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THE USE OF MULTI-ELEMENT BETA DOSIMETERS FOR MEASURING DOSE RATES IN THE TMI-2 CONTAINMENT BUILDING

**R. I. Scherpelz
G. W. R. Endres
L. A. Rathbun**

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**Pacific Northwest Laboratory
Richland, Washington 99352**

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SUMMARY

The use of thermoluminescent dosimeters (TLDs) for beta dosimetry has traditionally involved inaccuracies due to the energy-dependent response of the TLDs. In order to correct for the beta energy spectrum, researchers at the Pacific Northwest Laboratory (PNL--operated by Battelle Memorial Institute) have developed a dosimeter using TLDs under a number of different thicknesses of aluminum shields. These shields provide attenuation to the beta field that depends on the thickness of the shield and the energy of the beta particles striking the dosimeter. This type of dosimeter is able to automatically correct for the energy distribution of the beta radiation field, thus overcoming the energy-dependent inaccuracies of previous TLD-based dosimeters.

The PNL multi-element beta dosimeter has been used in four-element and seven-element configurations. The seven-element configurations were developed to provide better discrimination to low-energy betas. The dosimeters are assembled and analyzed in the PNL TLD Laboratory. Design considerations, analysis procedures, quality assurance, and error determinations for the dosimeters are described in this report. The methods of data analysis used for converting TLD response to dose are also described.

These multi-element dosimeters have been used to measure beta and gamma doses resulting from radioactive contaminants in the Three Mile Island Unit 2 containment building. Over 100 dosimeters have been used in three sets of experiments at a number of locations in the building. This report documents the experiments and presents the doses evaluated by the dosimeters.

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INTRODUCTION

There is a considerable amount of radioactive material contaminating many interior surfaces of the containment building of the Three Mile Island Unit 2 reactor as a result of the accident in March 1979. As work has begun on performing decontamination and other tasks in the building, it is important to have an accurate description of the contamination on these surfaces. This report describes dosimeters that were developed to measure dose rates due to the surface contamination found in TMI-2 containment. These dosimeters are capable of measuring doses due to beta and gamma radiation emitted by radio-nuclides deposited on the contaminated surfaces and suspended in the air near these surfaces. This report discusses the design of the dosimeter, and the calibration procedures and methods of using them for dose determinations. The report also describes the use of the dosimeters in TMI-2 containment and presents the results of this application.

A dosimeter may be placed near a contaminated surface for two basic purposes: (1) to give an indication of the quantity of radioactive material on the surface and (2) to give an estimate of the radiological hazard to a person positioned near the surface. For evaluating the presence of radioactive material, the quantity "dose," measured in units of rad, is most useful. In this study, dose is measured by dosimeters made of ^{7}LiF , which has energy absorption characteristics for beta and gamma radiation that are very similar to that of tissue, so the dosimeters give a good indication of dose to tissue. For evaluating the radiological hazard to personnel, the "dose equivalent," measured in units of rem, is most useful. (The dose equivalent for beta dosimetry is usually measured at a depth of 7 mg/cm^2 in tissue.) Since this discussion is concerned only with beta and gamma radiation, the quantities "dose to tissue" and "dose equivalent" are nearly numerically equal. Therefore this discussion will always refer to the dose (meaning "dose to tissue") measured by the dosimeter.

Another radiological quantity, "exposure," is commonly confused with dose and dose equivalent. This quantity is strictly valid only for photons in air, and in this report it is only used when discussing calibration procedures

using photons. Exposure is measured in units of roentgens (R). There will be instances in this report where the term "expose" is used, however. This term will be used, for example, when a dosimeter is placed in a radiation field and is therefore exposed to radiation. In this situation the dosimeter will still be used to evaluate the dose.

The dosimeter described in this report is a passive device, designed to be exposed to a field of radiation for a well-defined period of time. As the dosimeter is struck by radiation, material damage occurs in the dosimeter. After the dosimeter is taken from the radiation field, it is processed to determine the amount of material damage, and thus evaluate the dose received by the dosimeter. When this dose is divided by the amount of time in the radiation field, the result is an average dose rate. For this type of passive dosimetry, the health physics community has found thermoluminescent dosimeters (TLDs) to be very useful. The material has been shown to be rugged and reliable, with well-defined characteristics for dose determinations. The dose response of TLDs to radiation is linear over a wide range of doses for gammas and betas of any energy likely to be encountered in TMI-2 containment.

The use of TLDs for beta dosimetry has traditionally involved inaccuracies for beta dosimetry, however, due to the energy-dependent response of the TLDs to betas. In order to correct for differing beta energy spectra, researchers at the Pacific Northwest Laboratory (PNL) have developed a dosimeter using TLDs under shields of various thicknesses. These shields were chosen to provide differing amounts of attenuation to beta particles of a given energy, so that a mathematical analysis of the TLD responses would give an indication of the energy distribution of beta particles striking the dosimeter.

PNL MULTI-ELEMENT BETA DOSIMETER DESCRIPTION

PHYSICAL DESCRIPTION OF THE DOSIMETER

The researchers developing this dosimeter wanted to demonstrate that passive beta dosimetry could be accomplished without the resources of a sophisticated laboratory, but could rather be done adequately using the resources available to most health physicists. The holder was made of heavy fiberboard and aluminum. The shields were made of either aluminum or aluminized mylar. The phosphor selected for this dosimeter is 35-mil thick TLD-700, manufactured by Harshaw, a type commonly used by health physicists. Each shield covers three TLD chips; this report refers to each set of three chips and the accompanying shield as a dosimeter element. Two versions of the multi-element dosimeters have been used. The original four-element design did not yield the desired degree of separation for lower energy beta spectra. Therefore, three additional thin shields were added to bring the total to seven. Each dosimeter package is comprised of two four- or seven-element dosimeters placed back-to-back. Thus the four-element dosimeter contains 24 TLD dosimeter chips, and the seven-element dosimeter contains 42 chips. (See Figure 1. This is actually a picture of the new eight-element dosimeter; the seven-element dosimeter is identical except that it has no 1-mil shield.)

It is desirable to have a compact unit that is easy to handle. A small size is also desirable to minimize the effect of a radiation field that varies with position. The final version of the dosimeter is no larger than a pocket calculator. Because most beta dosimetry is performed in fields of mixed gamma and beta radiation, it was considered important to be able to derive separate dose values for gammas and betas. This requirement is met through the attenuation of the various shields.

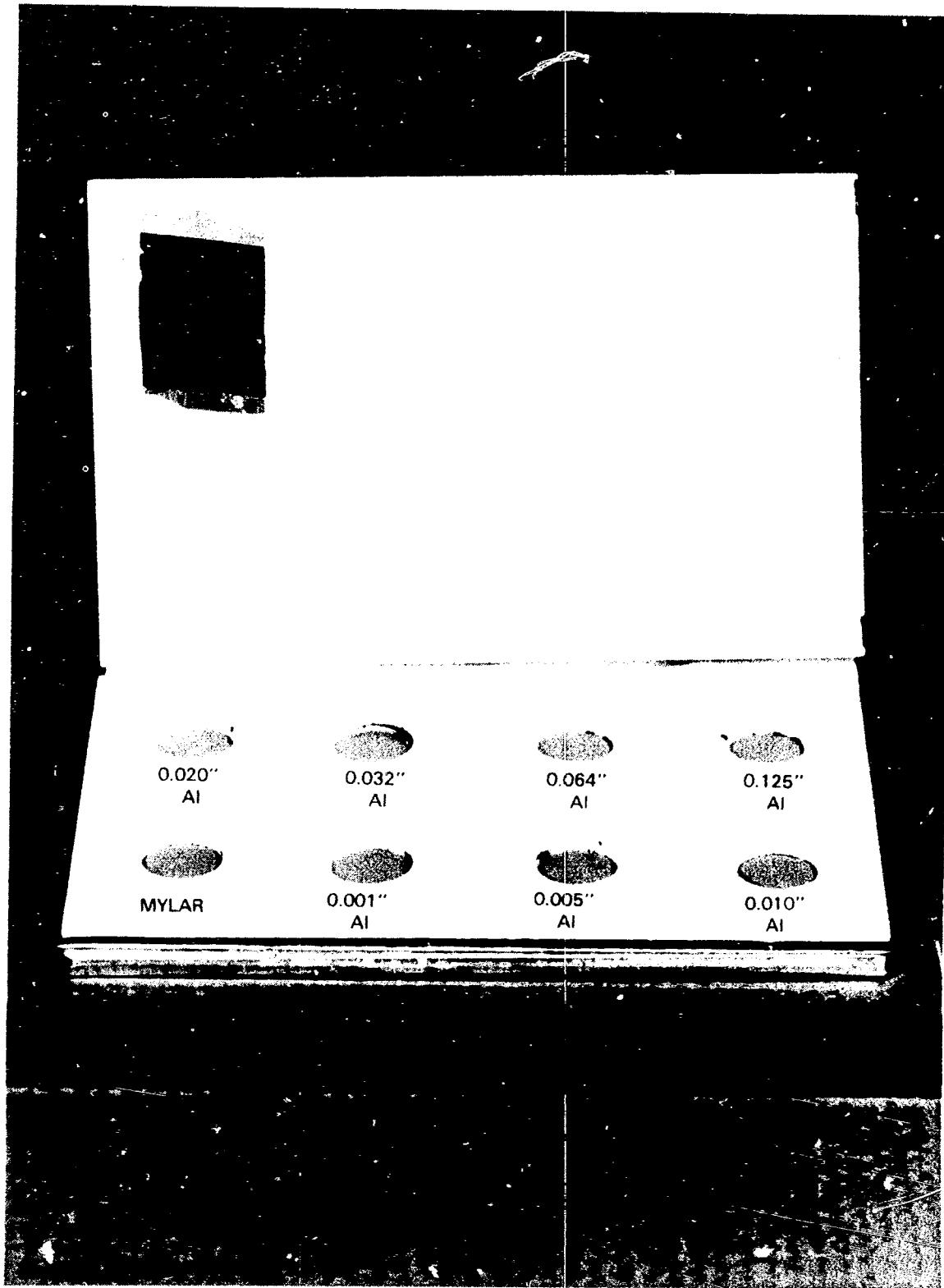


FIGURE 1. PNL Eight-Element Dosimeter

DOSIMETER SHIELD CHARACTERISTICS

All of the shields used in the multi-element dosimeter are made of aluminum (see Figure 2). In the case of the thinnest shield, 2×10^{-6} in., the aluminum is deposited on a mylar film. The other six shields in the seven-element dosimeter are square sheets of aluminum measuring 1.91 cm (3/4 in.) on a side. They have thicknesses of 0.013 cm (0.005 in.), 0.025 cm (0.010 in.), 0.051 cm (0.020 in.), 0.081 cm (0.032 in.), 0.163 cm (0.064 in.), and 0.318 cm (0.125 in.), respectively. (The four-element dosimeter used only the 0.051-cm, 0.081-cm, and the 0.318-cm shields.) The mass thickness can be obtained by multiplying by the density of aluminum, 2.7×10^3 mg/cm³. The mass thicknesses of the shields range from 0.013 mg/cm² to 860 mg/cm². This information can be applied to the appropriate range-energy curve (Figure 3) (Evans 1955) to determine the attenuation of the various shields. For example, beta particles with an energy of 1.9 MeV or less will be stopped by the thickest shield, whereas betas with energies greater than 180 keV will penetrate the 0.013-cm thick shield. Although not shown on the curve, the aluminized mylar film will stop only those beta particles with energies less than 3 keV. None of the shields will significantly affect the penetration of gamma photons with energies greater than 40 keV.

The response of TLDs shielded as described above are shown in Figures 4 and 5 (Endres, Scherpelz and Roberson 1982). In these figures, TLD responses are presented for seven-element dosimeters exposed to different sources of beta and photon radiation. The TLD response is listed in units of nano-coulombs (nc), corresponding to the light output from a TLD reader used to analyze exposed TLDs. Since the sources had differing intensities, the TLD responses in nc were divided by the dose delivered to the dosimeter (specifically the dose to the mylar-covered TLDs), producing normalized responses in units of nc/rad. These TLD responses for each dosimeter element were plotted against the thickness of the aluminum shield covering the TLDs. These empirical results seem to agree well with the results of the beta range-energy curve, with TLD response decreasing as a function of shield thickness. Nearly all the beta particles emitted by $^{90}\text{Sr}/^{90}\text{Y}$ (maximum energy 2.3 MeV) are stopped by the thickest filter.

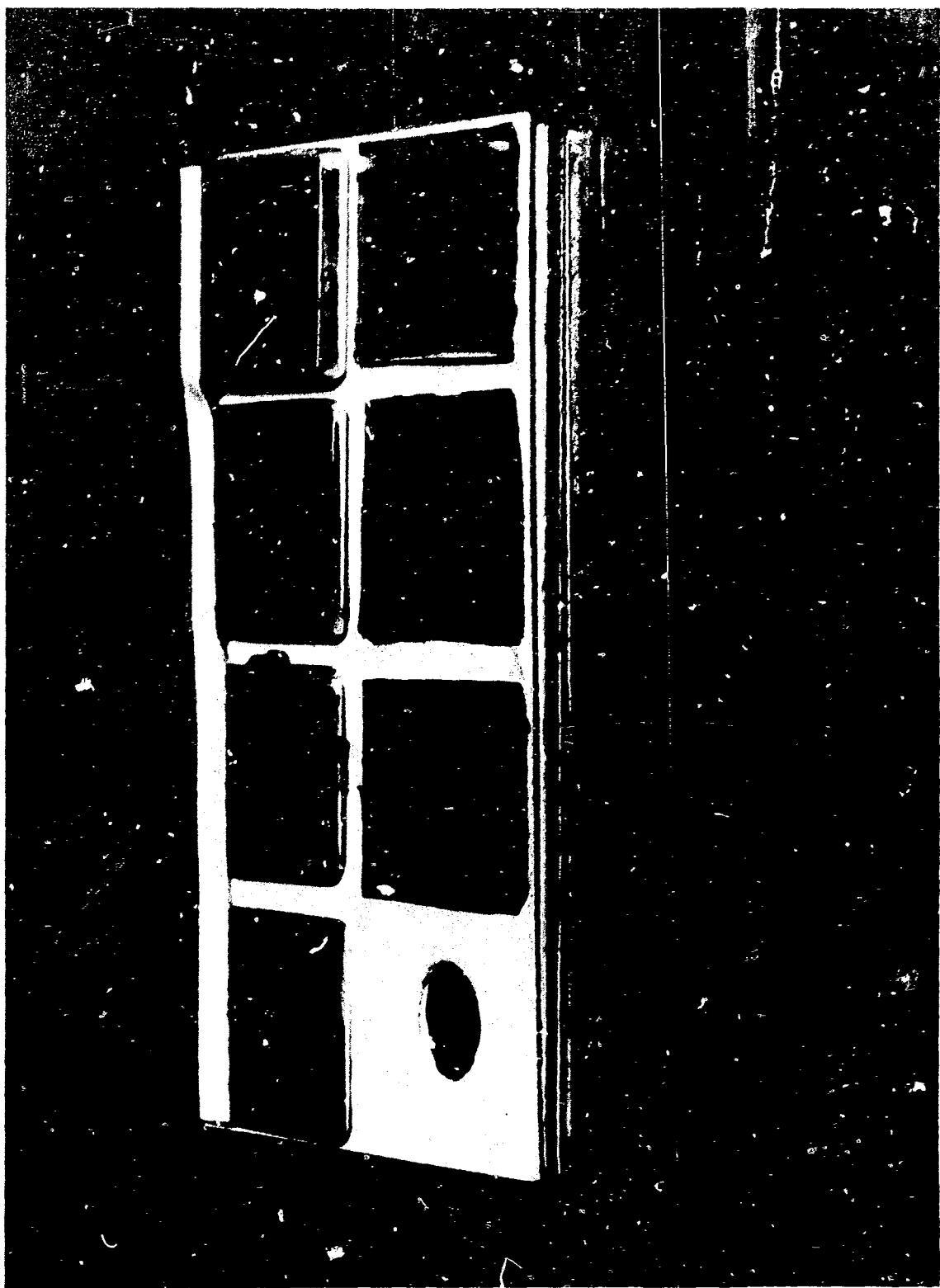


FIGURE 2. PNL Eight-Element Dosimeter Shields

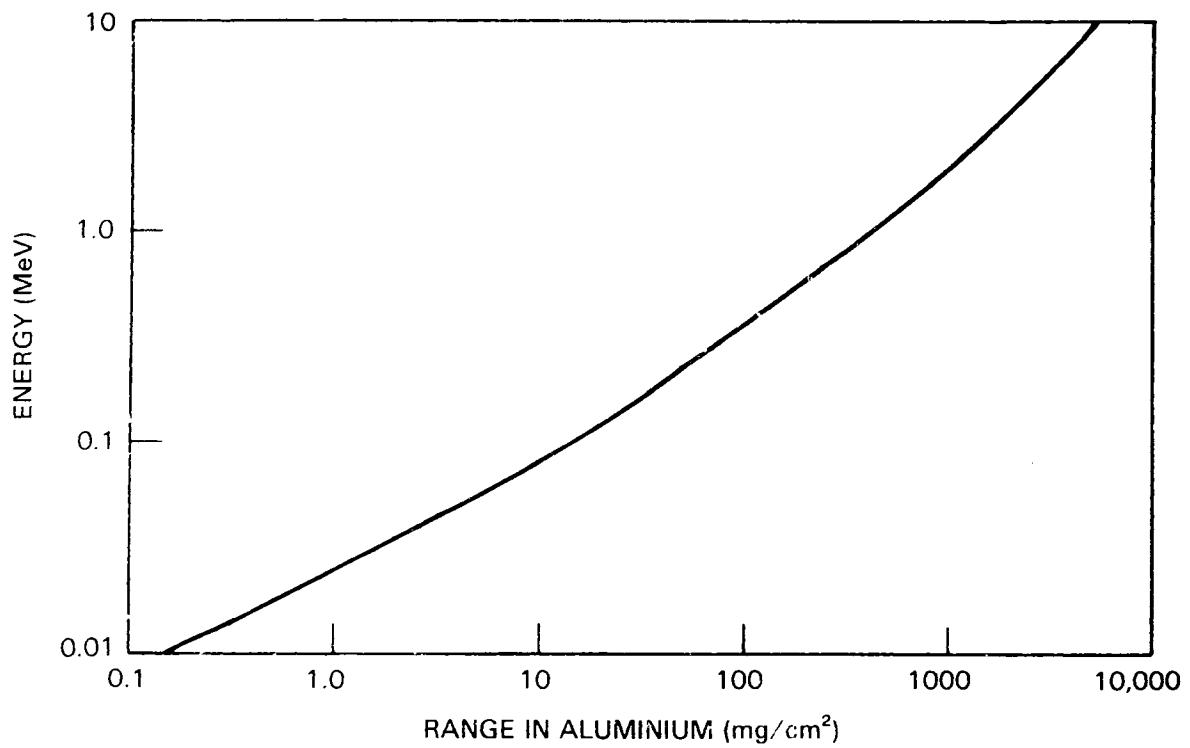
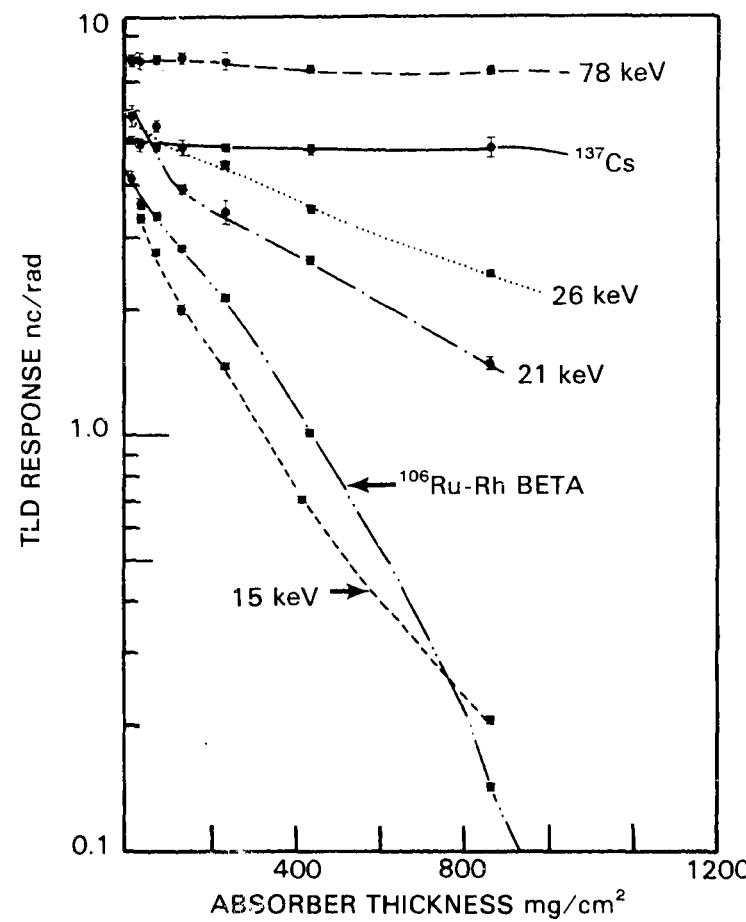
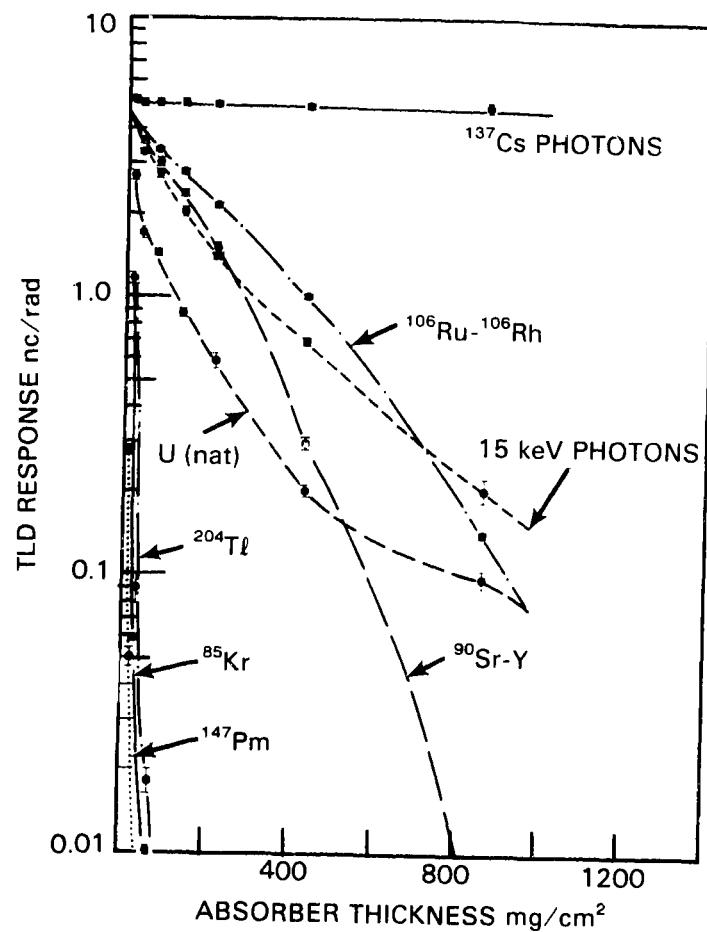


FIGURE 3. Beta Particle Range-Energy Curve

In Figure 4, natural uranium beta particles have an E_{\max} similar to $^{90}\text{Sr}/^{90}\gamma$, but the simultaneous emission of low energy photons increases the dose to the TLD behind the thickest shield. The $^{106}\text{Ru}/^{106}\text{Rh}$ source (E_{\max} , 3.5 MeV) irradiated the TLDs behind the thickest shield, but the two low energy beta sources, ^{85}Kr and ^{147}Pm , failed to irradiate the TLDs behind the 0.051-cm shield. Finally, the beta particles from the $^{137}\text{Cs}/^{137m}\text{Ba}$ source were stopped by the material encapsulating the source; the only TLD exposure was a result of the 662 keV gamma photons.

The PNL multi-element TLD dosimeters allow the user to make a correction for beta energy when converting the TLD data to dose values. Other beta dosimeters, including one type that was recently compared to the PNL multi-element dosimeter in a test at TMI-2, do not provide beta energy correction factors. The importance of making an energy correction is illustrated by Figures 6 and 7. Each graph compares two sets of dosimeters exposed to beta radiation at the same location. The ratios of indicated beta dose rates are plotted on the vertical axes, with logarithmic scales. The horizontal axes of



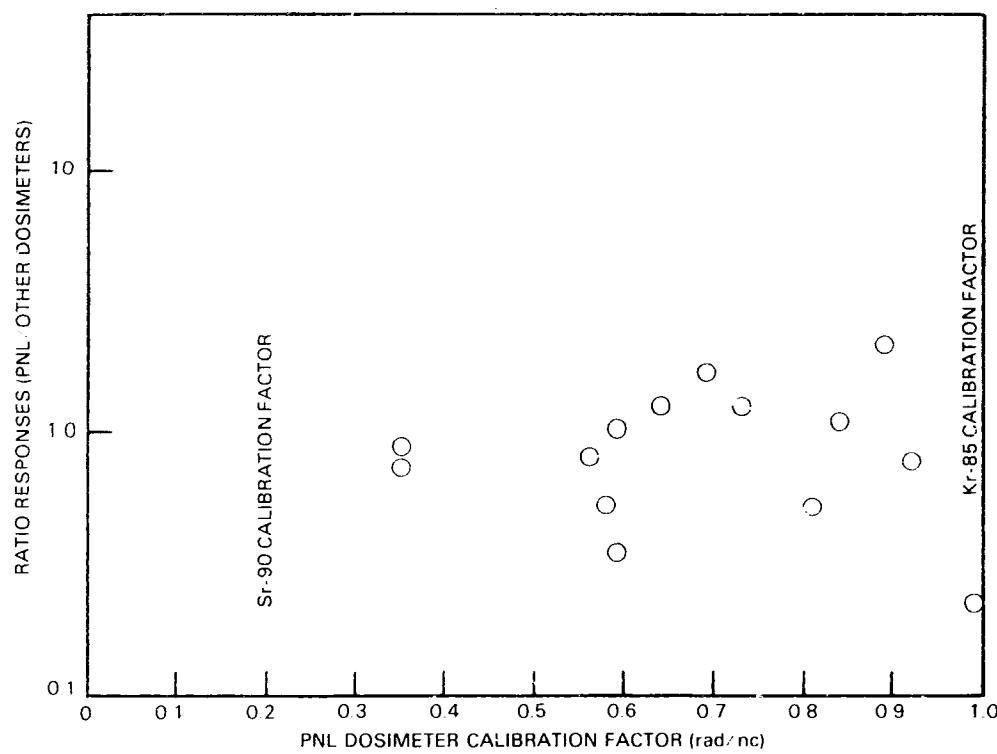


FIGURE 6. Comparison of PNL and Vendor 1 Dosimeters

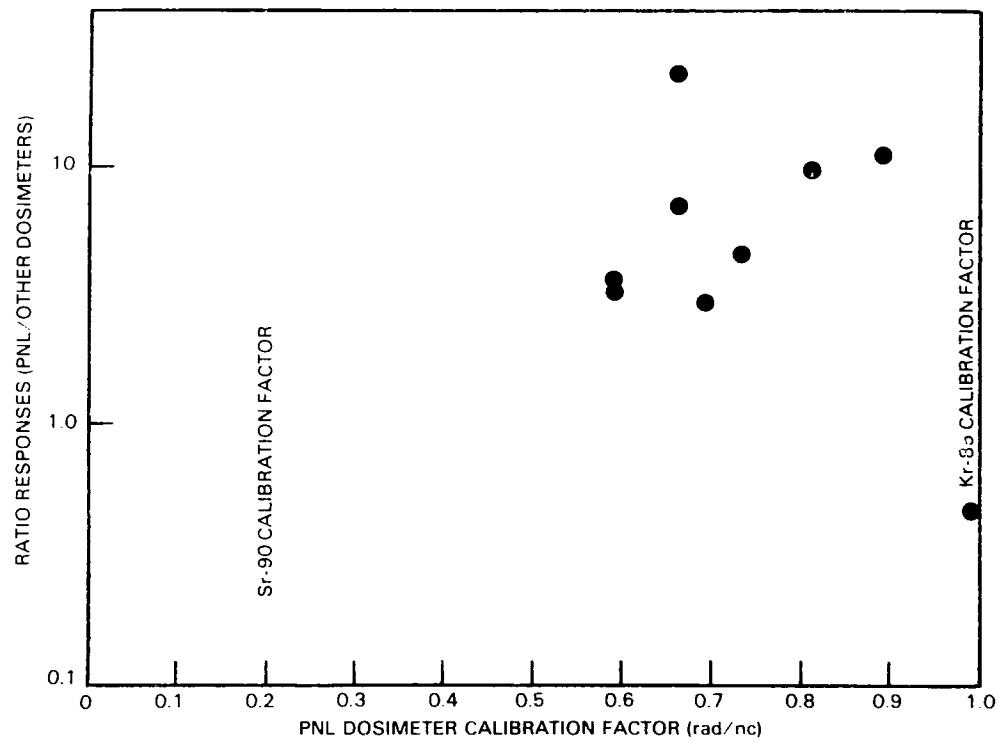


FIGURE 7. Comparison of PNL and Vendor 2 Dosimeters

these figures are used for presenting calibration factors, the values used to convert dosimeter response to dose. The calibration factors for the PNL dosimeters vary with energy, and in these studies this factor ranged from 0.35 to 0.99 rad/nc. Because the dosimeters from Vendor 2 rely on a single calibration factor, their dose determinations will be dependent on the source of calibration. If these dosimeters were calibrated with ^{90}Sr , a popular calibration source, the indicated dose could underestimate, by as much as a factor of 5, the dose as determined by PNL dosimeters. Because TLDs are known to have an energy-dependent response to beta radiation, PNL's TLD dosimeter results are expected to be more accurate than dosimeters using a fixed calibration factor.

CHARACTERISTICS AND QA PROCEDURES FOR THE TLDs

The TLDs used in the multi-element beta dosimeter are 0.318 cm by 0.318 cm by 0.089 cm (1/8 in. by 1/8 in. by 0.035 in.) ^7LiF ribbons (chips) with a mass of about 25 mg. They are available from the Harshaw Chemical Company as TLD-700s. The energy absorption characteristics of these TLDs to beta and gamma radiation resembles that of tissue. Lithium fluoride has an effective atomic number for photoelectric absorption of 8.14, compared with 7.42 for tissue and 7.64 for air. These high sensitivity ribbons are optically transparent, mechanically rugged, and conveniently handled.

When crystalline LiF is exposed to ionizing radiation at room temperature, electrons in the valence band are raised to the conduction bands. Imperfections in the LiF crystal lattice produced by dopants can trap the free electrons. Heating the LiF gives the electrons the additional energy that they need to escape the traps and return to the valence band. As the electrons return to a lower energy level, they emit visible light (3500-6000 Å). The amount of light emitted is proportional to the number of trapped electrons and is therefore proportional to the radiation dose.

The TLD-700 dosimeters are typically made in batches of thousands from the same batch of TLD powder. The manufacturer visually examines a representative statistical fraction of every batch for apparent defects and checks for thermoluminescent response at an exposure of 1 roentgen using a ^{60}Co source. The resulting TL response data are analyzed by a computer code which provides mean sensitivity and standard deviation data. These data are expressed as

percentage of the mean and stored by batch number for future reference. In a batch of thousands the typical measured standard deviation in sensitivity is in the range of 2% to 5% of the mean. Batch to batch means vary by less than 5%.

Batches of TLD material used in multi-element dosimeters receive additional screening at the PNL TLD Laboratory after receipt from the manufacturer. In the PNL screening, samples of 200 or more TLDs randomly selected from each new batch are annealed along with samples of 20-25 chips from an original reference set of TLD material and 20-25 chips from the set used in special studies. The chips are spread in vicor dishes and placed in a 400°C furnace under a nitrogen atmosphere for 1 hour, then transferred to a 100°C oven. After 2 hours, TLDs are placed in a low-background storage cave, where they are held for at least 24 hours. All transfers of heated chips are performed under dim light to avoid ultraviolet sensitization of the LiF.

After annealing, the samples are loaded into cardboard holders and irradiated with 250 mR gamma from a ^{137}Cs calibration source (off-phantom). A hot gas reader is normally used to compare light outputs. If the laboratory planchet reader is used, sample sizes are reduced. Sample means and standard deviations are calculated for each group. The irradiation/readout process is repeated twice to simulate the effects of reader annealing.

Batches are accepted if the sample mean falls within 5% of both reference sample means and the sample standard deviation is less than 10%. When the mean or standard deviation does not fall within acceptable limits, the batch sample and reference samples are reannealed and rescreened; the laboratory anneal will often stabilize chip responses sufficiently for samples to pass a second screening. If a sample is accepted after a second anneal and screening, the entire batch is annealed before use.

The LiF TLDs have a response that is a well-defined function of dose over the range of 10 mrad to 100,000 rad. When PNL's standard quality control procedures are observed, the TLD-700s can measure doses as low as 10 mrad with a standard deviation of less than 10%; higher doses can be measured with standard deviations as low as 2%. If several TLDs are used, doses as low as a few mrad can be measured by the TLD-700, but with standard deviations greater than 10%.

CALIBRATION AND MEASUREMENT

TLD READER SYSTEM

The instruments used to measure the energy absorbed by the TLDs in the multi-element dosimeter consist of a Harshaw Model 2000-A thermoluminescence analyzer and a Harshaw Model 2080 picoprocessor (see Figure 8). The thermoluminescence analyzer provides a means of heating the TLDs at a constant rate and uses a photomultiplier tube for measuring the amount of light produced (see Figure 9). The amount of light striking the photo-cathode of the photomultiplier tube is proportional to the energy absorbed by the TLDs.

The picoprocessor, or microprocessor-based picoammeter, allows for CRT presentation and storage of digitized glow curves. A glow curve is a plot of light output versus temperature for a TLD. A typical glow curve is evident on the video screen in Figure 8. Figure 10 presents a detailed representation of a glow curve for a TLD-700 read out in the PNL TLD Laboratory. An integration of the area under the glow curve represents the total light output of the TLD. This is the method used to analyze the TLDs from the PNL multi-element dosimeters. From the total light output, the dose to the TLD can be derived.

It is not necessary to use the new picoprocessor described above for glow curve analysis. Any good TLD reader with an x-y plotter is adequate. Calibration of the Model 2000-A thermoluminescence analyzer is checked through the use of a built-in ^{14}C arbon-activated sodium iodide (Tl) light source. The Model 2080 picoprocessor has an internal, electronic calibration source and the calibration can be checked from the keyboard. The complete system is checked with a set of reference TLD chips. These TLDs are irradiated with a gamma ray source of known strength such that a wide exposure range is obtained. The readout of the prepared standards gives a calibration curve in exposure versus charge.



FIGURE 8. Harshaw Thermoluminescence Analyzer and Picoprocessor

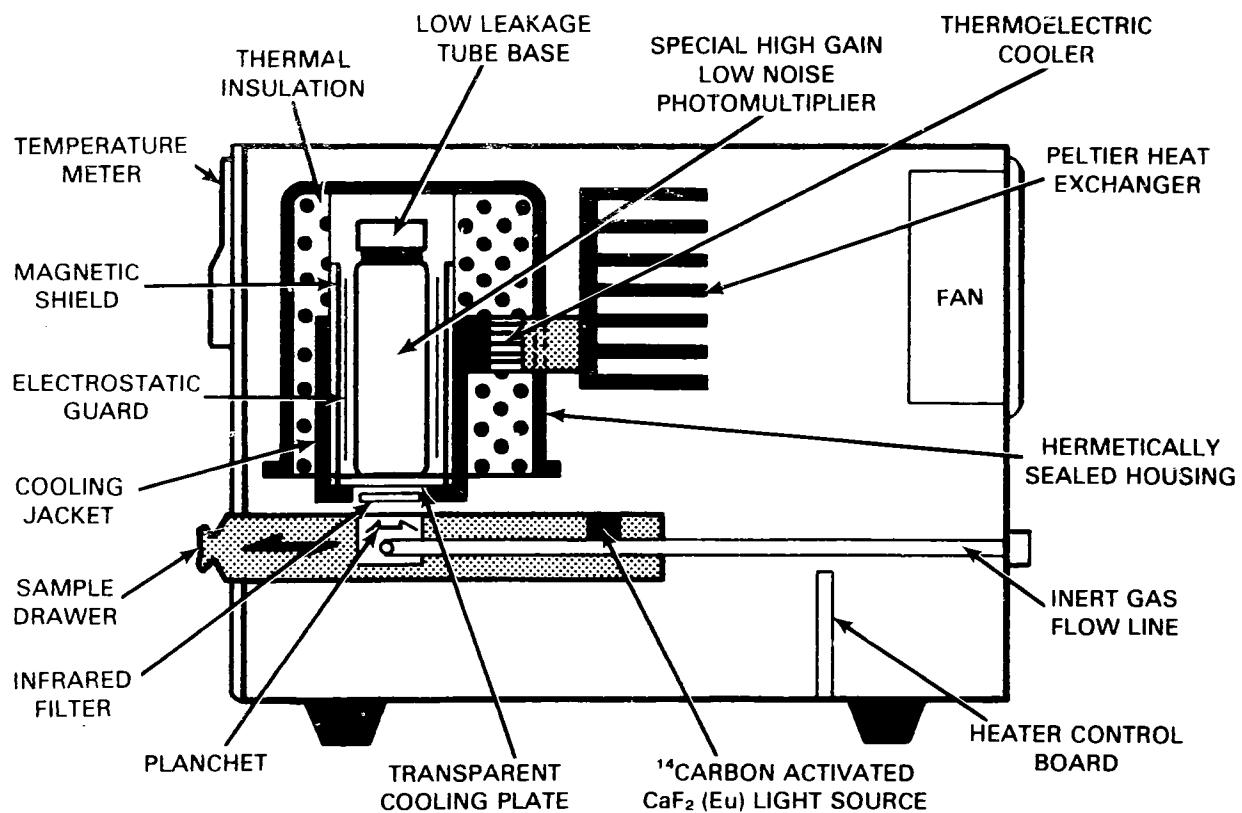


FIGURE 9. Physical Layout of Thermoluminescence Analyzer

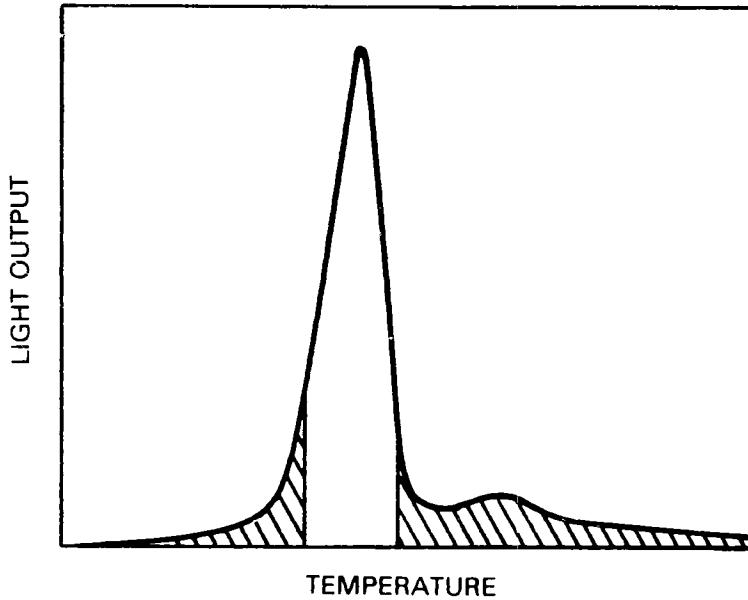


FIGURE 10. Typical TLD reader Glow Curve for a TLD-700

MULTI-ELEMENT DOSIMETER CALIBRATION

The multi-element beta dosimeters were calibrated by exposing them to known radiation sources at the PNL Calibrations Laboratory. The beta sources used in these calibrations and the maximum energies of the emitted betas are presented in Table 1. The responses of the dosimeters to these calibration sources are presented in Figure 4.

