

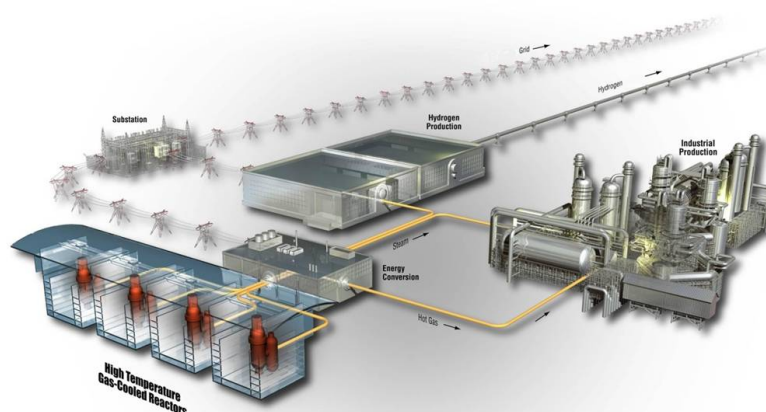


# Data Report on Post-Irradiation Dimensional Change in AGC-1 Samples

May 2021

*Changing the World's Energy Future*

William E. Windes



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**May 2021**

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## **ABSTRACT**

This report documents the measured post irradiation dimensional change in the AGC-1 samples. The AGC-1 capsule is the first in six planned irradiation capsules comprising the Advanced Graphite Creep (AGC) test series. AGC-1 irradiation began September 5, 2009 in the Advanced Test Reactor (ATR) and was completed on January 8, 2011. The capsule was cooled for 3 months in the ATR Canal, and then shipped to MFC in April 2011 for disassembly and sample extraction. After extraction the samples were shipped to the INL Research Center (IRC) for initial post-irradiation examination (PIE) and storage in the irradiated graphite vault. The AGC-1 capsule design contained “matched pair” samples to ascertain the irradiation-induced dimensional changes and levels of creep experienced in different graphite types. The irradiation-induced dimensional changes and creep levels are determined by comparing the total dimensional change for stressed and unstressed samples of the same type of graphite exposed to the same dose levels and at similar temperatures. Under irradiation creep (i.e. permanent strain due to irradiation, stress, and temperature) the stressed samples should demonstrate more dimensional change than the unstressed samples. This additional dimensional change in the stressed samples is designated as “irradiation-induced creep” in graphite. The data are further presented using the parameters influencing dimensional change in graphite; levels of induced stress, temperature, graphite type, and dose. However, the AGC-1 post-irradiation examination is a significant endeavor and this data report serves to provide irradiation-induced dimensional change data for AGC capsule design refinement as well as a status on the progress of the PIE activities. The dimensional changes of both the samples and graphite body are very important to the design of the future AGC capsules (AGC-3 through AGC-6) and are provided as soon as the data are available in order to determine whether design changes to the next capsule are required. A complete evaluation of the irradiation-induced dimensional change data will be performed for a final AGC-1 PIE report that will include full analysis of pre- and post-irradiation data, with verified AGC-1 irradiation conditions of temperature and dose.

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## ACRONYMS

AGC	Advanced Graphite Creep
ASME	American Society of Mechanical Engineers
ATR	Advance Test Reactor
INL	Idaho National Laboratory
IRC	INL Research Center
CCL	Carbon Characterization Laboratory
MFC	Material and Fuels Complex
HFEF	Hot Fuel Examination Facility
<b>LAMDA</b>	<b>Low Activation Materials Development and Analysis</b>
NDMAS	NGNP Data Management and Analysis System
NGNP	Next Generation Nuclear Plant
PIE	Post-Irradiation Examination
QA	Quality Assurance
R&D	research and development



# Data Report on Post-Irradiation Dimensional Change in AGC-1 Samples

## 1. INTRODUCTION

The Next Generation Nuclear Plant (NGNP) Graphite Research & Development (R&D) program is intended to provide quantitative material property data of nuclear grade graphite to predict the material's behavior within a nuclear reactor core. The five main areas of R&D initiated to achieve these goals are (1) establishing a viable nuclear graphite supply source by collaborating with graphite manufacturers and sharing data from material test programs, (2) building a statistically defensible as-formed (virgin) material property database that provides baseline values for all pertinent material properties, (3) conducting an extensive irradiation program that focuses on irradiation creep within nuclear graphite as the critical life limiting mechanism during irradiation, (4) developing an understanding of the underlying mechanisms controlling the graphite behavior under irradiation, and (5) developing analytical models based on the quantitative data and results from the fundamental studies. All five areas are critical to knowing the material performance during reactor operation, but the materials irradiation program is key in developing the tools needed to predict the thermal, mechanical, and physical behavior of graphite under irradiation.

The NGNP graphite materials irradiation program is being performed under the Advanced Graphite Creep (AGC) test series, as described in the Graphite Technology Development Plan (TDP).<sup>i</sup> This test series exposes a variety of nuclear grade graphite types to high temperatures and a range of doses that are expected within a high temperature gas-cooled reactor (HTGR) design. In addition, based upon previous experience with these graphite core reactor designs, the phenomenon of irradiation-induced creep within the graphite is critical to the total useful lifetime of the graphite components. Irradiation-induced creep occurs under the simultaneous application of high temperatures, neutron irradiation and applied stresses within the graphite components as shown in Figure 1. Significant internal stresses within the graphite components can arise from a second phenomenon, irradiation-induced dimensional change, where the graphite physically changes: first by shrinking and then by expanding, if greater levels of irradiation dose are experienced. This disparity in material volume change can induce significant internal stresses within the graphite components. Irradiation-induced creep assists in the removal of these large internal stresses, thus reducing the risk of crack formation and component failure. Obviously, higher irradiation creep levels tend to relieve more internal stress, allowing for the components longer useful lifetimes within the core. As a consequence, the AGC test series has a significant scope dedicated to determining the irradiation-induced creep rates of the different types of nuclear graphite.

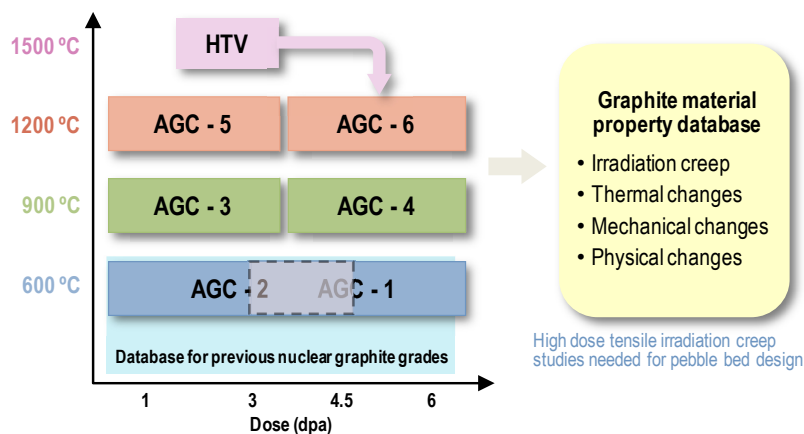


Figure 1. Irradiation dose and temperature parameters of the AGC Test series; the gray area between AGC-1 and AGC-2 is the expected dose overlap between capsule irradiation.



The traditional method for measuring irradiation-induced creep is to apply a significant load to half the samples during irradiation while leaving the remaining half of the samples unloaded. The samples under no applied load will experience only irradiation-induced dimensional change but the loaded samples will experience irradiation creep in addition to the dimensional changes. If each of the two different samples are irradiated to the same dose level and similar temperature, the measured difference in dimensional geometry between loaded and unloaded samples is the amount of irradiation-induced creep for the specific graphite type. The AGC test series uses this method to determine the irradiation-induced dimensional changes as well as irradiation creep levels for the five major types of nuclear grade graphite being considered for the NGNP. The AGC test series uses matched pair samples for each major graphite type to ascertain the irradiation-induced creep over a range of neutron dose levels, at three different applied load levels, and for three different temperatures.<sup>i</sup> The design concept of the individual AGC irradiation capsules is further explained in the sections that follow.

Before irradiation, each individual sample undergoes a series of thermal and physical (non-destructive) pre-irradiation tests.<sup>ii</sup> Extensive dimensional measurements are performed in both the axial and lateral dimensions according to ASTM C559 (05).<sup>iii,iv,v</sup> After irradiation, the samples are recovered and the physical dimensions are re-measured using the same techniques and standards as the pre-irradiation examination.<sup>vi,vii</sup> Both the loaded and unloaded samples are measured with the assumption that the temperatures and doses for the matched pair samples are similar.

This data report summarizes the dimensional changes for loaded and unloaded AGC-1 samples to provide irradiation-induced dimensional change data for refinement of AGC capsule designs and to status the progress of the AGC-1 post-irradiation examination (PIE) activities. The measured dimensional changes of both graphite samples and the graphite body holding the samples are very important to the design of the future AGC capsules (AGC-3 through AGC-6). Since the design of AGC-3 and AGC-4 capsules is currently underway, the dimensional measurement data are provided as soon as available in order to determine whether design changes are required. All dimensional changes for all samples are presented as a function of dose. The data are further presented by major graphite type and applied load levels<sup>viii</sup> to illustrate the influence of graphite forming processes and stress levels within the graphite components on the measured behavior. Finally, the dimensional changes to the unloaded (unstressed) minor graphite types and fuel compact matrix material are presented over the AGC-1 dose range.

## 2. DESCRIPTION OF AGC TEST SERIES

The AGC test series, consisting of six irradiation capsules, will generate irradiated graphite performance data for NGNP reactor operating conditions. The AGC test series is designed to determine the changes to specific material properties such as thermal diffusivity, thermal expansion, elastic modulus, mechanical strength, irradiation-induced dimensional change rate, and irradiation creep for a wide variety of nuclear grade graphite types over a range of high temperature and moderate doses. A series of six capsules containing graphite test specimens will be used to expose different nuclear graphite types to a dose range of 1 to 7 displacements per atom (dpa) at three different temperatures: 600, 900, and 1200°C. Since irradiation-induced creep within graphite components is considered critical to determining the operational life of the graphite core, approximately half of the irradiation creep samples will also be exposed to an applied load during exposure. This will allow a determination of the induced creep level for each graphite type at three different temperature levels and a moderate range of neutron dose.

### 2.1 General Design of AGC Capsules

The AGC test series consists of 6 irradiation capsules irradiating approximately 500 graphite samples in each capsule. As shown in Figure 1, the AGC test series is designed to irradiate graphite samples over a neutron dose range of 0.5 to 7 dpa. Two capsules must be used; one exposed to the range of 0.5–3.5 dpa and one irradiated twice as long, producing a dose range of 3–7 dpa. The first two capsules are intended to be irradiated at 600°C, the next two capsules at 900°C, and the final two at 1200°C. As explained previously, to determine the irradiation creep rate in specific types of nuclear graphite, half of the samples are placed under a mechanical load during irradiation, which is intended to accelerate dimension changes that occur naturally in graphite during irradiation. By measuring the dimensional changes of the mechanically loaded samples to samples without a mechanical load applied, but receiving the same dose and temperature, the irradiation-induced creep levels for each type of graphite can be determined as a function of dose within each capsule at a uniform temperature. The key is to provide mechanically loaded and unloaded samples of the same graphite type with temperatures and dose levels as similar as possible. The structure of the graphite irradiation capsules are centered around this design requirement and attempt to provide samples experiencing the same temperatures and neutron dose levels as possible.

The Advanced Graphite Capsules (AGC) are used to irradiate graphite samples to the high temperature reactor conditions of the NGNP. The design of these capsules makes use of the symmetric neutron flux profile of the Advanced Test Reactor (ATR) to irradiate matched pairs of graphite samples above the reactor mid-point elevation that are mechanically loaded and below the reactor mid-point line that are not mechanically loaded during irradiation as shown in Figure 2. The design of the capsule and an insulating helium-argon cover gas mixture ensures a constant temperature for all samples throughout the capsule, but to ensure that sample matched pairs are similar in dose, the sample stacking order must be matched to the ATR flux profile such that similar samples on the top portion of the capsule match the sample dose received in the bottom of the capsule.



Figure 2. Schematic of AGC-1 capsule sample loading stack. Loaded samples are shown above the core centerline.

To achieve similar dose levels, the ATR flux profile is compared to the sample/capsule elevation specifications. By taking into account the flux profile, the samples are ordered so that matched pairs will receive similar dose levels on the bottom and top sections of the capsule. This stacking order is further complicated by the fact that the axial ATR neutron flux profile is not completely symmetric because of the core components slightly altering the profile as shown in Figure 3. This requires a small offset in the sample stacking order in the bottom half of the capsule to line up samples to the correct dose level. The offset is achieved by inserting a few smaller piggyback samples next to the core centerline of the capsule before the first creep sample. The creep samples can then be positioned as close as possible within the ATR neutron flux profile to achieve similar dose levels for each matched pair.

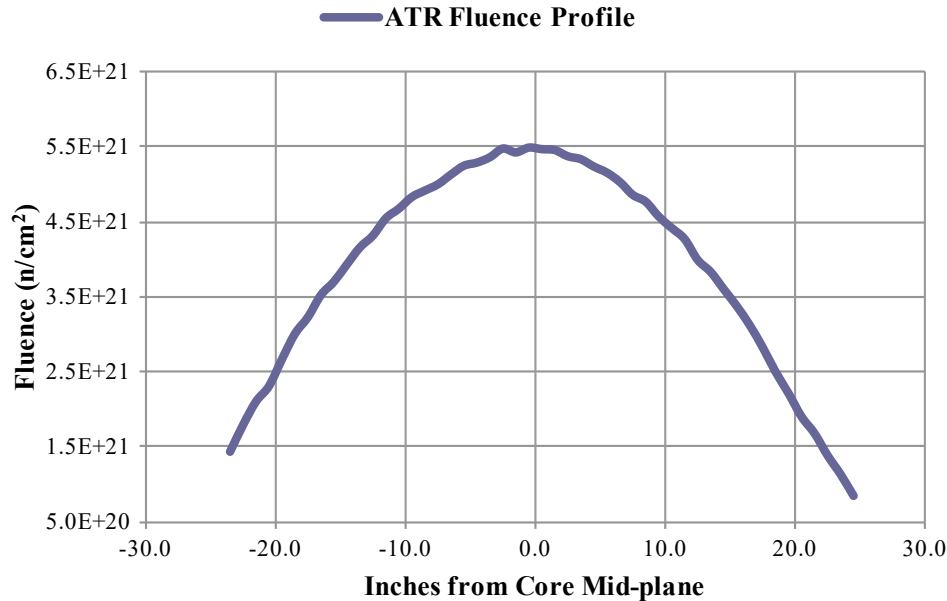


Figure 3. Fluence profile in ATR during AGC-1 capsule irradiation.

Because of the limited volume in the capsules and the large number of graphite types being investigated, the stacking order must ensure an equal distribution of samples over the entire dose range in the irradiation capsule. With six graphite types being investigated, three different mechanical load levels, and samples 25.4 mm long, a careful plan was required to evenly distribute as many samples as possible over the entire dose range. To gain more information for the newer graphite types, more samples of newer types were incorporated into the test train than older types (new PCEA graphite versus the old H451 type) somewhat skewing the number of samples slightly from type to type. Another consideration for the stacking order within the capsules is the microstructural orientation of the graphite samples to the applied load during irradiation. It is anticipated that with-grain creep rates differ from against-grain creep rates, and the with-grain creep is considered a more important parameter for nuclear graphite components so more samples in this orientation are required. Approximately 10–15% of the total samples are against-grain with the remaining being with-grain orientation.

Finally, the design has each capsule irradiated at a constant temperature, allowing only the dose and applied mechanical load to vary inside each capsule. The creep rate of graphite types is therefore assumed to be measured as only a function of load and dose within each capsule. To ascertain the temperature dependency of irradiation-induced material property changes, the creep rates of similar graphite type samples (at similar dose and load levels) must be compared between capsules. This implies that similar graphite types must be in the exact same locations in every capsule to receive similar dose and load levels at different temperatures. All six AGC capsules in the test series will be irradiated in the Idaho National Laboratory (INL) Advanced Test Reactor (ATR). AGC-1 and AGC-2 capsules were irradiated in the

south flux trap, AGC-3 will be irradiated in the east flux trap, and AGC-4 through AGC-6 capsules will be irradiated in the northeast flux trap to accommodate NGNP irradiation priorities. After irradiation, all AGC capsules will be cooled in the ATR Canal, sized for shipment, and shipped to the Materials and Fuels Complex where each capsule will be disassembled in the Hot Fuel Examination Facility (HFEF). During disassembly, the metallic capsule will be machined open and the individual samples removed from the interior graphite body containing the samples. Samples removed from the capsule will be loaded in a shipping drum and shipped to the INL Research Center (IRC) for PIE and storage for any future testing at INL's recently completed Carbon Characterization Laboratory (CCL) or ORNL's **Low Activation Materials Development and Analysis (LAMDA) Laboratory shown in Figures 4 and 5.**

Both the CCL and LAMDA facilities are designed to characterize and test low activated irradiated materials such as high-purity graphite, carbon-carbon composites, and silicon-carbide (SiC) composite materials.<sup>ix</sup> The laboratories are fully capable of characterizing properties of both irradiated and nonirradiated materials, and will share the testing responsibilities for all AGC samples. The CCL will also process all specimens for initial visual inspections, dimensional measurements, and repackaging of samples (both pre- and post-irradiation) for storage or shipping, as shown in Figure 6.



Figure 4. The INL CCL showing thermal testing equipment.



Figure 5. ORNL's LAMDA Laboratory.

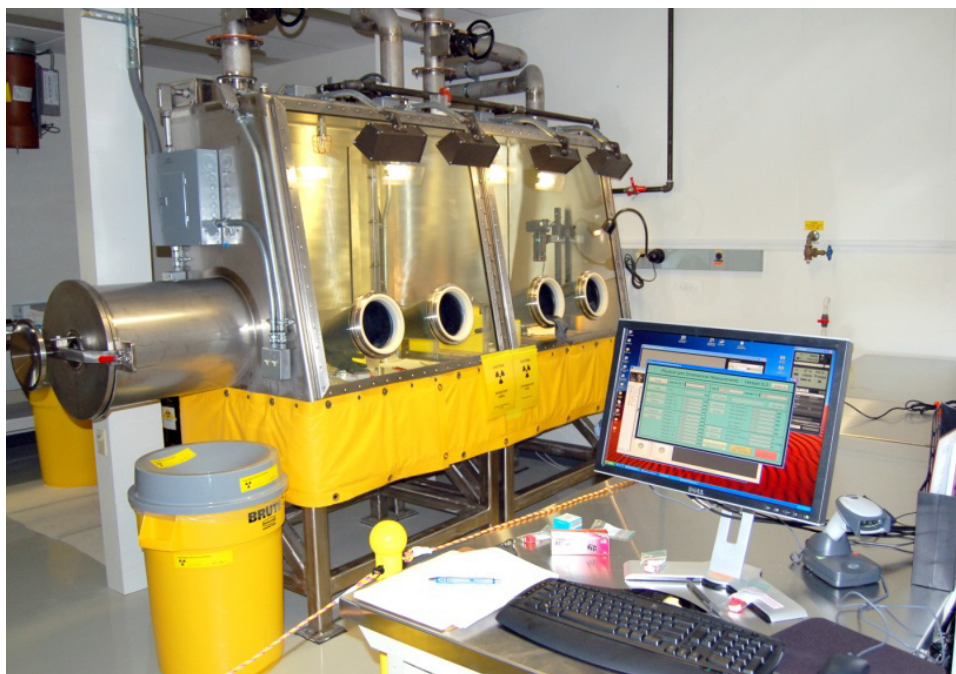


Figure 6. The CCL glove box used to visually inspect irradiated graphite samples, perform dimensional measurement, and repackage samples for storage in the irradiated graphite vault located in Lab C-19.

AGC-1 capsule irradiation and disassembly pre-irradiation examination of all AGC-1 samples was completed in July 2009. Sample loading and capsule insertion into the ATR occurred in August 2009. AGC-1 capsule irradiation began September 5, 2009, and was completed January 8, 2011, accumulating 351 effective full-power days of irradiation. AGC-1 was irradiated longer than originally planned, resulting in an accumulated dose range of from 1.36–6.94 dpa. After approximately 60 days of thermal cool-down, the top and bottom ends of the capsule were removed to allow the 42-inch-long sample section of the assembly to be inserted into a GE2000 shipping cask. The capsule was shipped to the Materials and Fuels Complex in April 2011, and disassembly was performed in the HFEF main cell from May through July 2011. Graphite samples were shipped to the IRC in June and July 2011, and PIE activities were initiated in July 2011.<sup>x</sup> Since the AGC-1 capsule was a first of its kind design, part of the function of the capsule was to determine the viability of these new designs and assumptions. No experiment works perfectly the first time and the AGC-1 capsule had some challenges as expected. The Technical and Functional Requirements<sup>xi</sup> required a uniform temperature of 600°C (+/- 50°C) throughout the entire capsule and a maximum dose of 3.5 dpa. Because of an error in the heat transfer software, the temperature profile achieved during irradiation was not as uniform as designed as shown in Figure 7. The initial measured temperature levels achieved in reactor were approximately 195°C lower in both the upper and lower regions of the capsule than planned. As a consequence, it was decided to raise the temperature of the entire capsule to ~675°C on average by eliminating the conducting helium gas in the gas mixture. While this increased the overall temperatures of the samples, it also increased the uniformity of the temperature profile along the length of the capsule, which is the primary objective for each capsule. Maintaining 600°C temperature within the capsule is of minimal importance when compared to providing a uniform temperature throughout the capsule. However, a large amount of temperature control over the capsule was forfeited when the helium gas was eliminated. This allowed the reactor power levels during each cycle to have greater influence on the capsule temperatures than was originally planned.



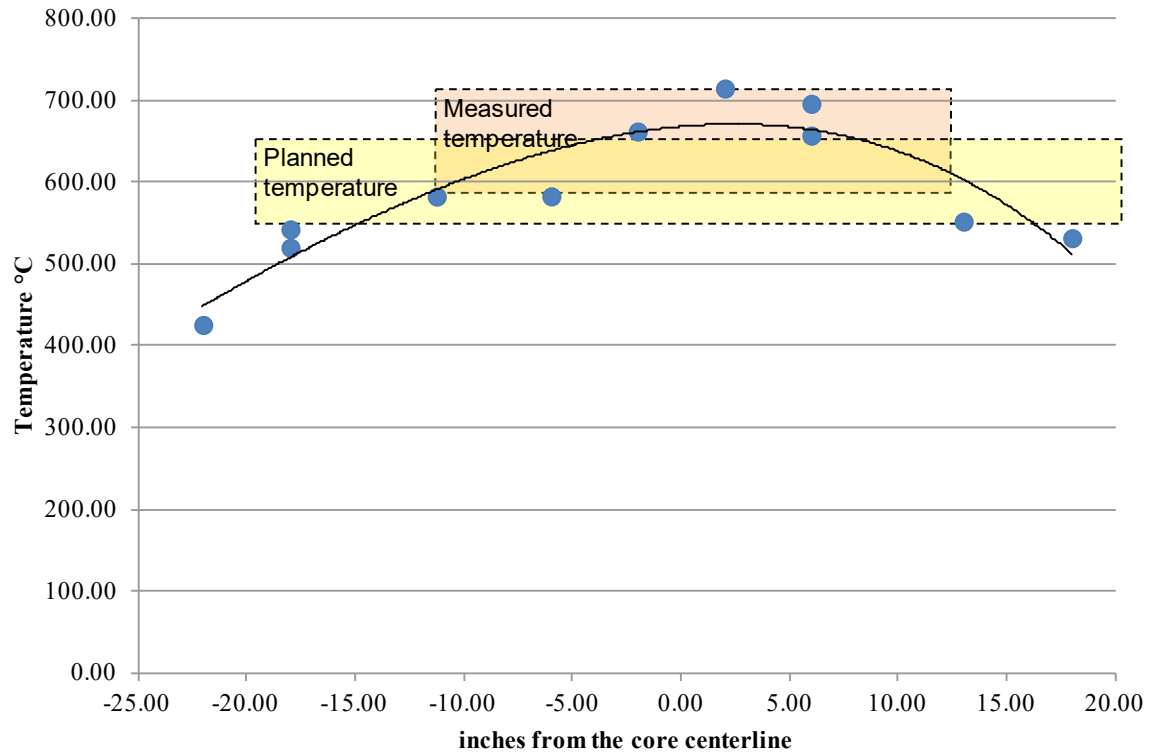


Figure 7. Preliminary estimate of achieved temperature profile in the AGC-1 capsule.

The AGC-1 capsule Technical and Functional Requirements targeted a maximum axial temperature variation of 100°C (+/- 50°C) and a maximum radial temperature variation of 40°C (+/- 20°C). During irradiation, the measured axial temperature variations were larger than planned but the radial variations were within acceptable levels for this first capsule (14°C difference at the cooler ends of the capsule to 59°C near the centerline of the capsule). The maximum measured and calculated axial temperature variation through the entire capsule was approximately 350°C with a dose ranging from 1.82–6.94 dpa.<sup>xii</sup> However, the temperature variations in the creep sample region near the capsule centerline were much lower than over the entire capsule length (maximum temperature variation of 250°C), and over half of the creep samples were located near the middle 25-inches of the capsule centerline, which had a maximum temperature variation of only 130°C over this central length, bringing the variation near to acceptable levels as shown in Figure 7. The temperature variation between matched pair samples in this central 25-inch region ranged from a low of 30°C to a high of 68°C between sample pairs. While these temperature variations are higher than planned, they are within acceptable levels of uncertainty. Samples outside this central 25-inch region will need further analysis to determine how the larger temperature uncertainty affects the irradiation property changes.

Additionally, the received doses to the samples in the bottom part of the AGC-1 capsule were slightly different than designed. Prior to irradiation, an ATR flux profile was used to calculate the dose levels for each sample as a function of position within the AGC-1 capsule. The profile used was not the most current ATR flux profile and the positions of the unstressed (bottom) samples were not correctly calculated. Instead of a 44.5 mm (1.75 inch) offset from the reactor core centerline, an 88.9 mm (3.5 inch) offset was calculated. Based on the most current ATR flux profile, this increased offset generated a maximum 9.4% difference in received dose levels between the matched-pair samples at the start of irradiation in the AGC-1 capsule. However, by the end of the irradiation, with both capsule and sample shrinkage because of irradiation, the sample positions changed with the upper loaded samples getting closer to the core centerline. This migration of sample position resulting from irradiation brings the

matched pair samples back into alignment, reducing the maximum dose difference between matched-pair samples to an estimated 3–4%. This small dose difference will lead to an additional uncertainty in the received dose levels between matched pair samples and between similar sample types in different capsules. A more thorough analysis of these irradiation differences will occur in the final AGC-1 PIE report, which will include a complete analysis of all material property changes achieved for each sample, and a thorough analysis of any additional uncertainty resulting from these larger temperature and dose variations for each type of graphite. While the complexity of this first graphite capsule design prevented it from achieving the desired degree of test parameter control, the as-irradiated environmental conditions were accurately measured. These accurate capsule condition measurements will provide the data necessary to ascertain the material properties change for each individual sample within the final PIE report as well as the uncertainty within the specific material changes.

### 3. INITIAL POST-IRRADIATION EXAMINATION OF AGC-1 SAMPLES

The AGC-1 samples are currently undergoing PIE at both of the INL and ORNL laboratories. At this time, approximately 25% of the PIE activity is complete with the remaining 75% of the work to be performed over the next 12 months. This is a significant endeavor. This data report provides a status on the progress of the PIE activity and presents dimensional change data for the AGC-1 samples.

#### 3.1 Measurement of Dimensional Change in AGC-1 samples.

All AGC-1 samples were disassembled from the capsule and initially examined at the INL CCL [10]. All samples received from the INL's HFEF were visually inspected for damage, dimensionally measured, repackaged and stored in the INL's irradiated graphite storage vault. In February 2012, most of the large AGC-1 creep samples were shipped to Oak Ridge National Laboratory for remaining PIE as detailed in Table 1. The INL held back two creep samples from each graphite type to assist in qualifying the CCL for irradiation testing of the next capsule of AGC samples (AGC-2 capsule). These 12 samples at INL are also currently undergoing PIE.

Table 1. Material property testing for AGC Graphite samples

Physical Properties	Applicable Mechanisms and Models
Mass (bulk density)	Creep models, strength models, thermal models
Irradiation dimensional change	Dimensional change models, creep rate, mechanical property changes
Elemental impurities	Impurity induced oxidation, waste, and recycling
Elastic modulus	Creep models, strength models
Shear and Young's modulus	Creep models, strength models
Poisson's ratio	Creep models, strength models
Microstructure isotropy	Dimensional change mechanisms, texture effects, creep models
<b>Thermal properties</b>	
Coefficient of thermal expansion (25 to 800°C)	Gaps between core components, fluid dynamics, external stresses on components
Thermal diffusivity (25 to 1000°C)	Passive heat removal, fuel temperature
Specific heat (selective samples)	Passive heat removal, fuel temperature
<b>Mechanical Strength</b>	
Compressive, tensile, and flexural	Strength models, fracture toughness/failure criteria
Irradiation creep	Rate internal stresses are relieved, turnaround point, induced pore formation

Post-irradiation dimensional measurements were conducted on all AGC-1 samples during the receipt and visual examination of samples after disassembly. Dimensional measurements used ASTM International standard C 559 (10) to provide consistency with the pre-irradiation dimensional measurements. Dimensional change in each cylindrically shaped sample is measured in both the axial and radial directions. Four axial measurements, placed at 90-degree positions, are averaged together to arrive at the total axial length. The radial cross-section is taken at eight different locations down the length of the specimen to determine the average radial dimension for each sample as shown in Figure 8.



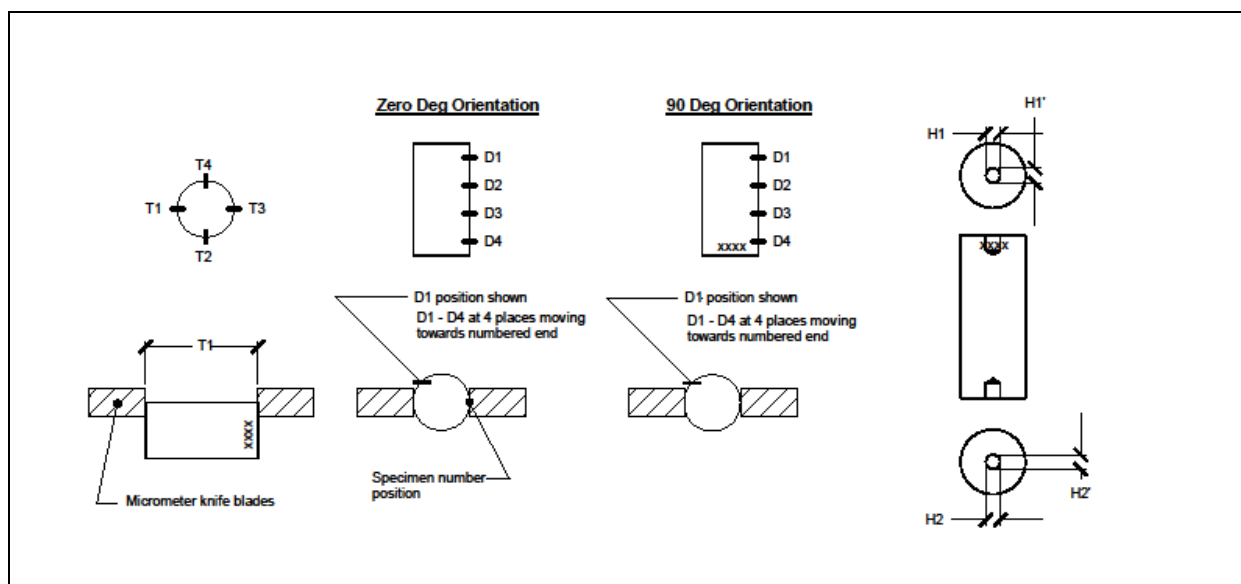


Figure 8. Schematic illustrating measuring points for dimensional measurement of large creep samples.

During irradiation, stressed samples with an applied compressive load will experience lateral creep (or barreling) due to Poisson's effect as shown in Figure 9 as well as more shrinkage from irradiation creep. Lateral creep in AGC-1 creep samples is determined by a comparison of the pre-irradiation and post-irradiation radial dimensions. However, the main focus for this report will be on axial dimensional changes (length changes) since the change is relatively large and requires minimum interpretation of the sample microstructure and grain orientation to ascertain the induced strain. Minimal lateral or volumetric creep results will be analyzed in this report but will be evaluated in the final AGC-1 PIE report.

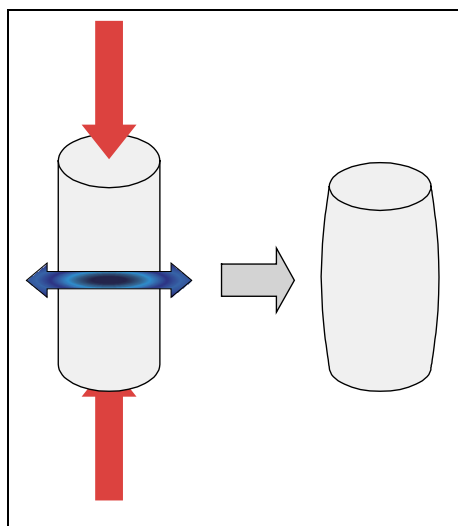


Figure 9. Schematic illustration of lateral creep (barreling) effect after irradiated compression testing.

