

# TABLE OF CONTENTS

Case Narrative.....	1
Chain of Custody and Supporting Documentation.....	3
Radiological Analysis.....	8
Sample Data Summary.....	22
Quality Control Data.....	26
Raw Data.....	32
Method Calibration Data.....	169
Continuing Calibration Data.....	650
Background and Efficiency Data.....	692
Quality Control Charts.....	757
Standards Data.....	846
Runlogs.....	904

# Case Narrative

**CASE NARRATIVE**  
**for**  
**MWH LABORATORIES**  
**MWH PROJECT: 99-22321/170226**  
**TRONOX HENDERSON SITE**  
**SDG: 159247**

**April 27, 2006**

**Laboratory Identification:**

General Engineering Laboratories, LLC  
2040 Savage Road  
Charleston, South Carolina 29407  
(843) 556-8171

**Summary**

**Sample receipt** The sample arrived at General Engineering Laboratories, LLC, Charleston, South Carolina on March 28, 2006 for analysis. Shipping container temperature was checked, documented, and within specifications. The sample was delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

**Sample Identification** The laboratory received the following sample:

<b><u>Laboratory ID</u></b>	<b><u>Client ID</u></b>
159247001	2603230069 M-120

**Case Narrative**

Sample analyses were conducted using methodology as outlined in General Engineering Laboratories (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

**Data Package**

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Radiochemistry.

This data package, to the best of my knowledge, is in compliance with technical and administrative requirements.



Edith Kent

Project Manager

# **Chain of Custody and Supporting Documentation**



MWH Laboratories  
 A Division of MWH Americas, Inc.  
 750 Royal Oaks Drive Suite 100  
 Monrovia, CA 91016-3629  
 Ph (626) 386-1100 Fax (626) 386-1095

Ship To **Edie Kent**

**General Engineering Laboratories, LLC**  
 2040 Savage Road  
 Charleston, SC 29414

(843) 556-8171 X4433 Fax (843) 766-1178

MWH Project # Report Due: Sub PO#  
 170226 04/11/06 99-22321

JDJ  
 Use MWH Lab # for ID

Date **03/27/06** **Submittal Form & Purchase Order 99-22321**  
 \*REPORTING REQUIREMENTS: Do Not Combine Report with any other samples submitted under different MWH project numbers!  
 Report & Invoice must have the MWH Project Number **170226** Sub PO# **99-22321** and Job # **Find Out**  
 Report all quality control data according to Method. Include dates analyzed, date extracted (if extracted) and Method reference on the report.  
 Results must have Complete data & QC with Approval Signature. See reverse side for List of Terms and Conditions

Reports: Julie Lee Sub-contracting Administrator  
 EMAIL TO: Julie.Lee@mwhglobal.com  
 MWH Laboratories 750 Royal Oaks Dr. Ste. 100, Monrovia, CA 91016  
 Phone (626) 386-1136 Fax (626) 386-1095  
 Invoices to: MWH LABORATORIES  
 Accounts Payable PO BOX 6610, Broomfield, CO 80021

Provide in each Report  
 the Specified State  
 Certification # & Exp Date for  
 requested tests + matrix

CA ELAP OK

Client Sample ID for reference only Analysis Requested Sample Date & Time Matrix Container

	Analysis Requested	Sample Date & Time	Matrix	Container
1	RADIUM 226	03/22/06 10:20	grnd	10 1L bottles
2	RADIUM 228			
3	LEAD 210			
4	LEAD212			
5	THORIUM (ISOTOPIC)			
6	URANIUM (ISOTOPIC)			
7	URANIUM (TOTAL)			
8	PRONACTINIUM 231			
9	ACTINIUM 228			
10	BISMUTH 212			
11	GROSS ALPHA (ADJUSTED)			
12	POLONIUM 210			

Relinquished by: *Nicky Yasa* Date **03/27/06** Time **1503** MUST HAVE NOTIFICATION IF TEMP IS GREATER THAN 6 OR LESS THAN 2 CELSIUS  
 Received by: *Sharon* Date **3/28/06** Time **1000** Page 1 An Acknowledgement of Receipt is requested to attn: Julie Lee



MWH Laboratories  
 A Division of MWH Americas, Inc.  
 750 Royal Oaks Drive Suite 100  
 Monrovia, CA 91016-3629  
 Ph (626) 386-1100 Fax (626) 386-1095

Ship To **Edie Kent**

**General Engineering Laboratories, LLC**

**2040 Savage Road  
 Charleston, SC 29414**

(843) 556-8171 X4433 Fax (843) 766-1178

MWH Project # **170226** Report Due: **04/11/06** Sub PO# **99-22321**

JDL

Use MWH Lab # for ID

Client Sample ID for reference only Analysis Requested Sample Date & Time Matrix Container

CUSTSUB	2603230069	M-120	RADIUM 226	03/22/06 10:20	grnd 10 1L bottles	
			RADIUM 228			
			LEAD 210			
			LEAD212			
			THORIUM (ISOTOPIC)			
			URANIUM (ISOTOPIC)			
			URANIUM (TOTAL)			
			PRONACTINIUM 231			
			ACTINIUM 228			
			BISMUTH 212			
			GROSS ALPHA (ADJUSTED)			
			POLONIUM 210			

Reports: Julie Lee Sub-contracting Administrator  
 EMAIL TO: Julie.Lee@mwhglobal.com  
 MWH Laboratories 750 Royal Oaks Dr. Ste. 100, Monrovia, CA 91016  
 Phone (626) 386-1136 Fax (626) 386-1095  
 Invoices to: MWH LABORATORIES  
 Accounts Payable PO BOX 6610, Broomfield, CO 80021

M-120 EXTRA VOLUME PROVIDED QC AS DISCUSSED WITH EDIE.

Provide in each Report  
 the Specified State  
 Certification # & Exp Date for  
 requested tests + matrix  
**CA ELAP OK**

Date **03/27/06** Submittal Form & Purchase Order **99-22321**

\*REPORTING REQUIREMENTS: Do Not Combine Report with any other samples submitted under different MWH project numbers!  
 Report & Invoice must have the MWH Project Number **170226** Sub PO# **99-22321** and Job # **Find Out**

Report all quality control data according to Method. Include dates analyzed, date extracted (if extracted) and Method reference on the report  
 Results must have Complete data & QC with Approval Signature. See reverse side for List of Terms and Conditions

Relinquished by: *Michelle Yusa* Sample Control Date **03/27/06** Time **1600** MUST HAVE NOTIFICATION IF TEMP IS GREATER THAN 6 OR LESS THAN 2 CELSIUS  
 Received by: *Quiana Galt* Date **3/28/06** Time **1000** Page 1  
 An Acknowledgement of Receipt is requested to attn: Julie Lee



# SAMPLE RECEIPT & REVIEW FORM

PM use only

<b>Client:</b> <u>MWH</u>	<b>SDG/ARCOC/Work Order:</b>
<b>Date Received:</b> <u>3/28/06</u>	<b>PM(A) Review (ensure non-conforming items are resolved prior to signing):</b>
<b>Received By:</b> <u>[Signature]</u>	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	/			Circle Applicable: seals broken damaged container leaking container other (describe)
2 Samples requiring cold preservation within (4 +/- 2 C)? Record preservation method.	/			Circle Coolant # ice bags <u>blue ice</u> dry ice none other describe <u>2°C</u>
3 Chain of custody documents included with shipment?	/			
4 Sample containers intact and sealed?	/			Circle Applicable: seals broken damaged container leaking container other (describe)
5 Samples requiring chemical preservation at proper pH?	/			Sample ID's, containers affected and observed pH:
6 VOA vials free of headspace (defined as < 6mm bubble)?		/		Sample ID's and containers affected:
7 Are Encore containers present? (If yes, immediately deliver to VOA laboratory)			/	
8 Samples received within holding time?	/			Id's and tests affected:
9 Sample ID's on COC match ID's on bottles?	/			Sample ID's and containers affected:
10 Date & time on COC match date & time on bottles?	/			Sample ID's affected:
11 Number of containers received match number indicated on COC?			/	Sample ID's affected: <u>See Continuation Sheet</u>
12 COC form is properly signed in relinquished/received sections?	/			

14	Air Bill ,Tracking #'s, & Additional Comments	<u>5548 - 32</u> <u>FX 16912 3665 5684 - 2°C</u>
----	---	---

Suspected Hazard Information	Non-Regulated	Regulated	High Level	RSO RAD Receipt # _____ *If > x2 area background is observed on samples identified as "non-regulated/non-radioactive", contact the Radiation Safety group for further investigation.
A Radiological Classification?	/			Maximum Counts Observed*: <u>0 PM 60</u>
B PCB Regulated?	/			Comments:
C Shipped as DOT Hazardous Material? If yes, contact Waste Manager or ESH Manager.	/			Hazard Class Shipped: UN#:

PM (or PMA) review of Hazard classification:	Initials	Date:
--	----------	-------



# SAMPLE RECEIPT & REVIEW FORM CONTINUATION FORM

NWH Laboratories

3/23/06

Received 10 containers w/ID# 2603230009  
5 Containers w/ID# 2603250005  
5 Containers w/ID# 2603230197  
5 Containers w/ID# 2603240118  
5 Containers w/ID# 2603240122  
5 Containers w/ID# 2603240135

Labels 2603240119  
2603240111  
2603240120

ARE ALL on the same sample  
container  
RECEIVE 5 Containers



# RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative  
MWH Laboratories (MWHL)  
Work Order 159247**

**Method/Analysis Information**

**Product:** Alphaspec Po210, liquid  
Analytical Method: DOE EML HASL-300, Po-01-RC Modified  
Analytical Batch Number: 520802

<b>Sample ID</b>	<b>Client ID</b>
159247001	2603230069 M-120
1201071152	Method Blank (MB)
1201071153	159247001(2603230069 M-120) Sample Duplicate (DUP)
1201071154	159247001(2603230069 M-120) Matrix Spike (MS)
1201071155	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-016 REV# 8.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 159247001 (2603230069 M-120).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Sample 1201071152 (MB) was recounted due to poor resolution.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Additional Comments**

The blank 1201071152 (MB) does have lower resolution, however it meets the tracer yield requirement and has no activity.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Alphaspec Th, Liquid  
**Analytical Method:** DOE EML HASL-300, Th-01-RC Modified  
**Analytical Batch Number:** 520798

<b>Sample ID</b>	<b>Client ID</b>
159247001	2603230069 M-120
1201071140	Method Blank (MB)
1201071141	159242003(2603240135 M-121) Sample Duplicate (DUP)
1201071142	159242003(2603240135 M-121) Matrix Spike (MS)
1201071143	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-038 REV# 9.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 159242003 (2603240135 M-121).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:****Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Sample 159247001 (2603230069 M-120) was recounted due to a suspected false positive.

**Miscellaneous Information:****NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Alphaspec U, Liquid  
**Analytical Method:** DOE EML HASL-300, U-02-RC Modified  
**Analytical Batch Number:** 520799

<b>Sample ID</b>	<b>Client ID</b>
159247001	2603230069 M-120
1201071144	Method Blank (MB)
1201071145	159242003(2603240135 M-121) Sample Duplicate (DUP)
1201071146	159242003(2603240135 M-121) Matrix Spike (MS)
1201071147	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 14.

**Calibration Information:****Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 159242003 (2603240135 M-121).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Sample 1201071145 (2603240135 M-121) was recounted due to poor resolution.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Manual Integration**

No manual integrations were performed on data in this batch.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Gamma, (Ac-228, Bi-212, Pb-212, Pa-231)  
**Analytical Method:** EPA 901.1  
**Analytical Batch Number:** 519510

Sample ID	Client ID
159247001	2603230069 M-120
1201068236	Method Blank (MB)
1201068237	159247001(2603230069 M-120) Sample Duplicate (DUP)
1201068238	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 10.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 159247001 (2603230069 M-120).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. The following NCR was generated for this SDG:  
NCR 311620 was generated due to RDL less than MDA. 1. RDL less than MDA: 159247 001 1201068236  
1201068237 See attached "Failed RDL Report" Samples did not meet the required detection limit due to limited sample volume. 1. Reporting results. Client granted permission to send the data. Samples counted for 600 minutes.

**Qualifier information**

Qualifier	Reason	Analyte	Sample
UI	Data rejected due to low abundance.	Bismuth-212	159247001
		Lead-212	159247001
			1201068236

**Method/Analysis Information**

**Product:** GFPC, Pb210, Liquid

Analytical Method: DOE RP280 Modified  
Analytical Batch Number: 520607

<b>Sample ID</b>	<b>Client ID</b>
159247001	2603230069 M-120
1201070733	Method Blank (MB)
1201070734	159242003(2603240135 M-121) Sample Duplicate (DUP)
1201070735	159242003(2603240135 M-121) Matrix Spike (MS)
1201070736	Laboratory Control Sample (LCS)

#### **SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-018 REV# 5.

#### **Calibration Information:**

##### **Calibration Information**

All initial and continuing calibration requirements have been met.

##### **Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

##### **Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

#### **Quality Control (QC) Information:**

##### **Blank Information**

The blank volume is representative of the sample volume in this batch.

##### **Designated QC**

The following sample was used for QC: 159242003 (2603240135 M-121).

##### **QC Information**

All of the QC samples met the required acceptance limits.

#### **Technical Information:**

##### **Holding Time**

All sample procedures for this sample set were performed within the required holding time.

##### **Preparation Information**

All preparation criteria have been met for these analyses.

##### **Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

##### **Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

#### **Miscellaneous Information:**

##### **NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** GFPC, Gross Alpha Liquid  
**Analytical Method:** EPA 900.0  
**Analytical Batch Number:** 521039

<b>Sample ID</b>	<b>Client ID</b>
159247001	2603230069 M-120
1201071723	Method Blank (MB)
1201071724	159247001(2603230069 M-120) Sample Duplicate (DUP)
1201071725	159247001(2603230069 M-120) Matrix Spike (MS)
1201071726	Laboratory Control Sample (LCS)
1201071728	159247001(2603230069 M-120) Matrix Spike Duplicate (MSD)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-001 REV# 9.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 159247001 (2603230069 M-120).

**QC Information**

Samples 1201071725 (2603230069 M-120) and 1201071728 (2603230069 M-120) did not meet the alpha recovery requirement due to the matrix of the sample. The samples are similar in results.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.



**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**Gross Alpha/Beta Preparation Information**

High hygroscopic salt content in evaporated samples can cause the sample mass to fluctuate due to moisture absorption. To minimize this interference, the salts are converted to oxides by heating the sample under a flame until a dull red color is obtained. The conversion to oxides stabilizes the sample weight and ensures that proper alpha/beta efficiencies are assigned for each sample. Volatile radioisotopes of carbon, hydrogen, technetium, polonium and cesium may be lost during sample heating.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** GFPC, Ra228, Liquid  
Analytical Method: EPA 904.0 Modified  
Analytical Batch Number: 515983

Sample ID	Client ID
159247001	2603230069 M-120
1201060416	Method Blank (MB)
1201060417	159242003(2603240135 M-121) Sample Duplicate (DUP)
1201060418	159242003(2603240135 M-121) Matrix Spike (MS)
1201060419	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-009 REV# 12.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 159242003 (2603240135 M-121).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Chemical Recoveries**

All chemical recoveries meet the required acceptance limits for this sample set.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** Lucas Cell, Ra226, liquid  
**Analytical Method:** EPA 903.1 Modified  
**Analytical Batch Number:** 518058

<b>Sample ID</b>	<b>Client ID</b>
159247001	2603230069 M-120
1201064983	Method Blank (MB)
1201064984	159247001(2603230069 M-120) Sample Duplicate (DUP)
1201064985	159247001(2603230069 M-120) Matrix Spike (MS)
1201064986	Laboratory Control Sample (LCS)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-008 REV# 9.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 159247001 (2603230069 M-120).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

None of the samples in this sample set required reprep or reanalysis.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Additional Comments**

The MDA for sample 159247001 (2603230069 M-120) was used to calculate the relative percent difference.

**Qualifier information**

Manual qualifiers were not required.

**Method/Analysis Information**

**Product:** KPA, Total U, Liquid  
Analytical Method: ASTM D 5174  
Analytical Batch Number: 523680

<b>Sample ID</b>	<b>Client ID</b>
159247001	2603230069 M-120

1201077880	Method Blank (MB)
1201077881	159242003(2603240135 M-121) Sample Duplicate (DUP)
1201077882	159242003(2603240135 M-121) Matrix Spike (MS)
1201077883	Laboratory Control Sample (LCS)
1201077884	Laboratory Control Sample Duplicate (LCSD)

**SOP Reference**

Procedure for preparation, analysis and reporting of analytical data are controlled by General Engineering Laboratories, LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-023 REV# 11.

**Calibration Information:**

**Calibration Information**

All initial and continuing calibration requirements have been met. The calibration for Total Uranium is performed prior to each analysis and is located in the raw data section.

**Standards Information**

Standard solution(s) for these analyses are NIST traceable and used before the expiration date(s).

**Sample Geometry**

All counting sources were prepared in the same geometry as the calibration standards.

**Quality Control (QC) Information:**

**Blank Information**

The blank volume is representative of the sample volume in this batch.

**Designated QC**

The following sample was used for QC: 159242003 (2603240135 M-121).

**QC Information**

All of the QC samples met the required acceptance limits.

**Technical Information:**

**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

**Preparation Information**

All preparation criteria have been met for these analyses.

**Sample Re-prep/Re-analysis**

Initial results of samples 1201077881 (2603240135 M-121) and 159247001 (2603230069 M-120) were greater than RDL. Samples were reanalyzed and verified initial results. The initial results are reported.

**Miscellaneous Information:**

**NCR Documentation**

Nonconformance reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A nonconformance report (NCR) was not generated for this SDG.

**Qualifier information**

Manual qualifiers were not required.

**Certification Statement**

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

**Review Validation:**

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

**The following data validator verified the information presented in this case narrative:**

Reviewer/Date:  4/27/06

**COMPANY - WIDE NONCONFORMANCE REPORT**

<b>Mo.Day Yr.</b> 27-APR-06	<b>Division:</b> Radiochemistry	<b>Quality Criteria:</b> Specifications	<b>Type:</b> Process
<b>Instrument Type:</b> GAMMA SPECTROMETER	<b>Test / Method:</b> EPA 901.1	<b>Matrix Type:</b> Liquid	<b>Client Code:</b> MWHL
<b>Batch ID:</b> 519510	<b>Sample Numbers:</b> See Below		
<b>Potentially affected work order(s)(SDG): 158272,158275,158276,158277,158436,158971,159242,159243,159244,159247</b>			
<b>Application Issues:</b> RDL less than MDA			
<b>Specification and Requirements</b>		<b>NRG Disposition:</b>	
<b>Nonconformance Description:</b>			
<p>1. RDL less than MDA:</p> <p>159247 001          1201068236          1201068237</p> <p>See attached "Failed RDL Report"</p> <p>Samples did not meet the required detection limit due to limited sample volume.</p>		<p>1. Reporting results. Client granted permission to send the data. Samples counted for 600 minutes.</p>	

**Originator's Name:**  
 Jodi Cummings 27-APR-06

**Data Validator/Group Leader:**  
 Heather Anderson 27-APR-06

**Quality Review:**

**Director:**

# SAMPLE DATA SUMMARY

**GENERAL ENGINEERING LABORATORIES, LLC**  
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

**Certificate of Analysis Report  
for**

MWHL002 MWH Laboratories

Client SDG: 159247 GEL Work Order: 159247

**The Qualifiers in this report are defined as follows:**

- \* Indicates that a quality control analyte recovery is outside of specified acceptance criteria.
- < Result is less than amount reported.
- > Result is greater than amount reported.
- B Target analyte was detected in the sample as well as the associated blank.
- BD Results below the MDC or low tracer recovery.
- D Sample has been diluted and reanalyzed after initially exceeding inst. calibration range
- E Concentration of the target analyte exceeds the instrument calibration range.
- H Analytical holding time exceeded.
- J Indicates an estimated value.
- P The response between the confirmation and the primary columns is >40% Different.
- R Sample results are rejected.
- U Target analyte was analyzed for but not detected above the MDL, MDA, or LOD.
- UI Uncertain identification for gamma spectroscopy.
- X Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.
- Y QC Samples were not spiked with this compound.
- Z Paint Filter qualifier: Particulates passed through the filter. No free liquids were observed.
- d The 2:1 depletion requirement was not met for this sample
- h Sample preparation or preservation holding time exceeded.
- ND The analyte concentration is not detected above the reporting limit.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

\*\* Indicates the analyte is a surrogate compound.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories, LLC standard operating procedures. Please direct any questions to your Project Manager, Edith Kent.



Reviewed by \_\_\_\_\_



# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556–8171 – www.gel.com

## Certificate of Analysis

Company : MWH Laboratories  
 Address : 750 Royal Oaks Drive, Suite 100  
 Monrovia, California 91016

Report Date: April 27, 2006

Contact: Ms. Julie Lee  
 Project: **Tronox Henderson**

Client Sample ID:	2603230069 M-120	Project:	MWHL00106
Sample ID:	159247001	Client ID:	MWHL002
Matrix:	Ground Water		
Collect Date:	22-MAR-06 10:20		
Receive Date:	28-MAR-06		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
<b>Rad Alpha Spec Analysis</b>											
<i>Alphaspec Po210, liquid</i>											
Polonium-210	U	-0.0487	+/-0.178	0.603	1.00	pCi/L		LCW1 04/21/06	1921	520802	1
<i>Alphaspec Th, Liquid</i>											
Thorium-228		0.451	+/-0.296	0.398	2.00	pCi/L		BJB1 04/21/06	1147	520798	2
Thorium-230		0.422	+/-0.266	0.288	2.00	pCi/L					
Thorium-232		0.436	+/-0.255	0.101	2.00	pCi/L					
<i>Alphaspec U, Liquid</i>											
Uranium-233/234		26.1	+/-1.93	0.259	1.00	pCi/L		BJB1 04/21/06	0738	520799	3
Uranium-235/236		1.14	+/-0.452	0.243	1.00	pCi/L					
Uranium-238		15.6	+/-1.50	0.282	1.00	pCi/L					
<b>Rad Gamma Spec Analysis</b>											
<i>Gamma, (Ac-228, Bi-212, Pb-212, Pa-231)</i>											
Actinium-228	U	-6.36	+/-6.34	3.94	2.00	pCi/L		MJH1 04/25/06	1846	519510	4
Bismuth-212	UUI	0.00	+/-10.1	10.3	10.0	pCi/L					
Lead-212	UUI	0.00	+/-5.11	2.68	10.0	pCi/L					
Protactinium-231	U	28.2	+/-65.7	56.6	280	pCi/L					
<b>Rad Gas Flow Proportional Counting</b>											
<i>GFPC, Gross Alpha Liquid</i>											
Alpha		48.2	+/-7.06	6.19	5.00	pCi/L		JXS4 04/20/06	2257	521039	5
<i>GFPC, Pb210, Liquid</i>											
Lead-210	U	-0.346	+/-0.635	1.45	3.00	pCi/L		BXF1 04/25/06	1103	520607	6
<i>GFPC, Ra228, Liquid</i>											
Radium-228	U	0.381	+/-0.499	1.09	2.00	pCi/L		KSD1 04/26/06	1332	515983	7
<b>Rad Radium-226</b>											
<i>Lucas Cell, Ra226, liquid</i>											
Radium-226	U	0.232	+/-0.356	0.615	2.00	pCi/L		SG 04/10/06	0855	518058	8
<b>Rad Total Uranium</b>											
<i>KPA, Total U, Liquid</i>											
Total Uranium		47.5	+/-2.87	0.430	1.00	ug/L		DRS1 04/26/06	1101	523680	9

**The following Analytical Methods were performed**

Method	Description	Analyst Comments
1	DOE EML HASL-300, Po-01-RC Modified	
2	DOE EML HASL-300, Th-01-RC Modified	

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston SC 29407 – (843) 556–8171 – www.gel.com

## Certificate of Analysis

Company : MWH Laboratories  
 Address : 750 Royal Oaks Drive, Suite 100  
 Monrovia, California 91016

Report Date: April 27, 2006

Contact: Ms. Julie Lee  
 Project: **Tronox Henderson**

Client Sample ID: 2603230069 M-120  
 Sample ID: 159247001

Project: MWHL00106  
 Client ID: MWHL002

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
3	DOE EML HASL-300, U-02-RC Modified											
4	EPA 901.1											
5	EPA 900.0											
6	DOE RP280 Modified											
7	EPA 904.0 Modified											
8	EPA 903.1 Modified											
9	ASTM D 5174											

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Polonium-209	Alphaspec Po210, liquid			61	(25%–125%)
Actinium-227	Alphaspec Th, Liquid			90	
Actinium-227	Alphaspec Th, Liquid			90	
Actinium-227	Alphaspec Th, Liquid			90	
Uranium-232	Alphaspec U, Liquid			87	(25%–125%)
Uranium-232	Alphaspec U, Liquid			87	(25%–125%)
Uranium-232	Alphaspec U, Liquid			87	(25%–125%)
Lead-210	GFPC, Pb210, Liquid			109	(25%–125%)
Radium-228	GFPC, Ra228, Liquid			84	(15%–125%)

# QUALITY CONTROL DATA

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Report Date: April 27, 2006

Page 1 of 5

**MWH Laboratories**  
**750 Royal Oaks Drive, Suite 100**  
**Monrovia, California**

**Contact:** Ms. Julie Lee

**Workorder:** 159247

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	520798										
QC1201071141	159242003	DUP									
Thorium-228		0.311	U	0.175	pCi/L	56*		(0%-20%)	BJB1	04/20/06	07:49
		+/-0.217		+/-0.215							
Thorium-230	U	0.114	U	0.0239	pCi/L	131*		(0%-20%)			
		+/-0.122		+/-0.0973							
Thorium-232	U	0.0416	U	0.081	pCi/L	64*		(0%-20%)			
		+/-0.0977		+/-0.133							
QC1201071143	LCS										
Thorium-228			U	0.211	pCi/L			(75%-125%)			
				+/-0.193							
Thorium-230	53.9			46.9	pCi/L		87	(75%-125%)			
				+/-8.06							
Thorium-232				0.316	pCi/L			(75%-125%)			
				+/-0.212							
QC1201071140	MB										
Thorium-228			U	0.0376	pCi/L						
				+/-0.158							
Thorium-230			U	0.0737	pCi/L						
				+/-0.116							
Thorium-232			U	-0.0233	pCi/L						
				+/-0.0271							
QC1201071142	159242003	MS									
Thorium-228		0.311	U	0.483	pCi/L			(75%-125%)			
		+/-0.217		+/-0.665							
Thorium-230	108	U	0.114	118	pCi/L		109	(75%-125%)			
			+/-0.122	+/-31.2							
Thorium-232	U	0.0416	U	0.121	pCi/L			(75%-125%)			
		+/-0.0977		+/-0.328							
Batch	520799										
QC1201071145	159242003	DUP									
Uranium-233/234		9.54		10.4	pCi/L	9		(0%-20%)	BJB1	04/22/06	07:38
		+/-1.27		+/-1.10							
Uranium-235/236		0.311		0.362	pCi/L	15		(0%-20%)			
		+/-0.261		+/-0.230							
Uranium-238		4.98		5.85	pCi/L	16		(0%-20%)			
		+/-0.916		+/-0.821							
QC1201071147	LCS										
Uranium-233/234				15.5	pCi/L			(75%-125%)		04/21/06	07:38
				+/-1.40							
Uranium-235/236				0.801	pCi/L			(75%-125%)			
				+/-0.356							
Uranium-238	13.1			14.1	pCi/L		108	(75%-125%)			
				+/-1.33							
QC1201071144	MB										

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Workorder: 159247

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Alpha Spec</b>											
Batch	520799										
Uranium-233/234			U	0.0694 +/-0.130	pCi/L						
Uranium-235/236			U	0.0565 +/-0.111	pCi/L				BJB1	04/21/06	07:38
Uranium-238			U	0.0128 +/-0.0969	pCi/L						
QC1201071146	159242003	MS									
Uranium-233/234		9.54 +/-1.27		33.4 +/-3.23	pCi/L			(75%-125%)			
Uranium-235/236		0.311 +/-0.261		1.18 +/-0.684	pCi/L			(75%-125%)			
Uranium-238	26.3	4.98 +/-0.916		32.3 +/-3.18	pCi/L		104	(75%-125%)			
Batch	520802										
QC1201071153	159247001	DUP									
Polonium-210	U	-0.0487 +/-0.178	U	0.0534 +/-0.142	pCi/L	4340*		(0%-20%)	_CW1	04/21/06	19:21
QC1201071155	LCS										
Polonium-210	35.3			31.3 +/-2.74	pCi/L		89	(75%-125%)			
QC1201071152	MB										
Polonium-210			U	-0.0879 +/-0.318	pCi/L					04/24/06	14:21
QC1201071154	159247001	MS									
Polonium-210	40.3	U	-0.0487 +/-0.178	34.0 +/-2.85	pCi/L		84	(75%-125%)		04/21/06	19:21
<b>Rad Gamma Spec</b>											
Batch	519510										
QC1201068237	159247001	DUP									
Actinium-228		U	-6.36 +/-6.34	U	0.813 +/-10.4	pCi/L	259		MJH1	04/26/06	05:28
Bismuth-212		UUI	0.00 +/-10.1	U	0.231 +/-9.51	pCi/L	193				
Lead-212		UUI	0.00 +/-5.11	U	1.88 +/-4.45	pCi/L	97				
Protactinium-231		U	28.2 +/-65.7	U	-52.7 +/-56.6	pCi/L	659				
QC1201068238	LCS										
Actinium-228				U	50.1 +/-38.8	pCi/L				04/26/06	05:24
Americium-241	1220				1330 +/-171	pCi/L		109	(75%-125%)		
Bismuth-212				U	68.2 +/-76.6	pCi/L					
Cesium-137	463				471 +/-34.7	pCi/L		102	(75%-125%)		
Cobalt-60	659				646 +/-49.1	pCi/L		98	(75%-125%)		

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Workorder: 159247

Page 3 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Gamma Spec</b>											
Batch	519510										
Lead-212			U	15.7 +/-16.8	pCi/L						
Protactinium-231			U	-412 +/-426	pCi/L				MJH1	04/26/06	05:24
QC1201068236	MB										
Actinium-228			U	5.78 +/-9.79	pCi/L					04/25/06	18:43
Bismuth-212			U	6.40 +/-10.3	pCi/L						
Lead-212			UUI	0.00 +/-2.25	pCi/L						
Protactinium-231			U	38.3 +/-60.7	pCi/L						
<b>Rad Gas Flow</b>											
Batch	515983										
QC1201060417	159242003 DUP										
Radium-228		1.24 +/-0.666	U	0.577 +/-0.503	pCi/L	73*		(0%-20%)	KSD1	04/26/06	13:29
QC1201060419	LCS										
Radium-228	40.3			46.1 +/-2.84	pCi/L		115	(75%-125%)		04/26/06	14:35
QC1201060416	MB										
Radium-228			U	0.323 +/-0.444	pCi/L					04/26/06	13:29
QC1201060418	159242003 MS										
Radium-228	61.0	1.24 +/-0.666		71.6 +/-4.18	pCi/L		115	(75%-125%)		04/26/06	13:44
Batch	520607										
QC1201070734	159242003 DUP										
Lead-210		1.08 +/-1.08	U	0.877 +/-1.12	pCi/L	0		(0%-20%)	BXF1	04/25/06	14:15
QC1201070736	LCS										
Lead-210	36.5			29.5 +/-4.70	pCi/L		81	(75%-125%)			
QC1201070733	MB										
Lead-210			U	0.253 +/-0.972	pCi/L						
QC1201070735	159242003 MS										
Lead-210	91.5	1.08 +/-1.08	U	70.3 +/-10.7	pCi/L		77	(75%-125%)			
Batch	521039										
QC1201071724	159247001 DUP										
Alpha		48.2 +/-7.06		49.9 +/-6.79	pCi/L	4		(0%-20%)	JXS4	04/20/06	22:57
QC1201071726	LCS										
Alpha	327			283 +/-30.4	pCi/L		87	(75%-125%)		04/21/06	11:57
QC1201071723	MB										

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Workorder: 159247

Page 4 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
<b>Rad Gas Flow</b>											
Batch	521039										
Alpha			U	0.133 +/-1.56	pCi/L					04/20/06	22:57
QC1201071725	159247001	MS									
Alpha	327	48.2 +/-7.06		261 +/-40.9	pCi/L		65*	(75%-125%)	JXS4	04/21/06	11:57
QC1201071728	159247001	MSD									
Alpha	327	48.2 +/-7.06		281 +/-41.6	pCi/L	7	71*	(0%-20%)			
<b>Rad Ra-226</b>											
Batch	518058										
QC1201064984	159247001	DUP									
Radium-226			U	0.232 +/-0.356	pCi/L	36*		(0%-20%)	SG	04/10/06	09:30
QC1201064986	LCS										
Radium-226	25.1			30.1 +/-2.32	pCi/L		120	(75%-125%)			
QC1201064983	MB										
Radium-226			U	0.550 +/-0.431	pCi/L					04/10/06	08:55
QC1201064985	159247001	MS									
Radium-226	25.1		U	0.232 +/-0.356	pCi/L		92	(75%-125%)		04/10/06	09:30
<b>Rad Total U</b>											
Batch	523680										
QC1201077881	159242003	DUP									
Total Uranium		13.7 +/-0.299		13.7 +/-0.299	ug/L	0		(0%-20%)	DRS1	04/26/06	10:18
QC1201077883	LCS										
Total Uranium	50.0			37.5 +/-2.27	ug/L		75	(75%-125%)		04/26/06	10:26
QC1201077884	LCSD										
Total Uranium	5.00			5.24 +/-0.116	ug/L	151	105			04/26/06	10:27
QC1201077880	MB										
Total Uranium			U	0.164 +/-0.035	ug/L					04/26/06	10:15
QC1201077882	159242003	MS									
Total Uranium	50.0	13.7 +/-0.299		65.8 +/-3.97	ug/L		104	(75%-125%)		04/26/06	10:22

Notes:

The Qualifiers in this report are defined as follows:

- B Target analyte was detected in the sample as well as the associated blank.
- BD Results below the MDC or low tracer recovery.
- E Concentration of the target analyte exceeds the instrument calibration range.
- H Analytical holding time exceeded.

# GENERAL ENGINEERING LABORATORIES, LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

## QC Summary

Workorder: 159247

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
J	Indicates an estimated value.										
U	Target analyte was analyzed for but not detected above the MDL, MDA, or LOD.										
UI	Uncertain identification for gamma spectroscopy.										
X	Lab-specific qualifier-please see case narrative, data summary package or contact your project manager for details.										
d	The 2:1 depletion requirement was not met for this sample										
h	Sample preparation or preservation holding time exceeded.										

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.



# RAW DATA

### Radiochemistry Batch Checklist, Rev 4

Batch# 520798 Product: Th-228 Date: 04/24/06

Criteria:	Yes	No	Comments
Sample Solids are less than 100 mg for GAB.			N/A
If activity less 10* MDA, error is 150% or less of sample activity. If greater 10* MDA, error is 40% or less. If below the MDA, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL has been met.	✓		
If duplicate activities are less 5* MDA, then rpd is 100% or less. If greater 5* MDA, then rpd 20% or less. If below the MDA, the rpd is 0%. Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.	✓		
Method blank is less than the RDL. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Special requirements page checked	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms. All lineouts initialed and dated. No transcription errors are apparent.	✓		
QC data entered into QC database. Batch entered into Case Narrative.	✓		
Batch non-conformances completed If applicable.			N/A

General Engineering Laboratories

2/22/2005  
Primary Review Performed By: Parrelaf Dalley 04/24/06

Secondary Review Performed By: no 4/25/06

04/20 - 04/27

# Thorium-228 Que Sheet

19-APR-06

Batch #: 520798    Analyst: BJB1    Minimum Due Date: 20-APR-06    Ac-227 Separation Date/Time: 4/19/06 0730; #45 0815  
 Tracer Isotope: Ac-227    Tracer Code: 0387-B-02    Expiration Date: 7/11/06    Vol: 0.1ml  
 LCS Isotope: Th-230    LCS Code: 0159-0    Expiration Date: 6/23/06    Vol: 0.1ml  
 Spike Isotope: Th-230    Spike Code: 0159-0    Expiration Date: 6/23/06    Vol: 0.1ml  
 Prep Date: 4/18/06    Initials: BJB    Pipet ID: 1167560257    Balance ID: 1167560257    Witness: JJB 4/18/06

of 913

Sample I	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Label #	Aliquot (g/μl)	Th Det #	Ash Weight (g)
158272001	2603140436 TR-10A	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	13-MAR-06	31	0.200	26	
158275001	2603140472 PUMP BLANK	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	13-MAR-06	32	0.200	27	
158276001	2603090347 FB-1	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	08-MAR-06	33	0.200	29	
158277001	2603100260 EB-1	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	09-MAR-06	34	0.200	30	
158436001	2603150120 TR-9A	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	14-MAR-06	35	0.200	65	
158971001	2603220347 M-103	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	21-MAR-06	36	0.200	69	
158971002	2603220348 TR-7	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	21-MAR-06	37	0.200	70	
158971003	2603220357 TR-9	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	21-MAR-06	38	0.200	72	
158971004	2603220360 TR-10	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	21-MAR-06	39	0.200	73	
159242001	2603240118 H-11	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	23-MAR-06	40	0.200	75	
159242002	2603240122 M-117	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	23-MAR-06	41	0.200	77	
159242003	2603240135 M-121	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	23-MAR-06	42	0.200	79	
159243001	2603230197 M-118	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	22-MAR-06	43	0.200	79	
159244001	2603250005 EB-3	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	24-MAR-06	44	0.200	80	
159247001	2603230069 M-120	SAMPLE		2 pCi/L	GROUND WATER	MWHL002	22-MAR-06	45	0.200	81	
1201071140	MB for batch 520798	MB		2 pCi/L	GROUND WATER	QC ACCOUNT		46	0.200	83	
1201071141	2603240135 M-121(159242003DUP)	DUP		2 pCi/L	GROUND WATER	QC ACCOUNT		47	0.200	85	
1201071142	2603240135 M-121(159242003MS)	MS		2 pCi/L	GROUND WATER	QC ACCOUNT		48	0.200	86	
1201071143	LCS for batch 520798	LCS		2 pCi/L	GROUND WATER	QC ACCOUNT		49	0.200	88	

BJB 4/18/06

Solid Sample Dissolution by: LEACH or DIGESTION

Data Reviewed By: Paralee Halley 04/24/06

Circle One

no 4/25/06

GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520798  
SAMPLE DATE : 19-APR-2006 07:30:00

SAMPLE ID : S0159242003\_TH  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :34425  
AVERAGE %EFFICIENCY :32.6623  
% YIELD : 107.855

COUNT DATE:20-APR-2006 07:49:44  
ELAPSED LIVE TIME(SEC): 14399.99  
ANALYST :BJB1

MS : 0159-O  
MSD : 0159-O  
LCS : 0159-O  
TRACER : 0387-B-102  
BKG FILE: B078.CNF;602  
BKG DATE: 16-APR-2006

MS PCI/L : 53.92892  
MSD PCI/L : 53.92892  
LCS PCI/L : 53.92892  
TRACER DPM : 4.3537  
EFF FILE : W078.CNF;154  
CAL DATE: 3-APR-2006

MS ISOTOPE : TH-230  
MSD ISOTOPE: TH-230  
LCS ISOTOPE: TH-230  
TRACER ISOTOPE: AC227  
LIB FILE : ENV\_ALPHA\_TH.N

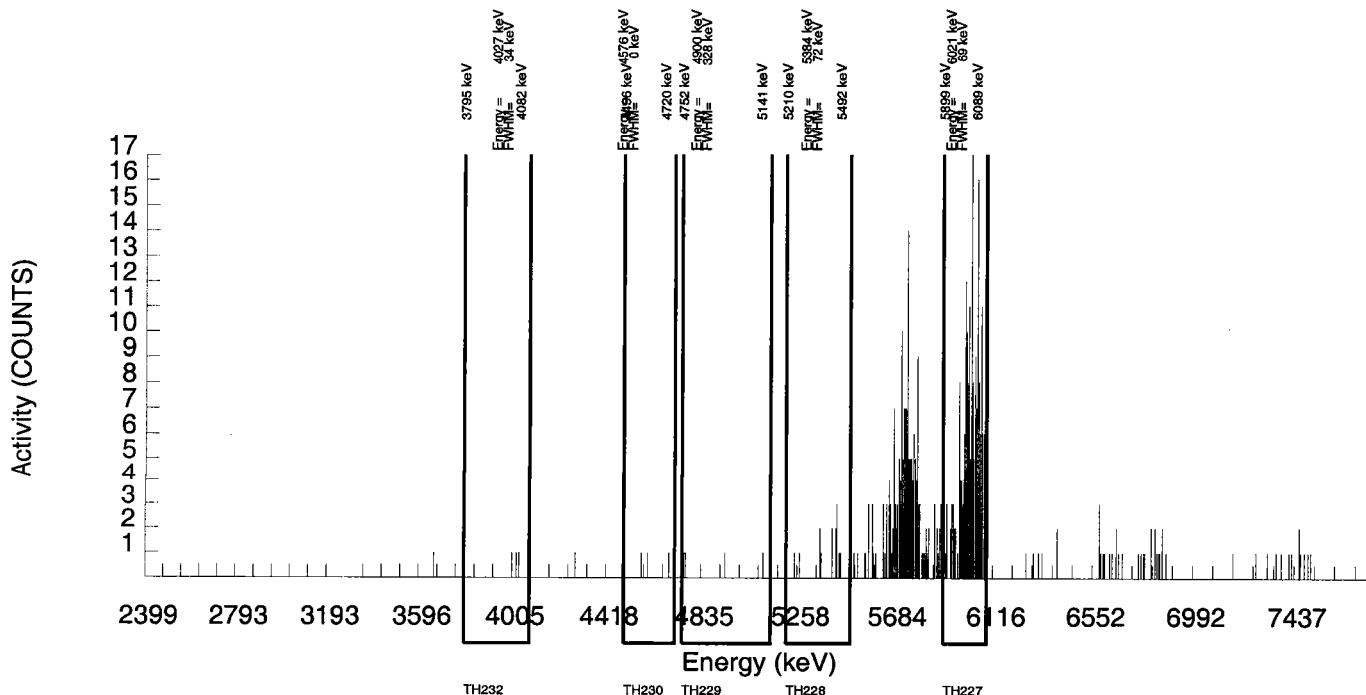
NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	ERROR 2-SIGMA	MDA pCi/L
AC-227	5978.000	193.520	0.480	54.75400	9.81E+00	2.07E+00	3.15E-01
TH-228	5363.000	11.640	3.360	99.94000	3.11E-01	2.17E-01	3.07E-01
TH229	4900.000	1.360	2.640	99.52000	3.64E-02	1.15E-01	2.83E-01
TH-230	4625.000	4.280	0.720	100.0000	1.14E-01	1.22E-01	1.85E-01
TH-232	3972.000	1.560	1.440	100.0000	4.16E-02	9.77E-02	2.29E-01

REVIEWED BY:

DATE :

*Handwritten signature*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520798 SAMPLE DATE : 19-APR-2006 08:15:00	SAMPLE ID : S0159247001_TH SAMPLE QTY: 0.200 L
--	---

DETECTOR NUMBER :9537 AVERAGE %EFFICIENCY :31.0572 % YIELD : 90.028	COUNT DATE:21-APR-2006 11:47:51 ELAPSED LIVE TIME(SEC): 14399.99 ANALYST :BJB1
---	--

MS : 0159-O MSD : 0159-O LCS : 0159-O TRACER : 0387-B-102 BKG FILE: B011.CNF;696 BKG DATE: 17-APR-2006	MS PCI/L : 53.92892 MSD PCI/L : 53.92892 LCS PCI/L : 53.92892 TRACER DPM : 4.3536 EFF FILE : W011.CNF;198 CAL DATE: 3-APR-2006	MS ISOTOPE : TH-230 MSD ISOTOPE: TH-230 LCS ISOTOPE: TH-230 TRACER ISOTOPE: AC227 LIB FILE : ENV_ALPHA_TH.N
---	---	---

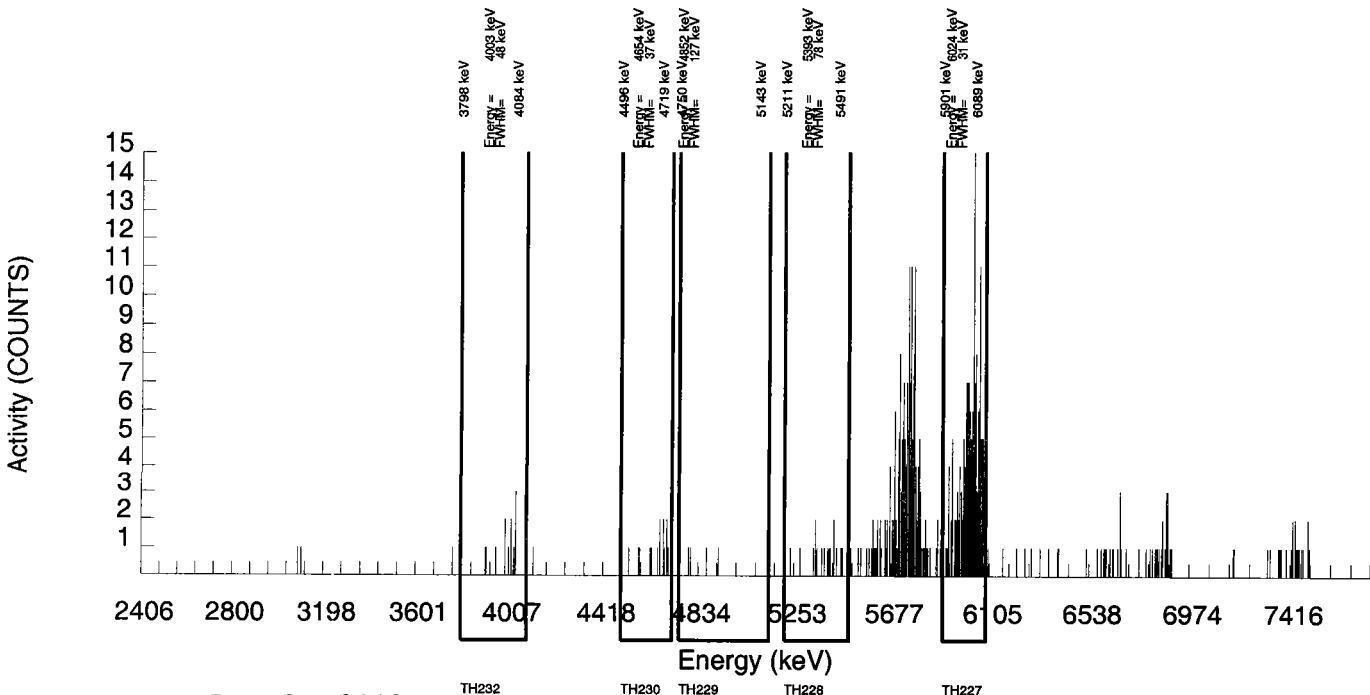
NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	ERROR 2-SIGMA	MDA pCi/L
AC-227	5978.000	147.280	0.720	54.75400	9.81E+00	2.42E+00	4.62E-01
TH-228	5363.000	13.400	3.600	99.94000	4.51E-01	2.96E-01	3.98E-01
TH229	4900.000	2.320	1.680	99.52000	7.82E-02	1.42E-01	3.04E-01
TH-230	4625.000	12.560	1.440	100.0000	4.22E-01	2.66E-01	2.88E-01
TH-232	3972.000	13.000	0.000	100.0000	4.36E-01	2.55E-01	1.01E-01

REVIEWED BY:

DATE :

*pu alliao*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520798  
SAMPLE DATE : 19-APR-2006 07:30:00

SAMPLE ID : S1201071140\_TH  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :34436  
AVERAGE %EFFICIENCY :30.6338  
% YIELD : 94.792

COUNT DATE:20-APR-2006 07:49:45  
ELAPSED LIVE TIME(SEC): 14400.00  
ANALYST :BJB1

MS : 0159-O  
MSD : 0159-O  
LCS : 0159-O  
TRACER : 0387-B-102  
BKG FILE: B083.CNF;602  
BKG DATE: 16-APR-2006

MS PCI/L : 53.92892  
MSD PCI/L : 53.92892  
LCS PCI/L : 53.92892  
TRACER DPM : 4.3537  
EFF FILE : W083.CNF;187  
CAL DATE: 3-APR-2006

MS ISOTOPE : TH-230  
MSD ISOTOPE: TH-230  
LCS ISOTOPE: TH-230  
TRACER ISOTOPE: AC227  
LIB FILE : ENV\_ALPHA\_TH.N

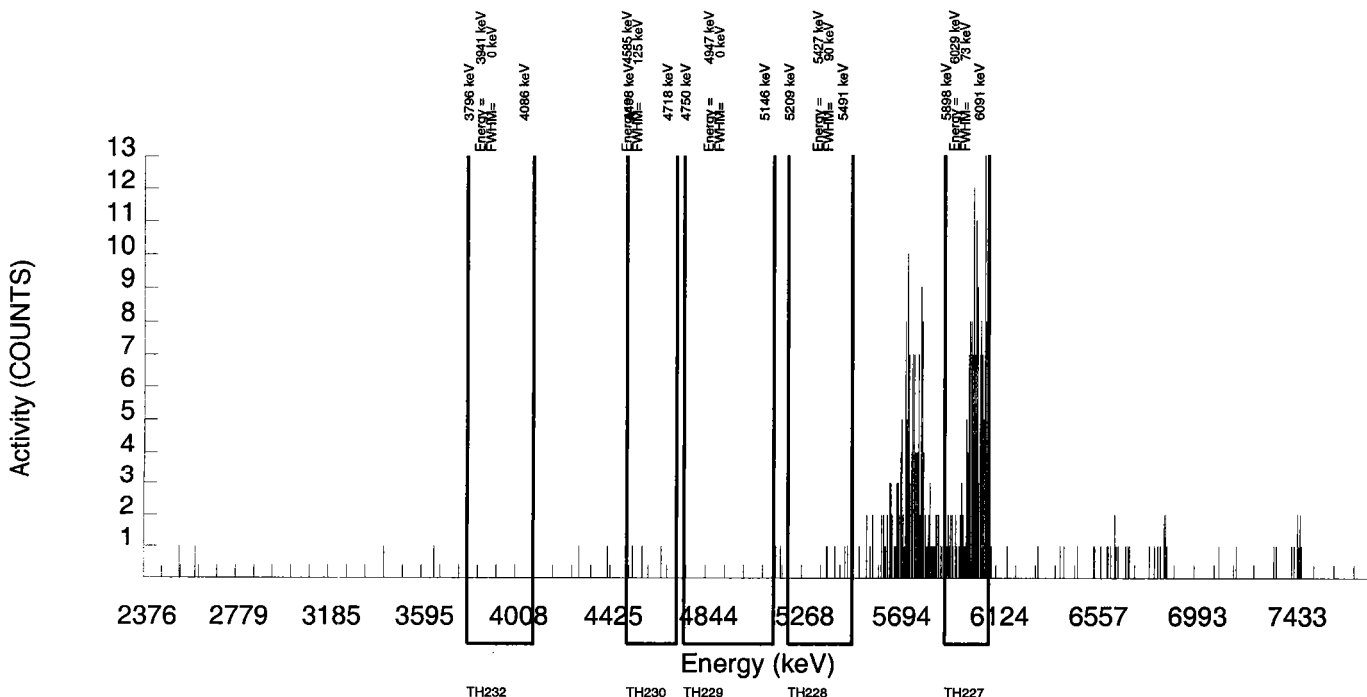
NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	ERROR 2-SIGMA	MDA pCi/L
AC-227	5978.000	159.520	0.480	54.75400	9.81E+00	2.26E+00	3.82E-01
TH-228	5363.000	1.160	3.840	99.94000	3.76E-02	1.58E-01	3.92E-01
TH229	4900.000	-4.560	4.560	99.52000	-1.48E-01	7.23E-02	4.20E-01
TH-230	4625.000	2.280	0.720	100.0000	7.37E-02	1.16E-01	2.24E-01
TH-232	3972.000	-0.720	0.720	100.0000	-2.33E-02	2.71E-02	2.24E-01

REVIEWED BY:

DATE :

*BJB*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520798  
SAMPLE DATE : 19-APR-2006 07:30:00

SAMPLE ID : S1201071141\_TH  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :30451  
AVERAGE %EFFICIENCY :29.9703  
% YIELD : 68.028

COUNT DATE:20-APR-2006 07:49:45  
ELAPSED LIVE TIME(SEC): 14400.00  
ANALYST :BJB1

MS : 0159-O  
MSD : 0159-O  
LCS : 0159-O  
TRACER : 0387-B-102  
BKG FILE: B085.CNF;607  
BKG DATE: 16-APR-2006

MS PCI/L : 53.92892  
MSD PCI/L : 53.92892  
LCS PCI/L : 53.92892  
TRACER DPM : 4.3537  
EFF FILE : W085.CNF;205  
CAL DATE: 3-APR-2006

MS ISOTOPE : TH-230  
MSD ISOTOPE: TH-230  
LCS ISOTOPE: TH-230  
TRACER ISOTOPE: AC227  
LIB FILE : ENV\_ALPHA\_TH.N

NUCLIDE ACTIVITY SUMMARY

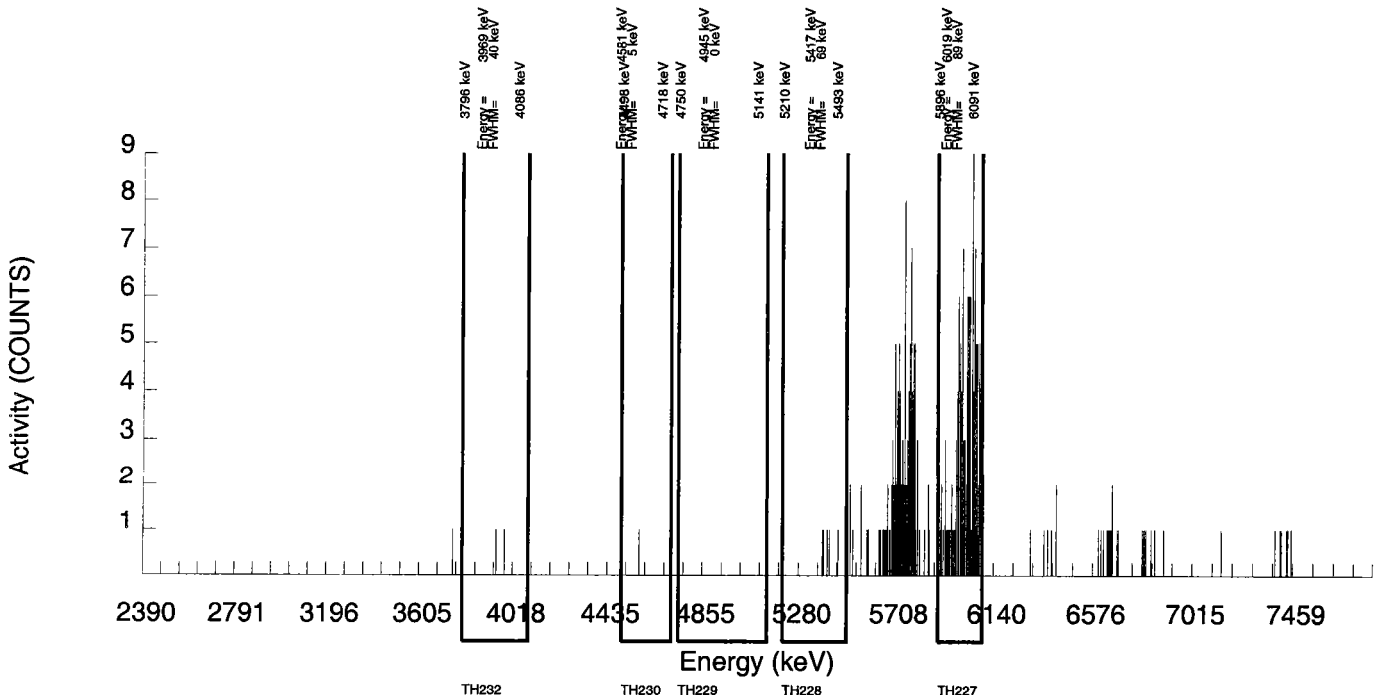
NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	ERROR 2-SIGMA	MDA pCi/L
AC-227	5978.000	112.000	0.000	54.75400	9.81E+00	2.67E+00	2.63E-01
TH-228	5363.000	3.800	1.200	99.94000	1.75E-01	2.15E-01	3.73E-01
TH229	4900.000	-1.200	1.200	99.52000	-5.55E-02	5.08E-02	3.74E-01
TH-230	4625.000	0.520	0.480	100.0000	2.39E-02	9.73E-02	2.86E-01
TH-232	3972.000	1.760	0.240	100.0000	8.10E-02	1.33E-01	2.43E-01

REVIEWED BY:

DATE :

*BJB 4/20/06*

*Th-228 = S.G.D ACT < MDA*  
*Th-230 } ACT < MDA*  
*Th-232*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520798  
SAMPLE DATE : 19-APR-2006 07:30:00

SAMPLE ID : S1201071142\_TH  
SAMPLE QTY: 0.100 L

DETECTOR NUMBER :29278  
AVERAGE %EFFICIENCY :26.2964  
% YIELD : 44.996

COUNT DATE:20-APR-2006 07:49:45  
ELAPSED LIVE TIME(SEC): 14400.00  
ANALYST :BJB1

MS : 0159-O  
MSD : 0159-O  
LCS : 0159-O  
TRACER : 0387-B-102  
BKG FILE: B086.CNF;608  
BKG DATE: 16-APR-2006

MS PCI/L : 107.8578  
MSD PCI/L : 107.8578  
LCS PCI/L : 107.8578  
TRACER DPM : 4.3537  
EFF FILE : W086.CNF;176  
CAL DATE: 3-APR-2006

MS ISOTOPE : TH-230  
MSD ISOTOPE: TH-230  
LCS ISOTOPE: TH-230  
TRACER ISOTOPE: AC227  
LIB FILE : ENV\_ALPHA\_TH.N

NUCLIDE ACTIVITY SUMMARY

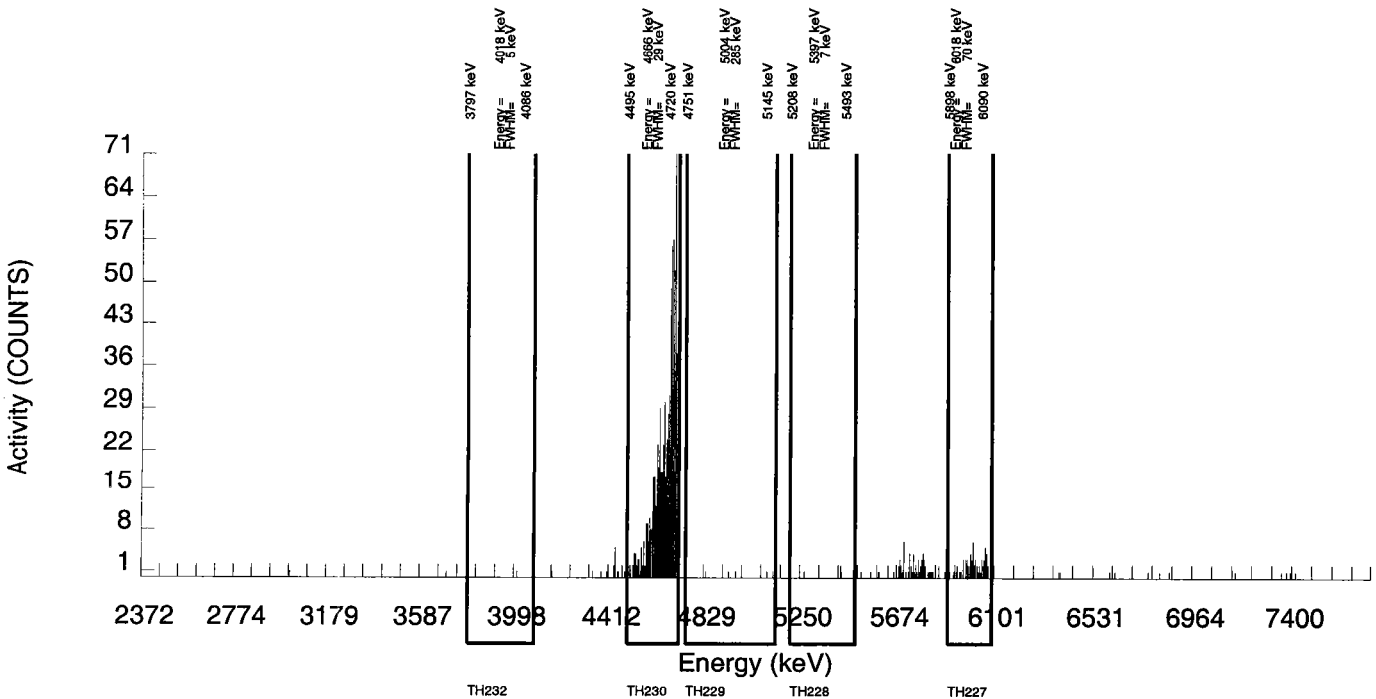
NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	ERROR 2-SIGMA	MDA pCi/L
AC-227	5978.000	65.000	0.000	54.75400	1.96E+01	6.96E+00	9.05E-01
TH-228	5363.000	3.040	0.960	99.94000	4.83E-01	6.65E-01	1.20E+00
TH229	4900.000	2.840	2.160	99.52000	4.53E-01	7.58E-01	1.57E+00
TH-230	4625.000	744.040	0.960	100.0000	1.18E+02	3.12E+01	1.20E+00
TH-232	3972.000	0.760	0.240	100.0000	1.21E-01	3.28E-01	8.37E-01

REVIEWED BY:

DATE :

*BJB 4/20/06*

$$MS = \frac{118 - 0}{108} = 109\%$$





GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520798  
SAMPLE DATE : 19-APR-2006 07:30:00

SAMPLE ID : S1201071143\_TH  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :30434  
AVERAGE %EFFICIENCY :27.0872  
% YIELD : 112.742

COUNT DATE:20-APR-2006 07:49:45  
ELAPSED LIVE TIME(SEC): 14400.00  
ANALYST :BJB1

MS : 0159-O  
MSD : 0159-O  
LCS : 0159-O  
TRACER : 0387-B-102  
BKG FILE: B088.CNF;598  
BKG DATE: 16-APR-2006

MS PCI/L : 53.92892  
MSD PCI/L : 53.92892  
LCS PCI/L : 53.92892  
TRACER DPM : 4.3537  
EFF FILE : W088.CNF;171  
CAL DATE: 3-APR-2006

MS ISOTOPE : TH-230  
MSD ISOTOPE: TH-230  
LCS ISOTOPE: TH-230  
TRACER ISOTOPE: AC227  
LIB FILE : ENV\_ALPHA\_TH.N

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	ERROR 2-SIGMA	MDA pCi/L
AC-227	5978.000	167.760	0.240	54.75400	9.81E+00	2.21E+00	3.08E-01
TH-228	5363.000	6.840	2.160	99.94000	2.11E-01	1.93E-01	3.03E-01
TH229	4900.000	10.560	1.440	99.52000	3.26E-01	2.23E-01	2.65E-01
TH-230	4625.000	1527.040	0.960	100.0000	4.69E+01	8.06E+00	2.32E-01
TH-232	3972.000	10.280	0.720	100.0000	3.16E-01	2.12E-01	2.13E-01

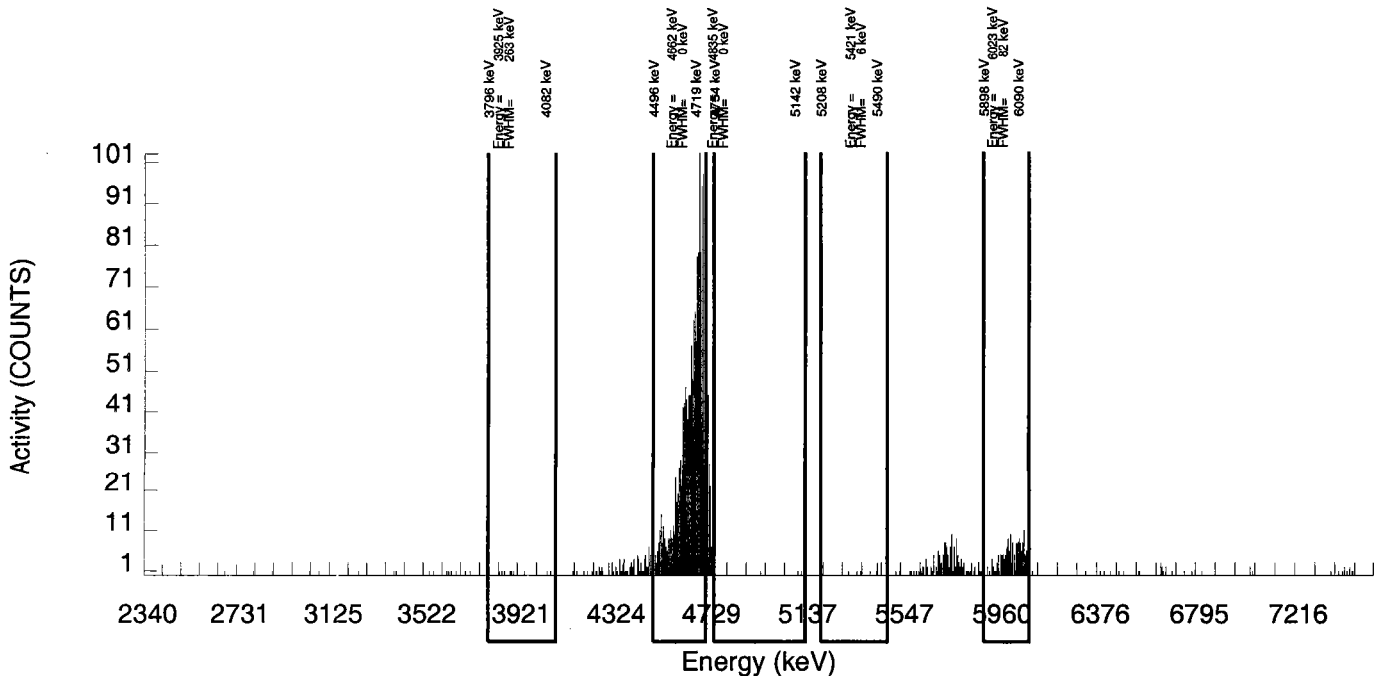
REVIEWED BY:

DATE:

*[Handwritten signature]*

*[Handwritten signature]*

$$LCS = \frac{46.9}{53.9} = 87.0\%$$



Radiochemistry Batch Checklist, Rev 4

Batch# 520799 Product: U Date: 04/25/06

Criteria:	Yes	No	Comments
Sample Solids are less than 100 mg for GAB.			N/A
If activity less 10* MDA, error is 150% or less of sample activity. If greater 10* MDA, error is 40% or less. If below the MDA, error is okay.	✓		
Instrument source check is within limits. Instument bkg check is within limits.	✓		
Method RDL has been met.	✓		
If duplicate activities are less 5* MDA, then rpd is 100% or less. If greater 5* MDA, then rpd 20% or less. If below the MDA, the rpd is 0%. Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.	✓		
Method blank is less than the RDL. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Special requirements page checked	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms. All lineouts initialed and dated.	✓		
No transcription errors are apparent.	✓		
QC data entered into QC database.	✓		
Batch entered into Case Narrative.	✓		
Batch non-conformances completed If applicable.			N/A

General Engineering Laboratories

2/22/2005 Primary Review Performed By: James Halley 04/25/06

Secondary Review Performed By: NO 4/25/06

04/20-04/27

# Uranium Que Sheet

13-APR-06

Batch #: 520799 Analyst: BJB1 Minimum Due Date: 20-APR-06  
 Tracer Isotope: U-232/U-236 Tracer Code: 0688-4 Expiration Date: 11/21/07 Vol: 0.100  
 LCS Isotope: U-238 LCS Code: 0850-3 Expiration Date: 11/21/07 Vol: 0.100  
 Spike Isotope: U-238 Spike Code: 0852-2 Expiration Date: 11/21/07 Vol: 0.100  
 Prep Date: 4/18/06 Initials: BJB Pipet ID: 182854 Balance ID: 167560 Z07

Witness: JKS 4/18/06

Sample ID	Client Description	Hazard Code	Type	Min CRDL	Matrix	Client	Collection Date	Label #	Aliquot (g)( $\mu$ l)	U Det #	Ash Weight (g)
158272001	2603140436 TR-10A		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	13-MAR-06	31	0.200	19	
158275001	2603140472 PUMP BLANK		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	13-MAR-06	32	0.200	20	
158276001	2603090347 FB-1		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	08-MAR-06	33	0.200	21	
158277001	2603100260 EB-1		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	09-MAR-06	34	0.200	23	
158436001	2603150120 TR-9A		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	14-MAR-06	35	0.200	1	
158971001	2603220347 M-103		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	21-MAR-06	36	0.200	7	
158971002	2603220348 TR-7		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	21-MAR-06	37	0.200	4	
158971003	2603220357 TR-9		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	21-MAR-06	38	0.200	5	
158971004	2603220360 TR-10		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	21-MAR-06	39	0.200	7	
159242001	2603240118 H-11		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	23-MAR-06	40	0.200	9	
159242002	2603240122 M-117		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	23-MAR-06	41	0.200	10	
159242003	2603240135 M-121		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	23-MAR-06	42	0.200	11	
159243001	2603230197 M-118		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	22-MAR-06	43	0.200	13	
159244001	2603250005 EB-3		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	24-MAR-06	44	0.200	16	
159247001	2603230069 M-120		SAMPLE	1 pCi/L	GROUND WATI	MWHL002	22-MAR-06	45	0.200	17	
1201071144	MB for batch 520799		MB		GROUND WATI	QC ACCOUNT		46	0.200	18	
1201071145	2603240135 M-121(159242003DUP)		DUP		GROUND WATI	QC ACCOUNT	23-MAR-06	47	0.200	19	
1201071146	2603240135 M-121(159242003MS)		MS		GROUND WATI	QC ACCOUNT	23-MAR-06	48	0.100	20	
1201071147	LCS for batch 520799		LCS		GROUND WATI	QC ACCOUNT		49	0.200	21	

388 4/17/06

Solid Sample Dissolution by: LEACH or DIGESTION  
 Circle One

Data Reviewed By: Barney D. Dole 4/25/06  
 No. of tests: 19

Choose SOP used: GL-RAD-A-011  
~~GL-RAD-A-038~~  
 GL-RAD-A-045  
 GL-RAD-A-043

General Engineering Laboratories, Radiochemistry Division

GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520799  
SAMPLE DATE : 23-MAR-2006 00:00:00

SAMPLE ID : S0159242003\_UU  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :9537  
AVERAGE %EFFICIENCY :31.0572  
% YIELD : 69.076

COUNT DATE:21-APR-2006 07:38:20  
ELAPSED LIVE TIME(SEC): 14400.00  
ANALYST :BJB1

MS : 0858-B  
MSD : 0858-B  
LCS : 0858-B  
TRACER : 0688-H  
BKG FILE: B011.CNF;696  
BKG DATE: 17-APR-2006

MS PCI/L : 13.14673  
MSD PCI/L : 13.14673  
LCS PCI/L : 13.14673  
TRACER DPM : 5.4106  
EFF FILE : W011.CNF;198  
CAL DATE: 3-APR-2006

MS ISOTOPE : U-238  
MSD ISOTOPE: U-238  
LCS ISOTOPE: U-238  
TRACER ISOTOPE: U232  
LIB FILE : ENV\_ALPHA\_UU.N

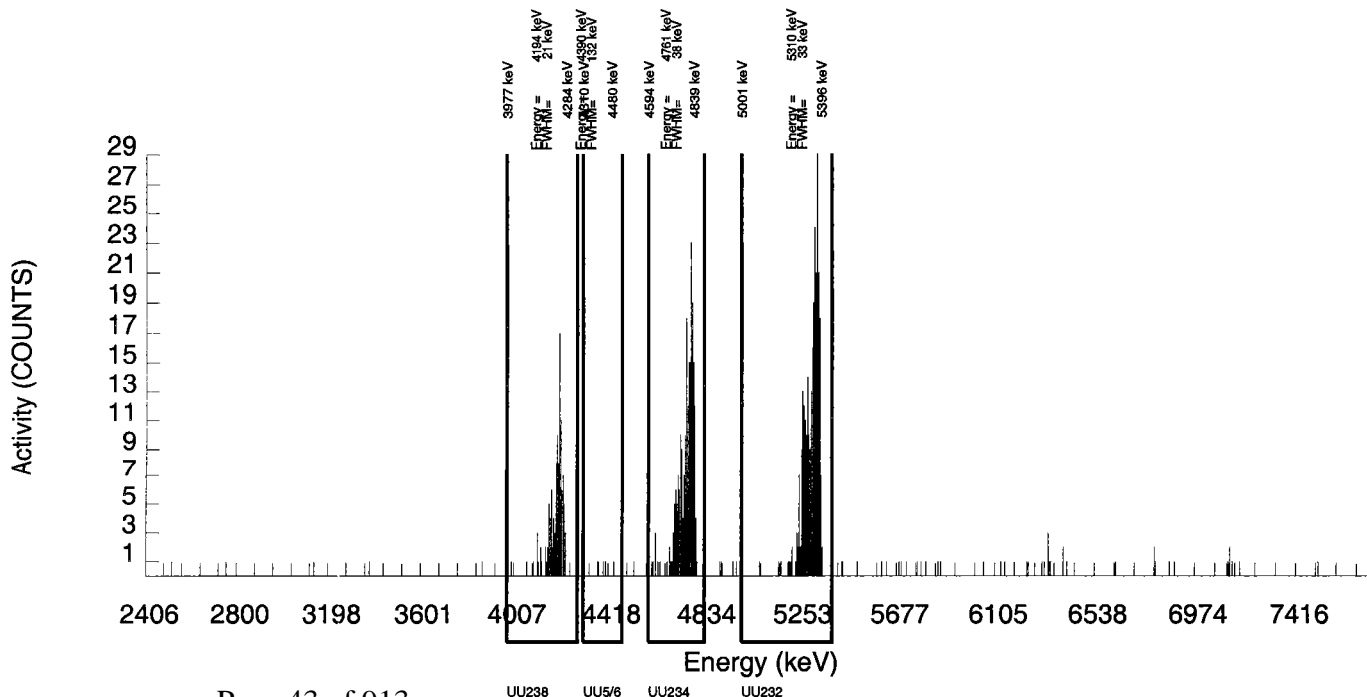
NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
U-3/4	4763.020	218.080	1.920	100.0000	9.54E+00	1.95E+00	4.13E-01	1.27E+00
U232	5302.100	278.360	2.640	100.0000	1.22E+01	2.37E+00	4.62E-01	1.44E+00
U-235	4391.000	5.760	0.240	80.90000	3.11E-01	2.65E-01	2.85E-01	2.61E-01
U-238	4184.730	113.760	0.240	100.0000	4.98E+00	1.20E+00	2.31E-01	9.16E-01

REVIEWED BY:

DATE :

*PSH 04/21/06*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520799  
SAMPLE DATE : 22-MAR-2006 00:00:00

SAMPLE ID : S0159247001\_UU  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :33203  
AVERAGE %EFFICIENCY :29.0269  
% YIELD : 86.716

COUNT DATE:21-APR-2006 07:38:29  
ELAPSED LIVE TIME(SEC): 14399.99  
ANALYST :BJB1

MS : 0858-B  
MSD : 0858-B  
LCS : 0858-B  
TRACER : 0688-H  
BKG FILE: B017.CNF;1520  
BKG DATE: 17-APR-2006

MS PCI/L : 13.14673  
MSD PCI/L : 13.14673  
LCS PCI/L : 13.14673  
TRACER DPM : 5.4107  
EFF FILE : W017.CNF;1149  
CAL DATE: 3-APR-2006

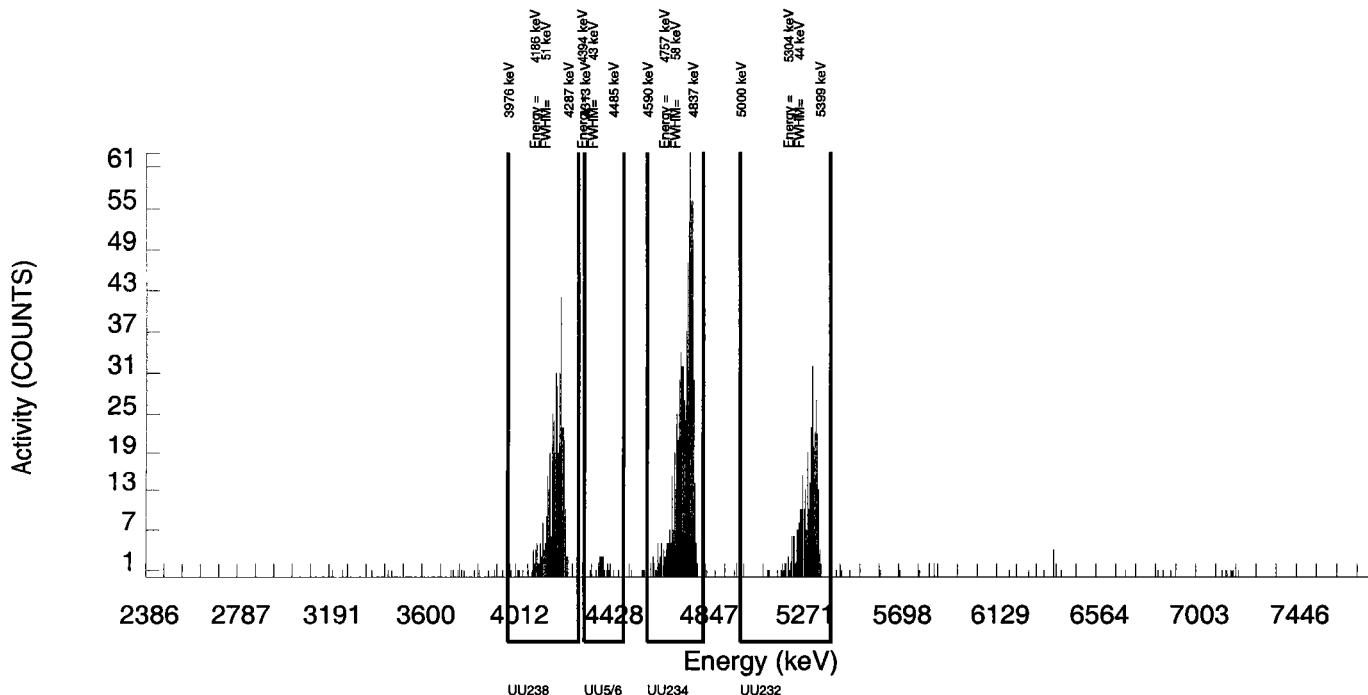
MS ISOTOPE : U-238  
MSD ISOTOPE: U-238  
LCS ISOTOPE: U-238  
TRACER ISOTOPE: U232  
LIB FILE : ENV\_ALPHA\_UU.N

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
U-3/4	4763.020	699.280	0.720	100.0000	2.61E+01	4.31E+00	2.59E-01	1.93E+00
U232	5302.100	326.600	2.400	100.0000	1.22E+01	2.24E+00	3.81E-01	1.33E+00
U-235	4391.000	24.760	0.240	80.90000	1.14E+00	4.83E-01	2.43E-01	4.52E-01
U-238	4184.730	419.040	0.960	100.0000	1.56E+01	2.75E+00	2.82E-01	1.50E+00

REVIEWED BY:

DATE: *PH 04/21/06*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520799  
SAMPLE DATE : 18-APR-2006 00:00:00

SAMPLE ID : S1201071144\_UU  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :21063  
AVERAGE %EFFICIENCY :25.5920  
% YIELD : 80.286

COUNT DATE:21-APR-2006 07:38:29  
ELAPSED LIVE TIME(SEC): 14399.99  
ANALYST :BJB1

MS : 0858-B  
MSD : 0858-B  
LCS : 0858-B  
TRACER : 0688-H  
BKG FILE: B018.CNF;670  
BKG DATE: 17-APR-2006

MS PCI/L : 13.14673  
MSD PCI/L : 13.14673  
LCS PCI/L : 13.14673  
TRACER DPM : 5.4069  
EFF FILE : W018.CNF;190  
CAL DATE: 3-APR-2006

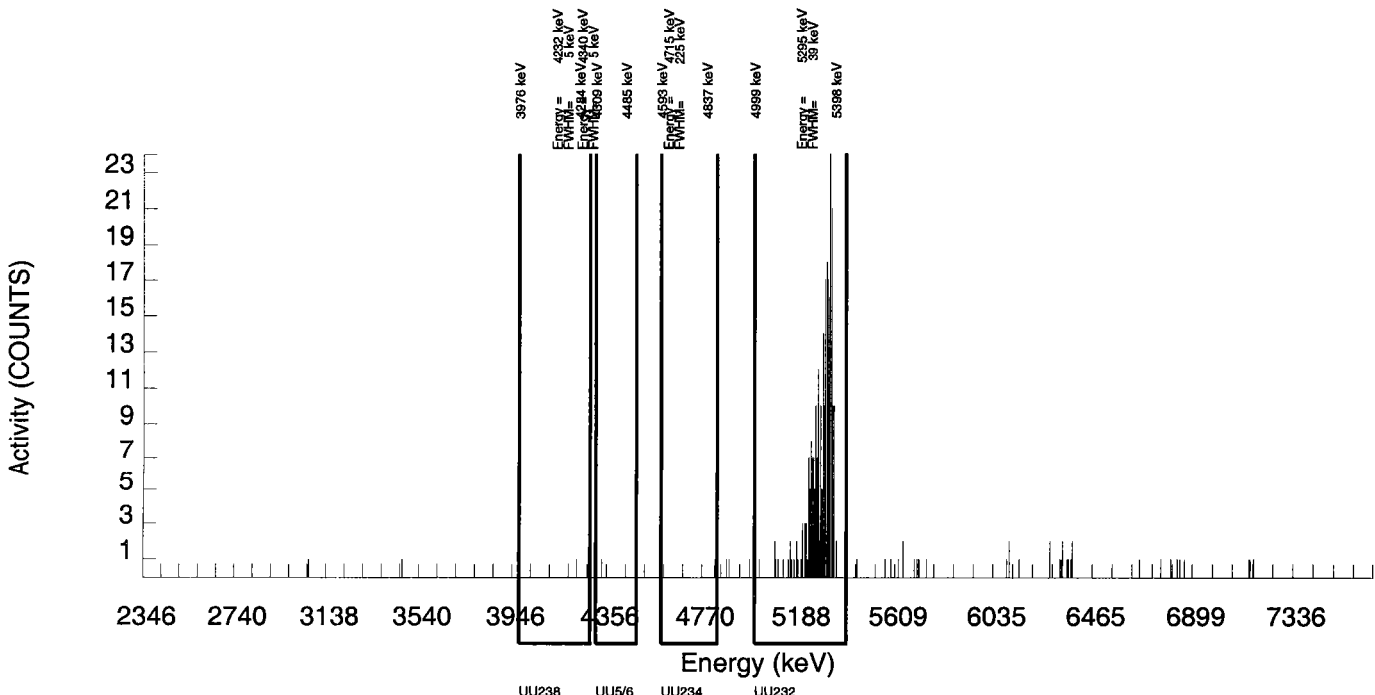
MS ISOTOPE : U-238  
MSD ISOTOPE: U-238  
LCS ISOTOPE: U-238  
TRACER ISOTOPE: U232  
LIB FILE : ENV\_ALPHA\_UU.N

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
U-3/4	4763.020	1.520	0.480	100.0000	6.94E-02	1.31E-01	2.84E-01	1.30E-01
U232	5302.100	266.600	2.400	100.0000	1.22E+01	2.41E+00	4.66E-01	1.47E+00
U-235	4391.000	1.000	0.000	80.90000	5.65E-02	1.11E-01	1.69E-01	1.11E-01
U-238	4184.730	0.280	0.720	100.0000	1.28E-02	9.70E-02	3.17E-01	9.69E-02

REVIEWED BY:

DATE: *DH 04/21/06*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520799 SAMPLE DATE : 23-MAR-2006 00:00:00		SAMPLE ID : S1201071145_UU SAMPLE QTY: 0.200 L	
DETECTOR NUMBER :45-132FF2 AVERAGE %EFFICIENCY :39.0663 % YIELD : 80.097		COUNT DATE:22-APR-2006 07:38:41 ELAPSED LIVE TIME(SEC): 14400.00 ANALYST :BJB1	
MS : 0858-B MSD : 0858-B LCS : 0858-B TRACER : 0688-H BKG FILE: B116.CNF;16 BKG DATE: 16-APR-2006	MS PCI/L : 13.14673 MSD PCI/L : 13.14673 LCS PCI/L : 13.14673 TRACER DPM : 5.4106 EFF FILE : W116.CNF;11 CAL DATE: 4-APR-2006	MS ISOTOPE : U-238 MSD ISOTOPE: U-238 LCS ISOTOPE: U-238 TRACER ISOTOPE: U232 LIB FILE : ENV_ALPHA_UU.N	

NUCLIDE ACTIVITY SUMMARY

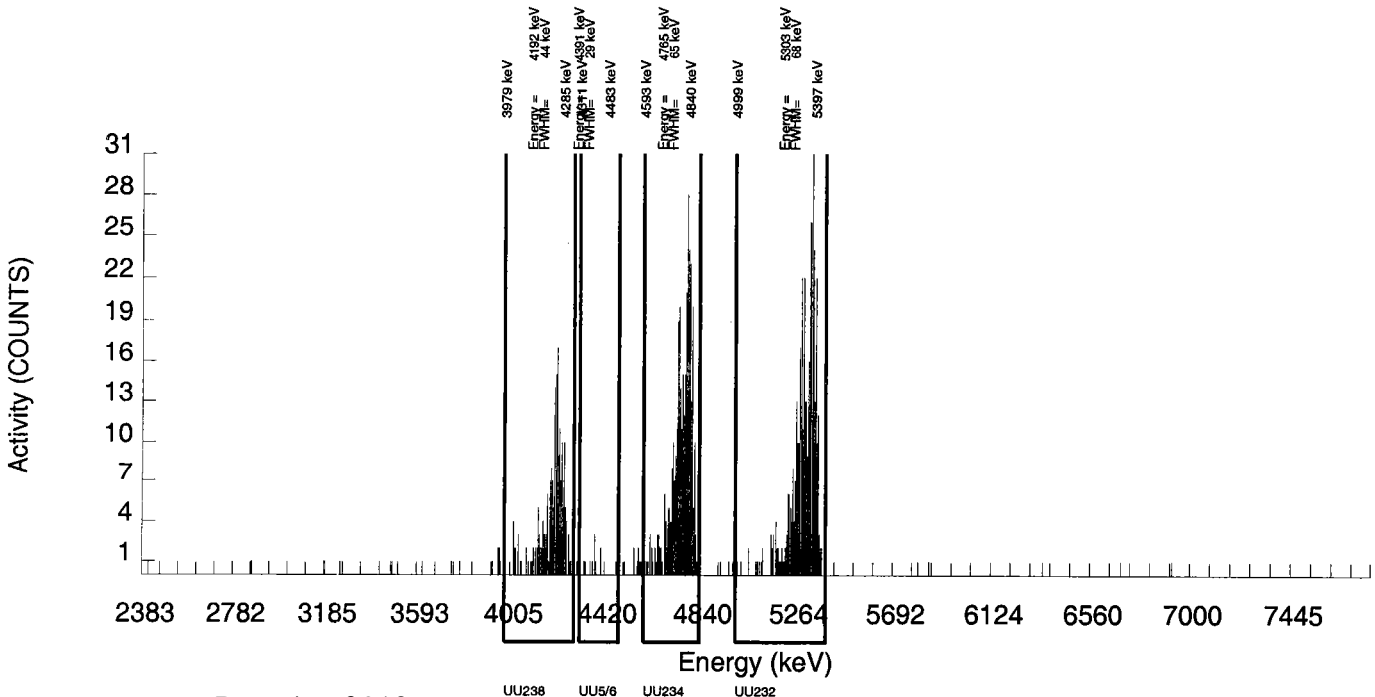
NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
U-3/4	4763.020	348.280	0.720	100.0000	1.04E+01	1.82E+00	2.08E-01	1.10E+00
U232	5302.100	406.000	0.000	100.0000	1.22E+01	2.07E+00	9.00E-02	1.19E+00
U-235	4391.000	9.760	0.240	80.90000	3.62E-01	2.36E-01	1.96E-01	2.30E-01
U-238	4184.730	195.000	0.000	100.0000	5.85E+00	1.16E+00	9.00E-02	8.21E-01

REVIEWED BY:

DATE :

*REC =*  
~~U-3/4 = 0.114 0.632~~  
~~U-235 = 0.057 0.282~~  
~~U-238 = 0.184 1.02~~  
*DUPLICATE*

*RPD =*  
 U-3/4 = 8.63%  
 U-235 = 15.2%  
 U-238 = 16.1%



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520799  
SAMPLE DATE : 23-MAR-2006 00:00:00

SAMPLE ID : S1201071146\_UU  
SAMPLE QTY: 0.100 L

DETECTOR NUMBER :33093  
AVERAGE %EFFICIENCY :33.7467  
% YIELD : 68.376

COUNT DATE:21-APR-2006 07:38:37  
ELAPSED LIVE TIME(SEC): 14400.00  
ANALYST :BJB1

MS : 0858-B  
MSD : 0858-B  
LCS : 0858-B  
TRACER : 0688-H  
BKG FILE: B020.CNF;677  
BKG DATE: 17-APR-2006

MS PCI/L : 26.29347  
MSD PCI/L : 26.29347  
LCS PCI/L : 26.29347  
TRACER DPM : 5.4106  
EFF FILE : W020.CNF;179  
CAL DATE: 3-APR-2006

MS ISOTOPE : U-238  
MSD ISOTOPE: U-238  
LCS ISOTOPE: U-238  
TRACER ISOTOPE: U232  
LIB FILE : ENV\_ALPHA\_UU.N

NUCLIDE ACTIVITY SUMMARY

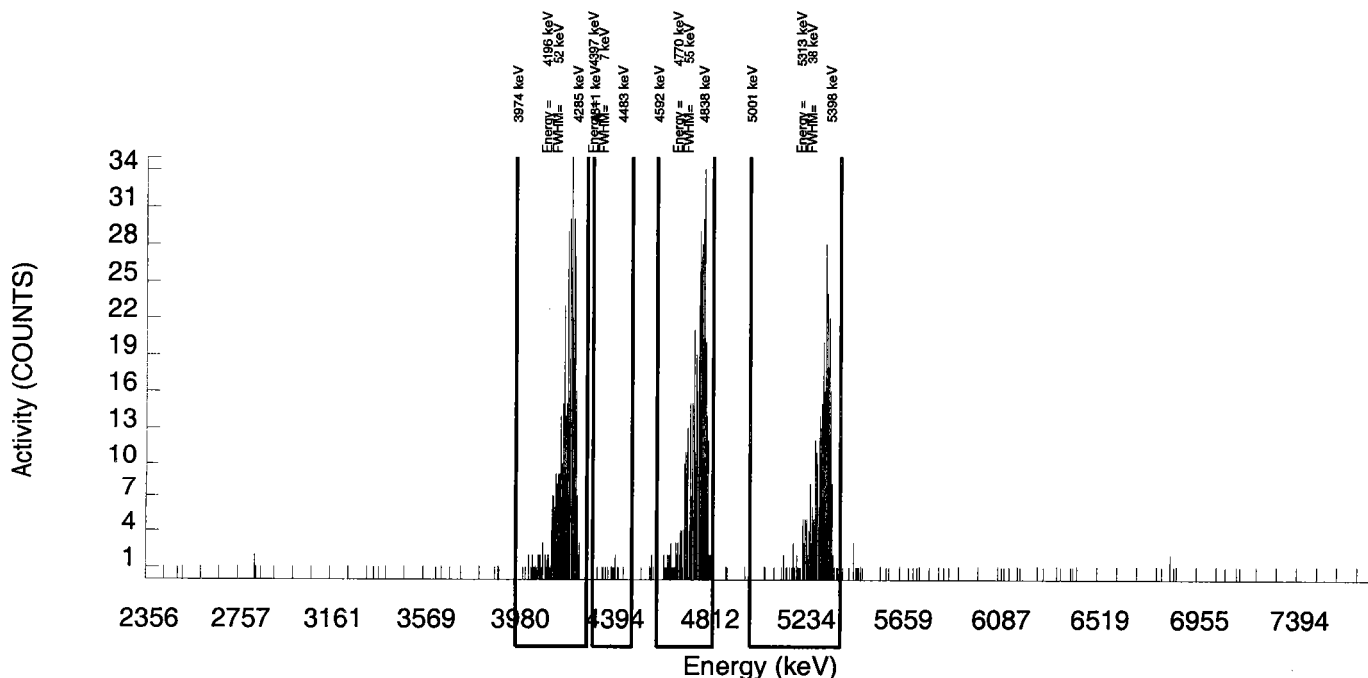
NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
U-3/4	4763.020	410.760	0.240	100.0000	3.34E+01	6.01E+00	4.29E-01	3.23E+00
U232	5302.100	299.400	3.600	100.0000	2.44E+01	4.63E+00	9.62E-01	2.78E+00
U-235	4391.000	11.760	0.240	80.90000	1.18E+00	7.07E-01	5.31E-01	6.84E-01
U-238	4184.730	397.280	0.720	100.0000	3.23E+01	5.84E+00	5.65E-01	3.18E+00

REVIEWED BY:

DATE :

$$ms = \frac{32.3 - 4.98}{26.3} = 104\%$$

PJH 04/21/06





GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520799  
SAMPLE DATE : 18-APR-2006 00:00:00

SAMPLE ID : S1201071147\_UU  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :33893  
AVERAGE %EFFICIENCY :30.9792  
% YIELD : 92.317

COUNT DATE:21-APR-2006 07:38:37  
ELAPSED LIVE TIME(SEC): 14400.00  
ANALYST :BJB1

MS : 0858-B  
MSD : 0858-B  
LCS : 0858-B  
TRACER : 0688-H  
BKG FILE: B021.CNF;681  
BKG DATE: 17-APR-2006

MS PCI/L : 13.14673  
MSD PCI/L : 13.14673  
LCS PCI/L : 13.14673  
TRACER DPM : 5.4069  
EFF FILE : W021.CNF;201  
CAL DATE: 3-APR-2006

MS ISOTOPE : U-238  
MSD ISOTOPE: U-238  
LCS ISOTOPE: U-238  
TRACER ISOTOPE: U232  
LIB FILE : ENV\_ALPHA\_UU.N

NUCLIDE ACTIVITY SUMMARY

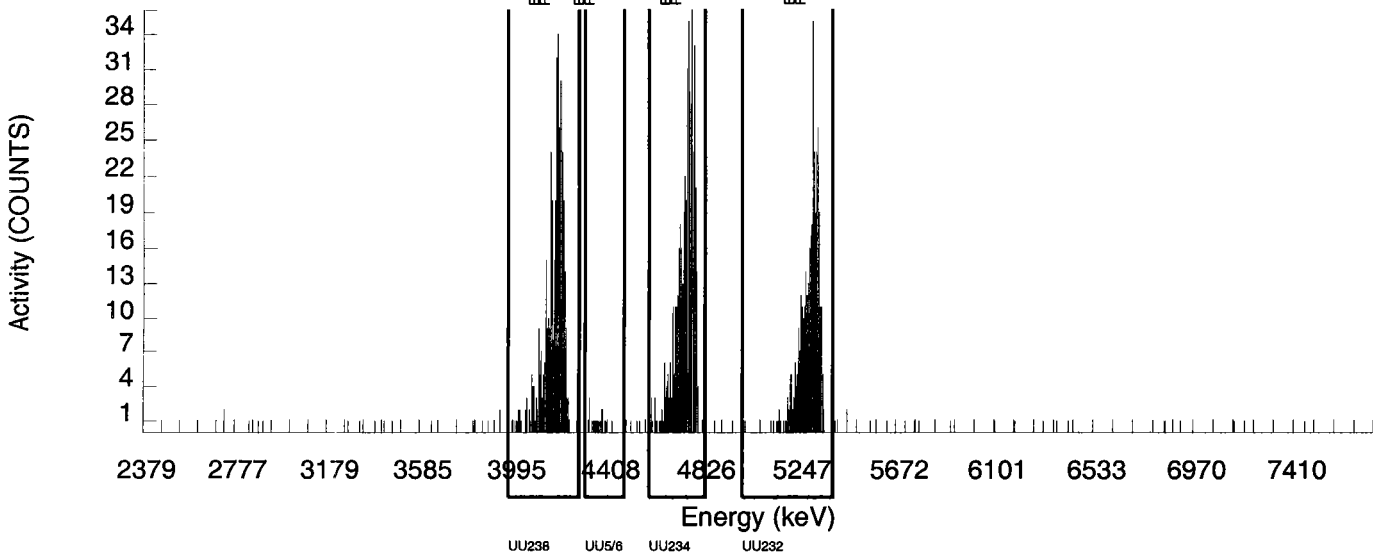
NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
U-3/4	4763.020	473.280	0.720	100.0000	1.55E+01	2.62E+00	2.28E-01	1.40E+00
U232	5302.100	371.080	1.920	100.0000	1.22E+01	2.14E+00	3.10E-01	1.24E+00
U-235	4391.000	19.760	0.240	80.90000	8.01E-01	3.74E-01	2.14E-01	3.56E-01
U-238	4184.730	428.520	0.480	100.0000	1.41E+01	2.41E+00	2.04E-01	1.33E+00

REVIEWED BY:

DATE:

PJH 04/21/06

$$UCS = \frac{14.1}{13.1} = 108\%$$



Radiochemistry Batch Checklist, Rev 4

Batch# 520802 Product: PO Date: 4/25/06

Criteria:	Yes	No	Comments
Sample Solids are less than 100 mg for GAB.			NA
If activity less 10* MDA, error is 150% or less of sample activity. If greater 10* MDA, error is 40% or less. If below the MDA, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL has been met.	✓		
If duplicate activities are less 5* MDA, then rpd is 100% or less. If greater 5* MDA, then rpd 20% or less. If below the MDA, the rpd is 0%. Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.	✓		
Method blank is less than the RDL. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Special requirements page checked	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms. All lineouts initialed and dated. No transcription errors are apparent.	✓		
QC data entered into QC database. Batch entered into Case Narrative.	✓		
Batch non-conformances completed If applicable.			NA

General Engineering Laboratories

2/22/2005

Primary Review Performed By: Manuel Alvarez 4/25/06

Secondary Review Performed By: Barbara Kelley 4/25/06

# Polonium Que Sheet

13-APR-06

Batch #: 520802      Analyst: LCW1      Minimum DueDate: 20-APR-06  
 Tracer Isotope: Po-209      Tracer Code: 05440D      Expiration Date: 11/19/06      Vol: 0.1  
 LCS Isotope: Po-210      LCS Code: 09040      Expiration Date: 4/10/07      Vol: 0.1  
 Spike Isotope: Po-210      Spike Code: 09040      Expiration Date: 4/10/07      Vol: 0.1  
 Prep Date: 4/17/06      Initials: LCW      Pipet ID: 1101544      Balance ID: 11150107

Witness: MS 4/17/06

Sample I	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Label #	Aliquot (g)	Po Det #	Ash Weight (g)
159247001	2603230069 M-120	SAMPLE		1 pCi/L	GROUND WA1	MWHL002	22-MAR-06	1	0.100	757 AM 256	
1201071152	MB for batch 520802	MB		1 pCi/L	GROUND WA1	QC ACCOUNT		2	0.200	83 32	
1201071153	2603230069 M-120(159247001DUP)	DUP		1 pCi/L	GROUND WA1	QC ACCOUNT	22-MAR-06	3	0.100	85	
1201071154	2603230069 M-120(159247001MS)	MS		1 pCi/L	GROUND WA1	QC ACCOUNT	22-MAR-06	4	0.100	86	
1201071155	LCS for batch 520802	LCS		1 pCi/L	GROUND WA1	QC ACCOUNT		5	0.200	86	

LCW 4/17/06

LCW 4/19/06  
 Solid Sample Dissolution by: LEACH DIGESTION  
 Circle One

Data Reviewed By: MS 4/20/06

GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520802 SAMPLE DATE : 22-MAR-2006 00:00:00		SAMPLE ID : S0159247001_PO SAMPLE QTY: 0.200 L	
DETECTOR NUMBER :29976 AVERAGE %EFFICIENCY :32.3837 % YIELD : 61.126		COUNT DATE:21-APR-2006 19:21:04 ELAPSED LIVE TIME(SEC): 14400.00 ANALYST :LCW1	
MS : 0904-B MSD : 0904-B LCS : 0904-B TRACER : 0546-D BKG FILE: B075.CNF;688 BKG DATE: 16-APR-2006	MS PCI/L : 40.26058 MSD PCI/L : 40.26058 LCS PCI/L : 40.26058 TRACER DPM : 4.6844 EFF FILE : W075.CNF;178 CAL DATE: 3-APR-2006	MS ISOTOPE : PO-210 MSD ISOTOPE: PO-210 LCS ISOTOPE: PO-210 TRACER ISOTOPE: PO-209 LIB FILE : ENV_ALPHA_PO.N	

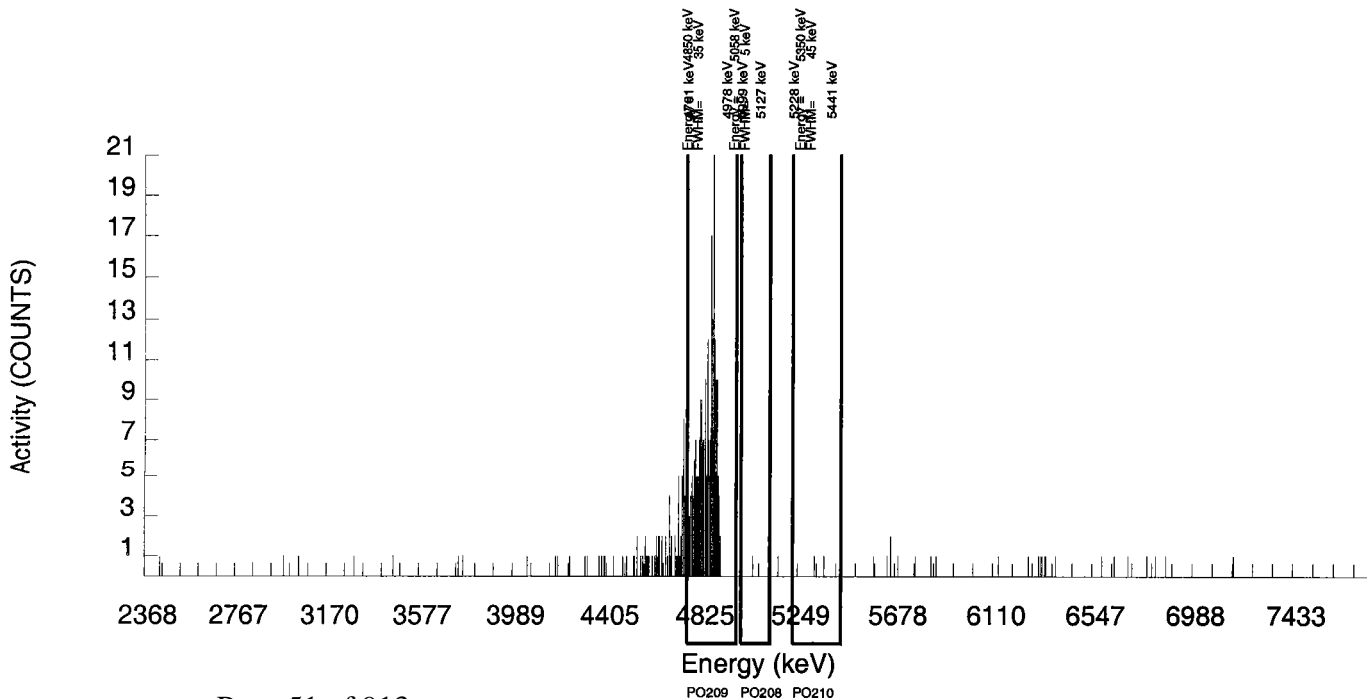
NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
PO-208	5115.000	-0.920	1.920	99.99800	-4.45E-02	1.15E-01	4.57E-01	1.15E-01
PO-209	4882.000	221.840	2.160	99.74000	1.06E+01	2.05E+00	4.68E-01	1.40E+00
PO-210	5304.380	-0.880 ✓	2.880	100.0000	-4.87E-02	1.78E-01	6.03E-01	1.78E-01

REVIEWED BY:

DATE :

*man by ke*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520802  
SAMPLE DATE : 17-APR-2006 00:00:00

SAMPLE ID : S1201071152\_PO  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :33207  
AVERAGE %EFFICIENCY :32.1060  
% YIELD : 37.333

COUNT DATE:24-APR-2006 14:21:46  
ELAPSED LIVE TIME(SEC): 14400.00  
ANALYST :LCW1

MS : 0904-B  
MSD : 0904-B  
LCS : 0904-B  
TRACER : 0546-D  
BKG FILE: B032.CNF;703  
BKG DATE: 23-APR-2006

MS PCI/L : 35.34450  
MSD PCI/L : 35.34450  
LCS PCI/L : 35.34450  
TRACER DPM : 4.6821  
EFF FILE : W032.CNF;242  
CAL DATE: 4-APR-2006

MS ISOTOPE : PO-210  
MSD ISOTOPE: PO-210  
LCS ISOTOPE: PO-210  
TRACER ISOTOPE: PO-209  
LIB FILE : ENV\_ALPHA\_PO.N

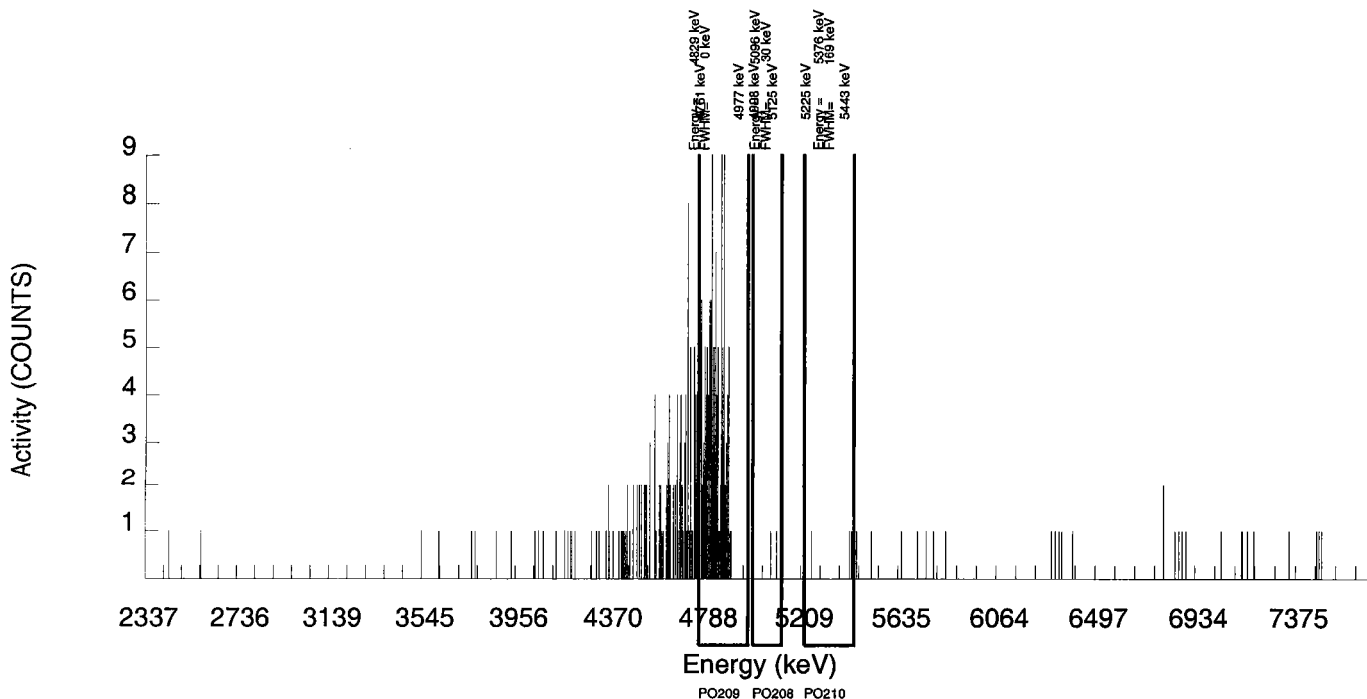
NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
PO-208	5115.000	0.320	1.680	99.99800	2.52E-02	2.39E-01	7.10E-01	2.39E-01
PO-209	4882.000	134.320	1.680	99.74000	1.05E+01	2.68E+00	7.09E-01	1.80E+00
PO-210	5304.380	-1.080 ✓	4.080	100.0000	-8.79E-02	3.19E-01	1.01E+00	3.18E-01

