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Additional Confirmatory LBL Analysis of AGR-5/6/7 Compacts and Overcoated Particles

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OAK RIDGE NATIONAL LABORATORY
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ADDITIONAL CONFIRMATORY LBL ANALYSIS OF AGR-5/6/7 COMPACTS AND OVERCOATED PARTICLES

BWXT NOG BATCHES 11034, 11035, 14154C&D, 14155C&D, AND 14156C&D

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ABBREVIATIONS

AGR	Advanced Gas Reactor Fuel Development and Qualification (Program)
AGR-5/6/7	AGR program irradiation experiments five, six, and seven
ATR	Advanced Test Reactor
BL	burn-leach
BWXT NOG	BWX Technologies Nuclear Operations Group (located in Lynchburg, Virginia)
CVD	chemical vapor deposition
DAM	data acquisition method
DOE	US Department of Energy
DRF	data report form
DUF	dispersed uranium fraction
DUF_{Post}	postburn leach dispersed uranium fraction
DUF_{Pre}	preburn leach dispersed uranium fraction
DUF_{Total}	total dispersed uranium fraction
EKF	exposed kernel fraction
INL	Idaho National Laboratory
IPyC	inner pyrolytic carbon (TRISO layer)
IRF	inspection report form
LBL	leach-burn-leach
MAD	median absolute deviation
OC	overcoated (TRISO particles)
OPyC	outer pyrolytic carbon (TRISO layer)
ORNL	Oak Ridge National Laboratory
PF	packing fraction (TRISO volume fraction in a compact)
SDF	SiC defect fraction
SiC	silicon carbide (TRISO layer)
TRISO	tristructural-isotropic (coated particles)
UCO	uranium carbide/uranium oxide mixture (fuel kernels)
XCT	x-ray computed tomography
Z	atomic number

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1. INTRODUCTION AND BACKGROUND

Fuel compacts for the Advanced Gas Reactor Fuel Development and Qualification (AGR) Program's AGR-5/6/7 irradiation test in the Idaho National Laboratory (INL) Advanced Test Reactor (ATR) were fabricated by BWX Technologies Nuclear Operations Group (BWXT NOG) located in Lynchburg, Virginia. Two compact packing fractions (PFs) were produced—nominally, 40% PF and 25% PF—in which the tristructural-isotropic (TRISO)-coated particle volume was targeted to be approximately 40% and 25% of the total compact volume, respectively. The TRISO coatings were deposited using a 150 mm diameter fluidized-bed chemical vapor deposition (CVD) furnace on spherical kernels that were nominally 425 µm in diameter. The kernels were from kernel composite Lot J52R-16-69317, which contained low-enriched uranium (15.5% ^{235}U) in a mixture of uranium carbide and uranium oxide (UCO). Kernels were coated with four concentric CVD layers: a porous carbon buffer layer that was nominally 100 µm thick, an inner pyrolytic carbon (IPyC) layer that was nominally 40 µm thick, a silicon carbide (SiC) layer that was nominally 35 µm thick, and an outer pyrolytic carbon (OPyC) layer that was nominally 40-µm-thick. Coated particle composite J52R-16-98005 was overcoated (OC) with a graphite/resin blend, and these OC TRISO particles were pressed to form cylindrical compacts that were nominally a half inch in diameter and one inch long.

Compact samples were deconsolidated and analyzed using the leach-burn-leach (LBL) procedure at Oak Ridge National Laboratory (ORNL) to provide additional data for use in evaluating the compact properties previously measured by LBL analysis at BWXT NOG. In addition, samples of OC TRISO particles were analyzed by LBL at ORNL to distinguish possible changes in defect fractions that result from (1) the OC process (by comparison to non-OC TRISO particle LBL) and (2) the compacting process (by comparison to compact LBL). Table 1-1 lists the samples analyzed at ORNL. Results from the first test series were reported in ORNL/TM-2019/744 (Hunn et al. 2018a). Results include the exposed kernel fraction (EKF), the SiC defect fraction (SDF), and the dispersed uranium fraction (DUF). Select impurities (Fe, Cr, Mn, Co, Ni, Ca, Al, Ti, and V) were also measured on some sub-samples. The definitions of EKF, SDF, and DUF are explained further in Section 2, and the methods for their calculation from the amount of leached U are presented. The combined results from the first and second test series are reported herein to provide better statistical sampling and to answer questions that arose from the first test series. The second test series only included analysis of leached U, because additional measurement of metallic impurities was not required. To address questions regarding possible artifacts from particle damage introduced by the LBL procedure, eighty 40% PF compacts were analyzed in the second test series by burn-leach (BL) to avoid the steps most likely to introduce damage.

Table 1-1. Samples analyzed at ORNL

Test Series	Nominal PF	Batch ID	Description	Analysis
1	40%	J52R-16-14154C	40 compacts	LBL in 2 groups of 4 clutches of 5 compacts
2	40%	J52R-16-14154C	20 compacts	LBL in 1 group of 4 clutches of 5 compacts
2	40%	J52R-16-14155C	40 compacts	LBL in 2 groups of 4 clutches of 5 compacts
2	40%	J52R-16-14154D	40 compacts	BL in 2 groups of 4 clutches of 5 compacts
2	40%	J52R-16-14155D	40 compacts	BL in 2 groups of 4 clutches of 5 compacts
1	25%	J52R-16-14156C J52R-16-14156D	29 compacts 11 compacts	LBL in 2 groups of 4 clutches of 5 compacts [a]
2	25%	J52R-16-14156D	20 compacts	LBL in 1 group of 4 clutches of 5 compacts
1	40%	J52R-16-11034	OC TRISO	LBL in 2 groups of 4 clutches of OC TRISO [b]
2	40%	J52R-16-11035	OC TRISO	LBL in 2 groups of 4 clutches of OC TRISO [b]

Note: Each 5-compact clutch was randomly chosen.
[a] The 25% PF compacts in the first test series were from production batches 14156C and 14156D.
[b] OC TRISO clutches were random samples with roughly the same number of particles as a 5-compact clutch.

2. ANALYSIS METHOD*

Deconsolidation and LBL analysis were performed on BWXT NOG compacts according to data acquisition method (DAM) AGR-CHAR-DAM-26 (Hunn and Montgomery 2018a) This DAM provides the instructions for performing deconsolidation and LBL analysis of cylindrical compacts containing coated particles. The LBL method attempts to thoroughly leach uranium (and other metallic impurities) not contained within gas-tight and liquid-tight SiC layers. The AGR-5/6/7 Fuel Specification (Marshall 2017) has specified limits for the amounts of selected metallic impurities (Fe, Cr, Mn, Co, Ni, Ca, Al, Ti, and V) in the compact outside of the intact SiC layers. The specification also includes a series of calculations that use the amount of uranium leached before and after burning off exposed carbon to calculate EKF, SDF, and DUF, as described below, and it specifies limits on these fractions.

Per DAM-26, compacts were electrolytically deconsolidated to separate the coated particles from the surrounding matrix of graphite and carbonized resin. This process involves submerging the tip of a compact in nitric acid and applying a voltage between the compact (the anode) and a platinum cathode in contact with the acid. During electrolytic deconsolidation, intercalation of nitrate anions and nitric acid between the basal planes of the graphite material in the compact matrix dissociates the graphite structure, breaks up the matrix, and releases the coated particles. Compacts were analyzed in randomly selected clutches of five compacts each. All compacts in a given clutch were sequentially deconsolidated into the same vessel by stacking them in a cylindrical-shaped deconsolidation tube with an open mesh bottom and a diameter slightly larger than the compacts. The deconsolidation tube was lowered into a vessel containing nitric acid to wet the tip of the bottom compact and a weighted rod with the anode wire placed on the top compact. As the lowest compact in the stack was deconsolidated, the compacts were gravity-fed downward such that the bottom of the lowest compact remained in contact with the acid until all compacts were deconsolidated.

Deconsolidated particles and matrix debris were subjected to two 24-hour preburn leaches in boiling concentrated nitric acid. The deconsolidation acid was used for the first preburn leach because some exposed uranium and metallic impurities can be dissolved in the room temperature acid during the deconsolidation phase. This first preburn leach acid was separated from the particles and matrix debris by centrifuging and decanting, and fresh acid was used for the second leach. Aliquots from the leach solutions were analyzed by mass spectrometry to determine the concentration of uranium and selected impurities dissolved in the acid. Measured concentrations were converted to mass quantities by multiplying by the collected volume of each leach solution. The equivalent number of leached kernels (*kernel equivalent*) was determined by dividing the total mass of uranium dissolved during the preburn leach by the average uranium content of one kernel.

Per DAM-26, sample clutches are typically leached at least twice; and if the uranium in the second leach is above the minimum detection limit and more than 10–20% of the amount in the first leach, then this is an indicator that uranium leaching may have been incomplete, so additional leaching is needed for better confidence in the results. Best practice is to postpone the burn phase until the uranium analysis of the first two preburn leaches is completed; this allows for the option of additional leaching in the preburn state if the second leach value indicates incomplete leaching of exposed uranium. However, due to schedule restraints for the confirmatory analysis presented herein, samples were subjected to burn-leach before preburn leach results were available.

To provide additional information on the adequacy of the two 24-hour leaches, an aliquot from the water used after the second leach to rinse the glassware, particles, and matrix debris was also analyzed in most cases. Per DAM-26, the data from the water rinse analysis were only included in the total if they were

* This section was duplicated with minor modifications and additions from ORNL/TM-2019/744 for the convenience of the reader and definition of terms used herein.

determined to be significant based on criterion that impurity values were >10% of the second leach, and for uranium analysis, significance was based on the criterion that values were >10% of the second leach and >1% of the average uranium per kernel. These criteria were applied so that the small values often dominated by measurement thresholds would not artificially elevate the totals.

After two 24-hour preburn leaches, each sample was heated at 750°C in air for 72 hours to oxidize and remove any exposed carbonaceous material, which would include the compact matrix carbon, the OPyC, and any IPyC and buffer coatings that were exposed to air due to a through-layer defect in the SiC layer. Uranium and metallic impurities exposed by the burn or not completely dissolved during the preburn leach phase were also oxidized during the burn phase, making them more soluble in hot nitric acid during the postburn leach phase.

Similar to the preburn leach phase, the "burned-back" particles and any residual ash were subjected to two 24-hour leaches in hot nitric acid to dissolve any exposed uranium and/or impurities. These postburn leaches were performed just below the 120°C boiling point of the ~70% concentrated nitric to minimize the chance of the solutions bumping, which can violently eject particles from the heating flask. Aliquots from the leach solutions and final water rinse were analyzed in the same manner as the preburn leach solutions.

The AGR-5/6/7 Fuel Specification provides a method for determining the EKF, SDF, and DUF based on the following definitions and assumptions. A particle is considered to have an exposed-kernel defect if the coating layers cannot prevent nitric acid from penetrating to the kernel during the preburn leach phase. Such a particle would likely perform poorly in a reactor, releasing an undesirable fraction of the radioactive material it was designed to retain. A particle is considered to have a SiC defect if uranium in the kernel is retained during preburn leaching but can be acid leached after removal of the exposed carbon coating layers by heating in air during the burn step described above. Particles with exposed-kernel defects also have through-layer defects in the SiC, but these particles are not counted again as SiC-defect particles because counting them as exposed-kernel defects already fully accounts for their impact on irradiated particle performance, as particles with exposed-kernel defects are presumed to release more fission products than those with SiC defects.

The AGR-5/6/7 Fuel Specification applies an assumption that uranium in a particle with an exposed-kernel defect or SiC defect will be almost completely leached during the preburn leach or postburn leach phase, respectively, yielding a uranium content that is close to the average of one kernel. If the total amount of uranium detected in either the preburn or postburn leaching of a clutch is below 0.5 kernel equivalents, then the specification stipulates that this uranium is to be identified as *dispersed uranium contamination* that is not associated with an individual particle with an exposed-kernel defect or SiC defect. The DUF is this dispersed uranium contamination divided by the amount of uranium in the clutch, which is approximately equal to the kernel equivalent amount of dispersed uranium divided by the average number of particles in a clutch.

Based on the methods prescribed in the AGR-5/6/7 Fuel Specification, a preburn leach dispersed uranium fraction (DUF_{Pre}) was determined for each clutch for which the cumulative leached uranium during the preburn leaching was <0.5 kernel equivalents. Similarly, a postburn leach dispersed uranium fraction (DUF_{Post}) was determined for each clutch for which the cumulative leached uranium during the postburn leaching was <0.5 kernel equivalents. Measured means and standard deviations for DUF_{Pre} and DUF_{Post} were calculated using all sampled clutches for which a DUF value was determined. The measured mean DUF_{Total} for each sample was calculated as the sum of the measured mean values for DUF_{Pre} and DUF_{Post}, as prescribed in the AGR-5/6/7 Fuel Specification. This implies an assumption that the DUF_{Pre} and DUF_{Post} mean values are measurements of variable properties of the batch, and these properties are independent.

Student's t-test statistics were applied to the mean (μ) and standard distribution (σ) of the DUF_{Pre} and DUF_{Post} measurements using the t-test equation and methods described in the AGR-5/6/7 Statistical Sampling Plan (Lybeck and Einerson 2016) to calculate the 95% confidence limits on the maximum mean values of DUF_{Pre} and DUF_{Post} in the sampled batch. Namely, the 95% confidence limit on the maximum mean value in the batch was calculated to be

$$\leq \mu + t_{c,n-1}\left(\sigma/\sqrt{n}\right), \tag{2.1}$$

where n is the number of determined DUF values, and $t_{c,n-1}$ is the one-sided Student's t-distribution critical value for n-1 degrees of freedom and a cumulative probability or confidence (c) of 95%.

The calculation of the 95% confidence limit on the maximum mean value of DUF_{Total} in the sampled batch could not be directly calculated using the simple Student's t-test equation provided in the sampling plan because DUF_{Total} was not based on individual measurements of DUF_{Total} in each clutch but rather on the combination of independent measurements of DUF_{Pre} and DUF_{Post}. To calculate the limit value for DUF_{Total}, approximations of the cumulative probability distributions for DUF_{Pre} and DUF_{Post} were constructed using stepwise evaluations of the Student's t-distribution and combined as described below.

In an Excel spreadsheet, a column of discrete maximum mean values of DUF_{Pre} for a range of cumulative probabilities from 0 to 100%, exclusive, was generated using the t-test equation

$$max_i(\mathrm{DUF_{Pre}}) = \mu + t_{c_i,n-1}\left(\sigma/\sqrt{n}\right) \text{ for } i = 1 \text{ to } (100/\Delta) - 1 \text{ and } c_i = i \times \Delta, \tag{2.2}$$

where μ, σ, and n are the same values used to calculate the 95% confidence limit on the maximum mean value of DUF_{Pre} in Eq. (2.1), $t_{c_i,n-1}$ is the one-sided Student's t-distribution critical value for n-1 degrees of freedom and a cumulative probability c_i, and Δ is a constant stepsize. Thus, the series of max_i values defined in Eq. (2.2) made up a stepwise approximation of the Student's t cumulative probability distribution for the maximum mean value of DUF_{Pre} in the sampled batch. Each max_i value was a slight overestimate of the possible true mean value of the batch, with a probability equal to the stepsize Δ of being the maximum value over the cumulative probability interval (c_i-Δ, c_i).

Similarly, an approximation of the cumulative probability distribution for the maximum mean value of DUF_{Post} in the sampled batch was generated for the same stepsize Δ. The DUF_{Post} values were arranged in a row in the Excel spreadsheet so that a matrix could be easily generated by summing all possible pairs of values from the two cumulative probability distributions,

$$sum_{ij} = max_i(\mathrm{DUF_{Pre}}) + max_j(\mathrm{DUF_{Post}}) \text{ for } i \text{ and } j = 1 \text{ to } (100/\Delta) - 1. \tag{2.3}$$

The probability associated with each individual sum_{ij} combination was the product of the probabilities for the corresponding max_i and max_j, namely, Δ^2 in every case. To approximate the 95% confidence limit on the maximum mean value of DUF_{Total}, the individual sum_{ij} values were combined as described below.

Starting with the measured mean, $\mu(DUF_{Total})$, for each sample (i.e., the sum of the measured means for DUF_{Pre} and DUF_{Post}), a series of discrete possible maximum mean values of DUF_{Total} was generated over a sufficient range,

$$max_k(\mathrm{DUF_{Total}}) = \mu(\mathrm{DUF_{Total}}) + k \times \partial \text{ for } k = 1 \text{ to } N, \tag{2.4}$$

where ∂ is a constant stepsize, and N is adjusted to ensure that enough values are generated in the series to reach a max_k value that corresponds to a 95% cumulative probability. The approximate cumulative probability (c_k) for each possible maximum mean value, $max_k(DUF_{Total})$, is determined by searching the

matrix of individual sum_{ij} values and counting the number of sum_{ij} values that are less than or equal to the candidate max_k value,

$$c_k = \Delta^2 \times \text{CountIf}\left(sum_{ij} \leq max_k(\text{DUF}_{\text{Total}})\right) \text{ for } k = 1 \text{ to } N. \quad (2.5)$$

The max_k value corresponding to the c_k value closest to and also greater than or equal to 95% is taken as the best approximation of the 95% confidence limit on the maximum mean value of $\text{DUF}_{\text{Total}}$ in the sampled batch. The approximation was conservative, as it was calculated to be a slight overestimate by using the upper bounds in the stepwise approximations of the Student's t cumulative probability distribution for the maximum mean values of DUF_{Pre} and DUF_{Post}, and it was required to have a confidence of at least 95%. The accuracy of the approximation was dependent on the stepsize Δ used in the stepwise approximations of the Student's t cumulative probability distribution for the maximum mean values of DUF_{Pre} and DUF_{Post}. The stepsize Δ was varied to examine the accuracy of the approximation. As stepsize Δ was reduced, the approximation of the 95% confidence limit on the maximum mean value of $\text{DUF}_{\text{Total}}$ asymptotically approached a minimum value from above. The stepsize was small enough to no longer change the value to three significant figures when the stepwise approximations of the Student's t cumulative probability distribution for the maximum mean values of DUF_{Pre} and DUF_{Post} did not change by more than ~0.1% per step. A stepsize around 0.1% was typically sufficient. The accuracy of the approximation was also dependent on the stepsize ∂ used to generate the search list of discrete possible maximum mean values of $\text{DUF}_{\text{Total}}$. The stepsize ∂ was also varied to ensure that an accurate approximation was calculated. For ∂, it was important that the candidate max_k values in the search series with corresponding c_k value immediately above and below 95% did not vary when rounded up to three significant figures.

In the definition of the EKF and SDF, according to the AGR-5/6/7 Fuel Specification, it is assumed that the equivalent number of leached kernels is dominated by individual defective particles in which the uranium in the kernel is exposed because of abnormal or damaged coatings (when they are present). Therefore, these defects are treated as attribute properties, and defect fractions are determined from the equivalent number of defective particles vs. the number of particles in the measured sample. Binomial distribution statistics are applied to determine with 95% confidence whether the sampled material is below a specified upper limit for the defect fraction.

Equations for determining EKF and SDF are provided in the AGR-5/6/7 Fuel Specification. The equivalent number of leached kernels detected during preburn leaching of a clutch of compacts is corrected by subtracting the kernel equivalent contribution from the dispersed uranium (assumed to be the mean DUF_{Pre} times the average number of particles per clutch). This corrected kernel equivalent value is rounded to the nearest integer to arrive at the preburn exposed kernel count for that clutch. The preburn exposed kernel count for all analyzed clutches is summed and divided by the estimated number of analyzed particles (calculated from the average number of particles per clutch times the number of clutches) to get the measured EKF. The 95% confidence determination of whether the sampled composite has an EKF below the allowed upper limit applies a binomial distribution calculation using the total preburn exposed kernel count and estimated number of analyzed particles. The SDF values are calculated in the same way, except the equivalent number of leached kernels detected during postburn leaching of a clutch is corrected with the mean DUF_{Post} value.

LBL analysis was performed on BWXT NOG OC particles according to AGR-CHAR-DAM-21 (Hunn and Montgomery 2018b). This procedure is essentially the same as DAM-26, except the compact deconsolidation is not required prior to the preburn acid leaching. The EKF, SDF, and DUF were calculated as they were for the compacts.

3. OVERCOATED PARTICLES

Supplementary LBL analysis was completed on samples from two OC TRISO batches that were used for the 40% PF compacts (Table 1-1). One large sample of OC TRISO from each batch was shipped from BWXT NOG to ORNL. Random samples (clutches) for LBL analysis were created from each large sample with approximately the same number of particles per clutch as in the five-compact clutches used in the 40% PF compact LBL analysis (Section 5). Rather than rotary riffling, gentler but less random sampling methods (cone and quartering supplemented by scoop sampling) were used to reduce the possibility of damage to the particles prior to analysis. Ten sub-samples from each batch were also used for measurement of average OC TRISO weight according to the procedure in AGR-CHAR-DAM-22 (Hunn 2017). The particle number in each clutch was determined by weighing the clutches and dividing by the average weight per OC particle in the relevant batch. Clutches were analyzed by LBL in groups of four. All leach solutions were analyzed for uranium content only. Appendix B contains copies of the official preburn leach and postburn leach data report forms (DRFs) for each analyzed clutch and inspection report forms (IRFs) that summarize the data. The data are further presented and discussed in the remainder of this section.

3.1 LBL ANALYSIS FOR EXPOSED URANIUM IN 40% PF OC TRISO

Table 3-1 shows details regarding the uranium (in kernel equivalents) in each solution collected during preburn leaching of the OC TRISO clutches and the total uranium leached from each clutch. According to the procedure in DAM-21, the water rinse data were not included in the total because they were ≤10% of the second leach or ≤1% of the average uranium per kernel. Table 3-1 also shows the individual preburn leach DUF_{Pre} values for each clutch without an exposed-kernel defect (i.e., the total leached uranium was <0.5 kernel equivalents per the AGR-5/6/7 Fuel Specification). Table 3-2 shows the same type of data for the postburn leach. The DUF_{Pre} and DUF_{Post} values were very consistent in the preburn and postburn clutches, respectively, and the uranium content in each second leach was appropriately lower than the first leach. These observations are good indicators that the LBL process was effective.

Table 3-1. Uranium leached from 40% PF OC TRISO before the burn

Series	Clutch	Particles	First leach	Second leach	H_2O rinse [a]	Total	DUF_{Pre} [b]
1	11034-1	17,627	7.92E-2	1.05E-2	6.36E-4	0.090	5.09E-6
	11034-2	18,614	8.03E-2	1.61E-2	9.27E-4	0.096	5.18E-6
	11034-3	17,972	8.06E-2	1.10E-2	7.25E-4	0.092	5.10E-6
	11034-4	17,826	7.88E-2	1.85E-2	9.78E-4	0.097	5.46E-6
2	11035-1	17,409	8.33E-2	4.66E-3	2.84E-4	0.088	5.05E-6
	11035-2	17,368	8.23E-2	3.63E-3	1.44E-4	0.086	4.94E-6
	11035-3	17,369	8.20E-2	4.10E-3	1.31E-4	0.086	4.96E-6
	11035-4	17,378	7.95E-2	5.84E-3	1.82E-4	0.085	4.91E-6
	11035-5	17,389	8.20E-2	7.38E-3	2.69E-4	0.089	5.14E-6
	11035-6	17,364	7.79E-2	6.01E-3	2.30E-4	0.084	4.83E-6
	11035-7	17,395	8.77E-2	4.14E-3	1.05E-4	0.092	5.28E-6
	11035-8	17,371	8.57E-2	4.50E-3	1.23E-4	0.090	5.20E-6

Note: Uranium content in each leach is reported in kernel equivalents.
[a] Gray shading indicates that the water rinse was not added to the total.
[b] Individual DUF_{Pre} is the preburn leach fraction of exposed uranium in each clutch with <0.5 exposed kernel equivalents.

Table 3-2. Uranium leached from 40% PF OC TRISO after the burn

Series	Clutch	Particles	First leach	Second leach	H_2O rinse [a]	Total	DUF_{Post} [b]
1	11034-1	17,627	2.38E-3	1.34E-3	not done	0.004	2.11E-7
	11034-2	18,614	2.58E-3	3.56E-4	not done	0.003	1.58E-7
	11034-3	17,972	3.01E-3	5.52E-4	not done	0.004	1.98E-7
	11034-4	17,826	1.23E+0	3.47E-3	not done	1.234	---
2	11035-1	17,409	1.56E-3	5.54E-4	1.38E-5	0.002	1.21E-7
	11035-2	17,368	1.66E-3	9.69E-4	1.58E-5	0.003	1.51E-7
	11035-3	17,369	1.83E-3	4.68E-4	2.03E-5	0.002	1.32E-7
	11035-4	17,378	2.10E-3	2.60E-4	3.57E-5	0.002	1.36E-7
	11035-5	17,389	1.72E-3	3.75E-5	1.02E-6	0.002	1.01E-7
	11035-6	17,364	3.60E-3	9.56E-5	1.02E-6	0.004	2.13E-7
	11035-7	17,395	1.01E+0	4.37E-3	1.72E-5	1.013	---
	11035-8	17,371	8.06E-3	1.75E-4	9.80E-6	0.008	4.74E-7

Note: Uranium content in each leach is reported in kernel equivalents.
[a] Gray shading indicates that the water rinse was not added to the total.
[b] Individual DUF_{Post} is the postburn leach fraction of exposed uranium in each clutch with <0.5 exposed kernel equivalents.

Table 3-3 summarizes the dispersed uranium analysis results for OC TRISO Batch 11034 and Batch 11035 separately and considered as a pooled data set. The mean and standard deviations for DUF_{Pre} and DUF_{Post} come from the individual clutch values reported in Table 3-1 and Table 3-2, respectively. The 95% confidence limits in Table 3-3 are the upper bounds of the 95% confidence interval of the mean value for the sampled material based on the measured sample. The DUF_{Pre} and DUF_{Post} 95% confidence limits were calculated using the Student's t-test (Equation 2.1). The DUF_{Total} mean value was calculated by adding the DUF_{Pre} and DUF_{Post} mean values as stipulated in the AGR-5/6/7 Fuel Specification, and the 95% confidence limit was determined from approximations of the cumulative probability distributions for DUF_{Pre} and DUF_{Post} as described in Section 2. The DUF results from the two OC TRISO batches were very similar, so pooling the data to provide better statistical sampling appears to be justified. Approximately 96% of the total dispersed uranium was leached in the preburn leaches.

Table 3-3. Dispersed uranium in 40% PF OC TRISO

Batch		DUF_{Pre}	DUF_{Post}	DUF_{Total}
11034	Measured mean	5.20E-6	1.89E-7	5.39E-6
	Standard deviation	1.73E-7	2.78E-8	---
	95% confidence limit	≤ 5.41E-6	≤ 2.37E-7	≤ 5.62E-6
11035	Measured mean	5.04E-6	1.90E-7	5.23E-6
	Standard deviation	1.55E-7	1.30E-7	---
	95% confidence limit	≤ 5.15E-6	≤ 2.86E-7	≤ 5.38E-6
Pooled	Measured mean	5.09E-6	1.90E-7	5.28E-6
	Standard deviation	1.73E-7	1.07E-7	---
	95% confidence limit	≤ 5.19E-6	≤ 2.52E-7	≤ 5.40E-6

Table 3-4 presents the EKF and SDF values calculated from the data presented in Table 3-1 and Table 3-2, respectively. Again, results are provided for Batches 11034 and 11035 separately and as a pooled data set. The 95% confidence limits in Table 3-4 correspond to the true defect fractions in the sampled population that yield a cumulative binomial distribution value of 0.95 for the observed number of defects and sample size. These values are the lowest tolerance limits for which the compact lot would be deemed acceptable at 95% confidence, based on the sample that was measured. There is no strong evidence for a significant difference in EKF and SDF in Batches 11034 and 11035, and given that they were processed similarly, it is reasonable to assume that pooling the data is justified. There were no exposed kernels detected in the preburn leach solutions. Zero exposed-kernel defects in a pooled sample of 211,082 OC particles satisfies an upper limit on the EKF in the OC TRISO composite of ≤1.42E-5 with 95% confidence. Based on the prescribed data analysis methods in the fuel specification, there were two exposed kernels detected in the postburn leach solutions, which satisfies to a 95% confidence an upper limit on the SDF in the OC TRISO composite of ≤2.99E-5.

Table 3-4. Defect fractions in 40% PF OC TRISO

Batch		EKF	SDF
11034	Number of defects	0	1
	Number of particles	~72,039	~72,039
	Measured defect fraction	0	1.39E-5
	95% confidence limit	≤ 4.16E-5	≤ 6.59E-5
11035	Number of defects	0	1
	Number of particles	~139,043	~139,043
	Measured defect fraction	0	7.19E-6
	95% confidence limit	≤ 2.16E-5	≤ 3.42E-5
Pooled	Number of defects	0	2
	Number of particles	~211,082	~211,082
	Measured defect fraction	0	9.47E-6
	95% confidence limit	≤ 1.42E-5	≤ 2.99E-5

The amount of uranium leached from Clutch 11035-7 after the burn was 1.013 kernel equivalents, which strongly supports a conclusion that the uranium came from a single particle with an exposed-kernel defect. The amount of uranium leached from Clutch 11034-4 was 1.234 kernel equivalents, which is uncharacteristically high for a typical LBL analysis involving one defective particle. Possible explanations include (1) higher than normal error in the mass spectrometry, (2) the presence of more than one particle with an exposed-kernel defect in conjunction with incomplete leaching, and (3) one particle with an exposed-kernel defect that had abnormally high uranium content. Incomplete leaching is unlikely given the low uranium content in the second postburn leach. The possibility that a single defective particle contained an abnormally high amount of uranium is likely given the observation of particles with additional kernel material in samples from the AGR-5/6/7 TRISO particle composite and from the individual TRISO particle batches that were blended to form the composite (Helmreich et al. 2017a, Helmreich et al. 2017b). In the x-ray analysis of 241,822 particles from the AGR-5/6/7 TRISO particle composite, six particles with additional kernel material were identified. The additional kernel material was related to the inclusion of fragments of fractured kernels that were bonded to the main kernel prior to coating or trapped in the buffer layer during coating. Figure 3-1 and Figure 3-2 show examples. Because the embedded fragments produce abnormal shapes and dispersed uranium in the coating layers, there may be a greater chance that particles of this type will also have coating defects.

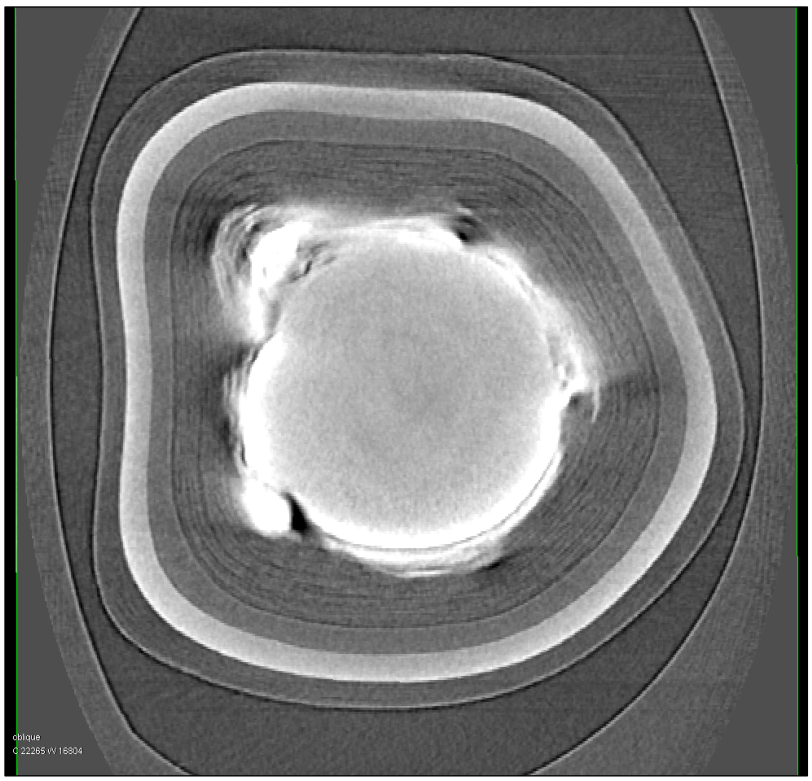

Figure 3-1. Tomographic cross section of a particle from Batch 93168 with embedded kernel fragments and uranium dispersion in the buffer layer (Helmreich et al. 2017b, Figure 2-12).

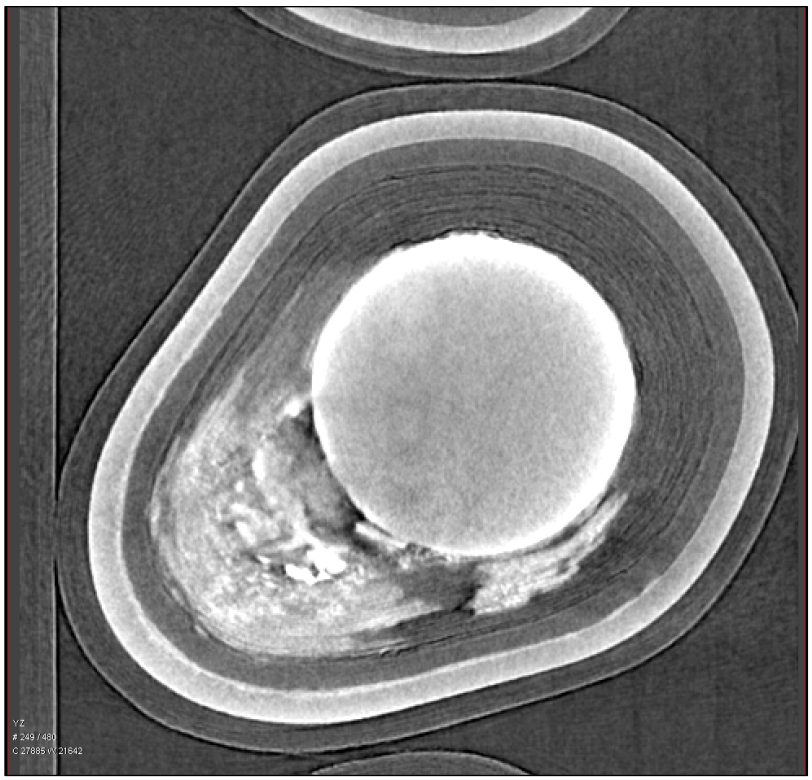

Figure 3-2. Tomographic cross-section of a particle from Batch 93172 with embedded kernel fragments and uranium dispersion in the buffer layer (Helmreich et al. 2017b, Figure 2-11).

The data presented herein do not include data from the second group of four OC TRISO samples analyzed in the first test series, which included three exposed kernels in the preburn leach of one clutch and four in another. These data were reported and discussed in ORNL/TM-2019/744. The second sample group in the first test series was suspected to contain erroneous data due to (1) the challenge of working with the AGR-5/6/7 graphite/resin overcoating material, which produced a viscous suspension in the leach acid that was difficult to separate from the TRISO particles, combined with (2) the fact that the analysis of the second sample group in the first test series was performed by less experienced personnel. Statistical analysis of the observed preburn leach defect distribution in the eight clutches from Batch 11034 in the first test series determined there was ≤1% probability for the observed distribution. The fact that no exposed kernels were observed in the preburn leaches performed on eight more OC TRISO clutches from Batch 11035 in the second test series reduces the probability to <0.05% with the assumption that the two batches should have similar EKFs. Therefore, the data from the suspect group have been discarded from the analysis of the results presented herein.

3.2 COMPARISON TO BWXT NOG LBL ANALYSIS OF TRISO PARTICLES

The OC TRISO particles in Batches 11034 and 11035 were made from a composite of four coated particle batches, Composite J52R-16-98005. TRISO particles from Composite 98005 were analyzed with LBL by BWXT NOG, and the DUF, EKF, and SDF results reported in INL/EXT-18-45110 (Marshall 2018) are shown in Table 3-5. The measured values and 95% confidence upper limits for the TRISO particles prior to overcoating are higher than what was determined for the pooled data from the ORNL LBL analysis of the OC TRISO particles (Table 3-3 and Table 3-4).

Table 3-5. Defect fractions in TRISO particle Lot 98005 prior to overcoating (Marshall 2018)

	DUF_{Total}	EKF	SDF
Number of defects	---	3	3
Number of particles	---	~319,000	~159,000
Measured defect fraction	1.04E-5	9.40E-6	1.89E-5
95% confidence limit	*a*	≤ 2.43E-5	≤ 4.88E-5

[a] No 95% confidence value was available for DUF because only one of the three postburn leach samples had no exposed kernels.

Using the comparison method described in Appendix A and the data in Table 3-4 and Table 3-5, the odds are 29:1 that the OC TRISO EKF is not >1E-5 higher[†] than the TRISO EKF, and the odds are 42:1 that the OC TRISO SDF is not >2E-5 higher[†] than the TRISO SDF. In both cases, it is more likely that the two populations had defect fractions within the chosen margins for comparison. This leads to the reasonable conclusion that the overcoating process did not significantly increase the populations of defective particles already present in the TRISO particle feedstock. The limited available information regarding the DUF_{Total} of TRISO Batch 98005 precludes detailed comparison to the OC TRISO, but since the measured mean DUF_{Total} for the TRISO is roughly double that for the OC TRISO, there is no evidence that DUF increased during overcoating.

[†] As discussed in Appendix A, the margins chosen for the statistical comparison between data sets are typically equal to 20% of the specified limits for EKF (20%×5E-5=1E-5) and SDF (20%×1E-4=2E-5). Differences less than this margin are expected to have insignificant impact on the acceptance testing.

4. 25% PF COMPACTS

Confirmatory LBL analysis was completed on 60 AGR-5/6/7 compacts with a nominal 25% PF (Table 1-1). Compacts were sampled in clutches of five compacts each and analyzed in groups of four clutches at a time. The eight clutches analyzed in the first test series were from two different BWXT NOG furnace tray batches. Each clutch was randomly selected from a composite sample containing 29 compacts from Batch 14156C and 11 compacts from Batch 14156D. These batches were pressed in the same compacting run but were heat treated separately. The 20 compacts measured in the second test series all came from Batch 14156D. All leach solutions were analyzed for uranium content, and the first group in the first test series was also analyzed for other impurities (Fe, Cr, Mn, Co, Ni, Ca, Al, Ti, and V). The impurity analysis results are reported in ORNL/TM-2019/744. Appendix C contains copies of the preburn leach and postburn leach DRFs for each analyzed clutch, as well as the IRFs that summarize the data. The data are further presented and discussed in the remainder of this section. Only analysis of the pooled data is presented because the results associated with Batches 14156C and 14156D in the first test series cannot be separated. With 29 compacts from Batch 14156C and 31 from Batch 14156D, the two batches are represented equally in the pooled data.

4.1 LBL ANALYSIS FOR EXPOSED URANIUM IN 25% PF COMPACTS

Table 4-1 shows the amounts of uranium (in kernel equivalents) detected in the solutions collected during preburn leaching of the 25% PF compact clutches, and Table 4-2 shows similar data for the postburn leaching. The values for total uranium leached from each clutch do not include the water rinse data except for the preburn leach total for Clutch 14156C/D-6, which met the DAM-26 criteria for inclusion because the uranium detected in the water rinse was >10% of the second leach and >1% of the average uranium per kernel. The elevated uranium content in the preburn water rinse of 1.56E-2 in Clutch 14156C/D-6 indicates that leaching of exposed uranium may not have been complete. Clutch 14156C/D-6 was also the only clutch in which a preburn leach exposed-kernel defect was detected based on the AGR-5/6/7 Fuel Specification definitions described in Section 2. Table 4-1 shows the individual preburn leach DUF_{Pre} values for the other clutches in which the preburn leached uranium was <0.5 kernel equivalents. Similarly, Table 4-2 shows the DUF_{Post} values for the clutches with <0.5 kernel equivalents in the postburn leach solutions.

Table 4-1. Uranium leached from 25% PF compacts before the burn

Series	Clutch	Particles [a]	First leach	Second leach	H_2O rinse [b]	Total	DUF_{Pre} [c]
1	14156C/D-1	11,465	3.66E-2	6.77E-3	6.56E-4	0.043	3.79E-6
	14156C/D-2	11,465	2.90E-2	6.01E-3	6.18E-4	0.035	3.05E-6
	14156C/D-3	11,465	1.87E-1	2.87E-2	2.98E-3	0.216	1.88E-5
	14156C/D-4	11,465	6.74E-2	8.13E-3	1.17E-3	0.076	6.59E-6
	14156C/D-5	11,465	4.12E-2	4.75E-3	7.66E-4	0.046	4.00E-6
	14156C/D-6	11,465	8.70E-1	6.29E-2	1.56E-2	0.949	---
	14156C/D-7	11,465	2.81E-2	2.96E-3	4.53E-4	0.031	2.71E-6
	14156C/D-8	11,465	3.15E-2	5.78E-3	8.55E-4	0.037	3.26E-6
2	14156D-1	11,465	3.75E-2	3.91E-3	1.88E-4	0.041	3.61E-6
	14156D-2	11,465	3.88E-2	5.00E-3	2.41E-4	0.044	3.82E-6
	14156D-3	11,465	4.80E-2	4.34E-3	2.36E-4	0.052	4.56E-6
	14156D-4	11,465	3.07E-2	3.13E-3	1.65E-4	0.034	2.95E-6

Note: Uranium content in each leach is reported in kernel equivalents.
[a] The number of particles per clutch was estimated from a determination of the average number of particles per compact, namely 2293 for Batch 14156 (Marshall 2019).
[b] Gray shading indicates that the water rinse was not added to the total.
[c] Individual DUF_{Pre} is the preburn leach fraction of exposed uranium in each clutch with <0.5 exposed kernel equivalents.

