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FINAL REPORT FOR THE ARRA SAMPLING OF CHEMICALS FROM ROOM 144 ANALYTICAL LAB OF BUILDING 234-5Z AT THE PLUTONIUM FINISHING PLANT, 2010 - SAMPLE DELIVERY GROUPS 222S20100687 AND 688

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222-S LABORATORY

FINAL REPORT FOR THE ARRA SAMPLING OF CHEMICALS FROM ROOM 144 ANALYTICAL LAB OF BUILDING 234-5Z AT THE PLUTONIUM FINISHING PLANT, 2010 - SAMPLE DELIVERY GROUPS 222S20100687 AND 688

1.0 INTRODUCTION

This report presents the final results for the 25 samples received between August 19, 2010 and August 30, 2010 from Building 234-5Z at the Plutonium Finishing Plant (PFP). The samples were chemicals collected from Room 144 Analytical Lab. The samples were analyzed in accordance with PFP-LOI-10-0004, *Letter of Instruction for Analysis of Chemicals from Room 144 Analytical Lab of 234-5Z Building* (LOI); Sampling Authorization Forms (SAF) F10-068 and 069; DOE/RL-2004-29, *Sampling and Analysis Plan for the Plutonium Finishing Plant, Above-Grade Structures* (SAP); ATL-MP-1011, *ATL Quality Assurance Project Plan for 222-S Laboratory* (QAPP); SW-846, *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods;* and the additional guidance given by the customer point of contact (POC).

Most SW-846 test methods performed at the 222-S Laboratory contain deviations that are listed in an appendix in the analytical procedures. All other known deviations or variances from SW-846 are documented in this narrative. The following attachments are included in this report.

Attachment 1	Data Summary Report
Attachment 2	Sample Breakdown Diagrams
Attachment 3	Tentatively Identified Compounds (TIC) Report
Attachment 4	Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report
Attachment 5	Surrogate Recoveries
Attachment 6	Correspondence
Attachment 7	Receipt Paperwork

2.0 SAMPLE RECEIPT, HANDLING, AND APPEARENCE

Two solid, two organic liquid, and 21 aqueous liquid samples were collected on July 13, 2010 and July 19, 2010, and received at the 222-S Laboratory between August 19 and 30, 2010, in good condition and with adequate paperwork. The customer POC verbally indicated that meeting holding times was not required because of the long delay between sample collection and delivery to the laboratory. Therefore, no holding time report is included in this document.

Solid sample B242B6 contained two small chunks of solids. There was sufficient material to prepare an acid-digested aliquot (using SW-846 Method 3050) and a water leach. The acid digest was used to obtain results for metals by inductively coupled plasma-atomic emission spectroscopy (ICP-AES) and inductively coupled plasma-mass spectrometry (ICP-MS), and all requested radionuclide results. The water leach was used for the requested anions analysis. There was insufficient sample to perform a pH measurement or to perform the mercury analysis.

Solid sample B241X2 appeared to be resin beads. The sample did not completely dissolve in the digestions, so reported results are from the leachable portion of the material on the resin beads.

Samples B24285 and B24298 were identified as organic liquids in a spreadsheet obtained from the customer POC. In addition, during some analyses, sample B24296 behaved like an organic or surfactant material. A pH measurement was obtained on sample B24296, but was not attempted on the other two samples that were identified as organic liquids. The ion chromatography (IC) analysis for anions was not performed on any of these samples.

The laboratory had difficulty performing the ICP and ICP-MS analyses on eight of the liquid samples that were not identified as being organic liquid. Due to the adverse matrix effects, these samples were acid-digested prior to analysis. The digested liquid samples are identified in the sample breakdown diagrams in Attachment 2.

3.0 HOLDING TIMES

The samples were collected at least 37 days prior to receipt of the samples at the 222-S Laboratory. Because of this, holding times for nitrate and nitrite (48 hours), chloride and sulfate (28 days), volatile organic analysis (VOA) (14 days), semivolatile organic analysis (SVOA) (14 days), and mercury (28 days) were all missed. The customer was informed of this on August 18, 2010 (see correspondence in Attachment 6). The six-month holding times for metals analysis by ICP and ICP-MS were met.

4.0 ANALYTICAL RESULTS SUMMARY

The Data Summary Report (Attachment 1) presents the final analytical results for those analytes requested in the SAF and LOI.

The laboratory did not meet the requested detection limits for all metals using the ICP method because of dilutions required to reduce matrix effects or to measure some high concentration analytes in the samples. The metals that missed the detection limit by ICP were analyzed using the ICP-MS method.

For the VOA and SVOA, there were some compounds identified in the samples that were not requested analytes. Non-requested compound results that were calculated using the instrument calibration are included in the Data Summary Report in Attachment 1. Non-requested compound results that were estimated using the National Institute of Standards and Technology (NIST) library or by comparison against spectra of known compounds are considered TICs and are included in Attachment 3.

The "Units" column in Attachment 1 contains the reporting units for the samples. For the solid samples, the units for the blank are not all the same as those for the samples. For anions, metals by ICP and ICP-MS, radionuclides by IPC-MS and mercury, the blank units are µg/mL. The "Det Limit" column in Attachment 1 contains the method detection limit (MDL) for non-radiochemical analyses or the minimum detectable activity for radionuclides determined by radiochemical methods.

In Attachment 1, the column labeled "A#" indicates the aliquot class or the method used for sample preparation before analysis. The aliquot classes are defined as follows:

- "A" indicates solid samples prepared by an acid digest that follows SW-846 Method 3050B.

- "B" indicates liquid samples prepared by an acid digest that follows SW-846 Method 3010A.
- "E" indicates liquid or solid samples prepared by a strong acid digest.
- "O" indicates liquid samples prepared by an extraction or dilution for organic analysis.
- "W" indicates solid samples prepared by a water digest.

Samples without a letter identifier in the "A#" column were analyzed directly with no separate preparation method or with sample preparation performed as a part of the analytical procedure steps.

The "Qual Flags" column in Attachment 1 contains data qualifier flags that are defined as follows:

Inorganic Qualifier flags:

- "B" indicates that the reported result should be considered an estimate because the sample concentration is greater than the MDL but less than the quantitation limit.
- "C" indicates that the analyte was detected in the blank and in the sample, and the blank concentration was greater than 5% of the concentration detected in the sample.
- "M" indicates that the relative percent difference (RPD) between the sample and duplicate results was outside of range listed in the SAP.
- "N" indicates that the MS is outside of range listed in the SAP.
- "U" indicates that the reported result is less than the calculated detection limit.
- ">" indicates that the reported result is outside the calibration range. In this report, this flag is used to indicate that the pH result was <pH 2, which was the low calibration standard value, or greater than 7, which, in some cases, was the high calibration standard.
- "X" is a user defined flag. For this report, this flag was used to indicate a failed serial dilution or a failed laboratory control sample (LCS) recovery was reported for sodium. It was also used to indicate a failed continuing-calibration verification (CCV) standard recovery for chromium. See discussions below.

Radionuclide Qualifier flags:

- "B" indicates that the radionuclide was detected in the blank and in the sample and the blank concentration or activity was greater than 5% of the concentration or activity detected in the sample.
- "U" indicates that the reported result is less than the calculated detection limit.

Organic Qualifier flags in Attachment 1: Data Summary Report:

- "D" indicates that a dilution was required to reduce the sample concentration to be within the calibration range.
- "J" indicates that the reported result should be considered an estimate because it was greater than the MDL but below the quantitation limit.

- "N" indicates a TIC that was matched with the NIST library.
- "P" indentifies a TIC that was potentially identified by matching to known spectra of compounds run on the same instrument.
- "T" indentifies a matrix spike failure.
- "U" indicates that the reported result is less than the calculated detection limit.
- "X" is a user-defined flag. For this report, this flag is applied to the non-requested acetone results because the recovery of the LCS was outside of the control limits.

Organic Qualifier flags in Attachment 3: TIC Report:

- "J" indicates that the reported result should be considered an estimate because it was greater than the MDL but below the quantitation limit.
- "N" indicates a TIC that was matched with the NIST library.
- "P" indentifies a TIC that was potentially identified by matching to known spectra of compounds run on the same instrument.
- "T" indentifies a compound as a TIC.

Manual calculations using rounded results from the Data Summary Report or result calculation forms may differ slightly from the actual results derived from the raw data.

4.1 INORGANIC ANALYSES

4.1.1 pH and Hydrogen Ion Analysis

The pH and hydrogen ion analyses were determined on direct aliquots. The pH LCS measurement and RPD met the acceptance criteria in ATL-MP-1011. This analysis was performed on 19 of the 25 samples received. As stated previously, pH was not measured on solid sample B242B6 due to insufficient material and the two organic liquid samples (B24285 and B24298. In addition, the pH analysis was not performed on the three samples with very high alpha activity (B24290, B24291, and B24297) because of the large sample size required and the hood limitation for alpha sample analysis. For these last three samples, the hydrogen ion concentration was determined in place of the pH measurement.

Results reported as < pH 2 were outside of the calibration range, which was the lower calibration standard value, and ">" flag was applied to the results. The hydrogen ion analysis was performed on these samples. For sample B24286, the pH was reported as 10.48, which was greater than the high calibration standard, and a ">" flag was applied. For this sample, the customer accepted the out-of-range result without reanalysis (see correspondence in Attachment 6).

For the hydrogen ion analysis, the LCS and spike recoveries and the RPDs met the criteria in the SAP. This analysis was performed on 17 of the 25 samples received. It was not performed on the solid samples, the organic liquids, or aqueous samples with a pH > 2. Solid and organic matrices are not applicable for this analysis.

During review of the hydrogen ion data, it was discovered that there were no approved MDLs for this analysis. Typically the lab runs an MDL study and receives approval on the data from a

quality assurance (QA) scientist prior to running samples. In this case, since the method addresses both free H^+ and OH^-, but is almost exclusively used for OH^-, it was believed to be fully validated for everything it covers. A set of standards were run and approved by QA after the sample analysis to establish an MDL. It is the Laboratory's opinion that this MDL is representative of the system at the time of the analysis. This was discussed with the customer POC who agreed with the approach and did not request a reanalysis (see correspondence in Attachment 6).

4.1.2 Mercury

The Hg analysis was performed on acid-digested aliquots. The LCS recoveries, MS recoveries, and RPD met the criteria in the SAP. For one batch of samples, a low level of Hg was detected in the method blank. Since the blank concentration was less than quantitation limit, no reanalysis was required. For samples B24285 and B24287, the concentration in the blank was greater than 5% of the concentration in the samples, so a "C" flag was applied to the sample results. The required detection limit (RDL) in the SAP was met for the one solid sample. However, for the liquid samples, the laboratory was unable to meet the RDL due to the small sample size required due to alpha activity or limited sample amount for performing all requested analyses.

4.1.3 Ion Chromatography

Ion chromatography analysis was performed on direct aliquots of liquid samples and on water-digested aliquots of the solid samples. As stated previously, this analysis was not performed on the organic liquids.

The LCS and MS recoveries and RPDs met the requirements in the SAP. Low levels of chloride, nitrate, and sulfate were detected in the preparation and method blanks associated with about half of the samples. Since the levels of these analytes in the blanks were below the quantitation limits, no reanalysis was required. For samples with low concentrations of these analytes, the concentration in the blanks was greater than 5% of the sample results and a "C" flag was applied. The results for the affected samples were also "B" flagged to indicate that they should be considered estimates because the concentration was below the quantitation limit. The blank contamination issue was communicated with the customer POC who indicated that "C" flagged result would not affect the use of the data, and no reanalysis was requested (see correspondence in Attachment 6). There were no RDLs listed in the SAP for anions.

4.1.4 Inductively Coupled Plasma-Atomic Emission Spectroscopy

The ICP-AES analysis was performed on acid-digested aliquots of the solid samples. For the organic liquids, the analysis was performed on a digested aliquot where the sample was ashed prior to digesting with strong acids to ensure organic compounds were broken down and removed. As discussed previously, eight of the other liquid samples exhibited matrix interference when the samples were analyzed with a 2X dilution. These samples were acid-digested using a procedure that follows SW-846 Method 3010C. The remaining aqueous liquid samples were analyzed with an acid dilution.

The requested analytes were aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, potassium, selenium, silver, sodium, strontium, thallium, vanadium, and zinc. The SAF and the chain of custody forms also requested

uranium. However, this was not listed in the LOI, and total uranium can be closely estimated from the ^{238}U result reported by ICP-MS. The SAP provided RDLs for barium, beryllium, cadmium, chromium, lead, nickel, and silver. Not all RDLs were met for all samples because of dilutions required based on high concentrations of certain analytes and/or to reduce matrix interference or the requirement to use a smaller sample size due to high alpha activity. Analytes that did not meet the RDL requirement were reanalyzed by ICP-MS.

Acid-digested solid samples — For the two solid samples, the LCS recovery met the requirement in the SAP for all reported analytes. No requested analytes were detected in the preparation blank. The RPDs met the requirement in the SAP. The MS recoveries for all analytes, except potassium and sodium met the requirement in the SAP. For sodium, the concentration in the sample was greater than the spike added, so the spike criteria are not applicable. The low MS recovery for potassium is discussed below.

The low level standard (LLS) had low recoveries for chromium (36%) and potassium (35%). The chromium results for both samples (B241X2 and B242B6) were reported as less than the MDL, but this could be due to the low bias indicated by the low LLS recovery. For potassium, the result for B241X2 was sufficiently above the quantitation limit that the low bias indicated by the low LLS recovery did not affect the result. For sample B242B6, the potassium result was less than the MDL, and may be a false non-detect due to the low bias. The MS recovery for potassium was outside of the criteria listed in the SAP, at 62%, possibly due to the low bias. An "N" flag was applied to the potassium results for both samples to indicate the spike failure.

For sodium, the percent difference between the sample and a five-fold serial dilution was 14%, which failed to meet the requirement in the QAPP. A dilution was chosen to obtain the best detection limits for those analytes with RDLs listed in the SAP. Using this dilution, the concentration for sodium was near the upper end of the linear range and the higher solids concentration may have caused a low bias in the sample result. The result for the serial dilution was higher, at 6.4E+04 μg/g. The sample result is flagged with an "X" to indicate this failure.

These issues were reported to the customer POC, who indicated that reported results were acceptable (see correspondence in Attachment 6).

Ash/acid-digested organic liquid samples — For the two organic liquid samples (B24285 and B24298), there was insufficient sample available to prepare a duplicate and spike and perform all other requested analyses. Therefore, these samples were prepared in a batch that contained an organic liquid sample from another customer. Because of this, no duplicate or spike results were included in the Data Summary Report in Attachment 1.

The LCS recovery for sodium was 138%, which was outside of the recovery limits of 70% - 130% requested in the SAP. An "X" flag was applied to the sodium result for each sample to indicate the standard recovery failure. The MS recovery for sodium was also outside of the limits at 147% recovery. Sodium and aluminum were detected in the preparation blank. The concentrations of these analytes in the blank were greater than 5% of the results for B24298 and a "C" flag was applied to each result. It is the Laboratory's opinion that high recoveries and blank contamination are due to sodium and aluminum leaching from the glassware during the digestion with strong acids. A repreparation and reanalysis would likely cause the same contamination issues. Thallium was inadvertently omitted from the LCS and MS. The recoveries for thallium in the initial calibration verification standard and post-digestion spike

were within the limits in the SAP. These recoveries do not show in the data summary report. The RPDs all met the requirements in the SAP.

The LLS recovery for potassium was low at 51%, which indicates a potential low bias for sample B24298, which was reported as < MDL. For sample B24285, the potassium result was sufficiently above the LLS that the result should not be affected. These issues were presented to the customer POC, and results were accepted without reanalysis (see correspondence in Attachment 6).

Acid-digested liquid samples — For eight of the assumed aqueous samples, there was an unknown matrix interference that caused sample uptake issues when analysis was attempted with only an acid dilution. These samples were acid-digested and reanalyzed. The LCS recoveries and RPDs for all reported analytes met the requirement in the SAP. The MS recoveries for all analytes, except antimony, met the requirement in the SAP. For antimony, the recovery was low at 48%. The antimony results for all samples in the batch were flagged with an "N" to indicate the spike failure. This failure may be due to insufficient hydrochloric acid added during the digestion. The sample results were all less than the MDL, but might be biased low. The customer POC indicated that the potential false negative would not affect the use of the data, so the results were accepted (see correspondence in Attachment 6).

The recovery for potassium in the LLS analyzed at the end of the run was low at 62%. The initial LLS recovery was acceptable at 94%, which indicates a potential stability issue by the end of the run. Most samples were all reported as less than the MDL, which might be false negatives. For sample B24292, the sample result was greater than the MDL, but less than the quantitation and was flagged with a "B". This result might be biased low.

A low level of chromium was detected in the preparation blank. For most samples, chromium was reported from ICP-MS, so this was not an issue. Since the level in the blank was less than the quantitation limit, no reanalysis was required. For sample B24293, the level of chromium in the blank was less than 5% of the sample result, thus no flag was requested.

Direct analyzed liquid samples — These samples were actually analyzed using an acid dilution. All LCS recoveries, MS recoveries, and RPDs met the requirements in the SAP. No requested analytes were detected in the blanks.

4.1.5 Inductively Coupled Plasma-Mass Spectrometry

The ICP-MS analysis was performed on acid-digested aliquots of the solid samples. For the organic liquids, the analysis was performed on a digested aliquot where the sample was ashed prior to digesting with strong acids to ensure organic compounds were broken down and removed. As discussed previously, eight of the other liquid samples exhibited matrix interference when the samples were analyzed with a 2X dilution by ICP. Because of the higher dilution required for the ICP-MS analysis, all of these samples were analyzed with just a dilution for the actinides and six of these eight samples were analyzed with just a dilution for the metals. Samples B24294 and B24296 had significant matrix interference for the ICP-MS metals analysis and were analyzed from the acid digest. These samples were acid-digested using a procedure that follows SW-846 Method 3010C. The remaining aqueous liquid samples were analyzed with an acid dilution.

Metals analysis — The SAP provided RDLs for barium, beryllium, cadmium, chromium, lead, nickel, and silver. As stated earlier, not all RDLs were met for all samples using the ICP method and analytes that did not meet the RDL requirement were reanalyzed by ICP-MS. However, some analytes also failed to meet the RDL by ICP-MS because of dilutions required due to high concentrations of other analytes and/or to reduce matrix interference, or small samples sizes required due to high alpha concentrations.

The LCS and spike recoveries all met the requirements in the SAP and the QAPP.

Sample B24286: The sample result for chromium was greater than four times the spike added, so the spike criteria were not applicable and an "n/a" was reported instead of the actual spike recovery. The RPD for chromium was greater than 30%, at 33.9%. An "M" flag was applied.

Sample B24292: The recovery for chromium in the ending LLS was <70%, which failed to meet the criteria in the QAPP. This indicates a potential low bias for chromium in this sample. The result was flagged with a "B" because it was less than the quantitation limit. The result of 0.0415 µg/mL was much less than the regulatory limit of 5 µg/mL, so it is the Laboratory's opinion that the potential 30% low bias for this result will not affect the use of the data.

Samples B24294 and B24296: Nickel was detected in the preparation blank above the MDL, but less than the quantitation limit, so no reanalysis was required. The blank result was greater than 5% of the sample results, so a "C" flag was applied. The result reported for sample B24294 was only slightly above the RDL; the result reported for B24296 was less than the RDL. These results were presented to the customer POC, who indicated that nickel is not a constituent of concern, and no reanalysis was requested (see correspondence in Attachment 6.)

Sample B24297: Barium was detected in the final CCB above the MDL, but less than the quantitation limit, so no reanalysis was required. Since the result in the blank was greater than 5% of the sample results (at 5.1%), a "C" flag was applied. Since the result of 0.181 µg/mL was well below the regulatory limit of 100 µg/mL and the blank was only 0.1% above the allowable criteria, it is the Laboratory's opinion that the potential high bias indicated by the blank will not affect the use of the data.

Sample B24299: The RPD for lead was greater than 30%, but the sample result was less than the quantitation limit, so the criterion was not applicable and no flag was applied.

Sample B241X2: The preparation blank contained chromium above the MDL, but below the quantitation limit, so no reanalysis was required. However, the concentration in the blank was greater than 5% of the chromium result for sample B241X2, so a "C" flag was applied.

Samples B242B4 and B242B8: The recovery for chromium in the ending CCV was >110%, which failed to meet the criteria in the QAPP. Since a high recovery indicates a potential high bias for sample results, and the results for these samples were less than the MDL, it is the Laboratory's opinion that there was minimal impact on the use of the data, so the results were reported from this batch. An "X" flag was applied to the chromium results for these two samples to indicate the failed ending CCV.

Organic liquid samples B24285 and B24298: The duplicate and MS analyses were performed on another customer's sample, and the recoveries are not included in Attachment 1. All RPDs and MS recoveries met the requirements in the SAP.

The initial LLS recovery for chromium was greater than 130%, which fails to meet the criteria in the QAPP. This indicates a potential high bias for sample B24285. The result for sample B24298 was sufficiently high that the bias indicated by the high LLS recovery should not affect that result. The LLS at the end of the run met the criteria in the QAPP. Chromium was detected in the initial continuing calibration blank (CCB) above the MDL, but less than the quantitation limit, so no reanalysis was required. The preparation blank result for chromium was greater than the MDL, but less than the quantitation limit, so no repreparation or reanalysis was required. The preparation blank result was greater than the chromium result for sample B24298 and was approximately 8% of the result for B24285, so a "C" flag was applied to both sample results. The high blanks might be due to the high bias indicated by the high recovery for the initial LLS. The blank was previously analyzed in another analytical batch and was less than the MDL. The results for the two samples from that initial batch were about the same as those reported from the reanalysis batch with the high blank result. However, since the CCV at the end of the initial run failed high, the results could not be reported from that run. Even with the potential high bias indicated by the high blank results, the sample result of 0.420 µg/mL for chromium for sample B24298 was less than the regulatory level of 5 µg/mL. The chromium result for sample B24285 was 10.6 µg/mL. Even if it was corrected for an 8% blank contribution, this result will be greater than the regulatory limit of 5 µg/mL. The preparation blank result for lead was greater than the MDL and the quantitation limit. The lead result in the preparation blank was also higher than the results for both samples and could indicate a false positive result. A "C" flag was applied to the lead results for both samples. Blank results greater than the quantitation limit typically require repreparation and reanalysis. However, since the lead results for both samples were below the regulatory level of 5 µg/mL, even with the potential high bias, it is the Laboratory's opinion that the potential high bias will not affect the use of the sample results. Nickel was detected in the preparation blank above the MDL, but below the quantitation limit. The blank result was greater than 5% of the result for sample B24298, so a "C" flag was applied. These blank contamination issues were discussed with the customer POC who indicated that the results were acceptable for the use of the data and no reanalysis was requested.

Actinides analysis — The requested analytes for the actinides analysis were ^{237}Np, ^{242}Pu, ^{233}U, ^{234}U, ^{235}U, and ^{238}U. The LCS and MS standards consisted of ^{237}Np, ^{239}Pu, ^{235}U, and ^{238}U. Since ^{239}Pu was not a requested analyte, it is not included in the data summary report. Most samples met the RDL for ^{235}U and ^{238}U. Those that did not meet the RDL had concentrations much greater than the quantitation limit and required a larger dilution. There were eight samples with low concentrations of analytes that required less dilution to meet the RDLs. The other samples failed to meet the RDL because of the large dilutions required based on the high concentrations of actinides or other analytes in the samples.

The LCS recoveries and MS recoveries for all isotopes met the criteria in the SAP. The RPDs all met the requirements in the SAP. All RPDs met the requirements in the SAP and/or QAPP. For sample B24286, the RPD for ^{234}U was greater than 30%, and for B24290 the RPDs for both ^{242}Pu and ^{234}U were greater 30%. However, since the results were less than the quantitation limit, the RPD criteria were not applicable.

For organic liquid samples B24285 and B24298, the duplicate and MS analyses were performed on another customer's sample, and the recoveries are not included in Attachment 1. All RPDs and MS recoveries met the requirements in the SAP.

The initial LLS recovery for ^{235}U failed high at 130.6% for the batch containing samples B242B6, B241X2, B24293, B242B4, and B242B8. This indicates a possible high bias for

sample B24293. The result for sample B242B6 was much greater than the LLS, so the affect of the high bias should be minimal. The results for the other samples were less than the detection limit and are not affected. The final LLS associated with samples B24280, B24281, B24283, B24288, and B24289 had a low recovery for ^{235}U at 61%. This indicates a possible low bias for samples B24280 and B24281, which had results approximately 10 times the LLS level. The other sample results should not be affected.

A low level of ^{234}U was detected in the method blank associated with sample B24287. The concentration in the blank was less than 5% of the sample concentration, so no qualifier flag was required. The blank concentration was also less than the quantitation limit, so no reanalysis was required. A low level of ^{237}Np was detected in the method blank associated with samples B24279, B24292, B24294, B24295, B24296, B24299, B242B1, and B242B2. For most samples in the batch, the concentration of ^{237}Np was less than the MDL, so the apparent contamination did not affect the results. For samples B24287 and B24292, the concentration in the blank was greater than 5% of the sample result and a "B" flag was applied. Since the sample concentration was less than the RDL, the use of the result should not be affected. Since the concentration in the blank was below the quantitation limit, no reanalysis was required.

Direct calibration, where a standard containing the isotope and element of interest is used to calibrate the response of the isotope, is the most accurate type of calibration; however, standard reference material is not available for all the isotopes of interest. Concentrations of those isotopes without available standards are estimated based on the instrument's mass-response curve, which is generated by using the intensity/concentration relationship for the available isotope standards. Results estimated in this manner are designated "semi-quantitative." The 222-S Laboratory currently does not have standards available for calibration, calibration checks, or matrix spikes for ^{242}Pu, ^{233}U, or ^{234}U. The results for these isotopes are all considered semi-quantitative.

4.2 RADIOCHEMICAL ANALYSIS

4.2.1 Total Alpha/Total Beta

The total alpha/total beta analysis for solid sample B241X2 was performed on acid-digested aliquots using the strong acid digest. For solid sample B242B6, there was insufficient sample to perform the analysis using the strong acid digest, so the analysis was performed using the acid digest that follows SW-846 Method 3050B. The organic liquids were analyzed using the ash/strong acid digest. The remaining liquid samples were analyzed using direct aliquots.

The LCSs and spikes were prepared after the digestion. The LCS recoveries, spike recoveries, and RPDs met the criteria in the SAP. No alpha or beta activity was detected in the method or preparation blanks. For organic liquid samples B24285 and B24298, the duplicate and MS analyses were performed on another customer's sample, and the recoveries are not included in Attachment 1. The RPDs and MS recoveries met the requirements in the SAP.

For most samples, the reported minimum detectable activities (MDA) for gross beta met the RDL requirements in the SAP or the sample results were above the quantitation limit. All alpha results reported below the MDA or quantitation limit met the RDL.

4.2.2 Gamma Energy Analysis

The GEA for solid sample B241X2 was performed on acid-digested aliquots using the strong acid digest. For solid sample B242B6, there was insufficient sample to perform the analysis using the strong acid digest, so the analysis was performed using the acid digest that follows SW-846 Method 3050B. The organic liquids were analyzed using the ash/strong acid digest. The remaining liquid samples were analyzed using direct aliquots. The requested isotopes for GEA were ^{60}Co and ^{137}Cs. The LCS recoveries met the criteria in the SAP. No isotopes were detected in the preparation blank. For organic liquid samples B24285 and B24298, the duplicate analysis was performed on another customer's sample, and the RPDs are not included in Attachment 1. The RPDs recoveries met the requirements in the SAP.

For solid sample B241X2, the MDA met the RDL in the SAP. For all other samples, the laboratory was unable to meet the RDL requirements in the SAP. The customer indicated that the missed RDLs would not affect the use of the data (see correspondence in Attachment 6).

4.2.3 Strontium-90

The ^{90}Sr analysis for solid sample B241X2 was performed on acid-digested aliquots using the strong acid digest. For solid sample B242B6, there was insufficient sample to perform the analysis using the strong acid digest, so the analysis was performed using the acid digest that follows SW-846 Method 3050B. The organic liquids were analyzed using the ash/strong acid digest. The remaining liquid samples were analyzed using direct aliquots.

The LCS recoveries met the criteria in the SAP. For samples with a negative result reported for either the sample or duplicate result, an RPD calculation is not applicable. For sample B24283, the RPD was greater than 30%, but the sample counting uncertainty was greater than 30%, so the criterion was not applicable. For sample B24279, an RPD was not calculated because the duplicate result was below the MDA. For organic liquid samples B24285 and B24298, the duplicate analysis was performed on another customer's sample, and the RPD is not included in Attachment 1. The RPD met the requirements in the SAP.

Solid sample B241X2 was the only sample to meet RDL requirement in the SAP. All others failed to meet the requirement either due to limiting sample size to ensure all analyses could be run or due to limitation based on high alpha activity.

Solid sample B242B6 was analyzed in the same analytical batch as sample B241X2. However, the only preparation blank that was included in the analytical batch was the one prepared for the strong acid digest. Since the SW-846 acid digest blank was not analyzed, the blank result for sample B242B6 is reported as "n/a". The sample result for sample B242B6 had a very high counting uncertainty (863%), and the result should be considered an estimate.

4.2.4 Americium-241

The ^{241}Am analysis for solid sample B241X2 was performed on acid-digested aliquots using the strong acid digest. For solid sample B242B6, there was insufficient sample to perform the analysis using the strong acid digest, so the analysis was performed using the acid digest that follows SW-846 Method 3050B. The organic liquids were analyzed using the ash/strong acid digest. The remaining liquid samples were analyzed using direct aliquots. The LCS recoveries and RPDs met the criteria in the SAP. For organic liquid samples B24285 and B24298, the

duplicate analysis was performed on another customer's sample, and the RPD is not included in Attachment 1. The RPD met the requirements in the SAP.

No ^{241}Am activity was detected in the preparation or method blanks. The reported MDAs did not meet the RDL requirement in the SAP because of a small sample size required due to high alpha activity or because of limit sample quantity.

4.2.5 **Plutonium-**238 and Plutonium-239/240

The ^{238}Pu and $^{239/240}$Pu analysis for solid sample B241X2 was performed on acid-digested aliquots using the strong acid digest. For solid sample B242B6, there was insufficient sample to perform the analysis using the strong acid digest, so the analysis was performed using the acid digest that follows SW-846 Method 3050B. The organic liquids were analyzed using the ash/strong acid digest. The remaining liquid samples were analyzed using direct aliquots. The LCS recoveries and RPDs met the criteria in the SAP. For organic liquid samples B24285 and B24298, the duplicate analysis was performed on another customer's sample, and the RPD is not included in Attachment 1. The RPD met the requirements in the SAP.

No ^{238}Pu or $^{239/240}$Pu activity was detected in the preparation and method blanks. The reported MDAs for only seven samples met the RDL requirement in the SAP. For the other samples, the RDL was missed because of a small sample size required due to high alpha activity or because of limit sample quantity.

4.3 ORGANIC ANALYSIS

4.3.1 Volatile Organic Analysis

VOA was performed on a direct aliquot of sample B24285. Because of the high concentration of tributyl phosphate in sample B24298, a very small sample aliquot was diluted in methanol prior to analysis. These samples were identified by the customer POC as organic liquids. This analysis was not requested for any other samples. The only requested compound was carbon tetrachloride.

The LCS recoveries were all within the statistical process control (SPC) limits and the limits in the SAP, except for acetone. The recoveries for vinyl chloride, acetone, and methyl acetate were outside the acceptance limits in the continuing CCV standard. These compounds were not requested, so no reanalysis was requested. No carbon tetrachloride was detected in the blank or the samples.

The MS and MSD recoveries and RPDs between the MS and MSD all met the requirement in the SAP. All surrogate recoveries met the SPC limits. The MS and MSD recoveries and RPD are presented in report included in Attachment 4. Surrogate recoveries are included in Attachment 5.

Acetone, 1-butanol, 2-hexanone, methyl acetate, and toluene were calibrated compounds that were not requested, but were detected in sample B24285. The recovery for acetone was outside of the control limits for the LCS and the result was flagged with an "X". The recoveries for both acetone and methyl acetate were outside of the control limits for the CCV and the results were flagged with a "J". The detected, calibrated compounds were included in the Data Summary Report in Attachment 1. Non-calibrated, TICs were included in Attachment 3.

For sample B24298, toluene and 2-hexanone were detected. These are included in Attachment 1. TICs were also detected and were included in Attachment 3.

4.3.2 Semivolatile Organic Analysis

SVOA was performed on an extracted aliquot for sample B24285 and by dilution in methylene chloride for sample B24298. The analysis was not requested for any other samples. The only requested compound was tributyl phosphate (TBP).

Both samples were identified by the customer POC as organic liquids. Therefore, the first analysis was attempted using a dilution of each sample in methylene chloride. Sample B24285 was chosen for analysis of an MS and MSD. The surrogate, MS, and MSD recoveries all failed to produce acceptable recoveries for this sample, which indicated that the sample matrix was insoluble in methylene chloride. This sample was reanalyzed by extraction. Therefore, there was no MS or MSD recoveries reported in the batch with sample B24298. This information was provided to the customer POC, who indicated that the quality control failures would not affect the use of the data (see correspondence in Attachment 6).

For sample B24298, the LCS recovery for 1,2,4 trichlorobenzene was outside of the SPC limit, but was within the 70% - 130% recovery limits listed in the SAP. No tributyl phosphate was detected in the method blank. The surrogate recoveries are included in Attachment 5. A number of TICs were potentially identified using retention times and reference spectra from known standards that were run on the same instrument. The results were flagged with a "T" to indicate that they are TICs and with a "P" to indicate they were potentially identified by the method discussed above. These and other TICs results were reported in Attachment 3. A "hydrocarbon hump" was observed in the diesel range. Therefore, this sample was analyzed using the NWTPH – Diesel method rather than analyzing for kerosene, as requested.

For sample B24285, the LCS recoveries for 1,2,4 trichlorobenzene and acenaphthene were below the limits of 70% - 130% recovery listed in the SAP, but were within the SPC limits for the method, so no qualifier flag was applied. For the MS and MSD recoveries, all except 2,4-dinitrotoluene and n-nitroso-di-n-propylamine were below the limits of 70% - 130% recovery. With the exception of pyrene in the MS, all were within the SPC limits, so no qualifier flags were applied. A "T" flag was applied to the sample result for pyrene to indicate the spike failure. It is the Laboratory's opinion that the low MS recovery for pyrene was due to a matrix effect from the organic acids that were present in the sample in significant quantities, so a re-extraction and reanalysis was not requested. The MS and MSD recoveries and the RPD are included in Attachment 4. All surrogate recoveries were within the required limits. These are included in Attachment 5. No compounds were detected in the method blank. TIC results are included in Attachment 3. No hydrocarbon TICs were observed, so the request for NWTPH – Kerosene for this sample was cancelled.

4.3.3 NWTH Kerosene/Diesel

The LOI and SAF requested the NWTPH – Kerosene analysis for the two organic liquid samples, if hydrocarbons were identified as TICs in the SVOA. For sample B24285, no hydrocarbons were detected in the SVOA, so this analysis was not performed. For sample B24298, hydrocarbons were detected in the SVOA. A preliminary run for kerosene indicated that the hydrocarbons detected in the sample appeared to be more similar to weathered diesel. Therefore, the sample was reanalyzed using a diesel calibration, LCS, MS, and MSD. Since the

sample contained a very high concentration of TBP, a dilution with methylene chloride was used for the sample preparation, rather than an extraction. The TBP peak eluted within the diesel retention time envelope and required manual subtraction from the total area in the range. Because the TBP peak represented approximately 88% of the total peak area within the diesel range, small variances in the TBP result were likely to lead to a significant error in the calculated diesel concentration. Therefore, the diesel result was "J" flagged. The LCS recovery met the acceptance limits in the test plan and the SAP. The LLS, also referred to as the minimum reporting limit standard, had a high recovery at 171%. It is the Laboratory's opinion that the diesel concentration in the sample was sufficiently high so as to not be affected by the hump in the chromatogram that caused the high LLS recovery. The MS and MSD recoveries were very high and did not meet the acceptance limits. This could be attributed to the errors associated with subtraction of the TBP peak. However, the concentration of diesel in the sample was more than 4 times the concentration in the spike added, so the criteria are not applicable. The RPD between the MS and MSD met the requirement in the SAP. The MS and MSD recoveries and RPD are included in Attachment 4. All surrogate recoveries were within the required limits. These are included in Attachment 5.

5.0 PROCEDURES

Table 2 lists the analytical procedures used for analysis of the PFP A Lab Rm 144 samples.