REVIEWED BY:

DATE :

*maula 5/20*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520802 SAMPLE DATE : 22-MAR-2006 00:00:00		SAMPLE ID : S1201071153_PO SAMPLE QTY: 0.200 L	
DETECTOR NUMBER :30451 AVERAGE %EFFICIENCY :29.9703 % YIELD : 52.032		COUNT DATE:21-APR-2006 19:21:09 ELAPSED LIVE TIME(SEC): 14400.00 ANALYST :LCW1	
MS : 0904-B MSD : 0904-B LCS : 0904-B TRACER : 0546-D BKG FILE: B085.CNF;607 BKG DATE: 16-APR-2006		MS PCI/L : 40.26058 MSD PCI/L : 40.26058 LCS PCI/L : 40.26058 TRACER DPM : 4.6844 EFF FILE : W085.CNF;205 CAL DATE: 3-APR-2006	
		MS ISOTOPE : PO-210 MSD ISOTOPE: PO-210 LCS ISOTOPE: PO-210 TRACER ISOTOPE: PO-209 LIB FILE : ENV_ALPHA_PO.N	

NUCLIDE ACTIVITY SUMMARY

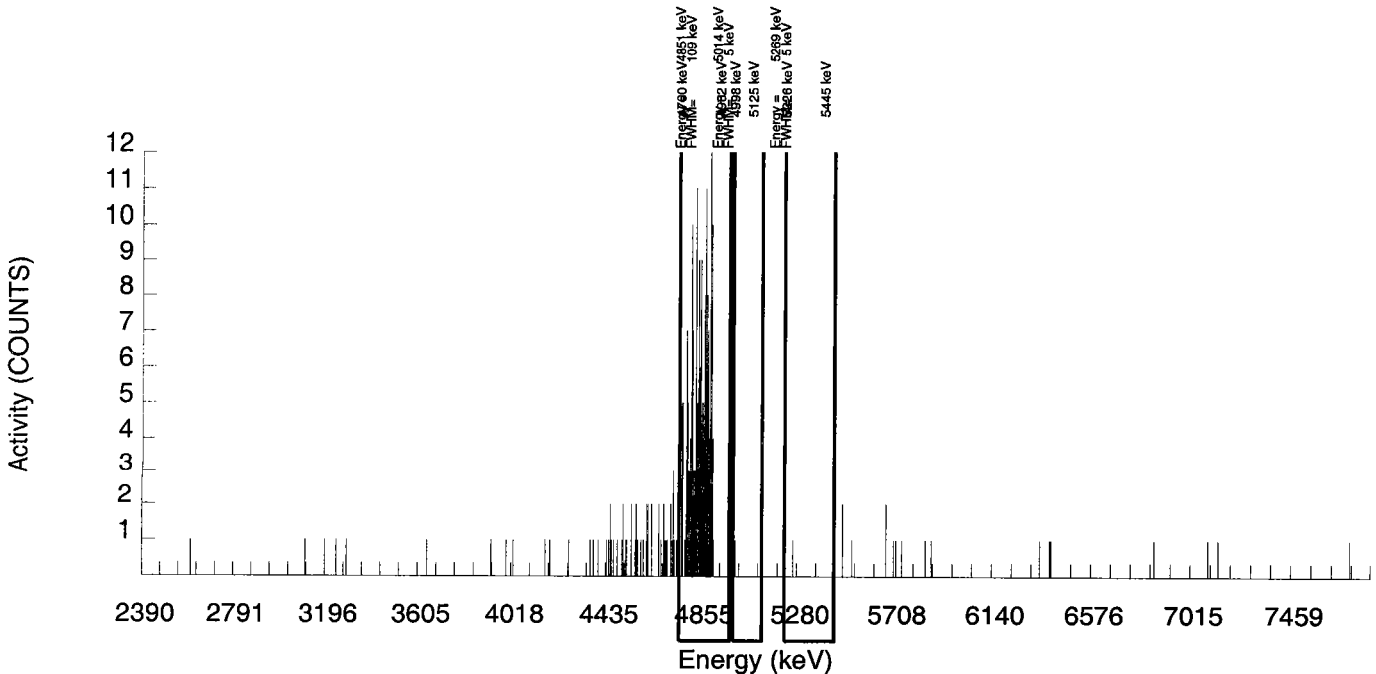
NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
PO-208	5115.000	0.040	0.960	99.99800	2.46E-03	1.34E-01	4.64E-01	1.34E-01
PO-209	4882.000	174.760	0.240	99.74000	1.06E+01	2.29E+00	3.19E-01	1.57E+00
PO-210	5304.380	0.760	0.240	100.0000	5.34E-02	1.42E-01	3.71E-01	1.42E-01

REVIEWED BY:

DATE :

*ACT < MDA*

*MA 4/24/06*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520802  
SAMPLE DATE : 22-MAR-2006 00:00:00

SAMPLE ID : S1201071154\_PO  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :29278  
AVERAGE %EFFICIENCY :26.2964  
% YIELD : 67.024

COUNT DATE:21-APR-2006 19:21:09  
ELAPSED LIVE TIME(SEC): 14400.00  
ANALYST :LCW1

MS : 0904-B  
MSD : 0904-B  
LCS : 0904-B  
TRACER : 0546-D  
BKG FILE: B086.CNF;608  
BKG DATE: 16-APR-2006

MS PCI/L : 40.26058  
MSD PCI/L : 40.26058  
LCS PCI/L : 40.26058  
TRACER DPM : 4.6844  
EFF FILE : W086.CNF;176  
CAL DATE: 3-APR-2006

MS ISOTOPE : PO-210  
MSD ISOTOPE: PO-210  
LCS ISOTOPE: PO-210  
TRACER ISOTOPE: PO-209  
LIB FILE : ENV\_ALPHA\_PO.N

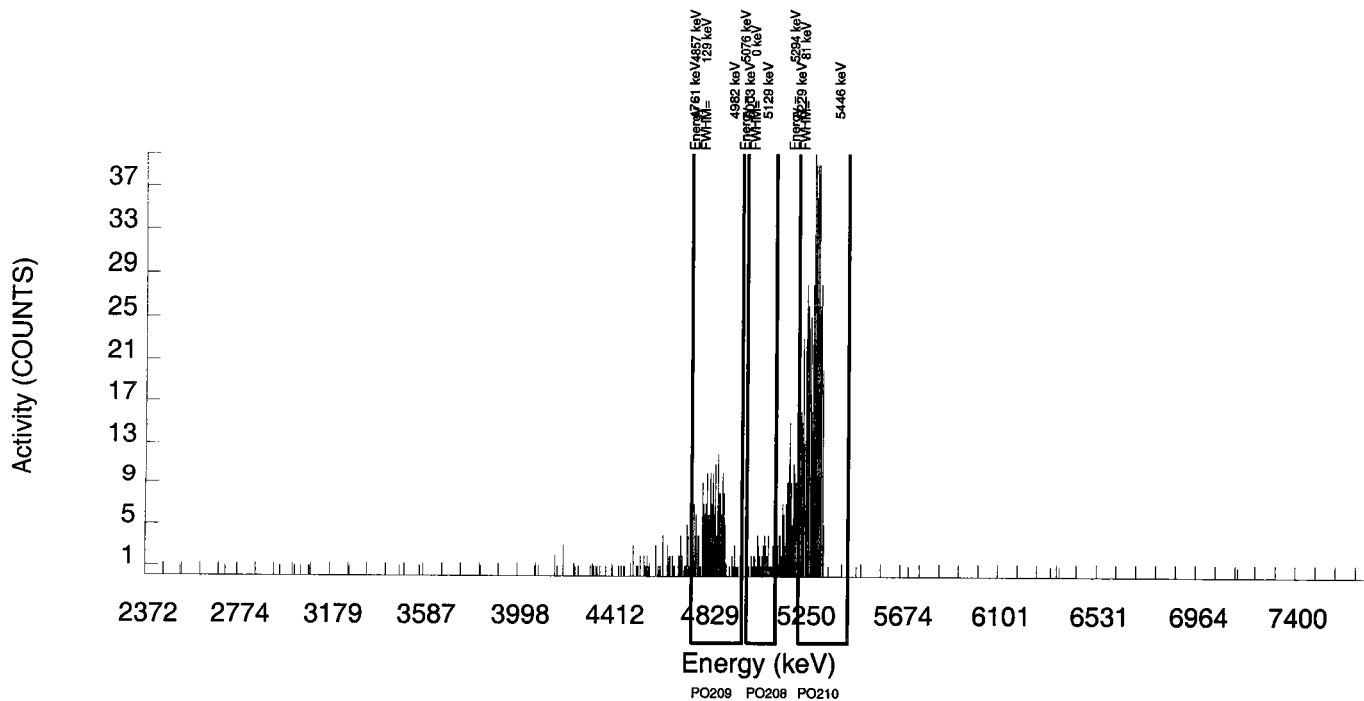
NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
PO-208	5115.000	48.560	1.440	99.99800	2.64E+00	8.53E-01	4.66E-01	7.56E-01
PO-209	4882.000	197.520	0.480	99.74000	1.06E+01	2.16E+00	3.32E-01	1.47E+00
PO-210	5304.380	546.520	0.480	100.0000	3.40E+01	5.83E+00	3.87E-01	2.85E+00

REVIEWED BY:

DATE :

*MS = 34.0 - 0 / 40.3 = 84.4% MAY/24/06*



GENERAL ENGINEERING LABORATORIES, LLC.  
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 520802  
SAMPLE DATE : 17-APR-2006 00:00:00

SAMPLE ID : S1201071155\_PO  
SAMPLE QTY: 0.200 L

DETECTOR NUMBER :30434  
AVERAGE %EFFICIENCY :27.0872  
% YIELD : 57.003

COUNT DATE:21-APR-2006 19:21:09  
ELAPSED LIVE TIME(SEC): 14400.00  
ANALYST :LCW1

MS : 0904-B  
MSD : 0904-B  
LCS : 0904-B  
TRACER : 0546-D  
BKG FILE: B088.CNF;598  
BKG DATE: 16-APR-2006

MS PCI/L : 35.34450  
MSD PCI/L : 35.34450  
LCS PCI/L : 35.34450  
TRACER DPM : 4.6821  
EFF FILE : W088.CNF;171  
CAL DATE: 3-APR-2006

MS ISOTOPE : PO-210  
MSD ISOTOPE: PO-210  
LCS ISOTOPE: PO-210  
TRACER ISOTOPE: PO-209  
LIB FILE : ENV\_ALPHA\_PO.N

NUCLIDE ACTIVITY SUMMARY

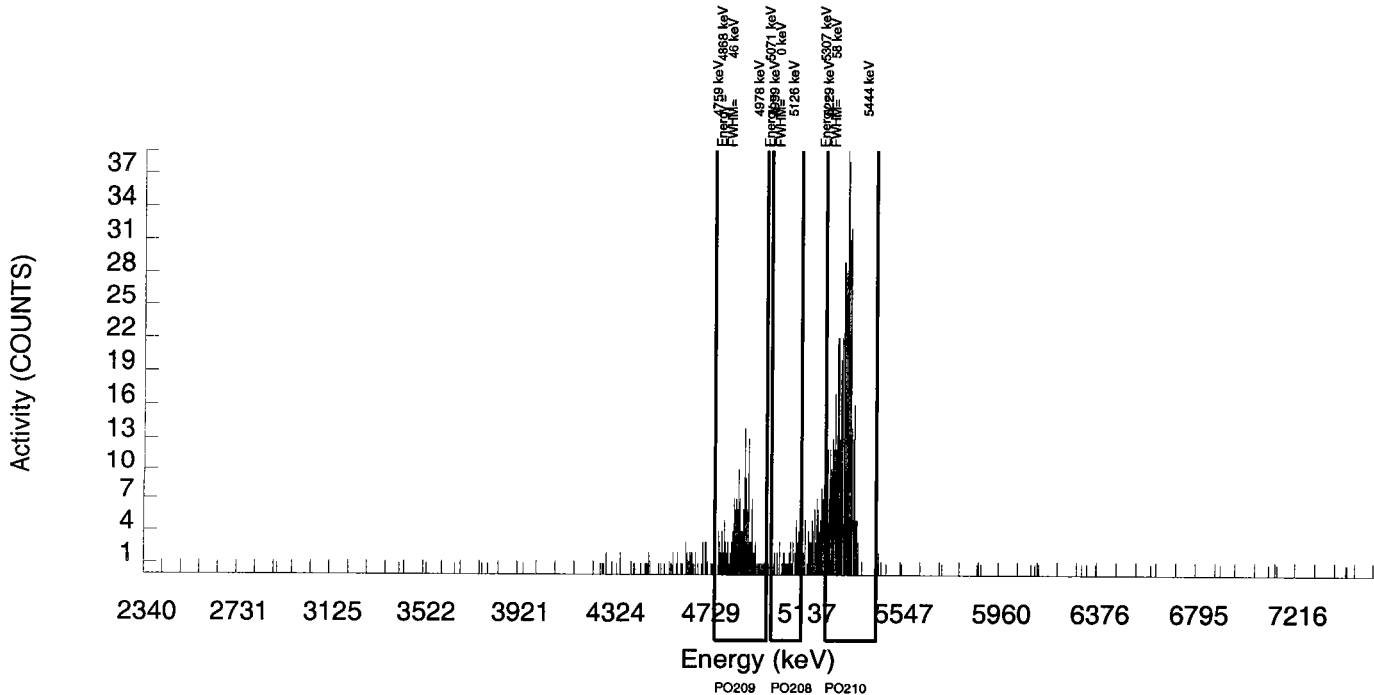
NUCLIDE	ENERGY	NET AREA	BKG AREA	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	UNC pCi/L
PO-208	5115.000	47.520	0.480	99.99800	2.90E+00	9.48E-01	3.79E-01	8.29E-01
PO-209	4882.000	173.040	0.960	99.74000	1.05E+01	2.30E+00	4.60E-01	1.58E+00
PO-210	5304.380	501.800	1.200	100.0000	3.13E+01	5.67E+00	5.04E-01	2.74E+00

REVIEWED BY:

DATE :

$$LCS = \frac{31.3}{35.3} = 88.7\%$$

man/24/06





Radiochemistry Batch Checklist, Rev 4

Batch# 519510 Product: 8U/mwHL Date: 4/26/06

Criteria:	Yes	No	Comments
Sample Solids are less than 100 mg for GAB.			NA
If activity less 10* MDA, error is 150% or less of sample activity. If greater 10* MDA, error is 40% or less. If below the MDA, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL has been met.	✓	✓	NCR 311620
If duplicate activities are less 5* MDA, then rpd is 100% or less. If greater 5* MDA, then rpd 20% or less. If below the MDA, the rpd is 0%. Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.			N/A
Method blank is less than the RDL. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Special requirements page checked	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.	✓		
All lineouts initialed and dated.	✓		
No transcription errors are apparent.	✓		
QC data entered into QC database.	✓		
Batch entered into Case Narrative.	✓		
Batch non-conformances completed If applicable.	✓		NCR 311620

General Engineering Laboratories

2/22/2005  
Primary Review Performed By: Jack Cummings 4/26/06

Secondary Review Performed By: Mike Pittner 4/26/06

# Gamma Spec Que Sheet

04/25/2006

Batch #: 519510

Analyst: ~~PKSI~~ <sup>MWHL</sup> ~~4/25/06~~  
MSTH Minimum Due Date: 04/20/2006

Gamma Spike Isotope: Mixed Gamma  
Gamma LCS Isotope: Mixed Gamma

Spike Code: ~~N/A~~  
LCS Code: ~~0781-A~~

Expiration Date: ~~N/A~~ Vol: ~~N/A~~ Nominal Concentration: ~~N/A~~  
Expiration Date: ~~4/27/06~~ Vol: ~~1.0 mL~~ Nominal Concentration: ~~657-463.2 (660) = 658.9~~

Initials: ~~DAS~~ Prep Date: ~~4-25-06~~

Witness: ~~N/A~~

Sample ID	Client Description / Container ID	Type	Hazard Code	RDL	Client	Matrix	Collect Date	Aliquot (g / F)	Detector	Sealing Date/Time (if Applicable)
158272001	2603140436 TR-10A	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	13-MAR-06 14:35:00	2.0	1	
158275001	2603140472 PUMP BLANK	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	13-MAR-06 10:45:00	2.0	3	
158276001	2603090347 FB-1	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	08-MAR-06 15:30:00	2.0	4	
158277001	2603100260 EB-1	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	09-MAR-06 14:00:00	2.0	6	
158436001	2603150120 TR-9A	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	14-MAR-06 14:45:00	2.0	7	
158971001	2603220347 M-103	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	21-MAR-06 14:00:00	1.926	8	
158971002	2603220348 TR-7	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	21-MAR-06 12:00:00	2.0	9	
158971003	2603220357 TR-9	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	21-MAR-06 09:00:00	2.0	10	
158971004	2603220360 TR-10	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	21-MAR-06 10:20:00	2.0	11	
159242001	2603240118 H-11	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	23-MAR-06 15:20:00	2.0	12	
159242002	2603240122 M-117	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	23-MAR-06 14:50:00	2.0	13	
159242003	2603240135 M-121	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	23-MAR-06 08:30:00	2.0	14	
159243001	2603230197 M-118	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	22-MAR-06 14:30:00	2.0	15	
159244001	2603250005 EB-3	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	24-MAR-06 12:00:00	2.0	16	
159247001	2603230069 M-120	SAMPLE	10 pCi/L		MWHL002	GROUND WATER	22-MAR-06 10:20:00	2.0	17	
1201068236	MB for batch 519510	MB	2 pCi/L		QC ACCOUNT	GROUND WATER	4/25/06	2.0	WELL	
1201068237	2603230069 M-120(159247001DUP)	DUP	2 pCi/L		QC ACCOUNT	GROUND WATER	22-MAR-06 10:20:00	2.0	19	
1201068238	LCS for batch 519510	LCS	2 pCi/L		QC ACCOUNT	GROUND WATER	4/25/06	2.0	WELL	
								2.0	WELL	

MWHL  
4/25/06

# Failed RDL Report

Batch Id	Samp Id	Sample Type	Run Date	Parmname	Result	MDA	RDL
519510	158272001	SAMPLE	25-APR-06				
519510	158275001	SAMPLE	25-APR-06				
519510	158276001	SAMPLE	25-APR-06				
519510	158277001	SAMPLE	25-APR-06				
519510	158436001	SAMPLE	25-APR-06				
519510	158971001	SAMPLE	25-APR-06				
519510	158971002	SAMPLE	25-APR-06				
519510	158971003	SAMPLE	25-APR-06				
519510	158971004	SAMPLE	25-APR-06				
519510	159242001	SAMPLE	25-APR-06				
519510	159242002	SAMPLE	25-APR-06				
519510	159242003	SAMPLE	25-APR-06				
519510	159243001	SAMPLE	26-APR-06				
519510	159244001	SAMPLE	25-APR-06				
519510	159247001	SAMPLE	25-APR-06	Actinium-228	-6.361	3.935	2.00
519510	1201068236	MB	25-APR-06	Actinium-228	5.78	10.21	2.00
				Bismuth-212	6.397	18.43	10.0
519510	1201068237	DUP	26-APR-06	Actinium-228	0.8134	4.83	2.00
519510	1201068238	LCS	26-APR-06	Actinium-228	50.08	75.87	2.00
				Bismuth-212	68.21	146.5	10.0
				Lead-212	15.72	30.23	10.0
				Protactinium-231	-412.2	684.7	280

# GEL QUALS

Batch ID: 519510

Report run on: April 27, 2006 8:49 AM

Samp Id	Parmname	Cofa	Edd	Qual Comments	Auto	Result	MDA	Uncert	SQL
158272001-1 25-APR-2006 18:37	Lead-212	UI	UI	UI	UI	UI	0		
				Data rejected due to low abundance.					
158275001-1 25-APR-2006 18:37	Lead-212	UI	UI	UI	UI	UI	0		
				Data rejected due to low abundance.					
158276001-1 25-APR-2006 18:37	Lead-212	UI	UI	UI	UI	UI	0		
				Data rejected due to low abundance.					
158436001-1 25-APR-2006 18:38	Lead-212	UI	UI	UI	UI	UI	0		
				Data rejected due to low abundance.					
158971004-1 25-APR-2006 18:39	Lead-212	UI	UI	UI	UI	UI	0		
				Data rejected due to low abundance.					
159244001-1 25-APR-2006 18:42	Lead-212	UI	UI	UI	UI	UI	0		
				Data rejected due to low abundance.					
159242002-1 25-APR-2006 18:43	Lead-212	UI	UI	UI	UI	UI	0		
				Data rejected due to low abundance.					
1201068236-1 MB 25-APR-2006 18:43	Lead-212	UI	UI	UI	UI	UI	0		
				Data rejected due to low abundance.					
159247001-1 25-APR-2006 18:46	Bismuth-212	UI	UI	UI	UI	UI	0		
				Data rejected due to low abundance.					
	Lead-212	UI	UI	UI	UI	UI	0		
				Data rejected due to low abundance.					

## Result Greater Than MDA

Batch Id	Sample Id	Sample Type	Run Date	Parmname	Result	Uncertainty	Units	MDA	RDL
519510	158272001	SAMPLE	25-APR-06	Annihilation Rad.	12.73	1.786	pCi/L	3.74	N
				Cadmium-115	2.320E+05	2.226E+06	pCi/L	0	N
				Iodine-135	1.000E+41	1.390E+41	pCi/L	0	N
				Lead-212 <i>LA</i>	<del>4.946</del> 0	2.429	pCi/L	4.371	10.0 <i>ul</i>
				Manganese-56	1.000E+41	2.000E+41	pCi/L	0	N
				Molybdenum-99	1.172E+05	89520	pCi/L	0	N
				Potassium-40 <i>HE</i>	43.16	16.33	pCi/L	34.39	N
				Technetium-99m	1.000E+41	7.636E+40	pCi/L	0	N
Thulium-171 <i>HE</i>	4043	2188	pCi/L	2075	N				
519510	158275001	SAMPLE	25-APR-06	Annihilation Rad.	15.58	2.031	pCi/L	3.721	N
				Antimony-127	4866	7583	pCi/L	0	N
				Cadmium-115	5.908E+05	2.532E+06	pCi/L	0	N
				Cerium-143	5.140E+08	8.507E+09	pCi/L	0	N
				Lead-212 <i>LA</i>	<del>7.154</del> 0	2.547	pCi/L	4.625	10.0 <i>ul</i>
				Molybdenum-99	1.425E+05	1.297E+05	pCi/L	0	N
				Potassium-40	32.23	15.22	pCi/L	30.47	N
				Praseodymium-144	1.000E+41	1.852E+41	pCi/L	0	N
				Promethium-149	1.750E+06	2.588E+07	pCi/L	0	N
				Sodium-24	2.035E+20	1.161E+21	pCi/L	0	N
				Technetium-99m	1.000E+41	1.213E+41	pCi/L	0	N
				Thorium-234 <i>HE</i>	287.2	154.4	pCi/L	117.4	N
				Thulium-171 <i>HE</i>	2399	1367	pCi/L	2171	N
				Uranium-238 <i>HE</i>	287.2	154.4	pCi/L	89.81	N
519510	158276001	SAMPLE	25-APR-06	Actinium-227 <i>HE</i>	32.23	23.18	pCi/L	25.11	N
				Annihilation Rad.	16.28	1.843	pCi/L	3.962	N
				Antimony-127	11930	16570	pCi/L	0	N
				Cadmium-115	1.783E+06	1.059E+07	pCi/L	0	N
				Cerium-143	1.154E+11	1.435E+11	pCi/L	0	N
				Lead-212 <i>LA</i>	<del>5.89</del> 0	2.591	pCi/L	4.671	10.0 <i>ul</i>
				Molybdenum-99	4.877E+05	3.927E+05	pCi/L	0	N
				Praseodymium-144	1.000E+41	2.000E+41	pCi/L	0	N
				Sodium-24	3.619E+23	2.323E+23	pCi/L	0	N
				Technetium-99m	1.000E+41	8.052E+40	pCi/L	0	N
				Thorium-227 <i>HE</i>	31.63	22.75	pCi/L	24.64	N
				Thulium-171 <i>HE</i>	2712	2464	pCi/L	2441	N
				519510	158277001	SAMPLE	25-APR-06	Annihilation Rad.	16.49
Antimony-127	6976	16060	pCi/L					0	N

## Result Greater Than MDA

Batch Id	Sample Id	Sample Type	Run Date	Parname	Result	Uncertainty	Units	MDA	RDL
519510	158277001	SAMPLE	25-APR-06	Cadmium-115	3.677E+06	9.401E+06	pCi/L	0	N
				Lanthanum-140	2.439E+08	5.002E+08	pCi/L	0	N
				Molybdenum-99	4.079E+05	2.336E+05	pCi/L	0	N
				Niobium-95m	5761	44030	pCi/L	0	N
				Potassium-40 <i>HE</i>	62.33	19.26	pCi/L	40.57	N
				Promethium-149	2.327E+07	1.026E+08	pCi/L	0	N
				Sodium-24	1.585E+22	8.289E+22	pCi/L	0	N
				Technetium-99m	1.000E+41	5.728E+40	pCi/L	0	N
				Thulium-171 <i>HE</i>	5661	3203	pCi/L	2659	N
519510	158436001	SAMPLE	25-APR-06	Annihilation Rad.	13.23	1.808	pCi/L	3.787	N
				Antimony-127	667.6	6518	pCi/L	0	N
				Cadmium-115	2.338E+06	1.802E+06	pCi/L	0	N
				Iodine-132	1.000E+41	2.000E+41	pCi/L	0	N
				Lead-212 <i>LA</i>	<del>4.907</del> 0	2.483	pCi/L	4.547	10.0 <i>ci</i>
				Molybdenum-99	50670	86830	pCi/L	0	N
				Praseodymium-144	1.000E+41	1.378E+41	pCi/L	0	N
				Technetium-99m	1.000E+41	1.714E+41	pCi/L	0	N
				Thulium-171 <i>HE</i>	2982	2061	pCi/L	2551	N
519510	158971001	SAMPLE	25-APR-06	Actinium-228 <i>HE</i>	10.61	4.909	pCi/L	9.879	N
				Annihilation Rad.	14.6	1.821	pCi/L	3.846	N
				Antimony-127	2131	1809	pCi/L	0	N
				Bismuth-211 <i>HE</i>	14.77	16.48	pCi/L	11.92	N
				Cadmium-115	52020	1.900E+05	pCi/L	0	N
				Cerium-143	6.537E+07	1.284E+08	pCi/L	0	N
				Iodine-132	1.000E+41	2.000E+41	pCi/L	0	N
				Iodine-135	2.156E+39	1.972E+39	pCi/L	0	N
				Molybdenum-99	17960	14140	pCi/L	0	N
				Potassium-40 <i>HE</i>	24.96	26.93	pCi/L	18.68	N
				Radium-228 <i>HE</i>	10.61	4.909	pCi/L	9.879	N
				Sodium-24	2.011E+17	1.617E+17	pCi/L	0	N
				Technetium-99m	1.000E+41	7.873E+40	pCi/L	0	N
				Thorium-234 <i>HE</i>	112.6	68.12	pCi/L	108.5	N
				Thulium-171 <i>HE</i>	2826	1738	pCi/L	1932	N
				Uranium-238 <i>HE</i>	112.6	68.12	pCi/L	108.5	N
519510	158971002	SAMPLE	25-APR-06	Annihilation Rad.	16.2	1.889	pCi/L	3.974	N
				Iodine-135	2.678E+38	2.518E+39	pCi/L	0	N

## Result Greater Than MDA

Batch Id	Sample Id	Sample Type	Run Date	Parmname	Result	Uncertainty	Units	MDA	RDL
519510	158971002	SAMPLE	25-APR-06	Manganese-56	1.000E+41	2.000E+41	pCi/L	0	N
				Molybdenum-99	18850	16570	pCi/L	0	N
				Praseodymium-144	1.000E+41	2.000E+41	pCi/L	0	N
				Promethium-149	9.997E+05	2.196E+06	pCi/L	0	N
				Technetium-99m	1.000E+41	8.788E+40	pCi/L	0	N
				Thulium-171 <i>HE</i>	3368	2485	pCi/L	2281	N
519510	158971003	SAMPLE	25-APR-06	Annihilation Rad.	15.53	2.091	pCi/L	3.875	N
				Iodine-133	1.048E+12	2.619E+12	pCi/L	0	N
				Molybdenum-99	23630	13690	pCi/L	0	N
				Potassium-40 <i>HE</i>	18.58	29.58	pCi/L	18.54	N
				Protactinium-234m <i>HE</i>	304.7	250.4	pCi/L	234.8	N
				Technetium-99m	1.000E+41	8.747E+40	pCi/L	0	N
519510	158971004	SAMPLE	25-APR-06	Annihilation Rad.	15.66	2.196	pCi/L	3.943	N
				Cerium-143	8.039E+07	1.510E+08	pCi/L	0	N
				Iodine-133	3.963E+11	2.726E+12	pCi/L	0	N
				Lead-212 <i>UA</i>	<del>5.589</del> 0	2.897	pCi/L	5	10.0 <i>UI</i>
				Manganese-56	1.000E+41	2.506E+41	pCi/L	0	N
				Molybdenum-99	20220	14670	pCi/L	0	N
				Praseodymium-144	1.000E+41	3.076E+41	pCi/L	0	N
				Promethium-149	1.033E+06	2.345E+06	pCi/L	0	N
				Sodium-24	3.551E+17	3.676E+17	pCi/L	0	N
				Technetium-99m	1.000E+41	9.772E+40	pCi/L	0	N
519510	159242001	SAMPLE	25-APR-06	Annihilation Rad.	17.95	1.793	pCi/L	3.848	N
				Cadmium-115	67830	1.070E+05	pCi/L	0	N
				Iodine-135	3.094E+37	2.350E+37	pCi/L	0	N
				Manganese-56	1.000E+41	2.000E+41	pCi/L	0	N
				Molybdenum-99	10770	9356	pCi/L	0	N
				Praseodymium-144	1.000E+41	2.000E+41	pCi/L	0	N
				Promethium-149	2.939E+05	1.135E+06	pCi/L	0	N
				Technetium-99m	2.596E+40	2.256E+40	pCi/L	0	N
				Tellurium-132	292.3	1344	pCi/L	0	N
				Thorium-234 <i>UA</i>	262.3	62.63	pCi/L	118.4	N
519510	159242002	SAMPLE	25-APR-06	Antimony-127	634.4	1211	pCi/L	0	N
				Bismuth-210 <i>HE</i>	126.9	280.6	pCi/L	116	N
				Bismuth-211 <i>HE</i>	12.88	12.43	pCi/L	6.006	N

## Result Greater Than MDA

Batch Id	Sample Id	Sample Type	Run Date	Parmname	Result	Uncertainty	Units	MDA	RDL
519510	159242002	SAMPLE	25-APR-06	Gross Gamma	7.527E+08	4.784E+08	pCi/L	5.223E+07	N
				Iodine-132	1.000E+41	7.243E+41	pCi/L	0	N
				Iodine-133	1.327E+10	4.512E+11	pCi/L	0	N
				Iodine-135	3.320E+36	1.362E+37	pCi/L	0	N
				Lead-210	126.9	280.6	pCi/L	116	N
				Lead-212 <i>UA</i>	<i>6.241</i>	4.662	pCi/L	3.129	10.0 <i>u1</i>
				Manganese-56	1.000E+41	1.295E+41	pCi/L	0	N
				Molybdenum-99	10380	7018	pCi/L	0	N
				Niobium-95m	3257	2617	pCi/L	0	N
				Praseodymium-144	1.000E+41	1.322E+41	pCi/L	0	N
				Promethium-149	97580	1.162E+06	pCi/L	0	N
				Protactinium-231 <i>HE</i>	70.73	69.61	pCi/L	61.12	N
				Radium-224 <i>HE</i>	46.55	35.72	pCi/L	24.83	N
				Sodium-24	1.151E+16	1.483E+16	pCi/L	0	N
				Technetium-99m	2.651E+40	2.421E+40	pCi/L	0	N
				Tellurium-125m	474.3	511.9	pCi/L	471.2	N
				Tellurium-132	214.8	1250	pCi/L	0	N
				Thorium-234 <i>HE</i>	55.7	77.63	pCi/L	46.22	N
				Thulium-171 <i>HE</i>	3903	2103	pCi/L	1226	N
				Uranium-238 <i>HE</i>	55.7	77.63	pCi/L	46.22	N
				519510	159242003	SAMPLE	25-APR-06	Annihilation Rad.	14.15
Antimony-127	127.3	1412	pCi/L					0	N
Bismuth-210 <i>HE</i>	45.91	48.07	pCi/L					33.22	N
Cadmium-115	1.166E+05	1.158E+05	pCi/L					0	N
Cerium-143	7.707E+06	4.887E+07	pCi/L					0	N
Iodine-135	5.803E+36	2.532E+37	pCi/L					0	N
Lead-210 <i>HE</i>	45.91	48.07	pCi/L					33.22	N
Manganese-56	1.000E+41	1.523E+41	pCi/L					0	N
Molybdenum-99	14010	8105	pCi/L					0	N
Potassium-40 <i>HE</i>	55.32	19.28	pCi/L					38.78	N
Sodium-24	1.081E+16	2.102E+16	pCi/L					0	N
Technetium-99m	6.943E+40	4.017E+40	pCi/L					0	N
Thorium-234 <i>UA</i>	153.9	25.81	pCi/L					49.19	N
Uranium-238 <i>UA</i>	153.9	25.81	pCi/L	49.19	N				
519510	159243001	SAMPLE	26-APR-06	Antimony-127	978.4	1558	pCi/L	0	N
				Cadmium-115	2.405E+05	1.452E+05	pCi/L	0	N
				Cerium-144 <i>HE</i>	12.34	10.23	pCi/L	9.106	N



## Result Greater Than MDA

Batch Id	Sample Id	Sample Type	Run Date	Parname	Result	Uncertainty	Units	MDA	RDL
519510	159243001	SAMPLE	26-APR-06	Gross Gamma	1.700E+09	1.537E+09	pCi/L	4.398E+08	N
				Iodine-133	1.988E+12	1.313E+12	pCi/L	0	N
				Iodine-135	2.996E+38	6.061E+38	pCi/L	0	N
				Manganese-56	1.000E+41	1.032E+42	pCi/L	0	N
				Molybdenum-99	19090	9959	pCi/L	0	N
				Neodymium-147 <i>KE</i>	94.56	58.27	pCi/L	65.94	N
				Niobium-95m	2646	3503	pCi/L	0	N
				Praseodymium-144	1.000E+41	1.359E+41	pCi/L	0	N
				Sodium-24	4.661E+16	7.977E+16	pCi/L	0	N
				Technetium-99m	1.000E+41	8.264E+40	pCi/L	0	N
				Tellurium-132	1717	1763	pCi/L	0	N
				Thorium-234 <i>KE</i>	99.27	90.06	pCi/L	55.46	N
				Thulium-171 <i>KE</i>	3245	1222	pCi/L	1167	N
				Tin-115 <i>KE</i>	192.7	155.5	pCi/L	162.1	N
				Uranium-238 <i>KE</i>	99.27	90.06	pCi/L	46.35	N
				519510	159244001	SAMPLE	25-APR-06	Annihilation Rad.	13.3
Cadmium-115	31370	1.007E+05	pCi/L					0	N
Iodine-132	1.000E+41	1.239E+41	pCi/L					0	N
Lead-212 <i>UA</i>	<del>6.051</del> 0	2.583	pCi/L					4.647	10.0 <i>U</i>
Manganese-56	1.000E+41	2.000E+41	pCi/L					0	N
Molybdenum-99	9982	5982	pCi/L					0	N
Praseodymium-144	1.000E+41	1.473E+41	pCi/L					0	N
Promethium-149	87820	8.511E+05	pCi/L					0	N
Protactinium-234m <i>KE</i>	324.3	205.2	pCi/L					309.9	N
Technetium-99m	2.771E+39	1.660E+39	pCi/L					0	N
Thulium-171 <i>KE</i>	1565	946.1	pCi/L					1119	N
Uranium-235 <i>KE</i>	14.95	8.194	pCi/L					14.62	N
519510	159247001	SAMPLE	25-APR-06					Antimony-127	718.1
				Bismuth-211 <i>KE</i>	12.27	15.52	pCi/L	6.833	N
				Bismuth-212 <i>UA</i>	<del>13.08</del> 0	10.09	pCi/L	10.25	10.0 <i>U</i>
				Californium-251	16.95	8.944	pCi/L	4.78	N
				Cerium-143	3.583E+07	8.342E+07	pCi/L	0	N
				Iodine-132	1.000E+41	6.603E+41	pCi/L	0	N
				Iodine-133	1.324E+11	1.047E+12	pCi/L	0	N
				Lead-212 <i>UA</i>	<del>5.428</del> 0	5.108	pCi/L	2.676	10.0 <i>U</i>
				Manganese-56	1.000E+41	1.619E+41	pCi/L	0	N
				Molybdenum-99	15550	10390	pCi/L	0	N

## Result Greater Than MDA

Batch Id	Sample Id	Sample Type	Run Date	Parmname	Result	Uncertainty	Units	MDA	RDL
519510	159247001	SAMPLE	25-APR-06	Niobium-95m	823.7	3112	pCi/L	0	N
				Praseodymium-144	1.000E+41	1.490E+41	pCi/L	0	N
				Promethium-149	1.785E+06	1.737E+06	pCi/L	0	N
				Radium-224 <del>HE</del>	61.27	57.61	pCi/L	22.48	N
				Technetium-99m	1.000E+41	9.224E+40	pCi/L	0	N
				Tellurium-132	205.2	1650	pCi/L	0	N
				Thorium-234 <del>HE</del>	112.1	96.33	pCi/L	59.99	N
				Thulium-171 <del>HE</del>	3807	1521	pCi/L	1261	N
				Uranium-238 <del>HE</del>	112.1	96.33	pCi/L	46.16	N
519510	1201068236	MB	25-APR-06	Barium-137m	17.07	2.005	pCi/L	4.244	N
				Bismuth-210 <del>HE</del>	231.5	98.63	pCi/L	157.3	N
				Cesium-137 <del>LA</del>	18.04	2.119	pCi/L	4.486	N
				Krypton-85 <del>LA</del>	1690	341.2	pCi/L	614.6	N
				Lead-210 <del>LA</del>	231.5	98.63	pCi/L	157.3	N
				Lead-212 <del>LA</del>	<del>9.659</del> 0	2.246	pCi/L	4.183	10.0 <del>u</del>
				Potassium-40 <del>HE</del>	35.98	14.79	pCi/L	29.86	N
				Praseodymium-144	1.000E+41	1.197E+41	pCi/L	0	N
				Promethium-147 <del>LA</del>	3.886E+06	1.932E+06	pCi/L	3.303E+06	N
519510	1201068237	DUP	26-APR-06	Antimony-127	199.1	1561	pCi/L	0	N
				Cadmium-115	1733	1.800E+05	pCi/L	0	N
				Californium-251 <del>LA</del>	19.33	9.376	pCi/L	5.512	N
				Iodine-133	3.961E+11	1.602E+12	pCi/L	0	N
				Iodine-135	1.134E+37	8.162E+38	pCi/L	0	N
				Molybdenum-99	23310	11740	pCi/L	0	N
				Niobium-95m	460.7	3550	pCi/L	0	N
				Praseodymium-144	1.000E+41	3.613E+42	pCi/L	0	N
				Sodium-24	2.522E+16	8.848E+16	pCi/L	0	N
				Technetium-99m	1.000E+41	8.176E+40	pCi/L	0	N
				Thorium-234 <del>LA</del>	89.8	91.91	pCi/L	60.98	N
				Thulium-171 <del>LA</del>	2844	1503	pCi/L	1251	N
				Uranium-238 <del>LA</del>	89.8	91.91	pCi/L	51.75	N
519510	1201068238	LCS	26-APR-06	Americium-241	1332	170.5	pCi/L	116.9	N
				Barium-137m	445.6	32.86	pCi/L	13.77	N
				Cadmium-109	8784	657.9	pCi/L	426.1	N
				Cerium-139	78.49	15.07	pCi/L	13.35	N
				Cesium-137	471	34.74	pCi/L	14.56	N
				Cobalt-57	138.8	16.11	pCi/L	13	N

## Result Greater Than MDA

Batch Id	Sample Id	Sample Type	Run Date	Parmname	Result	Uncertainty	Units	MDA	RDL
519510	1201068238	LCS	26-APR-06	Cobalt-60	645.8	49.12	pCi/L	15.69	N
				Gross Gamma	3193	746.2	pCi/L	1536	N
				Neptunium-237	2637	197.5	pCi/L	130.8	N
				Promethium-147	2.960E+08	3.437E+07	pCi/L	5.405E+07	N
				Tin-113	100.3	26.19	pCi/L	17.38	N
				Tin-126	898.1	67.27	pCi/L	43.85	N
				Yttrium-88	127.9	30.16	pCi/L	13.35	N

VAX/VMS Nuclide Identification Report Generated 26-APR-2006 04:46:35.81

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
Configuration   : DKA0:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G159247001.CNF;1
Sample date     : 22-MAR-2006 10:20:00 Acquisition date : 25-APR-2006 18:46:09
Sample ID      : G159247001 Sample quantity   : 2.00000E+00 LITER
Detector name   : GAM19 Detector geometry    : 2LMB
Elapsed live time: 0 10:00:00.00 Elapsed real time: 0 10:00:03.46 0.0%
Energy tolerance: 2.00000 keV Analyst Initials  : MJH1
Abundance limit : 75.00000 Sensitivity     : 3.00000
Batch ID       : 519510 Detector SN#    :
Matrix Spike DPM : LCS DPM                    :
*****

```

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	18.63	89	731	1.65	37.00	35	6	2.47E-03	49.5	0.00E+00
2	0	46.83*	41	492	1.45	93.34	89	9	1.14E-03	120.4	
3	2	63.46*	144	631	1.59	126.55	119	19	3.99E-03	41.9	1.21E+00
4	2	66.45	222	534	1.37	132.52	119	19	6.17E-03	19.4	
5	0	139.97*	157	547	1.35	279.40	275	10	4.37E-03	33.2	
6	0	176.58	207	632	2.92	352.55	346	13	5.75E-03	26.1	
7	0	198.34*	127	437	1.56	396.01	391	10	3.52E-03	46.0	
8	0	205.30	31	390	1.09	409.92	406	9	8.48E-04	118.4	
9	0	239.25*	138	614	1.34	477.75	470	16	3.84E-03	46.9	
10	0	262.42	22	397	3.93	524.03	519	12	6.16E-04	181.2	
11	0	283.63	24	256	0.64	566.41	563	8	6.70E-04	116.4	
12	0	326.90	67	266	2.58	652.88	648	10	1.86E-03	47.6	
13	0	351.80*	75	297	4.73	702.61	697	14	2.07E-03	63.1	
14	0	583.66*	32	138	1.44	1165.93	1160	12	8.75E-04	106.7	
15	0	609.82	90	160	2.33	1218.22	1212	13	2.51E-03	30.7	
16	0	622.49	12	114	0.47	1243.53	1240	10	3.24E-04	174.4	
17	0	630.27	28	75	1.33	1259.08	1254	8	7.92E-04	56.5	
18	0	707.74	60	137	1.65	1413.92	1407	13	1.68E-03	41.9	
19	0	774.15	21	65	1.57	1546.63	1541	9	5.72E-04	75.7	
20	0	787.43	14	91	1.35	1573.19	1569	11	3.84E-04	136.2	
21	0	795.85	39	106	0.82	1590.00	1583	13	1.07E-03	57.5	
22	0	868.26	33	102	5.17	1734.74	1727	14	9.12E-04	67.4	
23	0	1079.72	26	54	1.84	2157.45	2150	12	7.13E-04	60.6	
24	0	1462.26*	17	80	1.33	2922.31	2915	13	4.79E-04	140.0	
25	0	1518.18	12	29	1.74	3034.14	3027	9	3.30E-04	89.0	
26	0	1521.09	13	22	0.73	3039.97	3036	10	3.75E-04	68.4	
27	0	1667.29*	9	49	6.76	3332.35	3320	20	2.60E-04	207.9	
28	1	1700.12	20	37	2.37	3398.02	3393	22	5.51E-04	56.4	2.96E+00
29	1	1705.33	25	36	2.37	3408.43	3393	22	7.06E-04	55.5	
30	0	1709.99	14	12	0.67	3417.76	3414	7	3.86E-04	49.5	
31	6	1750.10	12	4	1.30	3497.98	3496	12	3.40E-04	38.3	8.96E-01
32	6	1752.99	18	12	1.85	3503.77	3496	12	5.00E-04	40.9	
33	0	1787.71	25	97	6.72	3573.20	3551	30	6.94E-04	116.9	
34	0	1848.41	13	29	4.37	3694.64	3685	13	3.49E-04	93.2	
35	0	1967.34	24	35	2.85	3932.53	3921	16	6.62E-04	59.7	

Flag: "\*" = Peak area was modified by background subtraction

VAX/VMS Nuclide Identification Report Generated

```

*****
*                               General Eng. Labs, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
*                               DETECTOR DATA                                       *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G159247001
* Acquisition date   : 25-APR-2006 18:46:09 Detector SN#      :
* Detector ID       : GAM19                               Sensitivity      : 3.000
* Geometry         : 2LMB                               Energy tolerance: 2.000
* Elapsed live time: 0 10:00:00.00                     Abundance limit : 75.000
* Elapsed real time: 0 10:00:03.46                     Half life ratio  : 8.000
*****
*                               SAMPLE DATA                                         *
*
* Sample date       : 22-MAR-2006 10:20:00 Nuclide Library :
* Sample ID        : G159247001                     Analyst initials: MJH1
* Batch Number     : 519510                           Sample Quantity : 2.0000E+00 LITER
* Recovery         : 1.00000                          Carrier Weight  : 0.00000
*****
*                               QC DATA                                             *
*
* Standard Weight  : 0.00000
* CALIB. DATE/TIME: 17-FEB-2006 16:09:06 MS Isotope      :
* MSD DPM          : 0.000                            MSD Isotope     :
* LCS DPM          : 0.000                            LCS Isotope     :
* LCSD DPM        : 0.000                            LCSD Isotope    :
*****

```

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER )	Act error	MDA (pCi/LITER )	
K-40	9.849E+00	2.759E+01	1.167E+01	0.000E+00
RU-106	3.959E+00	1.382E+01	1.038E+01	0.000E+00
BI-210	1.065E+02	2.568E+02	1.532E+02	0.000E+00
PB-210	1.065E+02	2.568E+02	1.532E+02	0.000E+00
BI-211	1.227E+01	1.552E+01	6.833E+00	0.000E+00
RA-224	6.127E+01	5.761E+01	2.248E+01	0.000E+00
RA-226	5.990E+00	3.709E+00	2.217E+00	0.000E+00
TH-228	5.426E+00	5.108E+00	1.955E+00	0.000E+00
TH-230	5.990E+00	3.709E+00	2.217E+00	0.000E+00
U-238	1.121E+02	9.633E+01	4.616E+01	0.000E+00
CF-251	1.695E+01	8.944E+00	4.780E+00	0.000E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER )	K.L. Act error ) Ided	MDA (pCi/LITER )	
BE-7	2.601E+00	1.464E+01	1.416E+01	0.000E+00 NOT IDENT.
NA-22	-1.934E-01	1.244E+00	1.173E+00	0.000E+00 NOT IDENT.
NA-24	0.000E+00	5.503E+16	0.000E+00	0.000E+00 SHORT HLIF
AL-26	-2.827E-01	1.362E+00	1.299E+00	0.000E+00 NOT IDENT.
SC-46	-6.438E-01	1.387E+00	1.304E+00	0.000E+00 NOT IDENT.
V-48	1.534E+00	4.647E+00	4.624E+00	0.000E+00 NOT IDENT.
CR-51	-1.805E-01	2.463E+01	2.262E+01	0.000E+00 NOT IDENT.
MN-54	-3.475E-01	1.124E+00	1.074E+00	0.000E+00 NOT IDENT.
CO-56	9.327E-01	1.509E+00	1.531E+00	0.000E+00 NOT IDENT.
MN-56	0.000E+00	1.619E+41	0.000E+00	0.000E+00 SHORT HLIF
CO-57	-1.860E-01	1.126E+00	1.061E+00	0.000E+00 NOT IDENT.
CO-58	1.499E+00	1.553E+00	1.552E+00	0.000E+00 NOT IDENT.
FE-59	1.851E+00	3.897E+00	3.885E+00	0.000E+00 NOT IDENT.
CO-60	3.256E-01	1.407E+00	1.367E+00	0.000E+00 NOT IDENT.
ZN-65	-5.230E-01	2.741E+00	2.601E+00	0.000E+00 NOT IDENT.
SE-75	-2.765E-01	2.037E+00	1.724E+00	0.000E+00 FAIL ABUN

KR-85	7.654E+01	3.964E+02	3.810E+02	0.000E+00	NOT IDENT.
SR-85	4.812E-01	2.492E+00	2.396E+00	0.000E+00	NOT IDENT.
Y-88	-8.333E-01	1.713E+00	1.586E+00	0.000E+00	NOT IDENT.
Y-91	-8.687E-01	1.645E+00	1.517E+00	0.000E+00	NOT IDENT.
NB-94	-1.139E+00	1.405E+00	1.056E+00	0.000E+00	NOT IDENT.
NB-95	-1.195E+00	2.165E+00	1.945E+00	0.000E+00	NOT IDENT.
NB-95M	0.000E+00	3.112E+03	0.000E+00	0.000E+00	SHORT HLIF
ZR-95	-1.823E+00	2.864E+00	2.558E+00	0.000E+00	NOT IDENT.
MO-99	0.000E+00	1.039E+04	0.000E+00	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	9.224E+40	0.000E+00	0.000E+00	SHORT HLIF
RU-103	-1.785E+00	2.004E+00	1.807E+00	0.000E+00	FAIL ABUN
RH-106	3.959E+00	1.381E+01	1.065E+01	0.000E+00	FAIL ABUN
AG-108	-8.011E-01	1.177E+00	1.092E+00	0.000E+00	NOT IDENT.
CD-109	-8.087E+01	3.303E+01	2.845E+01	0.000E+00	NOT IDENT.
AG-110M	-4.207E-01	1.175E+00	1.083E+00	0.000E+00	FAIL ABUN
SN-113	-7.211E-01	1.825E+00	1.730E+00	0.000E+00	NOT IDENT.
CD-115	0.000E+00	1.461E+05	0.000E+00	0.000E+00	SHORT HLIF
SN-115	1.834E+01	1.421E+02	1.395E+02	0.000E+00	NOT IDENT.
SN-117M	2.992E+00	5.814E+00	5.562E+00	0.000E+00	NOT IDENT.
TE-123M	3.219E-01	1.267E+00	1.202E+00	0.000E+00	NOT IDENT.
SB-124	-1.446E+00	4.161E+00	3.767E+00	0.000E+00	NOT IDENT.
SB-125	1.559E+00	3.413E+00	3.356E+00	0.000E+00	FAIL ABUN
TE-125M	8.217E+01	4.915E+02	4.693E+02	0.000E+00	NOT IDENT.
I-126	-7.012E+00	1.709E+01	1.570E+01	0.000E+00	NOT IDENT.
SB-126	8.222E+00	1.479E+01	1.440E+01	0.000E+00	NOT IDENT.
SN-126	-3.605E+00	3.032E+00	2.776E+00	0.000E+00	FAIL ABUN
SB-127	0.000E+00	1.494E+03	0.000E+00	0.000E+00	SHORT HLIF
I-131	-3.522E-01	2.196E+01	2.125E+01	0.000E+00	FAIL ABUN
I-132	0.000E+00	6.603E+41	0.000E+00	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.650E+03	0.000E+00	0.000E+00	SHORT HLIF
BA-133	1.360E+00	1.828E+00	1.604E+00	0.000E+00	NOT IDENT.
I-133	0.000E+00	1.047E+12	0.000E+00	0.000E+00	SHORT HLIF
CS-134	0.000E+00	2.020E+00	1.373E+00	0.000E+00	FAIL ABUN
CS-135	1.794E+00	6.232E+00	5.393E+00	0.000E+00	NOT IDENT.
I-135	0.000E+00	2.622E+38	0.000E+00	0.000E+00	SHORT HLIF
CS-136	-3.387E-01	9.470E+00	9.129E+00	0.000E+00	FAIL ABUN
BA-137M	3.314E-01	1.135E+00	1.093E+00	0.000E+00	NOT IDENT.
CS-137	3.520E-01	1.200E+00	1.156E+00	0.000E+00	NOT IDENT.
CE-139	3.987E-01	1.272E+00	1.208E+00	0.000E+00	NOT IDENT.
BA-140	-3.890E+00	2.518E+01	2.375E+01	0.000E+00	NOT IDENT.
LA-140	1.136E+00	8.949E+00	8.558E+00	0.000E+00	FAIL ABUN
CE-141	-3.104E+00	4.933E+00	3.601E+00	0.000E+00	NOT IDENT.
CE-143	0.000E+00	8.342E+07	0.000E+00	0.000E+00	SHORT HLIF
CE-144	5.871E+00	8.954E+00	8.325E+00	0.000E+00	NOT IDENT.
PM-144	8.612E-01	1.284E+00	1.257E+00	0.000E+00	NOT IDENT.
PR-144	0.000E+00	1.490E+41	0.000E+00	0.000E+00	SHORT HLIF
PM-146	9.193E-01	1.645E+00	1.620E+00	0.000E+00	NOT IDENT.
ND-147	-2.982E-01	6.112E+01	5.829E+01	0.000E+00	NOT IDENT.
PM-147	8.642E+05	2.216E+06	2.126E+06	0.000E+00	NOT IDENT.
PM-149	0.000E+00	1.737E+06	0.000E+00	0.000E+00	SHORT HLIF
EU-152	-3.506E+00	4.861E+00	3.360E+00	0.000E+00	NOT IDENT.
GD-153	-9.017E+00	4.528E+00	3.200E+00	0.000E+00	NOT IDENT.
EU-154	-5.600E-01	3.438E+00	3.239E+00	0.000E+00	NOT IDENT.
EU-155	-6.049E+00	4.391E+00	3.961E+00	0.000E+00	NOT IDENT.
TB-160	-2.731E-01	5.140E+00	4.993E+00	0.000E+00	NOT IDENT.
TM-171	0.000E+00	1.521E+03	1.261E+03	0.000E+00	FAIL ABUN
HF-181	6.491E-01	2.017E+00	1.966E+00	0.000E+00	FAIL ABUN
TA-182	-2.293E+00	5.871E+00	5.444E+00	0.000E+00	FAIL ABUN
IR-192	-5.901E-01	1.577E+00	1.512E+00	0.000E+00	NOT IDENT.
HG-203	8.353E-01	2.275E+00	1.973E+00	0.000E+00	NOT IDENT.
BI-207	9.205E-01	1.494E+00	1.513E+00	0.000E+00	NOT IDENT.
TL-208	1.153E+00	2.462E+00	1.395E+00	0.000E+00	FAIL ABUN
PB-211	1.092E+01	3.335E+01	3.200E+01	0.000E+00	NOT IDENT.
BI-212	0.000E+00	1.009E+01	1.025E+01	0.000E+00	NOT IDENT.
PB-212	0.000E+00	5.108E+00	2.676E+00	0.000E+00	FAIL ABUN
BI-214	0.000E+00	3.709E+00	2.656E+00	0.000E+00	FAIL ABUN
PB-214	0.000E+00	5.404E+00	2.792E+00	0.000E+00	FAIL ABUN
RN-219	-2.190E+00	1.471E+01	1.409E+01	0.000E+00	NOT IDENT.
RA-223	1.178E+01	2.876E+01	2.482E+01	0.000E+00	NOT IDENT.
AC-227	-2.265E+00	1.628E+01	1.445E+01	0.000E+00	NOT IDENT.
TH-227	-2.226E+00	1.601E+01	1.420E+01	0.000E+00	NOT IDENT.
AC-228	-6.361E+00	6.340E+00	3.935E+00	0.000E+00	FAIL ABUN
RA-228	-6.361E+00	6.340E+00	3.935E+00	0.000E+00	FAIL ABUN
TH-229	2.734E+00	2.319E+01	1.903E+01	0.000E+00	NOT IDENT.
PA-231	2.815E+01	6.566E+01	5.660E+01	0.000E+00	FAIL ABUN
TH-231	-1.226E+00	6.819E+00	6.255E+00	0.000E+00	FAIL ABUN
TH-232	0.000E+00	4.936E+00	2.584E+00	0.000E+00	FAIL ABUN
PA-233	-6.460E-01	2.423E+00	2.334E+00	0.000E+00	NOT IDENT.

PA-234	-1.765E-01	9.014E+00	8.745E+00	0.000E+00	FAIL ABUN
PA-234M	-1.769E+02	2.173E+02	1.466E+02	0.000E+00	NOT IDENT.
TH-234	0.000E+00	9.633E+01	5.999E+01	0.000E+00	FAIL ABUN
U-234	-1.491E+00	6.345E+00	4.861E+00	0.000E+00	FAIL ABUN
U-235	-2.234E+00	1.075E+01	8.010E+00	0.000E+00	FAIL ABUN
NP-237	-3.305E+00	8.871E+00	8.350E+00	0.000E+00	NOT IDENT.
NP-239	-7.024E+00	7.820E+00	7.182E+00	0.000E+00	NOT IDENT.
AM-241	-1.004E+00	7.986E+00	5.820E+00	0.000E+00	NOT IDENT.
AM-242	-1.887E+01	8.711E+01	8.227E+01	0.000E+00	NOT IDENT.
CM-247	3.372E-01	1.309E+00	1.278E+00	0.000E+00	NOT IDENT.
CF-249	5.133E-01	1.424E+00	1.399E+00	0.000E+00	NOT IDENT.
ANH-511	-6.930E+00	2.681E+00	2.090E+00	0.000E+00	NOT IDENT.

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29414                               *
*****
Configuration      : DKA0:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G159247001.CNF;1
Sample date        : 22-MAR-2006 10:20:00 Acquisition date : 25-APR-2006 18:46:09
Sample ID          : G159247001           Sample quantity  : 2.00000E+00 LITER
Detector name     : GAM19                 Detector geometry: 2LMB
Elapsed live time : 0 10:00:00.00         Elapsed real time: 0 10:00:03.46  0.0%
Energy tolerance  : 2.00000 keV          Analyst Initials  : MJH1
Abundance limit   : 75.00000             Sensitivity       : 3.00000
Batch ID          : 519510                Detector SN#      :
Matrix Spike DPM  :                       LCS DPM         :
*****

```

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	7	4.72	1176	298	1.05	9.21	6	14	3.27E-02	4.8	4.21E+00
2	7	6.48	1293	2094	2.30	12.73	6	14	3.59E-02	8.4	
3	0	10.85	355	1728	1.43	21.46	19	8	9.87E-03	21.2	
4	0	18.63	89	731	1.65	37.00	35	6	2.47E-03	49.5	
5	0	46.83	128	492	1.45	93.34	89	9	3.56E-03	32.4	
6	2	63.46	271	631	1.59	126.55	119	19	7.52E-03	18.8	1.21E+00
7	2	66.45	222	534	1.37	132.52	119	19	6.17E-03	19.4	
8	0	77.69	27	561	0.81	154.99	151	8	7.63E-04	152.2	
9	0	92.52	457	901	1.55	184.62	177	14	1.27E-02	14.7	
10	0	139.97	176	547	1.35	279.40	275	10	4.88E-03	26.0	
11	0	143.88	60	542	3.21	287.22	284	10	1.68E-03	73.3	
12	0	176.58	207	632	2.92	352.55	346	13	5.75E-03	26.1	
13	0	185.82	240	619	1.38	371.00	366	12	6.68E-03	21.7	
14	0	198.34	224	437	1.56	396.01	391	10	6.23E-03	18.8	
15	0	205.30	31	390	1.09	409.92	406	9	8.48E-04	118.4	
16	0	239.25	325	614	1.34	477.75	470	16	9.03E-03	17.9	
17	0	262.42	22	397	3.93	524.03	519	12	6.16E-04	181.2	
18	0	283.63	24	256	0.64	566.41	563	8	6.70E-04	116.4	
19	0	326.90	67	266	2.58	652.88	648	10	1.86E-03	47.6	
20	0	351.80	138	297	4.73	702.61	697	14	3.83E-03	27.8	
21	0	511.55	792	214	2.79	1021.83	1014	20	2.20E-02	5.8	
22	0	583.66	77	138	1.44	1165.93	1160	12	2.14E-03	32.8	
23	0	609.82	90	160	2.33	1218.22	1212	13	2.51E-03	30.7	
24	0	622.49	12	114	0.47	1243.53	1240	10	3.24E-04	174.4	
25	0	630.27	28	75	1.33	1259.08	1254	8	7.92E-04	56.5	
26	0	707.74	60	137	1.65	1413.92	1407	13	1.68E-03	41.9	
27	0	774.15	21	65	1.57	1546.63	1541	9	5.72E-04	75.7	
28	0	787.43	14	91	1.35	1573.19	1569	11	3.84E-04	136.2	
29	0	795.85	39	106	0.82	1590.00	1583	13	1.07E-03	57.5	
30	0	868.26	33	102	5.17	1734.74	1727	14	9.12E-04	67.4	
31	0	1079.72	26	54	1.84	2157.45	2150	12	7.13E-04	60.6	
32	0	1462.26	80	80	1.33	2922.31	2915	13	2.21E-03	25.8	
33	0	1518.18	12	29	1.74	3034.14	3027	9	3.30E-04	89.0	
34	0	1521.09	13	22	0.73	3039.97	3036	10	3.75E-04	68.4	
35	0	1667.29	20	49	6.76	3332.35	3320	20	5.60E-04	88.6	
36	1	1700.12	20	37	2.37	3398.02	3393	22	5.51E-04	56.4	2.96E+00
37	1	1705.33	25	36	2.37	3408.43	3393	22	7.06E-04	55.5	
38	0	1709.99	14	12	0.67	3417.76	3414	7	3.86E-04	49.5	



Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
39	6	1750.10	12	4	1.30	3497.98	3496	12	3.40E-04	38.3	8.96E-01
40	6	1752.99	18	12	1.85	3503.77	3496	12	5.00E-04	40.9	
41	0	1787.71	25	97	6.72	3573.20	3551	30	6.94E-04	116.9	
42	0	1848.41	13	29	4.37	3694.64	3685	13	3.49E-04	93.2	
43	0	1967.34	24	35	2.85	3932.53	3921	16	6.62E-04	59.7	

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                 *
*****
Configuration      : DKA0:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G159247001.CNF;1
Sample date        : 22-MAR-2006 10:20:00 Acquisition date : 25-APR-2006 18:46:09
Sample ID          : G159247001 Sample quantity : 2.00000E+00 LITER
Detector name     : GAM19 Detector geometry: 2LMB
Elapsed live time : 0 10:00:00.00 Elapsed real time: 0 10:00:03.46 0.0%
Energy tolerance  : 2.00000 keV Analyst Initials : MJH1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 519510 Detector SN# :
Matrix Spike DPM : LCS DPM :
*****
    
```

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
K-40	1460.81	17	10.67*	6.163E-01	9.849E+00	9.849E+00	280.09
RU-106	622.20	12	9.80*	1.204E+00	3.710E+00	3.959E+00	349.04
BI-210	46.50	41	4.05*	3.583E-01	1.062E+02	1.065E+02	241.03
PB-210	46.50	41	4.05*	3.583E-01	1.062E+02	1.065E+02	241.03
BI-211	351.07	75	12.94*	1.761E+00	1.227E+01	1.227E+01	126.47
RA-226	295.21	-----	19.20	1.962E+00	-----	Line Not Found	-----
	351.92	75	37.20	1.761E+00	4.270E+00	4.270E+00	126.44
	609.31	90	46.30*	1.222E+00	5.990E+00	5.990E+00	61.91
TH-228	84.40	-----	1.21	2.243E+00	-----	Line Not Found	-----
	238.60	138	44.60*	2.221E+00	5.243E+00	5.426E+00	94.14
	300.10	-----	3.41	1.943E+00	-----	Line Not Found	-----
TH-230	295.21	-----	19.20	1.962E+00	-----	Line Not Found	-----
	351.92	75	37.20	1.761E+00	4.270E+00	4.270E+00	126.44
	609.31	90	46.30*	1.222E+00	5.990E+00	5.990E+00	61.91
U-238	63.29	144	3.80*	1.265E+00	1.121E+02	1.121E+02	85.94
CF-251	176.00	207	17.70*	2.590E+00	1.695E+01	1.695E+01	52.77
	227.00	-----	6.30	2.287E+00	-----	Line Not Found	-----
	285.00	24	1.40	2.010E+00	3.218E+01	3.218E+01	232.88

Nuclide Type: NATURAL

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
RA-224	240.98	138	3.95*	2.221E+00	5.920E+01	6.127E+01	94.04

Flag: "\*" = Keyline

Total number of lines in spectrum 35  
 Number of unidentified lines 13  
 Number of lines tentatively identified by NID 22 62.86%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	9.849E+00	9.849E+00	27.59E+00	280.09	
RU-106	368.20D	1.07	3.710E+00	3.959E+00	13.82E+00	349.04	
BI-210	22.26Y	1.00	1.062E+02	1.065E+02	2.568E+02	241.03	
PB-210	22.26Y	1.00	1.062E+02	1.065E+02	2.568E+02	241.03	
BI-211	7.04E+08Y	1.00	1.227E+01	1.227E+01	1.552E+01	126.47	
RA-226	1600.00Y	1.00	5.990E+00	5.990E+00	3.709E+00	61.91	
TH-228	1.91Y	1.03	5.243E+00	5.426E+00	5.108E+00	94.14	
TH-230	7.70E+04Y	1.00	5.990E+00	5.990E+00	3.709E+00	61.91	
U-238	4.47E+09Y	1.00	1.121E+02	1.121E+02	0.963E+02	85.94	
CF-251	900.00Y	1.00	1.695E+01	1.695E+01	0.894E+01	52.77	
Total Activity :			3.846E+02	3.856E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-224	1.91Y	1.03	5.920E+01	6.127E+01	5.761E+01	94.04	
Total Activity :			5.920E+01	6.127E+01			

Grand Total Activity : 4.438E+02 4.469E+02

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	18.63	89	731	1.65	37.00	35	6	2.47E-03	99.0	1.87E-06	
2	66.45	222	534	1.37	132.52	119	19	6.17E-03	38.7	1.43E+00	T
0	139.97	157	547	1.35	279.40	275	10	4.37E-03	66.4	2.78E+00	T
0	198.34	127	437	1.56	396.01	391	10	3.52E-03	92.1	2.46E+00	T
0	205.30	31	390	1.09	409.92	406	9	8.48E-04	****	2.41E+00	T
0	262.42	22	397	3.93	524.03	519	12	6.16E-04	****	2.11E+00	T
0	326.90	67	266	2.58	652.88	648	10	1.86E-03	95.2	1.84E+00	T
0	583.66	32	138	1.44	1165.93	1160	12	8.75E-04	****	1.26E+00	T
0	630.27	28	75	1.33	1259.08	1254	8	7.92E-04	****	1.19E+00	T
0	707.74	60	137	1.65	1413.92	1407	13	1.68E-03	83.9	1.09E+00	T
0	774.15	21	65	1.57	1546.63	1541	9	5.72E-04	****	1.02E+00	T
0	787.43	14	91	1.35	1573.19	1569	11	3.84E-04	****	1.01E+00	
0	795.85	39	106	0.82	1590.00	1583	13	1.07E-03	****	1.00E+00	T
0	868.26	33	102	5.17	1734.74	1727	14	9.12E-04	****	9.34E-01	T
0	1079.72	26	54	1.84	2157.45	2150	12	7.13E-04	****	7.82E-01	
0	1518.18	12	29	1.74	3034.14	3027	9	3.30E-04	****	6.00E-01	
0	1521.09	13	22	0.73	3039.97	3036	10	3.75E-04	****	5.99E-01	
0	1667.29	9	49	6.76	3332.35	3320	20	2.60E-04	****	5.65E-01	
1	1700.12	20	37	2.37	3398.02	3393	22	5.51E-04	****	5.59E-01	
1	1705.33	25	36	2.37	3408.43	3393	22	7.06E-04	****	5.58E-01	T
0	1709.99	14	12	0.67	3417.76	3414	7	3.86E-04	99.1	5.57E-01	
6	1750.10	12	4	1.30	3497.98	3496	12	3.40E-04	76.6	5.50E-01	
6	1752.99	18	12	1.85	3503.77	3496	12	5.00E-04	81.8	5.49E-01	
0	1787.71	25	97	6.72	3573.20	3551	30	6.94E-04	****	5.44E-01	
0	1848.41	13	29	4.37	3694.64	3685	13	3.49E-04	****	5.35E-01	
0	1967.34	24	35	2.85	3932.53	3921	16	6.62E-04	****	5.22E-01	

Flags: "T" = Tentatively associated

```

*****
*                                     GENERAL ENG. LABS, LLC.                               *
*                                     2040 Savage Road                                   *
*                                     Charleston, SC 29414                             *
*****
*                                     DETECTOR DATA                                   *
*
* Configuration      : DKA0:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G159247001.CNF;1          *
* Acquisition date   : 25-APR-2006 18:46:09   Detector SN#      :                   *
* Detector ID       : GAM19                   Sensitivity        : 3.00000          *
* Geometry          : 2LMB                    Energy tolerance: 2.00000          *
* Elapsed live time : 0 10:00:00.00           Abundance limit  : 75.00000          *
* Elapsed real time : 0 10:00:03.46           Half life ratio  : 8.00000          *
*****
*                                     SAMPLE DATA                                   *
*
* Sample date       : 22-MAR-2006 10:20:00   Nuclide Library  : EPI                *
* Sample ID        : G159247001             Analyst initials : MJH1                *
* Batch Number     : 519510                 Sample Quantity  : 2.00000E+00 LITER    *
*****
*                                     QC DATA                                       *
*
* CALIB. DATE/TIME : 17-FEB-2006 16:09:06.3MS Isotope          :                   *
* MSD DPM          :                        MSD Isotope         :                   *
* LCS DPM          :                        LCS Isotope          :                   *
*****

```

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
K-40	9.849E+00	2.759E+01	1.167E+01	7.401E-01	0.844
RU-106	3.959E+00	1.382E+01	1.038E+01	1.236E+00	0.381
BI-210	1.065E+02	2.568E+02	1.532E+02	1.368E+01	0.696
PB-210	1.065E+02	2.568E+02	1.532E+02	1.368E+01	0.696
BI-211	1.227E+01	1.552E+01	6.833E+00	4.890E-01	1.796
RA-224	6.127E+01	5.761E+01	2.248E+01	1.698E+00	2.726
RA-226	5.990E+00	3.709E+00	2.217E+00	1.785E-01	2.702
TH-228	5.426E+00	5.108E+00	1.955E+00	1.719E-01	2.775
TH-230	5.990E+00	3.709E+00	2.217E+00	1.785E-01	2.702
U-238	1.121E+02	9.633E+01	4.616E+01	8.728E+00	2.428
CF-251	1.695E+01	8.944E+00	4.780E+00	3.632E-01	3.545

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/LITER)Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
BE-7	2.601E+00	1.464E+01	1.416E+01	9.975E-01	0.184

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
NA-22	-1.934E-01		1.244E+00	1.173E+00	7.194E-02	-0.165
NA-24	-1.935E+09		2.751E+10	Half-Life	too short	
AL-26	-2.827E-01		1.362E+00	1.299E+00	7.405E-02	-0.218
SC-46	-6.438E-01		1.387E+00	1.304E+00	1.040E-01	-0.494
V-48	1.534E+00		4.647E+00	4.624E+00	3.555E-01	0.332
CR-51	-1.805E-01		2.463E+01	2.262E+01	1.708E+00	-0.008
MN-54	-3.475E-01		1.124E+00	1.074E+00	8.069E-02	-0.323
CO-56	9.327E-01		1.509E+00	1.531E+00	1.165E-01	0.609
MN-56	1.000E+35		8.094E+34	Half-Life	too short	
CO-57	-1.860E-01		1.126E+00	1.061E+00	7.715E-02	-0.175
CO-58	1.499E+00		1.553E+00	1.552E+00	1.138E-01	0.966
FE-59	1.851E+00		3.897E+00	3.885E+00	3.034E-01	0.476
CO-60	3.256E-01		1.407E+00	1.367E+00	8.128E-02	0.238
ZN-65	-5.230E-01		2.741E+00	2.601E+00	1.781E-01	-0.201
SE-75	-2.765E-01		2.037E+00	1.724E+00	1.293E-01	-0.160
KR-85	7.654E+01		3.964E+02	3.810E+02	2.354E+01	0.201
SR-85	4.812E-01		2.492E+00	2.396E+00	1.480E-01	0.201
Y-88	-8.333E-01		1.713E+00	1.586E+00	8.983E-02	-0.526
Y-91	-8.687E-01		1.645E+00	1.517E+00	9.398E-02	-0.573
NB-94	-1.139E+00		1.405E+00	1.056E+00	6.769E-02	-1.079
NB-95	-1.195E+00		2.165E+00	1.945E+00	1.350E-01	-0.614
NB-95M	8.237E-04		1.556E-03	Half-Life	too short	
ZR-95	-1.823E+00		2.864E+00	2.558E+00	2.027E-01	-0.713
MO-99	1.555E-02	+	5.196E-03	Half-Life	too short	
TC-99M	1.000E+35	+	4.612E+34	Half-Life	too short	
RU-103	-1.785E+00		2.004E+00	1.807E+00	2.316E-01	-0.988
RH-106	3.959E+00	+	1.381E+01	1.065E+01	6.549E-01	0.372
AG-108M	-8.011E-01		1.177E+00	1.092E+00	7.132E-02	-0.733
CD-109	-8.087E+01		3.303E+01	2.845E+01	2.674E+00	-2.842
AG-110M	-4.207E-01		1.175E+00	1.083E+00	6.981E-02	-0.388
SN-113	-7.211E-01		1.825E+00	1.730E+00	1.091E-01	-0.417
CD-115	-9.720E-02		7.305E-02	Half-Life	too short	
SN-115	1.834E+01		1.421E+02	1.395E+02	1.105E+01	0.132
SN-117M	2.992E+00		5.814E+00	5.562E+00	4.167E-01	0.538
TE-123M	3.219E-01		1.267E+00	1.202E+00	9.084E-02	0.268
SB-124	-1.446E+00		4.161E+00	3.767E+00	2.396E-01	-0.384
SB-125	1.559E+00		3.413E+00	3.356E+00	2.105E-01	0.465
TE-125M	8.217E+01		4.915E+02	4.693E+02	4.526E+01	0.175
I-126	-7.012E+00		1.709E+01	1.570E+01	9.607E-01	-0.447
SB-126	8.222E+00		1.479E+01	1.440E+01	9.440E-01	0.571
SN-126	-3.605E+00		3.032E+00	2.776E+00	2.603E-01	-1.299
SB-127	7.181E-04		7.469E-04	Half-Life	too short	
I-131	-3.522E-01		2.196E+01	2.125E+01	1.549E+00	-0.017
I-132	1.000E+35		3.301E+35	Half-Life	too short	
TE-132	2.052E-04		8.252E-04	Half-Life	too short	
BA-133	1.360E+00		1.828E+00	1.604E+00	1.914E-01	0.848
I-133	1.324E+05		5.235E+05	Half-Life	too short	
CS-134	1.753E+00	+	2.020E+00	1.373E+00	9.939E-02	1.277

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
CS-135	1.794E+00		6.232E+00	5.393E+00	4.832E-01	0.333
I-135	-1.976E+31		1.311E+32	Half-Life	too short	
CS-136	-3.387E-01		9.470E+00	9.129E+00	7.100E-01	-0.037
BA-137M	3.314E-01		1.135E+00	1.093E+00	6.647E-02	0.303
CS-137	3.520E-01		1.200E+00	1.156E+00	7.055E-02	0.305
CE-139	3.987E-01		1.272E+00	1.208E+00	9.184E-02	0.330
BA-140	-3.890E+00		2.518E+01	2.375E+01	7.742E+00	-0.164
LA-140	1.136E+00		8.949E+00	8.558E+00	5.100E-01	0.133
CE-141	-3.104E+00		4.933E+00	3.601E+00	2.708E-01	-0.862
CE-143	3.583E+01		4.171E+01	Half-Life	too short	
CE-144	5.871E+00		8.954E+00	8.325E+00	1.236E+00	0.705
PM-144	8.612E-01		1.284E+00	1.257E+00	8.017E-02	0.685
PR-144	1.000E+35		7.452E+34	Half-Life	too short	
PM-146	9.193E-01		1.645E+00	1.620E+00	1.430E-01	0.567
ND-147	-2.982E-01		6.112E+01	5.829E+01	7.984E+00	-0.005
PM-147	8.642E+05		2.216E+06	2.126E+06	1.547E+05	0.407
PM-149	1.785E+00		8.685E-01	Half-Life	too short	
EU-152	-3.506E+00		4.861E+00	3.360E+00	2.466E-01	-1.043
GD-153	-9.017E+00		4.528E+00	3.200E+00	2.687E-01	-2.818
EU-154	-5.600E-01		3.438E+00	3.239E+00	3.091E-01	-0.173
EU-155	-6.049E+00		4.391E+00	3.961E+00	3.165E-01	-1.527
TB-160	-2.731E-01		5.140E+00	4.993E+00	3.941E-01	-0.055
TM-171	3.807E+03	+	1.521E+03	1.261E+03	1.245E+02	3.019
HF-181	6.491E-01		2.017E+00	1.966E+00	1.208E-01	0.330
TA-182	-2.293E+00		5.871E+00	5.444E+00	3.405E-01	-0.421
IR-192	-5.901E-01		1.577E+00	1.512E+00	1.067E-01	-0.390
HG-203	8.353E-01		2.275E+00	1.973E+00	1.510E-01	0.423
BI-207	9.205E-01		1.494E+00	1.513E+00	1.091E-01	0.608
TL-208	1.153E+00	+	2.462E+00	1.395E+00	9.798E-02	0.826
PB-211	1.092E+01		3.335E+01	3.200E+01	1.995E+01	0.341
BI-212	1.393E+01		1.009E+01	1.025E+01	8.551E-01	1.358
PB-212	5.426E+00	+	5.108E+00	2.676E+00	2.352E-01	2.028
BI-214	5.990E+00	+	3.709E+00	2.656E+00	2.139E-01	2.255
PB-214	4.270E+00	+	5.404E+00	2.792E+00	2.470E-01	1.529
RN-219	-2.190E+00		1.471E+01	1.409E+01	1.927E+00	-0.155
RA-223	1.178E+01		2.876E+01	2.482E+01	4.208E+00	0.475
AC-227	-2.265E+00		1.628E+01	1.445E+01	2.154E+00	-0.157
TH-227	-2.226E+00		1.601E+01	1.420E+01	2.493E+00	-0.157
AC-228	-6.361E+00		6.340E+00	3.935E+00	4.243E-01	-1.617
RA-228	-6.361E+00		6.340E+00	3.935E+00	4.243E-01	-1.617
TH-229	2.734E+00		2.319E+01	1.903E+01	1.447E+00	0.144
PA-231	2.815E+01	+	6.566E+01	5.660E+01	8.202E+00	0.497
TH-231	-1.226E+00		6.819E+00	6.255E+00	5.403E-01	-0.196
TH-232	5.243E+00	+	4.936E+00	2.584E+00	2.271E-01	2.029
PA-233	-6.460E-01		2.423E+00	2.334E+00	1.722E-01	-0.277
PA-234	-1.765E-01		9.014E+00	8.745E+00	1.612E+00	-0.020
PA-234M	-1.769E+02		2.173E+02	1.466E+02	1.331E+01	-1.207
TH-234	1.121E+02	+	9.633E+01	5.999E+01	1.134E+01	1.869

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
U-234	-1.491E+00		6.345E+00	4.861E+00	4.649E-01	-0.307
U-235	-2.234E+00		1.075E+01	8.010E+00	1.354E+00	-0.279
NP-237	-3.305E+00		8.871E+00	8.350E+00	1.891E+00	-0.396
NP-239	-7.024E+00		7.820E+00	7.182E+00	5.313E-01	-0.978
AM-241	-1.004E+00		7.986E+00	5.820E+00	6.840E-01	-0.173
AM-242	-1.887E+01		8.711E+01	8.227E+01	6.554E+00	-0.229
CM-247	3.372E-01		1.309E+00	1.278E+00	7.622E-02	0.264
CF-249	5.133E-01		1.424E+00	1.399E+00	8.385E-02	0.367
ANH-511	-6.930E+00		2.681E+00	2.090E+00	1.291E-01	-3.316



```

*****
*
*                               General Engineering Labs, LLC
*                               2040 SAVAGE ROAD
*                               CHARLESTON ,SC 29417
*                               GROSS GAMMA REPORT
*
*****
*
*   BATCH ID      : 519510                SAMPLE ID   : G159247001
*   ANALYST       : MJH1                  DETECTOR    : GAM19
*   SAMPLE DATE   : 22-MAR-2006 10:20:00.00  COUNT TIME  : 0 10:00:00.00
*   ANALYSIS DATE: 25-APR-2006 18:46:09.53  SAMPLE ALQT: 2.000 LITER
*
*****

```

```

GROSS GAMMA ACTIVITY (pCi/LITER ) : 1.785E+06
GROSS GAMMA ERROR   (pCi/LITER ) : 1.112E+06
GROSS GAMMA MDA     (pCi/LITER ) : 2.005E+06
GROSS GAMMA DLC     (pCi/LITER ) : 9.758E+05

```

VAX/VMS Nuclide Identification Report Generated 26-APR-2006 11:24:04.02

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
Configuration   : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068236.CNF;1
Sample date     : 25-APR-2006 00:00:00 Acquisition date : 25-APR-2006 18:43:09
Sample ID      : G1201068236 Sample quantity   : 2.00000E+00 LITER
Detector name  : WELL Detector geometry: 2L_MB
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:12.98 0.0%
Energy tolerance : 2.00000 KEV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity      : 3.00000
Batch ID       : 519510 Detector SN#      : 3941466
Matrix Spike DPM : LCS DPM                  :
*****

```

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.44*	104	992	1.38	125.44	121	9	1.74E-03	81.4	
2	0	84.25*	39	809	1.65	166.79	164	7	6.52E-04	187.9	
3	0	127.14	152	956	2.40	252.00	247	10	2.54E-03	38.9	
4	0	144.32*	106	902	1.26	286.13	282	9	1.76E-03	77.4	
5	0	185.86*	189	1096	1.32	368.66	363	13	3.15E-03	53.9	
6	0	198.00*	31	868	2.49	392.79	388	10	5.15E-04	240.7	
7	0	205.59*	26	541	0.98	407.86	405	7	4.33E-04	222.7	
8	0	269.75	49	442	1.16	535.37	533	7	8.15E-04	72.6	
9	0	284.94	42	391	1.32	565.55	563	7	7.00E-04	79.4	
10	0	295.73*	35	455	0.79	586.97	583	9	5.89E-04	155.8	
11	0	300.19	77	365	1.61	595.85	593	7	1.28E-03	42.7	
12	0	338.45*	7	526	2.03	671.87	666	11	1.14E-04	923.0	
13	0	409.22	29	262	0.99	812.52	810	7	4.84E-04	94.3	
14	0	437.53	30	235	1.04	868.79	865	7	5.02E-04	86.3	
15	0	511.12*	31	487	2.64	1015.05	1008	16	5.14E-04	273.2	
16	0	569.39*	73	365	3.52	1130.86	1122	17	1.22E-03	79.1	
17	0	582.82*	77	250	2.07	1157.56	1150	13	1.28E-03	71.7	
18	0	609.33*	38	156	1.75	1210.25	1207	7	6.39E-04	112.8	
19	0	680.39	51	122	2.73	1351.50	1348	9	8.52E-04	41.6	
20	0	766.58	61	107	2.16	1522.85	1519	8	1.02E-03	32.2	
21	0	794.47	33	82	2.36	1578.30	1575	8	5.58E-04	49.5	
22	0	802.47*	23	168	3.23	1594.20	1590	12	3.81E-04	150.8	
23	0	859.60	28	98	1.48	1707.79	1704	8	4.63E-04	64.6	
24	0	910.99*	41	131	2.78	1809.96	1805	12	6.83E-04	84.7	
25	0	921.32	27	123	0.61	1830.51	1823	12	4.46E-04	86.0	
26	0	939.39	38	61	0.71	1866.43	1864	8	6.36E-04	38.8	
27	0	963.77*	19	87	2.94	1914.92	1911	10	3.09E-04	154.3	
28	0	1076.24	68	98	7.89	2138.57	2130	19	1.13E-03	37.4	
29	0	1307.25	20	22	1.84	2598.01	2594	8	3.36E-04	46.0	
30	0	1364.42	49	45	2.44	2711.73	2706	14	8.17E-04	32.5	
31	0	1462.83	78	153	7.41	2907.51	2896	25	1.30E-03	45.4	
32	0	1500.73	15	45	1.37	2982.90	2977	11	2.51E-04	91.0	
33	0	1522.40	13	44	3.57	3026.02	3021	12	2.24E-04	103.2	
34	0	1559.27	16	23	0.76	3099.37	3095	9	2.72E-04	59.6	
35	0	1570.09*	6	50	0.54	3120.91	3118	14	9.80E-05	368.7	
36	0	1591.26	23	21	1.52	3163.02	3160	6	3.76E-04	39.1	
37	0	1668.54	13	15	1.47	3316.79	3315	7	2.10E-04	57.6	
38	0	1895.13	5	20	0.91	3767.70	3767	6	7.67E-05	160.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
39	0	1923.95*	6	7	0.63	3825.07	3822	5	1.05E-04	129.1	
40	0	1975.83*	2	25	4.62	3928.33	3921	17	2.94E-05	865.0	

Flag: "\*" = Peak area was modified by background subtraction

VAX/VMS Nuclide Identification Report Generated

```

*****
*                               General Eng. Labs, LLC.                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29414                               *
*****
*                               DETECTOR DATA                                       *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068236
* Acquisition date   : 25-APR-2006 18:43:09 Detector SN#      : 3941466
* Detector ID        : WELL                               Sensitivity      : 3.000
* Geometry           : 2L_MB                             Energy tolerance: 2.000
* Elapsed live time  : 0 16:40:00.00                    Abundance limit : 75.000
* Elapsed real time  : 0 16:40:12.98                    Half life ratio  : 8.000
*****
*                               SAMPLE DATA                                         *
*
* Sample date        : 25-APR-2006 00:00:00 Nuclide Library  : FERMC
* Sample ID          : G1201068236                      Analyst initials: MJH1
* Batch Number       : 519510                            Sample Quantity : 2.0000E+00 LITER
* Recovery           : 1.00000                           Carrier Weight  : 0.00000
*****
*                               QC DATA                                             *
*
* Standard Weight    : 0.00000
* CALIB. DATE/TIME  : 13-DEC-2005 09:34:01 MS Isotope      :
* MSD DPM            : *****                          MSD Isotope      :
* LCS DPM            : 0.000                             LCS Isotope      :
* LCSD DPM           : 0.000                             LCSD Isotope     :
*****

```

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER )	Act error	MDA (pCi/LITER )	
NB-95	2.134E+00	1.376E+00	1.970E+00	0.000E+00
CS-135	4.258E+00	6.180E+00	9.037E+00	0.000E+00
CE-141	1.356E+00	3.533E+00	2.610E+00	0.000E+00
PM-149	2.805E+01	4.453E+01	7.028E+01	0.000E+00
TL-208	2.484E+00	3.560E+00	2.331E+00	0.000E+00
PA-231	3.825E+01	6.072E+01	9.780E+01	0.000E+00
U-235	9.939E+00	1.538E+01	1.347E+01	0.000E+00
U-238	5.169E+01	8.414E+01	6.622E+01	0.000E+00
ANH-511	7.473E-01	4.083E+00	1.881E+00	0.000E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER )	K.L. Act error ) Ided	MDA (pCi/LITER )	
BE-7	3.532E+00	1.071E+01	1.812E+01	0.000E+00 NOT IDENT.
NA-22	-2.950E-01	1.261E+00	2.128E+00	0.000E+00 NOT IDENT.
NA-24	-2.677E+00	4.683E+00	6.790E+00	0.000E+00 NOT IDENT.
AL-26	1.775E-01	1.176E+00	2.152E+00	0.000E+00 FAIL ABUN
K-40	0.000E+00	1.479E+01	2.986E+01	0.000E+00 NOT IDENT.
SC-46	2.679E-01	1.263E+00	2.213E+00	0.000E+00 NOT IDENT.
V-48	-6.140E-01	1.236E+00	2.070E+00	0.000E+00 NOT IDENT.
CR-51	2.679E-01	9.895E+00	1.673E+01	0.000E+00 NOT IDENT.
MN-54	-7.428E-01	1.262E+00	2.117E+00	0.000E+00 NOT IDENT.
CO-56	-1.752E-01	1.254E+00	2.157E+00	0.000E+00 NOT IDENT.
MN-56	-1.228E+02	8.715E+02	1.499E+03	0.000E+00 NOT IDENT.
CO-57	1.219E+00	9.119E-01	1.531E+00	0.000E+00 NOT IDENT.
CO-58	3.440E-01	1.295E+00	2.276E+00	0.000E+00 NOT IDENT.
FE-59	1.213E+00	2.282E+00	4.078E+00	0.000E+00 NOT IDENT.
CO-60	2.143E+00	1.385E+00	2.635E+00	0.000E+00 NOT IDENT.
ZN-65	-3.648E-01	2.725E+00	4.634E+00	0.000E+00 NOT IDENT.
SE-75	9.296E-02	1.446E+00	2.464E+00	0.000E+00 FAIL ABUN
KR-85	0.000E+00	3.412E+02	6.146E+02	0.000E+00 NOT IDENT.

SR-85	0.000E+00	1.509E+00	2.719E+00	0.000E+00	NOT IDENT.
Y-88	9.787E-01	1.338E+00	2.547E+00	0.000E+00	NOT IDENT.
Y-91	-5.862E-01	1.215E+00	1.971E+00	0.000E+00	NOT IDENT.
NB-94	2.442E-01	1.252E+00	2.197E+00	0.000E+00	NOT IDENT.
NB-95M	-2.316E+01	4.814E+00	7.168E+00	0.000E+00	NOT IDENT.
ZR-95	1.694E+00	2.074E+00	3.775E+00	0.000E+00	NOT IDENT.
MO-99	1.763E-01	1.387E+00	2.128E+00	0.000E+00	NOT IDENT.
TC-99M	2.406E+00	1.894E+01	2.905E+01	0.000E+00	NOT IDENT.
RU-103	3.641E-01	1.250E+00	2.113E+00	0.000E+00	FAIL ABUN
RH-106	3.284E+00	1.184E+01	2.095E+01	0.000E+00	FAIL ABUN
RU-106	3.287E+00	1.184E+01	2.096E+01	0.000E+00	NOT IDENT.
AG-108M	5.621E-01	1.390E+00	2.088E+00	0.000E+00	NOT IDENT.
CD-109	2.205E+01	2.701E+01	4.492E+01	0.000E+00	NOT IDENT.
AG-110M	-1.258E+01	1.780E+00	2.263E+00	0.000E+00	FAIL ABUN
SN-113	1.488E-01	1.596E+00	2.689E+00	0.000E+00	NOT IDENT.
CD-115	-1.361E-01	5.258E+00	8.753E+00	0.000E+00	NOT IDENT.
SN-115	6.681E-01	9.192E+01	1.594E+02	0.000E+00	NOT IDENT.
SN-117M	3.280E-01	9.394E-01	1.633E+00	0.000E+00	NOT IDENT.
TE-123M	2.012E-01	9.163E-01	1.588E+00	0.000E+00	NOT IDENT.
SB-124	1.609E+00	2.610E+00	4.926E+00	0.000E+00	NOT IDENT.
SB-125	-3.360E-01	3.511E+00	5.862E+00	0.000E+00	NOT IDENT.
TE-125M	-5.709E+00	3.034E+02	4.917E+02	0.000E+00	NOT IDENT.
I-126	-2.521E+01	4.073E+00	5.272E+00	0.000E+00	NOT IDENT.
SB-126	2.823E+00	2.348E+00	4.327E+00	0.000E+00	NOT IDENT.
SN-126	2.888E+00	3.071E+00	4.596E+00	0.000E+00	FAIL ABUN
SB-127	1.086E+00	3.869E+00	6.855E+00	0.000E+00	NOT IDENT.
I-131	-4.598E-01	1.347E+00	2.238E+00	0.000E+00	FAIL ABUN
I-132	0.000E+00	1.748E+03	0.000E+00	0.000E+00	SHORT HLIF
TE-132	2.434E-01	1.194E+00	2.049E+00	0.000E+00	NOT IDENT.
BA-133	-6.041E-02	1.637E+00	2.754E+00	0.000E+00	NOT IDENT.
I-133	-2.322E-02	3.124E+00	5.199E+00	0.000E+00	NOT IDENT.
CS-134	1.376E+00	1.363E+00	2.416E+00	0.000E+00	FAIL ABUN
I-135	7.796E+00	6.750E+01	1.171E+02	0.000E+00	NOT IDENT.
CS-136	-6.304E-01	1.689E+00	2.840E+00	0.000E+00	NOT IDENT.
BA-137M	0.000E+00	2.005E+00	4.244E+00	0.000E+00	NOT IDENT.
CS-137	0.000E+00	2.119E+00	4.486E+00	0.000E+00	NOT IDENT.
CE-139	-5.681E-01	9.654E-01	1.639E+00	0.000E+00	NOT IDENT.
BA-140	-3.400E+00	4.764E+00	7.650E+00	0.000E+00	NOT IDENT.
LA-140	-7.499E-01	1.497E+00	2.561E+00	0.000E+00	FAIL ABUN
CE-143	2.575E+00	4.393E+00	6.696E+00	0.000E+00	NOT IDENT.
CE-144	-1.913E+00	6.887E+00	1.186E+01	0.000E+00	NOT IDENT.
PM-144	1.087E+00	1.301E+00	2.342E+00	0.000E+00	NOT IDENT.
PR-144	0.000E+00	1.197E+41	0.000E+00	0.000E+00	SHORT HLIF
PM-146	3.352E-01	1.722E+00	2.902E+00	0.000E+00	NOT IDENT.
ND-147	4.124E+00	8.905E+00	1.517E+01	0.000E+00	NOT IDENT.
PM-147	0.000E+00	1.932E+06	3.303E+06	0.000E+00	NOT IDENT.
EU-152	4.850E+00	3.685E+00	6.488E+00	0.000E+00	FAIL ABUN
GD-153	-1.123E+00	2.729E+00	4.395E+00	0.000E+00	FAIL ABUN
EU-154	-2.541E+00	3.690E+00	5.982E+00	0.000E+00	NOT IDENT.
EU-155	-1.960E+00	4.009E+00	6.426E+00	0.000E+00	NOT IDENT.
TB-160	-7.863E-01	4.181E+00	7.181E+00	0.000E+00	FAIL ABUN
TM-171	3.386E+02	9.621E+02	1.429E+03	0.000E+00	NOT IDENT.
HF-181	5.794E-01	1.320E+00	2.247E+00	0.000E+00	FAIL ABUN
TA-182	-2.994E+00	5.075E+00	8.316E+00	0.000E+00	NOT IDENT.
IR-192	-8.961E-02	1.121E+00	1.890E+00	0.000E+00	FAIL ABUN
HG-203	1.278E+00	1.199E+00	2.098E+00	0.000E+00	FAIL ABUN
BI-207	7.765E-01	1.769E+00	3.130E+00	0.000E+00	FAIL ABUN
BI-210	0.000E+00	9.863E+01	1.573E+02	0.000E+00	NOT IDENT.
PB-210	0.000E+00	9.863E+01	1.573E+02	0.000E+00	NOT IDENT.
BI-211	5.345E+00	7.711E+00	1.329E+01	0.000E+00	NOT IDENT.
PB-211	4.375E+00	3.592E+01	6.053E+01	0.000E+00	NOT IDENT.
BI-212	6.397E+00	1.028E+01	1.843E+01	0.000E+00	NOT IDENT.
PB-212	0.000E+00	2.246E+00	4.183E+00	0.000E+00	FAIL ABUN
BI-214	2.337E+00	5.274E+00	4.983E+00	0.000E+00	FAIL ABUN
PB-214	3.230E+00	2.649E+00	4.649E+00	0.000E+00	FAIL ABUN
RN-219	-5.727E+00	1.548E+01	2.562E+01	0.000E+00	FAIL ABUN
RA-223	-4.666E+00	2.524E+01	4.234E+01	0.000E+00	FAIL ABUN
RA-224	-1.132E+01	2.446E+01	4.107E+01	0.000E+00	NOT IDENT.
RA-226	2.337E+00	5.274E+00	4.983E+00	0.000E+00	FAIL ABUN
AC-227	-2.683E+00	1.399E+01	2.367E+01	0.000E+00	FAIL ABUN
TH-227	-2.644E+00	1.379E+01	2.333E+01	0.000E+00	FAIL ABUN
AC-228	5.780E+00	9.788E+00	1.021E+01	0.000E+00	FAIL ABUN
RA-228	5.780E+00	9.788E+00	1.021E+01	0.000E+00	FAIL ABUN
TH-228	0.000E+00	2.245E+00	4.183E+00	0.000E+00	FAIL ABUN
TH-229	4.427E+00	1.992E+01	3.031E+01	0.000E+00	FAIL ABUN
TH-230	2.337E+00	5.273E+00	4.983E+00	0.000E+00	FAIL ABUN
TH-231	5.009E+00	7.270E+00	1.141E+01	0.000E+00	FAIL ABUN
TH-232	0.000E+00	2.243E+00	4.178E+00	0.000E+00	FAIL ABUN

PA-233	-8.750E-01	2.342E+00	3.914E+00	0.000E+00	FAIL	ABUN
PA-234	-2.240E-01	1.012E+01	1.751E+01	0.000E+00	FAIL	ABUN
PA-234M	1.865E+02	1.661E+02	3.034E+02	0.000E+00	FAIL	ABUN
TH-234	5.169E+01	8.414E+01	8.462E+01	0.000E+00	FAIL	ABUN
U-234	2.765E+00	8.616E+00	8.496E+00	0.000E+00	FAIL	ABUN
NP-237	3.935E+00	9.269E+00	1.364E+01	0.000E+00	NOT	IDENT.
NP-239	-5.333E+00	7.140E+00	1.132E+01	0.000E+00	NOT	IDENT.
AM-241	4.433E+00	6.817E+00	8.173E+00	0.000E+00	NOT	IDENT.
AM-242	2.488E+01	8.066E+01	1.323E+02	0.000E+00	NOT	IDENT.
CM-247	-3.006E-01	1.402E+00	2.334E+00	0.000E+00	NOT	IDENT.
CF-249	-1.107E-03	1.531E+00	2.573E+00	0.000E+00	NOT	IDENT.
CF-251	1.957E+00	4.525E+00	7.852E+00	0.000E+00	FAIL	ABUN

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068236.CNF;1
Sample date        : 25-APR-2006 00:00:00 Acquisition date : 25-APR-2006 18:43:09
Sample ID          : G1201068236 Sample quantity : 2.00000E+00 LITER
Detector name     : WELL Detector geometry: 2L_MB
Elapsed live time : 0 16:40:00.00 Elapsed real time: 0 16:40:12.98 0.0%
Energy tolerance  : 2.00000 KEV Analyst Initials : MJH1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 519510 Detector SN# : 3941466
Matrix Spike DPM : LCS DPM :
*****

```

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.99	187	1051	1.76	92.75	88	9	3.12E-03	32.1	
2	0	63.44	588	992	1.38	125.44	121	9	9.80E-03	10.5	
3	0	77.52	65	658	0.88	153.41	151	5	1.08E-03	60.6	
4	0	84.25	182	809	1.65	166.79	164	7	3.04E-03	26.8	
5	0	87.95	55	1061	1.03	174.13	170	8	9.19E-04	103.1	
6	0	92.85	1280	1186	1.50	183.86	180	10	2.13E-02	5.8	
7	0	112.52	42	1085	1.21	222.96	220	9	7.04E-04	141.8	
8	0	127.14	152	956	2.40	252.00	247	10	2.54E-03	38.9	
9	0	144.32	215	902	1.26	286.13	282	9	3.59E-03	26.1	
10	0	162.52	52	791	0.95	322.29	320	8	8.61E-04	95.1	
11	0	185.86	869	1096	1.32	368.66	363	13	1.45E-02	8.6	
12	0	198.00	153	868	2.49	392.79	388	10	2.56E-03	37.0	
13	0	205.59	97	541	0.98	407.86	405	7	1.62E-03	41.2	
14	0	238.62	272	887	1.32	473.50	469	10	4.54E-03	21.3	
15	0	269.75	49	442	1.16	535.37	533	7	8.15E-04	72.6	
16	0	284.94	42	391	1.32	565.55	563	7	7.00E-04	79.4	
17	0	295.73	121	455	0.79	586.97	583	9	2.01E-03	33.3	
18	0	300.19	77	365	1.61	595.85	593	7	1.28E-03	42.7	
19	0	338.45	98	526	2.03	671.87	666	11	1.63E-03	46.6	
20	0	351.42	71	350	1.19	697.65	695	8	1.19E-03	46.7	
21	0	409.22	29	262	0.99	812.52	810	7	4.84E-04	94.3	
22	0	437.53	30	235	1.04	868.79	865	7	5.02E-04	86.3	
23	0	511.12	1085	487	2.64	1015.05	1008	16	1.81E-02	5.5	
24	0	569.39	105	365	3.52	1130.86	1122	17	1.76E-03	42.7	
25	0	582.82	200	250	2.07	1157.56	1150	13	3.33E-03	17.8	
26	0	609.33	87	156	1.75	1210.25	1207	7	1.44E-03	26.2	
27	0	650.12	38	375	8.18	1291.34	1285	20	6.27E-04	127.1	
28	0	661.54	530	251	2.20	1314.04	1308	13	8.83E-03	7.6	
29	0	680.39	51	122	2.73	1351.50	1348	9	8.52E-04	41.6	
30	0	725.65	25	419	9.16	1441.48	1426	23	4.25E-04	209.7	
31	0	766.58	61	107	2.16	1522.85	1519	8	1.02E-03	32.2	
32	0	794.47	33	82	2.36	1578.30	1575	8	5.58E-04	49.5	
33	0	802.47	65	168	3.23	1594.20	1590	12	1.08E-03	41.8	
34	0	859.60	28	98	1.48	1707.79	1704	8	4.63E-04	64.6	
35	0	910.99	111	131	2.78	1809.96	1805	12	1.85E-03	22.6	
36	0	921.32	27	123	0.61	1830.51	1823	12	4.46E-04	86.0	
37	0	939.39	38	61	0.71	1866.43	1864	8	6.36E-04	38.8	
38	0	963.77	50	87	2.94	1914.92	1911	10	8.31E-04	37.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
39	0	1000.49	55	84	1.32	1987.92	1984	9	9.10E-04	33.1	
40	0	1076.24	68	98	7.89	2138.57	2130	19	1.13E-03	37.4	
41	0	1239.65	12	39	1.34	2463.55	2462	7	2.03E-04	90.3	
42	0	1307.25	20	22	1.84	2598.01	2594	8	3.36E-04	46.0	
43	0	1332.48	59	58	2.35	2648.19	2642	14	9.81E-04	30.6	
44	0	1364.42	49	45	2.44	2711.73	2706	14	8.17E-04	32.5	
45	0	1462.83	78	153	7.41	2907.51	2896	25	1.30E-03	45.4	
46	0	1495.26	7	38	1.38	2972.02	2966	9	1.15E-04	166.2	
47	0	1500.73	15	45	1.37	2982.90	2977	11	2.51E-04	91.0	
48	0	1509.24	27	48	4.30	2999.83	2994	14	4.49E-04	58.2	
49	0	1522.40	13	44	3.57	3026.02	3021	12	2.24E-04	103.2	
50	0	1559.27	16	23	0.76	3099.37	3095	9	2.72E-04	59.6	
51	0	1570.09	14	50	0.54	3120.91	3118	14	2.27E-04	112.9	
52	0	1591.26	23	21	1.52	3163.02	3160	6	3.76E-04	39.1	
53	0	1668.54	13	15	1.47	3316.79	3315	7	2.10E-04	57.6	
54	0	1763.84	51	44	2.17	3506.43	3501	11	8.57E-04	28.6	
55	0	1772.46	9	15	0.59	3523.57	3519	7	1.44E-04	83.3	
56	0	1895.13	5	20	0.91	3767.70	3767	6	7.67E-05	160.1	
57	0	1923.95	12	7	0.63	3825.07	3822	5	2.04E-04	43.6	
58	0	1975.83	29	25	4.62	3928.33	3921	17	4.87E-04	46.0	



```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068236.CNF;1
Sample date        : 25-APR-2006 00:00:00 Acquisition date : 25-APR-2006 18:43:09
Sample ID          : G1201068236           Sample quantity  : 2.00000E+00 LITER
Detector name     : WELL                   Detector geometry: 2L_MB
Elapsed live time : 0 16:40:00.00         Elapsed real time: 0 16:40:12.98  0.0%
Energy tolerance  : 2.00000 KEV          Analyst Initials  : MJH1
Abundance limit   : 75.00000             Sensitivity       : 3.00000
Batch ID          : 519510                Detector SN#      : 3941466
Matrix Spike DPM  :                       LCS DPM         :
*****
    