TABLE 1. Beta Calibration Sources

<u>Nuclide</u>	<u>Maximum Beta Energy (MeV)</u>
^{147}Pm	0.23
^{85}Kr	0.62
^{204}Tl	0.76
$^{90}\text{Sr}/^{90}\text{Y}$	2.3
$^{106}\text{Ru}/^{106}\text{Rh}$	3.5

The dosimeters were also exposed to calibrated sources of x rays with energies ranging from 15 to 78 keV, and to a calibrated $^{137}\text{Cs}/^{137m}\text{Ba}$ source emitting 662-keV gammas. These measurements characterized the response of the dosimeters to photons. The responses of seven element dosimeters to these photon sources are presented in Figure 5. These studies demonstrated that the attenuation of photons is dependent on shield thickness if the energies are less than about 40 keV, but for photons with higher energies, the TLD response is fairly uniform for all elements. This characteristic of the dosimeter allows the use of the element with the thickest aluminum filter to be used as an indicator of gamma dose. The beta calibration studies summarized in Figure 4 show that the element behind the 0.318-cm Al filter is very nearly insensitive to betas. A calibration factor for gammas was thus determined from the irradiation by $^{137}\text{Cs}/^{137m}\text{Ba}$ to be 0.204 rad/nc. This value can be multiplied by the response of the 0.318-cm Al-filtered element of any exposed dosimeter to determine the gamma dose. The TLD response of this element can also be subtracted from the TLD response of all other elements in an exposed dosimeter to obtain the beta components of the element responses.

The data from these calibration studies were used to derive calibration data used in determining the beta doses from field-exposed dosimeters. For each dosimeter exposed to a calibrated beta source, a beta "Calibration Factor" (CF) was determined by subtracting the gamma component (the reading of the element covered by the 0.318-cm Al shield) from the TLD response of the mylar-covered shield, and dividing this value (in nanocoulombs) into the beta dose (in rads) absorbed by the mylar-covered TLDs during the calibration measurement. The beta dose delivered by the calibration source is defined as the dose to tissue at a depth of 7 mg/cm^2 . This factor could then be used to convert the responses of other dosimeters to a 7 mg/cm^2 dose, as long as the dosimeters were exposed to a field of betas with the same energy distribution as the beta calibration source. For each of the five elements with aluminum shields between 0.013 and 0.163 cm thick, the ratio of the element's beta response to the mylar-covered element's beta response was found for each calibration measurement. This ratio was a function of the calibration source's energy distribution: high beta energies resulted in high values of these ratios.

This data was plotted in Figure 11 for the most useful beta calibration measurements for each element. The Calibration Factor is plotted on the vertical scale and the CF value for each beta calibration source is identified. The element ratios are plotted on the horizontal scale. The points on the graph are the observed values for each of the element in each of the irradiations (the error associated with each point is less than 5%), and the lines are linear equations fitted to the observed values.

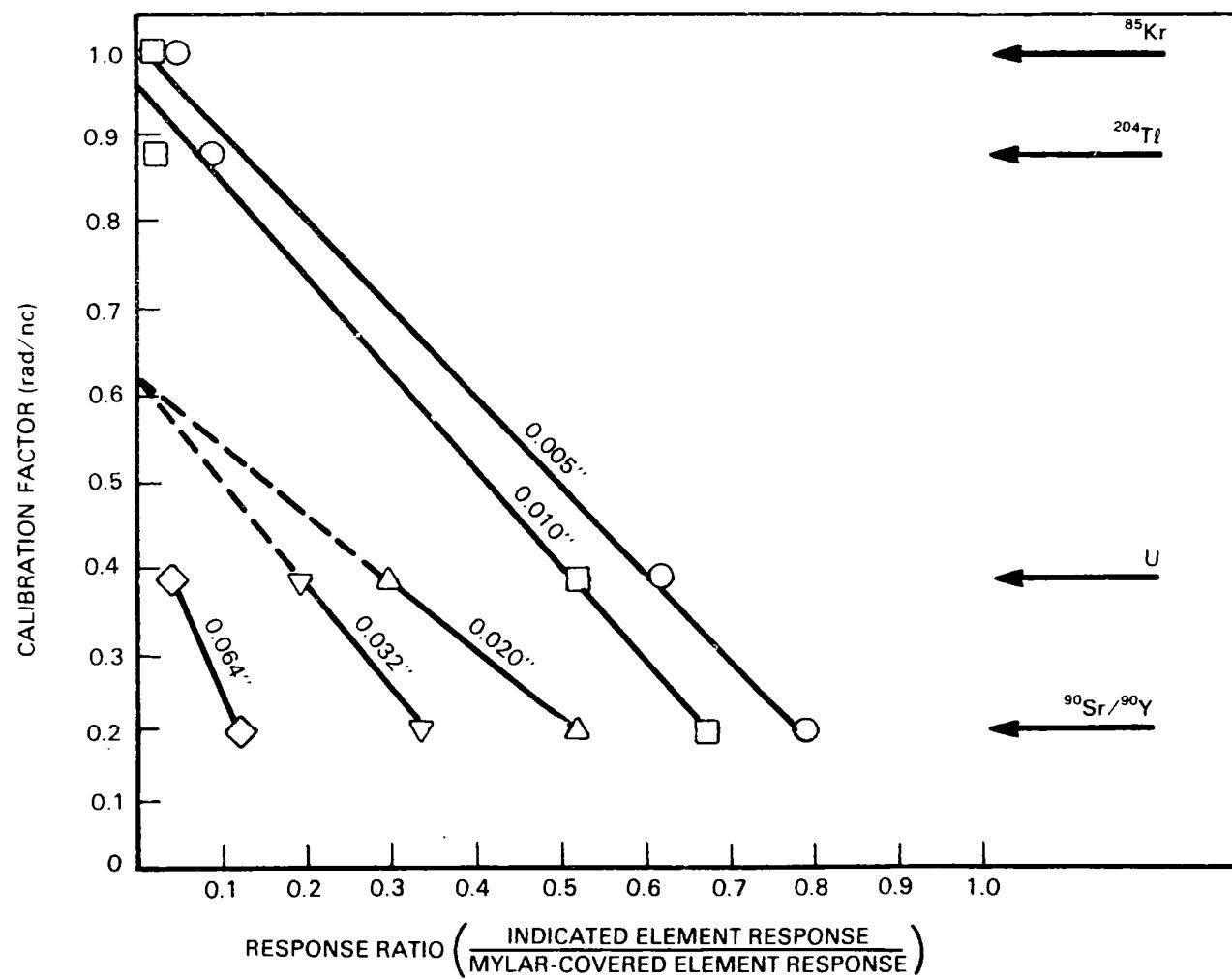


FIGURE 11. Calibration Factors Versus Element Ratios

DATA ANALYSIS METHOD

When exposed dosimeters are analyzed to determine the doses they were exposed to, the first task is to disassemble the dosimeters and extract the TLDs. As the TLDs are taken from the dosimeters, they are read out in the thermoluminescence analyzer and picoprocessor. This analysis results in TLD responses in units of nanocoulombs of light output. The TLD responses are then used as raw data in a computer program which converts the TLD responses to absorbed doses. This program first finds the gamma component of each dose, then subtracts the gamma response from each element response, and determines the ratios of Al-covered elements to the mylar-covered element. It uses these ratios, which are an indication of the beta energy spectrum, to select the appropriate calibration factor. This calibration factor is then multiplied by the mylar-covered element's response to determine the beta dose. This procedure will be illustrated by a sample dosimeter analysis.

The input data for the computer program consists of the TLD responses for all chips in the dosimeter. The program first looks at the TLD responses in sets of three for each element. Ideally these three chips should all have nearly identical readings. The program finds the mean and standard deviation for each set of three, and if a standard deviation is greater than 5%, it checks to see if two of the readings are close to each other; if so it rejects the "flier," and uses the mean value of the other two. If all three readings are quite dissimilar, it rejects all three if the element is one of 4, 5, or 6 (of the seven-element dosimeter); otherwise it accepts all three. This system is necessary to preserve data that is necessary for the analysis, but reject suspicious data that is unessential and may confuse the results.

Table 2 presents the "raw" data from a four-element dosimeter for an example data analysis to illustrate the operation of the computer code. In this example only the mean values of the three TLD readings for each element are recorded.

TABLE 2. Raw Data for Exposed Four-Element Dosimeter

<u>Shield</u>	<u>Gamma + Beta (nc)</u>	<u>Beta (nc)</u>
Mylar	543.0	200.6
0.051 cm Al	406.9	64.4
0.081 cm Al	366.0	23.6
0.318 cm Al	342.5	0

The reading for the TLDs under the thickest filter was used to indicate the gamma dose, and this value was subtracted from the other element readings to get responses due to betas alone. Ratios were then determined for the elements under each of the two thinnest aluminum shields to the mylar-covered element, and these two ratios indicated the energy distribution of the beta radiation incident on the dosimeter. These ratios were used to select the appropriate energy-dependent beta calibration factor for each shield from the set of calibration factors determined by the calibration irradiations. The CF values were determined by applying the fitted equations shown in Figure 11. These equations are listed in Table 3.

The average of the two calibration factors found by equations for #4 and #5 was then multiplied by the mylar-covered element's beta response to determine the beta dose. The worksheet for these calculations based on the raw data of Table 2, is presented in Table 4.

TABLE 3. Equations for Converting Element Ratios to Calibration Factors

<u>Element</u>	<u>Shield Thickness (cm)</u>	<u>Equation</u>
2	0.013	CF = -1.0032 * R + 0.9943
3	0.025	CF = -1.0960 * R + 0.9471
4	0.051	CF = -0.7438 * R + 0.6028
5	0.081	CF = -1.1420 * R + 0.5885
6	0.163	CF = -6.1597 * R + 0.6215

TABLE 4. Analysis of Exposed Four-Element Dosimeter

Shield (cm)	Ratio	Beta Calibration Factor	
		Element (rad/nc)	Average (rad/nc)
0.051 Al	0.321	0.364	0.409
0.081 Al	0.118	0.454	

$$\text{Beta Dose} = (201 \text{ nc}) * (0.409 \text{ rad/nc}) = 82.4 \text{ rad}$$

$$\text{Gamma Dose} = (342 \text{ nc}) * (0.204 \text{ rad/nc}) = 69.3 \text{ rad}$$

The final two lines of Table 4 show the conversion of TLD response to dose. The beta dose calculation uses the beta component of the mylar-element response, with the calibration factor selected in Table 4. The gamma dose calculation uses the TLD response from the element shielded by the thickest aluminum shield, with a gamma calibration factor determined by the calibration irradiations.

A similar method of using beta-component responses to calculate ratios of aluminum-shielded elements to mylar-shielded elements was used in the analysis of data from seven-element dosimeters. A set of raw data from a seven-element dosimeter is presented in Table 5.

TABLE 5 Data for Exposed Seven-Element Dosimeter

Element	Shield	Gamma + Beta (nc)	Beta (nc)	Element Ratio	Calibration Factor
1	Mylar	240.3	79.8	1.0	-
2	0.013 cm Al	191.5	31.0	0.3887	0.6044
3	0.025 cm Al	185.5	25.0	0.3132	0.6038
4	0.051 cm Al	177.0	16.5	0.2071	(0.4488)
5	0.081 cm Al	163.1	2.6	0.0322	(0.5517)
6	0.163 cm Al	158.7	0	0	(0.6215)
7	0.318 cm Al	160.5	0	0	-

The gamma dose for this example was found by multiplying the TLD response of element 7 by the gamma calibration factor:

$$(160.5 \text{ nc}) * (0.204 \text{ rad/nc}) = 32.7 \text{ rad.}$$

To evaluate the beta dose, a calibration factor could have been found by averaging the CF values for elements 2-6: 0.566 rad/nc. However, it would be poor practice to include element 6 in the beta calibration factor determination, since no betas penetrated the filter--the TLD response was zero. Therefore limits were set on the ratios of each element: if the ratios were below the lower limits, the element was disregarded in the beta CF determination. If the ratio was above the upper limit, the CF for a $^{90}\text{Sr}/^{90}\text{Y}$ spectrum was assigned to that element. The reasoning for setting the lower limit was to avoid using the results of thick-filtered elements in a low-energy field where these elements would be insensitive. From the results of the calibration studies, the lower ratio limits were set for elements 4, 5, and 6 as the ratio values corresponding to the uranium spectrum. No lower limits were set for the two thin-aluminum-filtered elements (2 and 3), since these are the most sensitive for the low-energy fields. Upper limits were set for all elements, 2-6, corresponding to ratios for a $^{90}\text{Sr}/^{90}\text{Y}$ beta field. The linearity of the ratio-CF equations are suspect for beta energies above this limit, so the conservative assumption was made to assign the $^{90}\text{Sr}/^{90}\text{Y}$ CF value to any element response with a ratio higher than this limit ratio value. The average CF for a dosimeter exposure was therefore found as the average of the CF values for all elements with ratios above the lower limit. For this example, the average of CF values for elements 2 and 3 was 0.6041 rad/nc. Thus the beta dose was calculated as:

$$(79.8 \text{ nc}) * (0.6041 \text{ rad/nc}) = 48.2 \text{ rad.}$$

The discussion of limits to the ratio values illustrates the advantage of the seven-element dosimeter over the four-element dosimeter. In the four-element dosimeter a lower limit could not be set for the two important aluminum-covered elements, since the two thinnest filters were not available.

(In Figure 11 the equations for these two elements were shown as dashed lines above the uranium CF, showing that these segments were used for the four-element dosimeter analysis, but not for the seven-element dosimeter analysis.) Thus in low-energy beta fields we had to rely on the ratios from the 0.051-cm and 0.081-cm Al filters, even though the 0.013-cm and 0.025-cm filtered elements would have given more reliable CF values.

A computer code, RAT1C7, has been written and used at PNL for the dosimeter data analysis. This code is listed in Appendix I.

Error Analysis

The major components of the error in a dosimeter measurement comes from uncertainties in:

- TLD chips
- TLD reader
- Calibration measurement and curve fitting
- Dosimeter placement and irradiation.

A thorough analysis of the measurement errors would involve isolating each individual factor affecting each component identified above, determining the variability of each factor, and combining all of these factors into one mathematical expression. A similar study was performed for the Hanford Multipurpose Dosimeter, and this study was recently published (Fi81). Since this type of error analysis is beyond the scope of this study, the errors in each dosimeter measurement were empirically approximated based on the results of each dosimeter's analysis.

The basic formula for converting a dosimeter response to measured dose is:

$$D = CF * TLD,$$

where D is the dose, CF is the calibration factor, and TLD is the TLD response of the appropriate element (for gammas, #7; for betas, #1 with gamma response subtracted off). The error analysis for these dosimeters consists of evaluating the observed variation for each of the two components, CF and TLD, and combining these into a total error for the measurement. The variation in CF

for betas is found by evaluating the standard deviation of the individual element CF values that are averaged to find the CF value used to determine the beta dose. The standard deviations of the three TLD counts for elements 1 and 7 were also evaluated and combined for the beta error:

$$\sigma_{TLD} = \sqrt{\sigma_{TLD-1}^2 + \sigma_{TLD-2}^2}$$

These two standard deviations were then combined to get the total beta error:

$$\sigma_D = D \sqrt{\frac{\sigma_{CF}^2}{CF^2} + \frac{\sigma_{TLD}^2}{TLD^2}}$$

The error for the gamma dose was found in a similar manner, using the same equation for σ_D . However, since a fixed value was used for CF, the standard deviation for CF was fixed at $0.093*CF$, based on uncertainties in the calibration measurements. σ_{TLD} was simpler for the gamma dose than for the beta dose, simply the standard deviation of the three TLD chips in element 7, the element used for the gamma dose determination.

COMPILATION OF DATA

DESCRIPTION OF EXPERIMENTS

Multi-element beta dosimeters have been exposed in three sets in the containment building of the Three Mile Island Unit II reactor. The three sets were used in the following experiments:

- pre-gross decontamination experiment
- post-gross decontamination experiment
- pre-flushing TLD tree.

In the pre-gross decontamination experiment, dosimeters were exposed between December 3 and December 15, 1981. Ten dosimeters were used in the vicinity of the dome monitor and on the elevator shaft roof, thirteen were placed on the 305 ft elevation, and 15 were placed on the 347 ft and 367 ft elevations. These dosimeters were returned to PNL and read out in the TLD readers in February 1982. The computer run used to analyze the data is presented in Appendix II. A summary of the dosimeter placements and the resulting dose rates are presented in Figures 12a, 12b, and 12c; and in Tables 6a, 6b, and 6c.

Tables 6a through 9 list four dose rates for each dosimeter location: the beta dose rates for the front and back of the dosimeter and the gamma dose rates for the front and back. With each dose rate is listed the associated error, expressed as one standard deviation. In some dosimeter analyses this error was larger than the evaluated dose rate itself, and if this error were subtracted from the evaluated dose rate, the value would be less than zero. Such a value would, of course, be nonsense. Any dose rate of zero (or smaller) should be interpreted as being lower than the dosimeter's minimum level of detection.

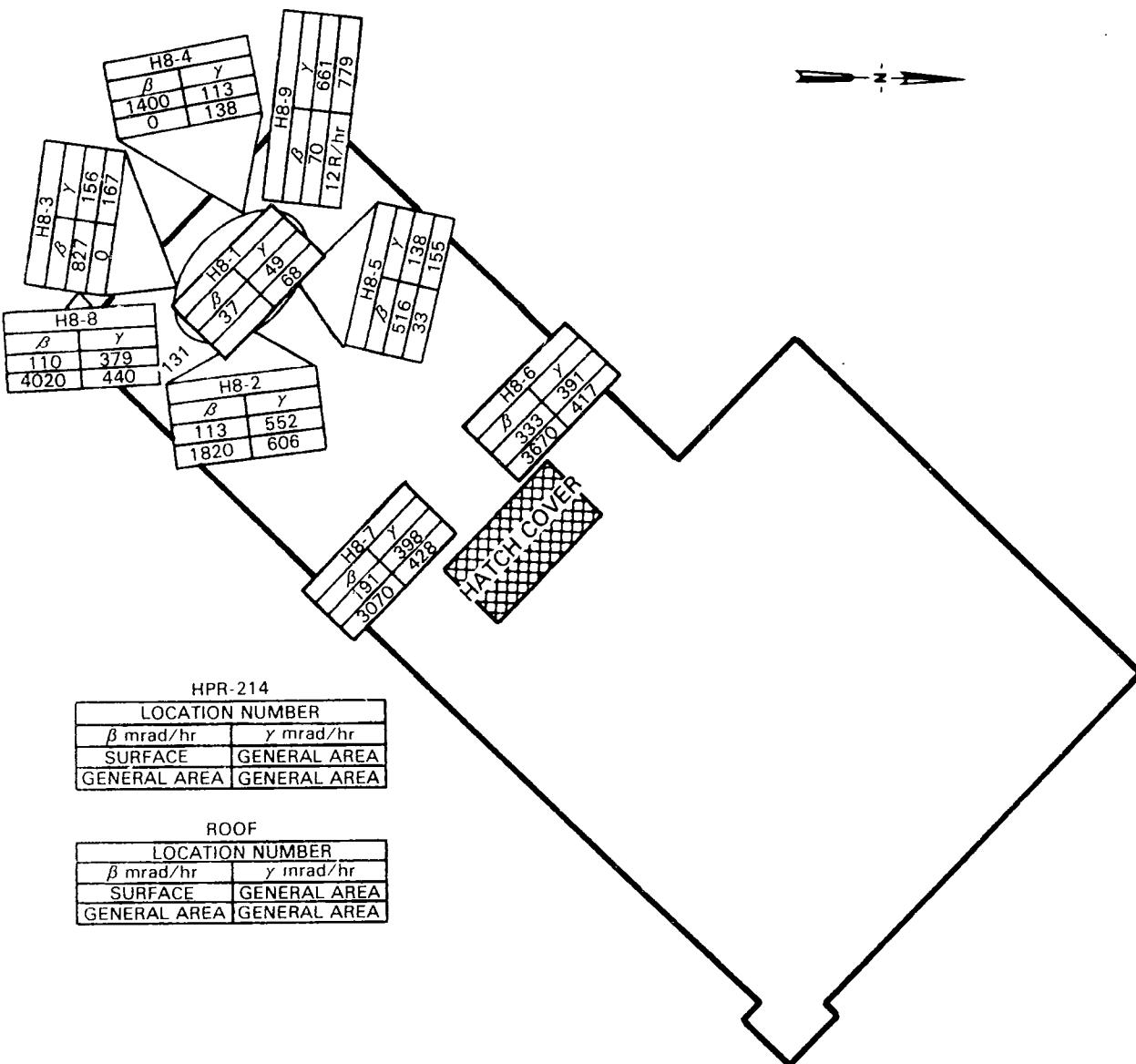


FIGURE 12a. Pre-Gross Decontamination Experiment Dosimeter Placement and Results - Dome Monitor and Elevator Shaft Roof

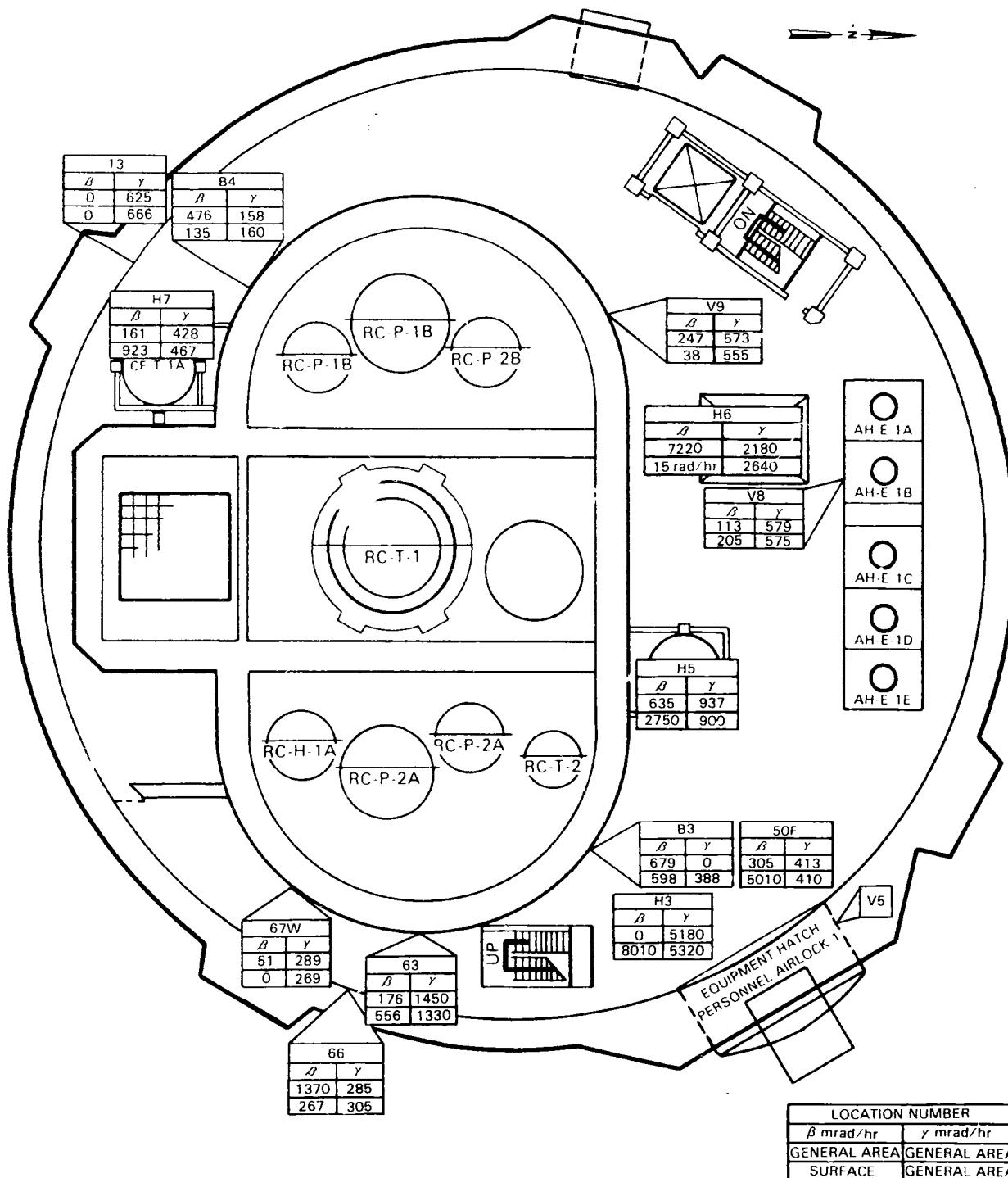


FIGURE 12b. Pre-Gross Decontamination Experiment Dosimeter Placement and Results - 305 ft Elevation

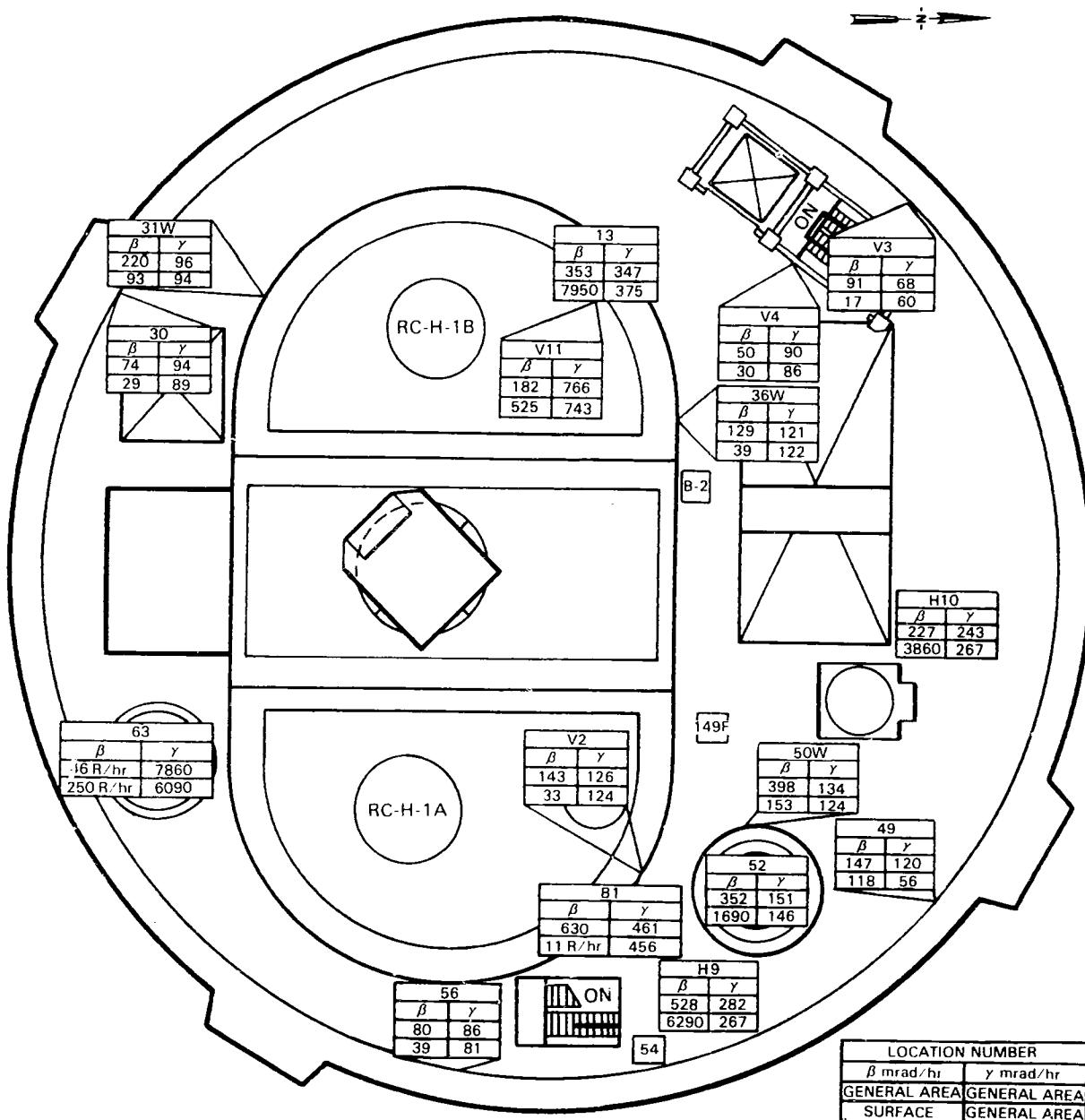


FIGURE 12c. Pre-Gross Decontamination Experiment Dosimeter Placement and Results - 347 and 367 ft Elevation

TABLE 6a. Pre-Gross Decontamination Experiment Dosimeter Placement and Results -
Dome Monitor and Elevator Shaft Roof

Type Surface	TLD #	Location #	Location Description	Date and Time Exposure		Exposure Time (hr)	Beta Dose Rate		Gamma Dose Rate	
				In	Out		Front (mrad/hr)	Back (mrad/hr)	Front (mrad/hr)	Back (mrad/hr)
Vertical or Horizontal Surface of Dome Monitor	1	H8-1	Horizontal surface, top of monitor	12/3/81 12:00	12/15/81 12:00	288	37.0 ± 20.1	131 ± 125	48.8 ± 4.6	68.2 ± 12.1
	2	H8-2	Vertical surface, side of monitor	12/3/81 12:00	12/15/81 12:00	288	113 ± 92	1820 ± 440	552 ± 52	606 ± 57
	3	H8-3	Vertical surface, side of monitor	12/3/81 12:00	12/15/81 12:00	288	827 ± 57	0	156 ± 16	167 ± 16
	4	H8-4	Vertical surface, side of monitor	12/3/81 12:00	12/15/81 12:00	288	1450 ± 89	0	113 ± 11	138 ± 14
	5	H8-5	Vertical surface, side of monitor	12/3/81 12:00	12/15/81 12:00	288	516 ± 268	33.0 ± 22.9	138 ± 13	155 ± 15
Elevator Shaft Roof (Horizontal Surface)	6	H8-6	Facing stairs and in front of hatch, TLD on immediate right	12/3/81 12:00	12/15/81 12:00	288	333 ± 83	3670 ± 79	391 ± 39	417 ± 39
	7	H8-7	Facing stairs and in front of TLD on immediate left	12/3/81 12:00	12/15/81 12:00	288	191 ± 72	3070 ± 250	398 ± 40	428 ± 41
	8	H8-8	Facing stairs and back to stairs, TLD on left corner of roof	12/3/81 12:00	12/15/81 12:00	288	110 ± 23	4020 ± 280	379 ± 36	440 ± 41
	9	H8-9	Facing monitor and back to stairs, TLD on right corner of roof	12/3/81 12:00	12/15/81 12:00	288	69.9 ± 33.5	11700 ± 3790	661 ± 63	779 ± 74
Control	10	H8-10	Carried to roof and brought out	12/3/81 12:00	12/3/81 13:00	1	45.9 ± 20.2	49.0 ± 33.3	221 ± 21	219 ± 21

Notes:

1. HPR-214
Horizontal and vertical measurements - front side of TLD system against monitor surface.
2. Elevator Roof Measurement
Horizontal measurements - back side of TLD system against roof surface.

**TABLE 6b. Pre-Gross Decontamination Experiment Dosimeter Placement and Results -
305 Foot Elevation**

TLD #	Location #	Location Description	Date and Time Exposure		Exposure Time (hr)	Beta Dose Rate		Gamma Dose Rate	
			In	Out		Front (mrad/hr)	Back (mrad/hr)	Front (mrad/hr)	Back (mrad/hr)
11	13	Vertical surface, taped to liner ~4 feet above floor, NE area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	0	0	625 ± 62	666 ± 63
12	H7	Horizontal surface, taped to floor, NE area of Rx Bldg., SE area under CF-T-1A	12/9/81 1427	12/15/81 1838	148.2	161 ± 64	923 ± 575	428 ± 41	467 ± 45
13	B4	Vertical surface, taped to underside of junction box, NE area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	476 ± 50	135 ± 16	158 ± 15	160 ± 15
14	V9	Vertical surface, taped to D-ring wall ~4 feet above floor, SE area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	247 ± 104	38.5 ± 81.3	573 ± 55	555 ± 54
15	H6	Horizontal surface, taped to West area of hatch cover, SE area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	7220 ± 481	14900 ± 10000	2180 ± 210	2640 ± 250
82	V8	Vertical surface, taped to front side of aircooler B ~4 feet above floor, SE area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	113 ± 40	205 ± 100	579 ± 54	575 ± 57
	H5	Horizontal surface, taped to floor, SW area of Rx Bldg., NE area under CP-T-1B	12/9/81 1427	12/15/81 1838	148.2	635 ± 283	2750 ± 1980	937 ± 110	900 ± 84
	67W	Vertical surface, taped to D-ring wall ~4 feet above floor, NW area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	51.4 ± 39.5	0	289 ± 27	269 ± 26
	66	Vertical surface, taped to liner ~4 feet above floor, NW area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	1370 ± 940	267 ± 54	285 ± 28	305 ± 31
	63	Vertical surface, taped to D-ring wall ~4 feet above floor, W area of Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	176 ± 192	556 ± 319	1450 ± 140	1330 ± 130
	H3	Horizontal surface, taped to floor, West area Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	0	8010 ± 610	5180 ± 480	5320 ± 520
	B3	Vertical surface, taped to underside of junction box ~8 feet off floor	12/9/81 1427	12/15/81 1838	148.2	679 ± 52	598 ± 49	0	388 ± 37
	50F	Horizontal surface, taped to floor, SW area of Rx Bldg.	12/9/81 1427	12/15/81 1838	148.2	305 ± 91	5010 ± 920	413 ± 42	410 ± 39

**TABLE 6c. Pre-Gross Decontamination Experiment Dosimeter Placement and Results -
347 and 367 Foot Elevations**

TLD #	Location #	Location Description	Date and Time Exposure		Exposure Time (hr)	Beta Dose Rate		Gamma Dose Rate	
			In	Out		Front (mrad/hr)	Back (mrad/hr)	Front (mrad/hr)	Back (mrad/hr)
29	30	Vertical surface, taped to liner ~4 feet above floor by hatch cover, NE area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	74.1 ± 13.9	29.0 ± 14.0	94.0 ± 9.5	88.7 ± 8.3
	31W	Vertical surface, taped to D-ring wall, ~4 feet above floor, NE area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	220 ± 8	92.9 ± 9.9	95.7 ± 9.2	93.7 ± 9.0
	V3	Vertical surface, taped to liner behind enclosed stairwell ~4 feet above floor	12/9/81 1507	12/15/81 1838	147.52	90.9 ± 32.7	16.5 ± 9.6	68.1 ± 7.0	59.8 ± 5.6
	V4	Vertical surface, taped to outside enclosed stairwell wall ~4 feet above floor	12/9/81 1507	12/15/81 1838	147.52	50.0 ± 19.4	29.9 ± 7.7	90.1 ± 9.1	86.1 ± 8.5
	36W	Vertical surface, taped to D-ring wall ~4 feet above floor, SE area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	129 ± 25	39.3 ± 17.5	121 ± 12	122 ± 11
	H10	Horizontal surface, taped to floor near SW corner of hatchcover, South area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	227 ± 42	3860 ± 600	243 ± 24	267 ± 27
	50W	Vertical surface, taped to Esst side of head stand, SW area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	398 ± 32	153 ± 28	134 ± 14	124 ± 12
	52	Horizontal surface, taped to top of head stand, SW area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	352 ± 49	1690 ± 78	151 ± 15	146 ± 14
	V2	Vertical surface, taped to D-ring wall ~4 feet above floor, West area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	143 ± 26	32.9 ± 37.2	126 ± 12	124 ± 12
	B1	Horizontal surface, placed on floor below junction box, West area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	630 ± 95	11200 ± 470	461 ± 44	456 ± 47
	H9	Horizontal surface, taped to floor ~4 feet south of open stairwell, West area Rx Bldg.	12/9/81 1507	12/15/81 1839	147.52	528 ± 319	6290 ± 340	282 ± 28	267 ± 26
	56	Vertical surface, taped to liner ~4 feet above floor, West area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	80.2 ± 17.4	38.9 ± 27.3	85.6 ± 8.1	81.1 ± 8.1
	63	Horizontal surface, West axis of in core instrumentation area	12/9/81 1507	12/15/81 1838	147.52	46400±14800	248000±21000	7860 ± 1280	6090 ± 640
	13	Horizontal surface, 367 foot elevation, top D-ring wall, East area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	353 ± 34	7950 ± 810	347 ± 32	375 ± 36
	V11	Vertical surface, 367 foot elevation, taped to inside D-ring wall, East area Rx Bldg.	12/9/81 1507	12/15/81 1838	147.52	182 ± 136	525 ± 123	766 ± 72	743 ± 70

The post-gross decontamination experiment was performed between March 25 and April 22, 1982. Fourteen dosimeters were exposed on the 305 ft elevation, seventeen were exposed on the 347 ft elevation, and two were exposed on the 367 ft level. The dosimeters were read out in the PNL TLD Laboratory in May 1982. The computer runs analyzing these dosimeters are presented in Appendix II, and the dosimeter placements and evaluated dose rates are presented in Figures 13a and 13b and in Tables 7a and 7b.