The change in axial (length) dimensions for irradiated samples ( $\Delta L/L$ ) is derived from simply subtracting the length change values of the unirradiated creep samples from the irradiated sample dimensional values. Plotting the sample length change as a function of received dose provides the influence of the neutron dose on the irradiation-induced permanent strain in each sample. There is a clear distinction between stressed and unstressed AGC-1 graphite samples, even when no other parameter is

considered as shown in Figure 10. Unstressed samples underwent a dimensional change of 0–2% whereas stressed samples saw larger linear shrinkage between 0.5 and 6%. These simple results prove the dose and stress levels selected for the AGC test series were accurately estimated to induce significant irradiation dimensional change for all graphite types within the NGNP graphite operating temperature envelope.

While the sample type (creep or piggyback), type of graphite, different stress levels, and effects of temperature variations within the AGC-1 capsule have not yet been segregated from each other, the general behavior for all the graphite types is universal and within the expected levels predicted for the test series based on past irradiation experience of historic graphite types. As seen in Figure 10, all new or currently available nuclear graphite types have nominally the same irradiation response as the historic H451 type, indicating that the newly developed nuclear graphite types are well within the NGNP nuclear graphite requirements.

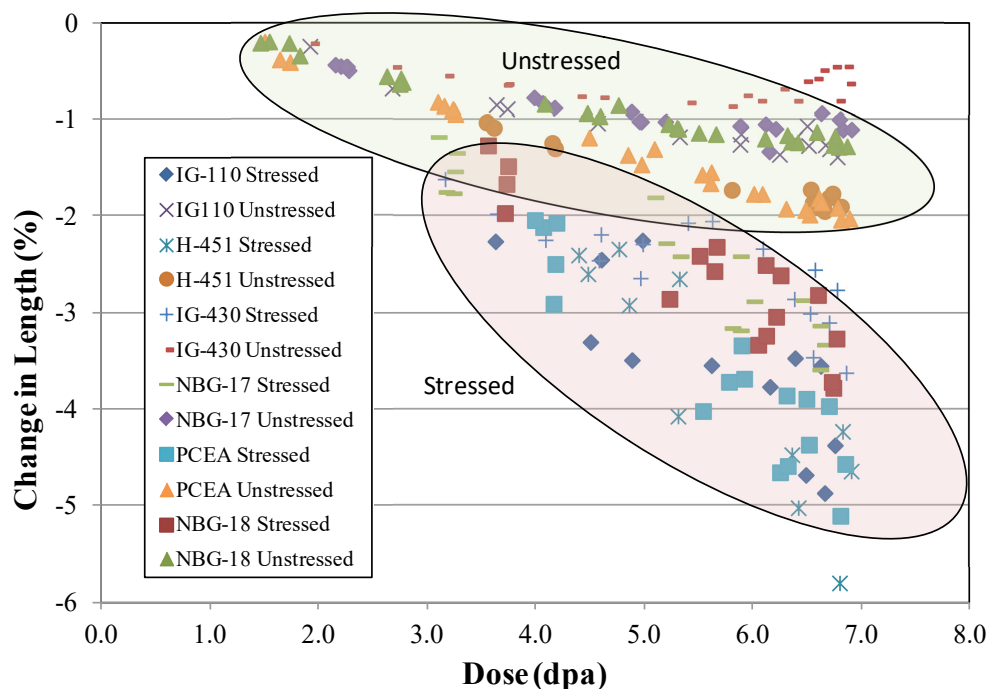


Figure 10. Change in sample length for all AGC-1 samples.

When data from only the creep samples are analyzed, some differences between graphite types are evident as shown in Figure 11. Even with the uncertainties identified previously, the unstressed length change for extruded graphite types is distinguishably larger than iso-molded or vibramolded graphite types. As seen in Table 2, this is not simply a difference in grain sizes or even coke source materials since the vibramolded NBG-18 material possesses the largest grain size (1.6 mm on average), the iso-molded IG-110 is formed with the smallest grain size (5–50  $\mu\text{m}$  on average), and the extruded PCEA has a moderate grain size (0.8 mm on average).

The data in Figure 11 has not differentiated the effects from applied load (induced stress) nor the individual sample temperatures. However, simply comparing the different levels of stress induced creep strain between the three forming methods shows differences between the extruded and isomolded graphite types. The dimensional change trends for vibramolded graphite types are difficult to analyze from this data, so additional testing parameters need to be accounted for to determine if any trends are apparent.

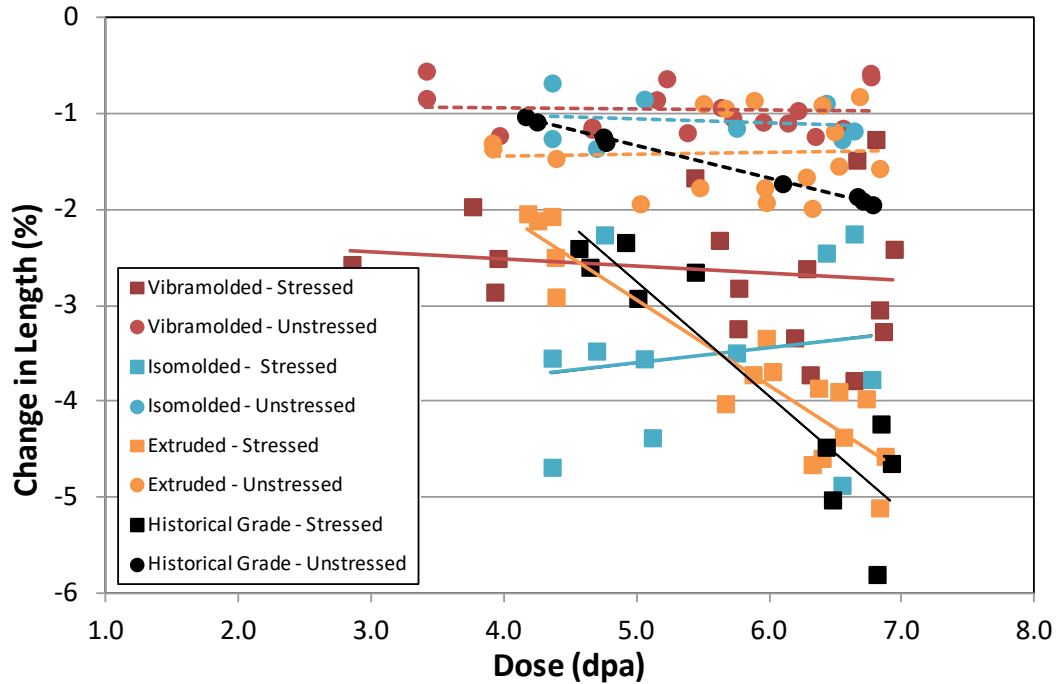


Figure 11. Differences in irradiation-induced length changes between the extruded, vibramolded, and isomolded graphite types for three different loading levels (14, 17, and 21 MPa).

Table 2. Major Types of AGC-1 graphite.

Graphite	Manufacturer	Coke Type	Grain Size	Forming Process	Remarks
IG-110	Toyo-Tanso	Petroleum coke	Fine grain	Iso-molded	Prismatic fuel element, replaceable reflector, and core support pedestals
IG-430	Toyo-Tanso	Pitch coke	Fine grain	Iso-molded	Prismatic fuel element, replaceable reflector, and core support pedestals
NBG-18	SGL	Pitch coke	Medium grain	Vibramolded	Prismatic replaceable reflector Pebble bed reflector structure
NBG-17	SGL	Pitch coke	Medium grain	Vibramolded	Prismatic fuel element and replaceable reflector. Pebble bed reflector structure and insulation blocks
PCEA	GrafTech	Petroleum coke	Medium grain	Extruded	Prismatic fuel and replaceable block. Pebble bed reflector and insulation blocks
H-451	SGL	Petroleum coke	Medium grain	Extruded	Historical reference, no longer available.

Dimensional length changes for the six major types of graphite at the four applied loads (0, 13.8, 17.2, and 20.7 MPa) are presented for each type of graphite in Figures 12, 13, and 14. Some trends are easily seen from the data. For example, samples for all graphite types with higher applied loads show an accelerated dimensional change for the same received dose levels. It is also interesting to note that all new graphite types appear to have lower dimensional changes under stress than the historic H451 graphite grade. However, this result will require further analysis in the final AGC-1 PIE report following completion of post-irradiation testing. The final PIE report will establish levels of confidence for the temperature, dose, and applied loads for each of the samples during analysis. Based on these confidence levels, the accuracy of the data analysis will be determined within the final report.

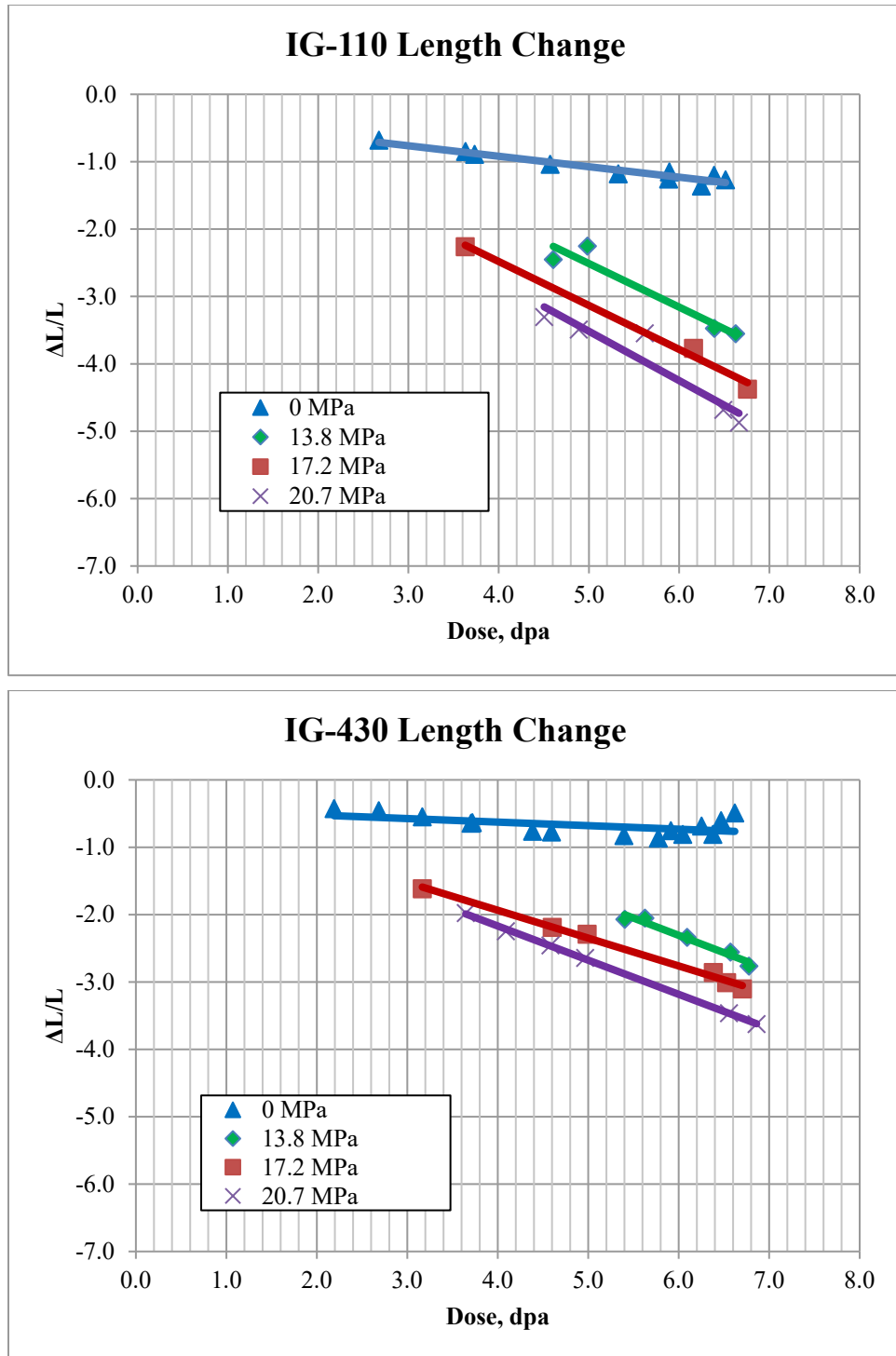


Figure 12. Irradiation-induced length change for isomolded graphite types at three different loading levels (IG-110 & IG-430).

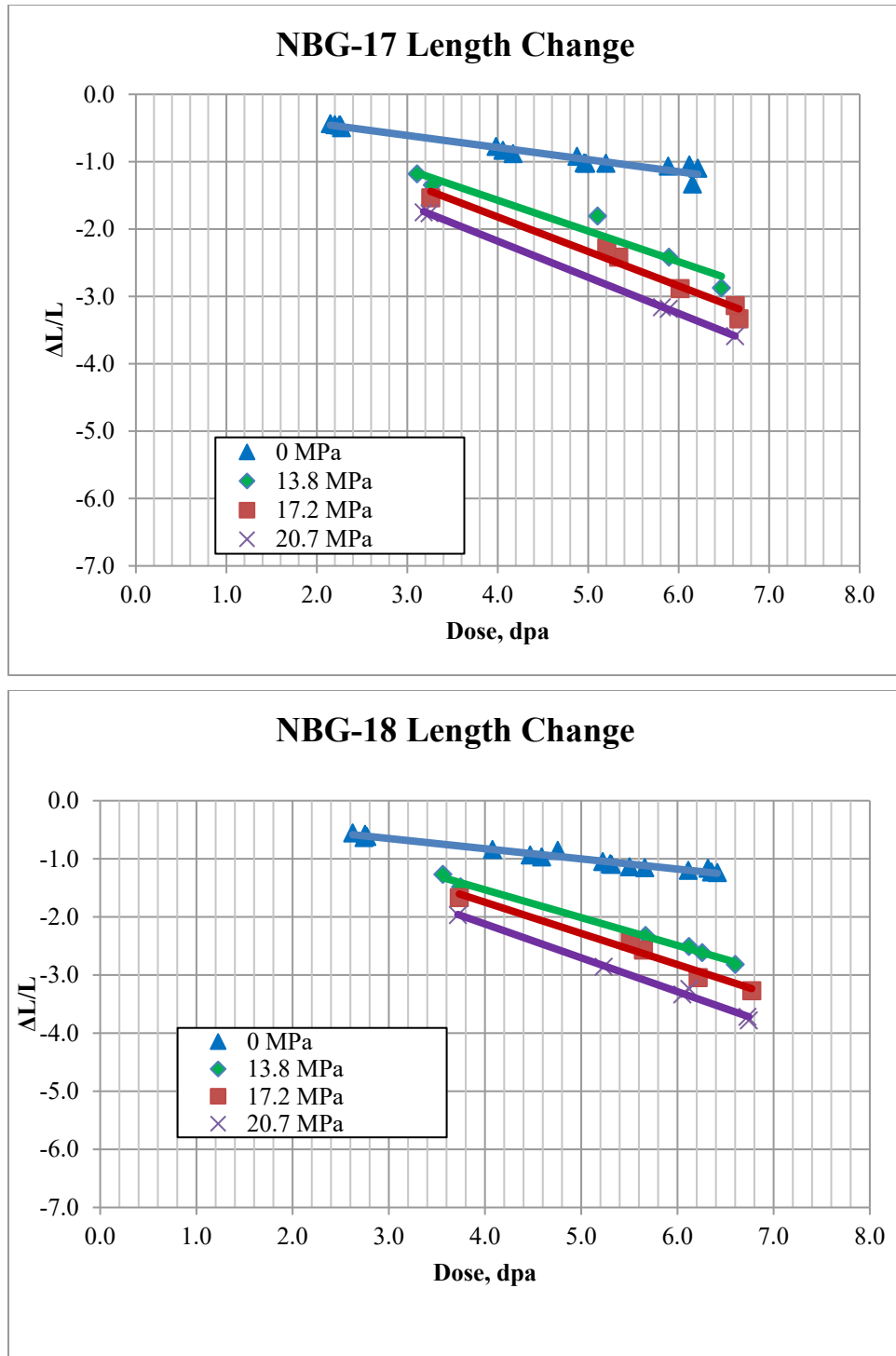


Figure 13. Irradiation-induced length change for vibramolded graphite types at three different loading levels (NBG-17 & NBG-18).

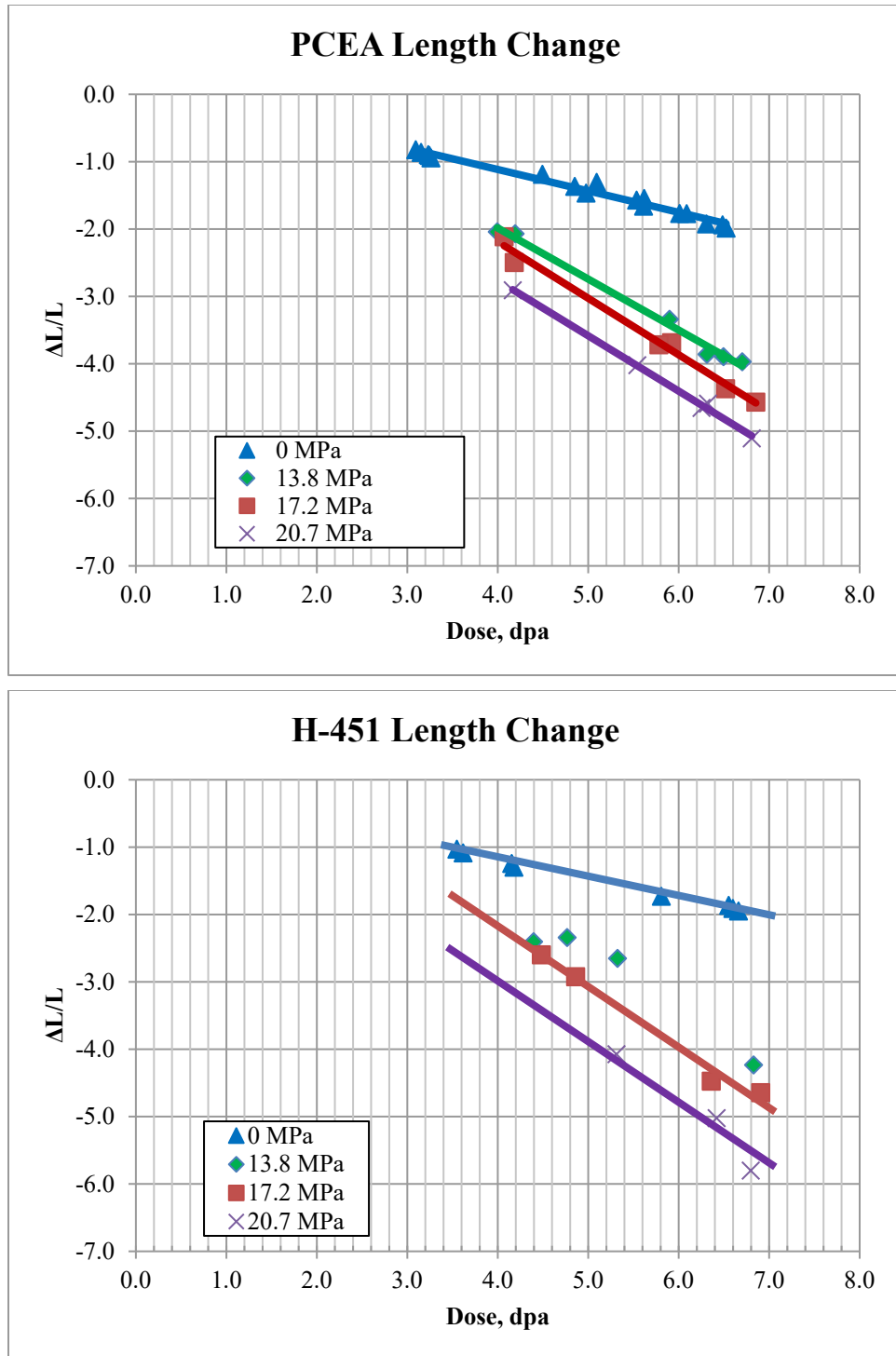


Figure 14. Irradiation-induced length change for extruded graphite types at three different loading levels (new PCEA & historic type H451).

The unstressed irradiation-induced dimensional change was measured for the A3 TRISO fuel compact matrix material and other minor graphite types as shown in Figures 15 and 16. The A3 compact matrix samples show dimensional growth/expansion at higher levels of neutron dose. Dimensional expansion past the original component dimensions is generally considered undesirable in a nuclear reactor and should be avoided. This undesirable behavior is most likely because of the relatively low A3 matrix fabrication temperatures of 1800°C, which is not enough to fully graphitize the carbon-rich compact material. Past experience and studies have shown that a component with a fully graphitic carbon structure provides greater stability under neutron irradiation. To provide maximum irradiation stability, nuclear grade graphite is fully graphitized at 2800–3000°C.

None of the minor graphite types exhibited dimensional increase over the AGC-1 dose range, illustrating the irradiation dimensional stability of nuclear grade graphite as shown in Figure 16. The unstressed dimensional changes for these minor types were comparable to the unstressed change for the major graphite types presented previously; -1 to -2% shrinkage. A summary of PIE dimensional change data measured for all AGC-1 samples is presented in Appendix A. The table includes dimensional length change measurements as well as lateral (diameter) dimensional (both measured in millimeters) and volumetric changes for each sample. This data will be presented within the final AGC-1 PIE report after a full analysis of all testing and measurements has been completed.

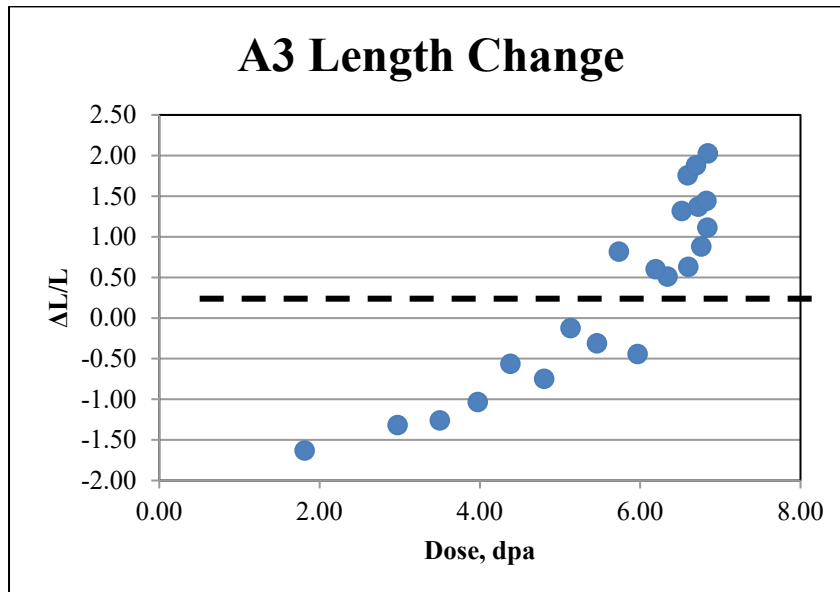


Figure 15. Irradiation-induced length change for A3 compact matrix material showing length expansion past the original (unirradiated) component length.



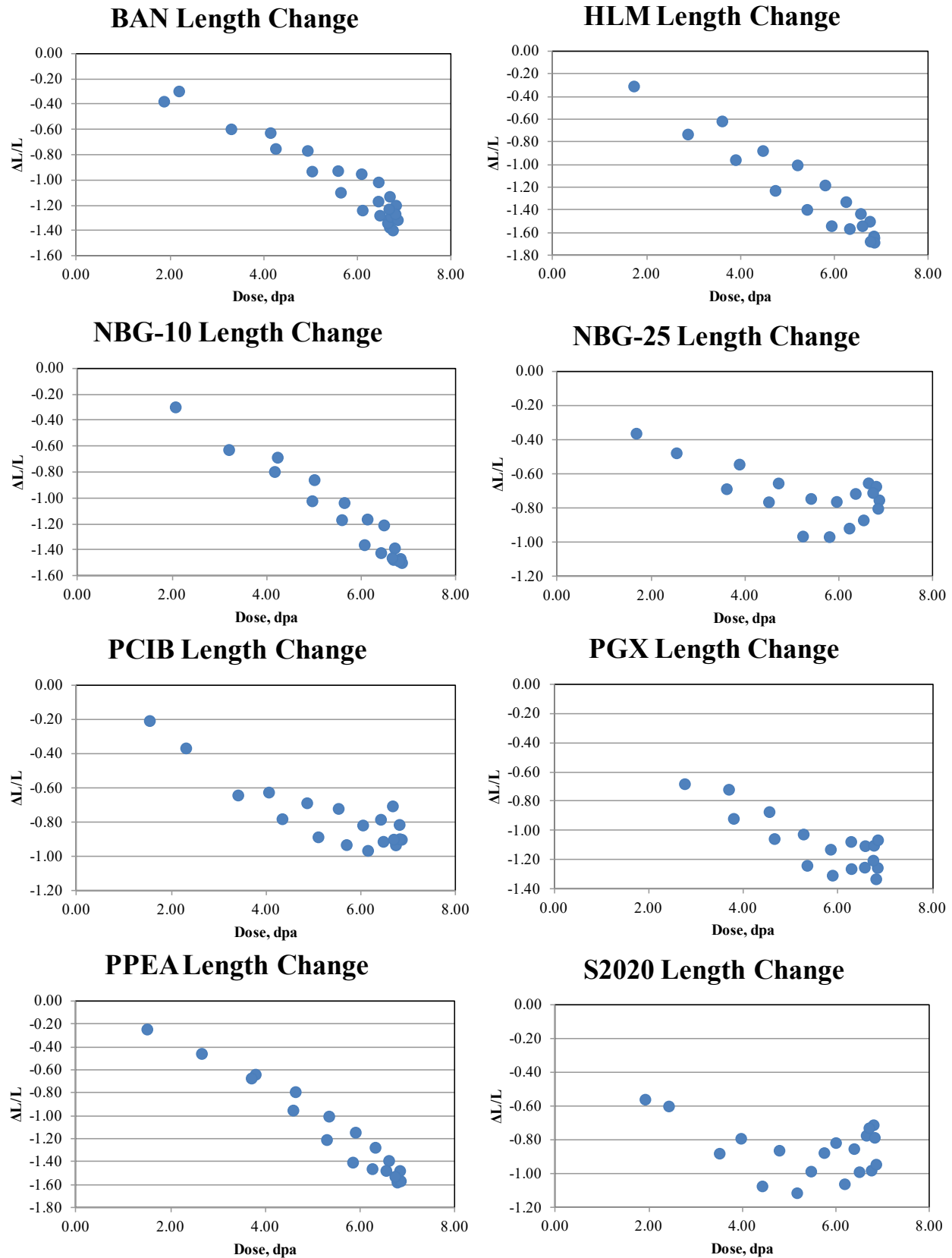


Figure 16. Irradiation-induced length change for minor graphite types in AGC-1 capsule.

## 4. REFERENCES

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- 10 W. D. Swank, Initial Data Report on Post-Irradiation Dimensional Change, INL/EXT-11-23165, September 2011.
- 11 B. Grover, Advanced Graphite Capsule AGC-1 Experiment Test Train, TFR-508, August 2009.
- 12 T. Reed, AGC-1 Irradiation Report, INL-EXT-12-1943, June 2012.

## **Appendix A**

### **Summary of Post-Irradiation Examination Dimensional Change Data Measured for all AGC-1 Samples**

Specimen ID#	Location	Grade	Initial Distance from Centerline	Ave. Temperature °C	Ave. dpa	Post Irradiation L1
H-16-1	5PB22	A3-Matrix	4.66	672.21	6.68	6.417
H-16-2	6PB17	A3-Matrix	2.17	679.54	6.88	6.437
H-17-1	6PB22	A3-Matrix	4.66	677.09	6.79	6.436
H-3-1	CPB2	A3-Matrix	18.47	620.90	3.50	6.242
H-3-2	CPB12	A3-Matrix	15.98	645.17	4.38	6.240
H-4-1	CPB22	A3-Matrix	13.49	680.90	5.13	6.269
H-4-2	CPB32	A3-Matrix	11.00	712.17	5.74	6.281
H-5-2	CPB52	A3-Matrix	6.02	747.27	6.52	6.376
H-7-1	CPB62	A3-Matrix	3.52	762.44	6.72	6.409
H-7-2	CPB72	A3-Matrix	1.03	748.61	6.83	6.353
H-8-1	CPB82	A3-Matrix	-1.46	732.60	6.84	6.338
H-8-2	CPB92	A3-Matrix	-3.95	733.15	6.76	6.373
H-9-1	CPB102	A3-Matrix	-6.44	726.89	6.60	6.342
H-9-2	CPB112	A3-Matrix	-8.93	718.17	6.34	6.335
H-10-1	CPB122	A3-Matrix	-11.42	686.25	5.97	6.284
H-10-2	CPB132	A3-Matrix	-13.91	642.68	5.47	6.265
H-12-1	CPB142	A3-Matrix	-16.40	619.86	4.81	6.261
H-12-2	CPB152	A3-Matrix	-18.89	573.72	3.99	6.239
H-13-1	CPB162	A3-Matrix	-21.38	504.48	2.99	6.201
H-13-2	CPB172	A3-Matrix	-23.88	507.84	1.82	NA
H-5-1	CPB42	A3-Matrix	8.51	724.59	6.20	6.345
R4C01A	1PB22	BAN	4.66	684.97	6.75	6.249
R4C04A	2PB22	BAN	4.66	688.32	6.83	6.249
R4C07A	3PB22	BAN	4.66	685.05	6.72	6.256
R4C08A	4PB22	BAN	4.66	676.80	6.55	6.254
R5C01A	5PB19	BAN	3.16	674.61	6.75	6.251
R5C02A	5PB23	BAN	22.63	434.06	2.38	6.314
R2B01A	CPB9	BAN	16.73	635.79	4.13	6.298
R2B03A	CPB19	BAN	14.23	671.86	4.92	6.288
R2B06A	CPB29	BAN	11.74	704.90	5.57	6.267
R2B07A	CPB39	BAN	9.25	719.38	6.07	6.27
R2B08A	CPB49	BAN	6.76	740.21	6.44	6.263
R2B09A	CPB59	BAN	4.27	759.61	6.67	6.248
R2B10A	CPB69	BAN	1.78	759.38	6.80	6.243
R3B01A	CPB79	BAN	-0.71	731.20	6.84	6.251
R3B02A	CPB89	BAN	-3.20	734.30	6.79	6.247
R3B03A	CPB99	BAN	-5.69	729.03	6.66	6.236
R3B04A	CPB109	BAN	-8.18	723.40	6.43	6.247
R3B06A	CPB119	BAN	-10.67	697.75	6.10	6.249
R3B07A	CPB129	BAN	-13.16	655.20	5.63	6.236
R3B08A	CPB139	BAN	-15.66	623.07	5.03	6.268
R6B01A	CPB149	BAN	-18.15	592.94	4.25	6.283
R6B02A	CPB159	BAN	-20.64	527.25	3.30	6.294

Specimen ID#	Location	Grade	Initial Distance from Centerline	Ave. Temperature °C	Ave. dpa	Post Irradiation L1
R6B04A	CPB169	BAN	-23.13	490.37	2.19	6.304
CPB1	CPB1	CAN	18.72	0.00	3.408	
CPB181	CPB181	CAN	16.23	0.00	4.298	
CPB21	CPB21	CAN	13.74	0.00	5.063	
CPB31	CPB31	CAN	11.24	0.00	5.682	
CPB41	CPB41	CAN	8.76	0.00	6.155	
CPB51	CPB51	CAN	6.26	0.00	6.492	
CPB61	CPB61	CAN	3.77	0.00	6.708	
CPB71	CPB71	CAN	1.28	0.00	6.821	
CPB81	CPB81	CAN	-1.21	0.00	6.841	
CPB91	CPB91	CAN	-3.70	0.00	6.775	
CPB101	CPB101	CAN	-6.19	0.00	6.621	
CPB111	CPB111	CAN	-8.68	0.00	6.372	
CPB121	CPB121	CAN	-11.17	0.00	6.011	
CPB131	CPB131	CAN	-13.66	0.00	5.518	
CPB141	CPB141	CAN	-16.15	0.00	4.875	
CPB151	CPB151	CAN	-18.64	0.00	4.064	
CPB161	CPB161	CAN	-21.14	0.00	3.080	
CPB171	CPB171	CAN	-23.63	0.00	1.936	
CW9-01	2S13	H-451	7.99	692.24	6.42	24.243
CW13-02	6S5	H-451	1.75	718.93	6.92	24.197
CW14-01	6U5	H-451	15.48	616.71	4.64	24.693
CW12-02	5S7	H-451	14.23	630.75	5.00	24.630
CW7-03	1S15	H-451	12.98	656.45	5.44	24.702
CW7-01	1S8	H-451	1.75	715.45	6.84	24.3
CW11-02	4S13	H-451	15.48	620.57	4.56	24.720
CW11-01	4S2	H-451	14.23	634.86	4.91	24.784
CW10-01	3S10	H-451	6.74	699.51	6.47	24.099
CW9-03	3S1	H-451	1.75	715.25	6.81	23.865
CW13-03	6S9	H-451	12.98	648.88	5.46	24.351
CW8-02	1U8	H-451	5.53	683.57	6.70	24.889
CW8-03	1U14	H-451	16.76	586.02	4.76	25.042
CW11-03	4U2	H-451	5.53	686.86	6.77	24.872
CW10-02	3U1	H-451	5.53	683.65	6.66	24.894
CW10-03	3U10	H-451	10.52	658.72	6.09	24.925
CW12-01	4U12	H-451	18.01	561.12	4.16	25.106
CW13-01	5U7	H-451	18.01	557.57	4.24	25.093
CW14-02	6U9	H-451	16.76	579.08	4.74	25.051
CW1C02	2PB20	H-451	3.66	690.46	6.88	6.21
CW1C03	3PB20	H-451	3.66	686.87	6.77	6.21
CW1C04	4PB20	H-451	3.66	678.58	6.60	6.215
CW2C01	6PB21	H-451	4.16	678.10	6.81	6.214
CW9-02	2U12	H-451	11.77	643.26	6.00	NA