```

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
NB-95	765.79	61	99.81*	6.608E-01	2.087E+00	2.134E+00	64.47
CS-135	268.24	49	16.00*	1.617E+00	4.258E+00	4.258E+00	145.13
CE-141	145.44	106	48.40*	2.280E+00	2.156E+00	2.209E+00	154.73
PM-149	285.95	42	3.10*	1.547E+00	1.974E+01	2.805E+01	158.77
TL-208	75.00	-----	3.43	1.606E+00	-----	Line Not Found	-----
	277.35	-----	6.80	1.581E+00	-----	Line Not Found	-----
	510.84	31	21.60	9.288E-01	3.460E+00	3.464E+00	546.34
	583.14	77	84.20*	8.292E-01	2.481E+00	2.484E+00	143.31
	763.30	-----	1.64	6.631E-01	-----	Line Not Found	-----
	860.37	28	12.46	6.035E-01	8.325E+00	8.334E+00	129.13
PA-231	1093.90	-----	0.37	5.016E-01	-----	Line Not Found	-----
	283.67	42	1.60*	1.547E+00	3.825E+01	3.825E+01	158.77
	301.29	77	4.60	1.481E+00	2.537E+01	2.537E+01	85.49
	330.00	-----	1.30	1.366E+00	-----	Line Not Found	-----
U-235	89.95	-----	2.70	1.980E+00	-----	Line Not Found	-----
	93.35	-----	4.50	2.042E+00	-----	Line Not Found	-----
	105.00	-----	2.10	2.194E+00	-----	Line Not Found	-----
	143.76	106	10.50*	2.280E+00	9.939E+00	9.939E+00	154.73
	163.33	-----	4.70	2.204E+00	-----	Line Not Found	-----
	185.71	189	54.00	2.082E+00	3.787E+00	3.787E+00	107.78
	205.31	26	5.00	1.965E+00	5.955E+00	5.955E+00	445.37
U-238	63.29	104	3.80*	1.197E+00	5.169E+01	5.169E+01	162.78
ANH-511	511.00	31	100.00*	9.288E-01	7.473E-01	7.473E-01	546.34

Flag: "\*" = Keyline

Total number of lines in spectrum 40  
 Number of unidentified lines 16  
 Number of lines tentatively identified by NID 24 60.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected	Decay Corr	Decay Corr	2-Sigma	Flags
			pCi/LITER	pCi/LITER	2-Sigma Error	%Error	
NB-95	35.06D	1.02	2.087E+00	2.134E+00	1.376E+00	64.47	
CS-135	2.30E+06Y	1.00	4.258E+00	4.258E+00	6.180E+00	145.13	
CE-141	32.50D	1.02	2.156E+00	2.209E+00	3.418E+00	154.73	
PM-149	53.08H	1.42	1.974E+01	2.805E+01	4.453E+01	158.77	
TL-208	1.91Y	1.00	2.481E+00	2.484E+00	3.560E+00	143.31	
PA-231	3.28E+04Y	1.00	3.825E+01	3.825E+01	6.072E+01	158.77	
U-235	7.04E+08Y	1.00	9.939E+00	9.939E+00	15.38E+00	154.73	
U-238	4.47E+09Y	1.00	5.169E+01	5.169E+01	8.414E+01	162.78	
ANH-511	1.00E+09Y	1.00	7.473E-01	7.473E-01	40.83E-01	546.34	
Total Activity :			1.313E+02	1.398E+02			

Grand Total Activity : 1.313E+02 1.398E+02

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	84.25	39	809	1.65	166.79	164	7	6.52E-04	****	1.86E+00	T
0	127.14	152	956	2.40	252.00	247	10	2.54E-03	77.7	2.30E+00	
0	198.00	31	868	2.49	392.79	388	10	5.15E-04	****	2.01E+00	T
0	295.73	35	455	0.79	586.97	583	9	5.89E-04	****	1.50E+00	T
0	338.45	7	526	2.03	671.87	666	11	1.14E-04	****	1.34E+00	T
0	409.22	29	262	0.99	812.52	810	7	4.84E-04	****	1.13E+00	
0	437.53	30	235	1.04	868.79	865	7	5.02E-04	****	1.07E+00	
0	569.39	73	365	3.52	1130.86	1122	17	1.22E-03	****	8.46E-01	T
0	609.33	38	156	1.75	1210.25	1207	7	6.39E-04	****	7.98E-01	T
0	680.39	51	122	2.73	1351.50	1348	9	8.52E-04	83.1	7.28E-01	
0	794.47	33	82	2.36	1578.30	1575	8	5.58E-04	99.1	6.42E-01	T
0	802.47	23	168	3.23	1594.20	1590	12	3.81E-04	****	6.37E-01	T
0	910.99	41	131	2.78	1809.96	1805	12	6.83E-04	****	5.77E-01	T
0	921.32	27	123	0.61	1830.51	1823	12	4.46E-04	****	5.72E-01	T
0	939.39	38	61	0.71	1866.43	1864	8	6.36E-04	77.6	5.63E-01	T
0	963.77	19	87	2.94	1914.92	1911	10	3.09E-04	****	5.52E-01	T
0	1076.24	68	98	7.89	2138.57	2130	19	1.13E-03	74.7	5.08E-01	
0	1307.25	20	22	1.84	2598.01	2594	8	3.36E-04	92.0	4.38E-01	
0	1364.42	49	45	2.44	2711.73	2706	14	8.17E-04	65.0	4.24E-01	T
0	1462.83	78	153	7.41	2907.51	2896	25	1.30E-03	90.8	4.02E-01	
0	1500.73	15	45	1.37	2982.90	2977	11	2.51E-04	****	3.94E-01	
0	1522.40	13	44	3.57	3026.02	3021	12	2.24E-04	****	3.89E-01	
0	1559.27	16	23	0.76	3099.37	3095	9	2.72E-04	****	3.82E-01	
0	1570.09	6	50	0.54	3120.91	3118	14	9.80E-05	****	3.80E-01	
0	1591.26	23	21	1.52	3163.02	3160	6	3.76E-04	78.1	3.76E-01	
0	1668.54	13	15	1.47	3316.79	3315	7	2.10E-04	****	3.62E-01	
0	1895.13	5	20	0.91	3767.70	3767	6	7.67E-05	****	3.24E-01	
0	1923.95	6	7	0.63	3825.07	3822	5	1.05E-04	****	3.20E-01	
0	1975.83	2	25	4.62	3928.33	3921	17	2.94E-05	****	3.13E-01	

Flags: "T" = Tentatively associated

```

*****
*                                     GENERAL ENG. LABS, LLC.                               *
*                                     2040 Savage Road                                   *
*                                     Charleston, SC 29414                             *
*****
*                                     DETECTOR DATA                                   *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068236.CNF;1
* Acquisition date   : 25-APR-2006 18:43:09   Detector SN#      : 3941466
* Detector ID        : WELL                    Sensitivity           : 3.00000
* Geometry           : 2L_MB                   Energy tolerance      : 2.00000
* Elapsed live time  : 0 16:40:00.00           Abundance limit      : 75.00000
* Elapsed real time  : 0 16:40:12.98           Half life ratio      : 8.00000
*****
*                                     SAMPLE DATA                                   *
*
* Sample date        : 25-APR-2006 00:00:00   Nuclide Library      : EPI
* Sample ID          : G1201068236           Analyst initials     : MJH1
* Batch Number       : 519510                Sample Quantity      : 2.00000E+00 LITER
*****
*                                     QC DATA                                       *
*
* CALIB. DATE/TIME  : 13-DEC-2005 09:34:01.1MS Isotope          :
* MSD DPM           :                        MSD Isotope         :
* LCS DPM           :                        LCS Isotope         :
*****

```

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
NB-95	2.134E+00	1.376E+00	1.970E+00	0.000E+00	1.083
CS-135	4.258E+00	6.180E+00	9.037E+00	0.000E+00	0.471
CE-141	1.356E+00	3.533E+00	2.610E+00	0.000E+00	0.520
PM-149	2.805E+01	4.453E+01	7.028E+01	0.000E+00	0.399
TL-208	2.484E+00	3.560E+00	2.331E+00	0.000E+00	1.066
PA-231	3.825E+01	6.072E+01	9.780E+01	0.000E+00	0.391
U-235	9.939E+00	1.538E+01	1.347E+01	0.000E+00	0.738
U-238	5.169E+01	8.414E+01	6.622E+01	0.000E+00	0.781
ANH-511	7.473E-01	4.083E+00	1.881E+00	0.000E+00	0.397

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/LITER) Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
BE-7	3.532E+00	1.071E+01	1.812E+01	0.000E+00	0.195
NA-22	-2.950E-01	1.261E+00	2.128E+00	0.000E+00	-0.139
NA-24	-2.677E+00	4.683E+00	6.790E+00	0.000E+00	-0.394

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
AL-26	1.775E-01		1.176E+00	2.152E+00	0.000E+00	0.082
K-40	3.598E+01		1.479E+01	2.986E+01	0.000E+00	1.205
SC-46	2.679E-01		1.263E+00	2.213E+00	0.000E+00	0.121
V-48	-6.140E-01		1.236E+00	2.070E+00	0.000E+00	-0.297
CR-51	2.679E-01		9.895E+00	1.673E+01	0.000E+00	0.016
MN-54	-7.428E-01		1.262E+00	2.117E+00	0.000E+00	-0.351
CO-56	-1.752E-01		1.254E+00	2.157E+00	0.000E+00	-0.081
MN-56	-1.228E+02		8.715E+02	1.499E+03	0.000E+00	-0.082
CO-57	1.219E+00		9.119E-01	1.531E+00	0.000E+00	0.796
CO-58	3.440E-01		1.295E+00	2.276E+00	0.000E+00	0.151
FE-59	1.213E+00		2.282E+00	4.078E+00	0.000E+00	0.298
CO-60	2.143E+00		1.385E+00	2.635E+00	0.000E+00	0.813
ZN-65	-3.648E-01		2.725E+00	4.634E+00	0.000E+00	-0.079
SE-75	9.296E-02		1.446E+00	2.464E+00	0.000E+00	0.038
KR-85	1.690E+03		3.412E+02	6.146E+02	0.000E+00	2.749
SR-85	7.475E+00		1.509E+00	2.719E+00	0.000E+00	2.749
Y-88	9.787E-01		1.338E+00	2.547E+00	0.000E+00	0.384
Y-91	-5.862E-01		1.215E+00	1.971E+00	0.000E+00	-0.297
NB-94	2.442E-01		1.252E+00	2.197E+00	0.000E+00	0.111
NB-95M	-2.316E+01		4.814E+00	7.168E+00	0.000E+00	-3.231
ZR-95	1.694E+00		2.074E+00	3.775E+00	0.000E+00	0.449
MO-99	1.763E-01		1.387E+00	2.128E+00	0.000E+00	0.083
TC-99M	2.406E+00		1.894E+01	2.905E+01	0.000E+00	0.083
RU-103	3.641E-01		1.250E+00	2.113E+00	0.000E+00	0.172
RH-106	3.284E+00		1.184E+01	2.095E+01	0.000E+00	0.157
RU-106	3.287E+00		1.184E+01	2.096E+01	0.000E+00	0.157
AG-108M	5.621E-01		1.390E+00	2.088E+00	0.000E+00	0.269
CD-109	2.205E+01		2.701E+01	4.492E+01	0.000E+00	0.491
AG-110M	-1.258E+01		1.780E+00	2.263E+00	0.000E+00	-5.558
SN-113	1.488E-01		1.596E+00	2.689E+00	0.000E+00	0.055
CD-115	-1.361E-01		5.258E+00	8.753E+00	0.000E+00	-0.016
SN-115	6.681E-01		9.192E+01	1.594E+02	0.000E+00	0.004
SN-117M	3.280E-01		9.394E-01	1.633E+00	0.000E+00	0.201
TE-123M	2.012E-01		9.163E-01	1.588E+00	0.000E+00	0.127
SB-124	1.609E+00		2.610E+00	4.926E+00	0.000E+00	0.327
SB-125	-3.360E-01		3.511E+00	5.862E+00	0.000E+00	-0.057
TE-125M	-5.709E+00		3.034E+02	4.917E+02	0.000E+00	-0.012
I-126	-2.521E+01		4.073E+00	5.272E+00	0.000E+00	-4.781
SB-126	2.823E+00		2.348E+00	4.327E+00	0.000E+00	0.653
SN-126	2.888E+00		3.071E+00	4.596E+00	0.000E+00	0.628
SB-127	1.086E+00		3.869E+00	6.855E+00	0.000E+00	0.158
I-131	-4.598E-01		1.347E+00	2.238E+00	0.000E+00	-0.205
TE-132	2.434E-01		1.194E+00	2.049E+00	0.000E+00	0.119
BA-133	-6.041E-02		1.637E+00	2.754E+00	0.000E+00	-0.022
I-133	-2.322E-02		3.124E+00	5.199E+00	0.000E+00	-0.004
CS-134	1.376E+00	+	1.363E+00	2.416E+00	0.000E+00	0.570
I-135	7.796E+00		6.750E+01	1.171E+02	0.000E+00	0.067
CS-136	-6.304E-01		1.689E+00	2.840E+00	0.000E+00	-0.222

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
BA-137M	1.707E+01		2.005E+00	4.244E+00	0.000E+00	4.022
CS-137	1.804E+01		2.119E+00	4.486E+00	0.000E+00	4.021
CE-139	-5.681E-01		9.654E-01	1.639E+00	0.000E+00	-0.347
BA-140	-3.400E+00		4.764E+00	7.650E+00	0.000E+00	-0.444
LA-140	-7.499E-01		1.497E+00	2.561E+00	0.000E+00	-0.293
CE-143	2.575E+00		4.393E+00	6.696E+00	0.000E+00	0.385
CE-144	-1.913E+00		6.887E+00	1.186E+01	0.000E+00	-0.161
PM-144	1.087E+00		1.301E+00	2.342E+00	0.000E+00	0.464
PM-146	3.352E-01		1.722E+00	2.902E+00	0.000E+00	0.115
ND-147	4.124E+00		8.905E+00	1.517E+01	0.000E+00	0.272
PM-147	3.886E+06		1.932E+06	3.303E+06	0.000E+00	1.177
EU-152	4.850E+00		3.685E+00	6.488E+00	0.000E+00	0.748
GD-153	-1.123E+00		2.729E+00	4.395E+00	0.000E+00	-0.255
EU-154	-2.541E+00		3.690E+00	5.982E+00	0.000E+00	-0.425
EU-155	-1.960E+00		4.009E+00	6.426E+00	0.000E+00	-0.305
TB-160	-7.863E-01		4.181E+00	7.181E+00	0.000E+00	-0.109
TM-171	3.386E+02		9.621E+02	1.429E+03	0.000E+00	0.237
HF-181	5.794E-01		1.320E+00	2.247E+00	0.000E+00	0.258
TA-182	-2.994E+00		5.075E+00	8.316E+00	0.000E+00	-0.360
IR-192	-8.961E-02		1.121E+00	1.890E+00	0.000E+00	-0.047
HG-203	1.278E+00		1.199E+00	2.098E+00	0.000E+00	0.609
BI-207	7.765E-01		1.769E+00	3.130E+00	0.000E+00	0.248
BI-210	2.315E+02		9.863E+01	1.573E+02	0.000E+00	1.471
PB-210	2.315E+02		9.863E+01	1.573E+02	0.000E+00	1.471
BI-211	5.345E+00		7.711E+00	1.329E+01	0.000E+00	0.402
PB-211	4.375E+00		3.592E+01	6.053E+01	0.000E+00	0.072
BI-212	6.397E+00		1.028E+01	1.843E+01	0.000E+00	0.347
PB-212	9.659E+00		2.246E+00	4.183E+00	0.000E+00	2.309
BI-214	2.337E+00	+	5.274E+00	4.983E+00	0.000E+00	0.469
PB-214	3.230E+00		2.649E+00	4.649E+00	0.000E+00	0.695
RN-219	-5.727E+00		1.548E+01	2.562E+01	0.000E+00	-0.224
RA-223	-4.666E+00		2.524E+01	4.234E+01	0.000E+00	-0.110
RA-224	-1.132E+01		2.446E+01	4.107E+01	0.000E+00	-0.276
RA-226	2.337E+00	+	5.274E+00	4.983E+00	0.000E+00	0.469
AC-227	-2.683E+00		1.399E+01	2.367E+01	0.000E+00	-0.113
TH-227	-2.644E+00		1.379E+01	2.333E+01	0.000E+00	-0.113
AC-228	5.780E+00	+	9.788E+00	1.021E+01	0.000E+00	0.566
RA-228	5.780E+00	+	9.788E+00	1.021E+01	0.000E+00	0.566
TH-228	9.658E+00		2.245E+00	4.183E+00	0.000E+00	2.309
TH-229	4.427E+00		1.992E+01	3.031E+01	0.000E+00	0.146
TH-230	2.337E+00	+	5.273E+00	4.983E+00	0.000E+00	0.469
TH-231	5.009E+00	+	7.270E+00	1.141E+01	0.000E+00	0.439
TH-232	9.647E+00		2.243E+00	4.178E+00	0.000E+00	2.309
PA-233	-8.750E-01		2.342E+00	3.914E+00	0.000E+00	-0.224
PA-234	-2.240E-01		1.012E+01	1.751E+01	0.000E+00	-0.013
PA-234M	1.865E+02		1.661E+02	3.034E+02	0.000E+00	0.615
TH-234	5.169E+01	+	8.414E+01	8.462E+01	0.000E+00	0.611
U-234	2.765E+00	+	8.616E+00	8.496E+00	0.000E+00	0.325

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
NP-237	3.935E+00		9.269E+00	1.364E+01	0.000E+00	0.288
NP-239	-5.333E+00		7.140E+00	1.132E+01	0.000E+00	-0.471
AM-241	4.433E+00		6.817E+00	8.173E+00	0.000E+00	0.542
AM-242	2.488E+01		8.066E+01	1.323E+02	0.000E+00	0.188
CM-247	-3.006E-01		1.402E+00	2.334E+00	0.000E+00	-0.129
CF-249	-1.107E-03		1.531E+00	2.573E+00	0.000E+00	0.000
CF-251	1.957E+00		4.525E+00	7.852E+00	0.000E+00	0.249

```

*****
*
*                               General Engineering Labs, LLC
*                               2040 SAVAGE ROAD
*                               CHARLESTON ,SC 29417
*                               GROSS GAMMA REPORT
*
*****
*
*  BATCH ID      : 519510                SAMPLE ID   : G1201068236
*  ANALYST       : MJH1                  DETECTOR    : WELL
*  SAMPLE DATE   : 25-APR-2006 00:00:00.00  COUNT TIME  : 0 16:40:00.00
*  ANALYSIS DATE: 25-APR-2006 18:43:09.10  SAMPLE ALQT: 2.000 LITER
*
*****

```

```

GROSS GAMMA ACTIVITY (pCi/LITER ) : 4.604E+01
GROSS GAMMA ERROR   (pCi/LITER ) : 5.361E+01
GROSS GAMMA MDA     (pCi/LITER ) : 1.983E+02
GROSS GAMMA DLC     (pCi/LITER ) : 9.730E+01

```



VAX/VMS Nuclide Identification Report Generated 26-APR-2006 15:32:33.23

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
Configuration : DKA0:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068237.CNF;1
Sample date   : 22-MAR-2006 10:20:00 Acquisition date : 26-APR-2006 05:28:03
Sample ID    : G1201068237 Sample quantity : 2.00000E+00 LITER
Detector name : GAM19 Detector geometry: 2LMB
Elapsed live time: 0 10:00:00.00 Elapsed real time: 0 10:00:06.59 0.0%
Energy tolerance : 2.00000 keV Analyst Initials : MJH1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 519510 Detector SN# :
Matrix Spike DPM : LCS DPM :
*****

```

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	9	5.01*	3201	1638	1.35	9.81	6	12	8.89E-02	3.9	3.49E+01
2	0	10.51*	66	4003	1.01	20.79	18	7	1.82E-03	191.0	
3	0	14.40	185	3325	1.55	28.56	26	7	5.13E-03	52.4	
4	0	46.86*	16	660	1.22	93.40	89	8	4.36E-04	338.8	
5	2	63.40*	115	606	1.56	126.45	121	16	3.19E-03	50.3	1.86E+00
6	2	66.41	166	578	1.60	132.45	121	16	4.60E-03	25.9	
7	0	84.72	39	587	0.66	169.02	164	9	1.10E-03	111.9	
8	0	140.04*	211	540	1.04	279.54	275	10	5.86E-03	24.9	
9	0	176.54	236	658	2.73	352.47	346	14	6.56E-03	24.0	
10	0	185.99*	34	461	1.26	371.34	367	10	9.35E-04	160.0	
11	0	198.61*	109	528	1.42	396.55	391	12	3.02E-03	57.9	
12	0	204.90	44	391	0.66	409.12	407	9	1.22E-03	82.2	
13	0	239.37*	48	510	1.24	477.98	472	13	1.33E-03	118.5	
14	0	265.86	25	264	0.72	530.92	528	8	6.94E-04	114.3	
15	0	326.20	46	259	1.32	651.46	646	10	1.29E-03	66.7	
16	0	352.31*	16	176	2.33	703.63	700	8	4.37E-04	233.9	
17	0	472.06	36	245	6.09	942.92	936	16	1.00E-03	98.1	
18	0	484.78	38	224	4.85	968.34	959	15	1.06E-03	87.2	
19	0	489.33	36	132	1.51	977.42	974	9	1.01E-03	59.0	
20	0	569.31*	16	208	3.26	1137.26	1128	15	4.54E-04	215.2	
21	0	584.22*	17	158	1.15	1167.05	1160	11	4.85E-04	194.2	
22	0	596.03	49	134	1.66	1190.65	1188	8	1.37E-03	42.6	
23	0	609.96	76	146	1.41	1218.49	1214	12	2.12E-03	34.0	
24	0	645.94	15	117	1.22	1290.39	1283	11	4.26E-04	141.7	
25	0	651.43	94	157	7.08	1301.38	1293	20	2.62E-03	34.0	
26	0	819.74	40	55	2.32	1637.76	1633	10	1.11E-03	38.7	
27	0	869.24	83	125	4.36	1736.70	1726	20	2.31E-03	34.7	
28	0	912.61*	5	148	4.28	1823.39	1812	19	1.48E-04	636.6	
29	0	922.01	15	52	0.49	1842.18	1836	9	4.13E-04	91.2	
30	0	1227.06	22	93	5.83	2452.03	2436	19	6.12E-04	110.2	
31	0	1287.80	41	81	7.73	2573.47	2562	23	1.14E-03	58.9	
32	0	1498.87	18	38	1.51	2995.54	2990	11	5.09E-04	69.4	
33	1	1696.61	28	35	2.16	3391.00	3373	38	7.83E-04	46.8	1.57E+00
34	1	1699.11	18	37	2.16	3396.00	3373	38	5.12E-04	73.9	
35	0	1745.33	23	57	7.21	3488.45	3477	18	6.33E-04	81.3	
36	0	1800.14	13	25	1.55	3598.08	3589	14	3.67E-04	84.3	
37	0	1873.57	17	44	6.51	3744.96	3732	17	4.86E-04	92.1	
38	0	1960.59	38	16	4.63	3919.04	3912	14	1.05E-03	28.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
----	----	--------	------	-------	------	---------	------	----	---------	------	-----

Flag: "\*" = Peak area was modified by background subtraction

VAX/VMS Nuclide Identification Report Generated

```

*****
*                               General Eng. Labs, LLC.                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29414                             *
*****
*                               DETECTOR DATA                                   *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068237
* Acquisition date   : 26-APR-2006 05:28:03 Detector SN#      :
* Detector ID       : GAM19                               Sensitivity      : 3.000
* Geometry          : 2LMB                               Energy tolerance: 2.000
* Elapsed live time: 0 10:00:00.00                      Abundance limit : 75.000
* Elapsed real time: 0 10:00:06.59                      Half life ratio  : 8.000
*****
*                               SAMPLE DATA                                   *
*
* Sample date       : 22-MAR-2006 10:20:00 Nuclide Library :
* Sample ID        : G1201068237                         Analyst initials: MJH1
* Batch Number     : 519510                               Sample Quantity : 2.0000E+00 LITER
* Recovery         : 1.00000                               Carrier Weight  : 0.00000
*****
*                               QC DATA                                   *
*
* Standard Weight  : 0.00000
* CALIB. DATE/TIME: 17-FEB-2006 16:09:06 MS Isotope      :
* MSD DPM          : 0.000                               MSD Isotope     :
* LCS DPM          : 0.000                               LCS Isotope     :
* LCSD DPM        : 0.000                               LCSD Isotope   :
*****

```

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER )	Act error	MDA (pCi/LITER )	
BI-210	4.053E+01	2.746E+02	1.833E+02	0.000E+00
PB-210	4.053E+01	2.746E+02	1.833E+02	0.000E+00
BI-211	2.595E+00	1.214E+01	6.879E+00	0.000E+00
RA-224	2.120E+01	5.028E+01	2.244E+01	0.000E+00
RA-226	5.065E+00	3.465E+00	2.297E+00	0.000E+00
TH-228	1.877E+00	4.454E+00	2.067E+00	0.000E+00
TH-230	5.065E+00	3.465E+00	2.297E+00	0.000E+00
TH-232	1.813E+00	4.302E+00	1.997E+00	0.000E+00
NP-237	5.213E+00	1.173E+01	8.155E+00	0.000E+00
U-238	8.980E+01	9.191E+01	5.175E+01	0.000E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER )	K.L. Act error ) Ided	MDA (pCi/LITER )	
BE-7	-4.062E+00	2.635E+01	1.424E+01	0.000E+00 NOT IDENT.
NA-22	3.565E-01	1.283E+00	1.257E+00	0.000E+00 NOT IDENT.
NA-24	0.000E+00	8.848E+16	0.000E+00	0.000E+00 SHORT HLIF
AL-26	3.295E-01	1.392E+00	1.362E+00	0.000E+00 NOT IDENT.
K-40	5.311E+00	2.121E+01	1.748E+01	0.000E+00 NOT IDENT.
SC-46	-2.367E-01	1.408E+00	1.355E+00	0.000E+00 NOT IDENT.
V-48	-7.506E+00	5.317E+00	4.562E+00	0.000E+00 NOT IDENT.
CR-51	1.087E+01	2.587E+01	2.241E+01	0.000E+00 NOT IDENT.
MN-54	7.352E-01	1.178E+00	1.197E+00	0.000E+00 NOT IDENT.
CO-56	-6.100E-01	1.519E+00	1.444E+00	0.000E+00 NOT IDENT.
MN-56	0.000E+00	2.491E+41	0.000E+00	0.000E+00 SHORT HLIF
CO-57	3.795E-01	1.098E+00	1.052E+00	0.000E+00 NOT IDENT.
CO-58	-2.751E-01	1.678E+00	1.551E+00	0.000E+00 NOT IDENT.
FE-59	3.084E-01	3.734E+00	3.624E+00	0.000E+00 NOT IDENT.
CO-60	2.445E-01	1.320E+00	1.280E+00	0.000E+00 NOT IDENT.
ZN-65	-5.357E-02	2.529E+00	2.432E+00	0.000E+00 NOT IDENT.
SE-75	9.199E-01	2.105E+00	1.800E+00	0.000E+00 FAIL ABUN

KR-85	-5.741E+02	3.887E+02	3.512E+02	0.000E+00	NOT IDENT.
SR-85	-3.626E+00	2.455E+00	2.218E+00	0.000E+00	NOT IDENT.
Y-88	6.325E-01	1.635E+00	1.651E+00	0.000E+00	NOT IDENT.
Y-91	-2.381E-01	1.581E+00	1.491E+00	0.000E+00	NOT IDENT.
NB-94	2.155E-01	1.234E+00	1.174E+00	0.000E+00	FAIL ABUN
NB-95	3.961E-01	2.134E+00	2.029E+00	0.000E+00	NOT IDENT.
NB-95M	0.000E+00	3.550E+03	0.000E+00	0.000E+00	SHORT HLIF
ZR-95	-1.915E+00	2.901E+00	2.587E+00	0.000E+00	NOT IDENT.
MO-99	0.000E+00	1.174E+04	0.000E+00	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	8.176E+40	0.000E+00	0.000E+00	SHORT HLIF
RU-103	-2.050E-01	2.099E+00	1.997E+00	0.000E+00	FAIL ABUN
RH-106	4.494E+00	1.181E+01	1.144E+01	0.000E+00	NOT IDENT.
RU-106	8.205E+00	1.173E+01	1.154E+01	0.000E+00	NOT IDENT.
AG-108M	5.042E-02	1.184E+00	1.141E+00	0.000E+00	NOT IDENT.
CD-109	-1.062E+02	3.843E+01	2.740E+01	0.000E+00	NOT IDENT.
AG-110M	-1.258E-01	1.361E+00	1.100E+00	0.000E+00	NOT IDENT.
SN-113	8.867E-01	1.761E+00	1.740E+00	0.000E+00	NOT IDENT.
CD-115	0.000E+00	1.800E+05	0.000E+00	0.000E+00	SHORT HLIF
SN-115	4.332E+01	1.554E+02	1.539E+02	0.000E+00	FAIL ABUN
SN-117M	3.664E+00	5.962E+00	5.721E+00	0.000E+00	NOT IDENT.
TE-123M	2.223E-01	1.265E+00	1.198E+00	0.000E+00	NOT IDENT.
SB-124	1.737E-01	3.786E+00	3.580E+00	0.000E+00	FAIL ABUN
SB-125	1.094E+00	3.333E+00	3.259E+00	0.000E+00	FAIL ABUN
TE-125M	-3.751E+02	4.910E+02	4.540E+02	0.000E+00	NOT IDENT.
I-126	1.496E+00	1.681E+01	1.597E+01	0.000E+00	NOT IDENT.
SB-126	9.136E+00	1.452E+01	1.422E+01	0.000E+00	NOT IDENT.
SN-126	-3.627E+00	3.383E+00	2.688E+00	0.000E+00	FAIL ABUN
SB-127	0.000E+00	1.561E+03	0.000E+00	0.000E+00	SHORT HLIF
I-131	-1.353E+01	2.344E+01	2.208E+01	0.000E+00	NOT IDENT.
I-132	0.000E+00	7.018E+41	0.000E+00	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.818E+03	0.000E+00	0.000E+00	SHORT HLIF
BA-133	5.742E-01	1.749E+00	1.503E+00	0.000E+00	NOT IDENT.
I-133	0.000E+00	1.602E+12	0.000E+00	0.000E+00	SHORT HLIF
CS-134	6.035E-01	1.325E+00	1.282E+00	0.000E+00	FAIL ABUN
CS-135	6.010E-01	6.359E+00	5.447E+00	0.000E+00	NOT IDENT.
I-135	0.000E+00	8.162E+38	0.000E+00	0.000E+00	SHORT HLIF
CS-136	-7.805E-01	8.986E+00	8.625E+00	0.000E+00	FAIL ABUN
BA-137M	-1.269E-01	1.199E+00	1.093E+00	0.000E+00	NOT IDENT.
CS-137	-1.383E-01	1.268E+00	1.155E+00	0.000E+00	NOT IDENT.
CE-139	-2.849E-01	1.299E+00	1.211E+00	0.000E+00	NOT IDENT.
BA-140	-1.850E+00	2.535E+01	2.406E+01	0.000E+00	NOT IDENT.
LA-140	-1.681E+00	9.371E+00	8.681E+00	0.000E+00	FAIL ABUN
CE-141	1.271E+00	4.976E+00	3.799E+00	0.000E+00	NOT IDENT.
CE-143	0.000E+00	1.111E+08	0.000E+00	0.000E+00	SHORT HLIF
CE-144	1.431E+00	8.854E+00	8.125E+00	0.000E+00	NOT IDENT.
PM-144	3.574E-02	1.291E+00	1.219E+00	0.000E+00	NOT IDENT.
PR-144	0.000E+00	3.613E+42	0.000E+00	0.000E+00	SHORT HLIF
PM-146	4.571E-01	1.597E+00	1.555E+00	0.000E+00	NOT IDENT.
ND-147	3.783E+01	6.585E+01	6.476E+01	0.000E+00	NOT IDENT.
PM-147	-9.980E+05	2.223E+06	2.075E+06	0.000E+00	NOT IDENT.
PM-149	0.000E+00	1.699E+06	0.000E+00	0.000E+00	SHORT HLIF
EU-152	-4.415E+00	4.885E+00	3.440E+00	0.000E+00	NOT IDENT.
GD-153	-1.165E+01	4.553E+00	3.094E+00	0.000E+00	FAIL ABUN
EU-154	1.011E+00	3.551E+00	3.480E+00	0.000E+00	NOT IDENT.
EU-155	4.074E+00	4.443E+00	4.335E+00	0.000E+00	FAIL ABUN
TB-160	4.123E+00	5.717E+00	5.720E+00	0.000E+00	NOT IDENT.
TM-171	0.000E+00	1.503E+03	1.251E+03	0.000E+00	FAIL ABUN
HF-181	4.640E-01	2.369E+00	1.995E+00	0.000E+00	FAIL ABUN
TA-182	2.574E+00	6.697E+00	5.766E+00	0.000E+00	FAIL ABUN
IR-192	-1.115E+00	1.553E+00	1.465E+00	0.000E+00	NOT IDENT.
HG-203	1.490E+00	1.974E+00	1.980E+00	0.000E+00	NOT IDENT.
BI-207	1.038E+00	1.584E+00	1.604E+00	0.000E+00	FAIL ABUN
TL-208	6.402E-01	2.488E+00	1.450E+00	0.000E+00	FAIL ABUN
PB-211	8.929E+00	3.257E+01	3.138E+01	0.000E+00	NOT IDENT.
BI-212	2.307E-01	9.514E+00	8.961E+00	0.000E+00	NOT IDENT.
PB-212	1.877E+00	4.454E+00	2.518E+00	0.000E+00	FAIL ABUN
BI-214	0.000E+00	3.465E+00	2.571E+00	0.000E+00	FAIL ABUN
PB-214	9.028E-01	4.225E+00	2.651E+00	0.000E+00	FAIL ABUN
RN-219	6.767E+00	1.464E+01	1.441E+01	0.000E+00	NOT IDENT.
RA-223	-5.475E-02	2.826E+01	2.389E+01	0.000E+00	NOT IDENT.
AC-227	-1.179E+01	1.431E+01	1.349E+01	0.000E+00	NOT IDENT.
TH-227	-1.158E+01	1.410E+01	1.326E+01	0.000E+00	NOT IDENT.
AC-228	8.134E-01	1.036E+01	4.830E+00	0.000E+00	FAIL ABUN
RA-228	8.134E-01	1.036E+01	4.830E+00	0.000E+00	FAIL ABUN
TH-229	6.179E+00	2.320E+01	1.918E+01	0.000E+00	FAIL ABUN
PA-231	-5.266E+01	5.658E+01	5.276E+01	0.000E+00	NOT IDENT.
TH-231	9.197E-01	7.290E+00	6.256E+00	0.000E+00	FAIL ABUN
PA-233	2.136E+00	2.360E+00	2.376E+00	0.000E+00	FAIL ABUN

PA-234	9.417E-01	9.561E+00	9.353E+00	0.000E+00	FAIL ABUN
PA-234M	-2.302E+02	2.175E+02	1.429E+02	0.000E+00	NOT IDENT.
TH-234	0.000E+00	9.191E+01	6.098E+01	0.000E+00	FAIL ABUN
U-234	3.646E-01	6.490E+00	5.106E+00	0.000E+00	FAIL ABUN
U-235	-4.325E+00	1.107E+01	8.209E+00	0.000E+00	FAIL ABUN
NP-239	-7.653E+00	7.948E+00	7.284E+00	0.000E+00	NOT IDENT.
AM-241	-2.304E+00	8.448E+00	6.218E+00	0.000E+00	NOT IDENT.
AM-242	2.172E+01	8.958E+01	8.587E+01	0.000E+00	NOT IDENT.
CM-247	1.107E+00	1.297E+00	1.300E+00	0.000E+00	NOT IDENT.
CF-249	-8.488E-01	1.374E+00	1.286E+00	0.000E+00	NOT IDENT.
CF-251	0.000E+00	9.376E+00	5.512E+00	0.000E+00	FAIL ABUN
ANH-511	-6.215E+00	2.644E+00	2.071E+00	0.000E+00	NOT IDENT.

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
Configuration      : DKA0:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068237.CNF;1
Sample date        : 22-MAR-2006 10:20:00 Acquisition date : 26-APR-2006 05:28:03
Sample ID          : G1201068237 Sample quantity : 2.00000E+00 LITER
Detector name      : GAM19 Detector geometry: 2LMB
Elapsed live time: 0 10:00:00.00 Elapsed real time: 0 10:00:06.59 0.0%
Energy tolerance  : 2.00000 keV Analyst Initials : MJH1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 519510 Detector SN# :
Matrix Spike DPM : LCS DPM :
*****

```

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	9	5.01	4433	1638	1.35	9.81	6	12	1.23E-01	2.5	3.49E+01
2	9	6.51	1724	4033	1.89	12.80	6	12	4.79E-02	8.3	
3	0	10.51	483	4003	1.01	20.79	18	7	1.34E-02	22.4	
4	0	14.40	185	3325	1.55	28.56	26	7	5.13E-03	52.4	
5	0	46.86	103	660	1.22	93.40	89	8	2.86E-03	44.5	
6	2	63.40	242	606	1.56	126.45	121	16	6.72E-03	19.8	1.86E+00
7	2	66.41	166	578	1.60	132.45	121	16	4.60E-03	25.9	
8	0	84.72	39	587	0.66	169.02	164	9	1.10E-03	111.9	
9	0	92.61	430	698	1.36	184.80	178	11	1.19E-02	12.9	
10	0	140.04	229	540	1.04	279.54	275	10	6.37E-03	20.1	
11	0	176.54	236	658	2.73	352.47	346	14	6.56E-03	24.0	
12	0	185.99	294	461	1.26	371.34	367	10	8.18E-03	14.8	
13	0	198.61	206	528	1.42	396.55	391	12	5.73E-03	23.4	
14	0	204.90	44	391	0.66	409.12	407	9	1.22E-03	82.2	
15	0	239.37	235	510	1.24	477.98	472	13	6.52E-03	20.9	
16	0	265.86	25	264	0.72	530.92	528	8	6.94E-04	114.3	
17	0	326.20	46	259	1.32	651.46	646	10	1.29E-03	66.7	
18	0	352.31	79	176	2.33	703.63	700	8	2.19E-03	31.2	
19	0	472.06	36	245	6.09	942.92	936	16	1.00E-03	98.1	
20	0	484.78	38	224	4.85	968.34	959	15	1.06E-03	87.2	
21	0	489.33	36	132	1.51	977.42	974	9	1.01E-03	59.0	
22	0	511.23	735	230	2.91	1021.18	1012	19	2.04E-02	6.2	
23	0	569.31	55	208	3.26	1137.26	1128	15	1.52E-03	59.1	
24	0	584.22	63	158	1.15	1167.05	1160	11	1.75E-03	40.8	
25	0	596.03	49	134	1.66	1190.65	1188	8	1.37E-03	42.6	
26	0	609.96	76	146	1.41	1218.49	1214	12	2.12E-03	34.0	
27	0	645.94	15	117	1.22	1290.39	1283	11	4.26E-04	141.7	
28	0	651.43	94	157	7.08	1301.38	1293	20	2.62E-03	34.0	
29	0	819.74	40	55	2.32	1637.76	1633	10	1.11E-03	38.7	
30	0	869.24	83	125	4.36	1736.70	1726	20	2.31E-03	34.7	
31	0	912.61	48	148	4.28	1823.39	1812	19	1.34E-03	61.8	
32	0	922.01	15	52	0.49	1842.18	1836	9	4.13E-04	91.2	
33	0	1227.06	22	93	5.83	2452.03	2436	19	6.12E-04	110.2	
34	0	1287.80	41	81	7.73	2573.47	2562	23	1.14E-03	58.9	
35	0	1463.26	46	91	1.35	2924.32	2915	14	1.28E-03	46.4	
36	0	1498.87	18	38	1.51	2995.54	2990	11	5.09E-04	69.4	
37	1	1696.61	28	35	2.16	3391.00	3373	38	7.83E-04	46.8	1.57E+00
38	1	1699.11	18	37	2.16	3396.00	3373	38	5.12E-04	73.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
39	0	1745.33	23	57	7.21	3488.45	3477	18	6.33E-04	81.3	
40	0	1800.14	13	25	1.55	3598.08	3589	14	3.67E-04	84.3	
41	0	1873.57	17	44	6.51	3744.96	3732	17	4.86E-04	92.1	
42	0	1960.59	38	16	4.63	3919.04	3912	14	1.05E-03	28.5	

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29414                               *
*****
Configuration      : DKA0:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068237.CNF;1
Sample date        : 22-MAR-2006 10:20:00 Acquisition date : 26-APR-2006 05:28:03
Sample ID          : G1201068237          Sample quantity  : 2.00000E+00 LITER
Detector name     : GAM19                 Detector geometry: 2LMB
Elapsed live time : 0 10:00:00.00         Elapsed real time: 0 10:00:06.59  0.0%
Energy tolerance  : 2.00000 keV          Analyst Initials  : MJH1
Abundance limit   : 75.00000             Sensitivity       : 3.00000
Batch ID          : 519510                Detector SN#      :
Matrix Spike DPM  :                       LCS DPM         :
*****

```

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
BI-210	46.50	16	4.05*	3.596E-01	4.041E+01	4.053E+01	677.59
PB-210	46.50	16	4.05*	3.596E-01	4.041E+01	4.053E+01	677.59
BI-211	351.07	16	12.94*	1.759E+00	2.595E+00	2.595E+00	467.92
RA-226	295.21	-----	19.20	1.962E+00	-----	Line Not Found	-----
	351.92	16	37.20	1.759E+00	9.028E-01	9.028E-01	467.91
	609.31	76	46.30*	1.221E+00	5.065E+00	5.065E+00	68.42
TH-228	84.40	39	1.21	2.253E+00	5.429E+01	5.621E+01	224.25
	238.60	48	44.60*	2.220E+00	1.813E+00	1.877E+00	237.24
	300.10	-----	3.41	1.943E+00	-----	Line Not Found	-----
TH-230	295.21	-----	19.20	1.962E+00	-----	Line Not Found	-----
	351.92	16	37.20	1.759E+00	9.028E-01	9.028E-01	467.91
	609.31	76	46.30*	1.221E+00	5.065E+00	5.065E+00	68.42
TH-232	238.59	48	44.60*	2.220E+00	1.813E+00	1.813E+00	237.24
	911.20	5	27.70	8.970E-01	8.041E-01	8.041E-01	1273.17
	964.40	-----	5.20	8.576E-01	-----	Line Not Found	-----
	969.11	-----	16.60	8.542E-01	-----	Line Not Found	-----
NP-237	86.48	39	12.60*	2.253E+00	5.213E+00	5.213E+00	224.98
	95.87	-----	2.60	2.545E+00	-----	Line Not Found	-----
U-238	63.29	115	3.80*	1.262E+00	8.980E+01	8.980E+01	102.35

Nuclide Type: NATURAL

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
RA-224	240.98	48	3.95*	2.220E+00	2.047E+01	2.120E+01	237.20

Flag: "\*" = Keyline



Total number of lines in spectrum 38  
 Number of unidentified lines 15  
 Number of lines tentatively identified by NID 23 60.53%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
BI-210	22.26Y	1.00	4.041E+01	4.053E+01	27.46E+01	677.59	
PB-210	22.26Y	1.00	4.041E+01	4.053E+01	27.46E+01	677.59	
BI-211	7.04E+08Y	1.00	2.595E+00	2.595E+00	12.14E+00	467.92	
RA-226	1600.00Y	1.00	5.065E+00	5.065E+00	3.465E+00	68.42	
TH-228	1.91Y	1.04	1.813E+00	1.877E+00	4.454E+00	237.24	
TH-230	7.70E+04Y	1.00	5.065E+00	5.065E+00	3.465E+00	68.42	
TH-232	1.41E+10Y	1.00	1.813E+00	1.813E+00	4.302E+00	237.24	
NP-237	2.14E+06Y	1.00	5.213E+00	5.213E+00	11.73E+00	224.98	
U-238	4.47E+09Y	1.00	8.980E+01	8.980E+01	9.191E+01	102.35	
Total Activity :			1.922E+02	1.925E+02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-224	1.91Y	1.04	2.047E+01	2.120E+01	5.028E+01	237.20	
Total Activity :			2.047E+01	2.120E+01			

Grand Total Activity : 2.127E+02 2.137E+02

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
9	5.01	3201	1638	1.35	9.81	6	12	8.89E-02	7.8	0.00E+00	
0	10.51	66	4003	1.01	20.79	18	7	1.82E-03	****	5.98E-15	
0	14.40	185	3325	1.55	28.56	26	7	5.13E-03	****	1.39E-09	
2	66.41	166	578	1.60	132.45	121	16	4.60E-03	51.9	1.43E+00	T
0	140.04	211	540	1.04	279.54	275	10	5.86E-03	49.8	2.78E+00	T
0	176.54	236	658	2.73	352.47	346	14	6.56E-03	47.9	2.59E+00	T
0	185.99	34	461	1.26	371.34	367	10	9.35E-04	****	2.53E+00	T
0	198.61	109	528	1.42	396.55	391	12	3.02E-03	****	2.45E+00	T
0	204.90	44	391	0.66	409.12	407	9	1.22E-03	****	2.42E+00	T
0	265.86	25	264	0.72	530.92	528	8	6.94E-04	****	2.09E+00	T
0	326.20	46	259	1.32	651.46	646	10	1.29E-03	****	1.85E+00	
0	472.06	36	245	6.09	942.92	936	16	1.00E-03	****	1.46E+00	T
0	484.78	38	224	4.85	968.34	959	15	1.06E-03	****	1.43E+00	T
0	489.33	36	132	1.51	977.42	974	9	1.01E-03	****	1.42E+00	T
0	569.31	16	208	3.26	1137.26	1128	15	4.54E-04	****	1.28E+00	T
0	584.22	17	158	1.15	1167.05	1160	11	4.85E-04	****	1.26E+00	T
0	596.03	49	134	1.66	1190.65	1188	8	1.37E-03	85.3	1.24E+00	
0	645.94	15	117	1.22	1290.39	1283	11	4.26E-04	****	1.17E+00	T
0	651.43	94	157	7.08	1301.38	1293	20	2.62E-03	67.9	1.16E+00	T
0	819.74	40	55	2.32	1637.76	1633	10	1.11E-03	77.4	9.77E-01	T
0	869.24	83	125	4.36	1736.70	1726	20	2.31E-03	69.5	9.33E-01	T
0	922.01	15	52	0.49	1842.18	1836	9	4.13E-04	****	8.90E-01	
0	1227.06	22	93	5.83	2452.03	2436	19	6.12E-04	****	7.05E-01	
0	1287.80	41	81	7.73	2573.47	2562	23	1.14E-03	****	6.78E-01	
0	1498.87	18	38	1.51	2995.54	2990	11	5.09E-04	****	6.06E-01	
1	1696.61	28	35	2.16	3391.00	3373	38	7.83E-04	93.7	5.59E-01	
1	1699.11	18	37	2.16	3396.00	3373	38	5.12E-04	****	5.59E-01	
0	1745.33	23	57	7.21	3488.45	3477	18	6.33E-04	****	5.51E-01	
0	1800.14	13	25	1.55	3598.08	3589	14	3.67E-04	****	5.42E-01	
0	1873.57	17	44	6.51	3744.96	3732	17	4.86E-04	****	5.32E-01	
0	1960.59	38	16	4.63	3919.04	3912	14	1.05E-03	57.0	5.23E-01	

Flags: "T" = Tentatively associated

```

*****
*                                     GENERAL ENG. LABS, LLC.                               *
*                                     2040 Savage Road                                   *
*                                     Charleston, SC 29414                             *
*****
*                                     DETECTOR DATA                                   *
*
* Configuration      : DKA0:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068237.CNF;1          *
* Acquisition date   : 26-APR-2006 05:28:03   Detector SN#      :                   *
* Detector ID        : GAM19                   Sensitivity       : 3.00000           *
* Geometry           : 2LMB                    Energy tolerance: 2.00000           *
* Elapsed live time  : 0 10:00:00.00           Abundance limit  : 75.00000           *
* Elapsed real time  : 0 10:00:06.59           Half life ratio  : 8.00000           *
*****
*                                     SAMPLE DATA                                   *
*
* Sample date        : 22-MAR-2006 10:20:00   Nuclide Library   : EPI               *
* Sample ID          : G1201068237           Analyst initials  : MJH1              *
* Batch Number       : 519510                Sample Quantity  : 2.00000E+00 LITER      *
*****
*                                     QC DATA                                       *
*
* CALIB. DATE/TIME  : 17-FEB-2006 16:09:06.3MS Isotope         :                   *
* MSD DPM           :                        MSD Isotope        :                   *
* LCS DPM           :                        LCS Isotope         :                   *
*****

```

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
BI-210	4.053E+01	2.746E+02	1.833E+02	1.637E+01	0.221
PB-210	4.053E+01	2.746E+02	1.833E+02	1.637E+01	0.221
BI-211	2.595E+00	1.214E+01	6.879E+00	4.923E-01	0.377
RA-224	2.120E+01	5.028E+01	2.244E+01	1.695E+00	0.945
RA-226	5.065E+00	3.465E+00	2.297E+00	1.850E-01	2.205
TH-228	1.877E+00	4.454E+00	2.067E+00	1.817E-01	0.908
TH-230	5.065E+00	3.465E+00	2.297E+00	1.849E-01	2.205
TH-232	1.813E+00	4.302E+00	1.997E+00	1.755E-01	0.908
NP-237	5.213E+00	1.173E+01	8.155E+00	1.847E+00	0.639
U-238	8.980E+01	9.191E+01	5.175E+01	9.784E+00	1.735

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/LITER) Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
BE-7	-4.062E+00	2.635E+01	1.424E+01	1.003E+00	-0.285
NA-22	3.565E-01	1.283E+00	1.257E+00	7.711E-02	0.284

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
NA-24	2.522E+10		4.424E+10	Half-Life too short		
AL-26	3.295E-01		1.392E+00	1.362E+00	7.763E-02	0.242
K-40	5.311E+00		2.121E+01	1.748E+01	1.109E+00	0.304
SC-46	-2.367E-01		1.408E+00	1.355E+00	1.081E-01	-0.175
V-48	-7.506E+00		5.317E+00	4.562E+00	3.507E-01	-1.645
CR-51	1.087E+01		2.587E+01	2.241E+01	1.692E+00	0.485
MN-54	7.352E-01		1.178E+00	1.197E+00	8.987E-02	0.614
CO-56	-6.100E-01		1.519E+00	1.444E+00	1.099E-01	-0.423
MN-56	-1.000E+35		1.245E+35	Half-Life too short		
CO-57	3.795E-01		1.098E+00	1.052E+00	7.650E-02	0.361
CO-58	-2.751E-01		1.678E+00	1.551E+00	1.137E-01	-0.177
FE-59	3.084E-01		3.734E+00	3.624E+00	2.830E-01	0.085
CO-60	2.445E-01		1.320E+00	1.280E+00	7.608E-02	0.191
ZN-65	-5.357E-02		2.529E+00	2.432E+00	1.665E-01	-0.022
SE-75	9.199E-01	+	2.105E+00	1.800E+00	1.350E-01	0.511
KR-85	-5.741E+02		3.887E+02	3.512E+02	2.170E+01	-1.635
SR-85	-3.626E+00		2.455E+00	2.218E+00	1.371E-01	-1.635
Y-88	6.325E-01		1.635E+00	1.651E+00	9.355E-02	0.383
Y-91	-2.381E-01		1.581E+00	1.491E+00	9.235E-02	-0.160
NB-94	2.155E-01		1.234E+00	1.174E+00	7.526E-02	0.184
NB-95	3.961E-01		2.134E+00	2.029E+00	1.407E-01	0.195
NB-95M	4.607E-04		1.775E-03	Half-Life too short		
ZR-95	-1.915E+00		2.901E+00	2.587E+00	2.050E-01	-0.740
MO-99	2.331E-02	+	5.870E-03	Half-Life too short		
TC-99M	1.000E+35	+	4.088E+34	Half-Life too short		
RU-103	-2.050E-01		2.099E+00	1.997E+00	2.560E-01	-0.103
RH-106	4.494E+00		1.181E+01	1.144E+01	7.032E-01	0.393
RU-106	8.205E+00		1.173E+01	1.154E+01	1.374E+00	0.711
AG-108M	5.042E-02		1.184E+00	1.141E+00	7.452E-02	0.044
CD-109	-1.062E+02		3.843E+01	2.740E+01	2.575E+00	-3.875
AG-110M	-1.258E-01		1.361E+00	1.100E+00	7.090E-02	-0.114
SN-113	8.867E-01		1.761E+00	1.740E+00	1.098E-01	0.510
CD-115	1.733E-03		8.999E-02	Half-Life too short		
SN-115	4.332E+01		1.554E+02	1.539E+02	1.219E+01	0.282
SN-117M	3.664E+00		5.962E+00	5.721E+00	4.285E-01	0.640
TE-123M	2.223E-01		1.265E+00	1.198E+00	9.050E-02	0.186
SB-124	1.737E-01		3.786E+00	3.580E+00	2.277E-01	0.049
SB-125	1.094E+00		3.333E+00	3.259E+00	2.044E-01	0.336
TE-125M	-3.751E+02		4.910E+02	4.540E+02	4.380E+01	-0.826
I-126	1.496E+00		1.681E+01	1.597E+01	9.771E-01	0.094
SB-126	9.136E+00		1.452E+01	1.422E+01	9.321E-01	0.643
SN-126	-3.627E+00		3.383E+00	2.688E+00	2.520E-01	-1.349
SB-127	1.991E-04		7.807E-04	Half-Life too short		
I-131	-1.353E+01		2.344E+01	2.208E+01	1.612E+00	-0.613
I-132	-1.000E+35		3.509E+35	Half-Life too short		
TE-132	-9.308E-04		9.091E-04	Half-Life too short		
BA-133	5.742E-01		1.749E+00	1.503E+00	1.794E-01	0.382
I-133	3.961E+05		8.009E+05	Half-Life too short		

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
CS-134	6.035E-01		1.325E+00	1.282E+00	9.280E-02	0.471
CS-135	6.010E-01		6.359E+00	5.447E+00	4.880E-01	0.110
I-135	1.134E+31		4.081E+32	Half-Life	too short	
CS-136	-7.805E-01		8.986E+00	8.625E+00	6.709E-01	-0.090
BA-137M	-1.269E-01		1.199E+00	1.093E+00	6.649E-02	-0.116
CS-137	-1.383E-01		1.268E+00	1.155E+00	7.053E-02	-0.120
CE-139	-2.849E-01		1.299E+00	1.211E+00	9.202E-02	-0.235
BA-140	-1.850E+00		2.535E+01	2.406E+01	7.841E+00	-0.077
LA-140	-1.681E+00		9.371E+00	8.681E+00	5.173E-01	-0.194
CE-141	1.271E+00		4.976E+00	3.799E+00	2.856E-01	0.334
CE-143	-8.497E+01		5.554E+01	Half-Life	too short	
CE-144	1.431E+00		8.854E+00	8.125E+00	1.207E+00	0.176
PM-144	3.574E-02		1.291E+00	1.219E+00	7.777E-02	0.029
PR-144	1.000E+35		1.807E+36	Half-Life	too short	
PM-146	4.571E-01		1.597E+00	1.555E+00	1.372E-01	0.294
ND-147	3.783E+01		6.585E+01	6.476E+01	8.871E+00	0.584
PM-147	-9.980E+05		2.223E+06	2.075E+06	1.510E+05	-0.481
PM-149	-1.390E+00		8.497E-01	Half-Life	too short	
EU-152	-4.415E+00		4.885E+00	3.440E+00	2.524E-01	-1.284
GD-153	-1.165E+01		4.553E+00	3.094E+00	2.598E-01	-3.764
EU-154	1.011E+00		3.551E+00	3.480E+00	3.322E-01	0.290
EU-155	4.074E+00		4.443E+00	4.335E+00	3.464E-01	0.940
TB-160	4.123E+00		5.717E+00	5.720E+00	4.515E-01	0.721
TM-171	2.844E+03	+	1.503E+03	1.251E+03	1.235E+02	2.274
HF-181	4.640E-01		2.369E+00	1.995E+00	1.226E-01	0.233
TA-182	2.574E+00		6.697E+00	5.766E+00	3.606E-01	0.446
IR-192	-1.115E+00		1.553E+00	1.465E+00	1.034E-01	-0.762
HG-203	1.490E+00		1.974E+00	1.980E+00	1.515E-01	0.753
BI-207	1.038E+00		1.584E+00	1.604E+00	1.157E-01	0.647
TL-208	6.402E-01	+	2.488E+00	1.450E+00	1.018E-01	0.442
PB-211	8.929E+00		3.257E+01	3.138E+01	1.956E+01	0.285
BI-212	2.307E-01		9.514E+00	8.961E+00	7.473E-01	0.026
PB-212	1.877E+00	+	4.454E+00	2.518E+00	2.213E-01	0.746
BI-214	5.065E+00	+	3.465E+00	2.571E+00	2.071E-01	1.970
PB-214	9.028E-01	+	4.225E+00	2.651E+00	2.346E-01	0.341
RN-219	6.767E+00		1.464E+01	1.441E+01	1.970E+00	0.470
RA-223	-5.475E-02		2.826E+01	2.389E+01	4.050E+00	-0.002
AC-227	-1.179E+01		1.431E+01	1.349E+01	2.011E+00	-0.874
TH-227	-1.158E+01		1.410E+01	1.326E+01	2.328E+00	-0.874
AC-228	8.134E-01	+	1.036E+01	4.830E+00	5.208E-01	0.168
RA-228	8.134E-01	+	1.036E+01	4.830E+00	5.208E-01	0.168
TH-229	6.179E+00		2.320E+01	1.918E+01	1.458E+00	0.322
PA-231	-5.266E+01		5.658E+01	5.276E+01	7.646E+00	-0.998
TH-231	9.197E-01		7.290E+00	6.256E+00	5.404E-01	0.147
PA-233	2.136E+00		2.360E+00	2.376E+00	1.753E-01	0.899
PA-234	9.417E-01		9.561E+00	9.353E+00	1.724E+00	0.101
PA-234M	-2.302E+02		2.175E+02	1.429E+02	1.297E+01	-1.611
TH-234	8.980E+01	+	9.191E+01	6.098E+01	1.153E+01	1.473

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
U-234	3.646E-01		6.490E+00	5.106E+00	4.883E-01	0.071
U-235	-4.325E+00		1.107E+01	8.209E+00	1.388E+00	-0.527
NP-239	-7.653E+00		7.948E+00	7.284E+00	5.389E-01	-1.051
AM-241	-2.304E+00		8.448E+00	6.218E+00	7.307E-01	-0.370
AM-242	2.172E+01		8.958E+01	8.587E+01	6.841E+00	0.253
CM-247	1.107E+00		1.297E+00	1.300E+00	7.753E-02	0.851
CF-249	-8.488E-01		1.374E+00	1.286E+00	7.711E-02	-0.660
CF-251	1.933E+01	+	9.376E+00	5.512E+00	4.188E-01	3.506
ANH-511	-6.215E+00		2.644E+00	2.071E+00	1.279E-01	-3.000

VAX/VMS Nuclide Identification Report Generated 26-APR-2006 06:24:34.65

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068238.CNF;1
Sample date        : 25-APR-2006 00:00:00 Acquisition date : 26-APR-2006 05:24:01
Sample ID          : G1201068238 Sample quantity      : 2.00000E+00 LITER
Detector name      : GAMMA6 Detector geometry        : 2L_MB
Elapsed live time  : 0 01:00:00.00 Elapsed real time: 0 01:00:01.09 0.0%
Energy tolerance  : 2.00000 KEV Analyst Initials    : MJH1
Abundance limit   : 75.00000 Sensitivity          : 3.00000
Batch ID          : 519510 Detector SN#         : 1922827
Matrix Spike DPM  : LCS DPM                          :
*****

```

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	59.54	924	675	1.09	120.28	115	11	2.57E-01	6.4	
2	0	66.80*	55	433	1.79	134.77	132	8	1.54E-02	66.5	
3	0	88.15*	1706	637	1.06	177.38	171	11	4.74E-01	3.7	
4	0	102.91	42	199	0.85	206.83	205	6	1.18E-02	54.6	
5	0	122.26	744	339	1.08	245.45	241	9	2.07E-01	5.8	
6	2	137.05	125	208	1.11	274.98	269	13	3.46E-02	21.2	3.92E+00
7	2	138.57	39	168	1.08	278.00	269	13	1.08E-02	59.2	
8	0	166.11	372	277	1.02	332.97	329	9	1.03E-01	9.6	
9	0	185.58*	27	215	1.37	371.82	367	9	7.39E-03	103.3	
10	0	198.42*	18	167	0.73	397.46	394	7	5.06E-03	124.6	
11	0	203.10*	36	136	1.60	406.80	405	7	9.93E-03	57.0	
12	0	294.96*	9	86	1.30	590.14	588	6	2.45E-03	175.6	
13	0	331.52	20	51	0.50	663.12	660	5	5.51E-03	58.5	
14	0	371.57	56	78	1.60	743.05	739	9	1.54E-02	31.8	
15	0	375.25	20	81	1.52	750.40	747	8	5.61E-03	80.0	
16	0	391.78*	231	159	1.19	783.40	777	13	6.43E-02	13.1	
17	1	469.59	27	76	1.55	938.72	931	21	7.54E-03	63.1	1.86E+00
18	1	473.38*	27	93	1.55	946.28	931	21	7.48E-03	62.8	
19	0	485.15*	10	65	0.59	969.78	964	8	2.84E-03	143.7	
20	0	511.14*	15	84	3.31	1021.66	1017	11	4.27E-03	133.0	
21	0	527.89	22	26	1.35	1055.09	1052	6	6.04E-03	43.3	
22	0	661.87	997	73	1.41	1322.59	1316	15	2.77E-01	3.7	
23	3	675.33	30	14	1.49	1349.46	1347	11	8.35E-03	26.2	1.83E+00
24	3	677.98	18	16	1.42	1354.74	1347	11	5.01E-03	41.7	
25	0	884.81	23	78	6.82	1767.73	1763	16	6.51E-03	85.9	
26	0	898.17	248	111	1.47	1794.41	1786	16	6.88E-02	11.5	
27	0	922.24	20	32	0.92	1842.48	1839	7	5.66E-03	50.8	
28	0	1053.34	25	33	2.13	2104.30	2100	11	6.96E-03	49.9	
29	0	1115.81	21	20	1.22	2229.06	2226	7	5.72E-03	45.3	
30	0	1159.36*	56	65	16.43	2316.05	2294	37	1.55E-02	48.2	
31	0	1173.41	1031	43	1.95	2344.11	2338	17	2.86E-01	3.5	
32	0	1239.28*	20	7	0.73	2475.67	2470	13	5.42E-03	36.4	
33	0	1299.97	18	7	4.82	2596.92	2590	14	5.00E-03	39.1	
34	0	1332.60*	903	48	1.71	2662.10	2653	19	2.51E-01	3.8	
35	0	1404.40*	11	27	14.79	2805.53	2782	36	3.00E-03	155.7	
36	0	1414.87	7	7	0.90	2826.44	2823	13	1.92E-03	85.5	
37	0	1426.57	9	18	1.04	2849.82	2846	23	2.43E-03	128.5	
38	0	1461.47*	3	0	3.33	2919.53	2916	9	8.80E-04	136.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
39	0	1538.95	9	6	3.46	3074.33	3071	10	2.61E-03	55.8	
40	0	1559.91	4	13	3.31	3116.21	3113	17	1.07E-03	219.0	
41	0	1836.62*	144	21	2.23	3669.14	3659	22	4.01E-02	11.8	

Flag: "\*" = Peak area was modified by background subtraction



VAX/VMS Nuclide Identification Report Generated

```

*****
*                               General Eng. Labs, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
*                               DETECTOR DATA                                       *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068238
* Acquisition date   : 26-APR-2006 05:24:01 Detector SN#      : 1922827
* Detector ID        : GAMMA6                      Sensitivity    : 3.000
* Geometry           : 2L_MB                       Energy tolerance: 2.000
* Elapsed live time  : 0 01:00:00.00              Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.09              Half life ratio  : 8.000
*****
*                               SAMPLE DATA                                         *
*
* Sample date        : 25-APR-2006 00:00:00 Nuclide Library  : FERMC
* Sample ID          : G1201068238                 Analyst initials  : MJH1
* Batch Number       : 519510                      Sample Quantity  : 2.0000E+00 LITER
* Recovery           : 1.00000                     Carrier Weight   : 0.00000
*****
*                               QC DATA                                             *
*
* Standard Weight    : 0.00000
* CALIB. DATE/TIME   : 29-DEC-2005 05:08:19 MS Isotope      : TOPLOADER
* MSD DPM            : 5.440                       MSD Isotope      : TOPLOADER
* LCS DPM            : 0.000                       LCS Isotope      : TOPLOADER
* LCSD DPM           : 0.000                       LCSD Isotope     : TOPLOADER
*****

```

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER )	Act error	MDA (pCi/LITER )	
K-40	2.276E+01	6.209E+01	1.148E+02	0.000E+00
CO-57	1.388E+02	1.611E+01	1.300E+01	0.000E+00
CO-60	6.458E+02	4.912E+01	1.569E+01	0.000E+00
ZN-65	2.514E+01	2.277E+01	4.058E+01	0.000E+00
Y-88	1.279E+02	3.016E+01	1.335E+01	0.000E+00
MO-99	1.025E+01	1.214E+01	1.707E+01	0.000E+00
TC-99M	2.186E+02	2.589E+02	3.640E+02	0.000E+00
CD-109	8.784E+03	6.579E+02	4.261E+02	0.000E+00
SN-113	1.003E+02	2.619E+01	1.738E+01	0.000E+00
SN-126	8.981E+02	6.727E+01	4.385E+01	0.000E+00
I-133	2.328E+01	2.014E+01	4.042E+01	0.000E+00
BA-137M	4.456E+02	3.286E+01	1.377E+01	0.000E+00
CS-137	4.710E+02	3.474E+01	1.456E+01	0.000E+00
CE-139	7.849E+01	1.507E+01	1.335E+01	0.000E+00
NP-237	2.637E+03	1.975E+02	1.308E+02	0.000E+00
AM-241	1.332E+03	1.705E+02	1.169E+02	0.000E+00
ANH-511	5.126E+00	1.364E+01	1.370E+01	0.000E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER )	K.L. Act error ) Ided	MDA (pCi/LITER )	
BE-7	-3.471E+01	8.309E+01	1.272E+02	0.000E+00 NOT IDENT.
NA-22	5.170E+00	6.742E+00	1.469E+01	0.000E+00 NOT IDENT.
NA-24	-1.840E+01	2.193E+01	3.549E+01	0.000E+00 NOT IDENT.
AL-26	-2.933E+00	5.963E+00	1.045E+01	0.000E+00 FAIL ABUN
SC-46	2.328E+00	1.272E+01	1.991E+01	0.000E+00 NOT IDENT.
V-48	-5.362E+00	1.081E+01	1.796E+01	0.000E+00 NOT IDENT.
CR-51	1.802E+01	7.275E+01	1.269E+02	0.000E+00 NOT IDENT.
MN-54	-4.854E+00	1.004E+01	1.689E+01	0.000E+00 NOT IDENT.
CO-56	-6.226E+00	1.034E+01	1.716E+01	0.000E+00 FAIL ABUN
MN-56	0.000E+00	3.189E+04	0.000E+00	0.000E+00 SHORT HLIF

CO-58	-5.073E+00	9.538E+00	1.603E+01	0.000E+00	NOT IDENT.
FE-59	6.860E+00	2.158E+01	3.869E+01	0.000E+00	NOT IDENT.
SE-75	1.168E+01	1.203E+01	2.183E+01	0.000E+00	FAIL ABUN
KR-85	1.677E+03	1.963E+03	3.402E+03	0.000E+00	NOT IDENT.
SR-85	7.429E+00	8.695E+00	1.507E+01	0.000E+00	NOT IDENT.
Y-91	3.841E+00	8.266E+00	1.543E+01	0.000E+00	NOT IDENT.
NB-94	-1.325E+00	8.479E+00	1.494E+01	0.000E+00	NOT IDENT.
NB-95	-3.221E+00	9.685E+00	1.665E+01	0.000E+00	NOT IDENT.
NB-95M	-3.522E+01	3.632E+01	5.924E+01	0.000E+00	NOT IDENT.
ZR-95	7.775E+00	1.711E+01	3.156E+01	0.000E+00	NOT IDENT.
RU-103	2.444E+00	8.378E+00	1.551E+01	0.000E+00	NOT IDENT.
RH-106	1.159E+01	7.269E+01	1.338E+02	0.000E+00	FAIL ABUN
RU-106	-1.247E+01	7.325E+01	1.306E+02	0.000E+00	NOT IDENT.
AG-108M	-6.696E-01	9.555E+00	1.606E+01	0.000E+00	NOT IDENT.
AG-110M	1.287E+00	8.854E+00	1.435E+01	0.000E+00	FAIL ABUN
CD-115	3.756E+01	3.249E+01	6.351E+01	0.000E+00	FAIL ABUN
SN-115	-2.380E+01	8.743E+02	1.522E+03	0.000E+00	FAIL ABUN
SN-117M	3.700E+00	7.121E+00	1.283E+01	0.000E+00	NOT IDENT.
TE-123M	3.152E+00	7.018E+00	1.259E+01	0.000E+00	NOT IDENT.
SB-124	-1.553E+00	1.186E+01	2.331E+01	0.000E+00	NOT IDENT.
SB-125	-1.295E+00	2.554E+01	4.312E+01	0.000E+00	NOT IDENT.
TE-125M	1.776E+02	2.379E+03	4.231E+03	0.000E+00	NOT IDENT.
I-126	-1.476E+01	2.427E+01	3.523E+01	0.000E+00	NOT IDENT.
SB-126	9.719E+00	1.584E+01	3.011E+01	0.000E+00	NOT IDENT.
SB-127	8.285E+00	2.806E+01	5.175E+01	0.000E+00	FAIL ABUN
I-131	2.661E+00	1.004E+01	1.745E+01	0.000E+00	NOT IDENT.
I-132	0.000E+00	7.708E+04	0.000E+00	0.000E+00	SHORT HLIF
TE-132	-5.670E+00	1.067E+01	1.789E+01	0.000E+00	NOT IDENT.
BA-133	-4.950E+00	1.204E+01	1.989E+01	0.000E+00	NOT IDENT.
CS-134	-2.886E+00	1.084E+01	1.874E+01	0.000E+00	NOT IDENT.
CS-135	-3.550E+01	4.372E+01	7.137E+01	0.000E+00	NOT IDENT.
I-135	6.145E+01	5.032E+02	1.011E+03	0.000E+00	NOT IDENT.
CS-136	5.657E-01	1.517E+01	2.656E+01	0.000E+00	FAIL ABUN
BA-140	-7.234E+00	3.119E+01	5.543E+01	0.000E+00	NOT IDENT.
LA-140	2.789E+00	9.529E+00	1.896E+01	0.000E+00	FAIL ABUN
CE-141	-4.868E+00	1.257E+01	2.171E+01	0.000E+00	NOT IDENT.
CE-143	9.136E+00	3.209E+01	5.256E+01	0.000E+00	FAIL ABUN
CE-144	-1.747E+01	6.141E+01	9.579E+01	0.000E+00	NOT IDENT.
PM-144	-6.150E+00	8.554E+00	1.428E+01	0.000E+00	NOT IDENT.
PR-144	0.000E+00	1.391E+41	0.000E+00	0.000E+00	SHORT HLIF
PM-146	-6.358E+00	1.211E+01	1.952E+01	0.000E+00	NOT IDENT.
ND-147	-4.335E+00	6.180E+01	1.111E+02	0.000E+00	NOT IDENT.
PM-147	0.000E+00	3.437E+07	5.405E+07	0.000E+00	FAIL ABUN
PM-149	1.515E+02	3.088E+02	5.501E+02	0.000E+00	NOT IDENT.
EU-152	-2.409E+01	2.681E+01	4.267E+01	0.000E+00	FAIL ABUN
GD-153	1.422E+01	2.216E+01	4.053E+01	0.000E+00	FAIL ABUN
EU-154	1.439E+01	1.894E+01	4.123E+01	0.000E+00	FAIL ABUN
EU-155	-1.218E+01	3.611E+01	5.674E+01	0.000E+00	FAIL ABUN
TB-160	1.399E+01	3.538E+01	6.475E+01	0.000E+00	FAIL ABUN
TM-171	1.213E+04	1.612E+04	1.856E+04	0.000E+00	FAIL ABUN
HF-181	-5.942E+00	1.037E+01	1.560E+01	0.000E+00	FAIL ABUN
TA-182	6.087E+00	2.754E+01	5.454E+01	0.000E+00	FAIL ABUN
IR-192	-1.083E+00	8.754E+00	1.485E+01	0.000E+00	FAIL ABUN
HG-203	3.915E+00	9.118E+00	1.610E+01	0.000E+00	NOT IDENT.
BI-207	-1.236E+01	1.476E+01	2.331E+01	0.000E+00	FAIL ABUN
TL-208	8.574E+00	9.469E+00	1.821E+01	0.000E+00	FAIL ABUN
BI-210	-9.189E+02	2.365E+03	3.516E+03	0.000E+00	NOT IDENT.
PB-210	-9.189E+02	2.365E+03	3.516E+03	0.000E+00	NOT IDENT.
BI-211	-3.950E+01	5.784E+01	9.358E+01	0.000E+00	NOT IDENT.
PB-211	1.329E+02	2.557E+02	4.524E+02	0.000E+00	NOT IDENT.
BI-212	6.821E+01	7.660E+01	1.465E+02	0.000E+00	NOT IDENT.
PB-212	1.572E+01	1.678E+01	3.023E+01	0.000E+00	FAIL ABUN
BI-214	2.661E+00	1.803E+01	3.268E+01	0.000E+00	FAIL ABUN
PB-214	1.793E+01	1.878E+01	3.437E+01	0.000E+00	FAIL ABUN
RN-219	1.933E-01	1.153E+02	1.957E+02	0.000E+00	NOT IDENT.
RA-223	1.595E+01	1.813E+02	3.123E+02	0.000E+00	FAIL ABUN
RA-224	-6.663E+01	1.894E+02	3.195E+02	0.000E+00	NOT IDENT.
RA-226	2.661E+00	1.803E+01	3.268E+01	0.000E+00	FAIL ABUN
AC-227	4.873E+01	1.080E+02	1.914E+02	0.000E+00	FAIL ABUN
TH-227	4.803E+01	1.064E+02	1.886E+02	0.000E+00	FAIL ABUN
AC-228	5.008E+01	3.883E+01	7.587E+01	0.000E+00	NOT IDENT.
RA-228	5.008E+01	3.883E+01	7.587E+01	0.000E+00	NOT IDENT.
TH-228	1.553E+01	1.677E+01	3.019E+01	0.000E+00	NOT IDENT.
TH-229	4.272E+01	1.385E+02	2.449E+02	0.000E+00	FAIL ABUN
TH-230	2.661E+00	1.803E+01	3.268E+01	0.000E+00	FAIL ABUN
PA-231	-4.122E+02	4.260E+02	6.847E+02	0.000E+00	FAIL ABUN
TH-231	-2.792E+01	5.018E+01	8.333E+01	0.000E+00	FAIL ABUN
TH-232	1.544E+01	1.675E+01	3.014E+01	0.000E+00	NOT IDENT.

PA-233	5.779E+00	1.730E+01	3.044E+01	0.000E+00	FAIL	ABUN
PA-234	6.687E+01	9.922E+01	1.826E+02	0.000E+00	FAIL	ABUN
PA-234M	-4.836E+02	1.386E+03	2.330E+03	0.000E+00	NOT	IDENT.
TH-234	8.569E+01	5.275E+02	8.016E+02	0.000E+00	NOT	IDENT.
U-234	1.066E+01	3.746E+01	6.189E+01	0.000E+00	FAIL	ABUN
U-235	4.096E+01	5.517E+01	1.006E+02	0.000E+00	FAIL	ABUN
U-238	8.569E+01	5.275E+02	8.016E+02	0.000E+00	NOT	IDENT.
NP-239	-4.913E+01	5.912E+01	1.009E+02	0.000E+00	NOT	IDENT.
AM-242	7.073E+02	7.722E+02	1.176E+03	0.000E+00	FAIL	ABUN
CM-247	-6.406E+00	1.042E+01	1.679E+01	0.000E+00	NOT	IDENT.
CF-249	3.763E+00	1.268E+01	1.976E+01	0.000E+00	FAIL	ABUN
CF-251	-1.287E+01	3.468E+01	5.946E+01	0.000E+00	NOT	IDENT.

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068238.CNF;1
Sample date        : 25-APR-2006 00:00:00 Acquisition date : 26-APR-2006 05:24:01
Sample ID          : G1201068238 Sample quantity   : 2.00000E+00 LITER
Detector name     : GAMMA6 Detector geometry: 2L_MB
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:01.09 0.0%
Energy tolerance  : 2.00000 KEV Analyst Initials  : MJH1
Abundance limit   : 75.00000 Sensitivity       : 3.00000
Batch ID          : 519510 Detector SN#      : 1922827
Matrix Spike DPM  : LCS DPM                      :
*****

```

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	59.54	924	675	1.09	120.28	115	11	2.57E-01	6.4	
2	0	66.80	59	433	1.79	134.77	132	8	1.63E-02	62.4	
3	0	88.15	1710	637	1.06	177.38	171	11	4.75E-01	3.7	
4	0	102.91	42	199	0.85	206.83	205	6	1.18E-02	54.6	
5	0	122.26	744	339	1.08	245.45	241	9	2.07E-01	5.8	
6	2	137.05	125	208	1.11	274.98	269	13	3.46E-02	21.2	3.92E+00
7	2	138.57	39	168	1.08	278.00	269	13	1.08E-02	59.2	
8	0	166.11	372	277	1.02	332.97	329	9	1.03E-01	9.6	
9	0	185.58	46	215	1.37	371.82	367	9	1.28E-02	59.0	
10	0	198.42	34	167	0.73	397.46	394	7	9.33E-03	66.4	
11	0	203.10	38	136	1.60	406.80	405	7	1.06E-02	53.1	
12	0	294.96	18	86	1.30	590.14	588	6	5.06E-03	83.6	
13	0	331.52	20	51	0.50	663.12	660	5	5.51E-03	58.5	
14	0	371.57	56	78	1.60	743.05	739	9	1.54E-02	31.8	
15	0	375.25	20	81	1.52	750.40	747	8	5.61E-03	80.0	
16	0	391.78	234	159	1.19	783.40	777	13	6.49E-02	12.9	
17	1	469.59	27	76	1.55	938.72	931	21	7.54E-03	63.1	1.86E+00
18	1	473.38	28	93	1.55	946.28	931	21	7.86E-03	59.6	
19	0	485.15	13	65	0.59	969.78	964	8	3.55E-03	113.5	
20	0	511.14	90	84	3.31	1021.66	1017	11	2.51E-02	22.1	
21	0	527.89	22	26	1.35	1055.09	1052	6	6.04E-03	43.3	
22	0	661.87	997	73	1.41	1322.59	1316	15	2.77E-01	3.7	
23	3	675.33	30	14	1.49	1349.46	1347	11	8.35E-03	26.2	1.83E+00
24	3	677.98	18	16	1.42	1354.74	1347	11	5.01E-03	41.7	
25	0	884.81	23	78	6.82	1767.73	1763	16	6.51E-03	85.9	
26	0	898.17	248	111	1.47	1794.41	1786	16	6.88E-02	11.5	
27	0	922.24	20	32	0.92	1842.48	1839	7	5.66E-03	50.8	
28	0	1053.34	25	33	2.13	2104.30	2100	11	6.96E-03	49.9	
29	0	1115.81	21	20	1.22	2229.06	2226	7	5.72E-03	45.3	
30	0	1159.36	57	65	16.43	2316.05	2294	37	1.59E-02	46.9	
31	0	1173.41	1031	43	1.95	2344.11	2338	17	2.86E-01	3.5	
32	0	1239.28	22	7	0.73	2475.67	2470	13	5.97E-03	32.6	
33	0	1299.97	18	7	4.82	2596.92	2590	14	5.00E-03	39.1	
34	0	1332.60	904	48	1.71	2662.10	2653	19	2.51E-01	3.8	
35	0	1404.40	12	27	14.79	2805.53	2782	36	3.32E-03	140.5	
36	0	1414.87	7	7	0.90	2826.44	2823	13	1.92E-03	85.5	
37	0	1426.57	9	18	1.04	2849.82	2846	23	2.43E-03	128.5	
38	0	1461.47	17	0	3.33	2919.53	2916	9	4.72E-03	24.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
39	0	1538.95	9	6	3.46	3074.33	3071	10	2.61E-03	55.8	
40	0	1559.91	4	13	3.31	3116.21	3113	17	1.07E-03	219.0	
41	0	1836.62	146	21	2.23	3669.14	3659	22	4.06E-02	11.6	

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068238.CNF;1
Sample date        : 25-APR-2006 00:00:00 Acquisition date : 26-APR-2006 05:24:01
Sample ID          : G1201068238           Sample quantity  : 2.00000E+00 LITER
Detector name     : GAMMA6                 Detector geometry: 2L_MB
Elapsed live time : 0 01:00:00.00          Elapsed real time: 0 01:00:01.09  0.0%
Energy tolerance  : 2.00000 KEV           Analyst Initials  : MJH1
Abundance limit   : 75.00000              Sensitivity       : 3.00000
Batch ID          : 519510                 Detector SN#      : 1922827
Matrix Spike DPM  :                        LCS DPM         :
*****

```

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
K-40	1460.81	3	10.67*	4.897E-01	2.276E+01	2.276E+01	272.82
CO-57	122.06	744	85.51*	2.359E+00	1.384E+02	1.388E+02	11.61
	136.47	125	10.47	2.353E+00	1.899E+02	1.905E+02	42.44
CO-60	1173.24	1031	99.90	5.825E-01	6.649E+02	6.652E+02	6.92
	1332.50	903	99.98*	5.250E-01	6.455E+02	6.458E+02	7.61
ZN-65	1115.55	21	50.75*	6.078E-01	2.505E+01	2.514E+01	90.59
Y-88	898.02	248	93.40	7.308E-01	1.362E+02	1.373E+02	22.95
	1836.01	144	99.38*	4.292E-01	1.269E+02	1.279E+02	23.58
MO-99	140.51	39	82.70*	2.350E+00	7.489E+00	1.025E+01	118.46
	181.06	-----	6.20	2.147E+00	-----	Line Not Found	-----
	739.58	-----	12.80	8.564E-01	-----	Line Not Found	-----
TC-99M	140.51	39	89.07*	2.350E+00	6.953E+00	2.186E+02	118.46
CD-109	88.03	1706	3.79*	1.927E+00	8.768E+03	8.784E+03	7.49
SN-113	391.69	231	64.90*	1.345E+00	9.951E+01	1.003E+02	26.12
SN-126	64.28	-----	9.60	9.606E-01	-----	Line Not Found	-----
	86.94	1706	8.90	1.927E+00	3.734E+03	3.734E+03	7.49
	87.57	1706	37.00*	1.927E+00	8.981E+02	8.981E+02	7.49
I-133	529.87	22	86.30*	1.101E+00	8.596E+00	2.328E+01	86.51
	875.33	-----	4.47	7.467E-01	-----	Line Not Found	-----
	1298.22	18	2.33	5.355E-01	5.415E+02	1.467E+03	78.17
BA-137M	661.65	997	89.98*	9.334E-01	4.455E+02	4.456E+02	7.38
CS-137	661.66	997	85.12*	9.334E-01	4.710E+02	4.710E+02	7.38
CE-139	165.85	372	80.35*	2.230E+00	7.800E+01	7.849E+01	19.20
PM-147	121.30	744	0.00*	2.359E+00	2.958E+08	2.960E+08	11.61
NP-237	86.48	1706	12.60*	1.927E+00	2.637E+03	2.637E+03	7.49
	95.87	-----	2.60	2.109E+00	-----	Line Not Found	-----
AM-241	59.54	924	35.90*	7.253E-01	1.332E+03	1.332E+03	12.80
ANH-511	511.00	15	100.00*	1.126E+00	5.126E+00	5.126E+00	266.05

Flag: "\*" = Keyline

Total number of lines in spectrum 41  
 Number of unidentified lines 11  
 Number of lines tentatively identified by NID 30 73.17%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.276E+01	2.276E+01	6.209E+01	272.82	
CO-57	270.90D	1.00	1.384E+02	1.388E+02	0.161E+02	11.61	
CO-60	5.27Y	1.00	6.455E+02	6.458E+02	0.491E+02	7.61	
ZN-65	244.40D	1.00	2.505E+01	2.514E+01	2.277E+01	90.59	
Y-88	106.60D	1.01	1.269E+02	1.279E+02	0.302E+02	23.58	
MO-99	66.02H	1.37	7.489E+00	1.025E+01	1.214E+01	118.46	
TC-99M	6.01H	31.4	6.953E+00	2.186E+02	2.589E+02	118.46	
CD-109	464.00D	1.00	8.768E+03	8.784E+03	0.658E+03	7.49	
SN-113	115.10D	1.01	9.951E+01	1.003E+02	0.262E+02	26.12	
SN-126	1.00E+05Y	1.00	8.981E+02	8.981E+02	0.673E+02	7.49	
I-133	20.80H	2.71	8.596E+00	2.328E+01	2.014E+01	86.51	
BA-137M	30.17Y	1.00	4.455E+02	4.456E+02	0.329E+02	7.38	
CS-137	30.17Y	1.00	4.710E+02	4.710E+02	0.347E+02	7.38	
CE-139	137.66D	1.01	7.800E+01	7.849E+01	1.507E+01	19.20	
PM-147	2.62Y	1.00	2.958E+08	2.960E+08	0.344E+08	11.61	
NP-237	2.14E+06Y	1.00	2.637E+03	2.637E+03	0.198E+03	7.49	
AM-241	432.20Y	1.00	1.332E+03	1.332E+03	0.171E+03	12.80	
ANH-511	1.00E+09Y	1.00	5.126E+00	5.126E+00	13.64E+00	266.05	
Total Activity :			2.958E+08	2.961E+08			

Grand Total Activity : 2.958E+08 2.961E+08

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	66.80	55	433	1.79	134.77	132	8	1.54E-02	****	1.09E+00	T
0	102.91	42	199	0.85	206.83	205	6	1.18E-02	****	2.22E+00	T
0	185.58	27	215	1.37	371.82	367	9	7.39E-03	****	2.12E+00	T
0	198.42	18	167	0.73	397.46	394	7	5.06E-03	****	2.05E+00	T
0	203.10	36	136	1.60	406.80	405	7	9.93E-03	****	2.02E+00	
0	294.96	9	86	1.30	590.14	588	6	2.45E-03	****	1.62E+00	T
0	331.52	20	51	0.50	663.12	660	5	5.51E-03	****	1.50E+00	T
0	371.57	56	78	1.60	743.05	739	9	1.54E-02	63.6	1.39E+00	T
0	375.25	20	81	1.52	750.40	747	8	5.61E-03	****	1.38E+00	
1	469.59	27	76	1.55	938.72	931	21	7.54E-03	****	1.19E+00	T
1	473.38	27	93	1.55	946.28	931	21	7.48E-03	****	1.19E+00	T
0	485.15	10	65	0.59	969.78	964	8	2.84E-03	****	1.17E+00	T
3	675.33	30	14	1.49	1349.46	1347	11	8.35E-03	52.5	9.19E-01	
3	677.98	18	16	1.42	1354.74	1347	11	5.01E-03	83.5	9.16E-01	T
0	884.81	23	78	6.82	1767.73	1763	16	6.51E-03	****	7.40E-01	T
0	922.24	20	32	0.92	1842.48	1839	7	5.66E-03	****	7.15E-01	
0	1053.34	25	33	2.13	2104.30	2100	11	6.96E-03	99.8	6.38E-01	
0	1159.36	56	65	16.43	2316.05	2294	37	1.55E-02	96.4	5.88E-01	
0	1239.28	20	7	0.73	2475.67	2470	13	5.42E-03	72.8	5.57E-01	
0	1404.40	11	27	14.79	2805.53	2782	36	3.00E-03	****	5.04E-01	T
0	1414.87	7	7	0.90	2826.44	2823	13	1.92E-03	****	5.01E-01	
0	1426.57	9	18	1.04	2849.82	2846	23	2.43E-03	****	4.98E-01	
0	1538.95	9	6	3.46	3074.33	3071	10	2.61E-03	****	4.72E-01	
0	1559.91	4	13	3.31	3116.21	3113	17	1.07E-03	****	4.68E-01	

Flags: "T" = Tentatively associated



```

*****
*                                     GENERAL ENG. LABS, LLC.                               *
*                                     2040 Savage Road                                   *
*                                     Charleston, SC 29414                             *
*****
*                                     DETECTOR DATA                                   *
*
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1201068238.CNF;1
* Acquisition date   : 26-APR-2006 05:24:01  Detector SN#      : 1922827
* Detector ID        : GAMMA6                  Sensitivity       : 3.00000
* Geometry           : 2L_MB                   Energy tolerance: 2.00000
* Elapsed live time  : 0 01:00:00.00          Abundance limit  : 75.00000
* Elapsed real time  : 0 01:00:01.09          Half life ratio  : 8.00000
*****
*                                     SAMPLE DATA                                   *
*
* Sample date        : 25-APR-2006 00:00:00  Nuclide Library   : EPI
* Sample ID          : G1201068238          Analyst initials   : MJH1
* Batch Number       : 519510              Sample Quantity   : 2.00000E+00 LITER
*****
*                                     QC DATA                                       *
*
* CALIB. DATE/TIME  : 29-DEC-2005 05:08:19.2MS Isotope         : TOPLOADER
* MSD DPM           :                      MSD Isotope         :
* LCS DPM           :                      LCS Isotope         :
*****

```

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
K-40	2.276E+01	6.209E+01	1.148E+02	0.000E+00	0.198
CO-57	1.388E+02	1.611E+01	1.300E+01	0.000E+00	10.678
CO-60	6.458E+02	4.912E+01	1.569E+01	0.000E+00	41.149
ZN-65	2.514E+01	2.277E+01	4.058E+01	0.000E+00	0.619
Y-88	1.279E+02	3.016E+01	1.335E+01	0.000E+00	9.583
MO-99	1.025E+01	1.214E+01	1.707E+01	0.000E+00	0.600
TC-99M	2.186E+02	2.589E+02	3.640E+02	0.000E+00	0.600
CD-109	8.784E+03	6.579E+02	4.261E+02	0.000E+00	20.614
SN-113	1.003E+02	2.619E+01	1.738E+01	0.000E+00	5.767
SN-126	8.981E+02	6.727E+01	4.385E+01	0.000E+00	20.484
I-133	2.328E+01	2.014E+01	4.042E+01	0.000E+00	0.576
BA-137M	4.456E+02	3.286E+01	1.377E+01	0.000E+00	32.348
CS-137	4.710E+02	3.474E+01	1.456E+01	0.000E+00	32.348
CE-139	7.849E+01	1.507E+01	1.335E+01	0.000E+00	5.879
NP-237	2.637E+03	1.975E+02	1.308E+02	0.000E+00	20.165
AM-241	1.332E+03	1.705E+02	1.169E+02	0.000E+00	11.395
ANH-511	5.126E+00	1.364E+01	1.370E+01	0.000E+00	0.374

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity K.L. (pCi/LITER) Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
BE-7	-3.471E+01	8.309E+01	1.272E+02	0.000E+00	-0.273

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
NA-22	5.170E+00		6.742E+00	1.469E+01	0.000E+00	0.352
NA-24	-1.840E+01		2.193E+01	3.549E+01	0.000E+00	-0.518
AL-26	-2.933E+00		5.963E+00	1.045E+01	0.000E+00	-0.281
SC-46	2.328E+00		1.272E+01	1.991E+01	0.000E+00	0.117
V-48	-5.362E+00		1.081E+01	1.796E+01	0.000E+00	-0.298
CR-51	1.802E+01		7.275E+01	1.269E+02	0.000E+00	0.142
MN-54	-4.854E+00		1.004E+01	1.689E+01	0.000E+00	-0.287
CO-56	-6.226E+00		1.034E+01	1.716E+01	0.000E+00	-0.363
CO-58	-5.073E+00		9.538E+00	1.603E+01	0.000E+00	-0.316
FE-59	6.860E+00		2.158E+01	3.869E+01	0.000E+00	0.177
SE-75	1.168E+01		1.203E+01	2.183E+01	0.000E+00	0.535
KR-85	1.677E+03		1.963E+03	3.402E+03	0.000E+00	0.493
SR-85	7.429E+00		8.695E+00	1.507E+01	0.000E+00	0.493
Y-91	3.841E+00		8.266E+00	1.543E+01	0.000E+00	0.249
NB-94	-1.325E+00		8.479E+00	1.494E+01	0.000E+00	-0.089
NB-95	-3.221E+00		9.685E+00	1.665E+01	0.000E+00	-0.193
NB-95M	-3.522E+01		3.632E+01	5.924E+01	0.000E+00	-0.594
ZR-95	7.775E+00		1.711E+01	3.156E+01	0.000E+00	0.246
RU-103	2.444E+00		8.378E+00	1.551E+01	0.000E+00	0.158
RH-106	1.159E+01		7.269E+01	1.338E+02	0.000E+00	0.087
RU-106	-1.247E+01		7.325E+01	1.306E+02	0.000E+00	-0.095
AG-108M	-6.696E-01		9.555E+00	1.606E+01	0.000E+00	-0.042
AG-110M	1.287E+00		8.854E+00	1.435E+01	0.000E+00	0.090
CD-115	3.756E+01	+	3.249E+01	6.351E+01	0.000E+00	0.591
SN-115	-2.380E+01		8.743E+02	1.522E+03	0.000E+00	-0.016
SN-117M	3.700E+00		7.121E+00	1.283E+01	0.000E+00	0.288
TE-123M	3.152E+00		7.018E+00	1.259E+01	0.000E+00	0.250
SB-124	-1.553E+00		1.186E+01	2.331E+01	0.000E+00	-0.067
SB-125	-1.295E+00		2.554E+01	4.312E+01	0.000E+00	-0.030
TE-125M	1.776E+02		2.379E+03	4.231E+03	0.000E+00	0.042
I-126	-1.476E+01		2.427E+01	3.523E+01	0.000E+00	-0.419
SB-126	9.719E+00		1.584E+01	3.011E+01	0.000E+00	0.323
SB-127	8.285E+00		2.806E+01	5.175E+01	0.000E+00	0.160
I-131	2.661E+00		1.004E+01	1.745E+01	0.000E+00	0.153
TE-132	-5.670E+00		1.067E+01	1.789E+01	0.000E+00	-0.317
BA-133	-4.950E+00		1.204E+01	1.989E+01	0.000E+00	-0.249
CS-134	-2.886E+00		1.084E+01	1.874E+01	0.000E+00	-0.154
CS-135	-3.550E+01		4.372E+01	7.137E+01	0.000E+00	-0.497
I-135	6.145E+01		5.032E+02	1.011E+03	0.000E+00	0.061
CS-136	5.657E-01		1.517E+01	2.656E+01	0.000E+00	0.021
BA-140	-7.234E+00		3.119E+01	5.543E+01	0.000E+00	-0.131
LA-140	2.789E+00		9.529E+00	1.896E+01	0.000E+00	0.147
CE-141	-4.868E+00		1.257E+01	2.171E+01	0.000E+00	-0.224
CE-143	9.136E+00	+	3.209E+01	5.256E+01	0.000E+00	0.174
CE-144	-1.747E+01		6.141E+01	9.579E+01	0.000E+00	-0.182
PM-144	-6.150E+00		8.554E+00	1.428E+01	0.000E+00	-0.431
PM-146	-6.358E+00		1.211E+01	1.952E+01	0.000E+00	-0.326
ND-147	-4.335E+00		6.180E+01	1.111E+02	0.000E+00	-0.039

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Ided	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
PM-147	2.960E+08		3.437E+07	5.405E+07	0.000E+00	5.477
PM-149	1.515E+02		3.088E+02	5.501E+02	0.000E+00	0.275
EU-152	-2.409E+01		2.681E+01	4.267E+01	0.000E+00	-0.565
GD-153	1.422E+01		2.216E+01	4.053E+01	0.000E+00	0.351
EU-154	1.439E+01		1.894E+01	4.123E+01	0.000E+00	0.349
EU-155	-1.218E+01		3.611E+01	5.674E+01	0.000E+00	-0.215
TB-160	1.399E+01		3.538E+01	6.475E+01	0.000E+00	0.216
TM-171	1.213E+04	+	1.612E+04	1.856E+04	0.000E+00	0.654
HF-181	-5.942E+00		1.037E+01	1.560E+01	0.000E+00	-0.381
TA-182	6.087E+00		2.754E+01	5.454E+01	0.000E+00	0.112
IR-192	-1.083E+00		8.754E+00	1.485E+01	0.000E+00	-0.073
HG-203	3.915E+00		9.118E+00	1.610E+01	0.000E+00	0.243
BI-207	-1.236E+01		1.476E+01	2.331E+01	0.000E+00	-0.530
TL-208	8.574E+00		9.469E+00	1.821E+01	0.000E+00	0.471
BI-210	-9.189E+02		2.365E+03	3.516E+03	0.000E+00	-0.261
PB-210	-9.189E+02		2.365E+03	3.516E+03	0.000E+00	-0.261
BI-211	-3.950E+01		5.784E+01	9.358E+01	0.000E+00	-0.422
PB-211	1.329E+02		2.557E+02	4.524E+02	0.000E+00	0.294
BI-212	6.821E+01		7.660E+01	1.465E+02	0.000E+00	0.466
PB-212	1.572E+01		1.678E+01	3.023E+01	0.000E+00	0.520
BI-214	2.661E+00		1.803E+01	3.268E+01	0.000E+00	0.081
PB-214	1.793E+01		1.878E+01	3.437E+01	0.000E+00	0.522
RN-219	1.933E-01		1.153E+02	1.957E+02	0.000E+00	0.001
RA-223	1.595E+01		1.813E+02	3.123E+02	0.000E+00	0.051
RA-224	-6.663E+01		1.894E+02	3.195E+02	0.000E+00	-0.209
RA-226	2.661E+00		1.803E+01	3.268E+01	0.000E+00	0.081
AC-227	4.873E+01		1.080E+02	1.914E+02	0.000E+00	0.255
TH-227	4.803E+01		1.064E+02	1.886E+02	0.000E+00	0.255
AC-228	5.008E+01		3.883E+01	7.587E+01	0.000E+00	0.660
RA-228	5.008E+01		3.883E+01	7.587E+01	0.000E+00	0.660
TH-228	1.553E+01		1.677E+01	3.019E+01	0.000E+00	0.514
TH-229	4.272E+01		1.385E+02	2.449E+02	0.000E+00	0.174
TH-230	2.661E+00		1.803E+01	3.268E+01	0.000E+00	0.081
PA-231	-4.122E+02		4.260E+02	6.847E+02	0.000E+00	-0.602
TH-231	-2.792E+01		5.018E+01	8.333E+01	0.000E+00	-0.335
TH-232	1.544E+01		1.675E+01	3.014E+01	0.000E+00	0.512
PA-233	5.779E+00		1.730E+01	3.044E+01	0.000E+00	0.190
PA-234	6.687E+01		9.922E+01	1.826E+02	0.000E+00	0.366
PA-234M	-4.836E+02		1.386E+03	2.330E+03	0.000E+00	-0.208
TH-234	8.569E+01		5.275E+02	8.016E+02	0.000E+00	0.107
U-234	1.066E+01	+	3.746E+01	6.189E+01	0.000E+00	0.172
U-235	4.096E+01		5.517E+01	1.006E+02	0.000E+00	0.407
U-238	8.569E+01		5.275E+02	8.016E+02	0.000E+00	0.107
NP-239	-4.913E+01		5.912E+01	1.009E+02	0.000E+00	-0.487
AM-242	7.073E+02	+	7.722E+02	1.176E+03	0.000E+00	0.601
CM-247	-6.406E+00		1.042E+01	1.679E+01	0.000E+00	-0.382
CF-249	3.763E+00		1.268E+01	1.976E+01	0.000E+00	0.190
CF-251	-1.287E+01		3.468E+01	5.946E+01	0.000E+00	-0.216

```

*****
*
*                               General Engineering Labs, LLC
*                               2040 SAVAGE ROAD
*                               CHARLESTON ,SC 29417
*                               GROSS GAMMA REPORT
*
*****
*
*   BATCH ID      : 519510                SAMPLE ID   : G1201068238
*   ANALYST       : MJH1                  DETECTOR    : GAMMA6
*   SAMPLE DATE   : 25-APR-2006 00:00:00.00  COUNT TIME  : 0 01:00:00.00
*   ANALYSIS DATE: 26-APR-2006 05:24:01.34  SAMPLE ALQT: 2.000 LITER
*
*****

```