In the pre-flushing TLD tree experiment, four multi-element dosimeters were placed on each of four TLD trees. These trees were lowered from the 305 ft elevation down into the reactor basement to measure radiation levels before flushing of the 282 ft elevation walls. Each tree also contained dosimeters provided by Panasonic and Harshaw, providing for rough comparisons between the different types of dosimeters. The dosimeters were exposed on June 22, 1982 for about three hours. The multi-element dosimeters were returned to PNL and the TLDs read out in July 1982. The computer analysis is listed in Appendix II. Figure 14 shows the placement of the TLD trees from the viewpoint of the 305 ft level and Table 8 describes the placement of the trees. Table 9 presents the dose rates determined from the PNL multi-element dosimeters and compares them to the doses determined by the Panasonic and Harshaw dosimeters. Comparisons of the doses determined by the different types of dosimeters are presented in Figures 6 and 7.

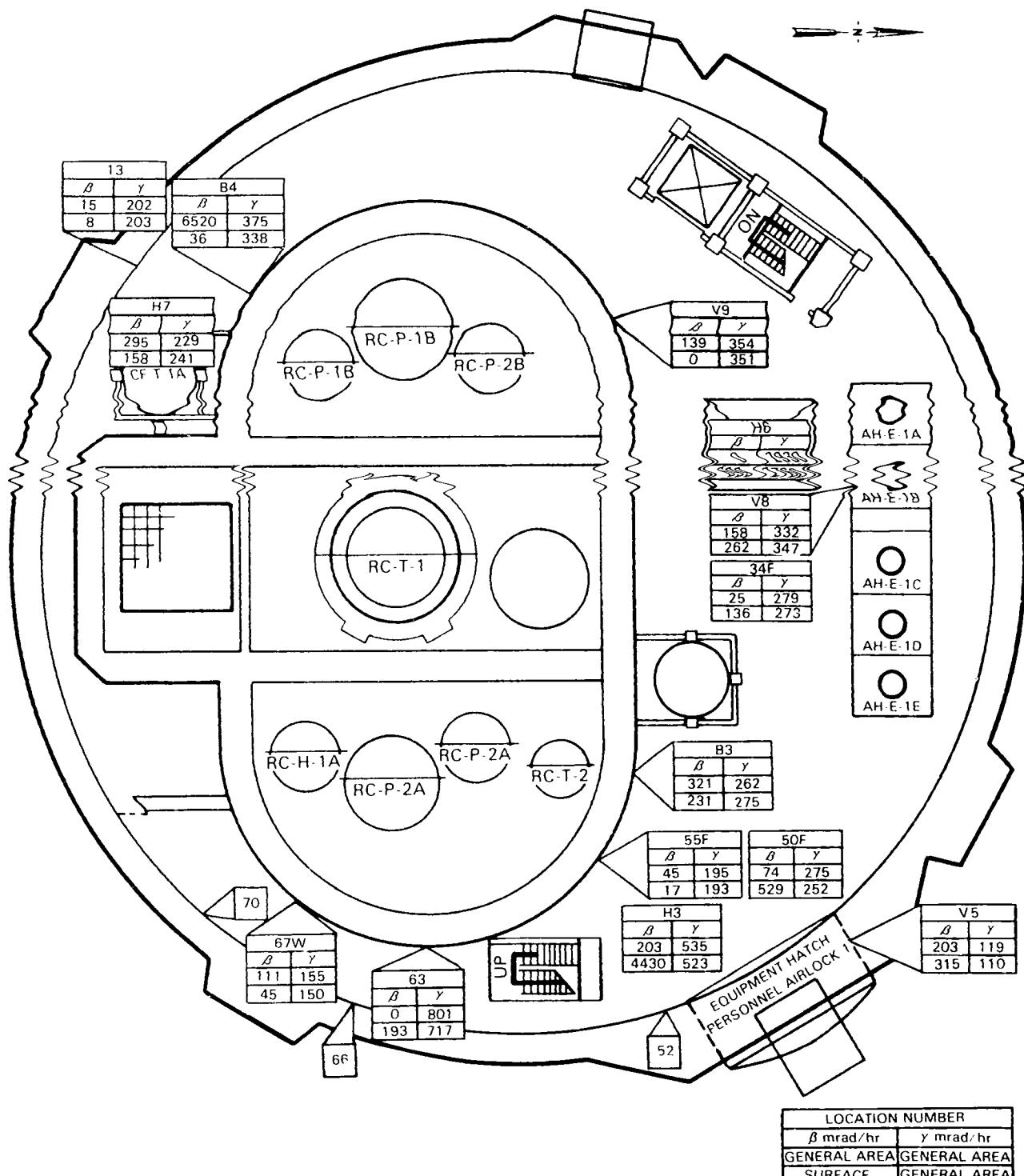


FIGURE 13a. Post Gross Decontamination Experiment Dosimeter Placement and Results - 305 Foot Elevation

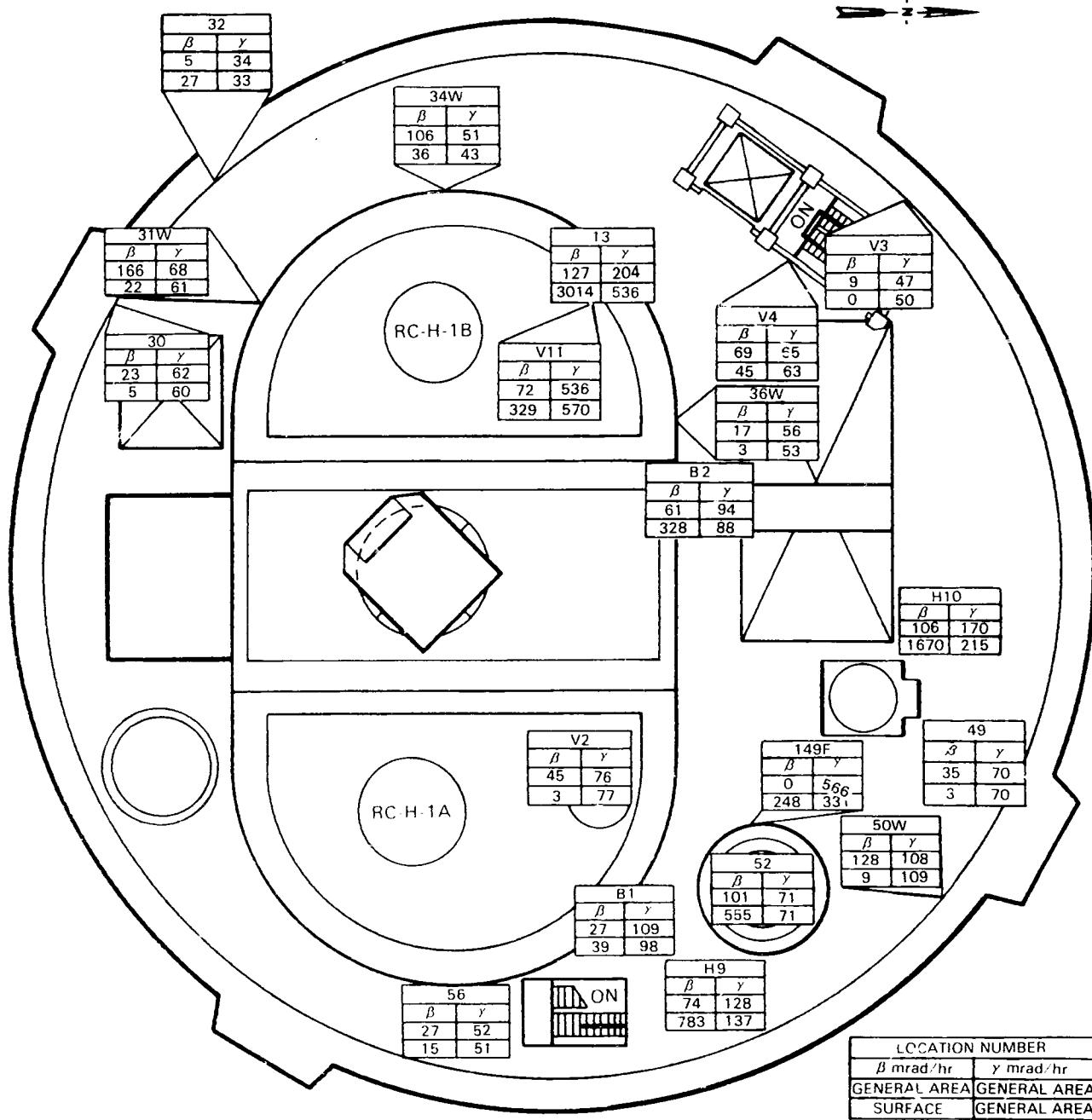


FIGURE 13b. Post Gross Decontamination Experiment Dosimeter Placement and Results - 347 and 367 Foot Elevations

**TABLE 7a. Post Gross Decontamination Experiment Dosimeter Placement and Results -
305 Foot Elevation**

TLD #	Location #	Location Description	Date and Time Exposure		Exposure Time (hr)	Beta Dose Rate		Gamma Dose Rate	
			In	Out		Front (mrad/hr)	Back (mrad/hr)	Front (mrad/hr)	Back (mrad/hr)
1	13	Vertical surface, taped to liner ~4 feet above floor, NE area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	15.2 ± 7.0	7.69 ± 5.46	202 ± 20	203 ± 19
2	H7	Horizontal surface, taped to floor, NE area of Rx Bldg., SE area under CF-T-1A	3/25/82 1500	4/22/82 1057	668	295 ± 192	158 ± 120	228 ± 23	241 ± 24
3	B4	Horizontal surface, placed on top of junction box, NE area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	6520 ± 1340	35.6 ± 36.9	375 ± 35	338 ± 32
4	V9	Vertical surface, taped to D-ring wall ~4 feet above floor, SE area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	139 ± 66	0	354 ± 35	351 ± 34
5	H6	Horizontal surface, taped to west area of hatch cover, SE area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	0	699 ± 195	2930 ± 280	2760 ± 270
6	V8	Vertical surface, taped to front side of aircooler B ~4 feet above floor, SE area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	158 ± 107	262 ± 235	332 ± 32	347 ± 32
58	34F	Horizontal surface, taped to floor, south area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	24.8 ± 37.7	136 ± 27	279 ± 27	273 ± 26
8	67W	Vertical surface, taped to L-ring wall ~4 feet above floor, NW area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	111 ± 73	45.1 ± 31.1	155 ± 15	150 ± 15
61	63	Vertical surface, taped to D-ring wall ~4 feet above floor, W area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	0	193 ± 134	801 ± 77	717 ± 70
63	V5	Vertical surface, taped to south equipment hatch wall ~4 feet above floor	3/25/82 1500	4/22/82 1057	668	203 ± 22	315 ± 67	119 ± 12	110 ± 11
7	H3	Horizontal surface, taped to floor, West area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	230 ± 188	4430 ± 2090	535 ± 52	523 ± 54
64	55P	Vertical surface, taped to D-ring wall ~4 feet above floor, SW area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	45.0 ± 15.7	16.7 ± 28.3	195 ± 19	193 ± 20
65	B3	Vertical surface, taped to underside of junction box ~8 feet off floor	3/25/82 1500	4/22/82 1057	668	321 ± 33	231 ± 32	262 ± 27	275 ± 26
66	50F	Horizontal surface, taped to floor, SW area Rx Bldg.	3/25/82 1500	4/22/82 1057	668	73.7 ± 30.8	529 ± 67	275 ± 26	252 ± 24

TABLE 7b. Post Gross Decontamination Experiment Dosimeter Placement and Results -
347 and 367 Foot Elevations

TLD #	Location #	Location Description	Date and Time Exposure		Exposure Time (hr)	Beta Dose Rate		Gamma Dose Rate	
			In	Out		Front (mrad/hr)	Back (mrad/hr)	Front (mrad/hr)	Back (mrad/hr)
13	30	Vertical surface, taped to liner ~4 feet above floor by hatch cover, NE area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	23.4 ± 7.2	5.37 ± 4.01	62.4 ± 6.1	59.8 ± 6.0
14	31W	Vertical surface, taped to D-ring wall ~4 feet above floor, NE area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	166 ± 14	22.3 ± 11.6	68.1 ± 6.6	61.3 ± 6.1
15	32	Vertical surface, taped to liner ~4 feet above floor, NE area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	5.28 ± 2.03	27.3 ± 6.5	34.1 ± 3.4	32.5 ± 3.1
18	34W	Vertical surface, taped to D-ring wall ~4 feet above floor, East area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	106 ± 12.3	35.8 ± 27.7	50.6 ± 4.8	43.0 ± 4.0
19	V3	Vertical surface, taped to liner behind enclosed stairwell ~4 feet above floor	3/26/82 1328	4/22/82 1057	645.5	8.78 ± 1.58	0	47.1 ± 4.6	50.0 ± 4.7
67	V4	Vertical surface, taped to outside enclosed stairwell wall ~4 feet above floor	3/26/82 1328	4/22/82 1057	645.5	69.2 ± 8.4	45.0 ± 9.7	65.5 ± 6.2	63.5 ± 6.1
12	36W	Vertical surface, taped to D-ring wall ~4 feet above floor, SE area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	17.2 ± 4.7	3.47 ± 2.49	56.5 ± 5.5	52.6 ± 5.1
68	B2	Horizontal surface, placed on top junction box, SE area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	61.3 ± 13.7	328 ± 9.9	94.4 ± 8.8	88.3 ± 8.3
70	H10	Horizontal surface, taped to floor near SW corner of hatch cover, South area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	106 ± 16	1670 ± 980	170 ± 16	215 ± 22
73	S0W	Vertical surface, taped to East side of head stand, SW area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	128 ± 21	9.01 ± 6.76	108 ± 10	109 ± 10
11	149F	Horizontal surface, taped to floor by D-ring wall, SW area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	0	248 ± 199	566 ± 58	331 ± 33
74	52	Horizontal surface, taped to top of head stand, SW area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	101 ± 12	555 ± 36	70.7 ± 6.9	70.6 ± 7.1
75	49	Vertical surface, taped to liner ~4 feet above floor, SW area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	34.8 ± 11.8	3.29 ± 6.76	69.8 ± 6.8	70.4 ± 6.9
76	V2	Vertical surface, taped to D-ring wall ~4 feet above floor, West area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	44.6 ± 7.0	3.17 ± 8.12	76.3 ± 7.1	77.3 ± 7.3
77	B1	Horizontal surface, placed on top of junction box, West area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	26.6 ± 86	39.3 ± 5.1	109 ± 10	97.6 ± 9.3
78	H9	Horizontal surface, taped to floor ~4 feet South of open stairwell, West area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	74.4 ± 24.7	783 ± 119	128 ± 13	137 ± 13
80	56	Vertical surface, taped to liner ~4 feet above floor, West area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	26.5 ± 5.1	14.7 ± 4.4	32.0 ± 4.9	50.6 ± 4.9
71	13	Horizontal surface, 367 foot elevation, top D-ring wall, East area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	129 ± 35	3020 ± 130	205 ± 20	232 ± 22
72	V11	Vertical surface, 367 foot elevation, taped to inside D-ring wall, East area Rx Bldg.	3/26/82 1328	4/22/82 1057	645.5	73.6 ± 26.3	331 ± 54	536 ± 50	571 ± 54

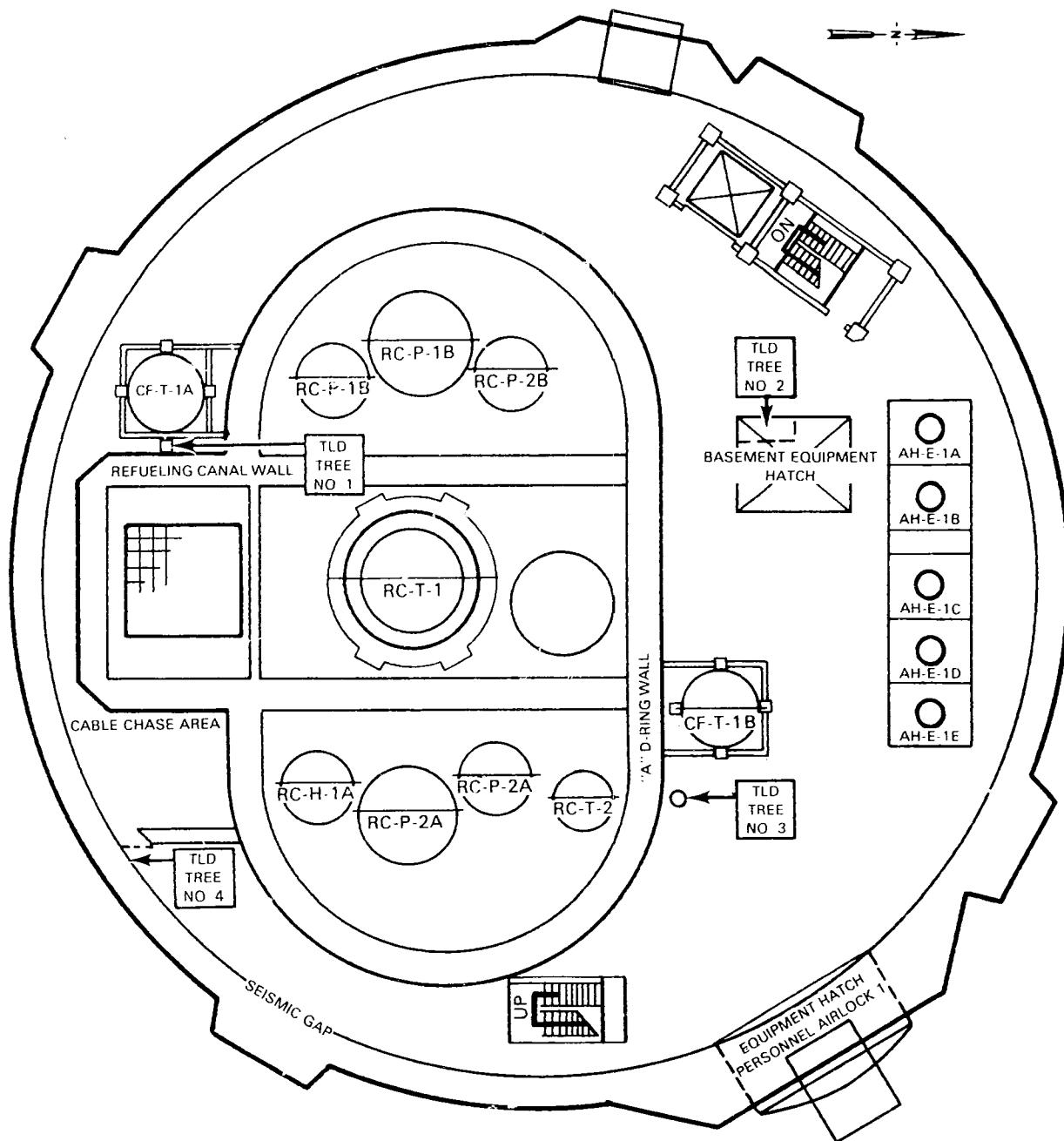


FIGURE 14. Preflushing of the Reactor Building Basement
TLD Tree Measurement Locations

TABLE 8. Placement of TLD Trees During Pre-Flushing of the Reactor Building Basement

<u>Tree #</u>	<u>Location Description</u>	<u>Orientation of TLD Tree</u>	<u>Comments</u>
1	TLD tree lowered through penetration 220, behind CF-T-1A and against the east wall of the refueling canal on the 305 foot elevation into the basement.	The front side of the TLD tree was facing toward the east wall of the refueling canal.	There was no problem with the lowering or raising of the TLD tree.
2	TLD tree lowered through the NE section of the basement equipment hatch on the 305 foot elevation basement.	The front side of the TLD tree was facing toward personnel airlock #1.	There was no problem with the lowering or raising of the TLD tree.
3	TLD tree lowered through penetration R-37, west of CF-T-1B and against the "A" D-ring wall on the 305 foot elevation into the basement.	The front side of the TLD tree was facing toward the "A" D-ring wall.	There was a slight problem with the lowering and raising of the TLD tree.
4	TLD tree lowered down the seismic gap by the cable chase area (NW area of Rx-Bldg.) on the 305 foot elevation into the basement.	The front side of the TLD tree was facing toward the containment liner.	There was no problem with the lowering or raising of the TLD tree.

TABLE 9. Pre-Flushing Experiment TLD Tree - Beta and Gamma Doses from Three Types of Dosimeters

TLD Tree #	TLD #	Eleva- tion (ft)	Exposure Dates		Exposure (hrs)	PNL Dosimeter Dose Rates				Dose Rates				
						Beta		Gamma		Panasonic		Harshaw		
			In Date & Time	Out Date & Time		Front (rad/hr)	Back (rad/hr)	Front (rad/hr)	Back (rad/hr)	Beta (rad/hr)	Gamma (rad/hr)	Beta (rad/hr)	Gamma (rad/hr)	
37	1	85	300	6/22/82 0945	6/22/82 1252	3.12	0.097 ± 0.142	0.0394 ± 0.563	1.10 ± 0.10	1.04 ± 0.10	0.449	1.058	0.208	0.801
	84	295	295	6/22/82 0945	6/22/82 1252	3.12	1.41 ± 0.68	3.65 ± 0.69	2.91 ± 0.31	2.93 ± 0.28	1.122	3.205	NA	3.462
	82	290	290	6/22/82 0945	6/22/82 1252	3.12	57.1 ± 7.7	34.6 ± 3.7	15.2 ± 1.7	14.2 ± 1.4	26.603	15.705	5.256	15.865
	81	285	285	6/22/82 0945	6/22/82 1252	3.12	57.2 ± 5.2	83.4 ± 4.0	16.2 ± 1.6	15.0 ± 1.7	48.077	16.987	12.885	23.750
37	2	89	300	6/22/82 1039	6/22/82 1259	2.33	1.27 ± 1.15	1.67 ± 1.18	9.32 ± 0.97	8.81 ± 0.86	1.159	10.730	NA	10.043
	88	295	295	6/22/82 1039	6/22/82 1259	2.33	6.54 ± 3.77	1.97 ± 2.1	22.0 ± 0.99	22.2 ± 2.1	12.446	24.464	NA	22.919
	87	290	290	6/22/82 1039	6/22/82 1259	2.33	11.6 ± 5.8	3.48 ± 1.95	46.7 ± 4.5	45.0 ± 4.3	22.318	41.202	NA	38.283
	86	285	285	6/22/82 1039	6/22/82 1259	2.33	70.2 ± 15.4	29.4 ± 8.0	65.3 ± 6.1	65.6 ± 6.5	NA	85.837	7.125	76.824
37	3	93	300	6/22/82 0949	6/22/82 1254	3.08	0.341 ± 0.321	0.637 ± 0.199	5.86 ± 0.62	5.40 ± 0.51	0.390	7.143	NA	6.818
	92	295	295	6/22/82 0949	6/22/82 1254	3.08	4.25 ± 0.69	3.22 ± 1.26	8.50 ± 0.82	7.99 ± 0.75	5.520	10.390	NA	11.721
	91	290	290	6/22/82 0949	6/22/82 1254	3.08	429 ± 8.5	22.5 ± 5.0	19.4 ± 1.9	17.9 ± 1.7	61.688	17.857	18.539	21.851
	90	285	285	6/22/82 0949	6/22/82 1254	3.08	22.3 ± 4.9	136 ± 21	13.3 ± 1.2	15.2 ± 1.5	64.935	18.831	6.201	15.877
37	4	97	300	6/22/82 0951	6/22/82 1256	3.08	0.249 ± 0.130	0	1.20 ± 0.11	1.24 ± 0.12	0.312	1.461	NA	1.299
	96	295	295	6/22/82 0951	6/22/82 1256	3.08	1.04 ± 0.25	1.58 ± 0.53	2.73 ± 0.26	2.74 ± 0.27	1.429	2.987	NA	3.052
	95	290	290	6/22/82 0951	6/22/82 1256	3.08	43.2 ± 2.0	33.7 ± 3.9	8.90 ± 0.85	7.85 ± 0.74	42.208	9.091	13.377	13.020
	94	285	285	6/22/82 0951	6/22/82 1256	3.08	99.0 ± 8.0	26.2 ± 5.3	18.1 ± 1.7	14.6 ± 1.5	56.442	18.182	33.766	21.948

CONCLUSIONS

The PNL multi-element beta dosimeter is a reliable device for determining doses in fields of mixed beta and gamma radiation. The studies that used these dosimeters illustrated the importance of using an energy-dependent calibration factor for beta dose determination: using a fixed calibration factor can result in a poor estimate of the dose. As illustrated by Figure 7, using only the calibration factor for betas from $^{90}\text{Sr}/^{90}\text{Y}$ can result in an underestimate of the dose as large as a factor of 5. The comparisons between the PNL dosimeter and dosimeters supplied by Vendor 2, the PNL dosimeters evaluated higher beta doses than those evaluated by the other dosimeters, indicating that the PNL dosimeters were operating as expected.

In Figure 6, a comparison between the PNL and Vendor 1 dosimeters, there is no well-defined trend as to which type determines a higher or lower dose. The PNL dosimeters measured higher doses than the Vendor 1 dosimeters in roughly half of the comparisons and lower doses in the other comparisons. This result is consistent with the fact that both PNL and Vendor 1 use energy-dependent calibration factors.

There is one important factor that could contribute to the discrepancy between the PNL, Vendor 2, and Vendor 1 dosimeters in dose evaluation--possible nonuniformities in the beta radiation field being measured. Since the range of betas in air is quite short compared to photons and neutrons, a variation in the concentration of beta emitters on a surface can lead to a similar variation in the intensity of the beta radiation striking nearby dosimeters. Thus two dosimeters placed several inches apart from each other against a contaminated wall could be exposed to different beta doses if the contamination on the wall were not uniform. It is quite likely that this effect occurred in some of the dosimeter comparisons.

The nonuniformity of beta radiation fields could also contribute to a poor dose determination by a multi-element dosimeter. The analysis of our dosimeter assumes that the entire dosimeter is exposed to a constant radiation field. There have been some instances in which it is obvious that some elements were exposed to higher dose rates than were other elements. There were dosimeters that showed higher TLD responses in elements that were covered by

thick shields than in the mylar-covered element, indicating a nonuniform field. The data analysis for such a dosimeter usually rejected the contribution of such an element, since the ratio to the mylar chip would be outside the allowed range, but this resulted in a loss of potential data. Smaller discrepancies could perhaps not be rejected, but instead would introduce some confusion into the data analysis. The error analysis routine was designed to catch such discrepancies and signal the possibility of a poor dose determination by indicating a large error. An example of an apparently nonuniform beta field can be seen in the results from dosimeter #3, back, in the post-gross decontamination experiment. For this dosimeter, elements 4, 5, and 6 had higher TLD responses than element 1. The evaluated error for this beta dose was larger than the evaluated dose itself.

Another possible error occurs when a significant amount of low energy x-rays are present. The relationship between TLD response and absorber thickness is flat for photons with energies greater than about 40 keV, so that the response of these photons would be correctly subtracted from the element responses to give the beta response. Photons with low energies, however, are weak penetrators of aluminum, and Figures 4 and 5 show that the relative responses of the elements are similar for betas and low-energy x-rays. The presence of these low energy x-rays would therefore be an interference in the dosimeter's dose evaluation. Preliminary studies of radionuclides in the TMI-2 containment building have indicated that three radionuclides, ^{134}Cs , ^{137}Cs and ^{90}Sr (and their radioactive progeny), are responsible for producing most of the dose observed in the building (NRC 1981). During the radioactive decay of these nuclides, the radiation emitted consists almost exclusively of betas and gammas; x rays with energies less than 40 keV make a negligible contribution to the dose (Kocher 1981). Thus, the presence of low energy x-rays did not appear to be a serious problem in the TMI-2 dosimeter exposures.

The presence of a very high-intensity gamma field in along with the betas could be an interference due to poor counting statistics. Since the data analysis depends on subtracting the gamma contribution to the TLD response of each element, a small beta response in the presence of a high gamma response would result in a high error for the beta response. Gamma intensities during the TMI-2 exposures never seemed to be high enough to cause such interference.

Since betas are attenuated by relatively thin absorbers, any material placed between the aluminum shields and the source of betas will attenuate the beta radiation. For use in a contaminated environment such as the TMI-2 containment building, it is necessary to enclose the dosimeters in a plastic bag to avoid contamination of the dosimeter itself. This plastic packaging acts as an additional absorber over the dosimeter. The plastic has the effect of stopping some very low energy betas that otherwise would have produced a response in the dosimeter, and generally reducing the number of betas of all energies that strike the dosimeter. The dosimeter that is packaged in plastic therefore records a beta dose that is a bit lower than the dose that would have been recorded by an unpackaged dosimeter.

None of the uncertainties identified in this discussion are seen as seriously affecting the use of the multi-element beta dosimeters. Although the dosimeters are still under development, especially in developing improved algorithms for dose analyses, the dosimeter is an important tool for reliably estimating beta and gamma doses.

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APPENDIX I
SOURCE CODE LISTING FOR RATIO7