Table 1. Analytical Procedures

Analysis	Preparation Method	Analysis Procedure
Inorganic Analyses		
pH Liquid (9040C) Solid (9045D)	Liquid - Direct Solid – LA-212-105, Rev. H-0	LA-212-106, Rev. H-0-A LA-212-105, Rev. H-0
Hydrogen Ion	Liquid - Direct	LA-211-102, Rev. I-1
Mercury – Cold Vapor Atomic Absorption Liquid (7470A); Solid (7471B)	LA-325-110, Rev. A-0	LA-325-110, Rev. A-0
IC (9056A)	Liquid – Direct Solid - LA-504-101, Rev. M-0	LA-533-107, Rev. I-0 LA-533-115, Rev. J-0
ICP/AES (3010C or 3050B/6010C)	Liquid – Direct or LA-505-158, Rev. J-0 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-505-163, Rev. G-0	LA-505-161, Rev. J-0-A
ICP/MS: actinides and metals	Liquid – Direct or LA-505-158, Rev. J-0 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-505-163, Rev. G-0	LA-506-102, Rev. F-1

Table 2. Analytical Procedures

Analysis	Preparation Method	Analysis Procedure
Radiochemical Analyses		
Total Alpha/Total Beta	Liquid – LA-508-101, Rev. L-2 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-544-101, Rev. F-0 and LA-505-163, Rev. G-0	LA-508-101, Rev. L-2
GEA	Liquid – LA-548-121, Rev. I-0 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-544-101, Rev. F-0 and LA-505-163, Rev. G-0	LA-548-121, Rev. I-0
^{90}Sr – Separation/Beta counting	Liquid – LA-220-101, Rev. I-0 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-544-101, Rev. F-0 and LA-505-163, Rev. G-0	LA-220-104, Rev. I-0 LA-220-101, Rev. I-0 LA-220-103, Rev. J-0
^{241}Am – Separation/AEA	Liquid - LA-953-104, Rev. H-1 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-544-101, Rev. F-0 and LA-505-163, Rev. G-0	LA-953-104, Rev. H-1
$^{239/240}$Pu, ^{238}Pu – Separation/AEA	Liquid - LA-953-104, Rev. H-1 Org. Liq. - LA-544-101, Rev. F-0 Solid - LA-544-101, Rev. F-0 and LA-505-163, Rev. G-0	LA-953-104, Rev. H-1
Organic Analyses		
VOA (8260C)	Direct	LA-523-118, Rev. H-0
SVOA (8270D)	Dilution: LA-523-149, Rev. A-0 Extraction: LA-523-115, Rev. H-0	LA-523-135, Rev. D-0
NWTPH – Kerosene/Diesel	ATL-2010-TP-117	ATL-2010-TP-117

6.0 REFERENCES

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Attachment 1

DATA SUMMARY REPORT

20100687
DECEMBER 21, 2010

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100687
Customer Group or SDG Number: 222S20100687
Customer Sample ID: B241X2
Sample Portion: Acid Dig

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000377		A	7429-90-5	Aluminum	ug/g	92.2	<0.0300	<11.8	<11.3	n/a	n/a	85.8	11.8	n/a	U
S10M000377		A	7440-38-2	Arsenic	ug/g	93.8	<0.0500	<19.7	<18.8	n/a	n/a	84.1	19.7	n/a	U
S10M000377		A	7440-48-4	Cobalt	ug/g	95.1	<0.0100	<3.94	<3.77	n/a	n/a	87.0	3.94	n/a	U
S10M000377		A	7440-50-8	Copper	ug/g	96.9	<5.00E-03	<1.97	<1.88	n/a	n/a	86.7	1.97	n/a	U
S10M000377		A	7440-09-7	Potassium	ug/g	80.7	<0.500	<197	<188	n/a	n/a	62.3	197	n/a	UN
S10M000377		A	7439-96-5	Manganese	ug/g	93.2	<3.00E-03	<1.18	<1.13	n/a	n/a	84.5	1.18	n/a	U
S10M000377		A	7440-23-5	Sodium	ug/g	103	<0.100	5.62E+04	5.36E+04	5.49E+04	4.76	-427	39.4	n/a	X
S10M000377		A	7440-36-0	Antimony	ug/g	90.9	<0.0500	<19.7	<18.8	n/a	n/a	78.9	19.7	n/a	U
S10M000377		A	7782-49-2	Selenium	ug/g	97.5	<0.100	<39.4	<37.7	n/a	n/a	88.9	39.4	n/a	U
S10M000377		A	7440-24-6	Strontium	ug/g	97.0	<3.00E-03	1.28	<1.13	n/a	n/a	85.5	1.18	n/a	B
S10M000377		A	7440-28-0	Thallium	ug/g	92.5	<0.100	<39.4	<37.7	n/a	n/a	73.1	39.4	n/a	U
S10M000377		A	7440-62-2	Vanadium	ug/g	96.7	<5.00E-03	<1.97	<1.88	n/a	n/a	87.3	1.97	n/a	U
S10M000377		A	7440-66-6	Zinc	ug/g	92.7	<5.00E-03	<1.97	2.01	n/a	n/a	85.5	1.97	n/a	U
S10M000377		A	7440-22-4	Silver	ug/g	105	<2.00E-04	<0.0373	<0.0357	n/a	n/a	102	0.0373	n/a	U
S10M000377		A	7440-39-3	Barium	ug/g	104	<1.60E-03	4.79	4.81	4.80	0.600	101	0.299	n/a	
S10M000377		A	7440-41-7	Beryllium	ug/g	107	<1.80E-03	<0.336	<0.322	n/a	n/a	103	0.336	n/a	U
S10M000377		A	7440-43-9	Cadmium	ug/g	104	<3.00E-04	0.0693	<0.0536	n/a	n/a	102	0.0560	n/a	B
S10M000377		A	7440-47-3	Chromium	ug/g	104	7.05E-03	4.18	4.71	4.44	12.0	98.4	1.31	n/a	CB
S10M000377		A	7439-92-1	Lead	ug/g	98.9	<1.50E-03	<0.280	0.285	n/a	n/a	95.9	0.280	n/a	U
S10M000377		A	7440-02-0	Nickel	ug/g	97.6	<1.20E-03	0.308	<0.214	n/a	n/a	95.7	0.224	n/a	B

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000371			7439-97-6	Mercury	ug/g	108	<1.00E-04	<0.0393	<0.0401	n/a	n/a	99.8	0.0393	n/a	U
S10M000371			PH	pH	unitless	n/a	n/a	11.0	11.1	11.1	0.722	n/a	0.0100	n/a	

Sample Portion: Water Dig

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
U - < Det Limit
B - Inorganic Estimated
C - Inorganic Blank Contamination
X - Comment
> - WetChem Outside Calibration Range
M - Inorganic RPD Outside Range

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100687
Customer Group or SDG Number: 222S20100687
Customer Sample ID: B241X2
Sample Portion: Water Dig

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000375		W	16984-48-8	Fluoride	ug/g	103	<1.61E-03	1.37	1.36	1.37	0.289	98.7	0.307	n/a	B
S10M000375		W	16887-00-6	Chloride	ug/g	103	0.0135	129	129	129	0.270	99.0	1.90	n/a	
S10M000375		W	14797-65-0	Nitrite	ug/g	101	<0.0192	5.46	4.77	5.11	13.4	97.0	3.66	n/a	B
S10M000375		W	14808-79-8	Sulfate	ug/g	104	<0.0187	8.21	8.86	8.54	7.55	100	3.56	n/a	B
S10M000375		W	338-70-5	Oxalate	ug/g	100	<0.0231	18.7	19.2	18.9	2.53	98.2	4.40	n/a	B
S10M000375		W	14797-55-8	Nitrate	ug/g	104	0.0535	13.3	14.6	14.0	9.25	97.6	3.96	n/a	CB

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100687
Customer Group or SDG Number: 222S20100687
Customer Sample ID: B242B6
Sample Portion: Acid Dig

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000376	A	7440-22-4	Silver	ug/g	83.5	<5.00E-03	<1.08	n/a	n/a	n/a	n/a	1.08	n/a	U
S10M000376	A	7429-90-5	Aluminum	ug/g	92.2	<0.0300	590	n/a	n/a	n/a	n/a	6.46	n/a	
S10M000376	A	7440-38-2	Arsenic	ug/g	93.8	<0.0500	<10.8	n/a	n/a	n/a	n/a	10.8	n/a	U
S10M000376	A	7440-39-3	Barium	ug/g	97.1	<3.00E-03	21.5	n/a	n/a	n/a	n/a	0.646	n/a	
S10M000376	A	7440-41-7	Beryllium	ug/g	103	<1.00E-03	<0.215	n/a	n/a	n/a	n/a	0.215	n/a	U
S10M000376	A	7440-48-4	Cobalt	ug/g	95.1	<0.0100	<2.15	n/a	n/a	n/a	n/a	2.15	n/a	U
S10M000376	A	7440-47-3	Chromium	ug/g	94.2	<5.00E-03	<1.08	n/a	n/a	n/a	n/a	1.08	n/a	U
S10M000376	A	7440-50-8	Copper	ug/g	96.9	<5.00E-03	<1.08	n/a	n/a	n/a	n/a	1.08	n/a	U
S10M000376	A	7440-09-7	Potassium	ug/g	80.7	<0.500	1.33E+03	n/a	n/a	n/a	n/a	108	n/a	N
S10M000376	A	7439-96-5	Manganese	ug/g	93.2	<3.00E-03	1.60	n/a	n/a	n/a	n/a	0.646	n/a	B
S10M000376	A	7440-23-5	Sodium	ug/g	103	<0.100	121	n/a	n/a	n/a	n/a	21.5	n/a	B
S10M000376	A	7439-92-1	Lead	ug/g	92.6	<0.0500	<10.8	n/a	n/a	n/a	n/a	10.8	n/a	U
S10M000376	A	7440-36-0	Antimony	ug/g	90.9	<0.0500	<10.8	n/a	n/a	n/a	n/a	10.8	n/a	U
S10M000376	A	7782-49-2	Selenium	ug/g	97.5	<0.100	<21.5	n/a	n/a	n/a	n/a	21.5	n/a	U
S10M000376	A	7440-24-6	Strontium	ug/g	97.0	<3.00E-03	<0.646	n/a	n/a	n/a	n/a	0.646	n/a	U
S10M000376	A	7440-28-0	Thallium	ug/g	92.5	<0.100	<21.5	n/a	n/a	n/a	n/a	21.5	n/a	U
S10M000376	A	7440-62-2	Vanadium	ug/g	96.7	<5.00E-03	<1.08	n/a	n/a	n/a	n/a	1.08	n/a	U
S10M000376	A	7440-66-6	Zinc	ug/g	92.7	<5.00E-03	7.57	n/a	n/a	n/a	n/a	1.08	n/a	B
S10M000376	A	7440-43-9	Cadmium	ug/g	104	<3.00E-04	<0.0323	n/a	n/a	n/a	n/a	0.0323	n/a	U
S10M000376	A	7440-02-0	Nickel	ug/g	97.6	<1.20E-03	0.930	n/a	n/a	n/a	n/a	0.129	n/a	B

Sample Portion: Water Dig

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000374	W	16984-48-8	Fluoride	ug/g	103	<1.61E-03	47.1	n/a	n/a	n/a	n/a	15.3	n/a	B
S10M000374	W	16887-00-6	Chloride	ug/g	103	0.0135	<94.9	n/a	n/a	n/a	n/a	94.9	n/a	U
S10M000374	W	14797-65-0	Nitrite	ug/g	101	<0.0192	<182	n/a	n/a	n/a	n/a	182	n/a	U
S10M000374	W	14808-79-8	Sulfate	ug/g	104	<0.0187	521	n/a	n/a	n/a	n/a	178	n/a	B
S10M000374	W	338-70-5	Oxalate	ug/g	100	<0.0231	<220	n/a	n/a	n/a	n/a	220	n/a	U

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
U - < Det Limit
B - Inorganic Estimated
C - Inorganic Blank Contamination
X - Comment
> - WetChem Outside Calibration Range
M - Inorganic RPD Outside Range

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100687
Customer Group or SDG Number: 222S20100687
Customer Sample ID: B242B6
Sample Portion: Water Dig

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000374		W	14797-55-8	Nitrate	ug/g	104	0.0535	1.24E+05	n/a	n/a	n/a	n/a	198	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24279
Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000479		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	<0.150	n/a	n/a	n/a	n/a	0.150	n/a	U
S10M000479		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000479		B	7440-41-7	Beryllium	ug/mL	91.8	<1.00E-03	8.02E-03	n/a	n/a	n/a	n/a	5.00E-03	n/a	B
S10M000479		B	7440-43-9	Cadmium	ug/mL	81.3	<5.00E-03	2.31	n/a	n/a	n/a	n/a	0.0250	n/a	
S10M000479		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000479		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	0.419	n/a	n/a	n/a	n/a	0.0250	n/a	
S10M000479		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000479		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000479		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	1.75	n/a	n/a	n/a	n/a	0.500	n/a	B
S10M000479		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000479		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000479		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000479		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000479		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000479		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000479		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	1.77	n/a	n/a	n/a	n/a	0.0250	n/a	

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000395			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	<2.00E-03	n/a	n/a	82.8	2.00E-03	n/a	U
S10M000395			16984-48-8	Fluoride	ug/mL	97.5	<6.16E-03	<0.123	<0.123	n/a	n/a	86.4	0.123	n/a	U
S10M000395			16887-00-6	Chloride	ug/mL	101	0.0191	0.469	0.370	0.420	23.7	101	0.0620	n/a	CB
S10M000395			14797-65-0	Nitrite	ug/mL	95.8	<0.0400	<0.800	<0.800	n/a	n/a	91.4	0.800	n/a	U
S10M000395			14797-55-8	Nitrate	ug/mL	98.3	<0.0162	<0.324	<0.324	n/a	n/a	92.6	0.324	n/a	U
S10M000395			14808-79-8	Sulfate	ug/mL	104	<0.0219	0.766	0.854	0.810	10.8	103	0.438	n/a	B
S10M000395			338-70-5	Oxalate	ug/mL	98.9	<0.105	<2.10	<2.10	n/a	n/a	101	2.10	n/a	U
S10M000395			7440-22-4	Silver	ug/mL	103	<2.00E-06	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000395			7440-39-3	Barium	ug/mL	102	<1.60E-05	<6.40E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	U

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N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24279
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000395			7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	0.481	n/a	n/a	n/a	n/a	0.0280	n/a	
S10M000395			7440-02-0	Nickel	ug/mL	98.5	<1.20E-05	<4.80E-03	<4.80E-03	n/a	n/a	99.8	4.80E-03	n/a	U
S10M000395			PH	pH	unitless	n/a	n/a	3.48	n/a	n/a	n/a	n/a	0.0100	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24280
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000386			7439-97-6	Mercury	ug/mL	105	<1.00E-04	2.06E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000386				Hydrogren Ion	M	94.4	<1.00E-04	3.49	3.54	3.52	1.42	102	0.0100	n/a	
S10M000386			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	55.0	n/a	n/a	n/a	n/a	6.16	n/a	B
S10M000386			16887-00-6	Chloride	ug/mL	104	0.0126	688	n/a	n/a	n/a	n/a	3.10	n/a	
S10M000386			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000386			14797-55-8	Nitrate	ug/mL	98.8	0.0198	5.24E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000386			14808-79-8	Sulfate	ug/mL	105	0.0891	1.49E+05	n/a	n/a	n/a	n/a	219	n/a	
S10M000386			338-70-5	Oxalate	ug/mL	101	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	U
S10M000386			7429-90-5	Aluminum	ug/mL	101	<0.0300	621	n/a	n/a	n/a	n/a	7.50	n/a	
S10M000386			7440-38-2	Arsenic	ug/mL	104	<0.0500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000386			7440-48-4	Cobalt	ug/mL	100	<0.0100	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000386			7440-47-3	Chromium	ug/mL	101	<5.00E-03	61.0	n/a	n/a	n/a	n/a	1.25	n/a	
S10M000386			7440-50-8	Copper	ug/mL	102	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000386			7440-09-7	Potassium	ug/mL	107	<0.500	<125	n/a	n/a	n/a	n/a	125	n/a	U
S10M000386			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	<0.750	n/a	n/a	n/a	n/a	0.750	n/a	U
S10M000386			7440-23-5	Sodium	ug/mL	95.1	<0.100	3.35E+03	n/a	n/a	n/a	n/a	25.0	n/a	
S10M000386			7440-36-0	Antimony	ug/mL	100	<0.0500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000386			7782-49-2	Selenium	ug/mL	103	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000386			7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.750	n/a	n/a	n/a	n/a	0.750	n/a	U
S10M000386			7440-28-0	Thallium	ug/mL	102	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000386			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000386			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000386			7440-22-4	Silver	ug/mL	101	<2.00E-06	0.0243	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000386			7440-39-3	Barium	ug/mL	100	<1.60E-05	0.0331	n/a	n/a	n/a	n/a	0.0200	n/a	B
S10M000386			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000386			7440-43-9	Cadmium	ug/mL	101	<9.00E-06	<3.60E-03	n/a	n/a	n/a	n/a	3.60E-03	n/a	U
S10M000386			7439-92-1	Lead	ug/mL	98.1	<1.50E-05	<6.00E-03	n/a	n/a	n/a	n/a	6.00E-03	n/a	U
S10M000386			7440-02-0	Nickel	ug/mL	97.7	<1.20E-05	0.374	n/a	n/a	n/a	n/a	6.00E-03	n/a	

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U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24280
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000386			PH	pH	unitless	n/a	n/a	<2.00	<2.00	n/a	n/a	n/a	2.00	n/a	>

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> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24281
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000387		7439-97-6	Mercury	ug/mL	100	1.05E-04	<2.00E-03	<2.00E-03	n/a	n/a	95.8	2.00E-03	n/a	U
S10M000387			Hydrogren Ion	M	94.4	<1.00E-04	4.65	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000387		16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	85.7	n/a	n/a	n/a	n/a	6.16	n/a	
S10M000387		16887-00-6	Chloride	ug/mL	104	0.0126	5.97E+03	n/a	n/a	n/a	n/a	31.0	n/a	
S10M000387		14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000387		14797-55-8	Nitrate	ug/mL	98.8	0.0198	2.58E+05	n/a	n/a	n/a	n/a	1.62E+03	n/a	
S10M000387		14808-79-8	Sulfate	ug/mL	105	0.0891	1.30E+04	n/a	n/a	n/a	n/a	21.9	n/a	
S10M000387		338-70-5	Oxalate	ug/mL	101	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	U
S10M000387		7429-90-5	Aluminum	ug/mL	101	<0.0300	1.00	n/a	n/a	n/a	n/a	0.750	n/a	B
S10M000387		7440-38-2	Arsenic	ug/mL	104	<0.0500	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000387		7440-48-4	Cobalt	ug/mL	100	<0.0100	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000387		7440-50-8	Copper	ug/mL	102	<5.00E-03	<0.125	n/a	n/a	n/a	n/a	0.125	n/a	U
S10M000387		7440-09-7	Potassium	ug/mL	107	<0.500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000387		7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	0.144	n/a	n/a	n/a	n/a	0.0750	n/a	B
S10M000387		7440-23-5	Sodium	ug/mL	95.1	<0.100	11.0	n/a	n/a	n/a	n/a	2.50	n/a	
S10M000387		7440-36-0	Antimony	ug/mL	100	<0.0500	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000387		7782-49-2	Selenium	ug/mL	103	<0.100	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000387		7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.0750	n/a	n/a	n/a	n/a	0.0750	n/a	U
S10M000387		7440-28-0	Thallium	ug/mL	102	<0.100	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000387		7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<0.125	n/a	n/a	n/a	n/a	0.125	n/a	U
S10M000387		7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	<0.125	n/a	n/a	n/a	n/a	0.125	n/a	U
S10M000387		7440-22-4	Silver	ug/mL	101	<2.00E-06	0.392	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000387		7440-39-3	Barium	ug/mL	100	<1.60E-05	0.0296	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000387		7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000387		7440-43-9	Cadmium	ug/mL	101	<9.00E-06	<3.60E-03	n/a	n/a	n/a	n/a	3.60E-03	n/a	U
S10M000387		7440-47-3	Chromium	ug/mL	101	<7.00E-05	0.0388	n/a	n/a	n/a	n/a	0.0280	n/a	B
S10M000387		7439-92-1	Lead	ug/mL	98.1	<1.50E-05	<6.00E-03	n/a	n/a	n/a	n/a	6.00E-03	n/a	U
S10M000387		7440-02-0	Nickel	ug/mL	97.7	<1.20E-05	0.0310	n/a	n/a	n/a	n/a	6.00E-03	n/a	B

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N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24281
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000387			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24283
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000388			7439-97-6	Mercury	ug/mL	100	1.05E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000388				Hydrogren Ion	M	94.4	<1.00E-04	0.180	n/a	n/a	n/a	n/a	5.00E-03	n/a	
S10M000388			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	<6.16	<61.6	n/a	n/a	96.7	6.16	n/a	U
S10M000388			16887-00-6	Chloride	ug/mL	104	0.0126	1.20E+04	1.19E+04	1.20E+04	0.645	94.5	31.0	n/a	
S10M000388			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	<400	n/a	n/a	101	40.0	n/a	U
S10M000388			14797-55-8	Nitrate	ug/mL	98.8	0.0198	31.9	31.8	31.9	0.309	95.4	16.2	n/a	CB
S10M000388			14808-79-8	Sulfate	ug/mL	105	0.0891	93.9	102	98.0	8.48	102	21.9	n/a	CB
S10M000388			338-70-5	Oxalate	ug/mL	101	<0.105	<1.05E+02	<1.05E+03	n/a	n/a	98.2	105	n/a	U
S10M000388			7429-90-5	Aluminum	ug/mL	101	<0.0300	0.591	n/a	n/a	n/a	n/a	0.300	n/a	B
S10M000388			7440-38-2	Arsenic	ug/mL	104	<0.0500	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000388			7440-48-4	Cobalt	ug/mL	100	<0.0100	<0.100	n/a	n/a	n/a	n/a	0.100	n/a	U
S10M000388			7440-50-8	Copper	ug/mL	102	<5.00E-03	0.136	n/a	n/a	n/a	n/a	0.0500	n/a	B
S10M000388			7440-09-7	Potassium	ug/mL	107	<0.500	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000388			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	0.0364	n/a	n/a	n/a	n/a	0.0300	n/a	B
S10M000388			7440-23-5	Sodium	ug/mL	95.1	<0.100	1.65	n/a	n/a	n/a	n/a	1.00	n/a	B
S10M000388			7440-36-0	Antimony	ug/mL	100	<0.0500	1.97	n/a	n/a	n/a	n/a	0.500	n/a	B
S10M000388			7782-49-2	Selenium	ug/mL	103	<0.100	<1.00	n/a	n/a	n/a	n/a	1.00	n/a	U
S10M000388			7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.0300	n/a	n/a	n/a	n/a	0.0300	n/a	U
S10M000388			7440-28-0	Thallium	ug/mL	102	<0.100	<1.00	n/a	n/a	n/a	n/a	1.00	n/a	U
S10M000388			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000388			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000388			7440-22-4	Silver	ug/mL	101	<2.00E-06	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000388			7440-39-3	Barium	ug/mL	100	<1.60E-05	<6.40E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	U
S10M000388			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000388			7440-43-9	Cadmium	ug/mL	101	<9.00E-06	9.08E-03	n/a	n/a	n/a	n/a	3.60E-03	n/a	B
S10M000388			7440-47-3	Chromium	ug/mL	101	<7.00E-05	3.44	n/a	n/a	n/a	n/a	0.0280	n/a	
S10M000388			7439-92-1	Lead	ug/mL	98.1	<1.50E-05	0.0346	n/a	n/a	n/a	n/a	6.00E-03	n/a	B
S10M000388			7440-02-0	Nickel	ug/mL	97.7	<1.20E-05	0.336	n/a	n/a	n/a	n/a	6.00E-03	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
U - < Det Limit
B - Inorganic Estimated
C - Inorganic Blank Contamination
X - Comment
> - WetChem Outside Calibration Range
M - Inorganic RPD Outside Range

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24283
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000388			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24285
Sample Portion: Env Dig

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000384		E	7429-90-5	Aluminum	ug/mL	99.4	18.2	4.09E+03	n/a	n/a	n/a	n/a	3.75	n/a	
S10M000384		E	7440-38-2	Arsenic	ug/mL	92.5	<6.25	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000384		E	7440-48-4	Cobalt	ug/mL	93.9	<1.25	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000384		E	7440-50-8	Copper	ug/mL	95.0	<0.625	<0.625	n/a	n/a	n/a	n/a	0.625	n/a	U
S10M000384		E	7440-09-7	Potassium	ug/mL	81.2	<62.5	9.31E+03	n/a	n/a	n/a	n/a	62.5	n/a	
S10M000384		E	7439-96-5	Manganese	ug/mL	92.5	<0.375	0.865	n/a	n/a	n/a	n/a	0.375	n/a	B
S10M000384		E	7440-23-5	Sodium	ug/mL	138	32.6	759	n/a	n/a	n/a	n/a	12.5	n/a	X
S10M000384		E	7440-36-0	Antimony	ug/mL	86.7	<6.25	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000384		E	7782-49-2	Selenium	ug/mL	89.5	<12.5	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000384		E	7440-24-6	Strontium	ug/mL	95.8	<0.375	0.736	n/a	n/a	n/a	n/a	0.375	n/a	B
S10M000384		E	7440-28-0	Thallium	ug/mL	n/a	<12.5	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000384		E	7440-62-2	Vanadium	ug/mL	95.7	<0.625	<0.625	n/a	n/a	n/a	n/a	0.625	n/a	U
S10M000384		E	7440-66-6	Zinc	ug/mL	93.0	<0.625	40.2	n/a	n/a	n/a	n/a	0.625	n/a	
S10M000384		E	7440-22-4	Silver	ug/mL	85.2	<0.0100	<0.0100	n/a	n/a	n/a	n/a	0.0100	n/a	U
S10M000384		E	7440-39-3	Barium	ug/mL	102	<1.60E-03	6.34	6.32	6.33	0.455	99.0	0.200	n/a	
S10M000384		E	7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<0.225	<0.225	n/a	n/a	105	0.225	n/a	U
S10M000384		E	7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<0.0750	<0.0750	n/a	n/a	99.5	0.0750	n/a	U
S10M000384		E	7440-47-3	Chromium	ug/mL	104	0.869	10.6	n/a	n/a	n/a	n/a	0.0875	n/a	C
S10M000384		E	7439-92-1	Lead	ug/mL	99.2	1.12	0.885	n/a	n/a	n/a	n/a	0.0388	n/a	C
S10M000384		E	7440-02-0	Nickel	ug/mL	95.2	0.104	11.6	n/a	n/a	n/a	n/a	0.0150	n/a	

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000378			7439-97-6	Mercury	ug/mL	100	1.05E-04	4.50E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	CB

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N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24286
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000389		7439-97-6	Mercury	ug/mL	100	1.05E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000389		16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	<6.16	n/a	n/a	n/a	n/a	6.16	n/a	U
S10M000389		16887-00-6	Chloride	ug/mL	104	0.0126	19.4	n/a	n/a	n/a	n/a	3.10	n/a	CB
S10M000389		14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000389		14797-55-8	Nitrate	ug/mL	98.8	0.0198	24.1	n/a	n/a	n/a	n/a	16.2	n/a	CB
S10M000389		14808-79-8	Sulfate	ug/mL	105	0.0891	109	n/a	n/a	n/a	n/a	21.9	n/a	CB
S10M000389		338-70-5	Oxalate	ug/mL	101	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	
S10M000389		7429-90-5	Aluminum	ug/mL	95.6	<0.0300	<7.50	n/a	n/a	n/a	n/a	7.50	n/a	U
S10M000389		7440-38-2	Arsenic	ug/mL	104	<0.0500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000389		7440-48-4	Cobalt	ug/mL	94.5	<0.0100	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000389		7440-50-8	Copper	ug/mL	98.5	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000389		7440-09-7	Potassium	ug/mL	99.5	<0.500	<125	n/a	n/a	n/a	n/a	125	n/a	U
S10M000389		7439-96-5	Manganese	ug/mL	93.7	<3.00E-03	<0.750	n/a	n/a	n/a	n/a	0.750	n/a	U
S10M000389		7440-23-5	Sodium	ug/mL	93.1	<0.100	7.11E+04	n/a	n/a	n/a	n/a	25.0	n/a	
S10M000389		7440-36-0	Antimony	ug/mL	96.0	<0.0500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000389		7782-49-2	Selenium	ug/mL	111	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000389		7440-24-6	Strontium	ug/mL	97.5	<3.00E-03	<0.750	n/a	n/a	n/a	n/a	0.750	n/a	U
S10M000389		7440-28-0	Thallium	ug/mL	99.5	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000389		7440-62-2	Vanadium	ug/mL	96.8	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000389		7440-66-6	Zinc	ug/mL	94.0	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000389		7440-22-4	Silver	ug/mL	101	<2.00E-06	<8.00E-04	<8.00E-04	n/a	n/a	93.9	8.00E-04	n/a	U
S10M000389		7440-39-3	Barium	ug/mL	100	<1.60E-05	0.0359	0.0372	0.0365	3.75	106	0.0200	n/a	B
S10M000389		7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	<7.20E-03	n/a	n/a	94.1	7.20E-03	n/a	U
S10M000389		7440-43-9	Cadmium	ug/mL	101	<9.00E-06	<3.60E-03	<3.60E-03	n/a	n/a	93.8	3.60E-03	n/a	U
S10M000389		7440-47-3	Chromium	ug/mL	101	<7.00E-05	2.01	2.83	2.42	33.9	n/a	0.0280	n/a	M
S10M000389		7439-92-1	Lead	ug/mL	98.1	<1.50E-05	<6.00E-03	<6.00E-03	n/a	n/a	106	6.00E-03	n/a	U
S10M000389		7440-02-0	Nickel	ug/mL	97.7	<1.20E-05	6.88E-03	<3.00E-03	n/a	n/a	88.8	3.00E-03	n/a	B
S10M000389		PH	pH	unitless	n/a	n/a	10.5	10.5	10.5	0.191	n/a	0.0100	n/a	>

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
U - < Det Limit
B - Inorganic Estimated
C - Inorganic Blank Contamination
X - Comment
> - WetChem Outside Calibration Range
M - Inorganic RPD Outside Range

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24287
Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000480		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	0.814	n/a	n/a	n/a	n/a	0.462	n/a	B
S10M000480		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.769	n/a	n/a	n/a	n/a	0.769	n/a	U
S10M000480		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.154	n/a	n/a	n/a	n/a	0.154	n/a	U
S10M000480		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	<0.0769	n/a	n/a	n/a	n/a	0.0769	n/a	U
S10M000480		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<7.69	n/a	n/a	n/a	n/a	7.69	n/a	U
S10M000480		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	<0.0462	n/a	n/a	n/a	n/a	0.0462	n/a	U
S10M000480		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	29.0	n/a	n/a	n/a	n/a	1.54	n/a	
S10M000480		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.769	n/a	n/a	n/a	n/a	0.769	n/a	UN
S10M000480		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<1.54	n/a	n/a	n/a	n/a	1.54	n/a	U
S10M000480		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	0.0635	n/a	n/a	n/a	n/a	0.0462	n/a	B
S10M000480		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<1.54	n/a	n/a	n/a	n/a	1.54	n/a	U
S10M000480		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0769	n/a	n/a	n/a	n/a	0.0769	n/a	U
S10M000480		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	0.0839	n/a	n/a	n/a	n/a	0.0769	n/a	B

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000396			7439-97-6	Mercury	ug/mL	100	1.05E-04	0.0414	n/a	n/a	n/a	n/a	0.0154	n/a	CB
S10M000396				Hydrogren Ion	M	99.7	<1.00E-03	7.86	7.82	7.84	0.510	99.3	0.200	n/a	
S10M000396			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<616	n/a	n/a	n/a	n/a	616	n/a	U
S10M000396			16887-00-6	Chloride	ug/mL	102	<3.10E-03	2.92E+05	n/a	n/a	n/a	n/a	310	n/a	
S10M000396			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<4.00E+03	n/a	n/a	n/a	n/a	4.00E+03	n/a	U
S10M000396			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	<1.62E+03	n/a	n/a	n/a	n/a	1.62E+03	n/a	U
S10M000396			14808-79-8	Sulfate	ug/mL	103	<0.0219	3.65E+03	n/a	n/a	n/a	n/a	2.19E+03	n/a	B
S10M000396			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+04	n/a	n/a	n/a	n/a	1.05E+04	n/a	U
S10M000396			7440-22-4	Silver	ug/mL	99.0	<8.00E-06	<8.00E-04	<8.00E-04	n/a	n/a	92.6	8.00E-04	n/a	U
S10M000396			7440-39-3	Barium	ug/mL	102	<1.60E-05	0.0160	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000396			7440-41-7	Beryllium	ug/mL	98.1	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000396			7440-43-9	Cadmium	ug/mL	101	<6.00E-06	0.0113	n/a	n/a	n/a	n/a	2.40E-03	n/a	B

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
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> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24287
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000396			7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	0.162	n/a	n/a	n/a	n/a	0.0280	n/a	B
S10M000396			7439-92-1	Lead	ug/mL	105	<3.10E-05	<3.10E-03	<3.10E-03	n/a	n/a	104	3.10E-03	n/a	U
S10M000396			7440-02-0	Nickel	ug/mL	91.2	<1.20E-05	<1.20E-03	<1.20E-03	n/a	n/a	87.1	1.20E-03	n/a	U
S10M000396			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24288
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000390		7439-97-6	Mercury	ug/mL	105	<1.00E-04	7.90E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000390			Hydrogren Ion	M	94.4	<1.00E-04	2.55	n/a	n/a	n/a	n/a	5.00E-03	n/a	
S10M000390		16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	<6.16	n/a	n/a	n/a	n/a	6.16	n/a	U
S10M000390		16887-00-6	Chloride	ug/mL	104	0.0126	298	n/a	n/a	n/a	n/a	3.10	n/a	
S10M000390		14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000390		14797-55-8	Nitrate	ug/mL	98.8	0.0198	1.06E+05	n/a	n/a	n/a	n/a	162	n/a	
S10M000390		14808-79-8	Sulfate	ug/mL	105	0.0891	2.20E+03	n/a	n/a	n/a	n/a	21.9	n/a	
S10M000390		338-70-5	Oxalate	ug/mL	101	<0.105	154	n/a	n/a	n/a	n/a	105	n/a	B
S10M000390		7429-90-5	Aluminum	ug/mL	95.6	<0.0300	123	n/a	n/a	n/a	n/a	3.75	n/a	
S10M000390		7440-38-2	Arsenic	ug/mL	104	<0.0500	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000390		7440-48-4	Cobalt	ug/mL	94.5	<0.0100	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000390		7440-47-3	Chromium	ug/mL	94.0	<5.00E-03	48.3	n/a	n/a	n/a	n/a	0.625	n/a	
S10M000390		7440-50-8	Copper	ug/mL	98.5	<5.00E-03	47.5	n/a	n/a	n/a	n/a	0.625	n/a	
S10M000390		7440-09-7	Potassium	ug/mL	99.5	<0.500	272	n/a	n/a	n/a	n/a	62.5	n/a	B
S10M000390		7439-96-5	Manganese	ug/mL	93.7	<3.00E-03	21.1	n/a	n/a	n/a	n/a	0.375	n/a	
S10M000390		7440-23-5	Sodium	ug/mL	93.1	<0.100	1.42E+04	n/a	n/a	n/a	n/a	12.5	n/a	
S10M000390		7440-02-0	Nickel	ug/mL	93.6	<0.0200	41.5	n/a	n/a	n/a	n/a	2.50	n/a	
S10M000390		7440-36-0	Antimony	ug/mL	96.0	<0.0500	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000390		7782-49-2	Selenium	ug/mL	111	<0.100	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000390		7440-24-6	Strontium	ug/mL	97.5	<3.00E-03	0.723	n/a	n/a	n/a	n/a	0.375	n/a	B
S10M000390		7440-28-0	Thallium	ug/mL	99.5	<0.100	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000390		7440-62-2	Vanadium	ug/mL	96.8	<5.00E-03	<0.625	n/a	n/a	n/a	n/a	0.625	n/a	U
S10M000390		7440-66-6	Zinc	ug/mL	94.0	<5.00E-03	466	n/a	n/a	n/a	n/a	0.625	n/a	
S10M000390		7440-22-4	Silver	ug/mL	101	<2.00E-06	0.103	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000390		7440-39-3	Barium	ug/mL	100	<1.60E-05	1.33	n/a	n/a	n/a	n/a	6.40E-03	n/a	
S10M000390		7440-41-7	Beryllium	ug/mL	103	<1.80E-05	0.0102	n/a	n/a	n/a	n/a	7.20E-03	n/a	B
S10M000390		7440-43-9	Cadmium	ug/mL	101	<9.00E-06	12.1	n/a	n/a	n/a	n/a	0.180	n/a	
S10M000390		7439-92-1	Lead	ug/mL	98.1	<1.50E-05	8.98	n/a	n/a	n/a	n/a	0.300	n/a	

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> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24288
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000390			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24289
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000391		7439-97-6	Mercury	ug/mL	105	<1.00E-04	0.0507	0.0509	0.0508	0.276	112	2.00E-03	n/a	
S10M000391			Hydrogren Ion	M	99.7	<1.00E-03	0.770	n/a	n/a	n/a	n/a	0.0170	n/a	
S10M000391		16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	193	n/a	n/a	n/a	n/a	6.16	n/a	
S10M000391		16887-00-6	Chloride	ug/mL	104	0.0126	432	n/a	n/a	n/a	n/a	3.10	n/a	
S10M000391		14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000391		14797-55-8	Nitrate	ug/mL	98.8	0.0198	2.56E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000391		14808-79-8	Sulfate	ug/mL	105	0.0891	1.77E+05	n/a	n/a	n/a	n/a	219	n/a	
S10M000391		338-70-5	Oxalate	ug/mL	101	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	U
S10M000391		7429-90-5	Aluminum	ug/mL	95.6	<0.0300	5.06E+04	n/a	n/a	n/a	n/a	7.50	n/a	
S10M000391		7440-38-2	Arsenic	ug/mL	104	<0.0500	33.0	n/a	n/a	n/a	n/a	12.5	n/a	B
S10M000391		7440-48-4	Cobalt	ug/mL	94.5	<0.0100	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000391		7440-50-8	Copper	ug/mL	98.5	<5.00E-03	17.2	n/a	n/a	n/a	n/a	1.25	n/a	
S10M000391		7440-09-7	Potassium	ug/mL	99.5	<0.500	1.91E+03	n/a	n/a	n/a	n/a	125	n/a	
S10M000391		7439-96-5	Manganese	ug/mL	93.7	<3.00E-03	147	n/a	n/a	n/a	n/a	0.750	n/a	
S10M000391		7440-23-5	Sodium	ug/mL	93.1	<0.100	8.18E+03	n/a	n/a	n/a	n/a	25.0	n/a	
S10M000391		7440-02-0	Nickel	ug/mL	93.6	<0.0200	73.3	n/a	n/a	n/a	n/a	5.00	n/a	
S10M000391		7440-36-0	Antimony	ug/mL	96.0	<0.0500	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000391		7782-49-2	Selenium	ug/mL	111	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000391		7440-24-6	Strontium	ug/mL	97.5	<3.00E-03	<0.750	n/a	n/a	n/a	n/a	0.750	n/a	U
S10M000391		7440-28-0	Thallium	ug/mL	99.5	<0.100	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000391		7440-62-2	Vanadium	ug/mL	96.8	<5.00E-03	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000391		7440-66-6	Zinc	ug/mL	94.0	<5.00E-03	159	n/a	n/a	n/a	n/a	1.25	n/a	
S10M000391		7440-22-4	Silver	ug/mL	101	<2.00E-06	0.0223	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000391		7440-39-3	Barium	ug/mL	100	<1.60E-05	<6.40E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	U
S10M000391		7440-41-7	Beryllium	ug/mL	103	<1.80E-05	0.0613	n/a	n/a	n/a	n/a	7.20E-03	n/a	B
S10M000391		7440-43-9	Cadmium	ug/mL	101	<9.00E-06	2.53	n/a	n/a	n/a	n/a	3.60E-03	n/a	
S10M000391		7440-47-3	Chromium	ug/mL	101	<7.00E-05	57.5	n/a	n/a	n/a	n/a	0.700	n/a	
S10M000391		7439-92-1	Lead	ug/mL	98.1	<1.50E-05	6.25E-03	n/a	n/a	n/a	n/a	6.00E-03	n/a	B

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Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24289
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000391			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24290
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000392			7439-97-6	Mercury	ug/mL	105	<1.00E-04	3.59	n/a	n/a	n/a	n/a	0.0200	n/a	
S10M000392				Hydrogren Ion	ug/mL	96.5	<0.0100	0.830	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000392			16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	1.68E+03	n/a	n/a	n/a	n/a	6.16	n/a	
S10M000392			16887-00-6	Chloride	ug/mL	104	0.0126	7.39E+04	n/a	n/a	n/a	n/a	310	n/a	
S10M000392			14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000392			14797-55-8	Nitrate	ug/mL	98.8	0.0198	2.09E+05	n/a	n/a	n/a	n/a	162	n/a	
S10M000392			14808-79-8	Sulfate	ug/mL	105	0.0891	9.54E+03	n/a	n/a	n/a	n/a	21.9	n/a	
S10M000392			338-70-5	Oxalate	ug/mL	101	<0.105	153	n/a	n/a	n/a	n/a	105	n/a	B
S10M000392			7429-90-5	Aluminum	ug/mL	101	<0.0300	3.47E+03	n/a	n/a	n/a	n/a	6.00	n/a	
S10M000392			7440-38-2	Arsenic	ug/mL	104	<0.0500	<10.0	n/a	n/a	n/a	n/a	10.0	n/a	U
S10M000392			7440-39-3	Barium	ug/mL	102	<3.00E-03	17.4	n/a	n/a	n/a	n/a	0.600	n/a	
S10M000392			7440-41-7	Beryllium	ug/mL	97.8	<1.00E-03	3.21	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000392			7440-43-9	Cadmium	ug/mL	100	<5.00E-03	24.6	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000392			7440-48-4	Cobalt	ug/mL	100	<0.0100	7.34	n/a	n/a	n/a	n/a	2.00	n/a	B
S10M000392			7440-47-3	Chromium	ug/mL	101	<5.00E-03	826	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000392			7440-50-8	Copper	ug/mL	102	<5.00E-03	108	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000392			7440-09-7	Potassium	ug/mL	107	<0.500	1.48E+04	n/a	n/a	n/a	n/a	100	n/a	
S10M000392			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	687	n/a	n/a	n/a	n/a	0.600	n/a	
S10M000392			7440-23-5	Sodium	ug/mL	95.1	<0.100	2.22E+04	n/a	n/a	n/a	n/a	20.0	n/a	
S10M000392			7440-02-0	Nickel	ug/mL	99.5	<0.0200	446	n/a	n/a	n/a	n/a	4.00	n/a	
S10M000392			7440-36-0	Antimony	ug/mL	100	<0.0500	<10.0	n/a	n/a	n/a	n/a	10.0	n/a	U
S10M000392			7782-49-2	Selenium	ug/mL	103	<0.100	<20.0	n/a	n/a	n/a	n/a	20.0	n/a	U
S10M000392			7440-24-6	Strontium	ug/mL	101	<3.00E-03	2.41	n/a	n/a	n/a	n/a	0.600	n/a	B
S10M000392			7440-28-0	Thallium	ug/mL	102	<0.100	<20.0	n/a	n/a	n/a	n/a	20.0	n/a	U
S10M000392			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	19.3	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000392			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	5.00E+04	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000392			7440-22-4	Silver	ug/mL	101	<2.00E-06	5.72	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000392			7439-92-1	Lead	ug/mL	102	<1.50E-05	67.3	n/a	n/a	n/a	n/a	1.50	n/a	