Table 4-2. Uranium leached from 25% PF compacts after the burn

Series	Clutch	Particles [a]	First leach	Second leach	H_2O rinse [b]	Total	DUF_{Post} [c]
1	14156C/D-1	11,465	1.25E-2	3.59E-4	2.04E-5	0.013	1.13E-6
	14156C/D-2	11,465	1.35E-2	2.96E-4	2.12E-5	0.014	1.20E-6
	14156C/D-3	11,465	1.29E-1	2.31E-4	1.79E-5	0.129	1.13E-5
	14156C/D-4	11,465	1.25E-2	3.94E-4	7.68E-5	0.013	1.13E-6
	14156C/D-5	11,465	1.17E+0	5.52E-3	5.42E-4	1.176	---
	14156C/D-6	11,465	2.16E+0	5.85E-3	4.08E-4	2.164	---
	14156C/D-7	11,465	1.45E-2	6.71E-4	1.01E-4	0.015	1.32E-6
	14156C/D-8	11,465	1.35E-2	2.59E-3	1.09E-4	0.016	1.40E-6
2	14156D-1	11,465	1.25E-2	4.21E-4	1.74E-5	0.013	1.12E-6
	14156D-2	11,465	1.27E-1	1.18E-1	2.92E-4	0.246	2.14E-5
	14156D-3	11,465	1.21E-2	3.05E-4	6.00E-5	0.012	1.08E-6
	14156D-4	11,465	1.25E-2	3.37E-4	3.21E-5	0.013	1.12E-6

Note: Uranium content in each leach is reported in kernel equivalents.
[a] The number of particles per clutch was estimated from a determination of the average number of particles per compact, namely 2293 for Batch 14156 (Marshall 2019).
[b] Gray shading indicates that the water rinse was not added to the total.
[c] Individual DUF_{Post} is the postburn leach fraction of exposed uranium in each clutch with <0.5 exposed kernel equivalents.

The calculated DUF_{Pre} and DUF_{Post} for clutches with <0.5 kernel equivalents of leached uranium were fairly consistent except for four significant outliers. Clutch 14156C/D-3 had elevated levels of uranium detected in both the preburn and postburn leach series, Clutch 14156C/D-4 had a slightly elevated level of uranium in the preburn leach series, and Clutch 14156D-2 had elevated levels detected in the postburn leach series. The source of these abnormally high levels of leached uranium can only be conjectured using the existing data. Possible sources may be (1) individual particles with an exposed kernel or SiC defect that were incompletely leached, or (2) the excess uranium could be from inclusion of a kernel fragment or some other localized uranium contamination. Incomplete leaching of the kernel in an individual particle due to restriction of acid infiltration to the kernel is unlikely for the preburn and postburn leaches of Clutch 14156C/D-3 because the successive analysis of the first leach, the second leach, and the water rinse showed significant reduction in the amount of uranium leached at each step, and the second postburn leach was very low, with a total of only 0.345 kernel equivalents leached. A more likely scenario is that an abnormally high amount of uranium was in the OPyC or matrix, and this uranium was in a form that was not easily leached until after the burn. Two observations support this hypothesis: (1) while the amount of uranium detected in each successive preburn leach dropped by approximately an order of magnitude, the amount in each leach was higher than observed in most of the other clutches, and (2) the amount of uranium leached after the burn dropped approximately three orders of magnitude after the first postburn leach to a level less than observed in most of the other clutches. The preburn leach progression in Clutch 14156C/D-4 also suggests localized uranium contamination in the OPyC or matrix. In contrast, the elevated amount of uranium detected in the postburn leaches of Clutch 14156D-2 appears to be more consistent with incomplete leaching of the kernel from a particle with defective SiC because the second acid leach contained almost as much uranium as the first.

After LBL, all particles in Clutch 14156D-2 were mounted in a single layer on Kapton tape for x-ray radiography. Examination of the x-ray radiographs revealed one particle with unusual x-ray opacity. This particle is shown in Figure 4-1a, where the darker areas in the radiograph indicate lower x-ray attenuation and the brighter areas indicate higher x-ray attenuation. The abnormal particle was removed from the Kapton tape and imaged with x-ray computed tomography (XCT). The x-ray tomogram in Figure 4-1b shows a lining inside the SiC layer containing material with high atomic number (Z), probably uranium. The interior of the particle could not be imaged because of the x-ray attenuation in this high-Z lining. A region of degraded SiC can also be seen in Figure 4-1b, with high-Z material in the degraded region. It is

possible that some of the particle's uranium was leached through the region of degraded SiC and that this particle is responsible for most of the 0.246 kernel equivalents detected during the postburn leach of Clutch 14156D-2. Confirmation of this hypothesis would require further analysis to determine how much uranium remains in the particle and why the SiC degradation only resulted in partial leaching.

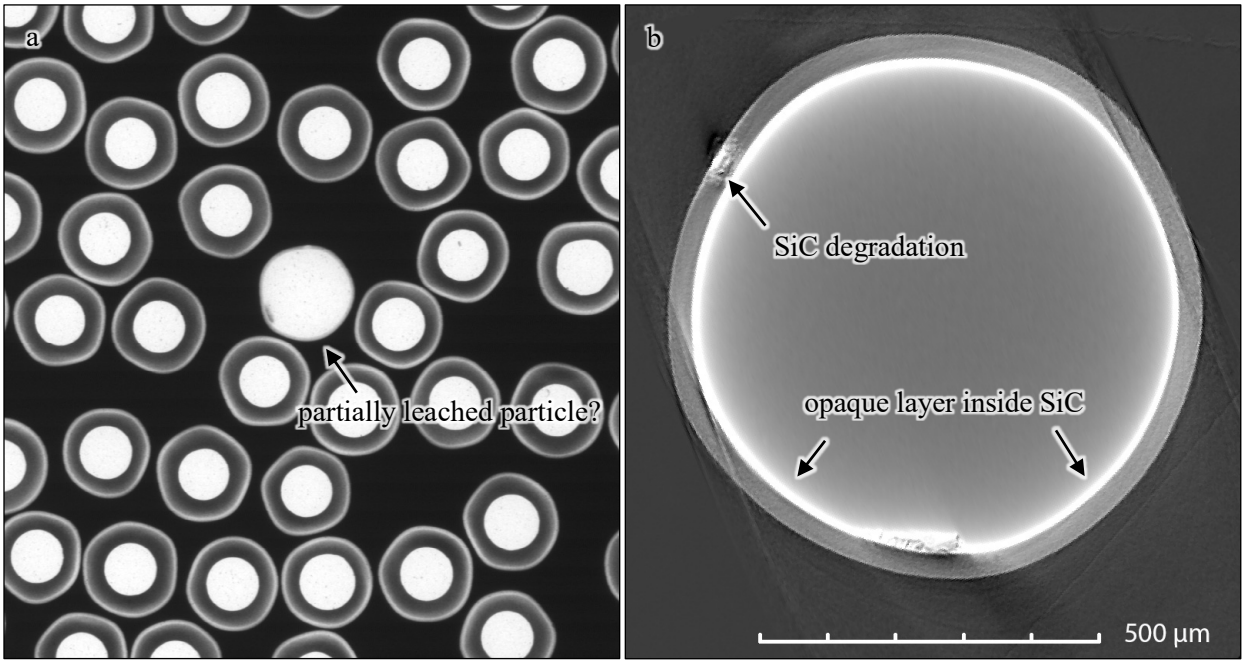

Figure 4-1. (a) Low resolution x-ray radiograph and (b) high-resolution x-ray tomogram showing what may be a partially leached particle from Clutch 14156D-2.

Table 4-3 shows the DUF data for the 25% PF compacts in terms of mean, standard deviation, and upper bounds of the 95% confidence interval of the mean value for the sampled material based on the measured samples. The distributions of the DUF values determined by the LBL analysis of the 25% PF compacts suggest that the measured DUF is comprised of uniformly distributed dispersed uranium plus localized higher concentrations in a few individual compacts. Such outliers do not conform to the definition for dispersed uranium and the assumption that it is a variable property as measured. Table 4-3 shows the calculated DUF using all available data and two alternate calculations using filtered data sets, where outliers were excluded to estimate the uniformly distributed contribution. Filtering was achieved by first calculating the median and median absolute deviation (MAD) from all available DUF_{Pre} and DUF_{Post} values, and then excluding values that deviated from the median by more than selected multiples of the MAD. A filter criterion of <10×MAD above the median can be considered to be a conservative approach for culling out only the outliers with an extreme deviation, and it resulted in the filtering out of the DUF contributions from the Clutch 14156C/D-3 preburn leach, the Clutch 14156C/D-3 postburn leach, and the Clutch 14156D-2 postburn leach. A filter criterion of <3×MAD above the median also filtered out the Clutch 14156C/D-4 preburn leach data. The mean, standard deviation, and 95% confidence limit for the filtered DUF values shown in Table 4-3 were calculated with the standard methods prescribed in the AGR-5/6/7 Fuel Specification and discussed in Section 2.

Table 4-3. Dispersed uranium in 25% PF compacts

		DUF_{Pre}	DUF_{Post}	DUF_{Total}
All data	Measured mean	5.20E-6	4.22E-6	9.42E-6
	Standard deviation	4.63E-6	6.83E-6	---
	95% confidence limit	≤ 7.73E-6	≤ 8.19E-6	≤ 1.42E-5
All data	Measured median	3.79E-6	1.17E-6	---
	Median absolute deviation	7.30E-7	6.48E-8	---
<10×MAD filtered data [a]	Measured mean	3.83E-6	1.19E-6	5.02E-6
	Standard deviation	1.12E-6	1.14E-7	---
	95% confidence limit	≤ 4.49E-6	≤ 1.27E-6	≤ 5.68E-6
<3×MAD filtered data [b]	Measured mean	3.53E-6	1.19E-6	4.72E-6
	Standard deviation	5.87E-7	1.14E-7	---
	95% confidence limit	≤ 3.90E-6	≤ 1.27E-6	≤ 5.10E-6

[a] The <10×MAD filtered data do not include data from the Clutch 14156C/D-3 preburn leach, the Clutch 14156C/D-3 postburn leach, or the Clutch 14156D-2 postburn leach.
[b] The <3×MAD filtered data do not include data from the Clutch 14156C/D-3 preburn leach, the Clutch 14156C/D-3 postburn leach, the Clutch 14156D-2 postburn leach, or the Clutch 14156C/D-4 preburn leach.

The DUF_{Total} mean and 95% confidence limit values for the 25% PF compact filtered data shown in Table 4-3 compare well with the DUF_{Total} mean value of 5.28E-6 and 95% confidence limit value of ≤5.40E-6 for the pooled OC TRISO data summarized in Table 3-3. This shows that the uranium contamination was generally not any higher in the majority of the 25% PF compacts than in the particles.[‡] However, for cases in which the DUF_{Pre} was ~96% of the DUF_{Total} in the OC TRISO, the filtered DUF_{Pre} was ~75–76% of the DUF_{Total} in the 25% PF compacts. This could indicate that the 1,800°C heat treatment was driving reaction of the dispersed uranium with the surrounding carbon, such that the preburn leachability of the uranium was reduced. Such an effect would also explain the slow preburn leaching of what is presumed to be localized uranium contamination in Clutch 14156C/D-3.

Although the DUF_{Total} for the filtered data sets indicates that the uniformly distributed dispersed uranium was below the specified limit of ≤1E-5 at 95% confidence, the impact of the outlier data on the overall amount of exposed uranium cannot be ignored. Without supplemental analyses to show that the excess uranium leached from these outlier samples came from individual particles with exposed-kernel defects or SiC defects, the most conservative approach is to include the outlier data in the calculation of mean DUF because the specification on maximum DUF is the most stringent (≤1E-5 at 95%) compared to the limits on EKF (≤5E-5 at 95%) and SDF (≤1E-4 at 95%). The upper bounds of the 95% confidence interval of the mean value for the sampled material—based on the DUF_{Total} calculated without filtering the outlier DUF data—are above the AGR-5/6/7 specified limit of ≤1E-5 at 95% confidence. Thus, it appears that the cause of the 25% PF compact batches failing to meet the specified criteria for DUF_{Total} may be associated with abnormal, localized contamination in individual compacts (most likely in individual particles). In addition, the fact that the outlier DUF values skewed the distribution of measured DUF values suggests that the Student's t-test based on means and standard deviations may not be appropriate for the calculation of the confidence interval.

Table 4-4 shows the calculated EKF and SDF for the 25% PF compacts. The 95% confidence limits in the table correspond to the true defect fractions in the sampled population that yield a cumulative binomial distribution value of 0.95 for the observed number of defects and sample size. These values are the lowest tolerance limits for which the compact lot would be deemed acceptable at 95% confidence based on the

[‡] While the data in Section 3 are from OC TRISO used for the 40% PF compacts, it is reasonable to presume that the source of the DUF, EKF, and SDF is from the underlying TRISO particles that were used for both AGR-5/6/7 packing fractions. Therefore, comparisons between the 40% PF OC TRISO and the 25% PF compacts are valid.

sample measured. The 95% confidence upper limits for EKF and SDF calculated from the pooled data were below the AGR-5/6/7 specified maximum values for EKF (≤5E-5 at 95%) and SDF (≤1E-4 at 95%). In the previous analysis of the first test series of 40 25% PF compacts that was reported in ORNL/TM-2018/744, the 95% confidence upper limit on EKF (≤5.18E-5) was just above the specified maximum. It was hypothesized in that report that additional sampling of the 25% PF compacts would likely provide a lower 95% confidence limit because the measured defect fraction in the 40-compact sample was only 1.09E-5. This hypothesis has been confirmed via the addition of 20 more compacts to the sample size.

Table 4-4. Defect fractions in 25% PF compacts

	EKF	SDF
Number of defects	1	3
Number of particles	~137,580	~137,580
Measured defect fraction	7.27E-6	2.18E-5
95% confidence limit	≤ 3.45E-5	≤ 5.64E-5

The measured defect fractions for EKF and SDF obtained from the 60 analyzed 25% PF compacts (Table 4-4) were higher than the measured defect fractions for EKF and SDF obtained from the OC TRISO analysis but were less than the 95% confidence limits for the OC TRISO EKF and SDF (Table 3-4). Using the comparison method described in Appendix A and the data in Table 3-4 and Table 4-4, the odds are only 0.65:1 that the EKF for the 25% PF compacts was >1E-5 higher than the OC TRISO EKF, and the odds are only 0.48:1 that the SDF was >2E-5 higher in the 25% PF compact lot. This comparison suggests that the 25% PF compacting may have resulted in a minor increase in the defect fractions, but the statistics do not provide significant certainty for this conclusion. Any increase can be considered essentially insignificant compared to the AGR-5/6/7 fuel specification limits given that the 25% PF compacts nevertheless pass the acceptance tests for EKF and SDF based on the data in Table 4-4. As discussed in Section 5.1, there is much stronger evidence that increasing the packing fraction to 40% resulted in significant particle damage. Therefore, it is possible that some particle damage was also occurring during compacting of the 25% PF compacts, but with lower probability due to the lower packing fraction.

4.2 COMPARISON BETWEEN ORNL AND BWXT NOG LBL OF 25% PF COMPACTS

Table 4-5 summarizes the available EKF and SDF data for the 25% PF compacts obtained from the independent analyses performed at BWXT NOG and ORNL. Using the comparison method described in Appendix A and the data in Table 4-5, the BWXT NOG data for the two sampled batches indicate odds of 1.4:1 that the Batch 14156C EKF was >1E-5 higher than the Batch 14157C EKF. This does not provide a high certainty that the variation in the EKF values for the two compacting runs analyzed by BWXT NOG was significant. Comparison of the BWXT NOG Batch 14156C EKF data to the ORNL Batch 14156C/D EKF data gave essentially even odds of 0.90:1 that the two sampled populations were within a comparison margin of 1E-5 and 3:1 odds that they were within 2E-5. Comparison of the BWXT NOG Batch 14157C EKF data to the ORNL Batch 14156C/D EKF data indicates better agreement, with odds of 1.3:1 that the EKF of the sampled populations were within a 1E-5 comparison margin and 4.5:1 that they were within 2E-5. Pooling all the EKF data in Table 4-5 gives a measured defect fraction of 7.35E-6 (3 defects in 408,000 particles), and the pooled data indicate that the pooled population would pass an acceptance criteria of ≤1.91E-5 at 95% confidence. Pooling just the BWXT NOG Batch 14157C EKF data and the ORNL Batch 14156C/D EKF data gives a lower measured defect fraction of 3.70E-6 (1 defect in 270,420 particles), but the pooled data only indicate that the pooled population would pass a slightly lower acceptance criteria of ≤1.76E-5 at 95% confidence. Therefore, even if it is biased high,

including the BWXT NOG data from Batch 14156C does not significantly impact the acceptance testing results.

Table 4-5. Comparison of 25% PF compact EKF and SDF results

		BWXT NOG data [a]			ORNL data
		14156C	14157C	Pooled	14156C/D
EKF	Number of defects	2	0	2	1
	Number of particles	~137,580	~132,840	~270,420	~137,580
	Measured defect fraction	1.45E-5	0	7.40E-6	7.27E-6
	95% confidence limit	≤ 4.58E-5	≤ 2.26E-5	≤ 2.33E-5	≤ 3.45E-5
SDF	Number of defects	17	8	25	3
	Number of particles	~137,580	~132,840	~270,420	~137,580
	Measured defect fraction	1.24E-4	6.02E-5	9.24E-5	2.18E-5
	95% confidence limit	≤ 1.86E-4	≤ 1.09E-4	≤ 1.30E-4	≤ 5.64E-5

[a] The BWXT NOG pooled data was extracted from INL/EXT-18-45110 (Marshall 2018), and the BWXT NOG batch data was extracted from the spreadsheet used for that report (Marshall 2019).

Using the comparison method described in Appendix A to examine the SDF data in Table 4-5 indicates significant discrepancies between the ORNL and BWXT NOG data. Comparison of the BWXT NOG Batch 14156C SDF data to the ORNL Batch 14156C/D SDF data gives odds of 137:1 that the population sampled by BWXT NOG had an SDF that was more than 2E-5 higher than the population sampled by ORNL. Since both these measured samples came from the same compacting run, this disagreement shows strong inconsistency in the analysis results. Comparison of the BWXT NOG Batch 14157C SDF data to the ORNL Batch 14156C/D SDF data indicates that the odds are 3.2:1 that the population sampled by BWXT NOG had an SDF >2E-5 higher than the population sampled by ORNL. Comparison between the BWXT NOG analyses of the SDF in Batches 14156C and 14157C is also unfavorable, with indication of 7.0:1 odds that the SDF in the Batch 14156C sampled population was >2E-5 higher than in the Batch 14157C sampled population.

It is most likely that the high SDF values observed in the BWXT NOG analyses were an artifact of the analyses. Otherwise, the comparison of the BWXT NOG TRISO particle data to the BWXT NOG data for the 25% PF compacts indicates there was a significantly higher SDF after compacting, especially for the Batch 14156C population, where the BWXT NOG analysis data indicates odds of 289:1 that the SDF was >2E-5 higher than the TRISO and 59:1 odds that it was >4E-5 higher. It is not reasonable that the SDF would increase this much without the EKF also increasing significantly. In contrast, comparing the ORNL 25% PF compact data for SDF to the BWXT NOG TRISO particle SDF data does not show a significant change in the SDF after compacting, with odds of 0.23:1 for the compact SDF being >2E-5 higher than the TRISO SDF, 0.11:1 for the TRISO SDF being >2E-5 higher than the compact SDF, and 2.5:1 for the compacts and TRISO having SDF values within the 2E-5 margin of comparison.

The ORNL DUF results are not compared herein to the BWXT NOG DUF results because of discrepancies in the available BWXT NOG data that would require additional information and analysis for meaningful comparison. The primary issue was the existence of non-physical zero values in the BWXT data for many of the clutches that skew the cumulative results. There are indications from a survey of the non-zero BWXT clutch data that some of the BWXT DUF results may be consistent with the ORNL DUF values and with observations made regarding contributions from general dispersed uranium and from localized higher concentrations of uranium contamination.

5. 40% PF COMPACTS

Confirmatory LBL analysis was completed on 100 AGR-5/6/7 compacts with a nominal 40% PF (Table 1-1). Compacts were randomly sampled in clutches of five compacts each and analyzed in groups of four clutches at a time. The first two groups were measured in the first test series and were obtained from Batch 14154C. The second test series included another group of 20 compacts from Batch 14154C and 40 compacts from Batch 14155C. All leach solutions were analyzed for uranium, and leachates from the second group in the first test series were also analyzed for other impurities (Fe, Cr, Mn, Co, Ni, Ca, Al, Ti, and V). Impurity analysis results are reported in ORNL/TM-2019/744. Appendix D contains copies of the preburn leach and postburn leach DRFs for each analyzed clutch, as well as the IRFs that summarize the data. The data are presented and discussed further in the remainder of this section.

5.1 LBL ANALYSIS FOR EXPOSED URANIUM IN 40% PF COMPACTS

Table 5-1 shows the amounts of uranium (in kernel equivalents) detected in the solutions collected during preburn leaching of the 40% PF compact clutches, and Table 5-2 shows similar data for the postburn leaching. Individual preburn leach DUF_{Pre} values and postburn leach DUF_{Post} values are shown for cases in which the total uranium leached before or after the burn was <0.5 kernel equivalents, respectively. There was a significant amount of uranium in each of the preburn leach water rinse solutions for the first four samples in the first test series (>10% of the second leach and >1% of the average uranium per kernel), so these data were included in the total leached uranium values. The water rinses were not analyzed for the other samples in the first test series.

Table 5-1. Uranium leached from 40% PF compacts before the burn

Series	Clutch	Particles [a]	First leach	Second leach	H_2O rinse [b]	Total	DUF_{Pre} [c]
1	14154C-1	~17,395	1.95E+0	1.38E-1	3.03E-2	2.12	---
	14154C-2	~17,395	8.55E-1	1.89E+0	3.22E-1	3.07	---
	14154C-3	~17,395	1.82E+0	1.86E-1	3.79E-2	2.04	---
	14154C-4	~17,395	2.47E+0	2.43E-1	2.79E-2	2.75	---
	14154C-5	~17,395	2.76E-2	5.73E-3		0.03	1.91E-6
	14154C-6	~17,395	3.87E-2	6.84E-3		0.05	2.62E-6
	14154C-7	~17,395	9.33E-1	1.52E-1		1.09	---
	14154C-8	~17,395	2.60E-2	6.36E-3		0.03	1.86E-6
2	14154C-1	~17,395	1.03E+0	3.71E-3	1.22E-4	1.03	---
	14154C-2	~17,395	9.75E-1	4.78E-2	8.33E-4	1.02	---
	14154C-3	~17,395	1.02E+0	4.72E-2	1.38E-3	1.07	---
	14154C-4	~17,395	3.11E-2	5.01E-3	1.68E-4	0.04	2.08E-6
	14155C-1	~17,100	4.23E+0	2.34E-1	7.36E-3	4.46	---
	14155C-2	~17,100	2.02E-1	2.65E-2	1.07E-3	0.23	1.33E-5
	14155C-3	~17,100	4.14E-2	5.03E-3	2.78E-4	0.05	2.71E-6
	14155C-4	~17,100	1.97E+0	1.01E-1	3.60E-3	2.08	---
	14155C-5	~17,100	1.91E+0	8.33E-2	2.50E-3	1.99	---
	14155C-6	~17,100	3.90E-2	3.92E-3	2.80E-4	0.04	2.51E-6
	14155C-7	~17,100	1.98E+0	1.35E-1	5.23E-3	2.12	---
	14155C-8	~17,100	9.98E-1	5.82E-2	2.60E-3	1.06	---

Note: Uranium content in each leach is reported in kernel equivalents.
[a] The number of particles per clutch was estimated from a determination of the average number of particles per compact, namely 3479 for Batch 14154 and 3420 for Batch 14155 (Marshall 2019).
[b] Gray shading indicates that the water rinse was not added to the total; blanks indicate that no measurement was taken.
[c] Individual DUF_{Pre} is the preburn leach fraction of exposed uranium in each clutch with <0.5 exposed kernel equivalents.

Table 5-2. Uranium leached from 40% PF compacts after the burn

Series	Clutch	Particles [a]	First leach	Second leach	H_2O rinse [b]	Total	DUF_{Post} [c]
1	14154C-1	~17,395	1.03E+0	8.35E-3	1.38E-4	1.04	---
	14154C-2	~17,395	8.10E-2	5.14E-3	2.10E-4	0.09	4.95E-6
	14154C-3	~17,395	8.27E-1	1.23E-2	2.44E-4	0.84	---
	14154C-4	~17,395	7.23E-1	3.17E-1	3.70E-3	1.04	---
	14154C-5	~17,395	3.70E-2	7.26E-4	8.88E-5	0.04	2.17E-6
	14154C-6	~17,395	3.14E-2	7.58E-4	1.50E-4	0.03	1.85E-6
	14154C-7	~17,395	1.06E+0	8.41E-3	1.60E-4	1.07	---
	14154C-8	~17,395	3.47E-2	6.62E-4	2.03E-4	0.04	2.03E-6
2	14154C-1	~17,395	4.09E-2	1.94E-2	1.68E-3	0.06	3.47E-6
	14154C-2	~17,395	2.07E+0	1.20E-2	1.86E-3	2.08	---
	14154C-3	~17,395	7.98E-2	3.18E-2	4.43E-4	0.11	6.42E-6
	14154C-4	~17,395	2.07E+0	3.91E-2	2.11E-4	2.11	---
	14155C-1	~17,100	1.13E+0	3.28E-3	2.44E-4	1.13	---
	14155C-2	~17,100	1.14E+0	4.28E-3	4.20E-4	1.15	---
	14155C-3	~17,100	2.85E+0	4.19E-3	1.93E-4	2.85	---
	14155C-4	~17,100	3.83E-2	2.45E-4	2.27E-4	0.04	2.25E-6
	14155C-5	~17,100	1.10E+0	4.53E-3	4.04E-5	1.10	---
	14155C-6	~17,100	3.23E-2	9.55E-4	1.07E-5	0.03	1.94E-6
	14155C-7	~17,100	1.03E+0	5.11E-3	6.40E-5	1.03	---
	14155C-8	~17,100	1.04E+0	4.89E-3	1.16E-4	1.04	---

Note: Uranium content in each leach is reported in kernel equivalents.
[a] The number of particles per clutch was estimated from a determination of the average number of particles per compact, namely 3479 for Batch 14154 and 3420 for Batch 14155 (Marshall 2019).
[b] Gray shading indicates that the water rinse was not added to the total.
[c] Individual DUF_{Post} is the postburn leach fraction of exposed uranium in each clutch with <0.5 exposed kernel equivalents.

Similar to what was observed in the 25% PF compact analysis, the calculated DUF_{Pre} and DUF_{Post} values for individual clutches were fairly consistent except for two significant outliers in the preburn leach of Clutch 14155C-2 and the postburn leach of Clutch 14154C-3. Table 5-3 shows the DUF results based on all available DUF data in Table 5-1 and Table 5-2 vs. a reduced data set in which these two outliers were excluded using a filter criteria of <10×MAD on the pooled data as described in Section 4.1. As for the 25% PF compacts, the outlier contribution to the DUF_{Total} measured for the 40% PF compacts resulted in an upper bound on the 95% confidence interval of the mean value for the sampled compacts that was slightly above the AGR-5/6/7 specified limit of ≤1E-5.

Table 5-3. Dispersed uranium in 40% PF compacts

		DUF_{Pre}	DUF_{Post}	DUF_{Total}
All data	Measured mean	3.86E-6	3.14E-6	7.00E-6
	Standard deviation	4.19E-6	1.70E-6	---
	95% confidence limit	≤ 6.95E-6	≤ 4.28E-6	≤ 1.04E-5
All data	Measured median	2.51E-6	2.21E-6	---
	Median absolute deviation	4.30E-7	3.13E-7	---
<10×MAD filtered data [a]	Measured mean	2.28E-6	2.67E-6	4.95E-6
	Standard deviation	3.75E-7	1.15E-6	---
	95% confidence limit	≤ 2.60E-6	≤ 3.51E-6	≤ 5.86E-6

[a] The <10×MAD filtered data do not include 14155C-2 preburn and 14154C-3 postburn data.

The measured mean DUF_{Total} for the <10×MAD filtered data set from the 40% PF compact analysis (4.95E-6) compares well with the measured mean DUF_{Total} values for the OC TRISO pooled sample reported in Table 3-3 (5.28E-6) and the <10×MAD filtered data set from the 25% PF compact sample reported in Table 4-3 (5.02E-6). This further reinforces the conclusions that there was a component of the total DUF uniformly distributed throughout the compacts and that this component was no higher than what was in the particles used to make the compacts. As observed when comparing the OC TRISO to the 25% PF compacts, the leachability of the uniformly dispersed uranium appeared different in the 40% PF compacts, presumably because of the thermal treatment of the compacts during processing. In the 40% PF compacts, ~46% of the <10×MAD filtered DUF was detected in the preburn leach compared to ~96% in the OC TRISO.

Table 5-4 shows the calculated EKF and SDF for the 40% PF compacts based on the data in Table 5-1 and Table 5-2. The 95% confidence limits in the table correspond to the true defect fractions in the sampled population that yield a cumulative binomial distribution value of 0.95 for the observed number of defects and sample size. These values are the lowest tolerance limits for which the compact lot would be deemed acceptable at 95% confidence based on the sample that was measured. Results are provided for Batches 14154C and 14155C separately and as a pooled data set. Using the comparison method described in Appendix A and the data in Table 5-4 results in odds of 1.3:1 that the EKF for Batch 14155C was >1E-5 higher than that in Batch 14154C, and it also results in odds of 0.95:1 that the SDF for Batch 14155C was >2E-5 higher than that in Batch 14154C. While the defect fractions in Batch 14155C may be marginally higher than those in Batch 14154C, these weak odds indicate that the difference is not likely to be significant with respect to the measured defect fractions. Pooling the data should not skew the data analyses more than ~1E-5, and it is statistically favorable to pool the data to reduce the uncertainty associated with the sample sizes. The SDF data for Batch 14154C indicate that the sampled population satisfied the specified limit of SDF ≤ 1E-4 at 95% confidence, as did the pooled population. The available SDF data for Batch 14155C was insufficient to show that the sampled population satisfied the specification, although it would pass a specified limit of SDF ≤ 1E-4 with 93.7% confidence, and additional sampling would most likely result in a positive acceptance test. Both individual batches and the pooled population failed to meet the specification of EKF ≤ 5E-5 at 95% confidence, and there is no indication that additional sampling would change this rejection result, given that the measured EKF values were all higher than the specified limit.

Table 5-4. Defect fractions in 40% PF compacts

Batch		EKF	SDF
14154C	Number of defects	14	8
	Number of particles	~208,740	~208,740
	Measured defect fraction	6.71E-5	3.83E-5
	95% confidence limit	≤ 1.05E-4	≤ 6.92E-5
14155C	Number of defects	11	8
	Number of particles	~136,800	~136,800
	Measured defect fraction	8.04E-5	5.85E-5
	95% confidence limit	≤ 1.34E-4	≤ 1.06E-4
Pooled	Number of defects	25	16
	Number of particles	~345,540	~345,540
	Measured defect fraction	7.24E-5	4.63E-5
	95% confidence limit	≤ 1.02E-4	≤ 7.04E-5

The measured defect fractions for EKF and SDF reported in Table 5-4 for the individual batches and the pooled sample of 100 analyzed 40% PF compacts are higher than the EKF and SDF reported in Table 3-4 for the OC TRISO. Using the comparison method described in Appendix A and the data in Table 3-4 and

Table 5-4, it can be shown that there is strong evidence that the pooled population of 40% PF compacts was higher than the pooled population of OC TRISO, with odds of 1,463:1 for a margin of >1E-5, 540:1 for a margin of >2E-5, and 46:1 for a margin of >4E-5. This indicates that the 40% PF compacting process was damaging the TRISO coatings, and kernels were exposed. There was also a less dramatic increase in SDF, indicating that the SiC layers in some particles were broken, but at least one of the pyrocarbon coatings remained liquid tight until after the burn. The measured results indicate odds of 6.0:1 that the SDF in the pooled population of 40% PF compacts was >2E-5 higher than the SDF in the pooled population of OC TRISO.

Table 5-1 shows the preburn leach results for the eight compact clutches in the first test series. There were ten exposed kernels in the first group of four compacts and only one in the second group. This result is discussed in ORNL/TM-2018/744 as an unlikely distribution if the failure mechanism were dependent on a particle attribute and only an ~10% probable distribution if the failure mechanism was dependent on variability in processing between individual compacts. This raised questions regarding the possibility of the observed particle defects being an artifact of the LBL performed on the first group in the first test series. Given the agreement between the reported EKF measured by BWXT NOG and the cumulative results for the ORNL measured EKF for the first test series of 40 of the 40% PF compacts and the fact that the ORNL results were based on an insufficient sample size, ORNL/TM-2018/744 recommends that additional samples be analyzed to determine if the improbable distribution was real or if it was an artifact of the LBL process. The number and distribution of exposed kernels in the preburn leach analysis of the second test series of 60 additional 40% PF compacts provides evidence that the EKF determined from the 40 compacts in the first test series was accurate and does not support a conclusion that the 10 defects measured in the first group represent an LBL artifact. In fact, the measured EKF from the first test series reported in ORNL/TM-2018/744 (7.90E-5) is nearly the same as the results for the pooled data reported in Table 5-4.

5.2 COMPARISON BETWEEN ORNL AND BWXT NOG LBL OF 40% PF COMPACTS

Table 5-5 shows the EKF and SDF data for the 40% PF compacts based on the BWXT NOG analyses and the ORNL analyses. The overall comparison is similar to the comparison of the LBL results from the analyses of the 25% PF compacts discussed in Section 4.2 in that the EKF data from the two independent analyses compare fairly well, while there is a clear discrepancy in the SDF data. As observed in the ORNL data, the BWXT NOG analyses indicated that the Batch 14155C EKF may be slightly higher than the Batch 14154C EKF. Using the comparison method described in Appendix A and the BWXT NOG data in Table 5-5, the odds are 1.3:1 that the EKF in Batch 14155C was >1E-5 higher than the EKF in Batch 14154C. However, as argued for the ORNL data in Section 5.1, even with this weak indication from the analyzed samples that the defect fractions in Batch 14155C may be marginally higher, pooling the BWXT data should not skew the data analyses more than ~1E-5, and it is statistically favorable to pool the data to reduce the uncertainty associated with the sample sizes. The measured and upper limits for the 95% confidence intervals for EKF in the pooled populations analyzed by BWXT NOG and ORNL were nearly identical. Pooling all the EKF results in Table 5-5 results in a measured EKF of 6.95E-5 (42 defects in 604,105 particles), and the pooled data indicates that the pooled population would pass an acceptance criteria of ≤9.0E-5 with 95% confidence. The pooled population does not meet the specified criteria of EKF ≤ 5E-5 at 95% confidence.

Comparison of the SDF data shows that the BWXT NOG measured results were slightly higher, but the differences were minor when used to calculate the confidence intervals for the sample populations. Using the comparison method described in Appendix A and the BWXT NOG data in Table 5-5, the odds are 1.3:1 that the SDF in the BWXT NOG pooled sample was >2E-5 higher than the SDF in the ORNL pooled sample. The pooled SDF data from the ORNL analysis satisfy the specification of SDF ≤ 1E-4 at 95% confidence, while the pooled SDF data from BWXT NOG analysis do not. Pooling all the SDF data

results in a measured defect fraction of 5.63E-5 (34 defects out of 604,105 particles), and the pooled population would pass an acceptance criteria of ≤7.5E-5 at 95% confidence.

Table 5-5. Comparison of 40% PF compact LBL results

		BWXT NOG data [a]			ORNL data		
		14154C	14155C	Pooled	14154C	14155C	Pooled
EKF	Number of defects	7	10	17	14	11	25
	Number of particles	~121,765	~136,800	~258,565	~208,740	~136,800	~345,540
	Measured defect fraction	5.75E-5	7.31E-5	6.57E-5	6.71E-5	8.04E-5	7.24E-5
	95% confidence limit	≤ 1.08E-4	≤ 1.24E-4	≤ 9.87E-5	≤ 1.05E-4	≤ 1.34E-4	≤ 1.02E-4
SDF	Number of defects	6	12	18	8	8	16
	Number of particles	~121,765	~136,800	~258,565	~208,740	~136,800	~345,540
	Measured defect fraction	4.93E-5	8.77E-5	6.96E-5	3.83E-5	5.85E-5	4.63E-5
	95% confidence limit	≤ 9.73E-5	≤ 1.43E-4	≤ 1.04E-4	≤ 6.92E-5	≤ 1.06E-4	≤ 7.04E-5

[a] The BWXT NOG pooled data was extracted from INL/EXT-18-45110 (Marshall 2018), and the BWXT NOG batch data was extracted from the spreadsheet used for that report (Marshall 2019).

As mentioned in Section 4.2, there is not sufficient information currently available for a detailed comparison of the DUF results. The reported results for the BWXT NOG analysis of DUF in the 40% PF compacts of ≤7.26E-5 at 95% confidence (Marshall 2018) were higher than those determined from the ORNL analyses (Table 5-3).

5.3 BL ANALYSIS FOR EXPOSED URANIUM IN 40% PF COMPACTS

To explore whether the LBL procedure may have introduced significant particle damage that could artificially elevate defect fractions in the 40% PF compact analysis, 80 compacts were analyzed using an optional burn-leach procedure according to DAM-26. With this optional procedure, electrolytic deconsolidation and preburn leaching were completely skipped. Compact clutches were loaded into quartz flasks and heated to 750°C in air to burn off all exposed carbon. The resultant burned-back particles and residual ash were subjected to the standard postburn leach process. This isolated the analysis from any possible particle damage during deconsolidation or preburn leaching. It was conjectured in ORNL/TM-2018/744 that particle damage may have occurred during preburn leaching due to the challenge of working with the digested AGR-5/6/7 matrix, which produced a very viscous suspension in the acid that complicated separation of the coated particles from the leach acid and increased the centrifuge time required to extract a suitable liquid sample of the acid for mass spectrometry. By skipping the deconsolidation and preburn leaching, this difficulty was eliminated because all matrix graphite was removed by oxidization during the burn. Decanting acid from a vessel containing burned-back particles was relatively easy, and the likelihood of damaging particles was minimal. Appendix E contains copies of the postburn leach DRFs for each analyzed clutch, as well as the IRFs that summarize the data.

Table 5-6 shows the amount of uranium (in kernel equivalents) detected in each solution collected using the burn-leach procedure on 40 of the 40% PF compacts, which were analyzed in clutches of five compacts each, and in groups of four clutches at a time. The decreasing amount of uranium as leaching progressed through the first and second 24-hour leaches and the water rinse showed that leaching was effective and complete. Water rinse data were not included in the total because they were ≤10% of the second leach or ≤1% of the average uranium per kernel. Some of the values for total leached uranium reported in Table 5-6 deviate significantly from whole numbers. This could be related to the DUF outliers observed in the LBL analysis discussed in Sections 4.1 and 5.1.

Table 5-6. Uranium leached from 40% PF compacts using burn-leach procedure

Series	Clutch	Particles [a]	First leach	Second leach	H_2O rinse [b]	Total	DUF_{Total} [c]
1	14154D-1	~17,395	3.32E+0	1.47E-2	8.08E-5	3.33	---
	14154D-2	~17,395	1.19E-1	9.18E-4	2.88E-5	0.12	6.88E-6
	14154D-3	~17,395	2.19E+0	1.16E-2	8.48E-5	2.21	---
	14154D-4	~17,395	2.22E+0	1.28E-2	6.57E-5	2.24	---
	14154D-5	~17,395	2.74E+0	1.14E-2	1.19E-4	2.75	---
	14154D-6	~17,395	3.28E+0	1.53E-2	1.74E-4	3.29	---
	14154D-7	~17,395	6.94E-2	6.36E-4	1.14E-5	0.07	4.03E-6
	14154D-8	~17,395	1.12E+0	6.63E-3	4.49E-5	1.13	---
2	14155D-1	~17,100	2.20E+0	7.54E-3	7.72E-5	2.21	---
	14155D-2	~17,100	1.46E+0	6.19E-3	6.50E-5	1.47	---
	14155D-3	~17,100	1.25E+0	5.58E-3	7.56E-5	1.26	---
	14155D-4	~17,100	2.13E+0	9.92E-3	6.90E-5	2.14	---
	14155D-5	~17,100	1.01E+0	5.23E-3	2.95E-5	1.01	---
	14155D-6	~17,100	1.53E+0	7.84E-3	3.54E-5	1.54 [d]	---
	14155D-7	~17,100	2.89E+0	1.48E-2	7.61E-5	2.90	---
	14155D-8	~17,100	8.32E-2	7.94E-4	2.64E-5	0.08	4.91E-6

Note: Uranium content in each leach is reported in kernel equivalents.
[a] The number of particles per clutch was estimated from a determination of the average number of particles per compact, namely 3479 for Batch 14154 and 3420 for Batch 14155 (Marshall 2019).
[b] Gray shading indicates that the water rinse was not added to the total.
[c] Individual DUF_{Total} is the fraction of exposed uranium in each clutch with <0.5 exposed kernel equivalents.
[d] Clutch 14155D-6 was counted as having one defect because the total leached uranium was <1.5 after subtraction of mean DUF according to specified procedure described in Section 2.

Because detection of the dispersed uranium during BL analysis is not split between a preburn and postburn leach series, DUF_{Total} is more directly measured but is only available for clutches which do not have an exposed-kernel defect or a SiC defect. As expected from the LBL presented in Table 5-1 and Table 5-2, there were only a few clutches that met the criteria of <0.5 kernel equivalents of total leached uranium (Table 5-6). The 95% confidence limit for the DUF_{Total} was calculated using Eq. (2.1) because a value for the standard deviation was available. Table 5-7 summarizes the dispersed uranium analysis results. The measured mean DUF_{Total} for the BL analysis (5.27E-6) compares well with the <10×MAD filtered value obtained with LBL analysis of the other 40% PF compacts (4.95E-6), as well as the <10×MAD filtered value for the 25% PF compacts (5.02E-5) and the OC TRISO DUF_{Total} of 5.28E-6.

