35.46	10.91	796.00	917.05
DF 19	25.40	02:40:29 PM	35.35	6.53	558.00	1532.62
DS 20	25.52	02:40:49 PM	35.89	5.79	565.00	1727.29
Calibration Information for Non–mailed Samples						
Blank 1	25.59	–	36.24	50.00	51.00	32.36
Blank 2	25.69	–	35.87	50.00	103.00	34.32
Blank 3	25.73	–	36.25	50.00	154.00	35.04
Blank 4	25.88	–	36.74	50.00	204.00	34.20
714 pCi STD.	–	–	–	1.35	207.00	7437.78
952 pCi STD.	–	–	–	1.06	209.00	9508.49
Calibration Information for Mailed Samples						
Blank 1	25.59	–	36.24	50.00	51.00	33.40
Blank 2	25.69	–	35.87	50.00	102.00	33.88
Blank 3	25.73	–	36.25	50.00	153.00	33.86
Blank 4	25.88	–	36.74	50.00	204.00	33.70
714 pCi STD.	–	–	–	1.38	206.00	7264.49
952 pCi STD.	–	–	–	1.06	208.00	9474.53

Table Notes:

1. Samples were collected on February 19, 1994.
2. Non–mailed samples were counted on February 22, 1994 at 10:57:00 AM.
3. Mailed samples were counted on February 25, 1994 at 10:54:00 AM.

Table A–L–6: Western Site E–Raw Data from Sample Run #5

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
EFM 1	25.52	01:38:02 PM	35.29	4.60	801.00	2175.22
ESM 2	25.59	01:38:15 PM	34.03	6.34	809.00	1579.81
EF 3	25.51	01:39:17 PM	35.46	2.63	568.00	3810.27
ES 4	25.47	01:39:32 PM	35.05	2.68	572.00	3734.33
EFM 5	25.54	01:40:22 PM	35.55	4.65	814.00	2152.69
ESM 6	25.41	01:40:39 PM	33.78	5.63	821.00	1779.57
EF 7	25.54	01:41:15 PM	35.17	2.68	575.00	3732.84
ES 8	25.50	01:41:31 PM	35.32	2.69	579.00	3722.30
EFM 9	25.44	01:42:11 PM	35.49	4.57	826.00	2192.34
ESM 10	25.38	01:42:28 PM	36.06	4.17	832.00	2404.32
EF 11	25.52	01:43:13 PM	35.51	2.51	583.00	3994.02
ES 12	25.57	01:43:30 PM	35.01	2.85	586.00	3517.54
EFM 13	25.68	01:44:47 PM	35.51	4.57	837.00	2189.72
ESM 14	25.48	01:45:10 PM	33.22	6.22	844.00	1608.36
EF 15	25.51	01:45:46 PM	35.30	2.60	590.00	3857.31
ES 16	25.50	01:45:59 PM	33.63	2.89	594.00	3474.39
EFM 17	25.54	01:46:44 PM	35.52	4.54	850.00	2203.74
ESM 18	25.44	01:46:58 PM	BROKE	0.00	0.00	0.00
EF 19	25.49	01:47:42 PM	35.61	2.57	597.00	3893.39
ES 20	25.51	01:47:57 PM	34.94	2.65	601.00	3780.00
Calibration Information for Non–mailed Samples						
Blank 1	25.59	–	36.24	50.00	51.00	32.36
Blank 2	25.69	–	35.87	50.00	103.00	34.32
Blank 3	25.73	–	36.25	50.00	154.00	35.04
Blank 4	25.88	–	36.74	50.00	204.00	34.20
714 pCi STD.	–	–	–	1.35	207.00	7437.78
952 pCi STD.	–	–	–	1.06	209.00	9508.49
Calibration Information for Mailed Samples						
Blank 1	25.59	–	36.24	50.00	51.00	33.40
Blank 2	25.69	–	35.87	50.00	102.00	33.88
Blank 3	25.73	–	36.25	50.00	153.00	33.86
Blank 4	25.88	–	36.74	50.00	204.00	33.70
714 pCi STD.	–	–	–	1.38	206.00	7264.49
952 pCi STD.	–	–	–	1.06	208.00	9474.53

Table Notes:

1. Samples were collected on February 19, 1994.
2. Non–mailed samples were counted on February 22, 1994 at 10:57:00 AM.
3. Mailed samples were counted on February 25, 1994 at 10:54:00 AM.

Table A–M–1: Eastern Sites' Results from Sample Run #8

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	11,556.86	1,491.71	11,342.27	1,016.00
	B	11,667.88	644.14	11,602.47	532.46
	C	21,690.81	1,233.69	22,061.33	1,104.60
	D	38,286.54	976.18	37,753.93	958.02
Slow–flow	A	10,839.12	948.05	11,262.84	412.89
	B	11,750.40	428.35	12,100.36	517.60
	C	24,269.83	508.79	23,529.30	758.84
	D	39,926.30	846.34	39,795.34	252.88

Table Notes:
1. Samples were collected on February 24, 1994.

Table A–M–2: Eastern Site A–Raw Data from Sample Run #8

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	25.90	10:54:32 AM	35.82	16.04	225.00	623.69
ASM	2	25.82	10:54:49 AM	36.21	16.52	242.00	605.45
AF	3	25.90	10:55:28 AM	35.66	14.87	258.00	672.49
AS	4	25.91	10:55:45 AM	37.80	18.66	278.00	536.07
AFM	5	26.02	10:56:26 AM	36.07	18.56	297.00	538.85
ASM	6	25.82	10:56:44 AM	34.86	20.45	319.00	489.10
AF	7	25.79	10:57:35 AM	35.94	18.11	338.00	552.62
AS	8	25.86	10:57:52 AM	37.52	15.47	354.00	646.54
AFM	9	25.83	10:58:35 AM	BROKE	0.00	0.00	0.00
ASM	10	25.96	10:58:55 AM	35.86	18.43	374.00	543.14
AF	11	25.78	11:00:00 AM	35.86	18.34	393.00	545.31
AS	12	25.98	11:00:17 AM	34.71	20.89	415.00	479.13
AFM	13	25.89	11:00:59 AM	35.79	18.92	435.00	528.59
ASM	14	25.84	11:01:16 AM	33.79	22.82	458.00	438.26
AF	15	25.88	11:01:56 AM	35.71	19.60	479.00	510.31
AS	16	25.98	11:02:17 AM	35.71	19.09	499.00	523.99
AFM	17	25.82	11:03:09 AM	35.73	20.00	520.00	500.15
ASM	18	25.78	11:03:29 AM	34.86	21.25	542.00	470.82
AF	19	25.74	11:04:13 AM	35.49	20.54	564.00	486.85
AS	20	25.86	11:04:29 AM	35.51	19.86	584.00	503.73
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	33.20
Blank 2		25.69	–	35.87	50.00	102.00	33.14
Blank 3		25.73	–	36.25	50.00	153.00	33.34
Blank 4		25.88	–	36.74	50.00	204.00	33.04
714 pCi STD.		–	–	–	1.37	206.00	7330.66
952 pCi STD.		–	–	–	1.05	208.00	9642.86

Table Notes:

1. Samples were collected on February 24, 1994.
2. Mailed and Non–mailed samples were counted on February 28, 1994 at 2:34:00 PM.

Table A–M–3: Eastern Site B–Raw Data from Sample Run #8

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.85	12:24:56 PM	35.58	18.51	604.00	540.36
BSM	2	25.83	12:25:20 PM	36.89	16.98	622.00	589.10
BF	3	25.76	12:26:08 PM	35.95	18.64	641.00	536.70
BS	4	25.92	12:26:29 PM	35.65	18.39	661.00	543.99
BFM	5	25.87	12:27:04 PM	35.80	19.76	681.00	506.28
BSM	6	25.76	12:27:59 PM	34.31	19.82	702.00	504.74
BF	7	25.87	12:28:40 PM	36.23	17.40	721.00	574.83
BS	8	25.99	12:29:00 PM	37.83	15.36	737.00	615.11
BFM	9	25.96	12:29:35 PM	35.91	18.55	756.00	539.73
BSM	10	25.89	12:29:45 PM	33.21	24.06	781.00	415.75
BF	11	25.72	12:30:05 PM	35.94	19.24	802.00	519.75
BS	12	25.79	12:30:27 PM	34.62	20.14	823.00	496.57
BFM	13	25.84	12:31:10 PM	36.03	17.99	842.00	555.86
BSM	14	25.75	12:31:27 PM	33.78	21.63	864.00	462.69
BF	15	25.92	12:32:11 PM	35.94	17.98	883.00	556.28
BS	16	25.92	12:32:27 PM	36.26	17.30	901.00	578.56
BFM	17	25.96	12:33:05 PM	35.82	18.14	920.00	551.27
BSM	18	25.88	12:33:21 PM	35.76	17.80	939.00	562.02
BF	19	26.01	12:34:02 PM	36.19	17.41	957.00	574.44
BS	20	25.92	12:35:03 PM	37.12	17.14	975.00	583.43
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	33.20
Blank 2		25.69	–	35.87	50.00	102.00	33.14
Blank 3		25.73	–	36.25	50.00	153.00	33.34
Blank 4		25.88	–	36.74	50.00	204.00	33.04
714 pCi STD.		–	–	–	1.37	206.00	7330.66
952 pCi STD.		–	–	–	1.05	208.00	9642.86

Table Notes:

1. Samples were collected on February 24, 1994.
2. Mailed and Non–mailed samples were counted on February 28, 1994 at 2:34:00 PM.

Table A–M–4: Eastern Site C–Raw Data from Sample Run #8

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	25.91	08:55:49 AM	35.39	11.53	988.00	867.82
CSM	2	25.96	08:56:17 AM	37.90	8.62	998.00	1160.32
CF	3	25.96	08:58:00 AM	36.04	9.89	1008.00	1011.22
CS	4	25.94	08:58:23 AM	35.33	10.02	1019.00	998.30
CFM	5	25.87	08:59:49 AM	35.94	11.19	1031.00	893.83
CSM	6	25.85	09:00:30 AM	37.01	9.18	1042.00	1089.43
CF	7	25.95	09:02:17 AM	35.95	11.11	1054.00	900.09
CS	8	25.87	09:02:52 AM	37.30	8.51	1063.00	1175.68
CFM	9	25.93	09:04:03 AM	35.91	10.49	1074.00	954.43
CSM	10	25.78	09:04:23 AM	36.68	9.26	1085.00	1080.67
CF	11	25.83	09:05:20 AM	35.83	10.62	1096.00	942.09
CS	12	25.63	09:05:39 AM	37.05	8.43	1105.00	1187.31
CFM	13	25.86	09:06:29 AM	35.76	10.52	1117.00	951.43
CSM	14	25.91	09:07:07 AM	37.15	8.63	1126.00	1159.21
CF	15	25.87	09:09:00 AM	36.02	11.54	1139.00	866.64
CS	16	25.88	09:09:31 AM	37.35	8.61	1149.00	1161.79
CFM	17	25.98	09:11:02 AM	35.89	10.26	1160.00	976.51
CSM	18	25.86	09:12:01 AM	37.39	8.58	1169.00	1165.62
CF	19	25.69	09:12:46 AM	35.55	11.04	1181.00	906.07
CS	20	25.96	09:13:06 AM	37.66	8.70	1191.00	1150.34
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	33.20
Blank 2		25.69	–	35.87	50.00	102.00	33.14
Blank 3		25.73	–	36.25	50.00	153.00	33.34
Blank 4		25.88	–	36.74	50.00	204.00	33.04
714 pCi STD.		–	–	–	1.37	206.00	7330.66
952 pCi STD.		–	–	–	1.05	208.00	9642.86

Table Notes:

1. Samples were collected on February 24, 1994.
2. Mailed and Non–mailed samples were counted on February 28, 1994 at 2:34:00 PM.
3. The pump was not running, therefore samples were taken from the system's line.

Table A–M–5: Eastern Site D–Raw Data from Sample Run #8

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM 1	25.95	08:27:14 AM	35.84	6.74	1198.00	1483.83
DSM 2	26.01	08:27:35 AM	35.47	6.42	1206.00	1559.35
DF 3	25.80	08:28:36 AM	35.52	6.75	1213.00	1483.56
DS 4	25.92	08:28:58 AM	36.05	6.12	1220.00	1635.78
DFM 5	26.03	08:30:05 AM	36.00	6.52	1228.00	1535.28
DSM 6	25.84	08:30:28 AM	35.30	6.44	1235.00	1553.11
DF 7	25.84	08:31:28 AM	35.91	6.17	1242.00	1621.88
DS 8	25.78	08:31:52 AM	35.07	6.44	1250.00	1552.95
DFM 9	25.96	08:32:45 AM	35.63	6.58	1257.00	1520.67
DSM 10	25.92	08:33:16 AM	36.10	6.10	1264.00	1639.34
DF 11	25.89	08:34:25 AM	35.79	6.40	1272.00	1562.97
DS 12	25.89	08:34:47 AM	36.20	5.86	1278.00	1707.51
DFM 13	25.94	08:35:49 AM	35.93	6.51	1286.00	1537.17
DSM 14	25.98	08:36:20 AM	37.53	5.37	1292.00	1864.43
DF 15	25.83	08:37:36 AM	35.86	6.53	1300.00	1532.31
DS 16	25.88	08:38:04 AM	36.53	5.95	1306.00	1680.84
DFM 17	25.98	08:39:16 AM	36.04	6.30	1314.00	1590.16
DSM 18	26.00	08:39:37 AM	36.80	5.73	1320.00	1745.55
DF 19	25.76	08:40:43 AM	35.79	6.30	1328.00	1587.78
DS 20	25.77	08:41:06 AM	36.22	5.89	1334.00	1697.96
Calibration Information for both Mailed and Non–mailed Samples						
Blank 1	25.59	–	36.24	50.00	51.00	33.20
Blank 2	25.69	–	35.87	50.00	102.00	33.14
Blank 3	25.73	–	36.25	50.00	153.00	33.34
Blank 4	25.88	–	36.74	50.00	204.00	33.04
714 pCi STD.	–	–	–	1.37	206.00	7330.66
952 pCi STD.	–	–	–	1.05	208.00	9642.86

Table Notes:

1. Samples were collected on February 24, 1994.
2. Mailed and Non–mailed samples were counted on February 28, 1994 at 2:34:00 PM.
3. The pump was not running, therefore samples were taken from the system's line.

Table A–N–1: Eastern Sites' Results from Sample Run #9

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	12,973.37	454.65	13,256.35	891.80
	B	12,560.15	351.76	12,768.47	348.25
	C	26,449.02	1,630.90	25,296.25	2,383.46
	D	44,362.98	2,137.08	44,166.21	2,176.15
Slow–flow	A	13,254.17	384.91	14,566.41	1,055.19
	B	13,284.35	270.65	12,925.80	296.16
	C	28,492.73	1,375.85	28,346.16	1,057.34
	D	48,206.98	1,452.24	47,022.88	1,606.31

Table Notes:

1. Samples from Eastern Sites B, C, and D were collected on March 14, 1994.
2. Samples from Eastern Site A were collected on March 15, 1994.

Table A–N–2: Eastern Site A–Raw Data from Sample Run #9

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	25.88	03:13:11 PM	35.85	18.53	228.00	539.72
ASM	2	25.91	03:13:20 PM	36.75	17.41	246.00	574.38
AF	3	25.91	03:14:06 PM	35.91	19.92	267.00	502.11
AS	4	25.92	03:14:20 PM	38.23	16.89	285.00	592.07
AFM	5	25.89	03:15:32 PM	35.77	20.97	307.00	477.11
ASM	6	26.02	03:15:48 PM	34.87	23.34	331.00	428.49
AF	7	26.10	03:16:38 PM	35.91	21.58	354.00	463.44
AS	8	25.92	03:16:59 PM	35.34	22.04	376.00	453.72
AFM	9	25.94	03:17:40 PM	35.94	21.62	399.00	462.67
ASM	10	26.06	03:17:54 PM	BROKE	0.00	0.00	0.00
AF	11	25.97	03:18:43 PM	35.91	21.70	422.00	460.83
AS	12	25.93	03:18:54 PM	35.71	20.70	443.00	483.19
AFM	13	25.95	03:19:45 PM	35.97	21.80	466.00	459.04
ASM	14	26.09	03:19:54 PM	36.56	19.60	487.00	510.51
AF	15	25.87	03:20:44 PM	35.86	21.92	509.00	456.34
AS	16	25.99	03:20:56 PM	35.21	22.91	533.00	436.58
AFM	17	25.98	03:22:13 PM	35.96	22.16	556.00	451.40
ASM	18	25.89	03:22:29 PM	35.83	21.94	579.00	455.88
AF	19	25.99	03:23:19 PM	35.99	22.53	603.00	443.90
AS	20	25.87	03:23:26 PM	34.61	25.30	629.00	395.38
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	34.32
Blank 2		25.69	–	35.87	50.00	102.00	34.24
Blank 3		25.73	–	36.25	50.00	153.00	34.80
Blank 4		25.88	–	36.74	50.00	204.00	35.00
714 pCi STD.		–	–	–	1.33	206.00	7524.06
952 pCi STD.		–	–	–	1.06	208.00	9504.72

Table Notes:

1. Samples were collected on March 15, 1994.
2. Mailed and Non–mailed samples were counted on March 21, 1994 at 11:53:05 AM.

Table A–N–3: Eastern Site B–Raw Data from Sample Run #9

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	26.05	12:45:12 PM	36.32	26.47	656.00	377.94
BSM	2	26.03	12:45:44 PM	36.04	26.02	683.00	384.44
BF	3	25.99	12:46:45 PM	36.06	26.89	711.00	371.89
BS	4	25.88	12:47:23 PM	37.64	22.21	734.00	450.25
BFM	5	25.94	12:48:34 PM	35.97	26.15	761.00	382.41
BSM	6	26.06	12:48:52 PM	36.25	25.91	788.00	386.07
BF	7	25.99	12:50:00 PM	36.10	27.80	817.00	359.89
BS	8	25.89	12:50:23 PM	36.96	24.20	842.00	413.51
BFM	9	26.02	12:51:42 PM	36.10	28.10	871.00	355.87
BSM	10	26.03	12:52:06 PM	35.43	29.59	902.00	338.12
BF	11	25.89	12:53:12 PM	35.96	27.26	930.00	366.95
BS	12	26.12	12:53:28 PM	35.21	28.43	959.00	351.74
BFM	13	25.95	12:54:41 PM	36.11	27.03	987.00	370.00
BSM	14	26.07	12:55:03 PM	35.65	28.80	1017.00	347.47
BF	15	26.05	12:56:11 PM	36.28	27.39	1046.00	365.28
BS	16	25.98	12:56:35 PM	34.05	33.53	1080.00	298.36
BFM	17	25.91	12:57:27 PM	35.79	28.72	1110.00	348.22
BSM	18	26.01	12:57:42 PM	36.23	27.81	1139.00	359.73
BF	19	25.80	12:58:46 PM	35.87	29.77	1169.00	335.94
BS	20	25.89	12:59:04 PM	35.52	28.80	1199.00	347.26
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	34.32
Blank 2		25.69	–	35.87	50.00	102.00	34.24
Blank 3		25.73	–	36.25	50.00	153.00	34.80
Blank 4		25.88	–	36.74	50.00	204.00	35.00
714 pCi STD.		–	–	–	1.33	206.00	7524.06
952 pCi STD.		–	–	–	1.06	208.00	9504.72

Table Notes:

1. Samples were collected on March 14, 1994.
2. Mailed and Non–mailed samples were counted on March 21, 1994 at 11:53:05 AM.
3. The well was not running, therefore samples were collected from the system's tank.

Table A–N–4: Eastern Site C–Raw Data from Sample Run #9

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	26.02	11:11:11 AM	36.21	17.05	1217.00	586.51
CSM	2	26.09	11:11:29 AM	36.24	14.45	1232.00	692.18
CF	3	25.93	11:12:59 AM	35.82	16.56	1250.00	604.29
CS	4	25.86	11:13:21 AM	36.40	13.81	1265.00	724.76
CFM	5	25.89	11:14:40 AM	36.09	15.37	1281.00	650.75
CSM	6	25.90	11:15:00 AM	36.50	12.84	1295.00	778.89
CF	7	26.09	11:16:01 AM	36.04	14.94	1311.00	669.41
CS	8	25.82	11:16:26 AM	35.73	13.85	1325.00	722.60
CFM	9	25.85	11:17:19 AM	35.91	14.82	1341.00	675.24
CSM	10	25.84	11:17:45 AM	36.81	12.67	1355.00	789.98
CF	11	25.89	11:19:01 AM	35.98	14.38	1370.00	695.41
CS	12	25.94	11:19:24 AM	36.36	13.12	1384.00	762.20
CFM	13	25.85	11:20:23 AM	BROKE	0.00	0.00	0.00
CSM	14	26.03	11:20:45 AM	36.07	13.58	1399.00	736.38
CF	15	26.14	11:21:41 AM	36.34	14.34	1414.00	697.70
CS	16	26.02	11:22:02 AM	35.52	13.87	1429.00	721.12
CFM	17	25.95	11:23:01 AM	36.07	14.26	1444.00	701.54
CSM	18	25.97	11:23:18 AM	36.87	13.01	1458.00	769.33
CF	19	25.87	11:24:19 AM	35.99	14.30	1473.00	699.37
CS	20	25.99	11:24:35 AM	37.05	13.33	1487.00	750.26
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	34.32
Blank 2		25.69	–	35.87	50.00	102.00	34.24
Blank 3		25.73	–	36.25	50.00	153.00	34.80
Blank 4		25.88	–	36.74	50.00	204.00	35.00
714 pCi STD.		–	–	–	1.33	206.00	7524.06
952 pCi STD.		–	–	–	1.06	208.00	9504.72

Table Notes:

1. Samples were collected on March 14, 1994.
2. Mailed and Non–mailed samples were counted on March 21, 1994 at 11:53:05 AM.
3. The well was not running, therefore samples were collected from the system's line.

Table A–N–5: Eastern Site D–Raw Data from Sample Run #9

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM	1	25.87	10:41:49 AM	BROKE	0.00	0.00	0.00
DSM	2	26.03	10:42:27 AM	35.65	8.89	1497.00	1125.98
DF	3	26.00	10:43:16 AM	35.95	9.17	1507.00	1091.71
DS	4	26.12	10:43:33 AM	36.68	7.93	1516.00	1262.30
DFM	5	26.00	10:44:41 AM	35.91	9.30	1526.00	1076.34
DSM	6	26.09	10:44:57 AM	36.62	8.25	1536.00	1213.21
DF	7	25.97	10:46:09 AM	35.85	9.77	1546.00	1024.46
DS	8	25.88	10:46:29 AM	34.73	9.80	1557.00	1020.92
DFM	9	25.88	10:47:51 AM	35.84	9.98	1568.00	1003.21
DSM	10	25.93	10:48:09 AM	36.08	9.20	1578.00	1087.50
DF	11	25.92	10:49:21 AM	35.76	10.11	1589.00	989.52
DS	12	25.95	10:50:00 AM	35.24	9.75	1600.00	1026.05
DFM	13	25.88	10:51:09 AM	35.86	9.62	1611.00	1040.02
DSM	14	25.90	10:51:34 AM	36.47	8.54	1620.00	1171.78
DF	15	26.04	10:53:09 AM	36.95	8.53	1629.00	1172.57
DS	16	25.86	10:53:30 AM	36.42	8.12	1638.00	1231.77
DFM	17	25.91	10:54:41 AM	36.00	8.88	1648.00	1126.69
DSM	18	25.74	10:55:07 AM	34.94	9.44	1659.00	1060.28
DF	19	25.84	10:56:13 AM	35.86	8.91	1669.00	1123.91
DS	20	25.96	10:56:37 AM	35.88	8.67	1678.00	1154.44
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	34.32
Blank 2		25.69	–	35.87	50.00	102.00	34.24
Blank 3		25.73	–	36.25	50.00	153.00	34.80
Blank 4		25.88	–	36.74	50.00	204.00	35.00
714 pCi STD.		–	–	–	1.33	206.00	7524.06
952 pCi STD.		–	–	–	1.06	208.00	9504.72

Table Notes:

1. Samples were collected on March 14, 1994.
2. Mailed and Non–mailed samples were counted on March 21, 1994 at 11:53:05 AM.
3. The well was not running, therefore samples were collected from the system's line.

Table A–O–1: Western Sites' Results from Sample Run #6

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	66,274.84	2,027.61	67,347.96	1,724.12
	B	28,073.29	382.67	28,075.48	877.52
	C	15,732.04	445.92	15,951.01	1,091.74
	E	72,358.60	8,618.01	74,569.35	2,988.86
Slow–flow	A	68,617.14	1,923.32	67,546.26	1,490.20
	B	29,623.19	1,265.76	29,806.57	1,449.64
	C	16,844.36	356.67	16,925.44	486.66
	E	75,103.22	5,335.62	72,521.36	5,440.10

Table Notes:
1. Samples were collected on March 26, 1994.
2. Western Site D was not accessible on this date.