```

GROSS GAMMA ACTIVITY (pCi/LITER ) : 3.193E+03
GROSS GAMMA ERROR   (pCi/LITER ) : 7.462E+02
GROSS GAMMA MDA     (pCi/LITER ) : 1.536E+03
GROSS GAMMA DLC     (pCi/LITER ) : 7.439E+02

```

Radiochemistry Batch Checklist, Rev 4

Batch# 515983 Product: Ra-228 Date: 4/26/06

Criteria:	Yes	No	Comments
Sample Solids are less than 100 mg for GAB.	NA		
If activity less 10* MDA, error is 150% or less of sample activity. If greater 10* MDA, error is 40% or less. If below the MDA, error is okay.	✓		
Instrument source check is within limits. Instrument bkg check is within limits.	✓		
Method RDL has been met.	✓		
If duplicate activities are less 5* MDA, then rpd is 100% or less. If greater 5* MDA, then rpd 20% or less. If below the MDA, the rpd is 0%. Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.	✓		
Method blank is less than the RDL. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time. Special requirements page checked	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.	NA		
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms. All lineouts initialed and dated. No transcription errors are apparent.	✓		
QC data entered into QC database. Batch entered into Case Narrative.	✓		
Batch non-conformances completed If applicable.	NA		

General Engineering Laboratories

2/22/2005  
Primary Review Performed By: J. Paron 4/26/06

Secondary Review Performed By: NO 4/26/06

4/20-4/27

03/29/2006

# Radium-228 Que Sheet

Batch #: 515983      Analyst: KSDI      Minimum Due Date: 04/20/2006 <sup>Jan</sup> <sub>1st</sub> <sup>14</sup>      Ac-228 Ingrow: 2200      4/24/06  
 Spike Isotope: Radium-228      Spike Code: ~~D503-B~~      Expiration Date: 4/1/06      Vol: 0.7      0.12  
 LCS Isotope: Radium-228      LCS Code: ~~D503-B~~      Expiration Date: 4/1/06      Vol: 0.1      0.12  
 Tracer Isotope: Barium-133      Tracer Code: 0112-H      Expiration Date: 1/18/07      Vol: 0.1      0.12  
 Prep Date: 4/20/06      Initials: KSD      Pipet ID: 276653      Balance ID: S1204863      Witness: MSP      4/20/06

Ac-228 Separation Date/Time: 112Y 4/26/06

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collect Date & Time	Bkr #	Vol (mL)	Det #	Ba Yield (%)	Gamma Det. #
158783003	2603210153	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	20-MAR-06 03:00 PM	1	600	1A	90.67	98-1
158783004	2603210155	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	20-MAR-06 02:00 PM	2	600	1B	91.83	98-2
158783005	2603210156	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	20-MAR-06 12:00 PM	3	600	1C	90.70	98-3
158971001	2603220347 M-103	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	21-MAR-06 02:00 PM	4	600	1D	90.76	98-4
158971002	2603220348 TR-7	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	21-MAR-06 12:00 PM	5	600	2A	101.86	98-5
158971003	2603220357 TR-9	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	21-MAR-06 09:00 AM	6	600	2B	77.34	91-6
158971004	2603220360 TR-10	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	21-MAR-06 10:20 AM	7	600	2C	86.39	91-7
159242001	2603240118 H-11	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	23-MAR-06 03:20 PM	8	600	2D	81.53	91-8
159242002	2603240122 M-117	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	23-MAR-06 02:50 PM	9	600	3A	83.35	91-9
159242003	2603240135 M-121	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	23-MAR-06 08:30 AM	10	600	3B	73.57	91-10
159243001	2603230197 M-118	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	22-MAR-06 02:30 PM	11	600	3C	87.91	94-11
159244001	2603250005 EB-3	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	24-MAR-06 12:00 PM	12	600	4A	84.17	94-12
159247001	2603230069 M-120	SAMPLE		2 pCi/L	GROUND WATI	MWHL002	22-MAR-06 10:20 AM	13	600	4B	83.70	94-13
1201060416	MB for batch 515983	MB		2 pCi/L	GROUND WATI	QC ACCOUNT		14	600	4C	89.32	94-14
1201060417	2603240135 M-121(159242003)DUIDUP			2 pCi/L	GROUND WATI	QC ACCOUNT		15	600	4D	88.86	94-15
1201060418	2603240135 M-121(159242003)MSMS			2 pCi/L	GROUND WATI	QC ACCOUNT	23-MAR-06 08:30 AM	16	400	3D	85.43	93-16
1201060419	LCS for batch 515983	LCS		2 pCi/L	GROUND WATI	QC ACCOUNT	23-MAR-06 08:30 AM	17	600	3E	88.79	93-17

Comments: \_\_\_\_\_  
 Data Reviewed By: SPM 4/26/06

Instrument Used: (Circle One) LB4100 S/N: 8219      PIC S/N: 10751-4

# Radium-228 Water

Filename : RA228.XLS  
 File type : Excel  
 Version # : 1

Spike S/N : 0503-B  
 Spike Exp Date : 9/9/2006  
 Spike Activity (dpm/ml): 268.22  
 Spike Volume Added: 0.2

Pipet, 0.1 ml Stdev : +/- 0.000701 ml  
 Pipet, 0.5 ml Stdev : +/- 0.002564 ml  
 Pipet, 1 ml Stdev : +/- 0.005480 ml

LCS S/N : 0503-B  
 LCS Exp Date : 9/9/2006  
 LCS Activity (dpm/ml): 268.22  
 LCS Volume Added: 0.2

Procedure Code : GFC28FIAL  
 Parmname : Radium-228

Required MDA: 2 pCi/L  
 Half-life of Ra-228: 5.75 years  
 Half-life of Ac-228: 6.13 hours  
 Batch counted on: PIC  
 BKG Count time: 500 min

Tracer S/N : 0112-H  
 Tracer Exp Date : 1/18/2007  
 Tracer Volume Added: 0.2

Batch : 515983  
 Analyst : KSD1  
 Prep Date : 4/20/2006  
 Ra-228 Abundance : 1

Calibration Date : 4/22/2005  
 Calibration Due Date : 4/30/2006

Sample Characteristics				Tracer Calculations				
Sample ID	Sample Aliquot L	Sample Aliquot StDev.	Sample Date/Time	Tracer Concentration (Ba-133 Ref.)	Tracer Ref. Count Uncertainty	Tracer Concentration (Ba-133 Samp.)	Tracer Aliquot (mL)	Tracer Aliquot StDev.
158783003	0.600	2.0573E-05	3/20/2006 15:00	391.9	2.40%	710.7	0.2	0.000701
158783004	0.600	2.0573E-05	3/20/2006 14:00	391.9	2.40%	719.8	0.2	0.000701
158783005	0.600	2.0573E-05	3/20/2006 12:00	391.9	2.40%	710.9	0.2	0.000701
158971001	0.600	2.0573E-05	3/21/2006 14:00	391.9	2.40%	734.9	0.2	0.000701
158971002	0.600	2.0573E-05	3/21/2006 12:00	391.9	2.40%	798.4	0.2	0.000701
158971003	0.600	2.0573E-05	3/21/2006 9:00	391.9	2.40%	606.2	0.2	0.000701
158971004	0.600	2.0573E-05	3/21/2006 10:20	391.9	2.40%	677.1	0.2	0.000701
159242001	0.600	2.0573E-05	3/23/2006 15:20	391.9	2.40%	639.0	0.2	0.000701
159242002	0.600	2.0573E-05	3/23/2006 14:50	391.9	2.40%	653.3	0.2	0.000701
159242003	0.600	2.0573E-05	3/23/2006 8:30	391.9	2.40%	576.8	0.2	0.000701
159243001	0.600	2.0573E-05	3/22/2006 14:30	391.9	2.40%	689.0	0.2	0.000701
159244001	0.600	2.0573E-05	3/24/2006 12:00	391.9	2.40%	659.7	0.2	0.000701
159247001	0.600	2.0573E-05	3/22/2006 10:20	391.9	2.40%	657.6	0.2	0.000701
1201060416	0.600	2.0573E-05	4/20/2006 0:00	391.9	2.40%	700.1	0.2	0.000701
1201060417	0.600	2.0573E-05	3/23/2006 8:30	391.9	2.40%	696.5	0.2	0.000701
1201060418	0.400	1.9669E-05	3/23/2006 8:30	391.9	2.40%	669.6	0.2	0.000701
1201060419	0.600	2.0573E-05	4/20/2006 0:00	391.9	2.40%	695.9	0.2	0.000701

*no 4/26/06*

*SK 4/26/06*

Count raw Data															
Detector ID	Counting Time	Gross Alpha	Gross Beta	Beta cpm	Detector Efficiency	Detector Efficiency Error	Weekly Bkg cpm	Count Time	Separation Date/Time	Count Start Date/Time	Ra-228 Decay	Ac-228 Decay	Ac-228 Count Correction	Sample Recovery %	Sample Recovery Error %
1A	60	14	70	1.167	0.5132	0.00600	0.414	500	4/26/2006 11:24	4/26/2006 13:29	0.988	0.789	1.058	90.67%	1.56%
1B	60	6	37	0.617	0.5082	0.00409	0.308	500	4/26/2006 11:24	4/26/2006 13:29	0.988	0.789	1.058	91.83%	1.56%
1C	60	8	39	0.650	0.5231	0.00344	0.368	500	4/26/2006 11:24	4/26/2006 13:29	0.988	0.789	1.058	90.70%	1.56%
1D	60	6	32	0.593	0.5121	0.00511	0.450	500	4/26/2006 11:24	4/26/2006 13:30	0.988	0.789	1.058	93.76%	1.55%
2A	60	6	31	0.517	0.5097	0.00349	0.376	500	4/26/2006 11:24	4/26/2006 13:30	0.988	0.789	1.058	101.86%	1.53%
2B	60	6	28	0.467	0.5242	0.00383	0.312	500	4/26/2006 11:24	4/26/2006 13:30	0.988	0.788	1.058	77.34%	1.61%
2C	60	4	44	0.733	0.5009	0.00575	0.294	500	4/26/2006 11:24	4/26/2006 13:30	0.988	0.788	1.058	86.39%	1.57%
2D	60	15	46	0.767	0.5067	0.00479	0.388	500	4/26/2006 11:24	4/26/2006 13:30	0.989	0.788	1.058	81.53%	1.59%
3A	60	15	49	0.817	0.4603	0.00943	0.308	500	4/26/2006 11:24	4/26/2006 13:30	0.989	0.788	1.058	83.35%	1.59%
3B	60	12	48	0.800	0.4832	0.00655	0.368	500	4/26/2006 11:24	4/26/2006 13:30	0.989	0.788	1.058	73.59%	1.62%
3C	60	6	47	0.783	0.4861	0.00535	0.436	500	4/26/2006 11:24	4/26/2006 13:30	0.989	0.788	1.058	87.91%	1.57%
4A	60	12	38	0.633	0.5121	0.00744	0.340	500	4/26/2006 11:24	4/26/2006 13:30	0.989	0.788	1.058	84.17%	1.58%
4B	60	9	40	0.667	0.5268	0.00196	0.502	500	4/26/2006 11:24	4/26/2006 13:32	0.988	0.786	1.058	83.90%	1.58%
4C	60	11	34	0.567	0.5052	0.00426	0.422	500	4/26/2006 11:24	4/26/2006 13:29	0.998	0.789	1.058	89.32%	1.57%
4D	60	15	42	0.700	0.5004	0.00816	0.448	500	4/26/2006 11:24	4/26/2006 13:29	0.989	0.789	1.058	88.86%	1.57%
3D	60	43	1181	19.683	0.4940	0.00464	0.420	500	4/26/2006 11:24	4/26/2006 13:44	0.989	0.768	1.058	85.43%	1.58%
3B	60	72	1063	17.717	0.4832	0.00655	0.368	500	4/26/2006 11:24	4/26/2006 14:35	0.998	0.698	1.058	88.79%	1.57%

*Handwritten signature*



Results Decision Level pCi/L	Critical Level pCi/L	MDA pCi/L	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	2 SIGMA Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	FIER	Nominal	Recovery
0.5994	0.4232	0.9451	1.6482	0.1889	0.7527	0.1424	0.6111	0.6135		SAMPLE				
0.5155	0.3640	0.8264	0.6740	0.3385	0.3087	0.1044	0.4467	0.4472		SAMPLE				
0.5543	0.3914	0.8796	0.6058	0.3818	0.2820	0.1076	0.4529	0.4533		SAMPLE				
0.6056	0.4275	0.9508	0.1768	1.1874	0.0833	0.0989	0.4115	0.4115		SAMPLE				
0.5120	0.3614	0.8114	0.2761	0.6881	0.1407	0.0968	0.3722	0.3723		SAMPLE				
0.5973	0.4217	0.9568	0.3888	0.5929	0.1547	0.0917	0.4516	0.4518		SAMPLE				
0.5433	0.3836	0.8734	1.0348	0.2582	0.4393	0.1132	0.5225	0.5236		SAMPLE				
0.6533	0.4613	1.0337	0.9337	0.3079	0.3787	0.1164	0.5626	0.5634		SAMPLE				
0.6269	0.4426	1.0049	1.3507	0.2352	0.5087	0.1193	0.6208	0.6227		SAMPLE				
0.7395	0.5221	1.1733	1.2379	0.2751	0.4320	0.1186	0.6662	0.6675		SAMPLE				
0.6700	0.4730	1.0537	0.8285	0.3402	0.3473	0.1180	0.5517	0.5524		SAMPLE				
0.5862	0.4139	0.9344	0.6933	0.3618	0.2933	0.1060	0.4910	0.4916		SAMPLE				
0.6973	0.4923	1.0890	0.3810	0.6886	0.1647	0.1101	0.4991	0.4993		SAMPLE				
0.6177	0.4361	0.9729	0.3233	0.7013	0.1447	0.1014	0.4443	0.4445		MB				
0.6518	0.4602	1.0236	0.5769	0.4451	0.2520	0.1121	0.5029	0.5033	159242003	DUP	72.8%		60.96	115.5%
1.0251	0.7237	1.6151	71.6257	0.0340	19.2633	0.5735	4.1795	4.7742	159242003	MS			40.27	114.5%
0.6861	0.4844	1.0888	46.1275	0.0357	17.3487	0.5441	2.8353	3.2251		LCS				

26  
4/26/01

SampleID	Instr	Time	Alpha	Beta	Count Start Time	Count End Time
158783003	1A	60	14	70	4/26/2006 13:29	4/26/2006 14:29
158783004	1B	60	6	37	4/26/2006 13:29	4/26/2006 14:29
158783005	1C	60	8	39	4/26/2006 13:29	4/26/2006 14:29
158971001	1D	60	6	32	4/26/2006 13:30	4/26/2006 14:30
158971002	2A	60	6	31	4/26/2006 13:30	4/26/2006 14:30
158971003	2B	60	6	28	4/26/2006 13:30	4/26/2006 14:30
158971004	2C	60	4	44	4/26/2006 13:30	4/26/2006 14:30
159242001	2D	60	15	46	4/26/2006 13:30	4/26/2006 14:30
159242002	3A	60	15	49	4/26/2006 13:30	4/26/2006 14:30
159242003	3B	60	12	48	4/26/2006 13:30	4/26/2006 14:30
159243001	3C	60	6	47	4/26/2006 13:30	4/26/2006 14:30
159244001	4A	60	12	38	4/26/2006 13:30	4/26/2006 14:30
159247001	4B	60	9	40	4/26/2006 13:32	4/26/2006 14:32
1201060416	4C	60	11	34	4/26/2006 13:29	4/26/2006 14:29
1201060417	4D	60	15	42	4/26/2006 13:29	4/26/2006 14:29
1201060418	3D	60	43	1181	4/26/2006 13:44	4/26/2006 14:44
1201060419	3B	60	72	1063	4/26/2006 14:35	4/26/2006 15:35

1/2/2006

1480, RiaCalc WIZ, program 3.6, serial #4800440

ASSAY 25-Apr-06 17:54:18

Protocol id 8 228\_REC  
Time limit 300  
Count limit 50000  
Isotope Ba-133  
Protocol date 27-Apr-05 14:46:49  
Run id. 94

	POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVI
	1	98	98	1	300	2127	391.9	2.4
*	1	98	98	1	300	3720	710.7	1.74 90.67
*	2	98	98	2	300	3766	719.8	1.72 91.83
*	3	98	98	3	300	3721	710.9	1.74 90.70
*	4	98	98	4	300	3841	734.9	1.71 93.76
*	5	98	98	5	300	4158	798.4	1.63 101.86
*	6	91	91	6	300	3198	606.2	1.89 77.34
*	7	91	91	7	300	3552	677.1	1.78 86.39
*	8	91	91	8	300	3362	639	1.84 81.53
*	9	91	91	9	300	3433	653.3	1.82 83.35
*	10	91	91	10	300	3051	576.8	1.94 73.59
*	11	94	94	11	300	3612	689	1.76 87.91
*	12	94	94	12	300	3465	659.7	1.81 84.17
*	13	94	94	13	300	3455	657.6	1.81 83.90
*	14	94	94	14	300	3667	700.1	1.75 89.32
*	15	94	94	15	300	3649	696.5	1.75 88.86
*	16	93	93	16	300	3515	669.6	1.79 85.43
*	17	93	93	17	300	3646	695.9	1.76 88.79

\* Samples were double spiked *traced. & 4/26/06*

END OF ASSAY

END OF COUNTING

*2/6 4/25/07*

Radiochemistry Batch Checklist, Rev 4

Batch# 520607 Product: Pb-210 Date: 4/26/04

Criteria:	Yes	No	Comments
Sample Solids are less than 100 mg for GAB.	NA		
If activity less 10* MDA, error is 150% or less of sample activity. If greater 10* MDA, error is 40% or less. If below the MDA, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL has been met.	✓		
If duplicate activities are less 5* MDA, then rpd is 100% or less. If greater 5* MDA, then rpd 20% or less. If below the MDA, the rpd is 0%.			
Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%.			
Or meets the client's contract acceptance criteria.	✓		
Method blank is less than the RDL. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Special requirements page checked	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.	NA		
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.			
All lineouts initialed and dated.	✓		
No transcription errors are apparent.	✓		
QC data entered into QC database.			
Batch entered into Case Narrative.	✓		
Batch non-conformances completed If applicable.	NA		

General Engineering Laboratories

2/22/2005

Primary Review Performed By:

J. Rosen 4/26/06

Secondary Review Performed By:

NO 4/26/04

4/20-4/27

MWHL Page 131 of 913

# Pb-210 Que Sheet

04/13/06

Batch #: 520607 Analyst: BXF1 Minimum Due Date 04/20/2006  
 Spike Isotope: Pb210 Spike Code: ET 491E Expiration Date: 11-11-06 Vol: 0.1 ml Bi Separation Date/Time: 1830 4/20/06  
 LCS Isotope: Pb210 LCS Code: ET 491E Expiration Date: 11-11-06 Vol: 0.1 ml Std Wt: 13.88  
 Carrier: Pb Carrier Code: 100L4864 Expiration Date: 1-19-08 Analytical Scale #: 38110047  
 Prep Date: 4-19-06 Initials: Bxif Pipet #: 4497063 Balance #: 36040216 Witness: Bx 4/19/06

32 of 91

Sample ID	Client Description	Type	Hazard Code	RDL	Client	Matrix	Collection Date & Time	Bkr#	Aliquot (ml or g)	Det	Initial Pb Weight (g)	Final Pb Weight (g)	Net Pb Weight (mg)
158272001	2603140436 TR-10A	SAMPLE		3 pCi/L	MWHL002	GROUND WAT13-MAR-06			500	1B	.0744	.0841	9.7
158275001	2603140472 PUMP BLANK	SAMPLE		3 pCi/L	MWHL002	GROUND WAT13-MAR-06			500	1C	.0739	.0832	9.3
158276001	2603090347 FB-1	SAMPLE		3 pCi/L	MWHL002	GROUND WAT08-MAR-06			500	1D	.0741	.0837	9.6
158277001	2603100260 EB-1	SAMPLE		3 pCi/L	MWHL002	GROUND WAT09-MAR-06			500	2A	.0748	.0841	9.3
158436001	2603150120 TR-9A	SAMPLE		3 pCi/L	MWHL002	GROUND WAT14-MAR-06			500	2B	.0734	.0816	8.2
158971001	2603220347 M-103	SAMPLE		3 pCi/L	MWHL002	GROUND WAT21-MAR-06			500	2C	.0734	.0823	8.9
158971002	2603220348 TR-7	SAMPLE		3 pCi/L	MWHL002	GROUND WAT21-MAR-06			500	2D	.0745	.0782	3.7
158971003	2603220357 TR-9	SAMPLE		3 pCi/L	MWHL002	GROUND WAT21-MAR-06			500	3A	.0736	.0819	8.3
158971004	2603220360 TR-10	SAMPLE		3 pCi/L	MWHL002	GROUND WAT21-MAR-06			500	3B	.0737	.0815	7.8
159242001	2603240118 H-11	SAMPLE		3 pCi/L	MWHL002	GROUND WAT23-MAR-06			500	3C	.0749	.0813	6.4
159242002	2603240122 M-117	SAMPLE		3 pCi/L	MWHL002	GROUND WAT23-MAR-06			500	7D	.0745	.0817	7.2
159242003	2603240135 M-121	SAMPLE		3 pCi/L	MWHL002	GROUND WAT23-MAR-06			400	4A	.0812	.0909	9.7
159243001	2603230197 M-118	SAMPLE		3 pCi/L	MWHL002	GROUND WAT22-MAR-06			500	4B	.0742	.0810	6.8
159244001	2603250005 EB-3	SAMPLE		3 pCi/L	MWHL002	GROUND WAT24-MAR-06			500	4C	.0793	.0882	8.9
159247001	2603230069 M-120	SAMPLE		3 pCi/L	MWHL002	GROUND WAT22-MAR-06			500	4D	.0769	.0920	15.1
1201070733	MB for batch 520607	MB		3 pCi/L	QC ACCOUNT	GROUND WAT1			500	3A	.0795	.0867	7.2
1201070734	2603240135 M-121(159242003DUP)DUP	DUP		3 pCi/L	QC ACCOUNT	GROUND WAT13-MAR-06			400	3B	.0729	.0823	9.4
1201070735	2603240135 M-121(159242003MS) MS	MS		3 pCi/L	QC ACCOUNT	GROUND WAT23-MAR-06			200	3C	.0777	.0860	9.3
1201070736	LCS for batch 520607	LCS		3 pCi/L	QC ACCOUNT	GROUND WAT1			500	3D	.0772	.0849	7.7
												.0842	7.0

WTR

*Handwritten signature*

Data Reviewed By:

Page 1 of 1

Instrument Used (circle one): LB4100 S/N 8219

PIC SN: 10751-4

NO 4 100 100

# Lead-210 Water

Filename : PB210.XLS  
 File type : Excel  
 Version # : 1

Spike S/N : ET491-E  
 Spike Exp Date : 11/11/2006  
 Spike Activity (dpm/ml) : 405.42  
 Spike Volume Added : 0.1

Pipet, 0.1 ml Stdev : +/-  
 Pipet, 0.5 ml Stdev : +/-  
 Pipet, 1 ml Stdev : +/-

0.000701 ml  
 0.002564 ml  
 0.005480 ml

GFC\_PBL  
 Lead-210  
 3 pCi/L  
 22.26 years  
 5.013 days

Procedure Code :  
 Parname :  
 Required MDA:  
 Half-life of Pb-210 :  
 Half-life of Bi-210 :  
 Batch counted on :  
 BKG Count time :

LCS S/N : ET491-E  
 LCS Exp Date : 11/11/2006  
 LCS Activity (dpm/ml) : 405.42  
 LCS Volume Added : 0.1

Batch : 520607  
 Analyst : BXF1  
 Prep Date : 4/19/2006

Pb-210 Abundance : 1

Carrier S/N : 1006864  
 Carrier Exp Date : 1/19/2008  
 Carrier Volume Added : 1.0  
 Carrier Weight (mg/ml) : 13.88  
 Carrier Weight StDev.: 0.05

Calibration Date : 7/29/2005  
 Calibration Due Date : 7/29/2006

Sample Characteristics				Carrier Calculations			
Sample ID	Sample Aliquot L	Sample Aliquot StDev.	Sample Date/Time	Carrier Weight (Standard)	Net Weight (Sample)	Net Weight StDev.	Carrier Aliquot (mL) Carrier Aliquot StDev.
158272001	0.500	2.0256E-05	3/13/2006 14:35	13.88	9.7	0.049021	1.0 0.005480
158275001	0.500	2.0256E-05	3/13/2006 10:45	13.88	9.3	0.047301	1.0 0.005480
158276001	0.500	2.0256E-05	3/8/2006 15:30	13.88	9.6	0.048591	1.0 0.005480
158277001	0.500	2.0256E-05	3/9/2006 14:00	13.88	9.3	0.047301	1.0 0.005480
158436001	0.500	2.0256E-05	3/14/2006 14:45	13.88	8.2	0.042574	1.0 0.005480
158971001	0.500	2.0256E-05	3/21/2006 14:00	13.88	8.9	0.045582	1.0 0.005480
158971002	0.500	2.0256E-05	3/21/2006 12:00	13.88	3.7	0.023233	1.0 0.005480
158971003	0.500	2.0256E-05	3/21/2006 9:00	13.88	8.3	0.043003	1.0 0.005480
158971004	0.500	2.0256E-05	3/21/2006 10:20	13.88	7.8	0.040854	1.0 0.005480
159242001	0.500	2.0256E-05	3/23/2006 15:20	13.88	6.4	0.034837	1.0 0.005480
159242002	0.500	2.0256E-05	3/23/2006 14:50	13.88	7.2	0.038276	1.0 0.005480
159242003	0.400	1.9669E-05	3/23/2006 8:30	13.88	9.7	0.049021	1.0 0.005480
159243001	0.500	2.0256E-05	3/22/2006 14:30	13.88	6.8	0.036556	1.0 0.005480
159244001	0.500	2.0256E-05	3/24/2006 12:00	13.88	8.9	0.045582	1.0 0.005480
159247001	0.500	2.0256E-05	3/22/2006 10:20	13.88	15.1	0.072230	1.0 0.005480
1201070733	0.500	2.0256E-05	4/19/2006 0:00	13.88	7.2	0.038276	1.0 0.005480
1201070734	0.400	1.9669E-05	3/23/2006 8:30	13.88	9.4	0.047731	1.0 0.005480
1201070735	0.200	1.6007E-05	3/23/2006 8:30	13.88	8.3	0.043003	1.0 0.005480
1201070736	0.500	2.0256E-05	4/19/2006 0:00	13.88	7.0	0.037416	1.0 0.005480

*Handwritten notes:*  
 1201070736  
 1201070735  
 1201070734

Count Raw Data														
Detector ID	Counting Time	Gross Alpha	Gross Beta	Gross Beta CPM	Weekly Bkg		Detector Efficiency	Detector Error	Count Start Date/Time	Bi-210 Separation Date/Time	Bi-210 Ingrowth	Pb-210 Decay	Sample Recovery %	Sample Recovery Error %
					CPM	Count Time								
1B	180	15	314	1.744	0.308	500	0.3392	0.00409	4/25/2006 11:02	4/20/2006 18:30	0.482	0.996	69.88%	0.97%
1C	180	15	75	0.417	0.368	500	0.3465	0.00344	4/25/2006 11:02	4/20/2006 18:30	0.482	0.996	67.00%	0.97%
1D	180	17	88	0.489	0.450	500	0.3439	0.00511	4/25/2006 11:02	4/20/2006 18:30	0.482	0.996	69.16%	0.97%
2A	180	13	88	0.489	0.376	500	0.3482	0.00349	4/25/2006 11:02	4/20/2006 18:30	0.482	0.996	67.00%	0.97%
2B	180	18	63	0.350	0.312	500	0.3583	0.00383	4/25/2006 11:02	4/20/2006 18:30	0.482	0.996	59.08%	0.98%
2C	180	9	75	0.417	0.294	500	0.3487	0.00575	4/25/2006 11:03	4/20/2006 18:30	0.482	0.997	64.12%	0.98%
2D	400	25	182	0.455	0.388	500	0.4007	0.00479	4/25/2006 12:32	4/20/2006 18:30	0.491	0.997	26.66%	1.10%
3A	180	15	86	0.478	0.308	500	0.3447	0.00943	4/25/2006 11:03	4/20/2006 18:30	0.482	0.997	59.80%	0.98%
3B	180	17	86	0.478	0.368	500	0.3527	0.00655	4/25/2006 11:03	4/20/2006 18:30	0.482	0.997	56.20%	0.99%
3C	180	18	75	0.417	0.436	500	0.3665	0.00535	4/25/2006 11:03	4/20/2006 18:30	0.482	0.997	46.11%	1.01%
3D	180	11	83	0.461	0.420	500	0.3619	0.00464	4/25/2006 11:03	4/20/2006 18:30	0.482	0.997	51.87%	1.00%
4A	180	11	81	0.450	0.340	500	0.3421	0.00744	4/25/2006 11:03	4/20/2006 18:30	0.482	0.997	69.88%	0.97%
4B	180	29	78	0.433	0.502	500	0.3720	0.00196	4/25/2006 11:03	4/20/2006 18:30	0.482	0.997	48.99%	1.00%
4C	180	17	58	0.322	0.422	500	0.3507	0.00426	4/25/2006 11:03	4/20/2006 18:30	0.482	0.997	64.12%	0.98%
4D	180	27	70	0.389	0.448	500	0.2944	0.00816	4/25/2006 11:03	4/20/2006 18:30	0.482	0.997	108.79%	0.94%
3A	180	15	60	0.333	0.308	500	0.3543	0.00943	4/25/2006 14:15	4/20/2006 18:30	0.491	0.999	51.87%	1.00%
3B	180	13	82	0.456	0.368	500	0.3391	0.00655	4/25/2006 14:15	4/20/2006 18:30	0.491	0.997	67.72%	0.97%
3C	60	5	217	3.617	0.436	500	0.3501	0.00535	4/25/2006 14:15	4/20/2006 18:30	0.488	0.997	59.80%	0.98%
3D	60	7	201	3.350	0.420	500	0.3637	0.00464	4/25/2006 14:15	4/20/2006 18:30	0.488	0.999	50.43%	1.00%

*Handwritten signature*  
4/26/06

Results		Critical Level	MDA	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	2 SIGMA Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal	Recovery
Decision Level	pCi/L	pCi/L	pCi/L												
1.0796	0.7622	1.6436	11.3779	0.0715	1.4364	0.1015	1.5762	1.5936			SAMPLE				
1.2048	0.8506	1.8227	0.3935	1.1350	0.0487	0.0552	0.8754	0.8754			SAMPLE				
1.3010	0.9185	1.9558	0.3071	1.5463	0.0369	0.0601	0.9307	0.9307			SAMPLE				
1.2125	0.8560	1.8331	0.9089	0.5218	0.1129	0.0589	0.9293	0.9295			SAMPLE				
1.2166	0.8589	1.8512	0.3370	1.3337	0.0360	0.0507	0.8809	0.8809			SAMPLE				
1.1174	0.7889	1.7040	1.0293	0.4394	0.1227	0.0539	0.8861	0.8864			SAMPLE				
1.7667	1.2473	2.6110	1.1534	0.6530	0.0670	0.0437	1.4759	1.4762			SAMPLE				
1.2405	0.8758	1.8885	1.5452	0.3371	0.1698	0.0572	1.0201	1.0210			SAMPLE				
1.4101	0.9955	2.1333	1.0389	0.5305	0.1098	0.0582	1.0801	1.0803			SAMPLE				
1.8001	1.2709	2.7087	-0.2146	2.9199	-0.0193	0.0565	1.2282	1.2282			SAMPLE				
1.5902	1.1227	2.3955	0.4107	1.4187	0.0411	0.0583	1.1421	1.1421			SAMPLE				
1.4043	0.9915	2.1304	1.0787	0.5128	0.1100	0.0564	1.0838	1.0841			SAMPLE				
1.7911	1.2645	2.6638	-0.7068	0.8507	-0.0687	0.0584	1.1783	1.1784			SAMPLE				
1.3306	0.9394	2.0042	-0.8321	0.5145	-0.0998	0.0513	0.8390	0.8391			SAMPLE				
0.9627	0.6797	1.4474	-0.3462	0.9354	-0.0591	0.0553	0.6346	0.6346			SAMPLE				
1.3612	0.9610	2.0722	0.2530	1.9610	0.0253	0.0497	0.9724	0.9724			MB				
1.4917	1.0532	2.2568	0.8766	0.6529	0.0876	0.0572	1.1216	1.1218	159242003		DUP	0.0%		91.52	76.8%
6.2076	4.3826	9.7619	70.2912	0.0785	3.1807	0.2473	10.7112	10.8217	159242003		MS			36.52	80.7%
2.7750	1.9592	4.3723	29.4923	0.0820	2.9300	0.2381	4.6966	4.7397			LCS				

*Day 12/10/15*



SampleID	Instr	Time	Alpha	Beta	Count Start Time	Count End Time
158272001	1B	180	15	314	4/25/2006 11:02	4/25/2006 14:02
158275001	1C	180	15	75	4/25/2006 11:02	4/25/2006 14:02
158276001	1D	180	17	88	4/25/2006 11:02	4/25/2006 14:02
158277001	2A	180	13	88	4/25/2006 11:02	4/25/2006 14:02
158436001	2B	180	18	63	4/25/2006 11:02	4/25/2006 14:02
158971001	2C	180	9	75	4/25/2006 11:03	4/25/2006 14:03
158971002	2D	400	25	182	4/25/2006 12:32	4/25/2006 19:12
158971003	3A	180	15	86	4/25/2006 11:03	4/25/2006 14:03
158971004	3B	180	17	86	4/25/2006 11:03	4/25/2006 14:03
159242001	3C	180	18	75	4/25/2006 11:03	4/25/2006 14:03
159242002	3D	180	11	83	4/25/2006 11:03	4/25/2006 14:03
159242003	4A	180	11	81	4/25/2006 11:03	4/25/2006 14:03
159243001	4B	180	29	78	4/25/2006 11:03	4/25/2006 14:03
159244001	4C	180	17	58	4/25/2006 11:03	4/25/2006 14:03
159247001	4D	180	27	70	4/25/2006 11:03	4/25/2006 14:03
1201070733	3A	180	15	60	4/25/2006 14:15	4/25/2006 17:15
1201070734	3B	180	13	82	4/25/2006 14:15	4/25/2006 17:15
1201070735	3C	60	5	217	4/25/2006 14:15	4/25/2006 15:15
1201070736	3D	60	7	201	4/25/2006 14:15	4/25/2006 15:15

*John*  
*4/26/06*

Radiochemistry Batch Checklist, Rev 4

Batch# 521039 Product: GAB Date: 4/24/06

Criteria:	Yes	No	Comments
Sample Solids are less than 100 mg for GAB.	✓		
If activity less 10* MDA, error is 150% or less of sample activity. If greater 10* MDA, error is 40% or less. If below the MDA, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL has been met.	✓		
If duplicate activities are less 5* MDA, then rpd is 100% or less. If greater 5* MDA, then rpd 20% or less. If below the MDA, the rpd is 0%. Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.	NA		
Method blank is less than the RDL. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Special requirements page checked	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.	NA		
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.		✓	Case narrative
No blank spaces on data forms. All lineouts initialed and dated. No transcription errors are apparent.	✓		
QC data entered into QC database. Batch entered into Case Narrative.	✓		
Batch non-conformances completed If applicable.	NA		

General Engineering Laboratories

2/22/2005

Primary Review Performed By:

J. Roen 4/24/06

Secondary Review Performed By:

no 4/24/06

4/20-4/27

MW H

# Gross Alpha Beta Que Sheet

04/20/2006 14:19:53

Batch #: 521039      Analyst: JXS4      Minimum Due Date: 04/20/2006  
 Alpha Spike Isotope: Th-230      Spike Code: 0159-0      Vol: 0.1      Balance #: 51204863  
 Beta Spike Isotope: Sr-90      Spike Code: 0133-0      Vol: 0.1      Pipet #: 4497063  
 Alpha LCS Isotope: Th-230      LCS Code: 0159-0      Vol: 0.1      Prep Date: 4/20/06  
 Beta LCS Isotope: Sr-90      LCS Code: 0133-0      Vol: 0.1      Initials: JXS4

10% HNO<sub>3</sub>: 358220.4  
 Conc HNO<sub>3</sub>: 512509.4  
 Conc HCl: NA  
 Conc HF: NA  
 Conc Boric: NA  
 Analytical Scale # C31514  
 Witness: MMO H/AD/DK

Sample ID	Client Description	Hazard Type Code	RDL Alpha/Beta	Client	Matrix	Bkr#	Aliquot (ml or g)	Carrier or Det#	Initial Wt (g)	Final Wt (g)	Net Wt (mg)
159247001	2603230069 M-120	SAMPLE	5 pCi/L	MWHL002	GROUND WATE	1	33	41	7.5120	7.5937	81.7
1201071723	MB for batch 521039	MB	5 pCi/L	QC.A.CCOUN	GROUND WATE	2	33	42	7.4645	7.4648	0.3
1201071724	2603230069 M-120(159247001DUP)	DUP	5 pCi/L	QC.A.CCOUN	GROUND WATE	3	33	43	7.4838	7.5652	81.4
1201071725	2603230069 M-120(159247001MS)	MS	5 pCi/L	QC.A.CCOUN	GROUND WATE	4	33	41	7.4452	7.5246	79.4
1201071728	2603230069 M-120(159247001MSD)	MSD	5 pCi/L	QC.A.CCOUN	GROUND WATE	5	33	42	7.4091	7.4872	78.1
1201071726	LCS for batch 521039	LCS	5 pCi/L	QC.A.CCOUN	GROUND WATE	6	33	43	7.4374	7.4374	0

*WAD*

Have the planchets been flamed?  Yes  No

Instrument Used: (Circle One) LAB4100 S/N: 8219      PIC S/N: 10751-4      PRO-AUTO3 S/N: 0329438      Data Reviewed By: JXS4      Page 1 of 1

*no 4/24/06*

### Gross Alpha/Beta Water

Filename : GAB.XLS  
 File type : Excel  
 Version # : 1

Alpha Spike S/N : 0159-O  
 Alpha Spike Exp Date : 6/23/2006  
 Alpha Spike Activity (dpm/ml): 239.44  
 Alpha Spike Volume Added: 0.1

Beta Spike S/N : 0133-Q  
 Beta Spike Exp Date : 12/20/2006  
 Beta Spike Activity (dpm/ml): 350.98  
 Beta Spike Volume Added: 0.1

Pipet, 0.1 ml Stdev : +/- 0.000701 ml  
 Pipet, 0.5 ml Stdev : +/- 0.002564 ml  
 Pipet, 1 ml Stdev : +/- 0.005480 ml

Batch : 521039  
 Analyst : JXS4  
 Prep Date : 4/20/2006

Procedure Code : GFCGANBL  
 Parmname1 : Alpha  
 Parmname2 : Beta  
 Required Alpha MDA: 5 pCi/L  
 Required Beta MDA: 5 pCi/L  
 Batch counted on : LB4100  
 BKG Count time : 500 min

Alpha LCS S/N : 0159-O  
 Alpha LCS Exp Date : 6/23/2006  
 AlphaLCS Activity (dpm/ml): 239.44  
 Alpha LCS Volume Added: 0.1

Calibration Date : 8/18/2005  
 Calibration Due Date : 8/18/2006

Beta LCS S/N : 0133-Q  
 Beta LCS Exp Date : 12/20/2006  
 Beta LCS Activity (dpm/ml): 350.98  
 Beta LCS Volume Added: 0.1

**Sample Characteristics**

Sample ID	Sample Aliquot L	Sample Residue Wt. (mg)	Sample Aliquot StDev.	Sample Date/Time
159247001	0.033	81.7	6.3969E-06	3/22/2006 10:20
1201071723	0.033	0.3	6.3969E-06	4/20/2006 0:00
1201071724	0.033	81.4	6.3969E-06	3/22/2006 10:20
1201071725	0.033	79.4	6.3969E-06	3/22/2006 10:20
1201071728	0.033	78.1	6.3969E-06	3/22/2006 10:20
1201071726	0.033	0.0	6.3969E-06	4/20/2006 0:00

**Count Raw Data**

Detector ID	Counting Time		Gross Counts		Weekly Bkg CPM		Detector Efficiency	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
H1	500	500	359	872	0.094	0.804	0.1527	0.3490
H2	500	417	37	417	0.050	0.736	0.2705	0.3994
H3	500	500	336	897	0.062	0.878	0.1510	0.3723
E1	60	60	206	1805	0.134	1.266	0.1569	0.3771
E2	60	209	209	1839	0.116	1.698	0.1551	0.3847
E3	60	370	370	1785	0.030	1.070	0.2824	0.4094

*Handwritten notes:*  
 2006/12/14/2006  
 JXS4

Detector Alpha	Efficiency Error		X-Talk		Count Start Date/Time
	Alpha	Beta	Alpha	Beta	
0.05164	0.02167	0.04855	0.02173	0.04855	4/20/2006 22:57
0.04319	0.01656	0.02561	0.01391	0.02561	4/20/2006 22:57
0.04392	0.01564	0.03207	0.01746	0.03207	4/20/2006 22:57
0.05186	0.02284	0.00989	0.00778	0.00989	4/21/2006 11:57
0.04520	0.02185	0.00562	0.01629	0.00562	4/21/2006 11:57
0.13900	0.05054	0.00962	0.01569	0.00962	4/21/2006 11:57

*Handwritten signature*  
4/24/06

Alpha Results														
Decision Level pCi/L	Critical Level pCi/L	MDA pCi/L	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	2 SIGMA Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal	Recovery
4.0380	2.8509	6.1854	48.2030	0.0827	0.6240	0.0403	7.0594	9.0389		SAMPLE				
1.6627	1.1739	2.6208	0.1333	0.6576	0.0240	0.0157	1.5575	1.5608		MB				
3.3174	2.3421	5.1736	49.9489	0.0766	0.6100	0.0383	6.7895	8.2847	159247001	DUP	3.6%		326.84	65.2%
13.5497	9.5662	23.0567	261.1828	0.0893	3.2993	0.2398	40.8917	50.2364	159247001	MS			326.84	71.3%
12.7520	9.0030	21.9755	281.2137	0.0848	3.3673	0.2414	41.6484	49.2352	159247001	MSD	7.4%		326.84	71.3%
3.5613	2.5143	7.2085	282.7819	0.1485	6.1367	0.3207	30.3797	86.3318		LCS			326.84	86.5%

*db*  
4/24/06

*Handwritten initials/signature*

Beta Results														
Decision Level pCi/L	Critical Level pCi/L	MDA pCi/L	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	2 SIGMA Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal	Recovery
5.1680	3.6486	7.5089	36.1545	0.0790	0.9400	0.0714	5.4724	5.6908		SAMPLE				
4.3202	3.0501	6.2852	3.3138	0.5720	0.0980	0.0560	3.7532	3.7548		MB				
5.0622	3.5740	7.3464	33.1517	0.0813	0.9160	0.0731	5.2529	5.3528	159247001	DUP	8.7%		958.16	105.0%
17.3244	12.2312	26.0948	1042.0731	0.0336	28.8173	0.7099	50.3598	68.6817	159247001	MS			958.16	103.2%
19.6711	13.8879	29.3763	1025.3933	0.0330	28.9520	0.7171	49.8768	66.5089	159247001	MSD	1.6%		958.16	99.5%
14.6717	10.3583	22.2204	953.0255	0.0562	28.6800	0.7057	46.1160	105.3476		LCS			958.16	

## 521039A

SampleID	Instr	Time	Alpha	Beta	Total Counts	Count Start Time	Count End Time	Voltage
159247001	H1	500	359	872	1444	4/20/2006 22:57	4/21/2006 7:17	1522.5
1201071723	H2	500	37	417	518	4/20/2006 22:57	4/21/2006 7:17	1522.5
1201071724	H3	500	336	897	1357	4/20/2006 22:57	4/21/2006 7:17	1522.5
1201071725	E1	60	206	1805	2260	4/21/2006 11:57	4/21/2006 12:57	1470
1201071728	E2	60	209	1839	2296	4/21/2006 11:57	4/21/2006 12:57	1470
1201071726	E3	60	370	1785	2589	4/21/2006 11:57	4/21/2006 12:57	1470

*dbp  
4/24/06*



Radiochemistry Batch Checklist, Rev 4

Batch# 523680 Product: Tetra Date: 8/26/06

Criteria:	Yes	No	Comments
Sample Solids are less than 100 mg for GAB.	✓		
If activity less 10* MDA, error is 150% or less of sample activity. If greater 10* MDA, error is 40% or less. If below the MDA, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL has been met.	✓		
If duplicate activities are less 5* MDA, then rpd is 100% or less. If greater 5* MDA, then rpd 20% or less. If below the MDA, the rpd is 0%. Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.	✓		
Method blank is less than the RDL. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Special requirements page checked	✓		
Sample was correctly preserved if required.	NA		
Smears Taken for Radioactive batches.	NA		
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.	✓		
All lineouts initialed and dated.	✓		
No transcription errors are apparent.	✓		
QC data entered into QC database.	✓		
Batch entered into Case Narrative.	✓		
Batch non-conformances completed If applicable.	MP		

General Engineering Laboratories

2/22/2005

Primary Review Performed By: SC 4/26/06

Secondary Review Performed By: SC 4/26/06

# Total Uranium Que Sheet

04/24/2006

Batch #: 523680 Analyst: DRS1 Minimum Due Date: 04/20/2006 Comments

Spike Isotope: Natural U Spike Code: 0903 Expiration Date: 3-1-07 Vol: 1.0 Nom Conc: 25.0

LCS Isotope: Natural U LCS Code: 0903 Expiration Date: 3-1-07 Vol: 1.0 Nom Conc: 25.0

Prep Date: 4-24-06 Initials: DRJ Pipet ID: 160845/1829224 (Co.) Witness: CHS 4/24/06

Sample I	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Bktr#	Sample Aliquot (g or mL)	Aliquot for Analysis (mL)
15827001	2603140436 TR-10A	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
158275001	2603140472 PUMP BLANK	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
158276001	2603090347 FB-1	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
158277001	2603100260 EB-1	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
158436001	2603150120 TR-9A	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
158971001	2603220347 M-103	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
158971002	2603220348 TR-7	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
158971003	2603220357 TR-9	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
158971004	2603220360 TR-10	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
159242001	2603240118 H-11	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
159242002	2603240122 M-117	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
159242003	2603240135 M-121	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
159243001	2603230197 M-118	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
159244001	2603250005 EB-3	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
159247001	2603230069 M-120	SAMPLE		1 ug/L	GROUND WATER	MWHL002		5:10	1.0
1201077880	MB for batch 523680	MB		UCF ug/L to uGROUND WATER	GROUND WATER	QC ACCOUNT		5:10	1.0
1201077881	2603240135 M-121(159242003)DUP	DUP		1 ug/L	GROUND WATER	QC ACCOUNT		5:10	1.0
1201077882	2603240135 M-121(159242003)MS	MS		1 ug/L	GROUND WATER	QC ACCOUNT		5:10	1.0
1201077883	LCS for batch 523680	LCS		UCF ug/L to uGROUND WATER	GROUND WATER	QC ACCOUNT		5:10	1.0
1201077884	LCSD for batch 523680	LCSD		UCF ug/L to uGROUND WATER	GROUND WATER	QC ACCOUNT		5:10	1.0

Instrument Used (circle one): KPA-10 S/N 89-05050-0035, KPA-10A S/N 89-05040-025, KPA-11 S/N 94-45050-064

Data Reviewed By: Sel 4/20/06

General Engineering Laboratories, Radiochemistry Division

# Uranium Water

Filename : TOTU.XLS  
 File type : Excel  
 Version # : 1

Spike S/N : 0903  
 Spike Exp Date : 3/1/2007  
 Spike Activity (ug/L): 250.00  
 Spike Volume Added(ml): 1.0

LCS S/N : 0903  
 LCS Exp Date : 3/1/2007  
 LCS Activity (ug/L): 250.00  
 LCS Volume Added(ml): 1.0

Batch : 523680  
 Analyst : DRS1  
 Prep Date : 4/24/2006  
 Nat-U Abundance : 1

Procedure Code : KPATOTUL  
 Parmname : Total Uranium

Batch counted on : KPA11AUTO2

Calibration Date : 4/26/2006 9:32:10  
 Calibration Due Date : 4/27/2006 9:32:10

**Sample Characteristics**

**KPA Raw Data**

Sample ID	Initial Aliquot L	Initial Sample StDev.	Final Aliquot L	Final Aliquot StDev.	Sample Counted mL	Sample Counted StDev.	Sample Date/Time	Analysis Range	Intensity	Lifetime (us)	R^2
158272001	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/13/2006 14:35	Low	14837.950	205.4560	0.9999
158275001	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/13/2006 10:45	Low	128.716	405.5095	0.9078
158276001	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/8/2006 15:30	Low	18179.560	314.5181	0.9997
158277001	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/9/2006 14:00	Low	109.785	389.9206	0.8704
158436001	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/14/2006 14:45	Low	8384.440	304.4823	0.9995
158971001	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/21/2006 14:00	Low	11429.830	304.0079	0.9997
158971002	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/21/2006 12:00	Low	8779.347	299.2141	0.9998
158971003	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/21/2006 9:00	Low	7751.080	315.1842	0.9996
158971004	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/21/2006 10:20	Low	14388.240	297.1293	0.9999
159242001	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/23/2006 15:20	Low	338.874	217.5325	0.9061
159242002	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/23/2006 14:50	Low	10709.190	301.4254	0.9996
159243001	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/23/2006 8:30	Low	47166.910	294.7017	0.9999
159244001	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/22/2006 14:30	Low	8510.882	301.0075	0.9993
159247001	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/24/2006 12:00	Low	99.989	340.0651	0.7262
1201077880	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/22/2006 10:20	High	2774.895	297.2591	0.9995
1201077881	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	4/24/2006 0:00	Low	120.520	401.1802	0.6136
1201077882	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/23/2006 8:30	Low	47183.600	296.7125	0.9999
1201077883	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	3/23/2006 8:30	High	3843.490	294.0193	0.9995
1201077884	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	4/24/2006 0:00	High	2185.972	323.5353	0.9990
1201077884	0.005	3.7355E-06	0.010	4.2391E-06	1.000	5.4802E-03	4/24/2006 0:00	Low	17815.530	317.4648	0.9998

*Handwritten signatures and initials:*  
 [Signature]  
 [Signature]  
 [Signature]

Ref Ratio	Results (ug/L)	Error (ug/L)	Count Date/Time	Dilution Corrected Results			Results (pCi)					pCi/ug= 0.67			1 SIGMA	
				KPA Result ug/L	KPA Error ug/L	Decision Level pCi/L	Critical Level pCi/L	MDA pCi/L	Sample Act. Conc. pCi/L	Sample Act. Error pCi/L	Counting Uncertainty	Total Prop. Uncertainty				
1.0242	2.1947	0.0252	4/26/2006 10:30	4.3894	0.0504	0.2040	0.1440	0.2880	2.9409	0.0077	0.0662	0.0736				
1.0268	0.0831	0.0037	4/26/2006 10:32	0.1663	0.0074	0.2040	0.1440	0.2880	0.1114	0.0298	0.0097	0.0098				
1.0246	2.6744	0.0305	4/26/2006 10:34	5.3488	0.0610	0.2040	0.1440	0.2880	3.5837	0.0076	0.0801	0.0891				
1.0267	0.0804	0.0044	4/26/2006 10:36	0.1608	0.0089	0.2040	0.1440	0.2880	0.1078	0.0371	0.0117	0.0117				
1.0188	1.2683	0.0149	4/26/2006 10:38	2.5365	0.0298	0.2040	0.1440	0.2880	1.6995	0.0079	0.0392	0.0433				
1.0186	1.7055	0.0196	4/26/2006 10:40	3.4109	0.0391	0.2040	0.1440	0.2880	2.2853	0.0077	0.0514	0.0571				
1.0182	1.3250	0.0150	4/26/2006 10:43	2.6499	0.0299	0.2040	0.1440	0.2880	1.7755	0.0076	0.0393	0.0438				
1.0126	1.1774	0.0137	4/26/2006 10:45	2.3547	0.0273	0.2040	0.1440	0.2880	1.5777	0.0078	0.0359	0.0398				
1.0195	2.1301	0.0239	4/26/2006 10:47	4.2603	0.0478	0.2040	0.1440	0.2880	2.8544	0.0075	0.0628	0.0701				
1.0180	0.1133	0.0093	4/26/2006 10:49	0.2266	0.0185	0.2040	0.1440	0.2880	0.1518	0.0548	0.0244	0.0244				
1.0307	1.6020	0.0186	4/26/2006 10:51	3.2040	0.0373	0.2040	0.1440	0.2880	2.1467	0.0078	0.0490	0.0543				
1.0177	6.8357	0.0763	4/26/2006 10:53	13.6713	0.1527	0.2040	0.1440	0.2880	9.1598	0.0075	0.2005	0.2240				
1.0208	1.2864	0.0155	4/26/2006 10:55	2.5728	0.0310	0.2040	0.1440	0.2880	1.7238	0.0081	0.0407	0.0448				
1.0279	0.0790	0.0079	4/26/2006 10:57	0.1580	0.0157	0.2040	0.1440	0.2880	0.1059	0.0667	0.0207	0.0207				
1.0368	23.7634	0.7311	4/26/2006 11:01	47.5268	1.4621	0.2040	0.1440	0.2880	31.8429	0.0206	1.9201	1.9512				
1.0199	0.0820	0.0089	4/26/2006 10:15	0.1639	0.0179	0.2040	0.1440	0.2880	0.1098	0.0730	0.0234	0.0235				
1.0191	6.8380	0.0762	4/26/2006 10:18	13.6761	0.1524	0.2040	0.1440	0.2880	9.1630	0.0075	0.2001	0.2236				
1.0301	32.8797	1.0119	4/26/2006 10:22	65.7593	2.0237	0.2040	0.1440	0.2880	44.0588	0.0206	2.6576	2.7007				
1.0376	18.7377	0.5803	4/26/2006 10:26	37.4754	1.1606	0.2040	0.1440	0.2880	25.1085	0.0207	1.5241	1.5485				
1.0327	2.6221	0.0295	4/26/2006 10:27	5.2443	0.0591	0.2040	0.1440	0.2880	3.5137	0.0075	0.0776	0.0865				

*Handwritten signature*

MDA Study Information

Effective Date: 4/1/2006  
 Expiration Date: 7/1/2006  
 Average: 1.090000000  
 StDev.: 0.046200000

Results (ug)	Decision Level ug/L	Critical Level ug/L	MDA ug/L	Sample Act. Conc. ug/L	Sample Act. Error ug/L	2 SIGMA Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal	Recovery
0.3045	0.2150	0.2150	0.4299	4.3894	0.0115	0.0988	0.1098		SAMPLE				
0.3045	0.2150	0.2150	0.4299	0.1663	0.0445	0.0145	0.0146		SAMPLE				
0.3045	0.2150	0.2150	0.4299	5.3488	0.0114	0.1196	0.1330		SAMPLE				
0.3045	0.2150	0.2150	0.4299	0.1608	0.0553	0.0174	0.0175		SAMPLE				
0.3045	0.2150	0.2150	0.4299	2.5365	0.0118	0.0585	0.0647		SAMPLE				
0.3045	0.2150	0.2150	0.4299	3.4109	0.0115	0.0767	0.0852		SAMPLE				
0.3045	0.2150	0.2150	0.4299	2.6499	0.0113	0.0586	0.0654		SAMPLE				
0.3045	0.2150	0.2150	0.4299	2.3547	0.0116	0.0536	0.0594		SAMPLE				
0.3045	0.2150	0.2150	0.4299	4.2603	0.0112	0.0938	0.1047		SAMPLE				
0.3045	0.2150	0.2150	0.4299	0.2266	0.0818	0.0363	0.0364		SAMPLE				
0.3045	0.2150	0.2150	0.4299	3.2040	0.0116	0.0731	0.0810		SAMPLE				
0.3045	0.2150	0.2150	0.4299	13.6713	0.0112	0.2992	0.3343		SAMPLE				
0.3045	0.2150	0.2150	0.4299	2.5728	0.0120	0.0607	0.0669		SAMPLE				
0.3045	0.2150	0.2150	0.4299	0.1580	0.0995	0.0308	0.0309		SAMPLE				
0.3045	0.2150	0.2150	0.4299	47.5268	0.0308	2.8658	2.9122		SAMPLE				
0.3045	0.2150	0.2150	0.4299	0.1639	0.1089	0.0350	0.0350		MB				
0.3045	0.2150	0.2150	0.4299	13.6761	0.0111	0.2986	0.3338	159242003	DUP	0.0%		50.00	104.2%
0.3045	0.2150	0.2150	0.4299	65.7593	0.0308	3.9665	4.0308	159242003	MS			50.00	75.0%
0.3045	0.2150	0.2150	0.4299	37.4754	0.0310	2.2748	2.3112		LCS			5.00	104.9%
0.3045	0.2150	0.2150	0.4299	5.2443	0.0113	0.1158	0.1291		LCS	150.9%		5.00	104.9%

*Handwritten signature*

Sample-ID	Sample-Description	Reference-ReferenceRatio	Sample-Lifetime	Sample-FY2	Sample-AnalysisDate	Analysis-Range	Sample-Intercept	Result-AnalyticalResult	Result-AnalyticalUncertainty	Standard	Recovery
2	COHkSid	1.008336	319.8756	0.994365	4/26/2006 9:48	Low	1.3367.54	1.982616	2.34E-02	2	99%
5	COHkSid	0.9957	342.7378	0.995929	4/26/2006 9:48	Low	33476.77	4.870665	5.42E-02	5	97%
50	COHkSid	1.012948	329.5086	0.993904	4/26/2006 9:50	High	5836.366	1.535339	7.505952	50	100%
250	COHkSid	1.019718	333.4145	0.998947	4/26/2006 9:52	High	28866.09	245.6594	7.505952	250	98%
1201077880	523680	1.019894	401.1802	0.6136399	4/26/2006 10:15	Low	120.5201	0.081953	8.93E-03		
1201077881	523680	1.019107	296.7125	0.9999429	4/26/2006 10:18	Low	4843.49	6.839049	7.62E-02		
1201077882	523680	1.030107	294.0193	0.9952585	4/26/2006 10:22	High	3843.49	32.87967	1.01187		
1201077883	523680	1.037649	323.5353	0.999103	4/26/2006 10:26	High	2185.972	18.7377	0.5803018		
1201077884	523680	1.032678	317.4648	0.9998407	4/26/2006 10:27	Low	17815.53	2.622143	2.95E-02		
158272001	523680	1.024196	205.456	0.9998615	4/26/2006 10:30	Low	14837.95	2.194699	2.52E-02		
158275001	523680	1.026815	405.5095	0.9077505	4/26/2006 10:32	Low	128.7159	8.31E-02	3.70E-03		
158276001	523680	1.024587	314.5181	0.9979399	4/26/2006 10:34	Low	18179.56	2.674401	3.05E-02		
158277001	523680	1.026663	389.9206	0.8704047	4/26/2006 10:36	Low	109.7853	8.04E-02	4.45E-03		
158936001	523680	1.018835	304.4823	0.9994978	4/26/2006 10:38	Low	8384.44	1.268272	1.49E-02		
158971001	523680	1.018659	304.0079	0.997096	4/26/2006 10:40	Low	11429.83	1.70545	1.96E-02		
158971002	523680	1.018247	299.2141	0.9988404	4/26/2006 10:43	Low	8779.347	1.324963	1.50E-02		
158971003	523680	1.012646	315.1642	0.9995634	4/26/2006 10:45	Low	7751.08	1.177351	1.37E-02		
158971004	523680	1.019471	297.1293	0.9998826	4/26/2006 10:47	Low	14388.24	2.130141	2.39E-02		
159242001	523680	1.017964	217.5325	0.9060565	4/26/2006 10:49	Low	338.8737	0.1132985	9.27E-03		
159242002	523680	1.030728	301.4254	0.9896001	4/26/2006 10:51	Low	10709.19	1.601989	1.86E-02		
159242003	523680	1.017673	294.7017	0.9999264	4/26/2006 10:53	Low	47166.91	6.835652	7.63E-02		
159243001	523680	1.027936	301.0075	0.9993118	4/26/2006 10:55	Low	8510.882	1.286423	1.55E-02		
159244001	523680	1.036785	340.0651	0.7261768	4/26/2006 10:57	Low	99.98947	7.90E-02	7.86E-03		
159247001	523680	1.036805	297.2591	0.9895376	4/26/2006 11:01	High	2774.895	23.76339	0.7310597		
2	COHkSid	1.026711	315.8319	0.9997725	4/26/2006 11:03	Low	13813.42	2.047624	2.39E-02	2	102%
5	COHkSid	1.029011	335.7921	0.9988769	4/26/2006 11:05	Low	33847.09	4.923639	5.51E-02	5	96%
50	COHkSid	1.035069	310.615	0.998076	4/26/2006 11:07	High	5863.474	50.10752	1.558863	50	100%
250	COHkSid	1.036787	301.1083	0.997845	4/26/2006 11:10	High	28638.64	243.7305	7.464115	250	97%
1201077881	523680	1.033274	283.2625	0.9999387	4/26/2006 11:27	Low	48063.77	6.9644	0.0776911		
158272001	523680	1.033903	202.8524	0.9991159	4/26/2006 11:30	Low	15430.48	2.27976	2.58E-02		
158276001	523680	1.027039	308.7499	0.9997751	4/26/2006 11:47	Low	18313.62	2.693646	3.06E-02		
158246001	523680	1.035334	301.1405	0.9996915	4/26/2006 11:49	Low	8599.921	1.298205	1.49E-02		
158971001	523680	1.034819	300.2019	0.9999371	4/26/2006 11:51	Low	11599.88	1.729862	0.0192821		
158971002	523680	1.031847	293.1121	0.9998036	4/26/2006 11:53	Low	9034.033	1.361524	1.59E-02		
158971003	523680	1.038871	309.3145	0.9997483	4/26/2006 11:55	Low	7863.461	1.193484	1.36E-02		
158971004	523680	1.034165	293.3963	0.9997494	4/26/2006 11:57	Low	14616.66	2.162932	2.47E-02		
159242002	523680	1.035918	298.0611	0.9988549	4/26/2006 11:59	Low	10856.67	1.623171	0.018296		
159242003	523680	1.030401	289.3569	0.9999629	4/26/2006 12:01	Low	48445.08	7.019139	7.80E-02		
159243001	523680	1.030012	299.8838	0.9999101	4/26/2006 12:04	High	8531.881	1.289438	1.44E-02		
159247001	523680	1.036722	294.4043	0.9888551	4/26/2006 12:08	High	2720.798	23.30097	0.7258568		
2	COHkSid	1.029769	318.2557	0.9997624	4/26/2006 12:09	Low	13542.14	2.00868	2.28E-02	2	100%
5	COHkSid	1.027396	335.2649	0.9999008	4/26/2006 12:12	Low	33896.15	4.887516	5.46E-02	5	96%
50	COHkSid	1.026352	320.9896	0.9993367	4/26/2006 12:14	High	5919.275	50.58372	1.55914	50	101%
250	COHkSid	1.026453	327.4967	0.9999558	4/26/2006 12:16	High	29737.5	253.0445	7.724933	250	101%
158275001*	523680	1.017958	295.488	0.9998349	4/26/2006 12:29	Low	32062.29	4.667323	5.28E-02		
158277001*	523680	1.025298	310.4645	0.9999432	4/26/2006 12:31	Low	31404.84	4.572943	5.09E-02		
159242001*	523680	1.031694	110.9822	0.9991679	4/26/2006 12:33	Low	25688.63	3.798003	6.74E-02		
159244001*	523680	1.028704	295.5443	0.9999573	4/26/2006 12:36	Low	32374.77	4.712181	5.24E-02		
2	COHkSid	1.027354	319.3503	0.9997203	4/26/2006 12:41	Low	13572.97	2.013107	2.30E-02	2	101%
5	COHkSid	1.029881	335.6642	0.9999529	4/26/2006 12:44	Low	33820.09	4.919662	5.47E-02	5	96%
50	COHkSid	1.03957	326.028	0.9996777	4/26/2006 12:46	High	5932.392	50.6957	1.554156	50	101%
250	COHkSid	1.046017	323.7836	0.9999275	4/26/2006 12:48	High	27518.17	234.2311	7.15382	250	94%

\*Denotes original was treated with a post-epkic.

*Supplied by Analyst*

KPAwin© (Version 1.2.8) Multiple Sample Report

Laboratory: ANALYTE: Uranium ANALYST: sa101078

Sample Identification

Sample ID	Proc ID	Sample Type	Description	Date / Time	SpA	SpG	Atomic Mass	Basis Sample	Customer ID
250.0	None	CChkStd	CChkStd	04/26/2006 09:45 AM	2.5E+04	1	238.0289	None	None
50.0	None	CChkStd	CChkStd	04/26/2006 09:48 AM	2.5E+04	1	238.0289	None	None
50.0	None	CChkStd	CChkStd	04/26/2006 09:50 AM	2.5E+04	1	238.0289	None	None
250.0	None	CChkStd	CChkStd	04/26/2006 09:52 AM	2.5E+04	1	238.0289	None	None
1201077880	None	MtdBlk	523680	04/26/2006 10:15 AM	2.5E+04	1	238.0289	None	None
1201077881	None	Sample	523680	04/26/2006 10:18 AM	2.5E+04	1	238.0289	None	None
1201077882	None	Sample	523680	04/26/2006 10:22 AM	2.5E+04	1	238.0289	None	None
1201077883	None	MtdStd	523680	04/26/2006 10:26 AM	2.5E+04	1	238.0289	None	None
1201077884	None	MtdStd	523680	04/26/2006 10:27 AM	2.5E+04	1	238.0289	None	None
158272001	None	Sample	523680	04/26/2006 10:30 AM	2.5E+04	1	238.0289	None	None
158275001	None	Sample	523680	04/26/2006 10:32 AM	2.5E+04	1	238.0289	None	None
158276001	None	Sample	523680	04/26/2006 10:34 AM	2.5E+04	1	238.0289	None	None
158277001	None	Sample	523680	04/26/2006 10:36 AM	2.5E+04	1	238.0289	None	None
158436001	None	Sample	523680	04/26/2006 10:38 AM	2.5E+04	1	238.0289	None	None
158271001	None	Sample	523680	04/26/2006 10:40 AM	2.5E+04	1	238.0289	None	None
158271002	None	Sample	523680	04/26/2006 10:43 AM	2.5E+04	1	238.0289	None	None
158271003	None	Sample	523680	04/26/2006 10:45 AM	2.5E+04	1	238.0289	None	None

8/8/12/06  
*[Handwritten Signature]*

*[Handwritten Initials]*

KPAWIN® (Version 1.2.8) Multiple Sample Report

Laboratory:

ANALYTE: Uranium

ANALYST:

sal01078

Sample Identification

Sample ID	Proc ID	Sample Type	Description	Date / Time	SpA	SPG	Atomic Mass	Basis Sample	Customer ID
158271004 <i>97</i>	None	Sample	523680	04/26/2006 10:47 AM	2.5E+04	1	238.0289	None	None
159242001 <i>98</i>	None	Sample	523680	04/26/2006 10:49 AM	2.5E+04	1	238.0289	None	None
159242002	None	Sample	523680	04/26/2006 10:51 AM	2.5E+04	1	238.0289	None	None
159242003	None	Sample	523680	04/26/2006 10:53 AM	2.5E+04	1	238.0289	None	None
159243001	None	Sample	523680	04/26/2006 10:55 AM	2.5E+04	1	238.0289	None	None
159244001	None	Sample	523680	04/26/2006 10:57 AM	2.5E+04	1	238.0289	None	None
159247001	None	Sample	523680	04/26/2006 11:01 AM	2.5E+04	1	238.0289	None	None
2.0	None	CChkStd	CChkStd	04/26/2006 11:03 AM	2.5E+04	1	238.0289	None	None
5.0	None	CChkStd	CChkStd	04/26/2006 11:05 AM	2.5E+04	1	238.0289	None	None
50.0	None	CChkStd	CChkStd	04/26/2006 11:07 AM	2.5E+04	1	238.0289	None	None
250.0	None	CChkStd	CChkStd	04/26/2006 11:10 AM	2.5E+04	1	238.0289	None	None
1201077881 <i>92</i>	None	Sample	523680	04/26/2006 11:27 AM	2.5E+04	1	238.0289	None	None
158272001 <i>93</i>	None	Sample	523680	04/26/2006 11:30 AM	2.5E+04	1	238.0289	None	None
1201077881 <i>94</i>	None	Sample	523680	04/26/2006 11:34 AM	2.5E+04	1	238.0289	None	None
158272001 <i>95</i>	None	Sample	523680	04/26/2006 11:36 AM	2.5E+04	1	238.0289	None	None
158276001	None	Sample	523680	04/26/2006 11:47 AM	2.5E+04	1	238.0289	None	None
158246001	None	Sample	523680	04/26/2006 11:49 AM	2.5E+04	1	238.0289	None	None

*Handwritten signature*



KPAWin® (Version 1.2.8) Multiple Sample Report

Laboratory:

ANALYTE: Uranium

ANALYST:

sal01078

Sample Identification

Sample ID	Proc ID	Sample Type	Description	Date / Time	SpA	SpG	Atomic Mass	Basis Sample	Customer ID
158271001	None	Sample	523680	04/26/2006 11:51 AM	2.5E+04	1	238.0289	None	None
158271002	None	Sample	523680	04/26/2006 11:53 AM	2.5E+04	1	238.0289	None	None
158271003	None	Sample	523680	04/26/2006 11:55 AM	2.5E+04	1	238.0289	None	None
158271004	None	Sample	523680	04/26/2006 11:57 AM	2.5E+04	1	238.0289	None	None
159242002	None	Sample	523680	04/26/2006 11:59 AM	2.5E+04	1	238.0289	None	None
159242003	None	Sample	523680	04/26/2006 12:01 PM	2.5E+04	1	238.0289	None	None
159243001	None	Sample	523680	04/26/2006 12:04 PM	2.5E+04	1	238.0289	None	None
159247001	None	Sample	523680	04/26/2006 12:08 PM	2.5E+04	1	238.0289	None	None
2.0	None	CChkStd	CChkStd	04/26/2006 12:09 PM	2.5E+04	1	238.0289	None	None
5.0	None	CChkStd	CChkStd	04/26/2006 12:12 PM	2.5E+04	1	238.0289	None	None
50.0	None	CChkStd	CChkStd	04/26/2006 12:14 PM	2.5E+04	1	238.0289	None	None
250.0	None	CChkStd	CChkStd	04/26/2006 12:16 PM	2.5E+04	1	238.0289	None	None
158275001	None	Sample	523680	04/26/2006 12:29 PM	2.5E+04	1	238.0289	None	None
158277001	None	Sample	523680	04/26/2006 12:31 PM	2.5E+04	1	238.0289	None	None
159242001	None	Sample	523680	04/26/2006 12:33 PM	2.5E+04	1	238.0289	None	None
159244001	None	Sample	523680	04/26/2006 12:36 PM	2.5E+04	1	238.0289	None	None
2.0	None	CChkStd	CChkStd	04/26/2006 12:41 PM	2.5E+04	1	238.0289	None	None

*Handwritten signature*

KPAWin© (Version 1.2.8) Multiple Sample Report

Laboratory: ANALYTE: Uranium ANALYST: sal01078

Sample Identification

Sample ID	Proc ID	Sample Type	Description	Date / Time	SpA	SPG	Atomic Mass	Basis Sample	Customer ID
153.0	None	CChkStd	CChkStd	04/26/2006 12:44 PM	2.5E+04	1	238.0289	None	None
154.0	None	CChkStd	CChkStd	04/26/2006 12:46 PM	2.5E+04	1	238.0289	None	None
250.0	None	CChkStd	CChkStd	04/26/2006 12:48 PM	2.5E+04	1	238.0289	None	None

*AS 4/26/06*

KPAWin© (Version 1.2.8) Multiple Sample Report

Laboratory: ANALYTE: Uranium ANALYST: sal01078

Analytical Results

Sample ID	Range	Time Gates	Sample Units	Analytical Result	Total Dilution	Sample Type	Final Result	Pulses	Calibration ID	Uncertainty
2.0	Low	5 -39	µg/l	1.98E+00		CChkStd		1000	4/26/06	2.34E-02
5.0	Low	5 -39	µg/l	4.87E+00		CChkStd		1000	4/26/06	5.42E-02
50.0	High	5 -39	µg/l	4.99E+01		CChkStd		1000	4/26/06	1.54E+00
250.0	High	5 -39	µg/l	2.46E+02		CChkStd		1000	4/26/06	7.51E+00
1201077880	Low	5 -39	µg/l	8.20E-02	1	MtdBlk	8.20E-02	1000	4/26/06	8.93E-03
1201077881	Low	5 -39	µg/l	6.84E+00	1	Sample	6.84E+00	1000	4/26/06	7.62E-02
1201077882	High	5 -39	µg/l	3.29E+01	1	Sample	3.29E+01	1000	4/26/06	1.01E+00
1201077883	High	5 -39	µg/l	1.87E+01	1	MtdStd	1.87E+01	1000	4/26/06	5.80E-01
1201077884	Low	5 -39	µg/l	2.62E+00	1	MtdStd	2.62E+00	1000	4/26/06	2.95E-02
158272001	Low	5 -39	µg/l	2.19E+00	1	Sample	2.19E+00	1000	4/26/06	2.52E-02
158275001	Low	5 -39	µg/l	8.31E-02	1	Sample	8.31E-02	1000	4/26/06	3.70E-03
158276001	Low	5 -39	µg/l	2.67E+00	1	Sample	2.67E+00	1000	4/26/06	3.05E-02
158277001	Low	5 -39	µg/l	8.04E-02	1	Sample	8.04E-02	1000	4/26/06	4.45E-03
158436001	Low	5 -39	µg/l	1.27E+00	1	Sample	1.27E+00	1000	4/26/06	1.49E-02
158271001	Low	5 -39	µg/l	1.71E+00	1	Sample	1.71E+00	1000	4/26/06	1.96E-02
158271002	Low	5 -39	µg/l	1.32E+00	1	Sample	1.32E+00	1000	4/26/06	1.50E-02
158271003	Low	5 -39	µg/l	1.18E+00	1	Sample	1.18E+00	1000	4/26/06	1.37E-02

*Sal*  
*4/26/06*  
*12:52:14*

**KPAWIN® (Version 1.2.8) Multiple Sample Report**

Laboratory:

ANALYTE: Uranium

ANALYST:

sal01078

**Analytical Results**

Sample ID	Range	Time Gates	Sample Units	Analytical Result	Total Dilution	Sample Type	Final Result	Pulses	Calibration ID	Uncertainty
15871004	Low	5 -39	µg/l	2.13E+00	1	Sample	2.13E+00	1000	4/26/06	2.39E-02
159242001	Low	5 -39	µg/l	1.13E-01	1	Sample	1.13E-01	1000	4/26/06	9.27E-03
159242002	Low	5 -39	µg/l	1.60E+00	1	Sample	1.60E+00	1000	4/26/06	1.86E-02
159242003	Low	5 -39	µg/l	6.84E+00	1	Sample	6.84E+00	1000	4/26/06	7.63E-02
159243001	Low	5 -39	µg/l	1.29E+00	1	Sample	1.29E+00	1000	4/26/06	1.55E-02
159244001	Low	5 -39	µg/l	7.90E-02	1	Sample	7.90E-02	1000	4/26/06	7.86E-03
159247001	High	5 -39	µg/l	2.38E+01	1	Sample	2.38E+01	1000	4/26/06	7.31E-01
2.0	Low	5 -39	µg/l	2.05E+00		CChkStd		1000	4/26/06	2.33E-02
5.0	Low	5 -39	µg/l	4.92E+00		CChkStd		1000	4/26/06	5.51E-02
50.0	High	5 -39	µg/l	5.01E+01		CChkStd		1000	4/26/06	1.56E+00
250.0	High	5 -39	µg/l	2.44E+02		CChkStd		1000	4/26/06	7.46E+00
1201077881	Low	5 -39	µg/l	6.96E+00	1	Sample	6.96E+00	1000	4/26/06	7.77E-02
158272001	Low	5 -39	µg/l	2.28E+00	1	Sample	2.28E+00	1000	4/26/06	2.58E-02
1201077881	Low	5 -39	µg/l	7.01E+00	1	Sample	7.01E+00	1000	4/26/06	7.77E-02
158272001	Low	5 -39	µg/l	2.30E+00	1	Sample	2.30E+00	1000	4/26/06	2.60E-02
158276001	Low	5 -39	µg/l	2.69E+00	1	Sample	2.69E+00	1000	4/26/06	3.06E-02
158246001	Low	5 -39	µg/l	1.30E+00	1	Sample	1.30E+00	1000	4/26/06	1.49E-02

KPAWIN® (Version 1.2.8) Multiple Sample Report

Laboratory:

ANALYTE: Uranium

ANALYST:

sal01078

Analytical Results

Sample ID	Range	Time Gates	Sample Units	Analytical Result	Total Dilution	Sample Type	Final Result	Pulses	Calibration ID	Uncertainty
158271001	Low	5 -39	µg/l	1.73E+00	1	Sample	1.73E+00	1000	4/26/06	1.93E-02
158271002	Low	5 -39	µg/l	1.36E+00	1	Sample	1.36E+00	1000	4/26/06	1.55E-02
158271003	Low	5 -39	µg/l	1.19E+00	1	Sample	1.19E+00	1000	4/26/06	1.36E-02
158271004	Low	5 -39	µg/l	2.16E+00	1	Sample	2.16E+00	1000	4/26/06	2.47E-02
159242002	Low	5 -39	µg/l	1.62E+00	1	Sample	1.62E+00	1000	4/26/06	1.83E-02