Table 5-7. Dispersed uranium in 40% PF compacts

	LBL DUF_{Total}	LBL <10×MAD filtered DUF_{Total}	BL DUF_{Total}
Measured mean	7.00E-6	4.95E-6	5.27E-6
Standard deviation	---	---	1.46E-6
95% confidence limit	≤ 1.04E-5	≤ 5.86E-6	≤ 7.74E-6

While the BL procedure does not distinguish between exposed-kernel (preburn-leach) defects and SiC (postburn-leach) defects, the number of exposed kernels detected in the BL solutions should equal the sum of these two types of defects. Table 5-8 compares the combined EKF+SDF determined by LBL versus BL of the 40% PF compacts. Results are provided for compacting runs 14154 and 14155 separately and as a pooled data set. The LBL was performed on Batches 14154C and 14155C, while the BL was performed on Batches 14154D and 14155D, where different letter suffixes indicate different furnace runs for carbonization and heat treatment.

Table 5-8. Combined defect fractions in 40% PF compacts

Batch		LBL EKF+SDF	BL EKF+SDF
	Sampled batches	14154C 14155C	14154D 14155D
14154	Number of defects	22	14
	Number of particles	~208,740	~139,160
	Measured defect fraction	1.05E-4	1.01E-4
	95% confidence limit	≤ 1.51E-4	≤ 1.58E-4
14155	Number of defects	19	11
	Number of particles	~136,800	~136,800
	Measured defect fraction	1.39E-4	8.04E-5
	95% confidence limit	≤ 2.04E-4	≤ 1.34E-4
Pooled	Number of defects	41	25
	Number of particles	~345,540	~275,960
	Measured defect fraction	1.19E-4	9.06E-5
	95% confidence limit	≤ 1.54E-4	≤ 1.27E-4

The measured EKF+SDF values from the LBL analysis of Batch 14154C and the BL analysis of Batch 14154D were almost identical. The method described in Appendix A was used to compare the true EKF+SDF in the Batch 14154C population sampled with LBL analysis to that in the Batch 14154D population sampled with BL analysis based on the data in Table 5-8. This resulted in odds of 0.28:1 that Batch 14154C was >3E-5 higher than Batch 14154D, 0.22:1 that Batch 14154D was >3E-5 higher than Batch 14154C, and 1.5:1 that the two sampled population were within 3.5E-5. This supports a conclusion that there was not significant damage to the particles during LBL of compacts from Batch 14154C. However, the measured EKF+SDF for Batch 14155C analyzed with LBL was higher than the measured BL value for Batch 14155D, and the Wilson score comparison yields odds of 3.1:1 that the Batch 14155C population sampled with LBL analysis had an EKF+SDF that was >3E-5 higher than the Batch 14155D population sampled with BL analysis. This suggests particles may have been damaged in the LBL of compacts from Batch 14155C unless the defect population in Batch 14155C was significantly higher than in Batch 14155D, which is unlikely given that any possible variation between furnace runs is not expected to have significantly impacted the defect fractions. It is possible that this result is biased by the limited sample sizes. Comparison of the pooled results indicates odds of 0.86:1 that the true EKF+SDF in the pooled population sampled with LBL analysis was >3E-5 higher than the true EKF+SDF in the pooled population sampled with BL analysis, and odds are 1.1:1 that the two populations had an EKF+SDF within the 3E-5 margin.

5.4 X-RAY ANALYSIS OF DEFECTIVE PARTICLES IN 40% PF COMPACTS

After LBL, particles from three 40% PF compact clutches were examined by x-ray radiography to identify any leached particles having a SiC shell that was still in one piece. Clutch 14155C-4 exhibited 2.08 kernel equivalents in the preburn leach and 0.04 kernel equivalents in the postburn leach. No leached particles with intact SiC shells were identified from the radiography survey, but there was one SiC hemispherical shell and five SiC fragments observed that looked to be consistent with the debris from two particles. Clutch 14155C-4 exhibited 0.05 kernel equivalents in the preburn leach and 2.85 kernel equivalents in the postburn leach. No leached particles with intact SiC shells were identified from the radiography survey, and only one small SiC fragment was found. Clutch 14155C-1 exhibited 4.46 kernel equivalents in the preburn leach and 1.13 kernel equivalents in the postburn leach. Six SiC fragments were observed that looked to be consistent with the debris from at least two particles. Two intact SiC shell with no remaining kernel or pyrocarbon material were found and further examined with XCT.

Figure 5-1 shows x-ray tomograms of the two intact SiC shells found after LBL of Clutch 14155C-1. One shell had a crack in the SiC traversing about one-quarter of the circumference. The other shell had a hole indicative of localized SiC degradation similar to that observed in the 25% compact particle shown in Figure 4-1. The SiC crack may have been introduced during compacting. The hole was probably the result of reaction with a metallic inclusion during the compact heat treatment. Figure 5-2 shows SiC degradation that was observed during defective IPyC analysis of particles from the AGR-5/6/7 TRISO fuel composite (Helmreich et al. 2017a, Helmreich et al. 2017b). For the defective IPyC analysis, the as-fabricated TRISO particles were heat treated for one hour at 1,800°C to simulate the heat treatment that is performed during compact fabrication. Similar degradation of SiC was observed after 1,800°C safety testing of AGR-2 Compact 2-3-2 (Hunn et al. 2018b) due to reaction with molybdenum, where the molybdenum presumably came from the hot-sampling cup in the BWXT NOG coater.

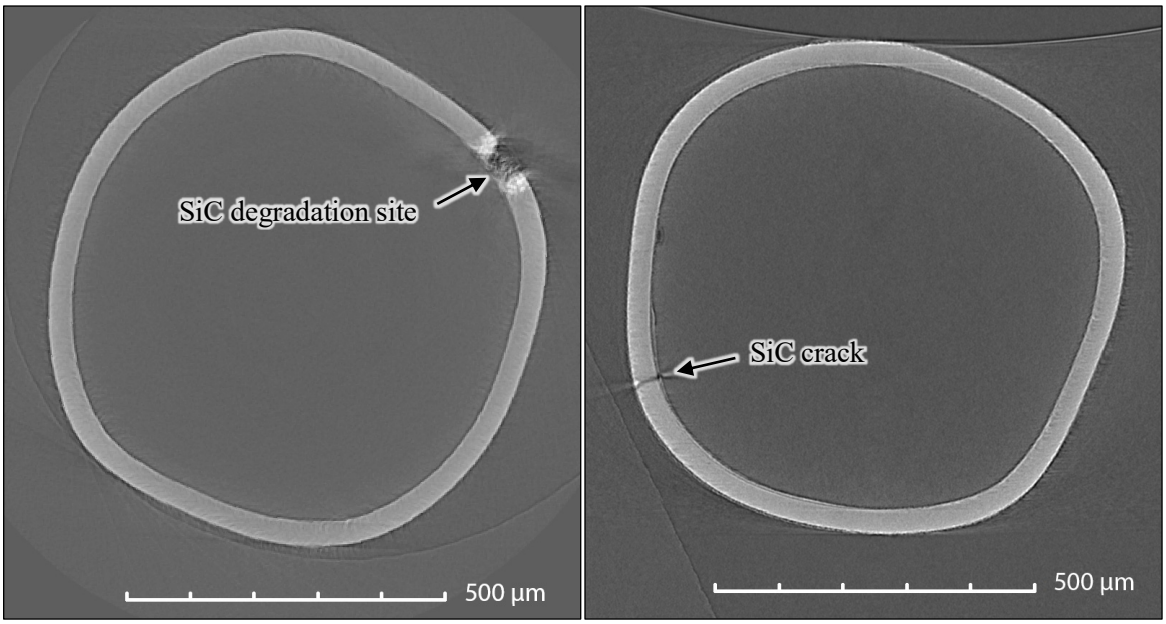

Figure 5-1. X-ray tomograms of SiC shells from two particle from Clutch 14155C-1.

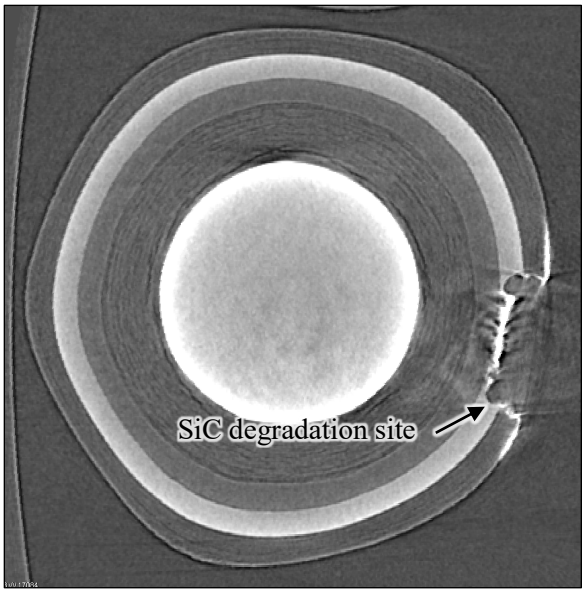

Figure 5-2. X-ray tomogram of particle from AGR-5/6/7 TRISO composite with degraded SiC (Helmreich et al. 2017b, Figure 4-7).

Two other particles were identified during the radiography survey of the particles from Clutch 14155C-1. These particles still had kernels and internal pyrocarbon but were examined by XCT to look for evidence of partial leaching. Figure 5-3 shows tomograms of these particles. There were no indications of defects in the SiC or signs of acid leaching. One particle had a large soot inclusion that compromised the IPyC coating and probably allowed HCl penetration during SiC coating that resulted in uranium dispersion during heat treatment. The other particle had an abnormal or missing IPyC layer that similarly resulted in uranium dispersion.

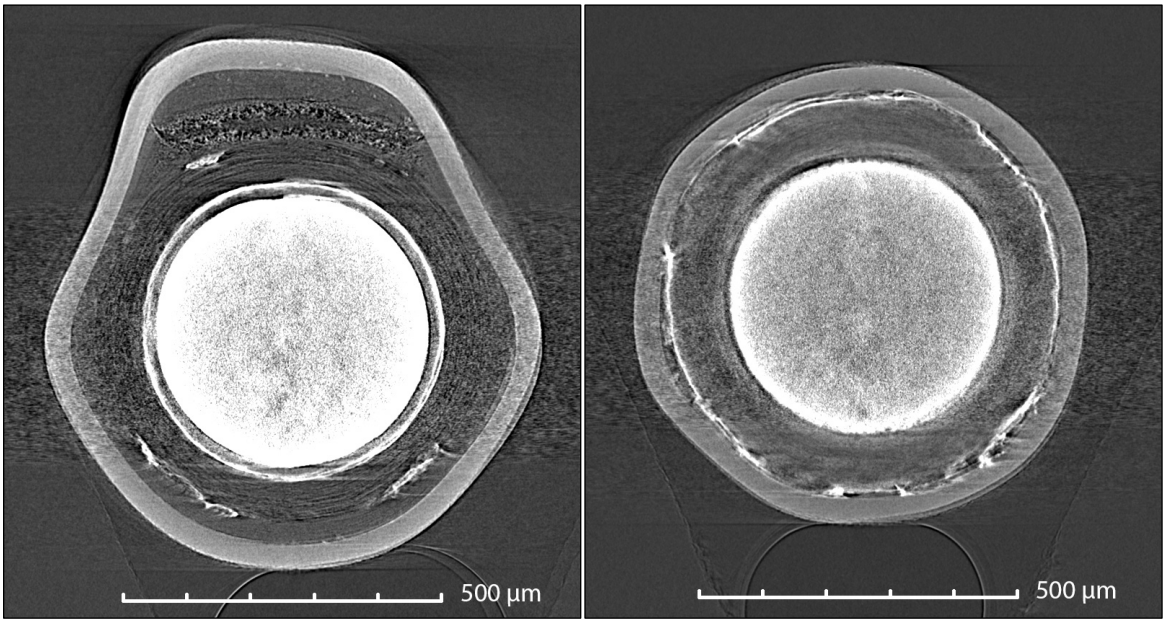

Figure 5-3. X-ray tomograms of two particle from Clutch 14155C-1 with defective IPyC but no indication of partial leaching.

6. CONCLUSION

Confirmatory LBL was completed on 100 40% PF compacts and 60 25% PF compacts taken from compact batches used for the AGR-5/6/7 irradiation test. Data from this confirmatory analysis were compared to data from the LBL analysis performed at BWXT NOG. Additional LBL was performed on OC TRISO taken from the composite used to form the 40% PF compacts to explore whether overcoating or compacting was responsible for the elevated EKF observed in the 40% PF compacts. To investigate the effect of the difficulties experienced when working with the digested matrix slurry during preburn leaching, BL analysis was performed on 80 40% PF compacts to acquire data without having to work with leachates containing digested matrix.

The LBL analysis of the OC TRISO showed that overcoating did not introduce significant damage to the TRISO particles. Statistical comparison of the EKF and SDF in the OC TRISO samples with the EKF and SDF in the TRISO samples showed similar defect fractions in the sampled populations. The OC TRISO LBL analysis also provided evidence that the DUF was a combination of uniformly distributed uranium contamination combined with high concentrations of uranium in some of the compacts. Although this localized contamination complicated the analysis, consistency was observed between the DUF in the OC TRISO and the DUF in the two types of compacts. Comparison to the TRISO particles was limited by the available data, but it is probable that uranium contamination in the TRISO particles was the source of all observed DUF.

The ORNL and BWXT NOG results for EKF were sufficiently consistent to allow them to be pooled for statistical analysis of the limit on the EKF in the 25% PF and 40% PF pooled samples. While there was some variation in the observed defect fractions for the analyzed samples of TRISO, OC TRISO, and 25% PF compacts, there were no strong indications for significant statistical differences after accounting for the sample sizes. The TRISO, OC TRISO, and 25% PF compacts were all found to have acceptable values for EKF compared to the AGR-5/6/7 specified limit of EKF $\leq$ 5E-5 at 95% confidence. However, the EKF for the 40% PF compacts clearly indicated that TRISO particles were damaged during compacting, and the 40% PF compacts did not satisfy the specification limit on EKF.

The ORNL confirmatory analysis indicated a high probability that there was a significant positive bias in the BWXT NOG results for SDF in the 25% PF compact Batch 14156C and a smaller bias in the 25% PF compact Batch 14157C. The BWXT NOG SDF data suggests that the 25% PF compacting process introduced damage to the SiC that elevated the SDF above the fraction observed in the TRISO particles but not to the entire TRISO coating, since the EKF values were not elevated. This is unlikely. The ORNL SDF data indicates that no significant damage was introduced in the SiC layer during compacting of the 25% PF compacts. Pooling of the results for the analysis of the SDF in the 25% PF compacts is not recommended. For the 40% PF compacts, there was a slight discrepancy between the BWXT NOG SDF data and the confirmatory analysis performed by ORNL, with the BWXT NOG SDF data being slightly higher. However, for the available data, pooling the 40% PF compact SDF data from BWXT NOG and ORNL did not adversely impact the upper limit on the 95% confidence interval.

Comparison between LBL and BL results for the 40% PF compacts was somewhat inconclusive. When data were grouped into two sets that corresponded with different compacting runs, one set (compacting run 14154) gave no indication that particle damage may have occurred during deconsolidation and preburn leaching. However, the other set (compacting run 14155) showed some indication that the combined EKF+SDF measured by LBL was higher than that measured by BL. This difference was not as statistically significant when the data from the two compacting runs were pooled. It is possible that the source of the EKF defects in the 40% PF compacts may be affecting the statistical calculations in this comparison. The assumption that each TRISO particle is an independent sample is probably flawed if the damage is occurring during compacting and varying from compact to compact. Under those conditions, the statistics may need to be adjusted to account for the number of compacts in the sample.

7. REFERENCES

Brown, L. D. and T. T. Cai. 2001. "Interval Estimation for a Binomial Proportion." *Statist. Sci. 16*, 101–133.

Cai, T. T. 2005. "One-sided Confidence Intervals in Discrete Distributions." *J. Statist. Plan. and Inf. 131*, 63–88.

Einerson, J. J. 2005. *Statistical Methods Handbook for Advanced Gas Reactor Fuel Materials*. INL/EXT-05-00349, Revision 0. Idaho Falls, Idaho: Idaho National Laboratory.

Helmreich, G. W., J. D. Hunn, D. J. Skitt, J. A. Dyer, and A. T. Schumacher. 2017a. *Acceptance Test Data for the AGR-5/6/7 Irradiation Test Fuel Composite—Defective IPyC and Pyrocarbon Anisotropy*. ORNL/TM-2017/037. Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Helmreich, G. W., J. D. Hunn, D. J. Skitt, J. A. Dyer, and A. T. Schumacher. 2017b. *X-ray Analysis of Defects and Anomalies in AGR-5/6/7 TRISO Particles*. ORNL/TM-2017/038. Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Hunn, J. D. 2017. *Data Acquisition Method: Estimation of Average Particle Weight*. AGR-CHAR-DAM-22, Revision 23. Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Hunn, J. D. and F. C. Montgomery. 2018a. *Data Acquisition Method: Compact Leach-Burn-Leach*. AGR-CHAR-DAM-26, Revision 3. Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Hunn, J. D. and F. C. Montgomery. 2018b. *Data Acquisition Method: Particle Leach-Burn-Leach*. AGR-CHAR-DAM-21, Revision 2. Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Hunn, J. D., F. C. Montgomery , J. A. Dyer, T. J. Keever, and G. W. Helmreich. 2018a. *Confirmatory LBL Analysis of AGR-5/6/7 Compacts and Overcoated Particles.* ORNL/TM-2018/774. Oak Ridge, Tennessee: Oak Ridge National Laboratory.

Hunn, J. D., R. N. Morris, F. C. Montgomery, T. J. Gerczak, D. J. Skitt, G. W. Helmreich, B. D. Eckhart, and Z. M. Burns. 2018b. *Safety-Testing and Post-Safety-Test Examination of AGR-2 UCO Compact 2-3-2 and AGR-2 UO_2 Compact 3-4-1*. ORNL/TM-2018/956, Revision 0. Oak Ridge, TN: Oak Ridge National Laboratory.

Newcombe, R. G. 1998. "Two-sided Confidence Intervals for the Single Proportion: Comparison of Seven Methods." *Statist. Med. 17*, 857–872.

Lybeck, N. J., and J. J. Einerson. 2016. *Statistical Sampling Plan for AGR-5/6/7 Fuel Materials*. PLN-4352, Revision 5. Idaho Falls, Idaho: Idaho National Laboratory.

Marshall, D. W. 2017. *AGR-5/6/7 Fuel Specification.* SPC-1352, Revision 8. Idaho Falls, Idaho: Idaho National Laboratory.

Marshall, D. W. 2018. *Confirmatory Defect Analyses of AGR-5/6/7 Fuel.* INL/EXT-18-45110, Revision 0. Idaho Falls, Idaho: Idaho National Laboratory.

Marshall, D. W. 2019. "Fuel Summary." Personal communication by e-mail on April 16, 2019 with an attached spreadsheet that was used for INL/EXT-18-45110, Revision 0 (Marshall 2018).

Wallis, S. A. 2013. "Binomial Confidence Intervals and Contingency Tests: Mathematical Fundamentals and the Evaluation of Alternate Methods." *J. Quant. Ling. 20*, 178–208.

Wilson, E. B. 1927. "Probable Inference, the Law of Succession, and Statistical Inference." *J. Am. Statist. Assoc. 22*, 209–212.

APPENDIX A. COMPARISON OF EKF AND SDF MEASUREMENTS

APPENDIX A. COMPARISON OF EKF AND SDF MEASUREMENTS

This Appendix explains the method used in this report to compare the results of the LBL analyses performed at BWXT NOG and ORNL in a way that accounts for the variations inherent in the statistical sampling. The basic approach involves estimating the probability that the measured defect fractions in two independent samples indicate significantly different values for the true defect fraction. For samples extracted from different populations, this can provide a measure of the likelihood that the sampled populations have significantly different true defect fractions. For samples taken from the same or similar populations, this provides an indication of whether one of the two measurements may have been flawed or the result of an unrepresentative sample.

As discussed in the Statistical Sampling Plan for AGR-5/6/7 Fuel Materials (Lybeck and Einerson 2016) and the AGR-5/6/7 Fuel Specification (Marshal 2017), exposed kernel defects and SiC defects are treated as TRISO particle attribute properties, and statistical sampling is used for acceptance testing. While the hyperbolic distribution more accurately describes sampling without replacement, which is the case for destructive analyses like LBL, the binomial distribution is a sufficient approximation if the total number of particles in the sampled population is much greater than the sampled number (Einerson 2005). The AGR program has adopted the cumulative distribution function of the binomial distribution as the primary statistical method to determine with 95% confidence if a population of particles has an EKF or SDF below a specified upper limit.

The probability that the number of defects observed in two independent samples indicate that a significant difference in the true defect fraction may be considered by constructing a stepwise approximation for each sample of the cumulative probability that the true defect fraction of the sampled population is less than a specific value over the range of all possible true defect fractions (i.e., 0–1). This is done by calculating a series of one-sided confidence intervals based on the observation of k defective particles in an analyzed sample of n particles over a stepwise series of confidence values from 0–100%, where each confidence interval represents the cumulative probability indicated by the associated sample that the true defect fraction in the sampled population is less than the interval's upper limit. Several methods for calculating binomial distribution confidence intervals from a single sample have been developed. The Wilson score interval with continuity correction has been compared to and recommended over other commonly used intervals, particularly for lots with very low defect fractions (Wilson 1927, Wallis 2013, Newcombe 1998, Brown and Cai 2001) and will be used herein. Cai (2005) has identified weaknesses when the score interval is applied to the approximation of one-sided intervals vs. two-sided intervals (as discussed in the other references), so it may be of value to consider other approaches to confirm or refine the method used for the comparisons in this report. However, the weaknesses identified by Cai are not likely to impact the comparisons made herein. The one-sided upper bound for the Wilson score interval with continuity correction is defined by Equation A-1, where $p = k/n$ is the measured defect fraction in the sample, and z_α is the value of the cumulative distribution function of the normal distribution for a given cumulative probability that the true defect fraction in the sampled population is less than w^+. The critical value z_α is the same value used to calculate the one-sided tolerance factor applied by the AGR program to tolerance interval acceptance testing for normal distributions of variable properties (Einerson 2005):

$$w^+ \equiv \min\left(0, \frac{2np+z_\alpha^2+z_\alpha\sqrt{4np(1-p)+z_\alpha^2-n^{-1}-4p+2}+1}{2\left(n+z_\alpha^2\right)}\right). \quad \text{(A-1)}$$

For each sample selected for comparison, Microsoft Excel was used to construct an array for w^+ over a stepwise series of confidence values from 0–100%. A 10,000-element array of confidence values from 0.01–100% with a constant stepsize of 0.01% was generated, and z_α was calculated for each element

using the NORM.S.INV function. For the confidence value of 100%, 1E9 was used to represent $z_\alpha = \infty$. The measured defect fraction for the sample, $p = k/n$, was used to calculate w^+ for each value in the z_α array. The resultant w^+ array was a stepwise approximation based on the measured sample of the cumulative probability that the true defect fraction of the sampled population was less than w^+ over the range of all possible true defect fractions. The stepsize of the w^+ array was not constant, but nevertheless, it covered the full range of possible values from 0–1.

To compare the LBL analysis results of two samples, the w^+ arrays for the two samples were used to estimate the probability that the true defect fraction indicated by Sample 2 was greater than that indicated by Sample 1 by more than a selected margin of Δ. The selected margin was typically chosen to be equal to 20% of that specified in the AGR-5/6/7 Fuel Specification as the upper limit at 95% confidence, i.e., EKF ≤ 5E-5 or SDF ≤ 1E-4. A margin less than this can be considered to result in an insignificant difference when the results of the two analyses are applied to determine if the measured population satisfies the specified limit.

The probability that the true defect fraction indicated by Sample 2 is greater than the true defect fraction indicated by Sample 1 by more than a specified margin of Δ is given by Eq. (A-2). The term $C\left(w_{1,i}^+\right)$ is the confidence (probability) based on Sample 1 that the true defect fraction in the population is less than the i^{th} element in the Sample 1 w^+ array. The difference between $C\left(w_{1,i}^+\right)$ and the probability associated with the next lower element in the Sample 1 w^+ array, $C\left(w_{1,i-1}^+\right)$ is the probability based on Sample 1 that the true defect fraction in the population is between $w_{1,i-1}^+$. and $w_{1,i}^+$. For the summation indices $i =$ 1 to N, where N is the number of elements in the Sample 1 w^+ array, the set of multiplicands $\left[C\left(w_{1,i}^+\right) - C\left(w_{1,i-1}^+\right)\right]$ in the summed product is a stepwise approximation based on Sample 1 of the probability for all possible true defect fractions from 0–1 and sums to 100%. The term $C\left(w_{2,m}^+\right)$ is the probability based on Sample 2 that the true defect fraction is less than the lowest element in the Sample 2 w^+ array that is greater than the i^{th} element in the Sample 1 w^+ array by a margin of at least Δ. The multiplier $\left[1 - C\left(w_{2,m}^+\right)\right]$ is the complement of $C\left(w_{2,m}^+\right)$, or the probability based on Sample 2 that the true defect fraction is greater or equal to $w_{2,m}^+$.

$$Probability(2 > 1 + \Delta) = \sum_{i=1}^{N} \left\{\left[C\left(w_{1,i}^+\right) - C\left(w_{1,i-1}^+\right)\right] \times \left[1 - C\left(w_{2,m}^+\right)\right]\right\}, \qquad \text{(A-2)}$$

$$\text{where } w_{2,m}^+ = \min\left[w_{2,j}^+ > \left(w_{1,i}^+ + \Delta\right)\right] \text{ for } j = 1 \text{ to } N.$$

Equation (A-3) converts $Probability(2 > 1 + \Delta)$ to a measure of the odds, which provides a more intuitive perception of certainty. A probability of 50% in Eq. (A-2) corresponds to odds of 1:1 that the true defect fraction indicated by Sample 2 is greater than the true defect fraction indicated by Sample 1 by more than the specified margin of Δ. In this case, there are equal odds for the complement condition that Sample 2 is not greater than the true defect fraction indicated by Sample 1 by more than Δ. Therefore, there is no certainty that one condition is more likely than the other. In contrast, a probability of 100% in Eq. (A-2) corresponds to infinite certainty that the true defect fraction indicated by Sample 2 is greater than the true defect fraction indicated by Sample 1 by more than the specified margin of Δ.

$$\text{odds}(2 > 1 + \Delta) = \frac{Probability(2>1+\Delta)}{1-Probability(2>1+\Delta)} \qquad \text{(A-3)}$$

APPENDIX B. REPORT FORMS FOR OVERCOATED PARTICLE LBL

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction

Particle clutch ID:	11034-01	11034-02	11034-03	11034-04	Total
Number of particles:	17627	18614	17972	17826	72039
Equivalent number of leached kernels:	9.0E-02	9.6E-02	9.2E-02	9.7E-02	3.7E-01

Comments

Data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction

Particle sample ID:	11035-01	11035-02	11035-03	11035-04	Total
Number of particles:	17409	17368	17369	17378	69524
Equivalent number of leached kernels:	8.8E-02	8.6E-02	8.6E-02	8.5E-02	3.5E-01

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction

Particle sample ID:	11035-05	11035-06	11035-07	11035-08	Total
Number of particles:	17389	17364	17395	17371	69519
Equivalent number of leached kernels:	8.9E-02	8.4E-02	9.2E-02	9.0E-02	3.6E-01

Comments

Fred C, Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction

Particle clutch ID:	11034-01	11034-02	11034-03	11034-04	Total
Number of particles:	17627	18614	17972	17826	72039
Equivalent number of leached kernels:	3.7E-03	2.9E-03	3.6E-03	1.2E+00	1.2E+00

Comments

Data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction

Particle sample ID:	11035-01	11035-02	11035-03	11035-04	Total
Number of particles:	17409	17368	17369	17378	69524
Equivalent number of leached kernels:	2.1E-03	2.6E-03	2.3E-03	2.4E-03	9.4E-03

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction

Particle sample ID:	11035-05	11035-06	11035-07	11035-08	Total
Number of particles:	17389	17364	17395	17371	69519
Equivalent number of leached kernels:	1.8E-03	3.7E-03	1.0E+00	8.2E-03	1.0E+00

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction
Particle clutch ID:	11034-01
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\11034-Group 1_DRF21R2.xls

Average weight per particle, mean value (g):	2.046E-03
Average weight per particle, uncertainty in mean (g):	1.27E-05
Weight of particle clutch (g):	36.0677
Approximate number of particles in clutch:	17627
Uncertainty in number of particles:	109
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L17091901	L17092101		W17092106	
Total volume of leach solution (ml):		94.0	103.5		40.0	
Radiochemical laboratory analysis number:		17665-001	17665-006		17665-011	
Measured uranium concentration (µg/ml):		3.32E-01	3.99E-02		6.26E-03	
Uncertainty in uranium concentration (µg/ml):		3.32E-02	3.99E-03		6.26E-04	
Weight uranium leached (g):		3.12E-05	4.13E-06	3.53E-05	2.50E-07	N
Uncertainty in weight uranium leached (g):		3.13E-06	4.14E-07	3.16E-06	2.54E-08	
Equivalent number of leached kernels:		7.92E-02	1.05E-02	8.97E-02	6.36E-04	
Uncertainty in equivalent number of leached kernels:		7.98E-03	1.06E-03	8.06E-03	6.47E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the Official Results of Analyses for RMAL17665 on 2/5/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction
Particle clutch ID:	11034-02
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\11034-Group 1_DRF21R2.xls

Average weight per particle, mean value (g):	2.05E-03
Average weight per particle, uncertainty in mean (g):	1.27E-05
Weight of particle clutch (g):	38.0877
Approximate number of particles in clutch:	18614
Uncertainty in number of particles:	115
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L17091902	L17092102		W17092107	
Total volume of leach solution (ml):		83.0	105.0		40.0	
Radiochemical laboratory analysis number:		17665-002	17665-007		17665-012	
Measured uranium concentration (µg/ml):		3.81E-01	6.05E-02		9.13E-03	
Uncertainty in uranium concentration (µg/ml):		3.81E-02	6.05E-03		9.13E-04	
Weight uranium leached (g):		3.16E-05	6.35E-06	3.80E-05	3.65E-07	N
Uncertainty in weight uranium leached (g):		3.17E-06	6.36E-07	3.24E-06	3.70E-08	
Equivalent number of leached kernels:		8.03E-02	1.61E-02	9.64E-02	9.27E-04	
Uncertainty in equivalent number of leached kernels:		8.09E-03	1.62E-03	8.27E-03	9.44E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the Official Results of Analyses for RMAL17665 on 2/5/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction
Particle clutch ID:	11034-03
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\11034-Group 1_DRF21R2.xls

Average weight per particle, mean value (g):	2.05E-03
Average weight per particle, uncertainty in mean (g):	1.27E-05
Weight of particle clutch (g):	36.7740
Approximate number of particles in clutch:	17972
Uncertainty in number of particles:	111
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L17091903	L17092103		W17092108	
Total volume of leach solution (ml):		92.0	87.5		40.0	
Radiochemical laboratory analysis number:		17665-003	17665-008		17665-013	
Measured uranium concentration (µg/ml):		3.45E-01	4.96E-02		7.14E-03	
Uncertainty in uranium concentration (µg/ml):		3.45E-02	4.96E-03		7.14E-04	
Weight uranium leached (g):		3.17E-05	4.34E-06	3.61E-05	2.86E-07	N
Uncertainty in weight uranium leached (g):		3.18E-06	4.35E-07	3.21E-06	2.89E-08	
Equivalent number of leached kernels:		8.06E-02	1.10E-02	9.16E-02	7.25E-04	
Uncertainty in equivalent number of leached kernels:		8.12E-03	1.11E-03	8.20E-03	7.38E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the Official Results of Analyses for RMAL17665 on 2/5/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction
Particle clutch ID:	11034-04
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\11034-Group 1_DRF21R2.xls

Average weight per particle, mean value (g):	2.05E-03
Average weight per particle, uncertainty in mean (g):	1.27E-05
Weight of particle clutch (g):	36.4763
Approximate number of particles in clutch:	17826
Uncertainty in number of particles:	110
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L17091904	L17092104		W17092109	
Total volume of leach solution (ml):		91.0	100.0		40.0	
Radiochemical laboratory analysis number:		17665-004	17665-009		17665-014	
Measured uranium concentration (µg/ml):		3.41E-01	7.29E-02		9.63E-03	
Uncertainty in uranium concentration (µg/ml):		3.41E-02	7.29E-03		9.64E-04	
Weight uranium leached (g):		3.10E-05	7.29E-06	3.83E-05	3.85E-07	N
Uncertainty in weight uranium leached (g):		3.11E-06	7.31E-07	3.20E-06	3.91E-08	
Equivalent number of leached kernels:		7.88E-02	1.85E-02	9.73E-02	9.78E-04	
Uncertainty in equivalent number of leached kernels:		7.94E-03	1.86E-03	8.17E-03	9.96E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the Official Results of Analyses for RMAL17665 on 2/5/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction
Particle clutch ID:	Pre-burn leach blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\11034-Group 1_DRF21R2.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L17091905	L17092105		W17092110	
	Total volume of leach solution (ml):	97.3	97.0		40.0	
	Radiochemical laboratory analysis number:	17665-005	17665-010		17665-015	
	Measured uranium concentration (µg/ml):	2.02E-04	2.68E-04		1.03E-04	
	Uncertainty in uranium concentration (µg/ml):	2.02E-05	2.68E-05		1.03E-05	
	Weight uranium leached (g):	1.97E-08	2.60E-08	4.57E-08	4.12E-09	N
	Uncertainty in weight uranium leached (g):	1.97E-09	2.61E-09	3.27E-09	4.17E-10	
	Equivalent number of leached kernels:	4.99E-05	6.60E-05	1.16E-04	1.05E-05	
	Uncertainty in equivalent number of leached kernels:	5.02E-06	6.65E-06	8.37E-06	1.06E-06	
Fe	Measured concentration (µg/ml):			Fe		
	Total weight of leached impurity (µg):					
Cr	Measured concentration (µg/ml):			Cr		
	Total weight of leached impurity (µg):					
Mn	Measured concentration (µg/ml):			Mn		
	Total weight of leached impurity (µg):					
Co	Measured concentration (µg/ml):			Co		
	Total weight of leached impurity (µg):					
Ni	Measured concentration (µg/ml):			Ni		
	Total weight of leached impurity (µg):					
Ca	Measured concentration (µg/ml):			Ca		
	Total weight of leached impurity (µg):					
Al	Measured concentration (µg/ml):			Al		
	Total weight of leached impurity (µg):					
Ti	Measured concentration (µg/ml):			Ti		
	Total weight of leached impurity (µg):					
V	Measured concentration (µg/ml):			V		
	Total weight of leached impurity (µg):					

Comments

FCM checked the data against the Official Results of Analyses for RMAL17665 on 2/5/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction
Particle clutch ID:	11034-01
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\11034-Group 1_DRF21R2.xls

Average weight per particle, mean value (g):	2.046E-03
Average weight per particle, uncertainty in mean (g):	1.27E-05
Weight of particle clutch (g):	36.0677
Approximate number of particles in clutch:	17627
Uncertainty in number of particles:	109
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B17101701	B17101706			
Total volume of leach solution (ml):		103.0	92.0			
Radiochemical laboratory analysis number:		17763-021	17763-026			
Measured uranium concentration (µg/ml):		9.11E-03	5.76E-03			
Uncertainty in uranium concentration (µg/ml):		9.11E-04	5.76E-04			
Weight uranium leached (g):		9.38E-07	5.30E-07	1.47E-06		
Uncertainty in weight uranium leached (g):		9.40E-08	5.31E-08	1.08E-07		
Equivalent number of leached kernels:		2.38E-03	1.34E-03	3.73E-03		
Uncertainty in equivalent number of leached kernels:		2.40E-04	1.36E-04	2.77E-04		
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the Official Results of Analyses for RMAL17763 on 2/5/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction
Particle clutch ID:	11034-02
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\11034-Group 1_DRF21R2.xls

Average weight per particle, mean value (g):	2.046E-03
Average weight per particle, uncertainty in mean (g):	1.27E-05
Weight of particle clutch (g):	36.0677
Approximate number of particles in clutch:	17627
Uncertainty in number of particles:	109
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B17101702	B17101707			
Total volume of leach solution (ml):		104.0	91.0			
Radiochemical laboratory analysis number:		17763-022	17763-027			
Measured uranium concentration (µg/ml):		9.79E-03	1.54E-03			
Uncertainty in uranium concentration (µg/ml):		9.79E-04	1.54E-04			
Weight uranium leached (g):		1.02E-06	1.40E-07	1.16E-06		
Uncertainty in weight uranium leached (g):		1.02E-07	1.40E-08	1.03E-07		
Equivalent number of leached kernels:		2.58E-03	3.56E-04	2.94E-03		
Uncertainty in equivalent number of leached kernels:		2.60E-04	3.58E-05	2.63E-04		
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the Official Results of Analyses for RMAL17763 on 2/5/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction
Particle clutch ID:	11034-03
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\11034-Group 1_DRF21R2.xls

Average weight per particle, mean value (g):	2.046E-03
Average weight per particle, uncertainty in mean (g):	1.27E-05
Weight of particle clutch (g):	36.0677
Approximate number of particles in clutch:	17627
Uncertainty in number of particles:	109
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B17101703	B17101708			
Total volume of leach solution (ml):		104.0	106.0			
Radiochemical laboratory analysis number:		17763-023	17763-028			
Measured uranium concentration (µg/ml):		1.14E-02	2.05E-03			
Uncertainty in uranium concentration (µg/ml):		1.14E-03	2.05E-04			
Weight uranium leached (g):		1.19E-06	2.17E-07	1.40E-06		
Uncertainty in weight uranium leached (g):		1.19E-07	2.18E-08	1.21E-07		
Equivalent number of leached kernels:		3.01E-03	5.52E-04	3.56E-03		
Uncertainty in equivalent number of leached kernels:		3.03E-04	5.55E-05	3.09E-04		
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the Official Results of Analyses for RMAL17763 on 2/5/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction
Particle clutch ID:	11034-04
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\11034-Group 1_DRF21R2.xls

Average weight per particle, mean value (g):	2.046E-03
Average weight per particle, uncertainty in mean (g):	1.27E-05
Weight of particle clutch (g):	36.0677
Approximate number of particles in clutch:	17627
Uncertainty in number of particles:	109
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B17101704	B17101709			
Total volume of leach solution (ml):		104.0	99.0			
Radiochemical laboratory analysis number:		17763-024	17763-029			
Measured uranium concentration (µg/ml):		4.66E+00	1.38E-02			
Uncertainty in uranium concentration (µg/ml):		4.66E-01	1.38E-03			
Weight uranium leached (g):		4.85E-04	1.37E-06	4.86E-04		
Uncertainty in weight uranium leached (g):		4.86E-05	1.37E-07	4.86E-05		
Equivalent number of leached kernels:		1.23E+00	3.47E-03	1.23E+00		
Uncertainty in equivalent number of leached kernels:		1.24E-01	3.49E-04	1.24E-01		
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the Official Results of Analyses for RMAL17763 on 2/5/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery/Dyer/Helmreich
Particle lot ID:	BWXT J52R-16-11034
Particle lot description:	AGR-5/6/7 over-coated particles, 40% packing fraction
Particle clutch ID:	Post-burn leach blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\11034-Group 1_DRF21R2.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

	First Leach	Second Leach	Total
Post-burn leach solution ID:	B17101705	B17101710	
Total volume of leach solution (ml):	70.0	98.0	
Radiochemical laboratory analysis number:	17763-025	17763-030	
Measured uranium concentration (µg/ml):	2.22E-04	2.54E-04	
Uncertainty in uranium concentration (µg/ml):	2.22E-05	2.54E-05	
Weight uranium leached (g):	1.55E-08	2.49E-08	4.04E-08
Uncertainty in weight uranium leached (g):	1.56E-09	2.49E-09	2.94E-09
Equivalent number of leached kernels:	3.94E-05	6.32E-05	1.03E-04
Uncertainty in equivalent number of leached kernels:	3.98E-06	6.36E-06	7.54E-06
Fe — Measured concentration (µg/ml):			Fe
Fe — Total weight of leached impurity (µg):			
Cr — Measured concentration (µg/ml):			Cr
Cr — Total weight of leached impurity (µg):			
Mn — Measured concentration (µg/ml):			Mn
Mn — Total weight of leached impurity (µg):			
Co — Measured concentration (µg/ml):			Co
Co — Total weight of leached impurity (µg):			
Ni — Measured concentration (µg/ml):			Ni
Ni — Total weight of leached impurity (µg):			
Ca — Measured concentration (µg/ml):			Ca
Ca — Total weight of leached impurity (µg):			
Al — Measured concentration (µg/ml):			Al
Al — Total weight of leached impurity (µg):			
Ti — Measured concentration (µg/ml):			Ti
Ti — Total weight of leached impurity (µg):			
V — Measured concentration (µg/ml):			V
V — Total weight of leached impurity (µg):			