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B - Inorganic Estimated
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Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24291
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000393		7439-97-6	Mercury	ug/mL	105	<1.00E-04	0.598	n/a	n/a	n/a	n/a	6.00E-03	n/a	
S10M000393			Hydrogren Ion	ug/mL	96.5	<0.0100	0.650	0.660	0.655	1.53	99.2	0.0100	n/a	
S10M000393		16984-48-8	Fluoride	ug/mL	99.0	<6.16E-03	465	n/a	n/a	n/a	n/a	6.16	n/a	
S10M000393		16887-00-6	Chloride	ug/mL	104	0.0126	1.45E+04	n/a	n/a	n/a	n/a	31.0	n/a	
S10M000393		14797-65-0	Nitrite	ug/mL	96.6	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000393		14797-55-8	Nitrate	ug/mL	98.8	0.0198	5.45E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000393		14808-79-8	Sulfate	ug/mL	105	0.0891	1.62E+04	n/a	n/a	n/a	n/a	21.9	n/a	
S10M000393		338-70-5	Oxalate	ug/mL	101	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	U
S10M000393		7429-90-5	Aluminum	ug/mL	101	<0.0300	1.82E+03	n/a	n/a	n/a	n/a	1.20	n/a	
S10M000393		7440-38-2	Arsenic	ug/mL	104	<0.0500	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	U
S10M000393		7440-39-3	Barium	ug/mL	102	<3.00E-03	3.46	n/a	n/a	n/a	n/a	0.120	n/a	
S10M000393		7440-41-7	Beryllium	ug/mL	97.8	<1.00E-03	0.563	n/a	n/a	n/a	n/a	0.0400	n/a	
S10M000393		7440-43-9	Cadmium	ug/mL	100	<5.00E-03	4.19	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000393		7440-48-4	Cobalt	ug/mL	100	<0.0100	1.30	n/a	n/a	n/a	n/a	0.400	n/a	B
S10M000393		7440-47-3	Chromium	ug/mL	101	<5.00E-03	161	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000393		7440-50-8	Copper	ug/mL	102	<5.00E-03	17.9	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000393		7440-09-7	Potassium	ug/mL	107	<0.500	2.94E+03	n/a	n/a	n/a	n/a	20.0	n/a	
S10M000393		7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	115	n/a	n/a	n/a	n/a	0.120	n/a	
S10M000393		7440-23-5	Sodium	ug/mL	95.1	<0.100	5.58E+03	n/a	n/a	n/a	n/a	4.00	n/a	
S10M000393		7440-36-0	Antimony	ug/mL	100	<0.0500	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	U
S10M000393		7782-49-2	Selenium	ug/mL	103	<0.100	<4.00	n/a	n/a	n/a	n/a	4.00	n/a	U
S10M000393		7440-24-6	Strontium	ug/mL	101	<3.00E-03	0.654	n/a	n/a	n/a	n/a	0.120	n/a	B
S10M000393		7440-28-0	Thallium	ug/mL	102	<0.100	<4.00	n/a	n/a	n/a	n/a	4.00	n/a	U
S10M000393		7440-62-2	Vanadium	ug/mL	101	<5.00E-03	5.25	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000393		7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	9.68E+03	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000393		7440-22-4	Silver	ug/mL	99.0	<8.00E-06	1.08	n/a	n/a	n/a	n/a	0.160	n/a	B
S10M000393		7439-92-1	Lead	ug/mL	105	<3.10E-05	7.15	n/a	n/a	n/a	n/a	0.620	n/a	
S10M000393		7440-02-0	Nickel	ug/mL	91.2	<1.20E-05	67.7	n/a	n/a	n/a	n/a	0.240	n/a	

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Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24292
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000397		7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000397		16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	5.01E+03	n/a	n/a	n/a	n/a	12.3	n/a	
S10M000397		16887-00-6	Chloride	ug/mL	102	<3.10E-03	19.1	n/a	n/a	n/a	n/a	3.10	n/a	CB
S10M000397		14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000397		14797-55-8	Nitrate	ug/mL	95.9	<0.0162	<16.2	n/a	n/a	n/a	n/a	16.2	n/a	U
S10M000397		14808-79-8	Sulfate	ug/mL	103	<0.0219	<21.9	n/a	n/a	n/a	n/a	21.9	n/a	U
S10M000397		338-70-5	Oxalate	ug/mL	98.1	<0.105	6.42E+03	n/a	n/a	n/a	n/a	105	n/a	
S10M000397		7429-90-5	Aluminum	ug/mL	102	<0.0300	<3.00	n/a	n/a	n/a	n/a	3.00	n/a	U
S10M000397		7440-38-2	Arsenic	ug/mL	97.0	<0.0500	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000397		7440-48-4	Cobalt	ug/mL	101	<0.0100	<1.00	n/a	n/a	n/a	n/a	1.00	n/a	U
S10M000397		7440-50-8	Copper	ug/mL	103	<5.00E-03	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000397		7440-09-7	Potassium	ug/mL	105	<0.500	<50.0	n/a	n/a	n/a	n/a	50.0	n/a	U
S10M000397		7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	<0.300	n/a	n/a	n/a	n/a	0.300	n/a	U
S10M000397		7440-23-5	Sodium	ug/mL	104	<0.100	9.58E+03	n/a	n/a	n/a	n/a	10.0	n/a	
S10M000397		7440-36-0	Antimony	ug/mL	95.7	<0.0500	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000397		7782-49-2	Selenium	ug/mL	101	<0.100	<10.0	n/a	n/a	n/a	n/a	10.0	n/a	U
S10M000397		7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.300	n/a	n/a	n/a	n/a	0.300	n/a	U
S10M000397		7440-28-0	Thallium	ug/mL	101	<0.100	<10.0	n/a	n/a	n/a	n/a	10.0	n/a	U
S10M000397		7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000397		7440-66-6	Zinc	ug/mL	98.9	<5.00E-03	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000397		7440-22-4	Silver	ug/mL	103	<2.00E-06	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000397		7440-39-3	Barium	ug/mL	102	<1.60E-05	<6.40E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	U
S10M000397		7440-41-7	Beryllium	ug/mL	98.1	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000397		7440-43-9	Cadmium	ug/mL	101	<6.00E-06	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000397		7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	0.0415	n/a	n/a	n/a	n/a	0.0280	n/a	B
S10M000397		7439-92-1	Lead	ug/mL	101	<1.50E-05	<6.00E-03	n/a	n/a	n/a	n/a	6.00E-03	n/a	U
S10M000397		7440-02-0	Nickel	ug/mL	98.5	<1.20E-05	<4.80E-03	n/a	n/a	n/a	n/a	4.80E-03	n/a	U
S10M000397		PH	pH	unitless	n/a	n/a	7.99	n/a	n/a	n/a	n/a	0.0100	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
U - < Det Limit
B - Inorganic Estimated
C - Inorganic Blank Contamination
X - Comment
> - WetChem Outside Calibration Range
M - Inorganic RPD Outside Range

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688

Customer Group or SDG Number: 222S20100688

Customer Sample ID: B24293

Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000481		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	2.84	n/a	n/a	n/a	n/a	0.150	n/a	
S10M000481		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000481		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000481		B	7440-47-3	Chromium	ug/mL	81.8	7.29E-03	0.705	n/a	n/a	n/a	n/a	0.0250	n/a	
S10M000481		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	0.840	n/a	n/a	n/a	n/a	0.0250	n/a	
S10M000481		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000481		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	0.0719	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000481		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	23.8	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000481		B	7440-02-0	Nickel	ug/mL	81.4	<0.0200	1.18	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000481		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000481		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000481		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000481		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	0.106	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000481		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000481		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000481		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	19.1	n/a	n/a	n/a	n/a	0.0250	n/a	

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000398			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000398				Hydrogren Ion	M	99.7	<1.00E-03	4.55	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000398			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<61.6	n/a	n/a	n/a	n/a	61.6	n/a	U
S10M000398			16887-00-6	Chloride	ug/mL	102	<3.10E-03	1.23E+05	n/a	n/a	n/a	n/a	310	n/a	
S10M000398			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<400	n/a	n/a	n/a	n/a	400	n/a	U
S10M000398			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	7.54E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000398			14808-79-8	Sulfate	ug/mL	103	<0.0219	<219	n/a	n/a	n/a	n/a	219	n/a	U
S10M000398			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+03	n/a	n/a	n/a	n/a	1.05E+03	n/a	U
S10M000398			7440-22-4	Silver	ug/mL	109	<2.00E-04	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24293
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000398			7440-39-3	Barium	ug/mL	102	<1.60E-03	0.0138	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000398			7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000398			7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000398			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24294
Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000482		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	3.80	3.79	3.79	0.267	82.2	0.150	n/a	
S10M000482		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	<0.250	n/a	n/a	81.8	0.250	n/a	U
S10M000482		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	<0.0500	n/a	n/a	83.6	0.0500	n/a	U
S10M000482		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	<0.0250	<0.0250	n/a	n/a	85.5	0.0250	n/a	U
S10M000482		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	2.78	<2.50	n/a	n/a	82.7	2.50	n/a	B
S10M000482		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	0.131	0.129	0.130	1.46	81.6	0.0150	n/a	B
S10M000482		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	3.00	3.01	3.01	0.304	85.4	0.500	n/a	B
S10M000482		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	<0.250	n/a	n/a	84.0	0.250	n/a	U
S10M000482		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	<0.250	n/a	n/a	48.1	0.250	n/a	UN
S10M000482		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	<0.500	n/a	n/a	85.3	0.500	n/a	U
S10M000482		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	0.136	0.134	0.135	1.11	84.9	0.0150	n/a	B
S10M000482		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	<0.500	n/a	n/a	83.2	0.500	n/a	U
S10M000482		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	<0.0250	n/a	n/a	84.8	0.0250	n/a	U
S10M000482		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	9.14	8.89	9.02	2.71	80.1	0.0250	n/a	
S10M000482		B	7440-02-0	Nickel	ug/mL	120	2.81E-03	0.0646	0.0676	0.0661	4.50	103	3.00E-03	n/a	C

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000399			7439-97-6	Mercury	ug/mL	102	<1.00E-04	2.04E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000399				Hydrogren Ion	M	99.7	<1.00E-03	7.22	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000399			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<616	n/a	n/a	n/a	n/a	616	n/a	U
S10M000399			16887-00-6	Chloride	ug/mL	102	<3.10E-03	2.71E+05	n/a	n/a	n/a	n/a	310	n/a	
S10M000399			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<4.00E+03	n/a	n/a	n/a	n/a	4.00E+03	n/a	U
S10M000399			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	<1.62E+03	n/a	n/a	n/a	n/a	1.62E+03	n/a	U
S10M000399			14808-79-8	Sulfate	ug/mL	103	<0.0219	<2.19E+03	n/a	n/a	n/a	n/a	2.19E+03	n/a	U
S10M000399			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+04	n/a	n/a	n/a	n/a	1.05E+04	n/a	U
S10M000399			7440-22-4	Silver	ug/mL	103	<2.00E-06	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000399			7440-39-3	Barium	ug/mL	102	<1.60E-05	0.0270	n/a	n/a	n/a	n/a	6.40E-03	n/a	B

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24294
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000399			7440-41-7	Beryllium	ug/mL	98.1	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000399			7440-43-9	Cadmium	ug/mL	101	<6.00E-06	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000399			7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	<0.0280	n/a	n/a	n/a	n/a	0.0280	n/a	U
S10M000399			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24295
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000400		7439-97-6	Mercury	ug/mL	102	<1.00E-04	2.26E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000400		16984-48-8	Fluoride	ug/mL	97.5	<6.16E-03	929	n/a	n/a	n/a	n/a	6.16	n/a	
S10M000400		16887-00-6	Chloride	ug/mL	101	0.0191	39.1	n/a	n/a	n/a	n/a	3.10	n/a	CB
S10M000400		14797-65-0	Nitrite	ug/mL	95.8	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000400		14797-55-8	Nitrate	ug/mL	98.3	<0.0162	186	n/a	n/a	n/a	n/a	16.2	n/a	B
S10M000400		14808-79-8	Sulfate	ug/mL	104	<0.0219	3.60E+03	n/a	n/a	n/a	n/a	21.9	n/a	
S10M000400		338-70-5	Oxalate	ug/mL	98.9	<0.105	1.17E+03	n/a	n/a	n/a	n/a	105	n/a	
S10M000400		7429-90-5	Aluminum	ug/mL	102	<0.0300	<15.0	n/a	n/a	n/a	n/a	15.0	n/a	U
S10M000400		7440-38-2	Arsenic	ug/mL	97.0	<0.0500	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000400		7440-48-4	Cobalt	ug/mL	101	<0.0100	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000400		7440-50-8	Copper	ug/mL	103	<5.00E-03	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000400		7440-09-7	Potassium	ug/mL	105	<0.500	<250	n/a	n/a	n/a	n/a	250	n/a	U
S10M000400		7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	<1.50	n/a	n/a	n/a	n/a	1.50	n/a	U
S10M000400		7440-23-5	Sodium	ug/mL	104	<0.100	1.10E+04	n/a	n/a	n/a	n/a	50.0	n/a	
S10M000400		7440-36-0	Antimony	ug/mL	95.7	<0.0500	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000400		7782-49-2	Selenium	ug/mL	101	<0.100	<50.0	n/a	n/a	n/a	n/a	50.0	n/a	U
S10M000400		7440-24-6	Strontium	ug/mL	101	<3.00E-03	<1.50	n/a	n/a	n/a	n/a	1.50	n/a	U
S10M000400		7440-28-0	Thallium	ug/mL	101	<0.100	<50.0	n/a	n/a	n/a	n/a	50.0	n/a	U
S10M000400		7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000400		7440-66-6	Zinc	ug/mL	98.9	<5.00E-03	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000400		7440-22-4	Silver	ug/mL	103	<2.00E-06	9.21E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	B
S10M000400		7440-39-3	Barium	ug/mL	102	<1.60E-05	0.130	n/a	n/a	n/a	n/a	6.40E-03	n/a	
S10M000400		7440-41-7	Beryllium	ug/mL	98.1	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000400		7440-43-9	Cadmium	ug/mL	101	<6.00E-06	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000400		7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	1.38	n/a	n/a	n/a	n/a	0.0280	n/a	
S10M000400		7439-92-1	Lead	ug/mL	101	<1.50E-05	0.0348	n/a	n/a	n/a	n/a	6.00E-03	n/a	B
S10M000400		7440-02-0	Nickel	ug/mL	98.5	<1.20E-05	0.602	n/a	n/a	n/a	n/a	4.80E-03	n/a	
S10M000400		PH	pH	unitless	n/a	n/a	8.08	n/a	n/a	n/a	n/a	0.0100	n/a	

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N - Spike Outside Range
U - < Det Limit
B - Inorganic Estimated
C - Inorganic Blank Contamination
X - Comment
> - WetChem Outside Calibration Range
M - Inorganic RPD Outside Range

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24296
Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000483		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	<0.150	n/a	n/a	n/a	n/a	0.150	n/a	U
S10M000483		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000483		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000483		B	7440-47-3	Chromium	ug/mL	81.8	7.29E-03	0.0403	n/a	n/a	n/a	n/a	0.0250	n/a	CB
S10M000483		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000483		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000483		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000483		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	4.04	n/a	n/a	n/a	n/a	0.500	n/a	B
S10M000483		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000483		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000483		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000483		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000483		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000483		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000483		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	0.748	n/a	n/a	n/a	n/a	0.0250	n/a	
S10M000483		B	7440-02-0	Nickel	ug/mL	120	2.81E-03	6.73E-03	n/a	n/a	n/a	n/a	3.00E-03	n/a	CB

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000401			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000401				Hydrogren Ion	M	99.7	<1.00E-03	0.0100	n/a	n/a	n/a	n/a	3.30E-03	n/a	
S10M000401			7440-22-4	Silver	ug/mL	109	<2.00E-04	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000401			7440-39-3	Barium	ug/mL	102	<1.60E-03	<6.40E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	U
S10M000401			7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000401			7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000401			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

NA = Not Analyzed, ND = Not Detected

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U - < Det Limit
B - Inorganic Estimated
C - Inorganic Blank Contamination
X - Comment
> - WetChem Outside Calibration Range
M - Inorganic RPD Outside Range

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24297
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000394		7439-97-6	Mercury	ug/mL	105	<1.00E-04	0.0101	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000394			Hydrogren Ion	ug/mL	96.5	<0.0100	1.30	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000394		16984-48-8	Fluoride	ug/mL	100	<6.16E-03	<6.16	n/a	n/a	n/a	n/a	6.16	n/a	U
S10M000394		16887-00-6	Chloride	ug/mL	104	0.0114	190	n/a	n/a	n/a	n/a	3.10	n/a	
S10M000394		14797-65-0	Nitrite	ug/mL	96.3	<0.0400	<40.0	n/a	n/a	n/a	n/a	40.0	n/a	U
S10M000394		14797-55-8	Nitrate	ug/mL	97.0	<0.0162	2.62E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000394		14808-79-8	Sulfate	ug/mL	102	0.102	5.43E+04	n/a	n/a	n/a	n/a	219	n/a	
S10M000394		338-70-5	Oxalate	ug/mL	95.7	<0.105	<105	n/a	n/a	n/a	n/a	105	n/a	U
S10M000394		7440-22-4	Silver	ug/mL	99.9	<5.00E-03	5.43	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000394		7429-90-5	Aluminum	ug/mL	101	<0.0300	<3.00	n/a	n/a	n/a	n/a	3.00	n/a	U
S10M000394		7440-38-2	Arsenic	ug/mL	104	<0.0500	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000394		7440-43-9	Cadmium	ug/mL	100	<5.00E-03	4.06	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000394		7440-48-4	Cobalt	ug/mL	100	<0.0100	3.47	n/a	n/a	n/a	n/a	1.00	n/a	B
S10M000394		7440-50-8	Copper	ug/mL	102	<5.00E-03	10.6	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000394		7440-09-7	Potassium	ug/mL	107	<0.500	<50.0	n/a	n/a	n/a	n/a	50.0	n/a	U
S10M000394		7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	10.3	n/a	n/a	n/a	n/a	0.300	n/a	
S10M000394		7440-23-5	Sodium	ug/mL	95.1	<0.100	60.6	n/a	n/a	n/a	n/a	10.0	n/a	
S10M000394		7440-36-0	Antimony	ug/mL	100	<0.0500	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000394		7782-49-2	Selenium	ug/mL	103	<0.100	23.5	n/a	n/a	n/a	n/a	10.0	n/a	B
S10M000394		7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.300	n/a	n/a	n/a	n/a	0.300	n/a	U
S10M000394		7440-28-0	Thallium	ug/mL	102	<0.100	11.3	n/a	n/a	n/a	n/a	10.0	n/a	B
S10M000394		7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000394		7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000394		7440-39-3	Barium	ug/mL	101	<1.60E-05	0.181	n/a	n/a	n/a	n/a	6.40E-03	n/a	C
S10M000394		7440-41-7	Beryllium	ug/mL	96.0	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000394		7440-47-3	Chromium	ug/mL	96.2	<7.00E-05	0.0519	n/a	n/a	n/a	n/a	0.0280	n/a	B
S10M000394		7439-92-1	Lead	ug/mL	102	<1.50E-05	0.0105	n/a	n/a	n/a	n/a	6.00E-03	n/a	B
S10M000394		7440-02-0	Nickel	ug/mL	97.7	<1.20E-05	0.137	n/a	n/a	n/a	n/a	0.0600	n/a	B

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> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24298
Sample Portion: Env Dig

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000385		E	7429-90-5	Aluminum	ug/mL	99.4	18.2	20.2	n/a	n/a	n/a	n/a	3.75	n/a	CB
S10M000385		E	7440-38-2	Arsenic	ug/mL	92.5	<6.25	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000385		E	7440-48-4	Cobalt	ug/mL	93.9	<1.25	<1.25	n/a	n/a	n/a	n/a	1.25	n/a	U
S10M000385		E	7440-50-8	Copper	ug/mL	95.0	<0.625	<0.625	n/a	n/a	n/a	n/a	0.625	n/a	U
S10M000385		E	7440-09-7	Potassium	ug/mL	81.2	<62.5	<62.5	n/a	n/a	n/a	n/a	62.5	n/a	U
S10M000385		E	7439-96-5	Manganese	ug/mL	92.5	<0.375	<0.375	n/a	n/a	n/a	n/a	0.375	n/a	U
S10M000385		E	7440-23-5	Sodium	ug/mL	138	32.6	149	n/a	n/a	n/a	n/a	12.5	n/a	CX
S10M000385		E	7440-36-0	Antimony	ug/mL	86.7	<6.25	<6.25	n/a	n/a	n/a	n/a	6.25	n/a	U
S10M000385		E	7782-49-2	Selenium	ug/mL	89.5	<12.5	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000385		E	7440-24-6	Strontium	ug/mL	95.8	<0.375	0.411	n/a	n/a	n/a	n/a	0.375	n/a	B
S10M000385		E	7440-28-0	Thallium	ug/mL	n/a	<12.5	<12.5	n/a	n/a	n/a	n/a	12.5	n/a	U
S10M000385		E	7440-62-2	Vanadium	ug/mL	95.7	<0.625	<0.625	n/a	n/a	n/a	n/a	0.625	n/a	U
S10M000385		E	7440-66-6	Zinc	ug/mL	93.0	<0.625	0.841	n/a	n/a	n/a	n/a	0.625	n/a	B
S10M000385		E	7440-22-4	Silver	ug/mL	85.2	<0.0100	<0.0100	n/a	n/a	n/a	n/a	0.0100	n/a	U
S10M000385		E	7440-39-3	Barium	ug/mL	102	<1.60E-03	6.27	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000385		E	7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<0.225	n/a	n/a	n/a	n/a	0.225	n/a	U
S10M000385		E	7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<0.0750	n/a	n/a	n/a	n/a	0.0750	n/a	U
S10M000385		E	7440-47-3	Chromium	ug/mL	104	0.869	0.420	n/a	n/a	n/a	n/a	0.0875	n/a	CB
S10M000385		E	7439-92-1	Lead	ug/mL	99.2	1.12	0.585	n/a	n/a	n/a	n/a	0.0388	n/a	C
S10M000385		E	7440-02-0	Nickel	ug/mL	95.2	0.104	0.216	n/a	n/a	n/a	n/a	0.0150	n/a	C

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000379			7439-97-6	Mercury	ug/mL	100	1.05E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U

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N - Spike Outside Range
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B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24299
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000402			7439-97-6	Mercury	ug/mL	102	<1.00E-04	2.72E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	B
S10M000402				Hydrogren Ion	M	99.7	<1.00E-03	1.06	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000402			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<30.8	n/a	n/a	n/a	n/a	30.8	n/a	U
S10M000402			16887-00-6	Chloride	ug/mL	102	<3.10E-03	206	n/a	n/a	n/a	n/a	15.5	n/a	CB
S10M000402			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<200	n/a	n/a	n/a	n/a	200	n/a	U
S10M000402			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	6.48E+04	n/a	n/a	n/a	n/a	81.0	n/a	
S10M000402			14808-79-8	Sulfate	ug/mL	103	<0.0219	<110	n/a	n/a	n/a	n/a	110	n/a	U
S10M000402			338-70-5	Oxalate	ug/mL	98.1	<0.105	<525	n/a	n/a	n/a	n/a	525	n/a	U
S10M000402			7429-90-5	Aluminum	ug/mL	101	<0.0300	0.402	0.410	0.406	1.90	96.5	0.0600	n/a	
S10M000402			7440-38-2	Arsenic	ug/mL	104	<0.0500	<0.100	<0.100	n/a	n/a	102	0.100	n/a	U
S10M000402			7440-48-4	Cobalt	ug/mL	100	<0.0100	<0.0200	<0.0200	n/a	n/a	93.0	0.0200	n/a	U
S10M000402			7440-50-8	Copper	ug/mL	102	<5.00E-03	<0.0100	<0.0100	n/a	n/a	98.3	0.0100	n/a	U
S10M000402			7440-09-7	Potassium	ug/mL	107	<0.500	<1.00	<1.00	n/a	n/a	103	1.00	n/a	U
S10M000402			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	<6.00E-03	<6.00E-03	n/a	n/a	93.1	6.00E-03	n/a	U
S10M000402			7440-23-5	Sodium	ug/mL	95.1	<0.100	6.01	5.86	5.94	2.63	85.9	0.200	n/a	
S10M000402			7440-02-0	Nickel	ug/mL	99.5	<0.0200	<0.0400	<0.0400	n/a	n/a	91.8	0.0400	n/a	U
S10M000402			7440-36-0	Antimony	ug/mL	100	<0.0500	<0.100	<0.100	n/a	n/a	94.9	0.100	n/a	U
S10M000402			7782-49-2	Selenium	ug/mL	103	<0.100	<0.200	<0.200	n/a	n/a	98.0	0.200	n/a	U
S10M000402			7440-24-6	Strontium	ug/mL	101	<3.00E-03	0.0225	0.0224	0.0225	0.401	96.7	6.00E-03	n/a	B
S10M000402			7440-28-0	Thallium	ug/mL	102	<0.100	<0.200	<0.200	n/a	n/a	93.4	0.200	n/a	U
S10M000402			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	<0.0100	<0.0100	n/a	n/a	93.6	0.0100	n/a	U
S10M000402			7440-66-6	Zinc	ug/mL	99.1	<5.00E-03	1.90	1.88	1.89	1.37	91.0	0.0100	n/a	
S10M000402			7440-22-4	Silver	ug/mL	103	<2.00E-06	1.49E-03	1.78E-03	1.64E-03	17.3	97.5	8.00E-04	n/a	B
S10M000402			7440-39-3	Barium	ug/mL	102	<1.60E-05	9.28E-03	1.14E-02	1.04E-02	20.8	99.4	6.40E-03	n/a	B
S10M000402			7440-41-7	Beryllium	ug/mL	98.1	<1.80E-05	9.53E-03	8.53E-03	9.03E-03	11.1	98.0	7.20E-03	n/a	B
S10M000402			7440-43-9	Cadmium	ug/mL	101	<6.00E-06	9.24E-03	1.10E-02	1.01E-02	17.0	95.6	2.40E-03	n/a	B
S10M000402			7440-47-3	Chromium	ug/mL	99.3	<7.00E-05	<0.0280	<0.0280	n/a	n/a	93.5	0.0280	n/a	U
S10M000402			7439-92-1	Lead	ug/mL	101	<1.50E-05	0.0136	0.0217	0.0176	45.9	98.2	6.00E-03	n/a	B

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C - Inorganic Blank Contamination
X - Comment
> - WetChem Outside Calibration Range
M - Inorganic RPD Outside Range

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24299
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000402			PH	pH	unitless	n/a	n/a	<2.00	<2.00	n/a	n/a	n/a	2.00	n/a	>

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B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B1
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000403			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000403				Hydrogren Ion	M	99.7	<1.00E-03	12.0	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000403			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<616	n/a	n/a	n/a	n/a	616	n/a	U
S10M000403			16887-00-6	Chloride	ug/mL	102	<3.10E-03	2.27E+03	n/a	n/a	n/a	n/a	310	n/a	CB
S10M000403			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<4.00E+03	n/a	n/a	n/a	n/a	4.00E+03	n/a	U
S10M000403			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	7.26E+05	n/a	n/a	n/a	n/a	1.62E+03	n/a	
S10M000403			14808-79-8	Sulfate	ug/mL	103	<0.0219	<2.19E+03	n/a	n/a	n/a	n/a	2.19E+03	n/a	U
S10M000403			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+04	n/a	n/a	n/a	n/a	1.05E+04	n/a	U
S10M000403			7429-90-5	Aluminum	ug/mL	102	<0.0300	33.4	34.1	33.7	2.00	101	3.00	n/a	
S10M000403			7440-38-2	Arsenic	ug/mL	97.0	<0.0500	<5.00	<5.00	n/a	n/a	98.2	5.00	n/a	U
S10M000403			7440-39-3	Barium	ug/mL	101	<3.00E-03	3.61	3.62	3.62	0.0257	101	0.300	n/a	
S10M000403			7440-48-4	Cobalt	ug/mL	101	<0.0100	3.16	3.03	3.09	4.01	99.9	1.00	n/a	B
S10M000403			7440-47-3	Chromium	ug/mL	100	<5.00E-03	936	940	938	0.407	98.3	0.500	n/a	
S10M000403			7440-50-8	Copper	ug/mL	103	<5.00E-03	77.0	77.2	77.1	0.286	99.6	0.500	n/a	
S10M000403			7440-09-7	Potassium	ug/mL	105	<0.500	<50.0	<50.0	n/a	n/a	102	50.0	n/a	U
S10M000403			7439-96-5	Manganese	ug/mL	98.7	<3.00E-03	68.5	68.6	68.5	0.208	99.5	0.300	n/a	
S10M000403			7440-23-5	Sodium	ug/mL	104	<0.100	17.0	15.3	16.1	10.6	101	10.0	n/a	B
S10M000403			7440-02-0	Nickel	ug/mL	99.5	<0.0200	587	590	588	0.544	97.6	2.00	n/a	
S10M000403			7440-36-0	Antimony	ug/mL	95.7	<0.0500	<5.00	<5.00	n/a	n/a	95.5	5.00	n/a	U
S10M000403			7782-49-2	Selenium	ug/mL	101	<0.100	<10.0	<10.0	n/a	n/a	101	10.0	n/a	U
S10M000403			7440-24-6	Strontium	ug/mL	101	<3.00E-03	<0.300	<0.300	n/a	n/a	98.7	0.300	n/a	U
S10M000403			7440-28-0	Thallium	ug/mL	101	<0.100	<10.0	<10.0	n/a	n/a	99.6	10.0	n/a	U
S10M000403			7440-62-2	Vanadium	ug/mL	101	<5.00E-03	1.20	1.30	1.25	7.30	99.7	0.500	n/a	B
S10M000403			7440-66-6	Zinc	ug/mL	98.9	<5.00E-03	282	282	282	0.0959	98.5	0.500	n/a	
S10M000403			7440-22-4	Silver	ug/mL	104	<2.00E-06	0.0630	n/a	n/a	n/a	n/a	8.00E-04	n/a	
S10M000403			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000403			7440-43-9	Cadmium	ug/mL	102	<6.00E-06	0.613	n/a	n/a	n/a	n/a	2.40E-03	n/a	
S10M000403			7439-92-1	Lead	ug/mL	99.9	<1.50E-05	164	n/a	n/a	n/a	n/a	6.00E-03	n/a	

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B1
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000403			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B2
Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000484		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	<0.150	n/a	n/a	n/a	n/a	0.150	n/a	U
S10M000484		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000484		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000484		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000484		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000484		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000484		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	1.78	n/a	n/a	n/a	n/a	0.500	n/a	B
S10M000484		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000484		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000484		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	<0.0150	n/a	n/a	n/a	n/a	0.0150	n/a	U
S10M000484		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000484		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000484		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	0.0303	n/a	n/a	n/a	n/a	0.0250	n/a	B

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000404			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000404				Hydrogren Ion	M	99.7	<1.00E-03	14.9	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000404			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<616	n/a	n/a	n/a	n/a	616	n/a	U
S10M000404			16887-00-6	Chloride	ug/mL	102	<3.10E-03	<310	n/a	n/a	n/a	n/a	310	n/a	U
S10M000404			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<4.00E+03	n/a	n/a	n/a	n/a	4.00E+03	n/a	U
S10M000404			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	8.88E+05	n/a	n/a	n/a	n/a	1.62E+03	n/a	
S10M000404			14808-79-8	Sulfate	ug/mL	103	<0.0219	<2.19E+03	n/a	n/a	n/a	n/a	2.19E+03	n/a	U
S10M000404			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+04	n/a	n/a	n/a	n/a	1.05E+04	n/a	U
S10M000404			7440-22-4	Silver	ug/mL	104	<2.00E-06	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000404			7440-39-3	Barium	ug/mL	101	<1.60E-05	0.0337	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000404			7440-41-7	Beryllium	ug/mL	103	<1.80E-05	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U
S10M000404			7440-43-9	Cadmium	ug/mL	102	<6.00E-06	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U

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N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B2
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000404			7440-47-3	Chromium	ug/mL	101	<7.00E-05	0.104	n/a	n/a	n/a	n/a	0.0280	n/a	B
S10M000404			7439-92-1	Lead	ug/mL	105	<3.10E-05	<6.20E-03	n/a	n/a	n/a	n/a	6.20E-03	n/a	U
S10M000404			7440-02-0	Nickel	ug/mL	91.2	<1.20E-05	6.14E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	B
S10M000404			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

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X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B4
Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000485		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	0.584	n/a	n/a	n/a	n/a	0.150	n/a	B
S10M000485		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000485		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000485		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	0.0544	n/a	n/a	n/a	n/a	0.0250	n/a	B
S10M000485		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000485		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	0.0246	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000485		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	8.35	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000485		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000485		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000485		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000485		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	0.0306	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000485		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000485		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000485		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	2.49	n/a	n/a	n/a	n/a	0.0250	n/a	

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000405			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	U
S10M000405				Hydrogren Ion	M	99.7	<1.00E-03	0.640	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000405			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<61.6	n/a	n/a	n/a	n/a	61.6	n/a	U
S10M000405			16887-00-6	Chloride	ug/mL	102	<3.10E-03	242	n/a	n/a	n/a	n/a	31.0	n/a	CB
S10M000405			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<400	n/a	n/a	n/a	n/a	400	n/a	U
S10M000405			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	3.75E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000405			14808-79-8	Sulfate	ug/mL	103	<0.0219	<219	n/a	n/a	n/a	n/a	219	n/a	U
S10M000405			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+03	n/a	n/a	n/a	n/a	1.05E+03	n/a	U
S10M000405			7440-22-4	Silver	ug/mL	109	<2.00E-04	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000405			7440-39-3	Barium	ug/mL	102	<1.60E-03	8.79E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000405			7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U

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N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B4
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000405			7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000405			7440-47-3	Chromium	ug/mL	102	<7.00E-03	<0.0280	n/a	n/a	n/a	n/a	0.0280	n/a	UX
S10M000405			7440-02-0	Nickel	ug/mL	98.5	<1.20E-05	<4.80E-03	n/a	n/a	n/a	n/a	4.80E-03	n/a	U
S10M000405			PH	pH	unitless	n/a	n/a	<2.00	<2.00	n/a	n/a	n/a	2.00	n/a	>

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Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B8
Sample Portion: Acid Digest

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000486		B	7429-90-5	Aluminum	ug/mL	83.4	<0.0300	0.608	n/a	n/a	n/a	n/a	0.150	n/a	B
S10M000486		B	7440-38-2	Arsenic	ug/mL	82.8	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000486		B	7440-48-4	Cobalt	ug/mL	82.3	<0.0100	<0.0500	n/a	n/a	n/a	n/a	0.0500	n/a	U
S10M000486		B	7440-50-8	Copper	ug/mL	89.9	<5.00E-03	0.0619	n/a	n/a	n/a	n/a	0.0250	n/a	B
S10M000486		B	7440-09-7	Potassium	ug/mL	76.7	<0.500	<2.50	n/a	n/a	n/a	n/a	2.50	n/a	U
S10M000486		B	7439-96-5	Manganese	ug/mL	82.1	<3.00E-03	0.0272	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000486		B	7440-23-5	Sodium	ug/mL	91.9	<0.100	8.18	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000486		B	7439-92-1	Lead	ug/mL	81.4	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	U
S10M000486		B	7440-36-0	Antimony	ug/mL	80.1	<0.0500	<0.250	n/a	n/a	n/a	n/a	0.250	n/a	UN
S10M000486		B	7782-49-2	Selenium	ug/mL	87.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000486		B	7440-24-6	Strontium	ug/mL	88.5	<3.00E-03	0.0183	n/a	n/a	n/a	n/a	0.0150	n/a	B
S10M000486		B	7440-28-0	Thallium	ug/mL	90.5	<0.100	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000486		B	7440-62-2	Vanadium	ug/mL	85.1	<5.00E-03	<0.0250	n/a	n/a	n/a	n/a	0.0250	n/a	U
S10M000486		B	7440-66-6	Zinc	ug/mL	82.2	<5.00E-03	0.0825	n/a	n/a	n/a	n/a	0.0250	n/a	B

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000406			7439-97-6	Mercury	ug/mL	102	<1.00E-04	<2.00E-03	<2.00E-03	n/a	n/a	105	2.00E-03	n/a	U
S10M000406				Hydrogren Ion	M	99.7	<1.00E-03	0.640	n/a	n/a	n/a	n/a	0.100	n/a	
S10M000406			16984-48-8	Fluoride	ug/mL	99.1	<6.16E-03	<61.6	n/a	n/a	n/a	n/a	61.6	n/a	U
S10M000406			16887-00-6	Chloride	ug/mL	102	<3.10E-03	220	n/a	n/a	n/a	n/a	31.0	n/a	CB
S10M000406			14797-65-0	Nitrite	ug/mL	95.0	<0.0400	<400	n/a	n/a	n/a	n/a	400	n/a	U
S10M000406			14797-55-8	Nitrate	ug/mL	95.9	<0.0162	3.79E+04	n/a	n/a	n/a	n/a	162	n/a	
S10M000406			14808-79-8	Sulfate	ug/mL	103	<0.0219	<219	n/a	n/a	n/a	n/a	219	n/a	U
S10M000406			338-70-5	Oxalate	ug/mL	98.1	<0.105	<1.05E+03	n/a	n/a	n/a	n/a	1.05E+03	n/a	U
S10M000406			7440-22-4	Silver	ug/mL	109	<2.00E-04	<8.00E-04	n/a	n/a	n/a	n/a	8.00E-04	n/a	U
S10M000406			7440-39-3	Barium	ug/mL	102	<1.60E-03	8.41E-03	n/a	n/a	n/a	n/a	6.40E-03	n/a	B
S10M000406			7440-41-7	Beryllium	ug/mL	105	<1.80E-03	<7.20E-03	n/a	n/a	n/a	n/a	7.20E-03	n/a	U

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M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Inorganic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B8
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000406			7440-43-9	Cadmium	ug/mL	102	<6.00E-04	<2.40E-03	n/a	n/a	n/a	n/a	2.40E-03	n/a	U
S10M000406			7440-47-3	Chromium	ug/mL	102	<7.00E-03	<0.0280	n/a	n/a	n/a	n/a	0.0280	n/a	UX
S10M000406			7440-02-0	Nickel	ug/mL	98.5	<1.20E-05	<4.80E-03	n/a	n/a	n/a	n/a	4.80E-03	n/a	U
S10M000406			PH	pH	unitless	n/a	n/a	<2.00	n/a	n/a	n/a	n/a	2.00	n/a	>

NA = Not Analyzed, ND = Not Detected

N - Spike Outside Range
X - Comment
U - < Det Limit
> - WetChem Outside Calibration Range
B - Inorganic Estimated
M - Inorganic RPD Outside Range
C - Inorganic Blank Contamination

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100687
Customer Group or SDG Number: 222S20100687
Customer Sample ID: B241X2
Sample Portion: Acid Dig

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000377		A	13968-55-3	Uranium-233	ug/g	n/a	<5.00E-06	<9.33E-04	<8.93E-04	n/a	n/a	n/a	9.33E-04	n/a	U
S10M000377		A	13966-29-5	Uranium-234	ug/g	n/a	<2.50E-06	<4.67E-04	<4.47E-04	n/a	n/a	n/a	4.67E-04	n/a	U
S10M000377		A	15117-96-1	Uranium-235	ug/g	129	<5.00E-06	<9.33E-04	<8.93E-04	n/a	n/a	85.0	9.33E-04	n/a	U
S10M000377		A	13994-20-2	Neptunium-237	ug/g	99.3	<5.00E-05	<9.33E-03	<8.93E-03	n/a	n/a	91.0	9.33E-03	n/a	U
S10M000377		A	U-238	Uranium-238	ug/g	102	<2.50E-04	<0.0467	<0.0447	n/a	n/a	95.7	0.0467	n/a	U
S10M000377		A	13982-10-0	Plutonium-242	ug/g	n/a	<2.00E-06	<3.73E-04	<3.57E-04	n/a	n/a	n/a	3.73E-04	n/a	U