Table A–O–2: Western Site A–Raw Data from Sample Run #6

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	25.83	01:21:50 PM	35.97	2.52	212.00	3972.22
ASM	2	26.03	01:22:17 PM	37.09	2.37	215.00	4222.78
AF	3	25.87	01:23:02 PM	35.94	2.71	219.00	3691.88
AS	4	25.87	01:23:24 PM	35.45	2.72	222.00	3681.62
AFM	5	25.92	01:24:09 PM	35.63	2.79	226.00	3593.55
ASM	6	25.92	01:24:31 PM	36.31	2.55	230.00	3931.76
AF	7	25.85	01:25:16 PM	35.75	2.78	233.00	3610.43
AS	8	26.00	01:25:37 PM	36.28	2.57	237.00	3905.06
AFM	9	25.94	01:26:27 PM	36.16	2.55	240.00	3933.33
ASM	10	25.95	01:26:47 PM	37.39	2.28	243.00	4396.05
AF	11	25.98	01:27:38 PM	35.95	2.61	247.00	3837.55
AS	12	25.86	01:28:01 PM	35.91	2.46	250.00	4076.83
AFM	13	25.85	01:29:05 PM	36.03	2.51	254.00	3994.82
ASM	14	25.94	01:29:30 PM	35.76	2.57	257.00	3906.62
AF	15	26.06	01:30:27 PM	36.04	2.65	261.00	3783.77
AS	16	25.92	01:30:51 PM	36.23	2.46	264.00	4077.64
AFM	17	25.87	01:31:46 PM	36.12	2.60	268.00	3856.15
ASM	18	25.79	01:32:09 PM	36.51	2.48	271.00	4041.94
AF	19	25.78	01:33:14 PM	35.90	2.55	275.00	3930.59
AS	20	25.75	01:33:33 PM	37.51	2.22	278.00	4507.21
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	51.00	33.66
Blank 2		25.69	–	35.87	50.00	102.00	34.18
Blank 3		25.73	–	36.24	50.00	153.00	33.40
Blank 4		25.88	–	36.73	50.00	204.00	33.28
714 pCi STD.		–	–	–	1.39	206.00	7230.22
952 pCi STD.		–	–	–	1.05	208.00	9585.71

Table Notes:

1. Samples were collected on March 26, 1994.
2. Mailed and Non–mailed samples were counted on March 29, 1994 at 1:59:00 PM.

Table A–O–3: Western Site B–Raw Data from Sample Run #6

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.96	01:54:14 PM	35.98	6.51	285.00	1537.94
BSM	2	26.13	01:54:14 PM	36.33	5.95	292.00	1681.01
BF	3	25.94	01:55:44 PM	35.98	6.24	299.00	1603.37
BS	4	25.81	01:56:26 PM	35.18	6.52	307.00	1534.36
BFM	5	25.94	01:57:19 PM	35.87	6.20	314.00	1616.94
BSM	6	25.96	01:57:46 PM	36.52	5.64	320.00	1773.76
BF	7	25.88	01:58:36 PM	35.92	6.25	328.00	1601.12
BS	8	25.93	01:59:02 PM	35.15	6.70	335.00	1493.88
BFM	9	25.98	01:59:50 PM	35.95	6.34	342.00	1578.23
BSM	10	25.89	02:00:17 PM	34.16	7.49	351.00	1336.58
BF	11	25.86	02:01:09 PM	35.91	6.30	358.00	1588.89
BS	12	25.91	02:01:34 PM	36.23	5.81	365.00	1723.06
BFM	13	26.03	02:02:22 PM	36.27	6.00	372.00	1670.67
BSM	14	25.92	02:02:53 PM	36.40	5.41	378.00	1849.72
BF	15	25.92	02:03:46 PM	35.63	6.32	385.00	1582.75
BS	16	26.02	02:04:10 PM	35.93	5.72	392.00	1748.60
BFM	17	25.87	02:05:11 PM	35.98	6.07	399.00	1649.75
BSM	18	26.00	02:05:35 PM	35.80	5.73	406.00	1745.90
BF	19	25.94	02:06:29 PM	36.00	6.24	413.00	1604.81
BS	20	25.83	02:06:49 PM	36.52	5.41	419.00	1852.13
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	51.00	33.66
Blank 2		25.69	–	35.87	50.00	102.00	34.18
Blank 3		25.73	–	36.24	50.00	153.00	33.40
Blank 4		25.88	–	36.73	50.00	204.00	33.28
714 pCi STD.		–	–	–	1.39	206.00	7230.22
952 pCi STD.		–	–	–	1.05	208.00	9585.71

Table Notes:

1. Samples were collected on March 26, 1994.
2. Mailed and Non–mailed samples were counted on March 29, 1994 at 1:59:00 PM.

Table A–O–4: Western Site C–Raw Data from Sample Run #6

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	25.90	02:46:51 PM	35.80	9.87	430.00	1013.78
CSM	2	26.00	02:47:05 PM	36.08	9.75	441.00	1026.05
CF	3	26.03	02:48:02 PM	35.83	10.83	452.00	924.01
CS	4	25.91	02:48:21 PM	35.68	10.39	464.00	962.46
CFM	5	25.98	02:49:06 PM	35.92	11.11	476.00	901.08
CSM	6	25.95	02:49:22 PM	35.61	10.75	487.00	931.44
CF	7	25.95	02:50:05 PM	36.08	10.84	499.00	923.34
CS	8	25.96	02:51:16 PM	36.62	9.57	510.00	1045.35
CFM	9	25.94	02:51:32 PM	35.86	11.23	522.00	890.92
CSM	10	25.90	02:52:24 PM	36.67	9.92	533.00	1008.37
CF	11	25.94	02:52:43 PM	35.89	11.45	545.00	873.71
CS	12	25.91	02:53:10 PM	35.32	11.18	557.00	895.08
CFM	13	25.83	02:53:30 PM	36.13	11.11	569.00	901.62
CSM	14	25.92	02:54:58 PM	36.72	9.71	580.00	1030.38
CF	15	26.00	02:54:40 PM	36.11	11.19	592.00	894.10
CS	16	25.84	02:55:17 PM	36.52	9.99	603.00	1001.30
CFM	17	25.85	02:56:15 PM	36.00	11.63	616.00	860.10
CSM	18	25.96	02:56:33 PM	36.27	10.37	627.00	964.51
CF	19	25.91	02:57:24 PM	35.90	11.61	639.00	861.33
CS	20	25.96	02:57:42 PM	36.92	9.93	650.00	1007.25
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	51.00	33.66
Blank 2		25.69	–	35.87	50.00	102.00	34.18
Blank 3		25.73	–	36.24	50.00	153.00	33.40
Blank 4		25.88	–	36.73	50.00	204.00	33.28
714 pCi STD.		–	–	–	1.39	206.00	7230.22
952 pCi STD.		–	–	–	1.05	208.00	9585.71

Table Notes:

1. Samples were collected on March 26, 1994.
2. Mailed and Non–mailed samples were counted on March 29, 1994 at 1:59:00 PM.

Table A–O–5: Western Site E–Raw Data from Sample Run #6

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
EFM	1	26.06	02:24:55 PM	36.10	2.63	654.00	3805.70
ESM	2	25.91	02:25:30 PM	37.69	2.44	657.00	4110.66
EF	3	25.98	02:26:41 PM	36.05	3.13	661.00	3199.04
ES	4	25.99	02:27:11 PM	36.92	2.56	665.00	3910.55
EFM	5	26.02	02:28:22 PM	36.08	2.44	668.00	4100.41
ESM	6	26.00	02:28:40 PM	36.11	2.60	672.00	3846.92
EF	7	25.89	02:29:11 PM	35.95	2.61	675.00	3833.72
ES	8	25.95	02:29:27 PM	34.32	2.93	679.00	3419.11
EFM	9	25.88	02:30:22 PM	35.77	2.51	683.00	3984.06
ESM	10	26.02	02:30:32 PM	35.96	2.43	686.00	4120.16
EF	11	26.01	02:31:34 PM	36.09	2.44	689.00	4111.07
ES	12	26.08	02:31:45 PM	35.63	2.50	693.00	4003.60
EFM	13	25.92	02:32:42 PM	35.82	2.46	696.00	4084.55
ESM	14	25.83	02:32:56 PM	35.70	2.52	699.00	3971.83
EF	15	26.00	02:33:42 PM	36.18	2.32	703.00	4328.02
ES	16	25.90	02:33:55 PM	36.62	2.21	706.00	4542.53
EFM	17	25.90	02:34:50 PM	35.81	2.41	709.00	4153.11
ESM	18	25.94	02:35:00 PM	35.18	2.59	713.00	3867.57
EF	19	25.91	02:36:03 PM	36.17	2.29	716.00	4391.70
ES	20	25.93	02:36:23 PM	35.88	2.37	719.00	4220.25
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	51.00	33.66
Blank 2		25.69	–	35.87	50.00	102.00	34.18
Blank 3		25.73	–	36.24	50.00	153.00	33.40
Blank 4		25.88	–	36.73	50.00	204.00	33.28
714 pCi STD.		–	–	–	1.39	206.00	7230.22
952 pCi STD.		–	–	–	1.05	208.00	9585.71

Table Notes:

1. Samples were collected on March 26, 1994.
2. Mailed and Non–mailed samples were counted on March 29, 1994 at 1:59:00 PM.

Table A–P–1: Eastern Sites' Results from Sample Run #10

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	11,080.47	336.59	11,060.43	256.77
	B	10,680.17	309.52	10,710.49	332.78
	C	20,730.43	962.67	20,276.03	1,720.32
	D	35,904.82	1,823.72	36,902.25	4,036.53
Slow–flow	A	11,341.12	308.51	11,232.48	505.91
	B	11,242.47	341.83	11,373.35	284.05
	C	23,865.61	346.78	23,166.11	595.82
	D	34,119.95	3,814.54	34,997.80	3,836.59

Table Notes:

1. Samples were collected on March 31, 1994.

Table A–P–2: Eastern Site A–Raw Data from Sample Run #10

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	25.88	11:27:23 AM	35.71	21.70	231.00	460.97
ASM	2	26.02	11:27:36 AM	34.03	27.14	259.00	368.50
AF	3	25.97	11:28:09 AM	35.50	21.94	282.00	455.79
AS	4	25.96	11:28:22 AM	35.85	20.85	304.00	479.62
AFM	5	26.02	11:28:58 AM	35.99	20.77	325.00	481.61
ASM	6	25.98	11:29:10 AM	36.11	19.94	346.00	501.55
AF	7	25.85	11:29:43 AM	35.83	21.25	368.00	470.59
AS	8	26.05	11:29:57 AM	36.54	19.71	389.00	507.41
AFM	9	26.15	11:30:27 AM	36.21	21.71	412.00	460.71
ASM	10	26.11	11:30:38 AM	36.11	21.10	434.00	474.03
AF	11	25.94	11:31:16 AM	35.55	22.07	457.00	453.15
AS	12	26.08	11:31:26 AM	37.37	18.74	477.00	533.67
AFM	13	26.02	11:32:02 AM	35.69	22.64	500.00	441.78
ASM	14	26.00	11:32:10 AM	37.29	18.93	520.00	528.31
AF	15	26.00	11:33:09 AM	35.97	22.21	543.00	450.47
AS	16	26.10	11:36:25 AM	35.95	22.58	567.00	442.91
AFM	17	26.17	11:33:51 AM	35.54	24.02	592.00	416.36
ASM	18	25.97	11:36:33 AM	36.34	21.92	615.00	456.34
AF	19	25.94	11:34:35 AM	35.19	25.03	641.00	399.56
AS	20	25.97	11:36:45 AM	36.82	20.66	662.00	484.27
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	33.66
Blank 2		25.69	–	35.87	50.00	102.00	33.98
Blank 3		25.73	–	36.25	50.00	153.00	32.22
Blank 4		25.88	–	36.74	50.00	204.00	32.16
714 pCi STD.		–	–	–	1.37	206.00	7335.77
952 pCi STD.		–	–	–	1.06	208.00	9488.68

Table Notes:

1. Samples were collected on March 31, 1994.
2. Mailed and Non–mailed samples were counted on April 5, 1994 at 10:52:20 AM.
3. The well was stopped running at sample 15. Remaining samples were taken from the system's tank.

Table A–P–3: Eastern Site B–Raw Data from Sample Run #10

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.93	09:48:15 AM	35.84	22.63	686.00	441.94
BSM	2	25.85	09:48:29 AM	36.47	20.80	708.00	480.91
BF	3	25.98	09:49:31 AM	35.98	23.63	732.00	423.19
BS	4	26.03	09:49:43 AM	36.03	21.60	755.00	463.10
BFM	5	26.08	09:50:36 AM	36.39	22.74	778.00	440.02
BSM	6	25.92	09:50:49 AM	36.41	21.12	801.00	473.48
BF	7	26.10	09:51:36 AM	36.03	23.49	825.00	425.71
BS	8	26.04	09:51:55 AM	35.97	23.32	849.00	429.16
BFM	9	26.14	09:52:42 AM	36.14	24.72	875.00	404.61
BSM	10	25.91	09:52:54 AM	36.75	20.59	896.00	485.77
BF	11	25.96	09:53:42 AM	35.95	24.75	922.00	404.08
BS	12	26.06	09:53:54 AM	36.10	22.62	946.00	442.31
BFM	13	26.06	09:54:38 AM	36.03	24.05	971.00	415.97
BSM	14	25.95	09:54:53 AM	36.17	22.36	994.00	447.36
BF	15	25.94	09:55:32 AM	36.08	23.17	1018.00	431.68
BS	16	26.13	09:55:45 AM	36.03	23.58	1043.00	424.13
BFM	17	25.96	09:57:49 AM	35.80	25.22	1069.00	396.67
BSM	18	26.10	09:58:02 AM	35.97	24.39	1094.00	410.25
BF	19	26.03	09:58:59 AM	36.18	24.78	1120.00	403.67
BS	20	25.95	09:59:12 AM	36.85	22.39	1143.00	446.63
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	33.66
Blank 2		25.69	–	35.87	50.00	102.00	33.98
Blank 3		25.73	–	36.25	50.00	153.00	32.22
Blank 4		25.88	–	36.74	50.00	204.00	32.16
714 pCi STD.		–	–	–	1.37	206.00	7335.77
952 pCi STD.		–	–	–	1.06	208.00	9488.68

Table Notes:

1. Samples were collected on March 31, 1994.
2. Mailed and Non–mailed samples were counted on April 5, 1994 at 10:52:20 AM.
3. The well was stopped running at sample 17. Remaining samples were taken from the system's tank.

Table A–P–4: Eastern Site C–Raw Data from Sample Run #10

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	26.12	08:56:48 AM	35.23	17.21	1161.00	581.06
CSM	2	25.92	08:57:03 AM	36.66	11.14	1174.00	898.20
CF	3	25.98	08:58:02 AM	36.10	14.30	1189.00	699.79
CS	4	26.07	08:58:11 AM	34.91	13.00	1203.00	769.23
CFM	5	25.95	08:59:15 AM	36.02	13.73	1218.00	728.40
CSM	6	25.87	08:59:30 AM	37.07	11.15	1230.00	897.04
CF	7	26.02	09:00:45 AM	36.16	13.08	1244.00	764.98
CS	8	26.07	09:00:58 AM	36.97	10.97	1255.00	911.58
CFM	9	25.92	09:01:52 AM	35.85	12.96	1269.00	771.91
CSM	10	25.99	09:02:04 AM	37.69	10.69	1281.00	935.64
CF	11	26.01	09:03:06 AM	36.03	13.51	1295.00	740.27
CS	12	26.03	09:03:20 AM	36.39	11.39	1308.00	878.14
CFM	13	26.05	09:04:18 AM	35.96	13.45	1322.00	744.16
CSM	14	26.14	09:04:30 AM	36.53	11.56	1335.00	865.48
CF	15	25.98	09:05:32 AM	35.88	13.51	1349.00	740.19
CS	16	26.10	09:05:41 AM	35.98	12.27	1362.00	815.40
CFM	17	26.02	09:06:44 AM	35.97	13.59	1377.00	736.28
CSM	18	25.97	09:06:58 AM	35.46	12.61	1390.00	793.10
CF	19	25.98	09:07:53 AM	36.14	12.96	1404.00	771.60
CS	20	26.01	09:08:09 AM	36.85	10.97	1416.00	911.85
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	33.66
Blank 2		25.69	–	35.87	50.00	102.00	33.98
Blank 3		25.73	–	36.25	50.00	153.00	32.22
Blank 4		25.88	–	36.74	50.00	204.00	32.16
714 pCi STD.		–	–	–	1.37	206.00	7335.77
952 pCi STD.		–	–	–	1.06	208.00	9488.68

Table Notes:

1. Samples were collected on March 31, 1994.
2. Mailed and Non–mailed samples were counted on April 5, 1994 at 10:52:20 AM.
3. The well was not running, therefore samples were collected from the system's line.

Table A–P–5: Eastern Site D–Raw Data from Sample Run #10

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM	1	25.90	08:32:03 AM	36.02	9.50	1427.00	1053.37
DSM	2	25.93	08:32:21 AM	34.93	8.24	1436.00	1215.05
DF	3	25.84	08:33:24 AM	36.00	7.85	1445.00	1274.39
DS	4	25.99	08:33:43 AM	35.44	7.22	1453.00	1386.29
DFM	5	25.78	08:34:58 AM	35.72	7.49	1461.00	1336.32
DSM	6	25.91	08:35:21 AM	36.03	8.80	1471.00	1137.95
DF	7	26.05	08:36:21 AM	35.89	9.61	1481.00	1041.21
DS	8	25.95	08:36:38 AM	35.99	7.52	1490.00	1330.19
DFM	9	25.94	08:37:36 AM	36.03	9.28	1500.00	1078.23
DSM	10	25.78	08:37:52 AM	35.60	7.91	1509.00	1265.87
DF	11	25.90	08:38:50 AM	35.92	9.55	1519.00	1047.12
DS	12	25.95	08:39:03 AM	35.99	7.92	1528.00	1262.63
DFM	13	26.02	08:40:06 AM	36.09	9.56	1539.00	1046.13
DSM	14	26.00	08:40:21 AM	35.91	7.89	1548.00	1268.57
DF	15	26.03	08:41:30 AM	36.00	9.68	1558.00	1033.26
DS	16	25.96	08:41:45 AM	34.82	8.32	1567.00	1202.76
DFM	17	25.88	08:43:09 AM	35.40	10.07	1578.00	993.15
DSM	18	25.93	08:43:25 AM	34.67	8.77	1588.00	1141.39
DF	19	25.89	08:45:01 AM	35.84	8.45	1597.00	1184.02
DS	20	26.11	08:45:15 AM	35.95	8.48	1607.00	1180.42
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.24	50.00	51.00	33.66
Blank 2		25.69	–	35.87	50.00	102.00	33.98
Blank 3		25.73	–	36.25	50.00	153.00	32.22
Blank 4		25.88	–	36.74	50.00	204.00	32.16
714 pCi STD.		–	–	–	1.37	206.00	7335.77
952 pCi STD.		–	–	–	1.06	208.00	9488.68

Table Notes:

1. Samples were collected on March 31, 1994.
2. Mailed and Non–mailed samples were counted on April 5, 1994 at 10:52:20 AM.
3. The well was not running, therefore samples were collected from the system's line.

Table A–Q–1: Eastern Sites' Results from Sample Run #11

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	10,307.63	495.49	10,697.17	833.76
	B	10,950.23	514.25	10,928.09	562.79
	C	20,098.46	778.47	20,058.59	841.22
	D	30,838.43	668.99	29,911.99	2,146.17
Slow–flow	A	11,240.75	280.51	10,851.88	346.92
	B	11,480.98	276.01	11,296.03	246.79
	C	21,902.06	2,213.93	21,592.26	1,873.72
	D	34,054.11	1,989.02	34,181.91	1,897.16

Table Notes:

1. Samples were collected on April 14, 1994.

Table A–Q–2: Eastern Site A–Raw Data from Sample Run #11

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	26.05	03:29:34 PM	36.26	22.59	231.00	442.72
ASM	2	25.96	03:30:23 PM	BROKE	0.00	0.00	0.00
AF	3	26.00	03:31:38 PM	36.00	29.03	261.00	344.54
AS	4	25.94	03:32:03 PM	35.51	26.85	289.00	372.59
AFM	5	25.96	03:33:02 PM	35.95	27.64	318.00	361.83
ASM	6	25.94	03:33:16 PM	34.32	30.06	349.00	332.67
AF	7	26.23	03:34:12 PM	36.12	26.60	377.00	375.94
AS	8	25.97	03:34:26 PM	35.21	26.90	405.00	371.78
AFM	9	26.02	03:35:07 PM	35.93	26.98	432.00	370.72
ASM	10	26.07	03:35:20 PM	35.39	27.37	461.00	365.51
AF	11	25.99	03:36:07 PM	35.95	27.78	489.00	360.04
AS	12	26.03	03:36:21 PM	35.60	26.88	517.00	372.06
AFM	13	25.95	03:37:14 PM	35.78	27.82	546.00	359.49
ASM	14	25.96	03:37:29 PM	BROKE	0.00	0.00	0.00
AF	15	26.05	03:38:17 PM	35.94	27.53	575.00	363.24
AS	16	25.93	03:38:33 PM	34.90	28.92	604.00	345.82
AFM	17	26.02	03:39:23 PM	35.88	28.56	634.00	350.25
ASM	18	25.88	03:39:31 PM	34.53	30.74	666.00	325.31
AF	19	25.74	03:40:25 PM	35.50	28.18	695.00	354.97
AS	20	26.03	03:40:39 PM	34.81	29.07	725.00	344.10
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	50.00	34.62
Blank 2		25.69	–	35.86	50.00	102.00	33.76
Blank 3		25.73	–	36.23	50.00	153.00	33.94
Blank 4		25.88	–	36.72	50.00	204.00	32.82
714 pCi STD.		–	–	–	1.38	206.00	7313.04
952 pCi STD.		–	–	–	1.06	208.00	9458.49

Table Notes:

1. Samples were collected on April 14, 1994.
2. Mailed and Non–mailed samples were counted on April 20, 1994 at 2:43:15 PM.

Table A–Q–3: Eastern Site B–Raw Data from Sample Run #11

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	25.93	02:18:55 PM	35.90	25.97	752.00	385.21
BSM	2	25.92	02:19:16 PM	35.24	28.30	781.00	353.43
BF	3	26.03	02:20:08 PM	35.98	26.88	809.00	372.10
BS	4	25.99	02:20:26 PM	35.63	27.56	837.00	363.17
BFM	5	26.02	02:21:29 PM	36.02	27.49	866.00	358.02
BSM	6	26.01	02:21:46 PM	35.98	27.29	895.00	366.43
BF	7	25.98	02:22:44 PM	35.94	29.71	925.00	336.59
BS	8	26.01	02:23:01 PM	34.95	30.27	957.00	330.46
BFM	9	25.87	02:24:04 PM	35.74	29.88	987.00	334.74
BSM	10	26.12	02:24:20 PM	36.66	26.37	1015.00	379.33
BF	11	25.95	02:25:21 PM	35.88	28.70	1044.00	348.43
BS	12	25.85	02:25:40 PM	35.78	27.11	1072.00	368.87
BFM	13	25.95	02:26:40 PM	36.10	28.69	1102.00	348.66
BSM	14	25.93	02:27:01 PM	35.39	28.78	1132.00	347.46
BF	15	25.99	02:28:13 PM	36.13	27.51	1160.00	363.50
BS	16	25.86	02:28:43 PM	36.23	25.90	1188.00	386.14
BFM	17	25.91	02:29:43 PM	35.84	27.49	1216.00	363.77
BSM	18	25.92	02:29:59 PM	37.13	24.34	1241.00	411.09
BF	19	25.92	02:30:40 PM	35.82	27.80	1270.00	359.71
BS	20	26.07	02:30:56 PM	36.47	26.03	1297.00	384.25
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	50.00	34.62
Blank 2		25.69	–	35.86	50.00	102.00	33.76
Blank 3		25.73	–	36.23	50.00	153.00	33.94
Blank 4		25.88	–	36.72	50.00	204.00	32.82
714 pCi STD.		–	–	–	1.38	206.00	7313.04
952 pCi STD.		–	–	–	1.06	208.00	9458.49

Table Notes:

1. Samples were collected on April 14, 1994.
2. Mailed and Non–mailed samples were counted on April 20, 1994 at 2:43:15 PM.

Table A–Q–4: Eastern Site C–Raw Data from Sample Run #11

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM	1	25.95	12:52:40 PM	35.63	17.58	1316.00	569.11
CSM	2	25.83	12:53:50 PM	35.55	18.69	1335.00	535.42
CF	3	26.15	12:56:00 PM	36.05	17.86	1354.00	560.08
CS	4	25.98	12:56:59 PM	35.94	17.83	1373.00	561.36
CFM	5	26.00	12:58:36 PM	35.98	17.58	1391.00	568.83
CSM	6	26.04	12:59:00 PM	36.45	14.67	1407.00	681.73
CF	7	26.01	12:59:54 PM	35.86	17.33	1425.00	577.15
CS	8	26.03	01:00:09 PM	36.83	14.00	1440.00	714.29
CFM	9	26.05	01:01:14 PM	35.90	17.57	1459.00	569.72
CSM	10	26.02	01:01:24 PM	36.45	14.99	1475.00	667.18
CF	11	25.98	01:02:36 PM	36.01	16.82	1492.00	594.59
CS	12	26.05	01:02:54 PM	37.08	13.98	1507.00	715.38
CFM	13	25.95	01:04:10 PM	35.98	16.26	1525.00	615.01
CSM	14	26.11	01:04:29 PM	36.88	14.44	1540.00	693.21
CF	15	26.10	01:05:28 PM	36.31	16.14	1557.00	619.64
CS	16	26.06	01:05:43 PM	36.73	14.16	1572.00	706.21
CFM	17	26.08	01:06:59 PM	36.10	16.55	1590.00	604.59
CSM	18	26.07	01:07:24 PM	35.96	15.19	1606.00	658.66
CF	19	26.06	01:08:15 PM	35.96	17.00	1624.00	588.53
CS	20	25.93	01:09:27 PM	35.98	16.67	1641.00	599.88
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	50.00	34.62
Blank 2		25.69	–	35.86	50.00	102.00	33.76
Blank 3		25.73	–	36.23	50.00	153.00	33.94
Blank 4		25.88	–	36.72	50.00	204.00	32.82
714 pCi STD.		–	–	–	1.38	206.00	7313.04
952 pCi STD.		–	–	–	1.06	208.00	9458.49

Table Notes:

1. Samples were collected on April 14, 1994.
2. Mailed and Non–mailed samples were counted on April 20, 1994 at 2:43:15 PM.
3. The well was not running, therefore samples were collected from the system's line.