Water rinse	Include if > 10% of 2nd leach

Comments

FCM checked the data against the Official Results of Analyses for RMAL17763 on 2/5/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-01
DRF filename:	11035_PF40 overcoated particles-Group 1_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9930
Approximate number of particles in sample:	17409
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L18121301	L18121701		W18121705	
Total volume of leach solution (ml):		112.0	133.0		42.5	
RMAL analysis number:		18947-001	18947-005		18947-009	
Measured uranium concentration (µg/ml):		2.93E-01	1.38E-02		2.63E-03	
Uncertainty in uranium concentration (µg/ml):		2.93E-02	1.38E-03		2.63E-04	
Weight uranium leached (g):		3.28E-05	1.84E-06	3.47E-05	1.12E-07	N
Uncertainty in weight uranium leached (g):		3.29E-06	1.84E-07	3.29E-06	1.13E-08	
Equivalent number of leached kernels:		8.33E-02	4.66E-03	8.79E-02	2.84E-04	
Uncertainty in equivalent number of leached kernels:		8.38E-03	4.69E-04	8.40E-03	2.88E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#2 (previously used for 14155D-Group 1 Clutch 1).
FCM checked the recorded data against the official Results of Analysis for RMAL18947 on 3/26/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-02
DRF filename:	11035_PF40 overcoated particles-Group 1_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9102
Approximate number of particles in sample:	17368
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L18121302	L18121702		W18121706	
	Total volume of leach solution (ml):	117.0	130.0		45.0	
	RMAL analysis number:	18947-002	18947-006		18947-010	
	Measured uranium concentration (µg/ml):	2.77E-01	1.10E-02		1.26E-03	
	Uncertainty in uranium concentration (µg/ml):	2.77E-02	1.10E-03		1.26E-04	
	Weight uranium leached (g):	3.24E-05	1.43E-06	3.38E-05	5.67E-08	N
	Uncertainty in weight uranium leached (g):	3.25E-06	1.43E-07	3.25E-06	5.73E-09	
	Equivalent number of leached kernels:	8.23E-02	3.63E-03	8.59E-02	1.44E-04	
	Uncertainty in equivalent number of leached kernels:	8.28E-03	3.65E-04	8.29E-03	1.46E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#3 (previously used for 14155D-Group 1 Clutch 2).
FCM checked the recorded data against the official Results of Analysis for RMAL18947 on 3/26/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-03
DRF filename:	11035_PF40 overcoated particles-Group 1_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9109
Approximate number of particles in sample:	17369
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L18121303	L18121703		W18121707	
Total volume of leach solution (ml):		113.0	137.0		42.5	
RMAL analysis number:		18947-003	18947-007		18947-011	
Measured uranium concentration (µg/ml):		2.86E-01	1.18E-02		1.21E-03	
Uncertainty in uranium concentration (µg/ml):		2.86E-02	1.18E-03		1.21E-04	
Weight uranium leached (g):		3.23E-05	1.62E-06	3.39E-05	5.14E-08	N
Uncertainty in weight uranium leached (g):		3.24E-06	1.62E-07	3.24E-06	5.20E-09	
Equivalent number of leached kernels:		8.20E-02	4.10E-03	8.61E-02	1.31E-04	
Uncertainty in equivalent number of leached kernels:		8.26E-03	4.13E-04	8.27E-03	1.33E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#11 (previously used for 14155D-Group 1 Clutch 3).
FCM checked the recorded data against the official Results of Analysis for RMAL18947 on 3/26/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-04
DRF filename:	11035_PF40 overcoated particles-Group 1_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9301
Approximate number of particles in sample:	17378
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L18121304	L18121704		W18121708	
Total volume of leach solution (ml):		103.0	142.0		42.5	
RMAL analysis number:		18947-004	18947-008		18947-012	
Measured uranium concentration (µg/ml):		3.04E-01	1.62E-02		1.69E-03	
Uncertainty in uranium concentration (µg/ml):		3.04E-02	1.62E-03		1.69E-04	
Weight uranium leached (g):		3.13E-05	2.30E-06	3.36E-05	7.18E-08	N
Uncertainty in weight uranium leached (g):		3.14E-06	2.30E-07	3.15E-06	7.27E-09	
Equivalent number of leached kernels:		7.95E-02	5.84E-03	8.53E-02	1.82E-04	
Uncertainty in equivalent number of leached kernels:		8.00E-03	5.87E-04	8.03E-03	1.85E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel FB#2 (previously used for 14155D-Group 1 Clutch 4).
FCM checked the recorded data against the official Results of Analysis for RMAL18947 on 3/26/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-01
DRF filename:	11035_PF40 overcoated particles-Group 1_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9930
Approximate number of particles in sample:	17409
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18123101	B19010201		W19010205	
Total volume of leach solution (ml):		61.5	65.0		20.0	
RMAL analysis number:		19027-001	19027-005		19027-009	
Measured uranium concentration (µg/ml):		1.00E-02	3.36E-03		2.72E-04	
Uncertainty in uranium concentration (µg/ml):		1.00E-03	3.36E-04		2.72E-05	
Weight uranium leached (g):		6.15E-07	2.18E-07	8.33E-07	5.44E-09	N
Uncertainty in weight uranium leached (g):		6.18E-08	2.19E-08	6.56E-08	5.72E-10	
Equivalent number of leached kernels:		1.56E-03	5.54E-04	2.12E-03	1.38E-05	
Uncertainty in equivalent number of leached kernels:		1.58E-04	5.60E-05	1.68E-04	1.46E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19027 on 3/26/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-02
DRF filename:	11035_PF40 overcoated particles-Group 1_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9930
Approximate number of particles in sample:	17409
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18123102	B19010202		W19010206	
Total volume of leach solution (ml):		58.8	64.8		20.0	
RMAL analysis number:		19027-002	19027-006		19027-010	
Measured uranium concentration (µg/ml):		1.11E-02	5.89E-03		3.12E-04	
Uncertainty in uranium concentration (µg/ml):		1.11E-03	5.89E-04		3.12E-05	
Weight uranium leached (g):		6.53E-07	3.82E-07	1.03E-06	6.24E-09	N
Uncertainty in weight uranium leached (g):		6.57E-08	3.84E-08	7.60E-08	6.56E-10	
Equivalent number of leached kernels:		1.66E-03	9.69E-04	2.63E-03	1.58E-05	
Uncertainty in equivalent number of leached kernels:		1.67E-04	9.78E-05	1.95E-04	1.67E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19027 on 3/26/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-03
DRF filename:	11035_PF40 overcoated particles-Group 1_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9930
Approximate number of particles in sample:	17409
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18123103	B19010203		W19010207	
Total volume of leach solution (ml):		61.0	63.2		20.0	
RMAL analysis number:		19027-003	19027-007		19027-011	
Measured uranium concentration (µg/ml):		1.18E-02	2.92E-03		3.99E-04	
Uncertainty in uranium concentration (µg/ml):		1.18E-03	2.92E-04		3.99E-05	
Weight uranium leached (g):		7.20E-07	1.85E-07	9.04E-07	7.98E-09	N
Uncertainty in weight uranium leached (g):		7.24E-08	1.86E-08	7.47E-08	8.39E-10	
Equivalent number of leached kernels:		1.83E-03	4.68E-04	2.30E-03	2.03E-05	
Uncertainty in equivalent number of leached kernels:		1.85E-04	4.73E-05	1.91E-04	2.14E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19027 on 3/26/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-04
DRF filename:	11035_PF40 overcoated particles-Group 1_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9930
Approximate number of particles in sample:	17409
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18123104	B19010204		W19010208	
Total volume of leach solution (ml):		60.8	64.8		20.0	
RMAL analysis number:		19027-004	19027-008		19027-012	
Measured uranium concentration (µg/ml):		1.36E-02	1.58E-03		7.04E-04	
Uncertainty in uranium concentration (µg/ml):		1.36E-03	1.58E-04		7.04E-05	
Weight uranium leached (g):		8.27E-07	1.02E-07	9.29E-07	1.41E-08	N
Uncertainty in weight uranium leached (g):		8.32E-08	1.03E-08	8.38E-08	1.48E-09	
Equivalent number of leached kernels:		2.10E-03	2.60E-04	2.36E-03	3.57E-05	
Uncertainty in equivalent number of leached kernels:		2.12E-04	2.62E-05	2.14E-04	3.77E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19027 on 3/26/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-05
DRF filename:	11035_PF40 overcoated particles-Group 2_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9526
Approximate number of particles in sample:	17389
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L19032101	L19032501		W19032503	
Total volume of leach solution (ml):		100.0	134.0		40.0	
RMAL analysis number:		19232-001	19232-003		19232-005	
Measured uranium concentration (µg/ml):		3.23E-01	2.17E-02		2.65E-03	
Uncertainty in uranium concentration (µg/ml):		3.23E-02	2.17E-03		2.65E-04	
Weight uranium leached (g):		3.23E-05	2.91E-06	3.52E-05	1.06E-07	N
Uncertainty in weight uranium leached (g):		3.24E-06	2.91E-07	3.25E-06	1.07E-08	
Equivalent number of leached kernels:		8.20E-02	7.38E-03	8.94E-02	2.69E-04	
Uncertainty in equivalent number of leached kernels:		8.26E-03	7.43E-04	8.30E-03	2.74E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #51 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL19232 on 4/12/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-06
DRF filename:	11035_PF40 overcoated particles-Group 2_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9015
Approximate number of particles in sample:	17364
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L19032102	L19032502		W19032504	
Total volume of leach solution (ml):		102.0	136.0		40.0	
RMAL analysis number:		19232-002	19232-004		19232-006	
Measured uranium concentration (µg/ml):		3.01E-01	1.74E-02		2.27E-03	
Uncertainty in uranium concentration (µg/ml):		3.01E-02	1.74E-03		2.27E-04	
Weight uranium leached (g):		3.07E-05	2.37E-06	3.31E-05	9.08E-08	N
Uncertainty in weight uranium leached (g):		3.08E-06	2.37E-07	3.09E-06	9.20E-09	
Equivalent number of leached kernels:		7.79E-02	6.01E-03	8.39E-02	2.30E-04	
Uncertainty in equivalent number of leached kernels:		7.85E-03	6.04E-04	7.88E-03	2.35E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #52 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL19232 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-07
DRF filename:	11035_PF40 overcoated particles-Group 2_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9633
Approximate number of particles in sample:	17395
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L19032601	L19032801		W19032803	
Total volume of leach solution (ml):		135.0	168.0		40.0	
RMAL analysis number:		19240-001	19240-003		19240-005	
Measured uranium concentration (µg/ml):		2.56E-01	9.72E-03		1.03E-03	
Uncertainty in uranium concentration (µg/ml):		2.56E-02	9.72E-04		1.03E-04	
Weight uranium leached (g):		3.46E-05	1.63E-06	3.62E-05	4.12E-08	N
Uncertainty in weight uranium leached (g):		3.46E-06	1.63E-07	3.46E-06	4.17E-09	
Equivalent number of leached kernels:		8.77E-02	4.14E-03	9.19E-02	1.05E-04	
Uncertainty in equivalent number of leached kernels:		8.83E-03	4.17E-04	8.84E-03	1.06E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #53 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL19240 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-08
DRF filename:	11035_PF40 overcoated particles-Group 2_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9150
Approximate number of particles in sample:	17371
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L19032602	L19032802		W19032804	
Total volume of leach solution (ml):		133.0	169.0		40.0	
RMAL analysis number:		19240-002	19240-004		19240-006	
Measured uranium concentration (µg/ml):		2.54E-01	1.05E-02		1.21E-03	
Uncertainty in uranium concentration (µg/ml):		2.54E-02	1.05E-03		1.21E-04	
Weight uranium leached (g):		3.38E-05	1.77E-06	3.56E-05	4.84E-08	N
Uncertainty in weight uranium leached (g):		3.38E-06	1.78E-07	3.39E-06	4.90E-09	
Equivalent number of leached kernels:		8.57E-02	4.50E-03	9.02E-02	1.23E-04	
Uncertainty in equivalent number of leached kernels:		8.63E-03	4.53E-04	8.64E-03	1.25E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #54 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL19240 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-05
DRF filename:	11035_PF40 overcoated particles-Group 2_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9526
Approximate number of particles in sample:	17389
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B19040201	B19040401		W19040405	
Total volume of leach solution (ml):		55.0	59.5		20.0	
RMAL analysis number:		19263-001	19263-005		19263-009	
Measured uranium concentration (µg/ml):		1.23E-02	2.48E-04		<2.00E-05	
Uncertainty in uranium concentration (µg/ml):		1.23E-03	2.48E-05			
Weight uranium leached (g):		6.77E-07	1.48E-08	6.91E-07	<4.00E-10	N
Uncertainty in weight uranium leached (g):		6.81E-08	1.48E-09	6.81E-08		
Equivalent number of leached kernels:		1.72E-03	3.75E-05	1.75E-03	1.02E-06	
Uncertainty in equivalent number of leached kernels:		1.74E-04	3.79E-06	1.74E-04		
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19263 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-06
DRF filename:	11035_PF40 overcoated particles-Group 2_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9526
Approximate number of particles in sample:	17389
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B19040202	B19040402		W19040406	
Total volume of leach solution (ml):		55.8	59.3		20.0	
RMAL analysis number:		19263-002	19263-006		19263-010	
Measured uranium concentration (µg/ml):		2.54E-02	6.35E-04		<2.00E-05	
Uncertainty in uranium concentration (µg/ml):		2.54E-03	6.35E-05			
Weight uranium leached (g):		1.42E-06	3.77E-08	1.45E-06	<4.00E-10	N
Uncertainty in weight uranium leached (g):		1.43E-07	3.79E-09	1.43E-07		
Equivalent number of leached kernels:		3.60E-03	9.56E-05	3.69E-03	1.02E-06	
Uncertainty in equivalent number of leached kernels:		3.64E-04	9.66E-06	3.64E-04		
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19263 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-07
DRF filename:	11035_PF40 overcoated particles-Group 2_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9526
Approximate number of particles in sample:	17389
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B19040301	B19040403		W19040407	
Total volume of leach solution (ml):		54.8	58.9		20.0	
RMAL analysis number:		19263-003	19263-007		19263-011	
Measured uranium concentration (µg/ml):		7.25E+00	2.92E-02		3.38E-04	
Uncertainty in uranium concentration (µg/ml):		7.25E-01	2.92E-03		3.38E-05	
Weight uranium leached (g):		3.97E-04	1.72E-06	3.99E-04	6.76E-09	N
Uncertainty in weight uranium leached (g):		4.00E-05	1.73E-07	4.00E-05	7.11E-10	
Equivalent number of leached kernels:		1.01E+00	4.37E-03	1.01E+00	1.72E-05	
Uncertainty in equivalent number of leached kernels:		1.02E-01	4.41E-04	1.02E-01	1.81E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19263 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-21B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-21 Rev. 2
Operator:	Montgomery
Particle lot ID:	BWXT J52R-16-11035
Particle lot description:	AGR-5/6/7 overcoated particles, 40% packing fraction
Particle sample ID:	11035-08
DRF filename:	11035_PF40 overcoated particles-Group 2_DLBL_ICPMS_DRF21R2.xls

Average weight per particle, mean value (g):	2.010E-03
Average weight per particle, uncertainty in mean (g):	6.4E-06
Weight of particle sample (g):	34.9526
Approximate number of particles in sample:	17389
Uncertainty in number of particles:	55
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B19040302	B19040404		W19040408	
Total volume of leach solution (ml):		56.5	58.5		20.0	
RMAL analysis number:		19263-004	19263-008		19263-012	
Measured uranium concentration (µg/ml):		5.62E-02	1.18E-03		1.93E-04	
Uncertainty in uranium concentration (µg/ml):		5.62E-03	1.18E-04		1.93E-05	
Weight uranium leached (g):		3.18E-06	6.90E-08	3.24E-06	3.86E-09	N
Uncertainty in weight uranium leached (g):		3.20E-07	6.95E-09	3.20E-07	4.06E-10	
Equivalent number of leached kernels:		8.06E-03	1.75E-04	8.23E-03	9.80E-06	
Uncertainty in equivalent number of leached kernels:		8.15E-04	1.77E-05	8.16E-04	1.03E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19263 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-22: Estimation of Average Particle Weight

Procedure:	AGR-CHAR-DAM-22 Rev. 1
Operator:	John Dyer
Particle sample ID:	11034-05-B01
Particle sample description:	BWXT overcoated LEU for LBL
Filename:	\\mc-agr\AGR\ParticleWeight\W17091501_DRF22R1.xls

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Weight of particles (g):	0.3338	0.3362	0.3026	0.3262	0.3356
Number of particles:	163	162	146	162	166
Average weight/particle (g):	2.048E-03	2.075E-03	2.073E-03	2.014E-03	2.022E-03

Mean average weight/particle (g):	2.046E-03
Standard error in mean average weight/particle (g):	1.27E-05

John Dyer
Operator

11-23-19
Date

Data Report Form DRF-22: Estimation of Average Particle Weight

Procedure:	AGR-CHAR-DAM-22 Rev. 2
Operator:	John Hunn/Brian Eckhart
Particle sample ID:	J52R-16-11035-B00
Particle sample description:	BWXT Overcoated particles
Filename:	\\mc-agr\AGR\ParticleWeight\W18120603_DRF22R2.xls

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Weight of particles (g):	0.4350	0.4957	0.3686	0.3644	0.4293
Number of particles:	217	246	183	182	213
Average weight/particle (g):	2.005E-03	2.015E-03	2.014E-03	2.002E-03	2.015E-03

Mean average weight/particle (g):	2.010E-03
Standard deviation in average weight/particle (g):	6.379E-06
Standard error in mean average weight/particle (g):	2.85E-06

Comments

Sample 3 had a large particle.

John Hunn — Operator

12-6-18 — Date

APPENDIX C. REPORT FORMS FOR 25% PF COMPACT LBL

Inspection Report Form IRF-B: Summary of Impurites Outside SiC — Maximum Corrected Values

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction

Compact ID numbers:	1225, 1287, 1303, 1802, 1829	1227, 1241, 1264, 1819, 1831	1223, 1309, 1319, 1800, 1805	1221, 1240, 1243, 1266, 1316	Mean	Standard Deviation
Number of compacts:	5	5	5	5		
Iron						
Pre-burn leach (DRF-26A) (µg):	170.56	160.90	177.34	160.64		
Post-burn leach (DRF-26B) (µg):	230.44	254.08	193.39	205.11		
Total leached (µg):	401.00	414.98	370.72	365.75		
Fe outside SiC (µg/compact):	**80.20**	**83.00**	**74.14**	**73.15**	**77.62**	**4.75**
Chromium						
Pre-burn leach (DRF-26A) (µg):	1.88	1.69	1.95	1.50		
Post-burn leach (DRF-26B) (µg):	0.36	0.15	0.17	0.14		
Total leached (µg):	2.25	1.84	2.13	1.64		
Cr outside SiC (µg/compact):	**0.45**	**0.37**	**0.43**	**0.33**	**0.39**	**0.06**
Manganese						
Pre-burn leach (DRF-26A) (µg):	2.86	2.58	2.66	2.48		
Post-burn leach (DRF-26B) (µg):	0.14	0.17	0.16	0.17		
Total leached (µg):	3.00	2.75	2.81	2.65		
Mn outside SiC (µg/compact):	**0.60**	**0.55**	**0.56**	**0.53**	**0.561**	**0.029**
Cobalt						
Pre-burn leach (DRF-26A) (µg):	0.06	0.05	0.06	0.08		
Post-burn leach (DRF-26B) (µg):	0.18	0.17	0.12	0.13		
Total leached (µg):	0.24	0.22	0.18	0.21		
Co outside SiC (µg/compact):	**0.048**	**0.044**	**0.036**	**0.042**	**0.043**	**0.005**
Nickel						
Pre-burn leach (DRF-26A) (µg):	2.89	2.41	2.69	3.44		
Post-burn leach (DRF-26B) (µg):	2.36	2.56	4.27	4.21		
Total leached (µg):	5.25	4.98	6.96	7.65		
Ni outside SiC (µg/compact):	**1.05**	**1.00**	**1.39**	**1.53**	**1.24**	**0.26**
Transition Metals						
Cr+Mn+Co+Ni outside SiC (µg/compact):	**2.15**	**1.96**	**2.42**	**2.43**	**2.24**	**0.23**
Calcium						
Pre-burn leach (DRF-26A) (µg):	622.90	574.91	628.06	641.30		
Post-burn leach (DRF-26B) (µg):	47.26	67.76	49.95	72.16		
Total leached (µg):	670.16	642.67	678.01	713.46		
Ca outside SiC (µg/compact):	**134.03**	**128.53**	**135.60**	**142.69**	**135.21**	**5.83**
Aluminum						
Pre-burn leach (DRF-26A) (µg):	794.67	744.73	783.94	773.60		
Post-burn leach (DRF-26B) (µg):	29.36	85.65	33.55	90.58		
Total leached (µg):	824.03	830.37	817.49	864.17		
Al outside SiC (µg/compact):	**164.81**	**166.07**	**163.50**	**172.83**	**166.80**	**4.16**
Titanium						
Pre-burn leach (DRF-26A) (µg):	33.92	34.63	57.64	24.62		
Post-burn leach (DRF-26B) (µg):	16.44	27.25	22.57	25.17		
Total leached (µg):	50.36	61.88	80.22	49.79		
Ti outside SiC (µg/compact):	**10.07**	**12.38**	**16.04**	**9.96**	**12.11**	**2.85**
Vanadium						
Pre-burn leach (DRF-26A) (µg):	20.98	19.60	21.10	19.60		
Post-burn leach (DRF-26B) (µg):	6.74	7.72	6.32	7.16		
Total leached (µg):	27.72	27.31	27.42	26.76		
V outside SiC (µg/compact):	**5.54**	**5.46**	**5.48**	**5.35**	**5.46**	**0.08**
Titanium and Vanadium						
Ti + V outside SiC (µg/compact):	**15.62**	**17.84**	**21.53**	**15.31**	**17.57**	**2.87**

Comments

Data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction

Compact ID numbers:	1225, 1287, 1303, 1802, 1829	1227, 1241, 1264, 1819, 1831	1223, 1309, 1319, 1800, 1805	1221, 1240, 1243, 1266, 1316	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	4.3E-02	3.5E-02	2.2E-01	7.6E-02	3.7E-01

Comments

2/05/2018 Pre-burn data has been verified

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction

Compact ID numbers:	1233, 1254, 1287, 1291, 1821	1236, 1305, 1321, 1807, 1808	1257, 1258, 1285, 1298, 1324	1277, 1279, 1314, 1812, 1828	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	4.6E-02	9.5E-01	3.1E-02	3.7E-02	1.1E+00

Comments

Data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction

Compact ID numbers:	1801, 1834, 1818, 1826, 1830	1809, 1817, 1823, 1803, 1833	1832, 1825, 1820, 1835, 1815	1816, 1813, 1822, 1827, 1814	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	4.1E-02	4.4E-02	5.2E-02	3.4E-02	1.7E-01

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction

Compact ID numbers:	1225, 1287, 1303, 1802, 1829	1227, 1241, 1264, 1819, 1831	1223, 1309, 1319, 1800, 1805	1221, 1240, 1243, 1266, 1316	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	1.3E-02	1.4E-02	1.3E-01	1.3E-02	1.7E-01

Comments

2/07/2018 Post-burn data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction

Compact ID numbers:	1233, 1254, 1287, 1291, 1821	1236, 1305, 1321, 1807, 1808	1257, 1258, 1285, 1298, 1324	1277, 1279, 1314, 1812, 1828	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	1.2E+00	2.2E+00	1.5E-02	1.6E-02	3.4E+00

Comments

Data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction

Compact ID numbers:	1801, 1834, 1818, 1826, 1830	1809, 1817, 1823, 1803, 1833	1832, 1825, 1820, 1835, 1815	1816, 1813, 1822, 1827, 1814	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	1.3E-02	2.5E-01	1.2E-02	1.3E-02	2.8E-01

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1225, 1287, 1303, 1802, 1829
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L17121401	L17121901		W17121901	
	Total volume of leach solution (ml):	156.0	192.0		182.0	
	Radiochemical laboratory analysis number:	17908-001	17908-006		171908-011	
	Measured uranium concentration (µg/ml):	9.25E-02	1.39E-02		1.42E-03	
	Uncertainty in uranium concentration (µg/ml):	9.25E-03	1.39E-03		1.42E-04	
	Weight uranium leached (g):	1.44E-05	2.67E-06	1.71E-05	2.58E-07	N
	Uncertainty in weight uranium leached (g):	1.44E-06	2.67E-07	1.47E-06	2.59E-08	
	Equivalent number of leached kernels:	3.66E-02	6.77E-03	4.34E-02	6.56E-04	
	Uncertainty in equivalent number of leached kernels:	3.68E-03	6.81E-04	3.75E-03	6.60E-05	
Fe	Measured concentration of impurity in sample (µg/ml):	8.79E-01	1.72E-01	Fe	2.59E-02	
	Uncorrected weight of impurity in sample (µg):	137.12	33.02	174.86	4.71	Y
	Weight of impurity in blank (µg):	3.41	< 1.67		0.89	
	Minimum corrected weight of impurity in sample (µg):	133.71	31.35	168.88	3.82	
	Maximum corrected weight of impurity in sample (µg):	133.71	33.02	170.56	3.82	
Cr	Measured concentration of impurity in sample (µg/ml):	7.57E-03	3.66E-03	Cr	< 2.91E-03	
	Uncorrected weight of impurity in sample (µg):	1.18	0.70	1.88	< 0.53	N
	Weight of impurity in blank (µg):	< 0.57	< 0.57		< 0.15	
	Minimum corrected weight of impurity in sample (µg):	0.61	0.13	0.74	0.00	
	Maximum corrected weight of impurity in sample (µg):	1.18	0.70	1.88	0.53	
Mn	Measured concentration of impurity in sample (µg/ml):	1.42E-02	3.08E-03	Mn	5.83E-04	
	Uncorrected weight of impurity in sample (µg):	2.22	0.59	2.91	0.11	Y
	Weight of impurity in blank (µg):	< 0.10	< 0.10		0.05	
	Minimum corrected weight of impurity in sample (µg):	2.12	0.49	2.67	0.06	
	Maximum corrected weight of impurity in sample (µg):	2.22	0.59	2.86	0.06	
Co	Measured concentration of impurity in sample (µg/ml):	4.16E-04	7.16E-05	Co	< 3.52E-05	
	Uncorrected weight of impurity in sample (µg):	0.06	0.01	0.08	< 0.01	N
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.05	0.01	0.05	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.05	0.01	0.06	0.01	
Ni	Measured concentration of impurity in sample (µg/ml):	9.42E-03	< 7.40E-03	Ni	< 7.40E-03	
	Uncorrected weight of impurity in sample (µg):	1.47	< 1.42	< 2.89	< 1.35	N
	Weight of impurity in blank (µg):	< 1.45	< 1.45		< 0.38	
	Minimum corrected weight of impurity in sample (µg):	0.02	0.00	0.02	0.00	
	Maximum corrected weight of impurity in sample (µg):	1.47	1.42	2.89	1.35	
Ca	Measured concentration of impurity in sample (µg/ml):	3.22E+00	6.28E-01	Ca	< 3.33E-01	
	Uncorrected weight of impurity in sample (µg):	502.32	120.58	622.90	<60.61	N
	Weight of impurity in blank (µg):	<65.27	<65.27		<17.32	
	Minimum corrected weight of impurity in sample (µg):	437.05	55.31	492.36	0.00	
	Maximum corrected weight of impurity in sample (µg):	502.32	120.58	622.90	60.61	
Al	Measured concentration of impurity in sample (µg/ml):	4.13E+00	7.67E-01	Al	1.09E-01	
	Uncorrected weight of impurity in sample (µg):	644.28	147.26	811.38	19.84	Y
	Weight of impurity in blank (µg):	7.70	3.94		5.07	
	Minimum corrected weight of impurity in sample (µg):	636.58	143.32	794.67	14.77	
	Maximum corrected weight of impurity in sample (µg):	636.58	143.32	794.67	14.77	
Ti	Measured concentration of impurity in sample (µg/ml):	9.25E-02	6.34E-02	Ti	4.02E-02	
	Uncorrected weight of impurity in sample (µg):	14.43	12.17	33.92	7.32	Y
	Weight of impurity in blank (µg):	< 1.04	< 1.04		< 0.28	
	Minimum corrected weight of impurity in sample (µg):	13.39	11.14	31.57	7.04	
	Maximum corrected weight of impurity in sample (µg):	14.43	12.17	33.92	7.32	
V	Measured concentration of impurity in sample (µg/ml):	1.01E-01	2.28E-02	V	4.66E-03	
	Uncorrected weight of impurity in sample (µg):	15.76	4.38	20.98	0.85	Y
	Weight of impurity in blank (µg):	< 0.03	< 0.03		< 0.01	
	Minimum corrected weight of impurity in sample (µg):	15.73	4.35	20.92	0.84	
	Maximum corrected weight of impurity in sample (µg):	15.76	4.38	20.98	0.85	

Comments

FCM checked the data against the Official Results of Analyses report for RMAL17908 on 2/5/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1227, 1241, 1264, 1819, 1831
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L17121402	L17121902		W17121902	
Total volume of leach solution (ml):		144.0	182.0		116.0	
Radiochemical laboratory analysis number:		17908-002	17908-007		17908-012	
Measured uranium concentration (µg/ml):		7.94E-02	1.30E-02		2.10E-03	
Uncertainty in uranium concentration (µg/ml):		7.94E-03	1.30E-03		2.10E-04	
Weight uranium leached (g):		1.14E-05	2.37E-06	1.38E-05	2.44E-07	N
Uncertainty in weight uranium leached (g):		1.14E-06	2.37E-07	1.17E-06	2.44E-08	
Equivalent number of leached kernels:		2.90E-02	6.01E-03	3.50E-02	6.18E-04	
Uncertainty in equivalent number of leached kernels:		2.92E-03	6.04E-04	2.99E-03	6.22E-05	
Fe	Measured concentration of impurity in sample (µg/ml):	9.01E-01	1.74E-01	**Fe**	3.27E-02	
	Uncorrected weight of impurity in sample (µg):	129.74	31.67	165.21	3.79	Y
	Weight of impurity in blank (µg):	3.41	< 1.67		0.89	
	Minimum corrected weight of impurity in sample (µg):	126.33	29.99	159.23	2.90	
	Maximum corrected weight of impurity in sample (µg):	126.33	31.67	160.90	2.90	
Cr	Measured concentration of impurity in sample (µg/ml):	7.30E-03	3.51E-03	**Cr**	< 2.91E-03	
	Uncorrected weight of impurity in sample (µg):	1.05	0.64	1.69	< 0.34	N
	Weight of impurity in blank (µg):	< 0.57	< 0.57		< 0.15	
	Minimum corrected weight of impurity in sample (µg):	0.48	0.07	0.55	0.00	
	Maximum corrected weight of impurity in sample (µg):	1.05	0.64	1.69	0.34	
Mn	Measured concentration of impurity in sample (µg/ml):	1.47E-02	2.55E-03	**Mn**	< 4.92E-04	
	Uncorrected weight of impurity in sample (µg):	2.12	0.46	2.58	< 0.06	N
	Weight of impurity in blank (µg):	< 0.10	< 0.10		0.05	
	Minimum corrected weight of impurity in sample (µg):	2.02	0.37	2.39	0.00	
	Maximum corrected weight of impurity in sample (µg):	2.12	0.46	2.58	0.01	
Co	Measured concentration of impurity in sample (µg/ml):	3.91E-04	6.52E-05	**Co**	< 3.52E-05	
	Uncorrected weight of impurity in sample (µg):	0.06	0.01	0.07	< 0.00	N
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.04	0.00	0.04	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.04	0.01	0.05	0.00	
Ni	Measured concentration of impurity in sample (µg/ml):	< 7.40E-03	< 7.40E-03	**Ni**	< 7.40E-03	
	Uncorrected weight of impurity in sample (µg):	< 1.07	< 1.35	< 2.41	< 0.86	N
	Weight of impurity in blank (µg):	< 1.45	< 1.45		< 0.38	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00	0.00	
	Maximum corrected weight of impurity in sample (µg):	1.07	1.35	2.41	0.86	
Ca	Measured concentration of impurity in sample (µg/ml):	3.20E+00	6.27E-01	**Ca**	< 3.33E-01	
	Uncorrected weight of impurity in sample (µg):	460.80	114.11	574.91	<38.63	N
	Weight of impurity in blank (µg):	<65.27	<65.27		<17.32	
	Minimum corrected weight of impurity in sample (µg):	395.53	48.85	444.38	0.00	
	Maximum corrected weight of impurity in sample (µg):	460.80	114.11	574.91	38.63	
Al	Measured concentration of impurity in sample (µg/ml):	4.16E+00	8.05E-01	**Al**	1.37E-01	
	Uncorrected weight of impurity in sample (µg):	599.04	146.51	761.44	15.89	Y
	Weight of impurity in blank (µg):	7.70	3.94		5.07	
	Minimum corrected weight of impurity in sample (µg):	591.34	142.57	744.73	10.82	
	Maximum corrected weight of impurity in sample (µg):	591.34	142.57	744.73	10.82	
Ti	Measured concentration of impurity in sample (µg/ml):	1.01E-01	7.08E-02	**Ti**	6.21E-02	
	Uncorrected weight of impurity in sample (µg):	14.54	12.89	34.63	7.20	Y
	Weight of impurity in blank (µg):	< 1.04	< 1.04		< 0.28	
	Minimum corrected weight of impurity in sample (µg):	13.51	11.85	32.28	6.93	
	Maximum corrected weight of impurity in sample (µg):	14.54	12.89	34.63	7.20	
V	Measured concentration of impurity in sample (µg/ml):	9.90E-02	2.48E-02	**V**	7.12E-03	
	Uncorrected weight of impurity in sample (µg):	14.26	4.51	19.60	0.83	Y
	Weight of impurity in blank (µg):	< 0.03	< 0.03		< 0.01	
	Minimum corrected weight of impurity in sample (µg):	14.23	4.49	19.54	0.82	
	Maximum corrected weight of impurity in sample (µg):	14.26	4.51	19.60	0.83	

Comments

FCM checked the data against the Official Results of Analyses report for RMAL17908 on 2/5/2018.

Fred C. Montgomery — Operator

2-8-18 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1223, 1309, 1319, 1800, 1805
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L17121403	L17121903		W17121903	
	Total volume of leach solution (ml):	156.0	208.0		160.0	
	Radiochemical laboratory analysis number:	17908-003	1798-008		17908-013	
	Measured uranium concentration (µg/ml):	4.72E-01	5.43E-02		7.34E-03	
	Uncertainty in uranium concentration (µg/ml):	4.72E-02	5.43E-03		7.34E-04	
	Weight uranium leached (g):	7.36E-05	1.13E-05	8.49E-05	1.17E-06	N
	Uncertainty in weight uranium leached (g):	7.37E-06	1.13E-06	7.46E-06	1.18E-07	
	Equivalent number of leached kernels:	1.87E-01	2.87E-02	2.16E-01	2.98E-03	
	Uncertainty in equivalent number of leached kernels:	1.88E-02	2.88E-03	1.90E-02	3.00E-04	
Fe	Measured concentration of impurity in sample (µg/ml):	9.34E-01	1.50E-01	**Fe**	2.96E-02	
	Uncorrected weight of impurity in sample (µg):	145.70	31.20	181.64	4.74	Y
	Weight of impurity in blank (µg):	3.41	< 1.67		0.89	
	Minimum corrected weight of impurity in sample (µg):	142.29	29.53	175.66	3.84	
	Maximum corrected weight of impurity in sample (µg):	142.29	31.20	177.34	3.84	
Cr	Measured concentration of impurity in sample (µg/ml):	8.65E-03	< 2.91E-03	**Cr**	< 2.91E-03	
	Uncorrected weight of impurity in sample (µg):	1.35	< 0.61	< 1.95	< 0.47	N
	Weight of impurity in blank (µg):	< 0.57	< 0.57		< 0.15	
	Minimum corrected weight of impurity in sample (µg):	0.78	0.00	0.78	0.00	
	Maximum corrected weight of impurity in sample (µg):	1.35	0.61	1.95	0.47	
Mn	Measured concentration of impurity in sample (µg/ml):	1.41E-02	2.19E-03	**Mn**	< 4.92E-04	
	Uncorrected weight of impurity in sample (µg):	2.20	0.46	2.66	< 0.08	N
	Weight of impurity in blank (µg):	< 0.10	< 0.10		0.05	
	Minimum corrected weight of impurity in sample (µg):	2.10	0.36	2.46	0.00	
	Maximum corrected weight of impurity in sample (µg):	2.20	0.46	2.66	0.03	
Co	Measured concentration of impurity in sample (µg/ml):	4.44E-04	6.32E-05	**Co**	< 3.52E-05	
	Uncorrected weight of impurity in sample (µg):	0.07	0.01	0.08	< 0.01	N
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.05	0.01	0.06	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.05	0.01	0.06	0.01	
Ni	Measured concentration of impurity in sample (µg/ml):	< 7.40E-03	< 7.40E-03	**Ni**	< 7.40E-03	
	Uncorrected weight of impurity in sample (µg):	< 1.15	< 1.54	< 2.69	< 1.18	N
	Weight of impurity in blank (µg):	< 1.45	< 1.45		< 0.38	
	Minimum corrected weight of impurity in sample (µg):	0.00	0.00	0.00	0.00	
	Maximum corrected weight of impurity in sample (µg):	1.15	1.54	2.69	1.18	
Ca	Measured concentration of impurity in sample (µg/ml):	3.25E+00	5.82E-01	**Ca**	< 3.33E-01	
	Uncorrected weight of impurity in sample (µg):	507.00	121.06	628.06	<53.28	N
	Weight of impurity in blank (µg):	<65.27	<65.27		<17.32	
	Minimum corrected weight of impurity in sample (µg):	441.73	55.79	497.52	0.00	
	Maximum corrected weight of impurity in sample (µg):	507.00	121.06	628.06	53.28	
Al	Measured concentration of impurity in sample (µg/ml):	4.08E+00	6.97E-01	**Al**	1.20E-01	
	Uncorrected weight of impurity in sample (µg):	636.48	144.98	800.66	19.20	Y
	Weight of impurity in blank (µg):	7.70	3.94		5.07	
	Minimum corrected weight of impurity in sample (µg):	628.78	141.04	783.94	14.13	
	Maximum corrected weight of impurity in sample (µg):	628.78	141.04	783.94	14.13	
Ti	Measured concentration of impurity in sample (µg/ml):	1.61E-01	1.03E-01	**Ti**	6.94E-02	
	Uncorrected weight of impurity in sample (µg):	25.12	21.42	57.64	11.10	Y
	Weight of impurity in blank (µg):	< 1.04	< 1.04		< 0.28	
	Minimum corrected weight of impurity in sample (µg):	24.08	20.39	55.30	10.83	
	Maximum corrected weight of impurity in sample (µg):	25.12	21.42	57.64	11.10	
V	Measured concentration of impurity in sample (µg/ml):	1.03E-01	2.06E-02	**V**	4.65E-03	
	Uncorrected weight of impurity in sample (µg):	16.07	4.28	21.10	0.74	Y
	Weight of impurity in blank (µg):	< 0.03	< 0.03		< 0.01	
	Minimum corrected weight of impurity in sample (µg):	16.04	4.26	21.04	0.74	
	Maximum corrected weight of impurity in sample (µg):	16.07	4.28	21.10	0.74	

Comments

FCM checked the data against the Official Results of Analyses report for RMAL17908 on 2/5/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1221, 1240, 1243, 1266, 1316
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L17121404	L17121904		W17121904	
Total volume of leach solution (ml):		182.0	180.0		148.0	
Radiochemical laboratory analysis number:		17908-004	17908-009		17908-014	
Measured uranium concentration (µg/ml):		1.46E-01	1.78E-02		3.12E-03	
Uncertainty in uranium concentration (µg/ml):		1.46E-02	1.78E-03		3.12E-04	
Weight uranium leached (g):		2.66E-05	3.20E-06	2.98E-05	4.62E-07	N
Uncertainty in weight uranium leached (g):		2.66E-06	3.21E-07	2.68E-06	4.62E-08	
Equivalent number of leached kernels:		6.74E-02	8.13E-03	7.56E-02	1.17E-03	
Uncertainty in equivalent number of leached kernels:		6.78E-03	8.18E-04	6.84E-03	1.18E-04	
Fe	Measured concentration of impurity in sample (µg/ml):	7.56E-01	1.32E-01	**Fe**	2.43E-02	
	Uncorrected weight of impurity in sample (µg):	137.59	23.76	164.95	3.60	Y
	Weight of impurity in blank (µg):	3.41	< 1.67		0.89	
	Minimum corrected weight of impurity in sample (µg):	134.18	22.09	158.97	2.70	
	Maximum corrected weight of impurity in sample (µg):	134.18	23.76	160.64	2.70	
Cr	Measured concentration of impurity in sample (µg/ml):	4.83E-03	3.44E-03	**Cr**	< 2.91E-03	
	Uncorrected weight of impurity in sample (µg):	0.88	0.62	1.50	< 0.43	N
	Weight of impurity in blank (µg):	< 0.57	< 0.57		< 0.15	
	Minimum corrected weight of impurity in sample (µg):	0.31	0.05	0.36	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.88	0.62	1.50	0.43	
Mn	Measured concentration of impurity in sample (µg/ml):	1.19E-02	1.72E-03	**Mn**	< 4.92E-04	
	Uncorrected weight of impurity in sample (µg):	2.17	0.31	2.48	< 0.07	N
	Weight of impurity in blank (µg):	< 0.10	< 0.10		0.05	
	Minimum corrected weight of impurity in sample (µg):	2.07	0.21	2.28	0.00	
	Maximum corrected weight of impurity in sample (µg):	2.17	0.31	2.48	0.02	
Co	Measured concentration of impurity in sample (µg/ml):	4.26E-04	7.72E-05	**Co**	4.40E-05	
	Uncorrected weight of impurity in sample (µg):	0.08	0.01	0.10	0.01	Y
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.06	0.01	0.07	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.06	0.01	0.08	0.01	
Ni	Measured concentration of impurity in sample (µg/ml):	1.16E-02	< 7.40E-03	**Ni**	< 7.40E-03	
	Uncorrected weight of impurity in sample (µg):	2.11	< 1.33	< 3.44	< 1.10	N
	Weight of impurity in blank (µg):	< 1.45	< 1.45		< 0.38	
	Minimum corrected weight of impurity in sample (µg):	0.66	0.00	0.66	0.00	
	Maximum corrected weight of impurity in sample (µg):	2.11	1.33	3.44	1.10	
Ca	Measured concentration of impurity in sample (µg/ml):	3.04E+00	4.89E-01	**Ca**	< 3.33E-01	
	Uncorrected weight of impurity in sample (µg):	553.28	88.02	641.30	<49.28	N
	Weight of impurity in blank (µg):	<65.27	<65.27		<17.32	
	Minimum corrected weight of impurity in sample (µg):	488.01	22.75	510.76	0.00	
	Maximum corrected weight of impurity in sample (µg):	553.28	88.02	641.30	49.28	
Al	Measured concentration of impurity in sample (µg/ml):	3.62E+00	6.35E-01	**Al**	1.16E-01	
	Uncorrected weight of impurity in sample (µg):	658.84	114.30	790.31	17.17	Y
	Weight of impurity in blank (µg):	7.70	3.94		5.07	
	Minimum corrected weight of impurity in sample (µg):	651.14	110.36	773.60	12.10	
	Maximum corrected weight of impurity in sample (µg):	651.14	110.36	773.60	12.10	
Ti	Measured concentration of impurity in sample (µg/ml):	6.20E-02	3.52E-02	**Ti**	4.73E-02	
	Uncorrected weight of impurity in sample (µg):	11.28	6.34	24.62	7.00	Y
	Weight of impurity in blank (µg):	< 1.04	< 1.04		< 0.28	
	Minimum corrected weight of impurity in sample (µg):	10.25	5.30	22.27	6.73	
	Maximum corrected weight of impurity in sample (µg):	11.28	6.34	24.62	7.00	
V	Measured concentration of impurity in sample (µg/ml):	7.97E-02	2.10E-02	**V**	8.90E-03	
	Uncorrected weight of impurity in sample (µg):	14.51	3.78	19.60	1.32	Y
	Weight of impurity in blank (µg):	< 0.03	< 0.03		< 0.01	
	Minimum corrected weight of impurity in sample (µg):	14.48	3.75	19.54	1.31	
	Maximum corrected weight of impurity in sample (µg):	14.51	3.78	19.60	1.32	