APPENDIX I
SOURCE CODE LISTING FOR RATIO7

```
0001      C
0002      C This Program Analyzes Multi-element Beta Dosimeters
0003      C It is designed to handle either 4-element or 7-element
0004      C dosimeters, with 3 TLD's in each element
0005      C
0006      C Written by R. I. S.    7/82
0007      C Altered           1/83
0008      C
0009      CHARACTER*1 ANS, BACK//'B//, STAR(200, 7, 3)/4200*'   /
0010      CHARACTER*3 OLDNEW, OLD//'OLD'
0011      CHARACTER*5 FRNTBK(2)//'FRONT', 'BACK '
0012      CHARACTER*8 HDG(7)//'MYLAR #1', ' 005" #2', ' 010" #3', ' 020" #4',
0013          ' 032" #5', ' 064" #6', ' 125" #7'
0014      CHARACTER*24 FLNM
0015      CHARACTER*80 TITLE
0016      DIMENSION RAW(200, 7, 3), AVE(200, 7), IPCT(200, 7), RATIO(200, 6),
0017          1 CAL(200, 6), DOSE(200), ID(200), IFB(200), COEF(6), YINT(6),
0018          2 RATIOMAX(6), RATIOMIN(6), BETA(200, 6), GAMMA(200), GAMDOS(200),
0019          3 ERBDOS(200), ERGDOS(200), HR(200)
0020      DATA CAL/1200*0 ./, RATIO/1200*0 ./,
0021          DATA HR/200*2 ./
0022      C
0023      C OPEN FILES
0024      C
0025          WRITE(6, 10)
0026      10 FORMAT(' Enter filename for input data: ', $)
0027          READ(5, 20)FLNM
0028      20 FORMAT(A24)
0029          OPEN(UNIT=10, FILE=FLNM, STATUS='OLD', READONLY)
0030          OPEN(UNIT=15, FILE='RATIOOUT.DAT', STATUS='NEW',
0031              1 DISPOSE='PRINT/DELETE')
0032      C
0033      C PRESET VALUES
0034      C
0035          COEF(2)=-1.0032
0036          COEF(3)=-1.0960
0037          COEF(4)=-.7438
0038          COEF(5)=-1.1142
0039          COEF(6)=-6.1597
0040          YINT(2)=.9943
0041          YINT(3)=.9471
0042          YINT(4)=.6028
0043          YINT(5)=.5885
0044          YINT(6)=.6215
0045          RATIOMAX(2)=.7800
0046          RATIOMAX(3)=.6641
0047          RATIOMAX(4)=.5174
0048          RATIOMAX(5)=.3325
0049          RATIOMAX(6)=.0655
0050          RATIOMIN(2)=0.
0051          RATIOMIN(3)=0.
0052          RATIOMIN(4)=.2996
0053          RATIOMIN(5)=.1871
0054          RATIOMIN(6)=.0392
0055          CALMAX=.218
0056          GCOEF=.2037
0057          DESCR=5.
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0058      IDESCR=I INT(DESCR)
0059      C
0060      C   INPUT
0061      C
0062          WRITE(6, 100)
0063      100    FORMAT('' Input '')
0064          READ(10, 110)TITLE
0065      110    FORMAT(A80)
0066          DO 160 I=1, 200
0067          READ(10, *)ID(I)
0068          IF(ID(I). LE. 0)GOTO 170
0069          READ(10, 130)ANS
0070      130    FORMAT(A1)
0071          PRINT*, ID(I), ANS
0072          IFB(I)=1
0073          IF(ANS. EQ. BACK)IFB(I)=2
0074          READ(10, *)HR(I)
0075          DO 145 IC=1, 7
0076      145    READ(10, *)(RAW(I, IC, J), J=1, 3)
0077      160    CONTINUE
0078          ND=200
0079          WRITE(6, 165)
0080      165    FORMAT('' *** LIMIT OF 200 DOSIMETERS -- ANALYSIS PROCEEDS ***')
0081      170    READ(10, 171, END=174)OLDNEW
0082      171    FORMAT(A3)
0083          IF(OLDNEW . NE. OLD)GOTO 174
0084      C
0085      C   Use old Calibration Factors (Dosimeters read out before 3/82)
0086      C
0087          COEF(4)=-1. 5103
0088          COEF(5)=-2. 3398
0089          YINT(4)=. 9901
0090          YINT(5)=. 9901
0091          CALMAX=. 3511
0092          RATIOMAX(4)=0. 4231
0093          RATIOMAX(5)=0. 2731
0094          GCOEF=. 2394
0095      174    CONTINUE
0096      C
0097      C   PROCESS RAW COUNTS
0098      C
0099          WRITE(6, 175)
0100      175    FORMAT('' OFF AND RUNNING... '', //)
0101          IF(ND. NE. 200)ND=I-1
0102          DO 200 I=1, ND
0103              WRITE(6, 177)ID(I), FRNTBK(IFB(I))
0104      177    FORMAT(1B, 1X, A5)
0105          DO 184 IC=1, 7
0106          AVE(I, IC)=0.
0107          SUMX2=0.
0108          SUMX=0.
0109          DO 179 J=1, 3
0110          AVE(I, IC)=AVE(I, IC)+RAW(I, IC, J)
0111          SUMX=SUMX+RAW(I, IC, J)
0112      179    SUMX2=SUMX2+RAW(I, IC, J)*RAW(I, IC, J)
0113          AVE(I, IC)=AVE(I, IC)/3.
0114          SD=0.
0115          IF(SUMX2-SUMX*SUMX/3. . GT. 0. )
0116              1          SD=SQRT((SUMX2-SUMX*SUMX/3. )/2. )
0117          IF(AVE(I, IC). GT. 0. )SD=SD/AVE(I, IC)
0118      180    PCT=SD*100.
0119      C
0120      C   Test for fliers in the TLD data
0121      C

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0122      IF(PCT .LE. DESCRL) GOTO 183
0123      C12=100.*ABS(RAW(I,IC,1)-RAW(I,IC,2))/RAW(I,IC,2)
0124      C23=100.*ABS(RAW(I,IC,2)-RAW(I,IC,3))/RAW(I,IC,3)
0125      C31=100.*ABS(RAW(I,IC,3)-RAW(I,IC,1))/RAW(I,IC,1)
0126      NLO=0
0127      IF(C12 .LT. DESCRL)NLO=NLO+1
0128      IF(C23 .LT. DESCRL)NLO=NLO+1
0129      IF(C31 .LT. DESCRL)NLO=NLO+1
0130      IF(NLO .GE. 2)GOTO 183
0131      IF(NLO .EQ. 1)GOTO 1830
0132      C -- accept AVE as is for thin elements & elt 7
0133      IF(IC .LT. 4 .OR. IC .EQ. 7)GOTO 183
0134      C -- if % > DESCRL+3, reject element data for elt. 4-6
0135      IF(PCT .LT. DESCRL+3.) GOTO 183
0136      AVE(I,IC)=0.
0137      DO 1820 J=1,3
0138      1820      STAR(I,IC,J)='*'
0139      GOTO 183
0140      C --- one TLD is a flier
0141      1830      IF(C12 .LT. DESCRL)ISTAR=3
0142      IF(C23 .LT. DESCRL)ISTAR=1
0143      IF(C31 .LT. DESCRL)ISTAR=2
0144      STAR(I,IC,ISTAR)='*'
0145      AVE(I,IC)=(3.*AVE(I,IC)-RAW(I,IC,ISTAR))/2
0146      KK=1
0147      IF(ISTAR .EQ. 1) KK=2
0148      PCT=100.*SQRT(2.)*ABS(RAW(I,IC,KK)-AVE(I,IC))/AVE(I,IC)
0149      183      IF(IC .EQ. 1)SD2CTS=(PCT/100.*AVE(I,1))**2
0150      IF(IC .EQ. 7)SD2CTS=SD2CTS+(PCT/100.*AVE(I,7))**2
0151      IF(IC .EQ. 7)ERGDOS(I)=SQRT(.093*.093 + PCT/100.*PCT/100.)
0152      IPCT(I,IC)=INT(.5+PCT)
0153      C
0154      C Subtract off Gamma Component of TLD responses
0155      C
0156      184      CONTINUE
0157      DO 185 IC=1,6
0158      BETA(I,IC)=AVE(I,IC)-AVE(I,7)
0159      185      IF(BETA(I,IC) .LT. 0.)BETA(I,IC)=0.
0160      GAMMA(I)=AVE(I,7)
0161      C
0162      C Determine Calibration Factors
0163      C
0164      IF(BETA(I,1) .LE. 0.) GOTO 189
0165      DO 188 J=2,6
0166      188      RATIO(I,J)=BETA(I,J)/BETA(I,1)
0167      189      IF(AVE(I,2) .GT. 0. .OR. AVE(I,3) .GT. 0. .OR. AVE(I,6)
0168      1 .GT. 0.) GOTO 190
0169      C --- 4-Element Dosimeter
0170      DO 1892 J=4,5
0171      CAL(I,J)=RATIO(I,J)*COEF(J)+YINT(J)
0172      IF(RATIO(I,J) .GT. RATIOMAX(J)) CAL(I,J)=CALMAX
0173      1892      CAL(I,1)=(CAL(I,4)+CAL(I,5))/2.
0174      SUMCF=2.*(CAL(I,4)-CAL(I,1))**2
0175      GOTO 1995
0176      C --- 7-Element Dosimeter
0177      190      ICAL=0.
0178      SUMCF=0.
0179      SUMCF2=0.
0180      DO 199 J=2,6
0181      IF(RATIO(I,J) .LT. RATIOMAX(J)) GOTO 192
0182      CAL(I,J)=CALMAX
0183      ICAL=ICAL+1
0184      GOTO 195

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0186      192      IF(RATIO(I,J) .LT. RATIOMIN(J)) GOTO 199
0187      CAL(I,J) = RATIO(I,J)*COEF(J) + YINT(J)
0188      ICAL=ICAL+1
0189      195      CAL(I,1) = CAL(I,1) + CAL(I,J)
0190      SUMCF=SUMCF+CAL(I,J)
0191      SUMCF2=SUMCF2+CAL(I,J)*CAL(I,J)
0192      199      CONTINUE
0193      CAL(I,1) = CAL(I,1)/ICAL
0194      SD2CF=(SUMCF2-SUMCF*SUMCF/ICAL)/(ICAL-1)
0195      C
0196      C Calculate Doses
0197      C
0198      1995     GAMMDOS(I)=GAMMA(I)*GCDEF
0199      ERGDOS(I)=ERGDOS(I)*GAMMDOS(I)
0200      DOSE(I)=CAL(I,1)*BETA(I,1)
0201      ERBDOS(I)=0.
0202      IF(DOSE(I) .EQ. 0.)GOTO 200
0203      ERBDOS(I)=SQRT(SD2CF/CAL(I,1)/CAL(I,1) + SD2CTS/
0204      1 BETA(I,1)/BETA(I,1))*DOSE(I)
0205      200      CONTINUE
0206      C
0207      C OUTPUT RAW DATA
0208      C
0209      WRITE(6,205)
0210      205      FORMAT(//' Creating output')
0211      WRITE(15,210)TITLE,HDG
0212      210      FORMAT(1H1,A80, //5X, 'SUMMARY OF DOSIMETER READINGS',
0213      1 //6X, 'Dosimeter',7(7X,AB), /13X,7(11X,'(nc)' ))
0214      IL=0
0215      DO 250 I=1,ND
0216      IL=IL+1
0217      IF(IL.LT.7)GOTO 215
0218      WRITE(15,212)
0219      212      FORMAT(//10X, '(* indicates a rejected flier *)')
0220      WRITE(15,210)TITLE,HDG
0221      IL=1
0222      WRITE(15,220)ID(I),FRNTBK(IFB(I)),(RAW(I,IC,1),STAR(I,IC,1),
0223      1 IC=1,7)
0224      220      FORMAT(//3X,I6,1X,A5, ' Raw',FB.2,A1,6(F14.2,A1))
0225      DO 225 J=2,3
0226      225      WRITE(15,230)(RAW(I,IC,J),STAR(I,IC,J),IC=1,7)
0227      230      FORMAT(17X, 'Raw',FB.2,A1,6(F14.2,A1))
0228      WRITE(15,240)(AVE(I,IC),IPCT(I,IC),IC=1,7),
0229      +(BETA(I,IC),IC=1,6),(RATIO(I,IC),IC=2,6)
0230      240      FORMAT(/17X, 'Ave',FB.2,'+/-',I2,'%',6(F9.2,'+/-',I2,'%'),
0231      +/16X, 'Beta',FB.2,5F15.2,11X,'0.00',/16X, 'Ratio',3X,'1.00',5F15.4)
0232      250      CONTINUE
0233      WRITE(15,212)
0234      C
0235      C OUTPUT RESULTS
0236      C
0237      WRITE(15,255)TITLE
0238      255      FORMAT(1H1,A80, //28X, '*** RESULTS ***',45X, 'CALCULATED DOSES',
0239      1 //1X, 'Dosimeter',19X, 'Calibration Factors',23X, 'Mylar Chip',
0240      2 5X, 'Calculated Beta',7X, 'Calculated Gamma',
0241      3 /12X, '.005"',5X, '.010"',5X, '.020"',5X, '.032"',5X, '.064"',
0242      4 7X, 'Ave.',6X, 'Reading',8X,2('Dose Error',9X),
0243      5 /9X,6(2X, '(rad/nc)'),7X, '(nc)',2(BX, '(rad) (rad)'))
0244      IL=0
0245      DO 280 I=1,ND,2
0246      IL=IL+1
0247      IF(IL.LT.17)GOTO 258
0248      WRITE(15,255)TITLE
0249      IL=0

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```

0250      258      WRITE(15, 259)
0251      259      FORMAT(1X)
0252      WRITE(15, 260) ID(I), FRNTBK(IFB(I)), (CAL(I, J), J=2, 6), CAL(I, 1),
0253      +BETA(I, 1), DOSE(I), ERBDOS(I), GAMDOS(I), ERGDOS(I)
0254      260      FORMAT(14, 1X, A5, F7.2, F10.2, F13.2, 2(F13.2, F9.2))
0255      IP=I+1
0256      WRITE(15, 260) ID(IP), FRNTBK(IFB(IP)), (CAL(IP, J), J=2, 6),
0257      +CAL(IP, 1), BETA(IP, 1), DOSE(IP), ERBDOS(IP), GAMDOS(IP), ERGDOS(IP)
0258      280      CONTINUE
0259      C
0260      C Output Summary Page of Doses, Dose Rates
0261      C
0262      WRITE(15, 300)TITLE
0263      300      FORMAT(1H1, A80, //28X, '*** SUMMARY OF DOSES AND DOSE RATES ***',
0264      1 //1X, 'Dosimeter', 5X, 'Beta', 6X, 'Gamma', 3X, 'Exposure', 3X,
0265      2 'Beta Dose Rate', 5X, 'Gamma Dose Rate', /9X, 2(6X, 'Dose'), 7X,
0266      3 'Time', 2(15X, 'Error'), /10X, 2(5X, '(rad)'), 6X, '(hr)', 1X,
0267      4 2(3X, '(rad/hr) (rad/hr)'))
0268      IL=0
0269      DO 350 I=1, ND, 2
0270      IL=IL+1
0271      IF(IL .LT. 17)GOTO 310
0272      WRITE(15, 300)TITLE
0273      IL=0
0274      310      BETADR=DOSE(I)/HR(I)
0275      GAMMADR=GAMDOS(I)/HR(I)
0276      ERRBDR=ERBDOS(I)/HR(I)
0277      ERRGDR=ERGDOS(I)/HR(I)
0278      WRITE(15, 259)
0279      WRITE(15, 320) ID(I), FRNTBK(IFB(I)), DOSE(I), GAMDOS(I), HR(I), BETADR,
0280      1 ERRBDR, GAMMADR, ERRGDR
0281      320      FORMAT(I3, 1X, A5, 1X, 2F10.2, F10.1, 1PE11.2E2, E9.2E2, 2X, 2E9.2E2)
0282      IP=I+1
0283      BETADR=DOSE(IP)/HR(IP)
0284      GAMMADR=GAMDOS(IP)/HR(IP)
0285      ERRBDR=ERBDOS(IP)/HR(IP)
0286      ERRGDR=ERGDOS(IP)/HR(IP)
0287      WRITE(15, 320) ID(IP), FRNTBK(IFB(IP)), DOSE(IP), GAMDOS(IP), HR(IP),
0288      1 BETADR, ERRBDR, GAMMADR, ERRGDR
0289      350      CONTINUE
0290      C
0291      C Final Comments
0292      C
0293
0294      WRITE(6, 400)
0295      400      FORMAT(//5X, 'END OF RUN', /)
0296      CLOSE(UNIT=10)
0297      CLOSE(UNIT=15, DISPOSE='PRINT/DELETE')
0298      STOP
0299      END

```

APPENDIX II
OUTPUT LISTINGS FOR RATIO7 RUNS

VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:38 TTA4: 13-JUN-1983 13:38 DISK\$USER_DISK1:[SCHE BETDOS]RATIOOUT DAT:1 VAX/VMS
VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:38 TTA4: 13-JUN-1983 13:38 DISK\$USER_DISK1:[SCHE BETDOS]RATIOOUT DAT:1 VAX/VMS
VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:38 TTA4: 13-JUN-1983 13:38 DISK\$USER_DISK1:[SCHE BETDOS]RATIOOUT DAT:1 VAX/VMS

SSSS CCCC H H EEEE
S C H H E
S C H H E
SSS C HHHHH EEEE
S C H H E
S C H H E
SSSS CCCC H H EEEE

RRRRRRRR AAAAAA TTTTTTTTTT I||||| 000000 000000 UU UU TT TT
RRRRRRRR AAAAAA TTTTTTTTTT I||||| 000000 000000 UU UU TT TT
RR RR AA AA TT II 00 00 00 00 UU UU TT
RR RR AA AA TT II 00 00 00 00 UU UU TT
RR RR AA AA TT II 00 00 00 00 UU UU TT
RR RR AA AA TT II 00 00 00 00 UU UU TT
RR RR AA AA TT II 00 00 00 00 UU UU TT
RR RR AAAAAAAA TT II 00 00 00 00 UU UU TT
RR RR AAAAAAAA TT II 00 00 00 00 UU UU TT
RR RR AA AA TT II 00 00 00 00 UU UU TT
RR RR AA AA TT II 00 00 00 00 UU UU TT
RR RR AA AA TT II 000000 000000 UUUUUUUUUU TT
RR RR AA AA TT II 000000 000000 UUUUUUUUUU TT

DDDDDDDD AAAAAA TTTTTTTTTT ||||| 11
DDDDDDDD AAAAAA TTTTTTTTTT ||||| 11
DD DD AA AA TT ||||| 1111
DD DD AA AA TT ||||| 1111
DD DD AA AA TT ||||| 11
DD DD AA AA TT ||||| 11
DD DD AA AA TT ||||| 11
DD DD AAAAAAAA TT ||||| 11
DD DD AAAAAAAA TT ||||| 11
DD DD AA AA TT ||||| 11
DD DD AA AA TT ||||| 11
DDDDDDDD AA AA TT ||||| 111111
DDDDDDDD AA AA TT ||||| 111111

SSSS CCCC H H EEEE
S C H H E
S C H H E
SSS C HHHHH EEEE
S C H H E
S C H H E
SSSS CCCC H H EEEE

VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:38 TTA4: 13-JUN-1983 13:38 DISK\$USER_DISK1:[SCHE BETDOS]RATIOOUT DAT:1 VAX/VMS
VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:38 TTA4: 13-JUN-1983 13:38 DISK\$USER_DISK1:[SCHE BETDOS]RATIOOUT DAT:1 VAX/VMS
VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:38 TTA4: 13-JUN-1983 13:38 DISK\$USER_DISK1:[SCHE BETDOS]RATIOOUT DAT:1 VAX/VMS

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
1 FRONT	Raw	74 56	0 00	0 00	66 25	57 20	0 00	59 20
	Raw	70 97	0 00	0 00	64 78	59 56	0 00	58 98
	Raw	75 20	0 00	0 00	61 02	59 64	0 00	58 10
	Ave	73 58+/- 3%	0 00+/- 0%	0 00+/- 0%	64 02+/- 4%	58 80+/- 2%	0 00+/- 0%	58 76+/- 1%
	Beta	14 82	0 00	0 00	5 26	0 04	0 00	0 00
	Ratio	1.00	0 0000	0 0000	0.3548	0.0027	0 0000	
1 BACK	Raw	154 30	0 00	0 00	67 88	69 05	0 00	95 06
	Raw	119 80	0 00	0 00	67 61	63 82	0 00	80 58
	Raw	86 14	0 00	0 00	68 38	68 21	0 00	70 47
	Ave	120 08+/- 28%	0 00+/- 0%	0 00+/- 0%	67 96+/- 1%	67 03+/- 4%	0 00+/- 0%	82 04+/- 15%
	Beta	38 04	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio	1.00	0 0000	0 0000	0 0000	0 0000	0 0000	
2 FRONT	Raw	734 00	0 00	0 00	623 80	686 80	0 00	671 60
	Raw	690 40	0 00	0 00	645 50	677 70	0 00	658 80
	Raw	713 50	0 00	0 00	620 80	667 30	0 00	662 20
	Ave	712 63+/- 3%	0 00+/- 0%	0 00+/- 0%	630 03+/- 2%	677 27+/- 1%	0 00+/- 0%	664 20+/- 1%
	Beta	48 43	0 00	0 00	0 00	13 07	0 00	0 00
	Ratio	1.00	0 0000	0 0000	0 0000	0.2698	0 0000	
2 BACK	Raw	1372 00	0 00	0 00	804 30*	741 50	0 00	734 80
	Raw	1477 00	0 00	0 00	886 00	766 00	0 00	718 20
	Raw	1466 00	0 00	0 00	918 40	800 50	0 00	733 40
	Ave	1438 33+/- 4%	0 00+/- 0%	0 00+/- 0%	902 20+/- 3%	769 33+/- 4%	0 00+/- 0%	728 80+/- 1%
	Beta	709 53	0 00	0 00	173 40	40 53	0 00	0 00
	Ratio	1.00	0 0000	0 0000	0 2444	0 0571	0 0000	
3 FRONT	Raw	483 10	0 00	0 00	227 50	204 10	0 00	188 10
	Raw	493 50	0 00	0 00	242 80	207 10	0 00	193 60
	Raw	484 80	0 00	0 00	229 40	212 90	0 00	180 60
	Ave	487 13+/- 1%	0 00+/- 0%	0 00+/- 0%	233 23+/- 4%	208 03+/- 2%	0 00+/- 0%	187 43+/- 3%
	Beta	299 70	0 00	0 00	45 80	20 60	0 00	0 00
	Ratio	1.00	0 0000	0 0000	0 1528	0 0607	0 0000	
3 BACK	Raw	197 30	0 00	0 00	171 50	203 90	0 00	198 00
	Raw	189 50	0 00	0 00	182 00	201 90	0 00	201 90
	Raw	193 50	0 00	0 00	180 80	198 70	0 00	201 40
	Ave	193 43+/- 2%	0 00+/- 0%	0 00+/- 0%	178 10+/- 3%	201 50+/- 1%	0 00+/- 0%	200 43+/- 1%
	Beta	0 00	0 00	0 00	0 00	1 07	0 00	0 00
	Ratio	1.00	0 0000	0 0000	0 0000	0 0000	0 0000	

(* indicates a rejected filter)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
4 FRONT	Raw	567 20	0 00	0 00	171 50	153 90	0 00	138 30
	Raw	592 10	0 00	0 00	168 20	140 10	0 00	138 90
	Raw	627 00*	0 00	0 00	171 00	144 60	0 00	132 40
	Ave	579 65+/- 3%	0 00+/- 0%	0 00+/- 0%	170 23+/- 1%	146 20+/- 5%	0 00+/- 0%	136 53+/- 3%
	Beta	443 12	0 00	0 00	33 70	9 67	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0761	0 0218	0 0000	
4 BACK	Raw	150 20	0 00	0 00	153 40	166 20	0 00	163 80
	Raw	163 40	0 00	0 00	147 70	156 40	0 00	172 00
	Raw	164 50	0 00	0 00	149 50	163 80	0 00	162 20
	Ave	159 37+/- 5%	0 00+/- 0%	0 00+/- 0%	150 20+/- 2%	162 13+/- 3%	0 00+/- 0%	166 00+/- 3%
	Beta	0 00	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0000	0 0000	0 0000	
5 FRONT	Raw	397 00	0 00	0 00	191 50	164 30	0 00	169 40
	Raw	352 50	0 00	0 00	177 70	172 50	0 00	164 30
	Raw	236 70	0 00	0 00	174 50	164 40	0 00	165 20
	Ave	328 73+/- 25%	0 00+/- 0%	0 00+/- 0%	181 23+/- 5%	167 07+/- 3%	0 00+/- 0%	166 30+/- 2%
	Beta	162 43	0 00	0 00	14 93	0 77	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0919	0 0047	0 0000	
5 BACK	Raw	200 20	0 00	0 00	180 30	181 00	0 00	180 50
	Raw	193 00	0 00	0 00	179 60	184 40	0 00	191 10
	Raw	196 10	0 00	0 00	176 70	180 30	0 00	188 90
	Ave	196 43+/- 2%	0 00+/- 0%	0 00+/- 0%	178 93+/- 1%	181 90+/- 1%	0 00+/- 0%	186 83+/- 3%
	Beta	9 60	0 00	0 00	0 00	0 00	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0000	0 0000	0 0000	
6 FRONT	Raw	571 80	0 00	0 00	472 30	445 50	0 00	450 50
	Raw	557 10	0 00	0 00	470 50	460 20	0 00	478 30
	Raw	590 40	0 00	0 00	491 60	458 00	0 00	482 30
	Ave	573 10+/- 3%	0 00+/- 0%	0 00+/- 0%	478 13+/- 2%	454 57+/- 2%	0 00+/- 0%	470 37+/- 4%
	Beta	102 73	0 00	0 00	7 77	0 00	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0756	0 0000	0 0000	
6 BACK	Raw	1709 00	0 00	0 00	582 90	562 20	0 00	500 10
	Raw	1740 0	0 00	0 00	636 10	588 10	0 00	555 70*
	Raw	1762 00	0 00	0 00	617 30	569 00	0 00	503 40
	Ave	1737 00+/- 2%	0 00+/- 0%	0 00+/- 0%	612 10+/- 4%	573 10+/- 2%	0 00+/- 0%	501 75+/- 0%
	Beta	1235 25	0 00	0 00	110 35	71 35	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0893	0 0578	0 0000	

(* indicates a rejected flier)

II.3

Pre-Cross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
7 FRONT	Raw	542.20	0.00	0.00	451.00	481.60	0.00	458.20
	Raw	481.70*	0.00	0.00	464.30	464.60	0.00	490.40
	Raw	525.70	0.00	0.00	445.80	469.80	0.00	486.20
	Ave	533.95+/- 2%	0.00+/- 0%	0.00+/- 0%	453.70+/- 2%	472.00+/- 2%	0.00+/- 0%	478.27+/- 4%
	Beta	55.68	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
7 BACK	Raw	1668.00*	0.00	0.00	634.70	543.00	0.00	523.60
	Raw	1503.00	0.00	0.00	611.00	582.60	0.00	504.80
	Raw	1570.00	0.00	0.00	635.50	533.10	0.00	517.60
	Ave	1536.50+/- 3%	0.00+/- 0%	0.00+/- 0%	627.07+/- 2%	552.90+/- 5%	0.00+/- 0%	515.33+/- 2%
	Beta	1021.17	0.00	0.00	111.73	37.57	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1094	0.0368	0.0000	
8 FRONT	Raw	496.10	0.00	0.00	472.60	451.60	0.00	454.40
	Raw	500.20	0.00	0.00	452.40	480.40	0.00	461.30
	Raw	509.10	0.00	0.00	475.50	450.90	0.00	453.40
	Ave	501.80+/- 1%	0.00+/- 0%	0.00+/- 0%	466.83+/- 3%	460.97+/- 4%	0.00+/- 0%	456.37+/- 1%
	Beta	45.43	0.00	0.00	10.47	4.60	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2304	0.1012	0.0000	
8 BACK	Raw	2084.00*	0.00	0.00	616.30	604.30	0.00	536.90
	Raw	1830.00	0.00	0.00	574.60	604.30	0.00	524.20
	Raw	1895.00	0.00	0.00	625.80	649.80	0.00	525.10
	Ave	1862.50+/- 2%	0.00+/- 0%	0.00+/- 0%	605.57+/- 4%	619.47+/- 4%	0.00+/- 0%	528.73+/- 1%
	Beta	1333.77	0.00	0.00	76.83	90.73	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0576	0.0680	0.0000	
9 FRONT	Raw	836.90	0.00	0.00	883.80	807.00	0.00	714.40*
	Raw	844.50	0.00	0.00	855.20	833.70	0.00	782.20
	Raw	875.80	0.00	0.00	842.00	881.30	0.00	807.90
	Ave	852.40+/- 2%	0.00+/- 0%	0.00+/- 0%	860.33+/- 2%	840.67+/- 4%	0.00+/- 0%	795.05+/- 2%
	Beta	57.35	0.00	0.00	65.28	45.62	0.00	0.00
	Ratio	1.00	0.0000	0.0000	1.1383	0.7954	0.0000	
9 BACK	Raw	3888.00	0.00	0.00	929.80	933.60	0.00	920.20
	Raw	3560.00	0.00	0.00	980.90	904.40	0.00	940.00
	Raw	5626.00	0.00	0.00	997.60	921.70	0.00	951.50
	Ave	4358.00+/- 25%	0.00+/- 0%	0.00+/- 0%	969.43+/- 4%	919.90+/- 2%	0.00+/- 0%	937.23+/- 2%
	Beta	3420.77	0.00	0.00	32.20	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0094	0.0000	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
10 FRONT	Raw	1.02	0.00	0.00	0.93	0.92	0.00	0.92
	Raw	0.99	0.00	0.00	0.93	0.92	0.00	0.92
	Raw	0.96	0.00	0.00	0.96	0.95	0.00	0.93
	Ave	0.99+/- 3%	0.00+/- 0%	0.00+/- 0%	0.94+/- 2%	0.93+/- 2%	0.00+/- 0%	0.92+/- 1%
	Beta	0.07	0.00	0.00	0.02	0.01	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2548	0.1154	0.0000	
10 BACK	Raw	1.01	0.00	0.00	0.98	0.92	0.00	0.92
	Raw	1.01	0.00	0.00	0.94	0.90	0.00	0.92
	Raw	0.97	0.00	0.00	0.94	0.94	0.00	0.90
	Ave	0.99+/- 2%	0.00+/- 0%	0.00+/- 0%	0.95+/- 3%	0.92+/- 2%	0.00+/- 0%	0.91+/- 1%
	Beta	0.08	0.00	0.00	0.04	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.5000	0.0500	0.0000	
11 FRONT	Raw	362.70	0.00	0.00	342.10	402.00	0.00	372.10
	Raw	375.20	0.00	0.00	345.30	382.30	0.00	394.00
	Raw	361.00	0.00	0.00	310.70*	386.60	0.00	395.50
	Ave	366.30+/- 2%	0.00+/- 0%	0.00+/- 0%	343.70+/- 1%	390.30+/- 3%	0.00+/- 0%	387.20+/- 3%
	Beta	0.00	0.00	0.00	0.00	3.10	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
11 BACK	Raw	356.40	0.00	0.00	367.10	388.60	0.00	420.20
	Raw	363.70	0.00	0.00	372.10	404.30	0.00	406.80
	Raw	373.50	0.00	0.00	345.20	416.00	0.00	409.30
	Ave	364.53+/- 2%	0.00+/- 0%	0.00+/- 0%	361.47+/- 4%	402.97+/- 3%	0.00+/- 0%	412.10+/- 2%
	Beta	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
12 FRONT	Raw	305.20	0.00	0.00	294.60	308.80	0.00	270.30
	Raw	357.90	0.00	0.00	294.70	292.00	0.00	263.30
	Raw	334.30	0.00	0.00	317.70	303.80	0.00	260.50
	Ave	332.47+/- 8%	0.00+/- 0%	0.00+/- 0%	302.33+/- 4%	301.53+/- 3%	0.00+/- 0%	264.70+/- 2%
	Beta	67.77	0.00	0.00	37.63	36.83	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.5553	0.5435	0.0000	
12 BACK	Raw	336.00	0.00	0.00	300.40	275.90	0.00	284.60
	Raw	511.20	0.00	0.00	304.90	259.00	0.00	287.40
	Raw	466.70	0.00	0.00	304.10	282.90	0.00	296.00
	Ave	437.97+/- 21%	0.00+/- 0%	0.00+/- 0%	303.13+/- 1%	272.60+/- 5%	0.00+/- 0%	289.33+/- 2%
	Beta	148.63	0.00	0.00	13.80	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0928	0.0000	0.0000	

(* indicates a rejected flier)

C.I.

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
13 FRONT	Raw	183.50	0.00	0.00	111.40	103.00	0.00	97.48
	Raw	181.90	0.00	0.00	109.10	99.26	0.00	96.79
	Raw	186.20	0.00	0.00	112.00	103.50	0.00	99.27
	Ave	183.87+/- 1%	0.00+/- 0%	0.00+/- 0%	110.83+/- 1%	101.92+/- 2%	0.00+/- 0%	97.85+/- 1%
	Beta	86.02	0.00	0.00	12.99	4.07	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1510	0.0474	0.0000	
13 BACK	Raw	121.50	0.00	0.00	98.50	98.28	0.00	97.92
	Raw	117.70	0.00	0.00	97.64	97.88	0.00	99.01
	Raw	119.10	0.00	0.00	97.40	96.98	0.00	100.70
	Ave	119.43+/- 2%	0.00+/- 0%	0.00+/- 0%	97.85+/- 1%	97.71+/- 1%	0.00+/- 0%	99.21+/- 1%
	Beta	20.22	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
14 FRONT	Raw	396.00	0.00	0.00	366.00	365.90	0.00	346.10
	Raw	427.80	0.00	0.00	385.50	365.20	0.00	356.30
	Raw	433.20	0.00	0.00	379.70	359.10	0.00	361.50
	Ave	419.00+/- 5%	0.00+/- 0%	0.00+/- 0%	377.07+/- 3%	363.40+/- 1%	0.00+/- 0%	354.63+/- 2%
	Beta	64.37	0.00	0.00	22.43	8.77	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3485	0.1362	0.0000	
14 BACK	Raw	367.40	0.00	0.00	335.60	362.80	0.00	335.60
	Raw	347.70	0.00	0.00	348.50	356.70	0.00	355.10
	Raw	341.20	0.00	0.00	324.70	347.20	0.00	340.10
	Ave	352.10+/- 4%	0.00+/- 0%	0.00+/- 0%	336.27+/- 4%	355.57+/- 2%	0.00+/- 0%	343.60+/- 3%
	Beta	8.50	0.00	0.00	0.00	11.97	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	1.4078	0.0000	
15 FRONT	Raw	2937.00	0.00	0.00	2938.00	1352.00	0.00	1375.00
	Raw	2989.00	0.00	0.00	2873.00	1362.00	0.00	1320.00
	Raw	2952.00	0.00	0.00	2798.00	1537.00*	0.00	1472.00*
	Ave	2959.33+/- 1%	0.00+/- 0%	0.00+/- 0%	2869.67+/- 2%	1357.00+/- 1%	0.00+/- 0%	1347.50+/- 3%
	Beta	1611.83	0.00	0.00	1522.17	9.50	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.9444	0.0059	0.0000	
15 BACK	Raw	4828.00	0.00	0.00	3368.00	1497.00	0.00	1642.00
	Raw	5054.00	0.00	0.00	3079.00	1354.00*	0.00	1606.00
	Raw	4875.00	0.00	0.00	3112.00	1533.00	0.00	1650.00
	Ave	4919.00+/- 2%	0.00+/- 0%	0.00+/- 0%	3186.33+/- 5%	1515.00+/- 2%	0.00+/- 0%	1632.67+/- 1%
	Beta	3286.33	0.00	0.00	1553.67	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.4728	0.0000	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
16 FRONT	Raw	390.30	0.00	0.00	374.70	382.30	0.00	353.30
	Raw	399.40	0.00	0.00	381.70	360.80	0.00	359.60
	Raw	398.70	0.00	0.00	352.90	381.60	0.00	362.70
	Ave	396.13+/- 1%	0.00+/- 0%	0.00+/- 0%	369.77+/- 4%	374.90+/- 3%	0.00+/- 0%	358.53+/- 1%
	Beta	37.60	0.00	0.00	11.23	16.37	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2988	0.4353	0.0000	
16 BACK	Raw	378.60*	0.00	0.00	362.00	395.40	0.00	364.90
	Raw	417.80	0.00	0.00	375.00	367.80	0.00	341.70
	Raw	414.00	0.00	0.00	369.80	361.80	0.00	361.50
	Ave	415.90+/- 1%	0.00+/- 0%	0.00+/- 0%	368.93+/- 2%	375.00+/- 5%	0.00+/- 0%	356.03+/- 4%
	Beta	59.87	0.00	0.00	12.90	18.97	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2155	0.3168	0.0000	
17 FRONT	Raw	1.43	0.00	0.00	1.27	1.27	0.00	1.23
	Raw	1.46	0.00	0.00	1.20	1.19	0.00	1.14
	Raw	1.42	0.00	0.00	1.23	1.19	0.00	1.25
	Ave	1.44+/- 1%	0.00+/- 0%	0.00+/- 0%	1.23+/- 3%	1.22+/- 4%	0.00+/- 0%	1.21+/- 5%
	Beta	0.23	0.00	0.00	0.03	0.01	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1111	0.0351	0.0000	
17 BACK	Raw	1.44	0.00	0.00	1.25	1.23	0.00	1.23
	Raw	1.47	0.00	0.00	1.22	1.20	0.00	1.29
	Raw	1.40	0.00	0.00	1.28	1.24	0.00	1.26
	Ave	1.43+/- 3%	0.00+/- 0%	0.00+/- 0%	1.25+/- 3%	1.22+/- 1%	0.00+/- 0%	1.26+/- 2%
	Beta	0.17	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
18 FRONT	Raw	664.80	0.00	0.00	589.60	590.30	0.00	622.90
	Raw	679.10	0.00	0.00	550.80	588.60	0.00	539.90
	Raw	692.00	0.00	0.00	577.40	570.20	0.00	576.70
	Ave	678.63+/- 2%	0.00+/- 0%	0.00+/- 0%	572.60+/- 3%	583.03+/- 2%	0.00+/- 0%	579.83+/- 7%
	Beta	98.80	0.00	0.00	0.00	3.20	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0324	0.0000	
18 BACK	Raw	1305.00	0.00	0.00	582.70	602.10	0.00	558.40
	Raw	1135.00	0.00	0.00	589.00	595.10	0.00	557.50
	Raw	651.00	0.00	0.00	587.70	574.90	0.00	555.00
	Ave	1030.33+/-33%	0.00+/- 0%	0.00+/- 0%	586.47+/- 1%	590.70+/- 2%	0.00+/- 0%	556.97+/- 0%
	Beta	473.37	0.00	0.00	29.50	33.73	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0623	0.0713	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
19 FRONT	Raw	309.10	0.00	0.00	238.80	235.50	0.00	0.00
	Raw	285.60	0.00	0.00	253.10	247.40	0.00	0.00
	Raw	265.10	0.00	0.00	226.80	247.80	0.00	0.00
	Ave	286.60+/- 8%	0.00+/- 0%	0.00+/- 0%	239.57+/- 5%	243.57+/- 3%	0.00+/- 0%	0.00+/- 0%
	Beta	286.60	0.00	0.00	239.57	243.57	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.8359	0.8498	0.0000	
19 BACK	Raw	327.30	0.00	0.00	227.70	227.60	0.00	234.70
	Raw	336.10	0.00	0.00	234.20	245.10	0.00	243.60
	Raw	326.00	0.00	0.00	243.00	231.80	0.00	242.40
	Ave	329.80+/- 2%	0.00+/- 0%	0.00+/- 0%	234.97+/- 3%	234.83+/- 4%	0.00+/- 0%	240.23+/- 2%
	Beta	89.57	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
21 FRONT	Raw	315.60	0.00	0.00	269.00	269.70	0.00	267.80
	Raw	313.40	0.00	0.00	251.80	258.90	0.00	249.30
	Raw	321.30	0.00	0.00	261.60	267.10	0.00	249.00
	Ave	316.77+/- 1%	0.00+/- 0%	0.00+/- 0%	260.80+/- 3%	265.23+/- 2%	0.00+/- 0%	255.37+/- 4%
	Beta	61.40	0.00	0.00	5.43	9.87	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0885	0.1607	0.0000	
21 BACK	Raw	866.60	0.00	0.00	270.00	254.40	0.00	255.80
	Raw	1144.00	0.00	0.00	260.80	244.00	0.00	257.10
	Raw	1032.00	0.00	0.00	268.60	264.70	0.00	248.80
	Ave	1014.20+/-14%	0.00+/- 0%	0.00+/- 0%	266.47+/- 2%	254.37+/- 4%	0.00+/- 0%	253.90+/- 2%
	Beta	760.30	0.00	0.00	12.57	0.47	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0165	0.0006	0.0000	
23 FRONT	Raw	3197.00	0.00	0.00	4928.00	5563.00	0.00	3224.00
	Raw	3234.00	0.00	0.00	5256.00	5228.00	0.00	3221.00
	Raw	3005.00	0.00	0.00	4939.00	5074.00	0.00	3172.00
	Ave	3145.33+/- 4%	0.00+/- 0%	0.00+/- 0%	5041.00+/- 4%	5288.33+/- 5%	0.00+/- 0%	3205.67+/- 1%
	Beta	0.00	0.00	0.00	1835.33	2082.67	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
23 BACK	Raw	6466.00	0.00	0.00	9283.00	7601.00	0.00	3564.00*
	Raw	6935.00	0.00	0.00	9006.00	8012.00	0.00	3222.00
	Raw	6618.00	0.00	0.00	9024.00	7566.00	0.00	3362.00
	Ave	6673.00+/- 4%	0.00+/- 0%	0.00+/- 0%	9104.33+/- 2%	7726.33+/- 2%	0.00+/- 0%	3292.00+/- 3%
	Beta	3381.00	0.00	0.00	5812.33	4434.33	0.00	0.00
	Ratio	1.00	0.0000	0.0000	1.7191	1.3115	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
25 FRONT	Raw	923.60	0.00	0.00	809.80	941.70	0.00	933.20
	Raw	941.90	0.00	0.00	811.30	871.80	0.00	884.30
	Raw	942.60	0.00	0.00	840.30	930.60	0.00	874.20
	Ave	936.03+/- 1%	0.00+/- 0%	0.00+/- 0%	820.47+/- 2%	914.70+/- 4%	0.00+/- 0%	897.23+/- 4%
	Beta	38.80	0.00	0.00	0.00	17.47	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.4502	0.0000	
25 BACK	Raw	942.00	0.00	0.00	836.20	700.70	0.00	841.80
	Raw	941.90	0.00	0.00	868.20	740.30	0.00	823.00
	Raw	919.30	0.00	0.00	878.00	742.70	0.00	796.00
	Ave	934.40+/- 1%	0.00+/- 0%	0.00+/- 0%	860.80+/- 3%	727.90+/- 3%	0.00+/- 0%	820.27+/- 3%
	Beta	114.13	0.00	0.00	40.53	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3551	0.0000	0.0000	
26 FRONT	Raw	426.80	0.00	0.00	198.00	192.60	0.00	181.40
	Raw	416.80	0.00	0.00	195.30	186.90	0.00	171.70
	Raw	397.40	0.00	0.00	205.20	187.70	0.00	176.60
	Ave	413.67+/- 4%	0.00+/- 0%	0.00+/- 0%	199.50+/- 3%	189.07+/- 2%	0.00+/- 0%	176.57+/- 3%
	Beta	237.10	0.00	0.00	22.93	12.50	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0967	0.0527	0.0000	
26 BACK	Raw	232.10	0.00	0.00	182.00	180.90	0.00	195.50
	Raw	233.00	0.00	0.00	194.00	193.50	0.00	181.40
	Raw	226.40	0.00	0.00	197.50	183.80	0.00	189.40
	Ave	230.50+/- 2%	0.00+/- 0%	0.00+/- 0%	191.17+/- 4%	186.07+/- 4%	0.00+/- 0%	188.77+/- 4%
	Beta	41.73	0.00	0.00	2.40	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0575	0.0000	0.0000	
27 FRONT	Raw	187.30	0.00	0.00	183.30	187.40	0.00	179.40
	Raw	154.40*	0.00	0.00	172.40	184.20	0.00	179.70
	Raw	192.90	0.00	0.00	174.00	178.80	0.00	177.10
	Ave	190.10+/- 2%	0.00+/- 0%	0.00+/- 0%	176.57+/- 3%	183.47+/- 2%	0.00+/- 0%	178.73+/- 1%
	Beta	11.37	0.00	0.00	0.00	4.73	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.4164	0.0000	
27 BACK	Raw	159.70	0.00	0.00	151.30	159.20	0.00	163.00
	Raw	155.70	0.00	0.00	156.50	173.30	0.00	170.50
	Raw	157.70	0.00	0.00	151.70	168.80	0.00	166.10
	Ave	157.70+/- 1%	0.00+/- 0%	0.00+/- 0%	153.17+/- 2%	167.10+/- 4%	0.00+/- 0%	166.53+/- 2%
	Beta	0.00	0.00	0.00	0.00	0.57	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	