159242003	Low	5 -39	µg/l	7.02E+00	1	Sample	7.02E+00	1000	4/26/06	7.80E-02
159243001	Low	5 -39	µg/l	1.29E+00	1	Sample	1.29E+00	1000	4/26/06	1.44E-02
159247001	High	5 -39	µg/l	2.33E+01	1	Sample	2.33E+01	1000	4/26/06	7.26E-01
2.0	Low	5 -39	µg/l	2.01E+00		CChkStd		1000	4/26/06	2.28E-02
5.0	Low	5 -39	µg/l	4.89E+00		CChkStd		1000	4/26/06	5.46E-02
50.0	High	5 -39	µg/l	5.06E+01		CChkStd		1000	4/26/06	1.56E+00
250.0	High	5 -39	µg/l	2.53E+02		CChkStd		1000	4/26/06	7.72E+00
158275001	Low	5 -39	µg/l	4.67E+00	1	Sample	4.67E+00	1000	4/26/06	5.28E-02
158277001	Low	5 -39	µg/l	4.57E+00	1	Sample	4.57E+00	1000	4/26/06	5.09E-02
159242001	Low	5 -39	µg/l	3.74E+00	1	Sample	3.74E+00	1000	4/26/06	6.74E-02
159244001	Low	5 -39	µg/l	4.71E+00	1	Sample	4.71E+00	1000	4/26/06	5.24E-02
2.0	Low	5 -39	µg/l	2.01E+00		CChkStd		1000	4/26/06	2.30E-02

*Handwritten signature*

KPAWin© (Version 1.2.8) Multiple Sample Report

Laboratory: ANALYTE: Uranium ANALYST: sal01078

Analytical Results

Sample ID	Range	Time Gates	Sample Units	Analytical Result	Total Dilution	Sample Type	Final Result	Pulses	Calibration ID	Uncertainty
157	Low	5 -39	µg/l	4.92E+00		CchkStd		1000	4/26/06	5.47E-02
158	High	5 -39	µg/l	5.07E+01		CchkStd		1000	4/26/06	1.55E+00
250.0	High	5 -39	µg/l	2.34E+02		CchkStd		1000	4/26/06	7.15E+00

Page 4 of 9

KPAWin© (Version 1.2.8) Multiple Sample Report

Laboratory:

ANALYTE: Uranium

ANALYST:

sal01078

Quality Control

Sample ID	Basis Sample	Reference Lifetime	R <sup>2</sup> Intensity	Reference Ratio	Sample Lifetime	Sample Intercept	IDL / MDL	Recovery (%)	RPD (%)	AW Flags
1502.0	None	297	.9994	1.00084	320	13368	0E+00/ 0E+00	99.18		
1505.0	None	297	.9999	.99957	343	33479	0E+00/ 0E+00	97.41		
50.0	None	297	.9994	1.01295	330	5836	0E+00/ 0E+00	99.75		
250.0	None	295	.9999	1.01972	333	28866	0E+00/ 0E+00	98.26		
1201077880	None	294	.6136	1.01989	401	121	0E+00/ 0E+00			A8, A10
1201077881	None	294	.9999	1.01911	297	47184	0E+00/ 0E+00			
1201077882	None	295	.9995	1.03011	294	3843	0E+00/ 0E+00			
1201077883	None	294	.9990	1.03765	324	2186	0E+00/ 0E+00	1873.77		
1201077884	None	293	.9998	1.03268	317	17816	0E+00/ 0E+00	262.21		
158272001	None	295	.9999	1.02420	205	14838	0E+00/ 0E+00			
158275001	None	295	.9078	1.02681	406	129	0E+00/ 0E+00			A8, A10, A73
158276001	None	295	.9997	1.02460	315	18180	0E+00/ 0E+00			
158277001	None	292	.8704	1.02666	390	110	0E+00/ 0E+00			A8, A10, A73
158436001	None	294	.9995	1.01883	304	8384	0E+00/ 0E+00			
158471001	None	291	.9997	1.01856	304	11430	0E+00/ 0E+00			
158471002	None	291	.9998	1.01825	299	8779	0E+00/ 0E+00			
158471003	None	293	.9996	1.01265	315	7751	0E+00/ 0E+00			

*4/26/06*  
*Sal*

KPAWin® (Version 1.2.8) Multiple Sample Report

Laboratory: ANALYTE: Uranium ANALYST: sal01078

Quality Control

Sample ID	Basis Sample	Reference Lifetime	R Intensity	Reference Ratio	Sample Lifetime	Sample Intercept	IDL / MDL	Recovery (%)	RPD (%)	AW Flags
158771004	None	291	.9999	1.01947	297	14388	0E+00/ 0E+00			
159242001	None	292	.9061	1.01796	218	339	0E+00/ 0E+00			A8, A73
159242002	None	288	.9996	1.03073	301	10709	0E+00/ 0E+00			
159242003	None	292	.9999	1.01767	295	47167	0E+00/ 0E+00			
159243001	None	290	.9993	1.02075	301	8511	0E+00/ 0E+00			
159244001	None	289	.7262	1.02794	340	100	0E+00/ 0E+00			A8, A73
159247001	None	289	.9995	1.03681	297	2775	0E+00/ 0E+00			
2.0	None	288	.9998	1.02671	316	13813	0E+00/ 0E+00	102.38		
5.0	None	288	.9999	1.02902	336	33847	0E+00/ 0E+00	98.47		
50.0	None	288	.9988	1.03507	311	5863	0E+00/ 0E+00	100.22		
250.0	None	288	.9998	1.03679	301	28639	0E+00/ 0E+00	97.49		
1201077881	None	285	.9999	1.03327	283	48064	0E+00/ 0E+00			
158272001	None	286	.9999	1.03390	203	15430	0E+00/ 0E+00			
1201077881	None	286	1.0000	1.03072	290	48394	0E+00/ 0E+00			
158272001	None	286	.9999	1.03448	203	15555	0E+00/ 0E+00			
158276001	None	287	.9998	1.02704	309	18314	0E+00/ 0E+00			
158246001	None	286	.9997	1.03553	301	8600	0E+00/ 0E+00			

*Handwritten signature*



KPAWin© (Version 1.2.8) Multiple Sample Report

Laboratory:

ANALYTE:

Uranium

ANALYST:

sal01078

Quality Control

Sample ID	Basis Sample	Reference Lifetime	R <sup>2</sup> Intensity	Reference Ratio	Sample Lifetime	Sample Intercept	IDL / MDL	Recovery (%)	RPD (%)	AW Flags
158271001	None	287	.9999	1.03482	300	11600	0E+00/ 0E+00			
158271002	None	288	.9998	1.03185	293	9034	0E+00/ 0E+00			
158271003	None	286	.9997	1.03887	309	7863	0E+00/ 0E+00			
158271004	None	289	.9997	1.03416	293	14617	0E+00/ 0E+00			
159242002	None	287	.9999	1.03592	298	10857	0E+00/ 0E+00			
159242003	None	287	1.0000	1.03040	289	48445	0E+00/ 0E+00			
159243001	None	286	.9999	1.03012	300	8532	0E+00/ 0E+00			
159247001	None	285	.9989	1.03672	294	2721	0E+00/ 0E+00			
2.0	None	285	.9998	1.02977	318	13542	0E+00/ 0E+00	100.43		
5.0	None	285	.9999	1.02740	335	33596	0E+00/ 0E+00	97.75		
50.0	None	285	.9993	1.02635	321	5919	0E+00/ 0E+00	101.17		
250.0	None	286	1.0000	1.02645	327	29738	0E+00/ 0E+00	101.22		
158275001	None	283	.9998	1.01796	295	32062	0E+00/ 0E+00			
158277001	None	284	.9999	1.02530	310	31405	0E+00/ 0E+00			
159242001	None	283	.9992	1.03169	111	25589	0E+00/ 0E+00			A9
159244001	None	284	1.0000	1.02870	296	32375	0E+00/ 0E+00			
2.0	None	284	.9997	1.02735	319	13573	0E+00/ 0E+00	100.66		

*AP*

KPAWin© (Version 1.2.8) Multiple Sample Report

Laboratory: ANALYTE: Uranium ANALYST: sa101078

Quality Control

Sample ID	Basis Sample	Reference Lifetime	R <sup>2</sup> Intensity	Reference Ratio	Sample Lifetime	Sample Intercept	IDL / MDL	Recovery (%)	RPD (%)	AW Flags
150.0	None	284	1.0000	1.02988	336	33820	0E+00 / 0E+00	98.39		
150.0	None	283	.9997	1.03957	326	5932	0E+00 / 0E+00	101.39		
250.0	None	282	.9999	1.04602	324	27518	0E+00 / 0E+00	93.69		

Page 4 of 9

**KPAWin® (Version 1.2.8) Multiple Sample Report**

Laboratory:

ANALYTE:

Uranium

ANALYST: sal01078

Calibration Report Results

Low Calibration ID - 4/26/06

High Calibration ID - 4/26/06

Batch ID - 1973

Date - 4/26/2006 9:32:10 AM

Calibration Report Results

Range	Used	Sample ID	Std Conc	Std ID	Intercept	Uncert	Percent Time Reference			R <sup>2</sup>	AW Flags
							Discrep	Gates	Ratio		
Low	+	BckGnd	0.000		488	22	.000	5-39	1.0000	303	.9613
Low	+	1.0 ug/L	1.000	0836	7000	84	6.950	5-39	1.0010	314	.9996
Low	+	3.0 ug/L	3.000	0838	20203	142	-1.172	5-39	1.0067	324	.9998
Low	+	5.0 ug/L	5.000	0839	33851	184	-1.517	5-39	1.0118	345	.9998
Low	+	10.0 ug/L	10.000	0840	69499	264	.415	5-39	1.0100	318	1.0000

---

High	+	BckGnd	0.000		5	3	.000	5-20	1.0000	154	.5912
High	+	10.0 ug/L	10.000	0840	1162	34	-.001	5-39	1.0129	320	.9991
High	+	250 ug/L	250.000	0856	29378	171	.000	5-39	1.0110	326	.9999
High	+	500 ug/L	500.000	0842	58986	243	.000	5-39	1.0105	320	.9999

*Handwritten signature*

*Handwritten signature*

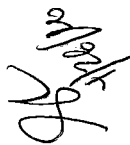
# KPAWin Detailed Calibration Report

**Laboratory:**

Calibration Details

Laboratory ID	KPA11AUTO2	Customer ID	None
Analyst	sal01078	Procedure ID	None
Calibration Config ID	1001 Config	Calibration Date	4/26/2006 9:32:10 AM
Calibration Batch ID	1973		

	<u>Low Range Details</u>	<u>High Range Details</u>
User Calibration	True	True
Calibration Id	4/26/06	4/26/06
Minimum Number of Standards	3	3
Calibration Alarms	0.9996973	1
Calibration R <sup>2</sup>	7.35E+03	2.13E-09
Variance	Y= +6966.018X -450.366	Y= +0.002X^2 +117.107X -8.91
Calibration Equation		



Radiochemistry Batch Checklist, Rev 4

Batch# 518058 Product: Ra-226 Date: 4/10/06

Criteria:	Yes	No	Comments
Sample Solids are less than 100 mg for GAB.	NA		
If activity less 10* MDA, error is 150% or less of sample activity. If greater 10* MDA, error is 40% or less. If below the MDA, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL has been met.	✓		
If duplicate activities are less 5* MDA, then rpd is 100% or less. If greater 5* MDA, then rpd 20% or less. If below the MDA, the rpd is 0%. Or meets the client's required RER acceptance criteria.	✓		Case narrative
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.	NA		
Method blank is less than the RDL. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Special requirements page checked	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.	NA		
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.	✓		
All lineouts initialed and dated.	✓		
No transcription errors are apparent.	✓		
QC data entered into QC database.	✓		
Batch entered into Case Narrative.	✓		
Batch non-conformances completed If applicable.	NA		

General Engineering Laboratories

2/22/2005

Primary Review Performed By: J. P. Green 4/10/06

Secondary Review Performed By: SKO 4/12/06

# Radium-226 Que Sheet

04/05/2006 General Engineering Laboratories, Radiochemistry Division

Batch #: 518058 Analyst: SG Minimum Due Date: 04/20/2006  
 Spike Isotope: Radium-226 Spike Code: 0638-B Expiration Date: 1-17-07 Vol: 0.1 Nom Conc: 2.5.11  
 LCS Isotope: Radium-226 LCS Code: 0638-B Expiration Date: 1-17-07 Vol: 0.1 Nom Conc: 2.5.11  
 Prep Date: 4-7-06 Pipet ID: 1429303 Initials: SNB Witness: SLS 4/2/06 Sample Count Time: 30 (Min)  
 Bkg Count Time: 30 (Min)

Sample I	Client Description	Type	Hazard Code Matrix	Min CRDL	Client	Vol (mL)	End Init Degas Date/Tin	End LN De-em Date/Time	Start Count Date/Time	Cell #	Det #	Bkg cpm	Total Counts
158272001	2603140436 TR-10A	SAMPLE	GROUND WAJ 2 pCi/L	MWHL002	1	500	4-7-06 0835	4-10-06 0520	4-10-06 0855	604	6	8	20
159242001	2603240118 H-11	SAMPLE	GROUND WAJ 2 pCi/L	MWHL002	2	500	4-7-06 0835	4-10-06 0555	4-10-06 0855	104	1	2	12
159242002	2603240122 M-117	SAMPLE	GROUND WAJ 2 pCi/L	MWHL002	3	500	4-7-06 0835	4-10-06 0555	4-10-06 0855	207	2	8	27
159243001	2603250197 M-118	SAMPLE	GROUND WAJ 2 pCi/L	MWHL002	4	500	4-7-06 0835	4-10-06 0555	4-10-06 0855	303	3	8	26
159244001	2603250005 EB-3	SAMPLE	GROUND WAJ 2 pCi/L	MWHL002	5	500	4-7-06 0835	4-10-06 0555	4-10-06 0855	406	4	5	20
159247001	2603230069 M-120	SAMPLE	GROUND WAJ 2 pCi/L	MWHL002	6	500	4-7-06 0835	4-10-06 0555	4-10-06 0855	572	5	8	14
1201064983	MB for batch 518058	MB	GROUND WAJ 2 pCi/L	QC ACCOUNT 7	7	500	4-7-06 0835	4-10-06 0555	4-10-06 0855	605	6	7	20
1201064984	2603230069 M-120(159247001)DxDUP	MB	GROUND WAJ 2 pCi/L	QC ACCOUNT 8	8	500	4-7-06 0835	4-10-06 0625	4-10-06 0930	112	1	8	26
1201064985	2603230069 M-120(159247001)MMS	MB	GROUND WAJ 2 pCi/L	QC ACCOUNT 9	9	500	4-7-06 0835	4-10-06 0625	4-10-06 0830	212	2	3	558
1201064986	LCS for batch 518058	LCS	GROUND WAJ 2 pCi/L	QC ACCOUNT 10	10	500	4-7-06 0835	4-10-06 0625	4-10-06 0930	307	3	7	665

Page 165 of 165

Data Reviewed By: SNB 4/10/06

Comments: \_\_\_\_\_  
 Instrument ID's: \_\_\_\_\_  
 LUCAS1-90988, LUCAS2:136917, LUCAS3:90989, LUCAS4:102753, LUC5:132286, LUC6:170055

MWH 4/12/06  
 Page 1 of 1

# Radium-226 Water

Filename : RA226.XLS  
 File type : Excel  
 Version # : 1

Spike S/N : 0638-B  
 Spike Exp Date : 1/17/2007  
 Spike Activity (dpm/ml): 278.75  
 Spike Volume Added: 0.1

Pipet, 0.1 ml Sdev : +/- 0.000701 ml  
 Pipet, 0.5 ml Sdev : +/- 0.002564 ml  
 Pipet, 1 ml Sdev : +/- 0.005480 ml

Batch : 518058

Procedure Code : LUC26RAL

Analyst : SG  
 Prep Date : 4/7/2006

Parname : Radium-226  
 Required MDA: 2 pCi/L

Ra-226 Abundance : 1

LCS S/N : 0638-B  
 LCS Exp Date : 1/17/2007  
 LCS Activity (dpm/ml): 278.75  
 LCS Volume Added: 0.1

Half-life of Ra-226 : 1600 years  
 Half-life of Rn-222 : 3.823 days

Calibration Date : 5/9/2005  
 Calibration Due Date : 5/9/2006

Batch counted on : LUCAS CELL DETECTOR  
 BKG Count time : 30 min

## Sample Characteristics

## Count Raw Data

Sample ID	Sample Aliquot L	Sample Aliquot StDev.	Sample Date/Time	Counting		Gross		Weekly Background		Detector Efficiency	
				Number	Time	Counts	CPM	Counts	CPM		Count Time
158272001	0.500	2.0256E-05	3/13/2006 14:35	604	30	20	0.667	8	0.267	30	1.8640
159242001	0.500	2.0256E-05	3/23/2006 15:20	104	30	12	0.400	2	0.067	30	1.7840
159242002	0.500	2.0256E-05	3/23/2006 14:50	207	30	27	0.900	8	0.267	30	1.7250
159243001	0.500	2.0256E-05	3/22/2006 14:30	303	30	26	0.867	8	0.267	30	1.8360
159244001	0.500	2.0256E-05	3/24/2006 12:00	406	30	20	0.667	5	0.167	30	1.9080
159247001	0.500	2.0256E-05	3/22/2006 10:20	512	30	14	0.467	8	0.267	30	1.9410
1201064983	0.500	2.0256E-05	4/7/2006 0:00	605	30	20	0.667	7	0.233	30	1.7780
1201064984	0.500	2.0256E-05	3/22/2006 10:20	112	30	26	0.867	8	0.267	30	1.5310
1201064985	0.500	2.0256E-05	3/22/2006 10:20	212	30	558	18.600	3	0.100	30	1.8080
1201064986	0.500	2.0256E-05	4/7/2006 0:00	307	30	665	22.167	7	0.233	30	1.6380

*Handwritten note:* 12/12/06

*Handwritten note:* 12/12/06

Detector Efficiency Error	De-Gas Date/Time	Rn-222 Ingrow End Date/Time	Count Start Date/Time	Rn-222 Corrections		Ra-226 Decay
				De-Gas to Ingrowth	Ingrowth to Count	
0.02655	4/7/2006 8:35	4/10/2006 5:20	4/10/2006 8:20	0.405	0.978	1.000
0.02415	4/7/2006 8:35	4/10/2006 5:55	4/10/2006 8:55	0.408	0.978	1.000
0.02691	4/7/2006 8:35	4/10/2006 5:55	4/10/2006 8:55	0.408	0.978	1.000
0.00980	4/7/2006 8:35	4/10/2006 5:55	4/10/2006 8:55	0.408	0.978	1.000
0.01759	4/7/2006 8:35	4/10/2006 5:55	4/10/2006 8:55	0.408	0.978	1.000
0.02843	4/7/2006 8:35	4/10/2006 5:55	4/10/2006 8:55	0.408	0.978	1.000
0.02655	4/7/2006 8:35	4/10/2006 5:55	4/10/2006 8:55	0.408	0.978	1.000
0.02415	4/7/2006 8:35	4/10/2006 6:25	4/10/2006 9:30	0.410	0.977	1.000
0.02691	4/7/2006 8:35	4/10/2006 6:25	4/10/2006 9:30	0.410	0.977	1.000
0.00980	4/7/2006 8:35	4/10/2006 6:25	4/10/2006 9:30	0.410	0.977	1.000

*Handwritten signature*



Results Decision Level pCi/L	Critical Level pCi/L	MDA pCi/L	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	2 SIGMA		Sample QC	Sample Type	RPD	RER	Nominal	Recovery
							Counting Uncertainty	Total Prop. Uncertainty						
0.3784	0.2672	0.6442	0.4873	0.4418	0.4000	0.1764	0.4211	0.4219		SAMPLE				
0.1964	0.1387	0.3914	0.4215	0.3749	0.3333	0.1247	0.3091	0.3098		SAMPLE				
0.4063	0.2869	0.6917	0.8283	0.3125	0.6333	0.1972	0.5055	0.5074		SAMPLE				
0.3817	0.2695	0.6499	0.7373	0.3241	0.6000	0.1944	0.4681	0.4683		SAMPLE				
0.2904	0.2050	0.5167	0.5912	0.3338	0.5000	0.1667	0.3862	0.3868		SAMPLE				
0.3611	0.2549	0.6147	0.2325	0.7823	0.2000	0.1563	0.3562	0.3564		SAMPLE				
0.3687	0.2603	0.6351	0.5498	0.4006	0.4333	0.1732	0.4307	0.4317		MB				
0.4556	0.3216	0.7756	0.8799	0.3248	0.6000	0.1944	0.5587	0.5602	159247001	DUP	35.5%		25.11	91.5%
0.2362	0.1668	0.4456	22.9729	0.0505	18.5000	0.7895	1.9216	2.2718	159247001	MS			25.11	119.7%
0.3983	0.2812	0.6860	30.0625	0.0406	21.9333	0.8641	2.3213	2.3921		LCS				
SAMPLE MDA USED TO CALCULATE RPD														

*RA518058*

# METHOD CALIBRATION DATA

# General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414  
(843)556-8171

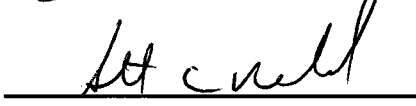
## Gas Flow Proportional Counter Calibration Package

Method: GAB

	YES	NO	Comments
1) Is all calibration standard information enclosed for: primary standard certificate? secondary standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
2) Are the detector graphs included? absorption curves? beta plateau?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
3) Is the raw count data included for: the plateau generation? the absorption curve generation? the calibration verification? the crosstalk calculations?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
4) Are the calibration verification calculations included? are verification recoveries 100% +/- 25%	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		

Prepared By: 

Date: 8/30/05

Reviewed By: 

Date: 8/30/05

Effective Date: ~~8/30/05~~ 8/18/05

**CERTIFICATE OF CALIBRATION**  
**Standard Radionuclide Source**

69030-278

Th-230 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Th-230
ACTIVITY (dps):	1.841 E4
HALF-LIFE:	7.538 E4 years
CALIBRATION DATE:	August 10, 2004 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.3%

Impurities:  $\gamma$ -impurities <0.1%  
 $\alpha$ -impurities <0.04%

5.09582 grams 0.5M HNO<sub>3</sub> solution.

P O NUMBER 3246RD, Item 1

SOURCE PREPARED BY:

E. A. Taskaev  
E. A. Taskaev, Production Manager

Q A APPROVED:

JM. M... 8-12-04

RECEIVED  
8/16/04  
TCW

ms/306



# Standard Traceability Log Rad

Source Material Info	
Parent Code:	0695
Prepared By:	Amanda Fehr
Carrier Conc:	0.5m HNO3
Reference Date:	08/10/2004
Ampoule Mass (g):	5.09582 g
Uncertainty:	+/- 3.3 %
LogBook No:	RC-S-037-094

A Solution Material Info	
Isotope:	Thorium-230
Prepared By:	Amanda Fehr
Prep Date:	05/26/2005
Verification Date:	05/26/2005
Expiration Date:	05/26/2006
Primary Code:	0695-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8637 g
Density(g/mL):	1.0137

### Calculations Converting parent activity to dpm/mL/dpm/g

$(\text{Mass of parent(g)}) * (\text{Parent Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parent Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.8637 \text{ g}) * (18410 \text{ dps}) * (59.9 \text{ dpm/dps}) / (5.09582 \text{ g} * 100 \text{ mL}) = 10525.2716 \text{ dpm/mL}$
$(4.8637 \text{ g}) * (18410 \text{ dps}) * (59.9 \text{ dpm/dps}) / (1.0137 \text{ g/mL}) / (5.09582 \text{ g} * 100 \text{ mL}) = 10382.8223 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
-----------	----------	--------------	---------------	------	-------------	-------------------	-----------------

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

*Amanda Fehr*

# CERTIFICATE OF CALIBRATION

## Standard Radionuclide Source

69415-278

Sr-90 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Sr-90
ACTIVITY (dps):	3.811 E4
HALF-LIFE:	28.79 years
CALIBRATION DATE:	October 28, 2004 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	2.0%

Impurities:  $\gamma$ -impurities <0.1%

5.06266 grams 0.1M HCl solution with 30  $\mu$ g/g Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

P O NUMBER 3248RD, Item 1

SOURCE PREPARED BY:

M. Taskaeva  
M. Taskaeva, Radiochemist

Q A APPROVED:

[Signature] 10-28-2004

RECEIVED  
11/10/04

*[Handwritten signature]*



# Standard Traceability Log Rad

Source Material Info	
Parent Code:	0717
Prepared By:	Angela Albee
Carrier Conc:	0.1 M HCL
Reference Date:	10/28/2004
Ampoule Mass (g):	5.06266 g
Uncertainty:	+/- 2 %
LogBook No:	RC S 039 001

A Solution Material Info	
Isotope:	Strontium-90
Prepared By:	Angela Albee
Prep Date:	11/01/2004
Verification Date:	11/01/2004
Expiration Date:	11/01/2005
Primary Code:	0717-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.74 g
Density(g/mL):	0.9998

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.74 \text{ g}) * (38110 \text{ dps}) * (59.9 \text{ dpm/dps}) / (5.06266 \text{ g} * 100 \text{ mL}) = 21372.9934 \text{ dpm/mL}$
$(4.74 \text{ g}) * (38110 \text{ dps}) * (59.9 \text{ dpm/dps}) / (0.9998 \text{ g/mL}) / (5.06266 \text{ g} * 100 \text{ mL}) = 21377.5258 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
-----------	----------	--------------	---------------	------	-------------	-------------------	-----------------

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

*Angela Albee*

**Isotope Products  
Laboratories**

24937 Avenue Tibbitts  
Valencia, California 91355

0685

An Eckert & Ziegler Company

Tel 661-309-1010  
Fax 661-257-8303

**RECEIVED**  
15/24/04

**CERTIFICATE OF CALIBRATION  
ALPHA STANDARD SOLUTION**

Radionuclide:	Po-210	Customer:	GENERAL ENGINEERING LABS
Half-life:	138.376 ± 0.002 days	P.O. No.:	3242RD
Catalog No.:	7310	Reference Date:	1-Jun-04 12:00 PST
Source No.:	1066-2	Contained Radioactivity:	9.153 $\mu$ Ci 338.7 kBq

**Physical Description:**

A. Mass of solution:	5.16490 g in 5 mL flame-sealed ampoule
B. Chemical form:	PoCl <sub>4</sub> in 2M HCl
C. Carrier content:	None
D. Density:	1.033 g/mL @ 20°C

**Radioimpurities:**

None detected

**RECEIVED**  
15/24/04  
Tew

Radionuclide Concentration: 1.772  $\mu$ Ci/g, 65.56 kBq/g

**Method of Calibration:**

This source was prepared from a weighed aliquot of solution whose activity in  $\mu$ Ci/g was determined using a liquid scintillation counter.

**Uncertainty of Measurement:**

A. Type A (random) uncertainty:	± 1.5 %
B. Type B (systematic) uncertainty:	± 3.0 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.4 %

**Notes:**

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from NCRP Report No. 58, 1985.
- This solution has a working life of 9 months.

*Daniel James Van Dalsen*  
Quality Control

17-May-04  
Date

IPL Ref. No.: 1066-2

*my/30/04*  
*pr 2/2/04*

ISO 9001 CERTIFIED

Medical Imaging Laboratory  
24937 Avenue Tibbitts Valencia, California 91355

Industrial Gauging Laboratory  
1800 North Keystone Street Burbank, California 91504



THE LEAK TEST(S) INDICATED BY THE CHECKED BOX(ES)  
WAS(WERE) APPLIED TO DETERMINE THE INTEGRITY OF THE  
SOURCE DESCRIBED ON THE FRONT SIDE

**Standard Wipe Test**

The source is wiped over its entire surface with a moistened filter paper disk. After drying, the disk is checked for activity using a windowless proportional counter or end-window G.M. tube. Activity levels exceeding 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha are cause for rejection of the source.

**Special Wipe Test**

The source is wiped over its entire surface with moistened polystyrene. The polystyrene is then dissolved in a cocktail and counted in a liquid scintillation counter. An activity level exceeding 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha is cause for rejection of the source.

**Soak Test**

The source is immersed in distilled water and maintained at  $50 \pm 10^\circ\text{C}$  for a minimum of four hours or at room temperature for a minimum of 12 hours. After removal of the source, the liquid is a) checked for activity using a liquid scintillation counter, or b) evaporated in a planchet and the residue is checked for activity using a windowless proportional counter or end-window G.M. tube. An activity level exceeding 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha is cause for rejection of the source.

**Vacuum Bubble Test**

The source is submerged completely in isopropanol to a depth of at least 5 cm below the liquid level in a suitable vacuum chamber between 15 and 25 kPa (113 and 188 mm Hg) absolute. Observe for bubble(s) over a period of 2 minutes. After the removal of the source, the liquid is checked for activity using a liquid scintillation counter. If bubbles are observed and/or an activity level exceeds 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha, the source is rejected.

**Gas Source Test**

The source is placed in a vacuum desiccator and maintained at a pressure less than 10 mm Hg for not less than 12 hours. The activity is checked by introducing air into the desiccator and monitoring the air with an end-window G.M. tube. An activity level exceeding 0.001  $\mu\text{Ci}$  beta-gamma is cause for rejection of the source.

**Ampule Leak Test**

The ampule is kept in an inverted position on a filter paper disk or polystyrene wipe for a minimum of 16 hours. The wipe is then checked for activity using a windowless proportional counter, end-window G.M. tube, or liquid scintillation counter. Activity levels exceeding 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha are cause for rejection of the source.

**Bubble Leak Test**

The container is pressurized to its fill pressure; then soapy water is applied over its valve and neck or, the valve and neck of the vessel is immersed in water. If no growing bubbles are observed, the container is considered leak free.

**Leak Test Not Applicable**

The active area of the source is uncovered or is protected by a very thin coating. Although the deposit is adherent, it is not designed or certified to pass a standard leak test. The inactive portions of the source have been checked using the standard wipe test. Levels of removable activity did not exceed 0.001  $\mu\text{Ci}$  beta-gamma or 0.0001  $\mu\text{Ci}$  alpha at the time of shipment.

**Wipe Test for Industrial Ni-63 Sources**

The sources are wipe tested by an approved sampling plan which may call for either 100% of the batch to be individually wipe tested, or, a subset thereof. The results are recorded on the front of this form.

**Other Leak Test**

*ms/12/01*  
*ms/12/01*

# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0685	Isotope:	Polonium-210
Prepared By:	Amanda Fehr	Prepared By:	Amanda Fehr
Carrier Conc:	2M HCl	Prep Date:	05/25/2004
Reference Date:	06/01/2004	Verification Date:	05/25/2004
Ampoule Mass (g):	5.1649 g	Expiration Date:	05/25/2005
Uncertainty:	+/- 3.4 %	Primary Code:	0685-A
LogBook No:	RC-S-037-084	Dilution(mL):	100 mL
		Mass of Parent(g):	4.855 g
		Specific Volume:	0.9688

### Calculations Converting parent activity to dpm/mL | dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / (\text{Dilution Vol}) * (\text{Specific Volume}) = \text{Parent Activity (dpm/g)}$
$(4.855 \text{ g}) * (1.772 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (100 \text{ mL}) = 190987.9320 \text{ dpm/mL}$
$(4.855 \text{ g}) * (1.772 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (100 \text{ mL}) * (0.9688) = 185021.5420 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
06/08/2004	Amanda Fehr	.7367	100	0685-B	1363.0537 dpm/mL	06/11/2004	06/11/2005
06/10/2004	Amanda Fehr	.7367	100	0685-C	1318.4635 dpm/mL	06/11/2004	06/11/2005
06/16/2004	Amanda Fehr	.135	100	0685-D	249.779 dpm/mL	06/16/2004	06/16/2005

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

*Handwritten signatures and date:*  
6/18/2004 2:35 PM

# Verification for Po-210 Standard 0685-A

A. Fehr 6/2/2004	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard	Source DPM/ml
						Vol. Used (ml)	
	0685-A N1	18517.7000	2.5000	18515.2000	0.99345189	0.1000	186372.388
	0685-A N2	18411.3000	2.5000	18408.8000	0.99345189	0.1000	185301.3729
	0685-A N3	18544.1000	2.5000	18541.6000	0.99345189	0.1000	186638.1261

Mean Value (Counting) = 186103.9817  
 Stdev = 707.6482167

97.70% % of known

Certificate Value = 190489.00  
 Lower Limit = 184888.6652  
 Upper Limit = 187519.2581  
 Rule 1 Pass/Fail Pass  
 Two sigma = 1415.296433  
 10 % of Mean = 18610.39817  
 Rule 2 (Pass/Fail) Pass

Pass Fail\*

\*Exception taken for this rule because 97.7% of standard was recovered and all other rules were met.

### Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

The analyst prepared three standard verification sources for Po-210 source 0685-A by transferring portions of the standard by pipette to glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1.0 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 32 for Po-210 source standard verification. The Po-210 efficiency calibration which was used for verification calculations was performed on 3/5/04 using source 0485-A (Po-210). Calibration data is recorded in this logbook under Po-210 0485-A. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

*Amanda L. Fehr 6/3/04*

*particular  
 procedure*

PROTOCOL : 32 Po-210 Std Ver  
DATE : 2004/06/02  
TIME : 00:32  
ID : P32AS072

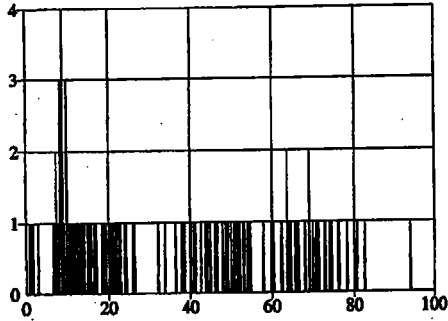
Wallac 1414 WinSpectral v1.30 S/N 4140127  
Counting mode : CPM  
Isotope(s) : Po210  
Po210 = 400- 900,Alpha,138.40 d  
Protocol name : Po-210 Std Ver  
Counting time : 300  
Repeats : 1  
Cycles : 1  
Replicates : 1  
2 sigma % : 0.01  
Minimum cpm : 0.00 Checking time: 10  
Advanced modes : PSA,Chemilum  
PSA level : 100  
Output to Display :  
POS,CTIME,DATE,TIME,RACKPOS,CPMw1,CPM,SQPI,CPM1  
Additions to Display : Spectrum,Header,Listing  
Spectrum : Beta,Alpha  
Window 1 : 400- 900 /Alpha  
Window 2 : 1-1024 /Beta  
Window 3 : 1-1024 /Beta  
Window 4 : 1-1024 /Beta  
Window 5 : 1-1024 /Beta  
Window 6 : 1-1024 /Beta  
FNCT1 = FNCT1 :  
FNCT2 = FNCT2 :  
FNCT3 = FNCT3 :  
FNCT4 = FNCT4 :

Total count rate:  
Po210 55475.6 CPM

AF 6/3/04  
out 6/2/04  
6/3/04

per 7/2/04  
per 8/2/04

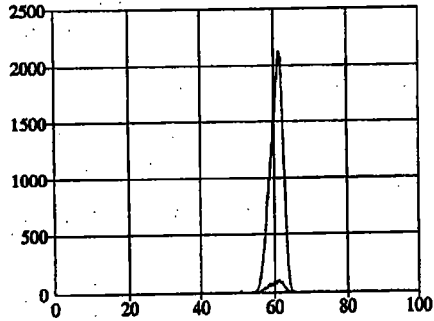
POS	CTIME	DATE	TIME	RACKPOS	CPMW1
1	300	6/2/2004	0:32 AM	1	2.50



Counts Beta

Counts Alpha

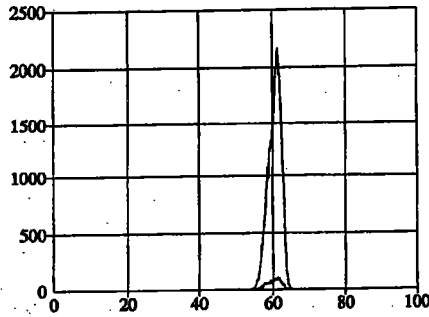
2	300	6/2/2004	0:38 AM	2	18517.70
---	-----	----------	---------	---	----------



Counts Beta

Counts Alpha

3	300	6/2/2004	0:43 AM	3	18411.30
---	-----	----------	---------	---	----------



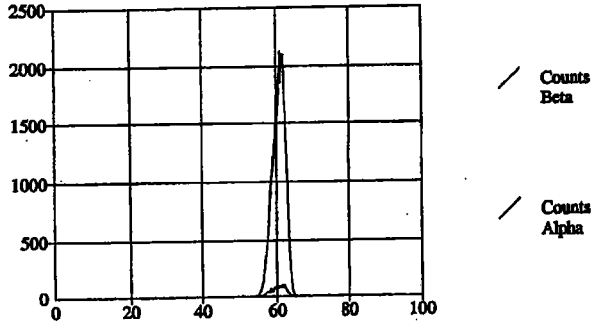
Counts Beta

Counts Alpha

OLF 6/3/04

*Montzela  
6/2/04*

POS	CTIME	DATE	TIME	RACKPOS	CPMW1
4	300	6/2/2004	0:49 AM	4	18544.10



QWF 613104

*mg 7/2/04  
mg 8/30/04*

**General Engineering Laboratories  
Calibration Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-001/001B Isotope Th-230  
 Date Standards Prepared 8/17/05 Cocktail Type Used N/A  
 Standard ID 0695-A Matrix of Vial/Planchett concentric ring SS.  
 Amount Used (g or ml) 2.0  
 Standard Activity (DPM/g or mL) 10542.7 Type of Scintillation Vial N/A  
 Reference Date 8/10/04 Pipette ID Used 1429303  
 Expiration Date 5/26/06 Balance ID Used 38080204  
 Residue/Carrier Agent BaCl<sub>2</sub> Quenching Agent N/A

Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
<del>S1 T1</del>	0.0	7.4496	7.4497	0.1
<del>S2 T2</del>	0.1	7.4018	7.4056	4.0
<del>S3 T3</del>	0.2	7.4414	7.4485	7.1
<del>S4 T4</del>	0.3	7.4090	7.4206	11.6
<del>S5 T5</del>	0.5	7.3665	7.3852	18.7
<del>T6</del>	0.7	7.4575	7.4838	26.3
<del>T7</del>	1.0	7.4538	7.4915	37.7
<del>T8</del>	1.2	7.4499	7.4955	45.6
<del>T9</del>	1.5	7.4331	7.4896	56.5
<del>T10</del>	2.0	7.4500	7.5247	74.7
<del>T11</del>	2.5	7.3815	7.4756	94.1
<del>T12</del>	3.0	7.4545	7.5603	105.8

Prepared By: [Signature] Date 8/30/05  
 Reviewed By: [Signature] Date 8/30/05

Rev 1 RLM 9/10/97

ALPHAEFF.XLS

Detector	Weight (mg)	Th-230	2 ml	0695-A	ACTIVITY:	21085.6	Alpha Bkg.	Voltage	Date/Time
Sample I.D.	Act. Time	Alpha	Beta	Alpha CPM	Alpha Eff.	Alpha Bkg.	Voltage	Date/Time	
A1	0	1	24973	3920	4994.6	0.236873	7.48	1470	8/18/05 9:11
A1	4	2	24419	3434	4883.8	0.231618	7.48	1470	8/18/05 9:39
A1	7.1	3	23887	2929	4777.4	0.226572	7.48	1470	8/18/05 9:33
A1	11.6	4	23594	3451	4718.8	0.223793	7.48	1470	8/18/05 9:17
A1	18.7	5	21140	2990	4228	0.200516	7.48	1470	8/18/05 11:28
A1	26.3	6	19744	3238	3948.8	0.187275	7.48	1470	8/18/05 11:54
A1	37.7	7	17389	2656	3477.8	0.164937	7.48	1470	8/18/05 11:47
A1	45.6	8	16160	2724	3232	0.15328	7.48	1470	8/18/05 11:39
A1	56.5	9	15403	2382	3080.6	0.1461	7.48	1470	8/18/05 10:48
A1	74.7	10	14859	2779	2971.8	0.14094	7.48	1470	8/18/05 11:15
A1	94.1	11	14638	1887	2927.6	0.138844	7.48	1470	8/18/05 11:09
A1	105.8	12	11047	2729	2209.4	0.104782	7.48	1470	8/18/05 11:00
A2	0	1	25917	3850	5183.4	0.245827	0.144	1470	8/18/05 9:17
A2	4	2	23582	3301	4716.4	0.223679	0.144	1470	8/18/05 9:11
A2	7.1	3	22887	3064	4577.4	0.217087	0.144	1470	8/18/05 9:39
A2	11.6	4	21866	3440	4373.2	0.207402	0.144	1470	8/18/05 9:33
A2	18.7	5	20020	3005	4004	0.189893	0.144	1470	8/18/05 11:39
A2	26.3	6	19616	3047	3923.2	0.186061	0.144	1470	8/18/05 11:28
A2	37.7	7	18864	2592	3772.8	0.178928	0.144	1470	8/18/05 11:54
A2	45.6	8	17616	2830	3523.2	0.16709	0.144	1470	8/18/05 11:47
A2	56.5	9	15883	2409	3176.6	0.150653	0.144	1470	8/18/05 11:00
A2	74.7	10	14866	2593	2973.2	0.141006	0.144	1470	8/18/05 10:48
A2	94.1	11	14197	1926	2839.4	0.134661	0.144	1470	8/18/05 11:15
A2	105.8	12	11212	2685	2242.4	0.106347	0.144	1470	8/18/05 11:09
A3	0	1	26027	3874	5205.4	0.24687	0.124	1470	8/18/05 9:33
A3	4	2	24095	3517	4819	0.228545	0.124	1470	8/18/05 9:17
A3	7.1	3	23777	2952	4755.4	0.225528	0.124	1470	8/18/05 9:11
A3	11.6	4	22115	3395	4423	0.209764	0.124	1470	8/18/05 9:39
A3	18.7	5	20556	2860	4111.2	0.194977	0.124	1470	8/18/05 11:47
A3	26.3	6	20294	2926	4058.8	0.192492	0.124	1470	8/18/05 11:39

*just to show*



ALPHAEFF.XLS

A3	37.7	7	5	19561	2628	3912.2	0.185539	0.124	1470	8/18/05 11:28
A3	45.6	8	5	17978	2962	3595.6	0.170524	0.124	1470	8/18/05 11:54
A3	56.5	9	5	15977	2431	3195.4	0.151544	0.124	1470	8/18/05 11:09
A3	74.7	10	5	14849	2559	2969.8	0.140845	0.124	1470	8/18/05 11:00
A3	94.1	11	5	14187	1921	2837.4	0.134566	0.124	1470	8/18/05 10:48
A3	105.8	12	5	11302	2856	2260.4	0.107201	0.124	1470	8/18/05 11:15
A4	0	1	5	30227	643240	6045.4	0.286708	0.064	1470	8/18/05 9:40
A4	4	2	5	29977	418606	5995.4	0.284336	0.064	1470	8/18/05 9:33
A4	7.1	3	5	28337	14514	5667.4	0.268781	0.064	1470	8/18/05 9:17
A4	11.6	4	5	27065	5822	5413	0.256715	0.064	1470	8/18/05 9:11
A4	18.7	5	5	25913	2849305	5182.6	0.245789	0.064	1470	8/18/05 11:56
A4	26.3	6	5	25215	2837239	5043	0.239168	0.064	1470	8/18/05 11:49
A4	37.7	7	5	25019	264817	5003.8	0.237309	0.064	1470	8/18/05 11:39
A4	45.6	8	5	24341	9998026	4868.2	0.230878	0.064	1470	8/18/05 11:33
A4	56.5	9	5	20092	94553	4018.4	0.190576	0.064	1470	8/18/05 11:17
A4	74.7	10	5	19391	45734	3878.2	0.183926	0.064	1470	8/18/05 11:09
A4	94.1	11	5	16877	331471	3375.4	0.160081	0.064	1470	8/18/05 11:02
A4	105.8	12	5	16069	328954	3213.8	0.152417	0.064	1470	8/18/05 10:50
B1	0	1	5	30255	5062	6051	0.286973	0.15	1470	8/18/05 10:10
B1	4	2	5	27295	4291	5459	0.258897	0.15	1470	8/18/05 10:29
B1	7.1	3	5	26753	3975	5350.6	0.253756	0.15	1470	8/18/05 10:22
B1	11.6	4	5	25687	4091	5137.4	0.243645	0.15	1470	8/18/05 10:16
B1	18.7	5	5	23729	3621	4745.8	0.225073	0.15	1470	8/18/05 9:11
B1	26.3	6	5	23355	3910	4671	0.221526	0.15	1470	8/18/05 9:39
B1	37.7	7	5	21394	3266	4278.8	0.202925	0.15	1470	8/18/05 9:33
B1	45.6	8	5	18698	3733	3739.6	0.177353	0.15	1470	8/18/05 9:17
B1	56.5	9	5	17839	3162	3567.8	0.169206	0.15	1470	8/18/05 11:28
B1	74.7	10	5	16715	3035	3343	0.158544	0.15	1470	8/18/05 11:54
B1	94.1	11	5	16434	3107	3286.8	0.155879	0.15	1470	8/18/05 11:47
B1	105.8	12	5	16312	3153	3262.4	0.154722	0.15	1470	8/18/05 11:39
B2	0	1	5	30479	4294	6095.8	0.289098	0.05	1470	8/18/05 10:16
B2	4	2	5	27737	3841	5547.4	0.26309	0.05	1470	8/18/05 10:10
B2	7.1	3	5	27612	3485	5522.4	0.261904	0.05	1470	8/18/05 10:29
B2	11.6	4	5	26455	3506	5291	0.25093	0.05	1470	8/18/05 10:22

ALPHAEFF.XLS

B2	18.7	5	24193	3070	4838.6	0.229474	0.05	1470	8/18/05 9:17
B2	26.3	6	24149	3021	4829.8	0.229057	0.05	1470	8/18/05 9:11
B2	37.7	7	21753	2778	4350.6	0.20633	0.05	1470	8/18/05 9:39
B2	45.6	8	18544	3107	3708.8	0.175893	0.05	1470	8/18/05 9:33
B2	56.5	9	16637	1902	3327.4	0.157804	0.05	1470	8/18/05 11:39
B2	74.7	10	16294	2285	3258.8	0.154551	0.05	1470	8/18/05 11:28
B2	94.1	11	12560	2753	2512	0.119133	0.05	1470	8/18/05 11:54
B2	105.8	12	12445	1885	2489	0.118043	0.05	1470	8/18/05 11:47
B3	0	1	30284	4265	6056.8	0.287248	0.034	1470	8/18/05 10:22
B3	4	2	27763	3599	5552.6	0.263336	0.034	1470	8/18/05 10:16
B3	7.1	3	27457	3239	5491.4	0.260434	0.034	1470	8/18/05 10:10
B3	11.6	4	26408	3316	5281.6	0.250484	0.034	1470	8/18/05 10:29
B3	18.7	5	24545	2996	4909	0.232813	0.034	1470	8/18/05 9:33
B3	26.3	6	23918	3017	4783.6	0.226866	0.034	1470	8/18/05 9:17
B3	37.7	7	21620	2758	4324	0.205069	0.034	1470	8/18/05 9:11
B3	45.6	8	19615	2877	3923	0.186051	0.034	1470	8/18/05 9:39
B3	56.5	9	19353	2919	3870.6	0.183566	0.034	1470	8/18/05 11:47
B3	74.7	10	18277	2827	3655.4	0.17336	0.034	1470	8/18/05 11:39
B3	94.1	11	15995	2656	3199	0.151715	0.034	1470	8/18/05 11:28
B3	105.8	12	12305	1943	2461	0.116715	0.034	1470	8/18/05 11:54
B4	0	1	30387	4758	6077.4	0.288225	0.048	1470	8/18/05 10:29
B4	4	2	27484	4413	5496.8	0.26069	0.048	1470	8/18/05 10:22
B4	7.1	3	27096	3915	5419.2	0.25701	0.048	1470	8/18/05 10:16
B4	11.6	4	26153	4202	5230.6	0.248065	0.048	1470	8/18/05 10:10
B4	18.7	5	23748	3579	4749.6	0.225253	0.048	1470	8/18/05 9:39
B4	26.3	6	23669	3821	4733.8	0.224504	0.048	1470	8/18/05 9:33
B4	37.7	7	21343	3261	4268.6	0.202441	0.048	1470	8/18/05 9:17
B4	45.6	8	19200	3590	3840	0.182115	0.048	1470	8/18/05 9:11
B4	56.5	9	18446	3535	3689.2	0.174963	0.048	1470	8/18/05 11:54
B4	74.7	10	16999	2982	3399.8	0.161238	0.048	1470	8/18/05 11:47
B4	94.1	11	16876	2950	3375.2	0.160071	0.048	1470	8/18/05 11:39
B4	105.8	12	11702	2118	2340.4	0.110995	0.048	1470	8/18/05 11:28
C1	0	1	29350	3415	5870	0.278389	0.09	1470	8/18/05 10:48
C1	4	2	25419	3213	5083.8	0.241103	0.09	1470	8/18/05 11:15

C1	7.1	3	5	24232	3182	4846.4	0.229844	0.09	1470	8/18/05 11:09
C1	11.6	4	5	23901	4065	4780.2	0.226704	0.09	1470	8/18/05 11:00
C1	18.7	5	5	22314	2867	4462.8	0.211652	0.09	1470	8/18/05 10:09
C1	26.3	6	5	21564	3037	4312.8	0.204538	0.09	1470	8/18/05 10:29
C1	37.7	7	5	18766	2677	3753.2	0.177998	0.09	1470	8/18/05 10:22
C1	45.6	8	5	17948	2791	3589.6	0.170239	0.09	1470	8/18/05 10:16
C1	56.5	9	5	16986	2788	3397.2	0.161115	0.09	1470	8/18/05 9:11
C1	74.7	10	5	16044	2579	3208.8	0.15218	0.09	1470	8/18/05 9:39
C1	94.1	11	5	15348	2663	3069.6	0.145578	0.09	1470	8/18/05 9:33
C1	105.8	12	5	11901	1963	2380.2	0.112883	0.09	1470	8/18/05 9:17
C2	0	1	5	28312	4433	5662.4	0.268543	0.078	1470	8/18/05 11:00
C2	4	2	5	24513	4147	4902.6	0.232509	0.078	1470	8/18/05 10:48
C2	7.1	3	5	23534	4507	4706.8	0.223223	0.078	1470	8/18/05 11:15
C2	11.6	4	5	22812	5289	4562.4	0.216375	0.078	1470	8/18/05 11:09
C2	18.7	5	5	21443	3928	4288.6	0.20339	0.078	1470	8/18/05 10:16
C2	26.3	6	5	21009	4102	4201.8	0.199273	0.078	1470	8/18/05 10:09
C2	37.7	7	5	18697	3369	3739.4	0.177344	0.078	1470	8/18/05 10:29
C2	45.6	8	5	17223	3557	3444.6	0.163363	0.078	1470	8/18/05 10:22
C2	56.5	9	5	16412	3503	3282.4	0.15567	0.078	1470	8/18/05 9:17
C2	74.7	10	5	15629	3111	3125.8	0.148243	0.078	1470	8/18/05 9:11
C2	94.1	11	5	14659	3340	2931.8	0.139043	0.078	1470	8/18/05 9:39
C2	105.8	12	5	11406	2548	2281.2	0.108188	0.078	1470	8/18/05 9:33
C3	0	1	5	28537	4125	5707.4	0.270678	0.076	1470	8/18/05 11:09
C3	4	2	5	24734	3764	4946.8	0.234606	0.076	1470	8/18/05 11:00
C3	7.1	3	5	24517	3902	4903.4	0.232547	0.076	1470	8/18/05 10:48
C3	11.6	4	5	23641	4727	4728.2	0.224238	0.076	1470	8/18/05 11:15
C3	18.7	5	5	21587	3394	4317.4	0.204756	0.076	1470	8/18/05 10:22
C3	26.3	6	5	21508	3675	4301.6	0.204007	0.076	1470	8/18/05 10:16
C3	37.7	7	5	18683	3035	3736.6	0.177211	0.076	1470	8/18/05 10:09
C3	45.6	8	5	17703	3235	3540.6	0.167916	0.076	1470	8/18/05 10:29
C3	56.5	9	5	16020	3393	3204	0.151952	0.076	1470	8/18/05 9:33
C3	74.7	10	5	15816	3008	3163.2	0.150017	0.076	1470	8/18/05 9:17
C3	94.1	11	5	15256	2942	3051.2	0.144705	0.076	1470	8/18/05 9:11
C3	105.8	12	5	11504	2139	2300.8	0.109117	0.076	1470	8/18/05 9:39

*pm 8/30/05*

C4	0	1	5	28199	4625	5639.8	0.267472	0.048	1470	8/18/05 11:15
C4	4	2	5	24788	4339	4957.6	0.235118	0.048	1470	8/18/05 11:09
C4	7.1	3	5	24229	4482	4845.8	0.229816	0.048	1470	8/18/05 11:00
C4	11.6	4	5	23523	5418	4704.6	0.223119	0.048	1470	8/18/05 10:48
C4	18.7	5	5	21938	3884	4387.6	0.208085	0.048	1470	8/18/05 10:29
C4	26.3	6	5	21449	4254	4289.8	0.203447	0.048	1470	8/18/05 10:22
C4	37.7	7	5	18019	3494	3603.8	0.170913	0.048	1470	8/18/05 10:16
C4	45.6	8	5	17280	3918	3456	0.163903	0.048	1470	8/18/05 10:09
C4	56.5	9	5	16782	3619	3356.4	0.15918	0.048	1470	8/18/05 9:39
C4	74.7	10	5	16042	3384	3208.4	0.152161	0.048	1470	8/18/05 9:33
C4	94.1	11	5	15222	3364	3044.4	0.144383	0.048	1470	8/18/05 9:17
C4	105.8	12	5	11500	2561	2300	0.109079	0.048	1470	8/18/05 9:11
D1	0	1	5	30819	4857	6163.8	0.292323	0.09	1470	8/18/05 11:28
D1	4	2	5	28744	4492	5748.8	0.272641	0.09	1470	8/18/05 11:54
D1	7.1	3	5	26236	4022	5247.2	0.248852	0.09	1470	8/18/05 11:47
D1	11.6	4	5	25215	4033	5043	0.239168	0.09	1470	8/18/05 11:39
D1	18.7	5	5	24904	3621	4980.8	0.236218	0.09	1470	8/18/05 10:48
D1	26.3	6	5	24749	3338	4949.8	0.234748	0.09	1470	8/18/05 11:15
D1	37.7	7	5	22517	3673	4503.4	0.213577	0.09	1470	8/18/05 11:09
D1	45.6	8	5	19027	3567	3805.4	0.180474	0.09	1470	8/18/05 11:00
D1	56.5	9	5	18977	3307	3795.4	0.18	0.09	1470	8/18/05 10:09
D1	74.7	10	5	17886	2874	3577.2	0.169651	0.09	1470	8/18/05 10:29
D1	94.1	11	5	17631	3320	3526.2	0.167233	0.09	1470	8/18/05 10:22
D1	105.8	12	5	13296	2224	2659.2	0.126115	0.09	1470	8/18/05 10:16
D2	0	1	5	28245	5093	5649	0.267908	0.064	1470	8/18/05 11:39
D2	4	2	5	28202	5113	5640.4	0.2675	0.064	1470	8/18/05 11:28
D2	7.1	3	5	28174	4594	5634.8	0.267235	0.064	1470	8/18/05 11:54
D2	11.6	4	5	26519	4894	5303.8	0.251537	0.064	1470	8/18/05 11:47
D2	18.7	5	5	25009	4677	5001.8	0.237214	0.064	1470	8/18/05 11:00
D2	26.3	6	5	24409	3939	4881.8	0.231523	0.064	1470	8/18/05 10:48
D2	37.7	7	5	22151	4418	4430.2	0.210105	0.064	1470	8/18/05 11:15
D2	45.6	8	5	20001	4398	4000.2	0.189712	0.064	1470	8/18/05 11:09
D2	56.5	9	5	18682	4048	3736.4	0.177202	0.064	1470	8/18/05 10:16
D2	74.7	10	5	17485	3418	3497	0.165848	0.064	1470	8/18/05 10:09
D2	94.1	11	5	16267	3869	3253.4	0.154295	0.064	1470	8/18/05 10:29

ALPHAEFF.XLS

D2	105.8	12	5	13141	2819	2628.2	0.124644	0.064	1470	8/18/05 10:22
D3	0	1	5	30835	4993	6167	0.292474	0.06	1470	8/18/05 11:47
D3	4	2	5	30565	5001	6113	0.289913	0.06	1470	8/18/05 11:39
D3	7.1	3	5	27194	4200	5438.8	0.257939	0.06	1470	8/18/05 11:28
D3	11.6	4	5	25972	4337	5194.4	0.246348	0.06	1470	8/18/05 11:54
D3	18.7	5	5	24418	3910	4883.6	0.231608	0.06	1470	8/18/05 11:09
D3	26.3	6	5	24017	3329	4803.4	0.227805	0.06	1470	8/18/05 11:00
D3	37.7	7	5	21662	3762	4332.4	0.205467	0.06	1470	8/18/05 10:48
D3	45.6	8	5	19368	3670	3873.6	0.183708	0.06	1470	8/18/05 11:15
D3	56.5	9	5	18506	3552	3701.2	0.175532	0.06	1470	8/18/05 10:22
D3	74.7	10	5	17698	3156	3539.6	0.167868	0.06	1470	8/18/05 10:16
D3	94.1	11	5	15823	3142	3164.6	0.150083	0.06	1470	8/18/05 10:09
D3	105.8	12	5	12731	2431	2546.2	0.120755	0.06	1470	8/18/05 10:29
D4	0	1	5	31076	5646	6215.2	0.29476	0.092	1470	8/18/05 11:54
D4	4	2	5	28384	5099	5676.8	0.269226	0.092	1470	8/18/05 11:47
D4	7.1	3	5	28171	4899	5634.2	0.267206	0.092	1470	8/18/05 11:39
D4	11.6	4	5	27872	4823	5574.4	0.26437	0.092	1470	8/18/05 11:28
D4	18.7	5	5	26580	4419	5316	0.252115	0.092	1470	8/18/05 11:15
D4	26.3	6	5	24409	3748	4881.8	0.231523	0.092	1470	8/18/05 11:09
D4	37.7	7	5	22085	4113	4417	0.209479	0.092	1470	8/18/05 11:00
D4	45.6	8	5	19840	4136	3968	0.188185	0.092	1470	8/18/05 10:48
D4	56.5	9	5	18777	3933	3755.4	0.178103	0.092	1470	8/18/05 10:29
D4	74.7	10	5	17788	3643	3557.6	0.168722	0.092	1470	8/18/05 10:22
D4	94.1	11	5	17637	3664	3527.4	0.16729	0.092	1470	8/18/05 10:16
D4	105.8	12	5	12247	2503	2449.4	0.116165	0.092	1470	8/18/05 10:09
E1	0	1	5	31311	4188	6262.2	0.296989	0.094	1470	8/18/05 12:03
E1	4	2	5	28599	3781	5719.8	0.271266	0.094	1470	8/18/05 12:20
E1	7.1	3	5	28233	3518	5646.6	0.267794	0.094	1470	8/18/05 12:15
E1	11.6	4	5	26093	3404	5218.6	0.247496	0.094	1470	8/18/05 12:09
E1	18.7	5	5	24726	3087	4945.2	0.234453	0.094	1470	8/18/05 13:15
E1	26.3	6	5	24537	3094	4907.4	0.232737	0.094	1470	8/18/05 13:33
E1	37.7	7	5	22561	2910	4512.2	0.213994	0.094	1470	8/18/05 13:27
E1	45.6	8	5	19842	3056	3968.4	0.188204	0.094	1470	8/18/05 13:21
E1	56.5	9	5	18915	3016	3783	0.179412	0.094	1470	8/18/05 12:51

ALPHAEFF.XLS

E1	74.7	10	5	17729	2555	3545.8	0.168162	0.094	1470	8/18/05 13:09
E1	94.1	11	5	17246	2892	3449.2	0.163581	0.094	1470	8/18/05 13:03
E1	105.8	12	5	13075	2033	2615	0.124018	0.094	1470	8/18/05 12:57
E2	0	1	5	30785	5160	6157	0.292	0.082	1470	8/18/05 12:09
E2	4	2	5	28194	4639	5638.8	0.267424	0.082	1470	8/18/05 12:03
E2	7.1	3	5	27623	4189	5524.6	0.262008	0.082	1470	8/18/05 12:20
E2	11.6	4	5	25553	4281	5110.6	0.242374	0.082	1470	8/18/05 12:15
E2	18.7	5	5	24158	3900	4831.6	0.229142	0.082	1470	8/18/05 13:21
E2	26.3	6	5	24086	3909	4817.2	0.228459	0.082	1470	8/18/05 13:15
E2	37.7	7	5	21844	3478	4368.8	0.207194	0.082	1470	8/18/05 13:33
E2	45.6	8	5	19389	3725	3877.8	0.183908	0.082	1470	8/18/05 13:27
E2	56.5	9	5	18501	3549	3700.2	0.175485	0.082	1470	8/18/05 12:57
E2	74.7	10	5	17503	3039	3500.6	0.166019	0.082	1470	8/18/05 12:51
E2	94.1	11	5	17253	3496	3450.6	0.163647	0.082	1470	8/18/05 13:09
E2	105.8	12	5	12746	2431	2549.2	0.120898	0.082	1470	8/18/05 13:03
E3	0	1	5	31152	3899	6230.4	0.295481	0.056	1470	8/18/05 12:15
E3	4	2	5	28483	3530	5696.6	0.270165	0.056	1470	8/18/05 12:09
E3	7.1	3	5	28366	3324	5673.2	0.269056	0.056	1470	8/18/05 12:03
E3	11.6	4	5	26173	3197	5234.6	0.248255	0.056	1470	8/18/05 12:20
E3	18.7	5	5	24742	2760	4948.4	0.234681	0.056	1470	8/18/05 13:27
E3	26.3	6	5	24687	2858	4937.4	0.23416	0.056	1470	8/18/05 13:21
E3	37.7	7	5	22118	2657	4423.6	0.209792	0.056	1470	8/18/05 13:15
E3	45.6	8	5	19984	2873	3996.8	0.189551	0.056	1470	8/18/05 13:33
E3	56.5	9	5	18660	2736	3732	0.176993	0.056	1470	8/18/05 13:03
E3	74.7	10	5	18096	2388	3619.2	0.171643	0.056	1470	8/18/05 12:57
E3	94.1	11	5	17428	2723	3485.6	0.165307	0.056	1470	8/18/05 12:51
E3	105.8	12	5	12832	1868	2566.4	0.121713	0.056	1470	8/18/05 13:09
E4	0	1	5	31551	4553	6310.2	0.299266	0.098	1470	8/18/05 12:20
E4	4	2	5	28773	4052	5754.6	0.272916	0.098	1470	8/18/05 12:15
E4	7.1	3	5	28490	3670	5698	0.270232	0.098	1470	8/18/05 12:09
E4	11.6	4	5	26165	3778	5233	0.248179	0.098	1470	8/18/05 12:03
E4	18.7	5	5	24643	3202	4928.6	0.233742	0.098	1470	8/18/05 13:33
E4	26.3	6	5	24637	3443	4927.4	0.233686	0.098	1470	8/18/05 13:27
E4	37.7	7	5	22297	3064	4459.4	0.21149	0.098	1470	8/18/05 13:21

ALPHAEFF.XLS

E4	45.6	8	5	19362	3423	3872.4	0.183651	0.098	1470	8/18/05 13:15
E4	56.5	9	5	18758	3065	3751.6	0.177922	0.098	1470	8/18/05 13:09
E4	74.7	10	5	17998	2729	3599.6	0.170714	0.098	1470	8/18/05 13:03
E4	94.1	11	5	17266	3045	3453.2	0.163771	0.098	1470	8/18/05 12:57
E4	105.8	12	5	13077	2227	2615.4	0.124037	0.098	1470	8/18/05 12:51
F1	0	1	5	30096	3971	6019.2	0.285465	0.086	1470	8/18/05 12:27
F1	4	2	5	27260	3650	5452	0.258565	0.086	1470	8/18/05 12:45
F1	7.1	3	5	26805	3022	5361	0.254249	0.086	1470	8/18/05 12:39
F1	11.6	4	5	25884	3028	5176.8	0.245514	0.086	1470	8/18/05 12:33
F1	18.7	5	5	23892	2802	4778.4	0.226619	0.086	1470	8/18/05 12:03
F1	26.3	6	5	23349	2804	4669.8	0.221469	0.086	1470	8/18/05 12:20
F1	37.7	7	5	21648	2562	4329.6	0.205334	0.086	1470	8/18/05 12:15
F1	45.6	8	5	19004	2716	3800.8	0.180256	0.086	1470	8/18/05 12:09
F1	56.5	9	5	18023	2947	3604.6	0.170951	0.086	1470	8/18/05 13:15
F1	74.7	10	5	16675	2273	3335	0.158165	0.086	1470	8/18/05 13:33
F1	94.1	11	5	16584	2602	3316.8	0.157302	0.086	1470	8/18/05 13:27
F1	105.8	12	5	12340	1897	2468	0.117047	0.086	1470	8/18/05 13:21
F2	0	1	5	30317	5497	6063.4	0.287561	0.152	1470	8/18/05 12:33
F2	4	2	5	27867	5042	5573.4	0.264323	0.152	1470	8/18/05 12:27
F2	7.1	3	5	27812	4324	5562.4	0.263801	0.152	1470	8/18/05 12:45
F2	11.6	4	5	26587	4273	5317.4	0.252182	0.152	1470	8/18/05 12:39
F2	18.7	5	5	24718	4032	4943.6	0.234454	0.152	1470	8/18/05 12:09
F2	26.3	6	5	24390	3850	4878	0.231343	0.152	1470	8/18/05 12:03
F2	37.7	7	5	21636	3577	4327.2	0.205221	0.152	1470	8/18/05 12:20
F2	45.6	8	5	19155	3831	3831	0.181688	0.152	1470	8/18/05 12:15
F2	56.5	9	5	18599	4000	3719.8	0.176414	0.152	1470	8/18/05 13:21
F2	74.7	10	5	17854	3212	3570.8	0.169348	0.152	1470	8/18/05 13:15
F2	94.1	11	5	17058	3456	3411.6	0.161798	0.152	1470	8/18/05 13:33
F2	105.8	12	5	13023	2300	2604.6	0.123525	0.152	1470	8/18/05 13:27
F3	0	1	5	29705	6163	5941	0.281756	0.116	1470	8/18/05 12:39
F3	4	2	5	27049	5511	5409.8	0.256564	0.116	1470	8/18/05 12:33
F3	7.1	3	5	26818	5016	5363.6	0.254373	0.116	1470	8/18/05 12:27
F3	11.6	4	5	25181	5362	5036.2	0.238845	0.116	1470	8/18/05 12:45
F3	18.7	5	5	23823	4515	4764.6	0.225965	0.116	1470	8/18/05 12:15

ALPHAEFF.XLS

F3	26.3	6	5	23493	4672	4698.6	0.222835	0.116	1470	8/18/05 12:09
F3	37.7	7	5	21190	4076	4238	0.20099	0.116	1470	8/18/05 12:03
F3	45.6	8	5	19046	4328	3809.2	0.180654	0.116	1470	8/18/05 12:20
F3	56.5	9	5	18039	4351	3607.8	0.171103	0.116	1470	8/18/05 13:27
F3	74.7	10	5	17066	3772	3413.2	0.161874	0.116	1470	8/18/05 13:21
F3	94.1	11	5	16638	3924	3327.6	0.157814	0.116	1470	8/18/05 13:15
F3	105.8	12	5	12420	2771	2484	0.117806	0.116	1470	8/18/05 13:33
F4	0	1	5	30937	4777	6187.4	0.293442	0.174	1470	8/18/05 12:45
F4	4	2	5	28272	4330	5654.4	0.268164	0.174	1470	8/18/05 12:39
F4	7.1	3	5	28173	3720	5634.6	0.267225	0.174	1470	8/18/05 12:33
F4	11.6	4	5	26615	3845	5323	0.252447	0.174	1470	8/18/05 12:27
F4	18.7	5	5	24778	3418	4955.6	0.235023	0.174	1470	8/18/05 12:20
F4	26.3	6	5	24556	3483	4911.2	0.232917	0.174	1470	8/18/05 12:15
F4	37.7	7	5	22379	3217	4475.8	0.212268	0.174	1470	8/18/05 12:09
F4	45.6	8	5	19296	3348	3859.2	0.183025	0.174	1470	8/18/05 12:03
F4	56.5	9	5	18604	3425	3720.8	0.176462	0.174	1470	8/18/05 13:33
F4	74.7	10	5	18123	2847	3624.6	0.171899	0.174	1470	8/18/05 13:27
F4	94.1	11	5	17466	3125	3493.2	0.165668	0.174	1470	8/18/05 13:21
F4	105.8	12	5	13186	2041	2637.2	0.125071	0.174	1470	8/18/05 13:15
G1	0	1	5	27641	3993	5528.2	0.262179	0.056	1470	8/18/05 12:51
G1	4	2	5	24577	3482	4915.4	0.233116	0.056	1470	8/18/05 13:09
G1	7.1	3	5	24156	3111	4831.2	0.229123	0.056	1470	8/18/05 13:03
G1	11.6	4	5	23511	3273	4702.2	0.223005	0.056	1470	8/18/05 12:57
G1	18.7	5	5	21871	2953	4374.2	0.20745	0.056	1470	8/18/05 12:27
G1	26.3	6	5	20681	2984	4136.2	0.196162	0.056	1470	8/18/05 12:45
G1	37.7	7	5	19040	2557	3808	0.180597	0.056	1470	8/18/05 12:39
G1	45.6	8	5	17131	2797	3426.2	0.16249	0.056	1470	8/18/05 12:33
G1	56.5	9	5	16239	2687	3247.8	0.154029	0.056	1470	8/18/05 12:03
G1	74.7	10	5	15745	2360	3149	0.149344	0.056	1470	8/18/05 12:20
G1	94.1	11	5	15663	2612	3132.6	0.148566	0.056	1470	8/18/05 12:15
G1	105.8	12	5	11860	1859	2372	0.112494	0.056	1470	8/18/05 12:09
G2	0	1	5	27084	6011	5416.8	0.256896	0.1	1470	8/18/05 12:57
G2	4	2	5	23828	5036	4765.6	0.226012	0.1	1470	8/18/05 12:51
G2	7.1	3	5	22861	4676	4572.2	0.21684	0.1	1470	8/18/05 13:09



G2	11.6	4	5	22860	4866	4572	0.21683	0.1	1470	8/18/05 13:03
G2	18.7	5	5	20897	4209	4179.4	0.198211	0.1	1470	8/18/05 12:33
G2	26.3	6	5	20448	4599	4089.6	0.193952	0.1	1470	8/18/05 12:27
G2	37.7	7	5	17817	3852	3563.4	0.168997	0.1	1470	8/18/05 12:45
G2	45.6	8	5	16124	4234	3224.8	0.152938	0.1	1470	8/18/05 12:39
G2	56.5	9	5	15820	3838	3164	0.150055	0.1	1470	8/18/05 12:09
G2	74.7	10	5	15507	3385	3101.4	0.147086	0.1	1470	8/18/05 12:03
G2	94.1	11	5	15005	3824	3001	0.142325	0.1	1470	8/18/05 12:20
G2	105.8	12	5	11419	2783	2283.8	0.108311	0.1	1470	8/18/05 12:15
G3	0	1	5	26710	7327	5342	0.253348	0.226	1470	8/18/05 13:03
G3	4	2	5	24059	6239	4811.8	0.228203	0.226	1470	8/18/05 12:57
G3	7.1	3	5	23009	5610	4601.8	0.218244	0.226	1470	8/18/05 12:51
G3	11.6	4	5	22735	6229	4547	0.215645	0.226	1470	8/18/05 13:09
G3	18.7	5	5	20953	5539	4190.6	0.198742	0.226	1470	8/18/05 12:39
G3	26.3	6	5	20678	5669	4135.6	0.196134	0.226	1470	8/18/05 12:33
G3	37.7	7	5	18745	4644	3749	0.177799	0.226	1470	8/18/05 12:27
G3	45.6	8	5	16658	5416	3331.6	0.158004	0.226	1470	8/18/05 12:45
G3	56.5	9	5	15694	4783	3138.8	0.14886	0.226	1470	8/18/05 12:15
G3	74.7	10	5	15512	4489	3102.4	0.147134	0.226	1470	8/18/05 12:09
G3	94.1	11	5	15014	4663	3002.8	0.14241	0.226	1470	8/18/05 12:03
G3	105.8	12	5	11336	3347	2267.2	0.107524	0.226	1470	8/18/05 12:20
G4	0	1	5	27468	7132	5493.6	0.260538	0.08	1470	8/18/05 13:09
G4	4	2	5	24295	6012	4859	0.230442	0.08	1470	8/18/05 13:03
G4	7.1	3	5	23019	5560	4603.8	0.218339	0.08	1470	8/18/05 12:57
G4	11.6	4	5	22884	5789	4576.8	0.217058	0.08	1470	8/18/05 12:51
G4	18.7	5	5	21361	5275	4272.2	0.202612	0.08	1470	8/18/05 12:45
G4	26.3	6	5	20128	5354	4025.6	0.190917	0.08	1470	8/18/05 12:39
G4	37.7	7	5	18499	4625	3699.8	0.175466	0.08	1470	8/18/05 12:33
G4	45.6	8	5	15744	4935	3148.8	0.149334	0.08	1470	8/18/05 12:27
G4	56.5	9	5	15318	4274	3063.6	0.145293	0.08	1470	8/18/05 12:20
G4	74.7	10	5	15206	4072	3041.2	0.144231	0.08	1470	8/18/05 12:15
G4	94.1	11	5	15128	4432	3025.6	0.143491	0.08	1470	8/18/05 12:09
G4	105.8	12	5	11307	3372	2261.4	0.107249	0.08	1470	8/18/05 12:03
H1	0	1	5	31121	3491	6224.2	0.295187	0.12	1522.5	8/18/05 13:15

ALPHAEFF.XLS

H1	4	2	5	27403	3162	5480.6	0.259921	0.12	1522.5	8/18/05 13:33
H1	7.1	3	5	27274	3003	5454.8	0.258698	0.12	1522.5	8/18/05 13:27
H1	11.6	4	5	25576	2839	5115.2	0.242592	0.12	1522.5	8/18/05 13:21
H1	18.7	5	5	24211	2580	4842.2	0.229645	0.12	1522.5	8/18/05 12:51
H1	26.3	6	5	24155	2436	4831	0.229114	0.12	1522.5	8/18/05 13:09
H1	37.7	7	5	21690	2454	4338	0.205733	0.12	1522.5	8/18/05 13:03
H1	45.6	8	5	19223	2519	3844.6	0.182333	0.12	1522.5	8/18/05 12:57
H1	56.5	9	5	18608	2629	3721.6	0.1765	0.12	1522.5	8/18/05 12:27
H1	74.7	10	5	17551	2081	3510.2	0.166474	0.12	1522.5	8/18/05 12:45
H1	94.1	11	5	17361	2498	3472.2	0.164672	0.12	1522.5	8/18/05 12:39
H1	105.8	12	5	12850	1556	2570	0.121884	0.12	1522.5	8/18/05 12:33
H2	0	1	5	30290	4128	6058	0.287305	0.104	1522.5	8/18/05 13:21
H2	4	2	5	27198	3742	5439.6	0.257977	0.104	1522.5	8/18/05 13:15
H2	7.1	3	5	26385	3423	5277	0.250266	0.104	1522.5	8/18/05 13:33
H2	11.6	4	5	25413	3278	5082.6	0.241046	0.104	1522.5	8/18/05 13:27
H2	18.7	5	5	23872	3100	4774.4	0.226429	0.104	1522.5	8/18/05 12:57
H2	26.3	6	5	23752	2938	4750.4	0.225291	0.104	1522.5	8/18/05 12:51
H2	37.7	7	5	21080	2801	4216	0.199947	0.104	1522.5	8/18/05 13:09
H2	45.6	8	5	18865	2892	3773	0.178937	0.104	1522.5	8/18/05 13:03
H2	56.5	9	5	18022	3038	3604.4	0.170941	0.104	1522.5	8/18/05 12:33
H2	74.7	10	5	17174	2494	3434.8	0.162898	0.104	1522.5	8/18/05 12:27
H2	94.1	11	5	17085	2811	3417	0.162054	0.104	1522.5	8/18/05 12:45
H2	105.8	12	5	12568	1917	2513.6	0.119209	0.104	1522.5	8/18/05 12:39
H3	0	1	5	30646	4366	6129.2	0.290682	0.066	1522.5	8/18/05 13:27
H3	4	2	5	27718	3990	5543.6	0.262909	0.066	1522.5	8/18/05 13:21
H3	7.1	3	5	27527	3532	5505.4	0.261098	0.066	1522.5	8/18/05 13:15
H3	11.6	4	5	25502	3606	5100.4	0.24189	0.066	1522.5	8/18/05 13:33
H3	18.7	5	5	24436	3149	4887.2	0.231779	0.066	1522.5	8/18/05 13:03
H3	26.3	6	5	23836	3022	4767.2	0.226088	0.066	1522.5	8/18/05 12:57
H3	37.7	7	5	21616	2879	4323.2	0.205031	0.066	1522.5	8/18/05 12:51
H3	45.6	8	5	19101	3142	3820.2	0.181176	0.066	1522.5	8/18/05 13:09
H3	56.5	9	5	18029	3210	3605.8	0.171008	0.066	1522.5	8/18/05 12:39
H3	74.7	10	5	17406	2542	3481.2	0.165098	0.066	1522.5	8/18/05 12:33
H3	94.1	11	5	17242	2973	3448.4	0.163543	0.066	1522.5	8/18/05 12:27
H3	105.8	12	5	12717	1975	2543.4	0.120623	0.066	1522.5	8/18/05 12:45

ALPHAEFF.XLS

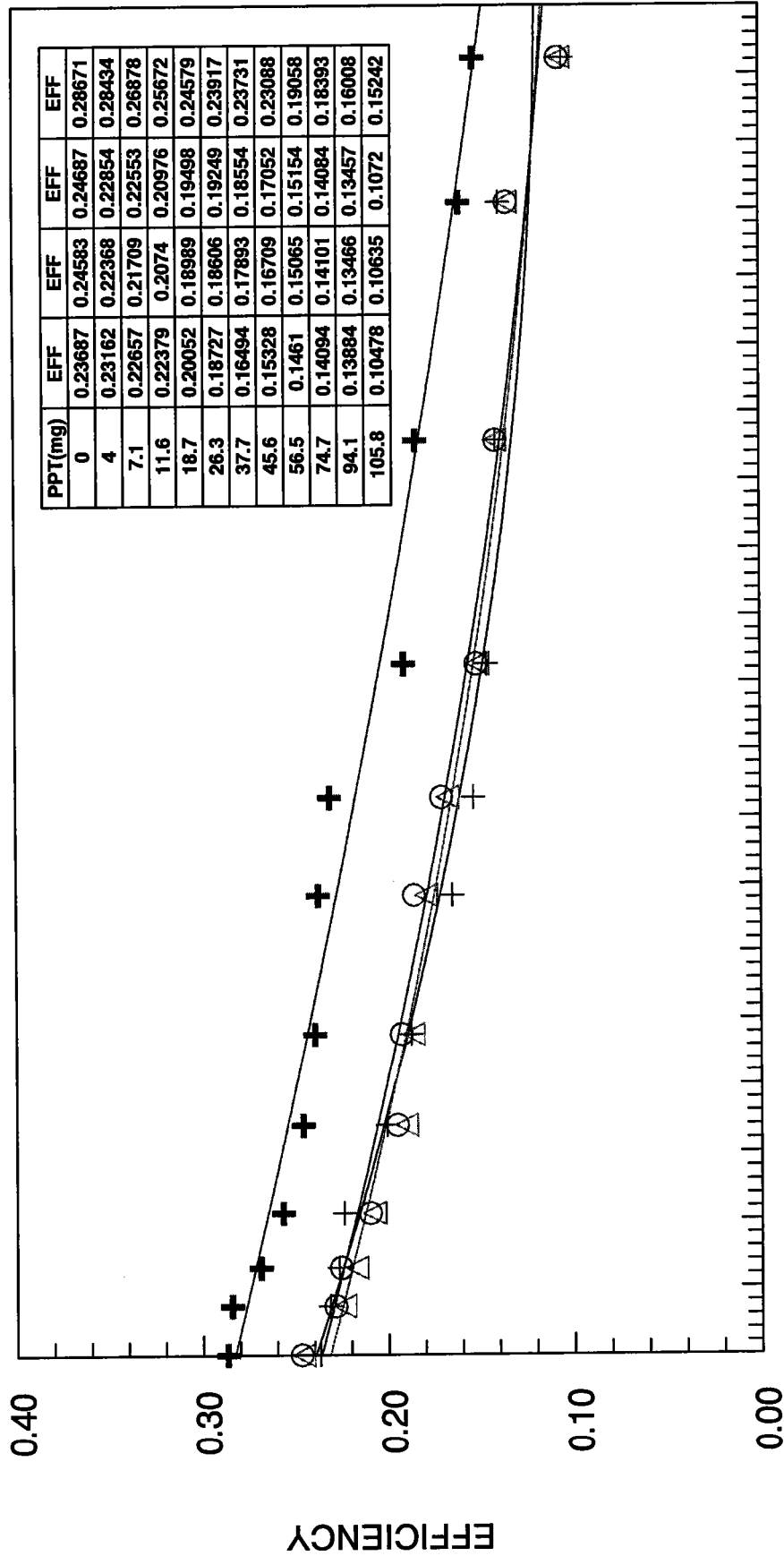
H4	0	1	5	30338	4000	6067.6	0.28776	0.076	1522.5	8/18/05 13:33
H4	4	2	5	26925	3667	5385	0.255388	0.076	1522.5	8/18/05 13:27
H4	7.1	3	5	25897	3276	5179.4	0.245637	0.076	1522.5	8/18/05 13:21
H4	11.6	4	5	24029	3272	4805.8	0.227919	0.076	1522.5	8/18/05 13:15
H4	18.7	5	5	23445	2914	4689	0.222379	0.076	1522.5	8/18/05 13:09
H4	26.3	6	5	22926	2833	4585.2	0.217456	0.076	1522.5	8/18/05 13:03
H4	37.7	7	5	20355	2732	4071	0.19307	0.076	1522.5	8/18/05 12:57
H4	45.6	8	5	18456	2837	3691.2	0.175058	0.076	1522.5	8/18/05 12:51
H4	56.5	9	5	17247	2787	3449.4	0.16359	0.076	1522.5	8/18/05 12:45
H4	74.7	10	5	16567	2368	3313.4	0.15714	0.076	1522.5	8/18/05 12:39
H4	94.1	11	5	16353	2717	3270.6	0.155111	0.076	1522.5	8/18/05 12:33
H4	105.8	12	5	12186	1821	2437.2	0.115586	0.076	1522.5	8/18/05 12:27

# ALPHA EFF LB4100 8/05

## DRAWER A

+ A1    Δ A2    ○ A3    + A4

Th-230 2mL 0695-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104 110

WEIGHT(mg)

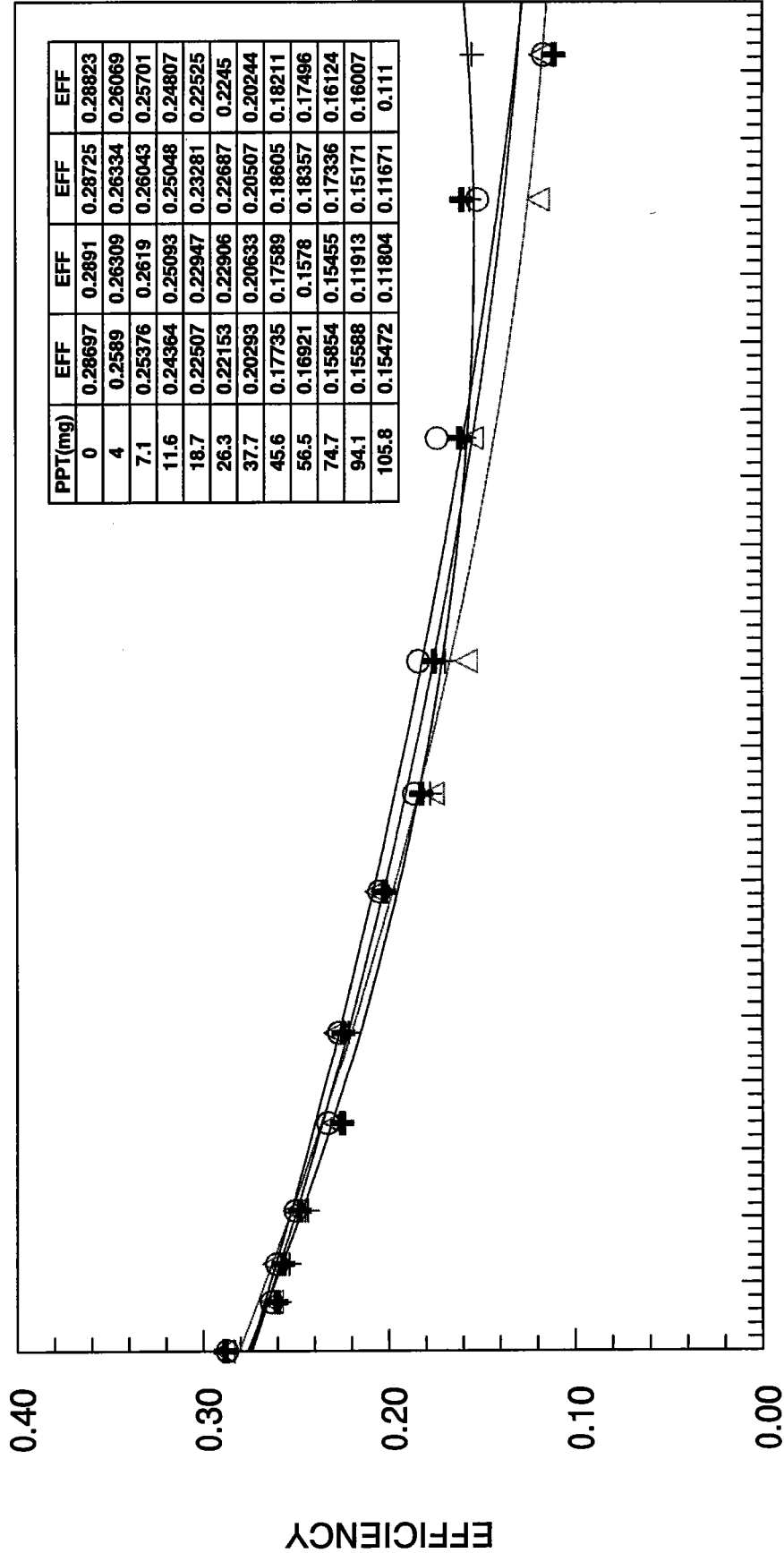
*Handwritten signature*

# ALPHA EFF LB4100 8/05

## DRAWER B

+ B1    Δ B2    ○ B3    + B4

Th-230 2mL 0695-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104.110

WEIGHT(mg)

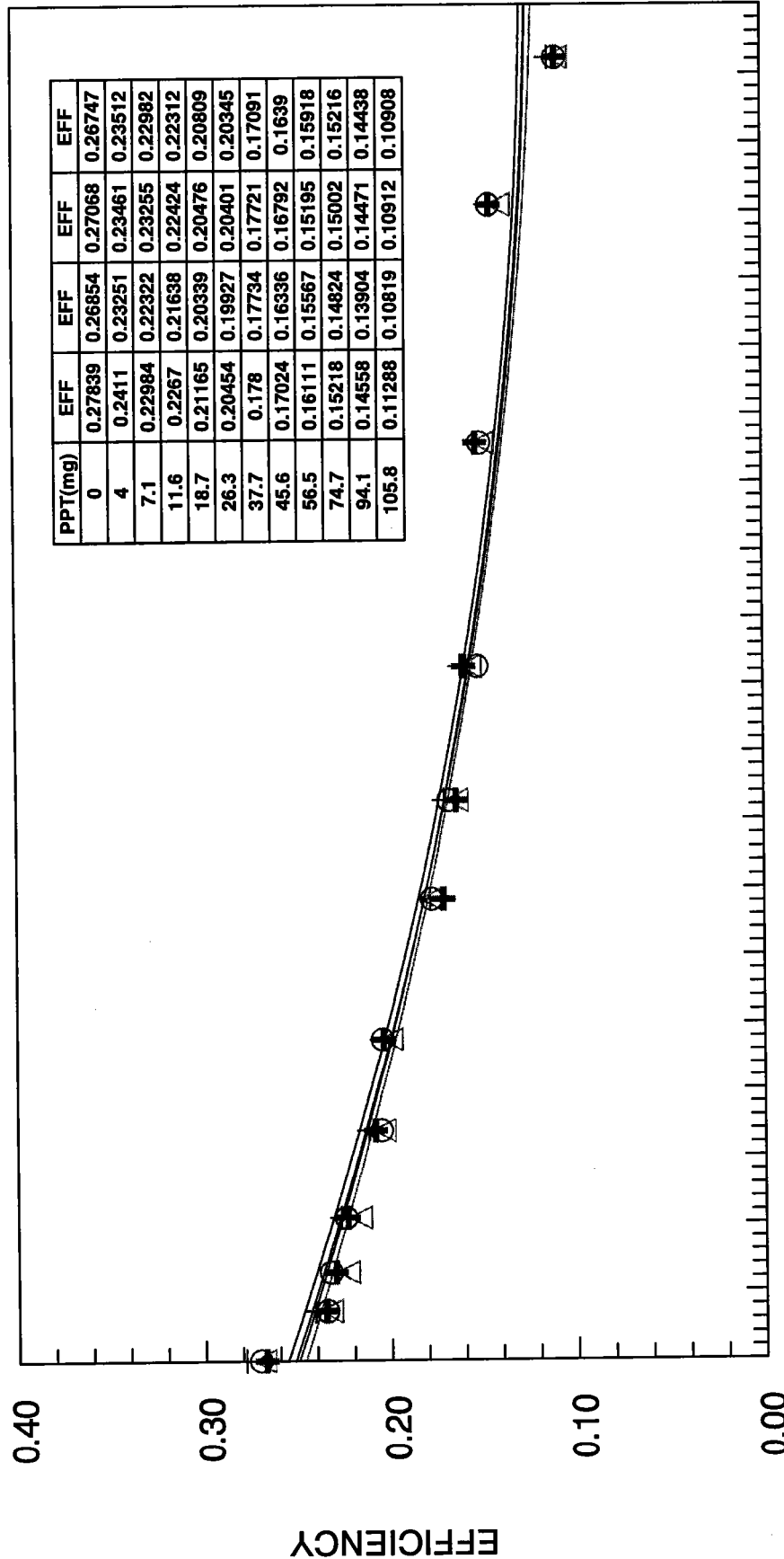
*Handwritten signature*

# ALPHA EFF LB4100 8/05

## DRAWER C

+ C1    Δ    C2    ○    C3    +    C4

Th-230 2mL 0695-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104.110

WEIGHT(mg)

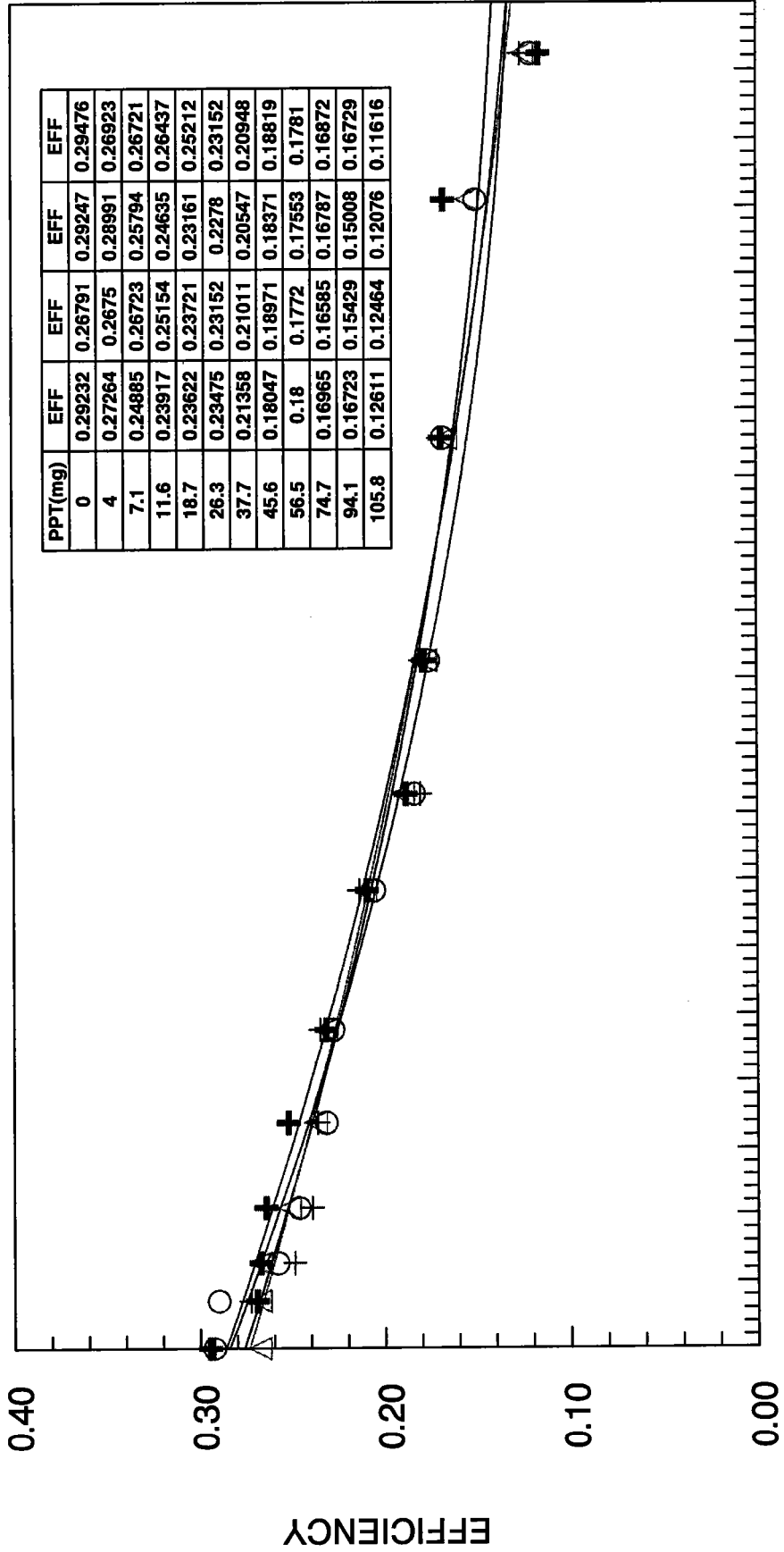
*2012/08/24*

# ALPHA EFF LB4100 8/05

## DRAWER D

+ D1    Δ D2    ○ D3    + D4

Th-230 2mL 0695-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104 110  
WEIGHT(mg)

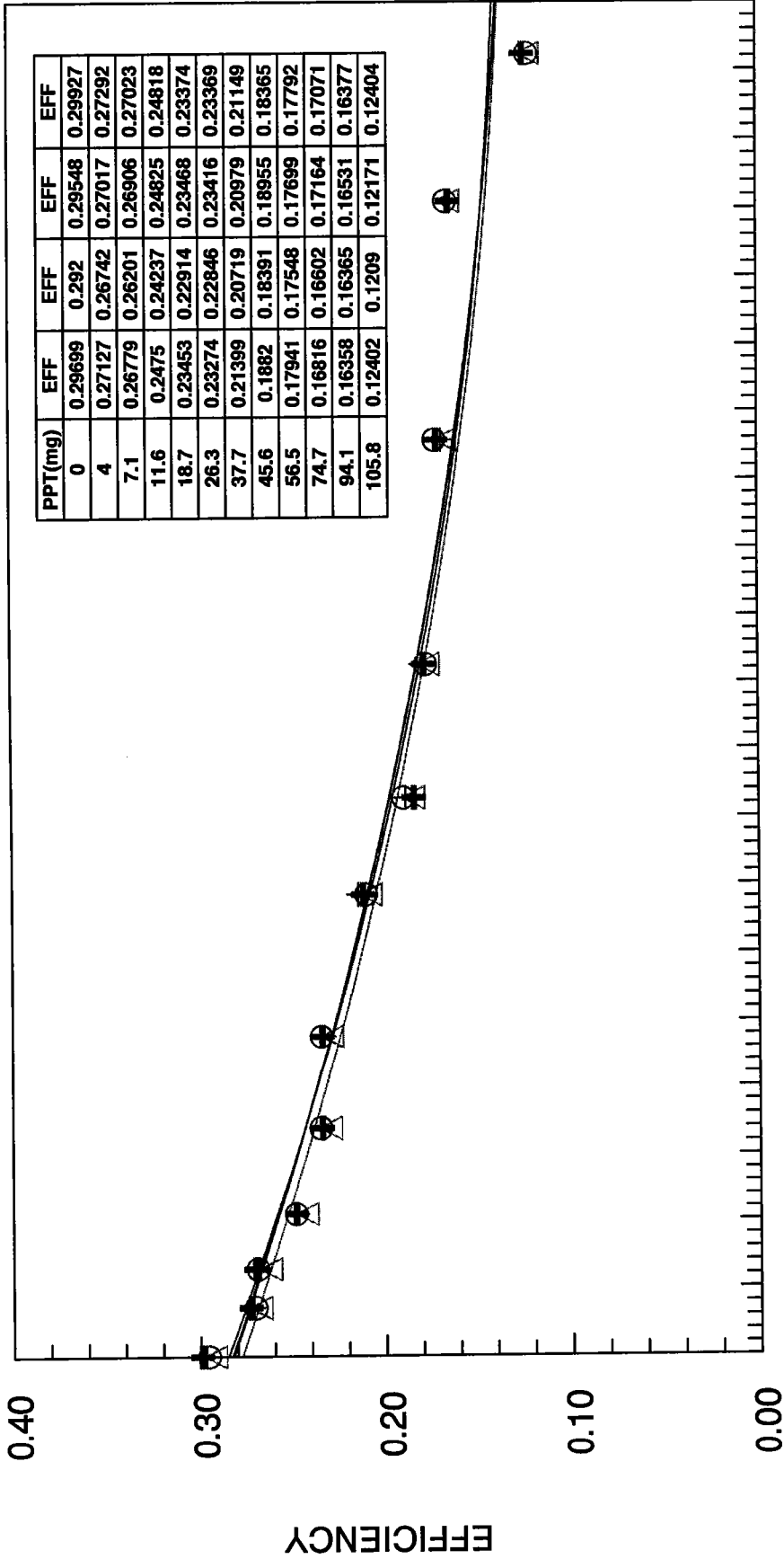
*Handwritten signature*

# ALPHA EFF LB4100 8/05

## DRAWER E

+ E1    △ E2    ○ E3    + E4

Th-230 2mL 0695-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104.110

WEIGHT(mg)

*msz*

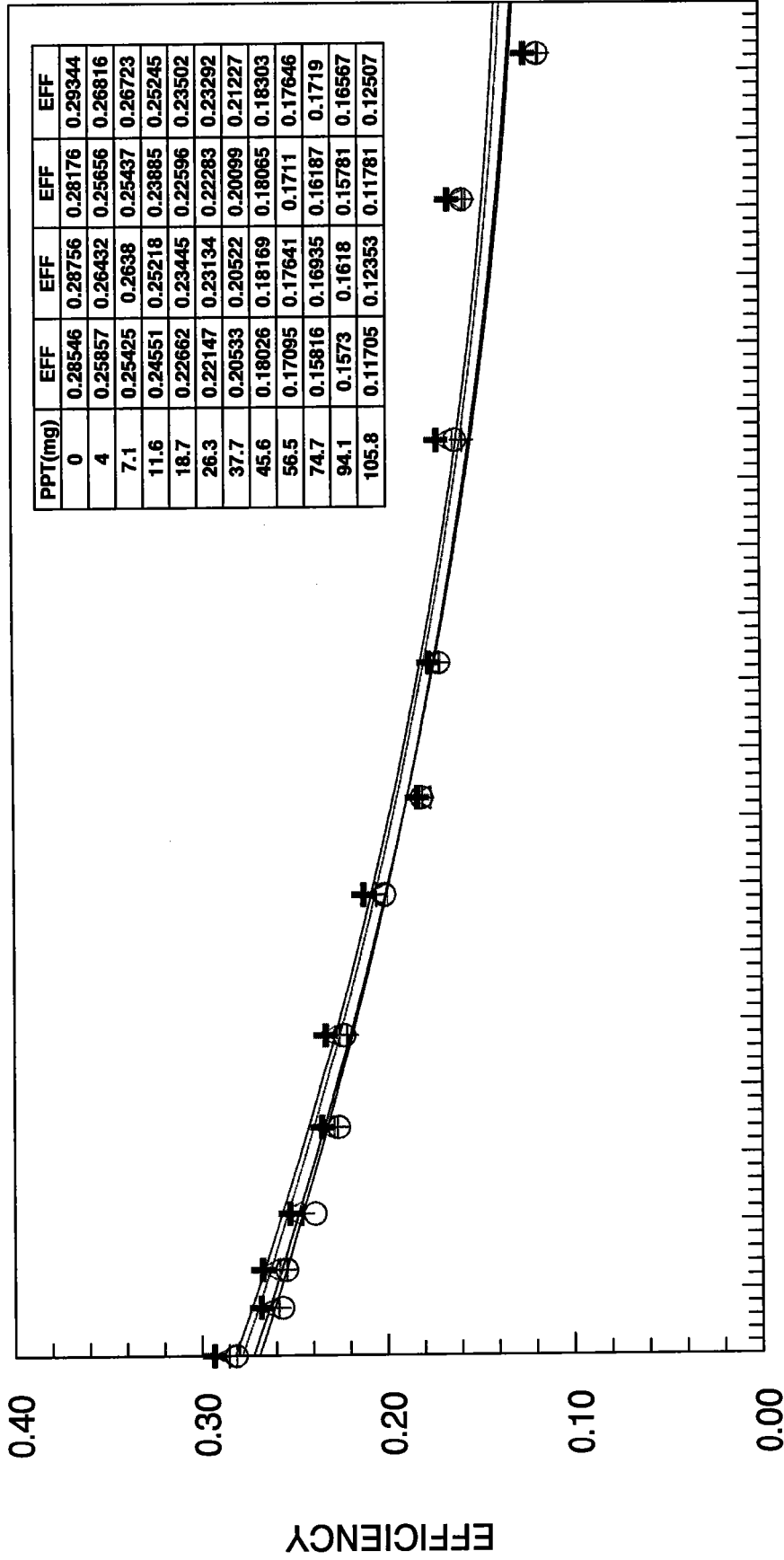


# ALPHA EFF LB4100 8/05

## DRAWER F

+ F1    Δ    F2    ○    F3    +    F4

Th-230 2mL 0695-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104.110

WEIGHT(mg)

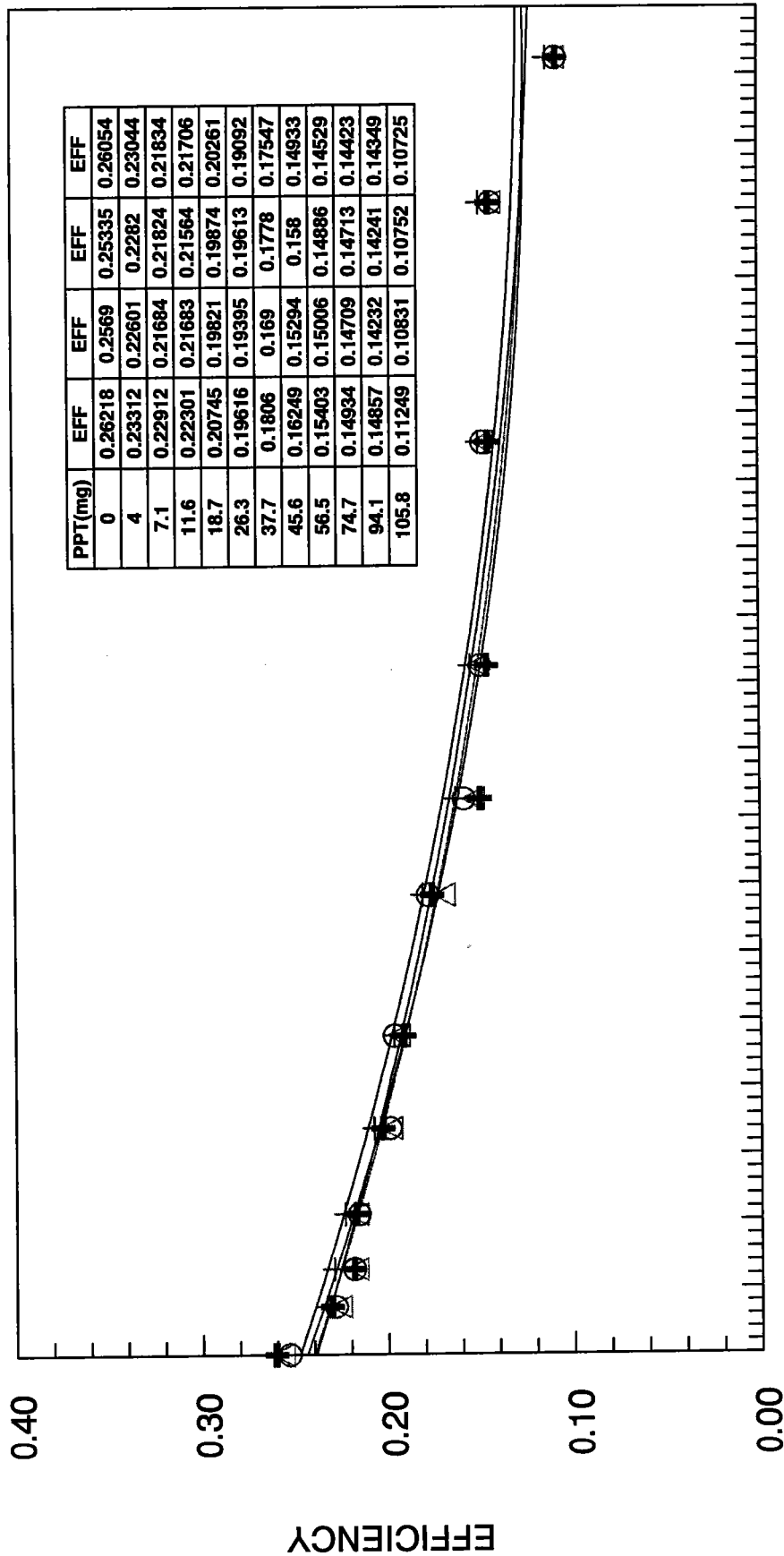
*Handwritten signature*

# ALPHA EFF LB4100 8/05

## DRAWER G

+ G1    △ G2    ○ G3    + G4

Th-230 2mL 0695-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104 110

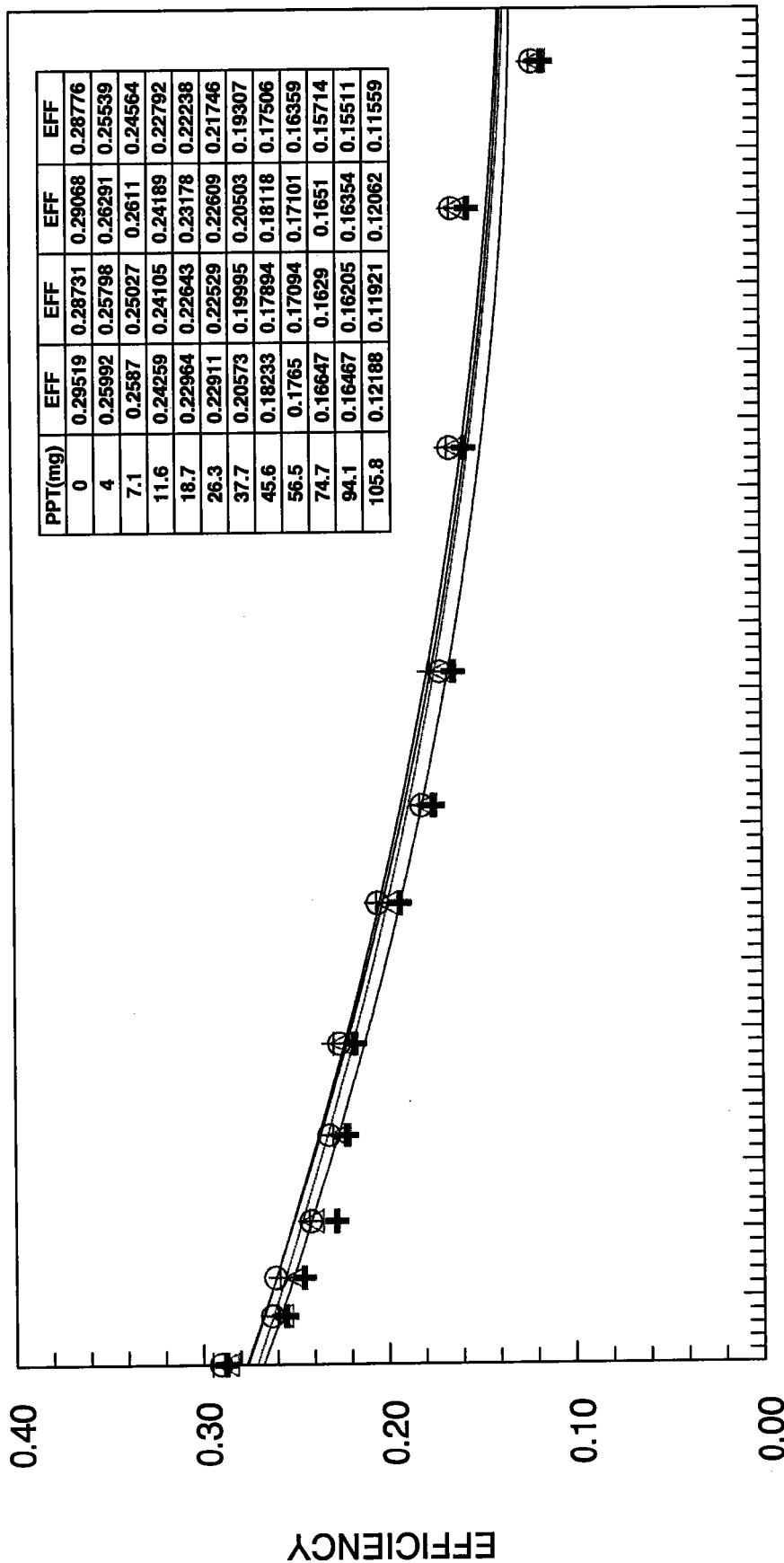
WEIGHT(mg)

# ALPHA EFF LB4100 8/05

## DRAWER H

+ H1    Δ H2    ○ H3    + H4

Th-230 2mL 0695-A



*Handwritten signature*

**General Engineering Laboratories  
Calibration Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-001/001B Isotope Sr90

Date Standards Prepared 8/17/05 Cocktail Type Used N/A

Standard ID (P) 817105  
~~0133~~ A 0717-A Matrix of Vial/Planchett Concentric ring S.S.

Amount Used (g or ml) (M) ~~0.1 + 1.0~~ 2.0

Standard Activity (DPM/g or (mL)) ~~1102820~~ 20996.2 Type of Scintillation Vial N/A

Reference Date 4/1/96 Pipette ID Used 1429303

Expiration Date 8/16/06 Balance ID Used 38080209