Sample Portion: Env Dig

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000373		E	12587-46-1	Gross alpha	uCi/g	97.3	<1.65E-05	<1.65E-05	<1.58E-05	n/a	n/a	72.1	1.65E-05	n/a	U
S10M000373		E	12587-47-2	Gross beta	uCi/g	113	<4.91E-05	<5.32E-05	<4.72E-05	n/a	n/a	111	5.32E-05	n/a	U
S10M000373		E	14596-10-2	Americium-241	uCi/g	96.4	0.0	0.0	0.0	n/a	n/a	n/a	8.78E-05	100	U
S10M000373		E	10198-40-0	Cobalt-60	uCi/g	99.4	<2.71E-05	<2.61E-05	<2.55E-05	n/a	n/a	n/a	2.61E-05	n/a	U
S10M000373		E	10045-97-3	Cesium-137	uCi/g	102	<3.35E-05	<3.40E-05	<3.15E-05	n/a	n/a	n/a	3.40E-05	n/a	U
S10M000373		E	PU-239/240	Plutonium-239/240	uCi/g	99.4	0.0	0.0	0.0	n/a	n/a	n/a	6.78E-05	100	U
S10M000373		E	13981-16-3	Plutonium-238	uCi/g	n/a	0.0	0.0	0.0	n/a	n/a	n/a	6.78E-05	100	U
S10M000373		E	SR-89/90	Strontium-89/90	uCi/g	91.9	2.98E-05	-5.08E-07	-2.76E-05	n/a	n/a	n/a	2.68E-05	7683.267	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100687
Customer Group or SDG Number: 222S20100687
Customer Sample ID: B242B6
Sample Portion: Acid Dig

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000376	A	12587-46-1	Gross alpha	uCi/g	89.7	<1.05E-04	0.0432	0.0438	0.0435	1.33	92.7	7.82E-05	3.28	
S10M000376	A	12587-47-2	Gross beta	uCi/g	100	<3.59E-04	2.47E-03	2.18E-03	2.33E-03	12.2	109	1.97E-04	15.54	
S10M000376	A	14596-10-2	Americium-241	uCi/g	106	0.0	1.59E-03	1.55E-03	1.57E-03	2.51	n/a	3.78E-04	5.51	
S10M000376	A	10198-40-0	Cobalt-60	uCi/g	98.8	<2.27E-05	<2.21E-03	n/a	n/a	n/a	n/a	2.21E-03	n/a	U
S10M000376	A	10045-97-3	Cesium-137	uCi/g	98.6	<2.91E-05	<3.16E-03	n/a	n/a	n/a	n/a	3.16E-03	n/a	U
S10M000376	A	13968-55-3	Uranium-233	ug/g	n/a	<5.00E-06	<5.38E-04	n/a	n/a	n/a	n/a	5.38E-04	n/a	U
S10M000376	A	13966-29-5	Uranium-234	ug/g	n/a	<2.50E-06	1.05E-03	n/a	n/a	n/a	n/a	2.69E-04	n/a	
S10M000376	A	15117-96-1	Uranium-235	ug/g	129	<5.00E-06	0.0488	n/a	n/a	n/a	n/a	5.38E-04	n/a	
S10M000376	A	13994-20-2	Neptunium-237	ug/g	99.3	<5.00E-05	<5.38E-03	n/a	n/a	n/a	n/a	5.38E-03	n/a	U
S10M000376	A	U-238	Uranium-238	ug/g	102	<2.50E-04	3.97	n/a	n/a	n/a	n/a	0.0269	n/a	
S10M000376	A	13982-10-0	Plutonium-242	ug/g	n/a	<2.00E-06	<2.15E-04	n/a	n/a	n/a	n/a	2.15E-04	n/a	U
S10M000376	A	PU-239/240	Plutonium-239/240	uCi/g	111	0.0	0.0519	0.0506	0.0512	2.54	n/a	2.87E-03	3.26	
S10M000376	A	13981-16-3	Plutonium-238	uCi/g	n/a	0.0	3.30E-03	3.19E-03	3.25E-03	3.60	n/a	2.87E-03	4.94	
S10M000376	A	SR-89/90	Strontium-89/90	uCi/g	91.9	n/a	3.92E-05	n/a	n/a	n/a	n/a	6.91E-04	862.906	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24279
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000395			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	<3.23E-05	<6.53E-05	n/a	n/a	97.4	3.23E-05	n/a	U
S10M000395			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<1.54E-04	<1.83E-04	n/a	n/a	115	1.54E-04	n/a	U
S10M000395			14596-10-2	Americium-241	uCi/mL	104	0.0	0.0	0.0	n/a	n/a	n/a	3.12E-05	100	U
S10M000395			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<3.18E-05	<2.93E-05	n/a	n/a	n/a	3.18E-05	n/a	U
S10M000395			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.55E-05	<4.46E-05	n/a	n/a	n/a	4.55E-05	n/a	U
S10M000395			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000395			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000395			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000395			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000395			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000395			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	5.85E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	
S10M000395			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	0.0	0.0	0.0	0.0	n/a	1.13E-06	100	U
S10M000395			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	0.0	0.0	0.0	n/a	1.13E-06	100	U
S10M000395			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	5.73E-05	3.29E-05	n/a	n/a	n/a	5.44E-05	146.26	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24280
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000386			12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	18.8	n/a	n/a	n/a	n/a	2.05E-03	0.79	
S10M000386			12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	0.934	n/a	n/a	n/a	n/a	5.05E-03	2.89	
S10M000386			14596-10-2	Americium-241	uCi/mL	94.9	0.0	1.13	n/a	n/a	n/a	n/a	1.92	15.22	
S10M000386			10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.25E-05	n/a	n/a	n/a	n/a	2.25E-05	n/a	U
S10M000386			10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	<3.36E-05	n/a	n/a	n/a	n/a	3.36E-05	n/a	U
S10M000386			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<4.00E-03	n/a	n/a	n/a	n/a	4.00E-03	n/a	U
S10M000386			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	5.64E-03	n/a	n/a	n/a	n/a	2.00E-03	n/a	
S10M000386			15117-96-1	Uranium-235	ug/mL	96.7	<1.00E-08	0.182	n/a	n/a	n/a	n/a	4.00E-03	n/a	
S10M000386			13994-20-2	Neptunium-237	ug/mL	98.0	<1.00E-07	<0.0400	n/a	n/a	n/a	n/a	0.0400	n/a	U
S10M000386			U-238	Uranium-238	ug/mL	95.1	<5.00E-07	<0.200	n/a	n/a	n/a	n/a	0.200	n/a	U
S10M000386			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	0.0679	n/a	n/a	n/a	n/a	1.60E-03	n/a	
S10M000386			PU-239/240	Plutonium-239/240	uCi/mL	97.8	0.0	20.4	n/a	n/a	n/a	n/a	3.17	5.59	
S10M000386			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	3.17	100	U
S10M000386			SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	5.27E-04	n/a	n/a	n/a	n/a	4.43E-05	18.791	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24281
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000387			12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	5.47	n/a	n/a	n/a	n/a	5.13E-04	0.73	
S10M000387			12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	0.338	n/a	n/a	n/a	n/a	1.26E-03	2.33	
S10M000387			14596-10-2	Americium-241	uCi/mL	94.9	0.0	0.865	n/a	n/a	n/a	n/a	1.99	16.88	
S10M000387			10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.50E-05	n/a	n/a	n/a	n/a	2.50E-05	n/a	U
S10M000387			10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	<3.06E-05	n/a	n/a	n/a	n/a	3.06E-05	n/a	U
S10M000387			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-03	n/a	n/a	n/a	n/a	1.00E-03	n/a	U
S10M000387			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	3.48E-03	n/a	n/a	n/a	n/a	5.00E-04	n/a	
S10M000387			15117-96-1	Uranium-235	ug/mL	96.7	<1.00E-08	0.0372	n/a	n/a	n/a	n/a	1.00E-03	n/a	
S10M000387			13994-20-2	Neptunium-237	ug/mL	98.0	<1.00E-07	<0.0100	n/a	n/a	n/a	n/a	0.0100	n/a	U
S10M000387			U-238	Uranium-238	ug/mL	95.1	<5.00E-07	0.0944	n/a	n/a	n/a	n/a	0.0500	n/a	
S10M000387			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	0.0184	n/a	n/a	n/a	n/a	4.00E-04	n/a	
S10M000387			PU-239/240	Plutonium-239/240	uCi/mL	97.8	0.0	5.36	n/a	n/a	n/a	n/a	3.53	11.62	
S10M000387			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	3.53	100	U
S10M000387			SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	3.35E-05	n/a	n/a	n/a	n/a	1.60E-04	189.833	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24283
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000388			12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	0.0342	0.0334	0.0338	2.20	94.6	4.66E-05	2.83	
S10M000388			12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	2.62E-03	2.19E-03	2.41E-03	17.9	112	1.15E-04	11	
S10M000388			14596-10-2	Americium-241	uCi/mL	96.9	0.0	4.82E-03	4.82E-03	4.82E-03	0.0209	n/a	2.38E-03	7.92	
S10M000388			10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.29E-05	<2.66E-05	n/a	n/a	n/a	2.29E-05	n/a	U
S10M000388			10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	<3.04E-05	<3.05E-05	n/a	n/a	n/a	3.04E-05	n/a	U
S10M000388			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<0.0200	n/a	n/a	n/a	n/a	0.0200	n/a	U
S10M000388			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	0.250	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000388			15117-96-1	Uranium-235	ug/mL	96.7	<1.00E-08	22.6	n/a	n/a	n/a	n/a	0.0200	n/a	
S10M000388			13994-20-2	Neptunium-237	ug/mL	98.0	<1.00E-07	<0.200	n/a	n/a	n/a	n/a	0.200	n/a	U
S10M000388			U-238	Uranium-238	ug/mL	95.1	<5.00E-07	22.6	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000388			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<8.00E-03	n/a	n/a	n/a	n/a	8.00E-03	n/a	U
S10M000388			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	0.0254	0.0267	0.0261	4.71	n/a	3.03E-03	4.59	
S10M000388			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0114	0.0112	0.0113	2.14	n/a	3.03E-03	5.96	
S10M000388			SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	6.81E-05	9.34E-05	8.07E-05	31.4	n/a	4.20E-05	97.756	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24285
Sample Portion: Env Dig

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000384	E	12587-46-1	Gross alpha	uCi/mL	106	<1.45E-05	1.05E-04	n/a	n/a	n/a	n/a	6.78E-06	24.7	
S10M000384	E	12587-47-2	Gross beta	uCi/mL	107	<1.01E-04	4.53E-05	n/a	n/a	n/a	n/a	2.35E-05	74.85	
S10M000384	E	14596-10-2	Americium-241	uCi/mL	97.6	0.0	1.10E-04	n/a	n/a	n/a	n/a	1.84E-04	100	
S10M000384	E	10198-40-0	Cobalt-60	uCi/mL	96.5	<3.04E-05	<3.12E-05	n/a	n/a	n/a	n/a	3.12E-05	n/a	U
S10M000384	E	10045-97-3	Cesium-137	uCi/mL	99.5	<4.39E-05	<4.58E-05	n/a	n/a	n/a	n/a	4.58E-05	n/a	U
S10M000384	E	13968-55-3	Uranium-233	ug/mL	n/a	<1.25E-04	<1.25E-04	n/a	n/a	n/a	n/a	1.25E-04	n/a	U
S10M000384	E	13966-29-5	Uranium-234	ug/mL	n/a	<6.25E-05	1.39E-04	n/a	n/a	n/a	n/a	6.25E-05	n/a	
S10M000384	E	15117-96-1	Uranium-235	ug/mL	103	<1.25E-04	<1.25E-04	n/a	n/a	n/a	n/a	1.25E-04	n/a	U
S10M000384	E	13994-20-2	Neptunium-237	ug/mL	92.5	<1.25E-03	<1.25E-03	n/a	n/a	n/a	n/a	1.25E-03	n/a	U
S10M000384	E	U-238	Uranium-238	ug/mL	97.0	<6.25E-03	0.0234	n/a	n/a	n/a	n/a	6.25E-03	n/a	
S10M000384	E	13982-10-0	Plutonium-242	ug/mL	n/a	<5.00E-05	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000384	E	PU-239/240	Plutonium-239/240	uCi/mL	100	0.0	0.0	n/a	n/a	n/a	n/a	1.14E-04	100	U
S10M000384	E	13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.14E-04	100	U
S10M000384	E	SR-89/90	Strontium-89/90	uCi/mL	100	-1.02E-07	5.58E-06	n/a	n/a	n/a	n/a	7.39E-05	631.912	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24286
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000389		12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	5.09E-03	n/a	n/a	n/a	n/a	9.32E-06	3.25	
S10M000389		12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	5.34E-04	n/a	n/a	n/a	n/a	2.30E-05	10.51	
S10M000389		14596-10-2	Americium-241	uCi/mL	96.9	0.0	1.26E-03	n/a	n/a	n/a	n/a	4.62E-04	6.95	
S10M000389		10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.54E-05	n/a	n/a	n/a	n/a	2.54E-05	n/a	U
S10M000389		10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	<3.07E-05	n/a	n/a	n/a	n/a	3.07E-05	n/a	U
S10M000389		13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-05	<1.00E-05	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000389		13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	5.85E-05	1.60E-05	3.72E-05	114	n/a	5.00E-06	n/a	
S10M000389		15117-96-1	Uranium-235	ug/mL	102	<1.00E-08	6.47E-04	6.58E-04	6.52E-04	1.61	101	1.00E-05	n/a	
S10M000389		13994-20-2	Neptunium-237	ug/mL	94.2	<1.00E-07	<1.00E-04	<1.00E-04	n/a	n/a	99.2	1.00E-04	n/a	U
S10M000389		U-238	Uranium-238	ug/mL	99.2	<5.00E-07	0.0927	0.0940	0.0933	1.32	103	5.00E-04	n/a	
S10M000389		13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	7.04E-05	5.42E-05	6.23E-05	25.9	n/a	4.00E-06	n/a	
S10M000389		PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	5.75E-03	n/a	n/a	n/a	n/a	5.45E-04	4.23	
S10M000389		13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	3.78E-04	n/a	n/a	n/a	n/a	5.45E-04	12.02	
S10M000389		SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	1.04E-05	n/a	n/a	n/a	n/a	1.38E-04	631.912	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24287
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000396			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	1.59E-03	n/a	n/a	n/a	n/a	3.23E-05	13.13	
S10M000396			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<2.30E-04	n/a	n/a	n/a	n/a	2.30E-04	n/a	U
S10M000396			14596-10-2	Americium-241	uCi/mL	104	0.0	1.76E-04	n/a	n/a	n/a	n/a	4.23E-05	5.73	
S10M000396			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<2.68E-05	n/a	n/a	n/a	n/a	2.68E-05	n/a	U
S10M000396			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.62E-05	n/a	n/a	n/a	n/a	4.62E-05	n/a	U
S10M000396			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	3.64E-06	4.34E-06	3.99E-06	17.7	n/a	2.00E-06	n/a	
S10M000396			13966-29-5	Uranium-234	ug/mL	n/a	6.00E-09	3.90E-05	4.91E-05	4.40E-05	23.0	n/a	1.00E-06	n/a	
S10M000396			15117-96-1	Uranium-235	ug/mL	99.1	<1.00E-08	1.17E-03	1.26E-03	1.22E-03	7.89	102	2.00E-06	n/a	
S10M000396			13994-20-2	Neptunium-237	ug/mL	94.9	<1.00E-07	2.59E-05	3.09E-05	2.84E-05	17.3	101	2.00E-05	n/a	B
S10M000396			U-238	Uranium-238	ug/mL	96.7	<5.00E-07	0.121	0.130	0.126	6.85	101	1.00E-04	n/a	
S10M000396			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	6.68E-05	7.24E-05	6.96E-05	8.07	n/a	8.00E-07	n/a	
S10M000396			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	7.27E-03	n/a	n/a	n/a	n/a	3.04E-04	2.87	
S10M000396			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	4.33E-04	n/a	n/a	n/a	n/a	3.04E-04	3.04	
S10M000396			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	3.61E-05	n/a	n/a	n/a	n/a	1.96E-04	223.822	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24288
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000390			12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	13.5	n/a	n/a	n/a	n/a	1.03E-03	0.66	
S10M000390			12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	1.56	n/a	n/a	n/a	n/a	2.52E-03	1.53	
S10M000390			14596-10-2	Americium-241	uCi/mL	94.9	0.0	7.57	n/a	n/a	n/a	n/a	1.29	4.72	
S10M000390			10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.58E-05	n/a	n/a	n/a	n/a	2.58E-05	n/a	U
S10M000390			10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	<3.53E-05	n/a	n/a	n/a	n/a	3.53E-05	n/a	U
S10M000390			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	0.0370	n/a	n/a	n/a	n/a	4.00E-03	n/a	
S10M000390			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	0.0636	0.0533	0.0584	17.6	n/a	2.00E-03	n/a	
S10M000390			15117-96-1	Uranium-235	ug/mL	96.7	<1.00E-08	2.41	2.38	2.39	1.30	93.0	4.00E-03	n/a	
S10M000390			13994-20-2	Neptunium-237	ug/mL	98.0	<1.00E-07	<0.0400	<0.0400	n/a	n/a	94.8	0.0400	n/a	U
S10M000390			U-238	Uranium-238	ug/mL	95.1	<5.00E-07	102	102	102	0.784	98.7	0.200	n/a	
S10M000390			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	0.0318	0.0327	0.0323	2.63	n/a	1.60E-03	n/a	
S10M000390			PU-239/240	Plutonium-239/240	uCi/mL	97.8	0.0	5.68	n/a	n/a	n/a	n/a	0.766	5.36	
S10M000390			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.526	n/a	n/a	n/a	n/a	0.766	14.83	
S10M000390			SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	1.37E-04	n/a	n/a	n/a	n/a	4.20E-05	52.298	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24289
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000391		12587-46-1	Gross alpha	uCi/mL	99.7	<4.73E-06	13.8	n/a	n/a	n/a	n/a	1.03E-03	0.65	
S10M000391		12587-47-2	Gross beta	uCi/mL	107	<4.74E-06	2.03	n/a	n/a	n/a	n/a	2.52E-03	1.32	
S10M000391		14596-10-2	Americium-241	uCi/mL	94.9	0.0	11.1	n/a	n/a	n/a	n/a	1.49	4.32	
S10M000391		10198-40-0	Cobalt-60	uCi/mL	103	<2.57E-05	<2.62E-05	n/a	n/a	n/a	n/a	2.62E-05	n/a	U
S10M000391		10045-97-3	Cesium-137	uCi/mL	105	<3.09E-05	5.43E-05	n/a	n/a	n/a	n/a	3.06E-05	37.38	
S10M000391		13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	0.0326	n/a	n/a	n/a	n/a	0.0200	n/a	
S10M000391		13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	0.587	n/a	n/a	n/a	n/a	0.0100	n/a	
S10M000391		15117-96-1	Uranium-235	ug/mL	96.7	<1.00E-08	14.8	n/a	n/a	n/a	n/a	0.0200	n/a	
S10M000391		13994-20-2	Neptunium-237	ug/mL	98.0	<1.00E-07	0.798	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000391		U-238	Uranium-238	ug/mL	95.1	<5.00E-07	1.85E+03	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000391		13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	0.0545	n/a	n/a	n/a	n/a	8.00E-03	n/a	
S10M000391		PU-239/240	Plutonium-239/240	uCi/mL	97.8	0.0	2.99	n/a	n/a	n/a	n/a	1.14	9.67	
S10M000391		13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.14	100	U
S10M000391		SR-89/90	Strontium-89/90	uCi/mL	105	-6.13E-06	5.97E-04	n/a	n/a	n/a	n/a	4.72E-05	17.989	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24290
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000392			12587-46-1	Gross alpha	uCi/mL	97.3	<0.157	1.14E+03	n/a	n/a	n/a	n/a	0.0831	0.69	
S10M000392			12587-47-2	Gross beta	uCi/mL	109	<0.274	172	n/a	n/a	n/a	n/a	0.232	1.37	
S10M000392			14596-10-2	Americium-241	uCi/mL	104	0.0	713	n/a	n/a	n/a	n/a	45.0	3.11	
S10M000392			10198-40-0	Cobalt-60	uCi/mL	103	<0.0335	<0.0359	<0.0344	n/a	n/a	n/a	0.0359	n/a	U
S10M000392			10045-97-3	Cesium-137	uCi/mL	108	<0.0447	<0.0435	<0.0436	n/a	n/a	n/a	0.0435	n/a	U
S10M000392			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<5.00	n/a	n/a	n/a	n/a	5.00	n/a	U
S10M000392			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	2.97	7.01	4.99	81.1	n/a	2.50	n/a	
S10M000392			15117-96-1	Uranium-235	ug/mL	104	<1.00E-08	202	188	195	7.03	104	5.00	n/a	
S10M000392			13994-20-2	Neptunium-237	ug/mL	96.7	<1.00E-07	<50.0	<50.0	n/a	n/a	99.7	50.0	n/a	U
S10M000392			U-238	Uranium-238	ug/mL	97.7	<5.00E-07	1.75E+04	1.76E+04	1.76E+04	0.568	101	250	n/a	
S10M000392			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	8.37	5.60	6.99	39.7	n/a	2.00	n/a	
S10M000392			PU-239/240	Plutonium-239/240	uCi/mL	97.9	0.0	383	n/a	n/a	n/a	n/a	22.6	4.61	
S10M000392			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	47.2	n/a	n/a	n/a	n/a	22.6	7.5	
S10M000392			SR-89/90	Strontium-89/90	uCi/mL	101	-1.71E-05	1.54E-05	n/a	n/a	n/a	n/a	1.22E-04	355.044	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24291
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000393			12587-46-1	Gross alpha	uCi/mL	97.3	<0.157	153	n/a	n/a	n/a	n/a	0.0166	0.84	
S10M000393			12587-47-2	Gross beta	uCi/mL	109	<0.274	24.1	n/a	n/a	n/a	n/a	0.0464	1.64	
S10M000393			14596-10-2	Americium-241	uCi/mL	104	0.0	112	n/a	n/a	n/a	n/a	6.59	2.91	
S10M000393			10198-40-0	Cobalt-60	uCi/mL	101	<2.76E-05	<2.78E-04	n/a	n/a	n/a	n/a	2.78E-04	n/a	U
S10M000393			10045-97-3	Cesium-137	uCi/mL	102	<3.20E-05	<3.64E-04	n/a	n/a	n/a	n/a	3.64E-04	n/a	U
S10M000393			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00	n/a	n/a	n/a	n/a	1.00	n/a	U
S10M000393			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	1.47	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000393			15117-96-1	Uranium-235	ug/mL	104	<1.00E-08	28.5	n/a	n/a	n/a	n/a	1.00	n/a	
S10M000393			13994-20-2	Neptunium-237	ug/mL	96.7	<1.00E-07	19.4	n/a	n/a	n/a	n/a	10.0	n/a	
S10M000393			U-238	Uranium-238	ug/mL	97.7	<5.00E-07	2.80E+03	n/a	n/a	n/a	n/a	50.0	n/a	
S10M000393			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	0.479	n/a	n/a	n/a	n/a	0.400	n/a	
S10M000393			PU-239/240	Plutonium-239/240	uCi/mL	99.9	0.0	37.7	n/a	n/a	n/a	n/a	2.72	3.65	
S10M000393			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	5.16	n/a	n/a	n/a	n/a	2.72	6.92	
S10M000393			SR-89/90	Strontium-89/90	uCi/mL	101	-1.71E-05	-7.91E-07	n/a	n/a	n/a	n/a	4.21E-05	7738.622	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24292
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000397			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	<3.23E-05	n/a	n/a	n/a	n/a	3.23E-05	n/a	U
S10M000397			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<1.71E-04	n/a	n/a	n/a	n/a	1.71E-04	n/a	U
S10M000397			14596-10-2	Americium-241	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	3.37E-05	100	U
S10M000397			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<2.65E-05	n/a	n/a	n/a	n/a	2.65E-05	n/a	U
S10M000397			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.49E-05	n/a	n/a	n/a	n/a	4.49E-05	n/a	U
S10M000397			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000397			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000397			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000397			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	5.13E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	B
S10M000397			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000397			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	5.08E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	
S10M000397			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	0.0	n/a	n/a	n/a	n/a	1.41E-06	100	U
S10M000397			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.41E-06	100	U
S10M000397			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	2.65E-05	n/a	n/a	n/a	n/a	1.86E-04	307.884	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24293
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000398		12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	<4.18E-05	n/a	n/a	n/a	n/a	4.18E-05	n/a	U
S10M000398		12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<1.66E-04	n/a	n/a	n/a	n/a	1.66E-04	n/a	U
S10M000398		14596-10-2	Americium-241	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	3.36E-05	100	U
S10M000398		10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<3.20E-05	n/a	n/a	n/a	n/a	3.20E-05	n/a	U
S10M000398		10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.43E-05	n/a	n/a	n/a	n/a	4.43E-05	n/a	U
S10M000398		13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<5.00E-06	<5.00E-06	n/a	n/a	n/a	5.00E-06	n/a	U
S10M000398		13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<2.50E-06	<2.50E-06	n/a	n/a	n/a	2.50E-06	n/a	U
S10M000398		15117-96-1	Uranium-235	ug/mL	98.0	<1.00E-08	1.17E-05	8.92E-06	1.03E-05	27.1	98.5	5.00E-06	n/a	
S10M000398		13994-20-2	Neptunium-237	ug/mL	94.6	<1.00E-07	<5.00E-05	<5.00E-05	n/a	n/a	99.5	5.00E-05	n/a	U
S10M000398		U-238	Uranium-238	ug/mL	95.3	<5.00E-07	1.54E-03	1.84E-03	1.69E-03	18.0	99.3	2.50E-04	n/a	
S10M000398		13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<2.00E-06	<2.00E-06	n/a	n/a	n/a	2.00E-06	n/a	U
S10M000398		PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	6.70E-06	n/a	n/a	n/a	n/a	2.38E-06	8.31	
S10M000398		13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	3.05E-06	n/a	n/a	n/a	n/a	2.38E-06	11.54	
S10M000398		SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	-1.90E-05	n/a	n/a	n/a	n/a	5.70E-05	426.968	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24294
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000399			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	<4.18E-05	n/a	n/a	n/a	n/a	4.18E-05	n/a	U
S10M000399			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<1.24E-04	n/a	n/a	n/a	n/a	1.24E-04	n/a	U
S10M000399			14596-10-2	Americium-241	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	3.56E-05	100	U
S10M000399			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<2.90E-05	n/a	n/a	n/a	n/a	2.90E-05	n/a	U
S10M000399			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.42E-05	n/a	n/a	n/a	n/a	4.42E-05	n/a	U
S10M000399			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000399			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000399			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	1.29E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	
S10M000399			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000399			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	1.73E-04	n/a	n/a	n/a	n/a	5.00E-05	n/a	
S10M000399			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<4.00E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	U
S10M000399			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	0.0	n/a	n/a	n/a	n/a	1.55E-06	100	U
S10M000399			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.55E-06	100	U
S10M000399			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	3.87E-05	n/a	n/a	n/a	n/a	2.10E-04	223.822	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24295
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000400			12587-46-1	Gross alpha	uCi/mL	103	<4.57E-07	<5.81E-05	n/a	n/a	n/a	n/a	5.81E-05	n/a	U
S10M000400			12587-47-2	Gross beta	uCi/mL	109	<1.93E-06	<1.24E-04	n/a	n/a	n/a	n/a	1.24E-04	n/a	U
S10M000400			14596-10-2	Americium-241	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	3.39E-05	100	U
S10M000400			10198-40-0	Cobalt-60	uCi/mL	92.9	<3.01E-05	<3.23E-05	n/a	n/a	n/a	n/a	3.23E-05	n/a	U
S10M000400			10045-97-3	Cesium-137	uCi/mL	102	<4.43E-05	<4.43E-05	n/a	n/a	n/a	n/a	4.43E-05	n/a	U
S10M000400			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000400			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000400			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000400			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000400			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	1.23E-04	n/a	n/a	n/a	n/a	5.00E-05	n/a	
S10M000400			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<4.00E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	U
S10M000400			PU-239/240	Plutonium-239/240	uCi/mL	97.7	0.0	0.0	n/a	n/a	n/a	n/a	1.54E-06	100	U
S10M000400			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.54E-06	100	U
S10M000400			SR-89/90	Strontium-89/90	uCi/mL	101	1.86E-05	-4.16E-05	n/a	n/a	n/a	n/a	4.96E-05	164.961	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24296
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000401			12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	<5.16E-05	n/a	n/a	n/a	n/a	5.16E-05	n/a	U
S10M000401			12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.24E-04	n/a	n/a	n/a	n/a	1.24E-04	n/a	U
S10M000401			14596-10-2	Americium-241	uCi/mL	101	0.0	0.0	n/a	n/a	n/a	n/a	3.57E-05	100	U
S10M000401			10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.52E-05	n/a	n/a	n/a	n/a	2.52E-05	n/a	U
S10M000401			10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<3.11E-05	n/a	n/a	n/a	n/a	3.11E-05	n/a	U
S10M000401			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000401			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000401			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000401			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000401			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000401			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<4.00E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	U
S10M000401			PU-239/240	Plutonium-239/240	uCi/mL	96.3	0.0	0.0	0.0	n/a	n/a	n/a	1.45E-06	100	U
S10M000401			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	0.0	n/a	n/a	n/a	1.45E-06	100	U
S10M000401			SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	-9.61E-06	n/a	n/a	n/a	n/a	4.62E-05	690.862	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24297
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000394			12587-46-1	Gross alpha	uCi/mL	97.3	<0.157	1.06E+03	1.06E+03	1.06E+03	0.0941	98.0	0.0831	0.71	
S10M000394			12587-47-2	Gross beta	uCi/mL	109	<0.274	63.3	62.1	62.7	1.93	115	0.232	2.34	
S10M000394			14596-10-2	Americium-241	uCi/mL	104	0.0	127	126	126	1.28	n/a	14.7	4.02	
S10M000394			10198-40-0	Cobalt-60	uCi/mL	101	<2.76E-05	<3.02E-04	<2.98E-04	n/a	n/a	n/a	3.02E-04	n/a	U
S10M000394			10045-97-3	Cesium-137	uCi/mL	102	<3.20E-05	<5.07E-04	<4.59E-04	n/a	n/a	n/a	5.07E-04	n/a	U
S10M000394			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<0.500	n/a	n/a	n/a	n/a	0.500	n/a	U
S10M000394			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	0.374	n/a	n/a	n/a	n/a	0.250	n/a	
S10M000394			15117-96-1	Uranium-235	ug/mL	104	<1.00E-08	6.34	n/a	n/a	n/a	n/a	0.500	n/a	
S10M000394			13994-20-2	Neptunium-237	ug/mL	96.7	<1.00E-07	8.31	n/a	n/a	n/a	n/a	5.00	n/a	
S10M000394			U-238	Uranium-238	ug/mL	97.7	<5.00E-07	<25.0	n/a	n/a	n/a	n/a	25.0	n/a	U
S10M000394			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	8.42	n/a	n/a	n/a	n/a	0.200	n/a	
S10M000394			PU-239/240	Plutonium-239/240	uCi/mL	99.9	0.0	1.02E+03	1.02E+03	1.02E+03	0.0332	n/a	71.0	3.48	
S10M000394			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	56.7	53.0	54.9	6.80	n/a	71.0	9.1	
S10M000394			SR-89/90	Strontium-89/90	uCi/mL	101	-1.71E-05	-6.44E-05	-1.58E-05	n/a	n/a	n/a	3.64E-05	73.394	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24298
Sample Portion: Env Dig

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000385	E	12587-46-1	Gross alpha	uCi/mL	106	<1.45E-05	<1.30E-05	n/a	n/a	n/a	n/a	1.30E-05	n/a	U
S10M000385	E	12587-47-2	Gross beta	uCi/mL	107	<1.01E-04	8.29E-05	n/a	n/a	n/a	n/a	2.35E-05	38.86	
S10M000385	E	14596-10-2	Americium-241	uCi/mL	97.6	0.0	0.0	n/a	n/a	n/a	n/a	1.55E-04	100	U
S10M000385	E	10198-40-0	Cobalt-60	uCi/mL	96.5	<3.04E-05	<2.92E-05	n/a	n/a	n/a	n/a	2.92E-05	n/a	U
S10M000385	E	10045-97-3	Cesium-137	uCi/mL	99.5	<4.39E-05	<4.52E-05	n/a	n/a	n/a	n/a	4.52E-05	n/a	U
S10M000385	E	13968-55-3	Uranium-233	ug/mL	n/a	<1.25E-04	<1.25E-04	n/a	n/a	n/a	n/a	1.25E-04	n/a	U
S10M000385	E	13966-29-5	Uranium-234	ug/mL	n/a	<6.25E-05	<6.25E-05	n/a	n/a	n/a	n/a	6.25E-05	n/a	U
S10M000385	E	15117-96-1	Uranium-235	ug/mL	103	<1.25E-04	<1.25E-04	n/a	n/a	n/a	n/a	1.25E-04	n/a	U
S10M000385	E	13994-20-2	Neptunium-237	ug/mL	92.5	<1.25E-03	<1.25E-03	n/a	n/a	n/a	n/a	1.25E-03	n/a	U
S10M000385	E	U-238	Uranium-238	ug/mL	97.0	<6.25E-03	<6.25E-03	n/a	n/a	n/a	n/a	6.25E-03	n/a	U
S10M000385	E	13982-10-0	Plutonium-242	ug/mL	n/a	<5.00E-05	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000385	E	PU-239/240	Plutonium-239/240	uCi/mL	100	0.0	0.0	n/a	n/a	n/a	n/a	1.14E-04	100	U
S10M000385	E	13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	1.14E-04	100	U
S10M000385	E	SR-89/90	Strontium-89/90	uCi/mL	100	-1.02E-07	3.25E-05	n/a	n/a	n/a	n/a	2.37E-05	114.357	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24299
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000402			12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	<4.66E-05	<5.16E-05	n/a	n/a	96.2	4.66E-05	n/a	U
S10M000402			12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.15E-04	<1.67E-04	n/a	n/a	114	1.15E-04	n/a	U
S10M000402			14596-10-2	Americium-241	uCi/mL	101	0.0	0.0	0.0	n/a	n/a	n/a	3.26E-05	100	U
S10M000402			10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.36E-05	<2.74E-05	n/a	n/a	n/a	2.36E-05	n/a	U
S10M000402			10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<2.97E-05	<3.34E-05	n/a	n/a	n/a	2.97E-05	n/a	U
S10M000402			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000402			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000402			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000402			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000402			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000402			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	7.37E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	
S10M000402			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	0.0	0.0	0.0	0.0	n/a	9.47E-07	100	U
S10M000402			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	0.0	0.0	0.0	n/a	9.47E-07	100	U
S10M000402			SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	-1.51E-05	-6.73E-06	n/a	n/a	n/a	4.50E-05	426.968	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B1
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000403			12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	7.99E-05	n/a	n/a	n/a	n/a	4.66E-05	104.9	
S10M000403			12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.41E-04	n/a	n/a	n/a	n/a	1.41E-04	n/a	U
S10M000403			14596-10-2	Americium-241	uCi/mL	101	0.0	4.06E-05	n/a	n/a	n/a	n/a	3.25E-05	10.33	
S10M000403			10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.54E-05	n/a	n/a	n/a	n/a	2.54E-05	n/a	U
S10M000403			10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<3.18E-05	n/a	n/a	n/a	n/a	3.18E-05	n/a	U
S10M000403			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000403			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000403			15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	2.30E-05	n/a	n/a	n/a	n/a	1.00E-06	n/a	
S10M000403			13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000403			U-238	Uranium-238	ug/mL	96.8	<5.00E-07	2.79E-03	n/a	n/a	n/a	n/a	5.00E-05	n/a	
S10M000403			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	4.25E-06	n/a	n/a	n/a	n/a	4.00E-07	n/a	
S10M000403			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	6.11E-05	n/a	n/a	n/a	n/a	3.41E-06	3.3	
S10M000403			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	9.62E-06	n/a	n/a	n/a	n/a	3.41E-06	5.18	
S10M000403			SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	1.63E-05	n/a	n/a	n/a	n/a	1.47E-04	413.061	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B2
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000404		12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	<9.24E-05	n/a	n/a	n/a	n/a	9.24E-05	n/a	U
S10M000404		12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.79E-04	n/a	n/a	n/a	n/a	1.79E-04	n/a	U
S10M000404		14596-10-2	Americium-241	uCi/mL	101	0.0	0.0	n/a	n/a	n/a	n/a	3.37E-05	100	U
S10M000404		10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.60E-05	n/a	n/a	n/a	n/a	2.60E-05	n/a	U
S10M000404		10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<3.26E-05	n/a	n/a	n/a	n/a	3.26E-05	n/a	U
S10M000404		13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<1.00E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	U
S10M000404		13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<5.00E-07	n/a	n/a	n/a	n/a	5.00E-07	n/a	U
S10M000404		15117-96-1	Uranium-235	ug/mL	99.3	<1.00E-08	2.42E-06	n/a	n/a	n/a	n/a	1.00E-06	n/a	
S10M000404		13994-20-2	Neptunium-237	ug/mL	95.0	1.46E-07	<1.00E-05	n/a	n/a	n/a	n/a	1.00E-05	n/a	U
S10M000404		U-238	Uranium-238	ug/mL	96.8	<5.00E-07	1.39E-04	n/a	n/a	n/a	n/a	5.00E-05	n/a	
S10M000404		13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	7.99E-07	n/a	n/a	n/a	n/a	4.00E-07	n/a	
S10M000404		PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	4.93E-05	n/a	n/a	n/a	n/a	2.87E-06	3.35	
S10M000404		13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	3.11E-06	n/a	n/a	n/a	n/a	2.87E-06	8	
S10M000404		SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	-2.11E-05	n/a	n/a	n/a	n/a	4.58E-05	307.656	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B4
Sample Portion: Parent

Sample# R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000405		12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	<4.66E-05	n/a	n/a	n/a	n/a	4.66E-05	n/a	U
S10M000405		12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.56E-04	n/a	n/a	n/a	n/a	1.56E-04	n/a	U
S10M000405		14596-10-2	Americium-241	uCi/mL	101	0.0	0.0	n/a	n/a	n/a	n/a	3.13E-05	100	U
S10M000405		10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.47E-05	n/a	n/a	n/a	n/a	2.47E-05	n/a	U
S10M000405		10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<3.26E-05	n/a	n/a	n/a	n/a	3.26E-05	n/a	U
S10M000405		13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<5.00E-06	n/a	n/a	n/a	n/a	5.00E-06	n/a	U
S10M000405		13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<2.50E-06	n/a	n/a	n/a	n/a	2.50E-06	n/a	U
S10M000405		15117-96-1	Uranium-235	ug/mL	98.0	<1.00E-08	<5.00E-06	n/a	n/a	n/a	n/a	5.00E-06	n/a	U
S10M000405		13994-20-2	Neptunium-237	ug/mL	94.6	<1.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000405		U-238	Uranium-238	ug/mL	95.3	<5.00E-07	<2.50E-04	n/a	n/a	n/a	n/a	2.50E-04	n/a	U
S10M000405		13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<2.00E-06	n/a	n/a	n/a	n/a	2.00E-06	n/a	U
S10M000405		PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	9.36E-07	100	U
S10M000405		13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	9.36E-07	100	U
S10M000405		SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	7.76E-06	n/a	n/a	n/a	n/a	1.37E-04	862.906	

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Radionuclide Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B242B8
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000406			12587-46-1	Gross alpha	uCi/mL	101	<4.66E-05	<5.16E-05	n/a	n/a	n/a	n/a	5.16E-05	n/a	U
S10M000406			12587-47-2	Gross beta	uCi/mL	105	<1.41E-04	<1.24E-04	n/a	n/a	n/a	n/a	1.24E-04	n/a	U
S10M000406			14596-10-2	Americium-241	uCi/mL	101	0.0	0.0	n/a	n/a	n/a	n/a	3.41E-05	100	U
S10M000406			10198-40-0	Cobalt-60	uCi/mL	98.6	<2.69E-05	<2.27E-05	n/a	n/a	n/a	n/a	2.27E-05	n/a	U
S10M000406			10045-97-3	Cesium-137	uCi/mL	102	<3.07E-05	<3.20E-05	n/a	n/a	n/a	n/a	3.20E-05	n/a	U
S10M000406			13968-55-3	Uranium-233	ug/mL	n/a	<1.00E-08	<5.00E-06	n/a	n/a	n/a	n/a	5.00E-06	n/a	U
S10M000406			13966-29-5	Uranium-234	ug/mL	n/a	<5.00E-09	<2.50E-06	n/a	n/a	n/a	n/a	2.50E-06	n/a	U
S10M000406			15117-96-1	Uranium-235	ug/mL	98.0	<1.00E-08	<5.00E-06	n/a	n/a	n/a	n/a	5.00E-06	n/a	U
S10M000406			13994-20-2	Neptunium-237	ug/mL	94.6	<1.00E-07	<5.00E-05	n/a	n/a	n/a	n/a	5.00E-05	n/a	U
S10M000406			U-238	Uranium-238	ug/mL	95.3	<5.00E-07	<2.50E-04	n/a	n/a	n/a	n/a	2.50E-04	n/a	U
S10M000406			13982-10-0	Plutonium-242	ug/mL	n/a	<4.00E-09	<2.00E-06	n/a	n/a	n/a	n/a	2.00E-06	n/a	U
S10M000406			PU-239/240	Plutonium-239/240	uCi/mL	104	0.0	0.0	n/a	n/a	n/a	n/a	8.22E-07	100	U
S10M000406			13981-16-3	Plutonium-238	uCi/mL	n/a	0.0	0.0	n/a	n/a	n/a	n/a	8.22E-07	100	U
S10M000406			SR-89/90	Strontium-89/90	uCi/mL	97.9	-1.85E-05	-1.26E-05	n/a	n/a	n/a	n/a	4.66E-05	528.233	U