(* indicates a rejected flier)

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Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
29 FRONT	Raw	78.19	0.00	0.00	61.22	62.53	0.00	57.89
	Raw	78.70	0.00	0.00	63.58	59.77	0.00	60.29
	Raw	74.76	0.00	0.00	63.82	62.86	0.00	55.60
	Ave	77.22+/- 3%	0.00+/- 0%	0.00+/- 0%	62.87+/- 2%	61.72+/- 3%	0.00+/- 0%	57.93+/- 4%
	Beta	19.29	0.00	0.00	4.95	3.79	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2564	0.1966	0.0000	
29 BACK	Raw	62.01	0.00	0.00	53.64	51.60	0.00	55.41
	Raw	59.08	0.00	0.00	54.81	56.46	0.00	54.22
	Raw	58.18	0.00	0.00	58.57	54.91	0.00	54.36
	Ave	59.76+/- 3%	0.00+/- 0%	0.00+/- 0%	55.67+/- 5%	54.32+/- 5%	0.00+/- 0%	54.66+/- 1%
	Beta	5.09	0.00	0.00	1.01	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1983	0.0000	0.0000	
30 FRONT	Raw	100.90	0.00	0.00	65.34	64.82	0.00	57.37
	Raw	100.60	0.00	0.00	62.85	61.91	0.00	59.59
	Raw	100.60	0.00	0.00	66.86	61.30	0.00	59.95
	Ave	100.70+/- 0%	0.00+/- 0%	0.00+/- 0%	65.02+/- 3%	62.68+/- 3%	0.00+/- 0%	58.97+/- 2%
	Beta	41.73	0.00	0.00	6.05	3.71	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1449	0.0888	0.0000	
30 BACK	Raw	71.48	0.00	0.00	55.74	53.67	0.00	56.06
	Raw	71.72	0.00	0.00	55.41	55.32	0.00	58.56
	Raw	60.45*	0.00	0.00	56.15	55.99	0.00	58.64
	Ave	71.60+/- 0%	0.00+/- 0%	0.00+/- 0%	55.77+/- 1%	54.99+/- 2%	0.00+/- 0%	57.75+/- 3%
	Beta	13.85	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
34 FRONT	Raw	107.70	0.00	0.00	81.71	83.58	0.00	76.76
	Raw	110.20	0.00	0.00	84.40	80.82	0.00	73.45
	Raw	107.00	0.00	0.00	81.32	80.60	0.00	73.31
	Ave	108.30+/- 2%	0.00+/- 0%	0.00+/- 0%	82.48+/- 2%	81.67+/- 2%	0.00+/- 0%	74.51+/- 3%
	Beta	33.79	0.00	0.00	7.97	7.16	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2358	0.2119	0.0000	
34 BACK	Raw	71.42*	0.00	0.00	72.36	69.95*	0.00	74.02
	Raw	78.98	0.00	0.00	71.46	65.26*	0.00	74.95
	Raw	82.48	0.00	0.00	66.48	77.79*	0.00	75.66
	Ave	80.73+/- 3%	0.00+/- 0%	0.00+/- 0%	70.10+/- 5%	0.00+/- 9%	0.00+/- 0%	74.88+/- 1%
	Beta	5.85	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
36 FRONT	Raw	59.92	0.00	0.00	45.37	40.76	0.00	40.32
	Raw	53.32*	0.00	0.00	44.19	40.34	0.00	41.48
	Raw	57.22	0.00	0.00	48.39	42.85	0.00	44.03
	Ave	58.57+/- 3%	0.00+/- 0%	0.00+/- 0%	45.98+/- 5%	41.32+/- 3%	0.00+/- 0%	41.94+/- 5%
	Beta	16.63	0.00	0.00	4.04	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2430	0.0000	0.0000	
36 BACK	Raw	40.81	0.00	0.00	36.31	33.52	0.00	36.62
	Raw	38.94	0.00	0.00	35.00	32.92	0.00	32.20*
	Raw	38.08	0.00	0.00	36.45	32.55	0.00	37.02
	Ave	39.28+/- 4%	0.00+/- 0%	0.00+/- 0%	35.92+/- 2%	33.00+/- 1%	0.00+/- 0%	36.82+/- 1%
	Beta	2.46	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
37 FRONT	Raw	210.40	0.00	0.00	168.80	164.80	0.00	154.10
	Raw	210.90	0.00	0.00	173.70	160.50	0.00	146.30
	Raw	216.30	0.00	0.00	171.50	155.80	0.00	149.10
	Ave	212.53+/- 2%	0.00+/- 0%	0.00+/- 0%	171.33+/- 1%	160.37+/- 3%	0.00+/- 0%	149.83+/- 3%
	Beta	62.70	0.00	0.00	21.50	10.53	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3429	0.1680	0.0000	
37 BACK	Raw	950.70	0.00	0.00	220.40	244.90	0.00	169.30
	Raw	819.60	0.00	0.00	224.60	254.90	0.00	157.80
	Raw	866.60	0.00	0.00	223.70	235.00	0.00	165.60
	Ave	878.97+/- 8%	0.00+/- 0%	0.00+/- 0%	222.90+/- 1%	244.93+/- 4%	0.00+/- 0%	164.23+/- 4%
	Beta	714.73	0.00	0.00	58.67	80.70	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0821	0.1129	0.0000	
39 FRONT	Raw	67.74	0.00	0.00	56.82	56.64	0.00	57.91
	Raw	69.20	0.00	0.00	56.25	60.37	0.00	55.00
	Raw	74.58*	0.00	0.00	60.79	58.84	0.00	53.71
	Ave	68.47+/- 2%	0.00+/- 0%	0.00+/- 0%	57.95+/- 4%	58.62+/- 3%	0.00+/- 0%	55.54+/- 4%
	Beta	12.93	0.00	0.00	2.41	3.08	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1866	0.2379	0.0000	
39 BACK	Raw	68.23*	0.00	0.00	55.55	54.12	0.00	54.36
	Raw	62.86	0.00	0.00	57.22	52.75	0.00	51.81
	Raw	61.50	0.00	0.00	50.80*	57.78	0.00	58.85*
	Ave	62.18+/- 2%	0.00+/- 0%	0.00+/- 0%	56.39+/- 2%	54.88+/- 5%	0.00+/- 0%	53.09+/- 3%
	Beta	9.10	0.00	0.00	3.30	1.80	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3628	0.1977	0.0000	

(* indicates a rejected flier.)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
40 FRONT	Raw	260.50	0.00	0.00	206.60*	186.20	0.00	213.50
	Raw	269.20	0.00	0.00	190.40	197.50	0.00	187.60*
	Raw	269.20	0.00	0.00	187.60	194.60	0.00	214.00
	Ave	266.30+/- 2%	0.00+/- 0%	0.00+/- 0%	189.00+/- 1%	192.77+/- 3%	0.00+/- 0%	213.75+/- 0%
	Beta	52.55	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
40 BACK	Raw	1478.00	0.00	0.00	288.80	254.30	0.00	238.20
	Raw	1386.00	0.00	0.00	305.30	275.50	0.00	226.20
	Raw	1639.00	0.00	0.00	296.40	253.70	0.00	228.60
	Ave	1501.00+/- 9%	0.00+/- 0%	0.00+/- 0%	296.83+/- 3%	261.17+/- 5%	0.00+/- 0%	231.00+/- 3%
	Beta	1270.00	0.00	0.00	65.83	30.17	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0518	0.0238	0.0000	0.0000
41 FRONT	Raw	509.60	0.00	0.00	465.50	483.50	0.00	463.10
	Raw	502.80	0.00	0.00	496.80*	479.10	0.00	474.50
	Raw	523.50	0.00	0.00	445.60	502.80	0.00	478.20
	Ave	511.97+/- 2%	0.00+/- 0%	0.00+/- 0%	455.55+/- 3%	488.47+/- 3%	0.00+/- 0%	471.93+/- 2%
	Beta	40.03	0.00	0.00	0.00	16.53	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.4130	0.0000	0.0000
41 BACK	Raw	556.90	0.00	0.00	489.70	469.10	0.00	466.30
	Raw	547.10	0.00	0.00	470.70	460.10	0.00	450.10
	Raw	577.80	0.00	0.00	478.70	423.90*	0.00	457.60
	Ave	560.60+/- 3%	0.00+/- 0%	0.00+/- 0%	479.70+/- 2%	464.60+/- 1%	0.00+/- 0%	458.00+/- 2%
	Beta	102.60	0.00	0.00	21.70	6.60	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2115	0.0643	0.0000	0.0000
43 FRONT	Raw	146.10	0.00	0.00	91.14*	79.14	0.00	82.74
	Raw	141.80	0.00	0.00	83.90	82.48	0.00	86.55
	Raw	140.50	0.00	0.00	83.46	91.10*	0.00	79.24
	Ave	142.80+/- 2%	0.00+/- 0%	0.00+/- 0%	83.68+/- 0%	80.81+/- 3%	0.00+/- 0%	82.84+/- 4%
	Beta	59.96	0.00	0.00	0.84	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0140	0.0000	0.0000	0.0000
43 BACK	Raw	104.10	0.00	0.00	81.26	74.42	0.00	78.38
	Raw	98.02	0.00	0.00	78.62	76.22	0.00	74.53
	Raw	99.82	0.00	0.00	75.18	70.88	0.00	75.64
	Ave	100.65+/- 3%	0.00+/- 0%	0.00+/- 0%	78.35+/- 4%	73.84+/- 4%	0.00+/- 0%	76.18+/- 3%
	Beta	24.46	0.00	0.00	2.17	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0887	0.0000	0.0000	0.0000

(* indicates a rejected flier)

11.12

Pre-Cross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS								
Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
44 FRONT	Raw	151.90	0.00	0.00	92.25	96.26	0.00	88.58
	Raw	150.40	0.00	0.00	92.07	94.73	0.00	95.34
	Raw	143.60	0.00	0.00	92.46	96.04	0.00	94.45
	Ave	148.63+/- 3%	0.00+/- 0%	0.00+/- 0%	92.26+/- 0%	95.68+/- 1%	0.00+/- 0%	92.79+/- 4%
44 BACK	Beta	55.84	0.00	0.00	0.00	2.89	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0517	0.0000	
	Raw	388.70	0.00	0.00	110.10	107.00	0.00	89.91
	Raw	368.30	0.00	0.00	110.10	102.10	0.00	88.09
44 BACK	Raw	364.80	0.00	0.00	122.70*	102.10	0.00	91.73
	Ave	373.93+/- 3%	0.00+/- 0%	0.00+/- 0%	110.10+/- 0%	103.73+/- 3%	0.00+/- 0%	89.91+/- 2%
	Beta	284.02	0.00	0.00	20.19	13.82	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0711	0.0487	0.0000	
45 FRONT	Raw	112.80	0.00	0.00	81.73	81.45	0.00	73.35
	Raw	103.00*	0.00	0.00	82.56	82.06	0.00	76.77
	Raw	112.70	0.00	0.00	78.13	80.69	0.00	75.88
	Ave	112.75+/- 0%	0.00+/- 0%	0.00+/- 0%	80.81+/- 3%	81.40+/- 1%	0.00+/- 0%	75.33+/- 2%
45 BACK	Beta	37.42	0.00	0.00	5.47	6.07	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1463	0.1621	0.0000	
	Raw	86.81	0.00	0.00	76.65	71.03	0.00	73.33
	Raw	82.71	0.00	0.00	77.62	77.00	0.00	76.88
45 BACK	Raw	87.19	0.00	0.00	76.32	72.18	0.00	73.04
	Ave	85.57+/- 3%	0.00+/- 0%	0.00+/- 0%	76.86+/- 1%	73.40+/- 4%	0.00+/- 0%	74.42+/- 3%
	Beta	11.15	0.00	0.00	2.45	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2194	0.0000	0.0000	
46 FRONT	Raw	275.20	0.00	0.00	185.50	172.30	0.00	176.90
	Raw	208.00	0.00	0.00	194.60	166.20	0.00	166.60
	Raw	307.50	0.00	0.00	184.80	157.80	0.00	178.30
	Ave	263.57+/- 19%	0.00+/- 0%	0.00+/- 0%	188.30+/- 3%	165.43+/- 4%	0.00+/- 0%	173.93+/- 4%
46 BACK	Beta	89.63	0.00	0.00	14.37	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1603	0.0000	0.0000	
	Raw	1238.00	0.00	0.00	228.10	196.40	0.00	163.50
	Raw	1185.00	0.00	0.00	216.50	193.80	0.00	169.30
46 BACK	Raw	1127.00	0.00	0.00	214.30	204.10	0.00	160.30
	Ave	1183.33+/- 5%	0.00+/- 0%	0.00+/- 0%	219.63+/- 3%	198.10+/- 3%	0.00+/- 0%	164.37+/- 3%
	Beta	1018.97	0.00	0.00	55.27	33.73	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0542	0.0331	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
48 FRONT	Raw	68.67	0.00	0.00	56.97	51.87	0.00	53.48
	Raw	65.01	0.00	0.00	53.30	54.05	0.00	47.38*
	Raw	68.39	0.00	0.00	55.67	54.06	0.00	51.99
	Ave	67.36+/- 3%	0.00+/- 0%	0.00+/- 0%	55.31+/- 3%	53.33+/- 2%	0.00+/- 0%	52.74+/- 2%
	Beta	14.62	0.00	0.00	2.58	0.59	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1763	0.0405	0.0000	
48 BACK	Raw	61.67	0.00	0.00	50.13	51.52	0.00	51.22
	Raw	57.43	0.00	0.00	51.74	48.31	0.00	47.94
	Raw	52.56	0.00	0.00	52.70	51.01	0.00	50.84
	Ave	57.29+/- 8%	0.00+/- 0%	0.00+/- 0%	51.52+/- 3%	50.28+/- 3%	0.00+/- 0%	50.00+/- 4%
	Beta	7.29	0.00	0.00	1.52	0.28	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2091	0.0384	0.0000	
49 FRONT	Raw11710.00	0.00	0.00	3991.00	5838.00	0.00	4711.00	
	Raw12600.00	0.00	0.00	4425.00*	5897.00	0.00	5550.00	
	Raw14610.00	0.00	0.00	4107.00	4400.00*	0.00	4269.00	
	Ave	2973.33+/-11%	0.00+/- 0%	0.00+/- 0%	4044.00+/- 2%	5857.50+/- 1%	0.00+/- 0%	4843.33+/-13%
	Beta	8130.00	0.00	0.00	0.00	1024.17	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.1260	0.0000	
49 BACK	Raw49580.00	0.00	0.00	10820.00	7611.00	0.00	3949.00	
	Raw53970.00	0.00	0.00	10490.00	7059.00	0.00	3597.00	
	Raw47020.00	0.00	0.00	9225.00*	7497.00	0.00	3720.00	
	Ave	50190.00+/- 7%	0.00+/- 0%	0.00+/- 0%	10655.00+/- 2%	7389.00+/- 4%	0.00+/- 0%	3755.33+/- 5%
	Beta	46434.67	0.00	0.00	6899.67	3633.67	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1486	0.0783	0.0000	
50 FRONT	Raw	386.70	0.00	0.00	280.10	275.00	0.00	288.00
	Raw	383.90	0.00	0.00	263.50	267.10	0.00	278.80
	Raw	362.30	0.00	0.00	260.10	232.70*	0.00	284.50
	Ave	377.63+/- 4%	0.00+/- 0%	0.00+/- 0%	270.57+/- 3%	271.05+/- 2%	0.00+/- 0%	283.77+/- 2%
	Beta	93.87	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
50 BACK	Raw	2136.00	0.00	0.00	355.60	332.30	0.00	278.30
	Raw	1991.00	0.00	0.00	370.10	308.00	0.00	294.70
	Raw	2049.00	0.00	0.00	360.40	338.60	0.00	269.70
	Ave	2058.67+/- 4%	0.00+/- 0%	0.00+/- 0%	362.03+/- 2%	326.30+/- 5%	0.00+/- 0%	280.90+/- 5%
	Beta	1777.77	0.00	0.00	81.13	45.40	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0456	0.0255	0.0000	

(* indicates a rejected filer)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
51 FRONT	Raw	112.80	0.00	0.00	92.28	83.42	0.00	79.07
	Raw	116.80	0.00	0.00	89.51	82.22	0.00	75.09
	Raw	116.80	0.00	0.00	88.47	85.48	0.00	79.23
	Ave	115.47+/- 2%	0.00+/- 0%	0.00+/- 0%	90.09+/- 2%	83.71+/- 2%	0.00+/- 0%	77.80+/- 3%
	Beta	37.67	0.00	0.00	12.29	5.91	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3263	0.1569	0.0000	
51 BACK	Raw	82.62	0.00	0.00	81.68	70.00	0.00	79.42
	Raw	78.50	0.00	0.00	81.37	74.23	0.00	76.53
	Raw	90.15	0.00	0.00	77.99	77.28	0.00	73.61
	Ave	83.76+/- 7%	0.00+/- 0%	0.00+/- 0%	80.35+/- 3%	73.84+/- 5%	0.00+/- 0%	76.52+/- 4%
	Beta	7.24	0.00	0.00	3.83	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.5288	0.0000	0.0000	
52 FRONT	Raw	1.53	0.00	0.00	1.24	1.28	0.00	1.34
	Raw	1.61	0.00	0.00	1.30	1.18	0.00	1.28
	Raw	1.51	0.00	0.00	1.26	1.28	0.00	1.26
	Ave	1.55+/- 3%	0.00+/- 0%	0.00+/- 0%	1.26+/- 2%	1.25+/- 4%	0.00+/- 0%	1.29+/- 3%
	Beta	0.25	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
52 BACK	Raw	2.05	0.00	0.00	1.37	1.35	0.00	1.24
	Raw	2.09	0.00	0.00	1.29	1.30	0.00	1.30
	Raw	2.64*	0.00	0.00	1.28	1.25	0.00	1.24
	Ave	2.07+/- 2%	0.00+/- 0%	0.00+/- 0%	1.31+/- 4%	1.30+/- 4%	0.00+/- 0%	1.26+/- 3%
	Beta	0.81	0.00	0.00	0.05	0.04	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0627	0.0478	0.0000	
53 FRONT	Raw	1.45	0.00	0.00	1.25	1.06*	0.00	1.12
	Raw	1.37	0.00	0.00	1.24	1.18	0.00	1.15
	Raw	1.39	0.00	0.00	1.23	1.15	0.00	1.10
	Ave	1.40+/- 3%	0.00+/- 0%	0.00+/- 0%	1.24+/- 1%	1.17+/- 2%	0.00+/- 0%	1.12+/- 2%
	Beta	0.28	0.00	0.00	0.12	0.04	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.4143	0.1500	0.0000	
53 BACK	Raw	1.44*	0.00	0.00	1.18	1.16	0.00	1.04
	Raw	1.58	0.00	0.00	1.12	1.04*	0.00	1.20*
	Raw	1.57	0.00	0.00	1.12	1.18	0.00	1.08
	Ave	1.57+/- 0%	0.00+/- 0%	0.00+/- 0%	1.14+/- 3%	1.17+/- 1%	0.00+/- 0%	1.06+/- 3%
	Beta	0.51	0.00	0.00	0.08	0.11	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1530	0.2140	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
54 FRONT	Raw	1.13	0.00	0.00	1.15	1.10*	0.00	1.07
	Raw	1.19	0.00	0.00	1.21	1.22	0.00	1.11
	Raw	1.31	0.00	0.00	1.10	1.16	0.00	1.10
	Ave	1.21+/- 8%	0.00+/- 0%	0.00+/- 0%	1.16+/- 5%	1.19+/- 3%	0.00+/- 0%	1.09+/- 2%
	Beta	0.11	0.00	0.00	0.06	0.10	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.5412	0.8588	0.0000	
54 BACK	Raw	1.39	0.00	0.00	1.14	1.16	0.00	1.15
	Raw	1.37	0.00	0.00	1.13	1.21	0.00	1.10
	Raw	1.48	0.00	0.00	1.14	1.12	0.00	1.12
	Ave	1.41+/- 4%	0.00+/- 0%	0.00+/- 0%	1.14+/- 1%	1.16+/- 4%	0.00+/- 0%	1.12+/- 2%
	Beta	0.29	0.00	0.00	0.01	0.04	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0463	0.1389	0.0000	
55 FRONT	Raw	2.48	0.00	0.00	1.65	1.63	0.00	1.58
	Raw	1.71*	0.00	0.00	1.57	1.50	0.00	1.70
	Raw	2.54	0.00	0.00	1.59	1.73	0.00	1.63
	Ave	2.51+/- 2%	0.00+/- 0%	0.00+/- 0%	1.60+/- 3%	1.62+/- 7%	0.00+/- 0%	1.64+/- 4%
	Beta	0.87	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
55 BACK	Raw	2.01	0.00	0.00	1.59	1.54	0.00	1.54
	Raw	2.22	0.00	0.00	1.61	1.51	0.00	1.54
	Raw	2.53	0.00	0.00	1.63	1.50	0.00	1.43
	Ave	2.25+/- 12%	0.00+/- 0%	0.00+/- 0%	1.61+/- 1%	1.52+/- 1%	0.00+/- 0%	1.50+/- 4%
	Beta	0.75	0.00	0.00	0.11	0.02	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1474	0.0231	0.0000	
56 FRONT	Raw	2.29	0.00	0.00	1.54	1.67	0.00	1.50
	Raw	2.17	0.00	0.00	1.65	1.72	0.00	1.44
	Raw	2.44	0.00	0.00	1.66	1.62	0.00	1.53
	Ave	2.30+/- 6%	0.00+/- 0%	0.00+/- 0%	1.61+/- 4%	1.67+/- 5%	0.00+/- 0%	1.49+/- 3%
	Beta	0.81	0.00	0.00	0.12	0.18	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1535	0.2211	0.0000	
56 BACK	Raw	2.28	0.00	0.00	1.60	1.38	0.00	1.53
	Raw	2.21	0.00	0.00	1.58	1.42	0.00	1.35*
	Raw	2.44	0.00	0.00	1.59	1.54*	0.00	1.51
	Ave	2.31+/- 5%	0.00+/- 0%	0.00+/- 0%	1.59+/- 1%	1.40+/- 2%	0.00+/- 0%	1.52+/- 1%
	Beta	0.79	0.00	0.00	0.07	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0901	0.0000	0.0000	

(* indicates a rejected flier)

II.16

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
57 FRONT	Raw	2.49	0.00	0.00	1.74	1.68	0.00	1.62
	Raw	2.53	0.00	0.00	1.66	1.68	0.00	1.56
	Raw	2.60	0.00	0.00	1.83	1.72	0.00	1.58
	Ave	2.54+/- 2%	0.00+/- 0%	0.00+/- 0%	1.75+/- 5%	1.69+/- 1%	0.00+/- 0%	1.59+/- 2%
	Beta	0.96	0.00	0.00	0.16	0.11	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1675	0.1104	0.0000	
57 BACK	Raw	2.94	0.00	0.00	1.74	1.67	0.00	1.50*
	Raw	2.78	0.00	0.00	1.68	1.62	0.00	1.67
	Raw	3.12	0.00	0.00	1.74	1.61	0.00	1.61
	Ave	2.95+/- 6%	0.00+/- 0%	0.00+/- 0%	1.72+/- 2%	1.63+/- 2%	0.00+/- 0%	1.64+/- 3%
	Beta	1.31	0.00	0.00	0.08	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0616	0.0000	0.0000	

(* indicates a rejected flier)

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

Dosimeter	*** RESULTS ***						CALCULATED DOSES					
	005"	010"	020"	030"	064"	Ave.	Mylar Chip	Calculated Beta	Calculated Gamma	Dose	Error	Dose
	(rad/nc)	(rad/nc)	(rad/nc)	(rad/nc)	(rad/nc)	(rad/nc)	Reading (nc)	Dose (rad)	Dose (rad)	(rad)	(rad)	(rad)
1 FRONT	0.00	0.00	0.45	0.78	0.00	0.72	14.82	10.65	5.80	14.07	1.32	
1 BACK	0.00	0.00	0.99	0.78	0.00	0.99	38.04	37.67	35.89	19.64	3.48	
2 FRONT	0.00	0.00	0.99	0.78	0.00	0.67	48.43	32.67	26.53	159.01	14.87	
2 BACK	0.00	0.00	0.62	0.88	0.00	0.74	709.53	524.15	125.76	174.47	16.38	
3 FRONT	0.00	0.00	0.76	0.88	0.00	0.79	299.70	238.05	16.32	44.87	4.46	
3 BACK	0.00	0.00	0.99	0.78	0.00	0.99	0.00	0.00	0.00	47.98	4.49	
4 FRONT	0.00	0.00	0.88	0.88	0.00	0.91	443.12	401.97	25.80	32.69	3.16	
4 BACK	0.00	0.00	0.99	0.78	0.00	0.99	0.00	0.00	0.00	39.74	3.90	
5 FRONT	0.00	0.00	0.85	0.78	0.00	0.92	162.43	148.65	77.18	39.81	3.76	
5 BACK	0.00	0.00	0.99	0.78	0.00	0.99	9.60	9.50	6.59	44.73	4.37	
6 FRONT	0.00	0.00	0.88	0.78	0.00	0.93	102.73	95.85	23.92	112.61	11.26	
6 BACK	0.00	0.00	0.86	0.88	0.00	0.86	1235.25	1056.22	22.86	120.12	11.19	
7 FRONT	0.00	0.00	0.99	0.78	0.00	0.99	55.68	55.13	20.83	114.50	11.44	
7 BACK	0.00	0.00	0.82	0.78	0.00	0.86	1021.17	882.73	70.81	123.37	11.70	
8 FRONT	0.00	0.00	0.64	0.78	0.00	0.70	45.43	31.70	6.58	109.25	10.21	
8 BACK	0.00	0.00	0.90	0.88	0.00	0.87	1333.77	1156.39	79.11	126.58	11.89	
9 FRONT	0.00	0.00	0.35	0.78	0.00	0.35	57.35	20.14	9.65	190.33	18.23	
9 BACK	0.00	0.00	0.98	0.78	0.00	0.98	3420.77	3362.59	1092.07	224.37	21.21	
10 FRONT	0.00	0.00	0.61	0.78	0.00	0.66	0.07	0.05	0.02	0.22	0.02	
10 BACK	0.00	0.00	0.35	0.81	0.00	0.61	0.08	0.05	0.03	0.22	0.02	
11 FRONT	0.00	0.00	0.99	0.78	0.00	0.99	0.00	0.00	0.00	92.70	9.17	
11 BACK	0.00	0.00	0.99	0.78	0.00	0.99	0.00	0.00	0.00	98.66	9.33	
12 FRONT	0.00	0.00	0.35	0.78	0.00	0.35	67.77	23.79	9.44	63.37	6.02	
12 BACK	0.00	0.00	0.85	0.78	0.00	0.92	148.63	136.74	85.24	69.27	6.60	
13 FRONT	0.00	0.00	0.76	0.88	0.00	0.82	86.02	70.60	7.42	23.42	2.20	
13 BACK	0.00	0.00	0.99	0.78	0.00	0.99	20.22	20.02	2.35	23.75	2.23	
14 FRONT	0.00	0.00	0.46	0.62	0.00	0.57	64.37	36.53	15.47	84.90	8.12	
14 BACK	0.00	0.00	0.99	0.78	0.00	0.67	8.50	5.70	12.06	82.26	8.03	
15 FRONT	0.00	0.00	0.35	0.78	0.00	0.66	1611.83	1069.78	713.26	322.59	31.41	
15 BACK	0.00	0.00	0.35	0.78	0.00	0.67	3286.33	2203.82	1487.14	390.86	36.78	
16 FRONT	0.00	0.00	0.54	0.78	0.00	0.44	37.60	16.73	5.88	85.83	8.06	
16 BACK	0.00	0.00	0.66	0.78	0.00	0.51	59.87	30.41	14.78	85.23	8.48	

11.18

Pre-Gross Decontamination Experiment, exposed 12/61 (TLD set #1)

Dosimeter	*** RESULTS ***						Mylar Chip Reading (nc)	CALCULATED DOSES			
	005" (rad/nc)	010" (rad/nc)	020" (rad/nc)	Factors 032" (rad/nc)	064" (rad/nc)	Ave (rad/nc)		Calculated Dose (rad)	Beta Error (rad)	Calculated Dose (rad)	
17 FRONT	0.00	0.00	0.82	0.91	0.00	0.87	0.23	0.20	0.05	0.29	0.03
17 BACK	0.00	0.00	0.99	0.99	0.00	0.99	0.17	0.17	0.05	0.30	0.03
18 FRONT	0.00	0.00	0.99	0.91	0.00	0.95	98.80	94.08	42.00	138.81	16.30
18 BACK	0.00	0.00	0.90	0.82	0.00	0.86	473.37	406.94	292.73	133.34	12.41
19 FRONT	0.00	0.00	0.35	0.35	0.00	0.35	286.60	100.63	7.73	0.00	0.00
19 BACK	0.00	0.00	0.99	0.99	0.00	0.99	89.57	88.68	7.24	57.51	5.47
21 FRONT	0.00	0.00	0.86	0.61	0.00	0.74	61.40	45.15	13.51	61.13	6.24
21 BACK	0.00	0.00	0.97	0.99	0.00	0.98	760.30	742.74	136.99	60.78	5.75
23 FRONT	0.00	0.00	0.99	0.99	0.00	0.99	0.00	0.00	0.00	767.44	71.71
23 BACK	0.00	0.00	0.35	0.35	0.00	0.35	3381.00	1187.07	90.92	788.10	77.03
25 FRONT	0.00	0.00	0.99	0.35	0.00	0.67	38.80	26.02	28.41	214.80	21.36
25 BACK	0.00	0.00	0.45	0.99	0.00	0.72	114.13	82.39	47.32	196.37	19.08
26 FRONT	0.00	0.00	0.84	0.87	0.00	0.86	237.10	202.81	13.97	42.27	4.10
26 BACK	0.00	0.00	0.90	0.99	0.00	0.95	41.73	39.51	7.93	45.19	4.53
27 FRONT	0.00	0.00	0.99	0.35	0.00	0.67	11.37	7.62	5.86	42.79	3.99
27 BACK	0.00	0.00	0.99	0.99	0.00	0.99	0.00	0.00	0.00	39.87	3.82
29 FRONT	0.00	0.00	0.60	0.53	0.00	0.57	19.29	10.93	2.06	13.87	1.41
29 BACK	0.00	0.00	0.69	0.99	0.00	0.84	5.09	4.28	2.07	13.09	1.23
30 FRONT	0.00	0.00	0.77	0.78	0.00	0.78	41.73	32.41	1.14	14.12	1.35
30 BACK	0.00	0.00	0.99	0.99	0.00	0.99	13.85	13.71	1.46	13.83	1.33
34 FRONT	0.00	0.00	0.63	0.49	0.00	0.56	33.79	19.06	3.64	17.84	1.72
34 BACK	0.00	0.00	0.99	0.99	0.00	0.99	5.85	5.80	2.58	17.93	1.68
36 FRONT	0.00	0.00	0.62	0.99	0.00	0.81	16.63	13.41	4.83	10.04	1.04
36 BACK	0.00	0.00	0.99	0.99	0.00	0.99	2.46	2.43	1.41	8.81	0.82
37 FRONT	0.00	0.00	0.47	0.60	0.00	0.53	62.70	33.52	6.18	35.87	3.47
37 BACK	0.00	0.00	0.87	0.73	0.00	0.80	714.73	568.94	88.54	39.32	3.92
39 FRONT	0.00	0.00	0.71	0.43	0.00	0.57	12.93	7.38	2.86	13.30	1.34
39 BACK	0.00	0.00	0.44	0.53	0.00	0.48	9.10	4.41	1.13	12.71	1.26
40 FRONT	0.00	0.00	0.99	0.99	0.00	0.99	52.55	52.03	4.99	51.17	4.76
40 BACK	0.00	0.00	0.91	0.93	0.00	0.92	1270.00	1172.42	120.11	55.30	5.36
41 FRONT	0.00	0.00	0.99	0.35	0.00	0.67	40.03	26.85	20.13	112.98	10.67
41 BACK	0.00	0.00	0.67	0.84	0.00	0.76	102.60	77.48	18.11	109.65	10.38
43 FRONT	0.00	0.00	0.97	0.99	0.00	0.98	59.96	58.73	4.48	19.83	2.04
43 BACK	0.00	0.00	0.86	0.99	0.00	0.92	24.46	22.58	4.13	18.24	1.76

619

Pre-Gross Decontamination Experiment, Exposed 12/81 (TLD set #1)

*** RESULTS ***							CALCULATED DOSES					
Dosimeter	Calibration Factors						Mylar Chip Reading (nc)	Calculated Beta Dose (rad)	Error (rad)	Calculated Gamma Dose (rad)	Error (rad)	
	.005" (rad/nc)	.010" (rad/nc)	.020" (rad/nc)	.032" (rad/nc)	.064" (rad/nc)	Ave. (rad/nc)						
44 FRONT	0.00	0.00	0.99	0.87	0.00	0.93	55.84	51.91	7.17	22.21	2.25	
44 BACK	0.00	0.00	0.88	0.88	0.00	0.88	284.02	249.79	11.54	21.52	2.05	
45 FRONT	0.00	0.00	0.77	0.61	0.00	0.69	37.42	25.82	4.37	18.03	1.73	
45 BACK	0.00	0.00	0.66	0.99	0.00	0.82	11.15	9.20	3.76	17.82	1.73	
46 FRONT	0.00	0.00	0.75	0.99	0.00	0.87	89.63	77.90	47.03	41.64	4.16	
46 BACK	0.00	0.00	0.91	0.91	0.00	0.91	1018.97	927.68	50.82	39.35	3.82	
48 FRONT	0.00	0.00	0.72	0.90	0.00	0.81	14.62	11.84	2.57	12.62	1.20	
48 BACK	0.00	0.00	0.67	0.90	0.00	0.79	7.29	5.74	4.03	11.97	1.19	
49 FRONT	0.00	0.00	0.99	0.70	0.00	0.84	8130.00	6851.34	2176.99	1159.49	189.45	
49 BACK	0.00	0.00	0.77	0.81	0.00	0.79	46434.67	36513.66	3082.13	899.03	93.91	
50 FRONT	0.00	0.00	0.99	0.99	0.00	0.99	93.87	92.94	14.00	67.93	6.41	
50 BACK	0.00	0.00	0.92	0.93	0.00	0.93	1777.77	1645.79	69.54	67.25	6.95	
51 FRONT	0.00	0.00	0.50	0.62	0.00	0.56	37.67	21.10	3.82	18.62	1.82	
51 BACK	0.00	0.00	0.35	0.99	0.00	0.67	7.24	4.85	5.49	18.32	1.84	
52 FRONT	0.00	0.00	0.99	0.99	0.00	0.99	0.25	0.25	0.07	0.31	0.03	
52 BACK	0.00	0.00	0.90	0.88	0.00	0.89	0.81	0.72	0.04	0.30	0.03	
53 FRONT	0.00	0.00	0.36	0.64	0.00	0.50	0.28	0.14	0.06	0.27	0.03	
53 BACK	0.00	0.00	0.76	0.49	0.00	0.62	0.51	0.32	0.10	0.25	0.02	
54 FRONT	0.00	0.00	0.35	0.35	0.00	0.35	0.11	0.04	0.03	0.26	0.03	
54 BACK	0.00	0.00	0.92	0.67	0.00	0.79	0.29	0.23	0.07	0.27	0.03	
55 FRONT	0.00	0.00	0.99	0.99	0.00	0.99	0.87	0.86	0.07	0.39	0.04	
55 BACK	0.00	0.00	0.77	0.94	0.00	0.85	0.75	0.64	0.25	0.36	0.04	
56 FRONT	0.00	0.00	0.76	0.47	0.00	0.62	0.81	0.50	0.19	0.36	0.04	
56 BACK	0.00	0.00	0.85	0.99	0.00	0.92	0.79	0.73	0.13	0.36	0.03	
57 FRONT	0.00	0.00	0.74	0.73	0.00	0.73	0.96	0.70	0.05	0.38	0.04	
57 BACK	0.00	0.00	0.90	0.99	0.00	0.94	1.31	1.23	0.19	0.39	0.04	