Specimen ID#	Location	Grade	Initial Distance from Centerline	Ave. Temperature °C	Ave. dpa	Post Irradiation L1
J3C01	6PB18	HLM	2.67	679.90	6.87	6.236
J3C04	6PB24	HLM	23.13	424.97	2.21	6.311
J1B03	CPB3	HLM	18.22	623.67	3.60	6.291
J1B04	CPB13	HLM	15.73	649.35	4.46	6.283
J1B05	CPB23	HLM	13.24	684.16	5.20	6.274
J1B06	CPB33	HLM	10.75	713.74	5.79	6.261
J1B07	CPB43	HLM	8.26	726.62	6.23	6.254
J2B01	CPB53	HLM	5.77	749.47	6.55	6.252
J2B03	CPB63	HLM	3.27	763.01	6.74	6.24
J2B04	CPB73	HLM	0.78	744.06	6.83	6.232
J2B05	CPB83	HLM	-1.71	733.27	6.83	6.225
J2B06	CPB93	HLM	-4.20	732.63	6.75	6.225
J5B01	CPB103	HLM	-6.69	726.35	6.58	6.231
J5B02	CPB113	HLM	-9.18	715.86	6.31	6.233
J5B04	CPB123	HLM	-11.67	682.11	5.93	6.244
J5B05	CPB133	HLM	-14.16	638.83	5.41	6.246
J5B06	CPB143	HLM	-16.65	618.14	4.74	6.254
J6B01	CPB153	HLM	-19.14	567.95	3.89	6.278
J6B02	CPB163	HLM	-21.63	497.17	2.88	6.289
EW5-01	2S7	IG-110	9.24	683.13	6.24	24.426
EW8-03	5S13	IG-110	17.97	592.80	3.82	24.819
EW8-02	5S1	IG-110	1.75	702.25	6.77	24.308
EW2-02	1S9	IG-110	15.48	627.41	4.75	24.76
EW2-01	1S7	IG-110	14.23	642.05	5.11	24.807
EW7-01	4S9	IG-110	5.49	701.07	6.42	24.496
EW6-03	4S4	IG-110	1.75	706.82	6.63	24.478
EW4-01	1U9	IG-110	15.48	627.49	4.69	24.551
EW6-01	3S9	IG-110	14.23	642.19	5.05	24.541
EW10-02	EW10-02	IG-110	4.24	-	-	24.142
EW9-03	6S14	IG-110	11.73	662.28	5.75	24.430
EW4-02	2S5	IG-110	6.74	691.16	6.54	24.191
EW2-03	1U7	IG-110	18.01	567.16	4.36	25.157
EW5-03	2U7	IG-110	13.02	567.16	4.36	25.075
EW10-03	EW10-03	IG-110	8.03	-	-	25.034
EW6-02	3U9	IG-110	18.01	567.47	4.25	25.171
EW7-03	4U4	IG-110	5.53	675.47	6.49	25.079
EW8-01	4U9	IG-110	9.28	664.85	6.13	25.087
EW9-01	5U1	IG-110	5.53	670.87	6.62	25.059
EW9-02	5U12	IG-110	20.51	499.42	3.31	25.211
EW5-02	2U5	IG-110	10.52	650.37	6.18	25.053
EW10-01	6U13	IG-110	15.52	579.20	5.11	25.12
EW13C01	1PB21	IG-110	4.16	686.07	6.78	6.244
EW13C02	2PB21	IG-110	4.16	689.37	6.86	6.243

Specimen ID#	Location	Grade	Initial Distance from Centerline	Ave. Temperature °C	Ave. dpa	Post Irradiation L1
EW13C03	2PB23	IG-110	22.63	443.14	2.46	6.316
EW13C04	3PB21	IG-110	4.16	685.94	6.74	6.254
EW14C01	4PB21	IG-110	4.16	677.66	6.58	6.270
FW3-01	2S15	IG-430	15.48	630.53	4.78	24.834
FW2-03	2S9	IG-430	14.23	645.34	5.15	24.803
FW2-02	2S3	IG-430	6.74	703.05	6.58	24.61
FW12-01	6U7	IG-430	19.22	585.22	3.37	24.975
FW9-03	5S10	IG-430	6.74	686.61	6.43	24.663
FW9-02	5S2	IG-430	3.00	704.69	6.72	24.606
FW13-01	FW13-01	IG-430	11.73	670.06	5.72	24.865
FW1-01	1S5	IG-430	3.00	717.91	6.79	24.671
FW8-02	4S10	IG-430	11.73	662.10	5.51	24.853
FW4-02	3S3	IG-430	7.99	680.45	6.15	24.786
FW8-01	4S3	IG-430	3.00	709.29	6.59	24.735
FW5-02	3S7	IG-430	17.97	601.79	3.87	24.899
FW5-01	3S5	IG-430	16.73	611.22	4.30	24.809
FW4-03	3S4	IG-430	5.49	709.30	6.59	24.489
FW11-02	6S10	IG-430	15.48	620.47	4.78	24.759
FW11-01	6S7	IG-430	14.23	634.74	5.14	24.721
FW10-03	6S2	IG-430	1.75	707.14	6.87	24.454
FW1-03	1U5	IG-430	6.78	680.72	6.61	25.224
FW2-01	1U10	IG-430	15.52	586.56	5.12	25.181
FW3-02	2U3	IG-430	10.52	661.88	6.22	25.192
FW3-03	2U9	IG-430	18.01	570.31	4.37	25.22
FW7-01	3U4	IG-430	9.27	672.92	6.28	25.173
FW7-02	3U5	IG-430	19.26	537.59	3.80	25.240
FW7-03	3U7	IG-430	20.51	507.81	3.32	25.266
FW8-03	4U3	IG-430	6.78	672.69	6.40	25.207
FW5-03	3U3	IG-430	11.77	632.06	5.74	25.173
FW9-01	4U10	IG-430	15.52	579.27	4.91	25.193
FW10-01	5U2	IG-430	6.78	668.09	6.52	25.187
FW10-02	5U10	IG-430	10.52	645.78	6.06	25.168
FW4-01	2U14	IG-430	21.76	464.64	2.78	25.271
FW11-03	6U2	IG-430	5.53	675.72	6.73	25.254
FW12-02	6U10	IG-430	18.01	560.76	4.34	25.224
FW18C01	1PB19	IG-430	3.16	687.93	6.82	6.275
FW18C02	1PB23	IG-430	22.63	441.01	2.46	6.317
FW18C03	2PB19	IG-430	3.16	691.19	6.90	6.312
FW18C04	2PB25	IG-430	23.63	415.92	1.97	6.33
FW18C06	3PB19	IG-430	3.16	687.54	6.79	6.298
FW19C01	3PB24	IG-430	23.13	429.86	2.17	6.333
FW19C02	4PB19	IG-430	3.16	679.22	6.62	6.300
FW19C04	FW19C04	IG-430	1.67	678.24	6.89	6.29

Specimen ID#	Location	Grade	Initial Distance from Centerline	Ave. Temperature °C	Ave. dpa	Post Irradiation L1
S2C01	5PB20	NBG-10	3.66	673.95	6.73	6.232
S1B01	CPB10	NBG-10	16.48	638.12	4.22	6.29
S1B03	CPB20	NBG-10	13.99	674.81	4.99	6.283
S1B04	CPB30	NBG-10	11.49	707.72	5.63	6.275
S1B07	CPB40	NBG-10	9.01	720.94	6.12	6.256
S1B08	CPB50	NBG-10	6.51	742.60	6.46	6.26
S1B09	CPB60	NBG-10	4.02	760.71	6.69	6.251
S1B10	CPB70	NBG-10	1.53	756.71	6.81	6.239
S3B01	CPB80	NBG-10	-0.96	731.38	6.84	6.226
S3B03	CPB90	NBG-10	-3.45	734.00	6.78	6.233
S3B04	CPB100	NBG-10	-5.94	728.28	6.64	6.224
S3B07	CPB110	NBG-10	-8.43	722.00	6.40	6.217
S3B08	CPB120	NBG-10	-10.92	694.08	6.06	6.256
S3B09	CPB130	NBG-10	-13.41	650.90	5.58	6.274
S3B10	CPB140	NBG-10	-15.90	621.97	4.96	6.277
S4B01	CPB150	NBG-10	-18.40	586.59	4.17	6.29
S4B03	CPB160	NBG-10	-20.89	518.97	3.20	6.3
S4B04	CPB170	NBG-10	-23.38	502.00	2.07	6.312
AW4-02	2U4	NBG-17	19.22	595.28	3.49	24.978
AW4-01	2S6	NBG-17	12.98	659.74	5.47	24.769
AL6-02	2S4	NBG-17	5.49	712.74	6.70	24.523
AL8-01	3S8	NBG-17	12.98	644.68	5.33	24.782
AW9-01	5S14	NBG-17	9.24	666.93	6.09	24.643
AW7-03	5S6	NBG-17	4.25	702.81	6.65	24.589
AW1-03	1S12	NBG-17	19.22	592.96	3.47	25.034
AW1-02	1S11	NBG-17	10.49	676.19	5.97	24.757
AW1-01	1S3	NBG-17	6.74	699.40	6.51	24.653
AW6-03	4S12	NBG-17	19.22	587.88	3.32	25.092
AW6-02	4S8	NBG-17	12.98	648.88	5.23	24.920
AW5-02	3S13	NBG-17	19.22	676.07	6.40	24.932
AW13-02	AW13-02	NBG-17	10.49	675.92	5.92	24.562
AW12-01	6S15	NBG-17	19.22	587.95	3.51	24.909
AW10-03	6S8	NBG-17	10.49	668.22	6.00	24.572
AW10-02	6S1	NBG-17	5.49	700.96	6.66	24.470
AW2-01	1U3	NBG-17	10.52	658.54	6.17	25.102
AW2-02	1U11	NBG-17	14.27	598.86	5.44	25.118
AW2-03	1U12	NBG-17		472.04	2.87	25.252
AL6-01	1S13	NBG-17	9.27	676.07	6.40	25.03
AW4-03	2U6	NBG-17	16.76	589.28	4.78	25.164
AW5-01	2U10	NBG-17	21.76	474.34	2.86	25.262
AW5-03	3U8	NBG-17	14.27	598.55	5.35	25.144
AW6-01	3U12	NBG-17	21.76	472.07	2.79	25.262
AW7-01	4U8	NBG-17	16.77	579.41	4.55	25.178



Specimen ID#	Location	Grade	Initial Distance from Centerline	Ave. Temperature °C	Ave. dpa	Post Irradiation L1
AW7-02	4U11	NBG-17	21.76	467.17	2.73	25.265
AW9-03	5U6	NBG-17	8.03	668.18	6.40	25.097
AW10-01	5U13	NBG-17	13.02	606.10	5.61	25.124
AL8-02	4S11	NBG-17	16.76	575.59	4.65	25.172
AW9-02	5U3	NBG-17	9.28	664.62	6.36	25.115
AW12-03	6U8	NBG-17	14.27	591.28	5.43	25.097
AW13-01	6U14	NBG-17	21.76	467.24	2.85	25.258
AW14C01	1PB16	NBG-17	1.67	686.40	6.86	6.274
AW14C02	2PB16	NBG-17	1.67	689.56	6.94	6.266
AW14C04	3PB16	NBG-17	1.67	685.94	6.83	6.268
AW15C02	4PB16	NBG-17	1.67	677.67	6.65	6.278
BW9-03	5U5	NBG-18	17.97	604.43	3.95	24.971
BW2-02	2S11	NBG-18	11.73	673.34	5.76	24.735
BW2-01	2S2	NBG-18	4.24	719.38	6.80	24.544
BW9-02	5S15	NBG-18	11.73	657.85	5.62	24.743
BW9-01	5S8	NBG-18	7.99	675.88	6.28	24.611
BW12-02	BW12-02	NBG-18	17.98	601.81	3.93	25.004
BW3-02	3S2	NBG-18	9.24	679.74	6.19	24.746
BW1-01	1S4	NBG-18	5.49	709.18	6.63	24.663
BW7-03	4S14	NBG-18	17.97	595.94	3.76	25.032
BW12-03	BW12-03	NBG-18	10.49	667.92	5.76	24.768
BW7-02	4S5	NBG-18	6.74	691.28	6.30	24.716
BW5-01	3S14	NBG-18	12.98	656.45	5.38	24.627
BW3-03	3S11	NBG-18	9.24	679.52	6.13	24.529
BL6-03	3S12	NBG-18	3.00	717.73	6.76	24.422
BL7-01	4S7	NBG-18	17.98	596.04	3.96	24.872
BW11-01	6S13	NBG-18	9.24	671.63	6.21	24.516
BW10-03	6S6	NBG-18	4.25	707.61	6.76	24.442
BW1-03	1U4	NBG-18	9.28	672.71	6.34	25.066
BW5-02	3U2	NBG-18	13.02	618.47	5.72	25.092
BW1-02	1U1	NBG-18	20.51	507.66	3.41	25.22
BW2-03	2U2	NBG-18	8.03	684.17	6.55	25.057
BW3-01	2U11	NBG-18	15.52	589.70	5.15	25.124
BW11-02	6U3	NBG-18	20.51	510.26	3.41	25.227
BL6-02	2S12	NBG-18	6.78	586.23	4.66	25.055
BW5-03	3U11	NBG-18	13.02	618.17	5.63	25.101
BW7-01	3U13	NBG-18	16.76	586.23	4.66	25.161
BW8-01	4U5	NBG-18	10.52	650.70	5.95	25.093
BW8-02	4U7	NBG-18	14.27	591.09	5.22	25.180
BW8-03	4U13	NBG-18	20.51	502.32	3.24	25.231
BW10-01	5U8	NBG-18	11.77	627.42	5.85	25.095
BW10-02	5U14	NBG-18	15.52	575.25	5.01	25.142
BW11-03	6U6	NBG-18	8.03	672.84	6.51	25.076

Specimen ID#	Location	Grade	Initial Distance from Centerline	Ave. Temperature °C	Ave. dpa	Post Irradiation L1
BW12-01	6U12	NBG-18	13.02	610.67	5.72	25.095
BL7-02	5S5	NBG-18	20.51	502.25	3.39	25.215
BW14C01	1PB18	NBG-18	2.66	688.18	6.83	6.269
BW15C05	BW15C05	NBG-18	3.66	687.18	6.80	6.256
BW14C02	1PB25	NBG-18	23.63	413.74	1.98	6.319
BW14C03	2PB18	NBG-18	2.66	691.42	6.92	6.237
BW14C04	2PB24	NBG-18	23.13	432.15	2.22	6.318
BW14C05	3PB18	NBG-18	2.66	687.72	6.80	6.23
BW15C02	4PB18	NBG-18	2.66	679.42	6.63	6.252
BW15C03	4PB23	NBG-18	22.63	436.40	2.34	6.3
BW15C04	4PB25	NBG-18	23.63	408.53	1.88	6.319
M2C02	5PB24	NBG-25	23.13	422.25	2.15	6.299
M3B01	CPB6	NBG-25	17.47	628.99	3.87	6.287
M3B02	CPB16	NBG-25	14.98	661.67	4.70	6.285
M3B03	CPB26	NBG-25	12.49	694.72	5.39	6.291
M3B04	CPB36	NBG-25	10.00	716.41	5.94	6.289
M3B05	CPB46	NBG-25	7.51	733.15	6.34	6.28
M4B01	CPB56	NBG-25	5.02	755.21	6.61	6.277
M4B02	CPB66	NBG-25	2.53	763.03	6.78	6.297
M4B03	CPB76	NBG-25	0.04	734.02	6.84	6.285
M4B04	CPB86	NBG-25	-2.46	734.48	6.82	6.285
M4B06	CPB96	NBG-25	-4.95	730.99	6.71	6.284
M7B01	CPB106	NBG-25	-7.44	725.33	6.51	6.258
M7B02	CPB116	NBG-25	-9.93	707.64	6.21	6.237
M7B03	CPB126	NBG-25	-12.42	668.61	5.79	6.263
M7B04	CPB136	NBG-25	-14.91	628.16	5.23	6.246
M7B07	CPB146	NBG-25	-17.40	607.82	4.50	6.249
M8B01	CPB156	NBG-25	-19.89	545.84	3.61	6.28
M8B03	CPB166	NBG-25	-22.38	472.91	2.54	6.292
M2C01	5PB16	NBG-25	1.67	673.07	6.79	NA
DW3-03	2S14	PCEA	16.73	614.10	4.38	24.744
DW3-02	2S8	PCEA	10.48	679.50	6.02	24.432
DW3-01	2S1	PCEA	3.00	721.41	6.87	24.233
DW8-02	5S12	PCEA	16.73	601.26	4.25	24.841
DW8-01	5S9	PCEA	10.49	663.57	5.87	24.446
DW7-03	5S4	PCEA	5.49	696.31	6.55	24.276
DW1-03	1S14	PCEA	16.73	611.25	4.36	24.884
DA602	4S1	PCEA	7.99	688.66	6.37	24.401
DW1-01	1S2	PCEA	4.25	715.84	6.73	24.369
DA701	4S6	PCEA	16.73	604.79	4.17	24.873
DW6-02	4S15	PCEA	9.24	671.37	5.97	24.53
DW6-03	4U1	PCEA	4.25	707.46	6.52	24.391
DW5-02	3S15	PCEA	11.73	669.89	5.66	24.367

Specimen ID#	Location	Grade	Initial Distance from Centerline	Ave. Temperature °C	Ave. dpa	Post Irradiation L1
DW11-01	DW11-01	PCEA	7.99	688.63	6.32	24.215
DW10-01	6S11	PCEA	16.73	604.82	4.39	24.647
DW1-02	1S6	PCEA	7.99	680.46	6.39	24.212
DW9-03	6S4	PCEA	3.00	709.59	6.83	24.103
DW2-01	1U2	PCEA	8.03	680.84	6.49	24.887
DA601	3S6	PCEA	11.77	640.06	5.96	24.993
DW2-03	1U13	PCEA	19.26	537.28	3.91	25.137
DW4-03	2U1	PCEA	6.78	683.96	6.68	24.878
DW4-01	2U8	PCEA	14.27	601.98	5.47	25.012
DW5-01	2U13	PCEA	19.26	540.21	3.91	25.153
DW5-03	3U6	PCEA	11.77	639.98	5.88	24.98
DW6-01	3U14	PCEA	15.51	586.42	5.02	25.078
DW7-01	4U6	PCEA	8.03	672.85	6.27	24.937
DW7-02	4U14	PCEA	13.02	610.40	5.50	25.072
DA702	5S11	PCEA	19.26	531.72	3.72	25.167
DW8-03	5U4	PCEA	9.27	660.01	6.24	24.94
DW9-01	5U9	PCEA	14.27	586.96	5.33	25.050
DW9-02	5U11	PCEA	19.26	528.47	3.80	25.167
DW10-03	6U4	PCEA	6.78	672.94	6.63	24.895
DW2-02	1U6	PCEA	11.77	632.01	5.96	24.955
DW10-02	6U11	PCEA	19.26	531.43	3.88	25.16
DW14C01	1PB17	PCEA	2.17	687.79	6.85	6.254
DW14C02	1PB24	PCEA	23.13	429.90	2.22	6.309
DW14C03	2PB17	PCEA	2.17	690.96	6.93	6.207
DW14C04	3PB17	PCEA	2.17	687.27	6.82	6.215
DW15C01	3PB25	PCEA	23.63	413.56	1.93	6.321
DW15C02	4PB17	PCEA	2.17	678.98	6.65	6.219
DW15C03	4PB24	PCEA	23.13	424.85	2.11	6.311
DW15C04	DW15C04	PCEA	4.16	673.10	6.70	6.215
DW14C05	3PB23	PCEA	22.63	441.04	2.40	NA
P2C02	5PB18	PCIB	2.66	674.86	6.76	6.273
P2C03	6PB25	PCIB	23.63	408.68	1.97	6.326
P1B02	CPB8	PCIB	16.98	633.24	4.04	6.310
P1B04	CPB18	PCIB	14.48	668.78	4.85	6.298
P1B05	CPB28	PCIB	11.99	701.75	5.51	6.297
P1B06	CPB38	PCIB	9.50	718.00	6.03	6.288
P1B07	CPB48	PCIB	7.01	737.84	6.41	6.285
P1B08	CPB58	PCIB	4.52	758.33	6.66	6.28
P1B10	CPB68	PCIB	2.03	761.19	6.80	6.281
P3B04	CPB78	PCIB	-0.46	731.70	6.84	6.286
P3B05	CPB88	PCIB	-2.95	734.50	6.80	6.282
P3B06	CPB98	PCIB	-5.45	729.76	6.68	6.285
P3B07	CPB108	PCIB	-7.94	724.38	6.46	6.269

Specimen ID#	Location	Grade	Initial Distance from Centerline	Ave. Temperature °C	Ave. dpa	Post Irradiation L1
P3B08	CPB118	PCIB	-10.42	701.24	6.13	6.269
P3B09	CPB128	PCIB	-12.92	659.59	5.69	6.283
P3B10	CPB138	PCIB	-15.41	624.65	5.09	6.289
P4B01	CPB148	PCIB	-17.90	598.87	4.34	6.282
P4B02	CPB158	PCIB	-20.39	535.13	3.41	6.297
P4B03	CPB168	PCIB	-22.88	474.36	2.31	6.316
K4C01	6PB19	PGX	3.16	679.65	6.85	6.246
K2B01	CPB4	PGX	17.97	625.79	3.69	6.281
K2B02	CPB14	PGX	15.48	653.52	4.54	6.274
K2B03	CPB24	PGX	12.99	687.57	5.27	6.273
K2B04	CPB34	PGX	10.50	714.87	5.84	6.245
K2B05	CPB44	PGX	8.01	728.72	6.27	6.263
K2B06	CPB54	PGX	5.52	751.53	6.57	6.270
K2B07	CPB64	PGX	3.03	763.32	6.75	6.256
K3B01	CPB74	PGX	0.53	740.02	6.83	6.254
K3B02	CPB84	PGX	-1.96	733.82	6.83	6.249
K3B03	CPB94	PGX	-4.45	732.09	6.74	6.246
K3B04	CPB104	PGX	-6.94	725.94	6.56	6.257
K3B05	CPB114	PGX	-9.43	713.33	6.28	6.254
K3B06	CPB124	PGX	-11.92	677.77	5.88	6.251
K3B07	CPB134	PGX	-14.41	635.14	5.35	6.251
K6B01	CPB144	PGX	-16.90	615.64	4.66	6.27
K6B02	CPB154	PGX	-19.39	560.72	3.80	6.275
K6B03	CPB164	PGX	-21.88	488.17	2.77	6.301
L4C01	5PB25	PPEA	23.63	405.81	1.91	6.316
L4C02	6PB20	PPEA	3.66	679.01	6.83	6.232
L2B02	CPB5	PPEA	17.72	627.39	3.78	6.295
L2B03	CPB15	PPEA	15.23	657.66	4.62	6.286
L2B04	CPB25	PPEA	12.74	691.10	5.33	6.264
L2B05	CPB35	PPEA	10.25	715.70	5.89	6.260
L2B06	CPB45	PPEA	7.76	730.90	6.31	6.25
L2B07	CPB55	PPEA	5.27	753.44	6.59	6.247
L2B08	CPB65	PPEA	2.78	763.34	6.76	6.229
L3B03	CPB75	PPEA	0.29	736.78	6.84	6.232
L3B04	CPB85	PPEA	-2.21	734.23	6.82	6.237
L3B05	CPB95	PPEA	-4.70	731.54	6.72	6.232
L3B06	CPB105	PPEA	-7.19	725.61	6.53	6.24
L3B07	CPB115	PPEA	-9.68	710.58	6.24	6.222
L3B08	CPB125	PPEA	-12.17	673.24	5.84	6.243
L3B09	CPB135	PPEA	-14.66	631.56	5.29	6.249
L6B01	CPB145	PPEA	-17.15	612.16	4.58	6.266
L6B02	CPB155	PPEA	-19.64	553.38	3.70	6.295
L6B03	CPB165	PPEA	-22.13	479.89	2.65	6.296

Specimen ID#	Location	Grade	Initial Distance from Centerline	Ave. Temperature °C	Ave. dpa	Post Irradiation L1
N3C01	5PB17	S2020	2.16	674.40	6.78	6.277
N3C02	6PB23	S2020	22.63	436.52	2.45	6.304
N1B03	CPB7	S2020	17.23	630.95	3.96	6.272
N1B04	CPB17	S2020	14.73	665.40	4.78	6.273
N1B05	CPB27	S2020	12.24	698.32	5.45	6.272
N1B06	CPB37	S2020	9.75	717.06	5.99	6.282
N1B08	CPB47	S2020	7.26	735.48	6.37	6.282
N2B04	CPB57	S2020	4.77	756.85	6.64	6.287
N2B05	CPB67	S2020	2.28	762.35	6.79	6.295
N2B06	CPB77	S2020	-0.21	733.06	6.84	6.274
N2B07	CPB87	S2020	-2.70	734.56	6.81	6.285
N2B08	CPB97	S2020	-5.20	730.41	6.69	6.288
N5B01	CPB107	S2020	-7.69	724.98	6.48	6.27
N5B02	CPB117	S2020	-10.17	704.53	6.17	6.27
N5B03	CPB127	S2020	-12.67	664.05	5.74	6.284
N5B04	CPB137	S2020	-15.16	626.28	5.16	6.254
N5B05	CPB147	S2020	-17.65	604.19	4.42	6.257
N6B02	CPB157	S2020	-20.14	541.21	3.51	6.275
N6B03	CPB167	S2020	-22.63	469.22	2.42	6.304
	Specimens were lost prior to post irradiation measurements. Post Irradiation dimensions were estimated using distance and % length change values from other specimens of same grade.					
	CAN specimens. Preirradiation lengths were taken as nominal. Post irradiation dimensions were estimated using distances and % length change of NBG-25 specimens in the center channel.					

Specimen ID#	Post Irradiation L2	Post Irradiation L3	Post Irradiation L4	Post Irradiation Average L	Post Irradiation D1
H-16-1	6.418	6.418	6.415	6.417	12.195
H-16-2	6.425	6.437	6.437	6.434	12.182
H-17-1	6.431	6.428	6.432	6.4318	12.213
H-3-1	6.226	6.232	6.225	6.2313	12.515
H-3-2	6.269	6.275	6.262	6.262	12.439
H-4-1	6.265	6.27	6.273	6.2692	12.373
H-4-2	6.283	6.281	6.267	6.278	12.312
H-5-2	6.395	6.386	6.373	6.3825	12.21
H-7-1	6.414	6.378	6.390	6.398	12.180
H-7-2	6.378	6.400	6.366	6.374	12.157
H-8-1	6.347	6.358	6.348	6.3477	12.143
H-8-2	6.372	6.374	6.384	6.3758	12.147
H-9-1	6.369	6.359	6.342	6.353	12.191
H-9-2	6.337	6.334	6.331	6.3342	12.21
H-10-1	6.292	6.285	6.282	6.286	12.254
H-10-2	6.279	6.276	6.279	6.2748	12.316
H-12-1	6.259	6.27	6.271	6.2652	12.384
H-12-2	6.240	6.234	6.232	6.236	12.450
H-13-1	6.203	6.203	6.199	6.2015	12.525
H-13-2	NA	NA	NA	6.212	NA
H-5-1	6.334	6.336	6.355	6.343	12.249
R4C01A	6.241	6.245	6.245	6.245	12.604
R4C04A	6.247	6.237	6.236	6.2423	12.612
R4C07A	6.256	6.251	6.248	6.253	12.613
R4C08A	6.255	6.25	6.25	6.2523	12.618
R5C01A	6.251	6.252	6.251	6.2513	12.621
R5C02A	6.317	6.321	6.319	6.3178	12.695
R2B01A	6.295	6.299	6.300	6.298	12.676
R2B03A	6.28	6.282	6.286	6.284	12.664
R2B06A	6.266	6.267	6.262	6.266	12.656
R2B07A	6.272	6.271	6.269	6.2705	12.653
R2B08A	6.267	6.265	6.262	6.2642	12.657
R2B09A	6.263	6.265	6.252	6.257	12.658
R2B10A	6.255	6.240	6.240	6.245	12.647
R3B01A	6.249	6.255	6.255	6.2525	12.643
R3B02A	6.245	6.245	6.246	6.2458	12.638
R3B03A	6.239	6.241	6.238	6.2385	12.64
R3B04A	6.243	6.247	6.25	6.2468	12.638
R3B06A	6.249	6.255	6.254	6.2517	12.633
R3B07A	6.232	6.233	6.237	6.235	12.634
R3B08A	6.273	6.269	6.266	6.269	12.646
R6B01A	6.286	6.286	6.285	6.285	12.654
R6B02A	6.297	6.301	6.295	6.2967	12.663

Specimen ID#	Post Irradiation L2	Post Irradiation L3	Post Irradiation L4	Post Irradiation Average L	Post Irradiation D1
R6B04A	6.306	6.296	6.3	6.3015	12.715
CPB1				6.294	
CPB181				6.286	
CPB21				6.281	
CPB31				6.278	
CPB41				6.278	
CPB51				6.279	
CPB61				6.281	
CPB71				6.281	
CPB81				6.280	
CPB91				6.276	
CPB101				6.272	
CPB111				6.268	
CPB121				6.265	
CPB131				6.265	
CPB141				6.269	
CPB151				6.277	
CPB161				6.289	
CPB171				6.299	
CW9-01	24.253	24.236	24.246	24.2445	12.651
CW13-02	24.212	24.183	24.192	24.196	12.671
CW14-01	24.707	24.718	24.717	24.7088	12.696
CW12-02	24.622	24.644	24.637	24.633	12.672
CW7-03	24.703	24.7	24.705	24.7025	12.669
CW7-01	24.321	24.308	24.285	24.3035	12.632
CW11-02	24.725	24.796	24.794	24.759	12.685
CW11-01	24.762	24.787	24.775	24.777	12.667
CW10-01	24.103	24.096	24.098	24.099	12.686
CW9-03	23.926	23.942	23.865	23.900	12.700
CW13-03	24.34	24.331	24.347	24.3422	12.684
CW8-02	24.891	24.894	24.888	24.891	12.558
CW8-03	25.047	25.045	25.040	25.044	12.605
CW11-03	24.88	24.881	24.868	24.8753	12.552
CW10-02	24.898	24.911	24.899	24.9005	12.546
CW10-03	24.935	24.93	24.925	24.9288	12.556
CW12-01	25.111	25.109	25.109	25.1088	12.62
CW13-01	25.088	25.092	25.096	25.0922	12.621
CW14-02	25.054	25.054	25.05	25.0523	12.611
CW1C02	6.209	6.217	6.216	6.213	12.568
CW1C03	6.209	6.209	6.211	6.2097	12.566
CW1C04	6.210	6.214	6.218	6.214	12.582
CW2C01	6.222	6.225	6.220	6.220	12.575
CW9-02	NA	NA	NA	24.941	NA

Specimen ID#	Post Irradiation L2	Post Irradiation L3	Post Irradiation L4	Post Irradiation Average L	Post Irradiation D1
J3C01	6.229	6.228	6.232	6.2313	12.547
J3C04	6.312	6.316	6.317	6.314	12.686
J1B03	6.298	6.299	6.304	6.298	12.632
J1B04	6.28	6.278	6.284	6.2812	12.612
J1B05	6.274	6.270	6.272	6.273	12.576
J1B06	6.256	6.261	6.265	6.2607	12.568
J1B07	6.258	6.253	6.246	6.2527	12.552
J2B01	6.241	6.241	6.249	6.2457	12.562
J2B03	6.236	6.242	6.243	6.2402	12.54
J2B04	6.231	6.229	6.231	6.2308	12.537
J2B05	6.229	6.228	6.229	6.228	12.521
J2B06	6.229	6.23	6.225	6.2272	12.536
J5B01	6.236	6.24	6.241	6.237	12.541
J5B02	6.237	6.238	6.24	6.237	12.531
J5B04	6.239	6.239	6.23	6.238	12.549
J5B05	6.247	6.246	6.248	6.2468	12.569
J5B06	6.261	6.256	6.26	6.2577	12.593
J6B01	6.277	6.279	6.275	6.2773	12.602
J6B02	6.289	6.29	6.292	6.29	12.638
EW5-01	24.447	24.415	24.412	24.425	12.628
EW8-03	24.837	24.788	24.791	24.8087	12.686
EW8-02	24.264	24.221	24.29	24.2707	12.624
EW2-02	24.768	24.77	24.754	24.763	12.663
EW2-01	24.815	24.821	24.81	24.8133	12.653
EW7-01	24.499	24.504	24.503	24.501	12.621
EW6-03	24.476	24.483	24.482	24.480	12.608
EW4-01	24.543	24.524	24.528	24.5365	12.686
EW6-01	24.473	24.484	24.484	24.4955	12.669
EW10-02	24.142	24.153	24.149	24.147	12.659
EW9-03	24.529	24.498	24.469	24.482	12.670
EW4-02	24.195	24.191	24.19	24.1917	12.673
EW2-03	25.161	25.163	25.164	25.161	12.606
EW5-03	25.08	25.08	25.075	25.0775	12.551
EW10-03	25.036	25.041	25.039	25.0375	12.507
EW6-02	25.176	25.169	25.165	25.1702	12.594
EW7-03	25.076	25.072	25.081	25.077	12.526
EW8-01	25.091	25.089	25.092	25.0897	12.506
EW9-01	25.056	25.063	25.063	25.060	12.517
EW9-02	25.212	25.21	25.206	25.2097	12.617
EW5-02	25.059	25.062	25.056	25.0575	12.531
EW10-01	25.124	25.118	25.114	25.119	12.552
EW13C01	6.246	6.248	6.248	6.247	12.526
EW13C02	6.248	6.242	6.244	6.2443	12.53