NA = Not Analyzed, ND = Not Detected

B - Rad Chem Blank Contamination

U - < Det Limit

Organic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688

Customer Group or SDG Number: 222S20100688

Customer Sample ID: B24285

Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000378			75-35-4	1,1-Dichloroethene	ug/L	86.9	<0.172	<3.44	n/a	n/a	n/a	86.0	3.44	n/a	U
S10M000378			71-36-3	1-Butanol	ug/L	76.6	<1.15	907	n/a	n/a	n/a	n/a	23.0	n/a	
S10M000378			591-78-6	2-Hexanone	ug/L	86.5	<0.454	58.0	n/a	n/a	n/a	n/a	9.09	n/a	J
S10M000378			67-64-1	Acetone	ug/L	59.2	<0.573	51.1	n/a	n/a	n/a	n/a	11.5	n/a	JX
S10M000378			71-43-2	Benzene	ug/L	98.9	<0.0163	<0.326	n/a	n/a	n/a	104	0.326	n/a	U
S10M000378			56-23-5	Carbon tetrachloride	ug/L	n/a	<0.0479	<0.958	n/a	n/a	n/a	n/a	0.958	n/a	U
S10M000378			108-90-7	Chlorobenzene	ug/L	92.7	<0.0320	<0.640	n/a	n/a	n/a	92.9	0.640	n/a	U
S10M000378			108-88-3	Toluene	ug/L	96.6	<0.0522	1.65	n/a	n/a	n/a	97.8	1.04	n/a	J
S10M000378			79-01-6	Trichloroethene	ug/L	97.0	<0.0378	<0.756	n/a	n/a	n/a	93.6	0.756	n/a	U
S10M000378			79-20-9	Methyl Acetate	ug/L	n/a	<0.0993	387	n/a	n/a	n/a	n/a	1.99	n/a	J

Sample Portion: SVOC Extr

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000380		O	120-82-1	1,2,4-Trichlorobenzene	ug/L	50.8	<357	<357	n/a	n/a	n/a	44.5	357	n/a	U
S10M000380		O	121-14-2	2,4-Dinitrotoluene	ug/L	72.1	<189	<189	n/a	n/a	n/a	73.6	189	n/a	U
S10M000380		O	83-32-9	Acenaphthene	ug/L	64.6	<353	<353	n/a	n/a	n/a	51.2	353	n/a	U
S10M000380		O	59-50-7	4-Chloro-3-methylphenol	ug/L	75.0	<243	<243	n/a	n/a	n/a	59.5	243	n/a	U
S10M000380		O	95-57-8	2-Chlorophenol	ug/L	71.2	<334	<334	n/a	n/a	n/a	55.9	334	n/a	U
S10M000380		O	84-74-2	Di-n-butylphthalate	ug/L	n/a	n/a	450	n/a	n/a	n/a	n/a	209	n/a	J
S10M000380		O	621-64-7	N-Nitroso-di-n-dipropylamine	ug/L	78.6	<334	<334	n/a	n/a	n/a	72.8	334	n/a	U
S10M000380		O	129-00-0	Pyrene	ug/L	79.8	<222	<222	n/a	n/a	n/a	60.1	222	n/a	UT
S10M000380		O	126-73-8	Tributyl phosphate	ug/L	n/a	<89.2	1.28E+05	n/a	n/a	n/a	n/a	892	n/a	D

NA = Not Analyzed, ND = Not Detected

J - Organic Estimated
D - Dilution
U - < Det Limit
T - Organic Spike Outside Range
X - Comment

Organic Analytes
PFP A Lab Rm 144
Data Summary Report

Sample Group: 20100688
Customer Group or SDG Number: 222S20100688
Customer Sample ID: B24298
Sample Portion: Parent

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000379			75-35-4	1,1-Dichloroethene	ug/L	86.9	<0.172	<1.72E+04	n/a	n/a	n/a	n/a	1.72E+04	n/a	U
S10M000379			591-78-6	2-Hexanone	ug/L	86.5	<0.454	5.73E+04	n/a	n/a	n/a	n/a	4.54E+04	n/a	J
S10M000379			71-43-2	Benzene	ug/L	98.9	<0.0163	<1.63E+03	n/a	n/a	n/a	n/a	1.63E+03	n/a	U
S10M000379			56-23-5	Carbon tetrachloride	ug/L	n/a	<0.0479	<4.79E+03	n/a	n/a	n/a	n/a	4.79E+03	n/a	U
S10M000379			108-90-7	Chlorobenzene	ug/L	92.7	<0.0320	<3.20E+03	n/a	n/a	n/a	n/a	3.20E+03	n/a	U
S10M000379			108-88-3	Toluene	ug/L	96.6	<0.0522	8.52E+03	n/a	n/a	n/a	n/a	5.22E+03	n/a	J
S10M000379			79-01-6	Trichloroethene	ug/L	97.0	<0.0378	<3.78E+03	n/a	n/a	n/a	n/a	3.78E+03	n/a	U

Sample Portion: SVOC Extr

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
S10M000381			120-82-1	1,2,4-Trichlorobenzene	ug/kg	89.4	<7.74E+04	<5.69E+04	n/a	n/a	n/a	n/a	5.69E+04	n/a	U
S10M000381			121-14-2	2,4-Dinitrotoluene	ug/kg	94.3	<3.81E+04	<2.80E+04	n/a	n/a	n/a	n/a	2.80E+04	n/a	U
S10M000381			83-32-9	Acenaphthene	ug/kg	92.3	<1.76E+04	<1.29E+04	n/a	n/a	n/a	n/a	1.29E+04	n/a	U
S10M000381			59-50-7	4-Chloro-3-methylphenol	ug/kg	83.0	<4.32E+04	<3.18E+04	n/a	n/a	n/a	n/a	3.18E+04	n/a	U
S10M000381			95-57-8	2-Chlorophenol	ug/kg	91.6	<6.65E+04	<4.89E+04	n/a	n/a	n/a	n/a	4.89E+04	n/a	U
S10M000381			621-64-7	N-Nitroso-di-n-dipropylamine	ug/kg	88.8	<5.81E+04	<4.27E+04	n/a	n/a	n/a	n/a	4.27E+04	n/a	U
S10M000381			129-00-0	Pyrene	ug/kg	107	<6.29E+04	<4.62E+04	n/a	n/a	n/a	n/a	4.62E+04	n/a	U
S10M000381			126-73-8	Tributyl phosphate	ug/kg	n/a	<1.08E+05	6.08E+08	n/a	n/a	n/a	n/a	3.96E+07	n/a	DX

NA = Not Analyzed, ND = Not Detected

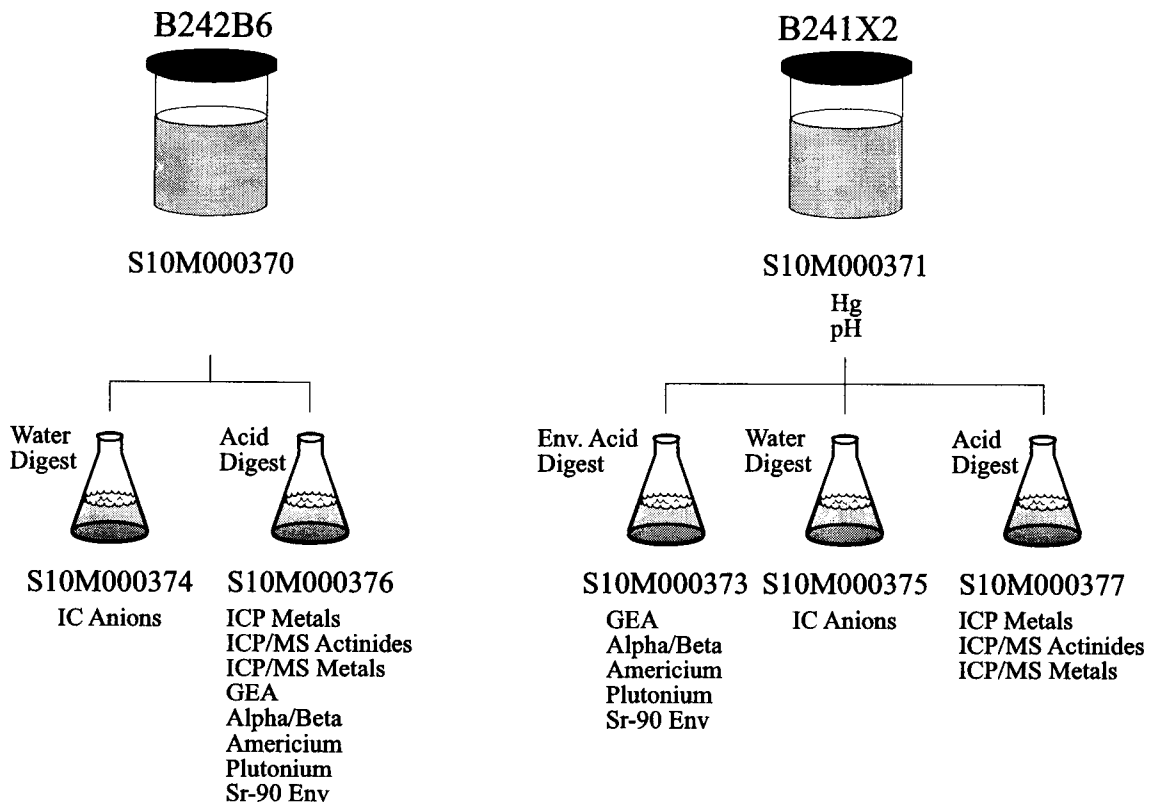
J - Organic Estimated
D - Dilution
U - < Det Limit
T - Organic Spike Outside Range
X - Comment

Attachment 2

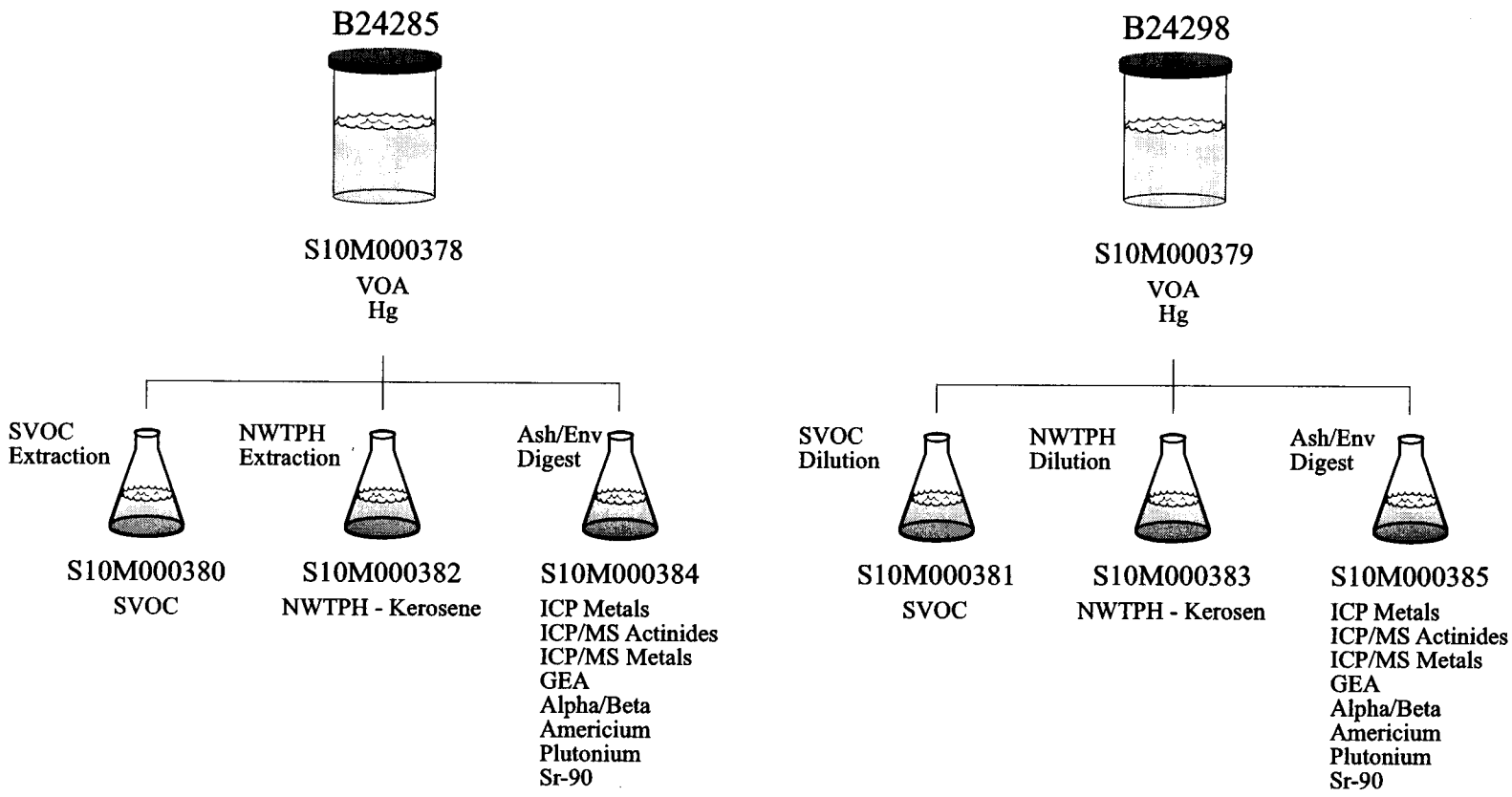
SAMPLE BREAKDOWN DIAGRAMS

DECEMBER 21, 2010

PFP A Lab Rm 144
SAF: F10-068
SDG 222S20100687



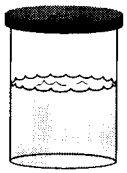
PFP A Lab Rm 144
SAF: F10-069
SDG 222S20100688



DECEMBER 21, 2010

PFP A Lab Rm 144
SAF: F10-069
SDG 222S20100688

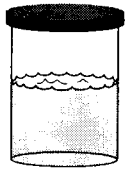
B24280



S10M000386

Hg
pH
H+
IC Anions
ICP Metals
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

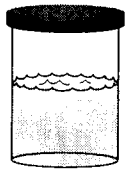
B24281



S10M000387

Hg
pH
H+
IC Anions
ICP Metals
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

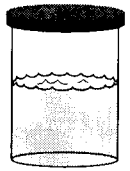
B24283



S10M000388

Hg
pH
H+
IC Anions
ICP Metals
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

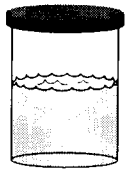
B24286



S10M000389

Hg
pH
IC Anions
ICP Metals
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

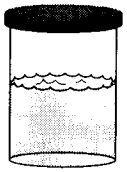
B24288



S10M000390

Hg
pH
H+
IC Anions
ICP Metals
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

B24289



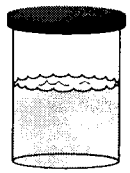
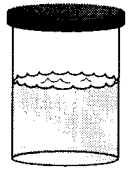
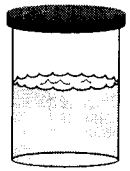
S10M000391

Hg
pH
H+
IC Anions
ICP Metals
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

20100687

DECEMBER 21, 2010

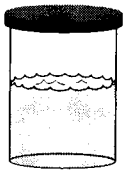
PFP A Lab Rm 144
SAF: F10-069
SDG 222S20100688

B24290	B24291	B24297
		
S10M000392	S10M000393	S10M000394
Hg	Hg	Hg
H+	H+	H+
IC Anions	IC Anions	IC Anions
ICP Metals	ICP Metals	ICP Metals
ICP/MS Actinides	ICP/MS Actinides	ICP/MS Actinides
ICP/MS Metals	ICP/MS Metals	ICP/MS Metals
GEA	GEA	GEA
Alpha/Beta	Alpha/Beta	Alpha/Beta
Americium	Americium	Americium
Plutonium	Plutonium	Plutonium
Sr-90 Env	Sr-90 Env	Sr-90 Env

DECEMBER 21, 2010

PFP A Lab Rm 144
SAF: F10-069
SDG 222S20100688

B24279



S10M000395

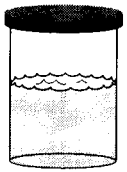
Hg
pH
IC Anions
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

Acid Digest

S10M000479

ICP Metals

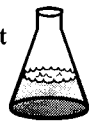
B24287



S10M000396

Hg
pH
H+
IC Anions
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

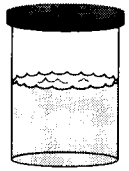
Acid Digest



S10M000480

ICP Metals

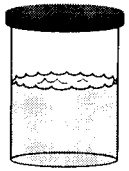
B24292



S10M000397

Hg
pH
IC Anions
ICP Metals
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

B24293



S10M000398

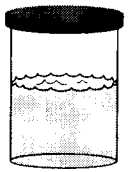
Hg
pH
H+
IC Anions
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

Acid Digest

S10M000481

ICP Metals

B24294



S10M000399

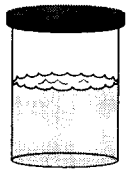
Hg
pH
H+
IC Anions
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

Acid Digest

S10M000482

ICP Metals
ICP/MS Metals

B24295



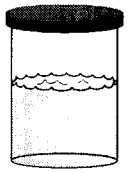
S10M000400

Hg
pH
IC Anions
ICP Metals
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

DECEMBER 21, 2010

PFP A Lab Rm 144
SAF: F10-069
SDG 222S20100688

B24296



S10M000401

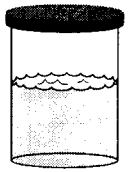
Hg
pH
H+
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

Acid Digest

S10M000483

ICP Metals
ICP/MS Metals

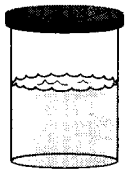
B24299



S10M000402

Hg
pH
H+
IC Anions
ICP Metals
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

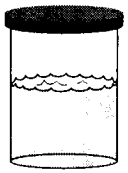
B242B1



S10M000403

Hg
pH
H+
IC Anions
ICP Metals
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

B242B2



S10M000404

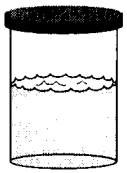
Hg
pH
H+
IC Anions
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

Acid Digest

S10M000484

ICP Metals

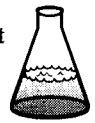
B242B4



S10M000405

Hg
pH
H+
IC Anions
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

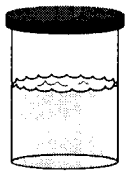
Acid Digest



S10M000485

ICP Metals

B242B8



S10M000406

Hg
pH
H+
IC Anions
ICP/MS Actinides
ICP/MS Metals
GEA
Alpha/Beta
Americium
Plutonium
Sr-90 Env

Acid Digest

S10M000486

ICP Metals

Attachment 3

TENTATIVELY IDENTIFIED COMPOUNDS REPORT

20100687

DECEMBER 21, 2010

PFP A Lab Rm 144

Opportunistic Analyte Results

Sample Group: 20100688

Customer Group or SDG Number: 222S20100688

Customer Sample ID: B24285

Sample Portion: Parent

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
S10M000378				Unknown-1		5.24	ug/L	39	JT
S10M000378				Unknown-2		6.54	ug/L	20	JT
S10M000378				Methyl propionate	554-12-1	10.73	ug/L	45	JNT
S10M000378				Butanoic acid, methyl	623-42-7	12.54	ug/L	19	JNT
S10M000378				Nitric acid, butyl est	928-45-0	14.67	ug/L	82	JNT
S10M000378				Unknown-3		17.03	ug/L	22	JT

Sample Portion: SVOC Extr

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
S10M000380		O		Oxirane, trimethyl-	5076-19-7	2.74	ug/L	2.8E+03	JNT
S10M000380		O		Unknown-1		3.27	ug/L	900	JT
S10M000380		O		Propanoic acid	79-09-4	3.61	ug/L	1.7E+04	JNT
S10M000380		O		Butanoic acid	107-92-6	4.58	ug/L	3.3E+04	JNT
S10M000380		O		Pentanoic acid	109-52-4	5.81	ug/L	6.3E+04	JNT
S10M000380		O		Unknown-2		6.20	ug/L	1.4E+03	JT
S10M000380		O		2-Fluoro-6-nitrophenol	1526-17-6	8.70	ug/L	5.4E+03	JT
S10M000380		O		Benzoic acid	65-85-0	8.80	ug/L	1.2E+04	JNT
S10M000380		O		1,3-Isobenzofurandione	85-44-9	10.39	ug/L	2.3E+03	JNT

NA = Not Analyzed, ND = Not Detectec

T - OrganicTICS P - Potentially Identified Compound J - Organic Estimated N - Identified TIC

20100687
DECEMBER 21, 2010

PFP A Lab Rm 144
Opportunistic Analyte Results

Sample Group: 20100688

Customer Group or SDG Number: 222S20100688

Customer Sample ID: B24298

Sample Portion: Parent

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
S10M000379				Unknown Alkane-1		19.35	ug/L	1.2E+05	JT
S10M000379				Nonane, 3,7-dimethyl-	17302-32-8	19.78	ug/L	4.0E+05	JNT
S10M000379				Tetradecane	629-59-4	19.96	ug/L	2.7E+05	JNT
S10M000379				Unknown Alkane-2		20.16	ug/L	1.5E+05	JT
S10M000379				Tridecane, 4,8-dimethy	55030-62-1	20.65	ug/L	1.3E+05	JNT
S10M000379				Dodecane, 2,6,10-trime	3891-98-3	20.93	ug/L	3.3E+05	JNT
S10M000379				Pentadecane	629-62-9	21.39	ug/L	1.7E+05	JNT

Sample Portion: SVOC Extr

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
S10M000381				Tridecane	629-50-5	10.32	ug/kg	2.3E+05	JNTP
S10M000381				Tridecane, 2-methyl-	1560-96-9	10.93	ug/kg	1.9E+05	JNT
S10M000381				Unknown-1		10.99	ug/kg	2.5E+05	JT
S10M000381				Dodecane, 2,7,10-trime	74645-98-0	11.03	ug/kg	4.7E+05	JNT
S10M000381				Tetradecane	629-59-4	11.26	ug/kg	1.5E+06	JNTP
S10M000381				Unknown-2		11.33	ug/kg	2.7E+05	JT
S10M000381				Unknown-3		11.36	ug/kg	2.3E+05	JT
S10M000381				Unknown-4		11.46	ug/kg	2.3E+05	JT
S10M000381				Unknown-5		11.68	ug/kg	4.1E+05	JT
S10M000381				Unknown-6		11.72	ug/kg	2.3E+05	JT
S10M000381				Heptadecane, 2,6,10,14	18344-37-1	11.79	ug/kg	9.6E+05	JNT
S10M000381				Unknown-7		11.82	ug/kg	4.6E+05	JT
S10M000381				Unknown-8		11.89	ug/kg	2.8E+05	JT
S10M000381				Unknown-9		11.94	ug/kg	2.0E+05	JT
S10M000381				Pentadecane	629-62-9	12.14	ug/kg	1.5E+06	JNTP
S10M000381				Unknown-10		12.52	ug/kg	3.1E+05	JT
S10M000381				Unknown-11		12.56	ug/kg	1.6E+05	JT

NA = Not Analyzed, ND = Not Detectec

T - OrganicTICS P - Potentially Identified Compound J - Organic Estimated N - Identified TIC

20100687

DECEMBER 21, 2010

PFP A Lab Rm 144

Opportunistic Analyte Results

Sample Group: 20100688

Customer Group or SDG Number: 222S20100688

Customer Sample ID: B24298

Sample Portion: SVOC Extr

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
S10M000381				Unknown Hydrocarbon-12		12.67	ug/kg	2.8E+05	JT
S10M000381				Hexadecane-	544-76-3	12.97	ug/kg	7.5E+05	JNTP
S10M000381				Heptadecane	629-78-7	13.78	ug/kg	8.8E+05	JNTP
S10M000381				Octadecane	593-45-3	14.50	ug/kg	3.8E+05	JNTP
S10M000381				Unknown-13		15.20	ug/kg	9.7E+05	JT
S10M000381				Eicosane	112-95-8	15.89	ug/kg	8.9E+04	JNTP

NA = Not Analyzed, ND = Not Detectec

T - OrganicTICS

P - Potentially Identified Compound

J - Organic Estimated

N - Identified TIC

Attachment 4

MS AND MSD REPORT

FORM 3

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 100927_PFP

Matrix Spike - Sample No.: S10M000378

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	200.00	0.0000	172.09	86	62-151
Acetone	1000.0	51.076	698.22	65	55-139
2-Butanone	1000.0	0.0000	916.67	92	60-146
n-Butanol	2000.0	907.32	2389.5	74	73-140
Benzene	200.00	0.0000	207.95	104	86-120
Trichloroethene	200.00	0.0000	187.19	94	71-128
Methyl Isobutyl Ketone	1000.0	0.0000	1001.2	100	75-137
Toluene	200.00	1.648	197.22	98	83-118
2-Hexanone	1000.0	58.035	1063.0	100	71-141
Chlorobenzene	200.00	0.0000	185.87	93	88-113

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	200.00	192.84	96	11	30	62-151
Acetone	1000.0	819.51	77	17	30	55-139
2-Butanone	1000.0	1051.4	105	13	30	60-146
n-Butanol	2000.0	2777.8	94	24	30	73-140
Benzene	200.00	215.24	108	4	30	86-120
Trichloroethene	200.00	188.94	94	0	30	71-128
Methyl Isobutyl Ketone	1000.0	1072.5	107	7	30	75-137
Toluene	200.00	192.23	95	3	30	83-118
2-Hexanone	1000.0	1179.4	112	11	30	71-141
Chlorobenzene	200.00	182.27	91	2	30	88-113

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 10 outside limits
Spike Recovery: 0 out of 20 outside limits

COMMENTS: _____

FORM III VOA

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 101028_PFP

Matrix Spike - EPA Sample No.: S10M000380

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,2,4-Trichlorobenzene	8000.0	0.00000	3562.4	44	24- 79
2,4-Dinitrotoluene	8000.0	0.00000	5890.2	74	55-105
Acenaphthene	8000.0	0.00000	4096.6	51	34-106
4-Chloro-3-Methylphenol	16000	0.00000	9513.3	59	50- 97
2-Chlorophenol	16000	0.00000	8946.0	56	40-106
N-Nitroso-di-n-prop.(1)	8000.0	0.00000	5823.4	73	44- 99
Pyrene	8000.0	0.00000	4806.0	60*	65-111

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,2,4-Trichlorobenzene	8000.0	3991.9	50	13	30	24- 79
2,4-Dinitrotoluene	8000.0	6413.1	80	8	30	55-105
Acenaphthene	8000.0	4589.8	57	11	30	34-106
4-Chloro-3-Methylphenol	16000	10346	65	10	30	50- 97
2-Chlorophenol	16000	10339	65	15	30	40-106
N-Nitroso-di-n-prop.(1)	8000.0	6492.4	81	10	30	44- 99
Pyrene	8000.0	5446.5	68	12	30	65-111

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 7 outside limits
Spike Recovery: 1 out of 14 outside limits

COMMENTS: _____

DECEMBER 21, 2010

3C

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: PFP A Room 144 Contract: _____

Lab Code: 222-S Case No.: _____ SAS No.: _____ SDG No.: 20100688

Matrix Spike - EPA Sample No. S10M000383

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC.
Diesel	9700000	61813830	98417476	377 *	70 - 130

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Diesel	8800000	89539474	315 *	18	30	70 - 130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 1 outside limits

Spike Recovery: 2 out of 2 outside limits

COMMENTS: RPD Value was Calculated using % Recov's as results for each Sample.

FORM III SV-1 OLM03.0

Attachment 5

SURROGATE RECOVERIES

FORM 2

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 100927_PFP

	CLIENT SAMPLE NO.	SMC1 #	SMC2 (DCE) #	SMC3 (TOL) #	OTHER (BFB) #	TOT OUT
01	S10M000378	103	100	99	102	0
02	S10M000378MS	102	107	101	101	0
03	S10M000378MS	109	107	96	102	0
04	S10M000379	103	100	102	104	0
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		QC LIMITS
SMC1	= Dibromofluoromethane	(73-136)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(77-132)
SMC3 (TOL)	= Toluene-d8	(86-119)
OTHER(BFB)	= Bromofluorobenzene	(82-128)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 2

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 100927_PFP

	CLIENT SAMPLE NO.	SMC1 #	SMC2 (DCE) #	SMC3 (TOL) #	OTHER (BFB) #	TOT OUT
01	CCB	102	101	99	93	0
02	LCS	100	101	98	94	0
03						
04						
05						
06						
07						
08						
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		QC LIMITS
SMC1	= Dibromofluoromethane	(85-123)
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(83-123)
SMC3 (TOL)	= Toluene-d8	(82-121)
OTHER(BFB)	= Bromofluorobenzene	(82-126)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D System Monitoring Compound diluted out

FORM 2

SOIL SEMIVOLATILE SURROGATE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: PFP

Level: (low/med) LOW

	CHG SAMPLE NO.	S1 (FBP) #	S2 (2FP) #	S3 (NBZ) #	S4 #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
01	S10M000381	0D	0	0	0D	0D	0D			0
02	BLANK	96	94	93	95	68	106			0
03	LCS	101	96	98	97	94	117			0
04	S10M000380	1*	0	0	0*	0*	1*			4
* 05	S10M000380MS	1*	0	0	0*	0*	1*			4
06	S10M000380MS	1*	0	0	0*	0*	1*			4
07	S10M000381	97	92	97	80	40	102			0
08										
09										
10										
11										
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			QC LIMITS
S1	(FBP)	= 2-Fluorobiphenyl	(10-147)
S2	(2FP)	= 2-Fluorophenol	(0-127)
S3	(NBZ)	= Nitrobenzene-d5	(0-125)
S4		= Phenol-d6	(37-125)
S5	(TBP)	= 2,4,6-Tribromophenol	(40-176)
S6	(TPH)	= Terphenyl-d14	(71-175)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate diluted out

*- Sample S10M000380 was reprepared using liquid extraction method and was reported on a separate batch.
MJD 10/26/10

DECEMBER 21, 2010

FORM 2
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 101028_PFP

	CHG SAMPLE NO.	S1 (FBP) #	S2 (2FP) #	S3 (NBZ) #	S4 #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
01	PRPBLK	48	80	92	84	66	98			0
02	LCS	54	79	91	83	71	107			0
DF 500 * 03	S10M000380	34	38	44	44	0D	76			0
DF=1 04	S10M000380	41	46	78	58	52	86			0
DF=1 05	S10M000380MS	40	55	84	68	61	82			0
DF=1 06	S10M000380MS	52	64	98	76	68	104			0
07										
08										
09	* Sample overdiluted and rerun (See line 4)									
10										
11								MD 11/4/10		
12										
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		QC LIMITS
S1 (FBP)	= 2-Fluorobiphenyl	(27- 91)
S2 (2FP)	= 2-Fluorophenol	(38-109)
S3 (NBZ)	= Nitrobenzene-d5	(43-108)
S4	= Phenol-d6	(39-115)
S5 (TBP)	= 2,4,6-Tribromophenol	(48-112)
S6 (TPH)	= Terphenyl-d14	(58-119)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate diluted out

DECEMBER 21, 2010

FORM 2

WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: Contract:

Lab Code: Case No.: SAS No.: SDG No.: 101101_PFP

	CHG SAMPLE NO.	S1 (FBP) #	S2 (2FP) #	S3 (NBZ) #	S4 #	S5 (TBP) #	S6 (TPH) #	S7 #	S8 #	TOT OUT
‡ 01	CCB	0*	0*	0*	0*	0*	0*			6
* 02	CCB	47	80	93	85	64	97	Information only - See 10/28/10 results for official values - MJD 11/4/10		0
* 03	LCS	55	80	91	83	70	110			0
DF 25 04	S10M000380	38	44	62	54	103	82			0
DF 10 05	S10M000380	41	47	72	57	67	90			0
06										
07										
08	‡ this is an instrument blank and was									
09	not spiked with surrogate									
10							MJD 11/4/10			
11										
12	* these extracted QC samples were initially									
13	~~extracted~~ MJD 11/4/10 analyzed on 10/28/10									
14	and passed all QC requirements, therefore									
15	they did not need to be reanalyzed.									
16	These rerun results, therefore, will be									
17	included as supporting data but will									
18	not be officially reported.									
19										
20							MJD 11/4/10			
21										
22										
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24										
25										
26										
27										
28										
29										
30										

		QC LIMITS
S1 (FBP)	= 2-Fluorobiphenyl	(27- 91)
S2 (2FP)	= 2-Fluorophenol	(38-109)
S3 (NBZ)	= Nitrobenzene-d5	(43-108)
S4	= Phenol-d6	(39-115)
S5 (TBP)	= 2,4,6-Tribromophenol	(48-112)
S6 (TPH)	= Terphenyl-d14	(58-119)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogate diluted out

DECEMBER 21, 2010

2C

WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: PFP A Room 144 Contract:

Lab Code: 222-S Case No.: SAS No.: SDG No.: 20100688

	EPA SAMPLE NO.	S1 #	TOT OUT
01	PRPBLK	82	0
02	MRL	92	0
03	LCS	94	0
04	S10M000383	79	0
05	S10M000383MS	88	0
06	S10M000383MS	94	0
07	CCB2	*	1

10x sample dilution resulted in surrogates being diluted below LOQ.

*- Surrogate NOT spiked into this instrument blank

QC LIMITS

S1 = p-terphenyl-d14 (70-130)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate diluted out

Attachment 6

CORRESPONDENCE

Bushaw, Ruth A

From: Cathel, Robert L
Sent: Wednesday, August 18, 2010 3:43 PM
To: Bushaw, Ruth A
Cc: Clinton, Richard (Rich); Hansen, Daniel R; Wyse, Eric J; Duchsherer, Mark J; Schroeder, Robert W; Ross, Roxie R
Subject: RE: Holding Times for PFP A Lab Room 144 Chemicals

Ruth,

PFP project personnel are aware that holding times for several of the analytes for these samples have already passed. The approach you propose in your email below (8/18 12:10 PM) is acceptable.

Thanks,
Bob Cathel

From: Bushaw, Ruth A
Sent: Wednesday, August 18, 2010 12:10 PM
To: Cathel, Robert L
Cc: Clinton, Richard (Rich); Hansen, Daniel R; Wyse, Eric J; Duchsherer, Mark J; Schroeder, Robert W; Ross, Roxie R
Subject: Holding Times for PFP A Lab Room 144 Chemicals
Importance: High

Bob,

The NDA report for the subject project states that the NDA was started on 7/21/2010. This indicates that the samples were collected at least 29 days before the expected delivery of the first 3 samples (expected on 8/19/2010). Therefore, short holding times are already missed; such as 48 hours for nitrate, nitrite, and phosphate for liquid samples; 14 days for SVOA extraction and VOA; and 28 days for Hg analysis. Since many of these samples have a very high alpha activity and will require continuous RCT support and air monitoring, I would prefer to NOT run any analyses on overtime. We might be able to get some analyses run with our normal swing shift personnel, if there is sufficient RCT coverage.

This means that I am not going to ask the lab to perform "heroics" to get any analysis done "as soon as possible" after receiving, if the holding time was already missed before we got the samples. Is this approach acceptable to you?

Please let me know if there are any assumptions that I have made that are incorrect. It is the laboratory's opinion that the short holding times are not applicable because the samples were collected so long prior to delivery.

Thanks,
Ruth A. Bushaw
Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

Bushaw, Ruth A

From: Cathel, Robert L
Sent: Thursday, September 16, 2010 8:07 AM
To: Bushaw, Ruth A
Cc: Clinton, Richard (Rich)
Subject: RE: PFP A Lab Room 144 Samples

Ruth,

I agree with the analytical proposals noted below.

Bob Cathel

From: Bushaw, Ruth A
Sent: Wednesday, September 15, 2010 10:12 AM
To: Cathel, Robert L
Cc: Clinton, Richard (Rich)
Subject: PFP A Lab Room 144 Samples
Importance: High

Bob,

I just spoke with our two chem techs who were going to run the pH on the two solid samples. They told me that sample B242B6 (S11B) was only two large chunks of solid, about 1 – 2 g each. Besides being the large chunks, he indicated that there was still a little of the liquid left in the jar, which you described as an organic liquid. When some of sample S11 was added to water, it did form a separate layer, so we know it is organic. Since this is not an appropriate matrix for running the pH, I'm going to cancel that analysis request for this sample.

Also for sample B242B6, since there are only two chunks of material, we are going to try to acid digest one and will use the other for a water leach. That will use up the sample. If we have digestate remaining after the metals and MS actinides are run, I can start adding other radionuclides per your priority list, but I don't know if we will be able to get all of them.

They are testing HEPA filters today in the hood where we could run the pH on the other solid sample, but we have access to a hood to prepare the acid digest for metals analysis. Therefore, even though your priority list indicates pH is top priority, I would prefer to get started on the acid digestion. We will run the pH before we run any other analysis on sample B241X2 (S28). Is this acceptable to you? Also, since we don't know how much sample is available in S28 for running the required duplicate and spikes, if there is a limited amount of sample, we might not spike for all of the radionuclides by ICP/MS. We need to prepare 2 separate bottles of spike to get all of the requested metals by ICP. If we need to prepare a digested spike for the radionuclides by ICP/MS, that will require 2 additional bottles. If we are limited in sample, I would think that you would prefer that we try to get additional analyses done (like IC-anions). Therefore, we might just run post-digestion spikes for the radionuclides. Is that acceptable?

Thanks,
Ruth A. Bushaw
Project Manager
ATL International, Inc.

Bushaw, Ruth A

From: Cathel, Robert L
Sent: Monday, September 27, 2010 10:55 AM
To: Bushaw, Ruth A
Cc: Clinton, Richard (Rich); Wyse, Eric J; Major, Christopher A
Subject: RE: PFP A Lab Room 144 SVOA Issue

Ruth,

The reasons for the failed QC results are understood and do not affect the use of the data by PFP Closure Project personnel. Therefore, PFP will accept the data as-is without reanalysis.

Bob Cathel

From: Bushaw, Ruth A
Sent: Thursday, September 23, 2010 3:34 PM
To: Cathel, Robert L
Cc: Clinton, Richard (Rich); Wyse, Eric J
Subject: PFP A Lab Room 144 SVOA Issue
Importance: High

Bob,

We run the SVOC analysis for samples B24285 (S11) and B24298 (D15) from the PFP A Lab Rm 144 project as "dilute and shoot" because these were indicated by you as being organic liquids. However, after the analysis was run, the chemist is of the opinion that sample B24285 was not an organic liquid. At the time of analysis, the analyst thought the sample was soluble in the organic solvent used for analysis, but when reviewing the results, the chemist believes that the sample was not soluble. They are scheduling this sample to be extracted and rerun.

Unfortunately, B24285 was the sample chosen for the MS and MSD for the "dilute and shoot" analysis batch. With the failure of the MS and MSD recoveries, we don't have sample QC to report for this batch, which still contains sample B24298. Sample B24298 appeared to be about 80% TBP. They ran it with a low dilution to look for TICs, and then ran it again at a very high dilution to read the TBP. It is the chemist's preference to NOT reanalyze this sample so as to preserve the life of the column in the instrument. If he was required to rerun the sample to get passing QC for an MS/MSD, they would spike the sample at a high level and only run very dilute. This would cause them to not be able to "see" and report any TICs.

Will it be acceptable for your use of the data if we report the results for sample B24298 in a batch with failing sample QC? The LCS recoveries were acceptable, but because of the large dilution required to report the TBP (the only requested analyte), the surrogates were also diluted out and not reported.