II.20

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate Error (rad/hr) (rad/hr)	Gamma Dose Rate Error (rad/hr) (rad/hr)
1 FRONT	10 65	14 07	288 0	3 70E-02 2 01E-02	4 88E-02 4 57E-03
1 BACK	37 67	19 64	288 0	1 31E-01 1 25E-01	6 82E-02 1 21E-02
2 FRONT	32 67	159 01	288 0	1 13E-01 9 21E-02	5 52E-01 5 16E-02
2 BACK	521 15	174 47	288 0	1 82E+00 4 37E-01	6 06E-01 5 69E-02
3 FRONT	238 05	44 87	288 0	8 27E-01 5 67E-02	1 56E-01 1 55E-02
3 BACK	0 00	47 98	288 0	0 00E+00 0 00E+00	1 67E-01 1 56E-02
4 FRONT	401 97	32 69	288 0	1 40E+00 8 96E-02	1 13E-01 1 10E-02
4 BACK	0 00	39 74	288 0	0 00E+00 0 00E+00	1 38E-01 1 36E-02
5 FRONT	148 65	39 81	288 0	5 16E-01 2 68E-01	1 38E-01 1 31E-02
5 BACK	9 50	44 73	288 0	3 30E-02 2 29E-02	1 55E-01 1 52E-02
6 FRONT	95 85	112 61	288 0	3 33E-01 8 31E-02	3 91E-01 3 91E-02
6 BACK	1056 22	120 12	288 0	3 67E+00 7 94E-02	4 17E-01 3 88E-02
7 FRONT	55 13	114 50	288 0	1 91E-01 7 23E-02	3 98E-01 3 97E-02
7 BACK	882 73	123 37	288 0	3 07E+00 2 46E-01	4 28E-01 4 06E-02
8 FRONT	31 70	109 25	288 0	1 10E-01 2 28E-02	3 79E-01 3 55E-02
8 BACK	1156 39	126 58	288 0	4 02E+00 2 75E-01	4 40E-01 4 13E-02
9 FRONT	20 14	190 33	288 0	6 99E-02 3 35E-02	6 61E-01 6 33E-02
9 BACK	3362 59	224 37	288 0	1 17E+01 3 79E+00	7 79E-01 7 36E-02
10 FRONT	0 05	0 22	1 0	4 59E-02 2 02E-02	2 21E-01 2 06E-02
10 BACK	0 05	0 22	1 0	4 90E-02 3 33E-02	2 19E-01 2 05E-02
11 FRONT	0 00	92 70	148 2	0 00E+00 0 00E+00	6 25E-01 6 19E-02
11 BACK	0 00	98 66	148 2	0 00E+00 0 00E+00	6 66E-01 6 30E-02
12 FRONT	23 79	63 37	148 2	1 61E-01 6 37E-02	4 28E-01 4 06E-02
12 BACK	136 74	69 27	148 2	9 23E-01 5 75E-01	4 67E-01 4 45E-02
13 FRONT	70 60	23 42	148 2	4 76E-01 5 01E-02	1 58E-01 1 48E-02
13 BACK	20 02	23 75	148 2	1 35E-01 1 59E-02	1 60E-01 1 51E-02
14 FRONT	36 53	84 90	148 2	2 47E-01 1 04E-01	5 73E-01 5 48E-02
14 BACK	5 70	82 26	148 2	3 65E-02 8 13E-02	5 55E-01 5 42E-02
15 FRONT	1069 78	322 59	148 2	7 22E+00 4 81E+00	2 18E+00 2 12E-01
15 BACK	2203 82	390 86	148 2	1 49E+01 1 00E+01	2 64E+00 2 48E-01
16 FRONT	16 73	85 83	148 2	1 13E-01 3 97E-02	5 79E-01 5 44E-02
16 BACK	30 41	85 23	148 2	2 05E-01 9 98E-02	5 75E-01 5 72E-02

II.21

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Error (rad/hr)	Gamma Dose Rate (rad/hr)	Error (rad/hr)
17 FRONT	0.20	0.29	1.0	1.97E-01	5.26E-02	2.89E-01	3.01E-02
17 BACK	0.17	0.30	1.0	1.73E-01	4.53E-02	3.01E-01	2.88E-02
18 FRONT	94.08	138.81	148.2	6.35E-01	2.83E-01	9.37E-01	1.10E-01
18 BACK	406.94	133.34	148.2	2.75E+00	1.98E+00	9.00E-01	8.37E-02
19 FRONT	100.63	0.00	148.2	6.79E-01	5.22E-02	0.00E+00	0.00E+00
19 BACK	88.68	57.51	148.2	5.98E-01	4.89E-02	3.88E-01	3.69E-02
21 FRONT	45.15	61.13	148.2	3.05E-01	9.11E-02	4.13E-01	4.21E-02
21 BACK	742.74	60.78	148.2	5.01E+00	9.24E-01	4.10E-01	3.88E-02
23 FRONT	0.00	767.44	148.2	0.00E+00	0.00E+00	5.18E+00	4.84E-01
23 BACK	1187.07	788.10	148.2	8.01E+00	6.14E-01	5.32E+00	5.20E-01
25 FRONT	26.02	214.80	148.2	1.76E-01	1.92E-01	1.45E+00	1.44E-01
25 BACK	82.39	196.37	148.2	5.56E-01	3.19E-01	1.33E+00	1.29E-01
26 FRONT	202.81	42.27	148.2	1.37E+00	9.43E-02	2.85E-01	2.77E-02
26 BACK	39.51	45.19	148.2	2.67E-01	5.35E-02	3.05E-01	3.06E-02
27 FRONT	7.62	42.79	148.2	5.14E-02	3.95E-02	2.89E-01	2.69E-02
27 BACK	0.00	39.87	148.2	0.00E+00	0.00E+00	2.69E-01	2.57E-02
29 FRONT	10.93	13.87	147.5	7.41E-02	1.39E-02	9.40E-02	9.53E-03
29 BACK	4.28	13.09	147.5	2.90E-02	1.40E-02	8.87E-02	8.32E-03
30 FRONT	32.41	14.12	147.5	2.20E-01	7.73E-03	9.57E-02	9.18E-03
30 BACK	13.71	13.83	147.5	9.29E-02	9.91E-03	9.37E-02	9.04E-03
34 FRONT	19.06	17.84	147.5	1.29E-01	2.47E-02	1.21E-01	1.17E-02
34 BACK	5.80	17.93	147.5	3.93E-02	1.75E-02	1.22E-01	1.14E-02
36 FRONT	13.41	10.04	147.5	9.09E-02	3.27E-02	6.81E-02	7.04E-03
36 BACK	2.43	8.81	147.5	1.65E-02	9.56E-03	5.98E-02	5.58E-03
37 FRONT	33.52	35.87	147.5	2.27E-01	4.19E-02	2.43E-01	2.35E-02
37 BACK	568.94	39.32	147.5	3.86E+00	6.00E-01	2.67E-01	2.66E-02
39 FRONT	7.38	13.30	147.5	5.00E-02	1.94E-02	9.01E-02	9.08E-03
39 BACK	4.41	12.71	147.5	2.99E-02	7.68E-03	8.61E-02	8.53E-03
40 FRONT	52.03	51.17	147.5	3.53E-01	3.38E-02	3.47E-01	3.23E-02
40 BACK	1172.42	55.30	147.5	7.95E+00	8.14E-01	3.75E-01	3.64E-02
41 FRONT	26.85	112.98	147.5	1.82E-01	1.36E-01	7.66E-01	7.24E-02
41 BACK	77.48	109.65	147.5	5.25E-01	1.23E-01	7.43E-01	7.04E-02
43 FRONT	58.73	19.83	147.5	3.98E-01	3.17E-02	1.34E-01	1.38E-02
43 BACK	22.58	18.24	147.5	1.53E-01	2.80E-02	1.24E-01	1.19E-02

Pre-Gross Decontamination Experiment, exposed 12/81 (TLD set #1)

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Beta Error (rad/hr)	Gamma Dose Rate (rad/hr)	Gamma Error (rad/hr)
44 FRONT	51. 91	22. 21	147. 5	3. 52E+01	4. 86E-02	1. 51E-01	1. 52E-02
44 BACK	249. 79	21. 52	147. 5	1. 69E+00	7. 82E-02	1. 46E-01	1. 39E-02
45 FRONT	25. 82	18. 03	1. 0	2. 58E+01	4. 37E+00	1. 80E+01	1. 73E+00
45 BACK	9. 20	17. 82	1. 0	9. 20E+00	3. 76E+00	1. 78E+01	1. 73E+00
46 FRONT	77. 90	41. 64	147. 5	5. 28E-01	3. 19E-01	2. 82E-01	2. 82E-02
46 BACK	927. 68	39. 35	147. 5	6. 29E+00	3. 44E-01	2. 67E-01	2. 59E-02
48 FRONT	11. 84	12. 62	147. 5	8. 02E-02	1. 74E-02	8. 56E-02	8. 14E-03
48 BACK	5. 74	11. 97	147. 5	3. 89E-02	2. 73E-02	8. 11E-02	8. 09E-03
49 FRONT	6851. 34	1159. 49	147. 5	4. 64E+01	1. 48E+01	7. 86E+00	1. 28E+00
49 BACK	36513. 66	899. 03	147. 5	2. 48E+02	2. 09E+01	6. 09E+00	6. 37E-01
50 FRONT	92. 94	67. 93	147. 5	6. 30E-01	9. 49E-02	4. 61E-01	4. 35E-02
50 BACK	1645. 79	67. 25	147. 5	1. 12E+01	4. 71E-01	4. 56E-01	4. 71E-02
51 FRONT	21. 10	18. 62	147. 5	1. 43E-01	2. 59E-02	1. 26E-01	1. 23E-02
51 BACK	4. 85	18. 32	147. 5	3. 29E-02	3. 72E-02	1. 24E-01	1. 25E-02
52 FRONT	0. 25	0. 31	1. 0	2. 52E-01	6. 62E-02	3. 10E-01	3. 04E-02
52 BACK	0. 72	0. 30	1. 0	7. 17E-01	4. 40E-02	3. 02E-01	2. 94E-02
53 FRONT	0. 14	0. 27	1. 0	1. 40E-01	5. 91E-02	2. 69E-01	2. 57E-02
53 BACK	0. 32	0. 25	1. 0	3. 21E-01	9. 96E-02	2. 54E-01	2. 46E-02
54 FRONT	0. 04	0. 26	1. 0	3. 98E-02	3. 32E-02	2. 62E-01	2. 50E-02
54 BACK	0. 23	0. 27	1. 0	2. 28E-01	7. 18E-02	2. 69E-01	2. 58E-02
55 FRONT	0. 86	0. 39	1. 0	8. 63E-01	7. 47E-02	3. 93E-01	3. 93E-02
55 BACK	0. 54	0. 36	1. 0	6. 39E-01	2. 46E-01	3. 59E-01	3. 67E-02
56 FRONT	0. 50	0. 36	1. 0	4. 97E-01	1. 85E-01	3. 57E-01	3. 52E-02
56 BACK	0. 73	0. 36	1. 0	7. 27E-01	1. 32E-01	3. 64E-01	3. 41E-02
57 FRONT	0. 70	0. 38	1. 0	7. 03E-01	4. 66E-02	3. 79E-01	3. 59E-02
57 BACK	1. 23	0. 39	1. 0	1. 23E+00	1. 88E-01	3. 92E-01	3. 79E-02

11.24

VAX/VMS SCHE	RATIOOUT	13-JUN-1983 13:39	TTA4:	13-JUN-1983 13:43	DISK\$USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT	2	VAX/VMS
VAX/VMS SCHE	RATIOOUT	13-JUN-1983 13:39	TTA4:	13-JUN-1983 13:43	DISK\$USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT	2	VAX/VMS
VAX/VMS SCHE	RATIOOUT	13-JUN-1983 13:39	TTA4:	13-JUN-1983 13:43	DISK\$USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT	2	VAX/VMS

SSSS	CCCC	H	H	EEEEEE
S	C	H	H	E
S	C	H	H	E
SSS	C	HHHHH	EEE	E
S	C	H	H	E
S	C	H	H	E
SSSS	CCCC	H	H	EEEEEE

RRRRRRRR	AAAAAA	TTTTTTTTTT	IIIIII	000000	000000	UU	UU	TTTTTTTTTT
RRRRRRRR	AAAAAA	TTTTTTTTTT	IIIIII	000000	000000	UU	UU	TTTTTTTTTT
RR RR	AA AA	TT	II	00	00	00	00	UU TT
RR RR	AA AA	TT	II	00	00	00	00	UU TT
RR RR	AA AA	TT	II	00	00	00	00	UU TT
RRRRRRRR	AA AA	TT	II	00	00	00	00	UU TT
RRRRRRRR	AA AA	TT	II	00	00	00	00	UU TT
RR RR	AAAAAAA	TT	II	00	00	00	00	UU TT
RR RR	AAAAAAA	TT	II	00	00	00	00	UU TT
RR RR	AA AA	TT	II	00	00	00	00	UU TT
RR RR	AA AA	TT	II	00	00	00	00	UU TT
RR RR	AA AA	TT	IIIIII	000000	000000	UUUUUUUUUU	UUUUUUUUUU	TT
RR RR	AA AA	TT	IIIIII	000000	000000	UUUUUUUUUU	UUUUUUUUUU	TT

DDDDDDDD	AAAAAA	TTTTTTTTTT	IIII	222222
DDDDDDDD	AAAAAA	TTTTTTTTTT	IIII	222222
DD DD	AA AA	TT	IIII	22 22
DD DD	AA AA	TT	IIII	22 22
DD DD	AA AA	TT	IIII	22
DD DD	AA AA	TT	IIII	22
DD DD	AA AA	TT	IIII	22
DD DD	AAAAAAA	TT	IIII	22
DD DD	AAAAAAA	TT	IIII	22
DD DD	AA AA	TT	II	22
DD DD	AA AA	TT	II	22
DDDDDDDD	AA AA	TT	II	2222222222
DDDDDDDD	AA AA	TT	II	2222222222

SSSS	CCCC	H	H	EEEEEE
S	C	H	H	E
S	C	H	H	E
SSS	C	HHHHH	EEE	E
S	C	H	H	E
S	C	H	H	E
SSSS	CCCC	H	H	EEEEEE

VAX/VMS SCHE	RATIOOUT	13-JUN-1983 13:39	TTA4:	13-JUN-1983 13:43	DISK\$USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT	2	VAX/VMS
VAX/VMS SCHE	RATIOOUT	13-JUN-1983 13:39	TTA4:	13-JUN-1983 13:43	DISK\$USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT	2	VAX/VMS
VAX/VMS SCHE	RATIOOUT	13-JUN-1983 13:39	TTA4:	13-JUN-1983 13:43	DISK\$USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT	2	VAX/VMS

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nr)	005" #2 (nr)	010" #3 (nr)	020" #4 (nr)	032" #5 (nr)	064" #6 (nr)	125" #7 (nr)
1 FRONT	Raw 706.50 Raw 722.80 Raw 700.70	718.20 730.40 765.80	675.50 755.60 813.70	627.10 623.20 573.80	567.50 572.60 607.80	576.70 530.10 563.90	663.90 681.10 645.20
	Ave 710.00+/- 2% Beta 46.60 Ratio 1.00	738.13+/- 3% 74.73 1.6037	748.27+/- 9% 84.87 1.8212	608.03+/- 5% 0.00 0.0000	582.63+/- 4% 0.00 0.0000	556.90+/- 4% 0.00 0.0000	663.40+/- 3% 0.00
1 BACK	Raw 698.50 Raw 674.40 Raw 695.60	725.50 746.20 697.00	698.00 735.30 753.10	540.60 576.20 547.30	530.70 547.30 587.00*	500.20 534.60 577.70	663.70 677.20 656.90
	Ave 689.50+/- 2% Beta 23.57 Ratio 1.00	722.90+/- 3% 56.97 2.4173	728.80+/- 4% 62.87 2.6676	554.70+/- 3% 0.00 0.0000	539.00+/- 2% 0.00 0.0000	537.50+/- 7% 0.00 0.0000	665.93+/- 2% 0.00
2 FRONT	Raw 1076.00 Raw 1112.00 Raw 967.60*	749.90 802.10 777.00	753.60 784.10 791.00	917.60* 833.40 849.40	852.30 832.80 835.70	918.60 907.80 900.00	774.60 723.80 744.80
	Ave 1094.00+/- 2% Beta 346.27 Ratio 1.00	776.33+/- 3% 28.60 0.0826	776.23+/- 3% 28.50 0.0823	841.40+/- 1% 93.67 0.2705	840.27+/- 1% 92.53 0.2672	908.80+/- 1% 161.07 0.4652	747.73+/- 3% 0.00
2 BACK	Raw 873.80* Raw 1012.00 Raw 989.90	787.20 832.70 766.00	811.80 760.00 862.40	883.80 890.40 889.80	849.10 874.60 928.80	920.90 898.80 948.60	821.90 771.50 774.60
	Ave 1000.95+/- 2% Beta 211.62 Ratio 1.00	795.30+/- 4% 5.97 0.0282	811.40+/- 6% 22.07 0.1043	888.00+/- 0% 98.67 0.4663	884.17+/- 5% 94.83 0.4481	922.77+/- 3% 133.43 0.6305	789.33+/- 4% 0.00
3 FRONT	Raw 4913.00 Raw 6111.00 Raw 6827.00	1493.00 1502.00 1627.00	1351.00 1356.00 1376.00	1385.00 1530.00* 1352.00	1337.00 1175.00* 1284.00	1315.00 1395.00* 1259.00	1223.00 1349.00* 1235.00
	Ave 5950.33+/- 16% Beta 4721.33 Ratio 1.00	1540.67+/- 5% 311.67 0.0660	1361.00+/- 1% 132.00 0.0280	1368.50+/- 2% 139.50 0.0295	1310.50+/- 3% 81.50 0.0173	1287.00+/- 3% 58.00 0.0123	1229.00+/- 1% 0.00
3 BACK	Raw 1136.00 Raw 1173.00 Raw 1269.00*	1126.00 1088.00 1077.00	1090.00 1029.00 1043.00	1195.00 1121.00 1174.00	1163.00 1159.00 974.20*	1138.00 1251.00 1183.00	1093.00 1109.00 1124.00
	Ave 1154.50+/- 2% Beta 45.83 Ratio 1.00	1097.00+/- 2% 0.00 0.0000	1054.00+/- 3% 0.00 0.0000	1163.33+/- 3% 54.67 1.1927	1161.00+/- 0% 52.33 1.1418	1190.67+/- 5% 82.00 1.7891	1108.67+/- 1% 0.00

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
4 FRONT	Raw 1363.00	1239.00	1237.00	1378.00*	1247.00	1276.00	1118.00
	Raw 1404.00	1244.00	1194.00	1254.00	1223.00	1105.00	1189.00
	Raw 1371.00	1217.00	1282.00	1239.00	1141.00	1190.00	1171.00
	Ave 1379.33+/- 2%	1233.33+/- 1%	1237.67+/- 4%	1246.50+/- 1%	1203.67+/- 5%	1190.33+/- 7%	1159.33+/- 3%
	Beta 220.00	74.00	78.33	87.17	44.33	31.00	0.00
	Ratio 1.00	0.3364	0.3561	0.3962	0.2015	0.1409	
4 BACK	Raw 1141.00	1056.00	1108.00	1166.00	1056.00	1036.00	1130.00
	Raw 1086.00	1121.00	1050.00	1153.00	1112.00	1190.00	1041.00*
	Raw 1079.00	1146.00	1110.00	1170.00	1163.00	1123.00	1172.00
	Ave 1102.00+/- 3%	1107.67+/- 4%	1089.33+/- 3%	1163.00+/- 1%	1110.33+/- 5%	1116.33+/- 7%	1151.00+/- 3%
	Beta 0.00	0.00	0.00	12.00	0.00	0.00	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
5 FRONT	Raw 9408.00	10070.00	9682.00	11860.00	11710.00	13740.00	9390.00
	Raw 8805.00	15070.00*	12290.00	12440.00	11250.00	13840.00	9638.00
	Raw 9172.00	10000.00	16010.00	12350.00	11520.00	15070.00*	9768.00
	Ave 9128.33+/- 3%	10035.00+/- 0%	12660.67+/- 25%	12183.33+/- 2%	11493.33+/- 2%	13790.00+/- 1%	9598.67+/- 2%
	Beta 0.00	436.33	3062.00	2584.67	1894.67	4191.33	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
5 BACK	Raw 11030.00	10870.00	10240.00	11980.00	12470.00	18770.00	8962.00
	Raw 11740.00	10710.00	10780.00	11980.00	10990.00*	17100.00	8918.00
	Raw 10700.00	13310.00*	10200.00	13780.00*	11920.00	17430.00	9308.00
	Ave 1156.67+/- 5%	10790.00+/- 1%	10406.67+/- 3%	11980.00+/- 0%	12205.00+/- 3%	17766.67+/- 5%	9062.67+/- 2%
	Beta 2094.00	1727.33	1344.00	2917.33	3142.33	8704.00	0.00
	Ratio 1.00	0.8249	0.6418	1.3932	1.5006	4.1566	
6 FRONT	Raw 1311.00	1101.00	978.20	1191.00*	1062.00	1285.00	1094.00
	Raw 1143.00*	1205.00	1085.00	1325.00*	1060.00	1111.00*	1064.00
	Raw 1268.00	1275.00	1233.00	1011.00*	1042.00	1233.00	1113.00
	Ave 1289.50+/- 2%	1193.67+/- 7%	1098.73+/- 12%	0.00+/-13%	1054.67+/- 1%	1259.00+/- 3%	1090.33+/- 2%
	Beta 199.17	103.33	8.40	0.00	0.00	168.67	0.00
	Ratio 1.00	0.5188	0.0422	0.0000	0.0000	0.8469	
6 BACK	Raw 1221.00	1179.00	1173.00	1167.00	1050.00	1283.00	949.50*
	Raw 1390.00	1138.00	1123.00	1220.00	1135.00	1226.00	1141.00
	Raw 1550.00	1085.00	1060.00*	1204.00	1046.00	1128.00*	1138.00
	Ave 1387.00+/-12%	1134.00+/- 4%	1148.00+/- 3%	1197.00+/- 2%	1077.00+/- 5%	1254.50+/- 3%	1139.50+/- 0%
	Beta 247.50	0.00	8.50	57.50	0.00	115.00	0.00
	Ratio 1.00	0.0000	0.0343	0.2323	0.0000	0.4646	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

DOSIMETER	MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
7 FRONT	Raw 2084.00	1801.00	1614.00	2960.00	2604.00	2116.00	1771.00
	Raw 2019.00	1687.00	1718.00	2868.00	2443.00	2114.00	1792.00
	Raw 2052.00	1773.00	1661.00	2835.00	2463.00	2046.00	1704.00
	Ave 2051.67+/- 2%	1753.67+/- 3%	1664.33+/- 3%	2887.67+/- 2%	2503.33+/- 4%	2092.00+/- 2%	1755.67+/- 3%
	Beta 296.00	0.00	0.00	1132.00	747.67	336.33	0.00
	Ratio 1.00	0.0000	0.0000	3.8243	2.5259	1.1363	
7 BACK	Raw 6020.00	2312.00	2000.00	2457.00	3435.00*	1946.00	1703.00
	Raw 6077.00	2207.00	2020.00	2518.00	3718.00*	1899.00	1799.00
	Raw 6035.00	2281.00	2013.00	2589.00	4458.00*	1956.00	1647.00
	Ave 6044.00+/- 0%	2266.67+/- 2%	2011.00+/- 1%	2521.33+/- 3%	0.00+/-14%	1933.67+/- 2%	1716.33+/- 4%
	Beta 4327.67	550.33	294.67	865.00	0.00	217.33	0.00
	Ratio 1.00	0.1272	0.0681	0.1860	0.0000	0.0502	
8 FRONT	Raw 670.10	564.70	531.00	472.60	483.60	489.30	509.10
	Raw 560.50*	538.90	660.10	449.90	452.20	480.90	514.20
	Raw 652.10	502.80*	620.00	454.00	494.70	435.10*	503.90
	Ave 661.10+/- 2%	551.80+/- 3%	603.70+/-11%	458.83+/- 3%	476.83+/- 5%	485.10+/- 1%	509.07+/- 1%
	Beta 152.03	42.73	94.63	0.00	0.00	0.00	0.00
	Ratio 1.00	0.2811	0.6225	0.0000	0.0000	0.0000	
8 BACK	Raw 530.90	520.50	508.40	441.10	458.40	563.00*	503.60
	Raw 529.40	526.50	517.50	467.00	514.90*	474.70*	469.50
	Raw 571.00	516.10	480.40	459.10	449.70	518.70*	501.90
	Ave 543.77+/- 4%	521.03+/- 1%	502.10+/- 4%	455.73+/- 3%	454.05+/- 1%	0.00+/- 9%	491.67+/- 4%
	Beta 52.10	29.37	10.43	0.00	0.00	0.00	0.00
	Ratio 1.00	0.5637	0.2003	0.0000	0.0000	0.0000	
11 FRONT	Raw 1212.00*	828.70	992.30	888.90	1154.00	2295.00	1728.00
	Raw 1326.00	849.90	1018.00	936.80	1095.00	1867.00*	1880.00
	Raw 1391.00	843.80	999.00	933.50	1177.00	2321.00	1769.00
	Ave 1359.50+/- 3%	840.80+/- 1%	1003.10+/- 1%	919.73+/- 3%	1142.00+/- 4%	2308.00+/- 1%	1792.33+/- 4%
	Beta 0.00	0.00	0.00	0.00	0.00	515.67	0.00
	Ratio 1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
11 BACK	Raw 1391.00	1026.00	813.60	1213.00	1814.00*	2210.00	1640.00
	Raw 1378.00	1010.00	907.70*	1227.00	1649.00	2581.00*	1095.00
	Raw 1288.00	1035.00	810.60	1127.00	1588.00	2210.00	1013.00
	Ave 1352.33+/- 4%	1023.67+/- 1%	812.10+/- 0%	1189.00+/- 5%	1618.50+/- 3%	2210.00+/- 0%	1049.33+/- 4%
	Beta 303.00	0.00	0.00	139.67	569.17	1160.67	0.00
	Ratio 1.00	0.0000	0.0000	0.4609	1.8784	3.8306	

(* indicates a rejected flier)

II.27

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
12 FRONT	Raw	230.70	221.70	202.40	188.50	197.10	182.70	182.70
	Raw	250.20*	212.90	210.10	187.30	201.10	195.20	181.80
	Raw	220.10	220.00	205.90	177.90	181.90*	192.10	172.70
	Ave	225.40+/- 3%	218.20+/- 2%	206.13+/- 2%	184.57+/- 3%	199.10+/- 1%	190.00+/- 3%	179.07+/- 3%
	Beta	46.33	39.13	27.07	5.50	20.03	10.93	0.00
	Ratio	1.00	0.8446	0.5842	0.1187	0.4324	0.2360	
12 BACK	Raw	172.90	186.50	186.90	178.40*	161.70	169.10	171.90
	Raw	194.20*	194.60	181.80	158.90	171.30	179.30	163.00
	Raw	181.00	194.50	184.20	161.90	171.60	165.90	165.10
	Ave	176.95+/- 3%	191.87+/- 2%	184.30+/- 1%	160.40+/- 1%	168.20+/- 3%	171.43+/- 4%	166.67+/- 3%
	Beta	10.28	25.20	17.63	0.00	1.53	4.77	0.00
	Ratio	1.00	2.4506	1.7147	0.0000	0.1491	0.4635	
13 FRONT	Raw	253.90	203.10	229.00	207.90	201.30	199.50	174.20*
	Raw	249.00	255.40	230.70	219.80	179.80*	200.10	193.70
	Raw	238.10	228.30	245.70	212.10	201.50	202.00	201.90
	Ave	247.00+/- 3%	228.93+/- 11%	235.13+/- 4%	213.27+/- 3%	201.40+/- 0%	200.53+/- 1%	197.80+/- 3%
	Beta	49.20	31.13	37.33	15.47	3.60	2.73	0.00
	Ratio	1.00	0.6328	0.7588	0.3144	0.0732	0.0556	
13 BACK	Raw	197.60	187.10*	200.40	184.90	167.50	189.10	184.80
	Raw	202.80	212.70	189.80	189.50	183.80*	194.20	186.10
	Raw	216.00	205.00	214.10	186.10	170.10	183.60	197.80
	Ave	205.47+/- 5%	208.85+/- 3%	201.43+/- 6%	186.83+/- 1%	168.80+/- 1%	188.97+/- 3%	189.57+/- 4%
	Beta	15.90	19.28	11.87	0.00	0.00	0.00	0.00
	Ratio	1.00	1.2128	0.7463	0.0000	0.0000	0.0000	
14 FRONT	Raw	367.60	250.40	219.80*	240.40	204.70	215.40	191.60*
	Raw	357.30	261.70	250.80	210.30	218.90	206.70	219.90
	Raw	378.50	259.30	251.90	223.30	203.80	221.40	212.00
	Ave	367.80+/- 3%	257.13+/- 2%	251.35+/- 0%	224.67+/- 7%	209.13+/- 4%	214.50+/- 3%	215.95+/- 3%
	Beta	151.85	41.18	35.40	8.72	0.00	0.00	0.00
	Ratio	1.00	0.2712	0.2331	0.0574	0.0000	0.0000	
14 BACK	Raw	219.30	214.00	214.80	205.90	187.90	202.30	191.50
	Raw	236.00	210.40	186.80*	189.90	194.30	203.30	189.50
	Raw	234.30	206.70	205.60	194.10	179.40	202.80	201.60
	Ave	229.87+/- 4%	210.37+/- 2%	210.20+/- 3%	196.63+/- 4%	193.87+/- 3%	202.80+/- 0%	194.20+/- 3%
	Beta	35.67	16.17	16.00	2.43	0.00	8.60	0.00
	Ratio	1.00	0.4533	0.4486	0.0682	0.0000	0.2411	

(* indicates a rejected filer)

TMI Post-Gross Decontamination TLD's (3015', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
15 FRONT	Raw	123.50	130.40	116.20	119.60	104.20	96.64	112.40
	Raw	132.90*	123.10	110.30	121.70	103.10	111.10	106.00
	Raw	120.20	126.90	121.80	123.10	110.40	103.80	106.20
	Ave	121.85+/- 2%	126.80+/- 3%	116.10+/- 5%	121.47+/- 1%	105.90+/- 4%	103.85+/- 7%	108.20+/- 3%
	Beta	13.65	18.60	7.90	13.27	0.00	0.00	0.00
	Ratio	1.00	1.3626	0.5788	0.9719	0.0000	0.0000	0.0000
15 BACK	Raw	118.80	99.01	99.98	106.40	105.70	95.63	103.40
	Raw	105.70*	92.28	100.20	98.16	94.45	94.50	100.30
	Raw	123.60	106.20	94.10	105.50	99.77	92.70	105.40
	Ave	121.20+/- 3%	99.16+/- 7%	98.09+/- 4%	103.35+/- 4%	99.97+/- 6%	94.28+/- 2%	103.03+/- 2%
	Beta	18.17	0.00	0.00	0.32	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0176	0.0000	0.0000	0.0000
17 FRONT	Raw	4.08	2.97	2.84	3.05	2.56	2.78	2.58
	Raw	3.53*	2.65*	2.96	2.76*	2.91	2.86	2.48
	Raw	4.01	2.84	2.91	3.12	2.77	2.34*	2.65
	Ave	4.05+/- 1%	2.91+/- 3%	2.90+/- 2%	3.09+/- 2%	2.75+/- 6%	2.82+/- 2%	2.57+/- 3%
	Beta	1.48	0.34	0.33	0.52	0.18	0.25	0.00
	Ratio	1.00	0.2273	0.2259	0.3507	0.1193	0.1676	0.0000
17 BACK	Raw	4.13	3.12	2.97	2.56	2.78	2.53	2.63
	Raw	4.11	3.17	3.04	2.76	2.82	2.44	2.53
	Raw	3.98	3.46*	2.66*	2.71	2.53*	2.42	2.56
	Ave	4.07+/- 2%	3.15+/- 1%	3.00+/- 2%	2.68+/- 4%	2.80+/- 1%	2.47+/- 2%	2.57+/- 2%
	Beta	1.50	0.57	0.43	0.10	0.23	0.00	0.00
	Ratio	1.00	0.3816	0.2867	0.0695	0.1505	0.0000	0.0000
18 FRONT	Raw	262.10	197.80	176.70	179.80	157.90	168.00*	158.10
	Raw	260.30	197.70	184.00	174.70	165.40	151.00	159.90
	Raw	198.60*	179.10*	195.80*	176.60	165.90	157.20	163.50
	Ave	261.20+/- 0%	197.75+/- 0%	180.35+/- 3%	177.03+/- 1%	163.07+/- 3%	154.10+/- 3%	160.50+/- 2%
	Beta	100.70	37.25	19.85	16.53	2.57	0.00	0.00
	Ratio	1.00	0.3699	0.1971	0.1642	0.0255	0.0000	0.0000
18 BACK	Raw	152.60*	171.00*	164.00	139.60	141.70*	141.30	136.10
	Raw	198.40	144.40	173.50	143.50	158.90	139.90	136.20
	Raw	191.30	145.40	175.60	139.60	159.30	139.00	154.70*
	Ave	194.85+/- 3%	144.90+/- 0%	171.03+/- 4%	140.90+/- 2%	159.10+/- 0%	140.07+/- 1%	136.15+/- 0%
	Beta	58.70	8.75	34.88	4.75	22.95	3.92	0.00
	Ratio	1.00	0.1491	0.5943	0.0809	0.3910	0.0667	0.0000

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-B2

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
19 FRONT	Raw	176.40	182.50	175.30	144.40	167.40*	128.50	152.00
	Raw	174.10	178.00	174.20	144.80	151.40	130.40	151.60
	Raw	197.70*	183.30	175.10	142.30	144.50	130.20	144.20
	Ave	175.25+/- 1%	181.27+/- 2%	174.87+/- 0%	143.83+/- 1%	147.95+/- 3%	129.70+/- 1%	149.27+/- 3%
	Beta	25.98	32.00	25.60	0.00	0.00	0.00	0.00
	Ratio	1.00	1.2316	0.9852	0.0000	0.0000	0.0000	0.0000
19 BACK	Raw	123.60	139.50	156.10	128.40	118.70*	118.90	158.70
	Raw	126.10	147.80	150.90	127.10	132.40	120.00	136.00*
	Raw	125.80	148.70	149.00	136.80	126.10	121.40	157.90
	Ave	125.17+/- 1%	145.33+/- 3%	152.00+/- 2%	130.77+/- 4%	129.25+/- 3%	120.10+/- 1%	158.30+/- 0%
	Beta	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21 FRONT	Raw	0.89	0.82	1.06	0.88	0.90	1.02	1.04
	Raw	0.90	0.97*	1.07	0.87	0.83	0.97	1.04
	Raw	0.89	0.83	1.02	0.87	0.86	1.03	1.04
	Ave	0.89+/- 1%	0.83+/- 1%	1.05+/- 3%	0.87+/- 1%	0.86+/- 4%	1.00+/- 3%	1.04+/- 0%
	Beta	0.00	0.00	0.01	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
21 BACK	Raw	1.02	0.93	1.05	0.94	0.95	0.95	0.90
	Raw	1.06	0.93	1.10	1.05*	0.97	1.05*	0.93
	Raw	1.02	0.98	1.08	0.94	1.04	0.94	0.92
	Ave	1.03+/- 2%	0.95+/- 3%	1.08+/- 2%	0.94+/- 0%	0.99+/- 5%	0.94+/- 1%	0.92+/- 1%
	Beta	0.11	0.03	0.16	0.03	0.07	0.03	0.00
	Ratio	1.00	0.2870	1.4000	0.2406	0.6000	0.2406	0.2406
33 FRONT	Raw	336.30	0.00	0.00	214.60	200.30	0.00	205.70
	Raw	344.60	0.00	0.00	204.60	207.90	0.00	183.40*
	Raw	330.40	0.00	0.00	229.20*	205.60	0.00	202.70
	Ave	337.10+/- 2%	0.00+/- 0%	0.00+/- 0%	209.60+/- 3%	204.60+/- 2%	0.00+/- 0%	204.20+/- 1%
	Beta	132.90	0.00	0.00	5.40	0.40	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0406	0.0030	0.0000	0.0000
33 BACK	Raw	207.40	0.00	0.00	197.70	180.10	0.00	170.90
	Raw	204.10	0.00	0.00	193.10	178.50	0.00	188.50*
	Raw	219.20	0.00	0.00	195.70	166.60	0.00	171.70
	Ave	210.23+/- 4%	0.00+/- 0%	0.00+/- 0%	195.50+/- 1%	175.07+/- 4%	0.00+/- 0%	171.30+/- 0%
	Beta	38.93	0.00	0.00	24.20	3.77	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.6216	0.0967	0.0000	0.0000

(* indicates a rejected flier)