Specimen ID#	Post Irradiation L2	Post Irradiation L3	Post Irradiation L4	Post Irradiation Average L	Post Irradiation D1
EW13C03	6.315	6.317	6.319	6.3167	12.652
EW13C04	6.254	6.25	6.249	6.2517	12.539
EW14C01	6.269	6.270	6.261	6.268	12.523
FW3-01	24.83	24.818	24.823	24.8263	12.66
FW2-03	24.801	24.795	24.804	24.801	12.628
FW2-02	24.62	24.618	24.61	24.6145	12.622
FW12-01	24.977	24.984	24.971	24.977	12.709
FW9-03	24.661	24.655	24.653	24.658	12.682
FW9-02	24.594	24.601	24.591	24.598	12.674
FW13-01	24.864	24.872	24.843	24.861	12.641
FW1-01	24.676	24.688	24.68	24.6788	12.621
FW8-02	24.85	24.867	24.863	24.8583	12.65
FW4-02	24.793	24.789	24.784	24.788	12.647
FW8-01	24.722	24.734	24.736	24.732	12.644
FW5-02	24.871	24.891	24.875	24.884	12.707
FW5-01	24.814	24.805	24.809	24.8092	12.693
FW4-03	24.511	24.501	24.490	24.498	12.701
FW11-02	24.758	24.760	24.756	24.758	12.688
FW11-01	24.703	24.710	24.721	24.714	12.698
FW10-03	24.444	24.481	24.48	24.4648	12.721
FW1-03	25.23	25.231	25.226	25.2278	12.564
FW2-01	25.185	25.183	25.178	25.1818	12.575
FW3-02	25.190	25.180	25.188	25.188	12.550
FW3-03	25.22	25.221	25.214	25.2187	12.581
FW7-01	25.193	25.192	25.171	25.182	12.562
FW7-02	25.247	25.240	25.243	25.243	12.636
FW7-03	25.27	25.271	25.27	25.2692	12.645
FW8-03	25.205	25.204	25.211	25.2067	12.546
FW5-03	25.181	25.180	25.173	25.177	12.588
FW9-01	25.2	25.194	25.189	25.194	12.592
FW10-01	25.191	25.182	25.18	25.185	12.568
FW10-02	25.173	25.17	25.17	25.1702	12.563
FW4-01	25.276	25.278	25.271	25.274	12.643
FW11-03	25.272	25.27	25.245	25.2602	12.565
FW12-02	25.225	25.223	25.224	25.224	12.614
FW18C01	6.28	6.276	6.283	6.2785	12.585
FW18C02	6.326	6.318	6.316	6.3193	12.68
FW18C03	6.306	6.3	6.306	6.306	12.555
FW18C04	6.328	6.33	6.33	6.3295	12.703
FW18C06	6.302	6.301	6.292	6.2982	12.562
FW19C01	6.329	6.332	6.332	6.3315	12.699
FW19C02	6.296	6.294	6.295	6.296	12.589
FW19C04	6.299	6.304	6.291	6.296	12.563

Specimen ID#	Post Irradiation L2	Post Irradiation L3	Post Irradiation L4	Post Irradiation Average L	Post Irradiation D1
S2C01	6.238	6.236	6.236	6.2355	12.568
S1B01	6.292	6.296	6.295	6.2933	12.658
S1B03	6.29	6.292	6.282	6.2867	12.64
S1B04	6.281	6.277	6.269	6.276	12.578
S1B07	6.255	6.254	6.251	6.254	12.604
S1B08	6.263	6.266	6.258	6.2618	12.591
S1B09	6.247	6.244	6.251	6.248	12.589
S1B10	6.251	6.243	6.242	6.2438	12.582
S3B01	6.229	6.227	6.224	6.2265	12.558
S3B03	6.233	6.229	6.229	6.231	12.57
S3B04	6.228	6.226	6.22	6.2245	12.57
S3B07	6.225	6.216	6.216	6.2185	12.595
S3B08	6.258	6.256	6.257	6.2568	12.582
S3B09	6.27	6.265	6.271	6.27	12.587
S3B10	6.277	6.272	6.272	6.2745	12.614
S4B01	6.288	6.287	6.289	6.2885	12.638
S4B03	6.301	6.304	6.303	6.302	12.671
S4B04	6.311	6.311	6.312	6.312	12.707
AW4-02	24.993	24.996	24.976	24.9857	12.717
AW4-01	24.773	24.759	24.752	24.7632	12.677
AL6-02	24.532	24.526	24.522	24.5257	12.678
AL8-01	24.770	24.785	24.784	24.780	12.689
AW9-01	24.647	24.645	24.655	24.6475	12.696
AW7-03	24.591	24.575	24.579	24.584	12.689
AW1-03	25.024	25.03	25.029	25.0293	12.713
AW1-02	24.769	24.766	24.749	24.760	12.644
AW1-01	24.652	24.647	24.65	24.6505	12.629
AW6-03	25.076	25.095	25.071	25.0835	12.714
AW6-02	24.916	24.921	24.919	24.919	12.684
AW5-02	24.941	24.925	24.925	24.9307	12.734
AW13-02	24.565	24.57	24.565	24.5655	12.706
AW12-01	24.915	24.911	24.902	24.9093	12.727
AW10-03	24.568	24.571	24.566	24.5693	12.684
AW10-02	24.465	24.465	24.469	24.467	12.701
AW2-01	25.103	25.108	25.110	25.106	12.590
AW2-02	25.123	25.118	25.111	25.1175	12.61
AW2-03	25.253	25.254	25.253	25.253	12.673
AL6-01	25.032	25.033	25.03	25.0312	12.577
AW4-03	25.166	25.166	25.164	25.165	12.621
AW5-01	25.263	25.262	25.259	25.2615	12.681
AW5-03	25.134	25.136	25.154	25.142	12.607
AW6-01	25.263	25.265	25.266	25.264	12.685
AW7-01	25.18	25.178	25.177	25.1782	12.63

Specimen ID#	Post Irradiation L2	Post Irradiation L3	Post Irradiation L4	Post Irradiation Average L	Post Irradiation D1
AW7-02	25.264	25.266	25.266	25.2652	12.676
AW9-03	25.104	25.104	25.097	25.1005	12.588
AW10-01	25.126	25.121	25.122	25.1232	12.581
AL8-02	25.17	25.166	25.171	25.1698	12.619
AW9-02	25.111	25.116	25.115	25.1142	12.59
AW12-03	25.103	25.1	25.095	25.0988	12.596
AW13-01	25.256	25.257	25.256	25.2568	12.664
AW14C01	6.267	6.263	6.266	6.268	12.538
AW14C02	6.263	6.259	6.265	6.2633	12.55
AW14C04	6.268	6.269	6.267	6.268	12.576
AW15C02	6.279	6.271	6.274	6.2755	12.565
BW9-03	24.988	24.943	24.942	24.961	12.702
BW2-02	24.736	24.703	24.71	24.721	12.677
BW2-01	24.557	24.528	24.535	24.541	12.676
BW9-02	24.749	24.775	24.778	24.7612	12.685
BW9-01	24.611	24.612	24.611	24.6112	12.696
BW12-02	25.007	24.999	25.002	25.003	12.703
BW3-02	24.75	24.752	24.747	24.7488	12.637
BW1-01	24.675	24.66	24.653	24.6627	12.653
BW7-03	25.052	25.060	25.050	25.049	12.713
BW12-03	24.779	24.785	24.780	24.778	12.672
BW7-02	24.72	24.721	24.708	24.7162	12.688
BW5-01	24.645	24.668	24.636	24.644	12.709
BW3-03	24.522	24.524	24.535	24.5275	12.709
BL6-03	24.424	24.413	24.416	24.4187	12.712
BL7-01	24.874	24.877	24.873	24.874	12.728
BW11-01	24.585	24.588	24.525	24.554	12.682
BW10-03	24.44	24.433	24.431	24.4365	12.688
BW1-03	25.07	25.075	25.073	25.071	12.582
BW5-02	25.094	25.095	25.097	25.0945	12.606
BW1-02	25.217	25.216	25.222	25.2187	12.681
BW2-03	25.063	25.061	25.058	25.060	12.573
BW3-01	25.129	25.130	25.124	25.127	12.626
BW11-02	25.23	25.232	25.232	25.2302	12.663
BL6-02	25.067	25.064	25.052	25.0595	12.571
BW5-03	25.116	25.105	25.099	25.1052	12.593
BW7-01	25.16	25.163	25.166	25.1625	12.638
BW8-01	25.095	25.092	25.09	25.0925	12.591
BW8-02	25.173	25.149	25.159	25.165	12.627
BW8-03	25.233	25.232	25.232	25.232	12.658
BW10-01	25.093	25.088	25.092	25.092	12.593
BW10-02	25.139	25.137	25.140	25.140	12.613
BW11-03	25.077	25.084	25.083	25.08	12.586

Specimen ID#	Post Irradiation L2	Post Irradiation L3	Post Irradiation L4	Post Irradiation Average L	Post Irradiation D1
BW12-01	25.099	25.098	25.098	25.0975	12.596
BL7-02	25.215	25.216	25.214	25.215	12.67
BW14C01	6.263	6.261	6.261	6.2635	12.562
BW15C05	6.242	6.23	6.242	6.2425	12.572
BW14C02	6.318	6.308	6.309	6.314	12.705
BW14C03	6.252	6.248	6.237	6.2435	12.551
BW14C04	6.319	6.314	6.314	6.3163	12.706
BW14C05	6.23	6.235	6.236	6.2328	12.567
BW15C02	6.250	6.249	6.249	6.250	12.581
BW15C03	6.298	6.309	6.309	6.304	12.695
BW15C04	6.316	6.301	6.303	6.3098	12.713
M2C02	6.304	6.311	6.308	6.3055	12.691
M3B01	6.291	6.282	6.282	6.286	12.650
M3B02	6.282	6.280	6.285	6.283	12.628
M3B03	6.294	6.283	6.283	6.2877	12.603
M3B04	6.288	6.282	6.286	6.286	12.602
M3B05	6.279	6.286	6.288	6.2832	12.585
M4B01	6.296	6.302	6.286	6.2903	12.583
M4B02	6.301	6.296	6.29	6.296	12.561
M4B03	6.283	6.29	6.288	6.2865	12.562
M4B04	6.294	6.29	6.291	6.29	12.563
M4B06	6.283	6.292	6.293	6.288	12.566
M7B01	6.253	6.243	6.249	6.2508	12.575
M7B02	6.244	6.253	6.252	6.2465	12.572
M7B03	6.267	6.262	6.249	6.2603	12.587
M7B04	6.258	6.252	6.247	6.2508	12.594
M7B07	6.26	6.264	6.254	6.2568	12.62
M8B01	6.283	6.28	6.273	6.279	12.641
M8B03	6.285	6.281	6.287	6.2862	12.667
M2C01	NA	NA	NA	6.281	NA
DW3-03	24.745	24.743	24.741	24.7432	12.702
DW3-02	24.448	24.45	24.429	24.4398	12.656
DW3-01	24.233	24.198	24.199	24.216	12.629
DW8-02	24.841	24.859	24.848	24.8473	12.708
DW8-01	24.440	24.436	24.434	24.439	12.657
DW7-03	24.280	24.267	24.268	24.273	12.667
DW1-03	24.885	24.825	24.829	24.8558	12.658
DA602	24.403	24.409	24.407	24.405	12.623
DW1-01	24.392	24.377	24.363	24.3753	12.599
DA701	24.851	24.885	24.879	24.872	12.69
DW6-02	24.537	24.529	24.529	24.5312	12.648
DW6-03	24.387	24.385	24.392	24.3888	12.638
DW5-02	24.375	24.363	24.336	24.3603	12.656

Specimen ID#	Post Irradiation L2	Post Irradiation L3	Post Irradiation L4	Post Irradiation Average L	Post Irradiation D1
DW11-01	24.211	24.188	24.2	24.2035	12.659
DW10-01	24.644	24.654	24.654	24.6497	12.693
DW1-02	24.216	24.221	24.219	24.217	12.635
DW9-03	24.108	24.082	24.077	24.0925	12.647
DW2-01	24.884	24.889	24.893	24.8882	12.528
DA601	24.998	25.003	24.993	24.997	12.543
DW2-03	25.137	25.136	25.136	25.1365	12.649
DW4-03	24.877	24.88	24.882	24.8792	12.517
DW4-01	25.019	25.021	25.017	25.0173	12.573
DW5-01	25.151	25.150	25.150	25.151	12.631
DW5-03	24.97	24.99	24.994	24.9835	12.552
DW6-01	25.07	25.085	25.089	25.0805	12.584
DW7-01	24.934	24.921	24.925	24.9292	12.527
DW7-02	25.052	25.034	25.034	25.048	12.586
DA702	25.164	25.166	25.166	25.1658	12.632
DW8-03	24.932	24.931	24.934	24.9342	12.523
DW9-01	25.043	25.030	25.037	25.040	12.575
DW9-02	25.168	25.168	25.166	25.167	12.635
DW10-03	24.896	24.89	24.894	24.8938	12.509
DW2-02	24.957	24.954	24.947	24.9533	12.553
DW10-02	25.158	25.157	25.158	25.1583	12.624
DW14C01	6.257	6.256	6.255	6.2555	12.524
DW14C02	6.309	6.31	6.31	6.3095	12.678
DW14C03	6.207	6.208	6.209	6.2077	12.495
DW14C04	6.214	6.21	6.216	6.2138	12.503
DW15C01	6.324	6.323	6.321	6.3223	12.703
DW15C02	6.222	6.223	6.22	6.221	12.508
DW15C03	6.31	6.314	6.311	6.3115	12.688
DW15C04	6.219	6.219	6.219	6.218	12.499
DW14C05	NA	NA	NA	6.312	NA
P2C02	6.274	6.276	6.275	6.275	12.644
P2C03	6.318	6.319	6.33	6.3232	12.715
P1B02	6.310	6.304	6.306	6.308	12.680
P1B04	6.299	6.295	6.293	6.2963	12.689
P1B05	6.297	6.293	6.294	6.2952	12.672
P1B06	6.286	6.282	6.28	6.284	12.654
P1B07	6.291	6.294	6.287	6.2893	12.673
P1B08	6.289	6.293	6.287	6.2873	12.675
P1B10	6.285	6.29	6.286	6.2855	12.677
P3B04	6.292	6.279	6.276	6.2832	12.665
P3B05	6.277	6.282	6.291	6.283	12.692
P3B06	6.289	6.289	6.286	6.2873	12.696
P3B07	6.28	6.28	6.272	6.2752	12.696

Specimen ID#	Post Irradiation L2	Post Irradiation L3	Post Irradiation L4	Post Irradiation Average L	Post Irradiation D1
P3B08	6.26	6.246	6.258	6.2583	12.647
P3B09	6.283	6.284	6.287	6.2843	12.666
P3B10	6.284	6.283	6.284	6.285	12.667
P4B01	6.278	6.274	6.279	6.2782	12.657
P4B02	6.299	6.290	6.291	6.294	12.672
P4B03	6.307	6.302	6.311	6.309	12.702
K4C01	6.252	6.252	6.246	6.249	12.544
K2B01	6.272	6.276	6.284	6.2782	12.64
K2B02	6.278	6.272	6.273	6.274	12.609
K2B03	6.272	6.276	6.274	6.2737	12.576
K2B04	6.251	6.263	6.252	6.253	12.579
K2B05	6.260	6.262	6.259	6.261	12.570
K2B06	6.271	6.261	6.260	6.266	12.561
K2B07	6.25	6.256	6.257	6.2547	12.55
K3B01	6.258	6.248	6.249	6.252	12.542
K3B02	6.245	6.259	6.256	6.2523	12.54
K3B03	6.24	6.245	6.247	6.2445	12.548
K3B04	6.26	6.254	6.256	6.2568	12.53
K3B05	6.25	6.255	6.257	6.254	12.537
K3B06	6.254	6.250	6.238	6.248	12.538
K3B07	6.255	6.246	6.243	6.2488	12.573
K6B01	6.267	6.266	6.265	6.267	12.593
K6B02	6.277	6.282	6.279	6.278	12.612
K6B03	6.3	6.292	6.289	6.2955	12.656
L4C01	6.316	6.310	6.315	6.314	12.701
L4C02	6.238	6.238	6.229	6.2343	12.568
L2B02	6.291	6.287	6.292	6.291	12.665
L2B03	6.285	6.278	6.281	6.2825	12.642
L2B04	6.262	6.261	6.263	6.2625	12.62
L2B05	6.260	6.256	6.257	6.258	12.603
L2B06	6.251	6.25	6.249	6.25	12.599
L2B07	6.247	6.244	6.243	6.245	12.601
L2B08	6.231	6.235	6.237	6.233	12.587
L3B03	6.237	6.235	6.24	6.236	12.555
L3B04	6.242	6.236	6.23	6.2363	12.583
L3B05	6.235	6.24	6.234	6.2353	12.576
L3B06	6.24	6.245	6.244	6.2423	12.576
L3B07	6.219	6.222	6.220	6.221	12.578
L3B08	6.246	6.242	6.240	6.243	12.592
L3B09	6.256	6.251	6.246	6.2505	12.604
L6B01	6.261	6.268	6.273	6.267	12.641
L6B02	6.294	6.29	6.29	6.2923	12.663
L6B03	6.295	6.296	6.296	6.2957	12.687

Specimen ID#	Post Irradiation L2	Post Irradiation L3	Post Irradiation L4	Post Irradiation Average L	Post Irradiation D1
N3C01	6.281	6.275	6.272	6.2763	12.566
N3C02	6.3	6.293	6.299	6.299	12.658
N1B03	6.287	6.288	6.274	6.2803	12.623
N1B04	6.276	6.286	6.280	6.279	12.620
N1B05	6.258	6.269	6.274	6.2683	12.581
N1B06	6.299	6.296	6.282	6.290	12.576
N1B08	6.283	6.285	6.272	6.2805	12.596
N2B04	6.278	6.288	6.283	6.284	12.611
N2B05	6.296	6.295	6.292	6.2945	12.595
N2B06	6.295	6.286	6.279	6.2835	12.594
N2B07	6.28	6.259	6.272	6.274	12.592
N2B08	6.282	6.292	6.289	6.2877	12.556
N5B01	6.261	6.265	6.273	6.2672	12.589
N5B02	6.278	6.272	6.261	6.2702	12.558
N5B03	6.283	6.277	6.276	6.28	12.558
N5B04	6.265	6.267	6.264	6.263	12.589
N5B05	6.258	6.263	6.262	6.26	12.605
N6B02	6.28	6.279	6.27	6.276	12.62
N6B03	6.309	6.305	6.302	6.305	12.653

Specimen ID#	Post Irradiation D2	Post Irradiation D3	Post Irradiation D4	Post Irradiation D1 90	Post Irradiation D2 90
H-16-1				12.196	
H-16-2				12.184	
H-17-1				12.211	
H-3-1				12.522	
H-3-2				12.437	
H-4-1				12.368	
H-4-2				12.308	
H-5-2				12.212	
H-7-1				12.172	
H-7-2				12.157	
H-8-1				12.149	
H-8-2				12.161	
H-9-1				12.186	
H-9-2				12.215	
H-10-1				12.254	
H-10-2				12.319	
H-12-1				12.389	
H-12-2				12.456	
H-13-1				12.522	
H-13-2				NA	
H-5-1				12.255	
R4C01A				12.607	
R4C04A				12.611	
R4C07A				12.611	
R4C08A				12.618	
R5C01A				12.624	
R5C02A				12.696	
R2B01A				12.678	
R2B03A				12.667	
R2B06A				12.658	
R2B07A				12.653	
R2B08A				12.654	
R2B09A				12.652	
R2B10A				12.644	
R3B01A				12.649	
R3B02A				12.643	
R3B03A				12.641	
R3B04A				12.643	
R3B06A				12.628	
R3B07A				12.635	
R3B08A				12.645	
R6B01A				12.649	
R6B02A				12.666	



Specimen ID#	Post Irradiation D2	Post Irradiation D3	Post Irradiation D4	Post Irradiation D1 90	Post Irradiation D2 90
R6B04A				12.717	
CPB1					
CPB181					
CPB21					
CPB31					
CPB41					
CPB51					
CPB61					
CPB71					
CPB81					
CPB91					
CPB101					
CPB111					
CPB121					
CPB131					
CPB141					
CPB151					
CPB161					
CPB171					
CW9-01	12.656	12.658	12.651	12.637	12.653
CW13-02	12.662	12.667	12.661	12.656	12.663
CW14-01	12.688	12.69	12.684	12.703	12.695
CW12-02	12.675	12.669	12.673	12.681	12.669
CW7-03	12.651	12.654	12.645	12.669	12.655
CW7-01	12.629	12.623	12.622	12.628	12.623
CW11-02	12.686	12.681	12.681	12.682	12.683
CW11-01	12.669	12.662	12.663	12.660	12.660
CW10-01	12.689	12.683	12.686	12.696	12.679
CW9-03	12.702	12.699	12.703	12.698	12.709
CW13-03	12.669	12.668	12.678	12.667	12.675
CW8-02	12.562	12.568	12.566	12.556	12.561
CW8-03	12.606	12.602	12.597	12.611	12.610
CW11-03	12.559	12.561	12.565	12.547	12.551
CW10-02	12.552	12.55	12.549	12.555	12.557
CW10-03	12.558	12.559	12.546	12.552	12.56
CW12-01	12.626	12.631	12.632	12.615	12.626
CW13-01	12.615	12.622	12.618	12.61	12.614
CW14-02	12.615	12.619	12.616	12.602	12.612
CW1C02				12.569	
CW1C03				12.567	
CW1C04				12.578	
CW2C01				12.579	
CW9-02				NA	

Specimen ID#	Post Irradiation D2	Post Irradiation D3	Post Irradiation D4	Post Irradiation D1 90	Post Irradiation D2 90
J3C01				12.544	
J3C04				12.674	
J1B03				12.627	
J1B04				12.599	
J1B05				12.593	
J1B06				12.563	
J1B07				12.556	
J2B01				12.569	
J2B03				12.532	
J2B04				12.549	
J2B05				12.535	
J2B06				12.554	
J5B01				12.549	
J5B02				12.545	
J5B04				12.543	
J5B05				12.553	
J5B06				12.588	
J6B01				12.61	
J6B02				12.639	
EW5-01	12.63	12.63	12.632	12.641	12.621
EW8-03	12.675	12.68	12.673	12.679	12.674
EW8-02	12.639	12.659	12.68	12.633	12.648
EW2-02	12.658	12.659	12.669	12.67	12.664
EW2-01	12.645	12.641	12.647	12.657	12.647
EW7-01	12.619	12.628	12.640	12.639	12.627
EW6-03	12.606	12.606	12.595	12.617	12.632
EW4-01	12.683	12.679	12.673	12.689	12.687
EW6-01	12.663	12.659	12.654	12.689	12.682
EW10-02	12.652	12.649	12.657	12.695	12.681
EW9-03	12.669	12.672	12.667	12.636	12.650
EW4-02	12.654	12.649	12.672	12.668	12.656
EW2-03	12.602	12.600	12.594	12.615	12.610
EW5-03	12.553	12.542	12.54	12.546	12.546
EW10-03	12.516	12.522	12.52	12.516	12.536
EW6-02	12.601	12.609	12.606	12.594	12.606
EW7-03	12.522	12.528	12.509	12.522	12.515
EW8-01	12.513	12.521	12.512	12.532	12.529
EW9-01	12.521	12.526	12.532	12.501	12.519
EW9-02	12.62	12.625	12.628	12.612	12.616
EW5-02	12.546	12.54	12.533	12.535	12.547
EW10-01	12.554	12.553	12.549	12.557	12.556
EW13C01				12.506	
EW13C02				12.532	

Specimen ID#	Post Irradiation D2	Post Irradiation D3	Post Irradiation D4	Post Irradiation D1 90	Post Irradiation D2 90
EW13C03				12.66	
EW13C04				12.516	
EW14C01				12.539	
FW3-01	12.661	12.663	12.653	12.648	12.644
FW2-03	12.634	12.641	12.652	12.653	12.652
FW2-02	12.621	12.627	12.627	12.645	12.653
FW12-01	12.702	12.705	12.712	12.707	12.698
FW9-03	12.669	12.667	12.681	12.678	12.673
FW9-02	12.643	12.663	12.688	12.688	12.673
FW13-01	12.639	12.648	12.658	12.646	12.650
FW1-01	12.622	12.618	12.628	12.61	12.604
FW8-02	12.648	12.657	12.667	12.646	12.645
FW4-02	12.643	12.63	12.634	12.66	12.646
FW8-01	12.629	12.647	12.664	12.666	12.669
FW5-02	12.7	12.695	12.715	12.716	12.709
FW5-01	12.687	12.687	12.692	12.681	12.681
FW4-03	12.697	12.696	12.684	12.703	12.695
FW11-02	12.678	12.680	12.686	12.700	12.695
FW11-01	12.676	12.673	12.682	12.693	12.675
FW10-03	12.681	12.689	12.706	12.706	12.692
FW1-03	12.561	12.57	12.567	12.556	12.56
FW2-01	12.575	12.57	12.561	12.563	12.57
FW3-02	12.555	12.563	12.553	12.541	12.553
FW3-03	12.602	12.602	12.605	12.582	12.601
FW7-01	12.557	12.559	12.567	12.573	12.569
FW7-02	12.639	12.641	12.635	12.633	12.635
FW7-03	12.652	12.652	12.654	12.646	12.65
FW8-03	12.551	12.552	12.555	12.541	12.537
FW5-03	12.584	12.585	12.589	12.578	12.574
FW9-01	12.597	12.602	12.602	12.599	12.596
FW10-01	12.57	12.567	12.571	12.561	12.575
FW10-02	12.567	12.564	12.572	12.585	12.561
FW4-01	12.641	12.649	12.652	12.641	12.646
FW11-03	12.555	12.549	12.552	12.569	12.563
FW12-02	12.612	12.613	12.617	12.613	12.615
FW18C01				12.572	
FW18C02				12.683	
FW18C03				12.563	
FW18C04				12.697	
FW18C06				12.578	
FW19C01				12.701	
FW19C02				12.610	
FW19C04				12.566	

Specimen ID#	Post Irradiation D2	Post Irradiation D3	Post Irradiation D4	Post Irradiation D1 90	Post Irradiation D2 90
S2C01				12.565	
S1B01				12.661	
S1B03				12.641	
S1B04				12.572	
S1B07				12.606	
S1B08				12.598	
S1B09				12.588	
S1B10				12.587	
S3B01				12.567	
S3B03				12.575	
S3B04				12.577	
S3B07				12.6	
S3B08				12.578	
S3B09				12.588	
S3B10				12.612	
S4B01				12.636	
S4B03				12.672	
S4B04				12.707	
AW4-02	12.716	12.714	12.713	12.715	12.711
AW4-01	12.67	12.67	12.673	12.671	12.672
AL6-02	12.668	12.663	12.67	12.7	12.693
AL8-01	12.695	12.697	12.707	12.681	12.688
AW9-01	12.682	12.681	12.68	12.698	12.681
AW7-03	12.682	12.683	12.699	12.684	12.683
AW1-03	12.708	12.706	12.71	12.714	12.709
AW1-02	12.653	12.653	12.654	12.641	12.651
AW1-01	12.622	12.622	12.629	12.638	12.628
AW6-03	12.703	12.699	12.696	12.712	12.707
AW6-02	12.681	12.670	12.672	12.686	12.683
AW5-02	12.724	12.709	12.711	12.735	12.723
AW13-02	12.697	12.685	12.704	12.71	12.697
AW12-01	12.723	12.728	12.732	12.725	12.725
AW10-03	12.676	12.679	12.696	12.682	12.68
AW10-02	12.687	12.691	12.711	12.699	12.685
AW2-01	12.594	12.599	12.598	12.589	12.592
AW2-02	12.604	12.594	12.591	12.607	12.602
AW2-03	12.666	12.665	12.663	12.673	12.662
AL6-01	12.577	12.58	12.582	12.581	12.592
AW4-03	12.628	12.632	12.637	12.621	12.624
AW5-01	12.684	12.682	12.683	12.683	12.686
AW5-03	12.607	12.609	12.607	12.603	12.607
AW6-01	12.683	12.681	12.683	12.686	12.685
AW7-01	12.635	12.64	12.643	12.624	12.632

Specimen ID#	Post Irradiation D2	Post Irradiation D3	Post Irradiation D4	Post Irradiation D1 90	Post Irradiation D2 90
AW7-02	12.684	12.689	12.695	12.676	12.689
AW9-03	12.58	12.58	12.576	12.587	12.584
AW10-01	12.584	12.592	12.588	12.588	12.582
AL8-02	12.626	12.629	12.629	12.62	12.63
AW9-02	12.585	12.587	12.581	12.591	12.59
AW12-03	12.587	12.588	12.591	12.597	12.59
AW13-01	12.685	12.683	12.697	12.67	12.682
AW14C01				12.536	
AW14C02				12.554	
AW14C04				12.574	
AW15C02				12.568	
BW9-03	12.700	12.694	12.695	12.699	12.703
BW2-02	12.673	12.672	12.678	12.676	12.672
BW2-01	12.67	12.669	12.688	12.682	12.668
BW9-02	12.68	12.673	12.682	12.686	12.679
BW9-01	12.684	12.684	12.698	12.698	12.688
BW12-02	12.703	12.703	12.704	12.701	12.702
BW3-02	12.637	12.637	12.645	12.637	12.637
BW1-01	12.637	12.64	12.642	12.655	12.642
BW7-03	12.703	12.700	12.695	12.721	12.703
BW12-03	12.673	12.672	12.683	12.670	12.669
BW7-02	12.672	12.674	12.684	12.68	12.672
BW5-01	12.701	12.702	12.709	12.705	12.699
BW3-03	12.693	12.695	12.698	12.716	12.694
BL6-03	12.693	12.697	12.711	12.708	12.691
BL7-01	12.718	12.716	12.727	12.73	12.72
BW11-01	12.680	12.685	12.699	12.680	12.682
BW10-03	12.676	12.678	12.697	12.684	12.679
BW1-03	12.584	12.585	12.594	12.581	12.584
BW5-02	12.606	12.598	12.6	12.599	12.603
BW1-02	12.673	12.675	12.673	12.68	12.672
BW2-03	12.573	12.577	12.576	12.567	12.575
BW3-01	12.619	12.622	12.625	12.622	12.617
BW11-02	12.672	12.669	12.67	12.662	12.671
BL6-02	12.568	12.572	12.574	12.57	12.571
BW5-03	12.6	12.608	12.606	12.598	12.603
BW7-01	12.63	12.627	12.629	12.634	12.627
BW8-01	12.586	12.582	12.582	12.593	12.586
BW8-02	12.630	12.621	12.620	12.627	12.624
BW8-03	12.664	12.671	12.674	12.657	12.666
BW10-01	12.591	12.593	12.595	12.591	12.589
BW10-02	12.611	12.626	12.621	12.614	12.611
BW11-03	12.584	12.588	12.581	12.588	12.59

Specimen ID#	Post Irradiation D2	Post Irradiation D3	Post Irradiation D4	Post Irradiation D1 90	Post Irradiation D2 90
BW12-01	12.598	12.596	12.593	12.596	12.599
BL7-02	12.675	12.67	12.665	12.67	12.672
BW14C01				12.563	
BW15C05				12.575	
BW14C02				12.707	
BW14C03				12.556	
BW14C04				12.706	
BW14C05				12.568	
BW15C02				12.582	
BW15C03				12.694	
BW15C04				12.716	
M2C02				12.693	
M3B01				12.651	
M3B02				12.628	
M3B03				12.608	
M3B04				12.597	
M3B05				12.585	
M4B01				12.584	
M4B02				12.566	
M4B03				12.563	
M4B04				12.56	
M4B06				12.568	
M7B01				12.574	
M7B02				12.57	
M7B03				12.586	
M7B04				12.595	
M7B07				12.621	
M8B01				12.645	
M8B03				12.664	
M2C01				NA	
DW3-03	12.684	12.673	12.673	12.695	12.68
DW3-02	12.627	12.624	12.639	12.657	12.631
DW3-01	12.596	12.611	12.650	12.621	12.599
DW8-02	12.688	12.677	12.681	12.715	12.691
DW8-01	12.641	12.648	12.686	12.647	12.638
DW7-03	12.625	12.620	12.643	12.665	12.628
DW1-03	12.663	12.67	12.69	12.661	12.669
DA602	12.601	12.601	12.624	12.61	12.587
DW1-01	12.578	12.587	12.61	12.598	12.57
DA701	12.678	12.671	12.673	12.692	12.679
DW6-02	12.616	12.609	12.616	12.643	12.61
DW6-03	12.605	12.601	12.62	12.639	12.606
DW5-02	12.651	12.659	12.697	12.658	12.656