Comments

FCM checked the data against the Official Results of Analyses report for RMAL17908 on 2/5/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	Pre-burn leach blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 1_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total
	Pre-burn leach solution ID:	L17121405	L17121905	
	Total volume of leach solution (ml):	196.0	196.0	
	Radiochemical laboratory analysis number:	17908-005	17908-010	
	Measured uranium concentration (µg/ml):	1.76E-04	5.84E-05	
	Uncertainty in uranium concentration (µg/ml):	1.76E-05	5.84E-06	
	Weight uranium leached (g):	3.45E-08	1.14E-08	4.59E-08
	Uncertainty in weight uranium leached (g):	3.45E-09	1.15E-09	3.64E-09
	Equivalent number of leached kernels:	8.76E-05	2.91E-05	1.17E-04
	Uncertainty in equivalent number of leached kernels:	8.80E-06	2.92E-06	9.30E-06
Fe	Measured concentration (µg/ml):	1.74E-02	< 8.54E-03	**Fe**
	Total weight of leached impurity (µg):	3.41	< 1.67	< 5.98
Cr	Measured concentration (µg/ml):	< 2.91E-03	< 2.91E-03	**Cr**
	Total weight of leached impurity (µg):	< 0.57	< 0.57	< 1.14
Mn	Measured concentration (µg/ml):	< 4.92E-04	< 4.92E-04	**Mn**
	Total weight of leached impurity (µg):	< 0.10	< 0.10	< 0.24
Co	Measured concentration (µg/ml):	1.00E-04	< 3.52E-05	**Co**
	Total weight of leached impurity (µg):	0.02	< 0.01	< 0.03
Ni	Measured concentration (µg/ml):	< 7.40E-03	< 7.40E-03	**Ni**
	Total weight of leached impurity (µg):	< 1.45	< 1.45	< 2.90
Ca	Measured concentration (µg/ml):	< 3.33E-01	< 3.33E-01	**Ca**
	Total weight of leached impurity (µg):	<65.27	<65.27	<130.54
Al	Measured concentration (µg/ml):	3.93E-02	2.01E-02	**Al**
	Total weight of leached impurity (µg):	7.70	3.94	16.71
Ti	Measured concentration (µg/ml):	< 5.29E-03	< 5.29E-03	**Ti**
	Total weight of leached impurity (µg):	< 1.04	< 1.04	< 2.07
V	Measured concentration (µg/ml):	< 1.33E-04	< 1.33E-04	**V**
	Total weight of leached impurity (µg):	< 0.03	< 0.03	< 0.05

Comments

FCM checked the data against the Official Results of Analyses report for RMAL17908 on 2/5/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1225, 1287, 1303, 1802, 1829
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18010401	B18010801		W18010801	
	Total volume of leach solution (ml):	48.0	54.2		21.0	
	Radiochemical laboratory analysis number:	18063-001	18063-006		18063-011	
	Measured uranium concentration (µg/ml):	1.03E-01	2.61E-03		3.83E-04	
	Uncertainty in uranium concentration (µg/ml):	1.03E-02	2.61E-04		3.83E-05	
	Weight uranium leached (g):	4.94E-06	1.41E-07	5.09E-06	8.04E-09	N
	Uncertainty in weight uranium leached (g):	4.99E-07	1.42E-08	4.99E-07	8.42E-10	
	Equivalent number of leached kernels:	1.25E-02	3.59E-04	1.29E-02	2.04E-05	
	Uncertainty in equivalent number of leached kernels:	1.27E-03	3.63E-05	1.27E-03	2.15E-06	
Fe	Measured concentration of impurity in sample (µg/ml):	4.73E+00	9.58E-02	**Fe**	1.43E-02	
Fe	Uncorrected weight of impurity in sample (µg):	227.04	5.19	232.23	0.30	N
Fe	Weight of impurity in blank (µg):	1.06	0.73		0.15	
Fe	Minimum corrected weight of impurity in sample (µg):	225.98	4.46	230.44	0.15	
Fe	Maximum corrected weight of impurity in sample (µg):	225.98	4.46	230.44	0.15	
Cr	Measured concentration of impurity in sample (µg/ml):	1.09E-02	< 2.91E-03	**Cr**	< 2.91E-03	
Cr	Uncorrected weight of impurity in sample (µg):	0.52	< 0.16	< 0.68	< 0.06	N
Cr	Weight of impurity in blank (µg):	0.16	0.20		0.04	
Cr	Minimum corrected weight of impurity in sample (µg):	0.36	0.00	0.36	0.00	
Cr	Maximum corrected weight of impurity in sample (µg):	0.36	0.00	0.36	0.02	
Mn	Measured concentration of impurity in sample (µg/ml):	3.69E-03	< 4.92E-04	**Mn**	< 4.92E-04	
Mn	Uncorrected weight of impurity in sample (µg):	0.18	< 0.03	< 0.20	< 0.01	N
Mn	Weight of impurity in blank (µg):	0.04	0.04		0.01	
Mn	Minimum corrected weight of impurity in sample (µg):	0.14	0.00	0.14	0.00	
Mn	Maximum corrected weight of impurity in sample (µg):	0.14	0.00	0.14	0.00	
Co	Measured concentration of impurity in sample (µg/ml):	3.74E-03	1.33E-04	**Co**	< 3.52E-05	
Co	Uncorrected weight of impurity in sample (µg):	0.18	0.01	0.19	< 0.00	N
Co	Weight of impurity in blank (µg):	0.00	0.00		< 0.00	
Co	Minimum corrected weight of impurity in sample (µg):	0.18	0.00	0.18	0.00	
Co	Maximum corrected weight of impurity in sample (µg):	0.18	0.00	0.18	0.00	
Ni	Measured concentration of impurity in sample (µg/ml):	4.08E-02	< 7.40E-03	**Ni**	< 7.40E-03	
Ni	Uncorrected weight of impurity in sample (µg):	1.96	< 0.40	< 2.36	< 0.16	N
Ni	Weight of impurity in blank (µg):	< 0.35	< 0.34		< 0.11	
Ni	Minimum corrected weight of impurity in sample (µg):	1.61	0.00	1.61	0.00	
Ni	Maximum corrected weight of impurity in sample (µg):	1.96	0.40	2.36	0.16	
Ca	Measured concentration of impurity in sample (µg/ml):	9.58E-01	< 3.33E-01	**Ca**	< 3.33E-01	
Ca	Uncorrected weight of impurity in sample (µg):	45.98	<18.05	<64.03	< 6.99	N
Ca	Weight of impurity in blank (µg):	<15.65	16.77		< 5.00	
Ca	Minimum corrected weight of impurity in sample (µg):	30.33	0.00	30.33	0.00	
Ca	Maximum corrected weight of impurity in sample (µg):	45.98	1.28	47.26	6.99	
Al	Measured concentration of impurity in sample (µg/ml):	7.34E-01	1.83E-01	**Al**	2.81E-02	
Al	Uncorrected weight of impurity in sample (µg):	35.23	9.92	45.15	0.59	N
Al	Weight of impurity in blank (µg):	5.88	11.46		1.09	
Al	Minimum corrected weight of impurity in sample (µg):	29.36	0.00	29.36	0.00	
Al	Maximum corrected weight of impurity in sample (µg):	29.36	0.00	29.36	0.00	
Ti	Measured concentration of impurity in sample (µg/ml):	2.88E-01	4.82E-02	**Ti**	< 5.29E-03	
Ti	Uncorrected weight of impurity in sample (µg):	13.82	2.61	16.44	< 0.11	N
Ti	Weight of impurity in blank (µg):	< 0.25	< 0.24		< 0.08	
Ti	Minimum corrected weight of impurity in sample (µg):	13.58	2.37	15.94	0.00	
Ti	Maximum corrected weight of impurity in sample (µg):	13.82	2.61	16.44	0.11	
V	Measured concentration of impurity in sample (µg/ml):	1.39E-01	1.61E-03	**V**	< 1.33E-04	
V	Uncorrected weight of impurity in sample (µg):	6.67	0.09	6.76	< 0.00	N
V	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
V	Minimum corrected weight of impurity in sample (µg):	6.65	0.08	6.73	0.00	
V	Maximum corrected weight of impurity in sample (µg):	6.65	0.09	6.74	0.00	

Comments

FCM checked the data against the Official Results of Analyses report for RMAL18063 on 2/7/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1227, 1241, 1264, 1819, 1831
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18010402	B18010802		W18010802	
	Total volume of leach solution (ml):	44.0	50.2		20.0	
	Radiochemical laboratory analysis number:	18063-002	18063-007		18063-012	
	Measured uranium concentration (µg/ml):	1.21E-01	2.32E-03		4.17E-04	
	Uncertainty in uranium concentration (µg/ml):	1.21E-02	2.32E-04		4.17E-05	
	Weight uranium leached (g):	5.32E-06	1.16E-07	5.44E-06	8.34E-09	N
	Uncertainty in weight uranium leached (g):	5.38E-07	1.17E-08	5.38E-07	8.77E-10	
	Equivalent number of leached kernels:	1.35E-02	2.96E-04	1.38E-02	2.12E-05	
	Uncertainty in equivalent number of leached kernels:	1.37E-03	3.00E-05	1.37E-03	2.24E-06	
	Measured concentration of impurity in sample (µg/ml):	5.72E+00	8.34E-02	**Fe**	1.91E-02	
Fe	Uncorrected weight of impurity in sample (µg):	251.68	4.19	255.87	0.38	N
	Weight of impurity in blank (µg):	1.06	0.73		0.15	
	Minimum corrected weight of impurity in sample (µg):	250.62	3.46	254.08	0.23	
	Maximum corrected weight of impurity in sample (µg):	250.62	3.46	254.08	0.23	
	Measured concentration of impurity in sample (µg/ml):	7.15E-03	< 2.91E-03	**Cr**	< 2.91E-03	
Cr	Uncorrected weight of impurity in sample (µg):	0.31	< 0.15	< 0.46	< 0.06	N
	Weight of impurity in blank (µg):	0.16	0.20		0.04	
	Minimum corrected weight of impurity in sample (µg):	0.15	0.00	0.15	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.15	0.00	0.15	0.01	
	Measured concentration of impurity in sample (µg/ml):	4.87E-03	< 4.92E-04	**Mn**	< 4.92E-04	
Mn	Uncorrected weight of impurity in sample (µg):	0.21	< 0.02	< 0.24	< 0.01	N
	Weight of impurity in blank (µg):	0.04	0.04		0.01	
	Minimum corrected weight of impurity in sample (µg):	0.17	0.00	0.17	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.17	0.00	0.17	0.00	
	Measured concentration of impurity in sample (µg/ml):	3.97E-03	8.28E-05	**Co**	< 3.52E-05	
Co	Uncorrected weight of impurity in sample (µg):	0.17	0.00	0.18	< 0.00	N
	Weight of impurity in blank (µg):	0.00	0.00		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.17	0.00	0.17	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.17	0.00	0.17	0.00	
	Measured concentration of impurity in sample (µg/ml):	4.98E-02	< 7.40E-03	**Ni**	< 7.40E-03	
Ni	Uncorrected weight of impurity in sample (µg):	2.19	< 0.37	< 2.56	< 0.15	N
	Weight of impurity in blank (µg):	< 0.35	< 0.34		< 0.11	
	Minimum corrected weight of impurity in sample (µg):	1.84	0.00	1.84	0.00	
	Maximum corrected weight of impurity in sample (µg):	2.19	0.37	2.56	0.15	
	Measured concentration of impurity in sample (µg/ml):	1.54E+00	< 3.33E-01	**Ca**	< 3.33E-01	
Ca	Uncorrected weight of impurity in sample (µg):	67.76	<16.72	<84.48	< 6.66	N
	Weight of impurity in blank (µg):	<15.65	16.77		< 5.00	
	Minimum corrected weight of impurity in sample (µg):	52.11	0.00	52.11	0.00	
	Maximum corrected weight of impurity in sample (µg):	67.76	0.00	67.76	6.66	
	Measured concentration of impurity in sample (µg/ml):	2.08E+00	1.80E-01	**Al**	3.18E-02	
Al	Uncorrected weight of impurity in sample (µg):	91.52	9.04	100.56	0.64	N
	Weight of impurity in blank (µg):	5.88	11.46		1.09	
	Minimum corrected weight of impurity in sample (µg):	85.65	0.00	85.65	0.00	
	Maximum corrected weight of impurity in sample (µg):	85.65	0.00	85.65	0.00	
	Measured concentration of impurity in sample (µg/ml):	5.87E-01	2.83E-02	**Ti**	< 5.29E-03	
Ti	Uncorrected weight of impurity in sample (µg):	25.83	1.42	27.25	< 0.11	N
	Weight of impurity in blank (µg):	< 0.25	< 0.24		< 0.08	
	Minimum corrected weight of impurity in sample (µg):	25.58	1.18	26.76	0.00	
	Maximum corrected weight of impurity in sample (µg):	25.83	1.42	27.25	0.11	
	Measured concentration of impurity in sample (µg/ml):	1.74E-01	1.65E-03	**V**	3.18E-04	
V	Uncorrected weight of impurity in sample (µg):	7.66	0.08	7.74	0.01	N
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	7.64	0.08	7.71	0.00	
	Maximum corrected weight of impurity in sample (µg):	7.64	0.08	7.72	0.01	

Comments

FCM checked the data against the Official Results of Analyses report for RMAL18063 on 2/7/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1223, 1309, 1319, 1800, 1805
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18010403	B18010803		W18010803	
	Total volume of leach solution (ml):	45.0	49.8		19.0	
	Radiochemical laboratory analysis number:	18063-003	18063-008		18063-013	
	Measured uranium concentration (µg/ml):	1.13E+00	1.83E-03		3.71E-04	
	Uncertainty in uranium concentration (µg/ml):	1.13E-01	1.83E-04		3.71E-05	
	Weight uranium leached (g):	5.09E-05	9.11E-08	5.09E-05	7.05E-09	N
	Uncertainty in weight uranium leached (g):	5.14E-06	9.19E-09	5.14E-06	7.45E-10	
	Equivalent number of leached kernels:	1.29E-01	2.31E-04	1.29E-01	1.79E-05	
	Uncertainty in equivalent number of leached kernels:	1.31E-02	2.34E-05	1.31E-02	1.90E-06	
Fe	Measured concentration of impurity in sample (µg/ml):	4.25E+00	7.14E-02	Fe	2.71E-02	
	Uncorrected weight of impurity in sample (µg):	191.25	3.56	195.32	0.51	Y
	Weight of impurity in blank (µg):	1.06	0.73		0.15	
	Minimum corrected weight of impurity in sample (µg):	190.19	2.83	193.39	0.37	
	Maximum corrected weight of impurity in sample (µg):	190.19	2.83	193.39	0.37	
Cr	Measured concentration of impurity in sample (µg/ml):	7.43E-03	< 2.91E-03	Cr	< 2.91E-03	
	Uncorrected weight of impurity in sample (µg):	0.33	< 0.14	< 0.48	< 0.06	N
	Weight of impurity in blank (µg):	0.16	0.20		0.04	
	Minimum corrected weight of impurity in sample (µg):	0.17	0.00	0.17	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.17	0.00	0.17	0.01	
Mn	Measured concentration of impurity in sample (µg/ml):	4.44E-03	4.97E-04	Mn	< 4.92E-04	
	Uncorrected weight of impurity in sample (µg):	0.20	0.02	0.22	< 0.01	N
	Weight of impurity in blank (µg):	0.04	0.04		0.01	
	Minimum corrected weight of impurity in sample (µg):	0.16	0.00	0.16	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.16	0.00	0.16	0.00	
Co	Measured concentration of impurity in sample (µg/ml):	2.68E-03	8.72E-05	Co	< 3.52E-05	
	Uncorrected weight of impurity in sample (µg):	0.12	0.00	0.12	< 0.00	N
	Weight of impurity in blank (µg):	0.00	0.00		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.12	0.00	0.12	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.12	0.00	0.12	0.00	
Ni	Measured concentration of impurity in sample (µg/ml):	5.17E-02	3.90E-02	Ni	< 7.40E-03	
	Uncorrected weight of impurity in sample (µg):	2.33	1.94	4.27	< 0.14	N
	Weight of impurity in blank (µg):	< 0.35	< 0.34		< 0.11	
	Minimum corrected weight of impurity in sample (µg):	1.98	1.60	3.58	0.00	
	Maximum corrected weight of impurity in sample (µg):	2.33	1.94	4.27	0.14	
Ca	Measured concentration of impurity in sample (µg/ml):	1.11E+00	< 3.33E-01	Ca	< 3.33E-01	
	Uncorrected weight of impurity in sample (µg):	49.95	<16.58	<66.53	< 6.33	N
	Weight of impurity in blank (µg):	<15.65	16.77		< 5.00	
	Minimum corrected weight of impurity in sample (µg):	34.30	0.00	34.30	0.00	
	Maximum corrected weight of impurity in sample (µg):	49.95	0.00	49.95	6.33	
Al	Measured concentration of impurity in sample (µg/ml):	8.76E-01	1.46E-01	Al	2.67E-02	
	Uncorrected weight of impurity in sample (µg):	39.42	7.27	46.69	0.51	N
	Weight of impurity in blank (µg):	5.88	11.46		1.09	
	Minimum corrected weight of impurity in sample (µg):	33.55	0.00	33.55	0.00	
	Maximum corrected weight of impurity in sample (µg):	33.55	0.00	33.55	0.00	
Ti	Measured concentration of impurity in sample (µg/ml):	4.58E-01	3.94E-02	Ti	< 5.29E-03	
	Uncorrected weight of impurity in sample (µg):	20.61	1.96	22.57	< 0.10	N
	Weight of impurity in blank (µg):	< 0.25	< 0.24		< 0.08	
	Minimum corrected weight of impurity in sample (µg):	20.36	1.72	22.08	0.00	
	Maximum corrected weight of impurity in sample (µg):	20.61	1.96	22.57	0.10	
V	Measured concentration of impurity in sample (µg/ml):	1.40E-01	8.34E-04	V	< 1.33E-04	
	Uncorrected weight of impurity in sample (µg):	6.30	0.04	6.34	< 0.00	N
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	6.28	0.04	6.32	0.00	
	Maximum corrected weight of impurity in sample (µg):	6.28	0.04	6.32	0.00	

Comments

FCM checked the data against the Official Results of Analyses report for RMAL18063 on 2/7/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1221, 1240, 1243, 1266, 1316
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18010404	B18010804		W18010804	
Total volume of leach solution (ml):		44.0	39.5		21.0	
Radiochemical laboratory analysis number:		18063-004	18063-009		18063-014	
Measured uranium concentration (µg/ml):		1.12E-01	3.93E-03		1.44E-03	
Uncertainty in uranium concentration (µg/ml):		1.12E-02	3.93E-04		1.44E-04	
Weight uranium leached (g):		4.93E-06	1.55E-07	5.08E-06	3.02E-08	N
Uncertainty in weight uranium leached (g):		4.98E-07	1.57E-08	4.98E-07	3.17E-09	
Equivalent number of leached kernels:		1.25E-02	3.94E-04	1.29E-02	7.68E-05	
Uncertainty in equivalent number of leached kernels:		1.27E-03	4.01E-05	1.27E-03	8.07E-06	
Fe	Measured concentration of impurity in sample (µg/ml):	4.62E+00	8.16E-02	**Fe**	2.56E-02	
	Uncorrected weight of impurity in sample (µg):	203.28	3.22	207.04	0.54	Y
	Weight of impurity in blank (µg):	1.06	0.73		0.15	
	Minimum corrected weight of impurity in sample (µg):	202.22	2.49	205.11	0.39	
	Maximum corrected weight of impurity in sample (µg):	202.22	2.49	205.11	0.39	
Cr	Measured concentration of impurity in sample (µg/ml):	6.84E-03	3.55E-03	**Cr**	< 2.91E-03	
	Uncorrected weight of impurity in sample (µg):	0.30	0.14	0.44	< 0.06	N
	Weight of impurity in blank (µg):	0.16	0.20		0.04	
	Minimum corrected weight of impurity in sample (µg):	0.14	0.00	0.14	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.14	0.00	0.14	0.02	
Mn	Measured concentration of impurity in sample (µg/ml):	4.67E-03	6.89E-04	**Mn**	9.36E-04	
	Uncorrected weight of impurity in sample (µg):	0.21	0.03	0.25	0.02	Y
	Weight of impurity in blank (µg):	0.04	0.04		0.01	
	Minimum corrected weight of impurity in sample (µg):	0.16	0.00	0.17	0.01	
	Maximum corrected weight of impurity in sample (µg):	0.16	0.00	0.17	0.01	
Co	Measured concentration of impurity in sample (µg/ml):	3.05E-03	1.11E-04	**Co**	< 3.52E-05	
	Uncorrected weight of impurity in sample (µg):	0.13	0.00	0.14	< 0.00	N
	Weight of impurity in blank (µg):	0.00	0.00		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.13	0.00	0.13	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.13	0.00	0.13	0.00	
Ni	Measured concentration of impurity in sample (µg/ml):	6.41E-02	1.29E-02	**Ni**	4.19E-02	
	Uncorrected weight of impurity in sample (µg):	2.82	0.51	4.21	0.88	Y
	Weight of impurity in blank (µg):	< 0.35	< 0.34		< 0.11	
	Minimum corrected weight of impurity in sample (µg):	2.47	0.17	3.41	0.77	
	Maximum corrected weight of impurity in sample (µg):	2.82	0.51	4.21	0.88	
Ca	Measured concentration of impurity in sample (µg/ml):	1.64E+00	< 3.33E-01	**Ca**	< 3.33E-01	
	Uncorrected weight of impurity in sample (µg):	72.16	<13.15	<85.31	< 6.99	N
	Weight of impurity in blank (µg):	<15.65	16.77		< 5.00	
	Minimum corrected weight of impurity in sample (µg):	56.51	0.00	56.51	0.00	
	Maximum corrected weight of impurity in sample (µg):	72.16	0.00	72.16	6.99	
Al	Measured concentration of impurity in sample (µg/ml):	2.11E+00	2.42E-01	**Al**	2.24E-01	
	Uncorrected weight of impurity in sample (µg):	92.84	9.56	107.10	4.70	Y
	Weight of impurity in blank (µg):	5.88	11.46		1.09	
	Minimum corrected weight of impurity in sample (µg):	86.97	0.00	90.58	3.61	
	Maximum corrected weight of impurity in sample (µg):	86.97	0.00	90.58	3.61	
Ti	Measured concentration of impurity in sample (µg/ml):	5.39E-01	3.67E-02	**Ti**	< 5.29E-03	
	Uncorrected weight of impurity in sample (µg):	23.72	1.45	25.17	< 0.11	N
	Weight of impurity in blank (µg):	< 0.25	< 0.24		< 0.08	
	Minimum corrected weight of impurity in sample (µg):	23.47	1.21	24.67	0.00	
	Maximum corrected weight of impurity in sample (µg):	23.72	1.45	25.17	0.11	
V	Measured concentration of impurity in sample (µg/ml):	1.61E-01	2.43E-03	**V**	1.83E-04	
	Uncorrected weight of impurity in sample (µg):	7.08	0.10	7.18	0.00	N
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	7.06	0.09	7.15	0.00	
	Maximum corrected weight of impurity in sample (µg):	7.06	0.10	7.16	0.00	

Comments

FCM checked the data against the Official Results of Analyses report for RMAL18063 on 2/7/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	Post-burn leach blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 1_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total
	Post-burn leach solution ID:	B18010405	B18010805	
	Total volume of leach solution (ml):	47.0	46.2	
	Radiochemical laboratory analysis number:	18063-005	18063-010	
	Measured uranium concentration (µg/ml):	2.34E-04	4.60E-05	
	Uncertainty in uranium concentration (µg/ml):	2.34E-05	4.60E-06	
	Weight uranium leached (g):	1.10E-08	2.13E-09	1.31E-08
	Uncertainty in weight uranium leached (g):	1.11E-09	2.15E-10	1.13E-09
	Equivalent number of leached kernels:	2.79E-05	5.39E-06	3.33E-05
	Uncertainty in equivalent number of leached kernels:	2.83E-06	5.47E-07	2.89E-06
Fe	Measured concentration (µg/ml):	2.25E-02	1.58E-02	**Fe**
	Total weight of leached impurity (µg):	1.06	0.73	1.94
Cr	Measured concentration (µg/ml):	3.43E-03	4.37E-03	**Cr**
	Total weight of leached impurity (µg):	0.16	0.20	0.41
Mn	Measured concentration (µg/ml):	8.64E-04	8.60E-04	**Mn**
	Total weight of leached impurity (µg):	0.04	0.04	0.09
Co	Measured concentration (µg/ml):	7.76E-05	6.56E-05	**Co**
	Total weight of leached impurity (µg):	0.00	0.00	0.01
Ni	Measured concentration (µg/ml):	< 7.40E-03	< 7.40E-03	**Ni**
	Total weight of leached impurity (µg):	< 0.35	< 0.34	< 0.69
Ca	Measured concentration (µg/ml):	< 3.33E-01	3.63E-01	**Ca**
	Total weight of leached impurity (µg):	<15.65	16.77	<32.42
Al	Measured concentration (µg/ml):	1.25E-01	2.48E-01	**Al**
	Total weight of leached impurity (µg):	5.88	11.46	17.33
Ti	Measured concentration (µg/ml):	< 5.29E-03	< 5.29E-03	**Ti**
	Total weight of leached impurity (µg):	< 0.25	< 0.24	< 0.49
V	Measured concentration (µg/ml):	4.18E-04	< 1.33E-04	**V**
	Total weight of leached impurity (µg):	0.02	< 0.01	< 0.03

Comments

FCM checked the data against the Official Results of Analyses report for RMAL18063 on 2/7/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1233, 1254, 1287, 1291, 1821
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L18011701	L18011901		W18011901	
Total volume of leach solution (ml):		115.0	96.0		88.2	
Radiochemical laboratory analysis number:		18062-001	18062-006		18062-011	
Measured uranium concentration (µg/ml):		1.41E-01	1.95E-02		3.42E-03	
Uncertainty in uranium concentration (µg/ml):		1.41E-02	1.95E-03		3.42E-04	
Weight uranium leached (g):		1.62E-05	1.87E-06	1.81E-05	3.02E-07	N
Uncertainty in weight uranium leached (g):		1.62E-06	1.88E-07	1.63E-06	3.02E-08	
Equivalent number of leached kernels:		4.12E-02	4.75E-03	4.59E-02	7.66E-04	
Uncertainty in equivalent number of leached kernels:		4.14E-03	4.79E-04	4.17E-03	7.71E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the official Results of Analyses report for RMAL18062 on 2/07/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1236, 1305, 1321, 1807, 1808
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L18011702	L18011902		W18011902	
	Total volume of leach solution (ml):	122.0	96.0		71.5	
	Radiochemical laboratory analysis number:	18062-002	18062-007		18062-012	
	Measured uranium concentration (µg/ml):	2.81E+00	2.58E-01		8.59E-02	
	Uncertainty in uranium concentration (µg/ml):	2.81E-01	2.58E-02		8.59E-03	
	Weight uranium leached (g):	3.43E-04	2.48E-05	3.74E-04	6.14E-06	Y
	Uncertainty in weight uranium leached (g):	3.43E-05	2.48E-06	3.44E-05	6.17E-07	
	Equivalent number of leached kernels:	8.70E-01	6.29E-02	9.49E-01	1.56E-02	
	Uncertainty in equivalent number of leached kernels:	8.76E-02	6.33E-03	8.79E-02	1.57E-03	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the official Results of Analyses report for RMAL18062 on 2/07/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1257, 1258, 1285, 1298, 1324
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L18011703	L18011903		W18011903	
	Total volume of leach solution (ml):	118.0	94.0		70.0	
	Radiochemical laboratory analysis number:	18062-003	18062-008		18062-013	
	Measured uranium concentration (µg/ml):	9.39E-02	1.24E-02		2.55E-03	
	Uncertainty in uranium concentration (µg/ml):	9.39E-03	1.24E-03		2.55E-04	
	Weight uranium leached (g):	1.11E-05	1.17E-06	1.22E-05	1.79E-07	N
	Uncertainty in weight uranium leached (g):	1.11E-06	1.17E-07	1.12E-06	1.79E-08	
	Equivalent number of leached kernels:	2.81E-02	2.96E-03	3.11E-02	4.53E-04	
	Uncertainty in equivalent number of leached kernels:	2.83E-03	2.98E-04	2.85E-03	4.57E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the official Results of Analyses report for RMAL18062 on 2/07/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1277, 1279, 1314, 1812, 1828
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L18011704	L18011904		W18011904	
Total volume of leach solution (ml):		109.0	104.0		73.2	
Radiochemical laboratory analysis number:		18062-004	18062-009		18062-014	
Measured uranium concentration (µg/ml):		1.14E-01	2.19E-02		4.60E-03	
Uncertainty in uranium concentration (µg/ml):		1.14E-02	2.19E-03		4.60E-04	
Weight uranium leached (g):		1.24E-05	2.28E-06	1.47E-05	3.37E-07	N
Uncertainty in weight uranium leached (g):		1.24E-06	2.28E-07	1.27E-06	3.38E-08	
Equivalent number of leached kernels:		3.15E-02	5.78E-03	3.73E-02	8.55E-04	
Uncertainty in equivalent number of leached kernels:		3.18E-03	5.82E-04	3.23E-03	8.62E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the official Results of Analyses report for RMAL18062 on 2/07/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	Pre-burn leach blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 2_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total
	Pre-burn leach solution ID:	L18011705	L18011905	
	Total volume of leach solution (ml):	150.0	100.0	
	Radiochemical laboratory analysis number:	18062-005	18062-010	
	Measured uranium concentration (µg/ml):	1.61E-04	1.00E-04	
	Uncertainty in uranium concentration (µg/ml):	1.61E-05	1.00E-05	
	Weight uranium leached (g):	2.42E-08	1.00E-08	3.42E-08
	Uncertainty in weight uranium leached (g):	2.42E-09	1.00E-09	2.62E-09
	Equivalent number of leached kernels:	6.13E-05	2.54E-05	8.67E-05
	Uncertainty in equivalent number of leached kernels:	6.17E-06	2.56E-06	6.70E-06
Fe	Measured concentration (µg/ml):			**Fe**
	Total weight of leached impurity (µg):			
Cr	Measured concentration (µg/ml):			**Cr**
	Total weight of leached impurity (µg):			
Mn	Measured concentration (µg/ml):			**Mn**
	Total weight of leached impurity (µg):			
Co	Measured concentration (µg/ml):			**Co**
	Total weight of leached impurity (µg):			
Ni	Measured concentration (µg/ml):			**Ni**
	Total weight of leached impurity (µg):			
Ca	Measured concentration (µg/ml):			**Ca**
	Total weight of leached impurity (µg):			
Al	Measured concentration (µg/ml):			**Al**
	Total weight of leached impurity (µg):			
Ti	Measured concentration (µg/ml):			**Ti**
	Total weight of leached impurity (µg):			
V	Measured concentration (µg/ml):			**V**
	Total weight of leached impurity (µg):			

Comments

FCM checked the data against the official Results of Analyses report for RMAL18062 on 2/07/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1233, 1254, 1287, 1291, 1821
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18012901	B18013001		W18013001	
	Total volume of leach solution (ml):	45.2	48.0		50.0	
	Radiochemical laboratory analysis number:	18079-001	18079-006		18079-011	
	Measured uranium concentration (µg/ml):	1.02E+01	4.53E-02		4.27E-03	
	Uncertainty in uranium concentration (µg/ml):	1.02E+00	4.53E-03		4.27E-04	
	Weight uranium leached (g):	4.61E-04	2.17E-06	4.63E-04	2.14E-07	N
	Uncertainty in weight uranium leached (g):	4.66E-05	2.19E-07	4.66E-05	2.15E-08	
	Equivalent number of leached kernels:	1.17E+00	5.52E-03	1.18E+00	5.42E-04	
	Uncertainty in equivalent number of leached kernels:	1.19E-01	5.60E-04	1.19E-01	5.49E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the official Results of Analyses report for RMAL18079 on 2/07/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1236, 1305, 1321, 1807, 1808
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18012902	B18013002		W18013002	
	Total volume of leach solution (ml):	45.0	47.8		49.5	
	Radiochemical laboratory analysis number:	18079-002	18079-007		18079-012	
	Measured uranium concentration (µg/ml):	1.89E+01	4.82E-02		3.25E-03	
	Uncertainty in uranium concentration (µg/ml):	1.89E+00	4.82E-03		3.25E-04	
	Weight uranium leached (g):	8.51E-04	2.30E-06	8.53E-04	1.61E-07	N
	Uncertainty in weight uranium leached (g):	8.59E-05	2.33E-07	8.59E-05	1.62E-08	
	Equivalent number of leached kernels:	2.16E+00	5.85E-03	2.16E+00	4.08E-04	
	Uncertainty in equivalent number of leached kernels:	2.19E-01	5.93E-04	2.19E-01	4.14E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the official Results of Analyses report for RMAL18079 on 2/07/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1257, 1258, 1285, 1298, 1324
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18012903	B18013003		W18013003	
	Total volume of leach solution (ml):	46.0	48.8		49.2	
	Radiochemical laboratory analysis number:	18079-003	18079-008		18079-013	
	Measured uranium concentration (µg/ml):	1.24E-01	5.42E-03		8.06E-04	
	Uncertainty in uranium concentration (µg/ml):	1.24E-02	5.42E-04		8.06E-05	
	Weight uranium leached (g):	5.70E-06	2.64E-07	5.97E-06	3.97E-08	N
	Uncertainty in weight uranium leached (g):	5.76E-07	2.67E-08	5.77E-07	4.00E-09	
	Equivalent number of leached kernels:	1.45E-02	6.71E-04	1.51E-02	1.01E-04	
	Uncertainty in equivalent number of leached kernels:	1.47E-03	6.81E-05	1.47E-03	1.02E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the official Results of Analyses report for RMAL18079 on 2/07/2018.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1277, 1279, 1314, 1812, 1828
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18012904	B18013004		W18013004	
Total volume of leach solution (ml):		46.9	47.0		49.0	
Radiochemical laboratory analysis number:		18079-004	18079-009		18079-014	
Measured uranium concentration (µg/ml):		1.13E-01	2.17E-02		8.79E-04	
Uncertainty in uranium concentration (µg/ml):		1.13E-02	2.17E-03		8.79E-05	
Weight uranium leached (g):		5.30E-06	1.02E-06	6.32E-06	4.31E-08	N
Uncertainty in weight uranium leached (g):		5.35E-07	1.03E-07	5.45E-07	4.34E-09	
Equivalent number of leached kernels:		1.35E-02	2.59E-03	1.60E-02	1.09E-04	
Uncertainty in equivalent number of leached kernels:		1.36E-03	2.63E-04	1.39E-03	1.11E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the data against the official Results of Analyses report for RMAL18079 on 2/07/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	B&W J52R-16-14156C and B&W J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	Post-burn leach blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14156C&D-Group 2_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total
	Post-burn leach solution ID:	B18012905	B18013005	
	Total volume of leach solution (ml):	48.8	48.0	
	Radiochemical laboratory analysis number:	18079-005	18079-010	
	Measured uranium concentration (µg/ml):	3.14E-04	1.88E-04	
	Uncertainty in uranium concentration (µg/ml):	3.14E-05	1.88E-05	
	Weight uranium leached (g):	1.53E-08	9.02E-09	2.43E-08
	Uncertainty in weight uranium leached (g):	1.55E-09	9.11E-10	1.79E-09
	Equivalent number of leached kernels:	3.89E-05	2.29E-05	6.18E-05
	Uncertainty in equivalent number of leached kernels:	3.94E-06	2.32E-06	4.60E-06
Fe	Measured concentration (µg/ml):			**Fe**
	Total weight of leached impurity (µg):			
Cr	Measured concentration (µg/ml):			**Cr**
	Total weight of leached impurity (µg):			
Mn	Measured concentration (µg/ml):			**Mn**
	Total weight of leached impurity (µg):			
Co	Measured concentration (µg/ml):			**Co**
	Total weight of leached impurity (µg):			
Ni	Measured concentration (µg/ml):			**Ni**
	Total weight of leached impurity (µg):			
Ca	Measured concentration (µg/ml):			**Ca**
	Total weight of leached impurity (µg):			
Al	Measured concentration (µg/ml):			**Al**
	Total weight of leached impurity (µg):			
Ti	Measured concentration (µg/ml):			**Ti**
	Total weight of leached impurity (µg):			
V	Measured concentration (µg/ml):			**V**
	Total weight of leached impurity (µg):			