The chemist's notes indicate that since the sample matrix was different, the failure of spike and surrogate compounds for sample B24285 do not indicate problems with the preparation and analysis of sample B24298.

On a side note, the chemist was able to positively identify the following compounds in the SVOC analysis:
n-hexadecane
n-tridecane
n-pentadecane

n-octadecane
n-eicosane
n-heptadecane
n-tetradecane

He indicated that the chromatogram does NOT resemble "NPH", a hydrocarbon mixture that was used in the past at the Hanford site.

Thanks,

Ruth A. Bushaw
Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

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Bushaw, Ruth A

From: Cathel, Robert L
Sent: Wednesday, September 29, 2010 7:35 AM
To: Bushaw, Ruth A
Cc: Clinton, Richard (Rich); Wyse, Eric J; Schroeder, Robert W; Brown, Kenneth M; Major, Christopher A
Subject: RE: PFP A Lab Rm 144 Samples pH Results

Ruth,

The pH result of ~10.5 is expected and in-line with our process knowledge. PFP Closure Project personnel will be able to use the results as-is, without reanalysis, for waste disposition.

Thanks,
Bob Cathel

From: Bushaw, Ruth A
Sent: Tuesday, September 28, 2010 11:26 AM
To: Cathel, Robert L
Cc: Clinton, Richard (Rich); Wyse, Eric J; Schroeder, Robert W; Brown, Kenneth M
Subject: PFP A Lab Rm 144 Samples pH Results
Importance: High

Bob,

When we ran the pH analysis for sample B24286 (S12) (assumed sodium carbonate), we calibrated with pH 7 and pH 10 standards. However, the result for the sample and duplicate for this sample were pH 10.48 and pH 10.5. These results are outside of our calibration range. We don't really think that there is anything wrong with the results, but the procedure requires a reanalysis. However, before doing so, since this sample requires that we have RCT support and air sampling during analysis, I wanted to know if you will be able to use these results without reanalysis. They will be flagged with an "E" (translated to a ">" for HEIS) to indicate that the results exceeded the calibration range.

Thanks,
Ruth A. Bushaw
Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

Bushaw, Ruth A

From: Major, Christopher A
Sent: Tuesday, October 05, 2010 12:37 PM
To: Bushaw, Ruth A
Cc: Clinton, Richard (Rich); Hansen, Daniel R
Subject: RE: PFP A Lab Rm 144 GEA Detection Limits and Project Delay

Ruth – for the two isotopes listed I believe your detection limits and "less than" values will work fine for our characterization purposes.

Sorry to hear about the other difficulties. We'll just have to wait until early November then.

Chris
942-6489

From: Bushaw, Ruth A
Sent: Tuesday, October 05, 2010 9:53 AM
To: Major, Christopher A
Cc: Clinton, Richard (Rich); Hansen, Daniel R
Subject: PFP A Lab Rm 144 GEA Detection Limits and Project Delay
Importance: High

Chris,

When we ran the GEA, we used only a 1 mL sample size for most samples to be sure to have sufficient sample for all other requested analyses, so we didn't meet the detection limits requested in DOE-RL-2004-29. NO ^{60}Co or ^{137}Cs was detected in any of the samples.

The requested limits are:
^{60}Co 9.00E-06 µCi/mL
^{137}Cs 1.25E-05 µCi/mL

We are currently reporting the following detection limits:
^{60}Co ~2.5E-05 µCi/mL
^{137}Cs ~3.0E-05 µCi/mL

For the alpha higher activity samples, our detection limits are quite a bit higher because we had to use much less sample.

Will these "less than" results meet your needs? Or would you prefer that we check remaining volume when all other analyses are complete to see if there is sufficient sample to rerun with 3 times for sample to meet your detection limits? Our counting room is currently on restricted access, so we can't run any radionuclides. We also have been having difficulty with the Pu analysis by AEA and most of the samples still need to be reanalyzed.

I also wanted to inform you that we are continuing to have facility issues causing delays. We still have limited RCT resources due to facility issues that need RCT support and because only a limited number of alpha sample analyses can be covered in the lab at one time. The ICP room is still under investigation for mold issues. There

was a spill in the counting room, so it is currently on restricted access. They are working on a recovery plan to attempt to get the counting room released by Friday, but it might be Tuesday before they can start counting samples again after getting the detectors back up and running and running all of the check standards and blanks over the weekend.

The 45-day due date for this report is 10/14/2010. Based on these outages and the other backlog of analyses in addition to this work, I most likely will not be able to issue the report until early November, at the earliest. I will have a better estimate of a completion date once the counting room and ICP room are released for running analyses.

We still have not run IC for any samples. I need Pu, ICP, ICP/MS, and Hg completed for most samples. There are still a few samples needing GEA and alpha/beta, and I still need Sr-90 and Am for about half of the samples. I believe that most of the organic analyses have been run, but the data still needs to be reviewed. Since the VOA room was taken out of service yesterday, the group had been focusing the last 2 weeks on getting all of the VOA samples run for all projects currently in the lab.

Thanks,

Ruth A. Bushaw

Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

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Bushaw, Ruth A

From: Clinton, Richard (Rich)
Sent: Wednesday, October 06, 2010 7:50 AM
To: Bushaw, Ruth A; Major, Christopher A
Cc: Wyse, Eric J
Subject: RE: PFP A Lab Hydrogen Ion Analysis Question

Ruth,
We are good with your approach.

Thanks – Rich C.

From: Bushaw, Ruth A
Sent: Tuesday, October 05, 2010 4:41 PM
To: Major, Christopher A; Clinton, Richard (Rich)
Cc: Wyse, Eric J
Subject: PFP A Lab Hydrogen Ion Analysis Question

Chris and Rich,

We ran the hydrogen ion analysis on the PFP A Lab Rm 144 samples on 9/21/2010. Upon review of the data, the chemist realized that there was no method detection limit (MDL) in the LIMS system for this method. Typically, the lab runs an MDL study a method and it gets approved by QA prior to running samples. This method addresses both free H+ and OH-, but is almost exclusively used for hydroxide, because the samples typically analyzed by 222-S are virtually always caustic. Since the method is commonly used, it was believed to be fully validated for everything it covers. We ran a set of standards yesterday to determine an MDL, and it was approved by QA. It is the laboratory's opinion that this MDL is representative of the system at the time of the analysis. However, since it was determined after the fact, I will need to explain the situation in the narrative.

Thanks,
Ruth A. Bushaw
Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

Bushaw, Ruth A

From: Major, Christopher A
Sent: Friday, October 08, 2010 7:58 AM
To: Bushaw, Ruth A
Cc: Clinton, Richard (Rich)
Subject: RE: PFP A Lab Room 144 IC Analysis

Ruth – I just got off the phone with Rich and we agree with canceling the IC anions and ICP/MS metals analysis. Do proceed with the Hg, though.

Chris

From: Bushaw, Ruth A
Sent: Thursday, October 07, 2010 3:58 PM
To: Major, Christopher A; Clinton, Richard (Rich)
Subject: PFP A Lab Room 144 IC Analysis

Chris and Rich,

We attempted to run the IC anions and ICP metals analyses on sample B24296. However, the chem techs indicated that the sample acted soapy when it was pipetted, and it formed a foamy solution when diluted for analysis. They decided to not try to run in on the IC, but they did try running it on the ICP and the lines were clogging and it shifted the baseline so that one of their check standards failed. They are trying to rinse out the lines right now to try to pass the closing QC.

I discussed this behavior with one of our Organic chemists, who indicated that it could be TBP that decomposes to dibutyl phosphate (DBP) + butanol, that further decomposes to monobutyl phosphate (MBP) + butanol. The MBP decomposes to phosphoric acid + butanol. We were able to measure a pH of 1.38 and the H+ was 0.01M. This could be from the phosphoric acid. The DBP and MBP can act like surfactants, which is consistent with our observation of the sample bubbling up when we try to dilute it.

Unfortunately, we don't have a method to determine if this sample contains DBP or MBP.

Regardless of what this sample really contains, I plan to cancel the request for IC anions and ICP and ICP/MS metals analysis. Since a larger dilution was analyzed for radionuclides by ICP/MS and radiochemistry isotopes, there was no issue reported for those analyses. I will talk to the chemist for Hg analysis to see if he thinks he can run that analysis. The Hg digestion is designed to breakdown organic compounds so that they don't interfere in the analysis.

Thanks,
Ruth A. Bushaw
Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

Bushaw, Ruth A

From:	Major, Christopher A
Sent:	Tuesday, October 12, 2010 4:39 PM
To:	Bushaw, Ruth A
Cc:	Clinton, Richard (Rich)
Subject:	RE: PFP A Lab Room 144 Request for Due Date Extension
Follow Up Flag:	Follow up
Flag Status:	Flagged

Ruth – I talked this over with Rich. We understand the problems and accept the extension. Please be mindful, however, that the delays have largely brought our disposal work on these chemicals to a standstill, so please continue to feed us preliminary data as soon as it becomes available. Thanks.

Chris
208-821-1291

From: Bushaw, Ruth A
Sent: Monday, October 11, 2010 2:49 PM
To: Clinton, Richard (Rich); Major, Christopher A
Cc: Schroeder, Robert W; Finn, Cheryl R; Hansen, Daniel R
Subject: PFP A Lab Room 144 Request for Due Date Extension
Importance: High

Chris and Rich,

We are continuing to have difficulty in getting the sample analyses completed for the PFP A Lab Room 144 samples. There are several issues that continue to impede progress on this project: it has been difficult to obtain sufficient RCT resources on a daily basis to run more than just a couple of analyses at a time (some days we have had no RCT coverage for working with alpha samples), we are having difficulty getting standards to pass recovery for the plutonium by AEA method, and we are having matrix issues with a number of the low alpha liquid samples on the ICP and are planning to try to rerun from an acid digestion.

Because of all of the issues, we don't expect to get analyses completed until at least the end of October; except I don't know if we will get the plutonium method working by then, I'll have to keep you informed on that.

Therefore, I would like to request an extension on the due date of the report from 10/14/2010 extended to 11/11/2010. Will that be acceptable?

Thanks,
Ruth A. Bushaw
Project Manager
ATL International, Inc.
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

Bushaw, Ruth A

From: Major, Christopher A
Sent: Monday, October 18, 2010 3:04 PM
To: Bushaw, Ruth A
Cc: Hansen, Daniel R; Schroeder, Robert W; Clinton, Richard (Rich)
Subject: RE: PFP A Lab Room 144 Preliminary IC Anions Data

Yes. We will conservatively take the highest concentration or "worse case scenario" for characterization purposes.

Chris

From: Bushaw, Ruth A
Sent: Monday, October 18, 2010 2:06 PM
To: Major, Christopher A; Clinton, Richard (Rich)
Cc: Hansen, Daniel R; Schroeder, Robert W
Subject: PFP A Lab Room 144 Preliminary IC Anions Data
Importance: High

Chris and Rich,

Based on sample matrix, I had requested the IC anions analysis on twenty of the liquid samples that you delivered. The attached Excel and .pdf files contain the preliminary results for these samples. I'm sorry that this wasn't available last week, but they had some difficulties with this analysis because of the high acid matrix, and it took longer than expected for the chemists to review the data. The solid samples have been analyzed and the results are still in the upload/data review process.

One issue was an unexplainable matrix spike failure. We figured out this morning that the chem tech might have used an incorrect standard, so we are planning to rerun that analysis tomorrow. I have included the results from the original analysis for those samples in the attached files. We believe that the sample results are correct, we just need to have a matrix spike that passes. However, the actual results that will be included in the final report might vary slightly from those in this file due to slight differences in the column conditions from day to day. I hope to have the reanalysis results uploaded and reviewed to be able to provide to you by the close of business on Wednesday.

One other issue with the data is that there was chloride, nitrate and sulfate detected in the method blanks. For the samples with low concentrations of these analytes, the results are flagged with a "C" to indicated blank contamination greater than 5% of the sample results. Our QAPP allows reporting of sample results flagged with blank contamination if the concentration detected in the blank was less than the quantitation limit. This was the case for these results. The affected sample results are also "B" flagged to indicate sample results less than the quantitation limit. **I believe that for your use of the data, you will be concerned with the higher concentrations of analytes in these samples so that the "C" flag on the low concentration analytes will not affect your use of the results. Is that correct?**

<< File: PFP A Lab Rm 144 IC Prelim Results.xlsx >> << File: PFP A Lab Rm 144 IC Prelim Results.pdf >>

Thanks,
Ruth A. Bushaw
Project Manager

Bushaw, Ruth A

From: Major, Christopher A
Sent: Friday, November 05, 2010 1:31 PM
To: Bushaw, Ruth A
Cc: Clinton, Richard (Rich)
Subject: RE: Additional ICP results for PFP A Lab Rm 144

Ruth, the potential false for Antimony is not a show stopper. So, it's acceptable. The other issues, particularly the Chromium detection limit for B241X2 (which factored 3X still comes in under RCRA limits), are acceptable.

Chris

From: Bushaw, Ruth A
Sent: Friday, November 05, 2010 10:18 AM
To: Major, Christopher A
Cc: Clinton, Richard (Rich)
Subject: FW: Additional ICP results for PFP A Lab Rm 144
Importance: High

Chris,

I had sent these results to you on 10/2282010 with the discussion of QC issues. I didn't receive a reply from you for whether the results will be acceptable as reported. Specifically, I was concerned about the potential false negative reported for Sb due to loss during the acid digest, indicated by the 48% matrix spike recovery. The results were all reported as <MDL, but there was no requested detection limit in the DOE document that we were asked to follow, so I don't know what your action level is for this analyte.

Please let me know if these results (all results discussed below with QC issues) will be acceptable for your use without reanalysis.

Thanks,
Ruth A. Bushaw
Project Manager
Advanced Technologies and Laboratories International, Inc.
Contractor to the Office of River Protection
U.S. Department of Energy 222-S Laboratory
373-4314

From: Bushaw, Ruth A
Sent: Friday, October 22, 2010 1:12 PM
To: Major, Christopher A
Cc: Clinton, Richard (Rich); Hansen, Daniel R
Subject: Additional ICP results for PFP A Lab Rm 144
Importance: High

Chris,

The attached files contain the ICP results for the PFP A Lab Rm 144 solid (B242B6 & B241X2), the organic liquid (B24285 & B24298) samples, and the 8 liquid samples that were acid digested. The last three liquid samples are analyzed but are in the process of upload and chemist review. Please read my comment below and let me know if these results will meet your needs, or if you want us to try a reanalysis.

<< File: PFP A Lab ICP Results 10-22-2010.xlsx >>

I also attached an Excel file for the hydrogen ion results for the last 4 samples that we haven't provided yet. There were no issues to report for these results.

<< File: PFP A Lab H+ Results for Last 4 Samples.xlsx >>

Some notes concerning these results:

1. Samples B24285 and B24298 were identified as organic liquids in the information that I received from Bob Cathel. Therefore, the sample preparation consisted of an ashing step to get rid of the organic material, then the ashed material was digested using a method that uses strong acids to ensure dissolution of analytes of interest. Historically we have not prepared a digested standard and matrix spike with this digestion method because of the concern of spattering. However, to check for analyte loss, we did prepare a digested standard and spike with this batch. Since the PFP samples had limited amount of material to perform all of the analyses, we prepared an organic liquid from another customer in the same batch and used that sample for the duplicate and spike analysis. The digested standard had a very low recovery for silver (47%). It is the laboratory's opinion that the low recovery is due to precipitation of silver chloride upon addition of the strong hydrochloric acid. All of the undigested calibration check standards and the low level standard met the recovery limits in the QAPP. There was no silver reported for the samples, but it could be that it was also precipitated. The digested matrix spike passed at 88%. This won't print in the attached data summary report because it was analyzed with a sample from another customer, but I can add a table to the report narrative to provide the duplicate RPDs and spike recoveries. The sodium recovery in the digested standard was high, 138%. It is the laboratory's opinion that this high recovery was due to leaching of sodium from the glassware during the digestion with strong acids. A "X" flag was applied to the sample results for silver and sodium to indicate the standard recovery failures. It is the laboratory's opinion that a repreparation would cause the same standard failures. Sodium and aluminum were both detected in the preparation blank and the concentrations were greater than 5% of the sample results, so a "C" flag was applied. These may have also leached from the glassware due to the strong acid digest. The low level standard (LLS), used to check for accuracy of results at the quantitation limit, was very low for chromium (36%). The laboratory believes that this was due to a bad standard, but to be conservative, the result for sample B24285 was flagged with a "B" to indicate that the result should be considered an estimate and could be biased low. The result for B24298 was below the detection limit and is flagged with a "U". The LLS recovery for potassium was also low (51%). Sample B24298 was reported as a non-detect possibly because of the low bias. The result for sample B24285 was sufficiently above the quantitation limit that the low bias did not affect the result.
2. For the solid samples, again the LLS had low recoveries for chromium (36%) and potassium (35%). The chromium results for both samples (B241X2 and B242B6) were reported as below the MDL, but again this could be because of the low bias causing the non-detect. The highest reported detection limit is 1.97 μg/g. If low bias indicates results could be 3 times higher, the results might be as high as 3 X 1.97 = 11.91 μg/g. If the level of concern is the TCLP limit of 5.0 μg/mL, you can divide the solid result by 20 to compare. So, 11.91/20 = 0.6 μg/mL. For the potassium, the result for B241X2 were sufficiently above the quantitation that the low bias indicated by the low LLS recovery did not affect the result. For sample B242B6, the result was < MDL, which may be a false non-detect due to the low bias. The pre-digestion matrix spike recovery for potassium failed at 62%. This could be due to the low bias.

An "N" flag was applied to indicate this spike failure. Another item of potential concern in this analysis run was that the percent difference for the serial dilution for sodium was 14%, which is outside the control limit of <10%. The serial diluted result was higher than the result reported in the attached file (serial dilution = 6.4E+04 μg/g; sample result = 5.6E+04 μg/g. This indicates that there is a low bias in the sample result possibly from the effect of higher solids concentration in the less diluted sample. The chemist selected a dilution to minimize the reported detection limits for analytes for which you provided requested detection limits. Unfortunately, using that dilution, the sodium concentration is high in the calibration range, which subsequently caused the serial dilution failure. The sample result is flagged with an "X" to indicate this failure. We also we failed to meet the recovery criteria for the pre-digested matrix spike for sodium because the sample concentration was much greater than 4 times the spike added. The spiking criterion is not applicable in this situation. The post-digestion spike recovery met the requirements.

3. For the liquids run from an acid digest (indicated by a B in the "A" column of the spreadsheet), one of the main concern is that the ending LLS for potassium is low (62%). The initial LLS was good (94%), so this indicates a stability issue by the end of the run. Most samples were reported <MDL. Sample B24294 was reported with a positive sample result, but the duplicate was <MDL. The result is flagged with a "B" to indicate that it is estimated. It is possibly biased low. Also, the digested matrix spike recovery for antimony for sample B24294 was low (48%), and "N" flag was applied to indicate the spike failure. This might be due to the acid digest not having enough hydrochloric acid. Typically a second digestion is required for reporting antimony. The addition of extra HCl keeps the antimony in solution. The sample results are all <MDL, but might be biased low from loss during the digestion. Antimony was also analyzed by ICP/MS. Those results are still in chemist review.

Thanks,

Ruth A. Bushaw

Project Manager
Advanced Technologies and Laboratories International, Inc.
Contractor to the Office of River Protection
U.S. Department of Energy
222-S Laboratory
office: 509-373-4314
cell: 509-554-4978

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Bushaw, Ruth A

From: Clinton, Richard (Rich)
Sent: Tuesday, November 16, 2010 9:25 AM
To: Bushaw, Ruth A; Major, Christopher A
Subject: RE: Lack of Sample QC in AEA Batches

I concur with the lab's conclusion.

Thanks – Rich C.

From: Bushaw, Ruth A
Sent: Tuesday, November 16, 2010 8:39 AM
To: Major, Christopher A; Clinton, Richard (Rich)
Subject: Lack of Sample QC in AEA Batches
Importance: High

Chris and Rich,

I had previously reported to you that we were needing a reanalysis on four samples (B24280, B24281, B24288, B24289) for americium and plutonium by AEA because the results were not in agreement with the non reported plutonium and americium results by GEA and total alpha results. In the original analysis batches, a duplicate analysis was performed on sample B24283 with acceptable results an RPD, so this sample was not requested for reanalysis. Unfortunately, due to an oversight, the reanalysis batch did not contain a duplicate, as required by HASQARD and our QAPP. Since the sample results on the reanalysis are in agreement with those obtained from the GEA, it is the laboratory's opinion that the lack of a sample duplicate in the batch has no adverse affect on the use of the data.

Will this be acceptable for your use of the data?

Thanks,

Ruth A. Bushaw

Project Manager
Advanced Technologies and Laboratories International, Inc.
Contractor to the Office of River Protection
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Bushaw, Ruth A

From: Clinton, Richard (Rich)
Sent: Wednesday, November 17, 2010 9:51 AM
To: Bushaw, Ruth A; Major, Christopher A
Subject: RE: Nickel Results Biased High for PFP A Lab Samples

Ruth,

The results are acceptable. Nickel is not constituent that causes us any problems. We'll take the data as is with an explanation in the narrative.

Thanks,

Rich C.

From: Bushaw, Ruth A
Sent: Tuesday, November 16, 2010 11:11 AM
To: Major, Christopher A; Clinton, Richard (Rich)
Subject: Nickel Results Biased High for PFP A Lab Samples
Importance: High

Chris and Rich,

We ran nickel by ICP/MS for the PFP A Lab samples because we couldn't meet the requested detection limit (RDL) of 0.057 μg/mL by ICP. For two of the liquid samples that were acid digested, the preparation blank had nickel above the MDL, but below the quantitation limit, so our QAPP does not require us to reanalysis. However, for sample B24296, the nickel result was lower than what was reported in the blank and was "C" flagged. The result of 6.73E-03 μg/mL is likely a false positive, but the result was less than the RDL, so I suspect that this should be an issue for you. For sample B24294, the result for the blank was about 10% of the sample result, so this sample result was also "C" flagged. The result was 6.46E-02 μg/mL is likely biased high and is slightly above the RDL. I hope that these results are acceptable for your use because our ICP/MS room is currently out-of-service for maintenance on the air conditioning system. I could report results from the ICP, but they will be reported as less than the MDL, which is 0.1μg/mL and doesn't meet the RDL.

Thanks,

Ruth A. Bushaw

Project Manager
Advanced Technologies and Laboratories International, Inc.
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Bushaw, Ruth A

From: Major, Christopher A
Sent: Monday, November 22, 2010 8:43 AM
To: Bushaw, Ruth A
Cc: Clinton, Richard (Rich)
Subject: RE: Chromium and Nickel Results by ICP-MS

Ruth – I follow your logic on the Cr issue and – yes – the results are useable. The Ni results are useable too.

Chris
942-6489

From: Bushaw, Ruth A
Sent: Monday, November 22, 2010 8:01 AM
To: Major, Christopher A; Clinton, Richard (Rich)
Subject: Chromium and Nickel Results by ICP-MS
Importance: High

Chris and Rich,

I have two more concerns; one about chromium results and the other about the nickel results for the ICP-MS analysis of the organic liquid samples B24285 and B25298.

The initial LLS recovery for chromium was greater than 130%, which fails to meet the criteria in the QAPP. This indicates a potential high bias for sample B24285. The result for sample B24298 was sufficiently high that the bias indicated by the high LLS recovery should not affect that result. The LLS at the end of the run met the criteria in the QAPP. Chromium was detected in the initial continuing calibration blank (CCB) above the MDL, but less than the quantitation limit, so no reanalysis was required. The preparation blank result for chromium was greater than the MDL, but less than the quantitation limit, so no repreparation or reanalysis was required. The preparation blank result was greater than the chromium result for sample B24285 and was approximately 8% of the result for B24298, so a "B" flag was applied to both sample results. The high blanks might be due to the high bias indicated by the high recovery for the initial LLS. The blank was previously analyzed in another analytical batch and was less than the MDL. The results for the two samples from that initial batch were about the same as those reported from the reanalysis batch with the high blank result. However, since the CCV at the end of the initial run failed high, the results could not be reported from that run. Even with the potential high bias indicated by the high blank results, the sample result for chromium for sample B24298 (0.420 µg/mL) was less than the regulatory level of 5 µg/mL. The chromium result for sample B24285 was 10.6 µg/mL. Even if you correct for an 8% blank contribution, this result will be greater than the regulatory limit of 5 µg/mL. I would prefer to not report the chromium results from the ICP run because the LLS indicated a very low bias, with a recovery of only 34%. Also, the ICP result for chromium for sample B24298 did not meet the requested detection limit.

For nickel, it was detected in the preparation blank above the MDL, but below the quantitation limit, so no repreparation or reanalysis is required. The blank result was less than 5% of that for sample B24285 (11.6 µg/mL), but was nearly 50% of the result for sample B24298 (0.216 µg/mL).

Since you previously indicated that nickel was not an analyte of concern for your use of the data, I assume that these nickel results are also usable. However, will the chromium results be usable?

Thanks,

Ruth A. Bushaw

Project Manager
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Bushaw, Ruth A

From: Major, Christopher A
Sent: Monday, November 22, 2010 10:37 AM
To: Bushaw, Ruth A
Cc: Clinton, Richard (Rich)
Subject: RE: PFP a Lab Room 144 Lead Results

Ruth – I would use the ICP/MS results with a note explaining the likely false positive.

Chris

From: Bushaw, Ruth A
Sent: Friday, November 19, 2010 3:38 PM
To: Major, Christopher A; Clinton, Richard (Rich)
Subject: PFP a Lab Room 144 Lead Results
Importance: High

Chris and Rich,

We were unable to meet the requested detection limit for lead by ICP, so we ran it by ICP/MS. For the organic liquid samples, we had a couple of issues. The result for the preparation blank was 1.12 µg/mL, which was greater than the quantitation limit and requires a repreparation and reanalysis, per our QAPP. The sample results were 0.885 µg/mL for sample B24285 and 0.585 µg/mL for B24298. The duplicate was run on an organic liquid sample from another customer because of limited sample volume in your two samples. The RPD was 116%. This also requires a repreparation and reanalysis by our QAPP. The chemist suspects that there was a non-homogenous matrix issue.

Currently our ICP-MS lab is out-of-service due to an HVAC upgrade. It's expected to be out for about a month, so we won't be able to reprep and reanalyze very soon.

The lead results from ICP were:
Prep blank = <6.25 µg/mL
B24285 = <6.25 µg/mL
B24298 = <6.25 µg/mL

Would you prefer that I report the ICP results with the high detection limit? Or will the ICP/MS results be usable for you? I will explain that the results are possibly a false positive based on the contamination indicated by the high blank result. I will also have to discuss that the initial low level standard recovery was low (63%), but since these sample results were above the EQL, they shouldn't be affected.

Thanks,
Ruth A. Bushaw

Project Manager
Advanced Technologies and Laboratories International, Inc.
Contractor to the Office of River Protection
U.S. Department of Energy
222-S Laboratory

office: 509-373-4314
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Bushaw, Ruth A

From: Major, Christopher A
Sent: Thursday, December 09, 2010 10:59 AM
To: Bushaw, Ruth A
Cc: Clinton, Richard (Rich)
Subject: RE: PFP A Lab Sr-90 Results

I think we would be able to use the Sr-90 data as is. Please qualify the value in your final report, however.

Chris
942-6489

From: Bushaw, Ruth A
Sent: Thursday, December 09, 2010 10:38 AM
To: Major, Christopher A; Clinton, Richard (Rich)
Subject: PFP A Lab Sr-90 Results
Importance: High

Chris and Rich,

I was just running the final data summary report for the PFP A Lab Rm 144 samples to verify that the correct flags are now being applied. I just noticed that for sample B242B6, the acid digest preparation blank was not analyzed for Sr-90. For this sample, we ran the radionuclides from the acid digest prepared for the ICP metals analysis. The acid digest preparation blank was run for all other radionuclides except for Sr-90. For the Sr-90, this sample was analyzed in the same batch as sample B241X2, which was prepared using the environmental digest (or what we call an acid digest using stronger acids). The only preparation blank that was analyzed with that batch was the environmental digest preparation blank.

Will you be able to use the Sr-90 result for sample B242B6 without a blank result? If I report without that blank, I'm about ready to provide the final report to a peer for review and we should have it ready to issue next week. If you need a blank result, we wouldn't be able to get the results from the lab until next Tuesday (12/14/2010) and I would need another couple of days to finish the report and get the peer review.

Thanks,
Ruth A. Bushaw

Project Manager
Advanced Technologies and Laboratories International, Inc.
Contractor to the Office of River Protection
U.S. Department of Energy
222-S Laboratory
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Attachment 7

RECEIPT PAPERWORK

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev EG. 0

Date Samples Received: 8.17.10 Group #: 20100688

Number of Samples: 13 Beryllums / 3 PFP ALAB Rm-144

Sample Custodian: [illegible]

Sample Custodian to Complete:

Action	OK? (Y/N)	N/A	Comments
RSA/COC provided?	✓		
RSR provided?	✓		
Verify GKI is complete	✓		on file
Check that outer custody seal is intact, if present	✓		
Record cooler temperature in centigrade, as appropriate		✓	☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓		If No, provide comments on back
Verify that COC or RSA is accurate and complete, containing the following information:			
• Client name and client sample number	✓		
• Date and time of sampling			
• Sampling location or origin			
• Container type, size, and number			
• Analysis request is clear			
• Signature of persons relinquishing and receiving samples			
• Date and/or time of sample custody exchange			
Verify that sample numbers on containers match the COC and/or RSA			
Samples stored properly (e.g., refrigeration)	✓		

Notify the PM immediately if any problems are noted. (A "No" answer requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? Yes PM Initials RMB Date 8/30/2010

If No, comment on communication and resolution:

Other Comments:

20100087

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-003	PAGE 1 OF 2
COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 9N	DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: S3; RM 144; Hood 1; bottle #11 Std lab	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069	AIR QUALITY: ☐	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-807-14.35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, O=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool 4C~~ None	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME							
24280 (S3)	OTHER LIQUID	7-13-10	1047	X						

bb 7/13/10 bb 7/13/10

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	1315 JUL 13 2010	KDWilson	1315 JUL 13 2010
KDWilson	8/18/10 2:37	RESTREGE	8-18-10 2:37
RESTREGE	8-19-10 9:20	Fidel Gutierrez	8/19 9:20
Fidel Gutierrez	8-19-10 1015	R Steele	8-19-10 1015
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688
SAM# S10M000386

☐ ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-003	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S3; RM 144; Hood 1; bottle #11 Std lab	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF -N-507-14 .35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Br 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ Br 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Br 6/28/10

1) ~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi VOA - 8270B - COMPLETE {Tributyl phosphate} TPH Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 - Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100087

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-004	PAGE 1 OF 2
COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 9N	DATA TURNAROUND
SAMPLING LOCATION: S4; RM 144; Hood 2; Ion Exchange waste	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14.35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool 4C~~ None	None													
TYPE OF CONTAINER	aG	P													
NO. OF CONTAINER(S)	1	1													
VOLUME	125mL	60mL													
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)													

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME												
B24281 (S4)	OTHER LIQUID	JUL 19 2010	1350	X											

bb 7/19/10

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
~~KB Hulse~~ CHPRC	JUL 19 2010 1530	KDWilson	JUL 19 2010 1530
KDWilson	8/18/10 2:37	RG Stegge	8-18-10 2:37
RG Stegge	8-19-10 9:20	Fidel Gutierrez	8-19-10 920
Fidel Gutierrez	8-19-10 1015	RG Stegge	8-19-10 10:15
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100688
SAM # S10M000387

ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6002-518(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-004	PAGE 2 OF 2
COLLECTOR KB Huise CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S4; RM 144; Hood 2; Ion Exchange waste	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-607-14.35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. 6/28/10

(1)~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi VOA - 8270B - COMPLETE {Tributyl phosphate} TPH Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100007

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-011	PAGE 1 OF 2
COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 9N	DATA TURNAROUND
SAMPLING LOCATION: S14; RM 144; Hood 5; A00109	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14-35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool 4C~~ None	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

bb 7/19/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME								
324288 (S14)	OTHER LIQUID	JUL 19 2010	1000	X							

bb 7/19/10

bb 7/19/10

CHAIN OF POSSESSION	DATE/TIME	SIGN/ PRINT NAMES	DATE/TIME
RELINQUISHED BY/REMOVED FROM: KB Hulse CHPRC	JUL 19 2010	RECEIVED BY/STORED IN: KDWilson	JUL 19 2010
RELINQUISHED BY/REMOVED FROM: KDWilson	8/18/10 2:37	RECEIVED BY/STORED IN: RE Stregge	8-18-10 2:37
RELINQUISHED BY/REMOVED FROM: RE Stregge	8-19-10 9:20	RECEIVED BY/STORED IN: Fidel Gutierrez	8-19-10 920
RELINQUISHED BY/REMOVED FROM: Fidel Gutierrez	8-19-10 1015	RECEIVED BY/STORED IN: R Stegle	8-19-10 1015
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100688
SAM # S10M000390

☐ ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-011	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S14; RM 144; Hood 5; A00109	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. ~~HNF-N-807-~~ 14-35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Br 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative~~. Br 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Br 6/28/10
(1)~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi VOA - 8270B - COMPLETE {Tributyl phosphate} TPH Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

OK

A-6003-618(01/06)

ISOCS Item Report

Item ID:	B24280 (S3)
Date Assayed:	7/20/10
Item Mass, kg:	0.16
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	1.93E+03	2.84E+02	2.50E+03	1.13E-04	1.66E-05	1.46E-04	I
Pu-239	81.361%	2.71E+03	2.93E+02	3.29E+03	4.36E-02	4.73E-03	5.31E-02	M
Pu-240	16.355%	1.99E+03	2.93E+02	2.58E+03	8.77E-03	1.29E-03	1.14E-02	I
Pu-242	0.670%	1.42E+00	2.10E-01	1.84E+00	3.59E-04	5.30E-05	4.65E-04	I
Np-237								
Am-241	2.470%	4.55E+03	6.74E+02	5.89E+03	1.32E-03	1.96E-04	1.72E-03	I
Other TRU								
U-235								
U-238								
Pu-241	1.404%	7.78E+04	1.15E+04	1.01E+05	7.53E-04	1.11E-04	9.75E-04	I
Other								
Other								
Other								

Total Pu, g**	5.364E-02
Total Uncertainty, g***	7.910E-03
Upper Limit, g Pu****	6.946E-02

Total TRU Activity, uCi	1.12E+04
Total Uncertainty, uCi***	1.36E+03
Upper Limit, uCi****	1.39E+04

TRU Specific Activity, nCi/g	7.20E+04
Total Uncertainty, nCi/g***	8.77E+03
Upper Limit, nCi/g****	8.95E+04

Total Activity (TRU + non-TRU), uCi	8.90E+04
Total Uncertainty, uCi***	1.25E+04
Upper Limit, uCi****	1.14E+05

* Codes: M = Activity directly measured by ISOCS.
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.
C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/29/10 — Calculated — Date

7/29/10 — Reviewed — Date

PFP ISOCS V2.00

ISOCS Item Report

Item ID:	B24281 (S4)
Date Assayed:	7/21/10
Item Mass, kg:	0.15
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	6.26E+01	1.17E+01	8.59E+01	3.66E-06	6.80E-07	5.02E-06	M, C
Pu-239	81.361%	6.73E+02	7.30E+01	8.19E+02	1.08E-02	1.18E-03	1.32E-02	M
Pu-240	16.355%	1.91E+02	3.19E+01	2.54E+02	8.40E-04	1.41E-04	1.12E-03	M, C
Pu-242	0.670%	3.54E-01	5.21E-02	4.58E-01	8.93E-05	1.32E-05	1.16E-04	I
Np-237		2.42E-04	1.08E-04	4.59E-04	3.45E-07	1.54E-07	6.53E-07	M
Am-241	0.303%	1.39E+02	1.58E+01	1.70E+02	4.04E-05	4.61E-06	4.96E-05	M, C
Other TRU								
U-235								
U-238								
Pu-241	1.404%	2.54E+03	3.75E+02	3.29E+03	2.45E-05	3.63E-06	3.18E-05	M, C
Other								
Other								
Other								

Total Pu, g**	1.333E-02
Total Uncertainty, g***	1.967E-03
Upper Limit, g Pu****	1.726E-02

Total TRU Activity, uCi	1.06E+03
Total Uncertainty, uCi***	1.37E+02
Upper Limit, uCi****	1.34E+03

TRU Specific Activity, nCi/g	7.34E+03
Total Uncertainty, nCi/g***	9.47E+02
Upper Limit, nCi/g****	9.23E+03

Total Activity (TRU + non-TRU), uCi	3.60E+03
Total Uncertainty, uCi***	4.76E+02
Upper Limit, uCi****	4.55E+03

* Codes: M = Activity directly measured by ISOCS.
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.
C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/29/10
Calculated Date

7/29/10
Reviewed Date

PFP ISOCS V2.00

ISOCS Item Report

Item ID:	B24288 (S14)
Date Assayed:	7/21/10
Item Mass, kg:	0.14
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	1.84E+03	2.71E+02	2.38E+03	1.07E-04	1.58E-05	1.39E-04	I
Pu-239	81.361%	2.58E+03	2.80E+02	3.14E+03	4.16E-02	4.51E-03	5.06E-02	M
Pu-240	16.355%	1.90E+03	2.80E+02	2.46E+03	8.36E-03	1.23E-03	1.08E-02	I
Pu-242	0.670%	1.36E+00	2.00E-01	1.76E+00	3.43E-04	5.05E-05	4.44E-04	I
Np-237								
Am-241	2.470%	4.33E+03	6.43E+02	5.62E+03	1.26E-03	1.87E-04	1.64E-03	I
Other TRU								
U-235								
U-238								
Pu-241	1.404%	7.42E+04	1.09E+04	9.60E+04	7.18E-04	1.06E-04	9.29E-04	I
Other								
Other								
Other								

Total Pu, g**	5.113E-02
Total Uncertainty, g***	7.542E-03
Upper Limit, g Pu****	6.621E-02

Total TRU Activity, uCi	1.07E+04
Total Uncertainty, uCi***	1.30E+03
Upper Limit, uCi****	1.32E+04

TRU Specific Activity, nCi/g	7.50E+04
Total Uncertainty, nCi/g***	9.14E+03
Upper Limit, nCi/g****	9.32E+04

Total Activity (TRU + non-TRU), uCi	8.48E+04
Total Uncertainty, uCi***	1.19E+04
Upper Limit, uCi****	1.09E+05

* Codes: M = Activity directly measured by ISOCS.
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.
C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/26/10
Calculated Date

7/29/10
Reviewed Date

PFP ISOCS V2.00

RADIOACTIVE SHIPMENT RECORD

3. Page 1 of 1 | 4. Ship Prepaid | 5. Via Site Carrier

1. SHIP FROM U.S. DEPT. OF ENERGY C/O
Company CH2MHILL PRC
Address PFP
City, State, Zip 200 West Area
Contact Jeff Widney
Phone 372-3090

2. SHIP TO ☒ U.S. DEPT. OF ENERGY C/O
Company ATLII
Address 222-S
City, State, Zip 200 West Area
Attention Gerald Ritenour
Phone 372-2742

6. SHIPMENT AUTHORIZATION NUMBER KM014

7. EMERGENCY RESPONSE
Telephone 1-509-373-3800
Emergency Response Guide(s) 163

HM 8. Proper Shipping Name: RQ Radioactive Material, Type A package — PRI HAZ 7 — SUB HAZ — UN ID UN2915

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
1	Viking	DOT 7A TYPE A	S/N 12	N/A	Pu238,Pu239,Pu240,Am241	N/A	0.2	6.57E-3 TBq	9 Kg

10. Identify for Normal Form Only
Physical Form Liquid
Chemical Form Mixture

11.
- ☐ Highway Route Controlled Quantity
- ☒ Exclusive Use Shipment with instructions
- ☐ Placards Applied
- ☒ Fissile Excepted, Grams .098
- ☒ UN ID Marking UN2915

12. LABELS APPLIED
Radioactive Yellow - II

13. ADDITIONAL LABELS / MARKINGS

HM 8. Proper Shipping Name: — PRI HAZ — SUB HAZ — UN ID

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

10. Identify for Normal Form Only
Physical Form
Chemical Form

11.
- ☐ Highway Route Controlled Quantity
- ☐ Exclusive Use Shipment with instructions
- ☐ Placards Applied
- ☐ Fissile Excepted, Grams
- ☐ UN ID Marking