Table A–Q–5: Eastern Site D–Raw Data from Sample Run #11

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM	1	26.02	12:22:11 PM	35.90	13.62	1656.00	734.58
DSM	2	25.98	12:22:40 PM	36.54	10.88	1668.00	919.12
DF	3	25.98	12:24:40 PM	36.11	11.72	1680.00	854.52
DS	4	25.99	12:25:08 PM	36.57	11.11	1692.00	900.36
DFM	5	25.95	12:26:33 PM	35.81	12.26	1705.00	815.82
DSM	6	26.07	12:26:51 PM	36.86	9.53	1716.00	1049.32
DF	7	26.18	12:27:58 PM	36.13	11.33	1728.00	883.32
DS	8	26.11	12:28:14 PM	36.81	9.62	1739.00	1039.71
DFM	9	26.05	12:29:06 PM	36.12	11.32	1751.00	884.19
DSM	10	25.92	12:29:27 PM	36.29	9.78	1762.00	1023.31
DF	11	25.97	12:30:34 PM	35.95	11.75	1775.00	851.06
DS	12	25.99	12:30:54 PM	35.61	10.76	1786.00	930.02
DFM	13	26.03	12:32:10 PM	35.92	11.77	1799.00	850.81
DSM	14	25.99	12:32:44 PM	36.22	10.63	1811.00	941.58
DF	15	26.07	12:34:10 PM	36.05	11.90	1823.00	840.76
DS	16	25.99	12:34:35 PM	35.98	10.55	1835.00	947.96
DFM	17	26.04	12:35:50 PM	36.13	11.74	1848.00	851.87
DSM	18	26.02	12:36:15 PM	36.25	10.19	1859.00	982.04
DF	19	25.97	12:37:50 PM	36.03	11.84	1872.00	844.85
DS	20	26.03	12:38:10 PM	36.71	9.92	1882.00	1008.27
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	50.00	34.62
Blank 2		25.69	–	35.86	50.00	102.00	33.76
Blank 3		25.73	–	36.23	50.00	153.00	33.94
Blank 4		25.88	–	36.72	50.00	204.00	32.82
714 pCi STD.		–	–	–	1.38	206.00	7313.04
952 pCi STD.		–	–	–	1.06	208.00	9458.49

Table Notes:

1. Samples were collected on April 14, 1994.
2. Mailed and Non–mailed samples were counted on April 20, 1994 at 2:43:15 PM.
3. The well was not running, therefore samples were collected from the system's line.

Table A–R–1: Western Results from Sample Run #7

Sampling Method	Site	Non–mailed Samples		Mailed Samples	
		Average (pCi/L)	Deviation (pCi/L)	Average (pCi/L)	Deviation (pCi/L)
Funnel–Syringe	A	72,264.94	1,569.42	72,445.80	1,744.66
	B	31,187.17	1,365.60	31,359.22	1,348.82
	C	15,631.43	446.68	15,778.30	725.16
	D	14,825.27	1,027.12	14,651.65	923.41
	E	65,674.93	1,332.76	64,986.61	1,790.36
Slow–flow	A	72,204.32	2,394.76	71,613.89	1,381.91
	B	33,136.05	1,071.07	32,502.50	683.84
	C	17,341.58	206.78	17,055.02	498.58
	D	16,325.38	419.24	16,286.24	596.56
	E	64,726.11	1,624.42	63,760.11	1,604.13

Table Notes:
1. Samples were collected on April 17, 1994.

Table A–R–2: Western Site A–Raw Data from Sample Run #7

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
AFM	1	25.93	11:50:00 AM	35.76	3.29	2099.00	3040.73
ASM	2	25.92	11:50:33 AM	36.67	3.04	2103.00	3291.78
AF	3	25.89	11:51:21 AM	35.75	3.21	2107.00	3120.25
AS	4	25.96	11:51:50 AM	36.70	3.04	2111.00	3291.78
AFM	5	25.95	11:52:34 AM	35.64	3.22	2115.00	3111.49
ASM	6	25.96	11:52:56 AM	36.23	3.06	2119.00	3269.28
AF	7	26.04	11:53:40 AM	35.97	3.12	2123.00	3210.90
AS	8	26.09	11:54:01 AM	35.27	3.53	2128.00	2835.13
AFM	9	25.99	11:54:46 AM	35.81	3.22	2132.00	3106.83
ASM	10	26.08	11:55:11 AM	36.20	3.12	2136.00	3210.26
AF	11	26.15	11:55:51 AM	36.13	3.24	2140.00	3091.05
AS	12	26.04	11:56:15 AM	37.72	2.67	2144.00	3761.42
AFM	13	25.93	11:57:03 AM	35.79	3.13	2148.00	3196.81
ASM	14	26.01	11:57:29 AM	35.77	3.24	2152.00	3086.73
AF	15	26.10	11:58:20 AM	35.97	3.11	2156.00	3226.37
AS	16	25.99	11:58:44 AM	36.81	2.82	2160.00	3546.10
AFM	17	26.00	11:59:28 AM	36.07	3.05	2164.00	3287.54
ASM	18	26.05	11:59:59 AM	35.35	3.36	2168.00	2979.46
AF	19	26.13	12:00:39 PM	36.12	3.18	2172.00	3154.09
AS	20	26.05	12:01:00 PM	36.49	2.96	2176.00	3382.09
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	50.00	34.62
Blank 2		25.69	–	35.86	50.00	102.00	33.76
Blank 3		25.73	–	36.23	50.00	153.00	33.94
Blank 4		25.88	–	36.72	50.00	204.00	32.82
714 pCi STD.		–	–	–	1.38	206.00	7313.04
952 pCi STD.		–	–	–	1.06	208.00	9458.49

Table Notes:

1. Samples were collected on April 17, 1994.
2. Mailed and Non–mailed samples were counted on April 20, 1994 at 2:43:15 PM.

Table A–R–3: Western Site B–Raw Data from Sample Run #7

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
BFM	1	26.03	12:20:45 PM	35.98	7.63	2185.00	1310.62
BSM	2	26.03	12:21:10 PM	36.01	6.98	2193.00	1433.09
BF	3	25.95	12:21:52 PM	35.96	7.74	2201.00	1293.41
BS	4	25.97	12:22:19 PM	35.02	7.51	2210.00	1332.62
BFM	5	26.00	12:23:02 PM	35.86	7.33	2218.00	1365.08
BSM	6	25.98	12:23:24 PM	36.50	6.60	2226.00	1516.36
BF	7	26.04	12:24:20 PM	35.68	7.60	2234.00	1316.32
BS	8	25.93	12:24:40 PM	35.51	6.83	2242.00	1465.74
BFM	9	25.85	12:25:24 PM	BROKE	0.00	0.00	0.00
BSM	10	25.99	12:25:45 PM	34.29	8.61	2251.00	1161.56
BF	11	26.04	12:26:33 PM	35.85	7.16	2260.00	1396.93
BS	12	25.93	12:26:58 PM	36.10	6.89	2267.00	1452.25
BFM	13	25.99	12:27:41 PM	35.92	7.11	2276.00	1407.45
BSM	14	25.86	12:28:04 PM	34.76	7.64	2284.00	1310.21
BF	15	25.93	12:28:48 PM	35.81	7.13	2292.00	1404.49
BS	16	26.02	12:29:01 PM	35.04	7.90	2301.00	1266.71
BFM	17	25.94	12:29:54 PM	35.62	7.23	2309.00	1383.54
BSM	18	25.91	12:30:13 PM	36.08	6.86	2317.00	1458.89
BF	19	26.09	12:30:59 PM	35.93	7.36	2326.00	1361.41
BS	20	26.02	12:31:22 PM	35.39	7.25	2334.00	1380.55
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	50.00	34.62
Blank 2		25.69	–	35.86	50.00	102.00	33.76
Blank 3		25.73	–	36.23	50.00	153.00	33.94
Blank 4		25.88	–	36.72	50.00	204.00	32.82
714 pCi STD.		–	–	–	1.38	206.00	7313.04
952 pCi STD.		–	–	–	1.06	208.00	9458.49

Table Notes:

1. Samples were collected on April 17, 1994.
2. Mailed and Non–mailed samples were counted on April 20, 1994 at 2:43:15 PM.

Table A–R–4: Western Site C–Raw Data from Sample Run #7

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
CFM 1	25.87	02:31:48 PM	BROKE	0.00	0.00	0.00
CSM 2	25.69	02:32:05 PM	35.27	14.03	2349.00	712.90
CF 3	25.95	02:32:54 PM	35.82	14.37	2364.00	696.66
CS 4	26.06	02:33:09 PM	36.88	11.93	2377.00	838.56
CFM 5	25.93	02:33:56 PM	36.12	13.09	2391.00	764.40
CSM 6	25.88	02:34:10 PM	35.58	13.48	2405.00	741.84
CF 7	26.01	02:34:56 PM	36.06	13.57	2420.00	736.99
CS 8	26.02	02:35:11 PM	35.66	13.40	2434.00	746.34
CFM 9	25.96	02:35:53 PM	35.96	13.94	2449.00	717.50
CSM 10	26.09	02:36:13 PM	37.86	11.16	2461.00	896.24
CF 11	25.96	02:36:54 PM	36.34	13.77	2476.00	726.65
CS 12	25.98	02:37:10 PM	36.10	12.98	2490.00	770.72
CFM 13	26.01	02:37:49 PM	36.07	14.40	2505.00	694.79
CSM 14	26.00	02:37:59 PM	36.79	12.37	2518.00	808.41
CF 15	25.94	02:38:43 PM	36.35	14.35	2534.00	697.35
CS 16	25.86	02:38:56 PM	35.15	13.99	2549.00	715.58
CFM 17	26.03	02:39:46 PM	36.05	15.03	2564.00	665.47
CSM 18	25.96	02:39:57 PM	36.14	12.58	2578.00	795.15
CF 19	26.01	02:40:41 PM	35.86	14.80	2594.00	675.95
CS 20	26.03	02:40:54 PM	36.13	12.79	2608.00	781.86
Calibration Information for both Mailed and Non–mailed Samples						
Blank 1	25.59	–	36.23	50.00	50.00	34.62
Blank 2	25.69	–	35.86	50.00	102.00	33.76
Blank 3	25.73	–	36.23	50.00	153.00	33.94
Blank 4	25.88	–	36.72	50.00	204.00	32.82
714 pCi STD.	–	–	–	1.38	206.00	7313.04
952 pCi STD.	–	–	–	1.06	208.00	9458.49

Table Notes:

1. Samples were collected on April 17, 1994.
2. Mailed and Non–mailed samples were counted on April 20, 1994 at 2:43:15 PM.

Table A–R–5: Western Site D–Raw Data from Sample Run #7

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
DFM	1	25.85	02:14:43 PM	35.47	17.52	2626.00	571.06
DSM	2	25.94	02:15:03 PM	35.41	15.71	2643.00	636.73
DF	3	26.06	02:16:03 PM	36.18	16.79	2661.00	595.71
DS	4	26.11	02:16:16 PM	35.85	14.98	2677.00	667.62
DFM	5	26.02	02:17:05 PM	36.20	15.71	2693.00	636.98
DSM	6	26.08	02:17:20 PM	35.66	14.65	2709.00	682.59
DF	7	26.02	02:18:10 PM	35.98	15.17	2725.00	659.26
DS	8	26.01	02:18:28 PM	36.58	13.64	2740.00	733.28
DFM	9	26.05	02:19:12 PM	35.84	16.38	2757.00	610.81
DSM	10	26.02	02:19:32 PM	34.66	15.82	2774.00	632.36
DF	11	25.85	02:20:16 PM	35.95	15.50	2790.00	645.16
DS	12	25.90	02:20:31 PM	36.10	13.83	2805.00	723.79
DFM	13	25.95	02:21:35 PM	35.77	15.19	2821.00	658.53
DSM	14	25.97	02:21:53 PM	36.78	13.20	2835.00	758.33
DF	15	25.92	02:22:23 PM	35.77	14.71	2851.00	680.08
DS	16	25.94	02:22:51 PM	35.60	14.78	2867.00	676.86
DFM	17	26.09	02:23:35 PM	35.98	15.33	2883.00	652.90
DSM	18	26.07	02:23:51 PM	36.18	14.35	2898.00	696.93
DF	19	26.02	02:24:41 PM	35.85	16.50	2916.00	606.24
DS	20	25.90	02:24:59 PM	33.88	17.54	2934.00	570.58
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	50.00	34.62
Blank 2		25.69	–	35.86	50.00	102.00	33.76
Blank 3		25.73	–	36.23	50.00	153.00	33.94
Blank 4		25.88	–	36.72	50.00	204.00	32.82
714 pCi STD.		–	–	–	1.38	206.00	7313.04
952 pCi STD.		–	–	–	1.06	208.00	9458.49

Table Notes:

1. Samples were collected on April 17, 1994.
2. Mailed and Non–mailed samples were counted on April 20, 1994 at 2:43:15 PM.

Table A–R–6: Western Site E–Raw Data from Sample Run #7

Sample		Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)
EFM	1	26.01	01:40:08 PM	LOST	0.00	0.00	0.00
ESM	2	26.07	01:40:22 PM	LOST	0.00	0.00	0.00
EF	3	26.09	01:41:15 PM	36.34	3.74	2939.00	2678.88
ES	4	25.92	01:41:35 PM	34.26	4.74	2944.00	2112.24
EFM	5	25.96	01:42:15 PM	36.12	3.73	2949.00	2685.25
ESM	6	25.98	01:42:32 PM	33.10	5.48	2955.00	1824.82
EF	7	25.94	01:43:11 PM	36.30	3.67	2960.00	2729.16
ES	8	25.94	01:43:31 PM	33.21	5.09	2966.00	1967.58
EFM	9	25.95	01:44:22 PM	35.72	3.85	2971.00	2597.92
ESM	10	26.12	01:44:42 PM	36.38	3.74	2976.00	2677.81
EF	11	25.95	01:45:24 PM	36.12	3.76	2980.00	2661.17
ES	12	25.96	01:45:44 PM	35.29	4.13	2985.00	2421.55
EFM	13	25.91	01:46:32 PM	35.89	4.00	2990.00	2504.75
ESM	14	26.01	01:46:50 PM	33.21	5.27	2996.00	1899.81
EF	15	26.03	01:47:50 PM	35.67	3.95	3001.00	2538.23
ES	16	26.02	01:48:14 PM	35.77	3.97	3006.00	2521.66
EFM	17	26.01	01:49:00 PM	36.14	3.72	3011.00	2691.94
ESM	18	26.07	01:49:22 PM	35.11	4.46	3016.00	2246.19
EF	19	26.00	01:50:14 PM	36.07	3.65	3021.00	2743.01
ES	20	26.03	01:50:30 PM	36.28	3.72	3025.00	2693.01
Calibration Information for both Mailed and Non–mailed Samples							
Blank 1		25.59	–	36.23	50.00	50.00	34.62
Blank 2		25.69	–	35.86	50.00	102.00	33.76
Blank 3		25.73	–	36.23	50.00	153.00	33.94
Blank 4		25.88	–	36.72	50.00	204.00	32.82
714 pCi STD.		–	–	–	1.38	206.00	7313.04
952 pCi STD.		–	–	–	1.06	208.00	9458.49

Table Notes:

1. Samples were collected on April 17, 1994.
2. Mailed and Non–mailed samples were counted on April 20, 1994 at 2:43:15 PM.

APPENDIX B:

Wilcoxon Signed Rank Tests

Table B-A-1: Eastern Site A – Funnel-Syringe / Mailed vs. Non-mailed

Sample Run	Funnel-Syringe (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Non-mailed	Mailed				
1	11,545.98	11,208.07	338	5	5	
2	12,112.91	12,485.22	-372	-6		6
3	10,906.29	10,970.09	-64	-2		2
4	---	---	---			
5	10,483.49	10,961.36	-478	-9		9
6	10,693.03	12,485.35	-1792	-10		10
7	10,716.10	11,164.46	-448	-8		8
8	11,556.86	11,342.27	215	3	3	
9	12,973.37	13,256.35	-283	-4		4
10	11,080.47	11,060.43	20	1	1	
11	10,307.63	10,697.17	-390	-7		7
Number of Pairs:	10	Sample Test Statistic (T+):		9	T+: 9	T-: 46
Alpha Error:	5% (2-sided)	T+ Statistic:		8,47		
d.f.:	9	Significant:		NO		

Table B-A-2: Eastern Site A – Slow-Flow / Mailed vs. Non-mailed

Sample Run	Slow-Flow (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Non-mailed	Mailed				
1	11,038.11	10,825.80	212	5	5	
2	12,144.26	11,986.20	158	3	3	
3	11,214.55	11,031.97	183	4	4	
4	---	---	---			
5	10,905.26	10,918.24	-13	-1		1
6	11,137.27	12,701.59	-1564	-10		10
7	11,130.28	11,413.86	-284	-6		6
8	10,839.12	11,262.84	-424	-8		8
9	13,254.17	14,566.41	-1312	-9		9
10	11,341.12	11,232.48	109	2	2	
11	11,240.75	10,851.88	389	7	7	
Number of Pairs:	10	Sample Test Statistic (T+):		21	T+: 21	T-: 34
Alpha Error:	5% (2-sided)	T+ Statistic:		8,47		
d.f.:	9	Significant:		NO		

Table B-A-3: Eastern Site A – Non-mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Non-mailed (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Funnel-Syringe	Slow-Flow				
1	11,545.98	11,038.11	508	8	8	
2	12,112.91	12,144.26	-31	-1		1
3	10,906.29	11,214.55	-308	-4		4
4	---	---	---			
5	10,483.49	10,905.26	-422	-6		6
6	10,693.03	11,137.27	-444	-7		7
7	10,716.10	11,130.28	-414	-5		5
8	11,556.86	10,839.12	718	9	9	
9	12,973.37	13,254.17	-281	-3		3
10	11,080.47	11,341.12	-261	-2		2
11	10,307.63	11,240.75	-933	-10		10
Number of Pairs:	10	Sample Test Statistic (T+):		17	T+: 17	T-: 38
Alpha Error:	5% (2-sided)	T+ Statistic:		8,47		
d.f.:	9	Significant:		NO		

Table B-A-4: Eastern Site A – Mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Mailed (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Funnel-Syringe	Slow-Flow				
1	11,208.07	10,825.80	382	8	8	
2	12,485.22	11,986.20	499	9	9	
3	10,970.09	11,031.97	-62	-2		2
4	---	---	---			
5	10,961.36	10,918.24	43	1	1	
6	12,485.35	12,701.59	-216	-6		6
7	11,164.46	11,413.86	-249	-7		7
8	11,342.27	11,262.84	79	3	3	
9	13,256.35	14,566.41	-1310	10	10	
10	11,060.43	11,232.48	-172	-5		5
11	10,697.17	10,851.88	-155	-4		4
Number of Pairs:	10	Sample Test Statistic (T+):		31	T+: 31	T-: 24
Alpha Error:	5% (2-sided)	T+ Statistic:		8,47		
d.f.:	9	Significant:		NO		

Table B-B-1: Eastern Site B – Funnel-Syringe / Mailed vs. Non-m4ailed

Sample Run	Funnel-Syringe (pCi/L) Non-mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	11,330.29	11,009.58	321	8	8	
2	11,131.53	10,597.28	534	10	10	
3	11,175.68	11,229.29	-54	-3		3
4	11,112.78	11,192.99	-80	-5		5
5	11,351.65	11,256.86	95	6	6	
6	---	---	---			
7	11,449.69	11,863.37	-414	-9		9
8	11,667.88	11,602.47	65	4	4	
9	12,560.15	12,786.47	-226	-7		7
10	10,680.81	10,710.49	-30	-2		2
11	10,950.23	10,928.09	22	1	1	
Number of Pairs:	10	Sample Test Statistic (T+):		29	T+: 29	T-: 26
Alpha Error:	5% (2-sided)	T+ Statistic:		8,47		
d.f.:	9	Significant:		NO		

Table B-B-2: Eastern Site B – Slow-Flow / Mailed vs. Non-mailed

Sample Run	Slow-Flow (pCi/L) Non-mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	11,332.35	11,317.96	14	1	1	
2	11,498.82	11,802.02	-303	-8		8
3	11,797.57	11,780.86	17	2	2	
4	12,403.50	12,358.80	45	3	3	
5	11,479.35	11,427.59	52	4	4	
6	---	---	---			
7	11,734.88	12,026.50	-292	-7		7
8	11,750.40	12,100.36	-350	-9		9
9	13,284.35	12,925.80	359	10	10	
10	11,242.47	11,373.35	-131	-5		5
11	11,480.98	11,296.03	185	6	6	
Number of Pairs:	10	Sample Test Statistic (T+):		26	T+: 26	T-: 29
Alpha Error:	5% (2-sided)	T+ Statistic:		8,47		
d.f.:	9	Significant:		NO		

Table B-B-3: Eastern Site B – Non-mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Non-mailed (pCi/L) Funnel-Syringe	Slow-Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	11,330.29	11,332.35	-2	-1		1
2	11,131.53	11,498.82	-367	-5		5
3	11,175.68	11,797.57	-622	-8		8
4	11,112.78	12,403.50	-1291	-10		10
5	11,351.65	11,479.35	-128	-3		3
6	---	---	---			
7	11,449.69	11,734.88	-285	-4		4
8	11,667.88	11,750.40	-83	-2		2
9	12,560.15	13,284.35	-724	-9		9
10	10,680.81	11,242.47	-562	-7		7
11	10,950.23	11,480.98	-531	-6		6
Number of Pairs:	10	Sample Test Statistic (T+):		0	T+: 0	T-: 55
Alpha Error:	5% (2-sided)	T+ Statistic:		8,47		
d.f.:	9	Significant:		YES		

Table B-B-4: Eastern Site B – Mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Mailed (pCi/L) Funnel-Syringe	Slow-Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	11,009.58	11,317.96	-308	-4		4
2	10,597.28	11,802.02	-1205	-10		10
3	11,229.29	11,780.86	-552	-7		7
4	11,192.99	12,358.80	-1166	-9		9
5	11,256.86	11,427.59	-171	-3		3
6	---	---	---			
7	11,863.37	12,026.50	-163	-2		2
8	11,602.47	12,100.36	-496	-6		6
9	12,786.47	12,925.80	-139	-1		1
10	10,710.49	11,373.35	-663	-8		8
11	10,928.09	11,296.03	-368	-5		5
Number of Pairs:	10	Sample Test Statistic (T+):		0	T+: 0	T-: 55
Alpha Error:	5% (2-sided)	T+ Statistic:		8,47		
d.f.:	9	Significant:		YES		

Table B-C-1: Eastern Site C – Funnel-Syringe / Mailed vs. Non-mailed

Sample Run	Funnel-Syringe (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Non-mailed	Mailed				
1	21,202.20	21,368.54	-166	-4		4
2	24,928.91	24,039.56	889	7	7	
3	---	---	---			
4	17,085.75	16,124.66	961	8	8	
5	13,310.21	13,383.39	-73	-3		3
6	---	---	---			
7	20,510.10	20,542.96	-33	-1		1
8	21,690.81	22,061.33	-371	-5		5
9	26,449.02	25,296.25	1153	9	9	
10	20,730.43	20,276.03	454	6	6	
11	20,098.46	20,058.59	40	2	2	
Number of Pairs:	9	Sample Test Statistic (T+):		32	T+: 32	T-: 13
Alpha Error:	5% (2-sided)	T+ Statistic:		5,40		
d.f.:	8	Significant:		NO		

Table B-C-2: Eastern Site C – Slow-Flow / Mailed vs. Non-mailed

Sample Run	Slow-Flow (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Non-mailed	Mailed				
1	23,828.99	24,167.56	-339	-6		6
2	26,410.11	26,292.19	118	1	1	
3	---	---	---			
4	15,197.26	14,387.50	810	9	9	
5	13,216.65	12,880.19	336	5	5	
6	---	---	---			
7	22,247.46	21,996.54	251	3	3	
8	24,269.83	23,529.30	741	8	8	
9	28,492.73	28,346.16	147	2	2	
10	23,865.61	23,166.11	700	7	7	
11	21,902.06	21,592.26	310	4	4	
Number of Pairs:	9	Sample Test Statistic (T+):		39	T+: 39	T-: 6
Alpha Error:	5% (2-sided)	T+ Statistic:		5,40		
d.f.:	8	Significant:		NO		

Table B-C-3: Eastern Site C – Non-mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Non-mailed (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Funnel-Syringe	Slow-Flow				
1	21,202.20	23,828.99	-2627	-8		8
2	24,928.91	26,410.11	-1481	-2		2
3	---	---	---			
4	17,085.75	15,197.26	1888	5	5	
5	13,310.21	13,216.65	94	1	1	
6	---	---	---			
7	20,510.10	22,247.46	-1737	-3		3
8	21,690.81	24,269.83	-2579	-7		7
9	26,449.02	28,492.73	-2044	-6		9
10	20,730.43	23,865.61	-3135	-9		6
11	20,098.46	21,902.06	-1804	-4		4
Number of Pairs:	9	Sample Test Statistic (T+):		6	T+: 6	T-: 39
Alpha Error:	5% (2-sided)	T+ Statistic:		5,40		
d.f.:	8	Significant:		NO		

Table B-C-4: Eastern Site C – Mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Mailed (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Funnel-Syringe	Slow-Flow				
1	21,368.54	24,167.56	-2799	-7		7
2	24,039.56	26,292.19	-2253	-6		6
3	---	---	---			
4	16,124.66	14,387.50	1737	5	5	
5	13,383.39	12,880.19	503	1	1	
6	---	---	---			
7	20,542.96	21,996.54	-1454	-2		2
8	22,061.33	23,529.30	-1468	-3		3
9	25,296.25	28,346.16	-3050	-9		9
10	20,276.03	23,166.11	-2890	-8		8
11	20,058.59	21,592.26	-1534	-4		4
Number of Pairs:	9	Sample Test Statistic (T+):		6	T+: 6	T-: 39
Alpha Error:	5% (2-sided)	T+ Statistic:		5,40		
d.f.:	8	Significant:		NO		