Comments

FCM checked the data against the official Results of Analyses report for RMAL18079 on 2/07/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1801, 1834, 1818, 1826, 1830
DRF filename:	14156D_PF25-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19021801	L19022001		W19022003	
	Total volume of leach solution (ml):	143.0	131.0		40.0	
	RMAL analysis number:	19145-001	19145-003		19145-005	
	Measured uranium concentration (µg/ml):	1.03E-01	1.18E-02		1.85E-03	
	Uncertainty in uranium concentration (µg/ml):	1.03E-02	1.18E-03		1.85E-04	
	Weight uranium leached (g):	1.48E-05	1.54E-06	1.63E-05	7.40E-08	N
	Uncertainty in weight uranium leached (g):	1.48E-06	1.54E-07	1.49E-06	7.50E-09	
	Equivalent number of leached kernels:	3.75E-02	3.91E-03	4.14E-02	1.88E-04	
	Uncertainty in equivalent number of leached kernels:	3.77E-03	3.93E-04	3.79E-03	1.91E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #31 (previously used for 14154C-Group 1 Clutch 1).
FCM checked the recorded data against the official Results of Analysis for RMAL19145 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1809, 1817, 1823, 1803, 1833
DRF filename:	14156D_PF25-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19021802	L19022002		W19022004	
	Total volume of leach solution (ml):	138.0	133.0		40.0	
	RMAL analysis number:	19145-002	19145-004		19145-006	
	Measured uranium concentration (µg/ml):	1.11E-01	1.48E-02		2.38E-03	
	Uncertainty in uranium concentration (µg/ml):	1.11E-02	1.48E-03		2.38E-04	
	Weight uranium leached (g):	1.53E-05	1.97E-06	1.73E-05	9.51E-08	N
	Uncertainty in weight uranium leached (g):	1.53E-06	1.97E-07	1.54E-06	9.64E-09	
	Equivalent number of leached kernels:	3.88E-02	5.00E-03	4.38E-02	2.41E-04	
	Uncertainty in equivalent number of leached kernels:	3.90E-03	5.03E-04	3.94E-03	2.46E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #32 (previously used for 14154C-Group 1 Clutch 2).
FCM checked the recorded data against the official Results of Analysis for RMAL19145 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1832, 1825, 1820, 1835, 1815
DRF filename:	14156D_PF25-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19021101	L19021301		W19021303	
	Total volume of leach solution (ml):	155.0	140.0		40.0	
	RMAL analysis number:	19129-001	19129-003		19129-005	
	Measured uranium concentration (µg/ml):	1.22E-01	1.22E-02		2.32E-03	
	Uncertainty in uranium concentration (µg/ml):	1.22E-02	1.22E-03		2.32E-04	
	Weight uranium leached (g):	1.89E-05	1.71E-06	2.06E-05	9.28E-08	N
	Uncertainty in weight uranium leached (g):	1.89E-06	1.71E-07	1.90E-06	9.40E-09	
	Equivalent number of leached kernels:	4.80E-02	4.34E-03	5.23E-02	2.36E-04	
	Uncertainty in equivalent number of leached kernels:	4.83E-03	4.36E-04	4.85E-03	2.40E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #33 (previously used for 14154C-Group 1 Clutch 3).
FCM checked the recorded data against the official Results of Analysis for RMAL19129 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1816, 1813, 1822, 1827, 1814
DRF filename:	14156D_PF25-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19021102	L19021302		W19021304	
	Total volume of leach solution (ml):	156.0	140.0		40.0	
	RMAL analysis number:	19129-002	19129-004		19129-006	
	Measured uranium concentration (µg/ml):	7.76E-02	8.80E-03		1.63E-03	
	Uncertainty in uranium concentration (µg/ml):	7.76E-03	8.80E-04		1.63E-04	
	Weight uranium leached (g):	1.21E-05	1.23E-06	1.33E-05	6.52E-08	N
	Uncertainty in weight uranium leached (g):	1.21E-06	1.23E-07	1.22E-06	6.61E-09	
	Equivalent number of leached kernels:	3.07E-02	3.13E-03	3.39E-02	1.65E-04	
	Uncertainty in equivalent number of leached kernels:	3.09E-03	3.15E-04	3.11E-03	1.68E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #30 (previously used for 14154C-Group 1 Clutch 4).
FCM checked the recorded data against the official Results of Analysis for RMAL19129 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1801, 1834, 1818, 1826, 1830
DRF filename:	14156D_PF25-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19022801	B19030501		W19030503	
	Total volume of leach solution (ml):	56.2	68.0		10.0	
	RMAL analysis number:	19192-001	19192-003		19192-005	
	Measured uranium concentration (µg/ml):	8.73E-02	2.44E-03		6.87E-04	
	Uncertainty in uranium concentration (µg/ml):	8.73E-03	2.44E-04		6.87E-05	
	Weight uranium leached (g):	4.91E-06	1.66E-07	5.07E-06	6.87E-09	N
	Uncertainty in weight uranium leached (g):	4.94E-07	1.67E-08	4.94E-07	8.19E-10	
	Equivalent number of leached kernels:	1.25E-02	4.21E-04	1.29E-02	1.74E-05	
	Uncertainty in equivalent number of leached kernels:	1.26E-03	4.25E-05	1.26E-03	2.09E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19192 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1809, 1817, 1823, 1803, 1833
DRF filename:	14156D_PF25-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B19022802	B19030502		W19030504	
Total volume of leach solution (ml):		57.2	58.8		20.0	
RMAL analysis number:		19192-002	19192-004		19192-006	
Measured uranium concentration (µg/ml):		8.78E-01	7.93E-01		5.75E-03	
Uncertainty in uranium concentration (µg/ml):		8.78E-02	7.93E-02		5.75E-04	
Weight uranium leached (g):		5.02E-05	4.66E-05	9.69E-05	1.15E-07	N
Uncertainty in weight uranium leached (g):		5.05E-06	4.69E-06	6.90E-06	1.21E-08	
Equivalent number of leached kernels:		1.27E-01	1.18E-01	2.46E-01	2.92E-04	
Uncertainty in equivalent number of leached kernels:		1.29E-02	1.20E-02	1.77E-02	3.08E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19192 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1832, 1825, 1820, 1835, 1815
DRF filename:	14156D_PF25-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19022101	B19022501		W19022503	
	Total volume of leach solution (ml):	55.7	59.0		20.0	
	RMAL analysis number:	19159-001	19159-003		19159-005	
	Measured uranium concentration (µg/ml):	8.54E-02	2.04E-03		1.18E-03	
	Uncertainty in uranium concentration (µg/ml):	8.54E-03	2.04E-04		1.18E-04	
	Weight uranium leached (g):	4.76E-06	1.20E-07	4.88E-06	2.36E-08	N
	Uncertainty in weight uranium leached (g):	4.79E-07	1.21E-08	4.79E-07	2.49E-09	
	Equivalent number of leached kernels:	1.21E-02	3.05E-04	1.24E-02	6.00E-05	
	Uncertainty in equivalent number of leached kernels:	1.22E-03	3.09E-05	1.22E-03	6.34E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19159 on 3/26/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14156D
Compact lot description:	AGR-5/6/7 compacts, 25% packing fraction
Compact ID numbers:	1816, 1813, 1822, 1827, 1814
DRF filename:	14156D_PF25-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19022102	B19022502		W19022504	
	Total volume of leach solution (ml):	57.7	57.5		20.0	
	RMAL analysis number:	19159-002	19159-004		19159-006	
	Measured uranium concentration (µg/ml):	8.55E-02	2.31E-03		6.32E-04	
	Uncertainty in uranium concentration (µg/ml):	8.55E-03	2.31E-04		6.32E-05	
	Weight uranium leached (g):	4.93E-06	1.33E-07	5.06E-06	1.26E-08	N
	Uncertainty in weight uranium leached (g):	4.96E-07	1.34E-08	4.97E-07	1.33E-09	
	Equivalent number of leached kernels:	1.25E-02	3.37E-04	1.29E-02	3.21E-05	
	Uncertainty in equivalent number of leached kernels:	1.27E-03	3.41E-05	1.27E-03	3.39E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19159 on 3/26/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

APPENDIX D. REPORT FORMS FOR 40% PF COMPACT LBL

Inspection Report Form IRF-B: Summary of Impurites Outside SiC — Maximum Corrected Values

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1021, 1042, 1056, 1093, 1105	1004, 1016, 1018, 1085, 1101	1006, 1057, 1068, 1078, 1107	1002, 1036, 1038, 1083, 1098	Mean	Standard Deviation
Number of compacts:	5	5	5	5		
Iron						
Pre-burn leach (DRF-26A) (µg):	102.24	114.25	122.92	119.03		
Post-burn leach (DRF-26B) (µg):	117.31	117.96	155.01	114.58		
Total leached (µg):	219.55	232.21	277.93	233.61		
Fe outside SiC (µg/compact):	**43.91**	**46.44**	**55.59**	**46.72**	**48.16**	**5.11**
Chromium						
Pre-burn leach (DRF-26A) (µg):	1.47	1.92	3.99	2.02		
Post-burn leach (DRF-26B) (µg):	1.05	0.77	0.90	0.83		
Total leached (µg):	2.52	2.69	4.89	2.85		
Cr outside SiC (µg/compact):	**0.50**	**0.54**	**0.98**	**0.57**	**0.65**	**0.22**
Manganese						
Pre-burn leach (DRF-26A) (µg):	1.29	1.42	1.31	1.42		
Post-burn leach (DRF-26B) (µg):	0.45	0.31	0.33	0.37		
Total leached (µg):	1.75	1.73	1.64	1.78		
Mn outside SiC (µg/compact):	**0.35**	**0.35**	**0.33**	**0.36**	**0.345**	**0.013**
Cobalt						
Pre-burn leach (DRF-26A) (µg):	0.03	0.06	0.04	0.04		
Post-burn leach (DRF-26B) (µg):	0.05	0.06	0.08	0.05		
Total leached (µg):	0.09	0.11	0.12	0.09		
Co outside SiC (µg/compact):	**0.017**	**0.023**	**0.025**	**0.018**	**0.021**	**0.004**
Nickel						
Pre-burn leach (DRF-26A) (µg):	2.92	5.73	4.05	8.51		
Post-burn leach (DRF-26B) (µg):	2.85	2.57	3.38	2.75		
Total leached (µg):	5.77	8.30	7.43	11.25		
Ni outside SiC (µg/compact):	**1.15**	**1.66**	**1.49**	**2.25**	**1.64**	**0.46**
Transition Metals						
Cr+Mn+Co+Ni outside SiC (µg/compact):	**2.03**	**2.57**	**2.82**	**3.20**	**2.65**	**0.49**
Calcium						
Pre-burn leach (DRF-26A) (µg):	532.64	567.86	491.77	489.92		
Post-burn leach (DRF-26B) (µg):	48.50	58.77	45.46	50.55		
Total leached (µg):	581.15	626.63	537.23	540.47		
Ca outside SiC (µg/compact):	**116.23**	**125.33**	**107.45**	**108.09**	**114.27**	**8.38**
Aluminum						
Pre-burn leach (DRF-26A) (µg):	604.67	606.05	573.87	595.01		
Post-burn leach (DRF-26B) (µg):	87.93	63.66	66.78	81.06		
Total leached (µg):	692.59	669.71	640.65	676.07		
Al outside SiC (µg/compact):	**138.52**	**133.94**	**128.13**	**135.21**	**133.95**	**4.33**
Titanium						
Pre-burn leach (DRF-26A) (µg):	21.57	19.58	24.84	28.18		
Post-burn leach (DRF-26B) (µg):	29.17	26.65	22.17	21.10		
Total leached (µg):	50.74	46.23	47.01	49.28		
Ti outside SiC (µg/compact):	**10.15**	**9.25**	**9.40**	**9.86**	**9.66**	**0.41**
Vanadium						
Pre-burn leach (DRF-26A) (µg):	15.10	16.29	15.81	16.51		
Post-burn leach (DRF-26B) (µg):	13.02	11.04	11.55	11.38		
Total leached (µg):	28.13	27.33	27.36	27.90		
V outside SiC (µg/compact):	**5.63**	**5.47**	**5.47**	**5.58**	**5.54**	**0.08**
Titanium and Vanadium						
Ti + V outside SiC (µg/compact):	**15.77**	**14.71**	**14.87**	**15.43**	**15.20**	**0.49**

Comments

Data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1009, 1015, 1059, 1065, 1069	1013, 1026, 1029, 1066, 1071	1054, 1062, 1089, 1096, 1097	1023, 1040, 1048, 1084, 1088	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	2.1E+00	3.1E+00	2.0E+00	2.7E+00	1.0E+01

Comments

Data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1021, 1042, 1056, 1093, 1105	1004, 1016, 1018, 1085, 1101	1006, 1057, 1068, 1078, 1107	1002, 1036, 1038, 1083, 1098	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	3.3E-02	4.6E-02	1.1E+00	3.2E-02	1.2E+00

Comments

Data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1052, 1086, 1104, 1034, 1007	1072, 1064, 1027, 1103, 1061	1094, 1050, 1106, 1079, 1041	1031, 1080, 1076, 1092, 1051	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	1.0E+00	1.0E+00	1.1E+00	3.6E-02	3.2E+00

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1167, 1137, 1162, 1129, 1136	1124, 1151, 1211, 1166, 1170	1194, 1195, 1156, 1169, 1205	1126, 1140, 1184, 1203, 1191	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	4.5E+00	2.3E-01	4.6E-02	2.1E+00	6.8E+00

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-C: Summary of Pre-burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1213, 1179, 1128, 1112, 1123	1145, 1186, 1113, 1214, 1119	1148, 1159, 1127, 1190, 1189	1202, 1121, 1208, 1207, 1183	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	2.0E+00	4.3E-02	2.1E+00	1.1E+00	5.2E+00

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1009, 1015, 1059, 1065, 1069	1013, 1026, 1029, 1066, 1071	1054, 1062, 1089, 1096, 1097	1023, 1040, 1048, 1084, 1088	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	1.0E+00	8.6E-02	8.4E-01	1.0E+00	3.0E+00

Comments

Data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1021, 1042, 1056, 1093, 1105	1004, 1016, 1018, 1085, 1101	1006, 1057, 1068, 1078, 1107	1002, 1036, 1038, 1083, 1098	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	3.8E-02	3.2E-02	1.1E+00	3.5E-02	1.2E+00

Comments

Data has been verified.

Fred C. Montgomery
Operator

2-8-2018
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1052, 1086, 1104, 1034, 1007	1072, 1064, 1027, 1103, 1061	1094, 1050, 1106, 1079, 1041	1031, 1080, 1076, 1092, 1051	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	6.0E-02	2.1E+00	1.1E-01	2.1E+00	4.4E+00

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1167, 1137, 1162, 1129, 1136	1124, 1151, 1211, 1166, 1170	1194, 1195, 1156, 1169, 1205	1126, 1140, 1184, 1203, 1191	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	1.1E+00	1.1E+00	2.9E+00	3.9E-02	5.2E+00

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1213, 1179, 1128, 1112, 1123	1145, 1186, 1113, 1214, 1119	1148, 1159, 1127, 1190, 1189	1202, 1121, 1208, 1207, 1183	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	1.1E+00	3.3E-02	1.0E+00	1.0E+00	3.2E+00

Comments

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1009, 1015, 1059, 1065, 1069
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L17110801	L17110901		W17111001	
Total volume of leach solution (ml):		156.0	91.0		150.0	
Radiochemical laboratory analysis number:		17812-001	17812-006		17812-011	
Measured uranium concentration (µg/ml):		4.93E+00	5.99E-01		7.97E-02	
Uncertainty in uranium concentration (µg/ml):		4.93E-01	5.99E-02		7.97E-03	
Weight uranium leached (g):		7.69E-04	5.45E-05	8.36E-04	1.20E-05	Y
Uncertainty in weight uranium leached (g):		7.70E-05	5.46E-06	7.72E-05	1.20E-06	
Equivalent number of leached kernels:		1.95E+00	1.38E-01	2.12E+00	3.03E-02	
Uncertainty in equivalent number of leached kernels:		1.96E-01	1.39E-02	1.97E-01	3.05E-03	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL17812 on 1/31/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1013, 1026, 1029, 1066, 1071
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L17110802	L17110902		W17111002	
	Total volume of leach solution (ml):	138.0	113.0		142.0	
	Radiochemical laboratory analysis number:	17812-002	17812-007		17812-012	
	Measured uranium concentration (µg/ml):	2.44E+00	6.59E+00		8.93E-01	
	Uncertainty in uranium concentration (µg/ml):	2.44E-01	6.59E-01		8.93E-02	
	Weight uranium leached (g):	3.37E-04	7.45E-04	1.21E-03	1.27E-04	Y
	Uncertainty in weight uranium leached (g):	3.37E-05	7.46E-05	8.28E-05	1.27E-05	
	Equivalent number of leached kernels:	8.55E-01	1.89E+00	3.07E+00	3.22E-01	
	Uncertainty in equivalent number of leached kernels:	8.60E-02	1.90E-01	2.12E-01	3.24E-02	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL17812 on 1/31/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1054, 1062, 1089, 1096, 1097
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L17110803	L17110903		W17111003	
	Total volume of leach solution (ml):	131.0	92.0		160.0	
	Radiochemical laboratory analysis number:	17812-003	17812-008		17812-013	
	Measured uranium concentration (µg/ml):	5.47E+00	7.96E-01		9.34E-02	
	Uncertainty in uranium concentration (µg/ml):	5.47E-01	7.96E-02		9.34E-03	
	Weight uranium leached (g):	7.17E-04	7.32E-05	8.05E-04	1.49E-05	Y
	Uncertainty in weight uranium leached (g):	7.17E-05	7.34E-06	7.21E-05	1.50E-06	
	Equivalent number of leached kernels:	1.82E+00	1.86E-01	2.04E+00	3.79E-02	
	Uncertainty in equivalent number of leached kernels:	1.83E-01	1.87E-02	1.84E-01	3.81E-03	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL17812 on 1/31/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1023, 1040, 1048, 1084, 1088
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L17110804	L17110904		W17111004	
Total volume of leach solution (ml):		133.0	117.0		137.0	
Radiochemical laboratory analysis number:		17812-004	17812-009		17812-004	
Measured uranium concentration (µg/ml):		7.33E+00	8.19E-01		8.02E-02	
Uncertainty in uranium concentration (µg/ml):		7.33E-01	8.19E-02		8.02E-03	
Weight uranium leached (g):		9.75E-04	9.58E-05	1.08E-03	1.10E-05	Y
Uncertainty in weight uranium leached (g):		9.76E-05	9.60E-06	9.81E-05	1.10E-06	
Equivalent number of leached kernels:		2.47E+00	2.43E-01	2.75E+00	2.79E-02	
Uncertainty in equivalent number of leached kernels:		2.49E-01	2.45E-02	2.50E-01	2.81E-03	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL17812 on 1/31/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	Pre-burn leach blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 1_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L17110805	L17110905		W17111005	
	Total volume of leach solution (ml):	177.0	93.0		61.0	
	Radiochemical laboratory analysis number:	17812-005	17812-010		17812-015	
	Measured uranium concentration (µg/ml):	7.81E-04	9.35E-04		<4.00E-05	
	Uncertainty in uranium concentration (µg/ml):	7.81E-05	9.35E-05			
	Weight uranium leached (g):	1.38E-07	8.70E-08	2.25E-07	<2.44E-09	N
	Uncertainty in weight uranium leached (g):	1.38E-08	8.72E-09	1.64E-08		
	Equivalent number of leached kernels:	3.51E-04	2.21E-04	5.72E-04	6.19E-06	
	Uncertainty in equivalent number of leached kernels:	3.53E-05	2.22E-05	4.19E-05		
Fe	Measured concentration (µg/ml):			Fe		
	Total weight of leached impurity (µg):					
Cr	Measured concentration (µg/ml):			Cr		
	Total weight of leached impurity (µg):					
Mn	Measured concentration (µg/ml):			Mn		
	Total weight of leached impurity (µg):					
Co	Measured concentration (µg/ml):			Co		
	Total weight of leached impurity (µg):					
Ni	Measured concentration (µg/ml):			Ni		
	Total weight of leached impurity (µg):					
Ca	Measured concentration (µg/ml):			Ca		
	Total weight of leached impurity (µg):					
Al	Measured concentration (µg/ml):			Al		
	Total weight of leached impurity (µg):					
Ti	Measured concentration (µg/ml):			Ti		
	Total weight of leached impurity (µg):					
V	Measured concentration (µg/ml):			V		
	Total weight of leached impurity (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL17812 on 1/31/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1009, 1015, 1059, 1065, 1069
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B17112801	B17113001		W17113001	
	Total volume of leach solution (ml):	48.0	50.0		25.0	
	Radiochemical laboratory analysis number:	17858-001	17858-006		17858-011	
	Measured uranium concentration (µg/ml):	8.45E+00	6.58E-02		2.18E-03	
	Uncertainty in uranium concentration (µg/ml):	8.45E-01	6.25E-03		2.18E-04	
	Weight uranium leached (g):	4.06E-04	3.29E-06	4.09E-04	5.45E-08	N
	Uncertainty in weight uranium leached (g):	4.09E-05	3.15E-07	4.09E-05	5.63E-09	
	Equivalent number of leached kernels:	1.03E+00	8.35E-03	1.04E+00	1.38E-04	
	Uncertainty in equivalent number of leached kernels:	1.04E-01	8.05E-04	1.04E-01	1.44E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL17858 on 1/31/2018.

Fred C. Montgomery
Operator

2-6-2018
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1013, 1026, 1029, 1066, 1071
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B17112802	B17113002		W17113002	
	Total volume of leach solution (ml):	54.0	53.0		17.5	
	Radiochemical laboratory analysis number:	17858-002	17858-007		17858-012	
	Measured uranium concentration (µg/ml):	5.91E-01	3.82E-02		4.73E-03	
	Uncertainty in uranium concentration (µg/ml):	5.91E-02	3.82E-03		4.73E-04	
	Weight uranium leached (g):	3.19E-05	2.02E-06	3.39E-05	8.28E-08	N
	Uncertainty in weight uranium leached (g):	3.21E-06	2.04E-07	3.22E-06	8.83E-09	
	Equivalent number of leached kernels:	8.10E-02	5.14E-03	8.61E-02	2.10E-04	
	Uncertainty in equivalent number of leached kernels:	8.20E-03	5.20E-04	8.22E-03	2.25E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL17858 on 1/31/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1054, 1062, 1089, 1096, 1097
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B17112803	B17113003		W17113003	
	Total volume of leach solution (ml):	53.0	47.0		19.0	
	Radiochemical laboratory analysis number:	17858-003	17858-008		17858-013	
	Measured uranium concentration (µg/ml):	6.15E+00	1.03E-01		5.06E-03	
	Uncertainty in uranium concentration (µg/ml):	6.15E-01	1.03E-02		5.06E-04	
	Weight uranium leached (g):	3.26E-04	4.84E-06	3.31E-04	9.61E-08	N
	Uncertainty in weight uranium leached (g):	3.28E-05	4.89E-07	3.28E-05	1.02E-08	
	Equivalent number of leached kernels:	8.27E-01	1.23E-02	8.40E-01	2.44E-04	
	Uncertainty in equivalent number of leached kernels:	8.38E-02	1.25E-03	8.38E-02	2.59E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL17858 on 1/31/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1023, 1040, 1048, 1084, 1088
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 1_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B17112804	B17113004		W17113004	
Total volume of leach solution (ml):		50.0	49.0		19.0	
Radiochemical laboratory analysis number:		17858-004	17858-009		17858-014	
Measured uranium concentration (µg/ml):		5.70E+00	2.55E+00		7.67E-02	
Uncertainty in uranium concentration (µg/ml):		5.70E-01	2.55E-01		7.67E-03	
Weight uranium leached (g):		2.85E-04	1.25E-04	4.10E-04	1.46E-06	N
Uncertainty in weight uranium leached (g):		2.87E-05	1.26E-05	3.14E-05	1.54E-07	
Equivalent number of leached kernels:		7.23E-01	3.17E-01	1.04E+00	3.70E-03	
Uncertainty in equivalent number of leached kernels:		7.33E-02	3.21E-02	8.03E-02	3.93E-04	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL17858 on 1/31/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	Post-burn leach blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 1_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	L17112805	L17113005		W17113005	
	Total volume of leach solution (ml):	47.0	50.0		21.0	
	Radiochemical laboratory analysis number:	17858-005	17858-010		17858-015	
	Measured uranium concentration (µg/ml):	2.16E-03	5.66E-04		4.27E-04	
	Uncertainty in uranium concentration (µg/ml):	2.16E-04	5.66E-05		4.27E-05	
	Weight uranium leached (g):	1.02E-07	2.83E-08	1.30E-07	8.97E-09	N
	Uncertainty in weight uranium leached (g):	1.02E-08	2.85E-09	1.06E-08	9.39E-10	
	Equivalent number of leached kernels:	2.58E-04	7.18E-05	3.29E-04	2.28E-05	
	Uncertainty in equivalent number of leached kernels:	2.61E-05	7.28E-06	2.72E-05	2.39E-06	
Fe	Measured concentration (µg/ml):			Fe		
	Total weight of leached impurity (µg):					
Cr	Measured concentration (µg/ml):			Cr		
	Total weight of leached impurity (µg):					
Mn	Measured concentration (µg/ml):			Mn		
	Total weight of leached impurity (µg):					
Co	Measured concentration (µg/ml):			Co		
	Total weight of leached impurity (µg):					
Ni	Measured concentration (µg/ml):			Ni		
	Total weight of leached impurity (µg):					
Ca	Measured concentration (µg/ml):			Ca		
	Total weight of leached impurity (µg):					
Al	Measured concentration (µg/ml):			Al		
	Total weight of leached impurity (µg):					
Ti	Measured concentration (µg/ml):			Ti		
	Total weight of leached impurity (µg):					
V	Measured concentration (µg/ml):			V		
	Total weight of leached impurity (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL17858 on 1/31/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1021, 1042, 1056, 1093, 1105
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L17112001	L17112201			
Total volume of leach solution (ml):		118.0	159.0			
Radiochemical laboratory analysis number:		17843-001	17843-006			
Measured uranium concentration (µg/ml):		9.20E-02	1.42E-02			
Uncertainty in uranium concentration (µg/ml):		9.20E-03	1.42E-03			
Weight uranium leached (g):		1.09E-05	2.26E-06	1.31E-05		
Uncertainty in weight uranium leached (g):		1.09E-06	2.26E-07	1.11E-06		
Equivalent number of leached kernels:		2.76E-02	5.73E-03	3.33E-02		
Uncertainty in equivalent number of leached kernels:		2.77E-03	5.76E-04	2.84E-03		
Fe	Measured concentration of impurity in sample (µg/ml):	8.20E-01	1.31E-01	**Fe**		
	Uncorrected weight of impurity in sample (µg):	96.76	20.83	117.59		
	Weight of impurity in blank (µg):	6.47	8.88			
	Minimum corrected weight of impurity in sample (µg):	90.29	11.95	102.24		
	Maximum corrected weight of impurity in sample (µg):	90.29	11.95	102.24		
Cr	Measured concentration of impurity in sample (µg/ml):	1.18E-02	2.96E-03	**Cr**		
	Uncorrected weight of impurity in sample (µg):	1.39	0.47	1.86		
	Weight of impurity in blank (µg):	< 0.38	0.39			
	Minimum corrected weight of impurity in sample (µg):	1.01	0.08	1.08		
	Maximum corrected weight of impurity in sample (µg):	1.39	0.08	1.47		
Mn	Measured concentration of impurity in sample (µg/ml):	1.14E-02	1.85E-03	**Mn**		
	Uncorrected weight of impurity in sample (µg):	1.35	0.29	1.64		
	Weight of impurity in blank (µg):	0.15	0.20			
	Minimum corrected weight of impurity in sample (µg):	1.20	0.10	1.29		
	Maximum corrected weight of impurity in sample (µg):	1.20	0.10	1.29		
Co	Measured concentration of impurity in sample (µg/ml):	3.74E-04	5.92E-05	**Co**		
	Uncorrected weight of impurity in sample (µg):	0.04	0.01	0.05		
	Weight of impurity in blank (µg):	0.02	< 0.01			
	Minimum corrected weight of impurity in sample (µg):	0.02	0.00	0.02		
	Maximum corrected weight of impurity in sample (µg):	0.02	0.01	0.03		
Ni	Measured concentration of impurity in sample (µg/ml):	1.43E-02	7.77E-03	**Ni**		
	Uncorrected weight of impurity in sample (µg):	1.69	1.24	2.92		
	Weight of impurity in blank (µg):	< 0.98	< 0.97			
	Minimum corrected weight of impurity in sample (µg):	0.71	0.27	0.98		
	Maximum corrected weight of impurity in sample (µg):	1.69	1.24	2.92		
Ca	Measured concentration of impurity in sample (µg/ml):	3.63E+00	6.56E-01	**Ca**		
	Uncorrected weight of impurity in sample (µg):	428.34	104.30	532.64		
	Weight of impurity in blank (µg):	<43.96	<43.62			
	Minimum corrected weight of impurity in sample (µg):	384.38	60.68	445.07		
	Maximum corrected weight of impurity in sample (µg):	428.34	104.30	532.64		
Al	Measured concentration of impurity in sample (µg/ml):	4.30E+00	7.25E-01	**Al**		
	Uncorrected weight of impurity in sample (µg):	507.40	115.28	622.68		
	Weight of impurity in blank (µg):	9.44	8.57			
	Minimum corrected weight of impurity in sample (µg):	497.96	106.71	604.67		
	Maximum corrected weight of impurity in sample (µg):	497.96	106.71	604.67		
Ti	Measured concentration of impurity in sample (µg/ml):	8.62E-02	7.17E-02	**Ti**		
	Uncorrected weight of impurity in sample (µg):	10.17	11.40	21.57		
	Weight of impurity in blank (µg):	< 0.70	< 0.69			
	Minimum corrected weight of impurity in sample (µg):	9.47	10.71	20.18		
	Maximum corrected weight of impurity in sample (µg):	10.17	11.40	21.57		
V	Measured concentration of impurity in sample (µg/ml):	9.89E-02	2.16E-02	**V**		
	Uncorrected weight of impurity in sample (µg):	11.67	3.43	15.10		
	Weight of impurity in blank (µg):	< 0.02	< 0.02			
	Minimum corrected weight of impurity in sample (µg):	11.65	3.42	15.07		
	Maximum corrected weight of impurity in sample (µg):	11.67	3.43	15.10		

Comments

Water rinse not analyzed.
FCM checked the data against the official results of RMAL17843 on 2/5/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1004, 1016, 1018, 1085, 1101
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L17112002	L17112202			
	Total volume of leach solution (ml):	121.0	154.0			
	Radiochemical laboratory analysis number:	17843-002	17843-007			
	Measured uranium concentration (µg/ml):	1.26E-01	1.75E-02			
	Uncertainty in uranium concentration (µg/ml):	1.26E-02	1.75E-03			
	Weight uranium leached (g):	1.52E-05	2.70E-06	1.79E-05		
	Uncertainty in weight uranium leached (g):	1.53E-06	2.70E-07	1.55E-06		
	Equivalent number of leached kernels:	3.87E-02	6.84E-03	4.55E-02		
	Uncertainty in equivalent number of leached kernels:	3.89E-03	6.88E-04	3.96E-03		
Fe	Measured concentration of impurity in sample (µg/ml):	8.98E-01	1.36E-01	**Fe**		
	Uncorrected weight of impurity in sample (µg):	108.66	20.94	129.60		
	Weight of impurity in blank (µg):	6.47	8.88			
	Minimum corrected weight of impurity in sample (µg):	102.19	12.06	114.25		
	Maximum corrected weight of impurity in sample (µg):	102.19	12.06	114.25		
Cr	Measured concentration of impurity in sample (µg/ml):	1.37E-02	4.29E-03	**Cr**		
	Uncorrected weight of impurity in sample (µg):	1.66	0.66	2.32		
	Weight of impurity in blank (µg):	< 0.38	0.39			
	Minimum corrected weight of impurity in sample (µg):	1.27	0.27	1.54		
	Maximum corrected weight of impurity in sample (µg):	1.66	0.27	1.92		
Mn	Measured concentration of impurity in sample (µg/ml):	1.21E-02	1.98E-03	**Mn**		
	Uncorrected weight of impurity in sample (µg):	1.46	0.30	1.77		
	Weight of impurity in blank (µg):	0.15	0.20			
	Minimum corrected weight of impurity in sample (µg):	1.31	0.11	1.42		
	Maximum corrected weight of impurity in sample (µg):	1.31	0.11	1.42		
Co	Measured concentration of impurity in sample (µg/ml):	5.22E-04	8.52E-05	**Co**		
	Uncorrected weight of impurity in sample (µg):	0.06	0.01	0.08		
	Weight of impurity in blank (µg):	0.02	< 0.01			
	Minimum corrected weight of impurity in sample (µg):	0.04	0.00	0.05		
	Maximum corrected weight of impurity in sample (µg):	0.04	0.01	0.06		
Ni	Measured concentration of impurity in sample (µg/ml):	3.39E-02	1.06E-02	**Ni**		
	Uncorrected weight of impurity in sample (µg):	4.10	1.63	5.73		
	Weight of impurity in blank (µg):	< 0.98	< 0.97			
	Minimum corrected weight of impurity in sample (µg):	3.13	0.66	3.79		
	Maximum corrected weight of impurity in sample (µg):	4.10	1.63	5.73		
Ca	Measured concentration of impurity in sample (µg/ml):	3.68E+00	7.96E-01	**Ca**		
	Uncorrected weight of impurity in sample (µg):	445.28	122.58	567.86		
	Weight of impurity in blank (µg):	<43.96	<43.62			
	Minimum corrected weight of impurity in sample (µg):	401.32	78.96	480.29		
	Maximum corrected weight of impurity in sample (µg):	445.28	122.58	567.86		
Al	Measured concentration of impurity in sample (µg/ml):	4.32E+00	6.58E-01	**Al**		
	Uncorrected weight of impurity in sample (µg):	522.72	101.33	624.05		
	Weight of impurity in blank (µg):	9.44	8.57			
	Minimum corrected weight of impurity in sample (µg):	513.28	92.76	606.05		
	Maximum corrected weight of impurity in sample (µg):	513.28	92.76	606.05		
Ti	Measured concentration of impurity in sample (µg/ml):	8.34E-02	6.16E-02	**Ti**		
	Uncorrected weight of impurity in sample (µg):	10.09	9.49	19.58		
	Weight of impurity in blank (µg):	< 0.70	< 0.69			
	Minimum corrected weight of impurity in sample (µg):	9.39	8.79	18.19		
	Maximum corrected weight of impurity in sample (µg):	10.09	9.49	19.58		
V	Measured concentration of impurity in sample (µg/ml):	1.06E-01	2.25E-02	**V**		
	Uncorrected weight of impurity in sample (µg):	12.83	3.47	16.29		
	Weight of impurity in blank (µg):	< 0.02	< 0.02			
	Minimum corrected weight of impurity in sample (µg):	12.81	3.45	16.26		
	Maximum corrected weight of impurity in sample (µg):	12.83	3.47	16.29		

Comments

Water rinse not analyzed.
FCM checked the data against the official results of RMAL17843 on 2/5/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1006, 1057, 1068, 1078, 1107
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L17112003	L17112203			
	Total volume of leach solution (ml):	119.0	147.0			
	Radiochemical laboratory analysis number:	17843-003	17843-008			
	Measured uranium concentration (µg/ml):	3.09E+00	4.08E-01			
	Uncertainty in uranium concentration (µg/ml):	3.09E-01	4.08E-02			
	Weight uranium leached (g):	3.68E-04	6.00E-05	4.28E-04		
	Uncertainty in weight uranium leached (g):	3.68E-05	6.00E-06	3.73E-05		
	Equivalent number of leached kernels:	9.33E-01	1.52E-01	1.09E+00		
	Uncertainty in equivalent number of leached kernels:	9.39E-02	1.53E-02	9.53E-02		
Fe	Measured concentration of impurity in sample (µg/ml):	9.47E-01	1.74E-01	**Fe**		
	Uncorrected weight of impurity in sample (µg):	112.69	25.58	138.27		
	Weight of impurity in blank (µg):	6.47	8.88			
	Minimum corrected weight of impurity in sample (µg):	106.23	16.70	122.92		
	Maximum corrected weight of impurity in sample (µg):	106.23	16.70	122.92		
Cr	Measured concentration of impurity in sample (µg/ml):	2.70E-02	7.95E-03	**Cr**		
	Uncorrected weight of impurity in sample (µg):	3.21	1.17	4.38		
	Weight of impurity in blank (µg):	< 0.38	0.39			
	Minimum corrected weight of impurity in sample (µg):	2.83	0.77	3.60		
	Maximum corrected weight of impurity in sample (µg):	3.21	0.77	3.99		
Mn	Measured concentration of impurity in sample (µg/ml):	1.12E-02	2.20E-03	**Mn**		
	Uncorrected weight of impurity in sample (µg):	1.33	0.32	1.66		
	Weight of impurity in blank (µg):	0.15	0.20			
	Minimum corrected weight of impurity in sample (µg):	1.18	0.13	1.31		
	Maximum corrected weight of impurity in sample (µg):	1.18	0.13	1.31		
Co	Measured concentration of impurity in sample (µg/ml):	4.29E-04	7.76E-05	**Co**		
	Uncorrected weight of impurity in sample (µg):	0.05	0.01	0.06		
	Weight of impurity in blank (µg):	0.02	< 0.01			
	Minimum corrected weight of impurity in sample (µg):	0.03	0.00	0.03		
	Maximum corrected weight of impurity in sample (µg):	0.03	0.01	0.04		
Ni	Measured concentration of impurity in sample (µg/ml):	2.49E-02	< 7.40E-03	**Ni**		
	Uncorrected weight of impurity in sample (µg):	2.96	< 1.09	< 4.05		
	Weight of impurity in blank (µg):	< 0.98	< 0.97			
	Minimum corrected weight of impurity in sample (µg):	1.99	0.00	1.99		
	Maximum corrected weight of impurity in sample (µg):	2.96	1.09	4.05		
Ca	Measured concentration of impurity in sample (µg/ml):	3.40E+00	5.93E-01	**Ca**		
	Uncorrected weight of impurity in sample (µg):	404.60	87.17	491.77		
	Weight of impurity in blank (µg):	<43.96	<43.62			
	Minimum corrected weight of impurity in sample (µg):	360.64	43.55	404.19		
	Maximum corrected weight of impurity in sample (µg):	404.60	87.17	491.77		
Al	Measured concentration of impurity in sample (µg/ml):	4.03E+00	7.64E-01	**Al**		
	Uncorrected weight of impurity in sample (µg):	479.57	112.31	591.88		
	Weight of impurity in blank (µg):	9.44	8.57			
	Minimum corrected weight of impurity in sample (µg):	470.13	103.74	573.87		
	Maximum corrected weight of impurity in sample (µg):	470.13	103.74	573.87		
Ti	Measured concentration of impurity in sample (µg/ml):	9.99E-02	8.81E-02	**Ti**		
	Uncorrected weight of impurity in sample (µg):	11.89	12.95	24.84		
	Weight of impurity in blank (µg):	< 0.70	< 0.69			
	Minimum corrected weight of impurity in sample (µg):	11.19	12.26	23.45		
	Maximum corrected weight of impurity in sample (µg):	11.89	12.95	24.84		
V	Measured concentration of impurity in sample (µg/ml):	1.02E-01	2.50E-02	**V**		
	Uncorrected weight of impurity in sample (µg):	12.14	3.68	15.81		
	Weight of impurity in blank (µg):	< 0.02	< 0.02			
	Minimum corrected weight of impurity in sample (µg):	12.12	3.66	15.78		
	Maximum corrected weight of impurity in sample (µg):	12.14	3.68	15.81		

Comments

Water rinse not analyzed.
FCM checked the data against the official results of RMAL17843 on 2/5/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1002, 1036, 1038, 1083, 1098
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L17112004	L17112204			
	Total volume of leach solution (ml):	116.0	140.0			
	Radiochemical laboratory analysis number:	17843-004	17843-009			
	Measured uranium concentration (µg/ml):	8.84E-02	1.79E-02			
	Uncertainty in uranium concentration (µg/ml):	8.84E-03	1.79E-03			
	Weight uranium leached (g):	1.03E-05	2.51E-06	1.28E-05		
	Uncertainty in weight uranium leached (g):	1.03E-06	2.51E-07	1.06E-06		
	Equivalent number of leached kernels:	2.60E-02	6.36E-03	3.24E-02		
	Uncertainty in equivalent number of leached kernels:	2.62E-03	6.40E-04	2.70E-03		
Fe	Measured concentration of impurity in sample (µg/ml):	9.46E-01	1.76E-01	**Fe**		
	Uncorrected weight of impurity in sample (µg):	109.74	24.64	134.38		
	Weight of impurity in blank (µg):	6.47	8.88			
	Minimum corrected weight of impurity in sample (µg):	103.27	15.76	119.03		
	Maximum corrected weight of impurity in sample (µg):	103.27	15.76	119.03		
Cr	Measured concentration of impurity in sample (µg/ml):	1.39E-02	5.73E-03	**Cr**		
	Uncorrected weight of impurity in sample (µg):	1.61	0.80	2.41		
	Weight of impurity in blank (µg):	< 0.38	0.39			
	Minimum corrected weight of impurity in sample (µg):	1.23	0.41	1.64		
	Maximum corrected weight of impurity in sample (µg):	1.61	0.41	2.02		
Mn	Measured concentration of impurity in sample (µg/ml):	1.20E-02	2.65E-03	**Mn**		
	Uncorrected weight of impurity in sample (µg):	1.39	0.37	1.76		
	Weight of impurity in blank (µg):	0.15	0.20			
	Minimum corrected weight of impurity in sample (µg):	1.24	0.17	1.42		
	Maximum corrected weight of impurity in sample (µg):	1.24	0.17	1.42		
Co	Measured concentration of impurity in sample (µg/ml):	4.18E-04	9.00E-05	**Co**		
	Uncorrected weight of impurity in sample (µg):	0.05	0.01	0.06		
	Weight of impurity in blank (µg):	0.02	< 0.01			
	Minimum corrected weight of impurity in sample (µg):	0.03	0.00	0.03		
	Maximum corrected weight of impurity in sample (µg):	0.03	0.01	0.04		
Ni	Measured concentration of impurity in sample (µg/ml):	6.44E-02	< 7.40E-03	**Ni**		
	Uncorrected weight of impurity in sample (µg):	7.47	< 1.04	< 8.51		
	Weight of impurity in blank (µg):	< 0.98	< 0.97			
	Minimum corrected weight of impurity in sample (µg):	6.49	0.00	6.49		
	Maximum corrected weight of impurity in sample (µg):	7.47	1.04	8.51		
Ca	Measured concentration of impurity in sample (µg/ml):	3.48E+00	6.16E-01	**Ca**		
	Uncorrected weight of impurity in sample (µg):	403.68	86.24	489.92		
	Weight of impurity in blank (µg):	<43.96	<43.62			
	Minimum corrected weight of impurity in sample (µg):	359.72	42.62	402.34		
	Maximum corrected weight of impurity in sample (µg):	403.68	86.24	489.92		
Al	Measured concentration of impurity in sample (µg/ml):	4.33E+00	7.91E-01	**Al**		
	Uncorrected weight of impurity in sample (µg):	502.28	110.74	613.02		
	Weight of impurity in blank (µg):	9.44	8.57			
	Minimum corrected weight of impurity in sample (µg):	492.84	102.17	595.01		
	Maximum corrected weight of impurity in sample (µg):	492.84	102.17	595.01		
Ti	Measured concentration of impurity in sample (µg/ml):	1.21E-01	1.01E-01	**Ti**		
	Uncorrected weight of impurity in sample (µg):	14.04	14.14	28.18		
	Weight of impurity in blank (µg):	< 0.70	< 0.69			
	Minimum corrected weight of impurity in sample (µg):	13.34	13.45	26.78		
	Maximum corrected weight of impurity in sample (µg):	14.04	14.14	28.18		
V	Measured concentration of impurity in sample (µg/ml):	1.10E-01	2.68E-02	**V**		
	Uncorrected weight of impurity in sample (µg):	12.76	3.75	16.51		
	Weight of impurity in blank (µg):	< 0.02	< 0.02			
	Minimum corrected weight of impurity in sample (µg):	12.74	3.73	16.48		
	Maximum corrected weight of impurity in sample (µg):	12.76	3.75	16.51		

Comments

Water rinse not analyzed.
FCM checked the data against the official results of RMAL17843 on 2/5/2018.