Specimen ID#	Post Irradiation D2	Post Irradiation D3	Post Irradiation D4	Post Irradiation D1 90	Post Irradiation D2 90
DW11-01	12.625	12.622	12.66	12.672	12.641
DW10-01	12.681	12.675	12.688	12.695	12.675
DW1-02	12.628	12.638	12.669	12.641	12.631
DW9-03	12.615	12.615	12.664	12.664	12.629
DW2-01	12.527	12.519	12.517	12.531	12.529
DA601	12.543	12.543	12.545	12.540	12.537
DW2-03	12.637	12.628	12.613	12.644	12.632
DW4-03	12.51	12.504	12.501	12.518	12.506
DW4-01	12.568	12.565	12.561	12.575	12.57
DW5-01	12.629	12.624	12.626	12.634	12.629
DW5-03	12.547	12.545	12.547	12.555	12.552
DW6-01	12.588	12.592	12.599	12.59	12.59
DW7-01	12.525	12.541	12.541	12.521	12.524
DW7-02	12.587	12.582	12.58	12.589	12.585
DA702	12.642	12.657	12.667	12.636	12.651
DW8-03	12.528	12.538	12.553	12.528	12.535
DW9-01	12.581	12.587	12.587	12.577	12.578
DW9-02	12.633	12.639	12.630	12.643	12.642
DW10-03	12.504	12.51	12.51	12.507	12.503
DW2-02	12.552	12.543	12.539	12.552	12.546
DW10-02	12.62	12.62	12.618	12.621	12.62
DW14C01				12.524	
DW14C02				12.685	
DW14C03				12.485	
DW14C04				12.503	
DW15C01				12.7	
DW15C02				12.515	
DW15C03				12.689	
DW15C04				12.509	
DW14C05				NA	
P2C02				12.685	
P2C03				12.709	
P1B02				12.683	
P1B04				12.68	
P1B05				12.653	
P1B06				12.684	
P1B07				12.656	
P1B08				12.666	
P1B10				12.699	
P3B04				12.693	
P3B05				12.697	
P3B06				12.677	
P3B07				12.662	

Specimen ID#	Post Irradiation D2	Post Irradiation D3	Post Irradiation D4	Post Irradiation D1 90	Post Irradiation D2 90
P3B08				12.688	
P3B09				12.645	
P3B10				12.662	
P4B01				12.669	
P4B02				12.670	
P4B03				12.696	
K4C01				12.538	
K2B01				12.638	
K2B02				12.608	
K2B03				12.588	
K2B04				12.572	
K2B05				12.581	
K2B06				12.586	
K2B07				12.555	
K3B01				12.544	
K3B02				12.535	
K3B03				12.535	
K3B04				12.531	
K3B05				12.541	
K3B06				12.536	
K3B07				12.566	
K6B01				12.596	
K6B02				12.620	
K6B03				12.653	
L4C01				12.703	
L4C02				12.568	
L2B02				12.665	
L2B03				12.642	
L2B04				12.621	
L2B05				12.602	
L2B06				12.598	
L2B07				12.598	
L2B08				12.585	
L3B03				12.563	
L3B04				12.582	
L3B05				12.575	
L3B06				12.573	
L3B07				12.583	
L3B08				12.586	
L3B09				12.605	
L6B01				12.641	
L6B02				12.661	
L6B03				12.686	



Specimen ID#	Post Irradiation D2	Post Irradiation D3	Post Irradiation D4	Post Irradiation D1 90	Post Irradiation D2 90
N3C01				12.574	
N3C02				12.654	
N1B03				12.628	
N1B04				12.601	
N1B05				12.611	
N1B06				12.605	
N1B08				12.586	
N2B04				12.588	
N2B05				12.592	
N2B06				12.609	
N2B07				12.57	
N2B08				12.592	
N5B01				12.58	
N5B02				12.566	
N5B03				12.551	
N5B04				12.572	
N5B05				12.593	
N6B02				12.617	
N6B03				12.657	

Specimen ID#	Post Irradiation D3 90	Post Irradiation D4 90	Post Irradiation Average D		Preirradiation L1	Preirradiation L2
H-16-1			12.196		6.308	6.316
H-16-2			12.183		6.301	6.301
H-17-1			12.212		6.314	6.311
H-3-1			12.5185		6.312	6.318
H-3-2			12.438		6.321	6.314
H-4-1			12.3705		6.264	6.276
H-4-2			12.31		6.238	6.209
H-5-2			12.211		6.298	6.292
H-7-1			12.176		6.314	6.302
H-7-2			12.157		6.292	6.307
H-8-1			12.146		6.293	6.247
H-8-2			12.154		6.322	6.320
H-9-1			12.1885		6.334	6.330
H-9-2			12.2125		6.316	6.292
H-10-1			12.254		6.323	6.318
H-10-2			12.3175		6.298	6.301
H-12-1			12.3865		6.321	6.307
H-12-2			12.453		6.308	6.304
H-13-1			12.5235		6.287	6.284
H-13-2					6.316	6.311
H-5-1			12.252		6.306	6.302
R4C01A			12.6055		6.334	6.328
R4C04A			12.6115		6.326	6.320
R4C07A			12.612		6.341	6.337
R4C08A			12.618		6.332	6.337
R5C01A			12.6225		6.331	6.335
R5C02A			12.6955		6.344	6.337
R2B01A			12.677		6.340	6.340
R2B03A			12.6655		6.327	6.331
R2B06A			12.657		6.323	6.323
R2B07A			12.653		6.332	6.330
R2B08A			12.6555		6.330	6.330
R2B09A			12.655		6.321	6.321
R2B10A			12.646		6.327	6.313
R3B01A			12.646		6.336	6.331
R3B02A			12.6405		6.325	6.326
R3B03A			12.6405		6.317	6.320
R3B04A			12.6405		6.314	6.317
R3B06A			12.6305		6.331	6.336
R3B07A			12.635		6.301	6.306
R3B08A			12.6455		6.327	6.323
R6B01A			12.6515		6.328	6.332
R6B02A			12.6645		6.331	6.331

Specimen ID#	Post Irradiation D3 90	Post Irradiation D4 90	Post Irradiation Average D		Preirradiation L1	Preirradiation L2
R6B04A			12.716		6.325	6.320
CPB1						
CPB181						
CPB21						
CPB31						
CPB41						
CPB51						
CPB61						
CPB71						
CPB81						
CPB91						
CPB101						
CPB111						
CPB121						
CPB131						
CPB141						
CPB151						
CPB161						
CPB171						
CW9-01	12.659	12.67	12.6544		25.378	25.381
CW13-02	12.665	12.673	12.6647		25.377	25.377
CW14-01	12.693	12.688	12.6921		25.364	25.366
CW12-02	12.666	12.660	12.671		25.373	25.378
CW7-03	12.657	12.654	12.6568		25.377	25.375
CW7-01	12.622	12.638	12.6271		25.378	25.380
CW11-02	12.681	12.682	12.683		25.366	25.367
CW11-01	12.665	12.669	12.664		25.367	25.372
CW10-01	12.672	12.669	12.6825		25.373	25.373
CW9-03	12.704	12.708	12.703		25.371	25.371
CW13-03	12.677	12.681	12.6749		25.378	25.377
CW8-02	12.562	12.553	12.561		25.375	25.373
CW8-03	12.600	12.596	12.603		25.371	25.373
CW11-03	12.556	12.555	12.5557		25.372	25.370
CW10-02	12.553	12.533	12.5494		25.375	25.373
CW10-03	12.558	12.546	12.5544		25.370	25.366
CW12-01	12.629	12.628	12.6259		25.371	25.373
CW13-01	12.621	12.621	12.6178		25.370	25.375
CW14-02	12.619	12.62	12.6143		25.367	25.367
CW1C02			12.5685		6.334	6.341
CW1C03			12.5665		6.327	6.327
CW1C04			12.580		6.321	6.318
CW2C01			12.577		6.327	6.334
CW9-02			NA		25.377	25.381

Specimen ID#	Post Irradiation D3 90	Post Irradiation D4 90	Post Irradiation Average D		Preirradiation L1	Preirradiation L2
J3C01			12.5455		6.335	6.335
J3C04			12.68		6.334	6.334
J1B03			12.6295		6.336	6.337
J1B04			12.6055		6.337	6.336
J1B05			12.585		6.336	6.337
J1B06			12.5655		6.335	6.335
J1B07			12.554		6.336	6.337
J2B01			12.5655		6.340	6.336
J2B03			12.536		6.337	6.336
J2B04			12.543		6.339	6.334
J2B05			12.528		6.331	6.335
J2B06			12.545		6.332	6.335
J5B01			12.545		6.335	6.335
J5B02			12.538		6.332	6.339
J5B04			12.546		6.334	6.337
J5B05			12.561		6.335	6.336
J5B06			12.5905		6.335	6.335
J6B01			12.606		6.336	6.337
J6B02			12.6385		6.336	6.337
EW5-01	12.635	12.632	12.6311		25.384	25.384
EW8-03	12.673	12.66	12.675		25.381	25.384
EW8-02	12.66	12.684	12.6534		25.378	25.382
EW2-02	12.67	12.669	12.6653		25.385	25.384
EW2-01	12.648	12.647	12.6481		25.385	25.386
EW7-01	12.626	12.618	12.627		25.381	25.382
EW6-03	12.636	12.626	12.616		25.384	25.381
EW4-01	12.686	12.685	12.6835		25.373	25.377
EW6-01	12.684	12.682	12.6728		25.382	25.382
EW10-02	12.678	12.696	12.671		25.381	25.384
EW9-03	12.651	12.665	12.660		25.380	25.382
EW4-02	12.651	12.669	12.6615		25.380	25.381
EW2-03	12.602	12.591	12.603		25.389	25.387
EW5-03	12.543	12.532	12.5441		25.373	25.381
EW10-03	12.537	12.525	12.5224		25.381	25.385
EW6-02	12.609	12.605	12.603		25.385	25.386
EW7-03	12.503	12.501	12.516		25.382	25.382
EW8-01	12.533	12.532	12.5222		25.381	25.382
EW9-01	12.525	12.515	12.520		25.382	25.382
EW9-02	12.624	12.625	12.6209		25.382	25.382
EW5-02	12.557	12.563	12.544		25.377	25.375
EW10-01	12.559	12.561	12.5551		25.381	25.385
EW13C01			12.516		6.328	6.330
EW13C02			12.531		6.332	6.331

Specimen ID#	Post Irradiation D3 90	Post Irradiation D4 90	Post Irradiation Average D		Preirradiation L1	Preirradiation L2
EW13C03			12.656		6.334	6.331
EW13C04			12.5275		6.332	6.332
EW14C01			12.531		6.335	6.335
FW3-01	12.649	12.656	12.6542		25.384	25.381
FW2-03	12.653	12.663	12.647		25.381	25.384
FW2-02	12.648	12.647	12.6363		25.378	25.378
FW12-01	12.695	12.707	12.704		25.387	25.387
FW9-03	12.666	12.679	12.6744		25.385	25.385
FW9-02	12.679	12.698	12.6758		25.387	25.384
FW13-01	12.650	12.659	12.649		25.385	25.382
FW1-01	12.6	12.609	12.614		25.381	25.381
FW8-02	12.651	12.659	12.6529		25.384	25.382
FW4-02	12.654	12.663	12.6471		25.382	25.382
FW8-01	12.662	12.671	12.657		25.382	25.382
FW5-02	12.71	12.723	12.7094		25.385	25.385
FW5-01	12.682	12.687	12.6862		25.377	25.380
FW4-03	12.693	12.696	12.696		25.375	25.377
FW11-02	12.697	12.707	12.691		25.382	25.382
FW11-01	12.677	12.690	12.683		25.385	25.385
FW10-03	12.692	12.706	12.6991		25.385	25.385
FW1-03	12.554	12.55	12.5602		25.382	25.381
FW2-01	12.575	12.569	12.5697		25.377	25.377
FW3-02	12.553	12.545	12.552		25.381	25.376
FW3-03	12.603	12.601	12.5971		25.381	25.378
FW7-01	12.562	12.556	12.563		25.387	25.386
FW7-02	12.635	12.636	12.636		25.382	25.382
FW7-03	12.651	12.655	12.6506		25.387	25.382
FW8-03	12.54	12.549	12.5464		25.378	25.382
FW5-03	12.579	12.580	12.582		25.387	25.386
FW9-01	12.607	12.608	12.6004		25.389	25.387
FW10-01	12.58	12.58	12.5715		25.389	25.391
FW10-02	12.563	12.569	12.568		25.390	25.390
FW4-01	12.645	12.644	12.6451		25.384	25.381
FW11-03	12.572	12.577	12.5627		25.386	25.385
FW12-02	12.618	12.619	12.6151		25.387	25.387
FW18C01			12.5785		6.330	6.330
FW18C02			12.6815		6.334	6.334
FW18C03			12.559		6.335	6.335
FW18C04			12.7		6.327	6.327
FW18C06			12.57		6.327	6.327
FW19C01			12.7		6.328	6.330
FW19C02			12.600		6.335	6.334
FW19C04			12.5645		6.336	6.337

Specimen ID#	Post Irradiation D3 90	Post Irradiation D4 90	Post Irradiation Average D		Preirradiation L1	Preirradiation L2
S2C01			12.5665		6.330	6.332
S1B01			12.6595		6.332	6.337
S1B03			12.6405		6.348	6.341
S1B04			12.575		6.348	6.345
S1B07			12.605		6.328	6.328
S1B08			12.5945		6.332	6.335
S1B09			12.589		6.337	6.341
S1B10			12.5845		6.335	6.336
S3B01			12.5625		6.321	6.318
S3B03			12.5725		6.322	6.322
S3B04			12.5735		6.313	6.322
S3B07			12.5975		6.307	6.302
S3B08			12.58		6.340	6.344
S3B09			12.5875		6.348	6.345
S3B10			12.613		6.342	6.342
S4B01			12.637		6.340	6.341
S4B03			12.6715		6.344	6.339
S4B04			12.707		6.330	6.330
AW4-02	12.715	12.715	12.7145		25.373	25.376
AW4-01	12.671	12.677	12.6726		25.375	25.377
AL6-02	12.683	12.687	12.6802		25.372	25.372
AL8-01	12.687	12.697	12.693		25.361	25.359
AW9-01	12.676	12.684	12.6847		25.381	25.382
AW7-03	12.687	12.696	12.688		25.380	25.384
AW1-03	12.708	12.707	12.7094		25.370	25.368
AW1-02	12.653	12.652	12.650		25.371	25.373
AW1-01	12.628	12.63	12.6282		25.378	25.382
AW6-03	12.702	12.697	12.7037		25.380	25.382
AW6-02	12.677	12.679	12.679		25.377	25.377
AW5-02	12.705	12.715	12.7195		25.371	25.373
AW13-02	12.687	12.708	12.6992		25.366	25.368
AW12-01	12.725	12.732	12.7271		25.357	25.356
AW10-03	12.682	12.695	12.6843		25.380	25.377
AW10-02	12.686	12.710	12.696		25.380	25.378
AW2-01	12.594	12.598	12.594		25.375	25.381
AW2-02	12.592	12.592	12.599		25.375	25.378
AW2-03	12.665	12.658	12.666		25.377	25.378
AL6-01	12.592	12.589	12.5838		25.368	25.371
AW4-03	12.629	12.633	12.6281		25.389	25.390
AW5-01	12.687	12.688	12.6843		25.377	25.375
AW5-03	12.609	12.607	12.607		25.377	25.375
AW6-01	12.686	12.687	12.6845		25.377	25.380
AW7-01	12.638	12.644	12.6357		25.377	25.373

Specimen ID#	Post Irradiation D3 90	Post Irradiation D4 90	Post Irradiation Average D		Preirradiation L1	Preirradiation L2
AW7-02	12.693	12.696	12.6873		25.377	25.375
AW9-03	12.581	12.575	12.5814		25.376	25.376
AW10-01	12.592	12.583	12.5862		25.384	25.387
AL8-02	12.628	12.629	12.6262		25.377	25.381
AW9-02	12.587	12.58	12.5864		25.377	25.384
AW12-03	12.591	12.586	12.5907		25.357	25.359
AW13-01	12.677	12.7	12.6822		25.373	25.372
AW14C01			12.537		6.346	6.340
AW14C02			12.552		6.328	6.337
AW14C04			12.575		6.327	6.330
AW15C02			12.5665		6.331	6.334
BW9-03	12.694	12.690	12.697		25.385	25.387
BW2-02	12.673	12.681	12.6753		25.377	25.373
BW2-01	12.669	12.679	12.6751		25.370	25.367
BW9-02	12.675	12.682	12.6803		25.375	25.376
BW9-01	12.683	12.7	12.6914		25.387	25.384
BW12-02	12.703	12.705	12.703		25.380	25.380
BW3-02	12.64	12.643	12.6391		25.385	25.387
BW1-01	12.638	12.643	12.6438		25.375	25.376
BW7-03	12.697	12.693	12.703		25.368	25.371
BW12-03	12.677	12.684	12.675		25.370	25.364
BW7-02	12.674	12.682	12.6783		25.377	25.378
BW5-01	12.703	12.701	12.704		25.368	25.367
BW3-03	12.698	12.703	12.7007		25.375	25.371
BL6-03	12.7	12.708	12.7025		25.378	25.378
BL7-01	12.725	12.733	12.7246		25.373	25.372
BW11-01	12.678	12.695	12.685		25.373	25.376
BW10-03	12.675	12.698	12.6844		25.381	25.381
BW1-03	12.585	12.597	12.5865		25.375	25.373
BW5-02	12.606	12.601	12.6024		25.372	25.375
BW1-02	12.675	12.671	12.675		25.375	25.372
BW2-03	12.576	12.575	12.574		25.370	25.367
BW3-01	12.626	12.623	12.623		25.372	25.368
BW11-02	12.669	12.667	12.6679		25.375	25.377
BL6-02	12.571	12.578	12.5719		25.373	25.372
BW5-03	12.608	12.608	12.603		25.370	25.370
BW7-01	12.624	12.625	12.6293		25.375	25.375
BW8-01	12.583	12.581	12.5855		25.385	25.382
BW8-02	12.620	12.622	12.624		25.378	25.382
BW8-03	12.674	12.677	12.6676		25.372	25.373
BW10-01	12.594	12.596	12.5928		25.378	25.384
BW10-02	12.626	12.619	12.618		25.375	25.377
BW11-03	12.586	12.578	12.5851		25.372	25.378

Specimen ID#	Post Irradiation D3 90	Post Irradiation D4 90	Post Irradiation Average D		Preirradiation L1	Preirradiation L2
BW12-01	12.594	12.592	12.5955		25.375	25.373
BL7-02	12.668	12.663	12.6691		25.380	25.377
BW14C01			12.5625		6.348	6.350
BW15C05			12.5735		6.311	6.325
BW14C02			12.706		6.320	6.334
BW14C03			12.5535		6.332	6.326
BW14C04			12.706		6.332	6.325
BW14C05			12.5675		6.307	6.309
BW15C02			12.582		6.318	6.320
BW15C03			12.6945		6.321	6.328
BW15C04			12.7145		6.335	6.331
M2C02			12.692		6.334	6.331
M3B01			12.651		6.320	6.326
M3B02			12.628		6.328	6.326
M3B03			12.6055		6.332	6.342
M3B04			12.600		6.340	6.328
M3B05			12.585		6.326	6.336
M4B01			12.5835		6.321	6.326
M4B02			12.5635		6.339	6.327
M4B03			12.5625		6.330	6.335
M4B04			12.5615		6.342	6.335
M4B06			12.567		6.344	6.334
M7B01			12.5745		6.311	6.316
M7B02			12.571		6.304	6.317
M7B03			12.5865		6.312	6.322
M7B04			12.5945		6.318	6.321
M7B07			12.6205		6.314	6.311
M8B01			12.643		6.318	6.323
M8B03			12.6655		6.322	6.313
M2C01			NA		6.332	6.340
DW3-03	12.666	12.671	12.6805		25.377	25.377
DW3-02	12.62	12.637	12.6364		25.375	25.377
DW3-01	12.612	12.655	12.622		25.376	25.376
DW8-02	12.682	12.683	12.6906		25.384	25.385
DW8-01	12.652	12.681	12.656		25.385	25.382
DW7-03	12.618	12.646	12.639		25.385	25.382
DW1-03	12.678	12.691	12.6725		25.382	25.381
DA602	12.586	12.61	12.6052		25.386	25.386
DW1-01	12.587	12.613	12.5928		25.384	25.384
DA701	12.671	12.68	12.6792		25.391	25.390
DW6-02	12.601	12.626	12.6211		25.380	25.380
DW6-03	12.596	12.618	12.6154		25.377	25.377
DW5-02	12.664	12.693	12.6668		25.381	25.381



Specimen ID#	Post Irradiation D3 90	Post Irradiation D4 90	Post Irradiation Average D		Preirradiation L1	Preirradiation L2
DW11-01	12.642	12.671	12.649		25.385	25.385
DW10-01	12.675	12.688	12.6837		25.387	25.386
DW1-02	12.640	12.678	12.645		25.382	25.382
DW9-03	12.629	12.67	12.6416		25.390	25.389
DW2-01	12.522	12.52	12.5241		25.377	25.376
DA601	12.538	12.542	12.541		25.390	25.385
DW2-03	12.619	12.609	12.6289		25.377	25.376
DW4-03	12.499	12.493	12.506		25.384	25.384
DW4-01	12.562	12.562	12.567		25.389	25.390
DW5-01	12.622	12.622	12.627		25.381	25.382
DW5-03	12.543	12.543	12.548		25.382	25.382
DW6-01	12.596	12.607	12.5932		25.381	25.382
DW7-01	12.531	12.542	12.5315		25.378	25.380
DW7-02	12.579	12.581	12.5836		25.381	25.381
DA702	12.658	12.669	12.6515		25.373	25.375
DW8-03	12.542	12.555	12.5378		25.384	25.384
DW9-01	12.587	12.589	12.583		25.387	25.386
DW9-02	12.637	12.634	12.637		25.386	25.386
DW10-03	12.505	12.502	12.5062		25.386	25.386
DW2-02	12.538	12.539	12.5452		25.375	25.376
DW10-02	12.618	12.615	12.6195		25.382	25.386
DW14C01			12.524		6.387	6.386
DW14C02			12.6815		6.336	6.335
DW14C03			12.49		6.336	6.336
DW14C04			12.503		6.336	6.336
DW15C01			12.7015		6.336	6.336
DW15C02			12.5115		6.336	6.336
DW15C03			12.6885		6.336	6.336
DW15C04			12.504		6.336	6.335
DW14C05			NA		6.336	6.337
P2C02			12.665		6.331	6.335
P2C03			12.712		6.342	6.336
P1B02			12.682		6.346	6.345
P1B04			12.6845		6.349	6.341
P1B05			12.6625		6.341	6.341
P1B06			12.669		6.337	6.336
P1B07			12.6645		6.336	6.340
P1B08			12.6705		6.332	6.331
P1B10			12.688		6.336	6.340
P3B04			12.679		6.342	6.335
P3B05			12.695		6.339	6.344
P3B06			12.6865		6.346	6.342
P3B07			12.679		6.336	6.337

Specimen ID#	Post Irradiation D3 90	Post Irradiation D4 90	Post Irradiation Average D		Preirradiation L1	Preirradiation L2
P3B08			12.6675		6.307	6.320
P3B09			12.6555		6.342	6.345
P3B10			12.6645		6.340	6.341
P4B01			12.663		6.328	6.325
P4B02			12.671		6.337	6.337
P4B03			12.699		6.328	6.327
K4C01			12.541		6.337	6.332
K2B01			12.639		6.317	6.328
K2B02			12.609		6.327	6.331
K2B03			12.582		6.340	6.337
K2B04			12.576		6.321	6.314
K2B05			12.576		6.331	6.332
K2B06			12.574		6.331	6.327
K2B07			12.5525		6.316	6.322
K3B01			12.543		6.317	6.321
K3B02			12.5375		6.330	6.327
K3B03			12.5415		6.317	6.325
K3B04			12.5305		6.335	6.335
K3B05			12.539		6.337	6.332
K3B06			12.537		6.322	6.325
K3B07			12.5695		6.322	6.332
K6B01			12.5945		6.335	6.336
K6B02			12.616		6.336	6.341
K6B03			12.6545		6.344	6.342
L4C01			12.702		6.335	6.335
L4C02			12.568		6.326	6.334
L2B02			12.665		6.332	6.336
L2B03			12.642		6.334	6.339
L2B04			12.6205		6.325	6.321
L2B05			12.603		6.337	6.330
L2B06			12.5985		6.331	6.332
L2B07			12.600		6.335	6.331
L2B08			12.586		6.336	6.334
L3B03			12.559		6.337	6.337
L3B04			12.5825		6.335	6.331
L3B05			12.5755		6.339	6.331
L3B06			12.5745		6.330	6.334
L3B07			12.581		6.311	6.314
L3B08			12.589		6.335	6.335
L3B09			12.6045		6.323	6.330
L6B01			12.641		6.327	6.322
L6B02			12.662		6.334	6.335
L6B03			12.6865		6.326	6.325

Specimen ID#	Post Irradiation D3 90	Post Irradiation D4 90	Post Irradiation Average D		Preirradiation L1	Preirradiation L2
N3C01			12.57		6.342	6.341
N3C02			12.656		6.340	6.340
N1B03			12.6255		6.323	6.322
N1B04			12.611		6.341	6.337
N1B05			12.596		6.330	6.321
N1B06			12.591		6.348	6.340
N1B08			12.591		6.332	6.331
N2B04			12.600		6.331	6.339
N2B05			12.5935		6.339	6.342
N2B06			12.6015		6.344	6.340
N2B07			12.581		6.327	6.326
N2B08			12.574		6.334	6.330
N5B01			12.5845		6.328	6.332
N5B02			12.562		6.330	6.334
N5B03			12.5545		6.334	6.332
N5B04			12.581		6.341	6.339
N5B05			12.599		6.326	6.325
N6B02			12.6185		6.339	6.331
N6B03			12.655		6.341	6.346

Specimen ID#	Preirradiation L3	Preirradiation L4	Preirradiation Average L	Preirradiation D1	Preirradiation D2
H-16-1	6.304	6.297	6.306	12.715	
H-16-2	6.312	6.312	6.306	12.714	
H-17-1	6.314	6.313	6.313	12.732	
H-3-1	6.311	6.303	6.311	12.731	
H-3-2	6.279	6.274	6.297	12.720	
H-4-1	6.301	6.267	6.277	12.719	
H-4-2	6.214	6.247	6.227	12.722	
H-5-2	6.316	6.293	6.300	12.720	
H-7-1	6.307	6.322	6.311	12.724	
H-7-2	6.284	6.252	6.284	12.715	
H-8-1	6.275	6.297	6.278	12.724	
H-8-2	6.320	6.320	6.320	12.718	
H-9-1	6.269	6.321	6.313	12.729	
H-9-2	6.292	6.309	6.302	12.720	
H-10-1	6.297	6.317	6.314	12.715	
H-10-2	6.281	6.298	6.294	12.714	
H-12-1	6.304	6.318	6.313	12.720	
H-12-2	6.299	6.294	6.301	12.719	
H-13-1	6.287	6.280	6.284	12.715	
H-13-2	6.312	6.322	6.315	12.714	
H-5-1	6.300	6.311	6.305	12.728	
R4C01A	6.334	6.332	6.332	12.731	
R4C04A	6.336	6.341	6.331	12.741	
R4C07A	6.336	6.336	6.338	12.742	
R4C08A	6.334	6.330	6.333	12.741	
R5C01A	6.335	6.331	6.333	12.733	
R5C02A	6.339	6.348	6.342	12.732	
R2B01A	6.335	6.336	6.338	12.743	
R2B03A	6.337	6.335	6.333	12.741	
R2B06A	6.326	6.323	6.324	12.745	
R2B07A	6.331	6.330	6.331	12.743	
R2B08A	6.328	6.326	6.328	12.742	
R2B09A	6.336	6.336	6.328	12.747	
R2B10A	6.312	6.328	6.320	12.747	
R3B01A	6.337	6.339	6.336	12.745	
R3B02A	6.327	6.326	6.326	12.741	
R3B03A	6.316	6.312	6.316	12.745	
R3B04A	6.326	6.325	6.321	12.743	
R3B06A	6.331	6.322	6.330	12.743	
R3B07A	6.308	6.301	6.304	12.741	
R3B08A	6.328	6.332	6.328	12.739	
R6B01A	6.336	6.334	6.333	12.729	
R6B02A	6.340	6.336	6.334	12.727	

Specimen ID#	Preirradiation L3	Preirradiation L4	Preirradiation Average L	Preirradiation D1	Preirradiation D2
R6B04A	6.316	6.321	6.320	12.747	
CPB1			6.325		
CPB181			6.325		
CPB21			6.325		
CPB31			6.325		
CPB41			6.325		
CPB51			6.325		
CPB61			6.325		
CPB71			6.325		
CPB81			6.325		
CPB91			6.325		
CPB101			6.325		
CPB111			6.325		
CPB121			6.325		
CPB131			6.325		
CPB141			6.325		
CPB151			6.325		
CPB161			6.325		
CPB171			6.325		
CW9-01	25.381	25.380	25.380	12.739	12.729
CW13-02	25.370	25.373	25.374	12.739	12.738
CW14-01	25.371	25.372	25.368	12.743	12.742
CW12-02	25.378	25.371	25.375	12.732	12.729
CW7-03	25.375	25.375	25.375	12.741	12.738
CW7-01	25.375	25.377	25.378	12.731	12.732
CW11-02	25.371	25.371	25.369	12.745	12.741
CW11-01	25.377	25.368	25.371	12.739	12.738
CW10-01	25.375	25.373	25.374	12.731	12.729
CW9-03	25.370	25.373	25.371	12.733	12.733
CW13-03	25.373	25.376	25.376	12.734	12.734
CW8-02	25.377	25.376	25.375	12.746	12.741
CW8-03	25.376	25.372	25.373	12.743	12.739
CW11-03	25.367	25.370	25.370	12.738	12.738
CW10-02	25.372	25.373	25.373	12.736	12.733
CW10-03	25.363	25.371	25.367	12.731	12.737
CW12-01	25.367	25.370	25.370	12.738	12.738
CW13-01	25.363	25.363	25.368	12.734	12.723
CW14-02	25.367	25.370	25.368	12.739	12.741
CW1C02	6.332	6.327	6.334	12.745	
CW1C03	6.321	6.321	6.324	12.739	
CW1C04	6.325	6.330	6.323	12.738	
CW2C01	6.337	6.331	6.332	12.741	
CW9-02	25.377	25.377	25.378	12.742	12.737

Specimen ID#	Preirradiation L3	Preirradiation L4	Preirradiation Average L	Preirradiation D1	Preirradiation D2
J3C01	6.335	6.334	6.334	12.717	
J3C04	6.332	6.335	6.334	12.720	
J1B03	6.337	6.337	6.337	12.714	
J1B04	6.337	6.336	6.337	12.713	
J1B05	6.335	6.336	6.336	12.710	
J1B06	6.336	6.336	6.335	12.710	
J1B07	6.337	6.336	6.337	12.714	
J2B01	6.336	6.334	6.336	12.711	
J2B03	6.334	6.334	6.335	12.717	
J2B04	6.331	6.336	6.335	12.713	
J2B05	6.337	6.335	6.334	12.711	
J2B06	6.335	6.331	6.333	12.709	
J5B01	6.334	6.335	6.334	12.711	
J5B02	6.337	6.336	6.336	12.711	
J5B04	6.336	6.335	6.335	12.711	
J5B05	6.336	6.334	6.335	12.711	
J5B06	6.336	6.336	6.335	12.708	
J6B01	6.340	6.339	6.338	12.715	
J6B02	6.336	6.336	6.336	12.720	
EW5-01	25.380	25.380	25.382	12.729	12.728
EW8-03	25.384	25.384	25.383	12.714	12.717
EW8-02	25.382	25.382	25.381	12.723	12.720
EW2-02	25.386	25.387	25.385	12.738	12.736
EW2-01	25.385	25.385	25.385	12.736	12.734
EW7-01	25.381	25.384	25.382	12.725	12.727
EW6-03	25.381	25.381	25.382	12.723	12.723
EW4-01	25.376	25.375	25.375	12.729	12.727
EW6-01	25.382	25.381	25.382	12.718	12.717
EW10-02	25.384	25.384	25.383	12.713	12.715
EW9-03	25.382	25.382	25.382	12.714	12.717
EW4-02	25.381	25.380	25.380	12.734	12.731
EW2-03	25.386	25.389	25.388	12.734	12.733
EW5-03	25.380	25.373	25.377	12.727	12.727
EW10-03	25.382	25.384	25.383	12.722	12.722
EW6-02	25.386	25.386	25.386	12.720	12.723
EW7-03	25.382	25.382	25.382	12.715	12.715
EW8-01	25.382	25.382	25.382	12.715	12.717
EW9-01	25.382	25.384	25.383	12.713	12.713
EW9-02	25.382	25.382	25.382	12.717	12.715
EW5-02	25.378	25.377	25.377	12.725	12.722
EW10-01	25.382	25.382	25.383	12.717	12.717
EW13C01	6.330	6.328	6.329	12.706	
EW13C02	6.334	6.332	6.332	12.710	