Table B-D-1: Eastern Site D -- Funnel-Syringe / Mailed vs. Non-mailed

Sample Run	Funnel-Syringe (pCi/L) Non-mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	41,381.74	43,275.52	-1894	-9		9
3	38,627.53	38,278.17	349	3	3	
4	39,109.67	37,317.25	1792	7	7	
5	35,099.45	35,122.31	-23	-1		1
6	---	---	---			
7	33,712.26	31,863.18	1,849	8	8	
8	38,286.54	37,753.93	533	4	4	
9	44,362.96	44,166.21	197	2	2	
10	35,904.82	36,902.25	-997	-6		6
11	30,838.43	29,911.99	926	5	5	
Number of Pairs:	9	Sample Test Statistic (T+):		29	T+: 29	T-: 16
Alpha Error:	5% (2-sided)	T+ Statistic:		5,40		
d.f.:	8	Significant:		NO		

Table B-D-2: Eastern Site D -- Slow-Flow / Mailed vs. Non-mailed

Sample Run	Slow-Flow (pCi/L) Non-mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	45,375.47	44,862.89	513	4	4	
3	40,097.31	40,375.65	-278	-3		3
4	40,632.44	42,159.58	-1527	-8		8
5	40,773.58	39,902.47	871	5	5	
6	---	---	---			
7	37,402.37	34,344.46	3,058	9	9	
8	39,926.30	39,795.34	131	2	2	
9	48,206.96	47,022.88	1184	7	7	
10	34,119.95	34,997.80	-878	-6		6
11	34,054.11	34,181.91	-128	-1		1
Number of Pairs:	11	Sample Test Statistic (T+):		27	T+: 27	T-: 18
Alpha Error:	5% (2-sided)	T+ Statistic:		5,40		
d.f.:	10	Significant:		NO		

Table B-D-3: Eastern Site D -- Non-mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Non-mailed (pCi/L) Funnel-Syringe	Slow-Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	41,381.74	45,375.47	-3994	-8		8
3	38,627.53	40,097.31	-1470	-1		1
4	39,109.67	40,632.44	-1523	-2		2
5	35,099.45	40,773.58	-5674	-9		9
6	---	---	---			
7	33,712.26	37,402.37	-3690	-6		6
8	38,286.54	39,926.30	-1640	-3		3
9	44,362.96	48,206.96	-3844	-7		7
10	35,904.82	34,119.95	1785	4	4	
11	30,838.43	34,054.11	-3216	-5		5
Number of Pairs:	11	Sample Test Statistic (T+):		4	T+: 4	T-: 41
Alpha Error:	5% (2-sided)	T+ Statistic:		5,40		
d.f.:	10	Significant:		YES		

Table B-D-4: Eastern Site D -- Mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Mailed (pCi/L) Funnel-Syringe	Slow-Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	43,275.52	44,862.89	-1587	-1		1
3	38,278.17	40,375.65	-2097	-4		4
4	37,317.25	42,159.58	-4842	-9		9
5	35,122.31	39,902.47	-4780	-8		8
6	---	---	---			
7	31,863.18	34,344.46	-2481	-5		5
8	37,753.93	39,795.34	-2041	-3		3
9	44,166.21	47,022.88	-2857	-6		6
10	36,902.25	34,997.80	1904	2	2	
11	29,911.99	34,181.91	-4270	-7		7
Number of Pairs:	9	Sample Test Statistic (T+):		2	T+: 2	T-: 43
Alpha Error:	5% (2-sided)	T+ Statistic:		5,40		
d.f.:	8	Significant:		YES		

Table B–E–1: Western Site A – Funnel–Syringe / Non–mailed vs. Mailed

Sample Run	Funnel–Syringe (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Non–mailed	Mailed				
1	67,502.08	66,560.00	942	4	4	
2	25,952.06	26,718.05	–766	–3		3
3	36,926.17	38,230.00	–1304	–7		7
4	25,171.98	24,106.33	1066	5	5	
5	70,430.48	69,951.07	479	2	2	
6	66,274.84	67,347.96	–1073	–6		6
7	72,264.94	72,445.80	–181	–1		1
Number of Pairs:	7	Sample Test Statistic (T+):		11	T+: 11	T–: 17
Alpha Error:	5% (2–Sided)	T+ Statistic:		2,26		
d.f.:	6	Significant:		NO		

Table B–E–2: Western Site A – Slow–Flow / Non–mailed vs. Mailed

Sample Run	Slow–Flow (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Non–mailed	Mailed				
1	64,614.18	63,872.94	741	3	3	
2	26,122.23	26,001.90	120	1	1	
3	39,848.90	39,007.36	842	4	4	
4	25,090.19	23,763.67	1327	7	7	
5	71,587.78	72,440.04	–852	–5		5
6	68,617.14	67,546.26	1071	6	6	
7	72,204.32	71,613.89	590	2	2	
Number of Pairs:	7	Sample Test Statistic (T+):		23	T+: 23	T–: 5
Alpha Error:	5% (2–Sided)	T+ Statistic:		2,26		
d.f.:	6	Significant:		NO		

Table B–E–3: Western Site A – Non–mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Non–mailed (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Funnel–Syringe	Slow–Flow				
1	67,502.08	64,614.18	2,888	6	6	
2	25,952.06	26,122.23	–170	–3		3
3	36,926.17	39,848.90	–2923	7	7	
4	25,171.98	25,090.19	82	2	2	
5	70,430.48	71,587.78	–1157	–4		4
6	66,274.84	68,617.14	–2342	–5		5
7	72,264.94	72,204.32	61	1	1	
Number of Pairs:	7	Sample Test Statistic (T+):		16	T+: 16	T–: 12
Alpha Error:	5% (2–Sided)	T+ Statistic:		2,26		
d.f.:	6	Significant:		NO		

Table B–E–4: Western Site A – Mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Mailed (pCi/L)		Difference	Rank of the Difference	Positive Ranks	Negative Ranks
	Funnel–Syringe	Slow–Flow				
1	66,560.00	63,872.94	2,687	7	7	
2	26,718.05	26,001.90	716	3	3	
3	38,230.00	39,007.36	–777	–4		4
4	24,106.33	23,763.67	343	2	2	
5	69,951.07	72,440.04	–2489	–6		6
6	67,347.96	67,546.26	–198	–1		1
7	72,445.80	71,613.89	832	5	5	
Number of Pairs:	7	Sample Test Statistic (T+):		17	T+: 17	T–: 11
Alpha Error:	5% (2–Sided)	T+ Statistic:		2,26		
d.f.:	6	Significant:		NO		

Table B–F–1: Western Site B – Funnel–Syringe / Non–mailed vs. Mailed

Sample Run	Funnel–Syringe (pCi/L) Non–mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	26,900.28	26,218.46	682	5	5	
3	24,364.40	24,054.49	310	3	3	
4	26,974.40	26,305.62	669	4	4	
5	18,529.44	19,705.67	−1176	−6		6
6	28,073.29	28,075.48	−2	−1		1
7	31,187.17	31,359.22	−172	−2		2
Number of Pairs:	6	Sample Test Statistic (T+):		12	T+: 12	T−: 9
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		NO		

Table B–F–2: Western Site B – Slow–Flow / Non–mailed vs. Mailed

Sample Run	Slow–Flow (pCi/L) Non–mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	27,325.42	27,645.31	−320	−2		2
3	24,096.37	25,013.28	−915	−5		5
4	25,166.78	28,175.31	−3007	−6		6
5	19,557.13	19,888.33	−331	−3		3
6	29,623.19	29,806.57	−183	−1		1
7	33,136.05	32,502.50	634	4	4	
Number of Pairs:	6	Sample Test Statistic (T+):		4	T+: 4	T−: 17
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		NO		

Table B–F–3: Western Site B – Non–mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Non–mailed (pCi/L) Funnel–Syringe	Slow–Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	26,900.28	27,325.42	−425	−2		2
3	24,364.40	24,096.37	268	1	1	
4	26,974.40	25,166.78	1808	5	5	
5	18,529.44	19,557.13	−1028	−3		3
6	28,073.29	29,623.19	−1550	−4		4
7	31,187.17	33,136.05	−1949	−5		5
Number of Pairs:	6	Sample Test Statistic (T+):		6	T+: 6	T−: 15
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		NO		

Table B–F–4: Western Site B – Mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Mailed (pCi/L) Funnel–Syringe	Slow–Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	26,218.46	27,645.31	−1427	−4		4
3	24,054.49	25,013.28	−959	−2		2
4	26,305.62	28,175.31	−1870	−6		6
5	19,705.67	19,888.33	−183	−1		1
6	28,075.48	29,806.57	−1731	−5		5
7	31,359.22	32,502.50	−1143	−3		3
Number of Pairs:	6	Sample Test Statistic (T+):		0	T+: 0	T−: 21
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		YES		

Table B–G–1: Western Site C – Funnel–Syringe / Non–mailed vs. Mailed

Sample Run	Funnel–Syringe (pCi/L) Non–mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	20,579.53	19,865.72	714	6	6	
2	2,366.61	2,436.69	−72	−1		1
3	18,014.78	18,350.01	−335	−5		5
4	15,790.43	16,033.24	−243	−4		4
5	11,310.00	12,044.64	−735	−7		7
6	15,732.04	15,951.01	−219	−3		3
7	15,631.43	15,778.30	−147	−2		2
Number of Pairs:	7	Sample Test Statistic (T+):		6	T+: 6	T−: 22
Alpha Error:	5% (2–Sided)	T+ Statistic:		2,26		
d.f.:	6	Significant:		NO		

Table B–G–2: Western Site C – Slow–Flow / Non–mailed vs. Mailed

Sample Run	Slow–Flow (pCi/L) Non–mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	20,125.47	20,729.68	−604	−6		6
2	2,485.44	2,505.11	−20	−1		1
3	19,989.30	19,704.86	284	3	3	
4	18,286.87	17,706.91	580	5	5	
5	12,223.92	11,541.10	683	7	7	
6	16,844.36	16,825.44	−81	−2		2
7	17,341.58	17,055.02	287	4	4	
Number of Pairs:	7	Sample Test Statistic (T+):		19	T+: 19	T−: 9
Alpha Error:	5% (2–Sided)	T+ Statistic:		2,26		
d.f.:	6	Significant:		NO		

Table B–G–3: Western Site C – Non–mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Non–mailed (pCi/L) Funnel–Syringe	Slow–Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	20,579.53	20,125.47	454	2	2	
2	2,366.61	2,485.44	−119	−1		1
3	18,014.78	19,989.30	−1975	−6		6
4	15,790.43	18,286.87	−2496	−7		7
5	11,310.00	12,223.92	−914	−3		3
6	15,732.04	16,844.36	−1112	−4		4
7	15,631.43	17,341.58	−1710	−5		5
Number of Pairs:	7	Sample Test Statistic (T+):		2	T+: 2	T−: 26
Alpha Error:	5% (2–Sided)	T+ Statistic:		2,26		
d.f.:	6	Significant:		YES		

Table B–G–4: Western Site C – Mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Mailed (pCi/L) Funnel–Syringe	Slow–Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	19,865.72	20,729.68	−864	−3		3
2	2,436.69	2,505.11	−66	−1		1
3	18,350.01	19,704.86	−1355	−6		6
4	16,033.24	17,706.91	−1674	−7		7
5	12,044.64	11,541.10	504	2	2	
6	15,951.01	16,825.44	−974	−4		4
7	15,778.30	17,055.02	−1277	−5		5
Number of Pairs:	7	Sample Test Statistic (T+):		2	T+: 2	T−: 26
Alpha Error:	5% (2–Sided)	T+ Statistic:		2,26		
d.f.:	6	Significant:		YES		

Table B–H–1: Western Site D – Funnel–Syringe / Non–mailed vs. Mailed

Sample Run	Funnel–Syringe (pCi/L) Non–mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	5,497.86	4,821.35	677	4	4	
2	4,341.28	3,722.49	619	3	3	
3	12,292.51	10,898.60	1394	5	5	
4	55,602.01	53,432.40	2170	6	6	
5	24,856.05	24,701.54	155	1	1	
6	---	---	---			
7	14,825	14,652	174	2	2	
Number of Pairs:	6	Sample Test Statistic (T+):		21	T+: 21	T–: 0
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		YES		

Table B–H–2: Western Site D – Slow–Flow / Non–mailed vs. Mailed

Sample Run	Slow–Flow (pCi/L) Non–mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	5,840.92	5,155.83	685	5	5	
2	4,418.12	4,264.69	153	2	2	
3	14,863.58	13,206.24	1657	6	6	
4	60,006.81	59,438.34	568	4	4	
5	26,545.59	26,108.94	437	3	3	
6	---	---	---			
7	16,325.38	16,286.24	39	1	1	
Number of Pairs:	6	Sample Test Statistic (T+):		21	T+: 21	T–: 0
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		YES		

Table B–H–3: Western Site D – Non–mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Non–mailed (pCi/L) Funnel–Syringe	Slow–Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	5,497.86	5,840.92	–343	–2		2
2	4,341.28	4,418.12	–77	–1		1
3	12,292.51	14,863.58	–2571	–5		5
4	55,602.01	60,006.81	–4405	–6		6
5	24,856.05	26,545.59	–1690	–4		4
6	---	---	---			
7	14,825.27	16,325.38	–1500	–3		3
Number of Pairs:	6	Sample Test Statistic (T+):		0	T+: 0	T–: 21
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		YES		

Table B–H–4: Western Site D – Mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Mailed (pCi/L) Funnel–Syringe	Slow–Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	4,821.35	5,155.83	–334	–1		1
2	3,722.49	4,264.69	–542	–2		2
3	10,898.60	13,206.24	–2308	–5		5
4	53,432.40	59,438.34	–6006	–6		6
5	24,701.54	26,108.94	–1407	–3		3
6	---	---	---			
7	14,651.65	16,286.24	–1635	–4		4
Number of Pairs:	6	Sample Test Statistic (T+):		0	T+: 0	T–: 21
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		YES		

Table B–I–1: Western Site E – Funnel–Syringe / Non–mailed vs. Mailed

Sample Run	Funnel–Syringe (pCi/L) Non–mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	82,821.43	84,491.11	−1670	−4		4
3	76,908.05	78,016.16	−1108	−3		3
4	86,029.88	88,815.99	−2786	−6		6
5	69,065.08	69,709.66	−645	−1		1
6	72,358.60	74,569.35	−2211	−5		5
7	65,674.93	64,986.61	688	2	2	
Number of Pairs:	6	Sample Test Statistic (T+):		2	T+: 2	T−: 19
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		NO		

Table B–I–2: Western Site E – Slow–Flow / Non–mailed vs. Mailed

Sample Run	Slow–Flow (pCi/L) Non–mailed	Mailed	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	83,873.31	80,779.93	3093	5	5	
3	77,030.29	76,630.51	400	2	2	
4	77,767.78	77,911.84	−144	−1		1
5	69,791.28	65,808.57	3983	6	6	
6	75,103.22	72,521.36	2582	4	4	
7	64,726.11	63,760.11	966	3	3	
Number of Pairs:	6	Sample Test Statistic (T+):		20	T+: 20	T−: 1
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		NO		

Table B–I–3: Western Site E – Non–mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Non–mailed (pCi/L) Funnel–Syringe	Slow–Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	82,821	83,873	−1052	−4		4
3	76,908	77,030	−122	−1		1
4	86,030	77,768	8262	6	6	
5	69,065	69,791	−726	−2		2
6	72,359	75,103	−2745	−5		5
7	65,675	64,726	949	3	3	
Number of Pairs:	6	Sample Test Statistic (T+):		9	T+: 9	T−: 12
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		NO		

Table B–I–4: Western Site E – Mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Mailed (pCi/L) Funnel–Syringe	Slow–Flow	Difference	Rank of the Difference	Positive Ranks	Negative Ranks
1	---	---	---			
2	84,491.11	80,779.93	3711	4	4	
3	78,016.16	76,630.51	1386	2	2	
4	88,815.99	77,911.84	10904	6	6	
5	69,709.66	65,808.57	3901	5	5	
6	74,569.35	72,521.36	2048	3	3	
7	64,986.61	63,760.11	1227	1	1	
Number of Pairs:	6	Sample Test Statistic (T+):		21	T+: 21	T−: 0
Alpha Error:	5% (2–Sided)	T+ Statistic:		0,21		
d.f.:	5	Significant:		YES		

APPENDIX C:

Paired t Tests

Table C-A-1: Eastern Site A – Funnel-Syringe / Non-mailed vs. Mailed

Sample Run	Funnel-Syringe (pCi/L)		Difference	Deviation
	Non-mailed	Mailed		
1	11,545.98	11,208.07	337.91	-663.37
2	12,112.91	12,485.22	-372.31	46.85
3	10,906.29	10,970.09	-63.80	-281.66
4	---	---	---	---
5	10,483.49	10,961.36	-477.87	152.41
6	10,693.03	12,485.35	-1792.32	1466.86
7	10,716.10	11,164.46	-448.36	122.90
8	11,556.86	11,342.27	214.59	-540.05
9	12,973.37	13,256.35	-282.98	-42.48
10	11,060.47	11,060.43	20.04	-345.50
11	10,307.63	10,697.17	-389.54	64.08
Number of Pairs:		10	Alpha Error:	5% (2-sided)
Mean Difference:		-325.46	d.f.:	9
Standard Deviation of Differences:		586.56	t Statistic (+/-):	2.2622
Sample Test Statistic (t):		-1.75	Significant:	NO

Table C-A-2: Eastern Site A – Slow-Flow / Non-mailed vs. Mailed

Sample Run	Slow-Flow (pCi/L)		Difference	Deviation
	Non-mailed	Mailed		
1	11,036.11	10,825.80	212.31	-466.95
2	12,144.26	11,966.20	158.06	-412.70
3	11,214.55	11,031.97	182.58	-437.22
4	---	---	---	---
5	10,905.26	10,918.24	-12.98	-241.66
6	11,137.27	12,701.59	-1564.32	1309.66
7	11,130.26	11,413.86	-283.58	28.94
8	10,839.12	11,262.84	-423.72	169.08
9	13,254.17	14,566.41	-1312.24	1057.60
10	11,341.12	11,232.48	108.64	-363.26
11	11,240.75	10,851.88	388.87	-643.51
Number of Pairs:		10	Alpha Error:	5% (2-sided)
Mean Difference:		-254.64	d.f.:	9
Standard Deviation of Differences:		670.59	t Statistic (+/-):	2.2622
Sample Test Statistic (t):		-1.20	Significant:	NO

Table C-A-3: Eastern Site A – Non-mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Non-mailed (pCi/L)		Difference	Deviation
	Funnel-Syringe	Slow-Flow		
1	11,545.98	11,038.11	507.87	-894.75
2	12,112.91	12,144.26	-31.35	-155.53
3	10,906.29	11,214.55	-308.26	121.36
4	---	---	---	---
5	10,483.49	10,905.26	-421.77	234.89
6	10,693.03	11,137.27	-444.24	257.36
7	10,716.10	11,130.28	-414.18	227.30
8	11,556.86	10,839.12	717.74	-904.62
9	12,973.37	13,254.17	-280.80	93.92
10	11,060.47	11,341.12	-280.65	73.77
11	10,307.63	11,240.75	-933.12	746.24
Number of Pairs:		10	Alpha Error:	5% (2-sided)
Mean Difference:		-186.88	d.f.:	9
Standard Deviation of Differences:		481.22	t Statistic (+/-):	2.2622
Sample Test Statistic (t):		-1.23	Significant:	NO

Table C-A-4: Eastern Site A – Mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Mailed (pCi/L)		Difference	Deviation
	Funnel-Syringe	Slow-Flow		
1	11208.07	10825.80	382.27	-496.32
2	12485.22	11966.20	499.02	-615.07
3	10970.09	11031.97	-61.88	-54.17
4	---	---	---	---
5	10961.36	10918.24	43.12	-159.17
6	12485.35	12701.59	-216.24	100.19
7	11164.46	11413.86	-249.40	133.35
8	11342.27	11262.84	79.43	-195.48
9	13256.35	14566.41	-1310.06	1194.01
10	11060.43	11232.48	-172.05	56.00
11	10697.17	10851.88	-154.71	38.66
Number of Pairs:		10	Alpha Error:	5% (2-sided)
Mean Difference:		-116.05	d.f.:	9
Standard Deviation of Differences:		486.90	t Statistic (+/-):	2.2622
Sample Test Statistic (t):		-0.75	Significant:	NO

Table C-B-1: Eastern Site B – Funnel-Syringe / Non-mailed vs. Mailed

Sample Run	Funnel-Syringe (pCi/L)		Difference	Deviation
	Non-mailed	Mailed		
1	11,330.29	11,009.58	320.71	-295.59
2	11,131.53	10,597.28	534.25	-509.13
3	11,175.68	11,229.29	-53.61	78.73
4	11,112.78	11,192.99	-80.21	105.33
5	11,351.65	11,256.86	94.79	-69.67
6	---	---	---	---
7	11,449.69	11,863.37	-413.68	438.80
8	11,667.86	11,602.47	65.41	-40.29
9	12,560.15	12,766.47	-206.32	233.44
10	10,660.17	10,710.49	-30.32	55.44
11	10,950.23	10,928.09	22.14	2.96
Number of Pairs:		10	Alpha Error:	5% (2-sided)
Mean Difference:		25.12	d.f.:	9
Standard Deviation of Differences:		262.57	t Statistic (+/-):	2.2622
Sample Test Statistic (t):		0.30	Significant:	NO

Table C-B-2: Eastern Site B – Slow-Flow / Non-mailed vs. Mailed

Sample Run	Slow-Flow (pCi/L)		Difference	Deviation
	Non-mailed	Mailed		
1	11,332.35	11,317.98	14.37	-54.83
2	11,496.82	11,802.02	-303.20	262.74
3	11,797.57	11,780.86	16.71	-57.17
4	12,403.50	12,358.80	44.70	-85.16
5	11,479.35	11,427.59	51.76	-92.22
6	---	---	---	---
7	11,734.68	12,026.50	-291.82	251.16
8	11,750.40	12,100.36	-349.96	309.50
9	13,264.35	12,925.80	356.55	-399.01
10	11,242.47	11,373.35	-130.88	90.42
11	11,480.98	11,296.03	184.95	-225.41
Number of Pairs:		10	Alpha Error:	5% (2-sided)
Mean Difference:		-40.46	d.f.:	9
Standard Deviation of Differences:		226.07	t Statistic (+/-):	2.2622
Sample Test Statistic (t):		-0.56	Significant:	NO

Table C-B-3: Eastern Site B – Non-mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Non-mailed (pCi/L)		Difference	Deviation
	Funnel-Syringe	Slow-Flow		
1	11,330.29	11,332.35	-2.06	-457.40
2	11,131.53	11,496.82	-367.29	-92.17
3	11,175.68	11,797.57	-621.89	162.43
4	11,112.78	12,403.50	-1290.72	831.26
5	11,351.65	11,479.35	-127.70	-331.76
6	---	---	---	---
7	11,449.69	11,734.88	-285.19	-174.27
8	11,667.86	11,750.40	-82.52	-376.94
9	12,560.15	13,264.35	-724.20	264.74
10	10,660.17	11,242.47	-582.30	102.64
11	10,950.23	11,480.98	-530.75	71.29
Number of Pairs:		10	Alpha Error:	5% (2-sided)
Mean Difference:		-459.46	d.f.:	9
Standard Deviation of Differences:		380.55	t Statistic (+/-):	2.2622
Sample Test Statistic (t):		-3.82	Significant:	YES

Table C-B-4: Eastern Site B – Mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Mailed (pCi/L)		Difference	Deviation
	Funnel-Syringe	Slow-Flow		
1	11009.58	11317.98	-308.40	-216.64
2	10597.28	11802.02	-1204.74	679.70
3	11229.29	11780.86	-551.57	26.53
4	11192.99	12358.80	-1165.81	640.77
5	11256.86	11427.59	-170.73	-354.31
6	---	---	---	---
7	11863.37	12026.50	-163.13	-361.91
8	11602.47	12100.36	-497.89	-27.15
9	12766.47	12925.80	-157.33	-367.71
10	10710.49	11373.35	-662.86	137.82
11	10928.09	11296.03	-367.94	-157.10
Number of Pairs:		10	Alpha Error:	5% (2-sided)
Mean Difference:		-525.04	d.f.:	9
Standard Deviation of Differences:		366.21	t Statistic (+/-):	2.2622
Sample Test Statistic (t):		-4.26	Significant:	YES

Table C-C-1: Eastern Site C – Funnel-Syringe / Non-mailed vs. Mailed

Sample Run	Funnel-Syringe (pCi/L)		Difference	Deviation
	Non-mailed	Mailed		
1	21,202.20	21,366.54	-166.34	483.52
2	24,928.91	24,039.56	889.35	-572.17
3	---	---	---	---
4	17,065.75	16,124.66	961.09	-643.91
5	13,310.21	13,383.39	-73.18	390.36
6	---	---	---	---
7	20,510.10	20,542.96	-32.86	350.04
8	21,690.81	22,061.33	-370.52	687.70
9	26,449.02	25,296.25	1152.77	-635.59
10	20,730.43	20,276.03	454.40	-137.22
11	20,096.46	20,058.59	39.87	277.31
Number of Pairs:		9	Alpha Error:	5% (2-sided)
Mean Difference:		317.18	d.f.:	8
Standard Deviation of Differences:		560.98	t Statistic (+/-):	2.306
Sample Test Statistic (t):		1.70	Significant:	NO