Residue/Carrier Agent BaCl2 Quenching Agent N/A

Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
S1	0.0	7.4218	7.4219	0.1
S2	0.1	7.4131	7.4195	7.4171
S3	0.2	7.4507	7.4585	7.8
S4	0.3	7.4236	7.4360	12.4
S5	0.5	7.4246	7.4435	18.9
S6	0.7	7.3795	7.4058	26.3
S7	1.0	7.4184	7.4521	33.8
S8	1.2	7.4198	7.4645	44.7
S9	1.5	7.3723	7.4277	55.4
S10	2.0	7.5400	7.6165	76.5
S11	2.5	7.4125	7.5073	94.8
S12	3.0	7.3692	7.4824	113.2

4.0

Prepared By: [Signature] Date 8/30/05

Reviewed By: [Signature] Date 8/30/05

Detector	Weight (mg)	Sr-90	2ml	0717-A	ACTIVITY:	41991.6	Beta Bkg.	Voltage	Date/Time
		Sample I.D.	Act. Time	Alpha	Beta	Beta CPM	Beta Eff.	Beta Bkg.	Voltage
A1	0	1	2	185	31895	15947.5	0.379778	7.48	1470
A1	4	2	2	238	31671	15835.5	0.377111	7.48	1470
A1	7.8	3	2	255	31486	15743	0.374908	7.48	1470
A1	12.4	4	2	217	30903	15451.5	0.367966	7.48	1470
A1	18.9	5	2	236	30651	15325.5	0.364966	7.48	1470
A1	26.3	6	2	180	30643	15321.5	0.364871	7.48	1470
A1	33.8	7	2	193	30328	15164	0.36112	7.48	1470
A1	44.7	8	2	201	29767	14883.5	0.35444	7.48	1470
A1	55.4	9	2	242	29642	14821	0.352952	7.48	1470
A1	76.5	10	2	180	29063	14531.5	0.346057	7.48	1470
A1	94.8	11	2	207	28851	14425.5	0.343533	7.48	1470
A1	113.2	12	2	210	27970	13985	0.333043	7.48	1470
A2	0	1	2	328	31165	15582.5	0.371086	0.144	1470
A2	4	2	2	344	31030	15515	0.369479	0.144	1470
A2	7.8	3	2	317	30756	15378	0.366216	0.144	1470
A2	12.4	4	2	274	30684	15342	0.365359	0.144	1470
A2	18.9	5	2	301	30628	15314	0.364692	0.144	1470
A2	26.3	6	2	264	30467	15233.5	0.362775	0.144	1470
A2	33.8	7	2	260	30461	15230.5	0.362703	0.144	1470
A2	44.7	8	2	294	28997	14498.5	0.345271	0.144	1470
A2	55.4	9	2	306	28978	14489	0.345045	0.144	1470
A2	76.5	10	2	274	28843	14421.5	0.343438	0.144	1470
A2	94.8	11	2	275	28628	14314	0.340878	0.144	1470
A2	113.2	12	2	259	28320	14160	0.33721	0.144	1470
A3	0	1	2	378	32008	16004	0.381124	0.124	1470
A3	4	2	2	435	31906	15953	0.379909	0.124	1470
A3	7.8	3	2	437	31788	15894	0.378504	0.124	1470
A3	12.4	4	2	374	30713	15356.5	0.365704	0.124	1470
A3	18.9	5	2	407	30623	15311.5	0.364632	0.124	1470
A3	26.3	6	2	327	30148	15074	0.358977	0.124	1470

*per 8/30/02*

BETAFF.XLS

A3	33.8	7	2	362	29992	14996	0.357119	0.124	1470	8/18/05 11:28
A3	44.7	8	2	384	29726	14863	0.353952	0.124	1470	8/18/05 11:54
A3	55.4	9	2	404	29568	14784	0.35207	0.124	1470	8/18/05 11:09
A3	76.5	10	2	337	29041	14520.5	0.345795	0.124	1470	8/18/05 11:00
A3	94.8	11	2	371	28290	14145	0.336853	0.124	1470	8/18/05 10:48
A3	113.2	12	2	332	28018	14009	0.333614	0.124	1470	8/18/05 11:15
B1	0	1	2	145	35217	17608.5	0.419334	0.15	1470	8/18/05 10:10
B1	4	2	2	157	34858	17429	0.415059	0.15	1470	8/18/05 10:29
B1	7.8	3	2	154	34649	17324.5	0.412571	0.15	1470	8/18/05 10:22
B1	12.4	4	2	125	34540	17270	0.411273	0.15	1470	8/18/05 10:16
B1	18.9	5	2	140	33880	16940	0.403414	0.15	1470	8/18/05 9:11
B1	26.3	6	2	116	33226	16613	0.395627	0.15	1470	8/18/05 9:39
B1	33.8	7	2	112	33126	16563	0.394436	0.15	1470	8/18/05 9:33
B1	44.7	8	2	104	33045	16522.5	0.393472	0.15	1470	8/18/05 9:17
B1	55.4	9	2	188	32905	16452.5	0.391805	0.15	1470	8/18/05 11:28
B1	76.5	10	2	99	32670	16335	0.389006	0.15	1470	8/18/05 11:54
B1	94.8	11	2	118	32367	16183.5	0.385399	0.15	1470	8/18/05 11:47
B1	113.2	12	2	129	31854	15927	0.37929	0.15	1470	8/18/05 11:39
B2	0	1	2	99	34523	17261.5	0.41107	0.05	1470	8/18/05 10:16
B2	4	2	2	142	33902	16951	0.403676	0.05	1470	8/18/05 10:10
B2	7.8	3	2	142	33851	16925.5	0.403069	0.05	1470	8/18/05 10:29
B2	12.4	4	2	139	33553	16776.5	0.39952	0.05	1470	8/18/05 10:22
B2	18.9	5	2	120	32974	16487	0.392626	0.05	1470	8/18/05 9:17
B2	26.3	6	2	98	32684	16342	0.389173	0.05	1470	8/18/05 9:11
B2	33.8	7	2	116	32505	16252.5	0.387042	0.05	1470	8/18/05 9:39
B2	44.7	8	2	128	32142	16071	0.382719	0.05	1470	8/18/05 9:33
B2	55.4	9	2	164	31973	15986.5	0.380707	0.05	1470	8/18/05 11:39
B2	76.5	10	2	103	31907	15953.5	0.379921	0.05	1470	8/18/05 11:28
B2	94.8	11	2	100	31807	15903.5	0.378731	0.05	1470	8/18/05 11:54
B2	113.2	12	2	99	31214	15607	0.37167	0.05	1470	8/18/05 11:47
B3	0	1	2	164	34871	17435.5	0.415214	0.034	1470	8/18/05 10:22
B3	4	2	2	178	34050	17025	0.405438	0.034	1470	8/18/05 10:16
B3	7.8	3	2	195	33493	16746.5	0.398806	0.034	1470	8/18/05 10:10
B3	12.4	4	2	160	33483	16741.5	0.398687	0.034	1470	8/18/05 10:29

BETAFF.XLS

B3	18.9	5	2	146	33467	16733.5	0.398496	0.034	1470	8/18/05 9:33
B3	26.3	6	2	126	33311	16655.5	0.396639	0.034	1470	8/18/05 9:17
B3	33.8	7	2	128	33041	16520.5	0.393424	0.034	1470	8/18/05 9:11
B3	44.7	8	2	160	32670	16335	0.389006	0.034	1470	8/18/05 9:39
B3	55.4	9	2	201	32336	16168	0.385029	0.034	1470	8/18/05 11:47
B3	76.5	10	2	141	32223	16111.5	0.383684	0.034	1470	8/18/05 11:39
B3	94.8	11	2	144	32193	16096.5	0.383327	0.034	1470	8/18/05 11:28
B3	113.2	12	2	153	31734	15867	0.377861	0.034	1470	8/18/05 11:54
B4	0	1	2	131	35273	17636.5	0.420001	0.048	1470	8/18/05 10:29
B4	4	2	2	174	34590	17295	0.411868	0.048	1470	8/18/05 10:22
B4	7.8	3	2	161	34440	17220	0.410082	0.048	1470	8/18/05 10:16
B4	12.4	4	2	126	34041	17020.5	0.405331	0.048	1470	8/18/05 10:10
B4	18.9	5	2	141	33731	16865.5	0.40164	0.048	1470	8/18/05 9:39
B4	26.3	6	2	123	33522	16761	0.399151	0.048	1470	8/18/05 9:33
B4	33.8	7	2	127	33416	16708	0.397889	0.048	1470	8/18/05 9:17
B4	44.7	8	2	161	32802	16401	0.390578	0.048	1470	8/18/05 9:11
B4	55.4	9	2	189	32683	16341.5	0.389161	0.048	1470	8/18/05 11:54
B4	76.5	10	2	122	32669	16334.5	0.388994	0.048	1470	8/18/05 11:47
B4	94.8	11	2	127	32580	16290	0.387935	0.048	1470	8/18/05 11:39
B4	113.2	12	2	157	32409	16204.5	0.385899	0.048	1470	8/18/05 11:28
C1	0	1	2	534	33855	16927.5	0.403116	0.09	1470	8/18/05 10:48
C1	4	2	2	606	32735	16367.5	0.38978	0.09	1470	8/18/05 11:15
C1	7.8	3	2	607	32373	16186.5	0.38547	0.09	1470	8/18/05 11:09
C1	12.4	4	2	573	32098	16049	0.382195	0.09	1470	8/18/05 11:00
C1	18.9	5	2	551	31868	15934	0.379457	0.09	1470	8/18/05 10:09
C1	26.3	6	2	511	31741	15870.5	0.377945	0.09	1470	8/18/05 10:29
C1	33.8	7	2	467	31696	15848	0.377409	0.09	1470	8/18/05 10:22
C1	44.7	8	2	543	31347	15673.5	0.373253	0.09	1470	8/18/05 10:16
C1	55.4	9	2	572	31330	15665	0.373051	0.09	1470	8/18/05 9:11
C1	76.5	10	2	521	30805	15402.5	0.3668	0.09	1470	8/18/05 9:39
C1	94.8	11	2	502	30280	15140	0.360548	0.09	1470	8/18/05 9:33
C1	113.2	12	2	502	29894	14947	0.355952	0.09	1470	8/18/05 9:17
C2	0	1	2	287	33761	16880.5	0.401997	0.078	1470	8/18/05 11:00
C2	4	2	2	299	32908	16454	0.39184	0.078	1470	8/18/05 10:48

BETAEFF.XLS

C2	7.8	3	2	360	32375	16187.5	0.385494	0.078	1470	8/18/05 11:15
C2	12.4	4	2	311	32180	16090	0.383172	0.078	1470	8/18/05 11:09
C2	18.9	5	2	300	32140	16070	0.382696	0.078	1470	8/18/05 10:16
C2	26.3	6	2	261	31971	15985.5	0.380683	0.078	1470	8/18/05 10:09
C2	33.8	7	2	306	31870	15935	0.379481	0.078	1470	8/18/05 10:29
C2	44.7	8	2	289	31750	15875	0.378052	0.078	1470	8/18/05 10:22
C2	55.4	9	2	311	31743	15871.5	0.377968	0.078	1470	8/18/05 9:17
C2	76.5	10	2	341	30772	15386	0.366407	0.078	1470	8/18/05 9:11
C2	94.8	11	2	271	30711	15355.5	0.365568	0.078	1470	8/18/05 9:39
C2	113.2	12	2	249	30571	15285.5	0.364013	0.078	1470	8/18/05 9:33
C3	0	1	2	293	34161	17080.5	0.40676	0.076	1470	8/18/05 11:09
C3	4	2	2	271	33043	16521.5	0.393448	0.076	1470	8/18/05 11:00
C3	7.8	3	2	304	32743	16371.5	0.389876	0.076	1470	8/18/05 10:48
C3	12.4	4	2	299	32301	16150.5	0.384613	0.076	1470	8/18/05 11:15
C3	18.9	5	2	289	32196	16098	0.383362	0.076	1470	8/18/05 10:22
C3	26.3	6	2	227	32178	16089	0.383148	0.076	1470	8/18/05 10:16
C3	33.8	7	2	242	32077	16038.5	0.381945	0.076	1470	8/18/05 10:09
C3	44.7	8	2	249	32023	16011.5	0.381302	0.076	1470	8/18/05 10:29
C3	55.4	9	2	272	31796	15898	0.3786	0.076	1470	8/18/05 9:33
C3	76.5	10	2	229	31684	15842	0.377266	0.076	1470	8/18/05 9:17
C3	94.8	11	2	242	31162	15581	0.37105	0.076	1470	8/18/05 9:11
C3	113.2	12	2	255	30733	15366.5	0.365942	0.076	1470	8/18/05 9:39
C4	0	1	2	165	34457	17228.5	0.410284	0.048	1470	8/18/05 11:15
C4	4	2	2	198	33404	16702	0.397746	0.048	1470	8/18/05 11:09
C4	7.8	3	2	198	33286	16643	0.396341	0.048	1470	8/18/05 11:00
C4	12.4	4	2	138	33118	16559	0.394341	0.048	1470	8/18/05 10:48
C4	18.9	5	2	184	33046	16523	0.393483	0.048	1470	8/18/05 10:29
C4	26.3	6	2	150	32921	16460.5	0.391995	0.048	1470	8/18/05 10:22
C4	33.8	7	2	153	32894	16447	0.391674	0.048	1470	8/18/05 10:16
C4	44.7	8	2	164	32593	16296.5	0.38809	0.048	1470	8/18/05 10:09
C4	55.4	9	2	197	32300	16150	0.384601	0.048	1470	8/18/05 9:39
C4	76.5	10	2	169	31573	15786.5	0.375944	0.048	1470	8/18/05 9:33
C4	94.8	11	2	176	30934	15467	0.368336	0.048	1470	8/18/05 9:17
C4	113.2	12	2	186	30932	15466	0.368312	0.048	1470	8/18/05 9:11



BETAFF.XLS

D1	0	1	2	142	35781	17890.5	0.426049	0.09	1470	8/18/05 11:28
D1	4	2	2	171	35267	17633.5	0.419929	0.09	1470	8/18/05 11:54
D1	7.8	3	2	175	35041	17520.5	0.417238	0.09	1470	8/18/05 11:47
D1	12.4	4	2	149	34937	17468.5	0.416	0.09	1470	8/18/05 11:39
D1	18.9	5	2	160	34390	17195	0.409487	0.09	1470	8/18/05 10:48
D1	26.3	6	2	113	34353	17176.5	0.409046	0.09	1470	8/18/05 11:15
D1	33.8	7	2	128	33798	16899	0.402438	0.09	1470	8/18/05 11:09
D1	44.7	8	2	177	33089	16544.5	0.393995	0.09	1470	8/18/05 11:00
D1	55.4	9	2	140	32731	16365.5	0.389733	0.09	1470	8/18/05 10:09
D1	76.5	10	2	105	31959	15979.5	0.38054	0.09	1470	8/18/05 10:29
D1	94.8	11	2	133	31438	15719	0.374337	0.09	1470	8/18/05 10:22
D1	113.2	12	2	119	31174	15587	0.371193	0.09	1470	8/18/05 10:16
D2	0	1	2	221	35869	17934.5	0.427097	0.064	1470	8/18/05 11:39
D2	4	2	2	235	35784	17892	0.426085	0.064	1470	8/18/05 11:28
D2	7.8	3	2	259	35747	17873.5	0.425645	0.064	1470	8/18/05 11:54
D2	12.4	4	2	234	35564	17782	0.423466	0.064	1470	8/18/05 11:47
D2	18.9	5	2	218	35288	17644	0.420179	0.064	1470	8/18/05 11:00
D2	26.3	6	2	177	34253	17126.5	0.407855	0.064	1470	8/18/05 10:48
D2	33.8	7	2	193	33946	16973	0.4042	0.064	1470	8/18/05 11:15
D2	44.7	8	2	224	33869	16934.5	0.403283	0.064	1470	8/18/05 11:09
D2	55.4	9	2	244	33745	16872.5	0.401807	0.064	1470	8/18/05 10:16
D2	76.5	10	2	234	33632	16816	0.400461	0.064	1470	8/18/05 10:09
D2	94.8	11	2	213	33062	16531	0.393674	0.064	1470	8/18/05 10:29
D2	113.2	12	2	192	31593	15796.5	0.376182	0.064	1470	8/18/05 10:22
D3	0	1	2	183	35760	17880	0.425799	0.06	1470	8/18/05 11:47
D3	4	2	2	234	35187	17593.5	0.418977	0.06	1470	8/18/05 11:39
D3	7.8	3	2	235	34614	17307	0.412154	0.06	1470	8/18/05 11:28
D3	12.4	4	2	198	34284	17142	0.408225	0.06	1470	8/18/05 11:54
D3	18.9	5	2	209	34041	17020.5	0.405331	0.06	1470	8/18/05 11:09
D3	26.3	6	2	178	33807	16903.5	0.402545	0.06	1470	8/18/05 11:00
D3	33.8	7	2	171	33338	16669	0.39696	0.06	1470	8/18/05 10:48
D3	44.7	8	2	179	33233	16616.5	0.39571	0.06	1470	8/18/05 11:15
D3	55.4	9	2	234	33174	16587	0.395008	0.06	1470	8/18/05 10:22
D3	76.5	10	2	195	32949	16474.5	0.392328	0.06	1470	8/18/05 10:16
D3	94.8	11	2	189	32517	16258.5	0.387185	0.06	1470	8/18/05 10:09

BETAEFF.XLS

D3	113.2	12	2	166	32321	16160.5	0.384851	0.06	1470	8/18/05 10:29
D4	0	1	2	112	36781	18390.5	0.437957	0.092	1470	8/18/05 11:54
D4	4	2	2	107	35883	17941.5	0.427264	0.092	1470	8/18/05 11:47
D4	7.8	3	2	152	35761	17880.5	0.425811	0.092	1470	8/18/05 11:39
D4	12.4	4	2	130	35299	17649.5	0.42031	0.092	1470	8/18/05 11:28
D4	18.9	5	2	103	34905	17452.5	0.415619	0.092	1470	8/18/05 11:15
D4	26.3	6	2	79	34879	17439.5	0.415309	0.092	1470	8/18/05 11:09
D4	33.8	7	2	93	34358	17179	0.409106	0.092	1470	8/18/05 11:00
D4	44.7	8	2	109	34113	17056.5	0.406188	0.092	1470	8/18/05 10:48
D4	55.4	9	2	109	33681	16840.5	0.401044	0.092	1470	8/18/05 10:29
D4	76.5	10	2	78	33666	16833	0.400866	0.092	1470	8/18/05 10:22
D4	94.8	11	2	118	32902	16451	0.391769	0.092	1470	8/18/05 10:16
D4	113.2	12	2	96	32391	16195.5	0.385684	0.092	1470	8/18/05 10:09
E1	0	1	2	288	35739	17869.5	0.425549	0.094	1470	8/18/05 12:03
E1	4	2	2	359	35697	17848.5	0.425049	0.094	1470	8/18/05 12:20
E1	7.8	3	2	330	35395	17697.5	0.421453	0.094	1470	8/18/05 12:15
E1	12.4	4	2	294	34602	17301	0.412011	0.094	1470	8/18/05 12:09
E1	18.9	5	2	320	34561	17280.5	0.411523	0.094	1470	8/18/05 13:15
E1	26.3	6	2	282	34293	17146.5	0.408332	0.094	1470	8/18/05 13:33
E1	33.8	7	2	265	34177	17088.5	0.40695	0.094	1470	8/18/05 13:27
E1	44.7	8	2	276	33769	16884.5	0.402092	0.094	1470	8/18/05 13:21
E1	55.4	9	2	338	33720	16860	0.401509	0.094	1470	8/18/05 12:51
E1	76.5	10	2	266	33327	16663.5	0.396829	0.094	1470	8/18/05 13:09
E1	94.8	11	2	291	32783	16391.5	0.390352	0.094	1470	8/18/05 13:03
E1	113.2	12	2	274	32675	16337.5	0.389066	0.094	1470	8/18/05 12:57
E2	0	1	2	330	35608	17804	0.42399	0.082	1470	8/18/05 12:09
E2	4	2	2	360	35447	17723.5	0.422073	0.082	1470	8/18/05 12:03
E2	7.8	3	2	330	35444	17722	0.422037	0.082	1470	8/18/05 12:20
E2	12.4	4	2	330	35082	17541	0.417726	0.082	1470	8/18/05 12:15
E2	18.9	5	2	280	34598	17299	0.411963	0.082	1470	8/18/05 13:21
E2	26.3	6	2	280	34494	17247	0.410725	0.082	1470	8/18/05 13:15
E2	33.8	7	2	307	34214	17107	0.407391	0.082	1470	8/18/05 13:33
E2	44.7	8	2	305	34154	17077	0.406677	0.082	1470	8/18/05 13:27
E2	55.4	9	2	332	34112	17056	0.406176	0.082	1470	8/18/05 12:57

BETAEFF.XLS

E2	76.5	10	2	315	33316	16658	0.396698	0.082	1470	8/18/05 12:51
E2	94.8	11	2	240	33308	16654	0.396603	0.082	1470	8/18/05 13:09
E2	113.2	12	2	283	33140	16570	0.394603	0.082	1470	8/18/05 13:03
E3	0	1	2	423	34428	17214	0.409939	0.056	1470	8/18/05 12:15
E3	4	2	2	400	34288	17144	0.408272	0.056	1470	8/18/05 12:09
E3	7.8	3	2	466	33995	16997.5	0.404783	0.056	1470	8/18/05 12:03
E3	12.4	4	2	405	33842	16921	0.402962	0.056	1470	8/18/05 12:20
E3	18.9	5	2	388	33722	16861	0.401533	0.056	1470	8/18/05 13:27
E3	26.3	6	2	346	32958	16479	0.392436	0.056	1470	8/18/05 13:21
E3	33.8	7	2	391	32727	16363.5	0.389685	0.056	1470	8/18/05 13:15
E3	44.7	8	2	361	32624	16312	0.388459	0.056	1470	8/18/05 13:33
E3	55.4	9	2	378	32600	16300	0.388173	0.056	1470	8/18/05 13:03
E3	76.5	10	2	339	32248	16124	0.383982	0.056	1470	8/18/05 12:57
E3	94.8	11	2	397	32023	16011.5	0.381302	0.056	1470	8/18/05 12:51
E3	113.2	12	2	337	31839	15919.5	0.379112	0.056	1470	8/18/05 13:09
E4	0	1	2	327	35569	17784.5	0.423525	0.098	1470	8/18/05 12:20
E4	4	2	2	335	35420	17710	0.421751	0.098	1470	8/18/05 12:15
E4	7.8	3	2	308	35271	17635.5	0.419977	0.098	1470	8/18/05 12:09
E4	12.4	4	2	319	34967	17483.5	0.416357	0.098	1470	8/18/05 12:03
E4	18.9	5	2	330	34830	17415	0.414726	0.098	1470	8/18/05 13:33
E4	26.3	6	2	273	34622	17311	0.412249	0.098	1470	8/18/05 13:27
E4	33.8	7	2	245	34258	17129	0.407915	0.098	1470	8/18/05 13:21
E4	44.7	8	2	291	34089	17044.5	0.405903	0.098	1470	8/18/05 13:15
E4	55.4	9	2	305	33684	16842	0.40108	0.098	1470	8/18/05 13:09
E4	76.5	10	2	305	33603	16801.5	0.400116	0.098	1470	8/18/05 13:03
E4	94.8	11	2	262	32984	16492	0.392745	0.098	1470	8/18/05 12:57
E4	113.2	12	2	328	32722	16361	0.389626	0.098	1470	8/18/05 12:51
F1	0	1	2	251	34103	17051.5	0.406069	0.086	1470	8/18/05 12:27
F1	4	2	2	272	33641	16820.5	0.400568	0.086	1470	8/18/05 12:45
F1	7.8	3	2	284	33591	16795.5	0.399973	0.086	1470	8/18/05 12:39
F1	12.4	4	2	255	33476	16738	0.398604	0.086	1470	8/18/05 12:33
F1	18.9	5	2	259	32937	16468.5	0.392186	0.086	1470	8/18/05 12:03
F1	26.3	6	2	244	32925	16462.5	0.392043	0.086	1470	8/18/05 12:20
F1	33.8	7	2	269	32805	16402.5	0.390614	0.086	1470	8/18/05 12:15

*Handwritten signature/initials*

F1	44.7	8	2	255	32504	16252	0.38703	0.086	1470	8/18/05 12:09
F1	55.4	9	2	302	32106	16053	0.382291	0.086	1470	8/18/05 13:15
F1	76.5	10	2	241	31979	15989.5	0.380779	0.086	1470	8/18/05 13:33
F1	94.8	11	2	256	31872	15936	0.379504	0.086	1470	8/18/05 13:27
F1	113.2	12	2	222	31084	15542	0.370122	0.086	1470	8/18/05 13:21
F2	0	1	2	111	36057	18028.5	0.429336	0.152	1470	8/18/05 12:33
F2	4	2	2	110	35992	17996	0.428562	0.152	1470	8/18/05 12:27
F2	7.8	3	2	154	35877	17938.5	0.427193	0.152	1470	8/18/05 12:45
F2	12.4	4	2	119	35467	17733.5	0.422311	0.152	1470	8/18/05 12:39
F2	18.9	5	2	126	35346	17673	0.42087	0.152	1470	8/18/05 12:09
F2	26.3	6	2	104	35003	17501.5	0.416786	0.152	1470	8/18/05 12:03
F2	33.8	7	2	102	34752	17376	0.413797	0.152	1470	8/18/05 12:20
F2	44.7	8	2	98	34666	17333	0.412773	0.152	1470	8/18/05 12:15
F2	55.4	9	2	160	34566	17283	0.411582	0.152	1470	8/18/05 13:21
F2	76.5	10	2	80	34021	17010.5	0.405093	0.152	1470	8/18/05 13:15
F2	94.8	11	2	119	33853	16926.5	0.403093	0.152	1470	8/18/05 13:33
F2	113.2	12	2	97	33763	16881.5	0.402021	0.152	1470	8/18/05 13:27
F3	0	1	2	97	35292	17646	0.420227	0.116	1470	8/18/05 12:39
F3	4	2	2	126	35070	17535	0.417584	0.116	1470	8/18/05 12:33
F3	7.8	3	2	97	34830	17415	0.414726	0.116	1470	8/18/05 12:27
F3	12.4	4	2	80	34609	17304.5	0.412094	0.116	1470	8/18/05 12:45
F3	18.9	5	2	94	34297	17148.5	0.408379	0.116	1470	8/18/05 12:15
F3	26.3	6	2	98	33980	16990	0.404605	0.116	1470	8/18/05 12:09
F3	33.8	7	2	63	33663	16831.5	0.40083	0.116	1470	8/18/05 12:03
F3	44.7	8	2	108	33575	16787.5	0.399782	0.116	1470	8/18/05 12:20
F3	55.4	9	2	113	32917	16458.5	0.391947	0.116	1470	8/18/05 13:27
F3	76.5	10	2	67	32894	16447	0.391674	0.116	1470	8/18/05 13:21
F3	94.8	11	2	84	32675	16337.5	0.389066	0.116	1470	8/18/05 13:15
F3	113.2	12	2	82	32298	16149	0.384577	0.116	1470	8/18/05 13:33
F4	0	1	2	165	35776	17888	0.42599	0.174	1470	8/18/05 12:45
F4	4	2	2	195	35529	17764.5	0.423049	0.174	1470	8/18/05 12:39
F4	7.8	3	2	189	35093	17546.5	0.417857	0.174	1470	8/18/05 12:33
F4	12.4	4	2	160	34954	17477	0.416202	0.174	1470	8/18/05 12:27
F4	18.9	5	2	152	34926	17463	0.415869	0.174	1470	8/18/05 12:20

BETAFF.XLS

F4	26.3	6	2	186	34618	17309	0.412201	0.174	1470	8/18/05 12:15
F4	33.8	7	2	153	34354	17177	0.409058	0.174	1470	8/18/05 12:09
F4	44.7	8	2	176	34087	17043.5	0.405879	0.174	1470	8/18/05 12:03
F4	55.4	9	2	184	33803	16901.5	0.402497	0.174	1470	8/18/05 13:33
F4	76.5	10	2	135	33538	16769	0.399342	0.174	1470	8/18/05 13:27
F4	94.8	11	2	190	33098	16549	0.394103	0.174	1470	8/18/05 13:21
F4	113.2	12	2	141	32388	16194	0.385649	0.174	1470	8/18/05 13:15
G1	0	1	2	352	32798	16399	0.39053	0.056	1470	8/18/05 12:51
G1	4	2	2	346	32332	16166	0.384982	0.056	1470	8/18/05 13:09
G1	7.8	3	2	409	32144	16072	0.382743	0.056	1470	8/18/05 13:03
G1	12.4	4	2	341	32072	16036	0.381886	0.056	1470	8/18/05 12:57
G1	18.9	5	2	416	31454	15727	0.374527	0.056	1470	8/18/05 12:27
G1	26.3	6	2	337	31122	15561	0.370574	0.056	1470	8/18/05 12:45
G1	33.8	7	2	358	31084	15542	0.370122	0.056	1470	8/18/05 12:39
G1	44.7	8	2	405	31072	15536	0.369979	0.056	1470	8/18/05 12:33
G1	55.4	9	2	361	30937	15468.5	0.368371	0.056	1470	8/18/05 12:03
G1	76.5	10	2	308	30900	15450	0.367931	0.056	1470	8/18/05 12:20
G1	94.8	11	2	345	29705	14852.5	0.353702	0.056	1470	8/18/05 12:15
G1	113.2	12	2	328	29544	14772	0.351785	0.056	1470	8/18/05 12:09
G2	0	1	2	162	34535	17267.5	0.411213	0.1	1470	8/18/05 12:57
G2	4	2	2	183	34288	17144	0.408272	0.1	1470	8/18/05 12:51
G2	7.8	3	2	201	34199	17099.5	0.407212	0.1	1470	8/18/05 13:09
G2	12.4	4	2	144	33934	16967	0.404057	0.1	1470	8/18/05 13:03
G2	18.9	5	2	177	33618	16809	0.400294	0.1	1470	8/18/05 12:33
G2	26.3	6	2	160	33153	16576.5	0.394758	0.1	1470	8/18/05 12:27
G2	33.8	7	2	163	33148	16574	0.394698	0.1	1470	8/18/05 12:45
G2	44.7	8	2	175	32875	16437.5	0.391447	0.1	1470	8/18/05 12:39
G2	55.4	9	2	152	32565	16282.5	0.387756	0.1	1470	8/18/05 12:09
G2	76.5	10	2	152	32100	16050	0.382219	0.1	1470	8/18/05 12:03
G2	94.8	11	2	173	31964	15982	0.3806	0.1	1470	8/18/05 12:20
G2	113.2	12	2	141	31461	15730.5	0.374611	0.1	1470	8/18/05 12:15
G3	0	1	2	15	34939	17469.5	0.416024	0.226	1470	8/18/05 13:03
G3	4	2	2	29	34897	17448.5	0.415524	0.226	1470	8/18/05 12:57
G3	7.8	3	2	49	34323	17161.5	0.408689	0.226	1470	8/18/05 12:51

*Handwritten signature/initials*

G3	12.4	4	2	19	34254	17127	0.407867	0.226	1470	8/18/05 13:09
G3	18.9	5	2	26	33736	16868	0.401699	0.226	1470	8/18/05 12:39
G3	26.3	6	2	8	33695	16847.5	0.401211	0.226	1470	8/18/05 12:33
G3	33.8	7	2	18	33554	16777	0.399532	0.226	1470	8/18/05 12:27
G3	44.7	8	2	29	33400	16700	0.397699	0.226	1470	8/18/05 12:45
G3	55.4	9	2	47	33331	16665.5	0.396877	0.226	1470	8/18/05 12:15
G3	76.5	10	2	7	33194	16597	0.395246	0.226	1470	8/18/05 12:09
G3	94.8	11	2	25	32582	16291	0.387959	0.226	1470	8/18/05 12:03
G3	113.2	12	2	13	32348	16174	0.385172	0.226	1470	8/18/05 12:20
G4	0	1	2	3	34995	17497.5	0.41669	0.08	1470	8/18/05 13:09
G4	4	2	2	31	34722	17361	0.41344	0.08	1470	8/18/05 13:03
G4	7.8	3	2	49	34464	17232	0.410368	0.08	1470	8/18/05 12:57
G4	12.4	4	2	6	34222	17111	0.407486	0.08	1470	8/18/05 12:51
G4	18.9	5	2	16	33900	16950	0.403652	0.08	1470	8/18/05 12:45
G4	26.3	6	2	2	33432	16716	0.39808	0.08	1470	8/18/05 12:39
G4	33.8	7	2	12	33115	16557.5	0.394305	0.08	1470	8/18/05 12:33
G4	44.7	8	2	16	33071	16535.5	0.393781	0.08	1470	8/18/05 12:27
G4	55.4	9	2	48	32888	16444	0.391602	0.08	1470	8/18/05 12:20
G4	76.5	10	2	5	32049	16024.5	0.381612	0.08	1470	8/18/05 12:15
G4	94.8	11	2	13	31913	15956.5	0.379993	0.08	1470	8/18/05 12:09
G4	113.2	12	2	19	31764	15882	0.378219	0.08	1470	8/18/05 12:03
H1	0	1	2	1879	32413	16206.5	0.385946	0.12	1522.5	8/18/05 13:15
H1	4	2	2	1869	31699	15849.5	0.377445	0.12	1522.5	8/18/05 13:33
H1	7.8	3	2	1913	31565	15782.5	0.375849	0.12	1522.5	8/18/05 13:27
H1	12.4	4	2	1861	31468	15734	0.374694	0.12	1522.5	8/18/05 13:21
H1	18.9	5	2	1750	31163	15581.5	0.371062	0.12	1522.5	8/18/05 12:51
H1	26.3	6	2	1643	30940	15470	0.368407	0.12	1522.5	8/18/05 13:09
H1	33.8	7	2	1674	30938	15469	0.368383	0.12	1522.5	8/18/05 13:03
H1	44.7	8	2	1722	30533	15266.5	0.363561	0.12	1522.5	8/18/05 12:57
H1	55.4	9	2	1755	30361	15180.5	0.361513	0.12	1522.5	8/18/05 12:27
H1	76.5	10	2	1586	30264	15132	0.360358	0.12	1522.5	8/18/05 12:45
H1	94.8	11	2	1626	29478	14739	0.350999	0.12	1522.5	8/18/05 12:39
H1	113.2	12	2	1570	28932	14466	0.344497	0.12	1522.5	8/18/05 12:33
H2	0	1	2	944	33633	16816.5	0.400473	0.104	1522.5	8/18/05 13:21

BETAFF.XLS

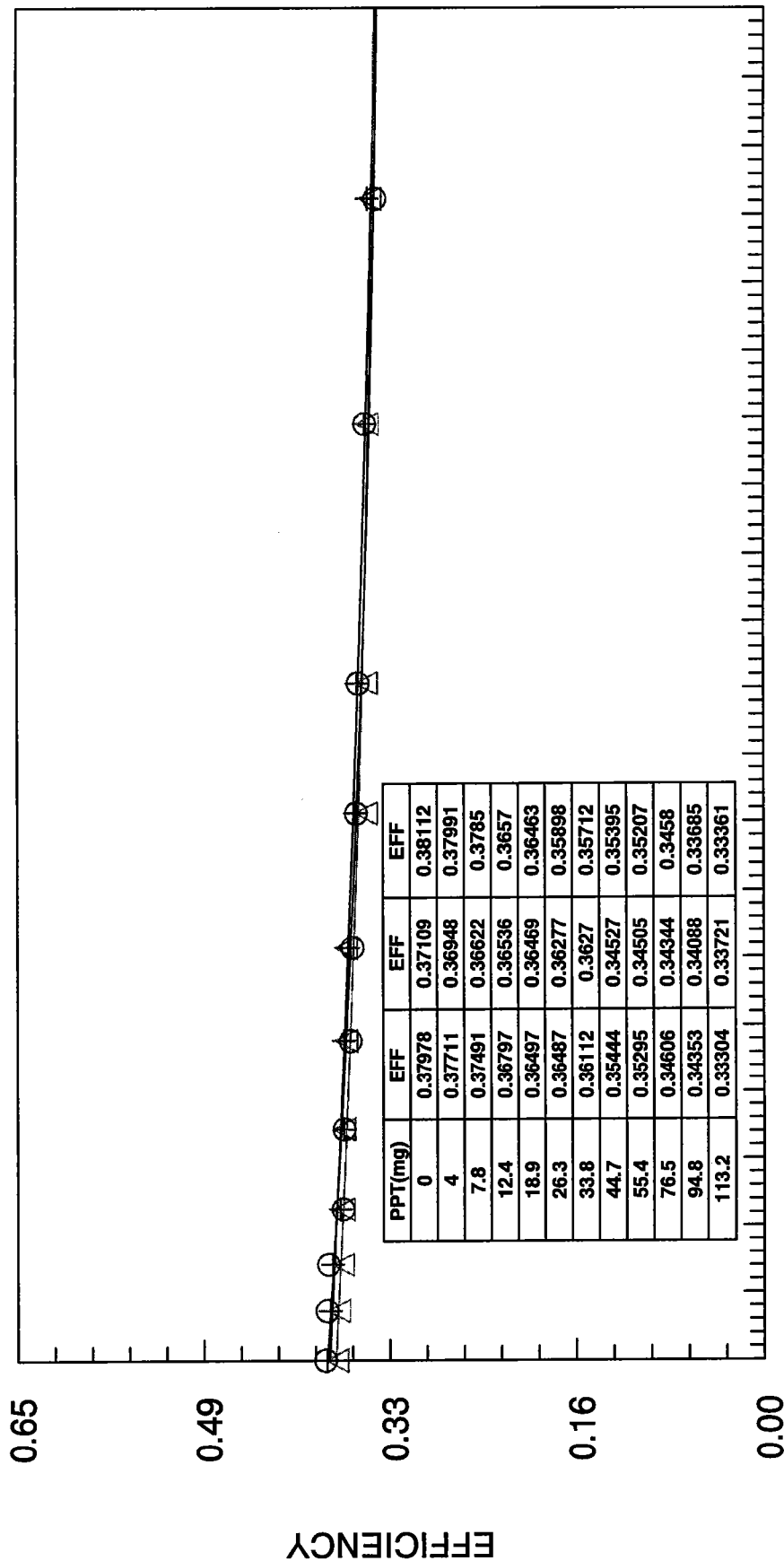
H2	4	2	994	33575	16787.5	0.399782	0.104	1522.5	8/18/05 13:15
H2	7.8	3	1029	33377	16688.5	0.397425	0.104	1522.5	8/18/05 13:33
H2	12.4	4	942	33266	16633	0.396103	0.104	1522.5	8/18/05 13:27
H2	18.9	5	905	33247	16623.5	0.395877	0.104	1522.5	8/18/05 12:57
H2	26.3	6	787	32849	16424.5	0.391138	0.104	1522.5	8/18/05 12:51
H2	33.8	7	875	32771	16385.5	0.390209	0.104	1522.5	8/18/05 13:09
H2	44.7	8	954	32733	16366.5	0.389757	0.104	1522.5	8/18/05 13:03
H2	55.4	9	938	32643	16321.5	0.388685	0.104	1522.5	8/18/05 12:33
H2	76.5	10	933	32344	16172	0.385125	0.104	1522.5	8/18/05 12:27
H2	94.8	11	864	31341	15670.5	0.373182	0.104	1522.5	8/18/05 12:45
H2	113.2	12	809	31308	15654	0.372789	0.104	1522.5	8/18/05 12:39
H3	0	1	1124	34411	17205.5	0.409737	0.066	1522.5	8/18/05 13:27
H3	4	2	1166	34300	17150	0.408415	0.066	1522.5	8/18/05 13:21
H3	7.8	3	1137	33800	16900	0.402461	0.066	1522.5	8/18/05 13:15
H3	12.4	4	1067	33669	16834.5	0.400902	0.066	1522.5	8/18/05 13:33
H3	18.9	5	1080	33483	16741.5	0.398687	0.066	1522.5	8/18/05 13:03
H3	26.3	6	1017	33450	16725	0.398294	0.066	1522.5	8/18/05 12:57
H3	33.8	7	1040	33417	16708.5	0.397901	0.066	1522.5	8/18/05 12:51
H3	44.7	8	1072	32937	16468.5	0.392186	0.066	1522.5	8/18/05 13:09
H3	55.4	9	1045	32640	16320	0.388649	0.066	1522.5	8/18/05 12:39
H3	76.5	10	890	32308	16154	0.384696	0.066	1522.5	8/18/05 12:33
H3	94.8	11	993	32159	16079.5	0.382922	0.066	1522.5	8/18/05 12:27
H3	113.2	12	997	31988	15994	0.380886	0.066	1522.5	8/18/05 12:45
H4	0	1	1214	33719	16859.5	0.401497	0.076	1522.5	8/18/05 13:33
H4	4	2	1274	33488	16744	0.398746	0.076	1522.5	8/18/05 13:27
H4	7.8	3	1218	33064	16532	0.393698	0.076	1522.5	8/18/05 13:21
H4	12.4	4	1240	33015	16507.5	0.393114	0.076	1522.5	8/18/05 13:15
H4	18.9	5	1060	32645	16322.5	0.388709	0.076	1522.5	8/18/05 13:09
H4	26.3	6	1034	32315	16157.5	0.384779	0.076	1522.5	8/18/05 13:03
H4	33.8	7	1044	32095	16047.5	0.38216	0.076	1522.5	8/18/05 12:57
H4	44.7	8	1150	32016	16008	0.381219	0.076	1522.5	8/18/05 12:51
H4	55.4	9	1132	31783	15891.5	0.378445	0.076	1522.5	8/18/05 12:45
H4	76.5	10	1047	31420	15710	0.374122	0.076	1522.5	8/18/05 12:39
H4	94.8	11	1022	31188	15594	0.37136	0.076	1522.5	8/18/05 12:33
H4	113.2	12	1140	30694	15347	0.365478	0.076	1522.5	8/18/05 12:27

# BETA EFF LB4100 8/05

## DRAWER A

+ A1      △ A2      ○ A3

Sr-90 2mL 0717-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104 110  
WEIGHT(mg)

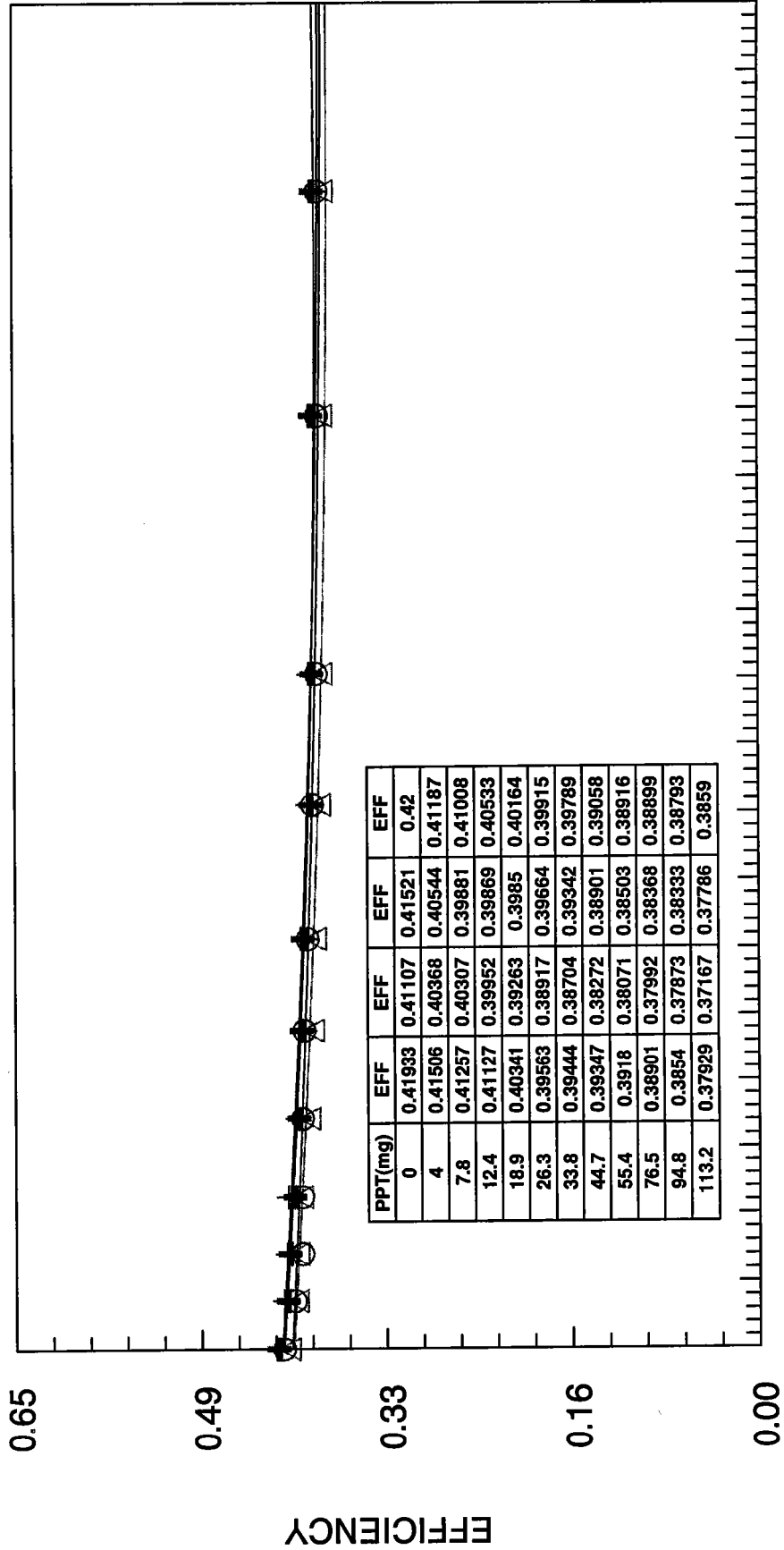


# BETA EFF LB4100 8/05

## DRAWER B

+ B1    △    B2    ○    B3    +    B4

**Sr-90 2mL 0717-A**



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104 110

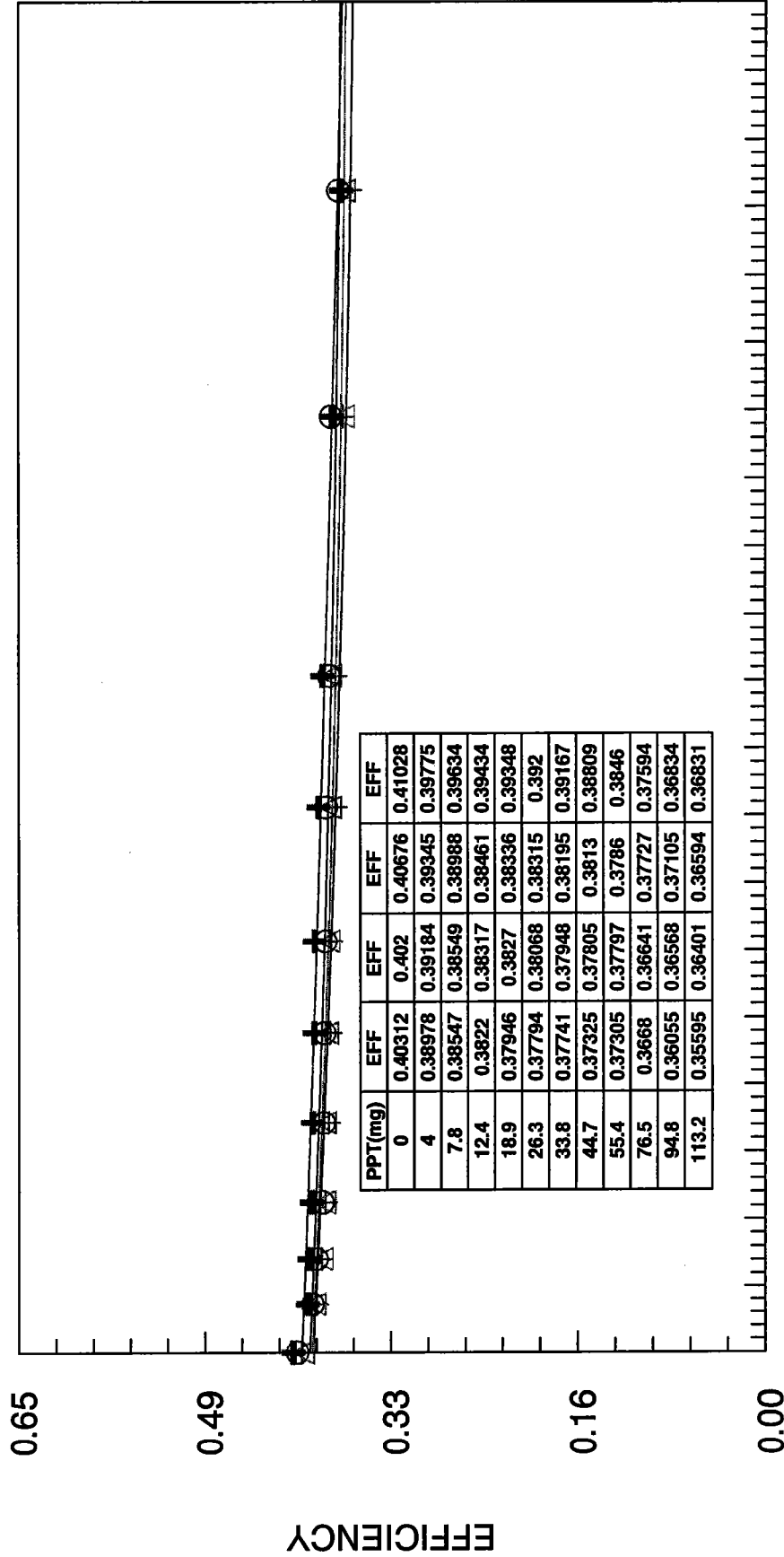
WEIGHT(mg)

# BETA EFF LB4100 8/05

## DRAWER C

+ C1    △ C2    ○ C3    + C4

Sr-90 2mL 0717-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104.110

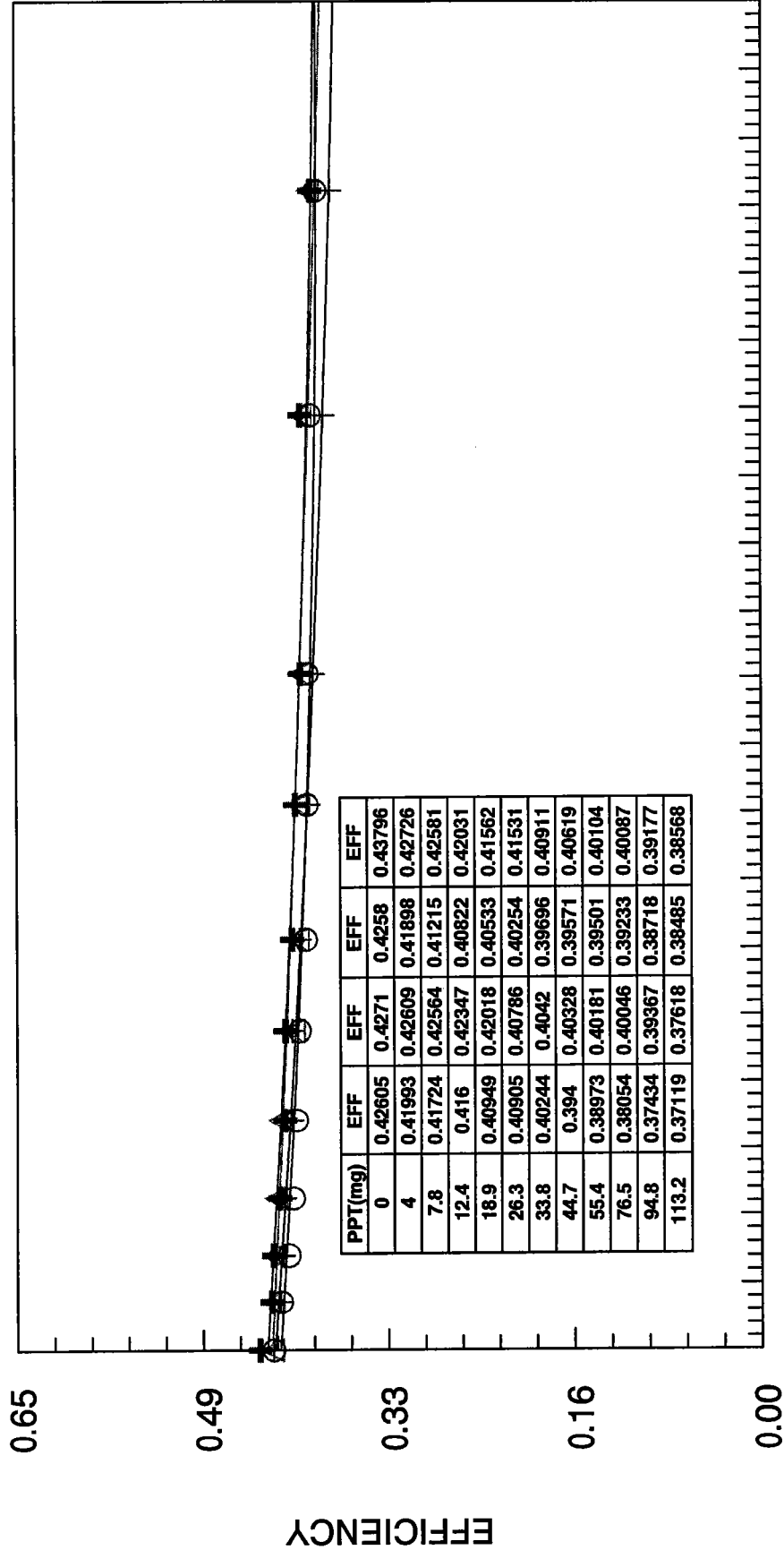
WEIGHT(mg)

# BETA EFF LB4100 8/05

## DRAWER D

+ D1    △ D2    ○ D3    + D4

Sr-90 2mL 0717-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104 110

WEIGHT(mg)

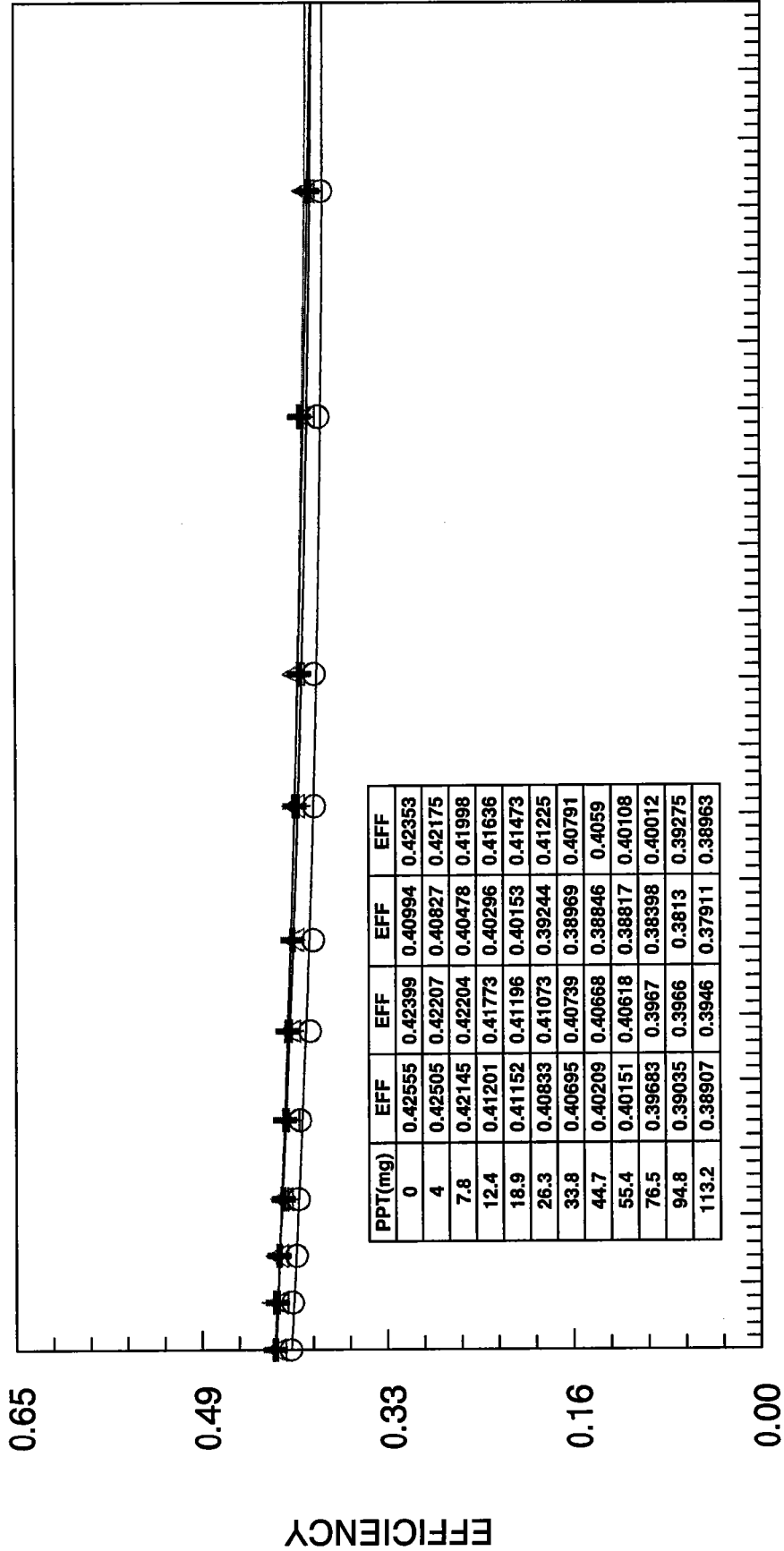
*[Handwritten signature]*

# BETA EFF LB4100 8/05

## DRAWER E

+ E1    △ E2    ○ E3    + E4

Sr-90 2mL 0717-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104.110  
WEIGHT(mg)

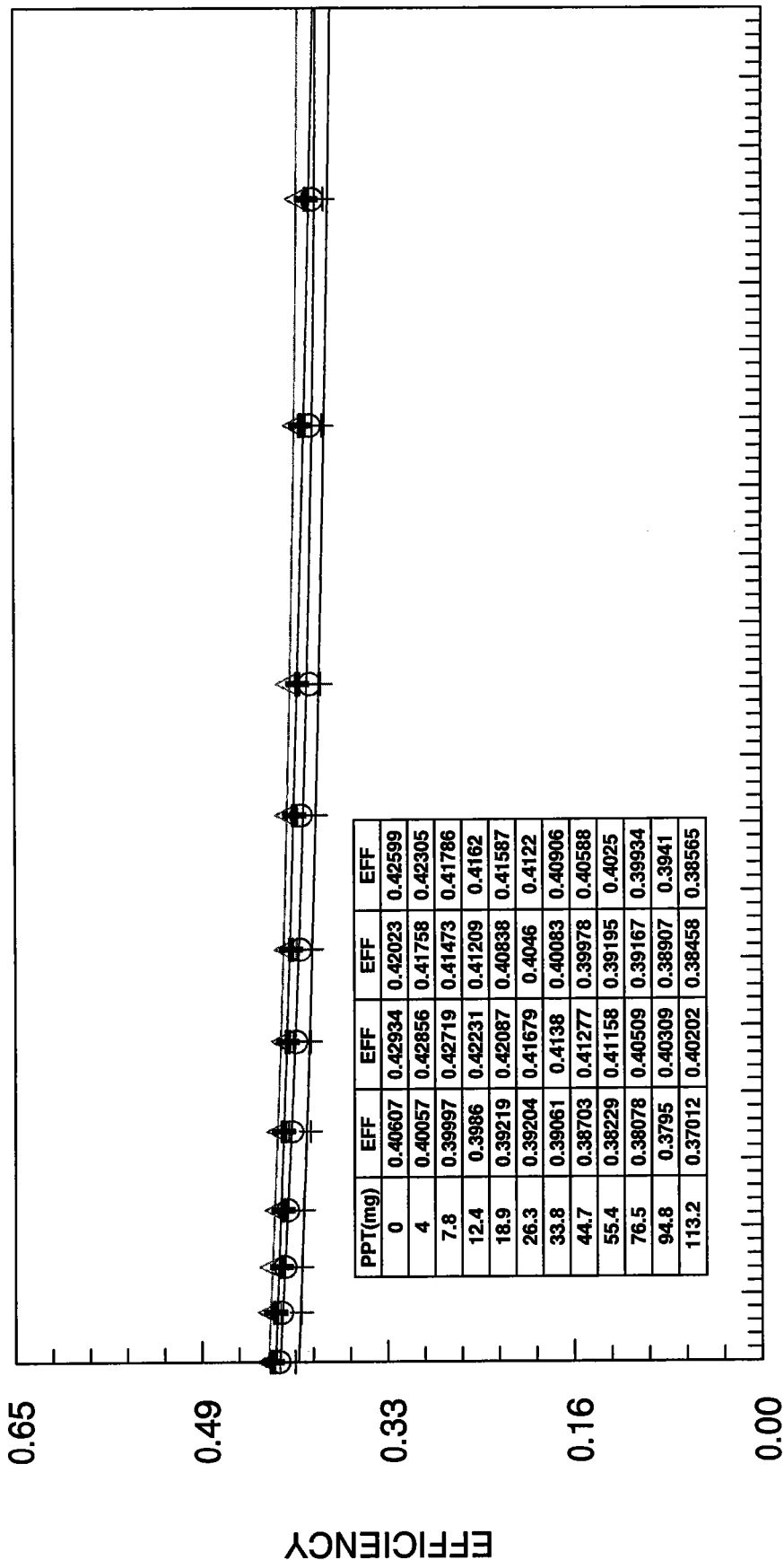
*[Handwritten signature]*

# BETA EFF LB4100 8/05

DRAWER F

+ F1    △ F2    ○ F3    + F4

Sr-90 2mL 0717-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104.110

WEIGHT(mg)

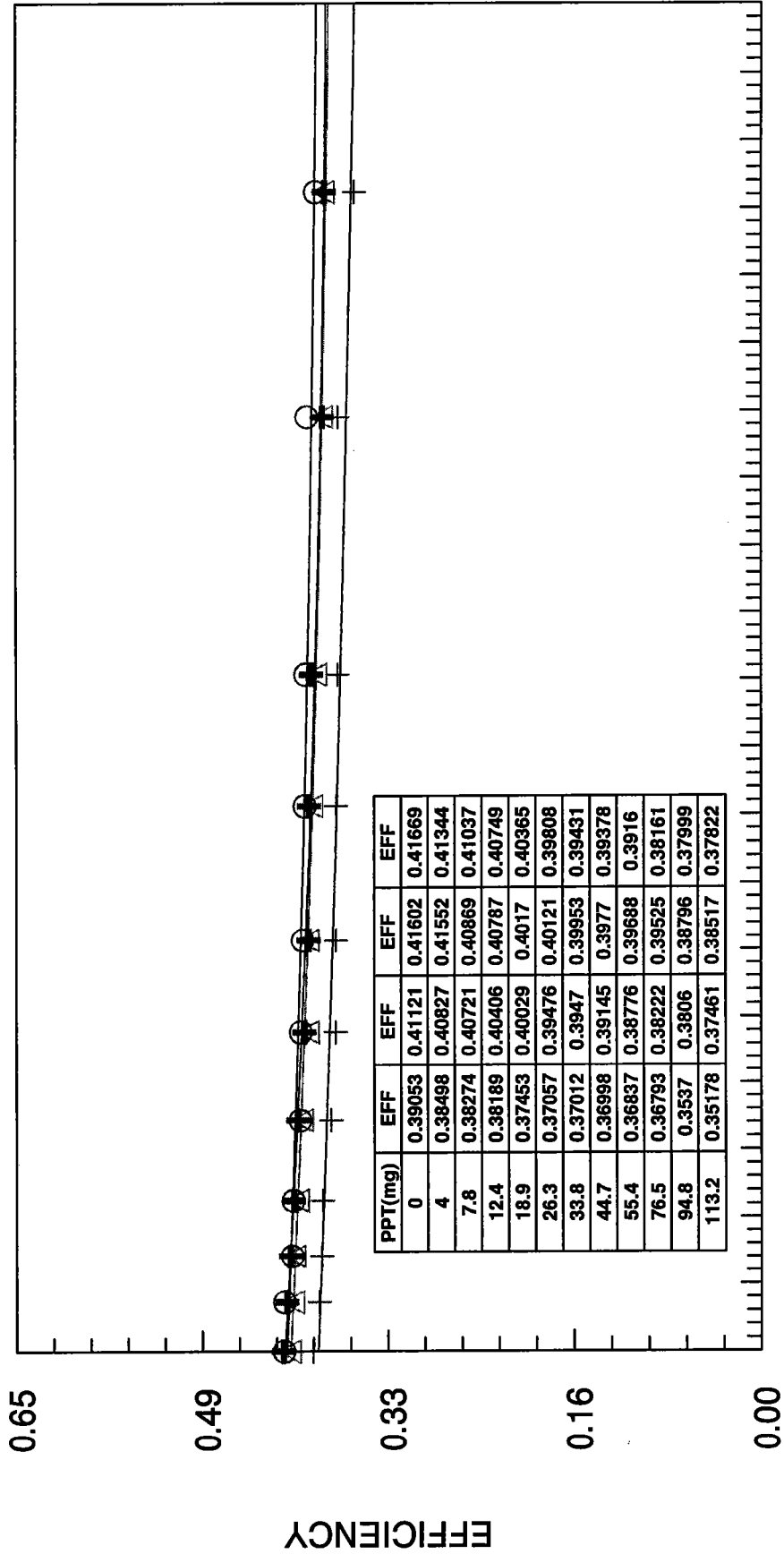
*[Handwritten signature]*

# BETA EFF LB4100 8/05

## DRAWER G

+ G1    △ G2    ○ G3    + G4

Sr-90 2mL 0717-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104 110

WEIGHT(mg)

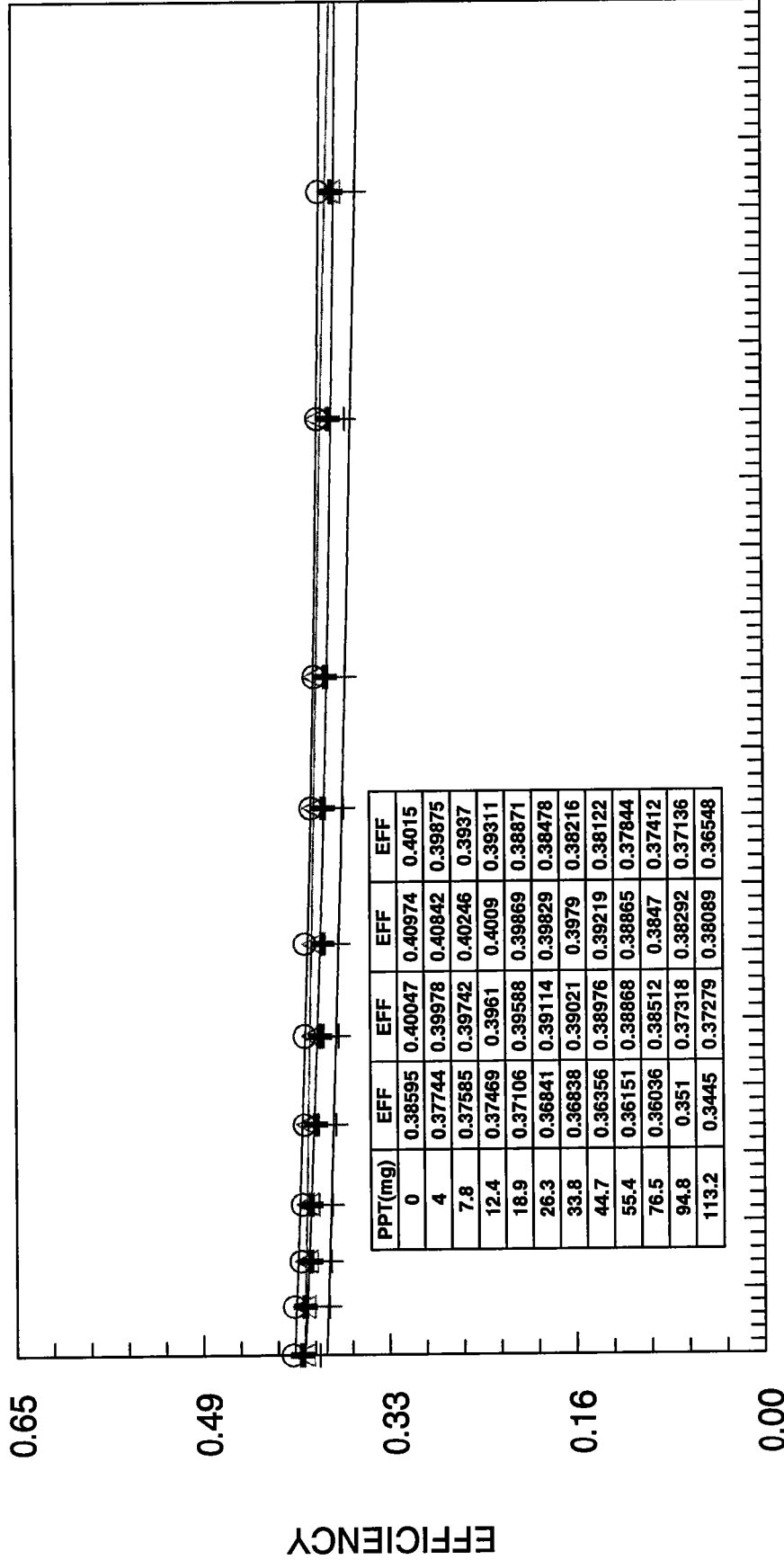
*Handwritten signature*

# BETA EFF LB4100 8/05

DRAWER H

+ H1    △ H2    ○ H3    + H4

Sr-90 2mL 0717-A



0.0 5.5 11. 16. 22. 27. 33. 38. 44. 49. 55. 60. 66. 71. 77. 82. 88. 93. 99. 104.110  
WEIGHT(mg)

*Handwritten signature/initials*

**General Engineering Laboratories  
Cross Talk Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-001/001B Isotope Po-210  
 Date Standards Prepared 6/18/04 Cocktail Type Used —  
 Standard ID 0685-A Matrix of Vial Planchets concentric ring SS  
 Amount Used (g or ml) 1.0  
 Standard Activity (DPM/g or ml) 190987.932 Type of Scintillation Vial —  
 Reference Date 6/1/04 Pipette ID Used 110265  
 Expiration Date 5/25/05 Balance ID Used C31514  
 Residue/Carrier Agent BaCl<sub>2</sub> Quenching Agent —

	Standard Number	Quenching Vol (uL)/ Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
C1	1	0.0	7.4480	7.4480	0.0
C2	2	0.1	7.4377	7.4403	2.6
C3	3	0.2	7.4223	7.4289	6.6
C4	4	0.3	7.4367	7.4464	9.7
C5	5	0.4	7.4405	7.4543	13.8
C6	6	0.5	7.4463	7.4628	16.5
C7	7	0.7	7.4540	7.4784	24.4
C8	8	1.0	7.4066	7.4411	34.5
C9	9	1.5	7.4488	7.5029	54.1
C10	10	2.0	7.4475	7.5225	75.0
C11	11	3.0 <del>2.5</del>	7.4405 6/18/04	7.5486	108.1
C12	12	3.5	7.4437	7.5723	128.6

Prepared By: Angela Zerbe Date 6/18/04  
 Reviewed By: [Signature] Date 7/21/04

Rev 1 RLM 9/10/97

*[Handwritten signature]*



BXTLK

Detector	Sample I.D.	Act. Time	Alpha	Beta	Voltage	Date/Time	XTLK
A1	1	2	196	67795	1470	7/19/04 9:40	0.002891
A2	2	2	207	70957	1470	7/19/04 9:40	0.002917
A3	3	2	286	69558	1470	7/19/04 9:40	0.004112
A4	4	2	71	66601	1470	7/19/04 9:40	0.001066
B1	5	2	161	81714	1470	7/19/04 9:40	0.00197
B2	6	2	84	68086	1470	7/19/04 9:40	0.001234
B3	7	2	195	60476	1470	7/19/04 9:40	0.003224
B4	8	2	157	84853	1470	7/19/04 9:40	0.00185
C1	9	2	515	73137	1470	7/19/04 9:40	0.007042
C2	10	2	69	57389	1470	7/19/04 9:40	0.001202
C3	11	2	10	68036	1470	7/19/04 9:40	0.000147
C4	12	2	12	77755	1470	7/19/04 9:40	0.000154
D1	13	2	115	85335	1470	7/19/04 9:40	0.001348
D2	14	2	128	58337	1470	7/19/04 9:40	0.002194
D3	15	2	157	68137	1470	7/19/04 9:40	0.002304
D4	16	2	64	75279	1470	7/19/04 9:40	0.00085
E1	1	2	678	68521	1470	7/19/04 10:42	0.009895
E2	2	2	421	74913	1470	7/19/04 10:42	0.00562
E3	3	2	663	68949	1470	7/19/04 10:42	0.009616
E4	4	2	457	67355	1470	7/19/04 10:42	0.006785
F1	5	2	366	77863	1470	7/19/04 10:42	0.004701
F2	6	2	170	70109	1470	7/19/04 10:42	0.002425
F3	7	2	25	61436	1470	7/19/04 10:42	0.000407
F4	8	2	231	85661	1470	7/19/04 10:42	0.002697
G1	9	2	449	68285	1470	7/19/04 10:42	0.006575
G2	10	2	199	58763	1470	7/19/04 10:42	0.003386
G3	11	2	11	71884	1470	7/19/04 10:42	0.000153
G4	12	2	14	81759	1470	7/19/04 10:42	0.000171
H1	13	2	3716	76542	1522.5	7/19/04 10:42	0.048549
H2	14	2	1388	54198	1522.5	7/19/04 10:42	0.02561
H3	15	2	2076	64735	1522.5	7/19/04 10:42	0.032069
H4	16	2	1978	67443	1522.5	7/19/04 10:42	0.029328

AXTLK

Detector	Weight (mg)	Sample I.D.	Act. Time	Alpha	Beta	Voltage	Date/Time	Alpha Xtlk
A1	0	1	4	123717	1302	1470	7/19/04 9:52	0.010524019
A1	2.6	2	4	136730	1988	1470	7/19/04 10:11	0.014539604
A1	6.6	3	4	140290	2162	1470	7/19/04 10:04	0.015410934
A1	9.7	4	4	122222	1759	1470	7/19/04 9:58	0.014391844
A1	13.8	5	4	149603	2108	1470	7/19/04 11:14	0.014090627
A1	16.5	6	4	160708	2304	1470	7/19/04 11:30	0.014336561
A1	24.4	7	4	130029	1849	1470	7/19/04 11:25	0.014219905
A1	34.5	8	4	129722	1907	1470	7/19/04 11:18	0.014700688
A1	54.1	9	4	124053	1898	1470	7/19/04 10:42	0.015299912
A1	75	10	4	100346	1736	1470	7/19/04 11:07	0.017300142
A1	108.1	11	4	104788	1621	1470	7/19/04 11:00	0.015469329
A1	128.6	12	4	102926	1462	1470	7/19/04 10:49	0.014204388
A2	0	1	4	130307	1237	1470	7/19/04 9:58	0.009492967
A2	2.6	2	4	138866	2058	1470	7/19/04 9:52	0.014820042
A2	6.6	3	4	145776	2074	1470	7/19/04 10:11	0.014227308
A2	9.7	4	4	127305	1773	1470	7/19/04 10:04	0.013927183
A2	13.8	5	4	154279	2052	1470	7/19/04 11:18	0.013300579
A2	16.5	6	4	165687	2157	1470	7/19/04 11:14	0.013018523
A2	24.4	7	4	138119	1869	1470	7/19/04 11:30	0.01353181
A2	34.5	8	4	130953	1900	1470	7/19/04 11:25	0.014509022
A2	54.1	9	4	130041	1950	1470	7/19/04 10:49	0.014995271
A2	75	10	4	104410	1657	1470	7/19/04 10:42	0.015870127
A2	108.1	11	4	108997	1756	1470	7/19/04 11:07	0.016110535
A2	128.6	12	4	106331	1572	1470	7/19/04 11:00	0.014784023
A3	0	1	4	130783	937	1470	7/19/04 10:04	0.00716454
A3	2.6	2	4	143586	1643	1470	7/19/04 9:58	0.01144262
A3	6.6	3	4	147082	1465	1470	7/19/04 9:52	0.00996043
A3	9.7	4	4	129766	1350	1470	7/19/04 10:11	0.010403341
A3	13.8	5	4	154169	1559	1470	7/19/04 11:25	0.010112279
A3	16.5	6	4	168726	1710	1470	7/19/04 11:18	0.010134775
A3	24.4	7	4	138452	1515	1470	7/19/04 11:14	0.01094242
A3	34.5	8	4	136632	1475	1470	7/19/04 11:30	0.010795421
A3	54.1	9	4	130139	1393	1470	7/19/04 11:00	0.01070394
A3	75	10	4	105636	1459	1470	7/19/04 10:49	0.013811579
A3	108.1	11	4	108753	1311	1470	7/19/04 10:42	0.01205484
A3	128.6	12	4	106754	1221	1470	7/19/04 11:07	0.011437511
A4	0	1	4	135486	1232	1470	7/19/04 10:11	0.00909319
A4	2.6	2	4	146040	2088	1470	7/19/04 10:04	0.014297453
A4	6.6	3	4	153755	2090	1470	7/19/04 9:58	0.013593054
A4	9.7	4	4	132749	1856	1470	7/19/04 9:52	0.013981273
A4	13.8	5	4	162322	2162	1470	7/19/04 11:30	0.013319205
A4	16.5	6	4	171420	2245	1470	7/19/04 11:25	0.013096488
A4	24.4	7	4	143298	1980	1470	7/19/04 11:18	0.01381736
A4	34.5	8	4	141360	2005	1470	7/19/04 11:14	0.014183645
A4	54.1	9	4	133616	1984	1470	7/19/04 11:07	0.014848521
A4	75	10	4	108311	1876	1470	7/19/04 11:00	0.017320494
A4	108.1	11	4	112868	1868	1470	7/19/04 10:49	0.016550307
A4	128.6	12	4	110913	1841	1470	7/19/04 10:42	0.016598595
							AVERAGE=	0.01454066
							AVERAGE=	0.014048949
							AVERAGE=	0.010746975
							AVERAGE=	0.014848521
							AVERAGE=	0.017320494
							AVERAGE=	0.016550307
							AVERAGE=	0.014224965

*Jan 28/2005*

AXTLK

B1	0	1	4	136855	1718	1470	7/19/04 10:18	0.012553432
B1	2.6	2	4	150611	3194	1470	7/19/04 10:35	0.02120695
B1	6.6	2	4	157772	3182	1470	7/19/04 10:29	0.020168344
B1	9.7	3	4	137486	2647	1470	7/19/04 10:23	0.019252869
B1	13.8	5	4	151499	3124	1470	7/19/04 9:52	0.020620598
B1	16.5	6	4	178375	3624	1470	7/19/04 10:11	0.020316748
B1	24.4	7	4	146445	2994	1470	7/19/04 10:04	0.020444535
B1	34.5	8	4	140044	3280	1470	7/19/04 9:58	0.02342121
B1	54.1	9	4	135197	2910	1470	7/19/04 11:14	0.021524146
B1	75	10	4	109731	2405	1470	7/19/04 11:30	0.021917234
B1	108.1	11	4	117355	2932	1470	7/19/04 11:25	0.024984023
B1	128.6	12	4	113124	2863	1470	7/19/04 11:18	0.025308511
B2	0	2	4	137607	1589	1470	7/19/04 10:23	0.011547378
B2	2.6	3	4	152047	3110	1470	7/19/04 10:18	0.020454202
B2	6.6	3	4	157696	3092	1470	7/19/04 10:35	0.019607346
B2	9.7	4	4	137643	2647	1470	7/19/04 10:29	0.019230909
B2	13.8	5	4	158139	3185	1470	7/19/04 9:58	0.020140509
B2	16.5	6	4	161449	3256	1470	7/19/04 9:52	0.020167359
B2	24.4	7	4	147272	2856	1470	7/19/04 10:11	0.019392688
B2	34.5	8	4	143406	3166	1470	7/19/04 10:04	0.022077179
B2	54.1	9	4	138245	2760	1470	7/19/04 11:18	0.019964556
B2	75	10	4	105891	2167	1470	7/19/04 11:14	0.02046444
B2	108.1	11	4	117177	2706	1470	7/19/04 11:30	0.023099269
B2	128.6	12	4	114792	2573	1470	7/19/04 11:25	0.022414454
B3	0	1	4	138852	1164	1470	7/19/04 10:29	0.008383027
B3	2.6	3	4	154826	2289	1470	7/19/04 10:23	0.014784339
B3	6.6	4	4	160372	2397	1470	7/19/04 10:18	0.014946499
B3	9.7	4	4	140528	2154	1470	7/19/04 10:35	0.015327906
B3	13.8	5	4	169176	2442	1470	7/19/04 10:04	0.014434672
B3	16.5	6	4	172395	3075	1470	7/19/04 9:58	0.017836944
B3	24.4	7	4	133136	2167	1470	7/19/04 9:52	0.016276589
B3	34.5	8	4	147646	2581	1470	7/19/04 10:11	0.017481002
B3	54.1	9	4	141138	2436	1470	7/19/04 11:25	0.017259703
B3	75	10	4	113459	1922	1470	7/19/04 11:18	0.01694004
B3	108.1	11	4	116253	2297	1470	7/19/04 11:14	0.01975863
B3	128.6	12	4	116340	2184	1470	7/19/04 11:30	0.01872563
B4	0	1	4	138357	1358	1470	7/19/04 10:35	0.009815188
B4	2.6	1	4	153797	2540	1470	7/19/04 10:29	0.016515277
B4	6.6	2	4	158499	2834	1470	7/19/04 10:23	0.017880239
B4	9.7	4	4	137345	2493	1470	7/19/04 10:18	0.018151371
B4	13.8	5	4	167244	2966	1470	7/19/04 10:11	0.017734567
B4	16.5	6	4	176687	3385	1470	7/19/04 10:04	0.019158172
B4	24.4	7	4	142295	2780	1470	7/19/04 9:58	0.019536878
B4	34.5	8	4	132760	2942	1470	7/19/04 9:52	0.022160289
B4	54.1	9	4	137917	2516	1470	7/19/04 11:30	0.018242856
B4	75	10	4	111108	2181	1470	7/19/04 11:25	0.01962955
B4	108.1	11	4	117999	2747	1470	7/19/04 11:18	0.023279858
B4	128.6	12	4	110997	2552	1470	7/19/04 11:14	0.022991612
C1	0	1	4	138219	2163	1470	7/19/04 10:42	0.015649079
							AVERAGE=	0.019879524
							AVERAGE=	0.016016826
							AVERAGE=	0.018757988

AXTLK

C1	2.6	2	4	159291	4652	1470	7/19/04 11:07	0.030347509	
C1	6.6	3	4	158108	4902	1470	7/19/04 11:00	0.031004124	
C1	9.7	4	4	137978	4809	1470	7/19/04 10:49	0.034853382	
C1	13.8	5	4	161750	3849	1470	7/19/04 10:18	0.023795981	
C1	16.5	6	4	179689	5144	1470	7/19/04 10:35	0.028627239	
C1	24.4	7	4	147770	4051	1470	7/19/04 10:29	0.027414225	
C1	34.5	8	4	145864	3799	1470	7/19/04 10:23	0.026044809	
C1	54.1	9	4	135877	3569	1470	7/19/04 9:52	0.026266403	
C1	75	10	4	112561	4081	1470	7/19/04 10:11	0.036255897	
C1	108.1	11	4	117648	3452	1470	7/19/04 10:04	0.029341765	
C1	128.6	12	4	116523	3039	1470	7/19/04 9:58	0.026080688	
C2	0	1	4	134961	2296	1470	7/19/04 10:49	0.017012322	AVERAGE= 0.027973425
C2	2.6	2	4	148449	4336	1470	7/19/04 10:42	0.029607577	
C2	6.6	3	4	155197	4139	1470	7/19/04 11:07	0.026669933	
C2	9.7	4	4	135438	3421	1470	7/19/04 11:00	0.02525879	
C2	13.8	5	4	162753	3917	1470	7/19/04 10:23	0.024067145	
C2	16.5	6	4	182621	4061	1470	7/19/04 10:18	0.024972175	
C2	24.4	7	4	144036	3683	1470	7/19/04 10:35	0.025569996	
C2	34.5	8	4	141748	3949	1470	7/19/04 10:29	0.0278593	
C2	54.1	9	4	134227	3745	1470	7/19/04 9:58	0.027900497	
C2	75	10	4	104861	2613	1470	7/19/04 9:52	0.024918702	
C2	108.1	11	4	114870	3342	1470	7/19/04 10:11	0.029098378	
C2	128.6	12	4	112700	3059	1470	7/19/04 10:04	0.027142857	AVERAGE= 0.025839371
C3	0	1	4	133041	2324	1470	7/19/04 11:00	0.017468299	
C3	2.6	2	4	145708	4317	1470	7/19/04 10:49	0.029627749	
C3	6.6	3	4	149428	4212	1470	7/19/04 10:42	0.028187488	
C3	9.7	4	4	131067	3495	1470	7/19/04 11:07	0.026665751	
C3	13.8	5	4	158877	4028	1470	7/19/04 10:29	0.025352946	
C3	16.5	6	4	170289	4407	1470	7/19/04 10:23	0.025879534	
C3	24.4	7	4	137489	3932	1470	7/19/04 10:18	0.028598652	
C3	34.5	8	4	137350	4105	1470	7/19/04 10:35	0.02988715	
C3	54.1	9	4	132544	3521	1470	7/19/04 10:04	0.026564763	
C3	75	10	4	105750	2549	1470	7/19/04 9:58	0.024104019	
C3	108.1	11	4	109529	3571	1470	7/19/04 9:52	0.032603237	
C3	128.6	12	4	110261	3199	1470	7/19/04 10:11	0.029012978	AVERAGE= 0.026996047
C4	0	1	4	134746	2194	1470	7/19/04 11:07	0.016282487	
C4	2.6	2	4	148747	3773	1470	7/19/04 11:00	0.025365217	
C4	6.6	3	4	153786	3731	1470	7/19/04 10:49	0.024260986	
C4	9.7	4	4	133542	3415	1470	7/19/04 10:42	0.025572479	
C4	13.8	5	4	161892	3928	1470	7/19/04 10:35	0.024263089	
C4	16.5	6	4	170420	4887	1470	7/19/04 10:29	0.025742284	
C4	24.4	7	4	144020	3534	1470	7/19/04 10:23	0.024538259	
C4	34.5	8	4	134159	4073	1470	7/19/04 10:18	0.030359499	
C4	54.1	9	4	132938	4065	1470	7/19/04 10:11	0.030578164	
C4	75	10	4	107125	3069	1470	7/19/04 10:04	0.028648775	
C4	108.1	11	4	111548	3284	1470	7/19/04 9:58	0.029440241	
C4	128.6	12	4	108909	2974	1470	7/19/04 9:52	0.027307201	AVERAGE= 0.02602989
D1	0	1	4	137183	836	1470	7/19/04 11:14	0.00609405	
D1	2.6	2	4	152146	1493	1470	7/19/04 11:30	0.009812943	

AXTLK

D1	6.6	3	4	157199	1410	1470	7/19/04 11:25	0.008969523	
D1	9.7	4	4	137356	1369	1470	7/19/04 11:18	0.009966802	
D1	13.8	5	4	163988	1354	1470	7/19/04 10:42	0.008256702	
D1	16.5	6	4	176886	1588	1470	7/19/04 11:07	0.008977534	
D1	24.4	7	4	147078	1394	1470	7/19/04 11:00	0.009477964	
D1	34.5	8	4	141703	1295	1470	7/19/04 10:49	0.009138833	
D1	54.1	9	4	139394	1402	1470	7/19/04 10:18	0.010057822	
D1	75	10	4	110371	1345	1470	7/19/04 10:35	0.012186172	
D1	108.1	11	4	117305	1282	1470	7/19/04 10:23	0.010928775	
D1	128.6	12	4	114717	1384	1470	7/19/04 10:29	0.012064472	AVERAGE= 0.009660966
D2	0	1	4	136308	1089	1470	7/19/04 11:18	0.00798926	
D2	2.6	2	4	150733	1897	1470	7/19/04 11:14	0.012585167	
D2	6.6	3	4	155852	1978	1470	7/19/04 11:30	0.012691528	
D2	9.7	4	4	136225	1670	1470	7/19/04 11:25	0.01225913	
D2	13.8	5	4	163314	1857	1470	7/19/04 10:49	0.011370734	
D2	16.5	6	4	175487	1984	1470	7/19/04 10:42	0.011305681	
D2	24.4	7	4	145522	1761	1470	7/19/04 11:07	0.012101263	
D2	34.5	8	4	143353	1869	1470	7/19/04 11:00	0.013037746	
D2	54.1	9	4	137872	1944	1470	7/19/04 10:23	0.014100035	
D2	75	10	4	109877	1929	1470	7/19/04 10:18	0.017555994	
D2	108.1	11	4	115832	1698	1470	7/19/04 10:35	0.014659162	
D2	128.6	12	4	112801	1686	1470	7/19/04 10:29	0.014946676	AVERAGE= 0.012883531
D3	0	1	4	136324	946	1470	7/19/04 11:25	0.00693935	
D3	2.6	2	4	150332	1529	1470	7/19/04 11:18	0.010170822	
D3	6.6	3	4	154792	1744	1470	7/19/04 11:14	0.011266732	
D3	9.7	4	4	134673	1519	1470	7/19/04 11:30	0.011279173	
D3	13.8	5	4	160967	1586	1470	7/19/04 11:00	0.009852951	
D3	16.5	6	4	170608	1766	1470	7/19/04 10:49	0.010351214	
D3	24.4	7	4	144894	1647	1470	7/19/04 10:42	0.01136683	
D3	34.5	8	4	142521	1646	1470	7/19/04 11:07	0.011549175	
D3	54.1	9	4	136291	1558	1470	7/19/04 10:29	0.011431422	
D3	75	10	4	108998	1596	1470	7/19/04 10:23	0.014642471	
D3	108.1	11	4	115214	1586	1470	7/19/04 10:18	0.013765688	
D3	128.6	12	4	113270	1481	1470	7/19/04 10:35	0.013074954	AVERAGE= 0.011307574
D4	0	1	4	136048	1072	1470	7/19/04 11:30	0.007879572	
D4	2.6	2	4	150927	1904	1470	7/19/04 11:25	0.01261537	
D4	6.6	3	4	157221	1906	1470	7/19/04 11:18	0.012123062	
D4	9.7	4	4	136596	1795	1470	7/19/04 11:14	0.013140941	
D4	13.8	5	4	164743	1764	1470	7/19/04 11:07	0.010707587	
D4	16.5	6	4	175983	2193	1470	7/19/04 11:00	0.012461431	
D4	24.4	7	4	144187	1883	1470	7/19/04 10:49	0.013059443	
D4	34.5	8	4	142773	2010	1470	7/19/04 10:42	0.014078292	
D4	54.1	9	4	137914	1896	1470	7/19/04 10:35	0.013747698	
D4	75	10	4	111428	1922	1470	7/19/04 10:29	0.017248806	
D4	108.1	11	4	117783	1762	1470	7/19/04 10:23	0.014959714	
D4	128.6	12	4	114284	1805	1470	7/19/04 10:18	0.015793987	AVERAGE= 0.013151324
E1	0	1	4	137237	1055	1470	7/19/04 14:37	0.007687431	
E1	2.6	2	4	150399	1078	1470	7/19/04 14:55	0.007167601	
E1	6.6	3	4	158695	1132	1470	7/19/04 14:49	0.00713318	

AXTLK

E1	9.7	4	4	4	137598	1032	1470	7/19/04 14:44	0.007500109	
E1	13.8	5	4	4	166520	1079	1470	7/19/04 15:49	0.006479702	
E1	16.5	6	4	4	175322	1214	1470	7/19/04 16:05	0.006924402	
E1	24.4	7	4	4	145851	1067	1470	7/19/04 16:00	0.007315685	
E1	34.5	8	4	4	139221	1152	1470	7/19/04 15:55	0.008274614	
E1	54.1	9	4	4	139940	1056	1470	7/19/04 15:28	0.007546091	
E1	75	10	4	4	113062	1152	1470	7/19/04 15:44	0.0101891	
E1	108.1	11	4	4	117022	946	1470	7/19/04 15:38	0.00808395	
E1	128.6	12	4	4	113637	1028	1470	7/19/04 15:33	0.009046349	AVERAGE= 0.007779018
E2	0	1	4	4	134148	1773	1470	7/19/04 14:44	0.013216746	
E2	2.6	2	4	4	147290	2442	1470	7/19/04 14:37	0.016579537	
E2	6.6	3	4	4	153367	2565	1470	7/19/04 14:55	0.016724589	
E2	9.7	4	4	4	133927	2073	1470	7/19/04 14:49	0.015478582	
E2	13.8	5	4	4	160373	2285	1470	7/19/04 15:55	0.014248034	
E2	16.5	6	4	4	173566	2777	1470	7/19/04 15:49	0.01599677	
E2	24.4	7	4	4	142143	2252	1470	7/19/04 16:05	0.0158432	
E2	34.5	8	4	4	137311	2298	1470	7/19/04 16:00	0.016735731	
E2	54.1	9	4	4	133456	2269	1470	7/19/04 15:33	0.017001858	
E2	75	10	4	4	109190	2062	1470	7/19/04 15:28	0.018884513	
E2	108.1	11	4	4	114947	2041	1470	7/19/04 15:44	0.01756009	
E2	128.6	12	4	4	112200	1907	1470	7/19/04 15:38	0.016996435	AVERAGE= 0.016288743
E3	0	1	4	4	136853	1530	1470	7/19/04 14:49	0.01179879	
E3	2.6	2	4	4	149460	2235	1470	7/19/04 14:44	0.014953834	
E3	6.6	3	4	4	157056	2346	1470	7/19/04 14:37	0.014937347	
E3	9.7	4	4	4	136746	2083	1470	7/19/04 14:55	0.015232621	
E3	13.8	5	4	4	165222	2404	1470	7/19/04 16:00	0.01455012	
E3	16.5	6	4	4	175732	2814	1470	7/19/04 15:55	0.01601302	
E3	24.4	7	4	4	145988	2366	1470	7/19/04 15:49	0.016206812	
E3	34.5	8	4	4	141445	2492	1470	7/19/04 16:05	0.017618155	
E3	54.1	9	4	4	139076	2171	1470	7/19/04 15:38	0.015729225	
E3	75	10	4	4	109960	1670	1470	7/19/04 15:33	0.015187341	
E3	108.1	11	4	4	115508	2122	1470	7/19/04 15:28	0.018371022	
E3	128.6	12	4	4	113364	2071	1470	7/19/04 15:44	0.018266586	AVERAGE= 0.015668683
E4	0	1	4	4	136681	1911	1470	7/19/04 14:55	0.01398146	
E4	2.6	2	4	4	149661	3044	1470	7/19/04 14:49	0.02033993	
E4	6.6	3	4	4	157492	3117	1470	7/19/04 14:44	0.019791481	
E4	9.7	4	4	4	139013	2670	1470	7/19/04 14:37	0.019346004	
E4	13.8	5	4	4	162274	3314	1470	7/19/04 16:05	0.020422249	
E4	16.5	6	4	4	173369	3672	1470	7/19/04 16:00	0.021180257	
E4	24.4	7	4	4	144542	3262	1470	7/19/04 15:55	0.022567835	
E4	34.5	8	4	4	142646	3088	1470	7/19/04 15:49	0.021647996	
E4	54.1	9	4	4	137724	3001	1470	7/19/04 15:44	0.021789957	
E4	75	10	4	4	111632	2178	1470	7/19/04 15:38	0.019510535	
E4	108.1	11	4	4	113857	2900	1470	7/19/04 15:33	0.024592252	
E4	128.6	12	4	4	114413	2472	1470	7/19/04 15:28	0.021605936	AVERAGE= 0.020564605
F1	0	1	4	4	134677	1802	1470	7/19/04 15:00	0.013380161	
F1	2.6	2	4	4	148604	2300	1470	7/19/04 15:21	0.015477376	
F1	6.6	3	4	4	155092	2283	1470	7/19/04 15:16	0.014720295	
F1	9.7	4	4	4	135403	1937	1470	7/19/04 15:05	0.014305444	

*Jan 8/30/02*

F1	13.8	5	4	163522	2352	1470	7/19/04 14:37	0.014383386
F1	16.5	6	4	172812	2915	1470	7/19/04 14:55	0.016868042
F1	24.4	7	4	145730	2224	1470	7/19/04 14:49	0.015261099
F1	34.5	8	4	139746	2527	1470	7/19/04 14:44	0.018082807
F1	54.1	9	4	136594	2049	1470	7/19/04 15:49	0.015000659
F1	75	10	4	109354	1947	1470	7/19/04 16:05	0.017804561
F1	108.1	11	4	113990	2101	1470	7/19/04 16:00	0.018431441
F1	128.6	12	4	114198	1942	1470	7/19/04 15:55	0.017005552
F2	0	1	4	134307	3011	1470	7/19/04 15:05	0.022418787
F2	2.6	2	4	146311	4626	1470	7/19/04 15:00	0.031617582
F2	6.6	3	4	154104	4688	1470	7/19/04 15:21	0.030421014
F2	9.7	4	4	135420	3931	1470	7/19/04 15:16	0.029028209
F2	13.8	5	4	161889	4597	1470	7/19/04 14:44	0.0283396
F2	16.5	6	4	173818	4612	1470	7/19/04 14:37	0.026533501
F2	24.4	7	4	143592	4173	1470	7/19/04 14:55	0.029061508
F2	34.5	8	4	141288	4413	1470	7/19/04 14:49	0.031234075
F2	54.1	9	4	136989	3957	1470	7/19/04 15:55	0.028885531
F2	75	10	4	111213	2787	1470	7/19/04 15:49	0.02506002
F2	108.1	11	4	113958	3611	1470	7/19/04 16:05	0.031687113
F2	128.6	12	4	114318	3116	1470	7/19/04 16:00	0.0272573
F3	0	1	4	132310	2934	1470	7/19/04 15:16	0.022175195
F3	2.6	2	4	142989	4498	1470	7/19/04 15:05	0.031456965
F3	6.6	3	4	149733	4634	1470	7/19/04 15:00	0.030948422
F3	9.7	4	4	130537	3835	1470	7/19/04 15:21	0.029378644
F3	13.8	5	4	157952	4324	1470	7/19/04 14:49	0.027375405
F3	16.5	6	4	168986	4617	1470	7/19/04 14:44	0.02792179
F3	24.4	7	4	140324	4098	1470	7/19/04 14:37	0.029203843
F3	34.5	8	4	134869	4370	1470	7/19/04 14:55	0.032401812
F3	54.1	9	4	131644	4032	1470	7/19/04 16:00	0.030628057
F3	75	10	4	105294	3486	1470	7/19/04 15:55	0.0331073
F3	108.1	11	4	110025	3604	1470	7/19/04 15:49	0.032756192
F3	128.6	12	4	108095	3243	1470	7/19/04 16:05	0.030001388
F4	0	1	4	134259	2759	1470	7/19/04 15:21	0.020549833
F4	2.6	2	4	146564	4598	1470	7/19/04 15:16	0.03137196
F4	6.6	3	4	153224	4466	1470	7/19/04 15:05	0.02914687
F4	9.7	4	4	134146	3626	1470	7/19/04 15:00	0.027030251
F4	13.8	5	4	161912	4154	1470	7/19/04 14:55	0.025655912
F4	16.5	6	4	174980	4493	1470	7/19/04 14:49	0.02567722
F4	24.4	7	4	144239	3953	1470	7/19/04 14:44	0.027405903
F4	34.5	8	4	140475	4158	1470	7/19/04 14:37	0.029599573
F4	54.1	9	4	135509	3801	1470	7/19/04 16:05	0.028049797
F4	75	10	4	110399	2685	1470	7/19/04 16:00	0.024320872
F4	108.1	11	4	114432	3518	1470	7/19/04 15:55	0.030743149
F4	128.6	12	4	112050	3336	1470	7/19/04 15:49	0.029772423
G1	0	1	4	114116	1325	1470	7/19/04 15:29	0.011610992
G1	2.6	2	4	119605	1327	1470	7/19/04 15:44	0.011094854
G1	6.6	3	4	123093	1375	1470	7/19/04 15:39	0.011170416
G1	9.7	4	4	116669	1308	1470	7/19/04 15:33	0.011211204
G1	13.8	5	4	129770	1424	1470	7/19/04 15:01	0.01097326
AVERAGE=								0.02846672
AVERAGE=								0.029729584
AVERAGE=								0.027443647

AXTLK

G1	16.5	6	4	149994	1546	1470	7/19/04 15:21	0.010307079	
G1	24.4	7	4	126830	1415	1470	7/19/04 15:16	0.011566666	
G1	34.5	8	4	120384	1376	1470	7/19/04 15:05	0.01143009	
G1	54.1	9	4	102626	1222	1470	7/19/04 14:38	0.011907314	
G1	75	10	4	96090	1288	1470	7/19/04 14:55	0.0134041	
G1	108.1	11	4	91633	1104	1470	7/19/04 14:50	0.012048061	
G1	128.6	12	4	99178	1242	1470	7/19/04 14:44	0.012522939	AVERAGE= 0.011569748
G2	0	1	4	129854	2318	1470	7/19/04 15:33	0.017850817	
G2	2.6	2	4	140486	2868	1470	7/19/04 15:29	0.020414846	
G2	6.6	3	4	141986	2783	1470	7/19/04 15:44	0.019600524	
G2	9.7	4	4	125232	2337	1470	7/19/04 15:39	0.018661365	
G2	13.8	5	4	147426	2555	1470	7/19/04 15:05	0.017330729	
G2	16.5	6	4	159664	3056	1470	7/19/04 15:01	0.019140194	
G2	24.4	7	4	138009	2604	1470	7/19/04 15:21	0.018668335	
G2	34.5	8	4	132563	2669	1470	7/19/04 15:16	0.020133823	
G2	54.1	9	4	130522	2642	1470	7/19/04 14:44	0.020241798	
G2	75	10	4	100613	2124	1470	7/19/04 14:38	0.021110592	
G2	108.1	11	4	108188	2212	1470	7/19/04 14:55	0.02044589	
G2	128.6	12	4	106064	2353	1470	7/19/04 14:50	0.022184719	AVERAGE= 0.019665303
G3	0	1	4	124600	2406	1470	7/19/04 15:39	0.019309791	
G3	2.6	2	4	132133	2829	1470	7/19/04 15:33	0.021410246	
G3	6.6	3	4	141994	2764	1470	7/19/04 15:29	0.019465611	
G3	9.7	4	4	117185	2211	1470	7/19/04 15:44	0.018867603	
G3	13.8	5	4	146232	2692	1470	7/19/04 15:16	0.018409103	
G3	16.5	6	4	151541	2882	1470	7/19/04 15:05	0.019017956	
G3	24.4	7	4	125618	2487	1470	7/19/04 15:01	0.019798118	
G3	34.5	8	4	130052	2720	1470	7/19/04 15:21	0.020914711	
G3	54.1	9	4	126433	2550	1470	7/19/04 14:50	0.020168785	
G3	75	10	4	99983	2258	1470	7/19/04 14:44	0.022583839	
G3	108.1	11	4	102221	2245	1470	7/19/04 14:38	0.021962219	
G3	128.6	12	4	101968	2162	1470	7/19/04 14:55	0.02120273	AVERAGE= 0.020259226
G4	0	1	4	122506	1877	1470	7/19/04 15:44	0.015321699	
G4	2.6	2	4	131808	2106	1470	7/19/04 15:39	0.015977786	
G4	6.6	3	4	139419	2044	1470	7/19/04 15:33	0.014660842	
G4	9.7	4	4	126460	2010	1470	7/19/04 15:29	0.015894354	
G4	13.8	5	4	148675	2192	1470	7/19/04 15:21	0.014743568	
G4	16.5	6	4	161908	2426	1470	7/19/04 15:16	0.014983818	
G4	24.4	7	4	126856	1785	1470	7/19/04 15:05	0.014071073	
G4	34.5	8	4	122914	1952	1470	7/19/04 15:01	0.015881023	
G4	54.1	9	4	125496	2093	1470	7/19/04 14:55	0.016677822	
G4	75	10	4	100175	2175	1470	7/19/04 14:50	0.021712004	
G4	108.1	11	4	103182	1867	1470	7/19/04 14:44	0.018094241	
G4	128.6	12	4	100780	1839	1470	7/19/04 14:38	0.018247668	AVERAGE= 0.016355492
H1	0	1	4	130221	2512	1522.5	7/19/04 15:49	0.019290283	
H1	2.6	2	4	140982	3517	1522.5	7/19/04 16:05	0.024946447	
H1	6.6	3	4	145972	3890	1522.5	7/19/04 16:00	0.026648946	
H1	9.7	4	4	129846	2734	1522.5	7/19/04 15:55	0.021055712	
H1	13.8	5	4	156251	3425	1522.5	7/19/04 15:28	0.02191986	
H1	16.5	6	4	166970	3134	1522.5	7/19/04 15:44	0.018769839	



AXTLK

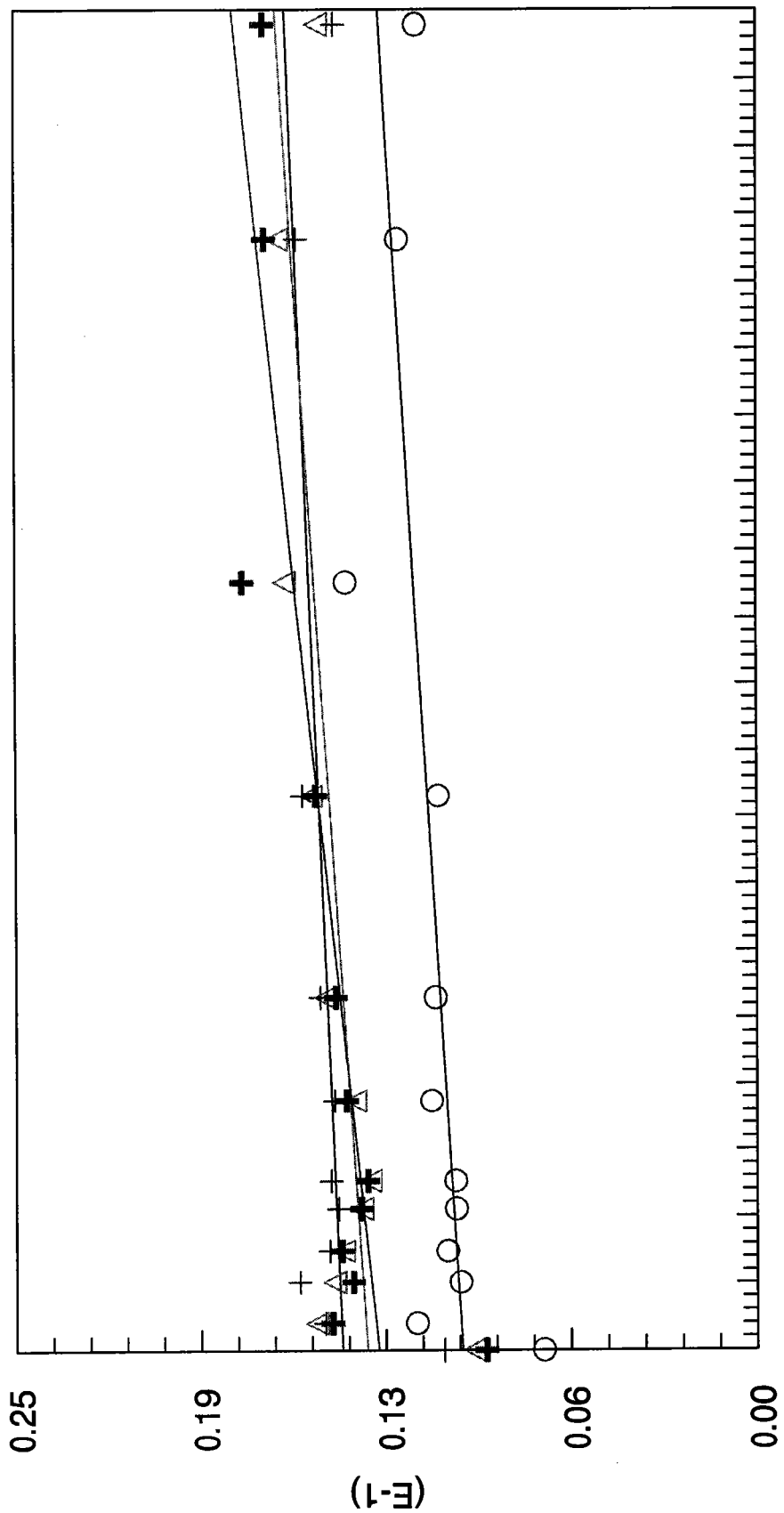
H1	24.4	7	4	138967	3001	1522.5	7/19/04 15:38	0.021595055	
H1	34.5	8	4	134324	2906	1522.5	7/19/04 15:33	0.021634257	
H1	54.1	9	4	130741	2732	1522.5	7/19/04 15:00	0.020896276	
H1	75	10	4	105775	1984	1522.5	7/19/04 15:21	0.018756795	
H1	108.1	11	4	109100	2469	1522.5	7/19/04 15:16	0.022630614	
H1	128.6	12	4	108273	2453	1522.5	7/19/04 15:05	0.022655694	
H2	0	1	4	131225	1762	1522.5	7/19/04 15:55	0.013427319	
H2	2.6	2	4	141982	2287	1522.5	7/19/04 15:49	0.016107676	
H2	6.6	3	4	150504	1888	1522.5	7/19/04 16:05	0.012544517	
H2	9.7	4	4	130591	1746	1522.5	7/19/04 16:00	0.013369987	
H2	13.8	5	4	156370	2124	1522.5	7/19/04 15:33	0.013583168	
H2	16.5	6	4	169890	1979	1522.5	7/19/04 15:28	0.011648714	
H2	24.4	7	4	139421	2031	1522.5	7/19/04 15:44	0.014567389	
H2	34.5	8	4	134048	1787	1522.5	7/19/04 15:38	0.013331046	
H2	54.1	9	4	132177	1812	1522.5	7/19/04 15:05	0.01370889	
H2	75	10	4	106645	1626	1522.5	7/19/04 15:00	0.015246847	
H2	108.1	11	4	109915	1639	1522.5	7/19/04 15:21	0.014911523	
H2	128.6	12	4	109840	1584	1522.5	7/19/04 15:16	0.014420976	
H3	0	1	4	133883	1981	1522.5	7/19/04 16:00	0.014796501	
H3	2.6	2	4	144332	2994	1522.5	7/19/04 15:55	0.020743841	
H3	6.6	3	4	151541	2740	1522.5	7/19/04 15:49	0.018080915	
H3	9.7	4	4	133382	2282	1522.5	7/19/04 16:05	0.017108755	
H3	13.8	5	4	160573	2720	1522.5	7/19/04 15:38	0.016939336	
H3	16.5	6	4	174202	2619	1522.5	7/19/04 15:33	0.015034271	
H3	24.4	7	4	141579	2479	1522.5	7/19/04 15:28	0.017509659	
H3	34.5	8	4	139121	2374	1522.5	7/19/04 15:44	0.017064282	
H3	54.1	9	4	133615	2258	1522.5	7/19/04 15:16	0.0168993	
H3	75	10	4	108785	1915	1522.5	7/19/04 15:05	0.01760353	
H3	108.1	11	4	111759	2109	1522.5	7/19/04 15:00	0.018870963	
H3	128.6	12	4	110381	2083	1522.5	7/19/04 15:21	0.018871001	
H4	0	1	4	128380	1455	1522.5	7/19/04 16:05	0.011333541	
H4	2.6	2	4	137234	1641	1522.5	7/19/04 16:00	0.011957678	
H4	6.6	3	4	144736	1537	1522.5	7/19/04 15:55	0.010619335	
H4	9.7	4	4	126330	1346	1522.5	7/19/04 15:49	0.010654635	
H4	13.8	5	4	152866	1672	1522.5	7/19/04 15:44	0.010937684	
H4	16.5	6	4	163306	1546	1522.5	7/19/04 15:38	0.00946689	
H4	24.4	7	4	135565	1484	1522.5	7/19/04 15:33	0.010946778	
H4	34.5	8	4	129860	1346	1522.5	7/19/04 15:28	0.010365008	
H4	54.1	9	4	126971	1490	1522.5	7/19/04 15:21	0.011734963	
H4	75	10	4	101810	1427	1522.5	7/19/04 15:16	0.014016305	
H4	108.1	11	4	105293	1190	1522.5	7/19/04 15:05	0.011301796	
H4	128.6	12	4	104583	1219	1522.5	7/19/04 15:00	0.011655814	
								AVERAGE=	0.017460196
								AVERAGE=	0.013905671
								AVERAGE=	0.01760353
								AVERAGE=	0.011333541
								AVERAGE=	0.011957678
								AVERAGE=	0.010619335
								AVERAGE=	0.010654635
								AVERAGE=	0.010937684
								AVERAGE=	0.00946689
								AVERAGE=	0.010946778
								AVERAGE=	0.010365008
								AVERAGE=	0.011734963
								AVERAGE=	0.014016305
								AVERAGE=	0.011301796
								AVERAGE=	0.011655814

# ALPHA Xtik LB4100 July, 2004

## DRAWER A

+ A1    △ A2    ○ A3    + A4

PO-210 1.0mL 0685-A



0.0 6.5 13. 19. 26. 32. 39. 45. 52. 58. 65. 71. 78. 84. 91. 97. 104 110 117 123 130

WEIGHT(mg)

XTLK

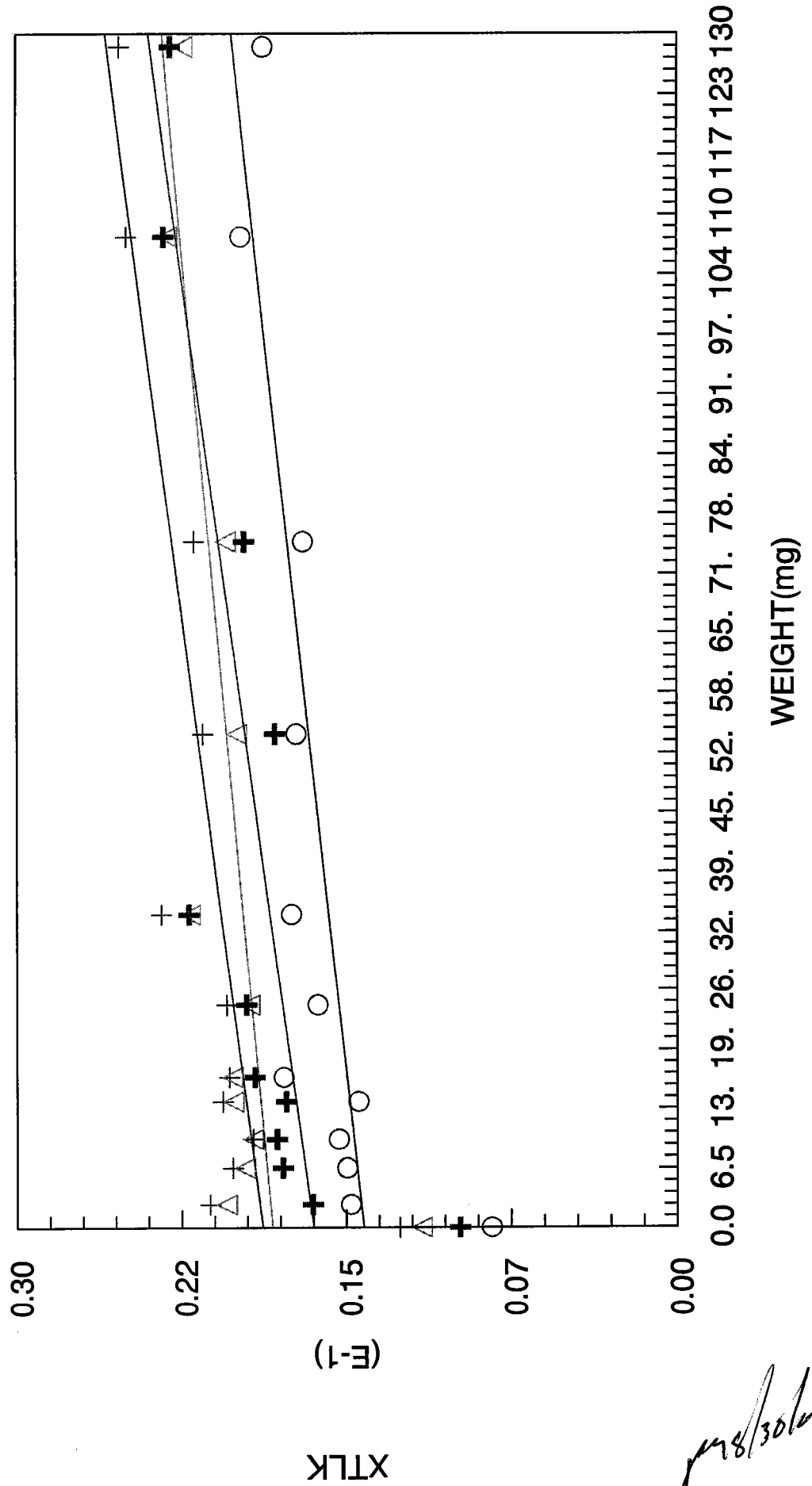
(F-1)

# ALPHA Xtik LB4100 July, 2004

## DRAWER B

+ B1     $\Delta$  B2     $\circ$  B3    + B4

PO-210 1.0mL 0685-A



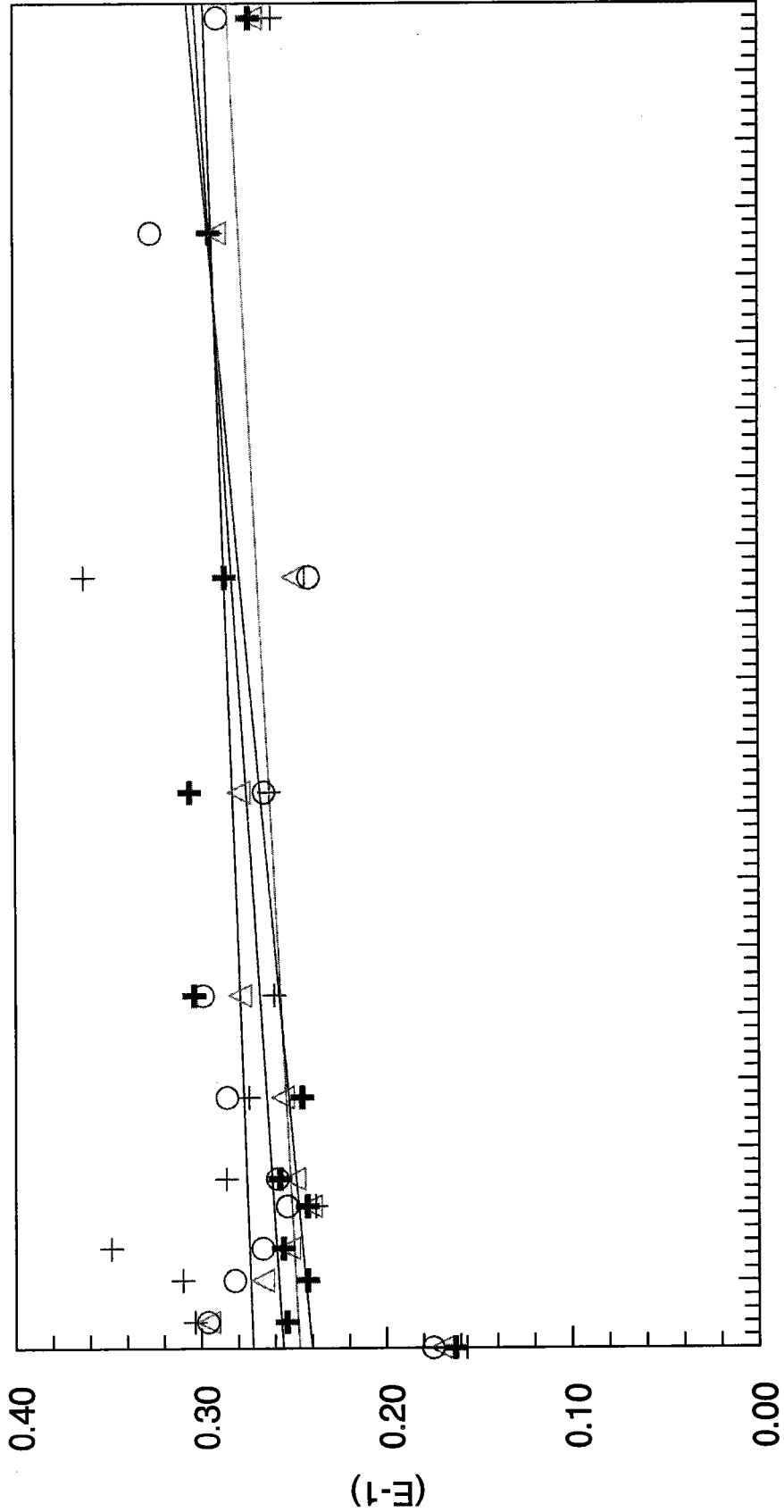
*Handwritten signature*

# ALPHA Xtik LB4100 July, 2004

## DRAWER C

+ C1     $\Delta$  C2     $\circ$  C3    + C4

PO-210 1.0mL 0685-A



WEIGHT(mg)

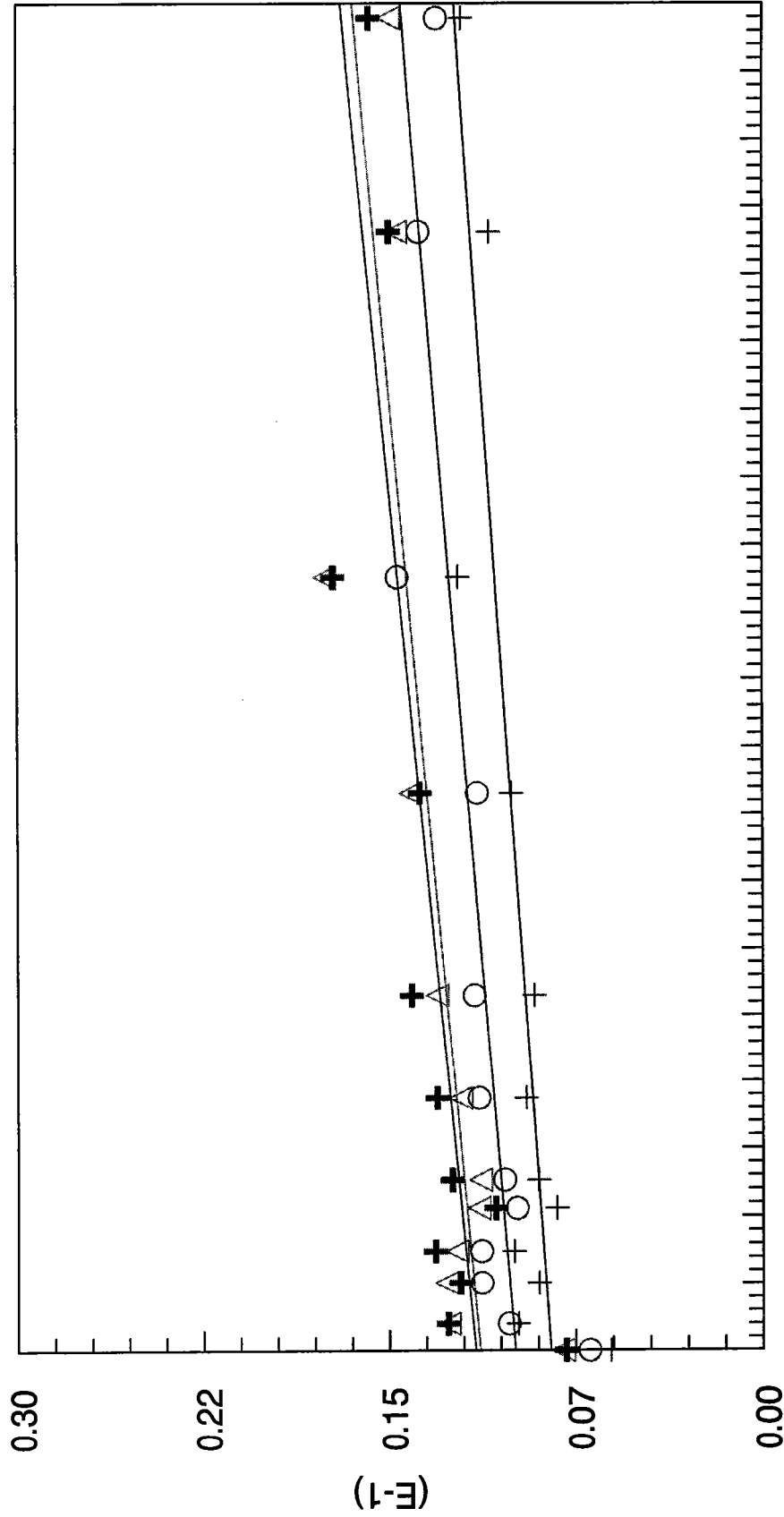
XTIK (F-1)

# ALPHA Xtik LB4100 July, 2004

## DRAWER D

+ D1    Δ D2    ○ D3    + D4

PO-210 1.0mL 0685-A



WEIGHT(mg)

XTLK

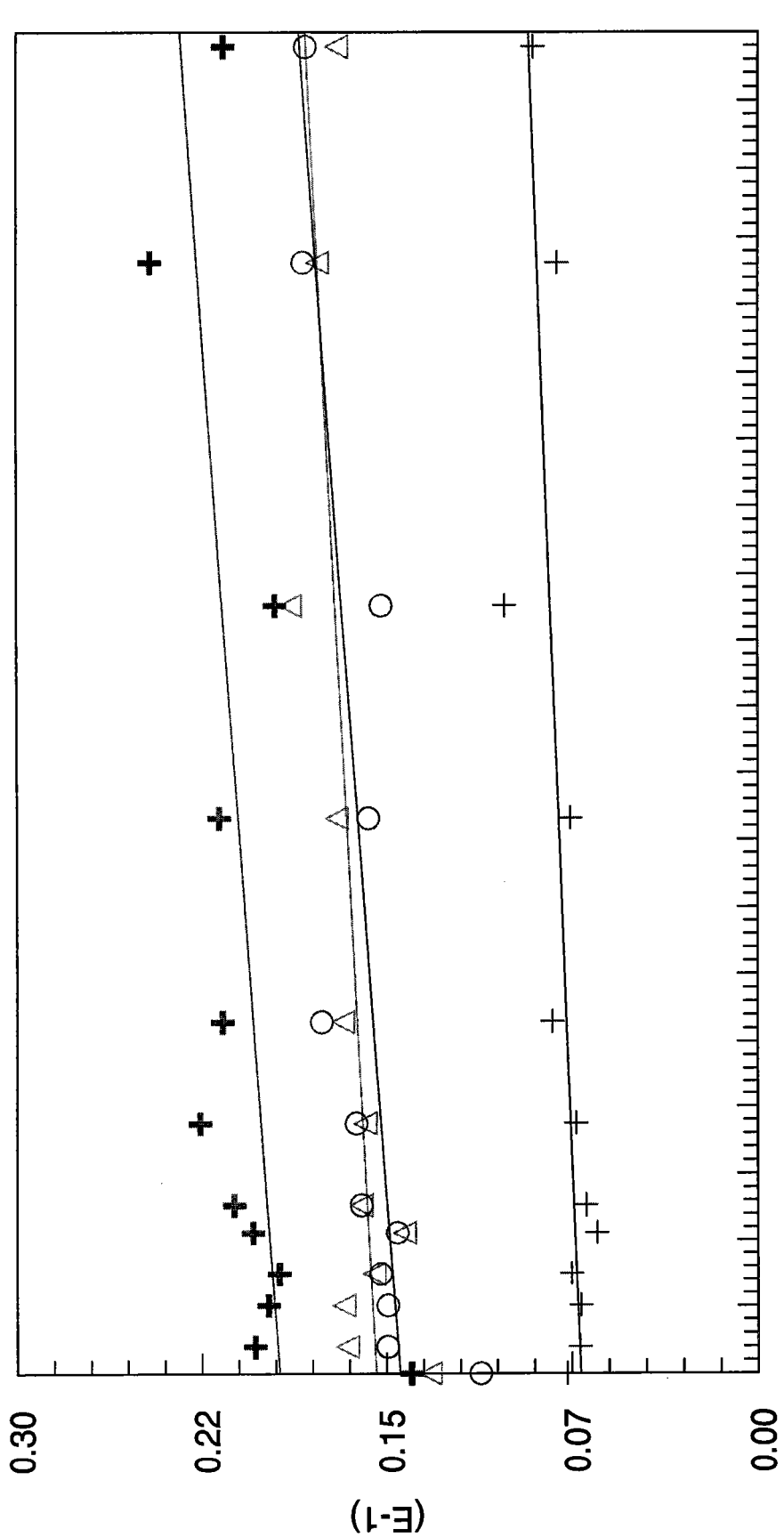
*Handwritten signature/initials*

# ALPHA Xtik LB4100 July, 2004

## DRAWER E

+ E1     $\Delta$  E2     $\circ$  E3    + E4

PO-210 1.0mL 0685-A



WEIGHT (mg)

XTLK

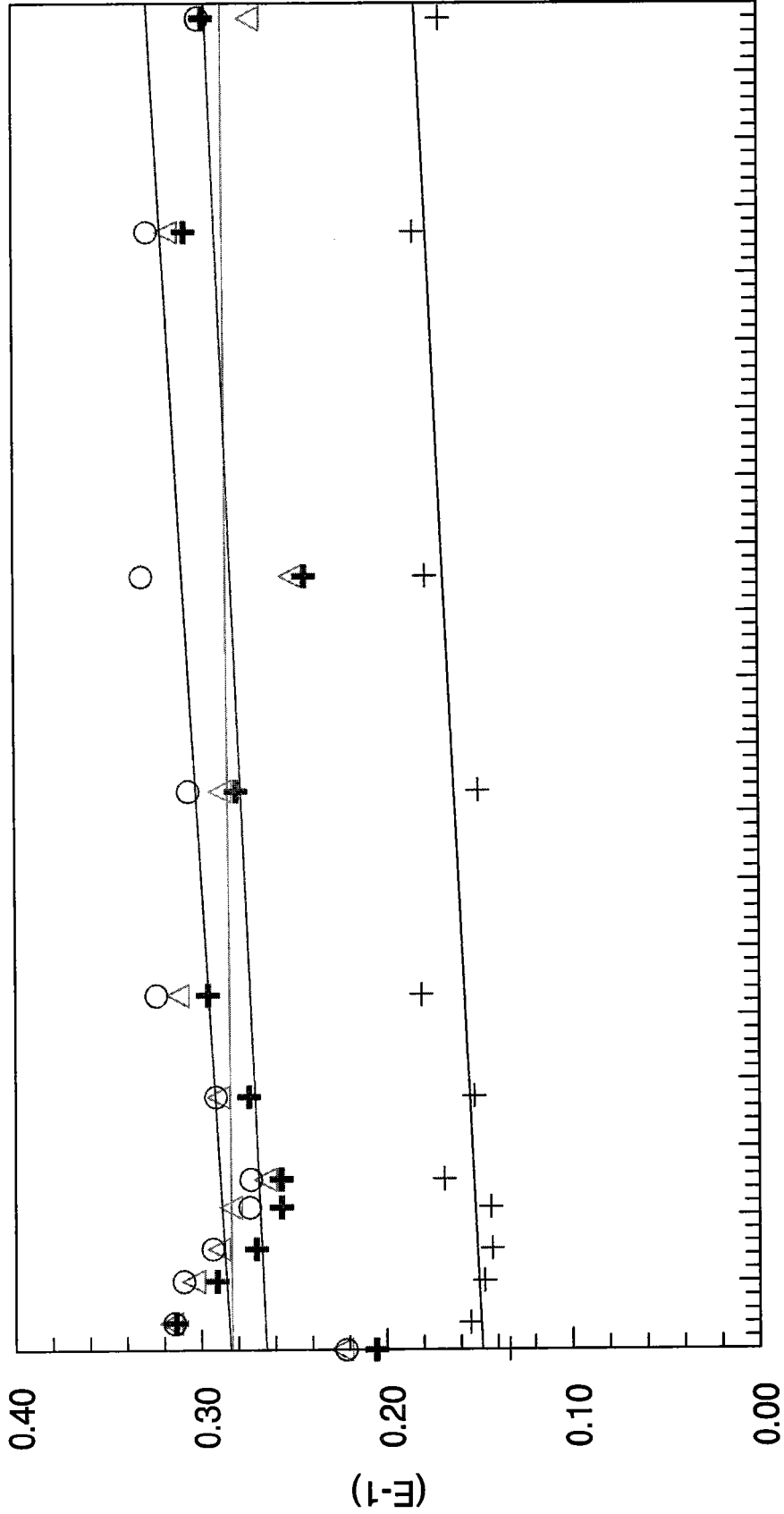
(F-1)

# ALPHA Xtik LB4100 July, 2004

## DRAWER F

Po-210 1.0mL 0685-A

+ F1    Δ F2    ○ F3    + F4



WEIGHT(mg)

XTLK

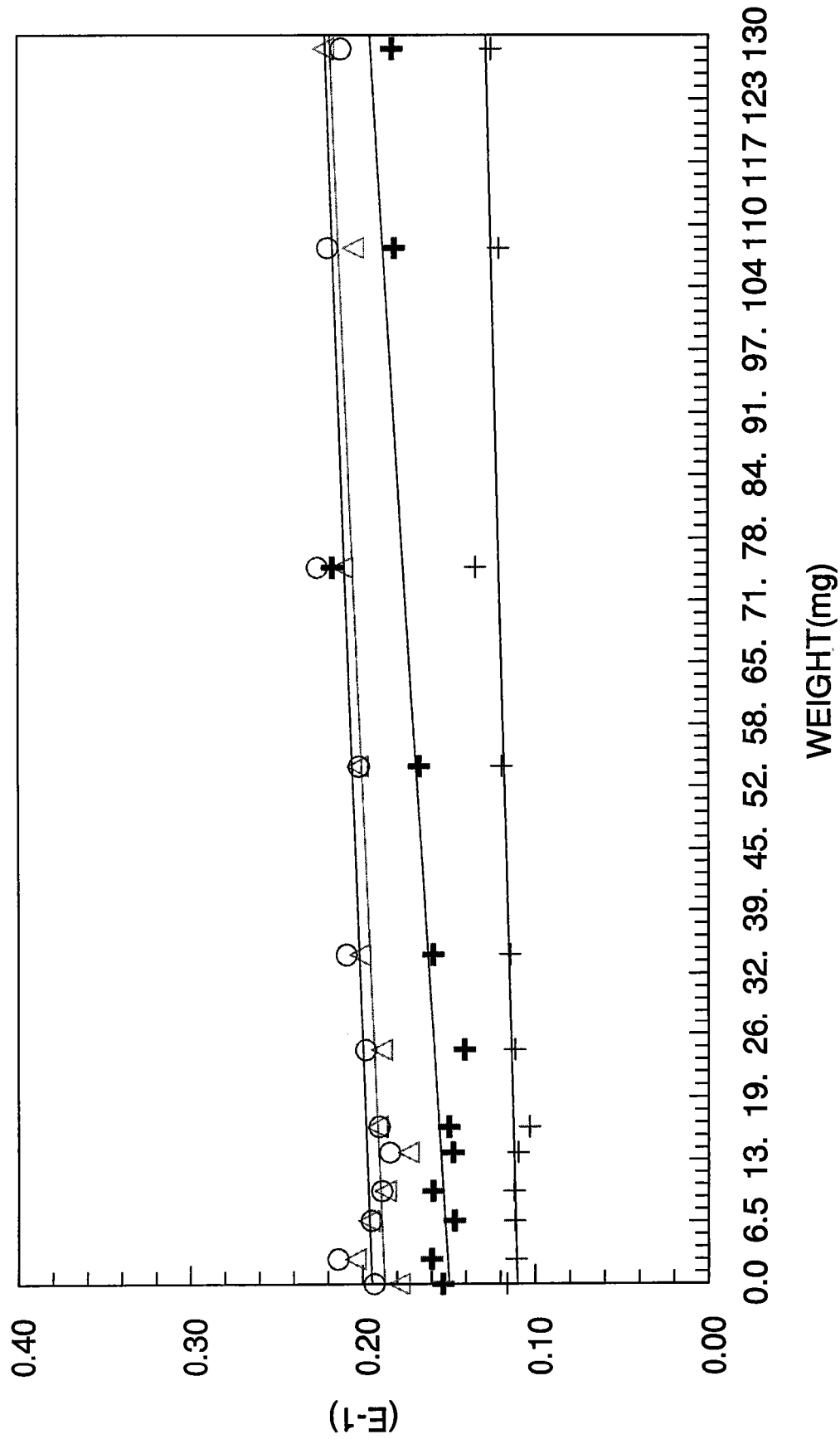
(F-1)

# ALPHA Xtik LB4100 July, 2004

## DRAWER G

+ G1    Δ G2    ○ G3    + G4

**PO-210 1.0mL 0685-A**



XTLK

(F-1)

*Handwritten signature*

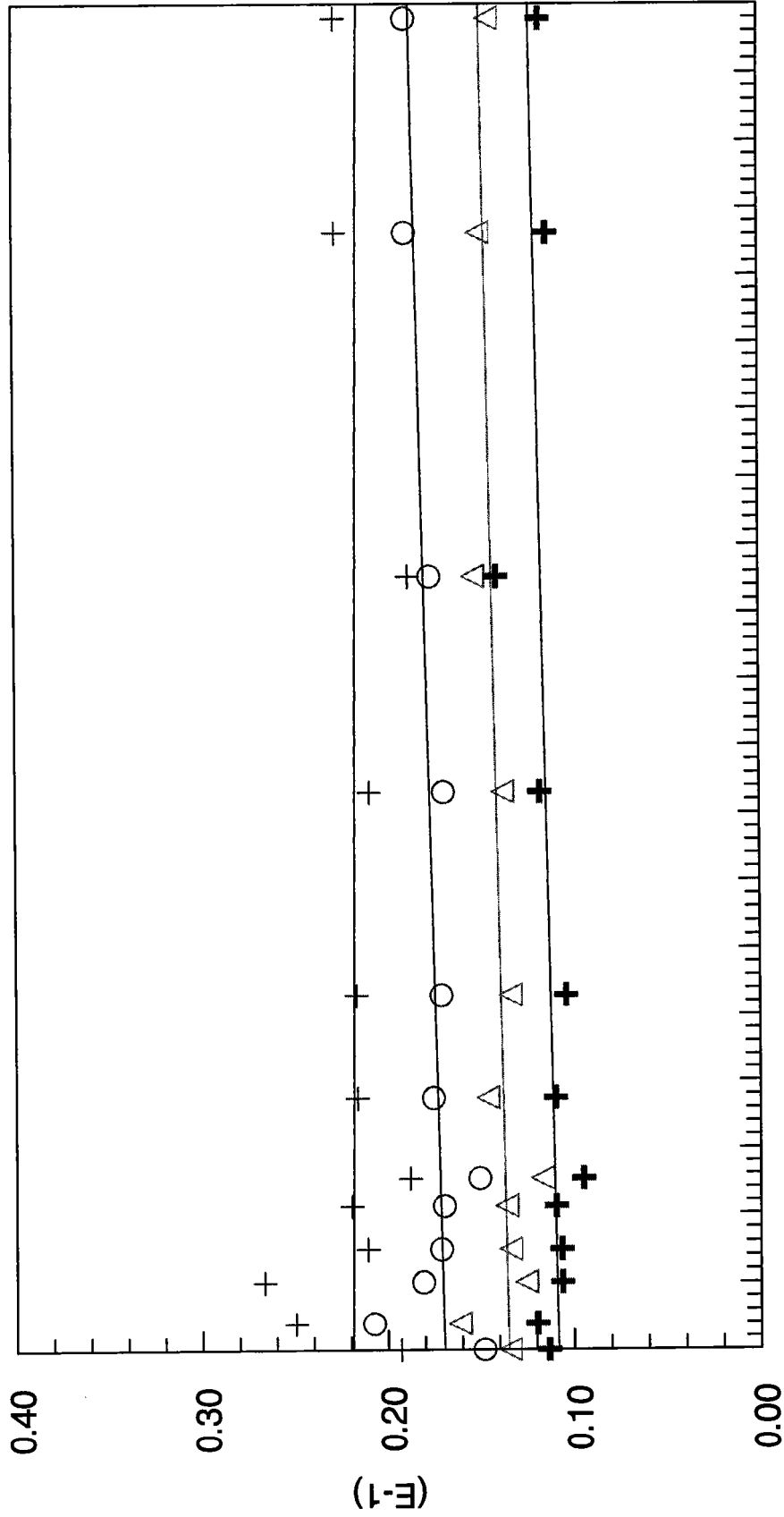


# ALPHA Xtik LB4100 July, 2004

## DRAWER H

+ H1    Δ H2    ○ H3    + H4

**Po-210 1.0mL 0685-A**



0.0 6.5 13. 19. 26. 32. 39. 45. 52. 58. 65. 71. 78. 84. 91. 97. 104 110 117 123 130

WEIGHT(mg)

XTLK

*Handwritten signature*

Plateau Raw Data

Detector	Pgm time	Sample I.D.	Alpha	Beta	Total	Voltage	Date/Time	% slope
A1	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
A1	1	SR-90	0	0	0	30	7/18/05 4:51	per 100v
A1	1	SR-90	0	0	0	60	7/18/05 4:53	#DIV/0!
A1	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
A1	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
A1	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
A1	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
A1	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
A1	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
A1	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
A1	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
A1	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
A1	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!
A1	1	SR-90	0	0	0	390	7/18/05 5:04	#DIV/0!
A1	1	SR-90	0	0	0	420	7/18/05 5:05	#DIV/0!
A1	1	SR-90	0	0	0	450	7/18/05 5:06	#DIV/0!
A1	1	SR-90	0	0	0	480	7/18/05 5:08	#DIV/0!
A1	1	SR-90	0	0	0	510	7/18/05 5:09	#DIV/0!
A1	1	SR-90	0	0	0	540	7/18/05 5:10	#DIV/0!
A1	1	SR-90	0	0	0	570	7/18/05 5:11	#DIV/0!
A1	1	SR-90	0	0	0	600	7/18/05 5:12	#DIV/0!
A1	1	SR-90	0	0	0	630	7/18/05 5:13	#DIV/0!
A1	1	SR-90	0	0	0	660	7/18/05 5:14	#DIV/0!
A1	1	SR-90	0	0	0	690	7/18/05 5:15	#DIV/0!
A1	1	SR-90	0	0	0	720	7/18/05 5:16	#DIV/0!
A1	1	SR-90	0	0	0	750	7/18/05 5:17	#DIV/0!
A1	1	SR-90	0	0	0	780	7/18/05 5:18	333.33
A1	1	SR-90	0	0	0	810	7/18/05 5:19	284.72
A1	1	SR-90	0	0	0	840	7/18/05 5:20	298.19
A1	1	SR-90	0	7	7	870	7/18/05 5:21	279.49
A1	1	SR-90	0	17	17	900	7/18/05 5:23	254.90
A1	1	SR-90	0	123	123	930	7/18/05 5:24	222.73
A1	1	SR-90	0	403	404	960	7/18/05 5:25	188.37
A1	1	SR-90	0	998	998	990	7/18/05 5:26	152.63
A1	1	SR-90	0	1838	1838	1020	7/18/05 5:27	122.86
A1	1	SR-90	0	3004	3004	1050	7/18/05 5:28	103.20
A1	1	SR-90	0	4169	4169	1080	7/18/05 5:29	91.12
A1	1	SR-90	0	5577	5577	1110	7/18/05 5:30	85.48
A1	1	SR-90	1	7339	7341	1140	7/18/05 5:31	79.16
A1	1	SR-90	0	9510	9510	1170	7/18/05 5:32	72.88
A1	1	SR-90	0	12135	12135	1200	7/18/05 5:33	53.65
A1	1	SR-90	0	14934	14934	1230	7/18/05 5:34	55.69
A1	1	SR-90	0	18213	18213	1260	7/18/05 5:35	54.66
A1	1	SR-90	0	18223	18223	1290	7/18/05 5:36	44.32
A1	1	SR-90	1	25280	25332	1320	7/18/05 5:38	41.95
A1	1	SR-90	0	28384	28652	1350	7/18/05 5:39	24.03
A1	1	SR-90	1	28594	28856	1380	7/18/05 5:40	17.39
A1	1	SR-90	1	31498	33381	1410	7/18/05 5:41	13.10
A1	1	SR-90	15	30829	33781	1440	7/18/05 5:42	4.57
A1	1	SR-90	111	30014	34493	1470	7/18/05 5:43	2.72
A1	1	SR-90	505	28509	34796	1500	7/18/05 5:44	1.76
A1	1	SR-90	1274	26860	35229	1530	7/18/05 5:45	1.84
A1	1	SR-90	2342	23878	34827	1560	7/18/05 5:46	0.81
A1	1	SR-90	3787	20987	35402	1590	7/18/05 5:47	1.69
A1	1	SR-90	5651	17432	35681	1620	7/18/05 5:48	0.77
A1	1	SR-90	7512	13129	35232	1650	7/18/05 5:49	-0.04
A1	1	SR-90	10660	9267	35811	1680	7/18/05 5:50	-0.08
A1	1	SR-90	13871	5593	35747	1710	7/18/05 5:51	-1.02
A1	1	SR-90	18147	2960	35404	1740	7/18/05 5:53	5.64
A1	1	SR-90	22962	1438	35391	1770	7/18/05 5:54	5.55
A1	1	SR-90	27878	828	35443	1800	7/18/05 5:55	
A2	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
A2	1	SR-90	0	0	0	30	7/18/05 4:51	per 100v
A2	1	SR-90	0	0	0	60	7/18/05 4:53	333.33
A2	1	SR-90	0	0	0	90	7/18/05 4:54	0.00
A2	1	SR-90	0	1	1	120	7/18/05 4:55	-166.67
A2	1	SR-90	0	0	0	150	7/18/05 4:56	-333.33
A2	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
A2	1	SR-90	0	0	0	210	7/18/05 4:58	333.33
A2	1	SR-90	0	0	0	240	7/18/05 4:59	166.67
A2	1	SR-90	0	0	0	270	7/18/05 5:00	166.67
A2	1	SR-90	0	1	1	300	7/18/05 5:01	0.00
A2	1	SR-90	0	0	0	330	7/18/05 5:02	-166.67
A2	1	SR-90	0	1	1	360	7/18/05 5:03	-166.67
A2	1	SR-90	0	0	0	390	7/18/05 5:04	-333.33

Plateau Raw Data

A2	1	SR-90	0	0	0	420	7/18/05 5:05	#DIV/0!