Specimen ID#	Preirradiation L3	Preirradiation L4	Preirradiation Average L	Preirradiation D1	Preirradiation D2
EW13C03	6.332	6.332	6.332	12.713	
EW13C04	6.331	6.331	6.332	12.709	
EW14C01	6.335	6.336	6.335	12.705	
FW3-01	25.384	25.381	25.382	12.719	12.720
FW2-03	25.382	25.382	25.382	12.717	12.718
FW2-02	25.378	25.378	25.378	12.717	12.715
FW12-01	25.389	25.386	25.387	12.722	12.723
FW9-03	25.384	25.382	25.384	12.717	12.718
FW9-02	25.387	25.386	25.386	12.715	12.713
FW13-01	25.380	25.381	25.382	12.728	12.731
FW1-01	25.380	25.381	25.381	12.727	12.723
FW8-02	25.386	25.384	25.384	12.710	12.709
FW4-02	25.381	25.380	25.381	12.727	12.723
FW8-01	25.380	25.378	25.381	12.710	12.710
FW5-02	25.387	25.386	25.386	12.731	12.727
FW5-01	25.381	25.380	25.379	12.729	12.725
FW4-03	25.378	25.377	25.377	12.724	12.723
FW11-02	25.382	25.382	25.382	12.723	12.724
FW11-01	25.385	25.385	25.385	12.723	12.719
FW10-03	25.385	25.385	25.385	12.723	12.720
FW1-03	25.382	25.382	25.382	12.724	12.724
FW2-01	25.380	25.378	25.378	12.717	12.711
FW3-02	25.377	25.381	25.379	12.722	12.722
FW3-03	25.380	25.381	25.380	12.722	12.720
FW7-01	25.389	25.389	25.388	12.741	12.738
FW7-02	25.382	25.381	25.382	12.734	12.731
FW7-03	25.387	25.386	25.386	12.733	12.732
FW8-03	25.380	25.382	25.381	12.715	12.718
FW5-03	25.386	25.387	25.387	12.731	12.728
FW9-01	25.387	25.387	25.388	12.714	12.713
FW10-01	25.392	25.390	25.391	12.722	12.720
FW10-02	25.390	25.390	25.390	12.722	12.723
FW4-01	25.382	25.384	25.383	12.725	12.722
FW11-03	25.384	25.386	25.385	12.724	12.719
FW12-02	25.389	25.387	25.388	12.725	12.722
FW18C01	6.330	6.330	6.330	12.734	
FW18C02	6.332	6.332	6.333	12.736	
FW18C03	6.335	6.335	6.335	12.731	
FW18C04	6.327	6.327	6.327	12.729	
FW18C06	6.327	6.327	6.327	12.732	
FW19C01	6.330	6.331	6.330	12.734	
FW19C02	6.332	6.331	6.333	12.733	
FW19C04	6.336	6.335	6.336	12.710	

Specimen ID#	Preirradiation L3	Preirradiation L4	Preirradiation Average L	Preirradiation D1	Preirradiation D2
S2C01	6.328	6.325	6.329	12.734	
S1B01	6.340	6.337	6.337	12.743	
S1B03	6.336	6.340	6.341	12.742	
S1B04	6.336	6.336	6.341	12.690	
S1B07	6.326	6.327	6.328	12.737	
S1B08	6.345	6.341	6.338	12.732	
S1B09	6.332	6.334	6.336	12.738	
S1B10	6.339	6.337	6.337	12.737	
S3B01	6.323	6.322	6.321	12.724	
S3B03	6.327	6.328	6.325	12.728	
S3B04	6.321	6.311	6.317	12.731	
S3B07	6.307	6.317	6.308	12.743	
S3B08	6.341	6.348	6.343	12.724	
S3B09	6.339	6.345	6.344	12.724	
S3B10	6.336	6.336	6.339	12.724	
S4B01	6.340	6.335	6.339	12.731	
S4B03	6.340	6.345	6.342	12.736	
S4B04	6.331	6.331	6.330	12.734	
AW4-02	25.377	25.377	25.376	12.736	12.736
AW4-01	25.377	25.377	25.377	12.733	12.731
AL6-02	25.371	25.371	25.371	12.727	12.729
AL8-01	25.357	25.358	25.359	12.733	12.713
AW9-01	25.377	25.377	25.379	12.738	12.732
AW7-03	25.377	25.377	25.379	12.733	12.733
AW1-03	25.373	25.372	25.371	12.733	12.734
AW1-02	25.377	25.372	25.373	12.733	12.736
AW1-01	25.376	25.381	25.379	12.725	12.725
AW6-03	25.382	25.389	25.383	12.729	12.729
AW6-02	25.375	25.381	25.378	12.732	12.732
AW5-02	25.381	25.375	25.375	12.743	12.734
AW13-02	25.370	25.366	25.367	12.738	12.733
AW12-01	25.357	25.357	25.357	12.743	12.739
AW10-03	25.376	25.377	25.378	12.733	12.732
AW10-02	25.377	25.378	25.378	12.741	12.739
AW2-01	25.376	25.373	25.376	12.738	12.738
AW2-02	25.378	25.377	25.377	12.731	12.732
AW2-03	25.380	25.378	25.378	12.723	12.723
AL6-01	25.368	25.368	25.369	12.732	12.736
AW4-03	25.389	25.386	25.388	12.739	12.739
AW5-01	25.377	25.378	25.377	12.738	12.738
AW5-03	25.375	25.376	25.376	12.745	12.734
AW6-01	25.377	25.380	25.378	12.746	12.739
AW7-01	25.371	25.377	25.375	12.736	12.738



Specimen ID#	Preirradiation L3	Preirradiation L4	Preirradiation Average L	Preirradiation D1	Preirradiation D2
AW7-02	25.375	25.377	25.376	12.734	12.736
AW9-03	25.381	25.382	25.379	12.734	12.734
AW10-01	25.381	25.380	25.383	12.733	12.732
AL8-02	25.380	25.386	25.381	12.733	12.733
AW9-02	25.380	25.381	25.380	12.737	12.733
AW12-03	25.357	25.357	25.358	12.731	12.724
AW13-01	25.373	25.371	25.372	12.727	12.728
AW14C01	6.328	6.336	6.338	12.710	
AW14C02	6.337	6.330	6.333	12.728	
AW14C04	6.335	6.334	6.331	12.739	
AW15C02	6.341	6.334	6.335	12.723	
BW9-03	25.384	25.382	25.384	12.724	12.725
BW2-02	25.370	25.373	25.373	12.734	12.739
BW2-01	25.372	25.373	25.371	12.745	12.743
BW9-02	25.371	25.372	25.373	12.727	12.729
BW9-01	25.380	25.385	25.384	12.734	12.739
BW12-02	25.377	25.381	25.379	12.737	12.736
BW3-02	25.386	25.384	25.385	12.729	12.731
BW1-01	25.380	25.381	25.378	12.741	12.739
BW7-03	25.371	25.371	25.370	12.731	12.731
BW12-03	25.364	25.367	25.366	12.743	12.742
BW7-02	25.381	25.382	25.380	12.738	12.738
BW5-01	25.370	25.372	25.369	12.729	12.737
BW3-03	25.375	25.375	25.374	12.731	12.738
BL6-03	25.378	25.377	25.378	12.742	12.741
BL7-01	25.373	25.376	25.374	12.739	12.737
BW11-01	25.377	25.376	25.376	12.738	12.741
BW10-03	25.381	25.380	25.381	12.738	12.733
BW1-03	25.375	25.377	25.375	12.731	12.733
BW5-02	25.375	25.370	25.373	12.738	12.737
BW1-02	25.373	25.380	25.375	12.746	12.745
BW2-03	25.373	25.376	25.371	12.729	12.731
BW3-01	25.376	25.372	25.372	12.745	12.739
BW11-02	25.380	25.377	25.377	12.734	12.738
BL6-02	25.376	25.372	25.373	12.745	12.739
BW5-03	25.372	25.373	25.371	12.737	12.734
BW7-01	25.377	25.377	25.376	12.741	12.737
BW8-01	25.382	25.390	25.385	12.738	12.737
BW8-02	25.387	25.381	25.382	12.734	12.739
BW8-03	25.375	25.372	25.373	12.741	12.732
BW10-01	25.382	25.380	25.381	12.741	12.738
BW10-02	25.380	25.376	25.377	12.734	12.725
BW11-03	25.377	25.372	25.375	12.733	12.731

Specimen ID#	Preirradiation L3	Preirradiation L4	Preirradiation Average L	Preirradiation D1	Preirradiation D2
BW12-01	25.375	25.371	25.373	12.733	12.733
BL7-02	25.373	25.375	25.376	12.743	12.743
BW14C01	6.342	6.340	6.345	12.733	
BW15C05	6.336	6.318	6.322	12.738	
BW14C02	6.330	6.321	6.326	12.733	
BW14C03	6.317	6.322	6.324	12.728	
BW14C04	6.327	6.335	6.330	12.742	
BW14C05	6.307	6.304	6.307	12.738	
BW15C02	6.325	6.323	6.321	12.741	
BW15C03	6.330	6.323	6.326	12.738	
BW15C04	6.312	6.314	6.323	12.738	
M2C02	6.325	6.325	6.328	12.734	
M3B01	6.321	6.313	6.320	12.738	
M3B02	6.321	6.322	6.324	12.731	
M3B03	6.337	6.327	6.335	12.728	
M3B04	6.330	6.340	6.334	12.733	
M3B05	6.332	6.320	6.328	12.733	
M4B01	6.341	6.339	6.332	12.737	
M4B02	6.341	6.348	6.339	12.732	
M4B03	6.337	6.335	6.334	12.728	
M4B04	6.340	6.346	6.341	12.733	
M4B06	6.325	6.330	6.333	12.731	
M7B01	6.297	6.299	6.306	12.737	
M7B02	6.302	6.294	6.304	12.731	
M7B03	6.332	6.320	6.321	12.736	
M7B04	6.304	6.303	6.312	12.734	
M7B07	6.297	6.298	6.305	12.732	
M8B01	6.328	6.320	6.322	12.736	
M8B03	6.309	6.321	6.316	12.727	
M2C01	6.320	6.313	6.326	12.738	
DW3-03	25.378	25.375	25.377	12.719	12.723
DW3-02	25.375	25.375	25.375	12.724	12.727
DW3-01	25.376	25.373	25.375	12.736	12.729
DW8-02	25.385	25.384	25.384	12.739	12.733
DW8-01	25.382	25.382	25.383	12.723	12.722
DW7-03	25.381	25.380	25.382	12.725	12.727
DW1-03	25.381	25.381	25.381	12.723	12.725
DA602	25.381	25.386	25.385	12.729	12.724
DW1-01	25.382	25.382	25.383	12.738	12.732
DA701	25.390	25.391	25.391	12.732	12.728
DW6-02	25.378	25.378	25.379	12.720	12.724
DW6-03	25.377	25.377	25.377	12.736	12.734
DW5-02	25.381	25.381	25.381	12.720	12.723

Specimen ID#	Preirradiation L3	Preirradiation L4	Preirradiation Average L	Preirradiation D1	Preirradiation D2
DW11-01	25.386	25.386	25.385	12.715	12.711
DW10-01	25.390	25.390	25.388	12.714	12.714
DW1-02	25.382	25.382	25.382	12.722	12.722
DW9-03	25.390	25.387	25.389	12.728	12.723
DW2-01	25.377	25.376	25.377	12.719	12.723
DA601	25.392	25.390	25.389	12.723	12.723
DW2-03	25.376	25.376	25.376	12.722	12.724
DW4-03	25.384	25.382	25.383	12.715	12.718
DW4-01	25.390	25.390	25.390	12.737	12.732
DW5-01	25.382	25.381	25.382	12.737	12.728
DW5-03	25.382	25.382	25.382	12.718	12.722
DW6-01	25.382	25.382	25.382	12.736	12.728
DW7-01	25.378	25.378	25.379	12.719	12.725
DW7-02	25.378	25.377	25.379	12.737	12.731
DA702	25.375	25.375	25.374	12.733	12.736
DW8-03	25.384	25.384	25.384	12.741	12.734
DW9-01	25.387	25.387	25.387	12.742	12.733
DW9-02	25.386	25.386	25.386	12.737	12.733
DW10-03	25.386	25.385	25.386	12.713	12.717
DW2-02	25.375	25.373	25.375	12.722	12.723
DW10-02	25.387	25.387	25.386	12.717	12.717
DW14C01	6.386	6.384	6.386	12.750	
DW14C02	6.336	6.335	6.335	12.724	
DW14C03	6.336	6.336	6.336	12.723	
DW14C04	6.334	6.335	6.335	12.722	
DW15C01	6.334	6.334	6.335	12.731	
DW15C02	6.336	6.336	6.336	12.731	
DW15C03	6.336	6.335	6.336	12.727	
DW15C04	6.335	6.337	6.336	12.728	
DW14C05	6.336	6.336	6.336	12.723	
P2C02	6.335	6.334	6.334	12.733	
P2C03	6.330	6.337	6.336	12.734	
P1B02	6.348	6.350	6.347	12.741	
P1B04	6.334	6.336	6.340	12.742	
P1B05	6.340	6.341	6.341	12.738	
P1B06	6.335	6.335	6.336	12.736	
P1B07	6.340	6.340	6.339	12.736	
P1B08	6.330	6.335	6.332	12.733	
P1B10	6.340	6.332	6.337	12.743	
P3B04	6.340	6.344	6.340	12.724	
P3B05	6.340	6.337	6.340	12.748	
P3B06	6.345	6.344	6.344	12.742	
P3B07	6.331	6.327	6.333	12.738	

Specimen ID#	Preirradiation L3	Preirradiation L4	Preirradiation Average L	Preirradiation D1	Preirradiation D2
P3B08	6.332	6.318	6.319	12.745	
P3B09	6.345	6.341	6.343	12.743	
P3B10	6.342	6.341	6.341	12.738	
P4B01	6.330	6.327	6.328	12.746	
P4B02	6.332	6.332	6.335	12.736	
P4B03	6.334	6.340	6.332	12.734	
K4C01	6.330	6.334	6.333	12.743	
K2B01	6.330	6.320	6.324	12.739	
K2B02	6.331	6.328	6.329	12.733	
K2B03	6.337	6.340	6.339	12.734	
K2B04	6.327	6.334	6.324	12.734	
K2B05	6.327	6.326	6.329	12.742	
K2B06	6.342	6.341	6.335	12.742	
K2B07	6.330	6.330	6.324	12.733	
K3B01	6.323	6.317	6.320	12.734	
K3B02	6.334	6.336	6.332	12.732	
K3B03	6.325	6.316	6.321	12.732	
K3B04	6.335	6.340	6.336	12.728	
K3B05	6.332	6.334	6.334	12.725	
K3B06	6.340	6.337	6.331	12.725	
K3B07	6.332	6.322	6.327	12.742	
K6B01	6.332	6.332	6.334	12.739	
K6B02	6.337	6.331	6.336	12.734	
K6B03	6.328	6.340	6.339	12.736	
L4C01	6.325	6.325	6.330	12.729	
L4C02	6.344	6.334	6.334	12.731	
L2B02	6.327	6.331	6.332	12.731	
L2B03	6.330	6.328	6.333	12.729	
L2B04	6.330	6.328	6.326	12.734	
L2B05	6.325	6.331	6.331	12.728	
L2B06	6.331	6.328	6.331	12.734	
L2B07	6.332	6.335	6.333	12.737	
L2B08	6.327	6.330	6.332	12.737	
L3B03	6.332	6.334	6.335	12.710	
L3B04	6.325	6.328	6.330	12.736	
L3B05	6.325	6.334	6.332	12.731	
L3B06	6.342	6.337	6.336	12.725	
L3B07	6.314	6.312	6.313	12.733	
L3B08	6.328	6.328	6.332	12.737	
L3B09	6.331	6.323	6.327	12.734	
L6B01	6.327	6.332	6.327	12.741	
L6B02	6.336	6.335	6.335	12.734	
L6B03	6.323	6.325	6.325	12.733	

Specimen ID#	Preirradiation L3	Preirradiation L4	Preirradiation Average L	Preirradiation D1	Preirradiation D2
N3C01	6.332	6.337	6.338	12.738	
N3C02	6.330	6.328	6.334	12.734	
N1B03	6.335	6.341	6.330	12.739	
N1B04	6.325	6.330	6.333	12.742	
N1B05	6.332	6.340	6.331	12.742	
N1B06	6.334	6.345	6.341	12.739	
N1B08	6.337	6.337	6.334	12.745	
N2B04	6.335	6.327	6.333	12.739	
N2B05	6.340	6.337	6.340	12.736	
N2B06	6.342	6.348	6.343	12.734	
N2B07	6.320	6.322	6.324	12.745	
N2B08	6.334	6.339	6.334	12.738	
N5B01	6.331	6.327	6.330	12.737	
N5B02	6.342	6.344	6.337	12.734	
N5B03	6.339	6.337	6.335	12.733	
N5B04	6.327	6.325	6.333	12.737	
N5B05	6.328	6.332	6.33	12.734	
N6B02	6.325	6.332	6.33	12.736	
N6B03	6.345	6.340	6.34	12.733	

Specimen ID#	Preirradiation D3	Preirradiation D4	Preirradiation D1 90	Preirradiation D2 90	Preirradiation D3 90
H-16-1			12.717		
H-16-2			12.715		
H-17-1			12.732		
H-3-1			12.725		
H-3-2			12.720		
H-4-1			12.722		
H-4-2			12.720		
H-5-2			12.720		
H-7-1			12.723		
H-7-2			12.713		
H-8-1			12.722		
H-8-2			12.715		
H-9-1			12.731		
H-9-2			12.720		
H-10-1			12.717		
H-10-2			12.715		
H-12-1			12.725		
H-12-2			12.720		
H-13-1			12.718		
H-13-2			12.713		
H-5-1			12.728		
R4C01A			12.729		
R4C04A			12.739		
R4C07A			12.743		
R4C08A			12.739		
R5C01A			12.734		
R5C02A			12.731		
R2B01A			12.743		
R2B03A			12.741		
R2B06A			12.746		
R2B07A			12.743		
R2B08A			12.743		
R2B09A			12.746		
R2B10A			12.748		
R3B01A			12.743		
R3B02A			12.742		
R3B03A			12.745		
R3B04A			12.745		
R3B06A			12.745		
R3B07A			12.742		
R3B08A			12.739		
R6B01A			12.729		
R6B02A			12.725		

Specimen ID#	Preirradiation D3	Preirradiation D4	Preirradiation D1 90	Preirradiation D2 90	Preirradiation D3 90
R6B04A			12.747		
CPB1					
CPB181					
CPB21					
CPB31					
CPB41					
CPB51					
CPB61					
CPB71					
CPB81					
CPB91					
CPB101					
CPB111					
CPB121					
CPB131					
CPB141					
CPB151					
CPB161					
CPB171					
CW9-01	12.733	12.732	12.739	12.733	12.729
CW13-02	12.734	12.738	12.743	12.739	12.737
CW14-01	12.739	12.745	12.741	12.741	12.743
CW12-02	12.729	12.728	12.733	12.729	12.727
CW7-03	12.736	12.736	12.741	12.737	12.736
CW7-01	12.731	12.734	12.727	12.725	12.732
CW11-02	12.741	12.745	12.742	12.742	12.743
CW11-01	12.737	12.733	12.739	12.734	12.733
CW10-01	12.731	12.736	12.729	12.729	12.732
CW9-03	12.741	12.736	12.737	12.733	12.738
CW13-03	12.733	12.731	12.738	12.736	12.731
CW8-02	12.738	12.739	12.746	12.741	12.738
CW8-03	12.736	12.731	12.745	12.738	12.734
CW11-03	12.739	12.743	12.739	12.739	12.741
CW10-02	12.737	12.737	12.732	12.734	12.734
CW10-03	12.731	12.729	12.729	12.736	12.731
CW12-01	12.738	12.741	12.741	12.738	12.738
CW13-01	12.731	12.733	12.731	12.724	12.729
CW14-02	12.738	12.742	12.739	12.737	12.737
CW1C02			12.745		
CW1C03			12.739		
CW1C04			12.736		
CW2C01			12.738		
CW9-02	12.736	12.731	12.742	12.734	12.733

Specimen ID#	Preirradiation D3	Preirradiation D4	Preirradiation D1 90	Preirradiation D2 90	Preirradiation D3 90
J3C01			12.717		
J3C04			12.725		
J1B03			12.713		
J1B04			12.706		
J1B05			12.710		
J1B06			12.704		
J1B07			12.715		
J2B01			12.710		
J2B03			12.717		
J2B04			12.714		
J2B05			12.714		
J2B06			12.710		
J5B01			12.710		
J5B02			12.713		
J5B04			12.709		
J5B05			12.713		
J5B06			12.713		
J6B01			12.713		
J6B02			12.718		
EW5-01	12.729	12.731	12.729	12.729	12.731
EW8-03	12.717	12.723	12.714	12.714	12.715
EW8-02	12.718	12.718	12.723	12.719	12.718
EW2-02	12.736	12.739	12.737	12.734	12.733
EW2-01	12.733	12.734	12.736	12.732	12.732
EW7-01	12.725	12.723	12.725	12.728	12.725
EW6-03	12.723	12.722	12.724	12.725	12.725
EW4-01	12.728	12.732	12.728	12.727	12.727
EW6-01	12.718	12.724	12.720	12.715	12.719
EW10-02	12.715	12.722	12.719	12.719	12.722
EW9-03	12.718	12.720	12.714	12.717	12.715
EW4-02	12.729	12.729	12.733	12.729	12.728
EW2-03	12.733	12.736	12.734	12.732	12.732
EW5-03	12.725	12.728	12.727	12.723	12.724
EW10-03	12.720	12.719	12.720	12.714	12.711
EW6-02	12.724	12.727	12.719	12.723	12.723
EW7-03	12.719	12.719	12.714	12.717	12.718
EW8-01	12.717	12.722	12.717	12.715	12.717
EW9-01	12.709	12.722	12.717	12.717	12.717
EW9-02	12.717	12.722	12.715	12.715	12.717
EW5-02	12.727	12.728	12.724	12.715	12.722
EW10-01	12.718	12.722	12.717	12.719	12.719
EW13C01			12.713		
EW13C02			12.710		



Specimen ID#	Preirradiation D3	Preirradiation D4	Preirradiation D1 90	Preirradiation D2 90	Preirradiation D3 90
EW13C03			12.711		
EW13C04			12.705		
EW14C01			12.708		
FW3-01	12.720	12.720	12.719	12.718	12.718
FW2-03	12.720	12.720	12.715	12.711	12.715
FW2-02	12.715	12.717	12.719	12.717	12.717
FW12-01	12.723	12.722	12.725	12.723	12.725
FW9-03	12.718	12.719	12.714	12.713	12.713
FW9-02	12.710	12.725	12.714	12.709	12.710
FW13-01	12.724	12.728	12.727	12.725	12.723
FW1-01	12.724	12.725	12.723	12.722	12.724
FW8-02	12.710	12.714	12.711	12.710	12.713
FW4-02	12.723	12.723	12.723	12.722	12.723
FW8-01	12.717	12.720	12.710	12.710	12.713
FW5-02	12.725	12.728	12.733	12.732	12.727
FW5-01	12.725	12.725	12.733	12.731	12.728
FW4-03	12.724	12.728	12.725	12.724	12.724
FW11-02	12.719	12.724	12.725	12.723	12.720
FW11-01	12.719	12.723	12.723	12.718	12.718
FW10-03	12.717	12.722	12.720	12.717	12.718
FW1-03	12.723	12.724	12.725	12.725	12.724
FW2-01	12.711	12.714	12.717	12.715	12.714
FW3-02	12.719	12.722	12.720	12.720	12.719
FW3-03	12.719	12.719	12.720	12.723	12.720
FW7-01	12.734	12.736	12.737	12.737	12.733
FW7-02	12.736	12.738	12.733	12.733	12.734
FW7-03	12.731	12.734	12.736	12.736	12.736
FW8-03	12.710	12.713	12.717	12.717	12.713
FW5-03	12.728	12.727	12.733	12.729	12.729
FW9-01	12.715	12.722	12.717	12.717	12.719
FW10-01	12.719	12.724	12.718	12.718	12.715
FW10-02	12.718	12.718	12.720	12.723	12.720
FW4-01	12.720	12.722	12.725	12.720	12.722
FW11-03	12.719	12.723	12.728	12.722	12.718
FW12-02	12.724	12.722	12.723	12.723	12.725
FW18C01			12.733		
FW18C02			12.736		
FW18C03			12.733		
FW18C04			12.732		
FW18C06			12.732		
FW19C01			12.736		
FW19C02			12.734		
FW19C04			12.708		

Specimen ID#	Preirradiation D3	Preirradiation D4	Preirradiation D1 90	Preirradiation D2 90	Preirradiation D3 90
S2C01			12.734		
S1B01			12.742		
S1B03			12.739		
S1B04			12.689		
S1B07			12.739		
S1B08			12.733		
S1B09			12.738		
S1B10			12.739		
S3B01			12.727		
S3B03			12.723		
S3B04			12.728		
S3B07			12.746		
S3B08			12.724		
S3B09			12.724		
S3B10			12.727		
S4B01			12.732		
S4B03			12.731		
S4B04			12.733		
AW4-02	12.736	12.738	12.738	12.738	12.733
AW4-01	12.736	12.737	12.731	12.734	12.737
AL6-02	12.733	12.734	12.728	12.727	12.732
AL8-01	12.724	12.724	12.733	12.713	12.725
AW9-01	12.732	12.731	12.741	12.731	12.733
AW7-03	12.737	12.741	12.733	12.736	12.736
AW1-03	12.738	12.738	12.733	12.738	12.738
AW1-02	12.734	12.734	12.734	12.736	12.738
AW1-01	12.725	12.723	12.725	12.727	12.727
AW6-03	12.729	12.734	12.729	12.729	12.731
AW6-02	12.736	12.738	12.732	12.734	12.733
AW5-02	12.722	12.724	12.743	12.727	12.725
AW13-02	12.732	12.732	12.741	12.739	12.732
AW12-01	12.736	12.731	12.742	12.738	12.734
AW10-03	12.733	12.738	12.733	12.733	12.734
AW10-02	12.738	12.736	12.746	12.741	12.738
AW2-01	12.732	12.731	12.741	12.737	12.733
AW2-02	12.733	12.737	12.731	12.733	12.733
AW2-03	12.722	12.724	12.725	12.720	12.720
AL6-01	12.733	12.737	12.729	12.734	12.733
AW4-03	12.745	12.748	12.738	12.739	12.742
AW5-01	12.741	12.743	12.739	12.742	12.742
AW5-03	12.732	12.733	12.742	12.731	12.736
AW6-01	12.745	12.734	12.748	12.742	12.739
AW7-01	12.739	12.746	12.738	12.738	12.741

Specimen ID#	Preirradiation D3	Preirradiation D4	Preirradiation D1 90	Preirradiation D2 90	Preirradiation D3 90
AW7-02	12.742	12.746	12.734	12.737	12.739
AW9-03	12.736	12.739	12.734	12.736	12.739
AW10-01	12.725	12.725	12.733	12.732	12.724
AL8-02	12.738	12.736	12.736	12.733	12.736
AW9-02	12.736	12.732	12.741	12.731	12.737
AW12-03	12.727	12.734	12.731	12.729	12.725
AW13-01	12.728	12.729	12.727	12.732	12.732
AW14C01			12.710		
AW14C02			12.728		
AW14C04			12.739		
AW15C02			12.724		
BW9-03	12.728	12.724	12.725	12.725	12.728
BW2-02	12.742	12.747	12.738	12.742	12.739
BW2-01	12.743	12.743	12.745	12.742	12.743
BW9-02	12.720	12.728	12.728	12.729	12.723
BW9-01	12.738	12.737	12.733	12.734	12.739
BW12-02	12.736	12.741	12.736	12.736	12.737
BW3-02	12.731	12.733	12.729	12.731	12.731
BW1-01	12.737	12.738	12.739	12.737	12.737
BW7-03	12.725	12.736	12.731	12.733	12.723
BW12-03	12.746	12.748	12.742	12.742	12.745
BW7-02	12.738	12.738	12.738	12.739	12.738
BW5-01	12.737	12.738	12.729	12.734	12.738
BW3-03	12.742	12.748	12.731	12.738	12.742
BL6-03	12.737	12.743	12.745	12.743	12.736
BL7-01	12.739	12.736	12.745	12.739	12.738
BW11-01	12.739	12.741	12.738	12.739	12.739
BW10-03	12.733	12.737	12.736	12.733	12.733
BW1-03	12.733	12.736	12.729	12.732	12.736
BW5-02	12.736	12.737	12.737	12.737	12.737
BW1-02	12.738	12.739	12.746	12.746	12.741
BW2-03	12.737	12.733	12.731	12.736	12.734
BW3-01	12.742	12.745	12.745	12.741	12.739
BW11-02	12.734	12.736	12.725	12.738	12.734
BL6-02	12.738	12.731	12.745	12.739	12.741
BW5-03	12.736	12.741	12.736	12.736	12.737
BW7-01	12.739	12.738	12.739	12.736	12.738
BW8-01	12.733	12.736	12.737	12.737	12.734
BW8-02	12.739	12.733	12.734	12.736	12.737
BW8-03	12.737	12.734	12.742	12.731	12.737
BW10-01	12.738	12.738	12.741	12.737	12.738
BW10-02	12.720	12.737	12.734	12.725	12.717
BW11-03	12.736	12.741	12.733	12.731	12.738

Specimen ID#	Preirradiation D3	Preirradiation D4	Preirradiation D1 90	Preirradiation D2 90	Preirradiation D3 90
BW12-01	12.738	12.732	12.734	12.737	12.738
BL7-02	12.742	12.741	12.742	12.745	12.743
BW14C01			12.732		
BW15C05			12.738		
BW14C02			12.733		
BW14C03			12.727		
BW14C04			12.743		
BW14C05			12.737		
BW15C02			12.741		
BW15C03			12.737		
BW15C04			12.738		
M2C02			12.732		
M3B01			12.738		
M3B02			12.733		
M3B03			12.727		
M3B04			12.734		
M3B05			12.733		
M4B01			12.736		
M4B02			12.729		
M4B03			12.728		
M4B04			12.732		
M4B06			12.733		
M7B01			12.734		
M7B02			12.732		
M7B03			12.737		
M7B04			12.736		
M7B07			12.733		
M8B01			12.736		
M8B03			12.728		
M2C01			12.736		
DW3-03	12.727	12.737	12.720	12.724	12.731
DW3-02	12.732	12.737	12.722	12.724	12.729
DW3-01	12.725	12.720	12.742	12.731	12.728
DW8-02	12.728	12.724	12.742	12.736	12.728
DW8-01	12.729	12.741	12.724	12.727	12.734
DW7-03	12.731	12.739	12.723	12.722	12.731
DW1-03	12.731	12.738	12.723	12.723	12.728
DA602	12.724	12.724	12.729	12.729	12.728
DW1-01	12.728	12.724	12.736	12.731	12.724
DA701	12.727	12.724	12.733	12.729	12.728
DW6-02	12.732	12.741	12.722	12.724	12.729
DW6-03	12.729	12.725	12.743	12.736	12.729
DW5-02	12.731	12.738	12.718	12.722	12.725

Specimen ID#	Preirradiation D3	Preirradiation D4	Preirradiation D1 90	Preirradiation D2 90	Preirradiation D3 90
DW11-01	12.714	12.718	12.722	12.717	12.710
DW10-01	12.715	12.715	12.717	12.714	12.717
DW1-02	12.731	12.736	12.720	12.725	12.733
DW9-03	12.723	12.719	12.729	12.725	12.724
DW2-01	12.725	12.737	12.720	12.724	12.731
DA601	12.724	12.731	12.723	12.724	12.725
DW2-03	12.731	12.733	12.719	12.722	12.728
DW4-03	12.723	12.731	12.720	12.723	12.725
DW4-01	12.728	12.723	12.737	12.731	12.727
DW5-01	12.724	12.720	12.736	12.717	12.722
DW5-03	12.728	12.733	12.724	12.725	12.728
DW6-01	12.723	12.720	12.741	12.733	12.723
DW7-01	12.729	12.732	12.725	12.725	12.733
DW7-02	12.727	12.720	12.734	12.731	12.725
DA702	12.741	12.747	12.732	12.736	12.741
DW8-03	12.729	12.723	12.743	12.737	12.732
DW9-01	12.729	12.725	12.745	12.734	12.733
DW9-02	12.728	12.727	12.738	12.734	12.725
DW10-03	12.717	12.717	12.715	12.713	12.715
DW2-02	12.728	12.734	12.722	12.724	12.729
DW10-02	12.715	12.717	12.720	12.715	12.711
DW14C01			12.747		
DW14C02			12.723		
DW14C03			12.720		
DW14C04			12.719		
DW15C01			12.728		
DW15C02			12.728		
DW15C03			12.728		
DW15C04			12.731		
DW14C05			12.723		
P2C02			12.733		
P2C03			12.733		
P1B02			12.742		
P1B04			12.741		
P1B05			12.738		
P1B06			12.736		
P1B07			12.736		
P1B08			12.728		
P1B10			12.743		
P3B04			12.723		
P3B05			12.748		
P3B06			12.742		
P3B07			12.738		

Specimen ID#	Preirradiation D3	Preirradiation D4	Preirradiation D1 90	Preirradiation D2 90	Preirradiation D3 90
P3B08			12.746		
P3B09			12.743		
P3B10			12.738		
P4B01			12.738		
P4B02			12.737		
P4B03			12.737		
K4C01			12.742		
K2B01			12.738		
K2B02			12.734		
K2B03			12.734		
K2B04			12.747		
K2B05			12.737		
K2B06			12.750		
K2B07			12.737		
K3B01			12.734		
K3B02			12.733		
K3B03			12.736		
K3B04			12.727		
K3B05			12.725		
K3B06			12.723		
K3B07			12.739		
K6B01			12.742		
K6B02			12.736		
K6B03			12.734		
L4C01			12.727		
L4C02			12.729		
L2B02			12.731		
L2B03			12.731		
L2B04			12.734		
L2B05			12.729		
L2B06			12.734		
L2B07			12.738		
L2B08			12.734		
L3B03			12.710		
L3B04			12.733		
L3B05			12.731		
L3B06			12.728		
L3B07			12.736		
L3B08			12.736		
L3B09			12.737		
L6B01			12.741		
L6B02			12.733		
L6B03			12.733		