Table C-C-2: Eastern Site C – Slow-Flow / Non-mailed vs. Mailed

Sample Run	Slow-Flow (pCi/L)		Difference	Deviation
	Non-mailed	Mailed		
1	23,828.99	24,167.56	-338.57	660.00
2	26,410.11	26,292.19	117.92	223.51
3	---	---	---	---
4	15,197.26	14,387.50	809.76	-468.33
5	13,216.65	12,880.19	336.46	4.97
6	---	---	---	---
7	22,247.46	21,996.54	250.92	90.51
8	24,269.83	23,529.30	740.53	-399.10
9	26,492.73	26,346.16	146.57	194.86
10	23,865.61	23,166.11	699.50	-358.07
11	21,902.06	21,592.26	309.80	31.63
Number of Pairs:		9	Alpha Error:	5% (2-sided)
Mean Difference:		341.43	d.f.:	8
Standard Deviation of Differences:		365.10	t Statistic (+/-):	2.306
Sample Test Statistic (t):		2.81	Significant:	YES

Table C-C-3: Eastern Site C – Non-mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Non-mailed (pCi/L)		Difference	Deviation
	Funnel-Syringe	Slow-Flow		
1	21,202.20	23,828.99	-2626.79	1136.14
2	24,928.91	26,410.11	-1481.20	-10.45
3	---	---	---	---
4	17,065.75	15,197.26	1868.49	-3360.14
5	13,310.21	13,216.65	93.56	-1585.21
6	---	---	---	---
7	20,510.10	22,247.46	-1737.36	245.71
8	21,690.81	24,269.83	-2579.02	1087.37
9	26,449.02	26,492.73	-2043.71	552.06
10	20,730.43	23,865.61	-3135.18	1643.53
11	20,096.46	21,902.06	-1803.60	311.95
Number of Pairs:		9	Alpha Error:	5% (2-sided)
Mean Difference:		-1491.65	d.f.:	8
Standard Deviation of Differences:		1564.17	t Statistic (+/-):	2.306
Sample Test Statistic (t):		-2.86	Significant:	YES

Table C-C-4: Eastern Site C – Mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Mailed (pCi/L)		Difference	Deviation
	Funnel-Syringe	Slow-Flow		
1	21,366.54	24,167.56	-2799.02	1331.63
2	24,039.56	26,292.19	-2252.63	785.24
3	---	---	---	---
4	16,124.66	14,387.50	1737.16	-3204.55
5	13,383.39	12,880.19	503.20	-1970.59
6	---	---	---	---
7	20,542.96	21,996.54	-1453.58	-13.81
8	22,061.33	23,529.30	-1467.97	0.58
9	25,296.25	26,346.16	-3049.91	1582.52
10	20,276.03	23,166.11	-2890.08	1422.69
11	20,058.59	21,592.26	-1533.67	66.26
Number of Pairs:		9	Alpha Error:	5% (2-sided)
Mean Difference:		-1467.39	d.f.:	8
Standard Deviation of Differences:		1623.06	t Statistic (+/-):	2.306
Sample Test Statistic (t):		-2.71	Significant:	YES

Table C-D-1: Eastern Site D – Funnel-Syringe / Non-mailed vs. Mailed

Sample Run	Funnel-Syringe (pCi/L) Non-mailed	Mailed	Difference	Deviation
1	---	---	---	---
2	41,361.74	43,275.52	-1893.78	2197.40
3	38,627.53	38,278.17	349.36	-45.74
4	39,109.67	37,317.25	1792.42	-1486.80
5	35,099.45	35,122.31	-22.86	326.48
6	---	---	---	---
7	33,712.26	31,863.18	1849.08	-1545.48
8	38,298.54	37,753.93	532.61	-228.99
9	44,362.98	44,166.21	196.77	106.85
10	35,904.82	36,902.25	-997.43	1301.05
11	30,838.43	29,911.99	926.44	-622.82
Number of Pairs:		9	Alpha Error:	5% (2-sided)
Mean Difference:		303.62	d.f.:	8
Standard Deviation of Differences:		1208.65	t Statistic (+/-):	2.306
Sample Test Statistic (t):		0.75	Significant:	NO

Table C-D-2: Eastern Site D – Slow-Flow / Non-mailed vs. Mailed

Sample Run	Slow-Flow (pCi/L) Non-mailed	Mailed	Difference	Deviation
1	---	---	---	---
2	45,375.47	44,862.89	512.58	-185.30
3	40,097.31	40,375.65	-278.34	606.62
4	40,632.44	42,159.58	-1527.14	1854.42
5	40,773.58	39,902.47	871.11	-543.83
6	---	---	---	---
7	37,402.37	34,344.46	3057.91	-2730.63
8	39,926.30	39,795.34	130.96	196.32
9	48,206.96	47,022.88	1184.10	-856.82
10	34,119.95	34,997.80	-877.85	1205.13
11	34,054.11	34,181.91	-127.80	455.06
Number of Pairs:		9	Alpha Error:	5% (2-sided)
Mean Difference:		327.26	d.f.:	8
Standard Deviation of Differences:		1324.02	t Statistic (+/-):	2.306
Sample Test Statistic (t):		0.74	Significant:	NO

Table C-D-3: Eastern Site D – Non-mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Non-mailed (pCi/L) Funnel-Syringe	Slow-Flow	Difference	Deviation
1	---	---	---	---
2	41,361.74	45,375.47	-3993.73	1408.72
3	38,627.53	40,097.31	-1469.78	-1115.23
4	39,109.67	40,632.44	-1522.77	-1062.24
5	35,099.45	40,773.58	-5674.13	3089.12
6	---	---	---	---
7	33,712.26	37,402.37	-3690.11	1105.10
8	38,298.54	39,926.30	-1639.76	-945.25
9	44,362.98	48,206.98	-3844.00	1258.99
10	35,904.82	34,119.95	1784.87	-4369.88
11	30,838.43	34,054.11	-3215.68	630.67
Number of Pairs:		9	Alpha Error:	5% (2-sided)
Mean Difference:		-2585.01	d.f.:	8
Standard Deviation of Differences:		2153.27	t Statistic (+/-):	2.306
Sample Test Statistic (t):		-3.60	Significant:	YES

Table C-D-4: Eastern Site D – Mailed / Funnel-Syringe vs. Slow-Flow

Sample Run	Mailed (pCi/L) Funnel-Syringe	Slow-Flow	Difference	Deviation
1	---	---	---	---
2	43,275.52	44,862.89	-1587.37	-499.55
3	38,278.17	40,375.65	-2097.48	10.56
4	37,317.25	42,159.58	-4842.33	2755.41
5	35,122.31	39,902.47	-4780.16	2693.24
6	---	---	---	---
7	31,863.18	34,344.46	-2481.28	394.36
8	37,753.93	39,795.34	-2041.41	-45.51
9	44,166.21	47,022.88	-2856.67	769.75
10	36,902.25	34,997.80	1904.45	-3991.37
11	0.00	0.00	0.00	-2086.92
Number of Pairs:		9	Alpha Error:	5% (2-sided)
Mean Difference:		-2086.92	d.f.:	8
Standard Deviation of Differences:		2125.20	t Statistic (+/-):	2.306
Sample Test Statistic (t):		-2.95	Significant:	YES

Table C–E–1: Western Site A – Funnel–Syringe / Non–mailed vs. Mailed

Sample Run	Funnel–Syringe (pCi/L)		Difference	Deviation
	Non–mailed	Mailed		
1	67,502.08	66,560.40	941.68	–1061.26
2	25,952.06	26,718.05	–765.99	646.41
3	36,926.17	38,230.00	–1303.83	1184.25
4	25,171.98	24,106.33	1065.65	–1185.23
5	70,430.48	69,951.07	479.41	–598.99
6	66,274.84	67,347.96	–1073.12	953.54
7	72,264.94	72,445.80	–180.86	61.28
Number of Pairs:		7	Alpha Error:	5% (2–sided)
Mean Difference:		–119.58	d.f.:	6
Standard Deviation of Differences:		968.08	t Statistic (+/–):	2.4469
Sample Test Statistic (t):		–0.33	Significant:	NO

Table C–E–2: Western Site A – Slow–Flow / Non–mailed vs. Mailed

Sample Run	Slow–Flow (pCi/L)		Difference	Deviation
	Non–mailed	Mailed		
1	64,614.18	63,872.94	741.24	–192.86
2	26,122.23	26,001.90	120.33	428.05
3	39,848.90	39,007.36	841.54	–293.16
4	25,090.19	23,763.67	1326.52	–778.14
5	71,587.78	72,440.04	–852.26	1400.64
6	68,617.14	67,546.26	1070.88	–522.50
7	72,204.32	71,613.89	590.43	–42.05
Number of Pairs:		7	Alpha Error:	5% (2–sided)
Mean Difference:		548.38	d.f.:	6
Standard Deviation of Differences:		724.39	t Statistic (+/–):	2.4469
Sample Test Statistic (t):		2.00	Significant:	NO

Table C–E–3: Western Site A – Non–mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Non–mailed (pCi/L)		Difference	Deviation
	Funnel–Syringe	Slow–Flow		
1	67,502.08	64,614.18	2887.90	–3396.78
2	25,952.06	26,122.23	–170.17	–338.71
3	36,926.17	39,848.90	–2922.73	2413.85
4	25,171.98	25,090.19	81.79	–590.67
5	70,430.48	71,587.78	–1157.30	648.42
6	66,274.84	68,617.14	–2342.30	1833.42
7	72,264.94	72,204.32	60.62	–569.50
Number of Pairs:		7	Alpha Error:	5% (2–sided)
Mean Difference:		–508.88	d.f.:	6
Standard Deviation of Differences:		1912.01	t Statistic (+/–):	2.4469
Sample Test Statistic (t):		–0.70	Significant:	NO

Table C–E–4: Western Site A – Mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Mailed (pCi/L)		Difference	Deviation
	Funnel–Syringe	Slow–Flow		
1	66,560.40	63,872.94	2687.46	–2528.38
2	26,718.05	26,001.90	716.15	–557.07
3	38,230.00	39,007.36	–777.36	936.44
4	24,106.33	23,763.67	342.66	–183.58
5	69,951.07	72,440.04	–2488.97	2648.05
6	67,347.96	67,546.26	–198.30	357.38
7	72,445.80	71,613.89	831.91	–672.83
Number of Pairs:		7	Alpha Error:	5% (2–sided)
Mean Difference:		159.08	d.f.:	6
Standard Deviation of Differences:		1591.97	t Statistic (+/–):	2.4469
Sample Test Statistic (t):		0.26	Significant:	NO

Table C–F–1: Western Site B – Funnel–Syringe / Non–mailed vs. Mailed

Sample Run	Funnel–Syringe (pCi/L) Non–mailed	Mailed	Difference	Deviation
1	------	------	------	------
2	26,900.28	26,218.46	681.82	–630.15
3	24,364.40	24,054.49	309.91	–258.24
4	26,974.40	26,305.62	668.78	–617.11
5	18,529.44	19,705.67	–1176.23	1227.90
6	28,073.29	28,075.48	–2.19	53.86
7	31,187.17	31,359.22	–172.05	223.72
Number of Pairs:		6	Alpha Error:	5% (2–sided)
Mean Difference:		51.67	d.f.:	5
Standard Deviation of Differences:		693.58	t Statistic (+/–):	2.5706
Sample Test Statistic (t):		0.18	Significant:	NO

Table C–F–2: Western Site B – Slow–Flow / Non–mailed vs. Mailed

Sample Run	Slow–Flow (pCi/L) Non–mailed	Mailed	Difference	Deviation
1	------	------	------	------
2	27,325.42	27,645.31	–319.89	–367.17
3	24,098.37	25,013.28	–914.91	227.85
4	25,168.78	28,175.31	–3006.53	2319.47
5	19,557.13	19,888.33	–331.20	–355.86
6	29,623.19	29,806.57	–183.38	–503.68
7	33,136.05	32,502.50	633.55	–1320.61
Number of Pairs:		6	Alpha Error:	5% (2–sided)
Mean Difference:		–687.06	d.f.:	5
Standard Deviation of Differences:		1240.24	t Statistic (+/–):	2.5706
Sample Test Statistic (t):		–1.36	Significant:	NO

Table C–F–3: Western Site B – Non–mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Non–mailed (pCi/L) Funnel–Syringe	Slow–Flow	Difference	Deviation
1	------	------	------	------
2	26,900.28	27,325.42	–425.14	–54.85
3	24,364.40	24,098.37	266.03	–746.02
4	26,974.40	25,168.78	1805.62	–2285.61
5	18,529.44	19,557.13	–1027.69	547.70
6	28,073.29	29,623.19	–1549.90	1069.91
7	31,187.17	33,136.05	–1948.88	1468.89
Number of Pairs:		6	Alpha Error:	5% (2–sided)
Mean Difference:		–479.99	d.f.:	5
Standard Deviation of Differences:		1370.10	t Statistic (+/–):	2.5706
Sample Test Statistic (t):		–0.86	Significant:	NO

Table C–F–4: Western Site B – Mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Mailed (pCi/L) Funnel–Syringe	Slow–Flow	Difference	Deviation
1	------	------	------	------
2	26,218.46	27,645.31	–1426.85	208.12
3	24,054.49	25,013.28	–958.79	–259.94
4	26,305.62	28,175.31	–1869.69	650.96
5	19,705.67	19,888.33	–182.66	–1036.07
6	28,075.48	29,806.57	–1731.09	512.36
7	31,359.22	32,502.50	–1143.28	–75.45
Number of Pairs:		6	Alpha Error:	5% (2–sided)
Mean Difference:		–1218.73	d.f.:	5
Standard Deviation of Differences:		612.58	t Statistic (+/–):	2.5706
Sample Test Statistic (t):		–4.87	Significant:	YES

Table C–G–1: Western Site C – Funnel–Syringe / Non–mailed vs. Mailed

Sample Run	Funnel–Syringe (pCi/L)		Difference	Deviation
	Non–mailed	Mailed		
1	20,579.53	19,865.72	713.81	−861.92
2	2,366.61	2,438.69	−72.08	−76.03
3	18,014.78	18,350.01	−335.23	187.12
4	15,790.43	16,033.24	−242.81	94.70
5	11,310.00	12,044.64	−734.64	586.53
6	15,732.04	15,951.01	−218.97	70.86
7	15,631.43	15,778.30	−146.87	−1.24
Number of Pairs:		7	Alpha Error:	5% (2–sided)
Mean Difference:		−148.11	d.f.:	6
Standard Deviation of Differences:		436.22	t Statistic (+/−):	2.4469
Sample Test Statistic (t):		−0.90	Significant:	NO

Table C–G–2: Western Site C – Slow–Flow / Non–mailed vs. Mailed

Sample Run	Slow–Flow (pCi/L)		Difference	Deviation
	Non–mailed	Mailed		
1	20,125.47	20,729.68	−604.21	765.47
2	2,485.44	2,505.11	−19.67	180.93
3	19,989.30	19,704.86	284.44	−123.18
4	18,286.87	17,706.91	579.96	−418.70
5	12,223.92	11,541.10	682.82	−521.56
6	16,844.36	16,925.44	−81.08	242.34
7	17,341.58	17,055.02	286.56	−125.30
Number of Pairs:		7	Alpha Error:	5% (2–sided)
Mean Difference:		161.26	d.f.:	6
Standard Deviation of Differences:		438.87	t Statistic (+/−):	2.4469
Sample Test Statistic (t):		0.97	Significant:	NO

Table C–G–3: Western Site C – Non–mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Non–mailed (pCi/L)		Difference	Deviation
	Funnel–Syringe	Slow–Flow		
1	20,579.53	20,125.47	454.06	−1578.65
2	2,366.61	2,485.44	−118.83	−1005.76
3	18,014.78	19,989.30	−1974.52	849.93
4	15,790.43	18,286.87	−2496.44	1371.85
5	11,310.00	12,223.92	−913.92	−210.67
6	15,732.04	16,844.36	−1112.32	−12.27
7	15,631.43	17,341.58	−1710.15	585.56
Number of Pairs:		7	Alpha Error:	5% (2–sided)
Mean Difference:		−1124.59	d.f.:	6
Standard Deviation of Differences:		1040.47	t Statistic (+/−):	2.4469
Sample Test Statistic (t):		−2.86	Significant:	YES

Table C–G–4: Western Site C – Mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Mailed (pCi/L)		Difference	Deviation
	Funnel–Syringe	Slow–Flow		
1	19,865.72	20,729.68	−863.96	48.74
2	2,438.69	2,505.11	−66.42	−748.80
3	18,350.01	19,704.86	−1354.85	539.63
4	16,033.24	17,706.91	−1673.67	858.45
5	12,044.64	11,541.10	503.54	−1318.76
6	15,951.01	16,925.44	−974.43	159.21
7	15,778.30	17,055.02	−1276.72	461.50
Number of Pairs:		7	Alpha Error:	5% (2–sided)
Mean Difference:		−815.22	d.f.:	6
Standard Deviation of Differences:		771.22	t Statistic (+/−):	2.4469
Sample Test Statistic (t):		−2.80	Significant:	YES

Table C–H–1: Western Site D – Funnel–Syringe / Non–mailed vs. Mailed

Sample Run	Funnel–Syringe (pCi/L)		Difference	Deviation
	Non–mailed	Mailed		
1	5,497.86	4,821.35	676.51	187.98
2	4,341.28	3,722.49	618.79	245.70
3	12,292.51	10,898.60	1393.91	–529.42
4	55,602.01	53,432.40	2169.61	–1305.12
5	24,856.05	24,701.54	154.51	709.98
6	------	------	------	------
7	14,825.27	14,651.65	173.62	690.87

Number of Pairs:	6	Alpha Error:	5% (2–sided)
Mean Difference:	864.49	d.f.:	5
Standard Deviation of Differences:	885.70	t Statistic (+/–):	2.5706
Sample Test Statistic (t):	2.39	Significant:	NO

Table C–H–2: Western Site D – Slow–Flow / Non–mailed vs. Mailed

Sample Run	Slow–Flow (pCi/L)		Difference	Deviation
	Non–mailed	Mailed		
1	5,840.92	5,155.83	685.09	–95.07
2	4,418.12	4,264.69	153.43	436.59
3	14,863.58	13,206.24	1657.34	–1067.32
4	60,006.81	59,438.34	568.47	21.55
5	26,545.59	26,108.94	436.65	153.37
6	------	------	------	------
7	16,325.38	16,286.24	39.14	550.88

Number of Pairs:	6	Alpha Error:	5% (2–sided)
Mean Difference:	590.02	d.f.:	5
Standard Deviation of Differences:	626.51	t Statistic (+/–):	2.5706
Sample Test Statistic (t):	2.31	Significant:	NO

Table C–H–3: Western Site D – Non–mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Non–mailed (pCi/L)		Difference	Deviation
	Funnel–Syringe	Slow–Flow		
1	5,497.86	5,840.92	–343.06	–1421.18
2	4,341.28	4,418.12	–76.84	–1687.40
3	12,292.51	14,863.58	–2571.07	806.83
4	55,602.01	60,006.81	–4404.80	2640.56
5	24,856.05	26,545.59	–1689.54	–74.70
6	------	------	------	------
7	14,825.27	16,325.38	–1500.11	–264.13

Number of Pairs:	6	Alpha Error:	5% (2–sided)
Mean Difference:	–1764.24	d.f.:	5
Standard Deviation of Differences:	1796.40	t Statistic (+/–):	2.5706
Sample Test Statistic (t):	–2.41	Significant:	NO

Table C–H–4: Western Site D – Mailed / Funnel–Syringe vs. S4low–Flow

Sample Run	Mailed (pCi/L)		Difference	Deviation
	Funnel–Syringe	Slow–Flow		
1	4,821.35	5,155.83	–334.48	–1704.23
2	3,722.49	4,264.69	–542.20	–1496.51
3	10,898.60	13,206.24	–2307.64	268.93
4	53,432.40	59,438.34	–6005.94	3967.23
5	24,701.54	26,108.94	–1407.40	–631.31
6	------	------	------	------
7	14,651.65	16,286.24	–1634.59	–404.12

Number of Pairs:	6	Alpha Error:	5% (2–sided)
Mean Difference:	–2038.71	d.f.:	5
Standard Deviation of Differences:	2285.42	t Statistic (+/–):	2.5706
Sample Test Statistic (t):	–2.19	Significant:	NO

Table C–I–1: Western Site E – Funnel–Syringe / Non–mailed vs. Mailed

Sample Run	Funnel–Syringe (pCi/L)		Difference	Deviation
	Non–mailed	Mailed		
1	------	------	------	------
2	82,821.43	84,491.11	–1669.68	381.20
3	76,908.05	78,016.16	–1108.11	–180.38
4	86,029.88	88,815.99	–2786.11	1497.63
5	69,065.08	69,709.66	–644.58	–643.91
6	72,358.60	74,569.35	–2210.75	922.27
7	65,674.93	64,986.61	688.32	–1976.80

Number of Pairs:	6	Alpha Error:	5% (2–sided)
Mean Difference:	–1288.48	d.f.:	5
Standard Deviation of Differences:	1232.37	t Statistic (+/–):	2.5706
Sample Test Statistic (t):	–2.56	Significant:	NO

Table C–I–2: Western Site E – Slow–Flow / Non–mailed vs. Mailed

Sample Run	Slow–Flow (pCi/L)		Difference	Deviation
	Non–mailed	Mailed		
1	------	------	------	------
2	83,873.31	80,779.93	3093.38	–1280.10
3	77,030.29	76,630.51	399.78	1413.50
4	77,767.78	77,911.84	–144.06	1957.34
5	69,791.28	65,808.57	3982.71	–2169.43
6	75,103.22	72,521.36	2581.86	–768.58
7	64,726.11	63,760.11	966.00	847.28

Number of Pairs:	6	Alpha Error:	5% (2–sided)
Mean Difference:	1813.26	d.f.:	5
Standard Deviation of Differences:	1642.12	t Statistic (+/–):	2.5706
Sample Test Statistic (t):	2.70	Significant:	YES

Table C–I–3: Western Site E – Non–mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Non–mailed (pCi/L)		Difference	Deviation
	Funnel–Syringe	Slow–Flow		
1	------	------	------	------
2	82,821.43	83,873.31	–1051.88	1812.88
3	76,908.05	77,030.29	–122.24	883.24
4	86,029.88	77,767.78	8262.10	–7501.10
5	69,065.08	69,791.28	–726.20	1487.20
6	72,358.60	75,103.22	–2744.62	3505.62
7	65,674.93	64,726.11	948.82	–187.82

Number of Pairs:	6	Alpha Error:	5% (2–sided)
Mean Difference:	761.00	d.f.:	5
Standard Deviation of Differences:	3869.61	t Statistic (+/–):	2.5706
Sample Test Statistic (t):	0.48	Significant:	NO

Table C–I–4: Western Site E – Mailed / Funnel–Syringe vs. Slow–Flow

Sample Run	Mailed (pCi/L)		Difference	Deviation
	Funnel–Syringe	Slow–Flow		
1	------	------	------	------
2	84,491.11	80,779.93	3711.18	151.58
3	78,016.16	76,630.51	1385.65	2477.11
4	88,815.99	77,911.84	10904.15	–7041.39
5	69,709.66	65,808.57	3901.09	–38.33
6	74,569.35	72,521.36	2047.99	1814.77
7	64,986.61	63,760.11	1226.50	2636.26

Number of Pairs:	6	Alpha Error:	5% (2–sided)
Mean Difference:	3862.76	d.f.:	5
Standard Deviation of Differences:	3632.77	t Statistic (+/–):	2.5706
Sample Test Statistic (t):	2.60	Significant:	YES

APPENDIX D:

Analysis of Variance Tests

Table D–1: Eastern Site A: ANOVA Statistical Analysis

Sample Run	Avg. Radon Conc. (pCi/L)	Sample Std. Dev. (pCi/L)	Sample Variance	Number of Samples	Squares Within (i)	Squares Between (i)
Funnel–Syringe / Non–mailed						
1	11,545.98	1,309.26	1.714E+06	5	6,856,646.99	475,451.03
2	12,112.91	1,327.78	1.763E+06	5	7,051,998.91	3,830,724.19
3	10,906.29	493.78	2.438E+05	5	975,274.75	548,874.65
4	------	------	------	------	------	------
5	10,483.49	484.37	2.346E+05	5	938,457.19	2,843,507.50
6	10,693.03	228.88	5.239E+04	5	209,544.22	1,482,853.22
7	10,716.10	164.69	2.712E+04	5	108,491.18	1,359,879.05
8	11,556.86	1,491.71	2.225E+06	5	8,900,794.90	509,593.24
9	12,973.37	454.65	2.067E+05	5	826,826.49	15,064,261.82
10	11,080.47	336.59	1.133E+05	5	453,171.31	123,469.61
11	10,307.63	495.49	2.455E+05	5	982,041.36	4,324,341.90
Mean Average:	11,237.61	MS (within):	682581.18			
Total Samples:	50	MS (between):	3395884	Significant:	YES	
F Statistic:	F(9,40) 2.12	Variance Ratio:	4.9750625			
Funnel–Syringe / Mailed						
1	11,208.07	619.04	3.832E+05	4	1,149,631.56	504,119.88
2	12,485.22	1,112.09	1.237E+06	5	4,946,976.67	4,251,738.56
3	10,970.09	291.49	8.497E+04	4	254,899.26	1,406,534.33
4	------	------	------	------	------	------
5	10,961.36	1,050.69	1.104E+06	5	4,415,797.90	1,810,316.74
6	12,485.35	2,603.18	6.777E+06	5	27,106,184.45	4,252,937.43
7	11,164.46	761.76	5.803E+05	2	580,278.30	317,791.03
8	11,342.27	1,016.00	1.032E+06	4	3,096,768.00	195,022.92
9	13,256.35	891.80	7.953E+05	5	3,181,228.96	14,335,867.26
10	11,060.43	256.77	6.593E+04	5	263,723.33	1,263,270.03
11	10,697.17	833.76	6.952E+05	5	2,780,622.95	3,748,974.66
Mean Average:	11,563.06	MS (within):	1405179.7			
Total Samples:	44	MS (between):	3565174.8	Significant:	YES	
F Statistic:	F(9,34) 2.17	Variance Ratio:	2.5371663			
Slow–Flow / Non–mailed						
1	11,038.11	632.43	4.000E+05	5	1,599,870.82	746,443.66
2	12,144.26	597.66	3.572E+05	5	1,428,789.90	2,590,351.46
3	11,214.55	935.71	8.756E+05	5	3,502,212.82	220,371.92
4	------	------	------	------	------	------
5	10,905.26	195.46	3.820E+04	5	152,818.45	1,347,993.77
6	11,137.27	268.68	7.219E+04	5	288,755.77	412,473.77
7	11,130.28	208.19	4.334E+04	5	173,372.30	432,794.68
8	10,839.12	948.05	8.988E+05	5	3,595,195.21	1,713,284.33
9	13,254.17	384.91	1.482E+05	5	592,622.83	16,738,662.81
10	11,341.12	308.51	9.518E+04	5	380,713.68	34,751.95
11	11,240.75	280.51	7.869E+04	5	314,743.44	168,800.10
Mean Average:	11,424.49	MS (within):	300727.38			
Total Samples:	50	MS (between):	2711769.8	Significant:		
F Statistic:	F(9,40) 2.12	Variance Ratio:	9.0173692			
Slow–Flow / Mailed						
1	10,825.80	131.88	1.739E+04	4	52,177.00	2,912,667.88
2	11,986.20	418.85	1.754E+05	5	701,741.29	471,469.14
3	11,031.97	279.96	7.838E+04	4	235,132.80	1,675,248.73
4	------	------	------	------	------	------
5	10,918.24	360.30	1.298E+05	5	519,264.36	2,894,745.13
6	12,701.59	2,206.42	4.868E+06	5	19,473,156.87	5,227,152.93
7	11,413.86	179.93	3.237E+04	2	32,374.80	140,733.16
8	11,262.84	412.89	1.705E+05	5	681,912.61	868,474.33
9	14,566.41	1,055.19	1.113E+06	4	3,340,277.81	33,345,612.49
10	11,232.48	505.91	2.559E+05	5	1,023,779.71	997,467.71
11	10,851.88	346.92	1.204E+05	3	240,706.97	2,053,012.80
Mean Average:	11,679.13	MS (within):	821891.38			
Total Samples:	42	MS (between):	5620509.4	Significant:	YES	
F Statistic:	F(9,32) 2.19	Variance Ratio:	6.8385063			

Table D–2: Eastern Site B: ANOVA Statistical Analysis

Sample Run	Avg. Radon Conc. (pCi/L)	Sample Std. Dev. (pCi/L)	Sample Variance	Number of Samples	Squares Within (i)	Squares Between (i)
Funnel–Syringe / Non–mailed						
1	11,330.29	946.09	8.951E+05	5	3,580,345.15	574.06
2	11,131.53	1,099.33	1.209E+06	5	4,834,105.80	219,398.88
3	11,175.68	391.52	1.533E+05	5	613,151.64	136,661.78
4	11,112.78	512.24	2.624E+05	5	1,049,559.27	260,433.25
5	11,351.65	118.58	1.406E+04	5	56,244.87	566.58
6	------	------	------	------	------	------
7	11,449.69	257.54	6.633E+04	5	265,307.41	59,062.15
8	11,667.68	644.14	4.149E+05	5	1,659,665.36	534,236.33
9	12,560.15	351.76	1.237E+05	5	494,940.39	7,431,572.66
10	10,680.17	309.52	9.580E+04	5	383,210.52	2,163,514.49
11	10,950.23	514.25	2.645E+05	5	1,057,812.25	763,525.50
Mean Average:	11,341.01	MS (within):	349856.57			
Total Samples:	50	MS (between):	1287727.3	Significant:	YES	
F Statistic:	F(9,40) 2.12	Variance Ratio:	3.6807082			
Funnel–Syringe / Mailed						
1	11,009.58	641.24	4.112E+05	4	1,233,568.21	375,300.81
2	10,597.28	781.66	6.110E+05	4	1,832,977.07	2,065,595.58
3	11,229.29	567.23	3.217E+05	4	965,249.62	29,997.55
4	11,192.99	582.75	3.396E+05	5	1,358,390.25	75,520.82
5	11,256.86	440.49	1.940E+05	4	582,094.32	13,937.69
6	------	------	------	------	------	------
7	11,863.37	1,265.20	1.601E+06	4	4,802,193.12	1,198,941.78
8	11,602.47	532.46	2.835E+05	5	1,134,054.61	410,643.35
9	12,768.47	348.25	1.213E+05	5	485,112.25	10,549,957.81
10	10,710.49	332.78	1.107E+05	5	442,970.11	1,832,539.75
11	10,928.09	562.79	3.167E+05	5	1,266,930.34	751,940.32
Mean Average:	11,315.89	MS (within):	402956.23			
Total Samples:	45	MS (between):	1922708.4	Significant:	YES	
F Statistic:	F(9,35) 2.17	Variance Ratio:	4.7714832			
Slow–Flow / Non–mailed						
1	11,332.35	1,065.23	1.135E+06	5	4,538,859.81	1,095,667.63
2	11,496.82	1,210.70	1.466E+06	5	5,863,177.96	454,954.56
3	11,797.57	294.39	8.667E+04	5	346,661.89	41.96
4	12,403.50	216.05	4.668E+04	5	186,710.41	1,818,244.00
5	11,479.35	65.33	4.268E+03	5	17,072.04	515,580.64
6	------	------	------	------	------	------
7	11,734.88	245.05	6.005E+04	5	240,198.01	21,508.27
8	11,750.40	428.35	1.835E+05	5	733,934.89	12,533.52
9	13,284.35	270.65	7.325E+04	5	293,005.69	11,009,543.79
10	11,242.47	341.83	1.168E+05	5	467,391.00	1,556,803.26
11	11,480.98	276.01	7.618E+04	5	304,726.08	510,359.72
Mean Average:	11,800.47	MS (within):	324793.44			
Total Samples:	50	MS (between):	1888359.7	Significant:	YES	
F Statistic:	F(9,40) 2.12	Variance Ratio:	5.8140327			
Slow–Flow / Mailed						
1	11,317.98	898.36	8.071E+05	5	3,228,202.76	1,367,378.28
2	11,802.02	1,256.54	1.579E+06	4	4,736,678.31	6,055.64
3	11,780.86	294.86	8.694E+04	3	173,884.84	10,824.85
4	12,358.80	376.19	1.415E+05	5	566,075.66	1,340,951.86
5	11,427.59	224.20	5.027E+04	5	201,062.56	854,245.64
6	------	------	------	------	------	------
7	12,026.50	484.71	2.349E+05	5	939,775.14	172,182.98
8	12,100.36	517.60	2.679E+05	5	1,071,639.04	336,522.22
9	12,925.80	296.16	8.771E+04	5	350,842.98	5,884,725.43
10	11,373.35	284.05	8.068E+04	5	322,737.61	1,093,150.61
11	11,296.03	246.79	6.091E+04	5	243,621.22	1,484,574.60
Mean Average:	11,840.93	MS (within):	319851.9			
Total Samples:	47	MS (between):	1394512.5	Significant:	YES	
F Statistic:	F (9,37) 2.15	Variance Ratio:	4.3596693			

Table D–3: Eastern Site C: ANOVA Statistical Analysis

Sample Run	Avg. Radon Conc. (pCi/L)	Sample Std. Dev. (pCi/L)	Sample Variance	Number of Samples	Squares Within (i)	Squares Between (i)
Funnel–Syringe / Non–mailed						
1	21,202.20	974.52	9.497E+05	5	3,798,756.92	1,430,477.13
2	24,928.91	2,496.94	6.235E+06	5	24,938,837.45	90,805,699.29
3	-------	-------	-------	-------	-------	-------
4	17,085.75	935.77	8.757E+05	5	3,502,661.97	64,138,258.12
5	13,310.21	943.74	8.906E+05	5	3,562,580.75	270,635,419.51
6	-------	-------	-------	-------	-------	-------
7	20,510.10	1,038.70	1.079E+06	5	4,315,590.76	123,592.39
8	21,690.81	1,233.69	1.522E+06	5	6,087,964.06	5,237,647.53
9	26,449.02	1,630.90	2.660E+06	5	10,639,339.24	167,140,210.21
10	20,730.43	962.67	9.267E+05	5	3,706,934.12	19,913.66
11	20,098.46	778.47	6.060E+05	5	2,424,062.16	1,618,014.82
Mean Average:	20,667.32	MS (within):	1749353.5			
Total Samples:	45	MS (between):	75143654	Significant:	YES	
F Statistic:	F(8,36) 2.22	Variance Ratio:	42.955099			
Funnel–Syringe / Mailed						
1	21,368.54	1,675.76	2.808E+06	5	11,232,686.31	5,185,636.22
2	24,039.56	2,534.66	6.425E+06	5	25,698,005.26	68,058,894.71
3	-------	-------	-------	-------	-------	-------
4	16,124.66	924.99	8.556E+05	5	3,422,426.00	89,273,640.90
5	13,383.39	1,617.88	2.618E+06	5	10,470,142.78	242,678,414.85
6	-------	-------	-------	-------	-------	-------
7	20,542.96	933.58	8.716E+05	5	3,486,286.47	185,887.05
8	22,061.33	1,104.60	1.220E+06	5	4,880,564.64	14,640,761.01
9	25,296.25	2,383.46	5.681E+06	4	17,042,644.71	97,855,796.70
10	20,276.03	1,720.32	2.960E+06	5	11,838,003.61	27,465.58
11	20,058.59	841.22	7.077E+05	5	2,830,604.35	425,023.21
Mean Average:	20,350.15	MS (within):	2597161.8			
Total Samples:	44	MS (between):	64791440	Significant:	YES	
F Statistic:	F(8,35) 2.23	Variance Ratio:	24.946825			
Slow–Flow / Non–mailed						
1	23,628.99	588.55	3.464E+05	5	1,385,564.41	13,944,889.67
2	26,410.11	479.65	2.301E+05	5	920,256.49	90,361,098.20
3	-------	-------	-------	-------	-------	-------
4	15,197.26	1,136.17	1.291E+06	5	5,163,529.08	242,326,798.56
5	13,216.65	1,089.54	1.187E+06	5	4,748,389.65	399,825,136.83
6	-------	-------	-------	-------	-------	-------
7	22,247.46	198.81	3.953E+04	5	158,101.66	39,155.35
8	24,269.83	508.79	2.589E+05	5	1,035,469.06	22,278,720.06
9	28,492.73	1,375.85	1.893E+06	5	7,571,852.89	200,582,789.81
10	23,865.61	346.78	1.203E+05	5	481,025.47	14,563,157.34
11	21,902.06	2,213.93	4.901E+06	5	19,605,944.18	330,005.18
Mean Average:	22,158.97	MS (within):	1140837			
Total Samples:	45	MS (between):	123031469	Significant:	YES	
F Statistic:	F(8,36) 2.22	Variance Ratio:	107.84316			
Slow–Flow / Mailed						
1	24,167.56	456.62	2.085E+05	5	834,007.30	27,613,100.56
2	26,292.19	381.50	1.455E+05	4	436,626.75	80,090,169.36
3	-------	-------	-------	-------	-------	-------
4	14,387.50	750.35	5.630E+05	5	2,252,100.49	276,027,059.23
5	12,880.19	1,038.71	1.079E+06	5	4,315,673.86	399,380,628.59
6	-------	-------	-------	-------	-------	-------
7	21,996.54	932.12	8.688E+05	4	2,606,543.08	128,171.96
8	23,529.30	758.84	5.758E+05	5	2,303,352.58	14,650,706.59
9	28,346.16	1,057.34	1.118E+06	5	4,471,871.50	213,114,758.22
10	23,166.11	595.82	3.550E+05	5	1,420,005.89	9,093,280.15
11	21,592.26	1,873.72	3.511E+06	5	14,043,306.55	253,742.88
Mean Average:	21,817.53	MS (within):	961279.06			
Total Samples:	43	MS (between):	127543952	Significant:	YES	
F Statistic:	F(8,34) 2.23	Variance Ratio:	132.6815			

Table D–4: Eastern Site D: ANOVA Statistical Analysis

Sample Run	Avg. Radon Conc. (pCi/L)	Sample Std. Dev. (pCi/L)	Sample Variance	Number of Samples	Squares Within (i)	Squares Between (i)
Funnel–Syringe / Non–mailed						
1	------	------	------	------	------	------
2	41,381.74	2,021.50	4.086E+06	5	16,345,849.00	76,103,049.25
3	38,627.53	1,745.91	3.048E+06	5	12,192,606.91	6,579,765.61
4	39,109.67	2,779.25	7.724E+06	5	30,896,922.25	13,272,929.52
5	35,099.45	2,907.17	8.452E+06	5	33,806,549.64	28,344,138.32
6	------	------	------	------	------	------
7	33,712.26	4,104.10	1.684E+07	5	67,374,547.24	70,993,641.67
8	38,286.54	976.18	9.529E+05	5	3,811,709.57	3,249,469.73
9	44,362.98	2,137.08	4.567E+06	5	18,268,443.71	236,850,913.80
10	35,904.82	1,823.72	3.326E+06	5	13,303,818.55	12,411,946.57
11	30,838.43	668.99	4.475E+05	5	1,790,190.48	220,577,499.01
Mean Average:	37,480.38	MS (within):	5494189.9			
Total Samples:	45	MS (between):	83547919	Significant:	YES	
F Statistic:	F(8,36) 2.22	Variance Ratio:	15.206595			
Funnel–Syringe / Mailed						
1	------	------	------	------	------	------
2	43,275.52	1,836.83	3.374E+06	5	13,495,777.80	185,974,570.98
3	38,278.17	1,208.92	1.461E+06	4	4,384,462.70	4,852,445.32
4	37,317.25	2,073.00	4.297E+06	5	17,189,316.00	98,691.88
5	35,122.31	3,028.61	9.172E+06	5	36,689,914.13	21,103,755.53
6	------	------	------	------	------	------
7	31,863.18	3,457.53	1.195E+07	5	47,818,054.80	141,170,484.96
8	37,753.93	958.02	9.178E+05	5	3,671,209.28	1,665,645.28
9	44,166.21	2,176.15	4.736E+06	4	14,206,886.47	195,409,831.60
10	36,902.25	4,036.53	1.629E+07	5	65,174,297.76	376,769.55
11	29,911.99	2,146.17	4.606E+06	5	18,424,182.68	263,884,173.61
Mean Average:	37,176.76	MS (within):	6501591.2			
Total Samples:	43	MS (between):	101817046	Significant:	YES	
F Statistic:	F(8,34) 2.23	Variance Ratio:	15.660327			
Slow–Flow / Non–mailed						
1	------	------	------	------	------	------
2	45,375.47	1,196.99	1.433E+06	5	5,731,140.24	140,984,748.03
3	40,097.31	3,224.85	1.040E+07	5	41,598,630.09	5,094.43
4	40,632.44	4,433.76	1.966E+07	5	78,632,910.95	1,607,728.51
5	40,773.58	1,867.52	3.488E+06	5	13,950,523.80	2,507,665.38
6	------	------	------	------	------	------
7	37,402.37	2,613.89	6.832E+06	5	27,329,683.73	35,458,377.60
8	39,926.30	846.34	7.163E+05	5	2,865,165.58	96,730.14
9	48,206.96	1,452.24	2.109E+06	5	8,436,004.07	331,427,438.64
10	34,119.95	3,814.54	1.455E+07	5	58,202,661.65	176,741,283.97
11	34,054.11	1,989.02	3.956E+06	5	15,824,802.24	180,677,436.19
Mean Average:	40,065.39	MS (within):	7015881.2			
Total Samples:	45	MS (between):	108688313	Significant:	YES	
F Statistic:	F(8,36) 2.22	Variance Ratio:	15.491755			
Slow–Flow / Mailed						
1	------	------	------	------	------	------
2	44,862.89	1,547.90	2.396E+06	5	9,583,977.64	131,316,907.18
3	40,375.65	2,998.89	8.993E+06	5	35,973,364.93	2,032,293.34
4	42,159.58	144.19	2.079E+04	5	83,163.02	29,317,611.71
5	39,902.47	2,780.40	7.731E+06	5	30,922,496.64	135,072.87
6	------	------	------	------	------	------
7	34,344.46	4,827.83	2.331E+07	5	93,231,770.04	145,457,241.68
8	39,795.34	252.88	6.395E+04	5	255,793.18	16,377.00
9	47,022.88	1,606.31	2.580E+06	5	10,320,927.26	265,339,450.71
10	34,997.80	3,836.59	1.472E+07	5	58,877,691.31	112,352,641.81
11	34,181.91	1,897.16	3.599E+06	5	14,396,864.26	154,356,730.46
Mean Average:	39,738.11	MS (within):	7045723.6			
Total Samples:	45	MS (between):	105040541	Significant:	YES	
F Statistic:	F(8,36) 2.22	Variance Ratio:	14.908411			

Table D–5: Western Site A: ANOVA Statistical Analysis

Sample Run	Avg. Radon Conc. (pCi/L)	Sample Std. Dev. (pCi/L)	Sample Variance	Number of Samples	Squares Within (i)	Squares Between (i)
Funnel–Syringe / Non–mailed						
1	67,502.08	1,189.66	1.415E+06	5	5,661,163.66	1,190,027,982.02
2	25,952.06	1,565.33	2.450E+06	5	9,801,032.04	3,411,948,541.54
3	36,926.17	888.90	7.901E+05	5	3,160,572.84	1,147,382,231.55
4	25,171.98	1,276.53	1.630E+06	5	6,518,115.36	3,618,768,265.64
5	70,430.48	1,074.09	1.154E+06	5	4,614,677.31	1,684,682,474.94
6	66,274.84	2,027.61	4.111E+06	5	16,444,809.25	1,008,226,980.18
7	72,264.94	1,569.42	2.463E+06	5	9,852,316.55	2,038,239,051.42
Mean Average:	52,074.65	MS (within):	2001881.7			
Total Samples:	35	MS (between):	2.35E+09	Significant:	YES	
F Statistic:	F(6,28) 2.45	Variance Ratio:	1173.8352			
Funnel–Syringe / Mailed						
1	66,560.40	3,493.75	1.221E+07	5	48,825,156.25	1,031,934,202.34
2	26,718.05	748.42	5.601E+05	5	2,240,529.99	3,245,178,736.96
3	38,230.00	1,339.43	1.794E+06	3	3,588,145.45	584,999,158.48
4	24,106.33	3,036.02	9.217E+06	4	27,652,252.32	3,155,720,505.64
5	69,951.07	1,082.27	1.171E+06	5	4,685,233.41	1,576,526,833.93
6	67,347.96	1,724.12	2.973E+06	5	11,890,359.10	1,148,177,664.56
7	72,445.80	1,744.66	3.044E+06	5	12,175,354.06	2,050,630,437.32
Mean Average:	52,194.23	MS (within):	4442281.2			
Total Samples:	32	MS (between):	2.13E+09	Significant:	YES	
F Statistic:	F(6,25) 2.49	Variance Ratio:	479.9774			
Slow–Flow / Non–mailed						
1	64,614.18	1,054.51	1.112E+06	5	4,447,965.36	723,682,181.51
2	26,122.23	539.01	2.905E+05	5	1,162,127.12	3,501,003,122.51
3	39,848.90	946.50	8.959E+05	5	3,583,449.00	810,854,551.95
4	25,090.19	2,112.86	4.464E+06	5	17,856,709.52	3,779,419,900.06
5	71,587.78	996.70	9.934E+05	5	3,973,643.56	1,805,806,775.84
6	68,617.14	1,923.32	3.699E+06	5	14,796,639.29	1,285,382,561.01
7	72,204.32	2,394.76	5.735E+06	5	22,939,501.83	1,924,876,160.23
Mean Average:	52,583.53	MS (within):	2455715.6			
Total Samples:	35	MS (between):	2.31E+09	Significant:	YES	
F Statistic:	F(6,28) 2.45	Variance Ratio:	938.6962			
Slow–Flow / Mailed						
1	63,872.94	1,065.65	1.136E+06	5	4,542,439.69	700,666,191.31
2	26,001.90	603.42	3.641E+05	5	1,456,462.79	3,388,650,899.72
3	39,007.36	1,040.24	1.082E+06	4	3,248,297.77	678,893,398.03
4	23,763.67	3,348.67	1.121E+07	4	33,640,772.31	3,197,106,648.66
5	72,440.04	1,293.17	1.672E+06	5	6,689,154.60	2,081,797,388.06
6	67,546.26	1,490.20	2.221E+06	5	8,882,784.16	1,202,972,445.57
7	71,613.89	1,381.91	1.910E+06	5	7,638,700.99	1,916,635,020.24
Mean Average:	52,035.15	MS (within):	2542177.4			
Total Samples:	33	MS (between):	2.19E+09	Significant:	YES	
F Statistic:	F(6,26) 2.47	Variance Ratio:	863.21815			

Table D–6: Western Site B: ANOVA Statistical Analysis

Sample Run	Avg. Radon Conc. (pCi/L)	Sample Std. Dev. (pCi/L)	Sample Variance	Number of Samples	Squares Within (i)	Squares Between (i)
Funnel–Syringe / Non–mailed						
1	------	------	------	------	------	------
2	26,900.28	2,230.64	4.976E+06	5	19,903,019.24	4,009,153.51
3	24,364.40	1,312.04	1.721E+06	5	6,885,795.85	13,455,052.92
4	26,974.40	1,566.87	2.455E+06	5	9,820,326.39	4,700,329.92
5	18,529.44	473.76	2.244E+05	5	897,794.15	279,407,278.26
6	28,073.29	382.67	1.464E+05	5	585,745.32	21,392,633.86
7	31,187.17	1,365.60	1.865E+06	5	7,459,453.44	134,283,239.38
Mean Average:	26,004.83	MS (within):	1898005.6			
Total Samples:	30	MS (between):	91449538	Significant:	YES	
F Statistic:	F(5,24) 2.62	Variance Ratio:	48.181911			
Funnel–Syringe / Mailed						
1	------	------	------	------	------	------
2	26,218.46	1,811.38	3.281E+06	5	13,124,390.02	351,929.29
3	24,054.49	1,301.11	1.693E+06	5	6,771,548.93	18,024,675.56
4	26,305.62	2,268.03	5.144E+06	5	20,575,840.32	621,152.01
5	19,705.67	2,362.92	5.583E+06	5	22,333,563.71	195,155,448.25
6	28,075.48	877.52	7.700E+05	5	3,080,165.40	22,521,281.66
7	31,359.22	1,348.82	1.819E+06	4	5,457,946.18	116,902,083.06
Mean Average:	25,953.16	MS (within):	3101889.3			
Total Samples:	29	MS (between):	70715314	Significant:	YES	
F Statistic:	F(5,23) 2.64	Variance Ratio:	22.797497			
Slow–Flow / Non–mailed						
1	------	------	------	------	------	------
2	27,325.42	2,516.63	6.333E+06	5	25,333,706.23	3,533,013.78
3	24,098.37	1,298.99	1.687E+06	5	6,749,500.08	28,475,797.56
4	25,168.78	4,622.30	2.137E+07	5	85,462,629.16	8,659,850.28
5	19,557.13	734.68	5.398E+05	5	2,159,018.81	239,964,674.60
6	29,623.19	1,265.76	1.602E+06	5	6,408,593.51	49,246,726.67
7	33,136.05	1,071.07	1.147E+06	5	4,588,763.78	221,194,080.86
Mean Average:	26,484.82	MS (within):	5445925.5			
Total Samples:	30	MS (between):	110214829	Significant:	YES	
F Statistic:	F(5,24) 2.62	Variance Ratio:	20.238035			
Slow–Flow / Mailed						
1	------	------	------	------	------	------
2	27,645.31	2,726.14	7.432E+06	5	29,727,357.20	1,120,664.04
3	25,013.28	695.99	4.844E+05	5	1,937,608.32	23,297,841.75
4	28,175.31	1,313.53	1.725E+06	5	6,901,444.24	5,034,325.38
5	19,888.33	769.57	5.922E+05	5	2,368,951.94	265,250,745.80
6	29,806.57	1,449.64	2.101E+06	5	8,405,824.52	34,707,869.16
7	32,502.50	683.84	4.676E+05	5	1,870,548.58	142,077,370.23
Mean Average:	27,171.88	MS (within):	2133822.3			
Total Samples:	30	MS (between):	94297763	Significant:	YES	
F Statistic:	F(5,24) 2.62	Variance Ratio:	44.191948			