A2	1	SR-90	0	0	0	450	7/18/05 5:06	#DIV/0!
A2	1	SR-90	0	0	0	480	7/18/05 5:08	#DIV/0!
A2	1	SR-90	0	0	0	510	7/18/05 5:09	333.33
A2	1	SR-90	0	0	0	540	7/18/05 5:10	166.67
A2	1	SR-90	0	0	0	570	7/18/05 5:11	0.00
A2	1	SR-90	0	1	1	600	7/18/05 5:12	83.33
A2	1	SR-90	0	0	0	630	7/18/05 5:13	-83.33
A2	1	SR-90	0	0	0	660	7/18/05 5:14	0.00
A2	1	SR-90	0	1	1	690	7/18/05 5:15	-166.67
A2	1	SR-90	0	0	0	720	7/18/05 5:16	-333.33
A2	1	SR-90	0	0	0	750	7/18/05 5:17	333.33
A2	1	SR-90	0	0	0	780	7/18/05 5:18	300.00
A2	1	SR-90	0	0	0	810	7/18/05 5:19	312.93
A2	1	SR-90	0	1	1	840	7/18/05 5:20	298.74
A2	1	SR-90	0	4	4	870	7/18/05 5:21	280.48
A2	1	SR-90	0	44	44	900	7/18/05 5:23	247.74
A2	1	SR-90	0	215	216	930	7/18/05 5:24	209.10
A2	1	SR-90	0	744	744	960	7/18/05 5:25	167.71
A2	1	SR-90	0	1570	1570	990	7/18/05 5:26	134.76
A2	1	SR-90	0	2634	2634	1020	7/18/05 5:27	112.82
A2	1	SR-90	0	3761	3762	1050	7/18/05 5:28	99.17
A2	1	SR-90	0	5320	5320	1080	7/18/05 5:29	89.93
A2	1	SR-90	0	7141	7141	1110	7/18/05 5:30	81.25
A2	1	SR-90	0	9331	9331	1140	7/18/05 5:31	75.41
A2	1	SR-90	0	11847	11847	1170	7/18/05 5:32	69.85
A2	1	SR-90	1	14765	14766	1200	7/18/05 5:33	52.03
A2	1	SR-90	0	18314	18314	1230	7/18/05 5:34	53.78
A2	1	SR-90	0	22098	22098	1260	7/18/05 5:35	51.91
A2	1	SR-90	1	22091	22092	1290	7/18/05 5:36	40.17
A2	1	SR-90	0	30160	30218	1320	7/18/05 5:38	36.11
A2	1	SR-90	0	33613	33987	1350	7/18/05 5:39	19.35
A2	1	SR-90	0	32881	33215	1380	7/18/05 5:40	14.01
A2	1	SR-90	4	35631	37615	1410	7/18/05 5:41	11.36
A2	1	SR-90	53	35224	38476	1440	7/18/05 5:42	2.83
A2	1	SR-90	269	34199	39018	1470	7/18/05 5:43	1.73
A2	1	SR-90	854	32271	38895	1500	7/18/05 5:44	2.14
A2	1	SR-90	1874	30057	39045	1530	7/18/05 5:45	2.15
A2	1	SR-90	3127	27554	39474	1560	7/18/05 5:46	1.57
A2	1	SR-90	4798	24380	39988	1590	7/18/05 5:47	0.41
A2	1	SR-90	6950	20013	39697	1620	7/18/05 5:48	-0.46
A2	1	SR-90	9611	15377	39865	1650	7/18/05 5:49	0.02
A2	1	SR-90	12741	10912	39778	1680	7/18/05 5:50	-0.32
A2	1	SR-90	16877	6656	39672	1710	7/18/05 5:51	-0.38
A2	1	SR-90	22212	3779	39806	1740	7/18/05 5:53	5.64
A2	1	SR-90	27588	1861	39663	1770	7/18/05 5:54	5.55
A2	1	SR-90	32401	948	39558	1800	7/18/05 5:55	
A3	1	SR-90	0	11	11	0	7/18/05 4:50	% slope
A3	1	SR-90	0	0	0	30	7/18/05 4:51	per 100v
A3	1	SR-90	0	0	0	60	7/18/05 4:53	#DIV/0!
A3	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
A3	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
A3	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
A3	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
A3	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
A3	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
A3	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
A3	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
A3	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
A3	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!
A3	1	SR-90	0	0	0	390	7/18/05 5:04	#DIV/0!
A3	1	SR-90	0	0	0	420	7/18/05 5:05	#DIV/0!
A3	1	SR-90	0	0	0	450	7/18/05 5:06	333.33
A3	1	SR-90	0	0	0	480	7/18/05 5:08	166.67
A3	1	SR-90	0	0	0	510	7/18/05 5:09	0.00
A3	1	SR-90	0	1	1	540	7/18/05 5:10	-166.67
A3	1	SR-90	0	0	0	570	7/18/05 5:11	-333.33
A3	1	SR-90	0	0	0	600	7/18/05 5:12	#DIV/0!
A3	1	SR-90	0	0	0	630	7/18/05 5:13	#DIV/0!
A3	1	SR-90	0	0	0	660	7/18/05 5:14	#DIV/0!
A3	1	SR-90	0	0	0	690	7/18/05 5:15	#DIV/0!
A3	1	SR-90	0	0	0	720	7/18/05 5:16	#DIV/0!
A3	1	SR-90	0	0	0	750	7/18/05 5:17	#DIV/0!
A3	1	SR-90	0	0	0	780	7/18/05 5:18	333.33
A3	1	SR-90	0	0	0	810	7/18/05 5:19	311.11
A3	1	SR-90	0	0	0	840	7/18/05 5:20	300.10

*per 100v*

Plateau Raw Data

A3	1	SR-90	0	8	8	870	7/18/05 5:21	267.60
A3	1	SR-90	0	52	52	900	7/18/05 5:23	240.14
A3	1	SR-90	0	281	281	930	7/18/05 5:24	205.75
A3	1	SR-90	0	696	696	960	7/18/05 5:25	168.20
A3	1	SR-90	0	1549	1549	990	7/18/05 5:26	136.37
A3	1	SR-90	0	2637	2637	1020	7/18/05 5:27	112.03
A3	1	SR-90	0	3867	3867	1050	7/18/05 5:28	96.62
A3	1	SR-90	0	5274	5274	1080	7/18/05 5:29	88.48
A3	1	SR-90	0	7094	7094	1110	7/18/05 5:30	81.85
A3	1	SR-90	0	9144	9144	1140	7/18/05 5:31	74.96
A3	1	SR-90	0	11801	11801	1170	7/18/05 5:32	68.63
A3	1	SR-90	0	14714	14714	1200	7/18/05 5:33	50.27
A3	1	SR-90	0	17963	17963	1230	7/18/05 5:34	51.56
A3	1	SR-90	1	21536	21537	1260	7/18/05 5:35	50.05
A3	1	SR-90	0	21603	21604	1290	7/18/05 5:36	40.16
A3	1	SR-90	0	28975	29128	1320	7/18/05 5:38	37.24
A3	1	SR-90	2	32048	32613	1350	7/18/05 5:39	21.23
A3	1	SR-90	0	32063	32596	1380	7/18/05 5:40	16.00
A3	1	SR-90	5	34534	36952	1410	7/18/05 5:41	12.86
A3	1	SR-90	42	33920	37721	1440	7/18/05 5:42	4.07
A3	1	SR-90	259	33297	38618	1470	7/18/05 5:43	2.60
A3	1	SR-90	748	31333	38892	1500	7/18/05 5:44	1.36
A3	1	SR-90	1710	28753	38696	1530	7/18/05 5:45	1.41
A3	1	SR-90	2868	26177	39186	1560	7/18/05 5:46	0.69
A3	1	SR-90	4509	22609	39266	1590	7/18/05 5:47	-0.31
A3	1	SR-90	6494	18757	39432	1620	7/18/05 5:48	-0.19
A3	1	SR-90	8715	13996	38978	1650	7/18/05 5:49	0.62
A3	1	SR-90	12095	9794	39148	1680	7/18/05 5:50	1.25
A3	1	SR-90	16007	6208	39296	1710	7/18/05 5:51	0.98
A3	1	SR-90	21007	3580	39641	1740	7/18/05 5:53	5.64
A3	1	SR-90	26440	1844	39471	1770	7/18/05 5:54	5.55
A3	1	SR-90	31417	976	39639	1800	7/18/05 5:55	
A4	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
A4	1	SR-90	0	0	0	30	7/18/05 4:51	per 100v
A4	1	SR-90	0	0	0	60	7/18/05 4:53	666.67
A4	1	SR-90	0	0	0	90	7/18/05 4:54	277.78
A4	1	SR-90	0	0	0	120	7/18/05 4:55	0.00
A4	1	SR-90	0	1	1	150	7/18/05 4:56	-166.67
A4	1	SR-90	0	0	0	180	7/18/05 4:57	-333.33
A4	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
A4	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
A4	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
A4	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
A4	1	SR-90	0	0	0	330	7/18/05 5:02	333.33
A4	1	SR-90	0	0	0	360	7/18/05 5:03	166.67
A4	1	SR-90	0	0	0	390	7/18/05 5:04	0.00
A4	1	SR-90	0	1	1	420	7/18/05 5:05	-166.67
A4	1	SR-90	0	0	0	450	7/18/05 5:06	-333.33
A4	1	SR-90	0	0	0	480	7/18/05 5:08	#DIV/0!
A4	1	SR-90	0	0	0	510	7/18/05 5:09	#DIV/0!
A4	1	SR-90	0	0	0	540	7/18/05 5:10	333.33
A4	1	SR-90	0	0	0	570	7/18/05 5:11	166.67
A4	1	SR-90	0	0	0	600	7/18/05 5:12	0.00
A4	1	SR-90	0	1	1	630	7/18/05 5:13	83.33
A4	1	SR-90	0	0	0	660	7/18/05 5:14	-83.33
A4	1	SR-90	0	0	0	690	7/18/05 5:15	0.00
A4	1	SR-90	0	1	1	720	7/18/05 5:16	83.33
A4	1	SR-90	0	0	0	750	7/18/05 5:17	240.74
A4	1	SR-90	0	0	0	780	7/18/05 5:18	312.21
A4	1	SR-90	0	1	1	810	7/18/05 5:19	289.62
A4	1	SR-90	0	7	7	840	7/18/05 5:20	271.46
A4	1	SR-90	0	63	63	870	7/18/05 5:21	238.22
A4	1	SR-90	0	234	234	900	7/18/05 5:23	204.29
A4	1	SR-90	0	732	732	930	7/18/05 5:24	166.63
A4	1	SR-90	0	1447	1447	960	7/18/05 5:25	135.84
A4	1	SR-90	0	2516	2516	990	7/18/05 5:26	112.71
A4	1	SR-90	0	3611	3611	1020	7/18/05 5:27	95.78
A4	1	SR-90	0	5122	5122	1050	7/18/05 5:28	85.64
A4	1	SR-90	0	6703	6704	1080	7/18/05 5:29	77.16
A4	1	SR-90	0	8599	8599	1110	7/18/05 5:30	71.82
A4	1	SR-90	0	10830	10830	1140	7/18/05 5:31	69.54
A4	1	SR-90	0	13395	13395	1170	7/18/05 5:32	64.60
A4	1	SR-90	0	16345	16345	1200	7/18/05 5:33	47.73
A4	1	SR-90	1	20343	20344	1230	7/18/05 5:34	47.37
A4	1	SR-90	0	23768	23768	1260	7/18/05 5:35	42.48
A4	1	SR-90	0	23644	23644	1290	7/18/05 5:36	33.45

*Handwritten signature/initials*

Plateau Raw Data

A4	1	SR-90	1	31016	31062	1320	7/18/05 5:38	28.81
A4	1	SR-90	0	33323	33570	1350	7/18/05 5:39	13.92
A4	1	SR-90	1	33198	33399	1380	7/18/05 5:40	9.48
A4	1	SR-90	2	34483	36112	1410	7/18/05 5:41	7.55
A4	1	SR-90	27	34181	36937	1440	7/18/05 5:42	1.90
A4	1	SR-90	158	32782	36833	1470	7/18/05 5:43	1.27
A4	1	SR-90	550	31486	37127	1500	7/18/05 5:44	1.89
A4	1	SR-90	1327	29318	37067	1530	7/18/05 5:45	0.70
A4	1	SR-90	2354	27179	37528	1560	7/18/05 5:46	0.45
A4	1	SR-90	3723	24373	37689	1590	7/18/05 5:47	-0.11
A4	1	SR-90	5185	20682	37207	1620	7/18/05 5:48	0.02
A4	1	SR-90	7689	16690	37482	1650	7/18/05 5:49	0.37
A4	1	SR-90	10296	12553	37569	1680	7/18/05 5:50	-0.41
A4	1	SR-90	13553	8428	37522	1710	7/18/05 5:51	0.48
A4	1	SR-90	17625	5217	37394	1740	7/18/05 5:53	5.64
A4	1	SR-90	22655	2849	37340	1770	7/18/05 5:54	5.55
A4	1	SR-90	28013	1423	37930	1800	7/18/05 5:55	
B1	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
B1	1	SR-90	0	0	0	30	7/18/05 4:51	per 100v
B1	1	SR-90	0	0	0	60	7/18/05 4:53	0.00
B1	1	SR-90	0	1	1	90	7/18/05 4:54	-277.78
B1	1	SR-90	0	0	0	120	7/18/05 4:55	0.00
B1	1	SR-90	0	0	0	150	7/18/05 4:56	166.67
B1	1	SR-90	0	0	0	180	7/18/05 4:57	166.67
B1	1	SR-90	0	1	1	210	7/18/05 4:58	0.00
B1	1	SR-90	0	0	0	240	7/18/05 4:59	0.00
B1	1	SR-90	0	1	1	270	7/18/05 5:00	0.00
B1	1	SR-90	0	0	0	300	7/18/05 5:01	-166.67
B1	1	SR-90	0	1	1	330	7/18/05 5:02	-166.67
B1	1	SR-90	0	0	0	360	7/18/05 5:03	0.00
B1	1	SR-90	0	0	0	390	7/18/05 5:04	250.00
B1	1	SR-90	0	0	0	420	7/18/05 5:05	83.33
B1	1	SR-90	0	1	1	450	7/18/05 5:06	55.56
B1	1	SR-90	0	1	1	480	7/18/05 5:08	0.00
B1	1	SR-90	0	0	0	510	7/18/05 5:09	-55.56
B1	1	SR-90	0	1	1	540	7/18/05 5:10	-83.33
B1	1	SR-90	0	1	1	570	7/18/05 5:11	-250.00
B1	1	SR-90	0	0	0	600	7/18/05 5:12	-333.33
B1	1	SR-90	0	0	0	630	7/18/05 5:13	#DIV/0!
B1	1	SR-90	0	0	0	660	7/18/05 5:14	333.33
B1	1	SR-90	0	0	0	690	7/18/05 5:15	166.67
B1	1	SR-90	0	0	0	720	7/18/05 5:16	0.00
B1	1	SR-90	0	1	1	750	7/18/05 5:17	-166.67
B1	1	SR-90	0	0	0	780	7/18/05 5:18	200.00
B1	1	SR-90	0	0	0	810	7/18/05 5:19	285.71
B1	1	SR-90	0	0	0	840	7/18/05 5:20	299.63
B1	1	SR-90	0	4	4	870	7/18/05 5:21	290.67
B1	1	SR-90	0	10	10	900	7/18/05 5:23	274.88
B1	1	SR-90	0	75	75	930	7/18/05 5:24	238.76
B1	1	SR-90	0	329	329	960	7/18/05 5:25	199.59
B1	1	SR-90	0	1079	1079	990	7/18/05 5:26	158.61
B1	1	SR-90	0	2035	2035	1020	7/18/05 5:27	126.45
B1	1	SR-90	0	3310	3311	1050	7/18/05 5:28	107.69
B1	1	SR-90	0	4630	4630	1080	7/18/05 5:29	94.24
B1	1	SR-90	0	6404	6405	1110	7/18/05 5:30	88.25
B1	1	SR-90	1	8538	8539	1140	7/18/05 5:31	80.43
B1	1	SR-90	0	10910	10911	1170	7/18/05 5:32	76.29
B1	1	SR-90	0	14210	14210	1200	7/18/05 5:33	56.68
B1	1	SR-90	0	17446	17446	1230	7/18/05 5:34	59.48
B1	1	SR-90	0	22005	22005	1260	7/18/05 5:35	57.25
B1	1	SR-90	0	21680	21680	1290	7/18/05 5:36	44.43
B1	1	SR-90	0	31053	31082	1320	7/18/05 5:38	42.43
B1	1	SR-90	0	34463	34706	1350	7/18/05 5:39	26.13
B1	1	SR-90	0	34524	34711	1380	7/18/05 5:40	21.38
B1	1	SR-90	0	38806	40586	1410	7/18/05 5:41	22.37
B1	1	SR-90	3	39501	42538	1440	7/18/05 5:42	8.92
B1	1	SR-90	50	38695	43359	1470	7/18/05 5:43	2.69
B1	1	SR-90	31396	1603	44537	1470	7/18/05 6:00	-0.06
B1	1	SR-90	248	37384	43819	1500	7/18/05 5:44	-0.89
B1	1	SR-90	866	34940	43902	1530	7/18/05 5:45	1.36
B1	1	SR-90	1929	32170	43923	1560	7/18/05 5:46	1.15
B1	1	SR-90	3312	28651	43900	1590	7/18/05 5:47	1.38
B1	1	SR-90	5063	24989	44720	1620	7/18/05 5:48	0.72
B1	1	SR-90	7251	19880	44266	1650	7/18/05 5:49	0.20
B1	1	SR-90	10358	14644	44656	1680	7/18/05 5:50	1.00
B1	1	SR-90	14074	9581	44414	1710	7/18/05 5:51	5.74

Plateau Raw Data

B1	1	SR-90	19158	5768	44780	1740	7/18/05 5:53	5.65
B1	1	SR-90	25118	3133	44876	1770	7/18/05 5:54	
B2	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
B2	1	SR-90	0	0	0	30	7/18/05 4:51	per 100v
B2	1	SR-90	0	0	0	60	7/18/05 4:53	#DIV/0!
B2	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
B2	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
B2	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
B2	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
B2	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
B2	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
B2	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
B2	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
B2	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
B2	1	SR-90	0	0	0	360	7/18/05 5:03	333.33
B2	1	SR-90	0	0	0	390	7/18/05 5:04	166.67
B2	1	SR-90	0	0	0	420	7/18/05 5:05	166.67
B2	1	SR-90	0	1	1	450	7/18/05 5:06	0.00
B2	1	SR-90	0	0	0	480	7/18/05 5:08	-166.67
B2	1	SR-90	0	1	1	510	7/18/05 5:09	-166.67
B2	1	SR-90	0	0	0	540	7/18/05 5:10	0.00
B2	1	SR-90	0	0	0	570	7/18/05 5:11	166.67
B2	1	SR-90	0	0	0	600	7/18/05 5:12	0.00
B2	1	SR-90	0	1	1	630	7/18/05 5:13	83.33
B2	1	SR-90	0	0	0	660	7/18/05 5:14	-83.33
B2	1	SR-90	0	0	0	690	7/18/05 5:15	166.67
B2	1	SR-90	0	1	1	720	7/18/05 5:16	111.11
B2	1	SR-90	0	0	0	750	7/18/05 5:17	-55.56
B2	1	SR-90	0	1	1	780	7/18/05 5:18	-83.33
B2	1	SR-90	0	1	1	810	7/18/05 5:19	227.27
B2	1	SR-90	0	0	0	840	7/18/05 5:20	293.94
B2	1	SR-90	0	0	0	870	7/18/05 5:21	303.25
B2	1	SR-90	0	9	9	900	7/18/05 5:23	272.08
B2	1	SR-90	0	45	45	930	7/18/05 5:24	238.95
B2	1	SR-90	0	295	295	960	7/18/05 5:25	205.28
B2	1	SR-90	0	772	772	990	7/18/05 5:26	166.83
B2	1	SR-90	0	1586	1586	1020	7/18/05 5:27	134.27
B2	1	SR-90	0	2762	2762	1050	7/18/05 5:28	109.85
B2	1	SR-90	0	4024	4024	1080	7/18/05 5:29	97.79
B2	1	SR-90	0	5419	5419	1110	7/18/05 5:30	90.16
B2	1	SR-90	0	7163	7163	1140	7/18/05 5:31	82.51
B2	1	SR-90	0	9729	9729	1170	7/18/05 5:32	76.96
B2	1	SR-90	0	12326	12326	1200	7/18/05 5:33	55.48
B2	1	SR-90	0	15164	15164	1230	7/18/05 5:34	60.74
B2	1	SR-90	1	19103	19104	1260	7/18/05 5:35	59.25
B2	1	SR-90	2	18849	18851	1290	7/18/05 5:36	46.93
B2	1	SR-90	0	27282	27401	1320	7/18/05 5:38	43.35
B2	1	SR-90	0	30256	30802	1350	7/18/05 5:39	25.49
B2	1	SR-90	0	30549	31038	1380	7/18/05 5:40	20.32
B2	1	SR-90	0	33301	35738	1410	7/18/05 5:41	20.88
B2	1	SR-90	3	33356	37347	1440	7/18/05 5:42	8.29
B2	1	SR-90	64	32627	38201	1470	7/18/05 5:43	2.29
B2	1	SR-90	30794	898	38993	1470	7/18/05 6:00	0.22
B2	1	SR-90	320	30588	38314	1500	7/18/05 5:44	0.12
B2	1	SR-90	969	28177	38462	1530	7/18/05 5:45	2.01
B2	1	SR-90	2020	25189	38721	1560	7/18/05 5:46	1.47
B2	1	SR-90	3433	21399	38861	1590	7/18/05 5:47	1.39
B2	1	SR-90	5132	17260	39281	1620	7/18/05 5:48	0.10
B2	1	SR-90	7461	12507	39037	1650	7/18/05 5:49	-0.66
B2	1	SR-90	10721	7914	39449	1680	7/18/05 5:50	0.11
B2	1	SR-90	14210	4515	38838	1710	7/18/05 5:51	5.74
B2	1	SR-90	19378	2451	38994	1740	7/18/05 5:53	5.65
B2	1	SR-90	25447	1294	39329	1770	7/18/05 5:54	
B3	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
B3	1	SR-90	0	0	0	30	7/18/05 4:51	per 100v
B3	1	SR-90	0	0	0	60	7/18/05 4:53	#DIV/0!
B3	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
B3	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
B3	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
B3	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
B3	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
B3	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
B3	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
B3	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
B3	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
B3	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!

*7/18/30/06*

Plateau Raw Data

B3	1	SR-90	0	0	0	390	7/18/05 5:04	#DIV/0!
B3	1	SR-90	0	0	0	420	7/18/05 5:05	#DIV/0!
B3	1	SR-90	0	0	0	450	7/18/05 5:06	#DIV/0!
B3	1	SR-90	0	0	0	480	7/18/05 5:08	#DIV/0!
B3	1	SR-90	0	0	0	510	7/18/05 5:09	#DIV/0!
B3	1	SR-90	0	0	0	540	7/18/05 5:10	#DIV/0!
B3	1	SR-90	0	0	0	570	7/18/05 5:11	#DIV/0!
B3	1	SR-90	0	0	0	600	7/18/05 5:12	#DIV/0!
B3	1	SR-90	0	0	0	630	7/18/05 5:13	#DIV/0!
B3	1	SR-90	0	0	0	660	7/18/05 5:14	#DIV/0!
B3	1	SR-90	0	0	0	690	7/18/05 5:15	#DIV/0!
B3	1	SR-90	0	0	0	720	7/18/05 5:16	#DIV/0!
B3	1	SR-90	0	0	0	750	7/18/05 5:17	#DIV/0!
B3	1	SR-90	0	0	0	780	7/18/05 5:18	333.33
B3	1	SR-90	0	0	0	810	7/18/05 5:19	291.67
B3	1	SR-90	0	0	0	840	7/18/05 5:20	302.47
B3	1	SR-90	0	4	4	870	7/18/05 5:21	288.14
B3	1	SR-90	0	12	12	900	7/18/05 5:23	260.61
B3	1	SR-90	0	92	92	930	7/18/05 5:24	229.00
B3	1	SR-90	0	364	364	960	7/18/05 5:25	190.59
B3	1	SR-90	0	903	903	990	7/18/05 5:26	155.14
B3	1	SR-90	0	1752	1752	1020	7/18/05 5:27	125.47
B3	1	SR-90	0	2748	2748	1050	7/18/05 5:28	107.27
B3	1	SR-90	0	3976	3976	1080	7/18/05 5:29	94.72
B3	1	SR-90	0	5326	5326	1110	7/18/05 5:30	87.75
B3	1	SR-90	0	7232	7232	1140	7/18/05 5:31	81.82
B3	1	SR-90	0	9219	9219	1170	7/18/05 5:32	74.25
B3	1	SR-90	0	11957	11957	1200	7/18/05 5:33	55.05
B3	1	SR-90	0	14901	14901	1230	7/18/05 5:34	56.46
B3	1	SR-90	0	18062	18062	1260	7/18/05 5:35	54.97
B3	1	SR-90	0	18097	18097	1290	7/18/05 5:36	43.63
B3	1	SR-90	0	25246	25323	1320	7/18/05 5:38	40.02
B3	1	SR-90	0	28208	28580	1350	7/18/05 5:39	22.85
B3	1	SR-90	0	27968	28314	1380	7/18/05 5:40	16.51
B3	1	SR-90	0	30578	32553	1410	7/18/05 5:41	17.50
B3	1	SR-90	5	30261	33501	1440	7/18/05 5:42	5.74
B3	1	SR-90	64	29137	33747	1470	7/18/05 5:43	1.63
B3	1	SR-90	29164	670	34629	1470	7/18/05 6:00	0.34
B3	1	SR-90	323	27583	34198	1500	7/18/05 5:44	-0.85
B3	1	SR-90	1099	25236	34123	1530	7/18/05 5:45	0.81
B3	1	SR-90	2111	22644	34350	1560	7/18/05 5:46	0.89
B3	1	SR-90	3321	19097	34115	1590	7/18/05 5:47	0.07
B3	1	SR-90	5082	15510	34618	1620	7/18/05 5:48	-0.04
B3	1	SR-90	7221	10939	34445	1650	7/18/05 5:49	-0.55
B3	1	SR-90	10116	6631	34223	1680	7/18/05 5:50	1.21
B3	1	SR-90	13776	3609	34294	1710	7/18/05 5:51	5.74
B3	1	SR-90	18580	1680	34409	1740	7/18/05 5:53	5.65
B3	1	SR-90	24449	954	34976	1770	7/18/05 5:54	
B4	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
B4	1	SR-90	0	0	0	30	7/18/05 4:51	per 100v
B4	1	SR-90	0	0	0	60	7/18/05 4:53	#DIV/0!
B4	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
B4	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
B4	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
B4	1	SR-90	0	0	0	180	7/18/05 4:57	333.33
B4	1	SR-90	0	0	0	210	7/18/05 4:58	166.67
B4	1	SR-90	0	0	0	240	7/18/05 4:59	0.00
B4	1	SR-90	0	1	1	270	7/18/05 5:00	-166.67
B4	1	SR-90	0	0	0	300	7/18/05 5:01	-333.33
B4	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
B4	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!
B4	1	SR-90	0	0	0	390	7/18/05 5:04	#DIV/0!
B4	1	SR-90	0	0	0	420	7/18/05 5:05	#DIV/0!
B4	1	SR-90	0	0	0	450	7/18/05 5:06	#DIV/0!
B4	1	SR-90	0	0	0	480	7/18/05 5:08	#DIV/0!
B4	1	SR-90	0	0	0	510	7/18/05 5:09	#DIV/0!
B4	1	SR-90	0	0	0	540	7/18/05 5:10	333.33
B4	1	SR-90	0	0	0	570	7/18/05 5:11	166.67
B4	1	SR-90	0	0	0	600	7/18/05 5:12	0.00
B4	1	SR-90	0	1	1	630	7/18/05 5:13	166.67
B4	1	SR-90	0	0	0	660	7/18/05 5:14	0.00
B4	1	SR-90	0	0	0	690	7/18/05 5:15	0.00
B4	1	SR-90	0	2	2	720	7/18/05 5:16	-166.67
B4	1	SR-90	0	0	0	750	7/18/05 5:17	-333.33
B4	1	SR-90	0	0	0	780	7/18/05 5:18	333.33
B4	1	SR-90	0	0	0	810	7/18/05 5:19	325.76

*plc 8/30/05*

Plateau Raw Data

B4	1	SR-90	0	0	0	840	7/18/05 5:20	304.29
B4	1	SR-90	0	1	1	870	7/18/05 5:21	291.19
B4	1	SR-90	0	21	21	900	7/18/05 5:23	263.12
B4	1	SR-90	0	110	110	930	7/18/05 5:24	232.87
B4	1	SR-90	0	481	481	960	7/18/05 5:25	192.39
B4	1	SR-90	0	1210	1210	990	7/18/05 5:26	155.35
B4	1	SR-90	0	2468	2468	1020	7/18/05 5:27	124.79
B4	1	SR-90	0	3738	3738	1050	7/18/05 5:28	106.00
B4	1	SR-90	0	5426	5426	1080	7/18/05 5:29	94.29
B4	1	SR-90	0	7255	7255	1110	7/18/05 5:30	86.40
B4	1	SR-90	0	9847	9847	1140	7/18/05 5:31	80.78
B4	1	SR-90	1	12489	12490	1170	7/18/05 5:32	74.32
B4	1	SR-90	0	16044	16044	1200	7/18/05 5:33	55.57
B4	1	SR-90	0	20084	20084	1230	7/18/05 5:34	57.05
B4	1	SR-90	0	24563	24563	1260	7/18/05 5:35	54.47
B4	1	SR-90	0	24518	24519	1290	7/18/05 5:36	43.62
B4	1	SR-90	0	34213	34276	1320	7/18/05 5:38	40.67
B4	1	SR-90	0	38029	38409	1350	7/18/05 5:39	23.64
B4	1	SR-90	1	38231	38603	1380	7/18/05 5:40	17.61
B4	1	SR-90	0	41914	44333	1410	7/18/05 5:41	17.96
B4	1	SR-90	5	41699	45581	1440	7/18/05 5:42	6.10
B4	1	SR-90	85	40307	46181	1470	7/18/05 5:43	2.99
B4	1	SR-90	35932	1300	47392	1470	7/18/05 6:00	1.07
B4	1	SR-90	416	38557	46619	1500	7/18/05 5:44	-0.36
B4	1	SR-90	1310	36112	47148	1530	7/18/05 5:45	0.87
B4	1	SR-90	2635	32660	47174	1560	7/18/05 5:46	0.13
B4	1	SR-90	4228	28343	46858	1590	7/18/05 5:47	-0.21
B4	1	SR-90	6328	23614	47377	1620	7/18/05 5:48	0.17
B4	1	SR-90	8936	18156	47138	1650	7/18/05 5:49	-0.12
B4	1	SR-90	12564	12405	46883	1680	7/18/05 5:50	0.81
B4	1	SR-90	16933	7849	47225	1710	7/18/05 5:51	5.74
B4	1	SR-90	22492	4319	47250	1740	7/18/05 5:53	5.65
B4	1	SR-90	29254	2238	47530	1770	7/18/05 5:54	
C1	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
C1	1	SR-90	0	0	0	30	7/18/05 4:52	per 100v
C1	1	SR-90	0	0	0	60	7/18/05 4:52	#DIV/0!
C1	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
C1	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
C1	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
C1	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
C1	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
C1	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
C1	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
C1	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
C1	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
C1	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!
C1	1	SR-90	0	1	0	390	7/18/05 5:04	#DIV/0!
C1	1	SR-90	0	0	0	420	7/18/05 5:05	#DIV/0!
C1	1	SR-90	0	0	0	450	7/18/05 5:06	#DIV/0!
C1	1	SR-90	0	0	0	480	7/18/05 5:08	#DIV/0!
C1	1	SR-90	0	0	0	510	7/18/05 5:09	#DIV/0!
C1	1	SR-90	0	0	0	540	7/18/05 5:10	#DIV/0!
C1	1	SR-90	0	0	0	570	7/18/05 5:11	#DIV/0!
C1	1	SR-90	0	0	0	600	7/18/05 5:12	#DIV/0!
C1	1	SR-90	0	0	0	630	7/18/05 5:13	#DIV/0!
C1	1	SR-90	0	0	0	660	7/18/05 5:14	#DIV/0!
C1	1	SR-90	0	0	0	690	7/18/05 5:15	#DIV/0!
C1	1	SR-90	0	0	0	720	7/18/05 5:16	333.33
C1	1	SR-90	0	0	0	750	7/18/05 5:17	166.67
C1	1	SR-90	0	0	0	780	7/18/05 5:18	166.67
C1	1	SR-90	0	1	1	810	7/18/05 5:19	296.30
C1	1	SR-90	0	0	0	840	7/18/05 5:20	306.57
C1	1	SR-90	0	1	1	870	7/18/05 5:21	288.77
C1	1	SR-90	0	16	16	900	7/18/05 5:23	260.13
C1	1	SR-90	0	119	119	930	7/18/05 5:24	223.53
C1	1	SR-90	0	440	440	960	7/18/05 5:25	189.20
C1	1	SR-90	0	1086	1086	990	7/18/05 5:26	153.24
C1	1	SR-90	0	1962	1962	1020	7/18/05 5:27	23.17
C1	1	SR-90	0	3250	3250	1050	7/18/05 5:28	57.72
C1	1	SR-90	0	4545	4545	1080	7/18/05 5:29	107.47
C1	1	SR-90	0	6141	589	1110	7/18/05 5:30	21.31
C1	1	SR-90	0	6149	6149	1140	7/18/05 5:31	107.39
C1	1	SR-90	1	10527	10528	1170	7/18/05 5:32	-30.43
C1	1	SR-90	1	13301	1036	1200	7/18/05 5:33	93.95
C1	1	SR-90	0	13339	13339	1230	7/18/05 5:34	159.85
C1	1	SR-90	0	20180	1749	1260	7/18/05 5:36	13.80



Plateau Raw Data

C1	1	SR-90	0	24622	24623	1290	7/18/05 5:36	79.14
C1	1	SR-90	0	28664	28694	1320	7/18/05 5:38	38.97
C1	1	SR-90	0	31840	2816	1350	7/18/05 5:39	61.14
C1	1	SR-90	2	33849	34611	1380	7/18/05 5:40	82.10
C1	1	SR-90	6	34809	36544	1410	7/18/05 5:41	11.61
C1	1	SR-90	99	34498	37547	1440	7/18/05 5:42	6.35
C1	1	SR-90	418	33707	38229	1470	7/18/05 5:43	2.63
C1	1	SR-90	35597	748	39190	1470	7/18/05 6:00	0.71
C1	1	SR-90	1194	31911	38444	1500	7/18/05 5:44	-0.30
C1	1	SR-90	2365	29938	38776	1530	7/18/05 5:45	0.72
C1	1	SR-90	3866	27093	38964	1560	7/18/05 5:46	0.23
C1	1	SR-90	5767	23187	38758	1590	7/18/05 5:47	0.17
C1	1	SR-90	7953	19132	38872	1620	7/18/05 5:48	0.73
C1	1	SR-90	11354	14224	38959	1650	7/18/05 5:49	1.06
C1	1	SR-90	14964	9421	38964	1680	7/18/05 5:50	0.86
C1	1	SR-90	20003	5448	39138	1710	7/18/05 5:51	5.74
C1	1	SR-90	25521	2697	39401	1740	7/18/05 5:53	5.65
C1	1	SR-90	31217	1407	39244	1770	7/18/05 5:54	
C2	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
C2	1	SR-90	0	0	0	30	7/18/05 4:52	per 100v
C2	1	SR-90	0	0	0	60	7/18/05 4:52	#DIV/0!
C2	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
C2	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
C2	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
C2	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
C2	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
C2	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
C2	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
C2	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
C2	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
C2	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!
C2	1	SR-90	0	0	0	390	7/18/05 5:04	333.33
C2	1	SR-90	0	0	0	420	7/18/05 5:05	166.67
C2	1	SR-90	0	0	0	450	7/18/05 5:06	0.00
C2	1	SR-90	0	2	2	480	7/18/05 5:08	-166.67
C2	1	SR-90	0	0	0	510	7/18/05 5:09	-111.11
C2	1	SR-90	0	0	0	540	7/18/05 5:10	166.67
C2	1	SR-90	0	0	0	570	7/18/05 5:11	0.00
C2	1	SR-90	0	1	1	600	7/18/05 5:12	166.67
C2	1	SR-90	0	0	0	630	7/18/05 5:13	0.00
C2	1	SR-90	0	0	0	660	7/18/05 5:14	0.00
C2	1	SR-90	0	2	2	690	7/18/05 5:15	-166.67
C2	1	SR-90	0	0	0	720	7/18/05 5:16	-333.33
C2	1	SR-90	0	0	0	750	7/18/05 5:17	#DIV/0!
C2	1	SR-90	0	0	0	780	7/18/05 5:18	#DIV/0!
C2	1	SR-90	0	0	0	810	7/18/05 5:19	333.33
C2	1	SR-90	0	0	0	840	7/18/05 5:20	306.45
C2	1	SR-90	0	0	0	870	7/18/05 5:21	293.60
C2	1	SR-90	0	5	5	900	7/18/05 5:23	277.68
C2	1	SR-90	0	26	26	930	7/18/05 5:24	249.04
C2	1	SR-90	0	120	120	960	7/18/05 5:25	215.26
C2	1	SR-90	0	409	409	990	7/18/05 5:26	181.60
C2	1	SR-90	0	917	917	1020	7/18/05 5:27	45.35
C2	1	SR-90	0	1632	1632	1050	7/18/05 5:28	77.39
C2	1	SR-90	0	2603	2604	1080	7/18/05 5:29	124.81
C2	1	SR-90	1	3680	373	1110	7/18/05 5:30	28.06
C2	1	SR-90	0	3685	3685	1140	7/18/05 5:31	106.38
C2	1	SR-90	0	6709	6709	1170	7/18/05 5:32	-29.56
C2	1	SR-90	0	8337	613	1200	7/18/05 5:33	97.63
C2	1	SR-90	0	8138	8138	1230	7/18/05 5:34	165.89
C2	1	SR-90	1	13273	1169	1260	7/18/05 5:36	20.59
C2	1	SR-90	0	15982	15982	1290	7/18/05 5:36	87.57
C2	1	SR-90	0	19066	19074	1320	7/18/05 5:38	50.85
C2	1	SR-90	0	21822	2053	1350	7/18/05 5:39	70.94
C2	1	SR-90	0	24447	24672	1380	7/18/05 5:40	86.40
C2	1	SR-90	2	25981	26678	1410	7/18/05 5:41	20.05
C2	1	SR-90	9	26771	28184	1440	7/18/05 5:42	12.08
C2	1	SR-90	75	26770	28949	1470	7/18/05 5:43	4.37
C2	1	SR-90	23764	1608	30752	1470	7/18/05 6:00	0.62
C2	1	SR-90	407	25935	29443	1500	7/18/05 5:44	-0.80
C2	1	SR-90	1019	24771	29793	1530	7/18/05 5:45	1.72
C2	1	SR-90	1713	23372	30041	1560	7/18/05 5:46	0.82
C2	1	SR-90	2872	21173	30094	1590	7/18/05 5:47	0.06
C2	1	SR-90	4323	18353	30062	1620	7/18/05 5:48	-0.07
C2	1	SR-90	6135	15302	30152	1650	7/18/05 5:49	0.17
C2	1	SR-90	8498	11607	30040	1680	7/18/05 5:50	0.79

Plateau Raw Data

C2	1	SR-90	11514	8217	30072	1710	7/18/05 5:51	5.74
C2	1	SR-90	15123	5264	30180	1740	7/18/05 5:53	5.65
C2	1	SR-90	19642	2946	30438	1770	7/18/05 5:54	
C3	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
C3	1	SR-90	0	0	0	30	7/18/05 4:52	per 100v
C3	1	SR-90	0	0	0	60	7/18/05 4:52	#DIV/0!
C3	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
C3	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
C3	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
C3	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
C3	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
C3	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
C3	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
C3	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
C3	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
C3	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!
C3	1	SR-90	0	0	0	390	7/18/05 5:04	#DIV/0!
C3	1	SR-90	0	0	0	420	7/18/05 5:05	#DIV/0!
C3	1	SR-90	0	0	0	450	7/18/05 5:06	#DIV/0!
C3	1	SR-90	0	0	0	480	7/18/05 5:08	#DIV/0!
C3	1	SR-90	0	0	0	510	7/18/05 5:09	#DIV/0!
C3	1	SR-90	0	0	0	540	7/18/05 5:10	#DIV/0!
C3	1	SR-90	0	0	0	570	7/18/05 5:11	#DIV/0!
C3	1	SR-90	0	0	0	600	7/18/05 5:12	#DIV/0!
C3	1	SR-90	0	0	0	630	7/18/05 5:13	333.33
C3	1	SR-90	0	0	0	660	7/18/05 5:14	166.67
C3	1	SR-90	0	0	0	690	7/18/05 5:15	0.00
C3	1	SR-90	0	1	1	720	7/18/05 5:16	-166.67
C3	1	SR-90	0	0	0	750	7/18/05 5:17	-333.33
C3	1	SR-90	0	0	0	780	7/18/05 5:18	333.33
C3	1	SR-90	0	0	0	810	7/18/05 5:19	300.00
C3	1	SR-90	0	0	0	840	7/18/05 5:20	270.83
C3	1	SR-90	0	1	1	870	7/18/05 5:21	301.17
C3	1	SR-90	0	4	4	900	7/18/05 5:23	285.91
C3	1	SR-90	0	11	11	930	7/18/05 5:24	261.14
C3	1	SR-90	0	98	98	960	7/18/05 5:25	227.44
C3	1	SR-90	0	364	364	990	7/18/05 5:26	192.69
C3	1	SR-90	0	929	929	1020	7/18/05 5:27	54.20
C3	1	SR-90	0	1738	1738	1050	7/18/05 5:28	79.86
C3	1	SR-90	0	2891	2891	1080	7/18/05 5:29	124.48
C3	1	SR-90	0	3992	413	1110	7/18/05 5:30	28.35
C3	1	SR-90	0	3974	3974	1140	7/18/05 5:31	113.55
C3	1	SR-90	0	7283	7283	1170	7/18/05 5:32	-21.20
C3	1	SR-90	0	9450	759	1200	7/18/05 5:33	103.12
C3	1	SR-90	0	9486	9486	1230	7/18/05 5:34	164.73
C3	1	SR-90	0	15065	1415	1260	7/18/05 5:36	20.28
C3	1	SR-90	0	18555	18555	1290	7/18/05 5:36	89.38
C3	1	SR-90	1	22050	22056	1320	7/18/05 5:38	55.40
C3	1	SR-90	0	26095	2448	1350	7/18/05 5:39	74.07
C3	1	SR-90	0	29012	29232	1380	7/18/05 5:40	86.74
C3	1	SR-90	1	31652	32361	1410	7/18/05 5:41	20.64
C3	1	SR-90	16	32022	33727	1440	7/18/05 5:42	12.13
C3	1	SR-90	111	31880	34663	1470	7/18/05 5:43	4.31
C3	1	SR-90	30410	1336	37005	1470	7/18/05 6:00	1.31
C3	1	SR-90	575	31452	35722	1500	7/18/05 5:44	-0.67
C3	1	SR-90	1322	29662	35508	1530	7/18/05 5:45	2.00
C3	1	SR-90	2461	28171	36500	1560	7/18/05 5:46	1.85
C3	1	SR-90	3943	25189	36254	1590	7/18/05 5:47	0.16
C3	1	SR-90	5821	22079	36429	1620	7/18/05 5:48	0.26
C3	1	SR-90	8333	17952	36549	1650	7/18/05 5:49	0.15
C3	1	SR-90	11084	13497	36440	1680	7/18/05 5:50	0.03
C3	1	SR-90	14964	8982	36391	1710	7/18/05 5:51	5.74
C3	1	SR-90	19558	5289	36592	1740	7/18/05 5:53	5.65
C3	1	SR-90	24903	2640	36489	1770	7/18/05 5:54	
C4	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
C4	1	SR-90	0	0	0	30	7/18/05 4:52	per 100v
C4	1	SR-90	0	0	0	60	7/18/05 4:52	#DIV/0!
C4	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
C4	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
C4	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
C4	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
C4	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
C4	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
C4	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
C4	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
C4	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!

Plateau Raw Data

C4	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!
C4	1	SR-90	0	0	0	390	7/18/05 5:04	#DIV/0!
C4	1	SR-90	0	0	0	420	7/18/05 5:05	#DIV/0!
C4	1	SR-90	0	0	0	450	7/18/05 5:06	#DIV/0!
C4	1	SR-90	0	0	0	480	7/18/05 5:08	#DIV/0!
C4	1	SR-90	0	0	0	510	7/18/05 5:09	#DIV/0!
C4	1	SR-90	0	0	0	540	7/18/05 5:10	#DIV/0!
C4	1	SR-90	0	0	0	570	7/18/05 5:11	#DIV/0!
C4	1	SR-90	0	0	0	600	7/18/05 5:12	#DIV/0!
C4	1	SR-90	0	0	0	630	7/18/05 5:13	#DIV/0!
C4	1	SR-90	0	0	0	660	7/18/05 5:14	#DIV/0!
C4	1	SR-90	0	0	0	690	7/18/05 5:15	#DIV/0!
C4	1	SR-90	0	0	0	720	7/18/05 5:16	#DIV/0!
C4	1	SR-90	0	0	0	750	7/18/05 5:17	#DIV/0!
C4	1	SR-90	0	0	0	780	7/18/05 5:18	333.33
C4	1	SR-90	0	0	0	810	7/18/05 5:19	166.67
C4	1	SR-90	0	0	0	840	7/18/05 5:20	222.22
C4	1	SR-90	0	1	1	870	7/18/05 5:21	55.56
C4	1	SR-90	0	0	0	900	7/18/05 5:23	0.00
C4	1	SR-90	0	2	2	930	7/18/05 5:24	236.11
C4	1	SR-90	0	0	0	960	7/18/05 5:25	289.95
C4	1	SR-90	0	1	1	990	7/18/05 5:26	286.53
C4	1	SR-90	0	9	9	1020	7/18/05 5:27	162.56
C4	1	SR-90	0	61	61	1050	7/18/05 5:28	214.22
C4	1	SR-90	0	221	221	1080	7/18/05 5:29	246.54
C4	1	SR-90	0	645	73	1110	7/18/05 5:30	108.21
C4	1	SR-90	0	663	663	1140	7/18/05 5:31	148.91
C4	1	SR-90	0	2277	2277	1170	7/18/05 5:32	15.94
C4	1	SR-90	0	3220	250	1200	7/18/05 5:33	133.08
C4	1	SR-90	0	3140	3140	1230	7/18/05 5:34	196.61
C4	1	SR-90	0	5652	561	1260	7/18/05 5:36	55.63
C4	1	SR-90	0	7670	7670	1290	7/18/05 5:36	124.35
C4	1	SR-90	0	11799	11799	1320	7/18/05 5:38	94.42
C4	1	SR-90	1	15438	1666	1350	7/18/05 5:39	96.99
C4	1	SR-90	0	18593	18593	1380	7/18/05 5:40	101.70
C4	1	SR-90	0	21657	21663	1410	7/18/05 5:41	63.85
C4	1	SR-90	0	24568	24584	1440	7/18/05 5:42	41.71
C4	1	SR-90	0	27200	27286	1470	7/18/05 5:43	18.22
C4	1	SR-90	9161	20345	40999	1470	7/18/05 6:00	1.58
C4	1	SR-90	0	29700	29917	1500	7/18/05 5:44	-3.48
C4	1	SR-90	0	32216	32772	1530	7/18/05 5:45	22.06
C4	1	SR-90	1	33784	34876	1560	7/18/05 5:46	17.29
C4	1	SR-90	22	34777	36690	1590	7/18/05 5:47	12.65
C4	1	SR-90	427	35302	39455	1620	7/18/05 5:48	6.91
C4	1	SR-90	1154	34154	40017	1650	7/18/05 5:49	2.25
C4	1	SR-90	2347	32064	40482	1680	7/18/05 5:50	1.61
C4	1	SR-90	3431	29666	40258	1710	7/18/05 5:51	5.74
C4	1	SR-90	4835	27362	40693	1740	7/18/05 5:53	5.65
C4	1	SR-90	6592	24313	40890	1770	7/18/05 5:54	
D1	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
D1	1	SR-90	0	0	0	30	7/18/05 4:52	per 100v
D1	1	SR-90	0	0	0	60	7/18/05 4:52	#DIV/0!
D1	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
D1	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
D1	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
D1	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
D1	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
D1	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
D1	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
D1	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
D1	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
D1	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!
D1	1	SR-90	0	0	0	390	7/18/05 5:04	#DIV/0!
D1	1	SR-90	0	0	0	420	7/18/05 5:05	#DIV/0!
D1	1	SR-90	0	0	0	450	7/18/05 5:06	#DIV/0!
D1	1	SR-90	0	0	0	480	7/18/05 5:08	#DIV/0!
D1	1	SR-90	0	0	0	510	7/18/05 5:09	#DIV/0!
D1	1	SR-90	0	0	0	540	7/18/05 5:10	#DIV/0!
D1	1	SR-90	0	0	0	570	7/18/05 5:11	#DIV/0!
D1	1	SR-90	0	0	0	600	7/18/05 5:12	#DIV/0!
D1	1	SR-90	0	0	0	630	7/18/05 5:13	333.33
D1	1	SR-90	0	0	0	660	7/18/05 5:14	166.67
D1	1	SR-90	0	0	0	690	7/18/05 5:15	166.67
D1	1	SR-90	0	1	1	720	7/18/05 5:16	0.00
D1	1	SR-90	0	0	0	750	7/18/05 5:17	0.00
D1	1	SR-90	0	1	1	780	7/18/05 5:18	111.11

Plateau Raw Data

D1	1	SR-90	0	0	0	810	7/18/05 5:19	166.67
D1	1	SR-90	0	1	1	840	7/18/05 5:20	300.00
D1	1	SR-90	0	1	1	870	7/18/05 5:21	293.69
D1	1	SR-90	0	4	4	900	7/18/05 5:23	277.71
D1	1	SR-90	0	39	39	930	7/18/05 5:24	250.86
D1	1	SR-90	0	182	182	960	7/18/05 5:25	218.01
D1	1	SR-90	0	601	601	990	7/18/05 5:26	182.29
D1	1	SR-90	0	1391	1393	1020	7/18/05 5:27	45.50
D1	1	SR-90	0	2550	2550	1050	7/18/05 5:28	77.34
D1	1	SR-90	0	3955	3955	1080	7/18/05 5:29	123.53
D1	1	SR-90	0	5667	556	1110	7/18/05 5:30	29.02
D1	1	SR-90	0	5666	5666	1140	7/18/05 5:31	114.29
D1	1	SR-90	0	10186	10186	1170	7/18/05 5:32	-19.20
D1	1	SR-90	0	13598	1000	1200	7/18/05 5:33	103.55
D1	1	SR-90	0	13480	13480	1230	7/18/05 5:34	164.31
D1	1	SR-90	0	21005	2148	1260	7/18/05 5:36	19.82
D1	1	SR-90	0	26022	26026	1290	7/18/05 5:36	86.48
D1	1	SR-90	0	31030	31065	1320	7/18/05 5:38	49.57
D1	1	SR-90	2	35619	3557	1350	7/18/05 5:39	68.74
D1	1	SR-90	0	39252	40071	1380	7/18/05 5:40	84.29
D1	1	SR-90	0	41073	42875	1410	7/18/05 5:41	15.77
D1	1	SR-90	4	41569	44910	1440	7/18/05 5:42	10.50
D1	1	SR-90	80	40872	48001	1470	7/18/05 5:43	4.27
D1	1	SR-90	37471	1061	47168	1470	7/18/05 6:00	-0.20
D1	1	SR-90	402	39458	47028	1500	7/18/05 5:44	-0.62
D1	1	SR-90	1221	36496	46873	1530	7/18/05 5:45	0.44
D1	1	SR-90	2513	32706	46400	1560	7/18/05 5:46	1.17
D1	1	SR-90	4247	28994	47048	1590	7/18/05 5:47	1.76
D1	1	SR-90	6457	24130	47248	1620	7/18/05 5:48	0.54
D1	1	SR-90	9266	18023	47274	1650	7/18/05 5:49	0.14
D1	1	SR-90	13228	12105	47532	1680	7/18/05 5:50	-0.31
D1	1	SR-90	17859	7192	47287	1710	7/18/05 5:51	5.74
D1	1	SR-90	23848	3841	47344	1740	7/18/05 5:53	5.65
D1	1	SR-90	31017	1883	47150	1770	7/18/05 5:54	
D2	1	SR-90	0	1	1	0	7/18/05 4:50	% slope
D2	1	SR-90	0	0	0	30	7/18/05 4:52	per 100v
D2	1	SR-90	0	0	0	60	7/18/05 4:52	#DIV/0!
D2	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
D2	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
D2	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
D2	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
D2	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
D2	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
D2	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
D2	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
D2	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
D2	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!
D2	1	SR-90	0	0	0	390	7/18/05 5:04	#DIV/0!
D2	1	SR-90	0	0	0	420	7/18/05 5:05	#DIV/0!
D2	1	SR-90	0	0	0	450	7/18/05 5:06	333.33
D2	1	SR-90	0	0	0	480	7/18/05 5:08	166.67
D2	1	SR-90	0	0	0	510	7/18/05 5:09	0.00
D2	1	SR-90	0	1	1	540	7/18/05 5:10	-166.67
D2	1	SR-90	0	0	0	570	7/18/05 5:11	-333.33
D2	1	SR-90	0	0	0	600	7/18/05 5:12	#DIV/0!
D2	1	SR-90	0	0	0	630	7/18/05 5:13	333.33
D2	1	SR-90	0	0	0	660	7/18/05 5:14	166.67
D2	1	SR-90	0	0	0	690	7/18/05 5:15	0.00
D2	1	SR-90	0	1	1	720	7/18/05 5:16	-166.67
D2	1	SR-90	0	0	0	750	7/18/05 5:17	-333.33
D2	1	SR-90	0	0	0	780	7/18/05 5:18	#DIV/0!
D2	1	SR-90	0	0	0	810	7/18/05 5:19	333.33
D2	1	SR-90	0	0	0	840	7/18/05 5:20	318.71
D2	1	SR-90	0	0	0	870	7/18/05 5:21	291.83
D2	1	SR-90	0	5	5	900	7/18/05 5:23	271.85
D2	1	SR-90	0	52	52	930	7/18/05 5:24	244.90
D2	1	SR-90	0	192	192	960	7/18/05 5:25	204.64
D2	1	SR-90	0	594	594	990	7/18/05 5:26	168.76
D2	1	SR-90	0	1332	1332	1020	7/18/05 5:27	34.85
D2	1	SR-90	0	2109	2109	1050	7/18/05 5:28	62.70
D2	1	SR-90	0	3189	3189	1080	7/18/05 5:29	114.57
D2	1	SR-90	0	4295	470	1110	7/18/05 5:30	23.95
D2	1	SR-90	0	4295	4295	1140	7/18/05 5:31	108.35
D2	1	SR-90	0	7641	7641	1170	7/18/05 5:32	-25.15
D2	1	SR-90	1	9787	780	1200	7/18/05 5:33	95.62
D2	1	SR-90	1	9650	9651	1230	7/18/05 5:34	161.08

*gpc 8/30/05*

Plateau Raw Data

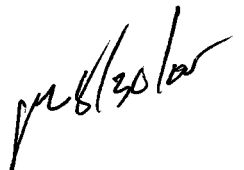
D2	1	SR-90	0	14800	1490	1260	7/18/05 5:36	17.38
D2	1	SR-90	0	18084	18086	1290	7/18/05 5:36	83.65
D2	1	SR-90	0	21404	21410	1320	7/18/05 5:38	45.88
D2	1	SR-90	0	24158	2459	1350	7/18/05 5:39	67.31
D2	1	SR-90	0	26658	26976	1380	7/18/05 5:40	84.40
D2	1	SR-90	0	27801	28746	1410	7/18/05 5:41	17.23
D2	1	SR-90	15	28773	30498	1440	7/18/05 5:42	10.83
D2	1	SR-90	95	28306	30999	1470	7/18/05 5:43	3.03
D2	1	SR-90	23021	2117	32403	1470	7/18/05 6:00	1.04
D2	1	SR-90	358	27703	31579	1500	7/18/05 5:44	0.34
D2	1	SR-90	945	26164	31620	1530	7/18/05 5:45	2.41
D2	1	SR-90	1803	24738	32098	1560	7/18/05 5:46	2.02
D2	1	SR-90	2815	22539	32307	1590	7/18/05 5:47	0.71
D2	1	SR-90	4246	19858	32393	1620	7/18/05 5:48	0.29
D2	1	SR-90	6013	16722	32448	1650	7/18/05 5:49	0.20
D2	1	SR-90	8212	12909	32374	1680	7/18/05 5:50	-0.85
D2	1	SR-90	11185	9277	32456	1710	7/18/05 5:51	5.74
D2	1	SR-90	14467	6294	32488	1740	7/18/05 5:53	5.65
D2	1	SR-90	18478	3684	31980	1770	7/18/05 5:54	
D3	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
D3	1	SR-90	0	0	0	30	7/18/05 4:52	per 100v
D3	1	SR-90	0	0	0	60	7/18/05 4:52	#DIV/0!
D3	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
D3	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
D3	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
D3	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
D3	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
D3	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
D3	1	SR-90	0	0	0	270	7/18/05 5:00	#DIV/0!
D3	1	SR-90	0	0	0	300	7/18/05 5:01	#DIV/0!
D3	1	SR-90	0	0	0	330	7/18/05 5:02	#DIV/0!
D3	1	SR-90	0	0	0	360	7/18/05 5:03	#DIV/0!
D3	1	SR-90	0	0	0	390	7/18/05 5:04	333.33
D3	1	SR-90	0	0	0	420	7/18/05 5:05	166.67
D3	1	SR-90	0	0	0	450	7/18/05 5:06	0.00
D3	1	SR-90	0	1	1	480	7/18/05 5:08	83.33
D3	1	SR-90	0	0	0	510	7/18/05 5:09	55.56
D3	1	SR-90	0	0	0	540	7/18/05 5:10	83.33
D3	1	SR-90	0	1	1	570	7/18/05 5:11	-83.33
D3	1	SR-90	0	1	1	600	7/18/05 5:12	-250.00
D3	1	SR-90	0	0	0	630	7/18/05 5:13	-333.33
D3	1	SR-90	0	0	0	660	7/18/05 5:14	#DIV/0!
D3	1	SR-90	0	0	0	690	7/18/05 5:15	#DIV/0!
D3	1	SR-90	0	0	0	720	7/18/05 5:16	#DIV/0!
D3	1	SR-90	0	0	0	750	7/18/05 5:17	333.33
D3	1	SR-90	0	0	0	780	7/18/05 5:18	250.00
D3	1	SR-90	0	0	0	810	7/18/05 5:19	270.83
D3	1	SR-90	0	1	1	840	7/18/05 5:20	298.74
D3	1	SR-90	0	1	1	870	7/18/05 5:21	296.55
D3	1	SR-90	0	6	6	900	7/18/05 5:23	274.87
D3	1	SR-90	0	45	45	930	7/18/05 5:24	244.21
D3	1	SR-90	0	237	237	960	7/18/05 5:25	204.17
D3	1	SR-90	0	706	706	990	7/18/05 5:26	163.59
D3	1	SR-90	0	1510	1510	1020	7/18/05 5:27	31.52
D3	1	SR-90	0	2422	2422	1050	7/18/05 5:28	68.08
D3	1	SR-90	0	3479	3479	1080	7/18/05 5:29	119.58
D3	1	SR-90	0	5047	540	1110	7/18/05 5:30	29.83
D3	1	SR-90	0	5121	5121	1140	7/18/05 5:31	107.58
D3	1	SR-90	0	8965	8965	1170	7/18/05 5:32	-25.76
D3	1	SR-90	0	11420	974	1200	7/18/05 5:33	94.68
D3	1	SR-90	0	11293	11293	1230	7/18/05 5:34	159.28
D3	1	SR-90	0	17501	1783	1260	7/18/05 5:36	16.23
D3	1	SR-90	0	21087	21087	1290	7/18/05 5:36	82.57
D3	1	SR-90	0	24610	24640	1320	7/18/05 5:38	45.78
D3	1	SR-90	1	27881	2868	1350	7/18/05 5:39	66.81
D3	1	SR-90	0	30529	31067	1380	7/18/05 5:40	84.56
D3	1	SR-90	0	32135	33401	1410	7/18/05 5:41	17.77
D3	1	SR-90	18	32463	34780	1440	7/18/05 5:42	11.81
D3	1	SR-90	107	32515	36068	1470	7/18/05 5:43	5.17
D3	1	SR-90	28458	1589	37558	1470	7/18/05 6:00	1.13
D3	1	SR-90	490	31614	36809	1500	7/18/05 5:44	0.47
D3	1	SR-90	1180	29845	36861	1530	7/18/05 5:45	1.71
D3	1	SR-90	2160	27685	37264	1560	7/18/05 5:46	1.93
D3	1	SR-90	3537	24987	37595	1590	7/18/05 5:47	0.69
D3	1	SR-90	5324	21409	37396	1620	7/18/05 5:48	-0.45
D3	1	SR-90	7622	17368	37879	1650	7/18/05 5:49	0.01

Plateau Raw Data

D3	1	SR-90	10311	12938	37510	1680	7/18/05 5:50	0.01
D3	1	SR-90	13699	8804	37285	1710	7/18/05 5:51	5.74
D3	1	SR-90	18401	5528	37696	1740	7/18/05 5:53	5.65
D3	1	SR-90	23565	3118	37794	1770	7/18/05 5:54	
D4	1	SR-90	0	0	0	0	7/18/05 4:50	% slope
D4	1	SR-90	0	0	0	30	7/18/05 4:52	per 100v
D4	1	SR-90	0	0	0	60	7/18/05 4:52	#DIV/0!
D4	1	SR-90	0	0	0	90	7/18/05 4:54	#DIV/0!
D4	1	SR-90	0	0	0	120	7/18/05 4:55	#DIV/0!
D4	1	SR-90	0	0	0	150	7/18/05 4:56	#DIV/0!
D4	1	SR-90	0	0	0	180	7/18/05 4:57	#DIV/0!
D4	1	SR-90	0	0	0	210	7/18/05 4:58	#DIV/0!
D4	1	SR-90	0	0	0	240	7/18/05 4:59	#DIV/0!
D4	1	SR-90	0	0	0	270	7/18/05 5:00	333.33
D4	1	SR-90	0	0	0	300	7/18/05 5:01	166.67
D4	1	SR-90	0	0	0	330	7/18/05 5:02	0.00
D4	1	SR-90	0	0	1	360	7/18/05 5:03	-166.67
D4	1	SR-90	0	0	0	390	7/18/05 5:04	0.00
D4	1	SR-90	0	0	0	420	7/18/05 5:05	166.67
D4	1	SR-90	0	0	0	450	7/18/05 5:06	0.00
D4	1	SR-90	0	0	1	480	7/18/05 5:08	-166.67
D4	1	SR-90	0	0	0	510	7/18/05 5:09	-333.33
D4	1	SR-90	0	0	0	540	7/18/05 5:10	#DIV/0!
D4	1	SR-90	0	0	0	570	7/18/05 5:11	#DIV/0!
D4	1	SR-90	0	0	0	600	7/18/05 5:12	#DIV/0!
D4	1	SR-90	0	0	0	630	7/18/05 5:13	#DIV/0!
D4	1	SR-90	0	0	0	660	7/18/05 5:14	#DIV/0!
D4	1	SR-90	0	0	0	690	7/18/05 5:15	#DIV/0!
D4	1	SR-90	0	0	0	720	7/18/05 5:16	#DIV/0!
D4	1	SR-90	0	0	0	750	7/18/05 5:17	#DIV/0!
D4	1	SR-90	0	0	0	780	7/18/05 5:18	#DIV/0!
D4	1	SR-90	0	0	0	810	7/18/05 5:19	333.33
D4	1	SR-90	0	0	0	840	7/18/05 5:20	312.21
D4	1	SR-90	0	0	0	870	7/18/05 5:21	289.04
D4	1	SR-90	0	0	9	900	7/18/05 5:23	274.32
D4	1	SR-90	0	0	62	930	7/18/05 5:24	244.32
D4	1	SR-90	0	0	230	960	7/18/05 5:25	208.20
D4	1	SR-90	0	0	775	990	7/18/05 5:26	168.22
D4	1	SR-90	0	0	1652	1020	7/18/05 5:27	33.45
D4	1	SR-90	0	0	2795	1050	7/18/05 5:28	65.16
D4	1	SR-90	0	0	3980	1080	7/18/05 5:29	115.01
D4	1	SR-90	0	0	594	1110	7/18/05 5:30	27.49
D4	1	SR-90	0	0	5613	1140	7/18/05 5:31	107.00
D4	1	SR-90	0	0	9860	1170	7/18/05 5:32	-25.60
D4	1	SR-90	0	0	1090	1200	7/18/05 5:33	96.20
D4	1	SR-90	0	0	12317	1230	7/18/05 5:34	160.36
D4	1	SR-90	0	0	2012	1260	7/18/05 5:36	17.53
D4	1	SR-90	0	0	23468	1290	7/18/05 5:36	82.83
D4	1	SR-90	0	0	27406	1320	7/18/05 5:38	45.98
D4	1	SR-90	0	0	3218	1350	7/18/05 5:39	66.26
D4	1	SR-90	0	0	34700	1380	7/18/05 5:40	82.61
D4	1	SR-90	0	0	37199	1410	7/18/05 5:41	14.69
D4	1	SR-90	0	0	38433	1440	7/18/05 5:42	8.79
D4	1	SR-90	0	0	39212	1470	7/18/05 5:43	3.28
D4	1	SR-90	0	0	40826	1470	7/18/05 6:00	-0.09
D4	1	SR-90	0	0	39991	1500	7/18/05 5:44	-0.77
D4	1	SR-90	0	0	39906	1530	7/18/05 5:45	0.59
D4	1	SR-90	0	0	40025	1560	7/18/05 5:46	1.02
D4	1	SR-90	0	0	40344	1590	7/18/05 5:47	1.23
D4	1	SR-90	0	0	40124	1620	7/18/05 5:48	0.38
D4	1	SR-90	0	0	40472	1650	7/18/05 5:49	0.35
D4	1	SR-90	0	0	40706	1680	7/18/05 5:50	-0.05
D4	1	SR-90	0	0	40284	1710	7/18/05 5:51	5.74
D4	1	SR-90	0	0	40428	1740	7/18/05 5:53	5.65
D4	1	SR-90	0	0	40581	1770	7/18/05 5:54	
E1	1	SR-90	0	0	0	0	7/18/05 6:12	% slope
E1	1	SR-90	0	0	0	30	7/18/05 6:13	per 100v
E1	1	SR-90	0	0	0	60	7/18/05 6:14	#DIV/0!
E1	1	SR-90	0	0	0	90	7/18/05 6:15	#DIV/0!
E1	1	SR-90	0	0	0	120	7/18/05 6:16	#DIV/0!
E1	1	SR-90	0	0	0	150	7/18/05 6:17	#DIV/0!
E1	1	SR-90	0	0	0	180	7/18/05 6:19	#DIV/0!
E1	1	SR-90	0	0	0	210	7/18/05 6:20	333.33
E1	1	SR-90	0	0	0	240	7/18/05 6:21	166.67
E1	1	SR-90	0	0	0	270	7/18/05 6:22	0.00
E1	1	SR-90	0	1	1	300	7/18/05 6:23	-166.67

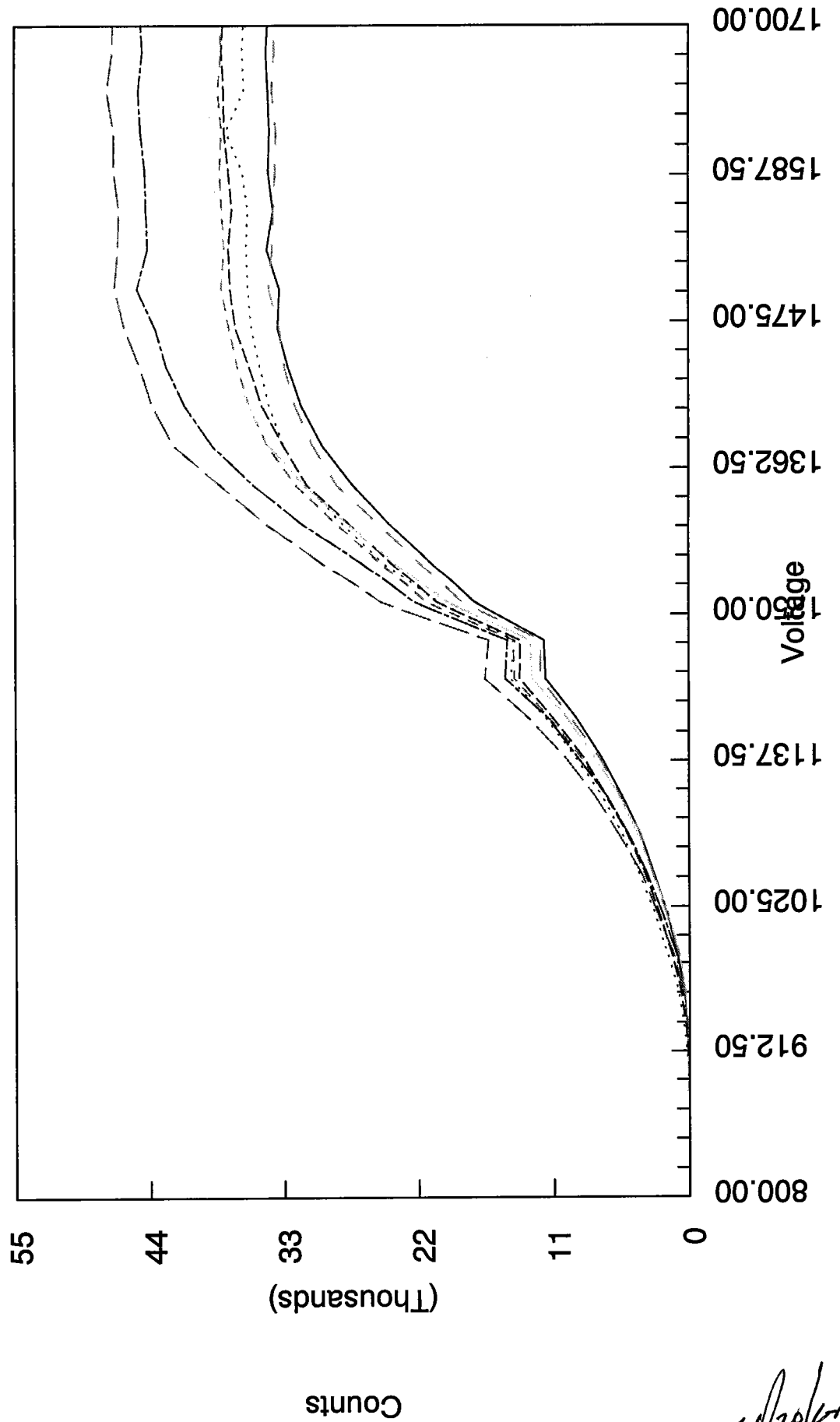
**Plateau Raw Data**

E1	1	SR-90	0	0	0	330	7/18/05 6:24	-333.33
E1	1	SR-90	0	0	0	360	7/18/05 6:25	#DIV/0!
E1	1	SR-90	0	0	0	390	7/18/05 6:26	#DIV/0!
E1	1	SR-90	0	0	0	420	7/18/05 6:27	#DIV/0!
E1	1	SR-90	0	0	0	450	7/18/05 6:28	333.33

A handwritten signature in black ink, appearing to read "m. b. star" or similar, located in the bottom right corner of the page.

# Beta Plateau July, 2005

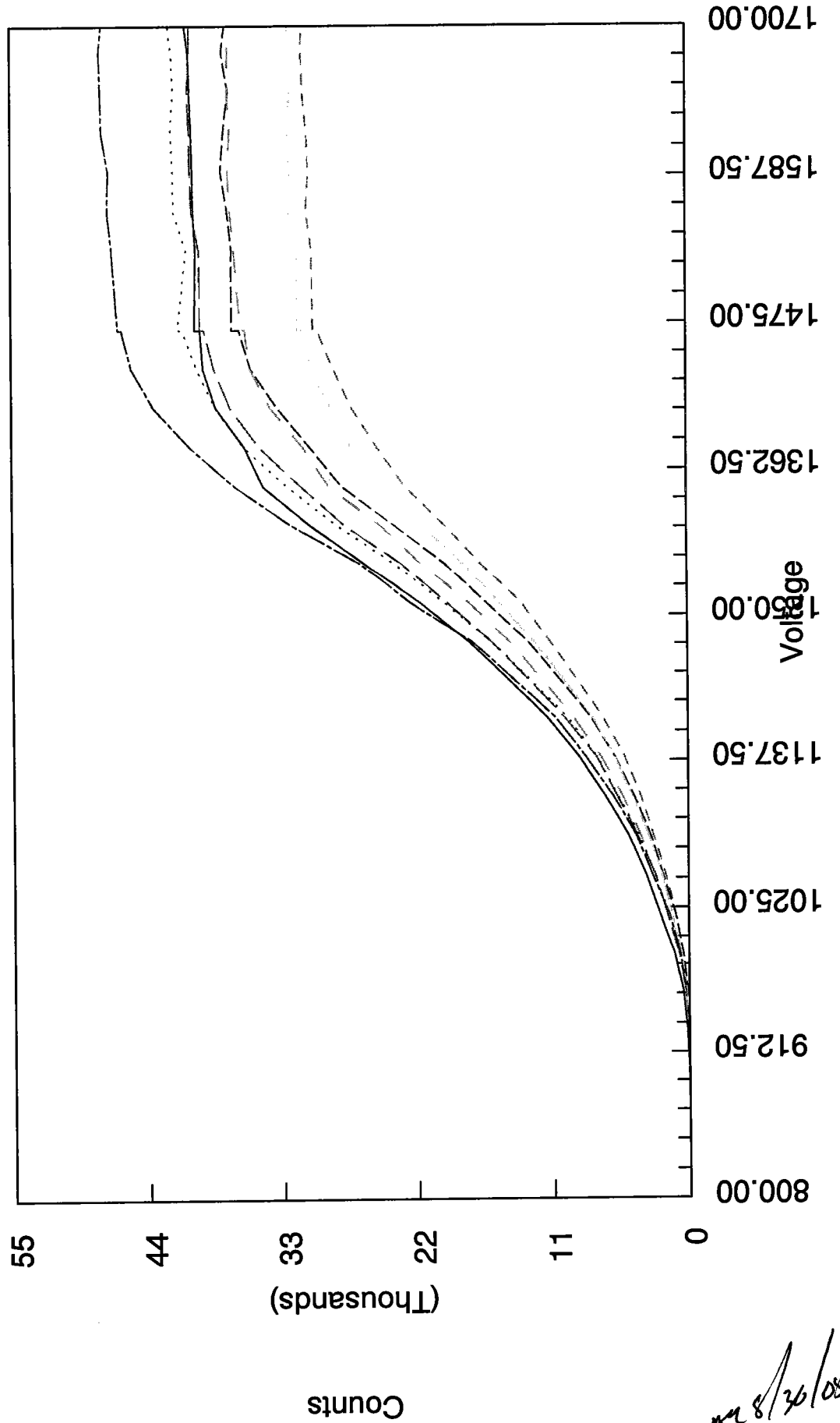
## Drawers A&B





# Beta Plateau July, 2005

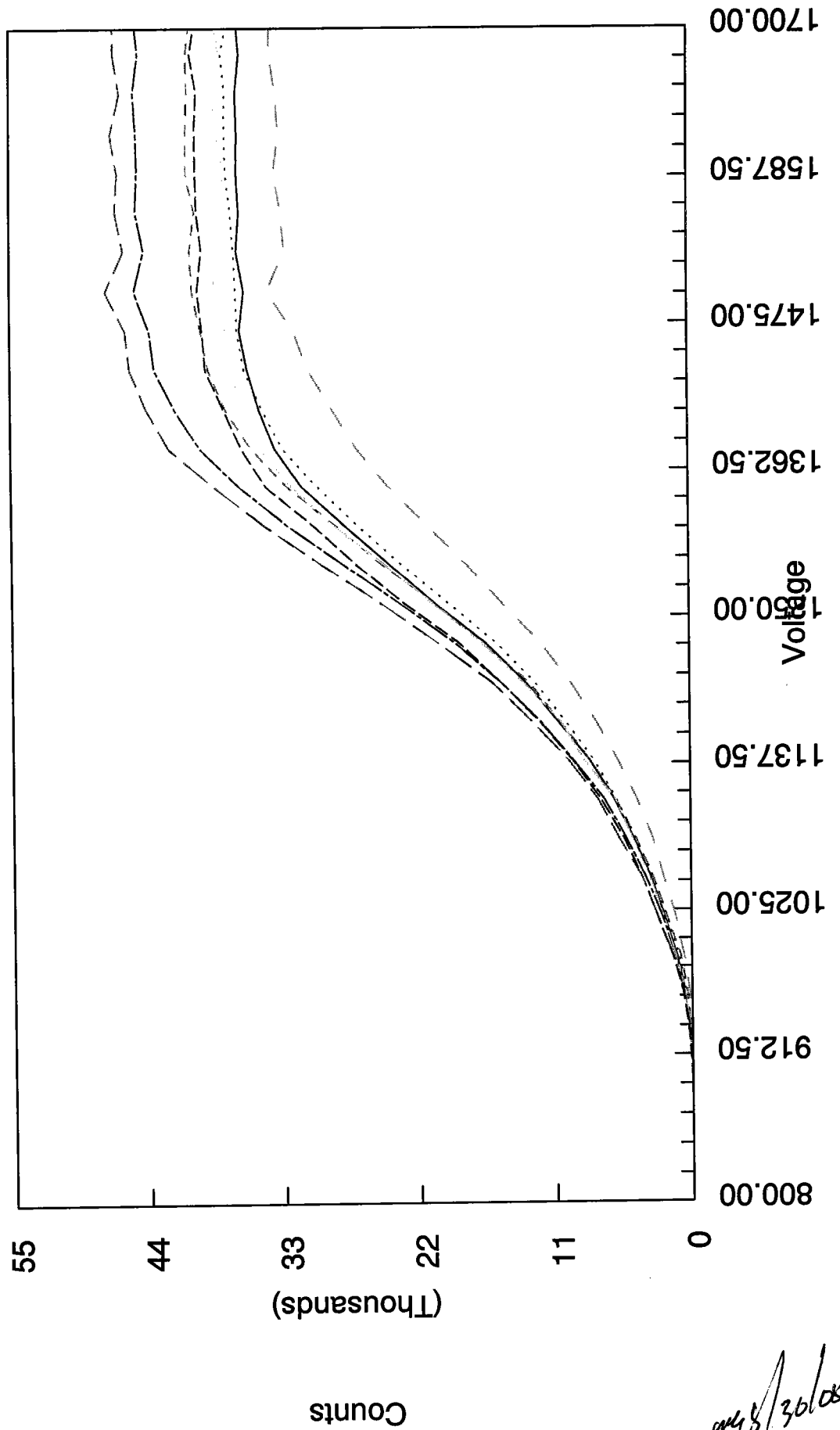
## Drawers C&D



*ms/9/26/05*

# Beta Plateau July, 2005

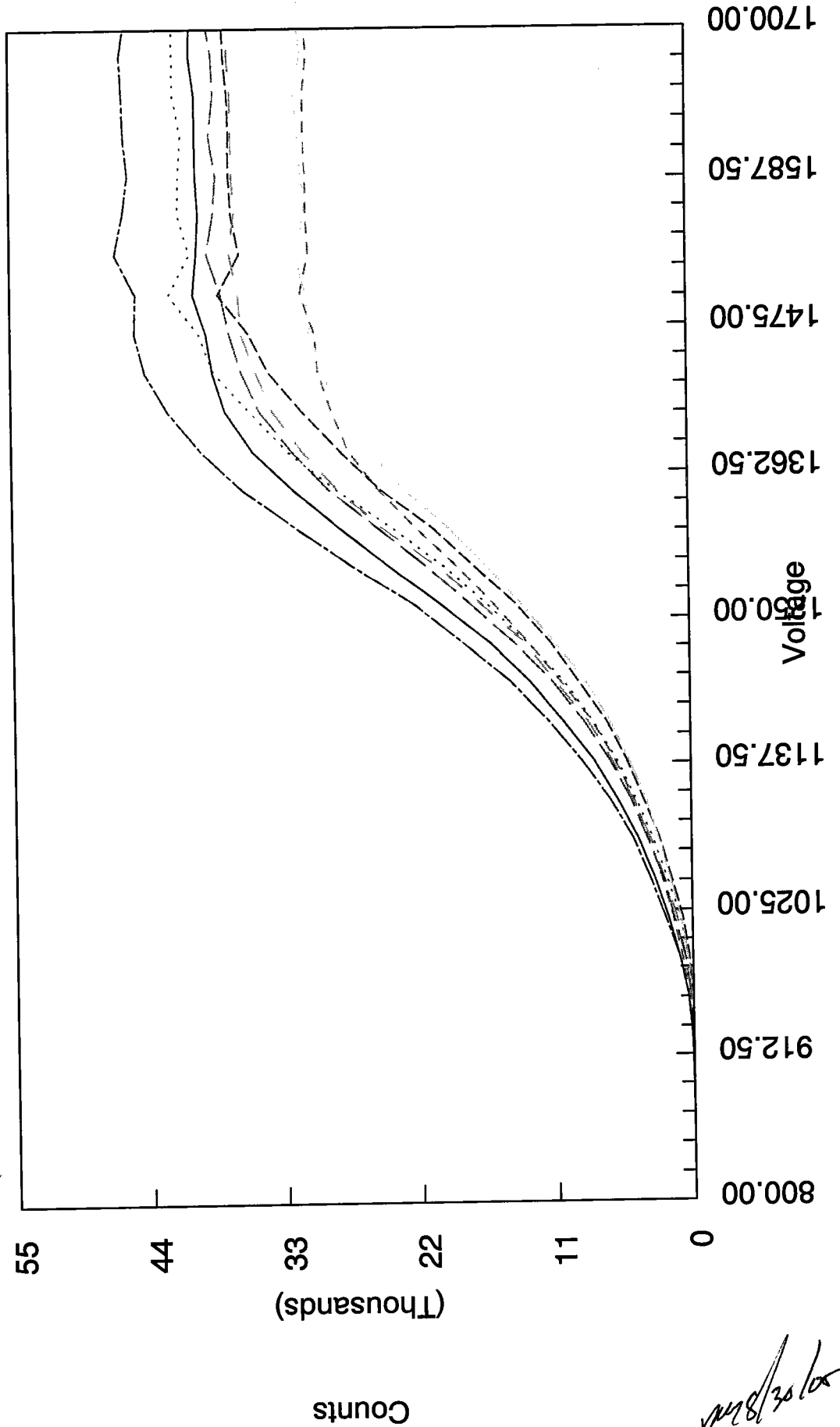
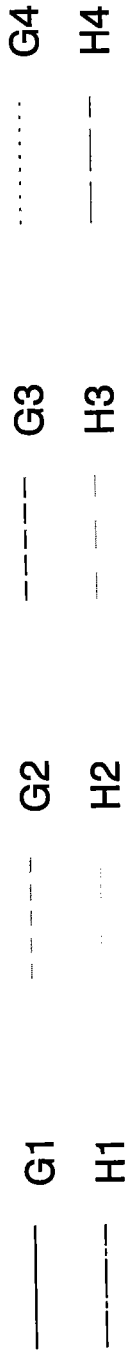
## Drawers E&F



*Handwritten signature*  
2005/8/26

# Beta Plateau July, 2005

## Drawers G&H



*Handwritten signature*

# GROSS ALPHA/BETA VERIFICATION

**Batch :** ver  
**Analyst :** JMJ  
**Date :** 8/26/2005  
**Required MDA :** Alpha PCL 5  
                   Beta PCL 5  
**Bkg Count time :** 500 min  
**Procedure Code :** GFCCGANBL  
**Parmname1 :** ALPHA  
**Parmname2 :** BETA  
**Batch Counted on :** LB4100

Sample ID	Sample Volume L	Solids Weight mg	Detector I.D.	Alpha Efficiency	Beta Efficiency	Net		Count Time min	ALPHA		BETA	
						Alpha CPM	Beta CPM		MDA pCi/L	MDA pCi/L		
1	0.100	0.0	A1	0.2393	0.3778	16413.22	92994.26	5	19.149	30.656		
2	0.100	3.7	A2	0.2264	0.3702	12462.59	85370.28	5	21.433	29.977		
3	0.100	7.5	A3	0.2243	0.3743	13379.98	84971.21	5	22.571	30.632		
*4	0.100	15.3	A4	0.2597	0.0000	12656.34	80130.84	5	17.484	#DIV/0!		
5	0.100	19.5	B1	0.2300	0.4038	11687.49	99483.27	5	30.192	39.733		
6	0.100	26.5	B2	0.2206	0.3893	13039.26	96301.05	5	30.572	41.383		
7	0.100	38.1	B3	0.2078	0.3875	12977.32	96618.98	5	22.051	33.705		
8	0.100	45.5	B4	0.1914	0.3839	12409.81	97019.09	5	21.252	28.768		
9	0.100	56.7	C1	0.1601	0.3627	10254.39	88623.81	5	40.134	33.555		
10	0.100	74.8	C2	0.1385	0.3572	8945.66	90574.42	5	43.871	35.265		
11	0.100	95.1	C3	0.1279	0.3535	8091.96	88081.42	5	37.649	32.212		
12	0.100	113.5	C4	0.1249	0.3563	7426.77	87717.53	5	37.345	31.792		
*1	0.100	0.0	D1	0.2764	0.4246	18845.46	99529.48	5	23.795	42.948		
*2	0.100	3.7	D2	0.2678	0.4252	15413.83	99640.67	5	22.693	27.057		
*3	0.100	7.5	D3	0.2673	0.4145	15906.56	101219.99	5	15.009	24.973		
*4	0.100	15.3	D4	0.2539	0.4208	14938.85	96817.44	5	20.333	28.421		

\* DETECTOR OUT OF SERVICE 8/28/05

8/30/05

ALPHA		BETA		Th-230		Sr-90	
RESULT	ALPHA ERROR	BETA RESULT	BETA ERROR	0159-A nominal conc.	0133-A nominal conc.	ALPHA % RECOVERY	BETA % RECOVERY
pCi/L	pCi/L	pCi/L	pCi/L			%	%
308977.693	2131.272	1108807.511	3191.132	283609.46	992936.94	108.94%	111.67%
247926.781	2252.270	1038877.775	3256.886	283609.46	992936.94	87.42%	104.63%
268671.020	2273.375	1022608.655	3220.938	283609.46	992936.94	94.73%	102.99%
<del>229001.331</del>	<del>1963.793</del>	<del>#DIV/0!</del>	<del>#DIV/0!</del>	<del>283609.46</del>	<del>992936.94</del>	<del>78.63%</del>	<del>#DIV/0!</del>
228917.083	2217.494	1109691.528	2985.362	283609.46	992936.94	80.72%	111.76%
266286.834	2312.076	1114328.325	3096.898	283609.46	992936.94	93.89%	112.23%
281321.697	2454.278	1123019.632	3110.782	283609.46	992936.94	99.19%	113.10%
292069.498	2664.566	1138245.093	3139.954	283609.46	992936.94	102.98%	114.63%
288567.158	3185.977	1100679.231	3323.955	283609.46	992936.94	101.75%	110.85%
290893.641	3681.523	1142300.933	3375.357	283609.46	992936.94	102.57%	115.04%
284934.515	3986.549	1122415.294	3410.468	283609.46	992936.94	100.47%	113.04%
267926.971	4084.340	1108973.740	3383.605	283609.46	992936.94	94.47%	111.69%
307160.891	1845.291	1056009.586	2839.624	283609.46	992936.94	108.30%	106.35%
259262.959	1904.301	1055632.114	2835.441	283609.46	992936.94	91.42%	106.31%
268023.218	1907.663	1099964.910	2908.421	283609.46	992936.94	94.50%	110.78%
265049.573	2008.702	1036392.253	2864.939	283609.46	992936.94	93.46%	104.38%

8/14

\* Method out of service for 8/14/08

2/28/08/08

# GROSS ALPHA/BETA VERIFICATION

**Batch:** ver  
**Analyst:** JMJ  
**Date:** 8/26/2005  
**Required MDA:** Alpha 5 PCL  
                   Beta 5 PCL  
**Bkg Count time:** 500 min  
  
**Procedure Code:** GFCGANBL  
**Parname1:** ALPHA  
**Parname2:** BETA  
**Batch Counted on:** LB4100

Sample ID	Sample Volume L	Solids Weight mg	Detector I.D.	Alpha Efficiency	Beta Efficiency	Net Alpha CPM	Net Beta CPM	Count Time min	ALPHA MDA pCi/L	BETA MDA pCi
5	0.100	19.5	E1	0.2426	0.4125	12324.00	99547.93	5	27.367	31.258
6	0.100	26.5	E2	0.2245	0.4104	12945.43	98719.20	5	27.602	34.427
7	0.100	38.1	E3	0.2088	0.3871	13073.20	95133.11	5	26.053	30.433
8	0.100	45.5	E4	0.1963	0.4025	12847.71	97727.32	5	27.559	37.859
9	0.100	56.7	F1	0.1743	0.3791	11692.18	92534.69	5	32.189	30.035
10	0.100	74.8	F2	0.1600	0.3936	10552.55	98955.87	5	38.126	31.080
11	0.100	95.1	F3	0.1391	0.3625	8370.70	88507.13	5	45.537	37.200
12	0.100	113.5	F4	0.1398	0.3760	8959.49	93377.05	5	75.632	77.774
1	0.100	0.0	G1	0.2478	0.3861	16921.29	91356.92	5	22.976	38.763
2	0.100	3.7	G2	0.2336	0.4083	13130.30	95421.24	5	22.770	27.526
3	0.100	7.5	G3	0.2256	0.4103	13866.99	96067.88	5	32.364	27.045
4	0.100	15.3	G4	0.2116	0.4055	13104.48	92335.52	5	23.932	27.290
*5	0.100	19.5	H1	0.2366	0.3728	11533.58	90358.76	5	24.402	28.125
*6	0.100	26.5	H2	0.2192	0.3938	12446.53	93894.31	5	29.312	34.626
*7	0.100	38.1	H3	0.2020	0.3914	12094.96	94781.83	5	30.559	30.103
*8	0.100	45.5	H4	0.1819	0.3761	11105.22	92418.46	5	28.739	29.2

*me 8/30/05*

ALPHA RESULT pCi/L	ALPHA ERROR pCi/L	BETA RESULT pCi/L	BETA ERROR pCi/L	Th-230		Sr-90	
				0159-A nominal conc.	% RECOVERY	0133-A nominal conc.	% RECOVERY
228811.334	1877.540	1086994.678	3021.353	283609.46	80.68%	992936.94	109.47%
259751.917	2029.110	1083526.910	3036.997	283609.46	91.59%	992936.94	109.12%
282042.847	2181.708	1106898.356	3219.455	283609.46	99.45%	992936.94	111.48%
294810.949	2320.498	1093774.696	3096.836	283609.46	103.95%	992936.94	110.16%
302139.752	2613.218	1099452.640	3287.594	283609.46	106.53%	992936.94	110.73%
297028.142	2846.450	1132491.701	3166.648	283609.46	104.73%	992936.94	114.05%
271046.866	3274.506	1099802.038	3438.290	283609.46	95.57%	992936.94	110.76%
288744.253	3259.067	1118737.552	3315.082	283609.46	101.81%	992936.94	112.67%
307597.437	1838.284	1065864.919	3228.249	283609.46	108.46%	992936.94	107.34%
253167.569	1949.830	1052828.609	3052.944	283609.46	89.27%	992936.94	106.03%
276881.518	2019.181	1054728.467	3037.867	283609.46	97.63%	992936.94	106.22%
279014.624	2153.132	1025746.784	3073.814	283609.46	98.38%	992936.94	103.30%
219577.282	1925.247	1091904.030	3343.648	283609.46	77.42%	992936.94	109.97%
255815.107	2078.458	1073997.832	3164.976	283609.46	90.20%	992936.94	108.16%
269714.566	2255.087	1090876.827	3184.615	283609.46	95.10%	992936.94	109.86%
275079.602	2504.925	1106750.951	3313.580	283609.46	96.99%	992936.94	111.46%

*per sales*

Detector	Sample I.D.	Act. Time	Alpha	Beta	Total	Alpha Bkg.	Beta Bkg.	Voltage	Date/Time
A1	1	5	83414	466141	608167	0.052	0.948	1470	8/26/05 8:42
A2	2	5	63561	427695	550358	0.066	0.85	1470	8/26/05 8:42
A3	3	5	68650	425551	559796	0.078	0.924	1470	8/26/05 8:42
A4	4	5	64710	401532	506545	0.05	3.27	1470	8/26/05 8:42
B1	5	5	59421	498608	612011	0.23	2.1	1470	8/26/05 8:42
B2	6	5	65793	482790	617069	0.21	2.12	1470	8/26/05 8:42
B3	7	5	66448	484161	619459	0.052	1.28	1470	8/26/05 8:42
B4	8	5	62949	486303	604211	0.03	0.84	1470	8/26/05 8:42
C1	9	5	54404	444666	556642	0.18	1.074	1470	8/26/05 8:42
C2	10	5	45275	454094	533565	0.15	1.17	1470	8/26/05 8:42
C3	11	5	40525	441587	523137	0.064	0.908	1470	8/26/05 8:42
C4	12	5	37202	439701	513826	0.056	0.896	1470	8/26/05 8:42
D1	1	5	94900	498468	664446	0.194	2.83	1470	8/26/05 8:51
D2	2	5	78165	499105	617516	0.15	0.932	1470	8/26/05 8:51
D3	3	5	80701	506925	636892	0.028	0.71	1470	8/26/05 8:51
D4	4	5	75107	485005	597869	0.084	1.028	1470	8/26/05 8:51
E1	5	5	66551	498242	642966	0.2	1.24	1470	8/26/05 8:51
E2	6	5	67508	494684	612669	0.16	1.55	1470	8/26/05 8:51
E3	7	5	69951	476766	624188	0.102	0.99	1470	8/26/05 8:51
E4	8	5	67564	490048	614367	0.1	1.858	1470	8/26/05 8:51
F1	9	5	60641	463671	599428	0.114	0.908	1470	8/26/05 8:51
F2	10	5	53967	496327	588059	0.152	1.088	1470	8/26/05 8:51
F3	11	5	42035	443869	515135	0.172	1.384	1470	8/26/05 8:51
F4	12	5	46064	468272	561880	0.75	8.15	1470	8/26/05 8:51
G1	1	5	87617	457760	611313	0.12	1.78	1470	8/26/05 8:58
G2	2	5	67272	478375	572023	0.094	0.878	1470	8/26/05 8:58
G3	3	5	69410	481704	560632	0.268	0.85	1470	8/26/05 8:58
G4	4	5	65602	462699	541764	0.078	0.844	1470	8/26/05 8:58
H1	5	5	77687	453535	612975	0.126	0.734	1522.5	8/26/05 8:58
H2	6	5	74283	470501	611974	0.18	1.422	1522.5	8/26/05 8:58
H3	7	5	75716	475235	611536	0.158	0.99	1522.5	8/26/05 8:58
H4	8	5	69102	462877	590212	0.088	0.834	1522.5	8/26/05 8:58

*Jan 8/30/06*



**General Engineering Laboratories  
Verification Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-001

Isotope Th230/Sr90

Date Standards Prepared 8/25/05

Cocktail Type Used N/A

Standard ID <sup>8/25/05 Th-230</sup> ~~015~~ 0159-A / 0133-A <sup>Sr-90</sup>

Matrix of Vial/Planchett Concentric Ring S.S.

Amount Used (g or ml) 0.3 | 0.1

Standard Activity (DPM/g or ml) 209880.23 / 1384260.71

Type of Scintillation Vial N/A

Reference Date 9/1/99 | 4/1/96

Pipette ID Used 1.0-3001383 0.1-1429303  
0.5-2440913

Expiration Date 7/13/06 | 8/16/06

Balance ID Used 3808004

Residue/Carrier Agent BaCl<sub>2</sub>

Quenching Agent N/A

	Standard Number	Quenching Vol (uL) Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
V1	1	0.0	7.4499	7.4499	0.0
V2	2	0.1	7.4513	7.4550	3.7
V3	3	0.2	7.4126	7.4201	7.5
V4	4	0.4	7.3744	7.3897	15.3
V5	5	0.5	7.3856	7.4051	19.5
V6	6	0.7	7.3604	7.3869	26.5
V7	7	1.0	7.4012	7.4393	38.1
V8	8	1.2	7.4639	7.5094	45.5
V9	9	1.5	7.4240	7.4807	56.7
V10	10	2.0	7.5051	7.5799	74.8
V11	11	2.5	7.3116	7.4067	95.1
V12	12	3.0	7.3674	7.4809	113.5

Prepared By: Amanda L. Lepe Date 8/25/05  
 Reviewed By: [Signature] Date 8/30/05

# CERTIFICATE OF CALIBRATION ALPHA STANDARD SOLUTION

0159

Radionuclide: Th-230  
Half Life:  $(7.54 \pm 0.03) \times 10^4$  years  
Catalog No.: 7230  
Source No.: 678-28-1  
Customer: GENERAL ENGINEERING LABS  
P.O.No.: 2507 RD  
Reference Date: 1 Sep 99 12:00 PST.  
Contained Radioactivity: Th-230: 9.740  $\mu$ Ci (360.4 kBq)

Description of Solution  
a. Mass of solution: 4.89252 grams in 5 mL flame sealed ampoule  
b. Chemical form: Thorium nitrate in 0.1M nitric acid  
c. Carrier content: 10  $\mu$ g Th/mL of solution  
d. Density: 1.0016 gram/mL @ 20°C

Radioimpurities  
Am-241: See Technical Data Sheet

Radioactive Daughters  
Ra-226: See Technical Data Sheet

Radionuclide Concentration  
Th-230: 1.991  $\mu$ Ci/gram of solution (73.67 kBq/gram of solution)

Method of Calibration  
Weighed aliquots of the solution were assayed using a liquid scintillation counter.

Uncertainty of Measurement  
a. Systematic uncertainty in instrument calibration:  $\pm 2.0\%$   
b. Random uncertainty in assay:  $\pm 0.8\%$   
c. Random uncertainty in weighing(s):  $\pm 0.0\%$   
d. Total uncertainty at the 99% confidence level:  $\pm 2.2\%$

NIST Traceability  
This calibration is implicitly traceable to the National Institute of Standards and Technology.

Leak Test(s)  
See reverse side for Leak Test(s) applied to this source.

- Notes
1. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)
  2. Nuclear data were taken from Table of Radioactive Isotopes (1986), edited by Virginia Shirley.



ISOTOPE PRODUCTS LABORATORIES  
1800 N. KEYSTONE STREET  
BURBANK, CALIFORNIA 91504  
818-843-7000 FAX 818-843-6168

*Daniel James Van Dalsam*  
QUALITY CONTROL

26-Aug-99  
Date Signed

*justin/2/04*  
*justin/3/04*

REC-5 - 024-102

0159



### Th-230 TECHNICAL DATA

The Th-230 used to prepare your order was taken from Isotope Products Laboratories Lot #6481 and had the following composition as of December 15, 1994.

<u>NUCLIDE</u>	<u>ATOM%</u>	<u>ACTIVITY%</u>
Th-229	<0.001	$<1.23 \times 10^{-2}$
Th-230	83.71	99.79
Th-232	16.29	$1.08 \times 10^{-4}$
Ra-226 (daughter Th-230)	----	0.15
Am-241	----	0.05

Isotopic composition provided by Oak Ridge National Laboratory.

No other alpha emitting nuclides were detected.

If you have any questions, please contact Technical Service.

RC-S-024-102A

*1/17/2004*  
*ms/306*



## Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0159	Isotope:	Thorium-230
Prepared By:	Joe Davis	Prepared By:	Joe Davis
Carrier Conc:	0.1M HNO3	Prep Date:	09/21/1999
Reference Date:	09/01/1999	Verification Date:	07/13/2005
Ampoule Mass (g):	4.89252 g	Expiration Date:	07/13/2006
Uncertainty:	+/- 2.2 %	Primary Code:	0159-A
LogBook No:	RC S 023 102	Dilution(mL):	100 mL
		Mass of Parent(g):	4.7484 g
		Density(g/mL):	0.9992

## Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parent Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parent Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.7484 \text{ g}) * (1.991 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (100 \text{ mL}) = 209880.2297 \text{ dpm/mL}$