Fred C. Montgomery — Operator

2-8-2018 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	Pre-burn leach blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 2_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L17112005	L17112205			
	Total volume of leach solution (ml):	132.0	131.0			
	Radiochemical laboratory analysis number:	17843-005	17843-010			
	Measured uranium concentration (µg/ml):	3.21E-04	4.56E-04			
	Uncertainty in uranium concentration (µg/ml):	3.21E-05	4.56E-05			
	Weight uranium leached (g):	4.24E-08	5.97E-08	1.02E-07		
	Uncertainty in weight uranium leached (g):	4.24E-09	5.98E-09	7.33E-09		
	Equivalent number of leached kernels:	1.08E-04	1.52E-04	2.59E-04		
	Uncertainty in equivalent number of leached kernels:	1.08E-05	1.53E-05	1.88E-05		
Fe	Measured concentration (µg/ml):	4.90E-02	6.78E-02	**Fe**		
	Total weight of leached impurity (µg):	6.47	8.88	15.35		
Cr	Measured concentration (µg/ml):	< 2.91E-03	3.01E-03	**Cr**		
	Total weight of leached impurity (µg):	< 0.38	0.39	< 0.78		
Mn	Measured concentration (µg/ml):	1.13E-03	1.51E-03	**Mn**		
	Total weight of leached impurity (µg):	0.15	0.20	0.35		
Co	Measured concentration (µg/ml):	6.55E-04	2.49E-03	**Co**		
	Total weight of leached impurity (µg):	0.02	< 0.01	< 0.03		
Ni	Measured concentration (µg/ml):	< 7.40E-03	< 7.40E-03	**Ni**		
	Total weight of leached impurity (µg):	< 0.98	< 0.97	< 1.95		
Ca	Measured concentration (µg/ml):	< 3.33E-01	< 3.33E-01	**Ca**		
	Total weight of leached impurity (µg):	<43.96	<43.62	<87.58		
Al	Measured concentration (µg/ml):	7.15E-02	6.54E-02	**Al**		
	Total weight of leached impurity (µg):	9.44	8.57	18.01		
Ti	Measured concentration (µg/ml):	< 5.29E-03	< 5.29E-03	**Ti**		
	Total weight of leached impurity (µg):	< 0.70	< 0.69	< 1.39		
V	Measured concentration (µg/ml):	< 1.33E-04	< 1.33E-04	**V**		
	Total weight of leached impurity (µg):	< 0.02	< 0.02	< 0.03		

Comments

Water rinse not analyzed.
FCM checked the data against the official results of RMAL17843 on 2/5/2018.
Cobalt values for this Blank sample were an artifact of contamination introduced during analysis. Reported values for 1st and 2nd leach of 0.09 µg and 0.33 µg, respectively, were replaced with typical values 0.02 and <0.01.

Fred C. Montgomery
Operator

2-8-2018
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1021, 1042, 1056, 1093, 1105
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B17120501	B17120801		W17120801	
	Total volume of leach solution (ml):	47.0	50.0		25.0	
	Radiochemical laboratory analysis number:	17875-001	17875-006		17875-011	
	Measured uranium concentration (µg/ml):	3.10E-01	5.72E-03		1.40E-03	
	Uncertainty in uranium concentration (µg/ml):	3.10E-02	5.72E-04		1.40E-04	
	Weight uranium leached (g):	1.46E-05	2.86E-07	1.49E-05	3.50E-08	N
	Uncertainty in weight uranium leached (g):	1.47E-06	2.88E-08	1.47E-06	3.62E-09	
	Equivalent number of leached kernels:	3.70E-02	7.26E-04	3.77E-02	8.88E-05	
	Uncertainty in equivalent number of leached kernels:	3.75E-03	7.36E-05	3.75E-03	9.22E-06	
Fe	Measured concentration of impurity in sample (µg/ml):	2.38E+00	< 1.09E-01	**Fe**	< 1.09E-01	
	Uncorrected weight of impurity in sample (µg):	111.86	< 5.45	<117.31	< 2.73	N
	Weight of impurity in blank (µg):	< 5.23	< 5.56		< 1.96	
	Minimum corrected weight of impurity in sample (µg):	106.63	0.00	106.63	0.00	
	Maximum corrected weight of impurity in sample (µg):	111.86	5.45	117.31	2.73	
Cr	Measured concentration of impurity in sample (µg/ml):	2.18E-02	< 5.79E-04	**Cr**	< 5.79E-04	
	Uncorrected weight of impurity in sample (µg):	1.02	< 0.03	< 1.05	< 0.01	N
	Weight of impurity in blank (µg):	< 0.03	< 0.03		< 0.01	
	Minimum corrected weight of impurity in sample (µg):	1.00	0.00	1.00	0.00	
	Maximum corrected weight of impurity in sample (µg):	1.02	0.03	1.05	0.01	
Mn	Measured concentration of impurity in sample (µg/ml):	8.36E-03	1.23E-03	**Mn**	< 9.36E-04	
	Uncorrected weight of impurity in sample (µg):	0.39	0.06	0.45	< 0.02	N
	Weight of impurity in blank (µg):	< 0.04	< 0.05		< 0.02	
	Minimum corrected weight of impurity in sample (µg):	0.35	0.01	0.36	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.39	0.06	0.45	0.02	
Co	Measured concentration of impurity in sample (µg/ml):	1.41E-03	< 1.69E-04	**Co**	< 1.69E-04	
	Uncorrected weight of impurity in sample (µg):	0.07	< 0.01	< 0.07	< 0.00	N
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.05	0.00	0.05	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.05	0.01	0.05	0.00	
Ni	Measured concentration of impurity in sample (µg/ml):	4.43E-02	< 1.54E-02	**Ni**	< 1.54E-02	
	Uncorrected weight of impurity in sample (µg):	2.08	< 0.77	< 2.85	< 0.39	N
	Weight of impurity in blank (µg):	< 0.74	< 0.79		< 0.28	
	Minimum corrected weight of impurity in sample (µg):	1.34	0.00	1.34	0.00	
	Maximum corrected weight of impurity in sample (µg):	2.08	0.77	2.85	0.39	
Ca	Measured concentration of impurity in sample (µg/ml):	9.87E-01	2.30E-01	**Ca**	9.59E-02	
	Uncorrected weight of impurity in sample (µg):	46.39	11.50	60.29	2.40	Y
	Weight of impurity in blank (µg):	7.58	3.27		0.93	
	Minimum corrected weight of impurity in sample (µg):	38.81	8.23	48.50	1.47	
	Maximum corrected weight of impurity in sample (µg):	38.81	8.23	48.50	1.47	
Al	Measured concentration of impurity in sample (µg/ml):	1.51E+00	3.20E-01	**Al**	1.29E-01	
	Uncorrected weight of impurity in sample (µg):	70.97	16.00	93.42	6.45	Y
	Weight of impurity in blank (µg):	1.78	2.20		1.52	
	Minimum corrected weight of impurity in sample (µg):	69.19	13.80	87.93	4.93	
	Maximum corrected weight of impurity in sample (µg):	69.19	13.80	87.93	4.93	
Ti	Measured concentration of impurity in sample (µg/ml):	5.44E-01	7.20E-02	**Ti**	1.11E-02	
	Uncorrected weight of impurity in sample (µg):	25.57	3.60	29.17	0.28	N
	Weight of impurity in blank (µg):	< 0.18	< 0.19		< 0.07	
	Minimum corrected weight of impurity in sample (µg):	25.39	3.41	28.80	0.21	
	Maximum corrected weight of impurity in sample (µg):	25.57	3.60	29.17	0.28	
V	Measured concentration of impurity in sample (µg/ml):	2.73E-01	3.87E-03	**V**	< 8.43E-04	
	Uncorrected weight of impurity in sample (µg):	12.83	0.19	13.02	< 0.02	N
	Weight of impurity in blank (µg):	< 0.04	< 0.04		< 0.02	
	Minimum corrected weight of impurity in sample (µg):	12.79	0.15	12.94	0.00	
	Maximum corrected weight of impurity in sample (µg):	12.83	0.19	13.02	0.02	

Comments

FCM checked the data against the official results of RMAL17875 on 2/5/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1004, 1016, 1018, 1085, 1101
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B17120502	B17120802		W17120802	
	Total volume of leach solution (ml):	41.0	48.0		19.0	
	Radiochemical laboratory analysis number:	17875-002	17875-007		17875-012	
	Measured uranium concentration (µg/ml):	3.02E-01	6.22E-03		3.11E-03	
	Uncertainty in uranium concentration (µg/ml):	3.02E-02	6.22E-04		3.11E-04	
	Weight uranium leached (g):	1.24E-05	2.99E-07	1.27E-05	5.91E-08	N
	Uncertainty in weight uranium leached (g):	1.25E-06	3.01E-08	1.25E-06	6.25E-09	
	Equivalent number of leached kernels:	3.14E-02	7.58E-04	3.22E-02	1.50E-04	
	Uncertainty in equivalent number of leached kernels:	3.20E-03	7.68E-05	3.20E-03	1.59E-05	
Fe	Measured concentration of impurity in sample (µg/ml):	2.74E+00	1.17E-01	Fe	< 1.09E-01	
	Uncorrected weight of impurity in sample (µg):	112.34	5.62	117.96	< 2.07	N
	Weight of impurity in blank (µg):	< 5.23	< 5.56		< 1.96	
	Minimum corrected weight of impurity in sample (µg):	107.11	0.06	107.17	0.00	
	Maximum corrected weight of impurity in sample (µg):	112.34	5.62	117.96	2.07	
Cr	Measured concentration of impurity in sample (µg/ml):	1.81E-02	< 5.79E-04	Cr	< 5.79E-04	
	Uncorrected weight of impurity in sample (µg):	0.74	< 0.03	< 0.77	< 0.01	N
	Weight of impurity in blank (µg):	< 0.03	< 0.03		< 0.01	
	Minimum corrected weight of impurity in sample (µg):	0.71	0.00	0.71	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.74	0.03	0.77	0.01	
Mn	Measured concentration of impurity in sample (µg/ml):	6.42E-03	< 9.36E-04	Mn	< 9.36E-04	
	Uncorrected weight of impurity in sample (µg):	0.26	< 0.04	< 0.31	< 0.02	N
	Weight of impurity in blank (µg):	< 0.04	< 0.05		< 0.02	
	Minimum corrected weight of impurity in sample (µg):	0.22	0.00	0.22	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.26	0.04	0.31	0.02	
Co	Measured concentration of impurity in sample (µg/ml):	1.74E-03	< 1.69E-04	Co	< 1.69E-04	
	Uncorrected weight of impurity in sample (µg):	0.07	< 0.01	< 0.08	< 0.00	N
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.05	0.00	0.05	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.05	0.01	0.06	0.00	
Ni	Measured concentration of impurity in sample (µg/ml):	4.46E-02	< 1.54E-02	Ni	< 1.54E-02	
	Uncorrected weight of impurity in sample (µg):	1.83	< 0.74	< 2.57	< 0.29	N
	Weight of impurity in blank (µg):	< 0.74	< 0.79		< 0.28	
	Minimum corrected weight of impurity in sample (µg):	1.09	0.00	1.09	0.00	
	Maximum corrected weight of impurity in sample (µg):	1.83	0.74	2.57	0.29	
Ca	Measured concentration of impurity in sample (µg/ml):	8.03E-01	7.10E-01	Ca	1.87E-01	
	Uncorrected weight of impurity in sample (µg):	32.92	34.08	70.56	3.55	Y
	Weight of impurity in blank (µg):	7.58	3.27		0.93	
	Minimum corrected weight of impurity in sample (µg):	25.34	30.81	58.77	2.62	
	Maximum corrected weight of impurity in sample (µg):	25.34	30.81	58.77	2.62	
Al	Measured concentration of impurity in sample (µg/ml):	1.09E+00	4.31E-01	Al	1.99E-01	
	Uncorrected weight of impurity in sample (µg):	44.69	20.69	69.16	3.78	Y
	Weight of impurity in blank (µg):	1.78	2.20		1.52	
	Minimum corrected weight of impurity in sample (µg):	42.91	18.48	63.66	2.27	
	Maximum corrected weight of impurity in sample (µg):	42.91	18.48	63.66	2.27	
Ti	Measured concentration of impurity in sample (µg/ml):	5.51E-01	8.46E-02	Ti	1.32E-02	
	Uncorrected weight of impurity in sample (µg):	22.59	4.06	26.65	0.25	N
	Weight of impurity in blank (µg):	< 0.18	< 0.19		< 0.07	
	Minimum corrected weight of impurity in sample (µg):	22.41	3.87	26.29	0.18	
	Maximum corrected weight of impurity in sample (µg):	22.59	4.06	26.65	0.25	
V	Measured concentration of impurity in sample (µg/ml):	2.65E-01	3.67E-03	V	< 8.43E-04	
	Uncorrected weight of impurity in sample (µg):	10.87	0.18	11.04	< 0.02	N
	Weight of impurity in blank (µg):	< 0.04	< 0.04		< 0.02	
	Minimum corrected weight of impurity in sample (µg):	10.82	0.13	10.96	0.00	
	Maximum corrected weight of impurity in sample (µg):	10.87	0.18	11.04	0.02	

Comments

FCM checked the data against the official results of RMAL17875 on 2/5/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1006, 1057, 1068, 1078, 1107
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B17120503	B17120803		W17120803	
	Total volume of leach solution (ml):	45.0	46.0		20.0	
	Radiochemical laboratory analysis number:	17875-003	17875-008		17875-013	
	Measured uranium concentration (µg/ml):	9.28E+00	7.20E-02		3.16E-03	
	Uncertainty in uranium concentration (µg/ml):	9.28E-01	7.20E-03		3.16E-04	
	Weight uranium leached (g):	4.18E-04	3.31E-06	4.21E-04	6.32E-08	N
	Uncertainty in weight uranium leached (g):	4.22E-05	3.34E-07	4.22E-05	6.65E-09	
	Equivalent number of leached kernels:	1.06E+00	8.41E-03	1.07E+00	1.60E-04	
	Uncertainty in equivalent number of leached kernels:	1.08E-01	8.53E-04	1.08E-01	1.69E-05	
Fe	Measured concentration of impurity in sample (µg/ml):	3.32E+00	1.22E-01	**Fe**	< 1.09E-01	
	Uncorrected weight of impurity in sample (µg):	149.40	5.61	155.01	< 2.18	N
	Weight of impurity in blank (µg):	< 5.23	< 5.56		< 1.96	
	Minimum corrected weight of impurity in sample (µg):	144.17	0.05	144.22	0.00	
	Maximum corrected weight of impurity in sample (µg):	149.40	5.61	155.01	2.18	
Cr	Measured concentration of impurity in sample (µg/ml):	1.94E-02	< 5.79E-04	**Cr**	< 5.79E-04	
	Uncorrected weight of impurity in sample (µg):	0.87	< 0.03	< 0.90	< 0.01	N
	Weight of impurity in blank (µg):	< 0.03	< 0.03		< 0.01	
	Minimum corrected weight of impurity in sample (µg):	0.85	0.00	0.85	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.87	0.03	0.90	0.01	
Mn	Measured concentration of impurity in sample (µg/ml):	6.30E-03	< 9.36E-04	**Mn**	< 9.36E-04	
	Uncorrected weight of impurity in sample (µg):	0.28	< 0.04	< 0.33	< 0.02	N
	Weight of impurity in blank (µg):	< 0.04	< 0.05		< 0.02	
	Minimum corrected weight of impurity in sample (µg):	0.24	0.00	0.24	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.28	0.04	0.33	0.02	
Co	Measured concentration of impurity in sample (µg/ml):	2.12E-03	< 1.69E-04	**Co**	< 1.69E-04	
	Uncorrected weight of impurity in sample (µg):	0.10	< 0.01	< 0.10	< 0.00	N
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.07	0.00	0.07	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.07	0.01	0.08	0.00	
Ni	Measured concentration of impurity in sample (µg/ml):	5.94E-02	< 1.54E-02	**Ni**	< 1.54E-02	
	Uncorrected weight of impurity in sample (µg):	2.67	< 0.71	< 3.38	< 0.31	N
	Weight of impurity in blank (µg):	< 0.74	< 0.79		< 0.28	
	Minimum corrected weight of impurity in sample (µg):	1.93	0.00	1.93	0.00	
	Maximum corrected weight of impurity in sample (µg):	2.67	0.71	3.38	0.31	
Ca	Measured concentration of impurity in sample (µg/ml):	1.01E+00	2.02E-01	**Ca**	1.25E-01	
	Uncorrected weight of impurity in sample (µg):	45.45	9.29	57.24	2.50	Y
	Weight of impurity in blank (µg):	7.58	3.27		0.93	
	Minimum corrected weight of impurity in sample (µg):	37.87	6.02	45.46	1.57	
	Maximum corrected weight of impurity in sample (µg):	37.87	6.02	45.46	1.57	
Al	Measured concentration of impurity in sample (µg/ml):	1.29E+00	2.27E-01	**Al**	1.89E-01	
	Uncorrected weight of impurity in sample (µg):	58.05	10.44	72.27	3.78	Y
	Weight of impurity in blank (µg):	1.78	2.20		1.52	
	Minimum corrected weight of impurity in sample (µg):	56.27	8.24	66.78	2.26	
	Maximum corrected weight of impurity in sample (µg):	56.27	8.24	66.78	2.26	
Ti	Measured concentration of impurity in sample (µg/ml):	4.29E-01	6.22E-02	**Ti**	9.67E-03	
	Uncorrected weight of impurity in sample (µg):	19.31	2.86	22.17	0.19	N
	Weight of impurity in blank (µg):	< 0.18	< 0.19		< 0.07	
	Minimum corrected weight of impurity in sample (µg):	19.13	2.67	21.80	0.13	
	Maximum corrected weight of impurity in sample (µg):	19.31	2.86	22.17	0.19	
V	Measured concentration of impurity in sample (µg/ml):	2.51E-01	5.55E-03	**V**	< 8.43E-04	
	Uncorrected weight of impurity in sample (µg):	11.30	0.26	11.55	< 0.02	N
	Weight of impurity in blank (µg):	< 0.04	< 0.04		< 0.02	
	Minimum corrected weight of impurity in sample (µg):	11.25	0.21	11.47	0.00	
	Maximum corrected weight of impurity in sample (µg):	11.30	0.26	11.55	0.02	

Comments

FCM checked the data against the official results of RMAL17875 on 2/5/2018.

Fred C. Montgomery — Operator

2-6-2018 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1002, 1036, 1038, 1083, 1098
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 2_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B17120504	B17120804		W17120804	
	Total volume of leach solution (ml):	45.0	48.0		20.0	
	Radiochemical laboratory analysis number:	17875-004	17875-009		17875-014	
	Measured uranium concentration (µg/ml):	3.04E-01	5.43E-03		4.00E-03	
	Uncertainty in uranium concentration (µg/ml):	3.04E-02	5.43E-04		4.00E-04	
	Weight uranium leached (g):	1.37E-05	2.61E-07	1.39E-05	8.00E-08	N
	Uncertainty in weight uranium leached (g):	1.38E-06	2.63E-08	1.38E-06	8.41E-09	
	Equivalent number of leached kernels:	3.47E-02	6.62E-04	3.54E-02	2.03E-04	
	Uncertainty in equivalent number of leached kernels:	3.53E-03	6.71E-05	3.53E-03	2.14E-05	
Fe	Measured concentration of impurity in sample (µg/ml):	2.43E+00	< 1.09E-01	**Fe**	< 1.09E-01	
	Uncorrected weight of impurity in sample (µg):	109.35	< 5.23	<114.58	< 2.18	N
	Weight of impurity in blank (µg):	< 5.23	< 5.56		< 1.96	
	Minimum corrected weight of impurity in sample (µg):	104.12	0.00	104.12	0.00	
	Maximum corrected weight of impurity in sample (µg):	109.35	5.23	114.58	2.18	
Cr	Measured concentration of impurity in sample (µg/ml):	1.79E-02	< 5.79E-04	**Cr**	< 5.79E-04	
	Uncorrected weight of impurity in sample (µg):	0.81	< 0.03	< 0.83	< 0.01	N
	Weight of impurity in blank (µg):	< 0.03	< 0.03		< 0.01	
	Minimum corrected weight of impurity in sample (µg):	0.78	0.00	0.78	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.81	0.03	0.83	0.01	
Mn	Measured concentration of impurity in sample (µg/ml):	7.19E-03	< 9.36E-04	**Mn**	< 9.36E-04	
	Uncorrected weight of impurity in sample (µg):	0.32	< 0.04	< 0.37	< 0.02	N
	Weight of impurity in blank (µg):	< 0.04	< 0.05		< 0.02	
	Minimum corrected weight of impurity in sample (µg):	0.28	0.00	0.28	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.32	0.04	0.37	0.02	
Co	Measured concentration of impurity in sample (µg/ml):	1.41E-03	< 1.69E-04	**Co**	< 1.69E-04	
	Uncorrected weight of impurity in sample (µg):	0.06	< 0.01	< 0.07	< 0.00	N
	Weight of impurity in blank (µg):	0.02	< 0.01		< 0.00	
	Minimum corrected weight of impurity in sample (µg):	0.04	0.00	0.04	0.00	
	Maximum corrected weight of impurity in sample (µg):	0.04	0.01	0.05	0.00	
Ni	Measured concentration of impurity in sample (µg/ml):	4.46E-02	< 1.54E-02	**Ni**	< 1.54E-02	
	Uncorrected weight of impurity in sample (µg):	2.01	< 0.74	< 2.75	< 0.31	N
	Weight of impurity in blank (µg):	< 0.74	< 0.79		< 0.28	
	Minimum corrected weight of impurity in sample (µg):	1.27	0.00	1.27	0.00	
	Maximum corrected weight of impurity in sample (µg):	2.01	0.74	2.75	0.31	
Ca	Measured concentration of impurity in sample (µg/ml):	1.06E+00	1.89E-01	**Ca**	2.78E-01	
	Uncorrected weight of impurity in sample (µg):	47.70	9.07	62.33	5.56	Y
	Weight of impurity in blank (µg):	7.58	3.27		0.93	
	Minimum corrected weight of impurity in sample (µg):	40.12	5.80	50.55	4.63	
	Maximum corrected weight of impurity in sample (µg):	40.12	5.80	50.55	4.63	
Al	Measured concentration of impurity in sample (µg/ml):	1.47E+00	2.65E-01	**Al**	3.84E-01	
	Uncorrected weight of impurity in sample (µg):	66.15	12.72	86.55	7.68	Y
	Weight of impurity in blank (µg):	1.78	2.20		1.52	
	Minimum corrected weight of impurity in sample (µg):	64.37	10.52	81.06	6.16	
	Maximum corrected weight of impurity in sample (µg):	64.37	10.52	81.06	6.16	
Ti	Measured concentration of impurity in sample (µg/ml):	4.21E-01	3.82E-02	**Ti**	1.61E-02	
	Uncorrected weight of impurity in sample (µg):	18.95	1.83	21.10	0.32	Y
	Weight of impurity in blank (µg):	< 0.18	< 0.19		< 0.07	
	Minimum corrected weight of impurity in sample (µg):	18.77	1.65	20.67	0.26	
	Maximum corrected weight of impurity in sample (µg):	18.95	1.83	21.10	0.32	
V	Measured concentration of impurity in sample (µg/ml):	2.47E-01	5.61E-03	**V**	< 8.43E-04	
	Uncorrected weight of impurity in sample (µg):	11.12	0.27	11.38	< 0.02	N
	Weight of impurity in blank (µg):	< 0.04	< 0.04		< 0.02	
	Minimum corrected weight of impurity in sample (µg):	11.07	0.23	11.30	0.00	
	Maximum corrected weight of impurity in sample (µg):	11.12	0.27	11.38	0.02	

Comments

FCM checked the data against the official results of RMAL17875 on 2/5/2018.

Fred C. Montgomery
Operator

2-6-2018
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery/Dyer
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	Post-burn leach blank
DRF filename:	\\mc-agr\AGR\LeachBurnLeach\14154C-Group 2_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B17120505	B17120805		W17120805	
	Total volume of leach solution (ml):	48.0	51.0		18.0	
	Radiochemical laboratory analysis number:	17875-005	17875-010		17875-015	
	Measured uranium concentration (µg/ml):	1.04E-03	3.28E-04		5.26E-04	
	Uncertainty in uranium concentration (µg/ml):	1.04E-04	3.28E-05		5.26E-05	
	Weight uranium leached (g):	4.99E-08	1.67E-08	6.66E-08	9.47E-09	N
	Uncertainty in weight uranium leached (g):	5.04E-09	1.69E-09	5.31E-09	1.01E-09	
	Equivalent number of leached kernels:	1.27E-04	4.25E-05	1.69E-04	2.40E-05	
	Uncertainty in equivalent number of leached kernels:	1.28E-05	4.30E-06	1.36E-05	2.57E-06	
Fe	Measured concentration (µg/ml):	< 1.09E-01	< 1.09E-01	**Fe**	< 1.09E-01	
	Total weight of leached impurity (µg):	< 5.23	< 5.56	<10.79	< 1.96	N
Cr	Measured concentration (µg/ml):	< 5.79E-04	< 5.79E-04	**Cr**	< 5.79E-04	
	Total weight of leached impurity (µg):	< 0.03	< 0.03	< 0.06	< 0.01	N
Mn	Measured concentration (µg/ml):	< 9.36E-04	< 9.36E-04	**Mn**	< 9.36E-04	
	Total weight of leached impurity (µg):	< 0.04	< 0.05	< 0.09	< 0.02	N
Co	Measured concentration (µg/ml):	4.35E-04	< 1.69E-04	**Co**	< 1.69E-04	
	Total weight of leached impurity (µg):	0.02	< 0.01	< 0.03	< 0.00	N
Ni	Measured concentration (µg/ml):	< 1.54E-02	< 1.54E-02	**Ni**	< 1.54E-02	
	Total weight of leached impurity (µg):	< 0.74	< 0.79	< 1.52	< 0.28	N
Ca	Measured concentration (µg/ml):	1.58E-01	6.41E-02	**Ca**	5.18E-02	
	Total weight of leached impurity (µg):	7.58	3.27	11.79	0.93	Y
Al	Measured concentration (µg/ml):	3.70E-02	4.32E-02	**Al**	8.42E-02	
	Total weight of leached impurity (µg):	1.78	2.20	5.49	1.52	Y
Ti	Measured concentration (µg/ml):	< 3.69E-03	< 3.69E-03	**Ti**	< 3.69E-03	
	Total weight of leached impurity (µg):	< 0.18	< 0.19	< 0.37	< 0.07	N
V	Measured concentration (µg/ml):	< 8.43E-04	< 8.43E-04	**V**	< 8.43E-04	
	Total weight of leached impurity (µg):	< 0.04	< 0.04	< 0.08	< 0.02	N

Comments

FCM checked the data against the official results of RMAL17875 on 2/5/2018.

Fred C. Montgomery
Operator

2-6-2018
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1052, 1086, 1104, 1034, 1007
DRF filename:	14154C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L19010701	L19010901		W19010903	
Total volume of leach solution (ml):		158.0	183.0		25.0	
RMAL analysis number:		19049-001	19049-005		19049-009	
Measured uranium concentration (µg/ml):		2.56E+00	7.98E-03		1.93E-03	
Uncertainty in uranium concentration (µg/ml):		2.56E-01	7.98E-04		1.93E-04	
Weight uranium leached (g):		4.04E-04	1.46E-06	4.06E-04	4.83E-08	N
Uncertainty in weight uranium leached (g):		4.05E-05	1.46E-07	4.05E-05	4.99E-09	
Equivalent number of leached kernels:		1.03E+00	3.71E-03	1.03E+00	1.22E-04	
Uncertainty in equivalent number of leached kernels:		1.03E-01	3.73E-04	1.03E-01	1.27E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #31 (previously used for 14155D-Group 2 Clutch 5).
FCM checked the recorded data against the official Results of Analysis for RMAL19049 on 3/26/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1072, 1064, 1027, 1103, 1061
DRF filename:	14154C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19010702	L19010802		W19010904	
	Total volume of leach solution (ml):	146.0	183.0		32.5	
	RMAL analysis number:	19049-002	19049-006		19049-010	
	Measured uranium concentration (µg/ml):	2.63E+00	1.03E-01		1.01E-02	
	Uncertainty in uranium concentration (µg/ml):	2.63E-01	1.03E-02		1.01E-03	
	Weight uranium leached (g):	3.84E-04	1.88E-05	4.03E-04	3.28E-07	N
	Uncertainty in weight uranium leached (g):	3.84E-05	1.89E-06	3.85E-05	3.35E-08	
	Equivalent number of leached kernels:	9.75E-01	4.78E-02	1.02E+00	8.33E-04	
	Uncertainty in equivalent number of leached kernels:	9.80E-02	4.81E-03	9.82E-02	8.54E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #32 (previously used for 14155D-Group 2 Clutch 6).
FCM checked the recorded data against the official Results of Analysis for RMAL19049 on 3/26/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1094, 1050, 1106, 1079, 1041
DRF filename:	14154C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19011001	L19011401		W19011403	
	Total volume of leach solution (ml):	170.0	179.0		37.5	
	RMAL analysis number:	19049-003	19049-007		19049-011	
	Measured uranium concentration (µg/ml):	2.37E+00	1.04E-01		1.45E-02	
	Uncertainty in uranium concentration (µg/ml):	2.37E-01	1.04E-02		1.45E-03	
	Weight uranium leached (g):	4.03E-04	1.86E-05	4.22E-04	5.44E-07	N
	Uncertainty in weight uranium leached (g):	4.03E-05	1.86E-06	4.04E-05	5.52E-08	
	Equivalent number of leached kernels:	1.02E+00	4.72E-02	1.07E+00	1.38E-03	
	Uncertainty in equivalent number of leached kernels:	1.03E-01	4.75E-03	1.03E-01	1.41E-04	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #33 (previously used for 14155D-Group 2 Clutch 7).
FCM checked the recorded data against the official Results of Analysis for RMAL19049 on 3/26/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1031, 1080, 1076, 1092, 1051
DRF filename:	14154C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L19011002	L19011402		W19011404	
Total volume of leach solution (ml):		168.0	181.0		37.5	
RMAL analysis number:		19049-004	19049-008		19049-012	
Measured uranium concentration (µg/ml):		7.30E-02	1.09E-02		1.76E-03	
Uncertainty in uranium concentration (µg/ml):		7.30E-03	1.09E-03		1.76E-04	
Weight uranium leached (g):		1.23E-05	1.97E-06	1.42E-05	6.60E-08	N
Uncertainty in weight uranium leached (g):		1.23E-06	1.97E-07	1.24E-06	6.70E-09	
Equivalent number of leached kernels:		3.11E-02	5.01E-03	3.61E-02	1.68E-04	
Uncertainty in equivalent number of leached kernels:		3.13E-03	5.04E-04	3.18E-03	1.71E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #30 (previously used for 14155D-Group 2 Clutch 8).
FCM checked the recorded data against the official Results of Analysis for RMAL19049 on 3/26/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1052, 1086, 1104, 1034, 1007
DRF filename:	14154C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19011701	B19012301		W19012303	
	Total volume of leach solution (ml):	59.0	64.8		20.0	
	RMAL analysis number:	19090-001	19090-005		19090-009	
	Measured uranium concentration (µg/ml):	2.73E-01	1.18E-01		3.30E-02	
	Uncertainty in uranium concentration (µg/ml):	2.73E-02	1.18E-02		3.30E-03	
	Weight uranium leached (g):	1.61E-05	7.65E-06	2.38E-05	6.60E-07	N
	Uncertainty in weight uranium leached (g):	1.62E-06	7.68E-07	1.79E-06	6.94E-08	
	Equivalent number of leached kernels:	4.09E-02	1.94E-02	6.03E-02	1.68E-03	
	Uncertainty in equivalent number of leached kernels:	4.13E-03	1.96E-03	4.59E-03	1.77E-04	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19090 on 4/04/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1072, 1064, 1027, 1103, 1061
DRF filename:	14154C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B19011702	B19012302		W19012304	
Total volume of leach solution (ml):		61.8	63.2		20.0	
RMAL analysis number:		19090-002	19090-006		19090-010	
Measured uranium concentration (µg/ml):		1.32E+01	7.50E-02		3.67E-02	
Uncertainty in uranium concentration (µg/ml):		1.32E+00	7.50E-03		3.67E-03	
Weight uranium leached (g):		8.16E-04	4.74E-06	8.21E-04	7.34E-07	N
Uncertainty in weight uranium leached (g):		8.20E-05	4.77E-07	8.20E-05	7.72E-08	
Equivalent number of leached kernels:		2.07E+00	1.20E-02	2.08E+00	1.86E-03	
Uncertainty in equivalent number of leached kernels:		2.09E-01	1.22E-03	2.09E-01	1.97E-04	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19090 on 4/04/2019.

Fred C. Montgomery
Operator

4-8-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1094, 1050, 1106, 1079, 1041
DRF filename:	14154C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19012401	B19012801		W19012803	
	Total volume of leach solution (ml):	61.3	63.3		20.0	
	RMAL analysis number:	19090-003	19090-007		19090-011	
	Measured uranium concentration (µg/ml):	5.13E-01	1.98E-01		8.73E-03	
	Uncertainty in uranium concentration (µg/ml):	5.13E-02	1.98E-02		8.73E-04	
	Weight uranium leached (g):	3.14E-05	1.25E-05	4.40E-05	1.75E-07	N
	Uncertainty in weight uranium leached (g):	3.16E-06	1.26E-06	3.40E-06	1.84E-08	
	Equivalent number of leached kernels:	7.98E-02	3.18E-02	1.12E-01	4.43E-04	
	Uncertainty in equivalent number of leached kernels:	8.07E-03	3.21E-03	8.71E-03	4.68E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19090 on 4/04/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1031, 1080, 1076, 1092, 1051
DRF filename:	14154C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19012402	B19012802		W19012804	
	Total volume of leach solution (ml):	61.0	64.0		20.0	
	RMAL analysis number:	19090-004	19090-008		19090-012	
	Measured uranium concentration (µg/ml):	1.34E+01	2.41E-01		4.16E-03	
	Uncertainty in uranium concentration (µg/ml):	1.34E+00	2.41E-02		4.16E-04	
	Weight uranium leached (g):	8.17E-04	1.54E-05	8.33E-04	8.32E-08	N
	Uncertainty in weight uranium leached (g):	8.22E-05	1.55E-06	8.22E-05	8.75E-09	
	Equivalent number of leached kernels:	2.07E+00	3.91E-02	2.11E+00	2.11E-04	
	Uncertainty in equivalent number of leached kernels:	2.10E-01	3.95E-03	2.10E-01	2.23E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19090 on 4/04/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1167, 1137, 1162, 1129, 1136
DRF filename:	14155C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19012501	L19013001		W19013101	
	Total volume of leach solution (ml):	150.0	184.0		40.0	
	RMAL analysis number:	19091-001	19091-003		19091-005	
	Measured uranium concentration (µg/ml):	1.11E+01	5.00E-01		7.25E-02	
	Uncertainty in uranium concentration (µg/ml):	1.11E+00	5.00E-02		7.25E-03	
	Weight uranium leached (g):	1.67E-03	9.20E-05	1.76E-03	2.90E-06	N
	Uncertainty in weight uranium leached (g):	1.67E-04	9.21E-06	1.67E-04	2.94E-07	
	Equivalent number of leached kernels:	4.23E+00	2.34E-01	4.46E+00	7.36E-03	
	Uncertainty in equivalent number of leached kernels:	4.25E-01	2.35E-02	4.26E-01	7.49E-04	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#2 (previously used for 11035 overcoated particles-Group 1 Clutch 1).
FCM checked the recorded data against the official Results of Analysis for RMAL19091 on 3/21/2019.
Poured 1st acid rinse from centrifuge tube 2A (L19013002) into the Rig #1 graduated cylinder (L19013001) instead of into the Rig #2 graduated cylinder. This does not impact data because L19013002 concentration was order of magitude lower than L19013001.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1124, 1151, 1211, 1166, 1170
DRF filename:	14155C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19012502	L19013002		W19013102	
	Total volume of leach solution (ml):	151.0	167.0		40.0	
	RMAL analysis number:	19091-002	19091-004		19091-006	
	Measured uranium concentration (µg/ml):	5.26E-01	6.25E-02		1.05E-02	
	Uncertainty in uranium concentration (µg/ml):	5.26E-02	6.25E-03		1.05E-03	
	Weight uranium leached (g):	7.94E-05	1.04E-05	8.99E-05	4.20E-07	N
	Uncertainty in weight uranium leached (g):	7.95E-06	1.04E-06	8.02E-06	4.26E-08	
	Equivalent number of leached kernels:	2.02E-01	2.65E-02	2.28E-01	1.07E-03	
	Uncertainty in equivalent number of leached kernels:	2.03E-02	2.66E-03	2.05E-02	1.09E-04	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#3 (previously used for 11035 overcoated particles-Group 1 Clutch 2).
FCM checked the recorded data against the official Results of Analysis for RMAL19091 on 3/21/2019.
Poured 1st acid rinse from centrifuge tube 2A (L19013002) into the Rig #1 graduated cylinder (L19013001) instead of into the Rig #2 graduated cylinder. This does not impact data because rinse represents small fracton of L19013002 uranium.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1194, 1195, 1156, 1169, 1205
DRF filename:	14155C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19020101	L19020401		W19020403	
	Total volume of leach solution (ml):	154.0	139.0		37.5	
	RMAL analysis number:	19121-001	19121-003		19121-005	
	Measured uranium concentration (µg/ml):	1.06E-01	1.43E-02		2.92E-03	
	Uncertainty in uranium concentration (µg/ml):	1.06E-02	1.43E-03		2.92E-04	
	Weight uranium leached (g):	1.63E-05	1.98E-06	1.83E-05	1.09E-07	N
	Uncertainty in weight uranium leached (g):	1.63E-06	1.99E-07	1.64E-06	1.11E-08	
	Equivalent number of leached kernels:	4.14E-02	5.03E-03	4.64E-02	2.78E-04	
	Uncertainty in equivalent number of leached kernels:	4.16E-03	5.06E-04	4.20E-03	2.83E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#11 (previously used for 11035 overcoated particles-Group 1 Clutch 3).
FCM checked the recorded data against the official Results of Analysis for RMAL19091 on 3/21/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1126, 1140, 1184, 1203, 1191
DRF filename:	14155C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19020102	L19020402		W19020404	
	Total volume of leach solution (ml):	151.0	137.0		37.5	
	RMAL analysis number:	19121-002	19121-004		19121-006	
	Measured uranium concentration (µg/ml):	5.15E+00	2.91E-01		3.78E-02	
	Uncertainty in uranium concentration (µg/ml):	5.15E-01	2.91E-02		3.78E-03	
	Weight uranium leached (g):	7.78E-04	3.99E-05	8.18E-04	1.42E-06	N
	Uncertainty in weight uranium leached (g):	7.79E-05	3.99E-06	7.80E-05	1.44E-07	
	Equivalent number of leached kernels:	1.97E+00	1.01E-01	2.08E+00	3.60E-03	
	Uncertainty in equivalent number of leached kernels:	1.99E-01	1.02E-02	1.99E-01	3.67E-04	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel FB#2 (previously used for 11035 overcoated particles-Group 1 Clutch 2).
FCM checked the recorded data against the official Results of Analysis for RMAL19091 on 3/21/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1167, 1137, 1162, 1129, 1136
DRF filename:	14155C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19020601	B19020801		W19020803	
	Total volume of leach solution (ml):	55.5	59.8		20.0	
	RMAL analysis number:	19109-001	19109-003		19109-005	
	Measured uranium concentration (µg/ml):	8.02E+00	2.16E-02		4.81E-03	
	Uncertainty in uranium concentration (µg/ml):	8.02E-01	2.16E-03		4.81E-04	
	Weight uranium leached (g):	4.45E-04	1.29E-06	4.46E-04	9.62E-08	N
	Uncertainty in weight uranium leached (g):	4.48E-05	1.30E-07	4.48E-05	1.01E-08	
	Equivalent number of leached kernels:	1.13E+00	3.28E-03	1.13E+00	2.44E-04	
	Uncertainty in equivalent number of leached kernels:	1.14E-01	3.31E-04	1.14E-01	2.58E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19109 on 4/12/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1124, 1151, 1211, 1166, 1170
DRF filename:	14155C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19020602	B19020802		W19020804	
	Total volume of leach solution (ml):	57.5	59.8		20.0	
	RMAL analysis number:	19109-002	19109-004		19109-006	
	Measured uranium concentration (µg/ml):	7.84E+00	2.82E-02		8.27E-03	
	Uncertainty in uranium concentration (µg/ml):	7.84E-01	2.82E-03		8.27E-04	
	Weight uranium leached (g):	4.51E-04	1.69E-06	4.52E-04	1.65E-07	N
	Uncertainty in weight uranium leached (g):	4.54E-05	1.70E-07	4.54E-05	1.74E-08	
	Equivalent number of leached kernels:	1.14E+00	4.28E-03	1.15E+00	4.20E-04	
	Uncertainty in equivalent number of leached kernels:	1.16E-01	4.33E-04	1.16E-01	4.43E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19109 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1194, 1195, 1156, 1169, 1205
DRF filename:	14155C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B19021201	B19021501		W19021503	
Total volume of leach solution (ml):		55.0	58.8		20.0	
RMAL analysis number:		19133-001	19133-003		19133-005	
Measured uranium concentration (µg/ml):		2.04E+01	2.81E-02		3.81E-03	
Uncertainty in uranium concentration (µg/ml):		2.04E+00	2.81E-03		3.81E-04	
Weight uranium leached (g):		1.12E-03	1.65E-06	1.12E-03	7.62E-08	N
Uncertainty in weight uranium leached (g):		1.13E-04	1.66E-07	1.13E-04	8.01E-09	
Equivalent number of leached kernels:		2.85E+00	4.19E-03	2.85E+00	1.93E-04	
Uncertainty in equivalent number of leached kernels:		2.88E-01	4.24E-04	2.88E-01	2.04E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Recorded data checked by FCM against the official Results of Analyses Report for RMAL19133 on 3/21/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1126, 1140, 1184, 1203, 1191
DRF filename:	14155C_PF40-Group 1_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19021202	B19021502		W19021504	
	Total volume of leach solution (ml):	56.7	57.5		20.0	
	RMAL analysis number:	19133-002	19133-004		19133-006	
	Measured uranium concentration (µg/ml):	2.66E-01	1.68E-03		4.47E-03	
	Uncertainty in uranium concentration (µg/ml):	2.66E-02	1.68E-04		4.47E-04	
	Weight uranium leached (g):	1.51E-05	9.66E-08	1.52E-05	8.94E-08	N
	Uncertainty in weight uranium leached (g):	1.52E-06	9.72E-09	1.52E-06	9.40E-09	
	Equivalent number of leached kernels:	3.83E-02	2.45E-04	3.85E-02	2.27E-04	
	Uncertainty in equivalent number of leached kernels:	3.87E-03	2.48E-05	3.87E-03	2.40E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Recorded data checked by FCM against the official Results of Analyses Report for RMAL19133 on 3/21/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1213, 1179, 1128, 1112, 1123
DRF filename:	14155C_PF40-Group 2_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19030401	L19030601		W19030603	
	Total volume of leach solution (ml):	161.0	142.0		40.0	
	RMAL analysis number:	19191-001	19191-003		19191-005	
	Measured uranium concentration (µg/ml):	4.67E+00	2.31E-01		2.46E-02	
	Uncertainty in uranium concentration (µg/ml):	4.67E-01	2.31E-02		2.46E-03	
	Weight uranium leached (g):	7.52E-04	3.28E-05	7.85E-04	9.84E-07	N
	Uncertainty in weight uranium leached (g):	7.52E-05	3.28E-06	7.53E-05	9.97E-08	
	Equivalent number of leached kernels:	1.91E+00	8.33E-02	1.99E+00	2.50E-03	
	Uncertainty in equivalent number of leached kernels:	1.92E-01	8.38E-03	1.92E-01	2.54E-04	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #41 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL19191 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1145, 1186, 1113, 1214, 1119
DRF filename:	14155C_PF40-Group 2_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19030402	L19030602		W19030604	
	Total volume of leach solution (ml):	149.0	138.0		37.5	
	RMAL analysis number:	19191-002	19191-004		19191-006	
	Measured uranium concentration (µg/ml):	1.03E-01	1.12E-02		2.94E-03	
	Uncertainty in uranium concentration (µg/ml):	1.03E-02	1.12E-03		2.94E-04	
	Weight uranium leached (g):	1.53E-05	1.55E-06	1.69E-05	1.10E-07	N
	Uncertainty in weight uranium leached (g):	1.54E-06	1.55E-07	1.54E-06	1.12E-08	
	Equivalent number of leached kernels:	3.90E-02	3.92E-03	4.29E-02	2.80E-04	
	Uncertainty in equivalent number of leached kernels:	3.92E-03	3.95E-04	3.94E-03	2.85E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #42 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL19191 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1148, 1159, 1127, 1190, 1189
DRF filename:	14155C_PF40-Group 2_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Pre-burn leach solution ID:		L19031101	L19031301		W19031303	
Total volume of leach solution (ml):		149.0	138.0		40.0	
RMAL analysis number:		19205-001	19205-003		19205-005	
Measured uranium concentration (µg/ml):		5.24E+00	3.85E-01		5.15E-02	
Uncertainty in uranium concentration (µg/ml):		5.24E-01	3.85E-02		5.15E-03	
Weight uranium leached (g):		7.81E-04	5.31E-05	8.34E-04	2.06E-06	N
Uncertainty in weight uranium leached (g):		7.82E-05	5.32E-06	7.83E-05	2.09E-07	
Equivalent number of leached kernels:		1.98E+00	1.35E-01	2.12E+00	5.23E-03	
Uncertainty in equivalent number of leached kernels:		1.99E-01	1.36E-02	2.00E-01	5.32E-04	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #43 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL19205 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26A: Pre-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1202, 1121, 1208, 1207, 1183
DRF filename:	14155C_PF40-Group 2_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Pre-burn leach solution ID:	L19031102	L19031302		W19031304	
	Total volume of leach solution (ml):	141.0	126.0		40.0	
	RMAL analysis number:	19205-002	19205-004		19205-006	
	Measured uranium concentration (µg/ml):	2.79E+00	1.82E-01		2.56E-02	
	Uncertainty in uranium concentration (µg/ml):	2.79E-01	1.82E-02		2.56E-03	
	Weight uranium leached (g):	3.93E-04	2.29E-05	4.16E-04	1.02E-06	N
	Uncertainty in weight uranium leached (g):	3.94E-05	2.30E-06	3.94E-05	1.04E-07	
	Equivalent number of leached kernels:	9.98E-01	5.82E-02	1.06E+00	2.60E-03	
	Uncertainty in equivalent number of leached kernels:	1.00E-01	5.86E-03	1.01E-01	2.65E-04	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #44 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL19205 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1213, 1179, 1128, 1112, 1123
DRF filename:	14155C_PF40-Group 2_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19031801	B19031901		W19031903	
	Total volume of leach solution (ml):	56.8	58.0		20.0	
	RMAL analysis number:	19214-001	19214-003		19214-005	
	Measured uranium concentration (µg/ml):	7.61E+00	3.08E-02		7.95E-04	
	Uncertainty in uranium concentration (µg/ml):	7.61E-01	3.08E-03		7.95E-05	
	Weight uranium leached (g):	4.32E-04	1.79E-06	4.34E-04	1.59E-08	N
	Uncertainty in weight uranium leached (g):	4.35E-05	1.80E-07	4.35E-05	1.67E-09	
	Equivalent number of leached kernels:	1.10E+00	4.53E-03	1.10E+00	4.04E-05	
	Uncertainty in equivalent number of leached kernels:	1.11E-01	4.58E-04	1.11E-01	4.26E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19214 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1145, 1186, 1113, 1214, 1119
DRF filename:	14155C_PF40-Group 2_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B19031802	B19031902		W19031904	
Total volume of leach solution (ml):		55.3	58.8		20.0	
RMAL analysis number:		19214-002	19214-004		19214-006	
Measured uranium concentration (µg/ml):		2.30E-01	6.40E-03		2.11E-04	
Uncertainty in uranium concentration (µg/ml):		2.30E-02	6.40E-04		2.11E-05	
Weight uranium leached (g):		1.27E-05	3.76E-07	1.31E-05	4.22E-09	N
Uncertainty in weight uranium leached (g):		1.28E-06	3.79E-08	1.28E-06	4.44E-10	
Equivalent number of leached kernels:		3.23E-02	9.55E-04	3.32E-02	1.07E-05	
Uncertainty in equivalent number of leached kernels:		3.27E-03	9.66E-05	3.27E-03	1.13E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19214 on 4/12/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1148, 1159, 1127, 1190, 1189
DRF filename:	14155C_PF40-Group 2_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B19032001	B19032201		W19032203	
	Total volume of leach solution (ml):	54.7	59.0		20.0	
	RMAL analysis number:	19221-001	19221-003		19221-005	
	Measured uranium concentration (µg/ml):	7.40E+00	3.41E-02		1.26E-03	
	Uncertainty in uranium concentration (µg/ml):	7.40E-01	3.41E-03		1.26E-04	
	Weight uranium leached (g):	4.05E-04	2.01E-06	4.07E-04	2.52E-08	N
	Uncertainty in weight uranium leached (g):	4.08E-05	2.02E-07	4.08E-05	2.65E-09	
	Equivalent number of leached kernels:	1.03E+00	5.11E-03	1.03E+00	6.40E-05	
	Uncertainty in equivalent number of leached kernels:	1.04E-01	5.16E-04	1.04E-01	6.76E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19221 on 4/12/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155C
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1202, 1121, 1208, 1207, 1183
DRF filename:	14155C_PF40-Group 2_DLBL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B19032002	B19032202		W19032204	
Total volume of leach solution (ml):		56.5	58.7		20.0	
RMAL analysis number:		19221-002	19221-004		19221-006	
Measured uranium concentration (µg/ml):		7.23E+00	3.28E-02		2.28E-03	
Uncertainty in uranium concentration (µg/ml):		7.23E-01	3.28E-03		2.28E-04	
Weight uranium leached (g):		4.08E-04	1.93E-06	4.10E-04	4.56E-08	N
Uncertainty in weight uranium leached (g):		4.11E-05	1.94E-07	4.11E-05	4.79E-09	
Equivalent number of leached kernels:		1.04E+00	4.89E-03	1.04E+00	1.16E-04	
Uncertainty in equivalent number of leached kernels:		1.05E-01	4.94E-04	1.05E-01	1.22E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