12. LABELS APPLIED

13. ADDITIONAL LABELS / MARKINGS

HM 8. Proper Shipping Name: — PRI HAZ — SUB HAZ — UN ID

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

10. Identify for Normal Form Only
Physical Form
Chemical Form

11.
- ☐ Highway Route Controlled Quantity
- ☐ Exclusive Use Shipment with instructions
- ☐ Placards Applied
- ☐ Fissile Excepted, Grams
- ☐ UN ID Marking

12. LABELS APPLIED

13. ADDITIONAL LABELS / MARKINGS

14. Shipment DE-Ci: 2.39E-02

Shipment Totals	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
	N/A	0.2	6.57E-3 TBq	9

15. Surface Dose Rate of Package
☐ <0.005 or _____ mSv/hr
<0.5 or <0.1 mrem/hr (N+ß γ)

Dose Rate @ 1 Meter from Surface of Package
☐ <0.005 or _____ mSv/hr
<0.5 or <0.1 mrem/hr (N+ß γ)

Smears of Outer Container
- ☐ <4.0 Bq (220 dpm) ß γ /cm²
- ☐ <0.4 Bq (22 dpm) α /cm²
- ☑ <Tbl. 2-2 HNF-5173 Limits

TRUCK LOAD OR EXCLUSIVE USE
- Surface ☑ <2 mSv/hr (200 mrem/hr)
- @ 2 meters ☑ <0.1 mSv/hr (10 mrem/hr)
- @ Cab or sleeper ☑ <0.02 mSv/hr (2 mrem/hr) (Using N+ß γ)

Additional Data and Instructions (inc. Readings on Internal Packaging)
Chris Gillingswater

Bldg. 234-52 | Survey No. 819004 | Date 8/19/10

16. TRANSPORTER
Vehicle Number: N068-B-7162
DRIVER SIGNATURE: [signature] PRINT NAME: Fidel Gutierrez

17. RECEIVER
RECEIVER SIGNATURE: [signature] PRINT NAME: RJ Steele Date: 8.19.10

18. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.
Certifier's Signature | Print Name | On behalf of DOE-RL | Date | Organization

19. AUTHORIZATION FOR SHIPMENT

AIR TRANSPORT CERTIFICATION ☐ N/A

CARGO AIRCRAFT: ☐ Cargo Aircraft Only Labels Applied

PASSENGER AIRCRAFT: ☐ Ltd Qty ☐ Research/Medical Diagnosis ☐ <3 T.I. ☐ Human Medical Research

Pkg. Dimensions (cm)

20. OFFSITE AUTHORIZATION

Survey No.	Date Shipped	Routing	ETA

Approved for Shipment Offsite | Date

A-6003-214.1 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev C.C.0

Date Samples Received: 8.23.10 Group #: 20100688

Number of Samples: 15

Sample Custodian: RHlad

Sample Custodian to Complete:

Action	OK? (Y/N)	N/A	Comments
RSA/COC provided?	✓		
RSR provided?	✓		
Verify GKI is complete		✓	on file
Check that outer custody seal is intact, if present	✓		
Record cooler temperature in centigrade, as appropriate		✓	☑ Check if no cooler and/or no ice
Samples are intact and in good condition	✓		If No, provide comments on back
Verify that COC or RSA is accurate and complete, containing the following information:			
• Client name and client sample number	✓		
• Date and time of sampling			
• Sampling location or origin			
• Container type, size, and number			
• Analysis request is clear			
• Signature of persons relinquishing and receiving samples			
• Date and/or time of sample custody exchange			
Verify that sample numbers on containers match the COC and/or RSA			
Samples stored properly (e.g., refrigeration)	✓		

Notify the PM immediately if any problems are noted. (A "No" answer requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? Yes PM Initials RWB Date 8/30/2010

If No, comment on communication and resolution:

Other Comments:

20100087

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F10-069-006	PAGE 1 OF 2

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 9N	DATA TURNAROUND
KB Hulse CHPRC	WIDRIG, DL	376-2858	WIDRIG, DL	AIR QUALITY ☐	45 Days / 45 Days

SAMPLING LOCATION	PROJECT DESIGNATION	SAF NO.
S8; RM 144; Hood 3; Waste from Hood 1	PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	F10-069

ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA	METHOD OF SHIPMENT
	HNF-N-807-14-35	N/A	301891ES10	GOVERNMENT VEHICLE

SHIPPED TO	OFFSITE PROPERTY NO.	BILL OF LADING/AIR BILL NO.
222-S Lab Operations	N/A	N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool 4C~~ None AR 6/28/10	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

AR 6/28/10

bb 7/19/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME								
B24283 ~~E3~~ AR	OTHER LIQUID	JUL 19 2010	1340	X							
(S8)											

bb 7/19/10

bb 7/19/10

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	JUL 19 2010 1530	KW Wilson / KW	JUL 19 2010 1530
KW Wilson KW	8/23/10 9:15	MARVIN Huck	8-23-10 9:15
MARVIN Huck	8-23-10 10:10	RL Steele	8.23.10 1010
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688
Sam# 510M000388

☐ ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-006	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S8; RM 144; Hood 3; Waste from Hood 1	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14 35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. 6/28/10
(1)~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range)~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

CH2MHill Plateau Remediation Company

20100087

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-012

COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL
SAMPLING LOCATION: S15; RM 144; Hood 5; A0086 (Liquid Rm 155)	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14.35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A

PRICE CODE: 9N

AIR QUALITY: ☐

DATA TURNAROUND: 45 Days / 45 Days

METHOD OF SHIPMENT: GOVERNMENT VEHICLE

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cooled~~ None	None	
TYPE OF CONTAINER	aG	P	
NO. OF CONTAINER(S)	1	1	
VOLUME	125mL	60mL	
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)	

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME								
B24289 (S15)	OTHER LIQUID	JUL 19 2010	1020	X							

bb 7/19/10

bb 7/19/10

bb 7/19/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	JUL 19 2010 1255	KD Wilson	JUL 19 2010 1255
KD Wilson	8/23/10 9:15	MARVIN Huck	8-23-10 9:15
MARVIN Huck	8-23-10 10:10	RA Steele	8-23-10 10:10

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688
SAM# S10M000391

ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-012	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S15; RM 144; Hood 5; A0086 (Liquid Rm 155)	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. ~~HNF-N-507-~~ 14.35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. 6/28/10
(1)~~VOA - 82608 - COMPLETE (Carbon tetrachloride) Semi VOA - 82708 - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range)~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

A-6003-618(01/06)

CH2MHill Plateau Remediation Company

20100067

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-020

COLLECTOR: KB Hulse CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL
PRICE CODE: 9N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: S29; RM 144; Hood 9; Red Std Pu 150 0901	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	SAF NO.: F10-069	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF ~~N-807~~ 14 35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: N/A	

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool 4C~~ UONE	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	General Testing (No CAS)

Pr 6/28/10

Pr 6/28/10

bb 7/19/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
324297 (S29)	OTHER LIQUID	JUL 19 2010	1435	X									

bb 7/19/10

bb 7/19/10

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	JUL 19 2010 1530	KOWilson / KOW	JUL 19 2010 1530
KOW KOWilson	8/23/10 9:15	MARVIN Huck	8-23-10 9:15
MARVIN Huck	8-23-10 1010	ebsteele	8-23-10 1010

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688
SAM# S10M000394

☐ ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

2010006 7

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-020	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S29; RM 144; Hood 9; Red Std Pu 150 0901	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF -N-807- 14 35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Br 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ Br 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Br 6/28/10
(1)~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi VOA - 8270B - COMPLETE {Tributyl phosphate} TPH Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100687

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-002

COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL
PRICE CODE: 9N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: S2; RM 144; Hood 1; Sample HIAC	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	SAF NO.: F10-069	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14-35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: N/A	

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool~~ None 6/28/10	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1 6/28/10
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME							
124279 (S2)	OTHER LIQUID	7-13-10	1020	X						

bb 7/13/10 bb 7/13/10 bb 7/13/10

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	1315 JUL 13 2010	KOWilson	1315 JUL 13 2010
KOWilson	8/18/10 2137	RESTREGE	8-18-10 2137
RE STREGE	8-23-10 9:15	Marvin Huck	8-23-10 9:15
Marvin Huck	8-23-10 10:10	RLRistedt	8-23-10 1010

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

COC# 20100688
SAMPLE# S10M000395

☐ ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-002	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S2; RM 144; Hood 1; Sample HIAC	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. ~~HNF-N-507-~~ 14-35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

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** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ 6/28/10

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~~**, 222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. 6/28/10
(1)~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi-VOA - 8270B - COMPLETE {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100087

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-010

COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL
PRICE CODE: 9N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: S13; RM 144; Hood 4; HCL	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	SAF NO.: F10-069	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14.35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A

MATRIX*
A=Air
DL=Drum
Liquids
DS=Drum
Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
O=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cooled~~ None	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME								
24287 (S13)	OTHER LIQUID	JUL 19 2010	1355	X							

bb 7/19/10

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	JUL 19 2010 1530	KDWilson	JUL 19 2010 1530
KDWilson	8/18/10 2:37	RE STEGE	8-18-10 2:37
RESTEGE	8-23-10 9:15	MARVIN Hick	8-23-10 9:15
MARVIN Hick	8-23-10 1010	RESTEGE	8-23-10 1010

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100688
SAM # 510M000396

☐ ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-010	PAGE 2 OF 2
COLLECTOR KB Huise CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N AIR QUALITY ☐	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION S13; RM 144; Hood 4; HCL	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069		
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14,35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

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** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ 6/28/10

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** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. 6/28/10
(1)~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH-Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range)~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240; Plutonium-238} Strontium-89,90 - Sr-90; Americium-241 {Americium-241}

OK/Rush

A-6003-618(01/06)

20100087

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-015

COLLECTOR KB Hulse CHPRC	**COMPANY CONTACT** WIDRIG, DL	**TELEPHONE NO.** 376-2858	**PROJECT COORDINATOR** WIDRIG, DL
PRICE CODE 9N	**DATA TURNAROUND** 45 Days / 45 Days	**AIR QUALITY** ☐	
SAMPLING LOCATION S19; RM 144; Hood 9; Acid from 143	**PROJECT DESIGNATION** PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	**SAF NO.** F10-069	
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF-~~N-507~~-14-35	**ACTUAL SAMPLE DEPTH** N/A	**COA** 301891ES10
METHOD OF SHIPMENT GOVERNMENT VEHICLE			
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool~~ NaNO	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

Pr 6/28/10

PM 6/28/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
324292 (S19)	OTHER LIQUID	7-13-10	1011	X									

bb 7/13/10

bb 7/13/10

bb 7/13/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	1315 JUL 13 2010	KOWilson / KOWilson	1315 JUL 13 2010
KOWilson / KOWilson	8/18/10 2:37	RE STREGE	8/18/10 2:37
RE STREGE	8-23-10 9:15	MARVIN HUCK	8-23-10 9:15
MARVIN HUCK	8-23-10 10:10	RE STREGE	8-23-10 1010

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

☐ ORIGINAL

GRP# 20100688
SAM# 510M000397

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-015	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S19; RM 144; Hood 9; Acid from 143	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF -N-507- 14 35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ BM 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative~~. BM 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. BM 6/28/10
(1)~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi VOA - 8270B - COMPLETE {Tributyl phosphate} TPH Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

A-6003-618(01/06)

20100067

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-016

COLLECTOR KB Hulse CHPRC	**COMPANY CONTACT** WIDRIG, DL	**TELEPHONE NO.** 376-2858	**PROJECT COORDINATOR** WIDRIG, DL
PRICE CODE 9N	**DATA TURNAROUND** 45 Days / 45 Days	**AIR QUALITY** ☐	
SAMPLING LOCATION S20; RM 144; Hood 9; HNO3, H2SO4, Hydro carbonic	**PROJECT DESIGNATION** PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	**SAF NO.** F10-069	
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF-~~N-507~~-14-35	**ACTUAL SAMPLE DEPTH** N/A	**COA** 301891ES10
METHOD OF SHIPMENT GOVERNMENT VEHICLE			
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool-4C~~ NONE (Br 6/28/10)	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1 (Br 6/28/10)
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

bb 7/13/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME								
324293 (S 20)	OTHER LIQUID	7-13-10	1022	X							

bb 7/13/10

bb 7/13/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
CHPRC	JUL 13 2010 1315	KOWilson	JUL 13 2010 1315
KOWilson	8/18/10 2:37	RESTREGE	8-18-10 2:37
RESTREGE	8/23/10 9:15	MARVIN HUCK	8-23-10 9:15
MARVIN HUCK	8-23-10 10:10	RHSteele	8.23.10 1010

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100688
SAM # 510M000398

☐ ORIGINAL

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-016	PAGE 2 OF 2
COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 9N	DATA TURNAROUND
SAMPLING LOCATION: S20; RM 144; Hood 9; HNO3, H2SO4, Hydro carbonic	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069	AIR QUALITY: ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14 35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Pr 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ Pr 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Pr 6/28/10
(1)~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range)~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100067

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-017 | PAGE 1 OF 2

COLLECTOR KB Hulse CHPRC	**COMPANY CONTACT** WIDRIG, DL	**TELEPHONE NO.** 376-2858	**PROJECT COORDINATOR** WIDRIG, DL
SAMPLING LOCATION S23; RM 144; Hood 9; Possible acid	**PROJECT DESIGNATION** PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		**SAF NO.** F10-069
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF-N-507-14-35	**ACTUAL SAMPLE DEPTH** N/A	**COA** 301891ES10
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A

PRICE CODE 9N | **AIR QUALITY** ☐ | **DATA TURNAROUND** 45 Days / 45 Days | **METHOD OF SHIPMENT** GOVERNMENT VEHICLE

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cooled/C NONE	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

Pr 6/28/10

Pr 6/28/10

bb 7/13/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME							
B24294 (S23)	OTHER LIQUID	7-13-10	1015	X						

bb 7/13/10

bb 7/13/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	1315 JUL 13 2010	KOWilson / KOWilson	1315 JUL 13 2010
KOWilson / KOWilson	8/18/10 2157	RE Stagg / Ryan Stagg	8-18-10 2:37
RE Stagg / Ryan Stagg	8-23-10 7:15	Marvin Huck / Marvin Huck	8-23-10 9:15
Marvin Huck / Marvin Huck	8-23-10 10:10	RE Stagg / RE Stagg	8-23-10 1010
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688
SAM# S10M000399

ORIGINAL

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

20100067

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-017	PAGE 2 OF 2
COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 9N	DATA TURNAROUND
SAMPLING LOCATION: S23; RM 144; Hood 9; Possible acid	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069	AIR QUALITY: ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14-35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Bc 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ Bc 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Bc 6/28/10
(1)~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi VOA - 8270B - COMPLETE {Tributyl phosphate} TPH Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100687

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-018

COLLECTOR: KB Hulse CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 9N / DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: S24; RM 144; Hood 9; Possible Acid	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069	AIR QUALITY ☐
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14 35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A	

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool 4C~~ NONE (Br 6/28/10)	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

(Br 6/28/10) bb 7/13/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
324295 (S24)	OTHER LIQUID	7-13-10	1045	X	

bb 7/13/10   bb 7/13/10

CHAIN OF POSSESSION — SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC [signature]	JUL 13 2010 1315	K Dun / KDWilson	JUL 13 2010 1315
DWilson / KDW	8/18/10 2:37	RESTREGE [signature]	8-18-10 2:37
RESTREGE [signature]	8-23-10 9:15	MARVEN HUCK [signature]	8-23-10 9:15
MARVEN HUCK [signature]	8-23-10 10:10	[signature] RSTEGLE	8-23-10 10.10

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688
Sam# S10M000400

ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-018	PAGE 2 OF 2
COLLECTOR KB Huise CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S24; RM 144; Hood 9; Possible Acid	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-607-14-35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Dr 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative~~. Dr 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Dr 6/28/10
(1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi-VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range)~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100067

CH2MHill Plateau Remediation Company | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | **F10-069-019** | **PAGE 1 OF 2**

COLLECTOR KB Hulse CHPRC	**COMPANY CONTACT** WIDRIG, DL	**TELEPHONE NO.** 376-2858	**PROJECT COORDINATOR** WIDRIG, DL
PRICE CODE 9N	**DATA TURNAROUND** 45 Days / 45 Days	**AIR QUALITY** ☐	
SAMPLING LOCATION S27; RM 144; Hood 9; Unknown	**PROJECT DESIGNATION** PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	**SAF NO.** F10-069	
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF -N-507-14 35	**ACTUAL SAMPLE DEPTH** N/A	**COA** 301891ES10
METHOD OF SHIPMENT GOVERNMENT VEHICLE	**SHIPPED TO** 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A	**BILL OF LADING/AIR BILL NO.** N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cooled~~ None	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
B24296 (S 27)	OTHER LIQUID	7-13-10	1026	X	

bb 7/13/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	1515 JUL 13 2010	KDWilson/KDWilson	1815 JUL 13 2010
KDWilson/KDWilson	8/18/10 2:37	RESTREGE	8-18-10 2:37
RESTREGE	8-23-10 9:15	MARVIN HUCK	8-23-10 9:15
MARVIN HUCK	8-23-10 10:10	RESTREGE	8.23.10 1010

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100688
SAM # S10M000401

☐ ORIGINAL

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-019	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S27; RM 144; Hood 9; Unknown	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14.35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ AC 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative~~. AC 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. AC 6/28/10
(1)~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi VOA - 8270B - COMPLETE {Tributyl phosphate} TPH Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

CH2MHill Plateau Remediation Company

20100067

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-022

COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL
PRICE CODE: 9N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: D16; RM 144; Hood 9; HN03 Std	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	SAF NO.: F10-069	
ICE CHEST NO.	FIELD LOGBOOK NO.: ~~HNF-N-507-~~ 14.35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cooled C~~ None	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

Dr 6/28/10

Dr 6/28/10

bb 7/13/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME								
324299 (D16)	OTHER LIQUID	JUL 13 2010	1039	X							

bb 7/13/10

bb 7/13/10

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: KB Hulse CHPRC	DATE/TIME: 1315 JUL 13 2010	RECEIVED BY/STORED IN: KOWilson	DATE/TIME: 1315 JUL 13 2010
RELINQUISHED BY/REMOVED FROM: KOWilson	DATE/TIME: 8/18/10 2:37	RECEIVED BY/STORED IN: RESTREGE	DATE/TIME: 8-18-10 2:37
RELINQUISHED BY/REMOVED FROM: RESTREGE	DATE/TIME: 8-23-10 9:15	RECEIVED BY/STORED IN: MARVIN Huck	DATE/TIME: 8-23-10 9:15
RELINQUISHED BY/REMOVED FROM: MARVIN Huck	DATE/TIME: 8-23-10 10:10	RECEIVED BY/STORED IN: RESTREGE	DATE/TIME: 8.23.10 1010
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688
SAM# S10M000402

☐ ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-022	PAGE 2 OF 2
COLLECTOR: KB Hulse CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 9N	DATA TURNAROUND
SAMPLING LOCATION: D16; RM 144; Hood 9; HN03 Std	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069	AIR QUALITY: ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF -~~N-507~~- 14.35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

* ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Bc 6/28/10

* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ Bc 6/28/10

* NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Bc 6/28/10

1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range)~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100687

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-024

COLLECTOR KB Hulse CHPRC	**COMPANY CONTACT** WIDRIG, DL	**TELEPHONE NO.** 376-2858	**PROJECT COORDINATOR** WIDRIG, DL
SAMPLING LOCATION S30; RM 144; Hood 1; HN03	**PROJECT DESIGNATION** PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		**SAF NO.** F10-069
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF -~~N-507~~- 1435	**ACTUAL SAMPLE DEPTH** N/A	**COA** 301891ES10
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A

PRICE CODE 9N

AIR QUALITY ☐

DATA TURNAROUND 45 Days / 45 Days

METHOD OF SHIPMENT GOVERNMENT VEHICLE

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cooled~~ None	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

Dr 6/28/10

Dr 6/28/10

bb 7/13/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
1242B1 (S30)	OTHER LIQUID	JUL 13 2010	1005	X								

bb 7/13/10

bb 7/13/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	1315 JUL 13 2010	KD Wilson	1315 JUL 13 2010
KD Wilson	8/18/10 2:37		8-18-10 2:37
	8-23-10 9:15	MARVIN HUCK	8-23-10 9:15
MARVIN HUCK	8-23-10 10:10		8-23-10 10:10

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100688
SAM # S10M000403

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-024	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S30; RM 144; Hood 1; HN03	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14-35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Br 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ Br 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Br 6/28/10

1) ~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi VOA - 8270B - COMPLETE {Tributyl phosphate} TPH Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100687

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-025

COLLECTOR KB Hulse CHPRC	**COMPANY CONTACT** WIDRIG, DL	**TELEPHONE NO.** 376-2858	**PROJECT COORDINATOR** WIDRIG, DL
PRICE CODE 9N	**DATA TURNAROUND** 45 Days / 45 Days	**AIR QUALITY** ☐	
SAMPLING LOCATION S31; RM 144; Hood 4; conc HN03	**PROJECT DESIGNATION** PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	**SAF NO.** F10-069	
ICE CHEST NO.	**FIELD LOGBOOK NO.** ~~HNF-N-607~~ 14.35	**ACTUAL SAMPLE DEPTH** N/A	**COA** 301891ES10
METHOD OF SHIPMENT GOVERNMENT VEHICLE	**SHIPPED TO** 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A	**BILL OF LADING/AIR BILL NO.** N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool-4C~~ None	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
3242B2 (S31)	OTHER LIQUID	JUL 19 2010	1405	X								

bb 7/19/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
~~KB Hulse~~ CHPRC	JUL 19 2010 1530	KOWilson	JUL 19 2010 1530
KOWilson	8/18/10 2:37	RE Stegge	8-18-10 2:37
RE Stegge	8-23-10 9:15	MARVIN HULK	8-23-10 9:15
MARVIN HULK	8-23-10 10:10	RE Stegge	8-23-10 1010

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100688
SAM # S10M000404

☐ ORK

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-025	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S31; RM 144; Hood 4; conc HN03	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14 35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC)~~. 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative~~. 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. 6/28/10

1)~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi-VOA - 8270B - COMPLETE {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plotonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100087

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-027

COLLECTOR KB Huise CHPRC	**COMPANY CONTACT** WIDRIG, DL	**TELEPHONE NO.** 376-2858	**PROJECT COORDINATOR** WIDRIG, DL
SAMPLING LOCATION S33; RM 144; Hood 9; 2 vials HN03	**PROJECT DESIGNATION** PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		**SAF NO.** F10-069
ICE CHEST NO.	**FIELD LOGBOOK NO.** HNF-~~N-607~~-14.35	**ACTUAL SAMPLE DEPTH** N/A	**COA** 301891ES10
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A

PRICE CODE 9N

AIR QUALITY ☐

DATA TURNAROUND 45 Days / 45 Days

METHOD OF SHIPMENT GOVERNMENT VEHICLE

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cooled~~ N/N	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

PM 6/28/10

PM 6/28/10

bb 7/13/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
3242B4 (S33)	OTHER LIQUID	JUL 13 2010	1032	✓

bb 7/13/10

bb 7/13/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Huise CHPRC	1315 JUL 13 2010	1315 KOWilson / KOWilson	JUL 13 2010
KOWilson / KOWilson	8/18/10 2:37	RESTEELG RESTEELG	8-18-10 2:37
RESTEELG RESTEELG	8-23-10 9:15	MARVIN Huck MARVIN Huck	8-23-10 9:15
MARVIN Huck MARVIN Huck	8-23-10 10:10	RESTEELG RESTEELG	8-23-10 1010

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688
SAM# 510M000405

☐ ORIGINAL

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

2010008 7

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-027	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S33; RM 144; Hood 9; 2 vials HN03	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF -N-507- 14-35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ BL 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

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** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. BL 6/28/10
1)~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi VOA - 8270B - COMPLETE {Tributyl phosphate} TPH Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

20100687

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-031 | PAGE 1 OF 2

COLLECTOR KB Hulse CHPRC	**COMPANY CONTACT** WIDRIG, DL	**TELEPHONE NO.** 376-2858	**PROJECT COORDINATOR** WIDRIG, DL
SAMPLING LOCATION Contengency #3 (533 B) Br 8/18/10	**PROJECT DESIGNATION** PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		**SAF NO.** F10-069
ICE CHEST NO.	**FIELD LOGBOOK NO.** ~~HNF-N-507-~~ 14.35	**ACTUAL SAMPLE DEPTH** N/A	**COA** 301891ES10
SHIPPED TO 222-S Lab Operations	**OFFSITE PROPERTY NO.** N/A		**BILL OF LADING/AIR BILL NO.** N/A

PRICE CODE 9N | **AIR QUALITY** ☐ | **DATA TURNAROUND** 45 Days / 45 Days

METHOD OF SHIPMENT GOVERNMENT VEHICLE

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool~~ None	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

Br 6/28/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
3242B8	OTHER LIQUID	7/13/10	1032	X	

bb 7/13/10

bb 7/13/10

bb 7/13/10

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	1315 JUL 13 2010	KDWilson	1315 JUL 13 2010
KDWilson/KDW	8/18/10 2137	RESTREGG	8-18-10 2137
RESTREGG	8-23-10 9:15	Marvin Huck	8-23-10 9:15
Marvin Huck	8-23-10 10:10	RESTREGG	8-23-10 1010

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688
STAT# 510M000406

☐ ORIGINAL

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-031	PAGE 2 OF 2
COLLECTOR: KB Hulse CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 9N	DATA TURNAROUND
SAMPLING LOCATION: Contengency #3	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069	AIR QUALITY: ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: ~~HNF-N-507-~~ 14.35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Br 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ Br 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Br 6/28/10

1) ~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi-VOA - 8270B - COMPLETE {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

ISOCS Item Report

Item ID:	B24283 (S8)
Date Assayed:	7/26/10
Item Mass, kg:	0.12
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	1.23E+00	1.81E-01	1.59E+00	7.18E-08	1.06E-08	9.30E-08	I
Pu-239	81.361%	1.73E+00	8.81E-01	3.49E+00	2.78E-05	1.42E-05	5.62E-05	M
Pu-240	16.355%	1.27E+00	1.87E-01	1.64E+00	5.59E-06	8.23E-07	7.24E-06	I
Pu-242	0.670%	9.07E-04	1.34E-04	1.17E-03	2.29E-07	3.37E-08	2.97E-07	I
Np-237								
Am-241	0.734%	8.61E-01	2.24E-01	1.31E+00	2.51E-07	6.52E-08	3.81E-07	M, C
Other TRU								
U-235		6.07E-03	6.69E-04	7.41E-03	2.81E-03	3.10E-04	3.43E-03	M
U-238								
Pu-241	1.404%	2.51E+01	4.31E+00	3.37E+01	2.43E-07	4.17E-08	3.26E-07	M, C
Other								
Other								
Other								

Total Pu, g**	3.418E-05
Total Uncertainty, g***	1.779E-05
Upper Limit, g Pu****	6.977E-05

Total TRU Activity, uCi	5.09E+00
Total Uncertainty, uCi***	1.07E+00
Upper Limit, uCi****	7.24E+00

TRU Specific Activity, nCi/g	4.42E+01
Total Uncertainty, nCi/g***	9.34E+00
Upper Limit, nCi/g****	6.29E+01

Total Activity (TRU + non-TRU), uCi	3.02E+01
Total Uncertainty, uCi***	4.79E+00
Upper Limit, uCi****	3.98E+01

* Codes: M = Activity directly measured by ISOCS.
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.
C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/29/10
Calculated Date

7/29/10
Reviewed Date

PFP ISOCS V2.00

ISOCS Item Report

Item ID:	B24289 (S15)
Date Assayed:	7/21/10
Item Mass, kg:	0.15
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	2.64E+02	3.89E+01	3.42E+02	1.54E-05	2.27E-06	2.00E-05	I
Pu-239	81.361%	3.70E+02	4.03E+01	4.51E+02	5.97E-03	6.50E-04	7.27E-03	M
Pu-240	16.355%	2.72E+02	4.01E+01	3.53E+02	1.20E-03	1.77E-04	1.55E-03	I
Pu-242	0.670%	1.95E-01	2.87E-02	2.52E-01	4.92E-05	7.24E-06	6.37E-05	I
Np-237		9.22E-02	1.00E-02	1.12E-01	1.31E-04	1.42E-05	1.59E-04	M
Am-241	8.212%	2.07E+03	2.27E+02	2.52E+03	6.03E-04	6.63E-05	7.35E-04	M, C
Other TRU								
U-235		6.92E-03	7.87E-04	8.49E-03	3.20E-03	3.64E-04	3.93E-03	M
U-238								
Pu-241	1.404%	1.34E+03	2.03E+02	1.74E+03	1.29E-05	1.96E-06	1.68E-05	M, C
Other								
Other								
Other								

Total Pu, g**	7.337E-03
Total Uncertainty, g***	1.085E-03
Upper Limit, g Pu****	9.507E-03

Total TRU Activity, uCi	2.98E+03
Total Uncertainty, uCi***	3.31E+02
Upper Limit, uCi****	3.64E+03

TRU Specific Activity, nCi/g	1.96E+04
Total Uncertainty, nCi/g***	2.18E+03
Upper Limit, nCi/g****	2.40E+04

Total Activity (TRU + non-TRU), uCi	4.31E+03
Total Uncertainty, uCi***	4.97E+02
Upper Limit, uCi****	5.30E+03

* Codes: M = Activity directly measured by ISOCS.
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.
C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/29/10
Calculated Date

7/29/10
Reviewed Date

PFP ISOCS V2.00

ISOCS Item Report

Item ID:	B24297 (S29)
Date Assayed:	7/21/10
Item Mass, kg:	0.01
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	9.15E+02	1.37E+02	1.19E+03	5.34E-05	7.98E-06	6.94E-05	M, C
Pu-239	81.361%	9.11E+03	9.87E+02	1.11E+04	1.47E-01	1.59E-02	1.79E-01	M
Pu-240	16.355%	4.91E+03	7.28E+02	6.37E+03	2.16E-02	3.21E-03	2.81E-02	M, C
Pu-242	0.670%	4.79E+00	7.06E-01	6.20E+00	1.21E-03	1.78E-04	1.57E-03	I
Np-237		7.30E-03	8.33E-04	8.97E-03	1.04E-05	1.18E-06	1.27E-05	M
Am-241	0.246%	1.53E+03	1.68E+02	1.86E+03	4.45E-04	4.90E-05	5.43E-04	M, C
Other TRU								
U-235								
U-238								
Pu-241	1.404%	3.60E+04	5.31E+03	4.66E+04	3.48E-04	5.13E-05	4.51E-04	M, C
Other								
Other								
Other								

Total Pu, g**	1.806E-01
Total Uncertainty, g***	2.662E-02
Upper Limit, g Pu****	2.338E-01

Total TRU Activity, uCi	1.65E+04
Total Uncertainty, uCi***	2.08E+03
Upper Limit, uCi****	2.06E+04

TRU Specific Activity, nCi/g	1.17E+06
Total Uncertainty, nCi/g***	1.48E+05
Upper Limit, nCi/g****	1.46E+06

Total Activity (TRU + non-TRU), uCi	5.24E+04
Total Uncertainty, uCi***	6.86E+03
Upper Limit, uCi****	6.62E+04

* Codes: M = Activity directly measured by ISOCS.
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.
C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/29/10 — Calculated — Date

7/29/10 — Reviewed — Date

PFP ISOCS V2.00

RADIOACTIVE SHIPMENT RECORD

3. Page 1 of 1 | 4. Ship Prepaid | 5. Via Site Carrier

1. SHIP FROM U.S. DEPT. OF ENERGY C/O
Company CH2MHILL PRC
Address PFP
City, State, Zip 200 West Area
Contact Jeff Widney
Phone 372-3090

2. SHIP TO ☒ U.S. DEPT. OF ENERGY C/O
Company ATLII
Address 222-S
City, State, Zip 200 West Area
Attention Gerald Ritenour
Phone 372-2742

6. SHIPMENT AUTHORIZATION NUMBER KM015

7. EMERGENCY RESPONSE
Telephone 1-509-373-3800
Emergency Response Guide(s) 163

HM 8. Proper Shipping Name: RQ Radioactive Material, Type A package — PRI HAZ 7 — SUB HAZ — UN ID UN2915

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
1	Viking	DOT 7A TYPE A	S/N 12		Pu238,Pu239,Pu240,Am241	N/A	0.2	2.10E-3 TBq	9 Kg

10. Identify for Normal Form Only
Physical Form Liquid
Chemical Form Mixture

11.
- ☐ Highway Route Controlled Quantity
- ☒ Exclusive Use Shipment with instructions
- ☐ Placards Applied
- ☒ Fissile Excepted, Grams 1.59E-01
- ☒ UN ID Marking UN2915

12. **LABELS APPLIED** Radioactive Yellow - II

13. **ADDITIONAL LABELS / MARKINGS**

HM 8. Proper Shipping Name: — PRI HAZ — SUB HAZ — UN ID

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

10. Identify for Normal Form Only
Physical Form
Chemical Form

11.
- ☐ Highway Route Controlled Quantity
- ☐ Exclusive Use Shipment with instructions
- ☐ Placards Applied
- ☐ Fissile Excepted, Grams
- ☐ UN ID Marking

12. **LABELS APPLIED**

13. **ADDITIONAL LABELS / MARKINGS**

HM 8. Proper Shipping Name: — PRI HAZ — SUB HAZ — UN ID

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

10. Identify for Normal Form Only
Physical Form
Chemical Form

11.
- ☐ Highway Route Controlled Quantity
- ☐ Exclusive Use Shipment with instructions
- ☐ Placards Applied
- ☐ Fissile Excepted, Grams
- ☐ UN ID Marking

12. **LABELS APPLIED**

13. **ADDITIONAL LABELS / MARKINGS**

14. Shipment DE-Ci: 1.95E-02

Shipment Totals	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
	N/A	0.2	2.10E-3 TBq	9

15. Surface Dose Rate of Package
☐ <0.005 or _____ mSv/hr
<0.5 or <0.2 mrem/hr (N+ß γ)

Dose Rate @ 1 Meter from Surface of Package
☐ <0.005 or _____ mSv/hr
<0.5 or <0.2 mrem/hr (N+ß γ)

Smears of Outer Container
- ☐ <4.0 Bq (220 dpm) ß γ /cm²
- ☐ <0.4 Bq (22 dpm) α /cm²
- ☑ <Tbl. 2-2 HNF-5173 Limits

TRUCK LOAD OR EXCLUSIVE USE
- Surface ☑ <2 mSv/hr (200 mrem/hr)
- @ 2 meters ☑ <0.1 mSv/hr (10 mrem/hr)
- @ Cab or sleeper ☑ <0.02 mSv/hr (2 mrem/hr) (Using N+ß γ)

Additional Data and Instructions (inc. Readings on Internal Packaging)
[illegible]

Bldg. 234-5Z | Survey No. 2100823004 | Date 8/23/10

16. TRANSPORTER
Vehicle Number HO-688-7162
DRIVER SIGNATURE [signature] PRINT NAME MARVIN HUCK

17. RECEIVER
RECEIVER SIGNATURE [signature] PRINT NAME [signature] Date 10-10 8-23-10

18. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.
Certifier's Signature [signature] Print Name Scott Weiss On behalf of DOE-RL Date 8-23-10 Organization CSG

19. AUTHORIZATION FOR SHIPMENT

AIR TRANSPORT CERTIFICATION ☐ N/A

CARGO AIRCRAFT: ☐ Cargo Aircraft Only Labels Applied

PASSENGER AIRCRAFT: ☐ Ltd Qty ☐ Research/Medical Diagnosis ☐ <3 T.I. ☐ Human Medical Research

Pkg. Dimensions (cm)

20. OFFSITE AUTHORIZATION

Survey No.	Date Shipped	Routing	ETA

Approved for Shipment Offsite | Date

A-6003-214.1 (REV 2)

SHIP TO:	HAZARDOUS MATERIAL SHIPMENT RECORD (HMSR)		Shipment# KM020
			Page 1 of 1
Company **ATLII**	Originating Facility/ Building: **PFP**	Originator Signature	Date: 8/23/10
Location **222S Labs**			
	Area: **200 West**	From **CHPRC**	
City, State, Zip **200 West Area**	OFFSITE ONLY:	SHIP: PREPAID [x] COLLECT [ ]	
Attention **Gerald Ritenour 372-2742**		**Cost Code: 300260**	

CONTAINERS/PACKAGING						CONTENT/DESCRIPTION
Number of Containers	Type Container	Package Spec.	Package Dimension	Quantity Pkg (Net)	Gross Wt each pkg	**See 49 CFR 172.101(c) Hazardous Material Table**
1	Drum	1A2	15 Gallon	1.132 Lt.	14 K	**Proper Shipping Name: Corrosive, liquid, acidic, inorganic, n.o.s.** **Hazard Class 8 (7)** **UN/NA No.: UN3264 (Nitric Acid)** **Limited Quantity of Radioactive Material** **List Secondary Hazards: Radioactive PG: II** **List Labels Req'd/Applied: Corrosive ERG: 154**
						Proper Shipping Name: Hazard Class: UN/NA No.: PG: List Secondary Hazards: ERG: List Labels Req'd/Applied:
						Proper Shipping Name: Hazard Class: UN/NA No.: PG: List Secondary Hazards: ERG: List Labels Req'd/Applied:

No. Containers	Gross Wt of Shipment	Identify Placards Required	Identify Property Control or Return Order No.: (if applicable)
1	**14 Kg**	**1 None** 2	**N/A**

	(Circle One)		*Describe Internal Packaging:*
Material in manufacturers original container	Yes	No	**Twelve,125 ml. bottles bagged and placed in a 1 qt. "ice cream**
Container free of deterioration or damage:	Yes	No	**carton" which, are placed upright in a plastic lined 15 gallon**
Container acceptability documented	Yes	No	**drum with chemically compatable absorbent pads.**
Material is packaged, sealed, marked and labeled to meet DOT requirements	Yes	No	

Radiation Release	Survey No.	Date	RM Signature	Print Name
	2-100822004	8/23/10	~~N/A~~ [illegible]	[illegible] Ellingsworth / C Ellingsworth

Transporter		Receiver	
Vehicle Number	Driver Signature	Receiver Signature	Date
HQ-688-7162	[illegible]	[illegible]	8-23-10 10:10

CERTIFICATION

CONTRACTORS CERTIFICATION	This is to certify that the above named-materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation:	This shipment is within the limitations prescribed for: Passenger Aircraft [ ] Cargo Aircraft [ ] NA [x]
	[signature] Scott Weiss 8-23-10 Certification Signature / Print Name / Date	

Emergency Contact 1-888-766-0771	B.L. No. N/A	Date Shipped	ETA	Routing	Special Considerations N/A
	DFSNW Traffic: N/A			DFSNW Shipping N/A	

BC-6002-652 (3/99)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev 66.0

Date Samples Received: 8.25.10 Group #: 20100687/688

Number of Samples: 5

Sample Custodian: [illegible]

Sample Custodian to Complete:

Action	OK? (Y/N)	N/A	Comments
RSA/COC provided?	✓		
RSR provided?	✓		
Verify GKI is complete		✓	on file
Check that outer custody seal is intact, if present	✓		
Record cooler temperature in centigrade, as appropriate		✓	☑ Check if no cooler and/or no ice
Samples are intact and in good condition	✓		If No, provide comments on back
Verify that COC or RSA is accurate and complete, containing the following information:			
• Client name and client sample number	✓		
• Date and time of sampling	✓		
• Sampling location or origin	✓		
• Container type, size, and number	✓		
• Analysis request is clear	✓		
• Signature of persons relinquishing and receiving samples	✓		
• Date and/or time of sample custody exchange	✓		
Verify that sample numbers on containers match the COC and/or RSA	✓		
Samples stored properly (e.g., refrigeration)	✓		

Notify the PM immediately if any problems are noted. (A "No" answer requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? Yes PM Initials BAB Date 8/30/2010

If No, comment on communication and resolution:

Other Comments:

CH2MHill Plateau Remediation Company

20100687

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-008

COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL
PRICE CODE: 9N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: S11; RM 144; Hood 3; Bag of glass waste (Hood 4)	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	SAF NO.: F10-069	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-~~N-507~~-14-35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE	SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: N/A

MATRIX*
A=Air
DL=Drum
Liquids
DS=Drum
Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool 4C~~ None	None
TYPE OF CONTAINER	aG	p
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

6/28/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
24285 (S11)	OTHER LIQUID	JUL 19 2010	1420	X									

bb 7/19/10

bb 7/19/10

bb 7/19/10

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse, CHPRC	JUL 19 2010 530	KD Wilson	JUL 19 2010 530
KD Wilson	8/24/10 1000	Wayne Rieke	8-24-10 1000
Wayne Rieke	8-25-10 1003	Juan F Mendoza	8/25/10 1003
Juan F Mendoza	8-25-10 1045	RHSteele	8-25-10 1045

SPECIAL INSTRUCTIONS
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

☐ ORIGINAL

Grp# 20100688
Snp# 510M000378

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

2010006 7

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-008	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S11; RM 144; Hood 3; Bag of glass waste (Hood 4)	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14.35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

* 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

* ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ 6/28/10

* 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

* ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative~~. 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. 6/28/10
1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH-D (Total petroleum hydrocarbons - kerosene range)~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

Deleted VOA - 8260B Complete & Semi VOA - 8270 Complete by MISTAKE. These analyses are to be conducted.
Bob Cattell 6/28/10

ORIGINAL

A-6003-618(01/06)

20100087

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-009

COLLECTOR: KB Hulse CHPRC

COMPANY CONTACT: WIDRIG, DL

TELEPHONE NO.: 376-2858

PROJECT COORDINATOR: WIDRIG, DL

PRICE CODE: 9N

DATA TURNAROUND: 45 Days / 45 Days

AIR QUALITY: ☐

SAMPLING LOCATION: S12; RM 144; Hood 4; sodium carbonate

PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid

SAF NO.: F10-069

ICE CHEST NO.:

FIELD LOGBOOK NO.: ~~HNF-N-507-~~ 14.35

ACTUAL SAMPLE DEPTH: N/A

COA: 301891ES10

METHOD OF SHIPMENT: GOVERNMENT VEHICLE

SHIPPED TO: 222-S Lab Operations

OFFSITE PROPERTY NO.: N/A

BILL OF LADING/AIR BILL NO.: N/A

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegetation
W=Water
WI=Wipe
O=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool~~ Alone	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

pm 6/28/10

pm 6/28/10

bb 7/19/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME		
24286 (S12)	OTHER LIQUID	JUL 19 2010	1400	X	

bb

bb 7/19/10

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC / KB Hulse	JUL 19 2010 1530	KD Wilson / KDWilson	JUL 19 2010 1530
KDWilson / KDWilson	8/24/10 1000	Wayne Rieke / Wayne A Rieke	8-24-10 1000
Wayne Rieke / Wayne A Rieke	8-25-10 1003	Juan F Mendoza / Juan F Mendoza	8/25/10 10:03
Juan F Mendoza / Juan F Mendoza	8-25-10 1045	Richard R Steele / Richard R Steele	8-25-10 1045
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP # 20100588
SAM # S10M000389

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-009	PAGE 2 OF 2
COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 9N	DATA TURNAROUND
SAMPLING LOCATION: S12; RM 144; Hood 4; sodium carbonate	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069	AIR QUALITY: ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: ~~HNF-N-507-~~ H-35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Br 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ Br 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Br 6/28/10

1) ~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi VOA - 8270B - COMPLETE {Tributyl phosphate} TPH Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

CH2MHill Plateau Remediation Company

20100667

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-021

COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL
PRICE CODE: 9N	DATA TURNAROUND: 45 Days / 45 Days	AIR QUALITY: ☐	
SAMPLING LOCATION: D15; RM 144; Hood 9; Tributyl phosphate	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	SAF NO.: F10-069	
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14.35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE	SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A	BILL OF LADING/AIR BILL NO.: N/A

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, O=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cooled~~ None	None
TYPE OF CONTAINER	aG	PG
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME								
24298 (D15)	OTHER LIQUID	JUL 13 2010	1043	X	X						

bb 7/13/10

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse CHPRC	1315 JUL 13 2010	KDWilson	1315 JUL 13 2010
KDWilson	8/24/10 1000	Wayne Rieke	8-24-10 1000
Wayne Rieke	8-25-10 1003	Juan F Mendoza	8/25/10 1003
Juan F Mendoza	8-25-10 1045	[illegible]	8-25-10 1045

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

GRP# 20100688
SAM# S10M000379

ORIGINAL

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-021	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION D15; RM 144; Hood 9; Tributyl phosphate	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14.35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** 222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.