Specimen ID#	Preirradiation D3	Preirradiation D4	Preirradiation D1 90	Preirradiation D2 90	Preirradiation D3 90
N3C01			12.739		
N3C02			12.733		
N1B03			12.741		
N1B04			12.743		
N1B05			12.743		
N1B06			12.741		
N1B08			12.746		
N2B04			12.738		
N2B05			12.736		
N2B06			12.734		
N2B07			12.743		
N2B08			12.734		
N5B01			12.739		
N5B02			12.734		
N5B03			12.733		
N5B04			12.739		
N5B05			12.734		
N6B02			12.737		
N6B03			12.733		

Specimen ID#	Preirradiation D4 90	Preirradiation Average D	Stress Level (ksi)	Average Length %Change	Average Diameter %Change
H-16-1		12.716		1.76	-4.09
H-16-2		12.715		2.03	-4.18
H-17-1		12.732		1.88	-4.08
H-3-1		12.728	0	-1.26	-1.65
H-3-2		12.720	0	-0.56	-2.22
H-4-1		12.720	0	-0.12	-2.75
H-4-2		12.721	0	0.82	-3.23
H-5-2		12.720	0	1.32	-4.00
H-7-1		12.724	0	1.37	-4.30
H-7-2		12.714	0	1.44	-4.38
H-8-1		12.723	0	1.11	-4.53
H-8-2		12.717	0	0.88	-4.42
H-9-1		12.730	0	0.63	-4.25
H-9-2		12.720	0	0.51	-3.99
H-10-1		12.716	0	-0.44	-3.63
H-10-2		12.715	0	-0.31	-3.12
H-12-1		12.723	0	-0.75	-2.64
H-12-2		12.720	0	-1.03	-2.10
H-13-1		12.717	0	-1.32	-1.52
H-13-2		12.713	0	-1.63	#N/A
H-5-1		12.728		0.60	-3.74
R4C01A		12.730		-1.37	-0.98
R4C04A		12.740		-1.39	-1.01
R4C07A		12.743		-1.34	-1.02
R4C08A		12.740		-1.28	-0.96
R5C01A		12.734		-1.29	-0.87
R5C02A		12.731		-0.38	-0.28
R2B01A		12.743	0	-0.62	-0.52
R2B03A		12.741	0	-0.77	-0.59
R2B06A		12.745	0	-0.93	-0.69
R2B07A		12.743	0	-0.95	-0.71
R2B08A		12.743	0	-1.01	-0.68
R2B09A		12.746	0	-1.13	-0.72
R2B10A		12.748	0	-1.20	-0.80
R3B01A		12.744	0	-1.31	-0.77
R3B02A		12.741	0	-1.27	-0.79
R3B03A		12.745	0	-1.23	-0.82
R3B04A		12.744	0	-1.17	-0.81
R3B06A		12.744	0	-1.24	-0.89
R3B07A		12.741	0	-1.10	-0.84
R3B08A		12.739	0	-0.93	-0.74
R6B01A		12.729	0	-0.75	-0.61
R6B02A		12.726	0	-0.60	-0.48



Specimen ID#	Preirradiation D4 90	Preirradiation Average D	Stress Level (ksi)	Average Length %Change	Average Diameter %Change
R6B04A		12.747	0	-0.30	-0.24
CPB1				-0.490	#N/A
CPB181				-0.610	#N/A
CPB21				-0.696	#N/A
CPB31				-0.736	#N/A
CPB41				-0.736	#N/A
CPB51				-0.715	#N/A
CPB61				-0.694	#N/A
CPB71				-0.689	#N/A
CPB81				-0.711	#N/A
CPB91				-0.762	#N/A
CPB101				-0.831	#N/A
CPB111				-0.900	#N/A
CPB121				-0.946	#N/A
CPB131				-0.945	#N/A
CPB141				-0.879	#N/A
CPB151				-0.746	#N/A
CPB161				-0.569	#N/A
CPB171				-0.408	#N/A
CW9-01	12.733	12.734	2.5	-4.47	-0.62
CW13-02	12.739	12.739	2.5	-4.64	-0.58
CW14-01	12.748	12.743	2.5	-2.60	-0.40
CW12-02	12.725	12.729	2.5	-2.92	-0.46
CW7-03	12.734	12.737	2	-2.65	-0.63
CW7-01	12.732	12.730	2	-4.23	-0.81
CW11-02	12.745	12.743	2	-2.40	-0.47
CW11-01	12.733	12.736	2	-2.34	-0.56
CW10-01	12.733	12.731	3	-5.02	-0.38
CW9-03	12.737	12.736	3	-5.80	-0.26
CW13-03	12.731	12.733	3	-4.07	-0.46
CW8-02	12.737	12.741		-1.91	-1.41
CW8-03	12.734	12.738		-1.30	-1.05
CW11-03	12.745	12.740		-1.95	-1.45
CW10-02	12.741	12.735		-1.86	-1.46
CW10-03	12.731	12.732		-1.73	-1.39
CW12-01	12.741	12.739		-1.03	-0.89
CW13-01	12.731	12.729		-1.09	-0.88
CW14-02	12.742	12.739		-1.24	-0.98
CW1C02		12.745		-1.90	-1.38
CW1C03		12.739		-1.81	-1.36
CW1C04		12.737		-1.73	-1.23
CW2C01		12.739		-1.77	-1.27
CW9-02	12.731	12.736		-1.72	-

Specimen ID#	Preirradiation D4 90	Preirradiation Average D	Stress Level (ksi)	Average Length %Change	Average Diameter %Change
J3C01		12.717		-1.63	-1.34
J3C04		12.723		-0.31	-0.34
J1B03		12.713	0	-0.62	-0.66
J1B04		12.710	0	-0.88	-0.82
J1B05		12.710	0	-1.00	-0.99
J1B06		12.707	0	-1.18	-1.11
J1B07		12.715	0	-1.33	-1.26
J2B01		12.711	0	-1.43	-1.14
J2B03		12.717	0	-1.50	-1.42
J2B04		12.713	0	-1.64	-1.34
J2B05		12.713	0	-1.68	-1.45
J2B06		12.710	0	-1.67	-1.29
J5B01		12.711	0	-1.54	-1.30
J5B02		12.712	0	-1.56	-1.37
J5B04		12.710	0	-1.54	-1.29
J5B05		12.712	0	-1.39	-1.19
J5B06		12.710	0	-1.23	-0.94
J6B01		12.714	0	-0.96	-0.85
J6B02		12.719	0	-0.73	-0.63
EW5-01	12.729	12.729	2.5	-3.77	-0.77
EW8-03	12.720	12.717	2.5	-2.26	-0.33
EW8-02	12.718	12.720	2.5	-4.38	-0.52
EW2-02	12.737	12.736	2	-2.45	-0.56
EW2-01	12.734	12.734	2	-2.25	-0.67
EW7-01	12.724	12.725	2	-3.47	-0.77
EW6-03	12.724	12.724	2	-3.55	-0.85
EW4-01	12.732	12.729	3	-3.31	-0.35
EW6-01	12.723	12.719	3	-3.49	-0.36
EW10-02	12.722	12.718	3	-4.87	-0.37
EW9-03	12.719	12.717	3	-3.55	-0.45
EW4-02	12.728	12.730	3	-4.68	-0.54
EW2-03	12.733	12.733		-0.89	-1.03
EW5-03	12.728	12.726		-1.18	-1.43
EW10-03	12.715	12.718		-1.36	-1.54
EW6-02	12.724	12.723		-0.85	-0.94
EW7-03	12.723	12.718		-1.20	-1.59
EW8-01	12.720	12.717		-1.15	-1.53
EW9-01	12.722	12.716		-1.27	-1.54
EW9-02	12.720	12.717		-0.68	-0.76
EW5-02	12.728	12.724		-1.26	-1.41
EW10-01	12.723	12.719		-1.04	-1.29
EW13C01		12.710		-1.30	-1.52
EW13C02		12.710		-1.39	-1.41

Specimen ID#	Preirradiation D4 90	Preirradiation Average D	Stress Level (ksi)	Average Length %Change	Average Diameter %Change
EW13C03		12.712		-0.24	-0.44
EW13C04		12.707		-1.26	-1.41
EW14C01		12.706		-1.07	-1.38
FW3-01	12.719	12.719	2.5	-2.19	-0.51
FW2-03	12.717	12.717	2.5	-2.29	-0.55
FW2-02	12.718	12.717	2.5	-3.01	-0.63
FW12-01	12.723	12.723	2.5	-1.62	-0.15
FW9-03	12.714	12.716	2.5	-2.86	-0.32
FW9-02	12.722	12.715	2.5	-3.10	-0.31
FW13-01	12.724	12.726	2	-2.05	-0.61
FW1-01	12.723	12.724	2	-2.77	-0.86
FW8-02	12.717	12.712	2	-2.07	-0.46
FW4-02	12.722	12.723	2	-2.34	-0.60
FW8-01	12.717	12.713	2	-2.56	-0.45
FW5-02	12.731	12.729	3	-1.98	-0.15
FW5-01	12.728	12.728	3	-2.25	-0.33
FW4-03	12.728	12.725	3	-3.46	-0.23
FW11-02	12.724	12.723	3	-2.46	-0.25
FW11-01	12.723	12.721	3	-2.64	-0.30
FW10-03	12.720	12.720	3	-3.62	-0.16
FW1-03	12.725	12.724		-0.61	-1.29
FW2-01	12.717	12.714		-0.77	-1.14
FW3-02	12.719	12.720		-0.75	-1.33
FW3-03	12.722	12.721		-0.64	-0.97
FW7-01	12.733	12.736		-0.81	-1.36
FW7-02	12.738	12.735		-0.55	-0.77
FW7-03	12.738	12.734		-0.46	-0.66
FW8-03	12.713	12.714		-0.69	-1.32
FW5-03	12.727	12.729		-0.83	-1.15
FW9-01	12.723	12.717		-0.76	-0.92
FW10-01	12.720	12.720		-0.81	-1.16
FW10-02	12.720	12.721		-0.86	-1.20
FW4-01	12.722	12.722		-0.43	-0.61
FW11-03	12.725	12.722		-0.49	-1.25
FW12-02	12.722	12.723		-0.64	-0.85
FW18C01		12.734		-0.81	-1.22
FW18C02		12.736		-0.21	-0.42
FW18C03		12.732		-0.45	-1.36
FW18C04		12.731		0.04	-0.24
FW18C06		12.732		-0.46	-1.27
FW19C01		12.735		0.03	-0.27
FW19C02		12.734		-0.58	-1.05
FW19C04		12.709		-0.63	-1.14

Specimen ID#	Preirradiation D4 90	Preirradiation Average D	Stress Level (ksi)	Average Length %Change	Average Diameter %Change
S2C01		12.734		-1.47	-1.32
S1B01		12.743	0	-0.68	-0.65
S1B03		12.741	0	-0.86	-0.79
S1B04		12.689	0	-1.03	-0.90
S1B07		12.738	0	-1.16	-1.04
S1B08		12.732	0	-1.21	-1.08
S1B09		12.738	0	-1.38	-1.17
S1B10		12.738	0	-1.47	-1.21
S3B01		12.725	0	-1.50	-1.28
S3B03		12.725	0	-1.48	-1.20
S3B04		12.729	0	-1.46	-1.22
S3B07		12.745	0	-1.42	-1.15
S3B08		12.724	0	-1.36	-1.13
S3B09		12.724	0	-1.17	-1.07
S3B10		12.725	0	-1.02	-0.88
S4B01		12.731	0	-0.80	-0.74
S4B03		12.733	0	-0.63	-0.48
S4B04		12.734	0	-0.30	-0.21
AW4-02	12.734	12.736	2.5	-1.54	-0.17
AW4-01	12.738	12.734	2.5	-2.42	-0.49
AL6-02	12.733	12.730	2.5	-3.33	-0.39
AL8-01	12.725	12.724	2.5	-2.28	-0.25
AW9-01	12.731	12.733	2.5	-2.88	-0.38
AW7-03	12.739	12.736	2.5	-3.14	-0.38
AW1-03	12.741	12.737	2	-1.35	-0.21
AW1-02	12.736	12.735	2	-2.42	-0.67
AW1-01	12.723	12.725	2	-2.87	-0.76
AW6-03	12.732	12.730	2	-1.18	-0.21
AW6-02	12.732	12.734	2	-1.81	-0.43
AW5-02	12.724	12.730	3	-1.75	-0.08
AW13-02	12.732	12.735	3	-3.16	-0.28
AW12-01	12.736	12.737	3	-1.76	-0.08
AW10-03	12.739	12.734	3	-3.18	-0.39
AW10-02	12.736	12.739	3	-3.59	-0.34
AW2-01	12.734	12.735		-1.07	-1.11
AW2-02	12.736	12.733		-1.02	-1.05
AW2-03	12.724	12.723		-0.49	-0.45
AL6-01	12.737	12.734		-1.33	-1.18
AW4-03	12.746	12.742		-0.88	-0.89
AW5-01	12.746	12.741		-0.45	-0.45
AW5-03	12.733	12.736		-0.92	-1.01
AW6-01	12.738	12.741		-0.45	-0.45
AW7-01	12.745	12.740		-0.77	-0.82

Specimen ID#	Preirradiation D4 90	Preirradiation Average D	Stress Level (ksi)	Average Length %Change	Average Diameter %Change
AW7-02	12.746	12.739		-0.44	-0.41
AW9-03	12.742	12.737		-1.10	-1.22
AW10-01	12.727	12.729		-1.02	-1.12
AL8-02	12.733	12.735		-0.83	-0.85
AW9-02	12.731	12.734		-1.05	-1.16
AW12-03	12.732	12.729		-1.02	-1.09
AW13-01	12.728	12.729		-0.46	-0.37
AW14C01		12.710		-1.11	-1.36
AW14C02		12.728		-1.10	-1.38
AW14C04		12.739		-1.00	-1.29
AW15C02		12.724		-0.94	-1.23
BW9-03	12.724	12.726	2.5	-1.67	-0.22
BW2-02	12.748	12.741	2.5	-2.57	-0.52
BW2-01	12.742	12.743	2.5	-3.27	-0.53
BW9-02	12.728	12.727	2.5	-2.41	-0.36
BW9-01	12.739	12.737	2.5	-3.04	-0.36
BW12-02	12.741	12.737	2	-1.48	-0.27
BW3-02	12.733	12.731	2	-2.51	-0.72
BW1-01	12.737	12.738	2	-2.82	-0.74
BW7-03	12.734	12.730	2	-1.27	-0.21
BW12-03	12.750	12.745	2	-2.32	-0.55
BW7-02	12.741	12.739	2	-2.61	-0.47
BW5-01	12.734	12.735	3	-2.86	-0.24
BW3-03	12.748	12.740	3	-3.33	-0.31
BL6-03	12.743	12.741	3	-3.78	-0.30
BL7-01	12.741	12.739	3	-1.97	-0.11
BW11-01	12.741	12.740	3	-3.24	-0.43
BW10-03	12.737	12.735	3	-3.72	-0.40
BW1-03	12.739	12.734		-1.20	-1.15
BW5-02	12.737	12.737		-1.10	-1.06
BW1-02	12.737	12.742		-0.62	-0.53
BW2-03	12.733	12.733		-1.23	-1.25
BW3-01	12.745	12.742		-0.97	-0.94
BW11-02	12.736	12.734		-0.58	-0.52
BL6-02	12.731	12.738		-1.24	-1.31
BW5-03	12.741	12.737		-1.05	-1.05
BW7-01	12.737	12.738		-0.84	-0.85
BW8-01	12.734	12.736		-1.15	-1.18
BW8-02	12.732	12.736		-0.85	-0.88
BW8-03	12.732	12.736		-0.56	-0.53
BW10-01	12.738	12.739		-1.14	-1.14
BW10-02	12.736	12.729		-0.94	-0.87
BW11-03	12.739	12.735		-1.16	-1.18

Specimen ID#	Preirradiation D4 90	Preirradiation Average D	Stress Level (ksi)	Average Length %Change	Average Diameter %Change
BW12-01	12.733	12.735		-1.09	-1.09
BL7-02	12.741	12.742		-0.64	-0.58
BW14C01		12.732		-1.28	-1.33
BW15C05		12.738		-1.26	-1.29
BW14C02		12.733		-0.20	-0.21
BW14C03		12.727		-1.28	-1.37
BW14C04		12.743		-0.21	-0.29
BW14C05		12.738		-1.17	-1.33
BW15C02		12.741		-1.13	-1.25
BW15C03		12.738		-0.34	-0.34
BW15C04		12.738		-0.21	-0.19
M2C02		12.733		-0.36	-0.32
M3B01		12.738	0	-0.54	-0.69
M3B02		12.732	0	-0.65	-0.81
M3B03		12.727	0	-0.74	-0.96
M3B04		12.734	0	-0.76	-1.05
M3B05		12.733	0	-0.71	-1.16
M4B01		12.736	0	-0.65	-1.20
M4B02		12.731	0	-0.67	-1.31
M4B03		12.728	0	-0.75	-1.30
M4B04		12.732	0	-0.80	-1.34
M4B06		12.732	0	-0.71	-1.29
M7B01		12.736	0	-0.87	-1.26
M7B02		12.731	0	-0.92	-1.26
M7B03		12.736	0	-0.97	-1.18
M7B04		12.735	0	-0.96	-1.10
M7B07		12.732	0	-0.76	-0.88
M8B01		12.736	0	-0.69	-0.73
M8B03		12.727	0	-0.48	-0.49
M2C01		12.737		-0.71	#VALUE!
DW3-03	12.734	12.727	2.5	-2.50	-0.36
DW3-02	12.734	12.729	2.5	-3.69	-0.72
DW3-01	12.724	12.729	2.5	-4.57	-0.85
DW8-02	12.727	12.732	2.5	-2.11	-0.33
DW8-01	12.739	12.730	2.5	-3.72	-0.58
DW7-03	12.737	12.729	2.5	-4.37	-0.71
DW1-03	12.737	12.728	2	-2.07	-0.44
DA602	12.725	12.727	2	-3.86	-0.95
DW1-01	12.722	12.729	2	-3.97	-1.07
DA701	12.727	12.728	2	-2.04	-0.39
DW6-02	12.738	12.729	2	-3.34	-0.85
DW6-03	12.727	12.732	2	-3.89	-0.92
DW5-02	12.734	12.726	3	-4.02	-0.47

Specimen ID#	Preirradiation D4 90	Preirradiation Average D	Stress Level (ksi)	Average Length %Change	Average Diameter %Change
DW11-01	12.714	12.715	3	-4.66	-0.52
DW10-01	12.722	12.716	3	-2.91	-0.25
DW1-02	12.737	12.728	3	-4.59	-0.65
DW9-03	12.725	12.725	3	-5.11	-0.65
DW2-01	12.737	12.727		-1.92	-1.59
DA601	12.732	12.726		-1.55	-1.45
DW2-03	12.737	12.727		-0.94	-0.77
DW4-03	12.731	12.723		-1.99	-1.71
DW4-01	12.722	12.729		-1.47	-1.28
DW5-01	12.718	12.725		-0.91	-0.77
DW5-03	12.734	12.727		-1.57	-1.40
DW6-01	12.723	12.728		-1.19	-1.06
DW7-01	12.738	12.728		-1.77	-1.55
DW7-02	12.722	12.728		-1.31	-1.14
DA702	12.748	12.739		-0.82	-0.69
DW8-03	12.727	12.733		-1.77	-1.53
DW9-01	12.727	12.734		-1.37	-1.19
DW9-02	12.725	12.731		-0.86	-0.74
DW10-03	12.719	12.716		-1.94	-1.65
DW2-02	12.737	12.727		-1.66	-1.43
DW10-02	12.715	12.716		-0.90	-0.76
DW14C01		12.748		-2.04	-1.76
DW14C02		12.724		-0.41	-0.33
DW14C03		12.722		-2.02	-1.82
DW14C04		12.720		-1.91	-1.71
DW15C01		12.729		-0.20	-0.22
DW15C02		12.729		-1.82	-1.71
DW15C03		12.727		-0.38	-0.30
DW15C04		12.729		-1.86	-1.77
DW14C05		12.723		-0.38	#VALUE!
P2C02		12.733		-0.93	-0.54
P2C03		12.734		-0.21	-0.17
P1B02		12.741	0	-0.62	-0.47
P1B04		12.741	0	-0.69	-0.45
P1B05		12.738	0	-0.72	-0.59
P1B06		12.736	0	-0.82	-0.52
P1B07		12.736	0	-0.78	-0.56
P1B08		12.731	0	-0.70	-0.47
P1B10		12.743	0	-0.81	-0.43
P3B04		12.724	0	-0.90	-0.35
P3B05		12.748	0	-0.90	-0.42
P3B06		12.742	0	-0.90	-0.43
P3B07		12.738	0	-0.91	-0.46

Specimen ID#	Preirradiation D4 90	Preirradiation Average D	Stress Level (ksi)	Average Length %Change	Average Diameter %Change
P3B08		12.745	0	-0.96	-0.61
P3B09		12.743	0	-0.93	-0.69
P3B10		12.738	0	-0.88	-0.58
P4B01		12.742	0	-0.78	-0.62
P4B02		12.736	0	-0.64	-0.51
P4B03		12.736	0	-0.37	-0.29
K4C01		12.743		-1.33	-1.58
K2B01		12.739	0	-0.72	-0.78
K2B02		12.734	0	-0.87	-0.98
K2B03		12.734	0	-1.02	-1.20
K2B04		12.741	0	-1.13	-1.30
K2B05		12.739	0	-1.07	-1.29
K2B06		12.746	0	-1.10	-1.35
K2B07		12.735	0	-1.10	-1.43
K3B01		12.734	0	-1.06	-1.50
K3B02		12.732	0	-1.25	-1.53
K3B03		12.734	0	-1.20	-1.51
K3B04		12.727	0	-1.25	-1.55
K3B05		12.725	0	-1.26	-1.46
K3B06		12.724	0	-1.30	-1.47
K3B07		12.741	0	-1.24	-1.34
K6B01		12.741	0	-1.05	-1.15
K6B02		12.735	0	-0.92	-0.93
K6B03		12.735	0	-0.68	-0.63
L4C01		12.728		-0.24	-0.20
L4C02		12.730		-1.58	-1.27
L2B02		12.731	0	-0.64	-0.51
L2B03		12.730	0	-0.79	-0.69
L2B04		12.734	0	-1.00	-0.89
L2B05		12.729	0	-1.14	-0.99
L2B06		12.734	0	-1.27	-1.07
L2B07		12.738	0	-1.39	-1.08
L2B08		12.736	0	-1.56	-1.17
L3B03		12.710	0	-1.56	-1.19
L3B04		12.734	0	-1.48	-1.19
L3B05		12.731	0	-1.53	-1.22
L3B06		12.727	0	-1.47	-1.20
L3B07		12.734	0	-1.46	-1.21
L3B08		12.736	0	-1.40	-1.16
L3B09		12.736	0	-1.21	-1.03
L6B01		12.741	0	-0.95	-0.78
L6B02		12.734	0	-0.67	-0.56
L6B03		12.733	0	-0.46	-0.37



Specimen ID#	Preirradiation D4 90	Preirradiation Average D	Stress Level (ksi)	Average Length %Change	Average Diameter %Change
N3C01		12.739		-0.98	-1.32
N3C02		12.734		-0.56	-0.61
N1B03		12.740	0	-0.79	-0.90
N1B04		12.743	0	-0.86	-1.04
N1B05		12.743	0	-0.98	-1.15
N1B06		12.740	0	-0.82	-1.17
N1B08		12.745	0	-0.85	-1.21
N2B04		12.739	0	-0.77	-1.09
N2B05		12.736	0	-0.71	-1.12
N2B06		12.734	0	-0.94	-1.04
N2B07		12.744	0	-0.78	-1.28
N2B08		12.736	0	-0.73	-1.27
N5B01		12.738	0	-0.99	-1.21
N5B02		12.734	0	-1.06	-1.35
N5B03		12.733	0	-0.87	-1.40
N5B04		12.738	0	-1.11	-1.24
N5B05		12.734	0	-1.07	-1.06
N6B02		12.736	0	-0.88	-0.92
N6B03		12.733	0	-0.60	-0.61

-Specimen ID#	Preirradiation Average Volume	Post Irradiation Average Volume	$\Delta V/V$	Channel
H-16-1	800.851	749.585	-0.06401	5
H-16-2	800.687	750.031	-0.06327	6
H-17-1	803.734	753.349	-0.06269	6
H-3-1	802.961	766.961	-0.04483	7
H-3-2	800.236	760.798	-0.04928	7
H-4-1	797.695	753.488	-0.05542	7
H-4-2	791.440	747.184	-0.05592	7
H-5-2	800.554	747.452	-0.06633	7
H-7-1	802.457	744.955	-0.07166	7
H-7-2	797.743	739.892	-0.07252	7
H-8-1	798.135	735.483	-0.07850	7
H-8-2	802.705	739.713	-0.07847	7
H-9-1	803.494	741.258	-0.07746	7
H-9-2	800.884	741.978	-0.07355	7
H-10-1	801.816	741.321	-0.07545	7
H-10-2	799.189	747.713	-0.06441	7
H-12-1	802.534	754.957	-0.05928	7
H-12-2	800.720	759.565	-0.05140	7
H-13-1	798.145	763.903	-0.04290	7
H-13-2	801.654	0.000	#N/A	7
H-5-1	802.165	747.764	-0.06782	7
R4C01A	805.874	779.368	-0.03289	1
R4C04A	807.000	779.773	-0.03374	2
R4C07A	808.210	781.146	-0.03349	3
R4C08A	807.332	781.827	-0.03159	4
R5C01A	806.495	782.260	-0.03005	5
R5C02A	807.286	799.752	-0.00933	5
R2B01A	808.298	794.924	-0.01655	7
R2B03A	807.318	791.718	-0.01932	7
R2B06A	806.804	788.328	-0.02290	7
R2B07A	807.406	788.459	-0.02347	7
R2B08A	807.036	787.978	-0.02362	7
R2B09A	807.530	787.010	-0.02541	7
R2B10A	806.636	784.259	-0.02774	7
R3B01A	808.132	785.326	-0.02822	7
R3B02A	806.566	783.802	-0.02822	7
R3B03A	805.708	782.886	-0.02833	7
R3B04A	806.193	783.928	-0.02762	7
R3B06A	807.405	783.302	-0.02985	7
R3B07A	803.722	781.642	-0.02747	7
R3B08A	806.567	787.336	-0.02384	7
R6B01A	805.874	790.095	-0.01958	7
R6B02A	805.711	793.193	-0.01554	7

Specimen ID#	Preirradiation Average Volume	Post Irradiation Average Volume	$\Delta V/V$	Channel
R6B04A	806.560	800.267	-0.00780	7
CPB1	0.000	0.000	#N/A	7
CPB181	0.000	0.000	#N/A	7
CPB21	0.000	0.000	#N/A	7
CPB31	0.000	0.000	#N/A	7
CPB41	0.000	0.000	#N/A	7
CPB51	0.000	0.000	#N/A	7
CPB61	0.000	0.000	#N/A	7
CPB71	0.000	0.000	#N/A	7
CPB81	0.000	0.000	#N/A	7
CPB91	0.000	0.000	#N/A	7
CPB101	0.000	0.000	#N/A	7
CPB111	0.000	0.000	#N/A	7
CPB121	0.000	0.000	#N/A	7
CPB131	0.000	0.000	#N/A	7
CPB141	0.000	0.000	#N/A	7
CPB151	0.000	0.000	#N/A	7
CPB161	0.000	0.000	#N/A	7
CPB171	0.000	0.000	#N/A	7
CW9-01	3232.043	3049.202	-0.05657	2
CW13-02	3233.906	3048.058	-0.05747	2
CW14-01	3235.210	3126.141	-0.03371	5
CW12-02	3229.199	3106.039	-0.03814	5
CW7-03	3233.259	3107.983	-0.03875	1
CW7-01	3230.100	3043.448	-0.05779	1
CW11-02	3235.261	3127.766	-0.03323	4
CW11-01	3232.127	3121.101	-0.03435	4
CW10-01	3230.010	3044.378	-0.05747	3
CW9-03	3232.127	3028.897	-0.06288	3
CW13-03	3231.457	3071.417	-0.04953	6
CW8-02	3235.036	3084.311	-0.04659	1
CW8-03	3233.182	3124.355	-0.03366	1
CW11-03	3234.157	3079.924	-0.04769	2
CW10-02	3232.154	3079.951	-0.04709	3
CW10-03	3229.461	3085.909	-0.04445	3
CW12-01	3233.637	3143.696	-0.02781	4
CW13-01	3228.384	3137.588	-0.02812	5
CW14-02	3233.458	3130.861	-0.03173	6
CW1C02	807.940	770.829	-0.04593	2
CW1C03	806.083	770.175	-0.04455	3
CW1C04	805.665	772.390	-0.04130	4
CW2C01	807.128	772.779	-0.04256	6
CW9-02	3232.867	-	-	2

Specimen ID#	Preirradiation Average Volume	Post Irradiation Average Volume	$\Delta V/V$	Channel
J3C01	804.508	770.273	-0.04255	6
J3C04	805.204	797.321	-0.00979	6
J1B03	804.434	788.978	-0.01921	7
J1B04	803.915	783.886	-0.02491	7
J1B05	803.914	780.194	-0.02951	7
J1B06	803.434	776.376	-0.03368	7
J1B07	804.560	773.966	-0.03803	7
J2B01	804.028	774.516	-0.03671	7
J2B03	804.597	770.205	-0.04274	7
J2B04	804.154	769.904	-0.04259	7
J2B05	804.028	767.694	-0.04519	7
J2B06	803.471	769.705	-0.04203	7
J5B01	803.787	770.916	-0.04090	7
J5B02	804.155	770.056	-0.04240	7
J5B04	803.838	771.162	-0.04065	7
J5B05	804.041	774.098	-0.03724	7
J5B06	803.838	779.095	-0.03078	7
J6B01	804.636	783.461	-0.02632	7
J6B02	805.066	789.099	-0.01983	7
EW5-01	3230.165	3060.602	-0.05249	2
EW8-03	3223.888	3130.328	-0.02902	5
EW8-02	3225.105	3052.015	-0.05367	5
EW2-02	3234.101	3119.781	-0.03535	1
EW2-01	3232.844	3117.633	-0.03564	1
EW7-01	3228.174	3068.215	-0.04955	4
EW6-03	3227.273	3060.029	-0.05182	4
EW4-01	3228.945	3100.136	-0.03989	3
EW6-01	3225.029	3089.736	-0.04195	3
EW10-02	3224.699	3044.802	-0.05579	3
EW9-03	3223.723	3081.735	-0.04404	6
EW4-02	3230.406	3045.977	-0.05709	6
EW2-03	3232.909	3138.603	-0.02917	1
EW5-03	3227.829	3099.225	-0.03984	2
EW10-03	3224.497	3083.585	-0.04370	3
EW6-02	3227.389	3139.962	-0.02709	3
EW7-03	3224.205	3085.196	-0.04311	4
EW8-01	3224.065	3089.916	-0.04161	4
EW9-01	3223.432	3084.952	-0.04296	5
EW9-02	3224.002	3153.829	-0.02177	5
EW5-02	3226.714	3096.704	-0.04029	6
EW10-01	3224.852	3109.801	-0.03568	6
EW13C01	802.938	768.525	-0.04286	1
EW13C02	803.432	770.096	-0.04149	2

Specimen ID#	Preirradiation Average Volume	Post Irradiation Average Volume	$\Delta V/V$	Channel
EW13C03	803.672	794.645	-0.01123	2
EW13C04	802.952	770.578	-0.04032	3
EW14C01	803.307	772.958	-0.03778	4
FW3-01	3225.067	3122.276	-0.03187	2
FW2-03	3223.799	3115.520	-0.03359	2
FW2-02	3223.317	3086.887	-0.04233	2
FW12-01	3227.744	3166.176	-0.01907	5
FW9-03	3223.445	3111.018	-0.03488	5
FW9-02	3223.319	3104.134	-0.03698	5
FW13-01	3228.580	3124.021	-0.03239	1
FW1-01	3227.197	3084.037	-0.04436	1
FW8-02	3221.468	3125.658	-0.02974	4
FW4-02	3226.880	3113.962	-0.03499	4
FW8-01	3221.873	3111.522	-0.03425	4
FW5-02	3230.535	3156.895	-0.02279	3
FW5-01	3229.226	3135.926	-0.02889	3
FW4-03	3227.373	3101.142	-0.03911	3
FW11-02	3226.944	3132.058	-0.02940	6
FW11-01	3226.107	3122.291	-0.03218	6
FW10-03	3225.549	3098.685	-0.03933	6
FW1-03	3227.666	3125.809	-0.03156	1
FW2-01	3222.113	3124.831	-0.03019	1
FW3-02	3225.180	3116.543	-0.03368	2
FW3-03	3225.497	3143.068	-0.02556	2
FW7-01	3234.280	3121.600	-0.03484	3
FW7-02	3232.843	3165.644	-0.02079	3
FW7-03	3233.175	3176.169	-0.01763	3
FW8-03	3222.379	3116.335	-0.03291	4
FW5-03	3230.561	3130.365	-0.03101	4
FW9-01	3224.789	3141.635	-0.02579	4
FW10-01	3226.274	3126.123	-0.03104	5
FW10-02	3226.692	3122.546	-0.03228	5
FW4-01	3226.627	3174.011	-0.01631	5
FW11-03	3226.957	3131.069	-0.02971	6
FW12-02	3227.782	3152.719	-0.02326	6
FW18C01	806.088	780.196	-0.03212	1
FW18C02	806.736	798.179	-0.01061	1
FW18C03	806.484	781.185	-0.03137	2
FW18C04	805.352	801.801	-0.00441	2
FW18C06	805.503	781.586	-0.02969	3
FW19C01	806.240	802.055	-0.00519	3
FW19C02	806.495	785.010	-0.02664	4
FW19C04	803.750	780.630	-0.02877	6