Table D–7: Western Site C: ANOVA Statistical Analysis

Sample Run	Avg. Radon Conc. (pCi/L)	Sample Std. Dev. (pCi/L)	Sample Variance	Number of Samples	Squares Within (i)	Squares Between (i)
Funnel–Syringe / Non–mailed						
1	20,579.53	303.20	9.193E+04	5	367,720.96	203,265,878.06
2	2,366.61	81.45	6.634E+03	5	26,536.41	700,565,235.52
3	18,014.78	911.11	8.301E+05	5	3,320,485.73	72,627,533.90
4	15,790.43	1,658.41	2.750E+06	5	11,001,294.91	12,591,008.68
5	11,310.00	1,515.35	2.296E+06	5	9,185,142.49	41,863,034.00
6	15,732.04	445.92	1.988E+05	5	795,378.59	11,681,473.91
7	15,631.43	446.68	1.995E+05	5	798,092.09	10,194,267.67
Mean Average:	14,203.55	MS (within):	910523.26			
Total Samples:	35	MS (between):	175464739	Significant:	YES	
F Statistic:	F(6,28) 2.45	Variance Ratio:	192.70759			
Funnel–Syringe / Mailed						
1	19,865.72	1,176.13	1.383E+06	5	5,533,127.11	152,024,367.19
2	2,438.69	97.65	9.536E+03	5	38,142.09	709,594,100.92
3	18,350.01	673.05	4.530E+05	5	1,811,985.21	79,934,070.73
4	16,033.24	1,623.83	2.637E+06	5	10,547,295.48	14,138,580.50
5	12,044.64	2,302.31	5.301E+06	5	21,202,525.34	26,611,673.44
6	15,951.01	1,091.74	1.192E+06	5	4,767,584.91	12,789,624.96
7	15,778.30	725.16	5.259E+05	4	1,577,571.08	8,141,223.06
Mean Average:	14,351.66	MS (within):	1684378.9			
Total Samples:	34	MS (between):	167205807	Significant:	YES	
F Statistic:	F(6,27) 2.46	Variance Ratio:	99.268403			
Slow–Flow / Non–mailed						
1	20,125.47	1,204.04	1.450E+06	5	5,798,849.29	115,072,149.78
2	2,485.44	73.62	5.420E+03	5	21,679.62	824,673,982.58
3	19,989.30	547.14	2.994E+05	5	1,197,448.72	108,632,329.08
4	18,286.87	1,716.04	2.945E+06	5	11,779,173.13	43,770,585.13
5	12,223.92	2,954.14	8.727E+06	5	34,907,772.56	48,180,731.66
6	16,844.36	356.67	1.272E+05	5	508,853.96	11,494,702.08
7	17,341.58	206.78	4.276E+04	5	171,031.87	20,269,818.22
Mean Average:	15,328.13	MS (within):	1942314.6			
Total Samples:	35	MS (between):	195349050	Significant:	YES	
F Statistic:	F(6,28) 2.45	Variance Ratio:	100.57539			
Slow–Flow / Mailed						
1	20,729.68	712.55	5.077E+05	5	2,030,910.01	154,724,037.07
2	2,505.11	46.03	2.119E+03	5	8,475.04	801,601,374.13
3	19,704.86	258.99	6.708E+04	5	268,303.28	102,966,571.72
4	17,706.91	1,503.58	2.261E+06	5	9,043,011.27	32,258,907.15
5	11,541.10	1,501.42	2.254E+06	5	9,017,048.07	65,731,195.85
6	16,925.44	486.66	2.368E+05	5	947,351.82	15,462,766.86
7	17,055.02	498.58	2.486E+05	5	994,328.07	17,825,471.19
Mean Average:	15,166.87	MS (within):	796765.27			
Total Samples:	35	MS (between):	198428387	Significant:	YES	
F Statistic:	F(6,28) 2.45	Variance Ratio:	249.04247			

Table D–8: Western Site D: ANOVA Statistical Analysis

Sample Run	Avg. Radon Conc. (pCi/L)	Sample Std. Dev. (pCi/L)	Sample Variance	Number of Samples	Squares Within (i)	Squares Between (i)
Funnel–Syringe / Non–mailed						
1	5,497.66	93.20	8.686E+03	5	34,744.96	990,007,887.49
2	4,341.28	639.00	4.083E+05	5	1,633,284.00	1,159,442,154.07
3	12,292.51	7,880.17	6.210E+07	5	248,388,316.92	264,748,418.67
4	55,602.01	3,759.43	1.413E+07	5	56,533,255.70	6,491,830,194.52
5	24,856.05	1,628.34	2.651E+06	5	10,605,964.62	139,755,853.13
6	------	------	------	------	------	------
7	14,825.27	1,027.12	1.055E+06	5	4,219,901.98	112,522,619.79
Mean Average:	19,569.16	MS (within):	13392311			
Total Samples:	30	MS (between):	1.90E+09	Significant:	YES	
F Statistic:	F(5,24) 2.62	Variance Ratio:	141.50661			
Funnel–Syringe / Mailed						
1	4,621.35	308.44	9.514E+04	4	285,405.70	770,986,482.00
2	3,722.49	1,460.95	2.134E+06	5	8,537,499.61	1,122,328,837.47
3	10,898.60	6,102.89	3.725E+07	4	111,735,799.06	243,739,019.46
4	53,432.40	5,854.93	3.428E+07	5	137,120,821.22	6,030,075,575.97
5	24,701.54	1,660.29	2.757E+06	5	11,026,251.54	179,812,149.04
6	------	------	------	------	------	------
7	14,651.65	923.41	8.527E+05	5	3,410,744.11	82,134,923.15
Mean Average:	18,704.67	MS (within):	12368933			
Total Samples:	28	MS (between):	1.74E+09	Significant:	YES	
F Statistic:	F(5,22) 2.66	Variance Ratio:	140.63918			
Slow–Flow / Non–mailed						
1	5,840.92	83.94	7.046E+03	5	28,183.69	1,200,084,682.75
2	4,418.12	851.73	7.254E+05	5	2,901,775.97	1,430,633,487.39
3	14,863.58	10,322.81	1.066E+08	5	426,241,625.18	209,292,854.16
4	60,006.81	4,535.06	2.057E+07	5	82,267,076.81	7,478,163,205.14
5	26,545.59	1,841.81	3.392E+06	5	13,569,056.30	135,834,622.98
6	------	------	------	------	------	------
7	16,325.38	419.24	1.758E+05	5	703,048.71	125,401,321.60
Mean Average:	21,333.40	MS (within):	21904815			
Total Samples:	30	MS (between):	2.22E+09	Significant:	YES	
F Statistic:	F(5,24) 2.62	Variance Ratio:	101.38884			
Slow–Flow / Mailed						
1	5,155.83	100.57	1.011E+04	4	30,342.97	971,886,860.01
2	4,264.69	669.52	4.483E+05	5	1,793,028.12	1,357,736,120.58
3	13,206.24	8,327.81	6.935E+07	4	208,057,258.19	227,233,917.52
4	59,438.34	4,952.30	2.453E+07	4	73,575,825.87	5,989,199,717.61
5	26,108.94	1,919.72	3.685E+06	5	14,741,299.51	143,946,170.57
6	------	------	------	------	------	------
7	16,286.24	596.56	3.559E+05	5	1,423,535.33	99,330,484.90
Mean Average:	20,743.38	MS (within):	14267680			
Total Samples:	27	MS (between):	1.82E+09	Significant:	YES	
F Statistic:	F(5,21) 2.68	Variance Ratio:	127.38624			

Table D–9: Western Site E: ANOVA Statistical Analysis

Sample Run	Avg. Radon Conc. (pCi/L)	Sample Std. Dev. (pCi/L)	Sample Variance	Number of Samples	Squares Within (i)	Squares Between (i)
Funnel–Syringe / Non–mailed						
1	------	------	------	------	------	------
2	82,821.43	13,963.62	1.950E+08	4	584,948,050.51	215,802,073.97
3	76,908.05	1,702.32	2.898E+06	5	11,591,573.53	10,249,134.65
4	86,029.88	3,098.09	9.598E+06	5	38,392,646.59	556,887,263.91
5	69,065.08	1,268.17	1.608E+06	5	6,433,020.60	205,520,525.96
6	72,358.60	8,618.01	7.427E+07	5	297,080,385.44	48,601,149.80
7	65,674.93	1,332.76	1.776E+06	5	7,104,996.87	480,337,046.44
Mean Average:	75,476.33	MS (within):	41110899			
Total Samples:	29	MS (between):	303479439	Significant:	YES	
F Statistic:	F(5,23) 2.64	Variance Ratio:	7.3819704			
Funnel–Syringe / Mailed						
1	------	------	------	------	------	------
2	84,491.11	13,899.10	1.932E+08	4	579,554,942.43	238,782,640.73
3	78,016.16	2,221.35	4.934E+06	5	19,737,583.29	7,829,342.40
4	88,815.99	3,890.07	1.513E+07	5	60,530,578.42	726,154,295.26
5	69,709.66	1,077.55	1.161E+06	5	4,644,456.01	248,875,942.78
6	74,569.35	2,988.86	8.933E+06	5	35,733,136.40	24,100,296.24
7	64,986.61	1,790.36	3.205E+06	4	9,616,166.79	554,904,295.05
Mean Average:	76,764.81	MS (within):	32264403			
Total Samples:	28	MS (between):	360129362	Significant:	YES	
F Statistic:	F(5,22) 2.66	Variance Ratio:	11.161817			
Slow–Flow / Non–mailed						
1	------	------	------	------	------	------
2	83,873.31	12,267.44	1.505E+08	5	601,960,336.61	419,342,835.77
3	77,030.29	1,114.84	1.243E+06	5	4,971,472.90	26,795,160.43
4	77,767.78	9,119.79	8.317E+07	5	332,682,278.58	46,587,204.14
5	69,791.28	3,848.84	1.481E+07	5	59,254,277.38	121,231,424.08
6	75,103.22	5,335.62	2.847E+07	5	113,875,363.14	752,286.80
7	64,726.11	1,624.42	2.639E+06	5	10,554,961.35	498,922,747.53
Mean Average:	74,715.33	MS (within):	46804112			
Total Samples:	30	MS (between):	222726332	Significant:	YES	
F Statistic:	F(5,24) 2.62	Variance Ratio:	4.7586915			
Slow–Flow / Mailed						
1	------	------	------	------	------	------
2	80,779.93	11,497.01	1.322E+08	5	528,724,955.76	310,304,703.88
3	76,630.51	2,095.77	4.392E+06	5	17,569,007.57	69,506,945.58
4	77,911.84	6,649.48	4.422E+07	5	176,862,337.08	125,489,812.23
5	65,806.57	5,233.48	2.739E+07	4	82,167,938.73	201,270,023.20
6	72,521.36	5,440.10	2.959E+07	5	118,378,752.04	724,637.07
7	63,760.11	1,604.13	2.573E+06	4	7,719,699.17	334,300,511.64
Mean Average:	72,902.05	MS (within):	42337395			
Total Samples:	28	MS (between):	208319327	Significant:	YES	
F Statistic:	F(5,22) 2.66	Variance Ratio:	4.9204569			

APPENDIX E:

Well Shaft Profile Analysis

WELL SHAFT PROFILE ANALYSIS

Objective

The objective of this experiment was to investigate the water radon concentration of the well at western site A as a function of pumping time. The experiment was two-fold: first, to investigate how the radon concentration varies with pumping time if the well has not been used for several days; and second, to investigate how the radon concentration varies with pumping time of water which has been standing in the well for several hours after the well had been purged for a few hours.

Materials and Methodology

Experimental Design

The experiment was designed to obtain data on radon concentrations as a function of water being withdrawn from the well. To obtain the data, two to three sample runs, containing two series of 15 samples each, were planned. The quantity of water intended to be withdrawn during the sampling procedure of each series of 15 samples was the quantity which could be held in the well shaft, approximately 515 gallons.

This experiment was conducted in conjunction with the major experiment of this report. The first series of samples was collected prior to collection of samples for the major experiment. The first series of samples was collected to determine the trend of radon concentrations of water, which had stood in the well shaft for several days, versus well depth. The second series of samples was collected after the samples were collected from all the western sites. Thus, the second series experiments were conducted to determine the trend of radon concentrations of water which had stood in the well shaft for several hours.

Sample Preparation

The sample preparation was similar to the major experiments preparation. The only difference was the number of vials prepared and the identifier scheme. The scheme used in this sub-study is as follows:

1. First the vial lid was labeled with the letter "P" to indicate that the samples were profile samples.
2. Next, the first 15, of 30 vials, were labeled with the letter "A" to indicate that this was the first sample series. The vials were then numbered 1 through 15.
3. Lastly, the second set of 15 samples was labeled with the letter "B" to indicated that this was the second series of samples. The vials were then numbered 1 through 15.

Sample Collection and Radon Calculation:

Prior to sample collection the maximum amount of water which could stand in the shaft was determined. The western site A well is 350 feet deep with a 6 inch diameter shaft. The quantity of water in the shaft was calculated to be approximately 515 gallons. This quantity of water was divided by 15, the number of samples, to obtain the quantity of water to be withdrawn between each sample, approximately 35 gallons. The flow rate was then determined to be 3.5 gallons per minute, which resulted in a purge time between samples of 10 minutes.

The EPA standard funnel-syringe sample collection method was used to collect samples. (See the procedure in the main report.) The first sample of series A was collected without any purge to obtain the zero depth. The remaining 14 samples were collected following each 10 minute purge, with the time noted each time a sample was collected. Collecting the series of 15 samples took approximately 3 hours to complete. Upon completion of the first series, series A, samples were collected for the major experiment. Approximately three gallons of

water was removed from the well at site A while samples were collected for the major experiment.

The second series of samples, series B, was collected approximately 3 to 4 hours after series A. The same procedure was followed for the collection of the series B samples as discussed above. That is, the first sample of series B was collected without a purge to determine the zero depth, and the remaining 14 samples were collected following each 10 minute purge.

The radon concentrations of the samples were determined as described in the main report.

Results and Discussion:

The results are presented in Figures E-1 through E-5. The radon concentrations displayed in the figures were measured by the liquid scintillation counter and corrected for radon decay. Three runs were conducted over three months, one run per month, collecting a total of 75 samples. The first run conducted only a series A run, while the second and third sample runs conducted both a series A and a series B run.

The figures are in a line graph format with the sample radon concentration versus sample number. The sample number can be related to the pumping time and/or the depth from which the sample was collected. Each 10 minute purge corresponds to a removal of 24 linear feet of water from the well shaft. The first sample was collected without a purge, corresponding to the 0 foot mark; the second sample was collected after a 10 minute purge, corresponding to the 24 foot mark; the third sample was collected after a second 10 minute purge (20 minutes total), corresponding to the 48 foot mark; and etc.

Figure E-1: Western Site A Well Shaft Profile (Run 1)

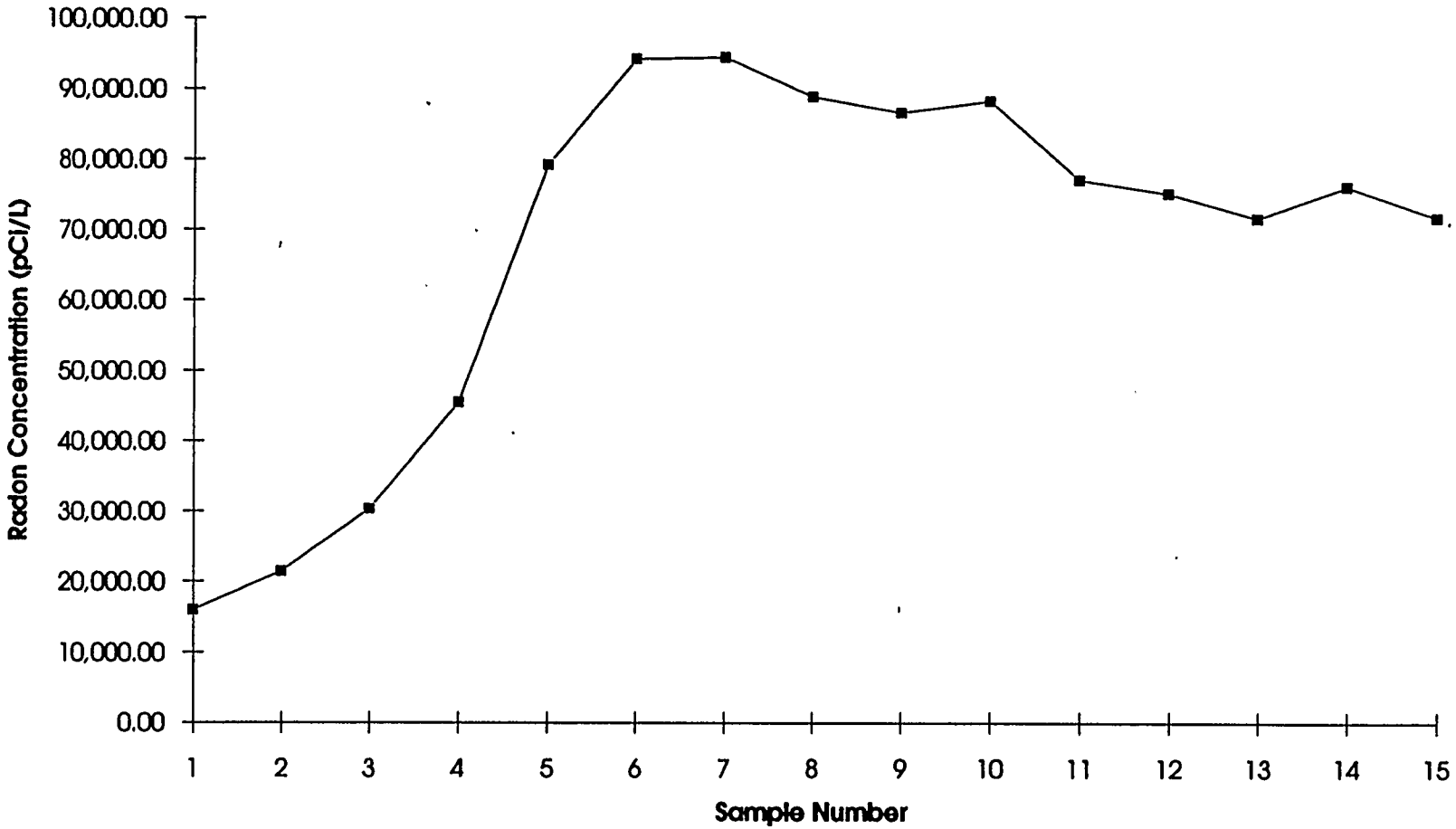


Figure E-2: Western Site A Well Shaft Profile (Run 2a)

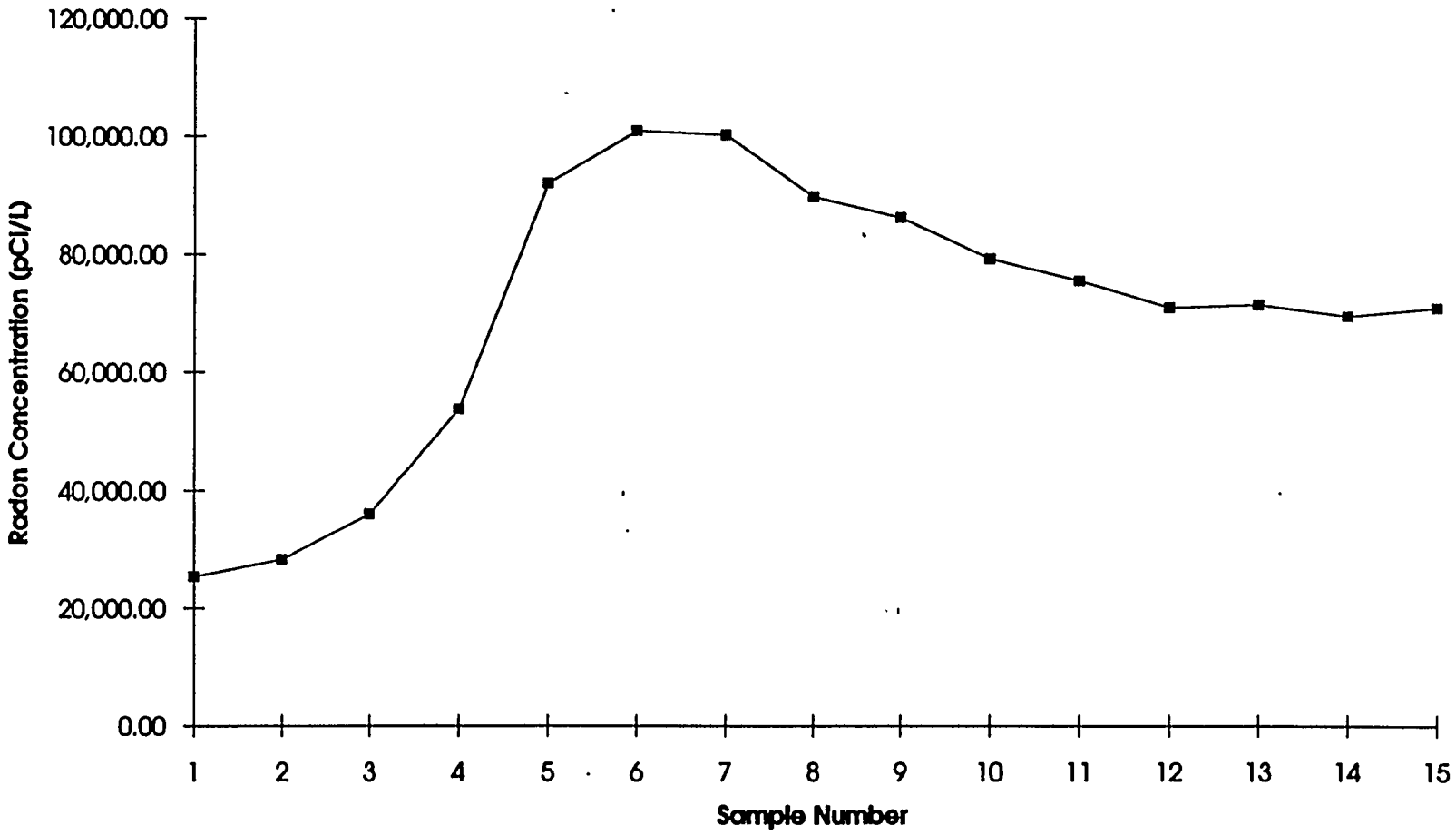


Figure E-3: Western Site A Well Shaft Profile (Run 2b)

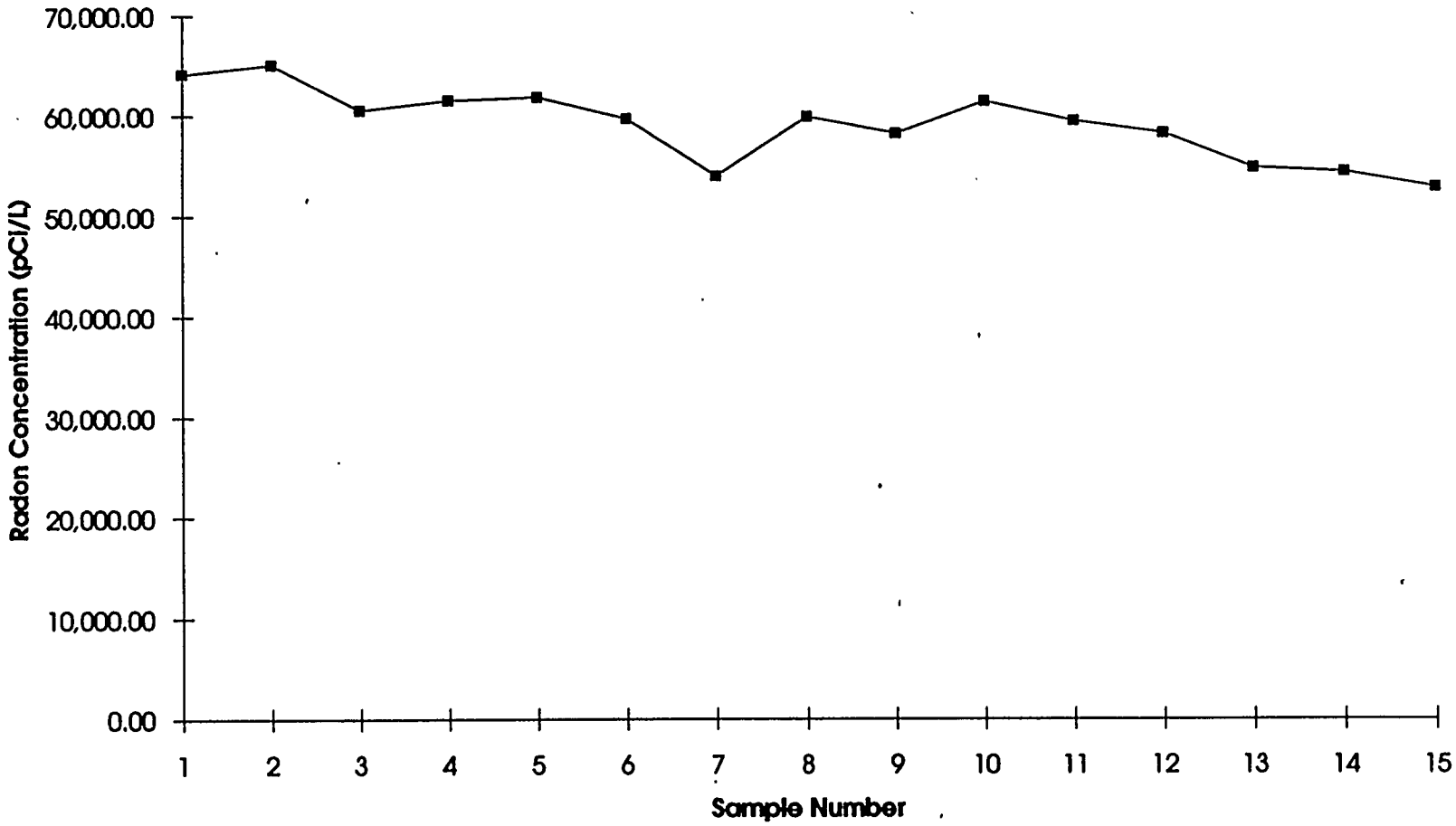


Figure E-4: Western Site A Well Shaft Profile (Run 3a)