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(1)VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi-VOA - 8270B - COMPLETE {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range} 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

ORIGINAL

A-6003-618(01/06)

ISOCS Item Report

Item ID:	B24285 (S11)
Date Assayed:	7/22/10
Item Mass, kg:	0.14
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	2.76E-01	4.07E-02	3.58E-01	1.61E-08	2.38E-09	2.09E-08	I
Pu-239	81.361%	3.87E-01	8.96E-02	5.67E-01	6.25E-06	1.44E-06	9.13E-06	M
Pu-240	16.355%	2.85E-01	4.20E-02	3.69E-01	1.26E-06	1.85E-07	1.63E-06	I
Pu-242	0.670%	2.04E-04	3.00E-05	2.64E-04	5.14E-08	7.58E-09	6.66E-08	I
Np-237								
Am-241	2.470%	6.51E-01	9.65E-02	8.44E-01	1.90E-07	2.81E-08	2.46E-07	I
Other TRU								
U-235								
U-238								
Pu-241	1.404%	1.11E+01	1.64E+00	1.44E+01	1.08E-07	1.59E-08	1.40E-07	I
Other								
Other								
Other								

Total Pu, g**	7.676E-06
Total Uncertainty, g***	1.934E-06
Upper Limit, g Pu****	1.154E-05

Total TRU Activity, uCi	1.60E+00
Total Uncertainty, uCi***	2.10E-01
Upper Limit, uCi****	2.02E+00

TRU Specific Activity, nCi/g	1.13E+01
Total Uncertainty, nCi/g***	1.48E+00
Upper Limit, nCi/g****	1.42E+01

Total Activity (TRU + non-TRU), uCi	1.27E+01
Total Uncertainty, uCi***	1.79E+00
Upper Limit, uCi****	1.63E+01

* Codes: M = Activity directly measured by ISOCS.

I = Activity inferred from ISOCS measured Pu-239 and mass fraction using Identified Isotopic source.

C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/29/10

Calculated Date

7/29/10

Reviewed Date

PFP ISOCS V2.00

ISOCS Item Report

Item ID:	B24285 (S11) SOLID
Date Assayed:	7/22/10
Item Mass, kg:	0.01
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	9.44E-02	1.39E-02	1.22E-01	5.51E-09	8.12E-10	7.13E-09	I
Pu-239	81.361%	1.32E-01	2.48E-02	1.82E-01	2.13E-06	4.00E-07	2.93E-06	M
Pu-240	16.355%	9.74E-02	1.43E-02	1.26E-01	4.29E-07	6.32E-08	5.55E-07	I
Pu-242	0.670%	6.96E-05	1.03E-05	9.01E-05	1.76E-08	2.59E-09	2.28E-08	I
Np-237								
Am-241	2.470%	2.22E-01	3.30E-02	2.88E-01	6.48E-08	9.61E-09	8.40E-08	I
Other TRU								
U-235								
U-238								
Pu-241	1.404%	3.81E+00	5.61E-01	4.93E+00	3.68E-08	5.43E-09	4.77E-08	I
Other								
Other								
Other								

Total Pu, g**	2.623E-06
Total Uncertainty, g***	5.573E-07
Upper Limit, g Pu****	3.738E-06

Total TRU Activity, uCi	5.47E-01
Total Uncertainty, uCi***	6.96E-02
Upper Limit, uCi****	6.86E-01

TRU Specific Activity, nCi/g	3.77E+01
Total Uncertainty, nCi/g***	4.80E+00
Upper Limit, nCi/g****	4.73E+01

Total Activity (TRU + non-TRU), uCi	4.35E+00
Total Uncertainty, uCi***	6.11E-01
Upper Limit, uCi****	5.58E+00

* Codes: M = Activity directly measured by ISOCS.
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.
C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/29/10
Calculated Date

7/29/10
Reviewed Date

PFP ISOCS V2.00

ISOCS Item Report

Item ID:	B24286 (S12)
Date Assayed:	7/22/10
Item Mass, kg:	0.11
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	3.34E-01	4.91E-02	4.32E-01	1.95E-08	2.87E-09	2.52E-08	I
Pu-239	81.361%	4.68E-01	9.19E-02	6.52E-01	7.54E-06	1.48E-06	1.05E-05	M
Pu-240	16.355%	3.44E-01	5.07E-02	4.46E-01	1.52E-06	2.23E-07	1.96E-06	I
Pu-242	0.670%	2.46E-04	3.63E-05	3.19E-04	6.21E-08	9.15E-09	8.05E-08	I
Np-237								
Am-241	2.470%	7.86E-01	1.17E-01	1.02E+00	2.29E-07	3.40E-08	2.97E-07	I
Other TRU								
U-235								
U-238								
Pu-241	1.404%	1.35E+01	1.98E+00	1.74E+01	1.30E-07	1.92E-08	1.69E-07	I
Other								
Other								
Other								

Total Pu, g**	9.273E-06
Total Uncertainty, g***	2.044E-06
Upper Limit, g Pu****	1.336E-05

Total TRU Activity, uCi	1.93E+00
Total Uncertainty, uCi***	2.48E-01
Upper Limit, uCi****	2.43E+00

TRU Specific Activity, nCi/g	1.81E+01
Total Uncertainty, nCi/g***	2.32E+00
Upper Limit, nCi/g****	2.27E+01

Total Activity (TRU + non-TRU), uCi	1.54E+01
Total Uncertainty, uCi***	2.16E+00
Upper Limit, uCi****	1.97E+01

* Codes: M = Activity directly measured by ISOCS.
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.
C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/29/10
Calculated Date

7/29/10
Reviewed Date

PFP ISOCS V2.00

RADIOACTIVE SHIPMENT RECORD

3. Page 1 of 1 | 4. Ship Prepaid | 5. Via Site Carrier

1. SHIP FROM U.S. DEPT. OF ENERGY C/O
Company CH2MHILL PRC
Address PFP
City, State, Zip 200 West Area
Contact Jeff Widney
Phone 372-3090

2. SHIP TO ☒ U.S. DEPT. OF ENERGY C/O
Company ATLII
Address 222-S
City, State, Zip 200 West Area
Attention Gerald Ritenour
Phone 372-2742

6. SHIPMENT AUTHORIZATION NUMBER KM016

7. EMERGENCY RESPONSE
Telephone 1-509-373-3800
Emergency Response Guide(s) 163

HM 8. Proper Shipping Name: X Radioactive Material, Type A package — PRI HAZ 7 — SUB HAZ — UN ID UN2915

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
1	Viking	DOT 7A TYPE A	S/N 12		Pu238,Pu239,Pu240,Am241	N/A	0.2	1.20E-6 TBq	9 Kg

10. Identify for Normal Form Only
Physical Form Liquid
Chemical Form Mixture

11.
- ☐ Highway Route Controlled Quantity
- ☒ Exclusive Use Shipment with instructions
- ☐ Placards Applied
- ☒ Fissile Excepted, Grams 1.62E-05
- ☒ UN ID Marking UN2915

12. LABELS APPLIED Radioactive Yellow - II

13. ADDITIONAL LABELS / MARKINGS

~~HM 8. Proper Shipping Name: PRI HAZ SUB HAZ UN ID~~

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

~~10. Identify for Normal Form Only~~
Physical Form
Chemical Form

11.
- ☐ Highway Route Controlled Quantity
- ☐ Exclusive Use Shipment with instructions
- ☐ Placards Applied
- ☐ Fissile Excepted, Grams
- ☐ UN ID Marking

12. LABELS APPLIED

13. ADDITIONAL LABELS / MARKINGS

~~HM 8. Proper Shipping Name: PRI HAZ SUB HAZ UN ID~~

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

~~10. Identify for Normal Form Only~~
Physical Form
Chemical Form

11.
- ☐ Highway Route Controlled Quantity
- ☐ Exclusive Use Shipment with instructions
- ☐ Placards Applied
- ☐ Fissile Excepted, Grams
- ☐ UN ID Marking

12. LABELS APPLIED

13. ADDITIONAL LABELS / MARKINGS

14. Shipment DE-Ci: 6.29e-06

Shipment Totals	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
	N/A	0.2	1.20E-6 TBq	9

15. Surface Dose Rate of Package
- ☐ <0.005 or _____ mSv/hr
- <0.5 or 0.2 mrem/hr (N+ß γ)

Dose Rate @ 1 Meter from Surface of Package
- ☐ <0.005 or _____ mSv/hr
- <0.5 or 0.2 mrem/hr (N+ß γ)

Smears of Outer Container
- ☐ <4.0 Bq (220 dpm) ß γ /cm²
- ☐ <0.4 Bq (22 dpm) α /cm²
- ☒ <Tbl. 2-2 HNF-5173 Limits

TRUCK LOAD OR EXCLUSIVE USE
- Surface ☒ <2 mSv/hr (200 mrem/hr)
- @ 2 meters ☒ <0.1 mSv/hr (10 mrem/hr)
- @ Cab or sleeper ☒ <0.02 mSv/hr (2 mrem/hr) (Using N+ß γ)

Additional Data and Instructions (inc. Readings on Internal Packaging)

Bldg. 734-5Z | Survey No. E-100825004 | Date 8-25-10

16. TRANSPORTER
Vehicle Number: HO-688-7162
DRIVER SIGNATURE: Juan F Mendoza
PRINT NAME: Juan F Mendoza

17. RECEIVER
RECEIVER SIGNATURE: [signature]
PRINT NAME: RFSteele
Date: 8-25-10 1045

18. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Certifier's Signature: Scott Weiss | Print Name: Scott Weiss | On behalf of DOE-RL | Date: 8-25-10 | Organization: CSG

19. AUTHORIZATION FOR SHIPMENT

AIR TRANSPORT CERTIFICATION ☐ N/A

CARGO AIRCRAFT: ☐ Cargo Aircraft Only Labels Applied

PASSENGER AIRCRAFT: ☐ Ltd Qty ☐ Research/Medical Diagnosis ☐ <3 T.I. ☐ Human Medical Research

Pkg. Dimensions (cm)

20. OFFSITE AUTHORIZATION

Survey No.	Date Shipped	Routing	ETA

Approved for Shipment Offsite | Date

A-6003-214.1 (REV 2)

ATL	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST	LO-090-101 Rev EE.0

Date Samples Received: 8.30.10 Group #: 20100688

Number of Samples:

Sample Custodian: [illegible]

Sample Custodian to Complete:

Action	OK? (Y/N)	N/A	Comments
RSA/COC provided?	✓		
RSR provided?	✓		
Verify GKI is complete	✓		
Check that outer custody seal is intact, if present	✓		
Record cooler temperature in centigrade, as appropriate		✓	☐ Check if no cooler and/or no ice
Samples are intact and in good condition	✓		If No, provide comments on back
Verify that COC or RSA is accurate and complete, containing the following information:			
• Client name and client sample number	✓		
• Date and time of sampling			
• Sampling location or origin			
• Container type, size and number			
• Analysis request is clear			
• Signature of persons relinquishing and receiving samples			
• Date and/or time of sample custody exchange			
Verify that sample numbers on containers match the COC and/or RSA			
Samples stored properly (e.g., refrigeration)	✓		

Notify the PM immediately if any problems are noted. (A "No" answer requires Project Manager resolution.)

PM to Complete:

Samples acceptable for release? yes PM Initials RB Date 8/30/2010

If No, comment on communication and resolution:

Other Comments:

20100087

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

F10-069-013

COLLECTOR: KB Hulse, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL
PRICE CODE: 9N	DATA TURNAROUND: 45 Days / 45 Days		
SAMPLING LOCATION: S17; RM 144; Hood 9; A0077 slurp jar	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid	SAF NO.: F10-069	AIR QUALITY: ☐
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14-35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10
METHOD OF SHIPMENT: GOVERNMENT VEHICLE			
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A

MATRIX*: W=Air, DL=Drum, Liquids, DS=Drum, Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool 4C~~ None (AR 6/28/10)	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL 60mL (bb 7/13/10)	60mL (AR 6/28/10)
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME			
24290	OTHER LIQUID	JUL 19 2010	0955	X		

bb 7/19/10

bb 7/19/10

bb 7/19/10

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
KB Hulse, CHPRC	JUL 19 2010 1255	KD Wilson	JUL 19 2010 1255
KD Wilson	8/26/10 1000	Wayne Rich	8-26-10 1000
Wayne Rich	8-30-10 0915	MARVIN Huck	8-30-10 9:15
MARVIN Huck	8-30-10 1316	[illegible]	8.30.10 1316

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

ORIGINAL

Grp # 20100688

S10M000392

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

2010008 7

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-013	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S17; RM 144; Hood 9; A0077 slurp jar	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. ~~HNF-N-507-~~ 14-35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ BL 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Colorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative~~. BL 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. BL 6/28/10

1) ~~VOA - 8260B - COMPLETE {Carbon tetrachloride} Semi-VOA - 8270B - COMPLETE {Tributyl phosphate} TPH-Diesel Range - WTPH-D {Total petroleum hydrocarbons - kerosene range}~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89,90 -- Sr-90; Americium-241 {Americium-241}

OK

A-6003-618(01/06)

CH2MHill Plateau Remediation Company	20100087 CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-014	PAGE 1 OF 2
COLLECTOR: KB Huise, CHPRC	COMPANY CONTACT: WIDRIG, DL	TELEPHONE NO.: 376-2858	PROJECT COORDINATOR: WIDRIG, DL	PRICE CODE: 9N	DATA TURNAROUND
SAMPLING LOCATION: S18; RM 144; Hood 9; A00110 slurp jar	PROJECT DESIGNATION: PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO.: F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO.: HNF-N-507-14.35	ACTUAL SAMPLE DEPTH: N/A	COA: 301891ES10	METHOD OF SHIPMENT: GOVERNMENT VEHICLE	
SHIPPED TO: 222-S Lab Operations	OFFSITE PROPERTY NO.: N/A		BILL OF LADING/AIR BILL NO.: N/A		

MATRIX*: =Air; L=Drum Liquids; S=Drum Solids; =Liquid; =Oil; =Soil; E=Sediment; =Tissue; =Vegetation; W=Water; WI=Wipe; =Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	~~Cool 4C~~ None	None
TYPE OF CONTAINER	aG	P
NO. OF CONTAINER(S)	1	1
VOLUME	125mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Generic Testing (No CAS)

bb 7/19/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
24291	OTHER LIQUID	JUL 19 2010	1025	X								

bb 7/19/10

bb 7/19/10

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: KB Huise, CHPRC	DATE/TIME: JUL 19 2010 1255	RECEIVED BY/STORED IN: KDWilson	DATE/TIME: JUL 19 2010 1255
RELINQUISHED BY/REMOVED FROM: KDWilson	DATE/TIME: 8/26/10 1000	RECEIVED BY/STORED IN: Wayne Rieke	DATE/TIME: 8-26-10 1000
RELINQUISHED BY/REMOVED FROM: Wayne Rieke	DATE/TIME: 8-30-10 0915	RECEIVED BY/STORED IN: MARVIN HUCK	DATE/TIME: 8-30-10 9:15
RELINQUISHED BY/REMOVED FROM: MARVIN HUCK	DATE/TIME: 8-30-10 1:15	RECEIVED BY/STORED IN: R.T. Steele	DATE/TIME: 8.30.10 1316
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

ORIGINAL

Grp # 20100688
S10M000393

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

A-6003-618(01/06)

2010008 7

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F10-069-014	PAGE 2 OF 2
COLLECTOR KB Hulse CHPRC	COMPANY CONTACT WIDRIG, DL	TELEPHONE NO. 376-2858	PROJECT COORDINATOR WIDRIG, DL	PRICE CODE 9N	DATA TURNAROUND
SAMPLING LOCATION S18; RM 144; Hood 9; A00110 slurp jar	PROJECT DESIGNATION PFP A Lab Room 144 Solid Chemical Characterization - Other Liquid		SAF NO. F10-069	AIR QUALITY ☐	45 Days / 45 Days
ICE CHEST NO.	FIELD LOGBOOK NO. HNF-N-507-14 35	ACTUAL SAMPLE DEPTH N/A	COA 301891ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO 222-S Lab Operations	OFFSITE PROPERTY NO. N/A		BILL OF LADING/AIR BILL NO. N/A		

SPECIAL INSTRUCTIONS

** The GKI associated with this SAF shall be provided to 222-S laboratory prior to sample receipt.

** 222-S shall use SW-846, QAPP (ATL-MP-1011), or HASQARD based on which ever methods or documents are applicable to radiochemistry analyses.

** ~~TPH - Kerosene shall be analyzed if SVOA TICs indicate the presence of Contaminant of Concern (COC).~~ Br 6/28/10

** 222-S is to perform titrations for H(+) and OH (-) analyses if pH readings are appropriate (pH<2 or pH>11).

** ~~222-S laboratory shall perform Differential Scanning Calorimetry (DSC) on the generic testing bottle. This analysis is being performed for indication purposes only and the results should be further evaluated in the report narrative.~~ Br 6/28/10

** NDA data shall be sent to Wanda Elliott and Mike Baechler to support transportation activities. It shall also be sent to JR Ritenour and Ruth Bushaw for 222-S laboratory acceptance. Br 6/28/10

1) ~~VOA - 8260B - COMPLETE (Carbon tetrachloride) Semi VOA - 8270B - COMPLETE (Tributyl phosphate) TPH Diesel Range - WTPH D (Total petroleum hydrocarbons - kerosene range)~~ 6020_METALS_ICPMS (TAL) {Arsenic, Lead, Antimony, Barium, Chromium, Cobalt, Cadmium, Copper, Strontium, Thallium, Beryllium, Manganese, Nickel, Vanadium, Silver, Uranium, Selenium} ICP Metals - 6010B (TAL) {Sodium, Aluminum, Potassium, Zinc} Actinides ICPMS {Neptunium-237, Uranium-235, Uranium-234, Uranium-233, Uranium-238, Plutonium-242} Mercury - 7471 - (CV); pH (Soil) - 9045; IC Anions - 9056 {Oxalate, Nitrate, Chloride, Fluoride, Nitrite, Sulfate} Gamma Spectroscopy {Cesium-137, Cobalt-60} Gross Alpha {Gross alpha} Gross Beta {Gross beta} Isotopic Plutonium {Plutonium-239/240, Plutonium-238} Strontium-89;90 -- Sr-90; Americium-241 {Americium-241}

A-6003-618(01/06)

ISOCS Item Report

Item ID:	B24290 (S17)
Date Assayed:	7/21/10
Item Mass, kg:	0.02
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	2.20E+03	3.29E+02	2.86E+03	1.28E-04	1.92E-05	1.67E-04	M, C
Pu-239	81.361%	6.83E+03	7.39E+02	8.30E+03	1.10E-01	1.19E-02	1.34E-01	M
Pu-240	16.355%	4.96E+03	7.41E+02	6.44E+03	2.19E-02	3.27E-03	2.84E-02	M, C
Pu-242	0.670%	3.59E+00	5.29E-01	4.65E+00	9.06E-04	1.33E-04	1.17E-03	I
Np-237		9.63E-02	1.05E-02	1.17E-01	1.37E-04	1.49E-05	1.67E-04	M
Am-241	3.198%	1.48E+04	1.63E+03	1.81E+04	4.32E-03	4.75E-04	5.27E-03	M, C
Other TRU								
U-235		1.47E-02	1.70E-03	1.81E-02	6.81E-03	7.89E-04	8.39E-03	M
U-238								
Pu-241	1.404%	8.90E+04	1.31E+04	1.15E+05	8.61E-04	1.27E-04	1.11E-03	M, C
Other								
Other								
Other								

Total Pu, g**	1.352E-01
Total Uncertainty, g***	1.994E-02
Upper Limit, g Pu****	1.751E-01

Total TRU Activity, uCi	2.88E+04
Total Uncertainty, uCi***	3.28E+03
Upper Limit, uCi****	3.54E+04

TRU Specific Activity, nCi/g	1.32E+06
Total Uncertainty, nCi/g***	1.51E+05
Upper Limit, nCi/g****	1.63E+06

Total Activity (TRU + non-TRU), uCi	1.18E+05
Total Uncertainty, uCi***	1.57E+04
Upper Limit, uCi****	1.49E+05

* Codes: M = Activity directly measured by ISOCS.
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.
C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/29/10
Calculated Date

7/29/10
Reviewed Date

PFP ISOCS V2.00

ISOCS Item Report

Item ID:	B24291 (S18)
Date Assayed:	7/21/10
Item Mass, kg:	0.13
Isotopic Source:	HNF-15500 (DSA)

Isotope	Mass Fraction (% of tot-Pu)	Activity (uCi)	Total Uncrtnty (uCi)	Upper Limit (uCi)	Isotope Mass (g)	Total Uncrtnty (g)	Upper Limit (g)	Codes*
Pu-238	0.210%	3.37E+03	5.09E+02	4.39E+03	1.97E-04	2.97E-05	2.56E-04	M, C
Pu-239	81.361%	1.37E+04	1.49E+03	1.67E+04	2.22E-01	2.40E-02	2.70E-01	M
Pu-240	16.355%	8.40E+03	1.26E+03	1.09E+04	3.70E-02	5.55E-03	4.81E-02	M, C
Pu-242	0.670%	7.23E+00	1.06E+00	9.35E+00	1.82E-03	2.69E-04	2.36E-03	I
Np-237		2.15E-01	2.34E-02	2.62E-01	3.06E-04	3.33E-05	3.73E-04	M
Am-241	1.622%	1.52E+04	1.67E+03	1.85E+04	4.42E-03	4.85E-04	5.39E-03	M, C
Other TRU								
U-235		1.69E-02	2.15E-03	2.12E-02	7.84E-03	9.92E-04	9.83E-03	M
U-238								
Pu-241	1.404%	9.87E+04	1.46E+04	1.28E+05	9.54E-04	1.41E-04	1.24E-03	M, C
Other								
Other								
Other								

Total Pu, g**	2.723E-01
Total Uncertainty, g***	4.014E-02
Upper Limit, g Pu****	3.526E-01

Total TRU Activity, uCi	4.07E+04
Total Uncertainty, uCi***	4.76E+03
Upper Limit, uCi****	5.02E+04

TRU Specific Activity, nCi/g	3.04E+05
Total Uncertainty, nCi/g***	3.56E+04
Upper Limit, nCi/g****	3.75E+05

Total Activity (TRU + non-TRU), uCi	1.39E+05
Total Uncertainty, uCi***	1.83E+04
Upper Limit, uCi****	1.76E+05

* Codes: M = Activity directly measured by ISOCS.
I = Activity inferred from ISOCS measured Pu-239 and mass fraction using identified isotopic source.
C = Mass fraction calculated from measured ISOCS value and total plutonium.

** Based on Pu-239 and mass fraction of Pu-239.

*** Uncertainties stated at 1 standard deviation.

**** The upper limit is the result plus 2 times the uncertainty. The Upper Limit, g Pu is also the PFP Criticality Value.

7/29/10 — Calculated — Date

7/29/10 — Reviewed — Date

PFP ISOCS V2.00

RADIOACTIVE SHIPMENT RECORD

3. Page 1 of 2 | 4. Ship Prepaid | 5. Via Site Carrier

1. SHIP FROM U.S. DEPT. OF ENERGY C/O
Company CH2MHill Plateau Remediation Co.
Address PFP / 200W
City, State, Zip Hanford Site
Contact Steve Heninger
Phone 373-1316

2. SHIP TO ☒ U.S. DEPT. OF ENERGY C/0
Company ATLII
Address 222S Labs
City, State, Zip 200 West Area
Attention Ruth Bushaw
Phone 373-4314

6. SHIPMENT AUTHORIZATION NUMBER KM019

7. EMERGENCY RESPONSE
Telephone 1-509-373-3800
Emergency Response Guide(s) 163

HM 8. Proper Shipping Name: RQ Radioactive Material, transported under special arrangement — PRI HAZ 7 — SUB HAZ — UN ID UN2919

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
1	Steel drum	DOT 7A Type A	0074571	NA	Pu238,Pu239,Pu24,Am241	N/A	0.2	9.52E-3 TBq	46

10. Identify for Normal Form Only
Physical Form Solid
Chemical Form Oxide

11.
☐ Highway Route Controlled Quantity
☒ Exclusive Use Shipment with instructions
☐ Placards Applied
☒ Fissile Excepted, Grams 0.35
☒ UN ID Marking 2919

12. LABELS APPLIED Radioactive Yellow - II

13. ADDITIONAL LABELS / MARKINGS

HM 8. Proper Shipping Name: — PRI HAZ — SUB HAZ — UN ID

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

10. Identify for Normal Form Only
Physical Form
Chemical Form

11.
☐ Highway Route Controlled Quantity
☐ Exclusive Use Shipment with instructions
☐ Placards Applied
☐ Fissile Excepted, Grams
☐ UN ID Marking

12. LABELS APPLIED

13. ADDITIONAL LABELS / MARKINGS

HM 8. Proper Shipping Name: — PRI HAZ — SUB HAZ — UN ID

9. No. Pkg.	Model Package	COC/Spec	Serial No.	Seal No.	Isotopes	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.

10. Identify for Normal Form Only
Physical Form
Chemical Form

11.
☐ Highway Route Controlled Quantity
☐ Exclusive Use Shipment with instructions
☐ Placards Applied
☐ Fissile Excepted, Grams
☐ UN ID Marking

12. LABELS APPLIED

13. ADDITIONAL LABELS / MARKINGS

14. Shipment DE-Ci: 6.76E-02

Shipment Totals	C.S.I.	T.I.	Bq/Package	Gr. Wt. Kg.
	N/A	0.2	9.52E-3 TBq	46

15. Surface Dose Rate of Package
☐ <0.5 or _____ mSv/hr
<0.5 or <0.05 mrem/hr (N+ß γ)

Dose Rate @ 1 Meter from Surface of Package
☐ <0.005 or _____ mSv/hr
<0.5 or <0.2 mrem/hr (N+ß γ)

Smears of Outer Container
☐ <4.0 Bq (220 dpm) ß γ /cm²
☐ <0.4 Bq (22 dpm) α /cm²
☒ <Tbl. 2-2 HNF-5173 Limits

TRUCK LOAD OR EXCLUSIVE USE
Surface ☒ <2 mSv/hr (200 mrem/hr)
@ 2 meters ☐ <0.1 mSv/hr (10 mrem/hr)
@ Cab or sleeper ☒ <0.02 mSv/hr (2 mrem/hr) (Using N+ß γ)

Additional Data and Instructions (inc. Readings on Internal Packaging)

Bldg. 234-5Z | Survey No. 2-100826010 | Date 8/30/10

16. TRANSPORTER

Vehicle Number	DRIVER SIGNATURE	PRINT NAME
HO-68B-7162	[signature]	MARION HUCK

17. RECEIVER

RECEIVER SIGNATURE	PRINT NAME	Date
[signature]	R T STEELE	13:16 8-30-10

18. This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Certifier's Signature	Print Name	On behalf of DOE-RL	Date	Organization
[signature]	Scott Weiss			CSG

19. AUTHORIZATION FOR SHIPMENT

AIR TRANSPORT CERTIFICATION ☐ N/A

CARGO AIRCRAFT: ☐ Cargo Aircraft Only Labels Applied

PASSENGER AIRCRAFT: ☐ Ltd Qty ☐ Research/Medical Diagnosis ☐ <3 T.I. ☐ Human Medical Research

Pkg. Dimensions (cm)

20. OFFSITE AUTHORIZATION

Survey No.	Date Shipped	Routing	ETA

Approved for Shipment Offsite | Date

A-6003-214.1 (REV 2)

GENERATOR KNOWLEDGE INFORMATION

1. Chain of Custody Number F10-069-XXX CACN/COA 301891 Customer Identification Number #'s D15 & D21

2. List generator knowledge or description of process that produced sample. Or list description of sample source:
Samples are from chemicals used at the PFP A Labs; currently in room 144.

MSDS Available? (●) No ( ) Yes Hanford MSDS No. N/A

3. List all waste codes and constituents associated with the waste or media that was sampled, regardless of CERCLA status.

a) Does the sample contain any of the following listed waste codes?
By checking "unknown" the customer understands that no knowledge is available following a careful search.

	List Federal Waste Code(s):	List Constituent(s):			
P Codes:			( ) Yes	(●) No	( ) Unknown
U Codes:			( ) Yes	(●) No	( ) Unknown
K Codes:			( ) Yes	(●) No	( ) Unknown
F Codes:			( ) Yes	(●) No	( ) Unknown

b) List applicable characteristic waste codes, flash point, pH, constituents, and concentrations as appropriate.

D001:	[ ] FP <100°F	[ ] FP ≥100 <140°F	[ ] DOT Oxidizer	( ) Yes	( ) No	(●) Unknown
D002:	[ ] pH ≤2	[ ] pH ≥12.5	[ ] Solid Corrosive (WSC2)	( ) Yes	( ) No	(●) Unknown
D003:	[ ] Cyanide	[ ] Sulfide	[ ] Water Reactive	[ ] Other _____ (i.e., peroxide former, explosive, air reactive)	( ) Yes	( ) No	(●) Unknown
D004-D043 (Identify applicable waste codes and concentrations):					( ) Yes	( ) No	(●) Unknown

c) If characteristic, list any known underlying hazardous constituents (UHCs) reasonably expected to be present, and their concentrations that may be present above the LDR treatment standard (40 CFR 268.48):
Unknown

d) List any known Land Disposal Restrictions (LDR) subcategories, if applicable (40 CFR 268.40):
Unknown

e) List any applicable Washington State dangerous waste codes: (not required if federally regulated)

WT01:	( ) Yes	(●) No	( ) Unknown
WT02:	( ) Yes	(●) No	( ) Unknown
W001:	( ) Yes	(●) No	( ) Unknown

List constituents and concentrations:

(*State mixture rule for ignitability)

WP01:	( ) Yes	(●) No	( ) Unknown
WP02:	( ) Yes	(●) No	( ) Unknown
WP03:	( ) Yes	(●) No	( ) Unknown
F003:*	( ) Yes	(●) No	( ) Unknown

4. Is this material TSCA regulated for PCBs? ( ) Yes (●) No ( ) Unknown ( ) Analysis Requested

List concentration if applicable: _____

If yes, what is the source of the PCBs? (see TSCA PCB Hanford Site User Guide, DOE/RL-2001-50)

[ ] PCB Liquid Waste [ ] PCB Bulk Product Waste [ ] PCB Transformer ≥500 ppm [ ] Unknown
[ ] PCB Remediation Waste [ ] PCB R&D Waste [ ] PCB contaminated electrical equipment (capacitor/ballast) <500 ppm
[ ] PCB Spill Material [ ] PCB Item [ ] Other PCB Waste (list) _____

5. Is this material TRU? (●) Yes ( ) No ( ) Unknown

6. ACCURACY OF INFORMATION

Based on my inquiry of those individuals immediately responsible for obtaining this information, that to the best of my knowledge, the information entered in this document is true, accurate, and complete.

Print & Sign Bob Cathel Bob Cathel Date 7/7/10

A-6002-990 (08/03)

GENERATOR KNOWLEDGE INFORMATION

1. Chain of Custody Number F10-069-XXX CACN/COA 301891 Customer Identification Number See item #2

2. List generator knowledge or description of process that produced sample. Or list description of sample source:
Samples are from chemicals used at the PFP A Labs; currently in room 144. Sample ID's include S2, S3, S4, S6, S8, S9, S11, S12, S14, S18, S27, S29 & S33.

MSDS Available? (•) No ( ) Yes Hanford MSDS No. N/A

3. List all waste codes and constituents associated with the waste or media that was sampled, regardless of CERCLA status.

a) Does the sample contain any of the following listed waste codes?
By checking "unknown" the customer understands that no knowledge is available following a careful search.

	List Federal Waste Code(s):	List Constituent(s):			
P Codes:			( ) Yes	(•) No	( ) Unknown
U Codes:			( ) Yes	(•) No	( ) Unknown
K Codes:			( ) Yes	(•) No	( ) Unknown
F Codes:			( ) Yes	(•) No	( ) Unknown

b) List applicable characteristic waste codes, flash point, pH, constituents, and concentrations as appropriate.

D001:	[ ] FP <100°F	[ ] FP ≥100 <140°F	[ ] DOT Oxidizer	( ) Yes	( ) No	(•) Unknown
D002:	[ ] pH ≤2	[ ] pH ≥12.5	[ ] Solid Corrosive (WSC2)	( ) Yes	( ) No	(•) Unknown
D003:	[ ] Cyanide	[ ] Sulfide	[ ] Water Reactive	[ ] Other _____	( ) Yes	( ) No	(•) Unknown
D004-D043 (Identify applicable waste codes and concentrations):				(i.e., peroxide former, explosive, air reactive)	( ) Yes	( ) No	(•) Unknown

c) If characteristic, list any known underlying hazardous constituents (UHCs) reasonably expected to be present, and their concentrations that may be present above the LDR treatment standard (40 CFR 268.48):
Unknown

d) List any known Land Disposal Restrictions (LDR) subcategories, if applicable (40 CFR 268.40):
Unknown

e) List any applicable Washington State dangerous waste codes: (not required if federally regulated)

WT01:	( ) Yes	(•) No	( ) Unknown
WT02:	( ) Yes	(•) No	( ) Unknown
W001:	( ) Yes	(•) No	( ) Unknown

List constituents and concentrations:

(*State mixture rule for ignitability)

WP01:	( ) Yes	(•) No	( ) Unknown
WP02:	( ) Yes	(•) No	( ) Unknown
WP03:	( ) Yes	(•) No	( ) Unknown
F003:*	( ) Yes	(•) No	( ) Unknown

4. Is this material TSCA regulated for PCBs? ( ) Yes (•) No ( ) Unknown ( ) Analysis Requested

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If yes, what is the source of the PCBs? (see TSCA PCB Hanford Site User Guide, DOE/RL-2001-50)

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[ ] PCB Spill Material [ ] PCB Item [ ] Other PCB Waste (list) _____

5. Is this material TRU? (•) Yes ( ) No ( ) Unknown

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Print & Sign Bob Cathel Bob Cathel Date 7/7/10

A-6002-990 (08/03)

GENERATOR KNOWLEDGE INFORMATION

1. Chain of Custody Number F10-069-XXX CACN/COA 301891 Customer Identification Number See item #2

2. List generator knowledge or description of process that produced sample. Or list description of sample source:
Samples are from chemicals used at the PFP A Labs; currently in room 144. Sample ID's include S13, S15, S17, S19, S20, S23, S24, S30, S31, S32, S34 & D16.

MSDS Available? (●) No ( ) Yes Hanford MSDS No. N/A

3. List all waste codes and constituents associated with the waste or media that was sampled, regardless of CERCLA status.

a) Does the sample contain any of the following listed waste codes?

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D002:	☒ pH ≤2	☐ pH ≥12.5	☐ Solid Corrosive (WSC2)	(●) Yes	( ) No	( ) Unknown
D003:	☐ Cyanide	☐ Sulfide	☐ Water Reactive ☐ Other _____	( ) Yes	( ) No	(●) Unknown
D004-D043 (Identify applicable waste codes and concentrations):			(i.e., peroxide former, explosive, air reactive)	( ) Yes	( ) No	(●) Unknown

c) If characteristic, list any known underlying hazardous constituents (UHCs) reasonably expected to be present, and their concentrations that may be present above the LDR treatment standard (40 CFR 268.48):
Unknown

d) List any known Land Disposal Restrictions (LDR) subcategories, if applicable (40 CFR 268.40):
Unknown

e) List any applicable Washington State dangerous waste codes: (not required if federally regulated)

WT01:	( ) Yes	(●) No	( ) Unknown
WT02:	( ) Yes	(●) No	( ) Unknown
W001:	( ) Yes	(●) No	( ) Unknown

List constituents and concentrations:

(*State mixture rule for ignitability)

WP01:	( ) Yes	(●) No	( ) Unknown
WP02:	( ) Yes	(●) No	( ) Unknown
WP03:	( ) Yes	(●) No	( ) Unknown
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☐ PCB Remediation Waste ☐ PCB R&D Waste ☐ PCB contaminated electrical equipment (capacitor/ballast) <500 ppm
☐ PCB Spill Material ☐ PCB Item ☐ Other PCB Waste (list) _____

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A-6002-990 (08/03)