FCM checked the recorded data against the official Results of Analysis for RMAL19221 on 4/12/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

APPENDIX E. REPORT FORMS FOR 40% PF COMPACT BL

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1504, 1538, 1524, 1514, 1507	1526, 1515, 1541, 1530, 1528	1539, 1527, 1512, 1513, 1517	1520, 1528, 1511, 1500, 1506	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	3.3E+00	1.2E-01	2.2E+00	2.2E+00	7.9E+00

Comments

No deconsolidation or pre-burn leach was performed. Compacts subjected to burn-leach.

Fred C. Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1508, 1510, 1501, 1533, 1519	1503, 1518, 1505, 1534, 1521	1537, 1535, 1540, 1502, 1509	1522, 1531, 1543, 1532, 1525	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	2.8E+00	3.3E+00	7.0E-02	1.1E+00	7.2E+00

Comments

No deconsolidation or pre-burn leach was performed. Compacts subjected to burn-leach.

Fred C. Montgomery
Operator

4/18-2019
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1659, 1648, 1670, 1655, 1662	1673, 1666, 1656, 1675, 1668	1669, 1657, 1661, 1649, 1650	1663, 1654, 1646, 1643, 1667	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	2.2E+00	1.5E+00	1.3E+00	2.1E+00	7.1E+00

Comments

No deconsolidation or pre-burn leach was performed. Compacts subjected to burn-leach.

Fred C. Montgomery
Operator

4-18-2019
Date

Inspection Report Form IRF-D: Summary of Post-Burn Leach Uranium

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction

Compact ID numbers:	1658, 1674, 1671, 1653, 1640	1652, 1641, 1644, 1642, 1665	1645, 1651, 1677, 1664, 1672	1679, 1647, 1676, 1678, 1660	Total
Number of compacts:	5	5	5	5	20
Equivalent number of leached kernels:	1.0E+00	1.5E+00	2.9E+00	8.4E-02	5.5E+00

Comments

No deconsolidation or pre-burn leach was performed. Compacts subjected to burn-leach.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1504, 1538, 1524, 1514, 1507
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18102301	B18102501		W18102601	
	Total volume of leach solution (ml):	60.0	62.5		20.0	
	RMAL analysis number:	18797-009	18797-013		18797-017	
	Measured uranium concentration (µg/ml):	2.18E+01	9.25E-02		1.59E-03	
	Uncertainty in uranium concentration (µg/ml):	2.18E+00	9.25E-03		1.59E-04	
	Weight uranium leached (g):	1.31E-03	5.78E-06	1.31E-03	3.18E-08	N
	Uncertainty in weight uranium leached (g):	1.31E-04	5.81E-07	1.31E-04	3.35E-09	
	Equivalent number of leached kernels:	3.32E+00	1.47E-02	3.33E+00	8.08E-05	
	Uncertainty in equivalent number of leached kernels:	3.35E-01	1.48E-03	3.35E-01	8.54E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#2 (previously leached and analyzed as Blank 1 before use).
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.
Shown is the result of the second ICPMS analyses of B18102301.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1504, 1538, 1524, 1514, 1507
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18102301	B18102501		W18102601	
	Total volume of leach solution (ml):	60.0	62.5		20.0	
	RMAL analysis number:	18797-009	18797-013		18797-017	
	Measured uranium concentration (µg/ml):	2.21E+01				
	Uncertainty in uranium concentration (µg/ml):	2.21E+00				
	Weight uranium leached (g):	1.32E-03				
	Uncertainty in weight uranium leached (g):	1.33E-04				
	Equivalent number of leached kernels:	3.36E+00				
	Uncertainty in equivalent number of leached kernels:	3.40E-01				
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#2 (previously leached and analyzed as Blank 1 before use).
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.
Shown is the result of the first ICPMS analysis of B18102301.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1504, 1538, 1524, 1514, 1507
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18102301	B18102501		W18102601	
Total volume of leach solution (ml):		60.0	62.5		20.0	
RMAL analysis number:		18797-009	18797-013		18797-017	
Measured uranium concentration (µg/ml):		2.12E+01				
Uncertainty in uranium concentration (µg/ml):		1.06E+00				
Weight uranium leached (g):		1.27E-03				
Uncertainty in weight uranium leached (g):		6.50E-05				
Equivalent number of leached kernels:		3.22E+00				
Uncertainty in equivalent number of leached kernels:		1.68E-01				
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#2 (previously leached and analyzed as Blank 1 before use).
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.
Shown is the result of the isotope dilution mass spectrometry analysis of B18102301.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1526, 1515, 1541, 1530, 1528
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18102302	B18102502		W18102602	
	Total volume of leach solution (ml):	59.5	62.8		20.0	
	RMAL analysis number:	18797-010	18797-014		18797-018	
	Measured uranium concentration (µg/ml):	7.86E-01	5.76E-03		5.67E-04	
	Uncertainty in uranium concentration (µg/ml):	7.86E-02	5.76E-04		5.67E-05	
	Weight uranium leached (g):	4.68E-05	3.62E-07	4.71E-05	1.13E-08	N
	Uncertainty in weight uranium leached (g):	4.70E-06	3.63E-08	4.70E-06	1.19E-09	
	Equivalent number of leached kernels:	1.19E-01	9.18E-04	1.20E-01	2.88E-05	
	Uncertainty in equivalent number of leached kernels:	1.20E-02	9.27E-05	1.20E-02	3.04E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#3 (previously leached and analyzed as Blank 2 before use).
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.
Shown is the result of the second ICPMS analyses of B18102302.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1526, 1515, 1541, 1530, 1528
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18102302	B18102502		W18102602	
	Total volume of leach solution (ml):	59.5	62.8		20.0	
	RMAL analysis number:	18797-010	18797-014		18797-018	
	Measured uranium concentration (µg/ml):	8.26E-01				
	Uncertainty in uranium concentration (µg/ml):	8.26E-02				
	Weight uranium leached (g):	4.91E-05				
	Uncertainty in weight uranium leached (g):	4.94E-06				
	Equivalent number of leached kernels:	1.25E-01				
	Uncertainty in equivalent number of leached kernels:	1.26E-02				
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#3 (previously leached and analyzed as Blank 2 before use).
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.
Shown is the result of the first ICPMS analyses of B18102302.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1539, 1527, 1512, 1513, 1517
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18102303	B18102503		K18102603	
	Total volume of leach solution (ml):	59.5	62.2		20.0	
	RMAL analysis number:	18797-011	18797-015		18797-019	
	Measured uranium concentration (µg/ml):	1.45E+01	7.32E-02		1.67E-03	
	Uncertainty in uranium concentration (µg/ml):	1.45E+00	7.32E-03		1.67E-04	
	Weight uranium leached (g):	8.65E-04	4.55E-06	8.69E-04	3.34E-08	N
	Uncertainty in weight uranium leached (g):	8.70E-05	4.58E-07	8.70E-05	3.51E-09	
	Equivalent number of leached kernels:	2.19E+00	1.16E-02	2.21E+00	8.48E-05	
	Uncertainty in equivalent number of leached kernels:	2.22E-01	1.17E-03	2.22E-01	8.95E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#11 (previously leached and analyzed as Blank 3 before use).
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.
Shown is the result of the second ICPMS analyses of B18102303.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1539, 1527, 1512, 1513, 1517
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18102303	B18102503		K18102603	
	Total volume of leach solution (ml):	59.5	62.2		20.0	
	RMAL analysis number:	18797-011	18797-015		18797-019	
	Measured uranium concentration (µg/ml):	1.57E+01				
	Uncertainty in uranium concentration (µg/ml):	1.57E+00				
	Weight uranium leached (g):	9.31E-04				
	Uncertainty in weight uranium leached (g):	9.37E-05				
	Equivalent number of leached kernels:	2.36E+00				
	Uncertainty in equivalent number of leached kernels:	2.39E-01				
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#11 (previously leached and analyzed as Blank 3 before use).
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.
Shown is the result of the first ICPMS analyses of B18102303.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1520, 1528, 1511, 1500, 1506
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18102304	B18102504		K18102604	
	Total volume of leach solution (ml):	61.0	64.0		22.5	
	RMAL analysis number:	18797-012	18797-016		18797-020	
	Measured uranium concentration (µg/ml):	1.44E+01	7.88E-02		1.15E-03	
	Uncertainty in uranium concentration (µg/ml):	1.44E+00	7.88E-03		1.15E-04	
	Weight uranium leached (g):	8.76E-04	5.05E-06	8.81E-04	2.59E-08	N
	Uncertainty in weight uranium leached (g):	8.81E-05	5.07E-07	8.81E-05	2.69E-09	
	Equivalent number of leached kernels:	2.22E+00	1.28E-02	2.24E+00	6.57E-05	
	Uncertainty in equivalent number of leached kernels:	2.25E-01	1.29E-03	2.25E-01	6.87E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel FB#2 (previously leached and analyzed as Blank 4 before use).
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.
Shown is the result of the second ICPMS analyses of B18102304.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1520, 1528, 1511, 1500, 1506
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18102304	B18102504		K18102604	
	Total volume of leach solution (ml):	61.0	64.0		22.5	
	RMAL analysis number:	18797-012	18797-016		18797-020	
	Measured uranium concentration (µg/ml):	1.44E+01				
	Uncertainty in uranium concentration (µg/ml):	1.44E+00				
	Weight uranium leached (g):	8.78E-04				
	Uncertainty in weight uranium leached (g):	8.83E-05				
	Equivalent number of leached kernels:	2.23E+00				
	Uncertainty in equivalent number of leached kernels:	2.25E-01				
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel FB#2 (previously leached and analyzed as Blank 4 before use).
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.
Shown is the result of the first ICPMS analyses of B18102304.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	Blank 1
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	L18100901				
	Total volume of leach solution (ml):	92.5				
	RMAL analysis number:	18797-001				
	Measured uranium concentration (µg/ml):	2.96E-03				
	Uncertainty in uranium concentration (µg/ml):	2.96E-04				
	Weight uranium leached (g):	2.74E-07				
	Uncertainty in weight uranium leached (g):	2.75E-08				
	Equivalent number of leached kernels:	6.95E-04				
	Uncertainty in equivalent number of leached kernels:	7.01E-05				
Fe	Measured concentration (µg/ml):			Fe		
	Total weight of leached impurity (µg):					
Cr	Measured concentration (µg/ml):			Cr		
	Total weight of leached impurity (µg):					
Mn	Measured concentration (µg/ml):			Mn		
	Total weight of leached impurity (µg):					
Co	Measured concentration (µg/ml):			Co		
	Total weight of leached impurity (µg):					
Ni	Measured concentration (µg/ml):			Ni		
	Total weight of leached impurity (µg):					
Ca	Measured concentration (µg/ml):			Ca		
	Total weight of leached impurity (µg):					
Al	Measured concentration (µg/ml):			Al		
	Total weight of leached impurity (µg):					
Ti	Measured concentration (µg/ml):			Ti		
	Total weight of leached impurity (µg):					
V	Measured concentration (µg/ml):			V		
	Total weight of leached impurity (µg):					

Comments

Blank 1 was obtained on Vessel RB#2 before it was used for burn-leach of 14154D-Group 1 Clutch 1.
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	Blank 2
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	L18100902				
	Total volume of leach solution (ml):	100.5				
	RMAL analysis number:	18797-002				
	Measured uranium concentration (µg/ml):	1.12E-03				
	Uncertainty in uranium concentration (µg/ml):	1.12E-04				
	Weight uranium leached (g):	1.13E-07				
	Uncertainty in weight uranium leached (g):	1.13E-08				
	Equivalent number of leached kernels:	2.86E-04				
	Uncertainty in equivalent number of leached kernels:	2.88E-05				
Fe	Measured concentration (µg/ml):			Fe		
	Total weight of leached impurity (µg):					
Cr	Measured concentration (µg/ml):			Cr		
	Total weight of leached impurity (µg):					
Mn	Measured concentration (µg/ml):			Mn		
	Total weight of leached impurity (µg):					
Co	Measured concentration (µg/ml):			Co		
	Total weight of leached impurity (µg):					
Ni	Measured concentration (µg/ml):			Ni		
	Total weight of leached impurity (µg):					
Ca	Measured concentration (µg/ml):			Ca		
	Total weight of leached impurity (µg):					
Al	Measured concentration (µg/ml):			Al		
	Total weight of leached impurity (µg):					
Ti	Measured concentration (µg/ml):			Ti		
	Total weight of leached impurity (µg):					
V	Measured concentration (µg/ml):			V		
	Total weight of leached impurity (µg):					

Comments

Blank 2 was obtained on Vessel RB#3 before it was used for burn-leach of 14154D-Group 1 Clutch 2.
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	Blank 3
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total
	Post-burn leach solution ID:	L18100903		
	Total volume of leach solution (ml):	92.0		
	RMAL analysis number:	18797-003		
	Measured uranium concentration (µg/ml):	3.87E-03		
	Uncertainty in uranium concentration (µg/ml):	3.87E-04		
	Weight uranium leached (g):	3.56E-07		
	Uncertainty in weight uranium leached (g):	3.57E-08		
	Equivalent number of leached kernels:	9.05E-04		
	Uncertainty in equivalent number of leached kernels:	9.11E-05		
Fe	Measured concentration (µg/ml):			Fe
	Total weight of leached impurity (µg):			
Cr	Measured concentration (µg/ml):			Cr
	Total weight of leached impurity (µg):			
Mn	Measured concentration (µg/ml):			Mn
	Total weight of leached impurity (µg):			
Co	Measured concentration (µg/ml):			Co
	Total weight of leached impurity (µg):			
Ni	Measured concentration (µg/ml):			Ni
	Total weight of leached impurity (µg):			
Ca	Measured concentration (µg/ml):			Ca
	Total weight of leached impurity (µg):			
Al	Measured concentration (µg/ml):			Al
	Total weight of leached impurity (µg):			
Ti	Measured concentration (µg/ml):			Ti
	Total weight of leached impurity (µg):			
V	Measured concentration (µg/ml):			V
	Total weight of leached impurity (µg):			

Water rinse	Include if > 10% of 2nd leach

Comments

Blank 3 was obtained on Vessel RB#11 before it was used for burn-leach of 14154D-Group 1 Clutch 3.
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	Blank 4
DRF filename:	14154D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	L18100904				
	Total volume of leach solution (ml):	99.0				
	RMAL analysis number:	18797-004				
	Measured uranium concentration (µg/ml):	1.04E-03				
	Uncertainty in uranium concentration (µg/ml):	1.04E-04				
	Weight uranium leached (g):	1.03E-07				
	Uncertainty in weight uranium leached (g):	1.03E-08				
	Equivalent number of leached kernels:	2.61E-04				
	Uncertainty in equivalent number of leached kernels:	2.63E-05				
Fe	Measured concentration (µg/ml):			Fe		
	Total weight of leached impurity (µg):					
Cr	Measured concentration (µg/ml):			Cr		
	Total weight of leached impurity (µg):					
Mn	Measured concentration (µg/ml):			Mn		
	Total weight of leached impurity (µg):					
Co	Measured concentration (µg/ml):			Co		
	Total weight of leached impurity (µg):					
Ni	Measured concentration (µg/ml):			Ni		
	Total weight of leached impurity (µg):					
Ca	Measured concentration (µg/ml):			Ca		
	Total weight of leached impurity (µg):					
Al	Measured concentration (µg/ml):			Al		
	Total weight of leached impurity (µg):					
Ti	Measured concentration (µg/ml):			Ti		
	Total weight of leached impurity (µg):					
V	Measured concentration (µg/ml):			V		
	Total weight of leached impurity (µg):					

Comments

Blank 4 was obtained on Vessel FB#2 before it was used for burn-leach of 14154D-Group 1 Clutch 4.
FCM checked the recorded data against the official Results of Analysis for RMAL18797 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1508, 1510, 1501, 1533, 1519
DRF filename:	14154D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18111501	B18111901		W18111905	
Total volume of leach solution (ml):		56.8	62.5		22.5	
RMAL analysis number:		18877-001	18877-005		18877-009	
Measured uranium concentration (µg/ml):		1.90E+01	7.19E-02		2.08E-03	
Uncertainty in uranium concentration (µg/ml):		1.90E+00	7.19E-03		2.08E-04	
Weight uranium leached (g):		1.08E-03	4.49E-06	1.08E-03	4.67E-08	N
Uncertainty in weight uranium leached (g):		1.09E-04	4.52E-07	1.09E-04	4.86E-09	
Equivalent number of leached kernels:		2.74E+00	1.14E-02	2.75E+00	1.19E-04	
Uncertainty in equivalent number of leached kernels:		2.77E-01	1.15E-03	2.77E-01	1.24E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #31 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL18877 on 3/21/2019.
Shown is the result of the second ICPMS analyses of B18111501.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1508, 1510, 1501, 1533, 1519
DRF filename:	14154D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18111501	B18111901		W18111905	
	Total volume of leach solution (ml):	56.8	62.5		22.5	
	RMAL analysis number:	18877-001	18877-005		18877-009	
	Measured uranium concentration (µg/ml):	2.45E+01				
	Uncertainty in uranium concentration (µg/ml):	2.45E+00				
	Weight uranium leached (g):	1.39E-03				
	Uncertainty in weight uranium leached (g):	1.40E-04				
	Equivalent number of leached kernels:	3.53E+00				
	Uncertainty in equivalent number of leached kernels:	3.57E-01				
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #31 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL18877 on 3/21/2019.
Shown is the result of the first ICPMS analysis of B18111501.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1508, 1510, 1501, 1533, 1519
DRF filename:	14154D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18111501	B18111901		W18111905	
Total volume of leach solution (ml):		56.8	62.5		22.5	
RMAL analysis number:		18877-001	18877-005		18877-009	
Measured uranium concentration (µg/ml):		1.93E+01				
Uncertainty in uranium concentration (µg/ml):		9.64E-01				
Weight uranium leached (g):		1.10E-03				
Uncertainty in weight uranium leached (g):		5.62E-05				
Equivalent number of leached kernels:		2.78E+00				
Uncertainty in equivalent number of leached kernels:		1.45E-01				
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #31 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL18877 on 3/21/2019.
Shown is the result of the isotope dilution mass spectrometry analysis of B18111501.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1503, 1518, 1505, 1534, 1521
DRF filename:	14154D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18111502	B18111902		W18111906	
	Total volume of leach solution (ml):	57.4	60.3		20.0	
	RMAL analysis number:	18877-002	18877-006		18877-010	
	Measured uranium concentration (µg/ml):	2.25E+01	1.00E-01		3.43E-03	
	Uncertainty in uranium concentration (µg/ml):	2.25E+00	1.00E-02		3.43E-04	
	Weight uranium leached (g):	1.29E-03	6.05E-06	1.30E-03	6.87E-08	N
	Uncertainty in weight uranium leached (g):	1.30E-04	6.08E-07	1.30E-04	7.22E-09	
	Equivalent number of leached kernels:	3.28E+00	1.53E-02	3.29E+00	1.74E-04	
	Uncertainty in equivalent number of leached kernels:	3.31E-01	1.55E-03	3.31E-01	1.84E-05	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #32 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL18877 on 3/21/2019.
Shown is the result of the second ICPMS analyses of B18111502.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1503, 1518, 1505, 1534, 1521
DRF filename:	14154D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18111502	B18111902		W18111906	
	Total volume of leach solution (ml):	57.4	60.3		20.0	
	RMAL analysis number:	18877-002	18877-006		18877-010	
	Measured uranium concentration (µg/ml):	2.45E+01				
	Uncertainty in uranium concentration (µg/ml):	2.45E+00				
	Weight uranium leached (g):	1.41E-03				
	Uncertainty in weight uranium leached (g):	1.41E-04				
	Equivalent number of leached kernels:	3.57E+00				
	Uncertainty in equivalent number of leached kernels:	3.61E-01				
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #32 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL18877 on 3/21/2019.
Shown is the result of the first ICPMS analysis of B18111502.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1503, 1518, 1505, 1534, 1521
DRF filename:	14154D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18111502	B18111902		W18111906	
	Total volume of leach solution (ml):	57.4	60.3		20.0	
	RMAL analysis number:	18877-002	18877-006		18877-010	
	Measured uranium concentration (µg/ml):	2.28E+01				
	Uncertainty in uranium concentration (µg/ml):	1.14E+00				
	Weight uranium leached (g):	1.31E-03				
	Uncertainty in weight uranium leached (g):	6.71E-05				
	Equivalent number of leached kernels:	3.32E+00				
	Uncertainty in equivalent number of leached kernels:	1.74E-01				
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #32 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL18877 on 3/21/2019.
Shown is the result of the isotope dilution mass spectrometry analysis of B18111502.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1537, 1535, 1540, 1502, 1509
DRF filename:	14154D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18111503	B18111903		W18111907	
Total volume of leach solution (ml):		59.5	61.9		20.0	
RMAL analysis number:		18877-003	18877-007		18877	
Measured uranium concentration (µg/ml):		4.59E-01	4.05E-03		2.25E-04	
Uncertainty in uranium concentration (µg/ml):		4.59E-02	4.05E-04		2.25E-05	
Weight uranium leached (g):		2.73E-05	2.50E-07	2.76E-05	4.51E-09	N
Uncertainty in weight uranium leached (g):		2.75E-06	2.52E-08	2.75E-06	4.74E-10	
Equivalent number of leached kernels:		6.94E-02	6.36E-04	7.00E-02	1.14E-05	
Uncertainty in equivalent number of leached kernels:		7.01E-03	6.42E-05	7.02E-03	1.21E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #33 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL18877 on 3/21/2019.
Shown is the result of the second ICPMS analyses of B18111503.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1537, 1535, 1540, 1502, 1509
DRF filename:	14154D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18111503	B18111903		W18111907	
	Total volume of leach solution (ml):	59.5	61.9		20.0	
	RMAL analysis number:	18877-003	18877-007		18877	
	Measured uranium concentration (µg/ml):	5.45E-01				
	Uncertainty in uranium concentration (µg/ml):	5.45E-02				
	Weight uranium leached (g):	3.24E-05				
	Uncertainty in weight uranium leached (g):	3.26E-06				
	Equivalent number of leached kernels:	8.23E-02				
	Uncertainty in equivalent number of leached kernels:	8.32E-03				
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #33 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL18877 on 3/21/2019.
Shown is the result of the first ICPMS analysis of B18111503.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1522, 1531, 1543, 1532, 1525
DRF filename:	14154D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18111504	B18111904		W18111908	
Total volume of leach solution (ml):		59.3	62.3		20.0	
RMAL analysis number:		18877-004	18877-008		18877-012	
Measured uranium concentration (µg/ml):		7.44E+00	4.19E-02		8.84E-04	
Uncertainty in uranium concentration (µg/ml):		7.44E-01	4.19E-03		8.84E-05	
Weight uranium leached (g):		4.41E-04	2.61E-06	4.44E-04	1.77E-08	N
Uncertainty in weight uranium leached (g):		4.44E-05	2.63E-07	4.44E-05	1.86E-09	
Equivalent number of leached kernels:		1.12E+00	6.63E-03	1.13E+00	4.49E-05	
Uncertainty in equivalent number of leached kernels:		1.13E-01	6.70E-04	1.13E-01	4.74E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #30 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL18877 on 3/21/2019.
Shown is the result of the second ICPMS analyses of B18111504.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14154D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1522, 1531, 1543, 1532, 1525
DRF filename:	14154D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18111504	B18111904		W18111908	
Total volume of leach solution (ml):		59.3	62.3		20.0	
RMAL analysis number:		18877-004	18877-008		18877-012	
Measured uranium concentration (µg/ml):		8.57E+00				
Uncertainty in uranium concentration (µg/ml):		8.57E-01				
Weight uranium leached (g):		5.08E-04				
Uncertainty in weight uranium leached (g):		5.11E-05				
Equivalent number of leached kernels:		1.29E+00				
Uncertainty in equivalent number of leached kernels:		1.30E-01				
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #30 (previously unused).
FCM checked the recorded data against the official Results of Analysis for RMAL18877 on 3/21/2019.
Shown is the result of the first ICPMS analysis of B18111504.
The first analysis results were rejected based on IDMS analysis.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1659, 1648, 1670, 1655, 1662
DRF filename:	14155D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18112801	B18113001		W18113005	
Total volume of leach solution (ml):		59.5	61.5		20.0	
RMAL analysis number:		18892-001	18892-005		18892-009	
Measured uranium concentration (µg/ml):		1.46E+01	4.83E-02		1.52E-03	
Uncertainty in uranium concentration (µg/ml):		1.46E+00	4.83E-03		1.52E-04	
Weight uranium leached (g):		8.69E-04	2.97E-06	8.72E-04	3.04E-08	N
Uncertainty in weight uranium leached (g):		8.74E-05	2.99E-07	8.74E-05	3.20E-09	
Equivalent number of leached kernels:		2.20E+00	7.54E-03	2.21E+00	7.72E-05	
Uncertainty in equivalent number of leached kernels:		2.23E-01	7.62E-04	2.23E-01	8.15E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#2 (previously used for 14154D-Group 1 Clutch 1).
FCM checked the recorded data against the official Results of Analysis for RMAL18892 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1673, 1666, 1656, 1675, 1668
DRF filename:	14155D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18112802	B18113002		W18113006	
	Total volume of leach solution (ml):	59.0	63.8		20.0	
	RMAL analysis number:	18892-002	18892-006		18892-010	
	Measured uranium concentration (µg/ml):	9.75E+00	3.82E-02		1.28E-03	
	Uncertainty in uranium concentration (µg/ml):	9.75E-01	3.82E-03		1.28E-04	
	Weight uranium leached (g):	5.75E-04	2.44E-06	5.78E-04	2.56E-08	N
	Uncertainty in weight uranium leached (g):	5.79E-05	2.45E-07	5.79E-05	2.69E-09	
	Equivalent number of leached kernels:	1.46E+00	6.19E-03	1.47E+00	6.50E-05	
	Uncertainty in equivalent number of leached kernels:	1.48E-01	6.25E-04	1.48E-01	6.86E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#3 (previously used for 14154D-Group 1 Clutch 2).
FCM checked the recorded data against the official Results of Analysis for RMAL18892 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1669, 1657, 1661, 1649, 1650
DRF filename:	14155D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18112803	B18113003		W18113007	
	Total volume of leach solution (ml):	60.3	63.0		20.0	
	RMAL analysis number:	18892-003	18892-007		18892-011	
	Measured uranium concentration (µg/ml):	8.20E+00	3.49E-02		1.49E-03	
	Uncertainty in uranium concentration (µg/ml):	8.20E-01	3.49E-03		1.49E-04	
	Weight uranium leached (g):	4.94E-04	2.20E-06	4.97E-04	2.98E-08	N
	Uncertainty in weight uranium leached (g):	4.97E-05	2.21E-07	4.97E-05	3.13E-09	
	Equivalent number of leached kernels:	1.25E+00	5.58E-03	1.26E+00	7.56E-05	
	Uncertainty in equivalent number of leached kernels:	1.27E-01	5.64E-04	1.27E-01	7.99E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel RB#11 (previously used for 14154D-Group 1 Clutch 3).
FCM checked the recorded data against the official Results of Analysis for RMAL18892 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1663, 1654, 1646, 1643, 1667
DRF filename:	14155D_PF40-Group 1_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18112804	B18113004		W18113008	
	Total volume of leach solution (ml):	59.5	64.5		20.0	
	RMAL analysis number:	18892-004	18892-008		18892-012	
	Measured uranium concentration (µg/ml):	1.41E+01	6.06E-02		1.36E-03	
	Uncertainty in uranium concentration (µg/ml):	1.41E+00	6.06E-03		1.36E-04	
	Weight uranium leached (g):	8.39E-04	3.91E-06	8.43E-04	2.72E-08	N
	Uncertainty in weight uranium leached (g):	8.44E-05	3.93E-07	8.44E-05	2.86E-09	
	Equivalent number of leached kernels:	2.13E+00	9.92E-03	2.14E+00	6.90E-05	
	Uncertainty in equivalent number of leached kernels:	2.15E-01	1.00E-03	2.15E-01	7.29E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel FB#2 (previously used for 14154D-Group 1 Clutch 4).
FCM checked the recorded data against the official Results of Analysis for RMAL18892 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1658, 1674, 1671, 1653, 1640
DRF filename:	14155D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18120603	B18121101		W18121105	
Total volume of leach solution (ml):		60.0	65.0		20.0	
RMAL analysis number:		18909-001	18909-005		18909-009	
Measured uranium concentration (µg/ml):		6.62E+00	3.17E-02		5.82E-04	
Uncertainty in uranium concentration (µg/ml):		6.62E-01	3.17E-03		5.82E-05	
Weight uranium leached (g):		3.97E-04	2.06E-06	3.99E-04	1.16E-08	N
Uncertainty in weight uranium leached (g):		4.00E-05	2.07E-07	4.00E-05	1.22E-09	
Equivalent number of leached kernels:		1.01E+00	5.23E-03	1.01E+00	2.95E-05	
Uncertainty in equivalent number of leached kernels:		1.02E-01	5.28E-04	1.02E-01	3.12E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #31 (previously used for 14154D-Group 2 Clutch 5).
FCM checked the recorded data against the official Results of Analysis for RMAL18909 on 3/21/2019.

Fred C. Montgomery — Operator

4-18-2019 — Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1652, 1641, 1644, 1642, 1665
DRF filename:	14155D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18120604	B18121102		W18121106	
Total volume of leach solution (ml):		57.5	62.5		20.0	
RMAL analysis number:		18909-002	18909-006		18909-010	
Measured uranium concentration (µg/ml):		1.05E+01	4.94E-02		6.97E-04	
Uncertainty in uranium concentration (µg/ml):		1.05E+00	4.94E-03		6.97E-05	
Weight uranium leached (g):		6.04E-04	3.09E-06	6.07E-04	1.39E-08	N
Uncertainty in weight uranium leached (g):		6.08E-05	3.10E-07	6.08E-05	1.47E-09	
Equivalent number of leached kernels:		1.53E+00	7.84E-03	1.54E+00	3.54E-05	
Uncertainty in equivalent number of leached kernels:		1.55E-01	7.92E-04	1.55E-01	3.74E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #32 (previously used for 14154D-Group 2 Clutch 6).
FCM checked the recorded data against the official Results of Analysis for RMAL18909 on 3/21/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1645, 1651, 1677, 1664, 1672
DRF filename:	14155D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
Post-burn leach solution ID:		B18120605	B18121103		W18121107	
Total volume of leach solution (ml):		59.0	63.5		20.0	
RMAL analysis number:		18909-003	18909-007		18909-011	
Measured uranium concentration (µg/ml):		1.93E+01	9.18E-02		1.50E-03	
Uncertainty in uranium concentration (µg/ml):		1.93E+00	9.18E-03		1.50E-04	
Weight uranium leached (g):		1.14E-03	5.83E-06	1.14E-03	3.00E-08	N
Uncertainty in weight uranium leached (g):		1.15E-04	5.86E-07	1.15E-04	3.15E-09	
Equivalent number of leached kernels:		2.89E+00	1.48E-02	2.90E+00	7.61E-05	
Uncertainty in equivalent number of leached kernels:		2.92E-01	1.49E-03	2.92E-01	8.04E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			**Fe**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			**Cr**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			**Mn**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			**Co**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			**Ni**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			**Ca**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			**Al**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			**Ti**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			**V**		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #33 (previously used for 14154D-Group 2 Clutch 7).
FCM checked the recorded data against the official Results of Analysis for RMAL18909 on 3/21/2019.

Fred C. Montgomery
Operator

4-18-2019
Date

Data Report Form DRF-26B: Post-Burn Leach Uranium and Impurities

Procedure:	AGR-CHAR-DAM-26 Rev. 3
Operator:	Montgomery
Compact lot ID:	BWXT J52R-16-14155D
Compact lot description:	AGR-5/6/7 compacts, 40% packing fraction
Compact ID numbers:	1679, 1647, 1676, 1678, 1660
DRF filename:	14155D_PF40-Group 2_BL_ICPMS_DRF26R3.xls

Number of compacts:	5
Average weight uranium per particle, mean value (g):	3.94E-04
Average weight uranium per particle, uncertainty in mean (g):	3.94E-06

		First Leach	Second Leach	Total	Water rinse	Include if > 10% of 2nd leach
	Post-burn leach solution ID:	B18120606	B18121104		W18121108	
	Total volume of leach solution (ml):	59.5	65.0		20.0	
	RMAL analysis number:	18909-004	18909-008		18909-012	
	Measured uranium concentration (µg/ml):	5.51E-01	4.81E-03		5.21E-04	
	Uncertainty in uranium concentration (µg/ml):	5.51E-02	4.81E-04		5.21E-05	
	Weight uranium leached (g):	3.28E-05	3.13E-07	3.31E-05	1.04E-08	N
	Uncertainty in weight uranium leached (g):	3.30E-06	3.14E-08	3.30E-06	1.10E-09	
	Equivalent number of leached kernels:	8.32E-02	7.94E-04	8.40E-02	2.64E-05	
	Uncertainty in equivalent number of leached kernels:	8.41E-03	8.01E-05	8.41E-03	2.79E-06	
Fe	Measured concentration of impurity in sample (µg/ml):			Fe		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Cr	Measured concentration of impurity in sample (µg/ml):			Cr		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Mn	Measured concentration of impurity in sample (µg/ml):			Mn		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Co	Measured concentration of impurity in sample (µg/ml):			Co		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ni	Measured concentration of impurity in sample (µg/ml):			Ni		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ca	Measured concentration of impurity in sample (µg/ml):			Ca		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Al	Measured concentration of impurity in sample (µg/ml):			Al		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
Ti	Measured concentration of impurity in sample (µg/ml):			Ti		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					
V	Measured concentration of impurity in sample (µg/ml):			V		
	Uncorrected weight of impurity in sample (µg):					
	Weight of impurity in blank (µg):					
	Minimum corrected weight of impurity in sample (µg):					
	Maximum corrected weight of impurity in sample (µg):					

Comments

Leached in Vessel #30 (previously used for 14154D-Group 2 Clutch 8).
FCM checked the recorded data against the official Results of Analysis for RMAL18909 on 3/21/2019.

Fred C. Montgomery
Operator

4-18-2019
Date