11.30

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-A2

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
58 FRONT	Raw	973.30	0.00	0.00	931.40	990.20	0.00	913.10
	Raw	1029.00	0.00	0.00	919.90	917.40	0.00	898.70
	Raw	894.10	0.00	0.00	926.30	927.50	0.00	937.20
	Ave	965.47+/- 7%	0.00+/- 0%	0.00+/- 0%	926.03+/- 1%	945.03+/- 4%	0.00+/- 0%	916.33+/- 2%
	Beta	49.13	0.00	0.00	9.70	28.70	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1974	0.5841	0.0000	
58 BACK	Raw	971.50*	0.00	0.00	922.00	825.20*	0.00	909.30
	Raw	1086.00	0.00	0.00	893.40	908.30	0.00	876.40
	Raw	1048.00	0.00	0.00	903.30	909.20	0.00	898.70
	Ave	1067.00+/- 3%	0.00+/- 0%	0.00+/- 0%	906.23+/- 2%	908.75+/- 0%	0.00+/- 0%	894.80+/- 2%
	Beta	172.20	0.00	0.00	11.43	13.95	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0664	0.0810	0.0000	
59 FRONT	Raw	1.06	0.00	0.00	0.96	0.94	0.00	0.96
	Raw	1.07	0.00	0.00	0.96	0.92	0.00	0.93
	Raw	1.03	0.00	0.00	0.99	0.98	0.00	1.02
	Ave	1.05+/- 2%	0.00+/- 0%	0.00+/- 0%	0.97+/- 2%	0.95+/- 4%	0.00+/- 0%	0.97+/- 4%
	Beta	0.08	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
59 BACK	Raw	1.01	0.00	0.00	0.95	0.90	0.00	0.95
	Raw	0.98	0.00	0.00	0.92	0.95	0.00	1.02
	Raw	0.99	0.00	0.00	0.99	0.96	0.00	0.84
	Ave	0.99+/- 2%	0.00+/- 0%	0.00+/- 0%	0.95+/- 4%	0.93+/- 3%	0.00+/- 0%	0.94+/- 10%
	Beta	0.06	0.00	0.00	0.01	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2558	0.0000	0.0000	
61 FRONT	Raw	2657.00	0.00	0.00	2444.00	2670.00	0.00	2369.00*
	Raw	2508.00	0.00	0.00	2418.00	2716.00	0.00	2583.00
	Raw	2690.00	0.00	0.00	2570.00	2674.00	0.00	2673.00
	Ave	2618.33+/- 4%	0.00+/- 0%	0.00+/- 0%	2477.33+/- 3%	2686.67+/- 1%	0.00+/- 0%	2628.00+/- 2%
	Beta	0.00	0.00	0.00	0.00	58.67	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
61 BACK	Raw	2694.00	0.00	0.00	2466.00	2225.00	0.00	2278.00
	Raw	2694.00	0.00	0.00	2621.00	2275.00	0.00	2400.00
	Raw	2624.00	0.00	0.00	2615.00	2314.00	0.00	2374.00
	Ave	2670.67+/- 2%	0.00+/- 0%	0.00+/- 0%	2567.33+/- 3%	2271.33+/- 2%	0.00+/- 0%	2350.67+/- 3%
	Beta	320.00	0.00	0.00	216.67	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.6771	0.0000	0.0000	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
63 FRONT	Raw	652.90	0.00	0.00	415.90	385.60	0.00	368.70
	Raw	646.90	0.00	0.00	418.00	412.70	0.00	396.50
	Raw	617.10	0.00	0.00	401.00	395.50	0.00	401.60
	Ave	638.97+/- 3%	0.00+/- 0%	0.00+/- 0%	411.63+/- 2%	397.93+/- 3%	0.00+/- 0%	388.93+/- 5%
	Beta	250.03	0.00	0.00	22.70	9.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0908	0.0360	0.0000	
63 BACK	Raw	819.80	0.00	0.00	434.00	369.00	0.00	342.40
	Raw	753.20	0.00	0.00	466.60	369.00	0.00	368.20
	Raw	774.10	0.00	0.00	473.20	367.80	0.00	369.30
	Ave	782.37+/- 4%	0.00+/- 0%	0.00+/- 0%	457.93+/- 5%	368.60+/- 0%	0.00+/- 0%	359.97+/- 4%
	Beta	422.40	0.00	0.00	97.97	8.63	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2319	0.0204	0.0000	
64 FRONT	Raw	761.40	0.00	0.00	720.00	654.50	0.00	656.80
	Raw	779.60	0.00	0.00	700.70	690.50	0.00	613.70
	Raw	731.30	0.00	0.00	721.20	667.80	0.00	648.10
	Ave	757.43+/- 3%	0.00+/- 0%	0.00+/- 0%	713.97+/- 2%	670.93+/- 3%	0.00+/- 0%	639.53+/- 4%
	Beta	117.90	0.00	0.00	74.43	31.40	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.6313	0.2663	0.0000	
64 BACK	Raw	651.70	0.00	0.00	607.40	618.40	0.00	622.50
	Raw	656.00	0.00	0.00	597.30	606.90	0.00	668.30
	Raw	647.40	0.00	0.00	667.00*	617.80	0.00	608.10
	Ave	651.70+/- 1%	0.00+/- 0%	0.00+/- 0%	602.35+/- 1%	614.37+/- 1%	0.00+/- 0%	632.97+/- 5%
	Beta	18.73	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
65 FRONT	Raw	1294.00	0.00	0.00	917.50	890.50	0.00	861.50
	Raw	1251.00	0.00	0.00	927.30	923.80	0.00	824.30
	Raw	1290.00	0.00	0.00	894.90	847.20	0.00	894.30
	Ave	1278.33+/- 2%	0.00+/- 0%	0.00+/- 0%	913.23+/- 2%	887.17+/- 4%	0.00+/- 0%	860.03+/- 4%
	Beta	418.30	0.00	0.00	53.20	27.13	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1272	0.0649	0.0000	
65 BACK	Raw	1188.00	0.00	0.00	897.30	889.10	0.00	881.70
	Raw	1133.00	0.00	0.00	913.20	869.00	0.00	924.80
	Raw	1163.00	0.00	0.00	851.90	873.50	0.00	899.90
	Ave	1161.33+/- 2%	0.00+/- 0%	0.00+/- 0%	887.47+/- 4%	877.20+/- 1%	0.00+/- 0%	902.13+/- 2%
	Beta	259.20	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305", 347" & 367") -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter	MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
66 FRONT	Raw 1023.00 Raw 992.40 Raw 1901.00*	0.00 0.00 0.00	0.00 0.00 0.00	842.90* 943.60 932.80	896.10 885.60 880.60	0.00 0.00 0.00	879.30 921.90 908.30
	Ave 1007.70+/- 2% Beta 104.53 Ratio 1.00	0.00+/- 0% 0.00 0.0000	0.00+/- 0% 0.00 0.0000	938.20+/- 1% 35.03 0.3351	887.43+/- 1% 0.00 0.0000	0.00+/- 0% 0.00 0.0000	903.17+/- 2% 0.00
66 BACK	Raw 1426.00 Raw 1494.00 Raw 1453.00	0.00 0.00 0.00	0.00 0.00 0.00	803.40 973.70* 808.30	847.30 857.80 898.50	0.00 0.00 0.00	814.70 839.60 820.00
	Ave 1458.33+/- 2% Beta 633.57 Ratio 1.00	0.00+/- 0% 0.00 0.0000	0.00+/- 0% 0.00 0.0000	805.85+/- 0% 0.00 0.0000	867.87+/- 3% 43.10 0.0680	0.00+/- 0% 0.00 0.0000	824.77+/- 2% 0.00
67 FRONT	Raw 247.40* Raw 284.30 Raw 292.10	0.00 0.00 0.00	0.00 0.00 0.00	211.90 218.60 19.60	226.80* 208.10 204.30	0.00 0.00 0.00	208.60 210.00 203.70
	Ave 288.20+/- 2% Beta 80.77 Ratio 1.00	0.00+/- 0% 0.00 0.0000	0.00+/- 0% 0.00 0.0000	216.70+/- 2% 9.27 0.1147	206.20+/- 1% 0.00 0.0000	0.00+/- 0% 0.00 0.0000	207.43+/- 2% 0.00
67 BACK	Raw 234.30* Raw 260.90 Raw 250.40	0.00 0.00 0.00	0.00 0.00 0.00	212.40 212.00 206.30	201.50 197.40 198.10	0.00 0.00 0.00	206.60 199.60 197.70
	Ave 255.65+/- 3% Beta 54.35 Ratio 1.00	0.00+/- 0% 0.00 0.0000	0.00+/- 0% 0.00 0.0000	210.23+/- 2% 8.93 0.1644	199.00+/- 1% 0.00 0.0000	0.00+/- 0% 0.00 0.0000	201.30+/- 2% 0.00
68 FRONT	Raw 384.20 Raw 359.20 Raw 359.20	0.00 0.00 0.00	0.00 0.00 0.00	307.60 281.00 297.90	308.00 294.20 301.50	0.00 0.00 0.00	295.70 299.60 302.20
	Ave 367.53+/- 4% Beta 68.37 Ratio 1.00	0.00+/- 0% 0.00 0.0000	0.00+/- 0% 0.00 0.0000	295.50+/- 5% 0.00 0.0000	301.23+/- 2% 2.07 0.0302	0.00+/- 0% 0.00 0.0000	299.17+/- 1% 0.00
68 BACK	Raw 668.10 Raw 675.90 Raw 679.90	0.00 0.00 0.00	0.00 0.00 0.00	313.80 326.50 319.00	287.10 303.70 293.60	0.00 0.00 0.00	275.50 281.00 282.60
	Ave 674.63+/- 1% Beta 394.93 Ratio 1.00	0.00+/- 0% 0.00 0.0000	0.00+/- 0% 0.00 0.0000	319.77+/- 2% 40.07 0.1015	294.87+/- 3% 15.17 0.0384	0.00+/- 0% 0.00 0.0000	279.70+/- 1% 0.00

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
70 FRONT	Raw	668.20	0.00	0.00	527.40	512.90	0.00	535.40
	Raw	653.40	0.00	0.00	509.60	520.10	0.00	534.90
	Raw	634.10	0.00	0.00	502.70	495.90	0.00	542.20
	Ave	651.90+/- 3%	0.00+/- 0%	0.00+/- 0%	513.23+/- 2%	509.63+/- 2%	0.00+/- 0%	537.50+/- 1%
	Beta	114.40	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
70 BACK	Raw	1276.00	0.00	0.00	687.00	742.40*	0.00	717.80
	Raw	2968.00	0.00	0.00	649.20	818.80*	0.00	664.40
	Raw	3233.00	0.00	0.00	674.80	677.10*	0.00	663.70
	Ave	2492.33+/- 43%	0.00+/- 0%	0.00+/- 0%	670.33+/- 3%	0.00+/- 10%	0.00+/- 0%	681.97+/- 5%
	Beta	1810.37	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
71 FRONT	Raw	832.10	0.00	0.00	656.80	668.60	0.00	659.50
	Raw	811.30	0.00	0.00	650.30	682.60	0.00	659.70
	Raw	846.90	0.00	0.00	692.80	695.80	0.00	650.60
	Ave	830.10+/- 2%	0.00+/- 0%	0.00+/- 0%	666.63+/- 3%	682.33+/- 2%	0.00+/- 0%	649.93+/- 3%
	Beta	180.17	0.00	0.00	16.70	32.40	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0927	0.1798	0.0000	
71 BACK	Raw	4490.00	0.00	0.00	1014.00	929.30	0.00	730.90
	Raw	4197.00	0.00	0.00	1028.00	918.00	0.00	742.40
	Raw	4382.00	0.00	0.00	1021.00	915.80	0.00	727.70
	Ave	4356.33+/- 3%	0.00+/- 0%	0.00+/- 0%	1021.00+/- 1%	921.03+/- 1%	0.00+/- 0%	733.67+/- 1%
	Beta	3622.67	0.00	0.00	287.33	187.37	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0793	0.0517	0.0000	
72 FRONT	Raw	1926.00	0.00	0.00	1866.00	1871.00	0.00	1700.00
	Raw	1834.00	0.00	0.00	1813.00	1874.00	0.00	1708.00
	Raw	1987.00	0.00	0.00	1843.00	1680.00*	0.00	1685.00
	Ave	1915.67+/- 4%	0.00+/- 0%	0.00+/- 0%	1840.67+/- 1%	1872.50+/- 0%	0.00+/- 0%	1697.67+/- 1%
	Beta	218.00	0.00	0.00	143.00	174.83	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.6560	0.8020	0.0000	
72 BACK	Raw	2115.00	0.00	0.00	1758.00	1772.00	0.00	1782.00
	Raw	2199.00	0.00	0.00	1778.00	1628.00	0.00	1851.00
	Raw	2189.00	0.00	0.00	1780.00	1743.00	0.00	1795.00
	Ave	2167.67+/- 2%	0.00+/- 0%	0.00+/- 0%	1772.00+/- 1%	1714.33+/- 4%	0.00+/- 0%	1809.33+/- 2%
	Beta	358.33	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
73 FRONT	Raw	543.50	0.00	0.00	396.60	354.10	0.00	351.00
	Raw	545.30	0.00	0.00	426.90	379.00	0.00	342.50
	Raw	540.30	0.00	0.00	397.20	365.00	0.00	333.90
	Ave	543.03+/- 0%	0.00+/- 0%	0.00+/- 0%	406.90+/- 4%	366.03+/- 3%	0.00+/- 0%	342.47+/- 2%
	Beta	200.57	0.00	0.00	64.43	23.57	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3213	0.1175	0.0000	
73 BACK	Raw	356.30	0.00	0.00	338.50	333.40*	0.00	348.50
	Raw	362.60	0.00	0.00	342.50	359.50	0.00	344.00
	Raw	357.30	0.00	0.00	339.30	367.30	0.00	341.20
	Ave	358.73+/- 1%	0.00+/- 0%	0.00+/- 0%	340.13+/- 1%	363.40+/- 2%	0.00+/- 0%	344.57+/- 1%
	Beta	14.17	0.00	0.00	0.00	18.83	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	1.3294	0.0000	
74 FRONT	Raw	380.10*	0.00	0.00	223.40	212.80	0.00	219.40
	Raw	337.10	0.00	0.00	219.60	231.80	0.00	220.60
	Raw	342.20	0.00	0.00	229.10	247.90	0.00	231.80
	Ave	339.65+/- 1%	0.00+/- 0%	0.00+/- 0%	224.03+/- 2%	230.83+/- 8%	0.00+/- 0%	223.93+/- 3%
	Beta	115.72	0.00	0.00	0.10	6.90	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0009	0.0596	0.0000	
74 BACK	Raw	918.70	0.00	0.00	270.90	268.10	0.00	228.00
	Raw	848.10	0.00	0.00	284.80	239.20*	0.00	213.70
	Raw	916.80	0.00	0.00	305.80*	255.30	0.00	229.10
	Ave	894.53+/- 4%	0.00+/- 0%	0.00+/- 0%	277.85+/- 4%	261.70+/- 3%	0.00+/- 0%	223.60+/- 4%
	Beta	670.93	0.00	0.00	54.25	38.10	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0809	0.0568	0.0000	
75 FRONT	Raw	284.90	0.00	0.00	229.90	235.30	0.00	213.80
	Raw	272.80	0.00	0.00	240.30	237.20	0.00	224.00
	Raw	280.70	0.00	0.00	225.00	235.90	0.00	225.70
	Ave	279.47+/- 2%	0.00+/- 0%	0.00+/- 0%	231.73+/- 3%	236.13+/- 0%	0.00+/- 0%	221.17+/- 3%
	Beta	58.30	0.00	0.00	10.57	14.97	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1812	0.2567	0.0000	
75 BACK	Raw	224.20	0.00	0.00	215.50	213.70	0.00	227.30
	Raw	226.10	0.00	0.00	190.00*	223.30	0.00	215.00
	Raw	229.20	0.00	0.00	218.10	231.50	0.00	226.50
	Ave	226.50+/- 1%	0.00+/- 0%	0.00+/- 0%	216.80+/- 1%	222.83+/- 4%	0.00+/- 0%	222.93+/- 3%
	Beta	3.57	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	

(* indicates a rejected flier)

II.35

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
76 FRONT	Raw	309.20	0.00	0.00	258.10	246.70	0.00	243.10
	Raw	305.20	0.00	0.00	258.60	249.20	0.00	239.90
	Raw	306.10	0.00	0.00	262.90	246.70	0.00	243.10
	Ave	306.83+/- 1%	0.00+/- 0%	0.00+/- 0%	259.87+/- 1%	247.53+/- 1%	0.00+/- 0%	241.70+/- 1%
	Beta	65.13	0.00	0.00	18.17	5.83	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2789	0.0896	0.0000	
76 BACK	Raw	242.60	0.00	0.00	219.10	236.70	0.00	241.80
	Raw	254.20	0.00	0.00	218.80	248.00	0.00	244.90
	Raw	273.80*	0.00	0.00	217.20	239.50	0.00	248.20
	Ave	248.40+/- 3%	0.00+/- 0%	0.00+/- 0%	218.37+/- 0%	241.40+/- 2%	0.00+/- 0%	244.97+/- 1%
	Beta	3.43	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
77 FRONT	Raw	376.20	0.00	0.00	348.90	351.30	0.00	338.90
	Raw	391.80	0.00	0.00	354.90	318.20*	0.00	341.20
	Raw	418.00*	0.00	0.00	355.90	348.20	0.00	351.80
	Ave	384.00+/- 3%	0.00+/- 0%	0.00+/- 0%	353.23+/- 1%	349.75+/- 1%	0.00+/- 0%	343.97+/- 2%
	Beta	40.03	0.00	0.00	9.27	5.78	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2315	0.1445	0.0000	
77 BACK	Raw	348.60*	0.00	0.00	346.40	347.00	0.00	316.20
	Raw	413.80	0.00	0.00	372.90	334.70	0.00	304.50
	Raw	398.40	0.00	0.00	343.20	330.40	0.00	307.30
	Ave	406.10+/- 3%	0.00+/- 0%	0.00+/- 0%	354.17+/- 5%	337.37+/- 3%	0.00+/- 0%	309.33+/- 2%
	Beta	96.77	0.00	0.00	44.83	28.03	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.4633	0.2897	0.0000	
78 FRONT	Raw	522.90	0.00	0.00	437.70	407.00	0.00	394.10
	Raw	582.80*	0.00	0.00	449.90	432.40	0.00	397.80
	Raw	523.30	0.00	0.00	462.70	403.10	0.00	420.70
	Ave	523.10+/- 0%	0.00+/- 0%	0.00+/- 0%	450.10+/- 3%	414.43+/- 4%	0.00+/- 0%	404.20+/- 4%
	Beta	118.90	0.00	0.00	45.90	10.23	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3860	0.0861	0.0000	
78 BACK	Raw	1296.00	0.00	0.00	456.80	532.80	0.00	434.60
	Raw	1377.00	0.00	0.00	479.50	504.50	0.00	424.70
	Raw	1494.00	0.00	0.00	489.00	524.10	0.00	444.90
	Ave	1387.00+/- 7%	0.00+/- 0%	0.00+/- 0%	475.10+/- 3%	520.47+/- 3%	0.00+/- 0%	434.73+/- 2%
	Beta	954.27	0.00	0.00	40.37	85.73	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0423	0.0878	0.0000	

(* indicates a rejected flier)

II.36

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-B2

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
80 FRONT	Raw	194.40	0.00	0.00	174.80	172.90	0.00	148.20*
	Raw	202.10	0.00	0.00	164.70	171.10	0.00	164.00
	Raw	204.10	0.00	0.00	166.30	164.50	0.00	165.80
	Ave	200.20+/- 3%	0.00+/- 0%	0.00+/- 0%	168.60+/- 3%	169.50+/- 3%	0.00+/- 0%	164.90+/- 1%
	Beta	35.30	0.00	0.00	3.70	4.60	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1048	0.1303	0.0000	
80 BACK	Raw	175.00	0.00	0.00	160.50	158.90	0.00	165.50
	Raw	177.00	0.00	0.00	148.20	168.10	0.00	156.50
	Raw	176.70	0.00	0.00	157.10	153.50	0.00	158.90
	Ave	176.23+/- 1%	0.00+/- 0%	0.00+/- 0%	155.27+/- 4%	160.17+/- 5%	0.00+/- 0%	160.30+/- 3%
	Beta	15.93	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
98 FRONT	Raw	1.65	0.00	0.00	1.54*	1.49	0.00	1.54
	Raw	1.67	0.00	0.00	1.39	1.50	0.00	1.53
	Raw	1.76	0.00	0.00	1.44	1.47	0.00	1.53
	Ave	1.69+/- 3%	0.00+/- 0%	0.00+/- 0%	1.41+/- 2%	1.49+/- 1%	0.00+/- 0%	1.53+/- 1%
	Beta	0.16	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
98 BACK	Raw	1.75	0.00	0.00	1.46	1.53	0.00	1.56
	Raw	1.79	0.00	0.00	1.59	1.50	0.00	1.60
	Raw	1.74	0.00	0.00	1.51	1.58	0.00	1.50
	Ave	1.76+/- 2%	0.00+/- 0%	0.00+/- 0%	1.52+/- 4%	1.53+/- 3%	0.00+/- 0%	1.55+/- 3%
	Beta	0.21	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
99 FRONT	Raw	2.84	0.00	0.00	2.38	2.42	0.00	2.46
	Raw	2.88	0.00	0.00	2.40	2.33	0.00	2.39
	Raw	2.87	0.00	0.00	2.50	2.44	0.00	2.35
	Ave	2.86+/- 1%	0.00+/- 0%	0.00+/- 0%	2.43+/- 3%	2.39+/- 2%	0.00+/- 0%	2.40+/- 2%
	Beta	0.46	0.00	0.00	0.03	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0552	0.0000	0.0000	
99 BACK	Raw	3.04*	0.00	0.00	2.48	2.58	0.00	2.36
	Raw	3.37	0.00	0.00	2.49	2.58	0.00	2.44
	Raw	3.27	0.00	0.00	2.50	2.53	0.00	2.37
	Ave	3.32+/- 2%	0.00+/- 0%	0.00+/- 0%	2.49+/- 0%	2.56+/- 1%	0.00+/- 0%	2.39+/- 2%
	Beta	0.93	0.00	0.00	0.10	0.17	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1032	0.1863	0.0000	

(* indicates a rejected flier)

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

II.38

Dosimeter	*** RESULTS ***						CALCULATED DOSES						
	Calibration Factors												
	.005" (rad/nc)	.010" (rad/nc)	.020" (rad/nc)	.032" (rad/nc)	.064" (rad/nc)	Ave. (rad/nc)	Mylar Chip	Calculated Beta	Calculated Gamma	Dose (rad)	Error (rad)	Dose (rad)	Error (rad)
1 FRONT	0.22	0.22	0.00	0.00	0.00	0.22	46.60	10.16	4.64	135.13	13.09		
1 BACK	0.22	0.22	0.00	0.00	0.00	0.22	23.57	5.14	3.65	135.65	12.79		
2 FRONT	0.91	0.86	0.00	0.29	0.22	0.57	346.27	197.12	128.21	152.31	15.09		
2 BACK	0.97	0.83	0.26	0.22	0.22	0.50	211.62	105.42	79.86	160.79	16.02		
3 FRONT	0.93	0.92	0.00	0.00	0.00	0.92	4721.33	4354.33	892.77	250.35	23.35		
3 BACK	0.99	0.95	0.22	0.22	0.22	0.52	45.83	23.79	24.63	225.84	21.24		
4 FRONT	0.66	0.56	0.31	0.36	0.22	0.42	220.00	92.57	43.74	236.16	23.21		
4 BACK	0.99	0.95	0.00	0.00	0.00	0.97	0.00	0.00	0.00	234.46	22.63		
5 FRONT	0.99	0.95	0.00	0.00	0.00	0.97	0.00	0.00	0.00	1955.25	186.00		
5 BACK	0.22	0.24	0.22	0.22	0.22	0.22	2094.00	467.23	130.04	1846.07	177.11		
6 FRONT	0.47	0.90	0.00	0.00	0.22	0.53	199.17	105.74	71.79	222.10	21.26		
6 BACK	0.99	0.91	0.00	0.00	0.22	0.71	247.50	175.05	157.00	232.12	21.59		
7 FRONT	0.99	0.95	0.22	0.22	0.22	0.52	296.00	153.65	125.58	357.63	34.55		
7 BACK	0.87	0.87	0.00	0.00	0.31	0.68	4327.67	2959.21	1393.99	349.62	36.09		
8 FRONT	0.71	0.26	0.00	0.00	0.00	0.49	152.03	74.28	48.57	103.70	9.70		
8 BACK	0.43	0.73	0.00	0.00	0.00	0.58	52.10	30.13	20.76	100.15	10.10		
11 FRONT	0.99	0.95	0.00	0.00	0.00	0.97	0.00	0.00	0.00	365.10	37.54		
11 BACK	0.99	0.95	0.26	0.22	0.22	0.53	303.00	159.82	128.23	213.75	21.62		
12 FRONT	0.22	0.31	0.00	0.22	0.22	0.24	46.33	11.13	3.04	36.48	3.57		
12 BACK	0.22	0.22	0.00	0.00	0.22	0.22	10.28	2.24	1.61	33.95	3.30		
13 FRONT	0.36	0.22	0.31	0.00	0.28	0.31	49.20	15.08	4.65	40.29	3.93		
13 BACK	0.22	0.22	0.00	0.00	0.00	0.22	15.90	3.47	2.59	38.61	3.88		
14 FRONT	0.72	0.69	0.00	0.00	0.00	0.71	151.85	107.34	9.09	43.99	4.25		
14 BACK	0.54	0.46	0.00	0.00	0.22	0.40	35.67	14.42	7.49	39.56	3.91		
15 FRONT	0.22	0.31	0.22	0.00	0.00	0.25	13.65	3.41	1.31	22.04	2.18		
15 BACK	0.99	0.95	0.00	0.00	0.00	0.97	18.17	17.63	4.18	20.99	2.02		
17 FRONT	0.77	0.70	0.34	0.00	0.22	0.51	1.48	0.75	0.40	0.52	0.05		
17 BACK	0.61	0.63	0.00	0.00	0.00	0.62	1.50	0.93	0.07	0.52	0.05		
18 FRONT	0.62	0.73	0.00	0.00	0.00	0.68	100.70	68.19	7.95	32.69	3.09		
18 BACK	0.84	0.30	0.00	0.22	0.22	0.39	58.70	23.14	17.88	27.73	2.58		
19 FRONT	0.22	0.22	0.00	0.00	0.00	0.22	25.98	5.66	1.02	30.41	2.97		
19 BACK	0.99	0.95	0.00	0.00	0.00	0.97	0.00	0.00	0.00	32.25	3.00		

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

*** RESULTS ***

Dosimeter	Calibration Factors						Mylar Chip Reading (nc)	CALCULATED DOSES			
	.005" (rad/nc)	.010" (rad/nc)	.020" (rad/nc)	.032" (rad/nc)	.064" (rad/nc)	Ave (rad/nc)		Calculated Beta Dose (rad)	Error (rad)	Calculated Gamma Dose (rad)	Error (rad)
21 FRONT	0.99	0.95	0.00	0.00	0.00	0.97	0.00	0.00	0.00	0.21	0.02
21 BACK	0.71	0.22	0.00	0.22	0.22	0.34	0.11	0.04	0.03	0.19	0.02
33 FRONT	0.00	0.00	0.57	0.59	0.00	0.58	132.90	76.93	4.47	41.60	3.89
33 BACK	0.00	0.00	0.22	0.48	0.00	0.35	38.93	13.60	7.75	34.89	3.25
58 FRONT	0.00	0.00	0.46	0.22	0.00	0.34	49.13	16.56	25.16	186.66	17.81
58 BACK	0.00	0.00	0.55	0.50	0.00	0.53	172.20	90.55	17.96	182.27	17.29
59 FRONT	0.00	0.00	0.60	0.59	0.00	0.60	0.08	0.05	0.03	0.20	0.02
59 BACK	0.00	0.00	0.41	0.59	0.00	0.50	0.06	0.03	0.05	0.19	0.03
61 FRONT	0.00	0.00	0.60	0.59	0.00	0.60	0.00	0.00	0.00	535.32	51.45
61 BACK	0.00	0.00	0.22	0.59	0.00	0.40	320.00	129.04	89.25	478.83	46.42
63 FRONT	0.00	0.00	0.54	0.55	0.00	0.54	250.03	135.48	14.33	79.23	8.20
63 BACK	0.00	0.00	0.43	0.57	0.00	0.50	422.40	210.36	44.51	73.33	7.49
64 FRONT	0.00	0.00	0.22	0.29	0.00	0.25	117.90	30.05	10.50	130.27	12.97
64 BACK	0.00	0.00	0.60	0.59	0.00	0.60	18.73	11.16	18.90	128.94	13.59
65 FRONT	0.00	0.00	0.51	0.52	0.00	0.51	418.30	214.26	21.81	175.19	17.79
65 BACK	0.00	0.00	0.60	0.59	0.00	0.60	259.20	154.39	21.02	183.76	17.65
66 FRONT	0.00	0.00	0.35	0.59	0.00	0.47	104.53	49.24	22.60	183.98	17.67
66 BACK	0.00	0.00	0.60	0.51	0.00	0.56	633.57	353.37	45.03	168.00	15.85
67 FRONT	0.00	0.00	0.52	0.59	0.00	0.55	80.77	44.66	5.40	42.25	3.99
67 BACK	0.00	0.00	0.48	0.59	0.00	0.53	54.35	29.05	6.26	41.00	3.93
68 FRONT	0.00	0.00	0.60	0.55	0.00	0.58	68.37	39.57	8.87	60.94	5.71
68 BACK	0.00	0.00	0.53	0.55	0.00	0.54	394.93	211.89	6.38	56.97	5.35
70 FRONT	0.00	0.00	0.60	0.59	0.00	0.60	114.40	68.14	10.53	109.49	10.22
70 BACK	0.00	0.00	0.60	0.59	0.00	0.60	1810.37	1078.34	632.92	138.92	14.38
71 FRONT	0.00	0.00	0.53	0.39	0.00	0.46	180.17	83.06	22.33	132.39	12.98
71 BACK	0.00	0.00	0.54	0.53	0.00	0.54	3622.67	1946.60	86.34	149.45	13.99
72 FRONT	0.00	0.00	0.22	0.22	0.00	0.22	218.00	47.52	16.98	345.81	32.25
72 BACK	0.00	0.00	0.60	0.59	0.00	0.60	358.33	213.44	35.17	368.56	35.08
73 FRONT	0.00	0.00	0.36	0.46	0.00	0.41	200.57	82.38	13.79	69.76	6.72
73 BACK	0.00	0.00	0.60	0.22	0.00	0.41	14.17	5.81	4.37	70.19	6.57
74 FRONT	0.00	0.00	0.60	0.52	0.00	0.56	115.72	65.05	7.86	45.62	4.47
74 BACK	0.00	0.00	0.54	0.53	0.00	0.53	670.93	358.24	23.47	45.55	4.58
75 FRONT	0.00	0.00	0.47	0.30	0.00	0.39	58.30	22.46	7.64	45.05	4.39
75 BACK	0.00	0.00	0.60	0.59	0.00	0.60	3.57	2.12	4.37	45.41	4.45

II.39

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-82

*** RESULTS ***

CALCULATED DOSES

Dosimeter	Calibration Factors					Mylar Chip	Calculated Beta		Calculated Gamma	
	.005" (rad/nc)	.010" (rad/nc)	.020" (rad/nc)	.032" (rad/nc)	.064" (rad/nc)	Ave. (rad/nc)	Dose (rad)	Error (rad)	Dose (rad)	Error (rad)
76 FRONT	0.00	0.00	0.40	0.49	0.00	0.44	65.13	28.79	49.23	4.61
76 BACK	0.00	0.00	0.60	0.59	0.00	0.60	3.43	2.05	49.90	4.69
77 FRONT	0.00	0.00	0.43	0.43	0.00	0.43	40.03	17.18	5.58	70.07
77 BACK	0.00	0.00	0.26	0.27	0.00	0.26	96.77	25.35	3.31	63.01
78 FRONT	0.00	0.00	0.32	0.49	0.00	0.40	118.90	48.05	15.98	82.34
78 BACK	0.00	0.00	0.57	0.49	0.00	0.53	954.27	505.63	77.09	88.56
80 FRONT	0.00	0.00	0.52	0.44	0.00	0.48	35.30	17.09	3.27	33.59
80 BACK	0.00	0.00	0.60	0.59	0.00	0.60	15.93	9.49	2.85	32.65
98 FRONT	0.00	0.00	0.60	0.59	0.00	0.60	0.16	0.10	0.03	0.31
98 BACK	0.00	0.00	0.60	0.59	0.00	0.60	0.21	0.12	0.04	0.32
99 FRONT	0.00	0.00	0.56	0.59	0.00	0.58	0.46	0.26	0.04	0.49
99 BACK	0.00	0.00	0.53	0.38	0.00	0.45	0.93	0.42	0.10	0.49

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-B2

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Beta Error (rad/hr)	Gamma Dose Rate (rad/hr)	Gamma Error (rad/hr)
1 FRONT	10.16	135.13	668.0	1.52E-02	6.95E-03	2.02E-01	1.96E-02
1 BACK	5.14	135.65	668.0	7.69E-03	5.46E-03	2.03E-01	1.91E-02
2 FRONT	197.12	152.31	668.0	2.95E-01	1.92E-01	2.28E-01	2.26E-02
2 BACK	105.42	160.79	668.0	1.58E-01	1.20E-01	2.41E-01	2.40E-02
3 FRONT	4354.33	250.35	668.0	6.52E+00	1.34E+00	3.75E-01	3.49E-02
3 BACK	23.79	225.84	668.0	3.56E-02	3.69E-02	3.38E-01	3.18E-02
4 FRONT	92.57	236.16	668.0	1.39E-01	6.55E-02	3.54E-01	3.48E-02
4 BACK	0.00	234.46	668.0	0.00E+00	0.00E+00	3.51E-01	3.39E-02
5 FRONT	0.00	1955.25	668.0	0.00E+00	0.00E+00	2.93E+00	2.78E-01
5 BACK	467.23	1846.07	668.0	6.99E-01	1.95E-01	2.76E+00	2.65E-01
6 FRONT	105.74	222.10	668.0	1.58E-01	1.07E-01	3.32E-01	3.18E-02
6 BACK	175.05	232.12	668.0	2.62E-01	2.35E-01	3.47E-01	3.23E-02
7 FRONT	153.65	357.63	668.0	2.30E-01	1.88E-01	5.35E-01	5.17E-02
7 BACK	2959.21	349.62	668.0	4.43E+00	2.09E+00	5.23E-01	5.40E-02
8 FRONT	74.28	103.70	668.0	1.11E-01	7.27E-02	1.55E-01	1.45E-02
8 BACK	30.13	100.15	668.0	4.51E-02	3.11E-02	1.50E-01	1.51E-02
11 FRONT	0.00	365.10	645.5	0.00E+00	0.00E+00	5.66E-01	5.82E-02
11 BACK	159.82	213.75	645.5	2.48E-01	1.99E-01	3.31E-01	3.35E-02
12 FRONT	11.13	36.48	645.5	1.72E-02	4.71E-03	5.65E-02	5.54E-03
12 BACK	2.24	33.95	645.5	3.47E-03	2.49E-03	5.26E-02	5.11E-03
13 FRONT	15.08	40.29	645.5	2.34E-02	7.21E-03	6.24E-02	6.09E-03
13 BACK	3.47	38.61	645.5	5.37E-03	4.01E-03	5.98E-02	6.00E-03
14 FRONT	107.34	43.99	645.5	1.66E-01	1.41E-02	6.81E-02	6.58E-03
14 BACK	14.42	39.56	645.5	2.23E-02	1.16E-02	6.13E-02	6.06E-03
15 FRONT	3.41	22.04	645.5	5.28E-03	2.03E-03	3.41E-02	3.38E-03
15 BACK	17.63	20.99	645.5	2.73E-02	6.47E-03	3.25E-02	3.13E-03
17 FRONT	0.75	0.52	1.0	7.47E-01	3.98E-01	5.24E-01	5.16E-02
17 BACK	0.93	0.52	1.0	9.32E-01	6.57E-02	5.24E-01	4.99E-02
18 FRONT	68.19	32.69	645.5	1.06E-01	1.23E-02	5.06E-02	4.79E-03
18 BACK	23.14	27.73	645.5	3.58E-02	2.77E-02	4.30E-02	4.00E-03
19 FRONT	5.66	30.41	645.5	8.78E-03	1.58E-03	4.71E-02	4.59E-03
19 BACK	0.00	32.25	645.5	0.00E+00	0.00E+00	5.00E-02	4.65E-03

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-B2

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Beta Error (rad/hr)	Gamma Dose Rate (rad/hr)	Gamma Error (rad/hr)
21 FRONT	0.00	0.21	1.0	0.00E+00	0.00E+00	2.12E-01	1.97E-02
21 BACK	0.04	0.19	1.0	3.91E-02	2.92E-02	1.87E-01	1.75E-02
33 FRONT	76.93	41.60	1.0	7.69E+01	4.47E+00	4.16E+01	3.89E+00
33 BACK	13.60	34.89	1.0	1.36E+01	7.75E+00	3.49E+01	3.25E+00
58 FRONT	16.56	186.66	668.0	2.48E-02	3.77E-02	2.79E-01	2.67E-02
58 BACK	90.55	182.27	668.0	1.36E-01	2.49E-02	2.73E-01	2.59E-02
59 FRONT	0.05	0.20	1.0	4.84E-02	2.82E-02	1.98E-01	2.03E-02
59 BACK	0.03	0.19	1.0	2.87E-02	4.67E-02	1.91E-01	2.56E-02
61 FRONT	0.00	535.32	668.0	0.00E+00	0.00E+00	8.01E-01	7.70E-02
61 BACK	129.04	478.83	668.0	1.93E-01	1.34E-01	7.17E-01	6.95E-02
63 FRONT	135.48	79.23	668.5	2.03E-01	2.15E-02	1.19E-01	1.23E-02
63 BACK	210.36	73.33	668.0	3.15E-01	6.66E-02	1.10E-01	1.12E-02
64 FRONT	30.05	130.27	668.0	4.50E-02	1.57E-02	1.95E-01	1.94E-02
64 BACK	11.16	128.94	668.0	1.67E-02	2.83E-02	1.93E-01	2.03E-02
65 FRONT	214.26	175.19	668.0	3.21E-01	3.26E-02	2.62E-01	2.66E-02
65 BACK	154.39	183.76	668.0	2.31E-01	3.15E-02	2.75E-01	2.64E-02
66 FRONT	49.24	183.98	668.0	7.37E-02	3.38E-02	2.75E-01	2.65E-02
66 BACK	353.37	168.00	668.0	5.29E-01	6.74E-02	2.52E-01	2.37E-02
67 FRONT	44.66	42.25	645.5	6.92E-02	8.36E-03	6.55E-02	6.18E-03
67 BACK	29.05	41.00	645.5	4.50E-02	9.70E-03	6.35E-02	6.09E-03
68 FRONT	39.57	60.94	645.5	6.13E-02	1.37E-02	9.44E-02	8.84E-03
68 BACK	211.89	56.97	645.5	3.28E-01	9.88E-03	8.83E-02	8.29E-03
70 FRONT	68.14	109.49	645.5	1.06E-01	1.63E-02	1.70E-01	1.58E-02
70 BACK	1078.34	138.92	645.5	1.67E+00	9.81E-01	2.15E-01	2.23E-02
71 FRONT	83.06	132.39	645.5	1.29E-01	3.46E-02	2.05E-01	2.01E-02
71 BACK	1946.50	149.45	645.5	3.02E+00	1.34E-01	2.32E-01	2.17E-02
72 FRONT	47.52	345.21	645.5	7.36E-02	2.63E-02	5.36E-01	5.00E-02
72 BACK	213.44	368.56	645.5	3.31E-01	5.45E-02	5.71E-01	5.43E-02
73 FRONT	82.38	69.76	645.5	1.28E-01	2.14E-02	1.08E-01	1.04E-02
73 BACK	5.81	70.19	645.5	9.01E-03	6.76E-03	1.09E-01	1.02E-02
74 FRONT	65.05	45.62	645.5	1.01E-01	1.22E-02	7.07E-02	6.92E-03
74 BACK	358.24	45.55	645.5	5.55E-01	2.64E-02	7.06E-02	7.10E-03
75 FRONT	22.46	45.05	645.5	3.48E-02	1.18E-02	6.98E-02	6.80E-03
75 BACK	2.12	45.41	645.5	3.29E-03	6.75E-03	7.04E-02	6.89E-03