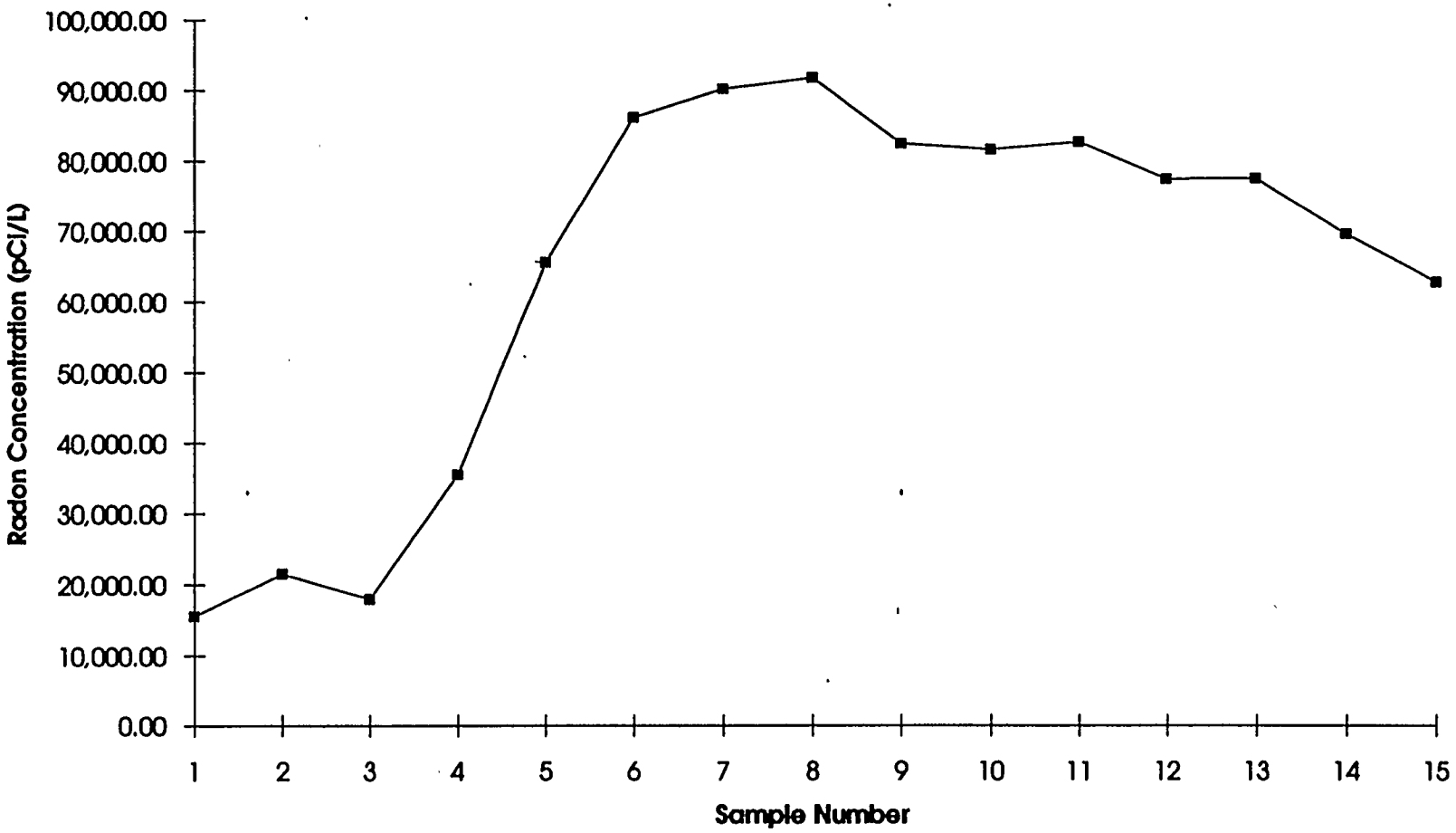
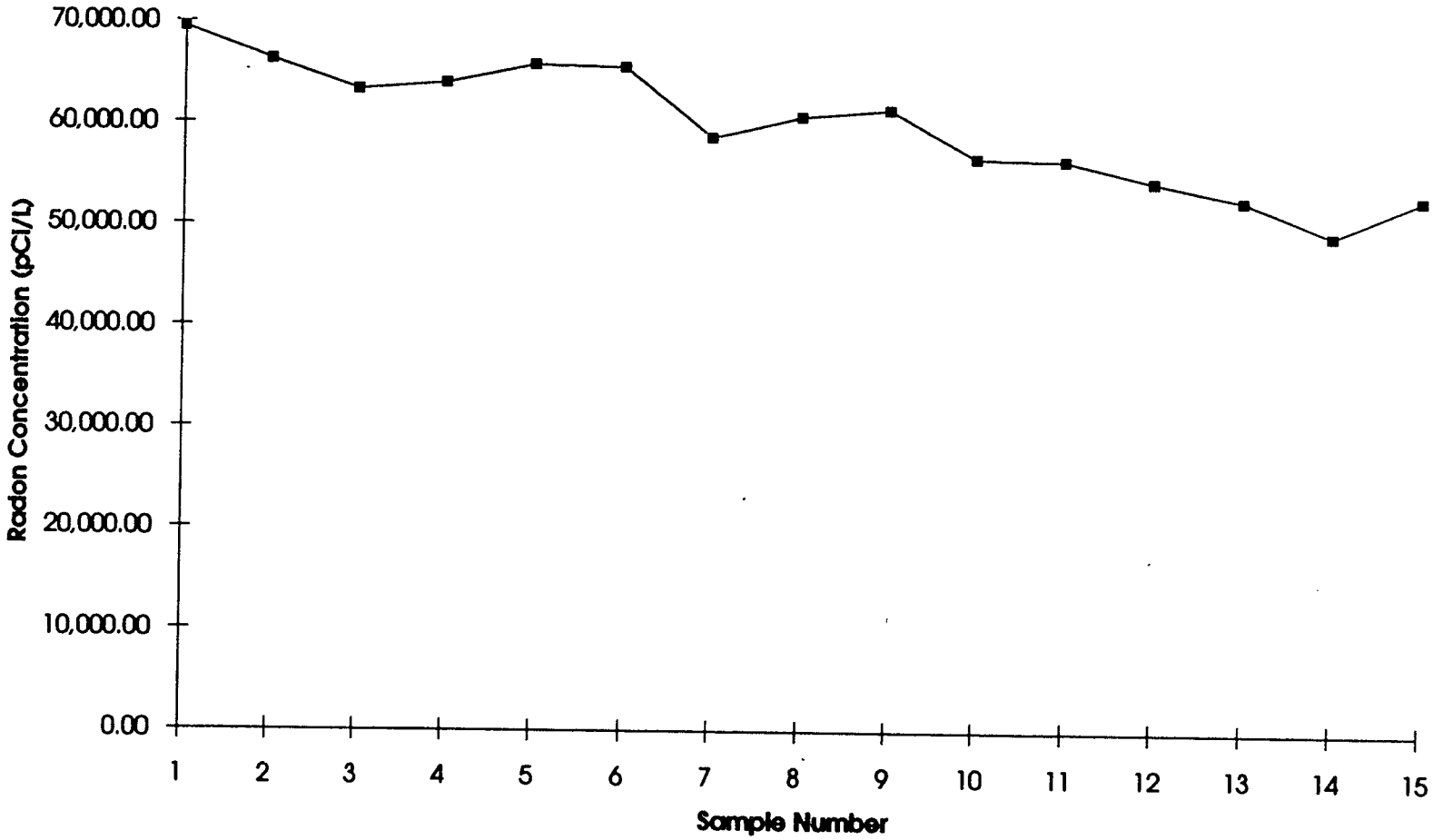


Figure E-5: Western Site A Well Shaft Profile (Run 3b)



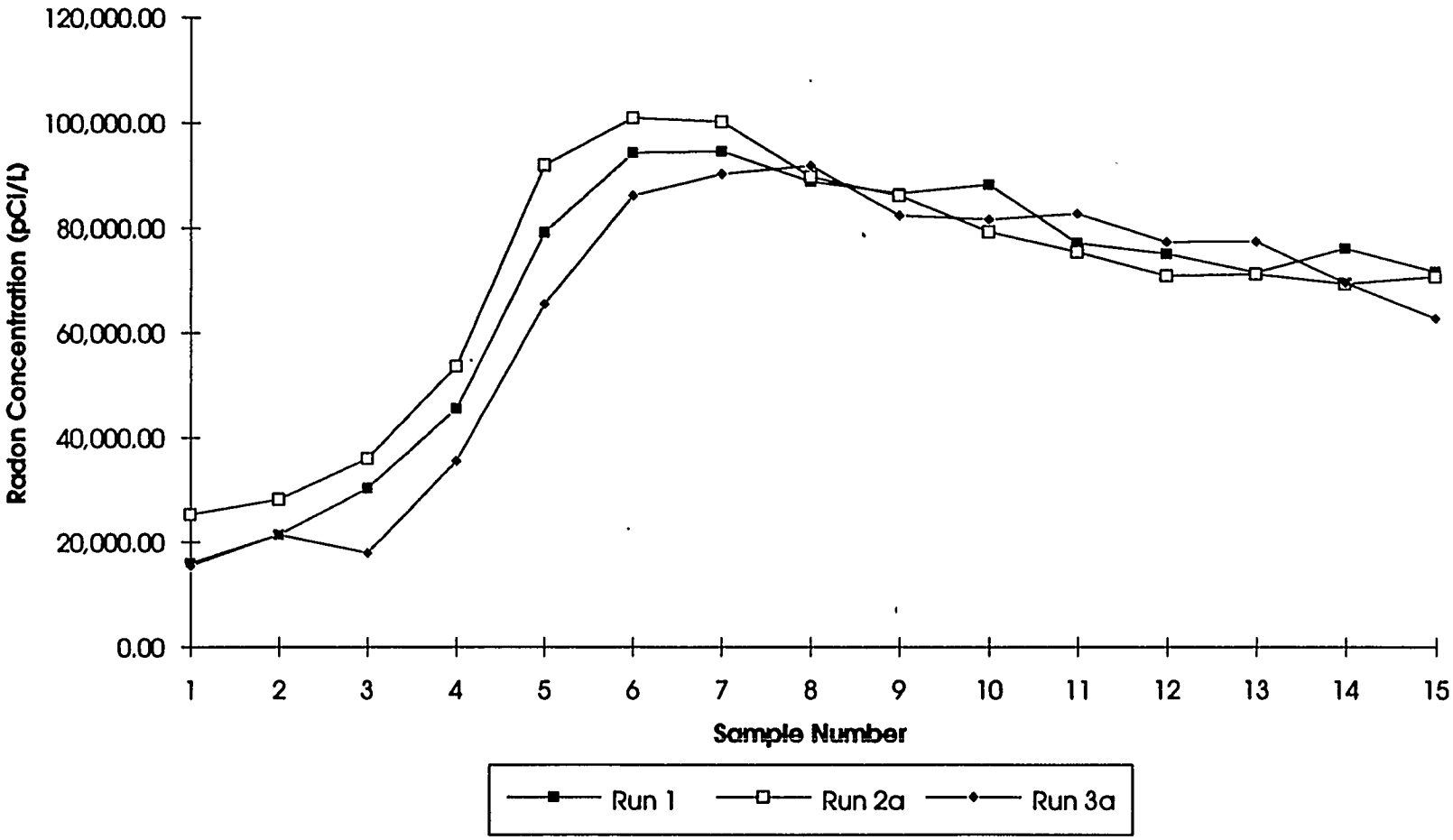
Figures E-1(run 1), E-2(run 2), and E-4(run 3) are series A profiles and display a consistent trend. The water radon concentrations of the three profiles rise quickly within the first 125 feet, peak, and slowly decline. Overlaying these three figures in Figure E-6, the peak radon concentration, approximately 100,000 pCi/L, occurs between the 120 foot and 150 foot mark.

The Figures E-3(run 2) and E-5(run 3) are series B profiles, and display a continuation of the downward trend noticed in their runs' respective series A profiles. The 0 foot mark (sample number 1) is the depth of the highest radon concentrations for both B series profiles, and range around 64,000 to 70,000 pCi/L.

The results of the series A runs are surprising. It was not expected to see the radon concentration peak at about the 120 - 150 foot mark; such a peak was expected to occur at a greater depth. The likely reason for the peak is the pumping of fresh ground water into the well. The radon concentration of the ground water was higher than the well shaft water due to the water standing and decaying in the well for several days. Thus, when the pump began running, fresh ground water was pumped into the well and mixed with the water standing in the well. The radon concentration of the fresh water was diluted, but raised the overall radon concentration of the water in the well. Because of the nature of the experiment, the pump was continually running, pumping fresh ground water into the well. The mixing of the well water and fresh ground water continued to raise the overall radon concentration of the well water to a maximum. This maximum water radon concentration consistently occurred between the 120 - 150 foot mark.

After the 150 foot mark, the radon concentration of the well water declined. The declines noticed in Figures E-2 and E-4, series A profiles, continued in their respective series B runs, Figures E-3 and E-5. The likely reason for this decline is

Figure E-6: Western Site A Well Shaft Profile (Runs 1, 2a, and 3a)



the mixing of ground water with a lower radon concentration than the water held in the well. That is, the radon concentration of the water in the well was now higher than the water being pumped into the well. It is believed that the water pumped into the well during the first 150 linear feet of the series A run was from the immediate surrounding geology of the well. Because the ground water velocity is very slow, on the order of feet per day or feet per year, and because the well had not been used for several days, it is likely the radon concentration of the water located in the immediate area of the well is at or near equilibrium with the surrounding geology (Edward 1960). As the water from the immediate area of the well was pumped into the well, the radon concentration of this water accounted for the peak observed during the series A runs, and then water from outside the immediate area of the well was drawn in. It seems likely that the water drawn into the well from outside the immediate area of the well had a lower radon concentration than the water pumped into the well during that first 150 linear feet of the series A run. Because the pump was in continual operation, water continued to be drawn from outside the immediate area of the well. The drawing force of the pump is believed to have increased the water's velocity through the geology surrounding the well and this did not allow radon to build-up in the water while traversing the geology to the well. Ground water continued to be pumped into the well, and the lower radon concentration of the ground water continued to dilute the radon concentration of the water in the well.

It is unclear what is truly occurring, but it is recommended that a study be conducted to determine the nature of this radon build-up and decline. During the interim, however, the results of this study indicate that to obtain the most representative sample, a sample containing the maximum radon concentration, one does not have to pump the well all the way down, rather one only needs to pump the well approximately a third of the way down.

APPENDIX F:

Well Shaft Profile Data and Results

Table F–A–1: Western Site A Well Shaft Profile––Data and Results

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)	[Rn–222] (pCi/L)
PA 1	25.84	09:07:20 AM	35.77	11.28	613.00	886.97	15,975.61
PA 2	25.86	09:27:00 AM	35.80	8.47	622.00	1181.82	21,439.86
PA 3	25.92	09:39:20 AM	35.70	6.12	629.00	1634.31	30,351.67
PA 4	25.88	09:52:05 AM	35.92	4.00	634.00	2502.50	45,549.26
PA 5	25.89	10:04:51 AM	35.82	2.34	638.00	4286.32	79,230.68
PA 6	25.87	10:17:15 AM	35.78	1.97	641.00	5091.37	94,305.01
PA 7	25.86	10:29:45 AM	35.73	1.97	643.00	5087.82	94,495.67
PA 8	25.85	10:42:15 AM	35.69	2.10	646.00	4779.52	88,896.48
PA 9	25.78	10:54:30 AM	35.62	2.15	650.00	4665.12	86,663.87
PA 10	25.85	11:07:13 AM	35.51	2.15	653.00	4671.16	88,285.67
PA 11	25.84	11:19:24 AM	35.38	2.48	656.00	4041.53	77,171.75
PA 12	26.03	11:31:00 AM	36.03	2.42	659.00	4133.88	75,236.37
PA 13	25.88	11:43:29 AM	35.70	2.59	663.00	3873.36	71,671.75
PA 14	25.77	11:55:15 AM	35.77	2.39	666.00	4195.82	76,206.89
PA 15	25.83	12:08:06 PM	35.65	2.58	670.00	3889.92	71,821.21
Calibration Information for Profile Samples							
Blank 1	25.59	–	36.24	50.00	51.00	32.36	–
Blank 2	25.69	–	35.87	50.00	103.00	34.32	–
Blank 3	25.73	–	36.25	50.00	154.00	35.04	–
Blank 4	25.88	–	36.74	50.00	204.00	34.20	–
714 pCi STD.	–	–	–	1.35	207.00	7437.78	–
952 pCi STD.	–	–	–	1.06	209.00	9508.49	–

Table Notes:

1. Samples were collected on February 19, 1994.
2. Profile samples were counted on February 22, 1994 at 10:57:00 AM.
3. Approximate Flow Rate: 3.5 gpm; Time between samples: 10 min.
4. Owners used water (washed their car) one day prior of sample run.

Table F–B–1: Western Site A Well Shaft Profile––Data and Results from Run 2

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)	[Rn–222] (pCi/L)
PA 1	25.94	09:55:47 AM	36.08	7.35	728.00	1362.31	25,393.36
PA 2	25.88	10:07:34 AM	36.03	6.61	735.00	1514.98	28,263.78
PA 3	25.91	10:20:09 AM	36.22	5.13	741.00	1950.10	35,962.37
PA 4	25.84	10:31:33 AM	36.06	3.48	745.00	2875.29	53,732.86
PA 5	25.94	10:44:14 AM	36.01	2.08	749.00	4830.29	91,935.81
PA 6	25.93	10:57:02 AM	36.11	1.87	751.00	5363.10	100,904.57
PA 7	26.00	11:09:52 AM	35.98	1.92	754.00	5227.60	100,186.16
PA 8	25.97	11:24:06 AM	36.04	2.12	758.00	4733.02	89,722.34
PA 9	26.05	11:36:55 AM	36.29	2.16	761.00	4633.33	86,254.81
PA 10	25.93	11:48:47 AM	36.12	2.36	764.00	4247.03	79,311.57
PA 11	25.91	12:01:02 PM	36.94	2.29	767.00	4382.53	75,539.18
PA 12	26.13	12:13:04 PM	36.41	2.61	771.00	3846.74	70,995.42
PA 13	25.93	12:27:00 PM	35.75	2.71	774.00	3701.85	71,399.43
PA 14	25.99	12:40:06 PM	35.84	2.77	778.00	3615.52	69,427.62
PA 15	26.02	12:51:48 PM	36.18	2.63	782.00	3807.98	70,856.00
Calibration Information for Profile Samples							
Blank 1	25.59	–	36.23	50.00	51.00	33.66	–
Blank 2	25.69	–	35.87	50.00	102.00	34.18	–
Blank 3	25.73	–	36.24	50.00	153.00	33.40	–
Blank 4	25.88	–	36.73	50.00	204.00	33.28	–
714 pCi STD.	–	–	–	1.39	206.00	7230.22	–
952 pCi STD.	–	–	–	1.05	208.00	9585.71	–

Table Notes:

1. Samples were collected on March 26, 1994.
2. Profile samples were counted on March 29, 1994 at 1:59:00 PM.
3. Approximate Flow Rate: 3.5 gpm; Time between samples: 10 min.
4. Owners used water (watered garden) one day prior of sample run.

Table F–B–2: Western Site A Well Shaft Profile––Data and Results from Run 2

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)	[Rn–222] (pCi/L)
PB 1	25.76	03:06:00 PM	35.83	2.88	786.00	3476.74	64,156.12
PB 2	25.81	03:17:41 PM	35.87	2.84	789.00	3526.41	65,074.80
PB 3	25.78	03:28:50 PM	35.65	3.11	793.00	3225.40	60,558.56
PB 4	25.95	03:40:30 PM	36.06	2.98	797.00	3358.05	61,517.77
PB 5	25.90	03:53:35 PM	36.01	2.96	801.00	3382.09	61,891.61
PB 6	25.72	04:05:54 PM	35.82	3.07	805.00	3264.50	59,715.35
PB 7	25.90	04:17:55 PM	35.96	3.40	809.00	2948.24	54,031.58
PB 8	25.75	04:29:53 PM	36.06	2.99	813.00	3350.84	59,940.99
PB 9	25.91	04:42:00 PM	36.01	3.14	817.00	3192.99	58,217.07
PB 10	25.93	04:54:16 PM	36.12	2.95	821.00	3399.32	61,406.03
PB 11	25.83	05:06:49 PM	36.05	3.03	825.00	3308.25	59,505.52
PB 12	25.84	05:17:09 PM	35.90	3.14	830.00	3194.90	58,320.89
PB 13	25.76	05:23:57 PM	35.97	3.28	834.00	3049.70	54,806.31
PB 14	25.80	05:31:19 PM	35.63	3.43	838.00	2918.37	54,424.06
PB 15	25.85	05:40:40 PM	35.96	3.43	842.00	2918.08	52,875.80
Calibration Information for Profile Samples							
Blank 1	25.59	–	36.23	50.00	51.00	33.66	–
Blank 2	25.69	–	35.87	50.00	102.00	34.18	–
Blank 3	25.73	–	36.24	50.00	153.00	33.40	–
Blank 4	25.88	–	36.73	50.00	204.00	33.28	–
714 pCi STD.	–	–	–	1.39	206.00	7230.22	–
952 pCi STD.	–	–	–	1.05	208.00	9585.71	–

Table Notes:

1. Samples were collected on March 26, 1994.
2. Profile samples were counted on March 29, 1994 at 1:59:00 PM.
3. Approximate Flow Rate: 3.5 gpm; Time between samples: 10 min.
4. Owners used water (watered garden) one day prior of sample run.

Table F–C–1: Western Site A Well Shaft Profile––Data and Results from Run 3

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)	[Rn–222] (pCi/L)
PA 1	25.97	09:01:13 AM	35.78	17.60	1952.00	568.69	12,502.46
PA 2	26.00	09:13:30 AM	35.93	10.36	1963.00	965.54	21,489.36
PA 3	26.15	09:25:26 AM	36.21	12.20	1976.00	819.75	17,899.69
PA 4	25.99	09:37:16 AM	35.75	6.45	1984.00	1550.70	35,563.34
PA 5	25.89	09:49:20 AM	35.89	3.45	1988.00	2906.38	65,637.78
PA 6	25.92	10:01:26 AM	35.84	2.65	1992.00	3779.24	86,175.79
PA 7	25.90	10:13:23 AM	35.83	2.53	1995.00	3965.22	90,260.47
PA 8	25.92	10:25:55 AM	35.78	2.50	1999.00	4009.60	91,828.32
PA 9	25.87	10:37:28 AM	35.98	2.71	2002.00	3695.94	82,405.63
PA 10	26.01	10:49:30 AM	36.00	2.76	2006.00	3623.19	81,656.71
PA 11	25.94	11:01:20 AM	36.23	2.65	2010.00	3783.77	82,739.67
PA 12	25.91	11:13:44 AM	35.60	3.00	2013.00	3345.67	77,509.66
PA 13	25.92	11:25:50 AM	36.01	2.87	2017.00	3489.55	77,590.33
PA 14	25.93	11:37:53 AM	36.01	3.19	2021.00	3136.36	69,661.66
PA 15	25.87	11:49:00 AM	35.58	3.67	2026.00	2730.79	62,818.29
Calibration Information for Profile Samples							
Blank 1	25.59	–	36.23	50.00	50.00	34.62	–
Blank 2	25.69	–	35.86	50.00	102.00	33.76	–
Blank 3	25.73	–	36.23	50.00	153.00	33.94	–
Blank 4	25.88	–	36.72	50.00	204.00	32.82	–
714 pCi STD.	–	–	–	1.38	206.00	7313.04	–
952 pCi STD.	–	–	–	1.06	208.00	9458.49	–

Table Notes:

1. Samples were collected on April 17, 1994.
2. Profile samples were counted on April 20, 1994 at 2:43:15 PM.
3. Approximate Flow Rate: 3.5 gpm; Time between samples: 10 min.

Table F–C–2: Western Site A Well Shaft Profile––Data and Results from Run 3

Sample	Pre–weight (g)	Collection Time (hrs:min:sec)	Post–weight (g)	Sample Count Time (min)	LSC Real Time (min)	Gross Counts Rate (cpm)	[Rn–222] (pCi/L)
PB 1	26.00	02:47:00 PM	35.95	3.17	2030.00	3155.52	69,414.35
PB 2	26.07	02:59:36 PM	36.21	3.26	2034.00	3076.07	66,308.93
PB 3	25.84	03:11:44 PM	35.94	3.41	2039.00	2934.60	63,420.16
PB 4	25.96	03:23:24 PM	36.20	3.33	2043.00	3008.41	64,082.10
PB 5	26.01	03:35:59 PM	36.24	3.24	2047.00	3093.52	65,907.97
PB 6	25.94	03:49:42 PM	35.98	3.31	2051.00	3028.40	65,646.15
PB 7	26.00	04:01:11 PM	36.21	3.63	2056.00	2762.53	58,776.28
PB 8	26.02	04:13:52 PM	36.03	3.57	2060.00	2805.32	60,823.74
PB 9	25.83	04:25:46 PM	35.87	3.51	2065.00	2852.71	61,624.84
PB 10	25.91	04:37:08 PM	36.23	3.69	2069.00	2710.30	56,872.63
PB 11	26.07	04:49:36 PM	36.21	3.77	2074.00	2655.97	56,654.49
PB 12	26.10	05:02:00 PM	36.43	3.84	2079.00	2609.11	54,568.18
PB 13	25.94	05:09:21 PM	35.80	4.15	2084.00	2413.25	52,807.92
PB 14	25.95	05:16:28 PM	35.80	4.44	2089.00	2257.66	49,393.62
PB 15	25.88	05:23:50 PM	35.85	4.08	2094.00	2451.72	53,039.24
Calibration Information for Profile Samples							
Blank 1	25.59	–	36.23	50.00	50.00	34.62	–
Blank 2	25.69	–	35.86	50.00	102.00	33.76	–
Blank 3	25.73	–	36.23	50.00	153.00	33.94	–
Blank 4	25.88	–	36.72	50.00	204.00	32.82	–
714 pCi STD.	–	–	–	1.38	206.00	7313.04	–
952 pCi STD.	–	–	–	1.06	208.00	9458.49	–

Table Notes:

1. Samples were collected on April 17, 1994.
2. Profile samples were counted on April 20, 1994 at 2:43:15 PM.
3. Approximate Flow Rate: 3.5 gpm; Time between samples: 10 min.