Specimen ID#	Preirradiation Average Volume	Post Irradiation Average Volume	$\Delta V/V$	Channel
S2C01	806.036	773.374	-0.04052	5
S1B01	808.095	792.139	-0.01974	7
S1B03	808.415	788.935	-0.02410	7
S1B04	801.905	779.389	-0.02808	7
S1B07	806.364	780.429	-0.03216	7
S1B08	807.018	780.101	-0.03335	7
S1B09	807.448	777.678	-0.03687	7
S1B10	807.537	776.624	-0.03828	7
S3B01	803.943	771.767	-0.04002	7
S3B03	804.427	773.555	-0.03838	7
S3B04	803.864	772.870	-0.03856	7
S3B07	804.700	775.076	-0.03681	7
S3B08	806.564	777.684	-0.03581	7
S3B09	806.691	780.255	-0.03277	7
S3B10	806.245	783.981	-0.02761	7
S4B01	806.930	788.724	-0.02256	7
S4B03	807.527	794.739	-0.01584	7
S4B04	806.164	800.403	-0.00715	7
AW4-02	3232.790	3172.342	-0.01870	2
AW4-01	3232.054	3123.404	-0.03362	2
AL6-02	3229.324	3097.159	-0.04093	2
AL8-01	3224.412	3135.421	-0.02760	5
AW9-01	3231.865	3114.750	-0.03624	5
AW7-03	3233.185	3108.230	-0.03865	5
AW1-03	3232.495	3175.329	-0.01768	1
AW1-02	3232.002	3111.945	-0.03715	1
AW1-01	3227.704	3087.440	-0.04346	1
AW6-03	3230.826	3179.351	-0.01593	4
AW6-02	3231.724	3146.230	-0.02645	4
AW5-02	3229.769	3167.849	-0.01917	3
AW13-02	3231.085	3111.489	-0.03701	3
AW12-01	3230.978	3168.913	-0.01921	6
AW10-03	3232.181	3104.672	-0.03945	6
AW10-02	3234.733	3097.623	-0.04239	6
AW2-01	3232.523	3127.606	-0.03246	1
AW2-02	3231.420	3131.399	-0.03095	1
AW2-03	3226.359	3181.665	-0.01385	1
AL6-01	3230.781	3113.115	-0.03642	2
AW4-03	3237.468	3151.830	-0.02645	2
AW5-01	3235.494	3192.141	-0.01340	2
AW5-03	3232.548	3138.436	-0.02911	3
AW6-01	3235.850	3192.557	-0.01338	3
AW7-01	3234.655	3157.281	-0.02392	4

Specimen ID#	Preirradiation Average Volume	Post Irradiation Average Volume	$\Delta V/V$	Channel
AW7-02	3234.414	3194.119	-0.01246	4
AW9-03	3233.552	3120.543	-0.03495	5
AW10-01	3230.077	3125.749	-0.03230	5
AL8-02	3232.716	3151.483	-0.02513	5
AW9-02	3232.538	3124.729	-0.03335	6
AW12-03	3226.946	3124.947	-0.03161	6
AW13-01	3228.639	3190.490	-0.01182	6
AW14C01	804.117	773.698	-0.03783	1
AW14C02	805.799	775.031	-0.03818	2
AW14C04	807.013	778.457	-0.03538	3
AW15C02	805.445	778.336	-0.03366	4
BW9-03	3228.593	3160.537	-0.02108	2
BW2-02	3235.149	3119.410	-0.03578	2
BW2-01	3235.757	3096.599	-0.04301	2
BW9-02	3227.638	3126.948	-0.03120	5
BW9-01	3234.202	3113.449	-0.03734	5
BW12-02	3233.794	3168.798	-0.02010	1
BW3-02	3231.360	3105.105	-0.03907	1
BW1-01	3234.098	3096.604	-0.04251	1
BW7-03	3229.171	3174.615	-0.01689	4
BW12-03	3235.932	3126.454	-0.03383	4
BW7-02	3234.594	3120.280	-0.03534	4
BW5-01	3231.226	3123.595	-0.03331	3
BW3-03	3234.375	3107.409	-0.03926	3
BL6-03	3235.660	3094.502	-0.04363	3
BL7-01	3234.121	3163.179	-0.02194	6
BW11-01	3234.528	3103.066	-0.04064	6
BW10-03	3232.830	3087.939	-0.04482	6
BW1-03	3231.393	3119.403	-0.03466	1
BW5-02	3232.788	3130.221	-0.03173	1
BW1-02	3235.760	3182.061	-0.01660	1
BW2-03	3230.643	3111.819	-0.03678	2
BW3-01	3235.555	3144.255	-0.02822	2
BW11-02	3232.130	3179.947	-0.01615	2
BL6-02	3233.677	3110.743	-0.03802	3
BW5-03	3232.686	3131.854	-0.03119	3
BW7-01	3233.856	3152.116	-0.02528	3
BW8-01	3233.771	3121.582	-0.03469	4
BW8-02	3233.389	3149.772	-0.02586	4
BW8-03	3232.217	3180.023	-0.01615	4
BW10-01	3234.747	3125.142	-0.03388	5
BW10-02	3229.148	3143.403	-0.02655	5
BW11-03	3232.205	3119.829	-0.03477	6

Specimen ID#	Preirradiation Average Volume	Post Irradiation Average Volume	$\Delta V/V$	Channel
BW12-01	3231.849	3127.168	-0.03239	6
BL7-02	3236.078	3178.633	-0.01775	6
BW14C01	807.858	776.353	-0.03900	1
BW15C05	805.714	775.105	-0.03799	1
BW14C02	805.515	800.530	-0.00619	1
BW14C03	804.591	772.765	-0.03955	2
BW14C04	807.202	800.885	-0.00783	2
BW14C05	803.651	773.163	-0.03794	3
BW15C02	805.903	777.025	-0.03583	4
BW15C03	806.046	797.879	-0.01013	4
BW15C04	805.791	801.132	-0.00578	4
M2C02	805.833	797.755	-0.01002	5
M3B01	805.383	790.033	-0.01906	7
M3B02	805.147	786.912	-0.02265	7
M3B03	805.926	784.697	-0.02634	7
M3B04	806.686	783.763	-0.02842	7
M3B05	805.833	781.587	-0.03009	7
M4B01	806.646	782.283	-0.03020	7
M4B02	806.815	780.505	-0.03261	7
M4B03	805.913	779.204	-0.03314	7
M4B04	807.336	779.513	-0.03446	7
M4B06	806.242	779.948	-0.03261	7
M7B01	803.258	776.260	-0.03361	7
M7B02	802.525	775.294	-0.03393	7
M7B03	805.347	778.924	-0.03281	7
M7B04	803.934	778.731	-0.03135	7
M7B07	802.765	782.700	-0.02500	7
M8B01	805.398	788.280	-0.02125	7
M8B03	803.573	791.996	-0.01441	7
M2C01	806.034	#VALUE!	#VALUE!	5
DW3-03	3228.235	3124.773	-0.03205	2
DW3-02	3228.945	3065.027	-0.05077	2
DW3-01	3229.351	3029.812	-0.06179	2
DW8-02	3231.854	3142.921	-0.02752	5
DW8-01	3230.534	3074.539	-0.04829	5
DW7-03	3230.102	3045.336	-0.05720	5
DW1-03	3229.620	3135.034	-0.02929	1
DA602	3229.202	3045.567	-0.05687	1
DW1-01	3230.229	3035.879	-0.06017	1
DA701	3230.790	3140.395	-0.02798	4
DW6-02	3229.479	3069.044	-0.04968	4
DW6-03	3231.115	3048.473	-0.05653	4
DW5-02	3228.554	3069.774	-0.04918	3



Specimen ID#	Preirradiation Average Volume	Post Irradiation Average Volume	$\Delta V/V$	Channel
DW11-01	3223.394	3041.448	-0.05645	3
DW10-01	3224.168	3114.537	-0.03400	6
DW1-02	3229.582	3041.220	-0.05832	6
DW9-03	3228.658	3023.959	-0.06340	6
DW2-01	3228.299	3066.030	-0.05026	1
DA601	3229.204	3087.910	-0.04376	1
DW2-03	3228.159	3148.660	-0.02463	1
DW4-03	3227.223	3056.069	-0.05303	2
DW4-01	3231.171	3103.084	-0.03964	2
DW5-01	3227.983	3149.578	-0.02429	2
DW5-03	3228.770	3089.528	-0.04313	3
DW6-01	3229.645	3123.908	-0.03274	3
DW7-01	3229.289	3074.711	-0.04787	4
DW7-02	3229.327	3115.105	-0.03537	4
DA702	3234.160	3163.623	-0.02181	4
DW8-03	3232.336	3078.421	-0.04762	5
DW9-01	3232.934	3113.616	-0.03691	5
DW9-02	3231.537	3156.351	-0.02327	5
DW10-03	3223.686	3057.960	-0.05141	6
DW2-02	3228.209	3084.417	-0.04454	6
DW10-02	3223.838	3146.701	-0.02393	6
DW14C01	815.072	770.616	-0.05454	1
DW14C02	805.521	796.941	-0.01065	1
DW14C03	805.357	760.581	-0.05560	2
DW14C04	805.078	762.914	-0.05237	3
DW15C01	806.167	801.078	-0.00631	3
DW15C02	806.320	764.837	-0.05145	4
DW15C03	806.041	798.074	-0.00988	4
DW15C04	806.282	763.552	-0.05300	5
DW14C05	805.560	#VALUE!	#VALUE!	3
P2C02	806.483	790.397	-0.01995	5
P2C03	806.928	802.518	-0.00547	6
P1B02	809.269	796.688	-0.01555	7
P1B04	808.338	795.650	-0.01570	7
P1B05	808.059	792.754	-0.01894	7
P1B06	807.092	792.156	-0.01851	7
P1B07	807.500	792.261	-0.01887	7
P1B08	805.963	792.760	-0.01638	7
P1B10	808.222	794.723	-0.01670	7
P3B04	806.132	793.306	-0.01591	7
P3B05	809.226	795.222	-0.01731	7
P3B06	808.988	794.763	-0.01758	7
P3B07	807.053	792.296	-0.01828	7

Specimen ID#	Preirradiation Average Volume	Post Irradiation Average Volume	$\Delta V/V$	Channel
P3B08	806.192	788.730	-0.02166	7
P3B09	809.025	790.506	-0.02289	7
P3B10	808.098	791.719	-0.02027	7
P4B01	806.846	790.675	-0.02004	7
P4B02	807.054	793.692	-0.01656	7
P4B03	806.647	799.079	-0.00938	7
K4C01	807.648	771.907	-0.04425	6
K2B01	805.943	787.681	-0.02266	7
K2B02	806.049	783.397	-0.02810	7
K2B03	807.297	780.033	-0.03377	7
K2B04	806.235	776.619	-0.03673	7
K2B05	806.720	777.650	-0.03604	7
K2B06	808.335	777.961	-0.03758	7
K2B07	805.552	774.028	-0.03913	7
K3B01	804.864	772.561	-0.04014	7
K3B02	806.165	771.883	-0.04252	7
K3B03	804.916	771.412	-0.04162	7
K3B04	806.079	771.576	-0.04280	7
K3B05	805.559	772.278	-0.04131	7
K3B06	805.025	771.328	-0.04186	7
K3B07	806.630	775.394	-0.03872	7
K6B01	807.484	780.749	-0.03311	7
K6B02	807.080	784.817	-0.02758	7
K6B03	807.373	791.790	-0.01930	7
L4C01	805.353	800.115	-0.00650	5
L4C02	806.154	773.410	-0.04062	6
L2B02	805.924	792.563	-0.01658	7
L2B03	805.950	788.595	-0.02153	7
L2B04	805.680	783.413	-0.02764	7
L2B05	805.557	780.656	-0.03091	7
L2B06	806.278	779.126	-0.03368	7
L2B07	807.015	778.663	-0.03513	7
L2B08	806.570	775.465	-0.03856	7
L3B03	803.800	772.514	-0.03892	7
L3B04	806.164	775.445	-0.03811	7
L3B05	805.963	774.458	-0.03909	7
L3B06	805.965	775.204	-0.03817	7
L3B07	804.024	773.271	-0.03825	7
L3B08	806.646	777.055	-0.03668	7
L3B09	805.959	779.930	-0.03229	7
L6B01	806.630	786.525	-0.02492	7
L6B02	806.737	792.326	-0.01786	7
L6B03	805.350	795.825	-0.01183	7

Specimen ID#	Preirradiation Average Volume	Post Irradiation Average Volume	$\Delta V/V$	Channel
N3C01	807.817	778.868	-0.03584	5
N3C02	806.686	792.418	-0.01769	6
N1B03	806.962	786.262	-0.02565	7
N1B04	807.648	784.195	-0.02904	7
N1B05	807.317	781.097	-0.03248	7
N1B06	808.377	783.079	-0.03129	7
N1B08	808.131	781.996	-0.03234	7
N2B04	807.129	783.489	-0.02929	7
N2B05	807.577	784.050	-0.02913	7
N2B06	807.896	783.675	-0.02998	7
N2B07	806.589	779.946	-0.03303	7
N2B08	806.926	780.780	-0.03240	7
N5B01	806.645	779.535	-0.03361	7
N5B02	807.132	777.121	-0.03718	7
N5B03	806.725	777.407	-0.03634	7
N5B04	807.053	778.455	-0.03543	7
N5B05	805.922	780.434	-0.03162	7
N6B02	806.646	784.853	-0.02702	7
N6B03	807.693	793.048	-0.01813	7

Specimen ID#	Final Distance from Centerline	DPA at Final Position	Estimated DPA		
H-16-1	4.83	6.578	6.628		
H-16-2	2.37	6.837	6.860		
H-17-1	4.84	6.682	6.734		
H-3-1	18.10	3.637	3.570		
H-3-2	15.63	4.494	4.438		
H-4-1	13.16	5.220	5.177		
H-4-2	10.69	5.801	5.769		
H-5-2	5.74	6.546			
H-7-1	3.27	6.739	6.629		
H-7-2	0.80	6.831	6.778		
H-8-1	-1.67	6.835	6.830		
H-8-2	-4.13	6.754	6.795		
H-9-1	-6.60	6.587	6.674		
H-9-2	-9.07	6.324	6.462		
H-10-1	-11.53	5.949	6.145		
H-10-2	-14.00	5.442	5.707		
H-12-1	-16.46	4.784	5.126		
H-12-2	-18.93	3.961	4.386		
H-13-1	-21.40	2.966	3.476		
H-13-2	-23.88	1.813	2.400		
H-5-1	8.22	6.239	4.032		
R4C01A	4.85	6.657	6.705		
R4C04A	4.85	6.723	6.777		
R4C07A	4.84	6.615	6.666		
R4C08A	4.83	6.449	6.499		
R5C01A	3.35	6.684	6.716		
R5C02A	22.64	1.854	2.119		
R2B01A	16.37	4.250	4.190		
R2B03A	13.90	5.017	4.970		
R2B06A	11.43	5.642	5.607		
R2B07A	8.96	6.122	6.098		
R2B08A	6.49	6.467	6.451		
R2B09A	4.01	6.692	6.683		
R2B10A	1.54	6.813	6.809		
R3B01A	-0.93	6.843	6.842		
R3B02A	-3.39	6.787	6.790		
R3B03A	-5.86	6.647	6.652		
R3B04A	-8.33	6.414	6.422		
R3B06A	-10.79	6.074	6.085		
R3B07A	-13.26	5.609	5.622		
R3B08A	-15.72	4.999	5.012		
R6B01A	-18.19	4.226	4.239		
R6B02A	-20.66	3.282	3.293		

Specimen ID#	Final Distance from Centerline	DPA at Final Position	Estimated DPA		
R6B04A	-23.13	2.174	2.181		
CPB1	18.35	3.546	3.477		
CPB181	15.88	4.414	4.356		
CPB21	13.40	5.154	5.108		
CPB31	10.93	5.749	5.716		
CPB41	8.46	6.201	6.178		
CPB51	5.99	6.521	6.506		
CPB61	3.52	6.724	6.716		
CPB71	1.05	6.826	6.823		
CPB81	-1.42	6.838	6.839		
CPB91	-3.89	6.766	6.770		
CPB101	-6.35	6.608	6.615		
CPB111	-8.82	6.355	6.363		
CPB121	-11.28	5.992	6.001		
CPB131	-13.75	5.499	5.509		
CPB141	-16.21	4.857	4.866		
CPB151	-18.68	4.051	4.057		
CPB161	-21.16	3.072	3.076		
CPB171	-23.63	1.934	1.935		
CW9-01	7.18	6.473	-		
CW13-02	1.16	6.924	6.881		
CW14-01	14.48	4.788	-		
CW12-02	13.27	5.129	4.946		
CW7-03	12.07	5.548	5.986		
CW7-01	1.16	6.843	6.880		
CW11-02	14.53	4.682	5.781		
CW11-01	13.31	5.018	5.896		
CW10-01	5.94	6.510	6.257		
CW9-03	1.15	6.814	6.643		
CW13-03	11.99	5.560	6.184		
CW8-02	5.71	6.581	6.674		
CW8-03	16.82	4.161	-		
CW11-03	5.71	6.643	6.369		
CW10-02	5.70	6.535	5.547		
CW10-03	10.63	5.784	5.348		
CW12-01	18.05	3.535	5.066		
CW13-01	18.05	3.602	3.879		
CW14-02	16.81	4.136	4.389		
CW1C02	3.87	6.799	5.901		
CW1C03	3.86	6.690	5.467		
CW1C04	3.84	6.523	5.992		
CW2C01	4.34	6.721	6.767		
CW9-02	11.87	5.614	5.180		

Specimen ID#	Final Distance from Centerline	DPA at Final Position	Estimated DPA		
J3C01	2.86	6.814	6.842		
J3C04	23.13	1.713	1.962		
J1B03	17.86	3.728	3.662		
J1B04	15.38	4.573	4.518		
J1B05	12.91	5.285	5.243		
J1B06	10.44	5.851	5.821		
J1B07	7.97	6.275	6.255		
J2B01	5.50	6.571	6.558		
J2B03	3.02	6.753	6.745		
J2B04	0.55	6.836	6.833		
J2B05	-1.91	6.831	6.831		
J2B06	-4.38	6.742	6.745		
J5B01	-6.85	6.565	6.572		
J5B02	-9.31	6.291	6.301		
J5B04	-11.78	5.904	5.916		
J5B05	-14.24	5.383	5.396		
J5B06	-16.71	4.710	4.723		
J6B01	-19.18	3.869	3.882		
J6B02	-21.65	2.858	2.867		
EW5-01	8.38	6.301	5.527		
EW8-03	16.92	4.004	4.559		
EW8-02	1.16	6.774	6.776		
EW2-02	14.51	4.902	-		
EW2-01	13.29	5.244	5.741		
EW7-01	4.79	6.452	-		
EW6-03	1.16	6.643	5.500		
EW4-01	14.38	4.842	3.651		
EW6-01	13.17	5.182	4.937		
EW10-02	3.54	6.711	5.881		
EW9-03	10.78	5.829	6.286		
EW4-02	5.97	6.576	5.414		
EW2-03	18.05	3.719	5.072		
EW5-03	13.10	5.303	5.969		
EW10-03	8.17	6.225	6.400		
EW6-02	18.04	3.621	5.058		
EW7-03	5.69	6.371	6.248		
EW8-01	9.39	5.871	4.847		
EW9-01	5.70	6.498	6.633		
EW9-02	20.53	2.666	4.644		
EW5-02	10.64	5.858	4.584		
EW10-01	15.58	4.551	-		
EW13C01	4.35	6.694	-		
EW13C02	4.36	6.763	-		

Specimen ID#	Final Distance from Centerline	DPA at Final Position	Estimated DPA		
EW13C03	22.64	1.914	3.512		
EW13C04	4.35	6.655	-		
EW14C01	4.33	6.488	-		
FW3-01	14.45	4.921	4.363		
FW2-03	13.23	5.269	-		
FW2-02	5.97	6.616	6.506		
FW12-01	18.14	3.569	-		
FW9-03	5.99	6.468	5.687		
FW9-02	2.36	6.734	6.627		
FW13-01	10.85	5.817	5.941		
FW1-01	2.37	6.805	4.792		
FW8-02	10.87	5.591	6.161		
FW4-02	7.22	6.198	5.267		
FW8-01	2.37	6.602	6.163		
FW5-02	16.82	4.058	5.426		
FW5-01	15.60	4.467	5.643		
FW4-03	4.74	6.623	6.614		
FW11-02	14.41	4.912	5.018		
FW11-01	13.20	5.255	3.860		
FW10-03	1.16	6.877	5.829		
FW1-03	6.94	6.448	5.797		
FW2-01	15.58	4.573	5.575		
FW3-02	10.64	5.890	6.394		
FW3-03	18.05	3.705	4.961		
FW7-01	9.40	6.022	5.194		
FW7-02	19.28	3.156	2.565		
FW7-03	20.53	2.677	3.276		
FW8-03	6.93	6.234	5.267		
FW5-03	11.87	5.374	5.984		
FW9-01	15.58	4.366	5.577		
FW10-01	6.93	6.359	6.318		
FW10-02	10.64	5.751	3.959		
FW4-01	21.77	2.186	3.848		
FW11-03	5.71	6.602	6.378		
FW12-02	18.05	3.691	5.140		
FW18C01	3.37	6.757	6.687		
FW18C02	22.64	1.924	2.648		
FW18C03	3.37	6.831	6.631		
FW18C04	23.63	1.537	-		
FW18C06	3.36	6.722	5.751		
FW19C01	23.13	1.679	3.409		
FW19C02	3.35	6.553	-		
FW19C04	1.87	6.856	6.874		

Specimen ID#	Final Distance from Centerline	DPA at Final Position	Estimated DPA		
S2C01	3.84	6.653	6.690		
S1B01	16.12	4.332	4.274		
S1B03	13.65	5.086	5.041		
S1B04	11.18	5.696	5.663		
S1B07	8.71	6.162	6.139		
S1B08	6.24	6.494	6.480		
S1B09	3.77	6.709	6.700		
S1B10	1.30	6.820	6.816		
S3B01	-1.17	6.841	6.841		
S3B03	-3.64	6.777	6.780		
S3B04	-6.11	6.628	6.634		
S3B07	-8.57	6.385	6.394		
S3B08	-11.04	6.034	6.045		
S3B09	-13.50	5.555	5.568		
S3B10	-15.97	4.929	4.942		
S4B01	-18.44	4.139	4.152		
S4B03	-20.91	3.178	3.189		
S4B04	-23.38	2.054	2.062		
AW4-02	18.12	3.679	3.573		
AW4-01	12.01	5.581	5.777		
AL6-02	4.76	6.731	6.623		
AL8-01	12.05	5.437	6.146		
AW9-01	8.41	6.152	6.159		
AW7-03	3.57	6.670	6.056		
AW1-03	18.18	3.671	-		
AW1-02	9.63	6.051	-		
AW1-01	6.00	6.552	-		
AW6-03	18.20	3.480	3.398		
AW6-02	12.09	5.322	6.129		
AW5-02	18.04	3.622	5.010		
AW13-02	9.55	5.995	5.386		
AW12-01	18.07	3.684	3.274		
AW10-03	9.57	6.065	6.031		
AW10-02	4.76	6.688	6.302		
AW2-01	10.64	5.860	-		
AW2-02	14.34	4.951	5.889		
AW2-03	21.77	2.269	2.569		
AL6-01	9.40	6.129	6.264		
AW4-03	16.81	4.153	-		
AW5-01	21.77	2.254	-		
AW5-03	14.33	4.856	5.101		
AW6-01	21.77	2.195	4.425		
AW7-01	16.81	3.964	4.258		



Specimen ID#	Final Distance from Centerline	DPA at Final Position	Estimated DPA		
AW7-02	21.77	2.146	2.436		
AW9-03	8.17	6.189	-		
AW10-01	13.11	5.171	-		
AL8-02	16.82	4.040	-		
AW9-02	9.41	6.095	6.226		
AW12-03	14.34	4.933	-		
AW13-01	21.77	2.244	-		
AW14C01	1.89	6.823	-		
AW14C02	1.90	6.901	-		
AW14C04	1.88	6.792	-		
AW15C02	1.87	6.622	-		
BW9-03	16.89	4.124	4.779		
BW2-02	10.80	5.857	4.352		
BW2-01	3.56	6.820	6.727		
BW9-02	10.83	5.710	6.273		
BW9-01	7.20	6.325	6.563		
BW12-02	16.95	4.114	-		
BW3-02	8.42	6.250	5.985		
BW1-01	4.78	6.662	5.036		
BW7-03	16.97	3.910	2.944		
BW12-03	9.65	5.826	4.888		
BW7-02	6.00	6.339	6.052		
BW5-01	11.96	5.488	-		
BW3-03	8.34	6.199	6.557		
BL6-03	2.34	6.774	-		
BL7-01	16.85	4.124	4.635		
BW11-01	8.36	6.267	4.838		
BW10-03	3.56	6.775	4.497		
BW1-03	9.41	6.090	5.733		
BW5-02	13.11	5.292	5.713		
BW1-02	20.53	2.764	4.762		
BW2-03	8.17	6.333	6.568		
BW3-01	15.57	4.571	-		
BW11-02	20.53	2.747	-		
BL6-02	6.93	6.396	5.527		
BW5-03	13.10	5.202	4.480		
BW7-01	16.81	4.062	4.910		
BW8-01	10.63	5.640	-		
BW8-02	14.34	4.737	5.685		
BW8-03	20.53	2.617	4.283		
BW10-01	11.87	5.479	5.350		
BW10-02	15.58	4.450	3.847		
BW11-03	8.17	6.296	4.319		

Specimen ID#	Final Distance from Centerline	DPA at Final Position	Estimated DPA		
BW12-01	13.11	5.279	3.581		
BL7-02	20.53	2.735	4.177		
BW14C01	2.87	6.783	-		
BW15C05	3.86	6.728	-		
BW14C02	23.63	1.542	-		
BW14C03	2.88	6.858	-		
BW14C04	23.13	1.724	-		
BW14C05	2.87	6.749	-		
BW15C02	2.85	6.580	-		
BW15C03	22.64	1.820	-		
BW15C04	23.63	1.459	-		
M2C02	23.13	1.669	1.910		
M3B01	17.12	3.994	3.931		
M3B02	14.64	4.801	4.751		
M3B03	12.17	5.470	5.431		
M3B04	9.70	5.992	5.965		
M3B05	7.23	6.376	6.359		
M4B01	4.76	6.636	6.625		
M4B02	2.28	6.787	6.782		
M4B03	-0.19	6.843	6.842		
M4B04	-2.65	6.813	6.815		
M4B06	-5.12	6.698	6.703		
M7B01	-7.59	6.494	6.502		
M7B02	-10.05	6.188	6.198		
M7B03	-12.51	5.763	5.775		
M7B04	-14.98	5.198	5.212		
M7B07	-17.45	4.476	4.489		
M8B01	-19.92	3.583	3.595		
M8B03	-22.39	2.523	2.531		
M2C01	1.87	6.753	6.770		
DW3-03	15.67	4.539	-		
DW3-02	9.59	6.096	-		
DW3-01	2.35	6.883	-		
DW8-02	15.70	4.412	-		
DW8-01	9.62	5.948	-		
DW7-03	4.78	6.582	-		
DW1-03	15.73	4.526	5.697		
DA602	7.21	6.416	5.399		
DW1-01	3.57	6.745	6.382		
DA701	15.75	4.312	5.493		
DW6-02	8.43	6.028	4.969		
DW6-03	3.58	6.539	6.005		
DW5-02	10.76	5.759	5.712		

Specimen ID#	Final Distance from Centerline	DPA at Final Position	Estimated DPA		
DW11-01	7.14	6.369	6.165		
DW10-01	15.63	4.535	4.778		
DW1-02	7.16	6.437	6.158		
DW9-03	2.36	6.837	6.602		
DW2-01	8.18	6.285	6.129		
DA601	11.87	5.594	4.884		
DW2-03	19.29	3.250	4.885		
DW4-03	6.94	6.504	6.001		
DW4-01	14.34	4.955	5.615		
DW5-01	19.29	3.234	3.477		
DW5-03	11.86	5.512	4.880		
DW6-01	15.57	4.475	5.515		
DW7-01	8.16	6.068	5.970		
DW7-02	13.10	5.073	4.435		
DA702	19.29	3.084	4.664		
DW8-03	9.40	5.987	5.657		
DW9-01	14.34	4.828	4.607		
DW9-02	19.29	3.141	4.984		
DW10-03	6.94	6.464	5.174		
DW2-02	11.87	5.587	6.109		
DW10-02	19.29	3.221	4.770		
DW14C01	2.38	6.805	6.826		
DW14C02	23.13	1.731	1.978		
DW14C03	2.39	6.882	6.905		
DW14C04	2.38	6.772	6.794		
DW15C01	23.63	1.499	-		
DW15C02	2.36	6.603	4.267		
DW15C03	23.13	1.638	4.142		
DW15C04	4.33	6.618	4.366		
DW14C05	22.64	1.864	4.284		
P2C02	2.85	6.711	6.738		
P2C03	23.63	1.527	1.747		
P1B02	16.62	4.165	4.105		
P1B04	14.15	4.947	4.898		
P1B05	11.67	5.586	5.550		
P1B06	9.20	6.080	6.055		
P1B07	6.73	6.438	6.422		
P1B08	4.26	6.675	6.665		
P1B10	1.79	6.806	6.801		
P3B04	-0.68	6.844	6.843		
P3B05	-3.15	6.797	6.799		
P3B06	-5.62	6.665	6.670		
P3B07	-8.08	6.442	6.450		

Specimen ID#	Final Distance from Centerline	DPA at Final Position	Estimated DPA		
P3B08	-10.54	6.113	6.124		
P3B09	-13.01	5.662	5.674		
P3B10	-15.47	5.067	5.080		
P4B01	-17.94	4.311	4.324		
P4B02	-20.41	3.384	3.395		
P4B03	-22.89	2.291	2.299		
K4C01	3.35	6.787	6.821		
K2B01	17.61	3.817	3.752		
K2B02	15.14	4.650	4.597		
K2B03	12.66	5.348	5.307		
K2B04	10.19	5.899	5.870		
K2B05	7.72	6.310	6.291		
K2B06	5.25	6.594	6.582		
K2B07	2.78	6.765	6.758		
K3B01	0.31	6.839	6.837		
K3B02	-2.16	6.825	6.827		
K3B03	-4.63	6.728	6.732		
K3B04	-7.10	6.543	6.550		
K3B05	-9.56	6.258	6.268		
K3B06	-12.02	5.858	5.870		
K3B07	-14.49	5.323	5.336		
K6B01	-16.95	4.633	4.647		
K6B02	-19.42	3.776	3.788		
K6B03	-21.89	2.748	2.757		
L4C01	23.63	1.488	1.700		
L4C02	3.85	6.756	6.796		
L2B02	17.36	3.906	3.842		
L2B03	14.89	4.726	4.674		
L2B04	12.42	5.409	5.370		
L2B05	9.95	5.946	5.918		
L2B06	7.48	6.344	6.325		
L2B07	5.00	6.615	6.604		
L2B08	2.53	6.776	6.771		
L3B03	0.06	6.841	6.840		
L3B04	-2.41	6.820	6.821		
L3B05	-4.87	6.714	6.718		
L3B06	-7.34	6.519	6.526		
L3B07	-9.81	6.224	6.234		
L3B08	-12.27	5.811	5.823		
L3B09	-14.73	5.262	5.275		
L6B01	-17.20	4.555	4.569		
L6B02	-19.67	3.680	3.692		
L6B03	-22.14	2.636	2.645		

Specimen ID#	Final Distance from Centerline	DPA at Final Position	Estimated DPA		
N3C01	2.36	6.734	6.756		
N3C02	22.64	1.904	2.175		
N1B03	16.87	4.080	4.018		
N1B04	14.39	4.875	4.825		
N1B05	11.92	5.528	5.491		
N1B06	9.45	6.037	6.011		
N1B08	6.98	6.408	6.391		
N2B04	4.51	6.656	6.646		
N2B05	2.04	6.797	6.792		
N2B06	-0.43	6.844	6.843		
N2B07	-2.90	6.805	6.807		
N2B08	-5.37	6.682	6.687		
N5B01	-7.83	6.468	6.476		
N5B02	-10.30	6.151	6.162		
N5B03	-12.76	5.713	5.725		
N5B04	-15.23	5.134	5.147		
N5B05	-17.69	4.394	4.407		
N6B02	-20.16	3.485	3.496		
N6B03	-22.64	2.408	2.416		

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- <sup>iv</sup> T. Burchell, *A Revised AGC-I Creep Capsule Layout*, ORNL/TM-2009/009, January 2009.
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- <sup>viii</sup> L. Hull, *AGC-I Irradiation Data Qualification Final Report: Data from ATR Cycles 147A, 148A, and 148B*, INL/LTD-11-21361, March 2011.
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