TMI Post-Gross Decontamination TLD's (305', 347' & 367') -- DCH-5-B2

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Error (rad/hr)	Gamma Dose Rate (rad/hr)	Error (rad/hr)
76 FRONT	28.79	49.23	645.5	4.46E-02	7.01E-03	7.63E-02	7.13E-03
76 BACK	2.05	49.90	645.5	3.17E-03	8.12E-03	7.73E-02	7.26E-03
77 FRONT	17.18	70.07	645.5	2.66E-02	8.64E-03	1.09E-01	1.03E-02
77 BACK	25.35	63.01	645.5	3.93E-02	5.13E-03	9.76E-02	9.28E-03
78 FRONT	48.05	82.34	645.5	7.44E-02	2.47E-02	1.28E-01	1.27E-02
78 BACK	505.63	88.56	645.5	7.83E-01	1.19E-01	1.37E-01	1.32E-02
80 FRONT	17.09	33.59	645.5	2.65E-02	5.06E-03	5.20E-02	4.86E-03
80 BACK	9.49	32.65	645.5	1.47E-02	4.42E-03	5.06E-02	4.93E-03
98 FRONT	0.10	0.31	1.0	9.53E-02	3.46E-02	3.13E-01	2.91E-02
98 BACK	0.12	0.32	1.0	1.25E-01	3.51E-02	3.16E-01	3.13E-02
99 FRONT	0.26	0.49	1.0	2.64E-01	3.55E-02	4.89E-01	4.70E-02
99 BACK	0.42	0.49	1.0	4.22E-01	1.02E-01	4.87E-01	4.63E-02

VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:39 TTA4: 13-JUN-1983 13:46 DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;3 VAX/VMS
VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:39 TTA4: 13-JUN-1983 13:46 DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;3 VAX/VMS
VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:39 TTA4: 13-JUN-1983 13:46 DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;3 VAX/VMS

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S	C	H	H	E
S	C	H	H	E
SSS	C	HHHHH	EEE	EE
S	C	H	H	E
S	C	H	H	E
SSSS	CCCC	H	H	EEEEEE

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RR      RR    AA      AA    TT      II    00    00    00    00    UU    UU    TT
RR      RR    AA      AA    TT      II    00    00    00    00    UU    UU    TT
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RR      RR    AAAAAAAA    TT      II    00    00    00    00    UU    UU    TT
RR      RR    AAAAAAAA    TT      II    00    00    00    00    UU    UU    TT
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RR      RR    AA      AA    TT      II    00    00    00    00    UU    UU    TT
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S          C       H   H   E
SSS   C       HHHHH   EEEE
S   C       H   H   E
S   C       H   H   E
SSSSS   CCCC   H   H   FFFFF

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VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:39 TTA4: 13-JUN-1983 13:46 DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;3 VAX/VMS
VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:39 TTA4: 13-JUN-1983 13:46 DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;3 VAX/VMS
VAX/VMS SCHE RATIOOUT 13-JUN-1983 13:39 TTA4: 13-JUN-1983 13:46 DISK*USER_DISK1:[SCHE.BETDOS]RATIOOUT.DAT;3 VAX/VMS

Pre-Flushing of the Reactor Building Basement, TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
B1 FRONT	Raw	631.70	0.00	0.00	319.00	312.40	0.00	244.20
	Raw	634.00	0.00	0.00	338.40	298.90	0.00	253.00
	Raw	688.00	0.00	0.00	326.20	281.00*	0.00	271.10*
	Ave	651.23+/- 5%	0.00+/- 0%	0.00+/- 0%	327.87+/- 3%	305.65+/- 3%	0.00+/- 0%	248.60+/- 3%
	Beta	402.63	0.00	0.00	79.27	57.05	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1969	0.1417	0.0000	
B1 BACK	Raw	824.40	0.00	0.00	375.50	303.50	0.00	245.40
	Raw	822.00	0.00	0.00	369.50	270.50*	0.00	228.30
	Raw	744.10*	0.00	0.00	367.30	302.50	0.00	215.70
	Ave	823.20+/- 0%	0.00+/- 0%	0.00+/- 0%	370.77+/- 1%	303.00+/- 0%	0.00+/- 0%	229.80+/- 6%
	Beta	593.40	0.00	0.00	140.97	73.20	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2376	0.1234	0.0000	
B2 FRONT	Raw	537.00	0.00	0.00	263.90	253.30	0.00	231.80
	Raw	553.00	0.00	0.00	287.40	216.10	0.00	247.70
	Raw	589.50	0.00	0.00	273.20	234.50	0.00	218.70
	Ave	559.83+/- 5%	0.00+/- 0%	0.00+/- 0%	274.83+/- 4%	234.63+/- 8%	0.00+/- 0%	232.73+/- 6%
	Beta	327.10	0.00	0.00	42.10	1.90	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1287	0.0058	0.0000	
B2 BACK	Raw	457.90	0.00	0.00	275.30	234.30	0.00	225.00
	Raw	461.10	0.00	0.00	289.30	246.90	0.00	209.20
	Raw	475.40	0.00	0.00	261.30*	254.20	0.00	220.50
	Ave	464.80+/- 2%	0.00+/- 0%	0.00+/- 0%	282.30+/- 4%	245.13+/- 4%	0.00+/- 0%	218.23+/- 4%
	Beta	246.57	0.00	0.00	64.07	26.90	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2598	0.1091	0.0000	
B3 FRONT	Raw	0.98	0.00	0.00	1.06*	0.74	0.00	0.87
	Raw	0.98	0.00	0.00	0.88*	0.76	0.00	0.85
	Raw	0.95	0.00	0.00	0.92*	0.86*	0.00	0.90
	Ave	0.97+/- 2%	0.00+/- 0%	0.00+/- 0%	0.00+/- 10%	0.95+/- 1%	0.00+/- 0%	0.87+/- 3%
	Beta	0.09	0.00	0.00	0.00	0.08	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.8406	0.0000	
B3 BACK	Raw	0.94	0.00	0.00	0.89	0.74	0.00	0.82
	Raw	0.94	0.00	0.00	0.93	0.72	0.00	0.92*
	Raw	0.87	0.00	0.00	0.95	0.95	0.00	0.85
	Ave	0.92+/- 4%	0.00+/- 0%	0.00+/- 0%	0.92+/- 4%	0.94+/- 2%	0.00+/- 0%	0.84+/- 2%
	Beta	0.08	0.00	0.00	0.09	0.10	0.00	0.00
	Ratio	1.00	0.0000	0.0000	1.1000	1.3000	0.0000	

(* indicates a rejected filer)

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45

Pre-Flushing of the Reactor Building Basement, TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	.005" #2 (nc)	.010" #3 (nc)	.020" #4 (nc)	.032" #5 (nc)	.064" #6 (nc)	.125" #7 (nc)
B4 FRONT	Raw	50.02*	0.00	0.00	50.88	45.74	0.00	47.10
	Raw	53.24	0.00	0.00	47.55	42.38	0.00	43.50
	Raw	55.88	0.00	0.00	46.59	46.34	0.00	43.12
	Ave	54.56+/- 3%	0.00+/- 0%	0.00+/- 0%	48.34+/- 5%	44.82+/- 5%	0.00+/- 0%	44.57+/- 5%
	Beta	9.99	0.00	0.00	3.77	0.25	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3772	0.0247	0.0000	
B4 BACK	Raw	71.23	0.00	0.00	53.76	47.41	0.00	45.70
	Raw	64.84*	0.00	0.00	51.90	46.99	0.00	44.18
	Raw	70.96	0.00	0.00	58.14*	43.04*	0.00	49.14*
	Ave	71.10+/- 0%	0.00+/- 0%	0.00+/- 0%	52.83+/- 2%	47.20+/- 1%	0.00+/- 0%	44.94+/- 2%
	Beta	26.16	0.00	0.00	7.89	2.26	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3017	0.0864	0.0000	
B5 FRONT	Raw	16.99	0.00	0.00	16.35	14.76	0.00	17.12
	Raw	16.94	0.00	0.00	17.28	15.06	0.00	16.66
	Raw	18.19	0.00	0.00	16.06	15.46	0.00	16.81
	Ave	17.37+/- 4%	0.00+/- 0%	0.00+/- 0%	16.56+/- 4%	15.09+/- 2%	0.00+/- 0%	16.86+/- 1%
	Beta	0.51	0.00	0.00	0.00	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0000	0.0000	
B5 BACK	Raw	15.73	0.00	0.00	18.82	17.92	0.00	16.39
	Raw	16.92	0.00	0.00	17.68	17.38	0.00	15.94
	Raw	16.89	0.00	0.00	18.36	18.06	0.00	15.52
	Ave	16.51+/- 4%	0.00+/- 0%	0.00+/- 0%	18.29+/- 3%	17.79+/- 2%	0.00+/- 0%	15.95+/- 3%
	Beta	0.56	0.00	0.00	2.34	1.84	0.00	0.00
	Ratio	1.00	0.0000	0.0000	4.1479	3.2603	0.0000	
B6 FRONT	Raw	1062.00	0.00	0.00	795.60	763.70	0.00	753.50
	Raw	1141.00	0.00	0.00	774.70	774.00	0.00	736.10
	Raw	1002.00	0.00	0.00	787.90	775.20	0.00	750.80
	Ave	1068.33+/- 7%	0.00+/- 0%	0.00+/- 0%	786.07+/- 1%	770.97+/- 1%	0.00+/- 0%	746.80+/- 1%
	Beta	321.53	0.00	0.00	39.27	24.17	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.1221	0.0752	0.0000	
B6 BACK	Raw	1029.00	0.00	0.00	855.30	806.30	0.00	732.50
	Raw	975.10	0.00	0.00	800.30	834.70	0.00	769.00
	Raw	921.30	0.00	0.00	853.90	790.50	0.00	686.50*
	Ave	975.13+/- 6%	0.00+/- 0%	0.00+/- 0%	836.50+/- 4%	810.50+/- 3%	0.00+/- 0%	750.75+/- 3%
	Beta	224.38	0.00	0.00	85.75	59.75	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3822	0.2663	0.0000	

(* indicates a rejected filer)

Pre-Flushing of the Reactor Building Basement. TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
87 FRONT	Raw	594 90	0 00	0 00	559 20	521 60	0 00	544 10
	Raw	604 40	0 00	0 00	529 40	549 80	0 00	539 30
	Raw	563 30	0 00	0 00	547 00	535 30	0 00	519 90
	Ave	587 53+/- 4%	0 00+/- 0%	0 00+/- 0%	545 20+/- 3%	535 57+/- 3%	0 00+/- 0%	534 43+/- 2%
	Beta	53 10	0 00	0 00	10 77	1 13	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 2028	0 0213	0 0000	
87 BACK	Raw	559 80	0 00	0 00	535 60	513 70	0 00	515 50
	Raw	532 00	0 00	0 00	576 60	544 00	0 00	503 10
	Raw	564 20	0 00	0 00	534 40	545 60	0 00	525 80
	Ave	552 00+/- 3%	0 00+/- 0%	0 00+/- 0%	548 93+/- 4%	534 43+/- 3%	0 00+/- 0%	514 80+/- 2%
	Beta	37 20	0 00	0 00	34 13	19 63	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 9176	0 5278	0 0000	
88 FRONT	Raw	292 20	0 00	0 00	255 10	266 40	0 00	254 40
	Raw	296 60	0 00	0 00	250 00	267 10	0 00	253 70
	Raw	292 50	0 00	0 00	266 30	290 20	0 00	247 50
	Ave	293 77+/- 1%	0 00+/- 0%	0 00+/- 0%	257 13+/- 3%	274 57+/- 5%	0 00+/- 0%	251 87+/- 2%
	Beta	41 90	0 00	0 00	5 27	22 70	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 1257	0 5418	0 0000	
88 BACK	Raw	262 00	0 00	0 00	252 40	262 80	0 00	254 50
	Raw	275 50	0 00	0 00	275 00	252 40	0 00	252 00
	Raw	276 80	0 00	0 00	255 50	267 00	0 00	253 70
	Ave	271 43+/- 3%	0 00+/- 0%	0 00+/- 0%	260 97+/- 5%	260 73+/- 3%	0 00+/- 0%	253 40+/- 1%
	Beta	18 03	0 00	0 00	7 57	7 33	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 4196	0 4067	0 0000	
89 FRONT	Raw	112 90	0 00	0 00	103 80	108 10	0 00	108 20
	Raw	112 00	0 00	0 00	104 40	102 40	0 00	110 60
	Raw	111 90	0 00	0 00	108 50	111 50	0 00	101 10
	Ave	112 27+/- 0%	0 00+/- 0%	0 00+/- 0%	105 57+/- 2%	107 33+/- 4%	0 00+/- 0%	106 63+/- 5%
	Beta	5 63	0 00	0 00	0 00	0 70	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0000	0 1243	0 0000	
89 BACK	Raw	113 50	0 00	0 00	102 10	103 80	0 00	99 45
	Raw	106 20	0 00	0 00	107 90	99 72	0 00	98 90
	Raw	105 30	0 00	0 00	95 43	100 00	0 00	104 00
	Ave	108 33+/- 4%	0 00+/- 0%	0 00+/- 0%	101 81+/- 6%	101 17+/- 2%	0 00+/- 0%	100 78+/- 3%
	Beta	7 55	0 00	0 00	1 03	0 39	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 1360	0 0517	0 0000	

(* indicates a rejected flier)

II.47

Pre-Flushing of the Reactor Building Basement. TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
90 FRONT	Raw	373.80	0.00	0.00	263.50	220.40	0.00	201.50
	Raw	375.30	0.00	0.00	260.30	211.80	0.00	201.10
	Raw	370.40	0.00	0.00	262.80	228.80	0.00	198.70
	Ave	373.17 +/- 1%	0.00 +/- 0%	0.00 +/- 0%	262.20 +/- 1%	220.33 +/- 4%	0.00 +/- 0%	200.43 +/- 1%
	Beta	172.73	0.00	0.00	61.77	19.90	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.3576	0.1152	0.0000	
90 BACK	Raw	1030.00	0.00	0.00	482.30*	299.90	0.00	219.40
	Raw	1005.00	0.00	0.00	381.90*	244.40*	0.00	231.80
	Raw	951.40	0.00	0.00	455.00*	294.50	0.00	236.90
	Ave	995.47 +/- 4%	0.00 +/- 0%	0.00 +/- 0%	0.00 +/- 12%	297.20 +/- 1%	0.00 +/- 0%	229.37 +/- 4%
	Beta	766.10	0.00	0.00	0.00	67.83	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0000	0.0885	0.0000	
91 FRONT	Raw	3330.00	0.00	0.00	932.00	751.40	0.00	288.00
	Raw	3265.00	0.00	0.00	950.60	702.90	0.00	261.60*
	Raw	3327.00	0.00	0.00	941.30	684.30	0.00	297.80
	Ave	3307.33 +/- 1%	0.00 +/- 0%	0.00 +/- 0%	941.30 +/- 1%	712.87 +/- 5%	0.00 +/- 0%	292.90 +/- 2%
	Beta	3014.43	0.00	0.00	648.40	419.97	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2151	0.1393	0.0000	
91 BACK	Raw	369.20*	0.00	0.00	299.20	277.60	0.00	245.10*
	Raw	412.40	0.00	0.00	313.80	257.40	0.00	272.60
	Raw	397.10	0.00	0.00	286.20	261.70	0.00	267.80
	Ave	404.75 +/- 3%	0.00 +/- 0%	0.00 +/- 0%	299.73 +/- 5%	265.57 +/- 4%	0.00 +/- 0%	270.20 +/- 1%
	Beta	134.55	0.00	0.00	29.33	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.2195	0.0000	0.0000	
92 FRONT	Raw	151.20	0.00	0.00	132.70	127.20	0.00	126.70
	Raw	152.60	0.00	0.00	128.60	126.10	0.00	126.60
	Raw	152.10	0.00	0.00	131.30	127.70	0.00	132.40
	Ave	151.97 +/- 0%	0.00 +/- 0%	0.00 +/- 0%	130.87 +/- 2%	127.00 +/- 1%	0.00 +/- 0%	128.57 +/- 3%
	Beta	23.40	0.00	0.00	2.30	0.00	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.0983	0.0000	0.0000	
92 BACK	Raw	155.20	0.00	0.00	137.30	119.10	0.00	119.90
	Raw	142.70	0.00	0.00	127.90	131.20	0.00	121.60
	Raw	153.20	0.00	0.00	137.90	126.20	0.00	139.80*
	Ave	150.37 +/- 4%	0.00 +/- 0%	0.00 +/- 0%	134.37 +/- 4%	125.50 +/- 5%	0.00 +/- 0%	120.75 +/- 1%
	Beta	29.62	0.00	0.00	13.62	4.75	0.00	0.00
	Ratio	1.00	0.0000	0.0000	0.4598	0.1604	0.0000	

(* indicates a rejected filer)

Pre-Flushing of the Reactor Building Basement. TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
96 FRONT	Raw	53 59	0 00	0 00	48 43	45 79	0 00	42 23
	Raw	55 91	0 00	0 00	46 67	42 77	0 00	40 80
	Raw	51 50	0 00	0 00	47 25	45 31	0 00	40 71
	Ave	53 67+/- 4%	0 00+/- 0%	0 00+/- 0%	47 45+/- 2%	44 62+/- 4%	0 00+/- 0%	41 25+/- 2%
Beta	12 42	0 00	0 00	6 20	3 38	0 00	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 4995	0 2719	0 0000	0 0000
96 BACK	Raw	51 13	0 00	0 00	43 55	39 66	0 00	34 05*
	Raw	51 09	0 00	0 00	44 64	39 53	0 00	42 33
	Raw	52 01	0 00	0 00	44 94	41 39	0 00	40 40
	Ave	51 41+/- 1%	0 00+/- 0%	0 00+/- 0%	44 38+/- 2%	40 19+/- 3%	0 00+/- 0%	41 37+/- 3%
Beta	10 04	0 00	0 00	3 01	0 00	0 00	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 2998	0 0000	0 0000	0 0000
97 FRONT	Raw	20 55	0 00	0 00	19 91	18 87	0 00	18 00
	Raw	20 37	0 00	0 00	18 94	18 52	0 00	18 34
	Raw	19 89	0 00	0 00	18 71	17 60	0 00	18 02
	Ave	20 27+/- 2%	0 00+/- 0%	0 00+/- 0%	19 19+/- 3%	18 33+/- 4%	0 00+/- 0%	18 12+/- 1%
Beta	2 15	0 00	0 00	1 07	0 21	0 00	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 4961	0 0977	0 0000	0 0000
97 BACK	Raw	18 74	0 00	0 00	17 15	19 67	0 00	19 25
	Raw	18 32	0 00	0 00	18 08	19 75	0 00	18 35
	Raw	16 64*	0 00	0 00	18 38	18 75	0 00	18 45
	Ave	18 53+/- 2%	0 00+/- 0%	0 00+/- 0%	18 20+/- 1%	19 39+/- 3%	0 00+/- 0%	18 68+/- 3%
Beta	0 00	0 00	0 00	0 00	0 71	0 00	0 00	0 00
	Ratio	1 00	0 0000	0 0000	0 0000	0 0000	0 0000	0 0000

(* indicates a rejected flier)

Pre-Flushing of the Reactor Building Basement, TLD Measurements -- DCH-6-82

SUMMARY OF DOSIMETER READINGS

Dosimeter		MYLAR #1 (nc)	005" #2 (nc)	010" #3 (nc)	020" #4 (nc)	032" #5 (nc)	064" #6 (nc)	125" #7 (nc)
93 FRONT	Raw	92 12	0.00	0.00	96 34	92 24	0 00	84.32
	Raw	94 96	0.00	0.00	92 76	87 96	0 00	92.92
	Raw	93 34	0.00	0.00	93 77	92 32	0 00	88.72
	Ave	93.47+/- 2%	0.00+/- 0%	0.00+/- 0%	94.29+/- 2%	90.84+/- 3%	0.00+/- 0%	88.65+/- 5%
	Beta	4 82	0.00	0.00	5 64	2 19	0 00	0 00
	Ratio	1 00	0.0000	0.0000	1 1694	0 4537	0 0000	
93 BACK	Raw	91.78	0.00	0.00	86 92	81 70	0 00	82.74
	Raw	89 95	0.00	0.00	89 44	85 26	0 00	81.21
	Raw	87 64	0.00	0.00	89 84	85 14	0 00	81.12
	Ave	89.79+/- 2%	0.00+/- 0%	0.00+/- 0%	88.73+/- 2%	84.03+/- 2%	0.00+/- 0%	81.69+/- 1%
	Beta	8 10	0.00	0.00	7 04	2 34	0 00	0 00
	Ratio	1 00	0.0000	0.0000	0 8695	0 2893	0 0000	
94 FRONT	Raw	907 70	0.00	0.00	424 50	338 80	0.00	269.90
	Raw	936 20	0.00	0.00	424 00	338 60	0.00	276.20
	Raw	955 20	0.00	0.00	408 20	324 80	0.00	237.00*
	Ave	933.03+/- 3%	0.00+/- 0%	0.00+/- 0%	418.90+/- 2%	334.07+/- 2%	0.00+/- 0%	273.05+/- 2%
	Beta	659 98	0.00	0.00	145 85	61 02	0.00	0 00
	Ratio	1 00	0.0000	0.0000	0 2210	0.0925	0 0000	
94 BACK	Raw	393.20	0.00	0.00	265 00	226 40	0 00	224.90
	Raw	397.90	0.00	0.00	267 00	234 60	0.00	226.00
	Raw	385.30	0.00	0.00	227 00*	226 10	0.00	211.00
	Ave	392.13+/- 2%	0.00+/- 0%	0.00+/- 0%	266 00+/- 1%	229.03+/- 2%	0.00+/- 0%	220.63+/- 4%
	Beta	171 50	0.00	0.00	45 37	8 40	0.00	0 00
	Ratio	1 00	0.0000	0.0000	0 2645	0.0490	0 0000	
95 FRONT	Raw	475 90	0.00	0.00	260 00*	195 40	0.00	157.10*
	Raw	463 90	0.00	0.00	225.20	188.90	0.00	136.70
	Raw	465.00	0.00	0.00	216 70	200.10	0.00	132.50
	Ave	468.27+/- 1%	0.00+/- 0%	0.00+/- 0%	220.95+/- 3%	194.80+/- 3%	0.00+/- 0%	134.60+/- 2%
	Beta	333 67	0.00	0.00	86 35	60 20	0.00	0 00
	Ratio	1 00	0.0000	0.0000	0 2588	0 1804	0 0000	
95 BACK	Raw	298 60	0.00	0.00	145 10*	127 50	0.00	116.70
	Raw	306 50	0.00	0.00	170 90*	128 50	0.00	120.60
	Raw	308 30	0.00	0.00	160 00*	137 40	0.00	119.00
	Ave	304.47+/- 2%	0.00+/- 0%	0.00+/- 0%	0.00+/- 8%	131.13+/- 4%	0.00+/- 0%	118.77+/- 2%
	Beta	185 70	0.00	0.00	0 00	12 37	0.00	0 00
	Ratio	1 00	0.0000	0.0000	0 0000	0 0666	0 0000	

(* indicates a rejected flier)

Pre-Flushing of the Reactor Building Basement. TLD Measurements -- DCH-6-B2

Dosimeter	*** RESULTS ***						CALCULATED DOSES				
	005"	010"	020"	032"	064"	Ave	Mylar Chip Reading (nc)	Calculated Beta Dose (rad)	Error (rad)	Calculated Gamma Dose (rad)	Error (rad)
	(rad/nc)	(rad/nc)	(rad/nc)	(rad/nc)	(rad/nc)	(rad/nc)					
B1 FRONT	0 00	0 00	0 46	0 43	0 00	0 44	402 63	178 57	16 16	50 64	4 88
B1 BACK	0 00	0 00	0 43	0 45	0 00	0 44	593 40	260 25	12 37	46 81	5 31
B2 FRONT	0 00	0 00	0 51	0 58	0 00	0 54	327 10	178 12	24 04	47 41	5 31
B2 BACK	0 00	0 00	0 41	0 47	0 00	0 44	246 57	108 06	11 38	44 45	4 45
B3 FRONT	0 00	0 00	0 60	0 22	0 00	0 41	0 09	0 04	0 03	0 18	0 02
B3 BACK	0 00	0 00	0 22	0 22	0 00	0 22	0 08	0 02	0 01	0 17	0 02
B4 FRONT	0 00	0 00	0 32	0 56	0 00	0 44	6 99	4 41	2 11	9 08	0 96
B4 BACK	0 00	0 00	0 38	0 49	0 00	0 44	26 16	11 39	2 16	9 15	0 88
B5 FRONT	0 00	0 00	0 60	0 59	0 00	0 60	0 51	0 30	0 44	3 44	0 32
B5 BACK	0 00	0 00	0 22	0 22	0 00	0 22	0 56	0 12	0 18	3 25	0 31
B6 FRONT	0 00	0 00	0 51	0 50	0 00	0 51	321 53	163 45	35 80	152 12	14 28
B6 BACK	0 00	0 00	0 32	0 29	0 00	0 31	224 38	68 48	18 71	152 93	15 16
B7 FRONT	0 00	0 00	0 45	0 56	0 00	0 51	53 10	26 99	13 42	108 86	10 46
B7 BACK	0 00	0 00	0 22	0 22	0 00	0 22	37 20	8 11	4 54	104 86	10 02
B8 FRONT	0 00	0 00	0 51	0 22	0 00	0 36	41 90	15 24	8 79	51 31	4 83
B8 BACK	0 00	0 00	0 29	0 22	0 00	0 25	18 03	4 59	2 30	51 62	4 81
B9 FRONT	0 00	0 00	0 60	0 45	0 00	0 53	5 63	2 97	2 69	21 72	2 26
B9 BACK	0 00	0 00	0 50	0 53	0 00	0 52	7 55	3 90	2 74	20 53	1 99
90 FRONT	0 00	0 00	0 34	0 46	0 00	0 40	172 73	68 83	15 11	40 83	3 81
90 BACK	0 00	0 00	0 60	0 49	0 00	0 55	766 10	418 54	15 19	46 72	4 72
91 FRONT	0 00	0 00	0 44	0 43	0 00	0 44	3014 43	1320 44	26 10	59 66	5 73
91 BACK	0 00	0 00	0 44	0 59	0 00	0 51	134 55	69 16	15 32	55 04	5 17
92 FRONT	0 00	0 00	0 53	0 59	0 00	0 56	23 40	13 08	2 13	26 19	2 53
92 BACK	0 00	0 00	0 26	0 41	0 00	0 34	29 62	9 93	3 87	24 60	2 30
93 FRONT	0 00	0 00	0 22	0 22	0 00	0 22	4 82	1 05	0 99	18 06	1 89
93 BACK	0 00	0 00	0 22	0 27	0 00	0 24	8 10	1 96	0 61	16 64	1 56
94 FRONT	0 00	0 00	0 44	0 49	0 00	0 46	659 98	304 89	24 67	55 62	5 25
94 BACK	0 00	0 00	0 41	0 53	0 00	0 47	171 50	80 60	16 28	44 94	4 51
95 FRONT	0 00	0 00	0 41	0 37	0 00	0 40	333 67	133 10	6 12	27 42	2 62
95 BACK	0 00	0 00	0 60	0 51	0 00	0 56	185 70	103 72	12 02	24 19	2 29
96 FRONT	0 00	0 00	0 23	0 29	0 00	0 26	12 42	3 21	0 78	8 40	0 80
96 BACK	0 00	0 00	0 38	0 59	0 00	0 48	10 04	4 86	1 64	8 43	0 83

11.51

Pre-Flushing of the Reactor Building Basement. TLD Measurements -- DCH-6-82

*** RESULTS ***

CALCULATED DOSES

Dosimeter	Calibration Factors						Mylar Chip Reading (nc)	Calculated Beta		Calculated Gamma	
	.005" (rad/nc)	.010" (rad/nc)	.020" (rad/nc)	.032" (rad/nc)	.064" (rad/nc)	Ave (rad/nc)		Dose (rad)	Error (rad)	Dose (rad)	Error (rad)
97 FRONT	0.00	0.00	0.23	0.48	0.00	0.36	2.15	0.77	0.40	3.69	0.35
97 BACK	0.00	0.00	0.60	0.59	0.00	0.60	0.00	0.00	0.00	3.81	0.37

Pre-Flushing of the Reactor Building Basement. TLD Measurements - DCH-6-82

*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Beta Error (rad/hr)	Gamma Dose Rate (rad/hr)	Gamma Error (rad/hr)
81 FRONT	178 57	50 64	3 1	5 72E+01	5 18E+00	1 62E+01	1 56E+00
81 BACK	260 25	46 81	3 1	8 34E+01	3 96E+00	1 50E+01	1 70E+00
82 FRONT	178 12	47 41	3 1	5 71E+01	7 70E+00	1 52E+01	1 70E+00
82 BACK	108 06	44 45	3 1	3 46E+01	3 65E+00	1 42E+01	1 43E+00
83 FRONT	0 04	0 18	1 0	3 78E-02	2 83E-02	1 78E-01	1 75E-02
83 BACK	0 02	0 17	1 0	1 74E-02	9 10E-03	1 70E-01	1 62E-02
84 FRONT	4 41	9 08	3 1	1 41E+00	6 77E-01	2 91E+00	3 06E-01
84 BACK	11 39	9 15	3 1	3 65E+00	6 92E-01	2 93E+00	2 82E-01
85 FRONT	0 30	3 44	3 1	9 74E-02	1 42E-01	1 10E+00	1 04E-01
85 BACK	0 12	3 25	3 1	3 94E-02	5 63E-02	1 04E+00	1 01E-01
86 FRONT	163 45	152 12	2 3	7 02E+01	1 54E+01	6 53E+01	6 13E+00
86 BACK	68 48	152 93	2 3	2 94E+01	8 03E+00	6 56E+01	6 51E+00
87 FRONT	26 99	108 86	2 3	1 16E+01	5 76E+00	4 67E+01	4 49E+00
87 BACK	8 11	104 86	2 3	3 48E+00	1 95E+00	4 50E+01	4 30E+00
88 FRONT	15 24	51 31	2 3	6 54E+00	3 77E+00	2 20E+01	2 07E+00
88 BACK	4 59	51 62	2 3	1 97E+00	9 89E-01	2 22E+01	2 06E+00
89 FRONT	2 97	21 72	2 3	1 27E+00	1 15E+00	9 32E+00	9 69E-01
89 BACK	3 90	20 53	2 3	1 67E+00	1 18E+00	8 81E+00	8 55E-01
90 FRONT	68 83	40 83	3 1	2 23E+01	4 90E+00	1 33E+01	1 24E+00
90 BACK	418 54	46 72	3 1	1 36E+02	2 12E+01	1 52F+01	1 53E+00
91 FRONT	1320 44	57 66	3 1	4 29E+02	8 47E+00	1 94E+01	1 86E+00
91 BACK	69 16	55 04	3 1	2 25E+01	4 98E+00	1 79E+01	1 66E+00
92 FRONT	13 08	26 19	3 1	4 25E+00	6 92E-01	8 50E+00	8 21E-01
92 BACK	9 93	24 60	3 1	3 22E+00	1 26E+00	7 99E+00	7 47E-01
93 FRONT	1 05	18 06	3 1	3 41E-01	3 21E-01	5 86E+00	6 15E-01
93 BACK	1 96	16 64	3 1	6 37E-01	1 99E-01	5 40E+00	5 06E-01
94 FRONT	304 89	55 62	3 1	9 90E+01	8 01E+00	1 81E+01	1 71E+00
94 BACK	80 60	44 94	3 1	2 62E+01	5 23E+00	1 46E+01	1 47E+00
95 FRONT	133 10	27 42	3 1	4 32E+01	1 99E+00	8 90E+00	8 51E-01
95 BACK	103 72	24 19	3 1	3 37E+01	3 90E+00	7 85E+00	7 42E-01
96 FRONT	3 21	8 40	3 1	1 04E+00	2 52E-01	2 73E+00	2 60E-01
96 BACK	4 86	8 43	3 1	1 58E+00	5 33E-01	2 74E+00	2 70E-01

Pre-Flushing of the Reactor Building Basement, TLD Measurements -- DCH-6-82

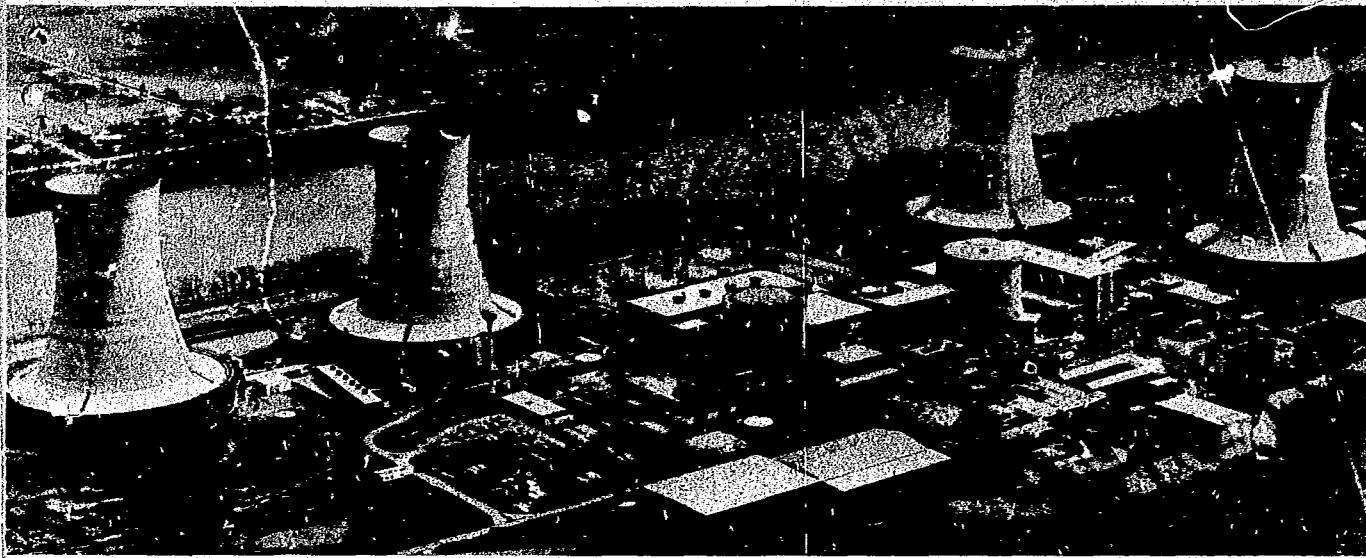
*** SUMMARY OF DOSES AND DOSE RATES ***

Dosimeter	Beta Dose (rad)	Gamma Dose (rad)	Exposure Time (hr)	Beta Dose Rate (rad/hr)	Beta Error (rad/hr)	Gamma Dose Rate (rad/hr)	Gamma Error (rad/hr)
97 FRONT	0.77	3.69	3.1	2.49E-01	1.30E-01	1.20E+00	1.12E-01
97 BACK	0.00	3.81	3.1	0.00E+00	0.00E+00	1.24E+00	1.19E-01

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Submerged Demineralizer System Vessel Shipment Report

MASTER

Geoffrey J. Quinn
James O. Henrie
Jess Greenborg

June 1984

Prepared for the
U.S. Department of Energy
Three Mile Island Operations Office
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SUBMERGED DEMINERALIZER SYSTEM VESSEL SHIPMENT REPORT

**Geoffrey J. Quinn, EG&G Idaho, Inc.
James O. Henrie, Rockwell Hanford Operations
Jess Greenborg, GPU Nuclear Corporation**

Published June 1984

**EG&G Idaho, Inc.
Idaho Falls, Idaho 83415**

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ABSTRACT

Vessels containing zeolites and absorbed fission products from processing accident generated water at Three Mile Island through the Submerged Demineralizer System were found to generate radiolytic hydrogen and oxygen gases. In some vessels with high curie contents, gas generation during shipment could have resulted in flammable gas concentrations exceeding federal limits for radioactive material shipments. Tests of a catalyst bed in the vessel demonstrated that recombination of the gases back into water would permit safe shipment of the sealed vessels. Catalyst was loaded into an available screen assembly in each vessel. Vessel pressure monitoring ensured that net gas generation had stopped and that hydrogen and oxygen concentrations were kept below flammable limits. All shipments complied with federal regulations.

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