$(4.7484 \text{ g}) * (1.991 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (0.9992 \text{ g/mL}) / (100 \text{ mL}) = 210051.8397 \text{ dpm/g}$

## Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/29/2001	Angela Albee	.0992	100	0159-H	208.37 dpm/mL	01/29/2001	01/29/2002
02/28/2001	Angela Albee	1.0451	1000	0159-I-102	219.525 dpm/mL	03/06/2002	03/06/2003
02/28/2001	Angela Albee	1.0451	1000	0159-I-202	219.525 dpm/mL	03/12/2002	03/12/2003
09/21/1999	Joe Davis	.1172	100	0159-B	246.18 dpm/mL	09/21/1999	09/21/2000
09/23/1999	Joe Davis	.1016	100	0159-C	213.41 dpm/mL	09/23/1999	09/23/2000
01/10/2000	Joe Davis	.1008	100	0159-D	211.56 dpm/mL	01/10/2000	01/10/2001
02/16/2000	Richard Kinney	.2422	500	0159-E	101.75 dpm/mL	02/16/2000	02/16/2001
03/20/2000	Joe Davis	.0998	100	0159-F	209.63 dpm/mL	03/20/2000	03/20/2001
07/28/2000	Robert Timm	1.0046	1000	0159-G	211.02 dpm/mL	07/28/2000	07/28/2001
05/10/2001	Angela Albee	.0987	1000	0159-J	210.1569 dpm/mL	05/10/2001	05/10/2002
08/31/2001	Lonnie Morris	.0416	100	0159-K	87.31 dpm/mL	09/23/2002	09/23/2003
06/07/2002	Angela Albee	1.0002	1000	0159-L	207.278 dpm/mL	06/07/2002	06/07/2003
01/16/2003	Angela Albee	4.5144	1000	0159-M	947.483 dpm/mL	01/16/2003	01/16/2004
02/27/2003	Angela Albee	1.1079	1000	0159-N	232.526 dpm/mL	02/27/2004	02/27/2005
06/23/2004	Amanda Fehr	1.14	1000	0159-O	239.459 dpm/mL	07/03/2005	07/03/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

*Handwritten signature/initials*

# Verification for Th-230 Standard 0159-A

Standard	Mass Used	Source DPM/G
0.1000	208653.2749	
0.1000	217682.1726	
0.1000	215922.8742	

Detector Eff	NET CPM	BKG CPM	Detector CPM	Isotope
0.83044467	17327.5000	0.4000	17327.9000	0159-A N1
0.83044467	18077.3000	0.4000	18077.7000	0159-A N2
0.83044467	17931.2000	0.4000	17931.6000	0159-A N3

Mean Value (Counting) = 214086.1072  
 Stdev = 4786.494879  
 Rule 3 (Pass/Fail) Pass

Certificate Value = 209869  
 Lower Limit = 204513.1175  
 Upper Limit = 223659.097  
 Rule 1 Pass/Fail Pass  
 Two sigma = 9572.989758  
 10 % of Mean = 21408.61072  
 Rule 2 (Pass/Fail) Pass

### Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Th-230 source 0159-A by transferring portions of the standard to tared glass liquid scintillation vials. Ten mL of Ready Safe liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 26 for alpha source standard verification. The alpha efficiency calibration which was used for verification calculations was performed on 7/13/05 using NIST source 0695-A (Th-230). Calibration data is recorded in this logbook under Th-230 0695-A. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

*Handwritten signature*

*Amanda L. Fehr 7/14/05*

**PROTOCOL** : 26 Alpha Std. Ver.  
**DATE** : 2005/07/13  
**TIME** : 23:42  
**ID** : P26AS006

Wallac 1414 WinSpectral v1.40 S/N 4140127

**Counting mode** : CPM  
**Isotope(s)** : Po210  
**Po210** = 400- 900,Alpha,138.40 d  
**Protocol name** : Alpha Std. Ver.  
**Counting time** : 300  
**Repeats** : 1  
**Cycles** : 1  
**Replicates** : 1  
**2 sigma %** : 0.01  
**Minimum cpm** : 0.00 **Checking time: 10**  
**Advanced modes** : PSA,PAC,Chemilum  
**PSA level** : low  
**PAC level** : low  
**Output to Display** :  
**POS,CTIME,DATE,TIME,RACKPOS,CPMw1,CPM,SQPI,CPM1**  
**Additions to Display** : Spectrum,Header,Listing  
**Spectrum** : Alpha  
**Window 1** : 1-1024 /Alpha  
**Window 2** : 1-1024 /Beta  
**Window 3** : 1-1024 /Beta  
**Window 4** : 1-1024 /Beta  
**Window 5** : 1-1024 /Beta  
**Window 6** : 1-1024 /Beta  
**FNCT1 = FNCT1** :  
**FNCT2 = FNCT2** :  
**FNCT3 = FNCT3** :  
**FNCT4 = FNCT4** :

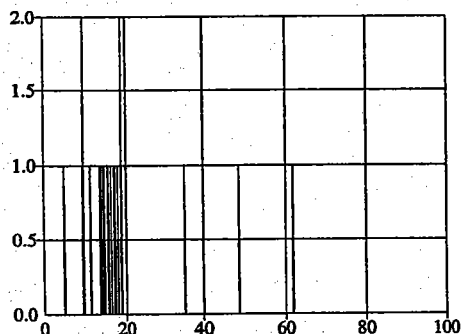
**Total count rate:**  
**Po210 54322.1 CPM**

*ASG 7/14/05*

*gms 8/30/05*

POS CTIME DATE TIME RACKPOS CPMW1

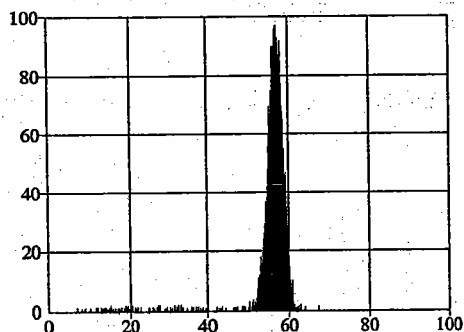
1 300 7/13/2005 11:42 PM 1 4.80



Counts Alpha

Bkg

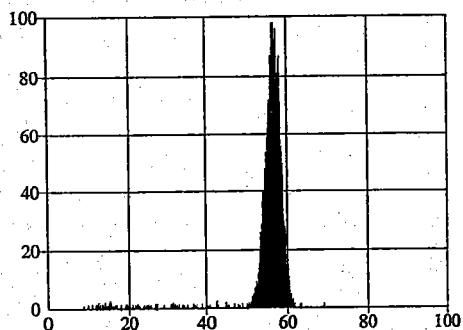
2 300 7/13/2005 11:48 PM 2 879.30



Counts Alpha

0695-A

3 300 7/13/2005 11:53 PM 3 872.90



Counts Alpha

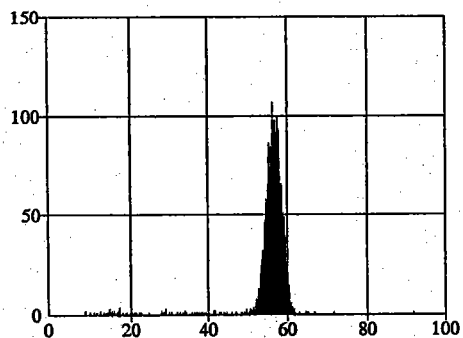
0695-A

ALF 7/14/05

*ms/306*

POS CTIME DATE TIME RACKPOS CPMW1

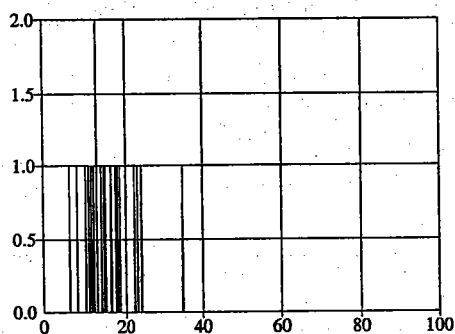
4 300 7/13/2005 11:59 PM 4 900.70



Counts Alpha

0695-A

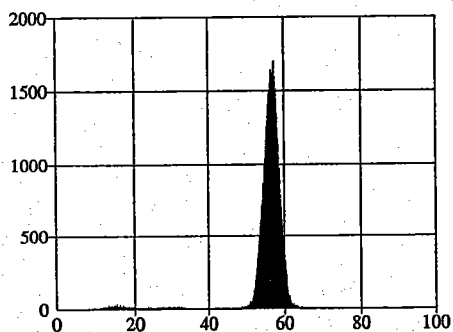
5 300 7/14/2005 0:04 AM 5 4.80



Counts Alpha

Bkg

6 300 7/14/2005 0:10 AM 6 17327.90



Counts Alpha

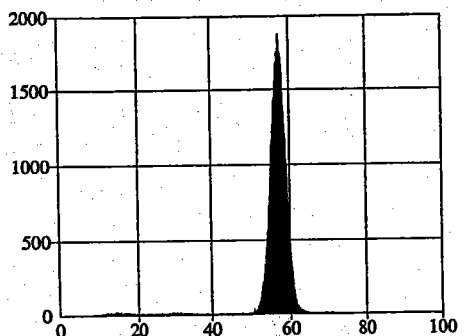
0159-A

au=7/14/05

*gms/306*



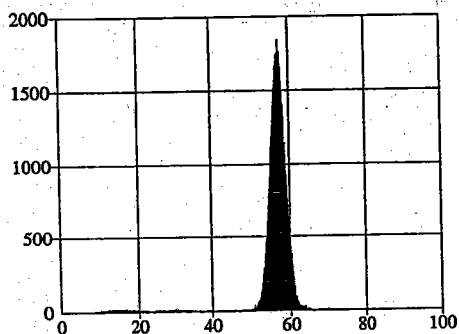
POS	CTIME	DATE	TIME	RACKPOS	CPMW1
7	300	7/14/2005	0:15 AM	7	18077.70



■ Counts Alpha

0159-A

8	300	7/14/2005	0:21 AM	8	17931.60
---	-----	-----------	---------	---	----------



■ Counts Alpha

0159-A

AUF-7/14/05

0133

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Measurement Reference time for solution number S6/7/19: 1200 GMT on 1 April 1996

Radioactive concentration of strontium-90: 477.1 kilobecquerels per gram of solution  
 which is equivalent to: 12.89 microcuries per gram of solution

Mass of solution: 5.0669 grams

Total activity of strontium-90: 2.417 megabecquerels  
 which is equivalent to: 65.3 microcuries

Method of measurement used (see page 3 of the certificate): K

Calibration dates: 25 March 1996 to 27 March 1996

The calibration date is provided for added information only, and must not be confused with the reference date on pages 1 and 2 of the certificate. It is the reference date that must be used in all calculations relating to the values of activity.

Accuracy Expanded uncertainty in the radioactive concentration quoted above:  $\pm 0.80\%$

Combined Type A uncertainty:  $\pm 0.05\%$

Combined Type B uncertainty:  $\pm 0.40\%$

Radionuclidic purity The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Other radionuclides 0.0005(3) %

Chemical composition 0.1 M HCl containing 100 micrograms of strontium and 100 micrograms of yttrium per ml.

Physical data Recommended half life:  $29.12 \pm 0.24$  years (1 year = 365.25 days)

Strontium-90: 100% beta particle emission.  
Yttrium-90: 100% beta particle emission. Half life  $64.1 \pm 0.1$  hours.

The activity of the yttrium-90 is equal to the activity of the strontium-90.

Remarks This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

Tests made over a period of 2 years on standardised solutions of strontium-90 stored in glass ampoules have shown that loss of strontium-90 from solution is negligible other than by radioactive decay.

*pr 7/21/04*

*21-5-023-000  
mu 1/31/04*

Nycomed Amersham plc  
Amersham Laboratories



ISSUED BY: Nycomed Amersham plc  
Radiation & Radioactivity  
Calibration Laboratory  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ISSUED FOR: AEA Technology plc  
Isotrak  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

Description Principal radionuclide: Strontium-90

Product code: SIZ64  
Solution number: S6/7/19

Measurement Reference time: 1200 GMT on 1 April 1996

Nuclear data Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

Expression of uncertainties The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k = 2.00$ , which for a  $t$ -distribution with  $v_{\text{eff}} = \infty$  effective degrees of freedom corresponds to a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated by the following examples;

6.5(21)	-	$6.5 \pm 2.1$
6.54(21)	-	$6.54 \pm 0.21$
6.543(21)	-	$6.543 \pm 0.021$

Approved Signatory

*W. F. Carr*

Date of issue

11 May 1997

*pr2/21/07*  
2C-S-023-060A  
**Nycomed**  
*pr2/21/07*

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Methods of measurement The measurement techniques listed below are currently in use at Nycomed Amersham for the absolute standardisation of radioactive solutions. The methods used for this standardisation are indicated on page 2 of the certificate.

Using a gas flow proportional counter

- A 4 pi beta counting
- B 4 pi alpha counting
- C 4 pi internal conversion electron counting
- D 4 pi coincidence counting
- E 4 pi anticoincidence counting
- F 4 pi coincidence and anticoincidence counting

Using a liquid scintillation counter

- G 4 pi coincidence counting
- H 4 pi anticoincidence counting
- J 4 pi coincidence and anticoincidence counting
- K 4 pi efficiency tracing

SI unit of radioactivity The S.I. unit of radioactivity is the becquerel  
1 becquerel (Bq) = 1 nuclear transformation per second, therefore  
1 curie (Ci) =  $3.7 \times 10^{10}$  becquerels exactly

Useful conversion factors are:

1 microcurie ( $\mu$ Ci)	=	$3.7 \times 10^4$ Bq	=	37 kilobecquerels (kBq)
1 millicurie (mCi)	=	$3.7 \times 10^7$ Bq	=	37 megabecquerels (MBq)
1 kilobecquerel (kBq)	=	27.027 nanocuries (nCi)		
1 megabecquerel (MBq)	=	27.027 microcuries ( $\mu$ Ci)		

*me 7/2/04*  
*RC-5-023-0600B*  
*me 7/2/04*



## Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0133	Isotope:	Strontium-90
Prepared By:	Joe Davis	Prepared By:	Joe Davis
Carrier Conc:	0.1 M HCL	Prep Date:	09/25/1999
Reference Date:	04/01/1996	Verification Date:	08/16/2005
Ampoule Mass (g):	5.0669 g	Expiration Date:	08/16/2006
Uncertainty:	+/- .8 %	Primary Code:	0133-A
LogBook No:	RC S 023 060	Dilution(mL):	100 mL
		Mass of Parent(g):	4.8374 g
		Density(g/mL):	1.0041

## Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.8374 \text{ g}) * (12.89 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (100 \text{ mL}) = 1384260.7092 \text{ dpm/mL}$
$(4.8374 \text{ g}) * (12.89 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (1.0041 \text{ g/mL}) / (100 \text{ mL}) = 1378622.1492 \text{ dpm/g}$

## Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
09/06/2000	Joe Davis	.0899	1000	0133-F	124.445 dpm/mL	09/06/2000	09/06/2001
12/05/1999	Joe Davis	.9937	100	0133-C	13699.37 dpm/mL	12/05/1999	12/05/2000
12/05/1999	Joe Davis	.0995	100	0133-B	1371.73 dpm/mL	12/05/1999	12/05/2000
02/16/2000	Richard Kinney	.0349	500	0133-D	96.23 dpm/mL	02/16/2000	02/16/2001
03/09/2000	Richard Kinney	.0282	250	0133-E	155.51 dpm/mL	03/09/2000	03/09/2001
10/13/2000	Robert Timm	.3194	1000	0133-G-104	440.332 dpm/mL	10/09/2001	10/09/2002
10/13/2000	Robert Timm	1.0865	100	0133-H	14978.73 dpm/mL	10/09/2002	10/09/2003
10/13/2000	Robert Timm	.3194	1000	0133-G-204	440.332 dpm/mL	10/09/2001	10/09/2002
10/13/2000	Robert Timm	.3194	1000	0133-G-304	440.332 dpm/mL	10/09/2001	10/09/2002
10/13/2000	Robert Timm	.3194	1000	0133-G-404	440.332 dpm/mL	10/09/2001	10/09/2002
05/10/2001	Angela Albee	1.0005	1000	0133-I	1379.311 dpm/mL	05/11/2001	05/11/2002
05/06/2002	Angela Albee	.3738	1000	0133-J	515.329 dpm/mL	05/09/2002	05/09/2003
06/07/2002	Angela Albee	.1816	1000	0133-K	250.358 dpm/mL	06/07/2002	06/07/2003
01/16/2003	Angela Albee	.2964	1000	0133-L	408.624 dpm/mL	01/16/2003	01/16/2004
04/18/2003	Lonnie Morris	.3247	1000	0133-M	447.6386 dpm/mL	04/16/2004	04/16/2005
10/31/2002	Angela Albee	10.11	1000	0133-G		10/31/2002	10/31/2003
05/25/2004	Amanda Fehr	.361	1000	0133-N	497.6826 dpm/mL	05/24/2005	05/24/2006
07/22/2005	Brenda Burke	.098	500	0133-O	270.2099 dpm/mL	08/16/2005	08/16/2006
08/15/2005	Amanda Fehr	.1582	500	0133-P	436.196 dpm/mL	08/15/2005	08/15/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000


# General Engineering Laboratories

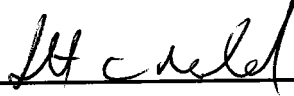
2040 Savage Road, Charleston, SC 29414  
(843)556-8171

## Gas Flow Proportional Counter Calibration Package

Method: Pb-210

	YES	NO	Comments
1) Is all calibration standard information enclosed for: primary standard certificate? secondard standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
2) Are the detector graphs included? beta absorption curves? beta plateau?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
3) Is the raw count data included for: the plateau generation? the absorption curve generation? the calibration verification? the crosstalk calculations?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
4) Are the calibration verification calculations included? are verification recoveries 100% +/- 25%	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		

Prepared By:  Date: 7/29/05

Reviewed By:  Date: 7/30/05

Effective Date: 7/29/05

0356

# DEUTSCHER KALIBRIERDIENST **DKD**

Kalibrierlaboratorium für Meßgrößen der Radioaktivität  
*Calibration laboratory for measurements of radioactivity*

AKKREDITIERT DURCH DIE  
**PHYSIKALISCH-TECHNISCHE BUNDESANSTALT (PTB)**



**AEA Technology QSA GmbH**  
Postfach 58 42 Gieselweg 1  
D-38049 Braunschweig D-38110 Braunschweig

Tel. +49 (0) 5307 932-0  
Fax +49 (0) 5307 932-194

Source no. FX 248

08640
DKD-K-06501
01-01

**Kalibrierschein**  
*Calibration Certificate*

**Kalibrierzeichen**  
*Calibration mark*

**Gegenstand**  
*Object*

**Reference Solution**

Dieser Kalibrierschein dokumentiert die Rückführung auf nationale Normale zur Darstellung der Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI).

**Hersteller**  
*Manufacturer*

**AEA Technology QSA GmbH**

Der Deutsche Kalibrierdienst ist Unterzeichner des multilateralen Übereinkommens der European co-operation for Accreditation (EA) zur gegenseitigen Anerkennung der Kalibrierscheine.

**Typ**  
*Type*

**RBZB44**

Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

**Strahler-Nr.**  
*Source number*

**FX 248**

**Auftraggeber**  
*Customer*

**AEA TECHNOLOGY QSA, INC.**  
**USA-BURLINGTON MA 01803**

*This calibration certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI).*

**Auftragsnummer**  
*Order No.*

**CO 34622**

*The Deutscher Kalibrierdienst is signatory to the multilateral agreement of the European co-operation for (EA) for the mutual recognition of calibration certificates.*

**Anzahl der Seiten des Kalibrierscheines**  
*Number of pages of the certificate*

**2**

*The user is obliged to have the object recalibrated at appropriate intervals.*

**Referenzdatum**  
*Reference date*

**1 January 2001**

Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung sowohl der Physikalisch-Technischen Bundesanstalt als auch des ausstellenden Kalibrierlaboratoriums. Kalibrierscheine ohne Unterschrift und Stempel haben keine Gültigkeit.

*This calibration certificate may not be reproduced other than in full except with the permission of both the Physikalisch-Technische Bundesanstalt and the issuing laboratory. Calibration certificates without signature and seal are not valid.*

<b>Stempel</b> <i>Seal</i>	<b>Datum</b> <i>Date</i>	<b>Leiter des Kalibrierlaboratoriums</b> <i>Head of the calibration laboratory</i>	<b>Stellvertreter</b> <i>Deputy</i>	<b>Bearbeiter</b> <i>Person in charge</i>
	31 January 2001		Schott	
		Dr. Thieme	Schott	Linke / Schott / Schüler

*mm 7/29/05*

**Reference Solution**

Solution no.	FX 248
Drawing	VZ-2058/1
Nuclide	Lead-210
Radioactive concentration	34.2 kBq/g
Reference date	1 January 20001 at 12.00 GMT
Mass of solution	(5.182 ± 0.001) g
Volume of solution	approx. 5 ml
Contamination test	Wipe test according to ISO 9978.
Date of wipe test	30 January 2001
Chemical composition	Solution in 1.2 M HNO <sub>3</sub> ; Carrier: Pb(NO <sub>3</sub> ) <sub>2</sub> , Bi(NO <sub>3</sub> ) <sub>3</sub> ; each 20 mg/l of the corresponding element.
Measuring method	The activity was determined by comparison with a reference solution by measurement with a Ge-detector with MCA.
Traceability	Additional to the direct traceability to the PTB through the DKD this product complies with the requirements for traceability to NIST specified in the American National Standard "Traceability of Radioactive Sources to the NIST and Associated Instrument Quality Control (ANSI N42.22-1995)". As a requirement of the ANSI N42.22-1995 AEA Technology QSA GmbH participates in the NEI/NIST Measurements Assurance Program of the Nuclear Power Industry.
Uncertainty	The relative uncertainty of the activity is 3 %. The reported uncertainty is based on a standard uncertainty multiplied by a coverage factor $k = 2$ , providing a level of confidence of approximately 95 %. (Ref. NIST Technical Note 1297/"Guide to the Expression of Uncertainty in Measurement" ISO Guide, 1995)
Radioactive impurities	Related to Pb-210 (equal 100 %) the following radioactive impurities were detected: Ra-226: 0.003 %
Quality assurance system	The quality assurance system of AEA Technology QSA GmbH was certified by Lloyd's Register Quality Assurance (LRQA) according to ISO 9001, issue 1994. Isotrak products meet the requirements of 10CFR50 Appendix B in the USA.
Remark	

*1297/29/02*



# Explanations for Certificates (Page 2 of Certificates)

## Overall uncertainty

The reported uncertainty is based on standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a level of confidence of approximately 95 %. (ISO Guide, 1995)

## Traceability

This certificate documents the traceability of measurement results to national standards, standard measuring equipment and methods for the realisation of physical units of measurement according to the International System of Units (SI). Traceability is defined as 'the property of a result of a measurement whereby it can be related to appropriate standards, generally International or national standards, through an unbroken chain of comparisons'.

AEA Technology QSA GmbH has been accredited as DKD (Deutscher Kalibrierdienst) calibration laboratory by the Physikalisch-Technische Bundesanstalt (PTB) and is authorized to issue reference sources which are traceable to national standards held at the PTB in Germany. Because of the European co-operation for Accreditation (EA) mutual recognition agreement the certificates are also accepted by all EA-members (e. g. NAMAS, UK).

This product complies with the requirements for traceability to NIST specified in the American National Standard 'Traceability of Radioactive Sources to the NIST and Associated Instrument Quality Control (ANSI N42.22-1995)'. As a requirement for the ANSI N42.22-1995 AEA Technology QSA participates in the NEVNIST Measurements Assurance Program of the Nuclear Power Industry.

## Leakage and contamination tests

Stringent tests for leakage are an essential feature of radioactive sources production. They are based on ISO 9978. Some standard methods used for testing radiation sources are listed below.

### Wipe test I

The source is wiped with a swab or tissue, moistened with ethanol or water, the activity removed is measured. Limit: 185 Bq

### Immersion test II

The source is immersed in a suitable liquid at 50 °C for at least 4 hours and the activity removed is measured. Limit: 185 Bq

### Bubble test III

The source is immersed in water or a suitable liquid and the pressure in the vessel reduced to 13 kPa (100 mm Hg). No bubbles must be observed. (This test conforms to ISO 9978 except that for some sources, the 100 mm<sup>3</sup> free volume requirement is not met.)

### Emanation test IV

The source is placed in a gas tight enclosure with activated carbon as absorber and is left there for at least 3 h. The source is considered leak tight when not more than 185 Bq Radon related to a collection time of 12 h can be measured afterwards.

## ISO classification

The International Organization for Standardization (ISO) has proposed a system of classification of sealed radioactive sources based on safety requirements for typical uses (see ISO 2919). This system provides a manufacturer of sealed radioactive sources with a set of tests to evaluate the safety of his products. It also assists a user of such sealed sources to select types which suit the application he has in mind. The tests to which specimen sources are subjected are listed in the following table.

Classification of sealed source performance standard according to ISO 2919

	Class 1	2	3	4	5	6
Temperature	No test	- 40 °C (20 min) + 80 °C (1 h)	- 40 °C (20 min) + 180 °C (1 h)	- 40 °C (20 min) + 400 °C (1 h) and thermal shock 400 °C to 20 °C	- 40 °C (20 min) + 600 °C (1 h) and thermal shock 600 °C to 20 °C	- 40 °C (20 min) + 800 °C (1 h) and thermal shock 800 °C to 20 °C
External Pressure	No test	25 kPa absolute	25 kPa absolute to 2 MPa absolute	25 kPa absolute to 7 MPa absolute	25 kPa absolute to 70 MPa absolute	25 kPa absolute to 170 MPa absolute
Impact	No test	50 g from 1 m	200 g from 1 m	2 kg from 1 m	5 kg from 1 m	20 kg from 1 m
Vibration	No test	3 x 10 min 25 - 500 Hz at 5 g peak amplitude	3 x 10 min 25 - 50 Hz at 5 g peak amplitude and 50 - 90 Hz at 0.635 mm amplitude peak to peak and 90 - 500 Hz at 10 g peak amplitude	3 x 30 min 25 - 80 Hz at 1.5 mm amplitude peak to peak and 80 - 2000 Hz at 20 g peak amplitude		
Puncture	No test	1 g from 1 m	10 g from 1 m	50 g from 1 m	300 g from 1 m	1 kg from 1 m

## Special applications

No test programme can cover all possible combinations of environments to which a source may be exposed. Users should therefore consult our experts before using sources in potentially adverse environments.

## IAEA Special Form

'Special Form' is a test specification for sealed sources given in the IAEA transport regulations (IAEA Safety Series No. 6, 1985, revised edition). It is used in determining the maximum acceptable activities for various types of transport containers.

## Quality assurance system

The quality assurance system of AEA Technology QSA GmbH was certified by Lloyd's Register Quality Assurance (LRQA) according to ISO 9001, issue 1994. Isotrak products meet the requirements of 10CFR50 Appendix B.



*ms/ector*





# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0356	Isotope:	Lead-210
Prepared By:	Angela Albee	Prepared By:	Angela Albee
Carrier Conc:	1.2M HNO3	Prep Date:	04/03/2001
Reference Date:	01/01/2001	Verification Date:	07/12/2005
Ampoule Mass (g):	5.182 g	Expiration Date:	07/12/2006
Uncertainty:	+/- 3 %	Primary Code:	0356-A
LogBook No:	RC S 034 16b	Dilution(mL):	100 mL
		Mass of Parent(g):	4.275 g
		Density(g/mL):	1.0290

### Calculations Converting parent activity to dpm/mL/dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.275 \text{ g}) * (34.2 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 87723.0000 \text{ dpm/mL}$
$(4.275 \text{ g}) * (34.2 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0290 \text{ g/mL}) / (100 \text{ mL}) = 85250.5630 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
-----------	----------	--------------	---------------	------	-------------	-------------------	-----------------

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

*Angela Albee*

# Verification for Pb-210 Standard 0356-A

A. Fehr 7/12/2005		Standard	
Isotope	Detector CPM	BKG CPM	NET CPM
0356-A N1	20294.0000	21.7000	20294.0000
0356-A N2	20276.6000	21.7000	20276.6000
0356-A N3	20079.7000	21.7000	20079.7000
			Average =
			75761.76771

Detector Eff Mass. Used (mL)	Source DPM/mL
0.1000	76051.19747
0.1000	75985.99146
0.1000	75248.11421
	75761.76771

Mean Value (Counting) =	Pass
75761.76771	99.4402909
Stdev =	Rule 3 (Pass/Fail)
446.03015	0.00588727

Certificate Value =	Unit
76188.2	dpm/g
Lower Limit = 74869.70741	dpm/g
Upper Limit = 76653.82801	dpm/g
Rule 1 Pass/Fail	Pass
Two sigma = 892.0603001	
10 % of Mean = 7576.176771	
Rule 2 (Pass/Fail)	Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three calibration sources for source 0356-A by transferring portions of the standard to tared glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The calibration vials and background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 31 for Pb-210 standard verification. The efficiency calibration which was used for verification calculations was performed on 7/12/05 using source ET491-A (Pb-210). Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

*7/12/2005*

*Angela D. Johnson 7/29/05*

**PROTOCOL** : 31 Pb-210 Verification  
**DATE** : 2005/07/12  
**TIME** : 05:29  
**ID** : P31AS005

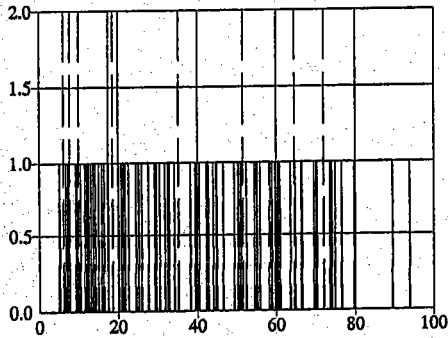
**Wallac 1414 WinSpectral v1.40 S/N 4140127**  
**Counting mode** : CPM  
**Isotope(s)** : Pb210  
**Pb210** = 5- 520,21.00 y  
**Protocol name** : Pb-210 Verification  
**Counting time** : 300  
**Repeats** : 1  
**Cycles** : 1  
**Replicates** : 1  
**2 sigma %** : 0.01  
**Minimum cpm** : 0.00 Checking time: 10  
**Advanced modes** : Chemilum,PSA  
**PSA level** : 35  
**Output to Display** :  
 POS,CTIME,DATE,TIME,RACKPOS,CPMw1,CPM,SQPI,CPM1  
**Additions to Display** : Spectrum,Header,Listing  
**Spectrum** : Alpha,Beta  
**Window 1** : 685- 745 /Alpha  
**Window 2** : 1-1024 /Beta  
**Window 3** : 1-1024 /Beta  
**Window 4** : 1-1024 /Beta  
**Window 5** : 1-1024 /Beta  
**Window 6** : 1-1024 /Beta  
**FNCT1 = FNCT1** :  
**FNCT2 = FNCT2** :  
**FNCT3 = FNCT3** :  
**FNCT4 = FNCT4** :

**Total count rate:**  
 Pb210 72372.3 CPM

*per 1/2/05*  
 Oct 7/12/05

*AAQ*  
 7/29/05

POS	CTIME	DATE	TIME	RACKPOS	CPM
1	300	7/12/2005	5:29 AM	1	20.20

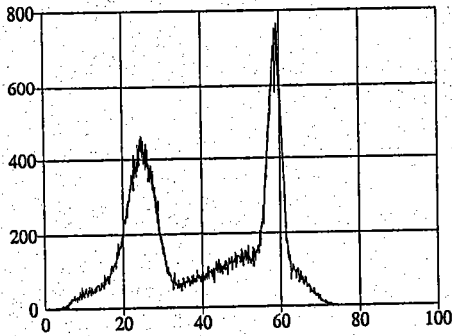


Counts Alpha

Counts Beta

Bkg

2	300	7/12/2005	5:35 AM	2	22785.60
---	-----	-----------	---------	---	----------

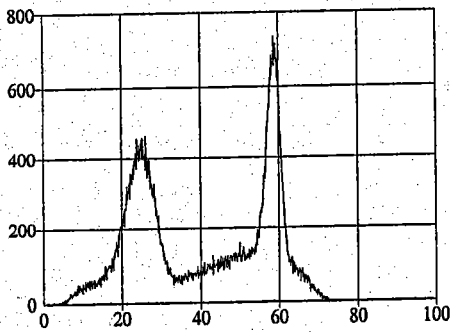


Counts Alpha

Counts Beta

ET491-A

3	300	7/12/2005	5:41 AM	3	22178.60
---	-----	-----------	---------	---	----------



Counts Alpha

Counts Beta

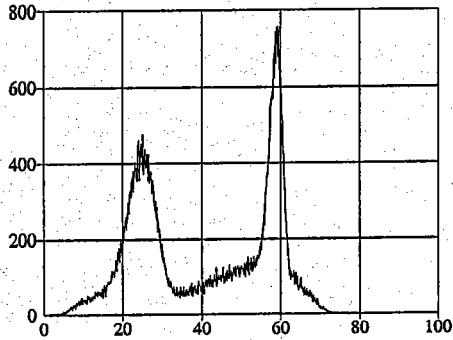
ET491-A

*ms 7/29/05*

ALF 7/12/05

*AdQ*  
*7/29/05*

POS	CTIME	DATE	TIME	RACKPOS	CPM
4	300	7/12/2005	5:46 AM	4	22065.70

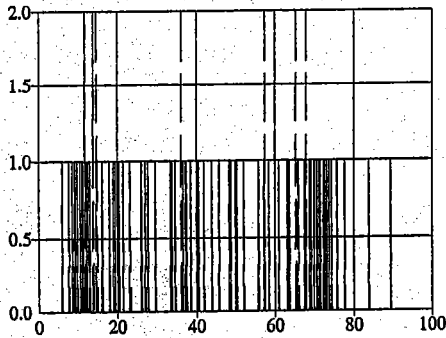


Counts Alpha

Counts Beta

ET491-A

5	300	7/12/2005	5:52 AM	5	21.70
---	-----	-----------	---------	---	-------

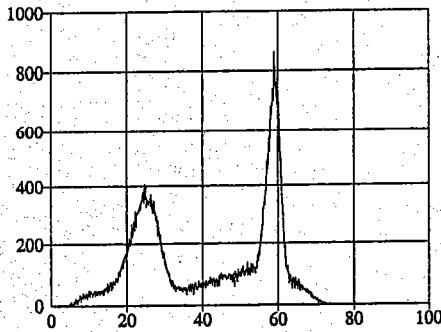


Counts Alpha

Counts Beta

Bkg

6	300	7/12/2005	5:58 AM	6	20294.00
---	-----	-----------	---------	---	----------



Counts Alpha

Counts Beta

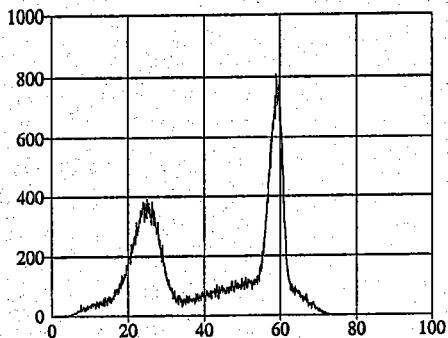
0356-A

*ms/rals*

ALF7/12/05

*ms*  
7/29/05

POS	CTIME	DATE	TIME	RACKPOS	CPM
7	300	7/12/2005	6:04 AM	7	20276.60

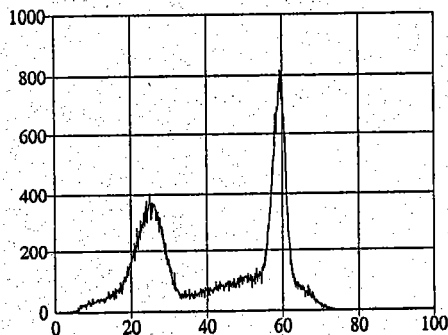


Counts Alpha

Counts Beta

0356-A

8	300	7/12/2005	6:09 AM	8	20079.70
---	-----	-----------	---------	---	----------



Counts Alpha

Counts Beta

0356-A

*pm 7/29/05*  
*ALF 7/12/05*

*ALF*  
*7/29/05*

**General Engineering Laboratories  
Calibration Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-018 Isotope Pb-210  
 Date Standards Prepared 7/14/05 Cocktail Type Used NA  
 Standard ID 0356-A Matrix of Vial/Planchett Lead chromate  
 Amount Used (g or ml) 0.5 precipitate on  
 Standard Activity (DPM/g or ml) 87723 Tuffryn filter  
 Reference Date 11/1/05 Type of Scintillation Vial N/A  
 Expiration Date 7/12/06 Pipette ID Used 2440913  
 Residue/Carrier Agent Lead Carrier 14.65  $\mu$ g/ml Balance ID Used R1212  
 Quenching Agent NIA

Separation Date / Time: 7/14/05 0800

Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
C1	0.1	0.0844	<del>0.0850</del>	<del>0.6</del>
C2	0.2	0.0851	<del>0.0865</del>	<del>1.4</del>
C3	0.3	0.0845	0.0880	3.5
C4	0.4	0.0849	0.0913	6.4
C5	0.5	0.0847	0.0926	7.9
C6	0.6	0.0874	0.0975	10.1
C7	0.7	0.0860	0.0950	9.0
C8	0.8	0.0879	0.1000	12.1
C9	0.9	0.0846	0.0966	12.0
C10	1.0	0.0852	0.1000	14.8
C11	1.1	0.0841	0.1010	16.9
C12	1.3	0.0865	0.1033	18.8
		0.0850	0.1053	
		0.0713/05		

0.0854 1.0  
0.0875 2.4

Prepared By: [Signature] Date 7/22/05  
 Reviewed By: [Signature] Date 7/26/05



Det	Sample ID	Count	Alpha Counts	Beta Counts	Bkg CPM	Pb mg	Target	Rec (%)	Volage	Count	Dpm Added	CPM	Rec. Corr.	BI-210 Ing. Days	Factor	BI-210 Ing. CPM	Ing. Corr. CPM	Pb-210 Efficiency
Instrument 1 - A	1	2	84	22018	0.362	1	1.5	68.3%	1575	7/28/2005 7:55	38089.65	11008.64	16127.65	13.997	0.8557	18948.12	0.4948	
Instrument 1 - A	2	2	84	22854	0.362	2.4	2.9	81.9%	1575	7/28/2005 8:20	38089.65	1426.64	13450.02	14.014	0.8560	16296.61	0.4278	
Instrument 1 - A	3	2	102	20935	0.362	3.5	4.4	79.6%	1575	7/28/2005 8:05	38089.65	10467.14	13143.73	14.004	0.8558	15358.20	0.4032	
Instrument 1 - A	4	2	99	22720	0.362	6.4	5.9	109.2%	1575	7/28/2005 8:01	38089.65	13569.64	10401.17	14.001	0.8558	12154.42	0.3191	
Instrument 1 - A	5	2	83	22892	0.362	7.9	7.3	107.8%	1575	7/28/2005 10:09	38089.65	11445.84	10612.57	14.090	0.8575	12375.96	0.3249	
Instrument 1 - A	6	2	95	23217	0.362	10.1	8.8	114.9%	1575	7/28/2005 10:25	38089.65	11608.14	10102.53	14.101	0.8577	11778.26	0.3092	
Instrument 1 - A	7	2	63	21913	0.362	9	10.3	87.8%	1575	7/28/2005 10:20	38089.65	9596.14	10934.27	14.098	0.8576	12748.81	0.3947	
Instrument 1 - A	8	2	78	20620	0.362	12.1	11.7	103.2%	1575	7/28/2005 10:16	38089.65	13099.64	9985.96	14.095	0.8577	11643.66	0.3057	
Instrument 1 - A	9	2	65	18730	0.362	12	13.2	91.0%	1575	7/28/2005 9:35	38089.65	9364.64	10269.40	14.066	0.8570	12005.70	0.3182	
Instrument 1 - A	10	2	71	20335	0.362	14.8	14.7	101.0%	1575	7/28/2005 10:06	38089.65	10157.14	10064.09	14.067	0.8575	11737.03	0.3081	
Instrument 1 - A	11	2	81	19864	0.362	16.9	16.1	104.9%	1575	7/28/2005 10:02	38089.65	9846.64	9389.26	14.072	0.8574	10650.66	0.2875	
Instrument 1 - A	12	2	89	20801	0.362	18.9	19.0	98.7%	1575	7/28/2005 9:43	38089.65	10400.14	10535.67	14.075	0.8572	12291.42	0.3227	
Instrument 1 - B	1	2	56	21763	0.296	1	1.5	68.3%	1575	7/28/2005 8:01	38089.65	10981.20	15840.96	13.987	0.8557	16627.99	0.4891	
Instrument 1 - B	2	2	78	22474	0.296	2.4	2.9	81.9%	1575	7/28/2005 7:55	38089.65	11236.70	13718.14	13.982	0.8577	16032.10	0.4209	
Instrument 1 - B	3	2	73	20359	0.296	3.5	4.4	79.6%	1575	7/28/2005 8:06	38089.65	10179.20	12782.17	14.014	0.8560	14932.28	0.3920	
Instrument 1 - B	4	2	58	22111	0.296	6.4	5.9	109.2%	1575	7/28/2005 10:16	38089.65	11055.20	10122.42	14.004	0.8558	11778.26	0.3092	
Instrument 1 - B	5	2	58	22056	0.296	7.9	7.3	107.8%	1575	7/28/2005 10:09	38089.65	11452.20	9966.82	14.095	0.8576	12463.31	0.3051	
Instrument 1 - B	6	2	72	22905	0.296	10.1	8.8	114.9%	1575	7/28/2005 10:25	38089.65	9331.70	10686.66	14.090	0.8575	11822.90	0.3255	
Instrument 1 - B	7	2	62	18664	0.296	9	10.3	87.8%	1575	7/28/2005 10:21	38089.65	10309.20	9985.44	14.072	0.8572	11642.51	0.3147	
Instrument 1 - B	8	2	56	20619	0.296	12.1	11.7	103.2%	1575	7/28/2005 9:43	38089.65	9392.20	10275.73	14.098	0.8570	11416.59	0.2997	
Instrument 1 - B	9	2	82	18705	0.296	12	13.2	91.0%	1575	7/28/2005 9:43	38089.65	9864.70	9784.52	14.066	0.8575	10633.70	0.2792	
Instrument 1 - B	10	2	45	19770	0.296	14.8	14.7	101.0%	1575	7/28/2005 9:35	38089.65	9562.20	9148.04	14.088	0.8575	11960.46	0.3137	
Instrument 1 - B	11	2	42	19125	0.296	16.9	16.1	104.9%	1575	7/28/2005 10:06	38089.65	10114.70	10246.52	14.086	0.8574	11861.93	0.4852	
Instrument 1 - B	12	2	56	20230	0.296	18.8	19.0	98.7%	1575	7/28/2005 10:02	38089.65	10114.70	10246.52	14.004	0.8558	16191.57	0.4251	
Instrument 1 - C	1	2	132	22038	0.36	1	1.5	68.3%	1575	7/28/2005 8:06	38089.65	11349.64	13856.02	13.997	0.8557	15079.77	0.3959	
Instrument 1 - C	2	2	151	22700	0.36	2.4	2.9	81.9%	1575	7/28/2005 8:01	38089.65	10275.64	12903.27	14.014	0.8560	12134.71	0.3186	
Instrument 1 - C	3	2	161	20552	0.36	3.5	4.4	79.6%	1575	7/28/2005 7:55	38089.65	11344.64	10876.55	14.098	0.8577	12448.29	0.3268	
Instrument 1 - C	4	2	179	22690	0.36	6.4	5.9	109.2%	1575	7/28/2005 8:20	38089.65	11514.64	9597.22	14.095	0.8576	11657.06	0.3060	
Instrument 1 - C	5	2	149	23030	0.36	7.9	7.3	114.9%	1575	7/28/2005 10:21	38089.65	11487.14	10898.95	14.090	0.8575	12709.87	0.3337	
Instrument 1 - C	6	2	163	22975	0.36	10.1	8.8	114.9%	1575	7/28/2005 10:09	38089.65	9565.14	10968.95	14.090	0.8577	11694.15	0.3070	
Instrument 1 - C	7	2	137	19131	0.36	9	10.3	87.8%	1575	7/28/2005 10:25	38089.65	10355.64	10030.42	14.085	0.8574	12177.92	0.3197	
Instrument 1 - C	8	2	136	20712	0.36	12.1	11.7	103.2%	1575	7/28/2005 10:02	38089.65	9623.14	10441.58	14.072	0.8572	11579.53	0.3040	
Instrument 1 - C	9	2	132	19007	0.36	12	13.2	101.0%	1575	7/28/2005 9:43	38089.65	10021.14	9525.51	14.066	0.8570	10571.55	0.2775	
Instrument 1 - C	10	2	129	20055	0.36	14.8	14.7	104.9%	1575	7/28/2005 9:35	38089.65	9501.64	9060.29	14.088	0.8560	12159.96	0.3192	
Instrument 1 - C	11	2	110	19004	0.36	16.9	16.1	109.2%	1575	7/28/2005 8:20	38089.65	10992.16	10426.77	14.014	0.8560	18912.29	0.4639	
Instrument 1 - C	12	2	125	20586	0.36	18.8	18.8	98.7%	1575	7/28/2005 10:06	38089.65	10292.64	16103.52	14.004	0.8558	16102.73	0.4228	
Instrument 1 - D	1	2	314	21985	0.338	1	1.5	68.3%	1575	7/28/2005 8:06	38089.65	11349.64	13856.02	13.997	0.8557	15079.77	0.3959	
Instrument 1 - D	2	2	339	22577	0.338	2.4	2.9	81.9%	1575	7/28/2005 8:01	38089.65	10275.64	12903.27	14.014	0.8560	12134.71	0.3186	
Instrument 1 - D	3	2	302	20759	0.338	3.5	4.4	79.6%	1575	7/28/2005 7:55	38089.65	11388.16	10898.95	14.098	0.8558	12448.29	0.3268	
Instrument 1 - D	4	2	337	22777	0.338	6.4	5.9	109.2%	1575	7/28/2005 8:20	38089.65	11525.65	9597.22	14.095	0.8557	11657.06	0.3060	
Instrument 1 - D	5	2	289	23652	0.338	7.9	7.3	114.9%	1575	7/28/2005 10:21	38089.65	11476.66	10898.95	14.090	0.8577	12709.87	0.3337	
Instrument 1 - D	6	2	273	22954	0.338	10.1	8.8	114.9%	1575	7/28/2005 10:09	38089.65	9565.14	10968.95	14.090	0.8575	11694.15	0.3070	
Instrument 1 - D	7	2	234	19018	0.338	9	10.3	87.8%	1575	7/28/2005 10:25	38089.65	10355.64	10030.42	14.085	0.8574	12177.92	0.3197	
Instrument 1 - D	8	2	275	20545	0.338	12.1	11.7	103.2%	1575	7/28/2005 10:02	38089.65	9501.64	9060.29	14.066	0.8570	10571.55	0.2775	
Instrument 1 - D	9	2	253	18798	0.338	12	13.2	101.0%	1575	7/28/2005 9:43	38089.65	10021.14	9525.51	14.088	0.8560	12159.96	0.3192	
Instrument 1 - D	10	2	272	20117	0.338	14.8	14.7	104.9%	1575	7/28/2005 8:20	38089.65	10992.16	10426.77	14.014	0.8560	18912.29	0.4639	
Instrument 1 - D	11	2	259	19117	0.338	16.9	16.1	109.2%	1575	7/28/2005 10:06	38089.65	10292.64	16103.52	14.004	0.8558	16102.73	0.4228	
Instrument 1 - D	12	2	229	20656	0.338	18.8	18.8	98.7%	1575	7/28/2005 8:06	38089.65	9565.14	10968.95	14.090	0.8577	11694.15	0.3070	
Instrument 2 - A	1	2	205	21853	0.348	1	1.5	68.3%	1575	7/28/2005 7:55	38089.65	11388.16	10898.95	14.101	0.8577	12459.35	0.3271	
Instrument 2 - A	2	2	254	22781	0.348	2.4	2.9	81.9%	1575	7/28/2005 8:21	38089.65	11390.15	13905.48	14.029	0.8565	16228.60	0.4281	
Instrument 2 - A	3	2	246	20682	0.348	3.5	4.4	79.6%	1575	7/28/2005 8:52	38089.65	10340.65	12984.90	14.037	0.8564	15161.12	0.3860	
Instrument 2 - A	4	2	280	22878	0.348	6.4	5.9	109.2%	1575	7/28/2005 8:30	38089.65	11438.65	10473.52	14.034	0.8564	18857.20	0.4651	
Instrument 2 - A	5	2	266	23137	0.348	7.9	7.3	107.8%	1575	7/28/2005 8:49	38089.65	11522.11	14066.58	14.029	0.8569	16203.90	0.3992	
Instrument 2 - A	6	2	231	23217	0.348	10.1	8.8	114.9%	1575	7/28/2005 7:55	38089.65	11568.15	10728.17	13.997	0.8567	12535.41	0.3291	
Instrument 2 - A	7	2	172	19166	0.348	9	10.3	87.8%	1575	7/28/2005 8:06	38089.65	9562.65	11608.14	14.014	0.8560	1801.88	0.3998	
Instrument 2 - A	8	2	193	20672	0.348	12.1	11.7	103.2%	1575	7/28/2005 8:06	38089.65	9562.65	10918.90	14.004	0.8558	12758.47	0.3350	
Instrument 2 - A	9	2	201	19025	0.348	12	13.2	91.0%	1575	7/28/2005 10:02	38089.65	10335.65	10011.06	14.001				

Instrument 2 - B	11	2	14	19263	0.396	16.9	16.1	104.9%	1575	7/28/2005 10:25	38089.65	9631.11	9183.75	7/14/2005 8:00	14.101	0.8577	10706.99	0.2811
Instrument 2 - B	12	2	8	20493	0.396	18.8	19.0	98.7%	1575	7/28/2005 10:21	38089.65	10241.11	10374.58	7/14/2005 8:00	14.098	0.8577	12096.16	0.3176
Instrument 2 - C	1	2	280	19896	0.42	1	1.5	68.3%	1575	7/28/2005 8:52	38089.65	1697.58	1611.45	7/14/2005 8:00	14.037	0.8565	18811.64	0.4939
Instrument 2 - C	2	2	292	22505	0.42	2.4	2.9	81.9%	1575	7/28/2005 8:49	38089.65	13263.58	13738.75	7/14/2005 8:00	14.035	0.8564	15642.09	0.4212
Instrument 2 - C	3	2	244	20689	0.42	3.5	4.4	79.6%	1575	7/28/2005 8:42	38089.65	10344.08	12989.21	7/14/2005 8:00	14.029	0.8563	16168.74	0.3982
Instrument 2 - C	4	2	283	22519	0.42	6.4	5.9	109.2%	1575	7/28/2005 9:21	38089.65	12565.58	10398.64	7/14/2005 8:00	14.056	0.8569	12530.83	0.3159
Instrument 2 - C	5	2	264	23133	0.42	7.9	7.3	107.8%	1575	7/28/2005 8:06	38089.65	11966.08	10724.25	7/14/2005 8:00	14.004	0.8568	12530.83	0.3290
Instrument 2 - C	6	2	268	22568	0.42	10.1	8.8	114.8%	1575	7/28/2005 8:01	38089.65	11963.58	9820.07	7/14/2005 8:00	14.001	0.8558	11475.29	0.3013
Instrument 2 - C	7	2	240	18943	0.42	9	10.3	87.8%	1575	7/28/2005 7:55	38089.65	9471.06	10791.77	7/14/2005 8:00	13.997	0.8558	12612.03	0.3311
Instrument 2 - C	8	2	239	20584	0.42	12.1	11.7	103.2%	1575	7/28/2005 8:20	38089.65	10291.58	9968.37	7/14/2005 8:00	14.014	0.8560	11645.11	0.3057
Instrument 2 - C	9	2	222	18740	0.42	12	13.2	91.0%	1575	7/28/2005 10:17	38089.65	9369.58	9968.37	7/14/2005 8:00	14.014	0.8577	12003.14	0.3151
Instrument 2 - C	10	2	222	18943	0.42	14.8	14.7	101.0%	1575	7/28/2005 10:21	38089.65	9971.06	9870.02	7/14/2005 8:00	14.098	0.8576	11508.63	0.3021
Instrument 2 - C	11	2	231	19189	0.42	16.9	16.1	104.9%	1575	7/28/2005 10:15	38089.65	10261.08	10394.80	7/14/2005 8:00	14.101	0.8577	10674.02	0.2902
Instrument 2 - C	12	2	234	20623	0.42	18.8	19.0	98.7%	1575	7/28/2005 10:25	38089.65	10261.08	10394.80	7/14/2005 8:00	14.098	0.8577	12118.89	0.3182
Instrument 2 - D	1	2	280	22194	0.414	2.4	1.5	68.3%	1575	7/28/2005 9:21	38089.65	11065.59	16256.50	7/14/2005 8:00	14.056	0.8569	18972.33	0.4981
Instrument 2 - D	2	2	338	23021	0.414	2.4	2.9	81.9%	1575	7/28/2005 8:53	38089.65	11510.09	14051.90	7/14/2005 8:00	14.037	0.8565	16406.89	0.4307
Instrument 2 - D	3	2	288	20861	0.414	3.5	4.4	79.6%	1575	7/28/2005 8:49	38089.65	10430.09	13097.21	7/14/2005 8:00	14.035	0.8564	15292.99	0.4015
Instrument 2 - D	4	2	282	22714	0.414	6.4	5.9	109.2%	1575	7/28/2005 8:42	38089.65	11956.59	10398.37	7/14/2005 8:00	14.029	0.8583	12143.17	0.3188
Instrument 2 - D	5	2	254	23276	0.414	7.9	7.3	107.8%	1575	7/28/2005 8:06	38089.65	11548.09	10960.56	7/14/2005 8:00	14.014	0.8583	12605.57	0.3309
Instrument 2 - D	6	2	282	23097	0.414	10.1	8.8	114.9%	1575	7/28/2005 8:02	38089.65	11637.59	10794.55	7/14/2005 8:00	14.014	0.8583	12605.57	0.3309
Instrument 2 - D	7	2	282	19264	0.414	9	10.3	87.8%	1575	7/28/2005 7:55	38089.65	9631.59	10574.66	7/14/2005 8:00	14.004	0.8558	11743.44	0.3083
Instrument 2 - D	8	2	274	21105	0.414	12.1	11.7	103.2%	1575	7/28/2005 10:25	38089.65	10552.09	10220.70	7/14/2005 8:00	14.014	0.8577	12387.25	0.3252
Instrument 2 - D	9	2	221	19341	0.414	12	13.2	91.0%	1575	7/28/2005 10:15	38089.65	9670.09	10626.01	7/14/2005 8:00	14.101	0.8577	11733.47	0.3080
Instrument 2 - D	10	2	250	20334	0.414	14.8	14.7	101.0%	1575	7/28/2005 10:21	38089.65	10166.59	10063.55	7/14/2005 8:00	14.098	0.8576	10847.36	0.2949
Instrument 2 - D	11	2	210	19513	0.414	16.9	16.1	104.9%	1575	7/28/2005 10:17	38089.65	9768.09	9302.92	7/14/2005 8:00	14.086	0.8576	12209.90	0.3206
Instrument 2 - D	12	2	241	20572	0.414	18.8	19.0	98.7%	1575	7/28/2005 10:17	38089.65	10335.59	10470.28	7/14/2005 8:00	14.086	0.8570	18519.74	0.4882
Instrument 3 - A	1	2	151	21669	0.32	1	1.5	68.3%	1575	7/28/2005 9:34	38089.65	10834.18	15872.07	7/14/2005 8:00	14.087	0.8574	14709.56	0.3652
Instrument 3 - A	2	2	140	21967	0.32	2.4	2.9	81.9%	1575	7/28/2005 10:05	38089.65	10963.18	13408.63	7/14/2005 8:00	14.071	0.8571	11641.14	0.3056
Instrument 3 - A	3	2	151	20088	0.32	3.5	4.4	79.6%	1575	7/28/2005 10:01	38089.65	10043.68	12611.99	7/14/2005 8:00	14.084	0.8563	11351.52	0.2960
Instrument 3 - A	4	2	162	21796	0.32	6.4	5.9	109.2%	1575	7/28/2005 8:42	38089.65	10897.68	10335.37	7/14/2005 8:00	14.029	0.8563	12069.58	0.3169
Instrument 3 - A	5	2	165	22294	0.32	7.9	7.3	107.8%	1575	7/28/2005 8:21	38089.65	11146.68	9976.19	7/14/2005 8:00	14.057	0.8569	11351.52	0.3056
Instrument 3 - A	6	2	180	22353	0.32	10.1	8.8	114.9%	1575	7/28/2005 8:53	38089.65	9172.68	10451.76	7/14/2005 8:00	14.037	0.8565	12203.38	0.3204
Instrument 3 - A	7	2	95	18346	0.32	9	10.3	87.8%	1575	7/28/2005 8:49	38089.65	9620.18	9608.64	7/14/2005 8:00	14.035	0.8564	11219.55	0.2946
Instrument 3 - A	8	2	136	19841	0.32	12.1	11.7	103.2%	1575	7/28/2005 10:15	38089.65	9620.18	9608.64	7/14/2005 8:00	14.035	0.8564	11219.55	0.2946
Instrument 3 - A	9	2	104	18127	0.32	12	13.2	91.0%	1575	7/28/2005 10:21	38089.65	9063.18	9608.64	7/14/2005 8:00	13.997	0.8557	11637.78	0.3055
Instrument 3 - A	10	2	178	19341	0.32	14.8	14.7	101.0%	1575	7/28/2005 10:17	38089.65	9670.18	8572.17	7/14/2005 8:00	14.014	0.8560	1182.24	0.2936
Instrument 3 - A	11	2	120	18537	0.32	16.9	16.1	104.9%	1575	7/28/2005 8:20	38089.65	9670.18	8572.17	7/14/2005 8:00	14.065	0.8558	10326.55	0.2711
Instrument 3 - A	12	2	142	20233	0.32	18.8	18.8	98.7%	1575	7/28/2005 8:06	38089.65	9568.18	8537.69	7/14/2005 8:00	14.001	0.8558	11975.34	0.3144
Instrument 3 - B	1	2	236	21613	0.366	2.4	1.5	68.3%	1575	7/28/2005 9:42	38089.65	10116.18	10248.01	7/14/2005 8:00	14.071	0.8570	15676.62	0.4116
Instrument 3 - B	2	2	219	22011	0.366	2.4	2.9	81.9%	1575	7/28/2005 8:02	38089.65	10806.13	15830.99	7/14/2005 8:00	14.071	0.8570	15676.62	0.4116
Instrument 3 - B	3	2	220	20493	0.366	3.5	4.4	79.6%	1575	7/28/2005 10:05	38089.65	11005.13	13435.43	7/14/2005 8:00	14.087	0.8575	15005.11	0.3939
Instrument 3 - B	4	2	235	22109	0.366	6.4	5.9	109.2%	1575	7/28/2005 10:01	38089.65	11054.13	10121.44	7/14/2005 8:00	14.084	0.8574	11804.78	0.3069
Instrument 3 - B	5	2	244	22536	0.366	7.9	7.3	107.8%	1575	7/28/2005 8:49	38089.65	11267.63	10447.52	7/14/2005 8:00	14.035	0.8564	12199.07	0.3203
Instrument 3 - B	6	2	221	22858	0.366	10.1	8.8	114.9%	1575	7/28/2005 8:53	38089.65	11328.63	9659.28	7/14/2005 8:00	14.029	0.8563	11513.58	0.3023
Instrument 3 - B	7	2	207	18526	0.366	9	10.3	87.8%	1575	7/28/2005 9:21	38089.65	9312.63	10611.23	7/14/2005 8:00	14.057	0.8569	12383.92	0.3251
Instrument 3 - B	8	2	216	20102	0.366	12.1	11.7	103.2%	1575	7/28/2005 8:53	38089.65	10500.63	9734.59	7/14/2005 8:00	14.037	0.8565	11366.48	0.2984
Instrument 3 - B	9	2	188	18433	0.366	12	13.2	91.0%	1575	7/28/2005 8:02	38089.65	9216.13	10126.23	7/14/2005 8:00	14.002	0.8558	11833.00	0.3107
Instrument 3 - B	10	2	228	19517	0.366	14.8	14.7	101.0%	1575	7/28/2005 8:52	38089.65	9758.13	9659.23	7/14/2005 8:00	13.997	0.8557	11288.41	0.2797
Instrument 3 - B	11	2	189	19126	0.366	16.9	16.1	104.9%	1575	7/28/2005 8:20	38089.65	9562.63	9118.45	7/14/2005 8:00	14.014	0.8560	10652.20	0.2797
Instrument 3 - B	12	2	205	20505	0.366	18.8	19.0	98.7%	1575	7/28/2005 8:06	38089.65	10252.13	10385.74	7/14/2005 8:00	14.005	0.8558	12135.41	0.3186
Instrument 3 - C	1	2	322	21556	0.402	2.4	1.5	68.3%	1575	7/28/2005 10:01	38089.65	10777.50	15789.18	7/14/2005 8:00	14.084	0.8574	18415.11	0.4835
Instrument 3 - C	2	2	360	22173	0.402	2.4	2.9	81.9%	1575	7/28/2005 8:49	38089.65	11086.10	13534.28	7/14/2005 8:00	14.072	0.8572	15789.85	0.4145
Instrument 3 - C	3	2	329	20388	0.402	3.5	4.4	79.6%	1575	7/28/2005 9:34	38089.65	10193.60	12800.25	7/14/2005 8:00	14.066	0.8570	14935.46	0.3921
Instrument 3 - C	4	2	325	22168	0.402	6.4	5.9	109.2%	1575	7/28/2005 10:05	38089.65	11063.60	10148.42	7/14/2005 8:00	14.087	0.8575	11835.48	0.3107
Instrument 3 - C	5	2	338	23046	0.402	7.9	7.3	107.8%	1575	7/28/2005 8:53	38089.65	11522.60	10683.93	7/14/2005 8:00	14.037	0.8565	12474.43	0.3275
Instrument 3 - C	6	2	378	22957	0.402	10.1	8.8	114.9%	1575	7/28/2005 8:49	38089.65	11478.10	9995.35	7/14/2005 8:00	14.030	0.8564	11684.08	0.3082
Instrument 3 - C	7	2	283	18866	0.402	9	10.3	87.8%	1575	7/28/2005 8:42	38089.65	9432.60	10747.92	7/14/2005 8:00	14.030	0.8563	12551.32	0.3285
Instrument 3 - C	8	2	308	20233	0.402	12.1	11.7	103.2%	1575	7/28/2005 9:21	38089.65	10116.10	9798.40	7/14/2005 8:00	14.057	0.8569	11435.30	

INSTR_ID	SAMPLE_ID	CNT_TIME	A	B	TIME	USER2	BATCH_ID
Instrument 1 - A	1	2	84	22018	7/28/2005 7:55	1575	PbCal705
Instrument 1 - A	2	2	84	22854	7/28/2005 8:20	1575	PbCal705
Instrument 1 - A	3	2	102	20935	7/28/2005 8:05	1575	PbCal705
Instrument 1 - A	4	2	99	22720	7/28/2005 8:01	1575	PbCal705
Instrument 1 - A	5	2	95	22892	7/28/2005 10:09	1575	PbCal705
Instrument 1 - A	6	2	83	23217	7/28/2005 10:25	1575	PbCal705
Instrument 1 - A	7	2	63	19193	7/28/2005 10:20	1575	PbCal705
Instrument 1 - A	8	2	78	20620	7/28/2005 10:16	1575	PbCal705
Instrument 1 - A	9	2	65	18730	7/28/2005 9:35	1575	PbCal705
Instrument 1 - A	10	2	73	20335	7/28/2005 10:06	1575	PbCal705
Instrument 1 - A	11	2	81	19694	7/28/2005 10:02	1575	PbCal705
Instrument 1 - A	12	2	89	20801	7/28/2005 9:43	1575	PbCal705
Instrument 1 - B	1	2	56	21763	7/28/2005 8:01	1575	PbCal705
Instrument 1 - B	2	2	78	22474	7/28/2005 7:55	1575	PbCal705
Instrument 1 - B	3	2	73	20359	7/28/2005 8:20	1575	PbCal705
Instrument 1 - B	4	2	58	22111	7/28/2005 8:05	1575	PbCal705
Instrument 1 - B	5	2	71	23056	7/28/2005 10:16	1575	PbCal705
Instrument 1 - B	6	2	72	22905	7/28/2005 10:09	1575	PbCal705
Instrument 1 - B	7	2	62	18664	7/28/2005 10:25	1575	PbCal705
Instrument 1 - B	8	2	56	20619	7/28/2005 10:21	1575	PbCal705
Instrument 1 - B	9	2	62	18705	7/28/2005 9:43	1575	PbCal705
Instrument 1 - B	10	2	45	19770	7/28/2005 9:35	1575	PbCal705
Instrument 1 - B	11	2	42	19125	7/28/2005 10:06	1575	PbCal705
Instrument 1 - B	12	2	56	20230	7/28/2005 10:02	1575	PbCal705
Instrument 1 - C	1	2	132	22038	7/28/2005 8:06	1575	PbCal705
Instrument 1 - C	2	2	151	22700	7/28/2005 8:01	1575	PbCal705
Instrument 1 - C	3	2	161	20552	7/28/2005 7:55	1575	PbCal705
Instrument 1 - C	4	2	179	22690	7/28/2005 8:20	1575	PbCal705
Instrument 1 - C	5	2	149	23030	7/28/2005 10:21	1575	PbCal705
Instrument 1 - C	6	2	163	22975	7/28/2005 10:16	1575	PbCal705
Instrument 1 - C	7	2	137	19131	7/28/2005 10:09	1575	PbCal705
Instrument 1 - C	8	2	136	20712	7/28/2005 10:25	1575	PbCal705
Instrument 1 - C	9	2	132	19007	7/28/2005 10:02	1575	PbCal705
Instrument 1 - C	10	2	129	20055	7/28/2005 9:43	1575	PbCal705
Instrument 1 - C	11	2	110	19004	7/28/2005 9:35	1575	PbCal705
Instrument 1 - C	12	2	125	20586	7/28/2005 10:06	1575	PbCal705
Instrument 1 - D	1	2	314	21985	7/28/2005 8:20	1575	PbCal705
Instrument 1 - D	2	2	339	22577	7/28/2005 8:06	1575	PbCal705
Instrument 1 - D	3	2	302	20759	7/28/2005 8:01	1575	PbCal705
Instrument 1 - D	4	2	337	22777	7/28/2005 7:55	1575	PbCal705
Instrument 1 - D	5	2	299	23052	7/28/2005 10:25	1575	PbCal705
Instrument 1 - D	6	2	273	22954	7/28/2005 10:21	1575	PbCal705
Instrument 1 - D	7	2	234	19018	7/28/2005 10:16	1575	PbCal705
Instrument 1 - D	8	2	275	20545	7/28/2005 10:09	1575	PbCal705
Instrument 1 - D	9	2	253	18798	7/28/2005 10:06	1575	PbCal705
Instrument 1 - D	10	2	272	20117	7/28/2005 10:02	1575	PbCal705
Instrument 1 - D	11	2	259	19117	7/28/2005 9:43	1575	PbCal705
Instrument 1 - D	12	2	229	20856	7/28/2005 9:35	1575	PbCal705
Instrument 2 - A	1	2	225	21853	7/28/2005 8:42	1575	PbCal705
Instrument 2 - A	2	2	264	22781	7/28/2005 9:21	1575	PbCal705
Instrument 2 - A	3	2	246	20682	7/28/2005 8:52	1575	PbCal705

Instrument 2 - A	4	2	230	22878	7/28/2005 8:49	1575	PbCal705
Instrument 2 - A	5	2	266	23137	7/28/2005 7:55	1575	PbCal705
Instrument 2 - A	6	2	231	23217	7/28/2005 8:20	1575	PbCal705
Instrument 2 - A	7	2	172	19166	7/28/2005 8:06	1575	PbCal705
Instrument 2 - A	8	2	193	20672	7/28/2005 8:01	1575	PbCal705
Instrument 2 - A	9	2	201	19025	7/28/2005 10:09	1575	PbCal705
Instrument 2 - A	10	2	188	20237	7/28/2005 10:25	1575	PbCal705
Instrument 2 - A	11	2	194	19477	7/28/2005 10:21	1575	PbCal705
Instrument 2 - A	12	2	193	20724	7/28/2005 10:17	1575	PbCal705
Instrument 2 - B	1	2	9	22048	7/28/2005 8:49	1575	PbCal705
Instrument 2 - B	2	2	15	23045	7/28/2005 8:42	1575	PbCal705
Instrument 2 - B	3	2	16	20750	7/28/2005 9:21	1575	PbCal705
Instrument 2 - B	4	2	9	22958	7/28/2005 8:52	1575	PbCal705
Instrument 2 - B	5	2	12	23347	7/28/2005 8:01	1575	PbCal705
Instrument 2 - B	6	2	12	22888	7/28/2005 7:55	1575	PbCal705
Instrument 2 - B	7	2	12	19018	7/28/2005 8:20	1575	PbCal705
Instrument 2 - B	8	2	9	20774	7/28/2005 8:06	1575	PbCal705
Instrument 2 - B	9	2	12	18915	7/28/2005 10:17	1575	PbCal705
Instrument 2 - B	10	2	10	20157	7/28/2005 10:10	1575	PbCal705
Instrument 2 - B	11	2	14	19263	7/28/2005 10:25	1575	PbCal705
Instrument 2 - B	12	2	8	20483	7/28/2005 10:21	1575	PbCal705
Instrument 2 - C	1	2	280	21996	7/28/2005 8:52	1575	PbCal705
Instrument 2 - C	2	2	292	22508	7/28/2005 8:49	1575	PbCal705
Instrument 2 - C	3	2	244	20689	7/28/2005 8:42	1575	PbCal705
Instrument 2 - C	4	2	283	22518	7/28/2005 9:21	1575	PbCal705
Instrument 2 - C	5	2	264	23133	7/28/2005 8:06	1575	PbCal705
Instrument 2 - C	6	2	268	22568	7/28/2005 8:01	1575	PbCal705
Instrument 2 - C	7	2	240	18943	7/28/2005 7:55	1575	PbCal705
Instrument 2 - C	8	2	239	20584	7/28/2005 8:20	1575	PbCal705
Instrument 2 - C	9	2	222	18740	7/28/2005 10:21	1575	PbCal705
Instrument 2 - C	10	2	222	19943	7/28/2005 10:17	1575	PbCal705
Instrument 2 - C	11	2	221	19199	7/28/2005 10:10	1575	PbCal705
Instrument 2 - C	12	2	234	20523	7/28/2005 10:25	1575	PbCal705
Instrument 2 - D	1	2	280	22194	7/28/2005 9:21	1575	PbCal705
Instrument 2 - D	2	2	338	23021	7/28/2005 8:53	1575	PbCal705
Instrument 2 - D	3	2	288	20861	7/28/2005 8:49	1575	PbCal705
Instrument 2 - D	4	2	282	22714	7/28/2005 8:42	1575	PbCal705
Instrument 2 - D	5	2	254	23276	7/28/2005 8:20	1575	PbCal705
Instrument 2 - D	6	2	282	23097	7/28/2005 8:06	1575	PbCal705
Instrument 2 - D	7	2	232	19264	7/28/2005 8:02	1575	PbCal705
Instrument 2 - D	8	2	274	21105	7/28/2005 7:55	1575	PbCal705
Instrument 2 - D	9	2	221	19341	7/28/2005 10:25	1575	PbCal705
Instrument 2 - D	10	2	250	20334	7/28/2005 10:21	1575	PbCal705
Instrument 2 - D	11	2	210	19513	7/28/2005 10:17	1575	PbCal705
Instrument 2 - D	12	2	241	20672	7/28/2005 10:10	1575	PbCal705
Instrument 3 - A	1	2	151	21669	7/28/2005 9:34	1575	PbCal705
Instrument 3 - A	2	2	140	21967	7/28/2005 10:05	1575	PbCal705
Instrument 3 - A	3	2	151	20088	7/28/2005 10:01	1575	PbCal705
Instrument 3 - A	4	2	162	21796	7/28/2005 9:42	1575	PbCal705
Instrument 3 - A	5	2	165	22294	7/28/2005 8:42	1575	PbCal705
Instrument 3 - A	6	2	180	22353	7/28/2005 9:21	1575	PbCal705
Instrument 3 - A	7	2	95	18346	7/28/2005 8:53	1575	PbCal705

*M 7/29/05*

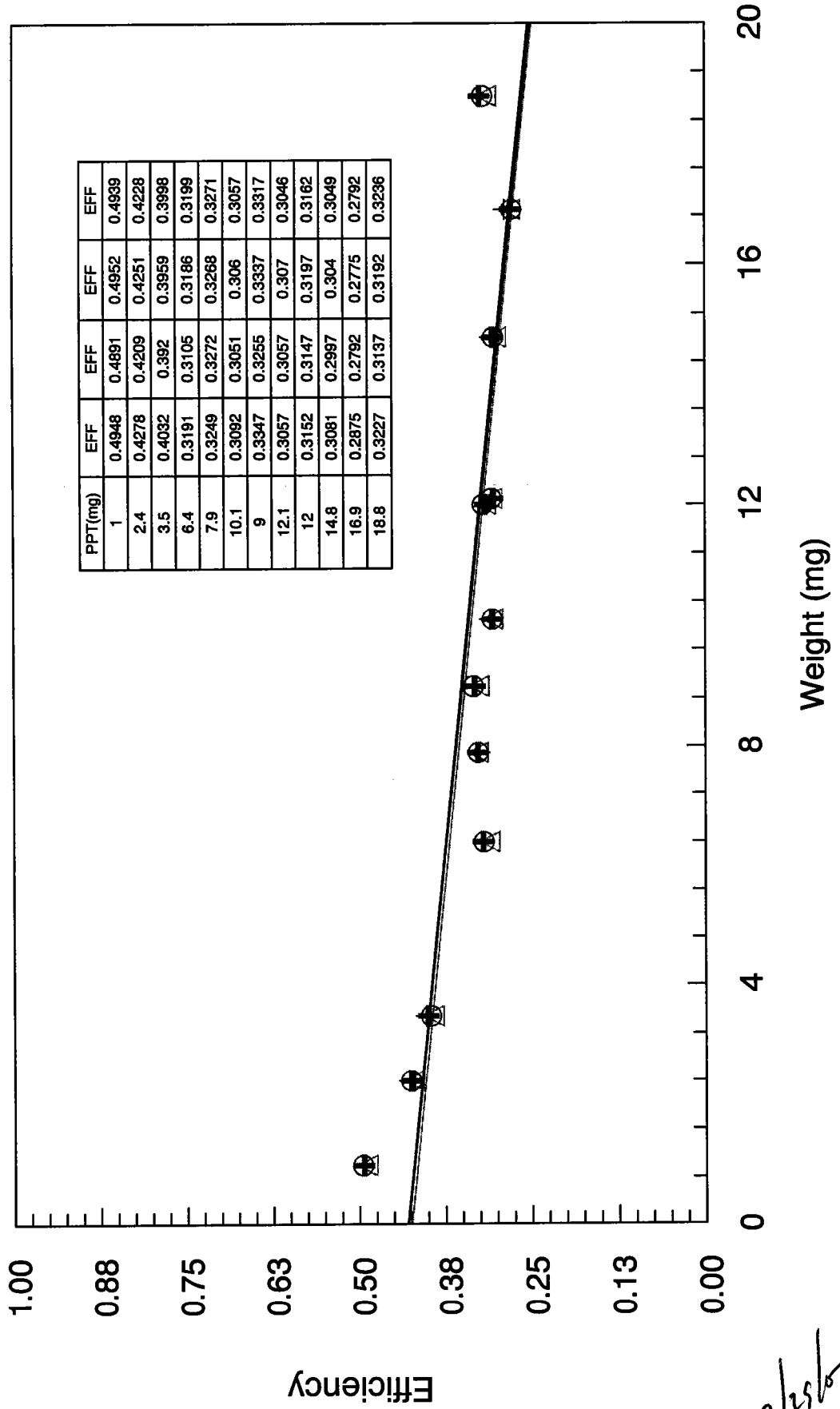
Instrument 3 - A	8	2	136	19841	7/28/2005 8:49	1575	PbCal705
Instrument 3 - A	9	2	104	18127	7/28/2005 7:56	1575	PbCal705
Instrument 3 - A	10	2	176	19341	7/28/2005 8:20	1575	PbCal705
Instrument 3 - A	11	2	120	18537	7/28/2005 8:06	1575	PbCal705
Instrument 3 - A	12	2	142	20233	7/28/2005 8:02	1575	PbCal705
Instrument 3 - B	1	2	236	21613	7/28/2005 9:42	1575	PbCal705
Instrument 3 - B	2	2	219	22011	7/28/2005 9:34	1575	PbCal705
Instrument 3 - B	3	2	220	20493	7/28/2005 10:05	1575	PbCal705
Instrument 3 - B	4	2	235	22109	7/28/2005 10:01	1575	PbCal705
Instrument 3 - B	5	2	244	22536	7/28/2005 8:49	1575	PbCal705
Instrument 3 - B	6	2	221	22658	7/28/2005 8:42	1575	PbCal705
Instrument 3 - B	7	2	207	18626	7/28/2005 9:21	1575	PbCal705
Instrument 3 - B	8	2	216	20102	7/28/2005 8:53	1575	PbCal705
Instrument 3 - B	9	2	188	18433	7/28/2005 8:02	1575	PbCal705
Instrument 3 - B	10	2	228	19517	7/28/2005 7:56	1575	PbCal705
Instrument 3 - B	11	2	189	19126	7/28/2005 8:20	1575	PbCal705
Instrument 3 - B	12	2	205	20505	7/28/2005 8:06	1575	PbCal705
Instrument 3 - C	1	2	322	21556	7/28/2005 10:01	1575	PbCal705
Instrument 3 - C	2	2	360	22173	7/28/2005 9:43	1575	PbCal705
Instrument 3 - C	3	2	329	20388	7/28/2005 9:34	1575	PbCal705
Instrument 3 - C	4	2	326	22168	7/28/2005 10:05	1575	PbCal705
Instrument 3 - C	5	2	338	23046	7/28/2005 8:53	1575	PbCal705
Instrument 3 - C	6	2	378	22957	7/28/2005 8:49	1575	PbCal705
Instrument 3 - C	7	2	283	18866	7/28/2005 8:42	1575	PbCal705
Instrument 3 - C	8	2	308	20233	7/28/2005 9:21	1575	PbCal705
Instrument 3 - C	9	2	291	18650	7/28/2005 8:06	1575	PbCal705
Instrument 3 - C	10	2	305	19515	7/28/2005 8:02	1575	PbCal705
Instrument 3 - C	11	2	290	19302	7/28/2005 7:56	1575	PbCal705
Instrument 3 - C	12	2	318	20119	7/28/2005 8:20	1575	PbCal705
Instrument 3 - D	1	2	244	21693	7/28/2005 10:05	1575	PbCal705
Instrument 3 - D	2	2	239	22623	7/28/2005 10:01	1575	PbCal705
Instrument 3 - D	3	2	241	20563	7/28/2005 9:43	1575	PbCal705
Instrument 3 - D	4	2	244	22484	7/28/2005 9:34	1575	PbCal705
Instrument 3 - D	5	2	258	23049	7/28/2005 9:21	1575	PbCal705
Instrument 3 - D	6	2	262	22650	7/28/2005 8:53	1575	PbCal705
Instrument 3 - D	7	2	196	19014	7/28/2005 8:50	1575	PbCal705
Instrument 3 - D	8	2	234	20041	7/28/2005 8:42	1575	PbCal705
Instrument 3 - D	9	2	213	18822	7/28/2005 8:20	1575	PbCal705
Instrument 3 - D	10	2	239	19800	7/28/2005 8:06	1575	PbCal705
Instrument 3 - D	11	2	221	18990	7/28/2005 8:02	1575	PbCal705
Instrument 3 - D	12	2	234	20049	7/28/2005 7:56	1575	PbCal705
Instrument 4 - A	1	2	179	22048	7/28/2005 10:09	1575	PbCal705
Instrument 4 - A	2	2	167	22217	7/28/2005 10:24	1575	PbCal705
Instrument 4 - A	3	2	149	20830	7/28/2005 10:20	1575	PbCal705
Instrument 4 - A	4	2	133	22551	7/28/2005 10:16	1575	PbCal705
Instrument 4 - A	5	2	137	23240	7/28/2005 9:34	1575	PbCal705
Instrument 4 - A	6	2	164	22718	7/28/2005 10:05	1575	PbCal705
Instrument 4 - A	7	2	130	19096	7/28/2005 10:01	1575	PbCal705
Instrument 4 - A	8	2	139	20375	7/28/2005 9:43	1575	PbCal705
Instrument 4 - A	9	2	126	18833	7/28/2005 8:42	1575	PbCal705
Instrument 4 - A	10	2	128	20217	7/28/2005 9:21	1575	PbCal705
Instrument 4 - A	11	2	149	19209	7/28/2005 8:53	1575	PbCal705

Instrument 4 - A	12	2	141	20634	7/28/2005 8:50	1575	PbCal705
Instrument 4 - B	1	2	19	22035	7/28/2005 10:16	1575	PbCal705
Instrument 4 - B	2	2	17	22750	7/28/2005 10:09	1575	PbCal705
Instrument 4 - B	3	2	21	21081	7/28/2005 10:24	1575	PbCal705
Instrument 4 - B	4	2	19	22859	7/28/2005 10:20	1575	PbCal705
Instrument 4 - B	5	2	19	23403	7/28/2005 9:43	1575	PbCal705
Instrument 4 - B	6	2	24	23177	7/28/2005 9:34	1575	PbCal705
Instrument 4 - B	7	2	13	19259	7/28/2005 10:05	1575	PbCal705
Instrument 4 - B	8	2	16	20883	7/28/2005 10:01	1575	PbCal705
Instrument 4 - B	9	2	12	19153	7/28/2005 8:50	1575	PbCal705
Instrument 4 - B	10	2	15	20262	7/28/2005 8:42	1575	PbCal705
Instrument 4 - B	11	2	23	19727	7/28/2005 9:21	1575	PbCal705
Instrument 4 - B	12	2	23	20878	7/28/2005 8:53	1575	PbCal705
Instrument 4 - C	1	2	249	22116	7/28/2005 10:20	1575	PbCal705
Instrument 4 - C	2	2	278	22252	7/28/2005 10:16	1575	PbCal705
Instrument 4 - C	3	2	254	20864	7/28/2005 10:09	1575	PbCal705
Instrument 4 - C	4	2	272	22535	7/28/2005 10:24	1575	PbCal705
Instrument 4 - C	5	2	272	23428	7/28/2005 10:02	1575	PbCal705
Instrument 4 - C	6	2	262	23097	7/28/2005 9:43	1575	PbCal705
Instrument 4 - C	7	2	208	19113	7/28/2005 9:35	1575	PbCal705
Instrument 4 - C	8	2	217	20633	7/28/2005 10:05	1575	PbCal705
Instrument 4 - C	9	2	233	18843	7/28/2005 8:53	1575	PbCal705
Instrument 4 - C	10	2	209	20281	7/28/2005 8:50	1575	PbCal705
Instrument 4 - C	11	2	244	19412	7/28/2005 8:43	1575	PbCal705
Instrument 4 - C	12	2	239	20691	7/28/2005 9:21	1575	PbCal705
Instrument 4 - D	1	2	522	21545	7/28/2005 10:25	1575	PbCal705
Instrument 4 - D	2	2	521	22295	7/28/2005 10:20	1575	PbCal705
Instrument 4 - D	3	2	520	20598	7/28/2005 10:16	1575	PbCal705
Instrument 4 - D	4	2	528	22522	7/28/2005 10:09	1575	PbCal705
Instrument 4 - D	5	2	519	23125	7/28/2005 10:05	1575	PbCal705
Instrument 4 - D	6	2	539	23225	7/28/2005 10:02	1575	PbCal705
Instrument 4 - D	7	2	422	18621	7/28/2005 9:43	1575	PbCal705
Instrument 4 - D	8	2	490	20410	7/28/2005 9:35	1575	PbCal705
Instrument 4 - D	9	2	450	18857	7/28/2005 9:21	1575	PbCal705
Instrument 4 - D	10	2	477	20057	7/28/2005 8:53	1575	PbCal705
Instrument 4 - D	11	2	424	19123	7/28/2005 8:50	1575	PbCal705
Instrument 4 - D	12	2	484	20501	7/28/2005 8:43	1575	PbCal705

# Pb-210 Efficiency Curve 7/05

## Instrument 1

+ 1-A    Δ 1-B    ○ 1-C    + 1-D

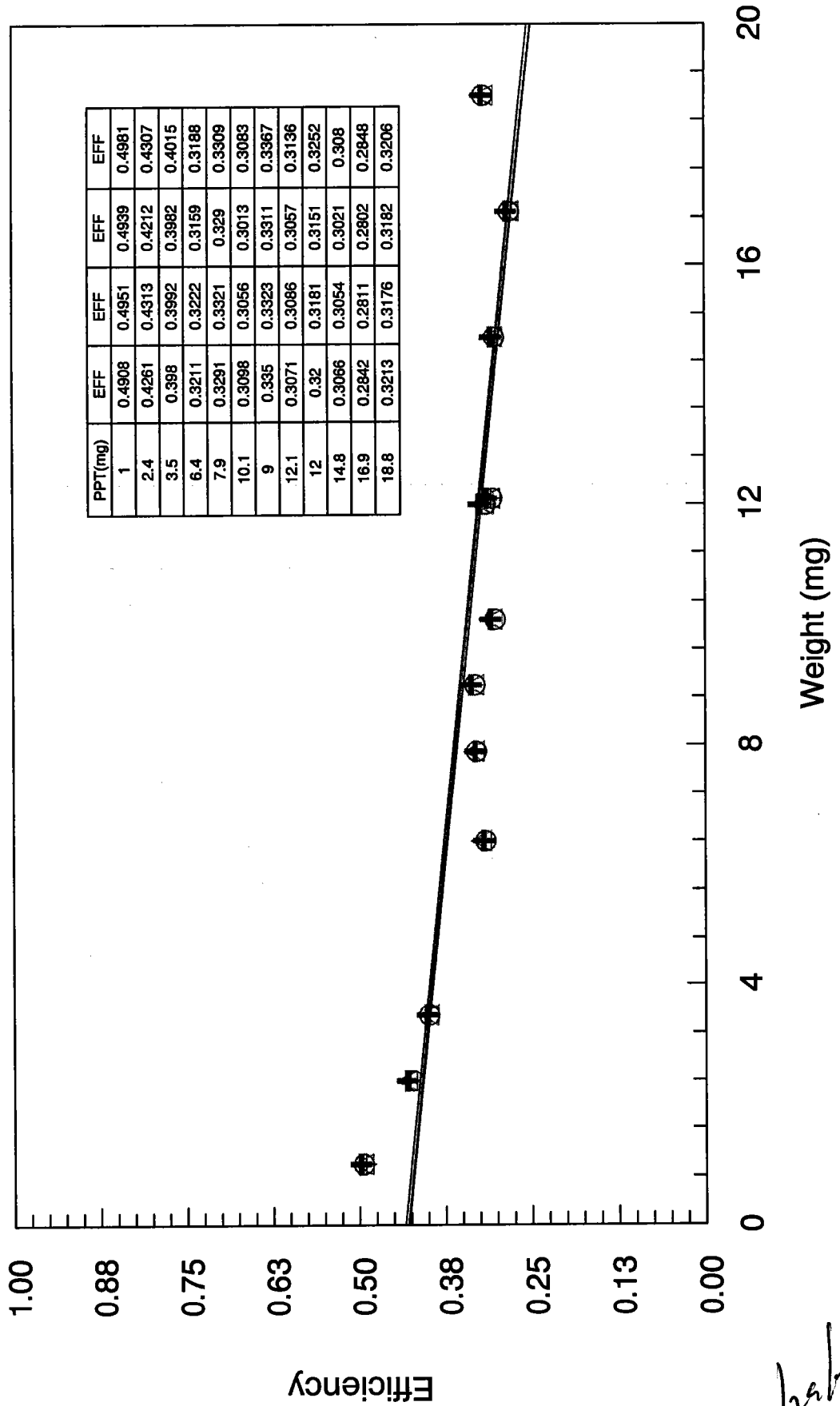


*Handwritten signature*

# Pb-210 Efficiency Curve 7/05

## Instrument 2

+ 2-A    Δ 2-B    ○ 2-C    + 2-D



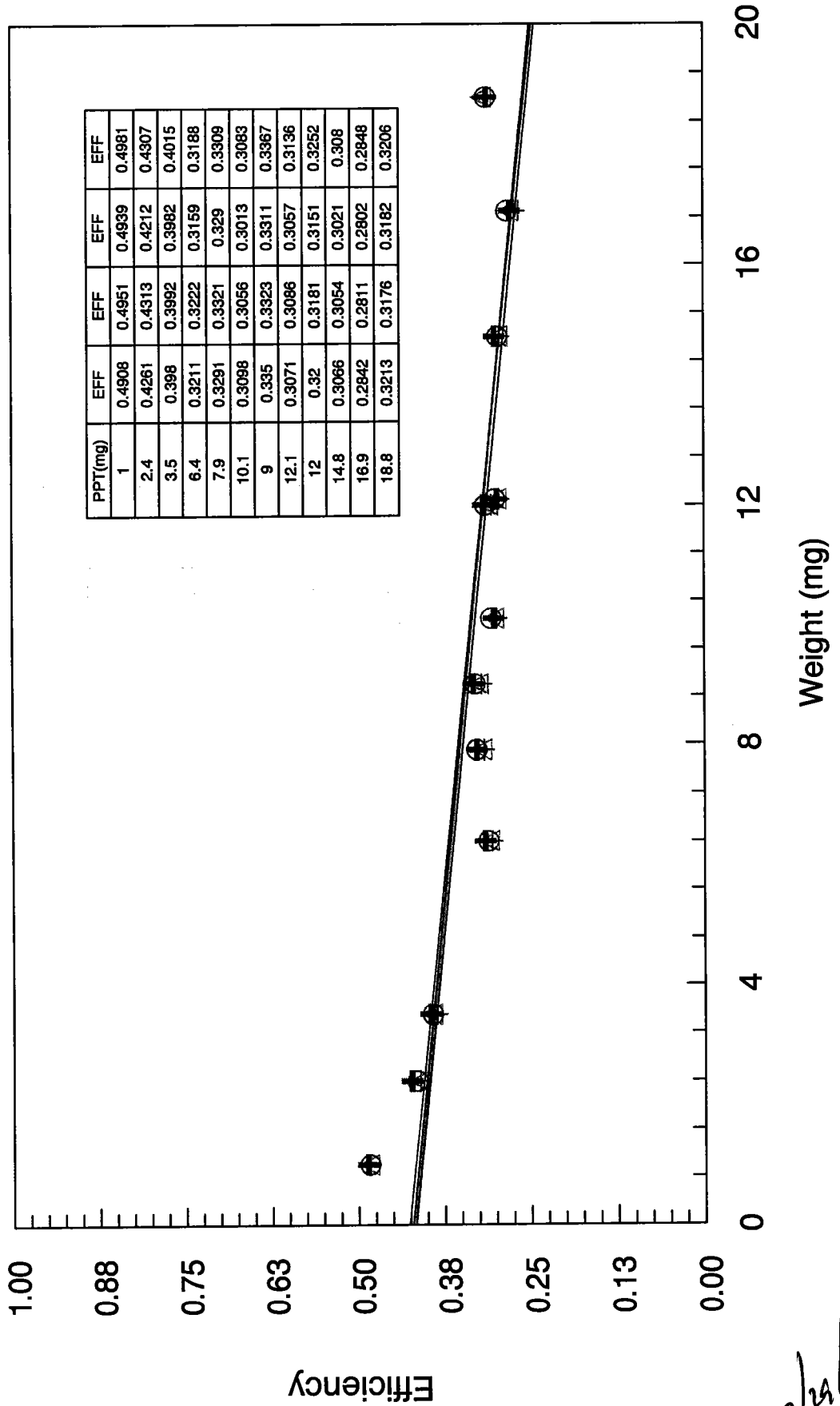
*Handwritten signature*



# Pb-210 Efficiency Curve 7/05

## Instrument 3

+ 3-A    Δ 3-B    ○ 3-C    + 3-D

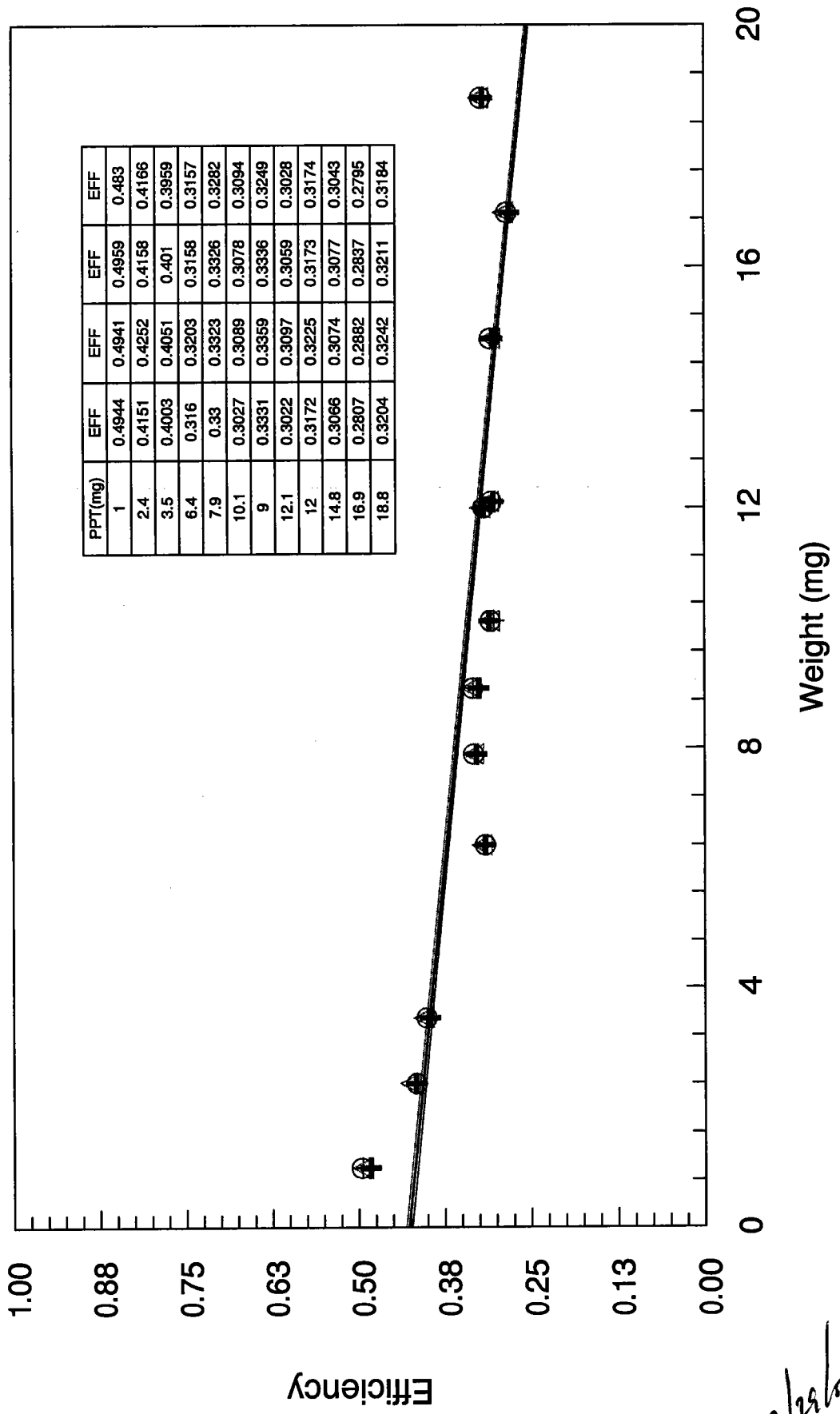


*Handwritten signature*

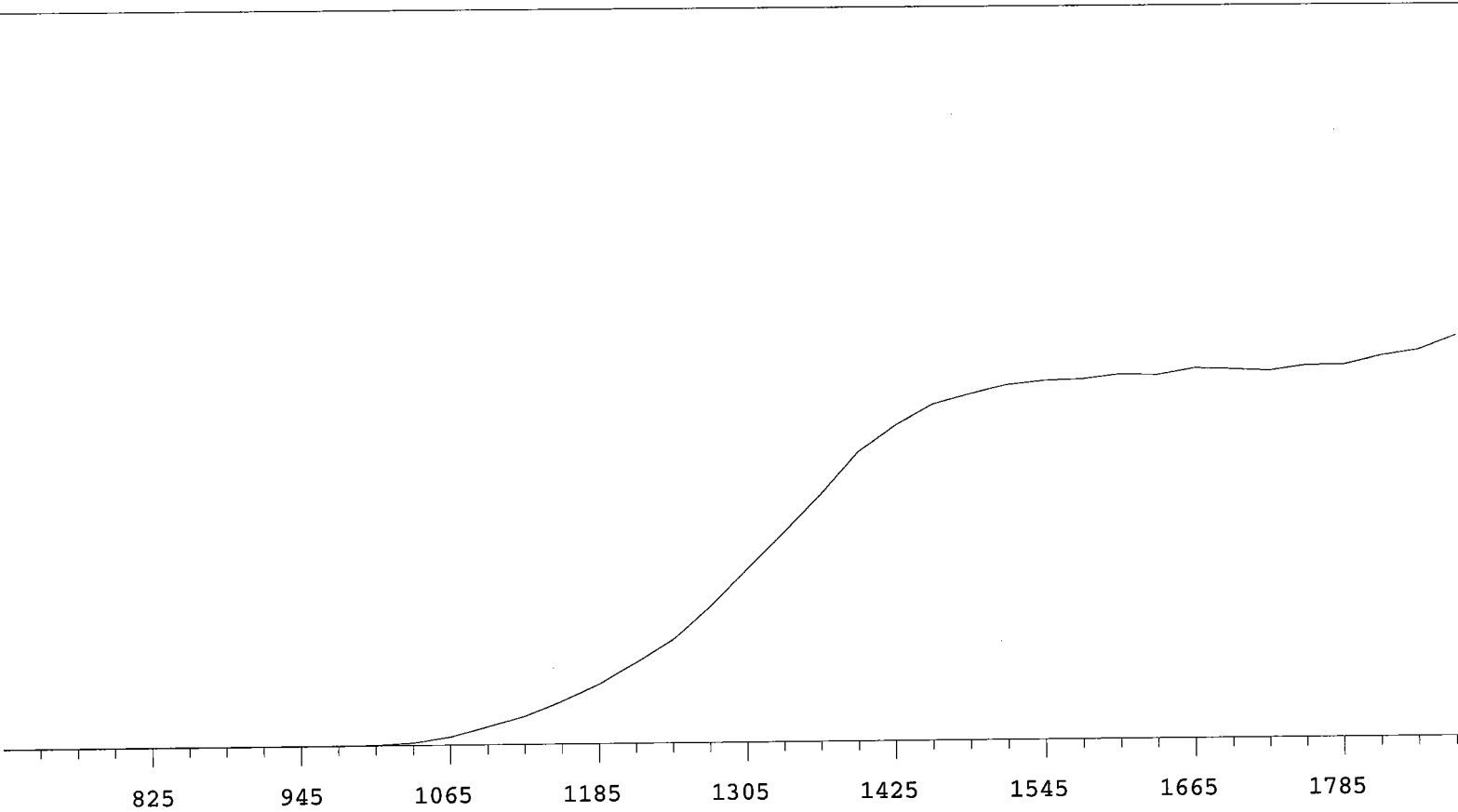
# Pb-210 Efficiency Curve 7/05

## Instrument 4

+ 4-A    Δ 4-B    ○ 4-C    + 4-D

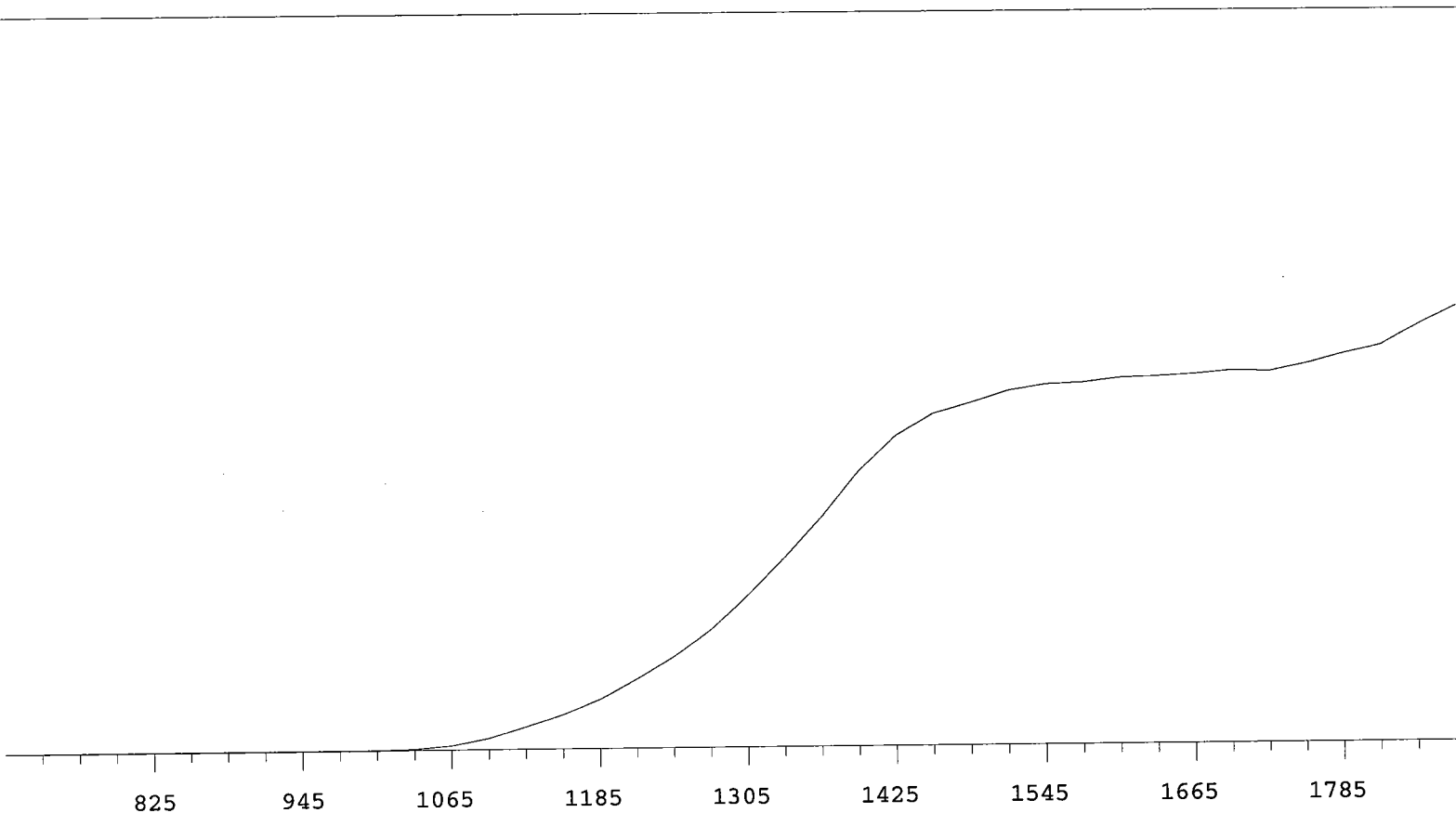


*7/2/05*



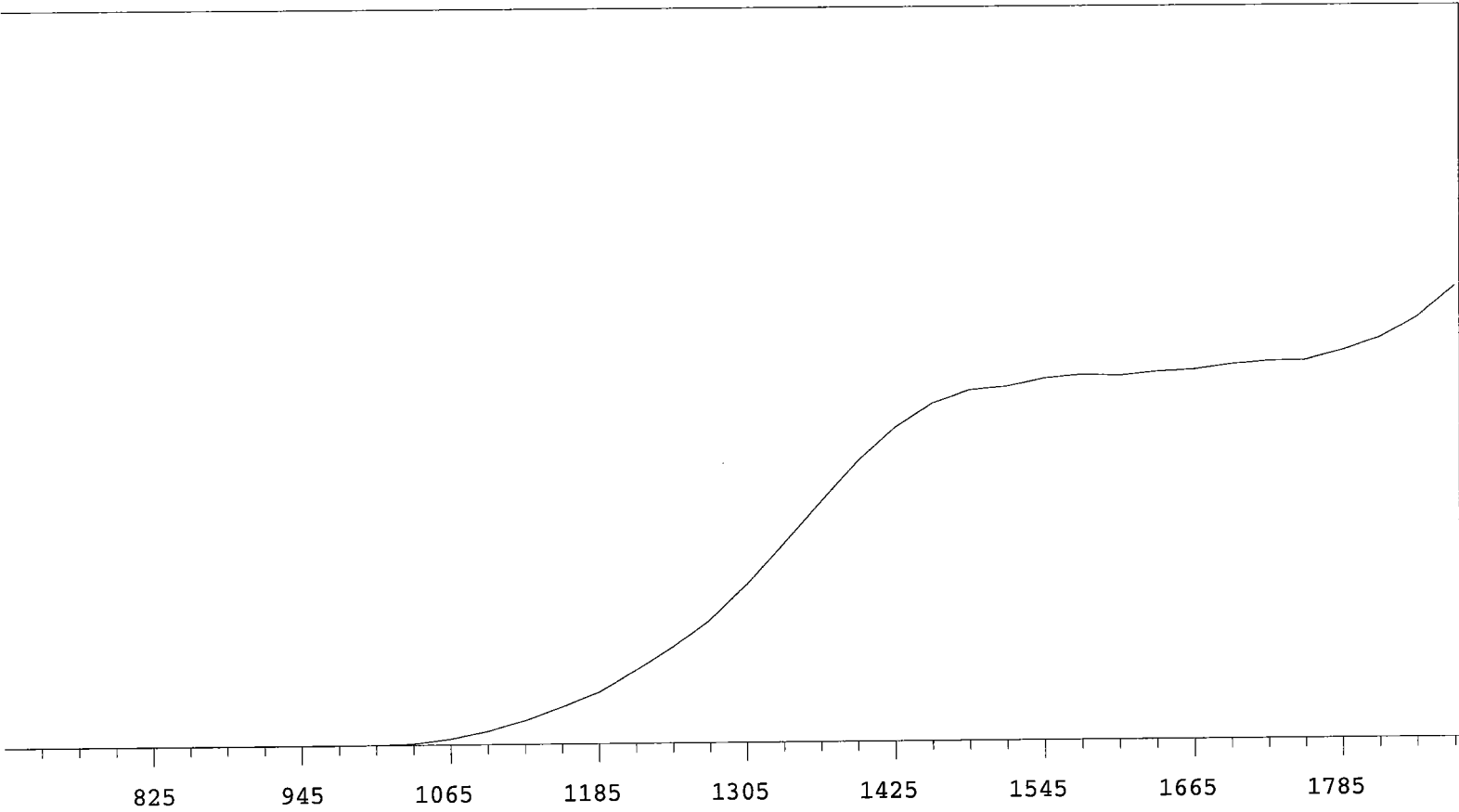
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	3		1305	16206	+70.03
735	1		1335	19739	+60.77
765	1	-18.52	1365	23317	+49.57
795	2	>100	1395	27238	+38.47
825	2	+76.92	1425	29745	+26.87
855	6	+0.00	1455	31733	+16.81
885	2	+0.00	1485	32738	+10.51
915	2	+0.00	1515	33561	+5.83
945	4	>100	1545	33929	+3.90
975	5	>100	1575	34042	+2.13
1005	45	>100	1605	34473	+2.40
1035	260	>100	1635	34376	+2.14
1065	800	>100	1665	34998	+0.99
1095	1706	>100	1695	34891	+1.35
1125	2681	>100	1725	34732	+0.78
1155	4043	>100	1755	35214	+2.68
1185	5606	+98.69	1785	35247	+4.20
1215	7546	+90.11	1815	36051	+6.12
1245	9680	+84.91	1845	36556	
1275	12706	+78.21	1875	37879	

*Yurkalo*



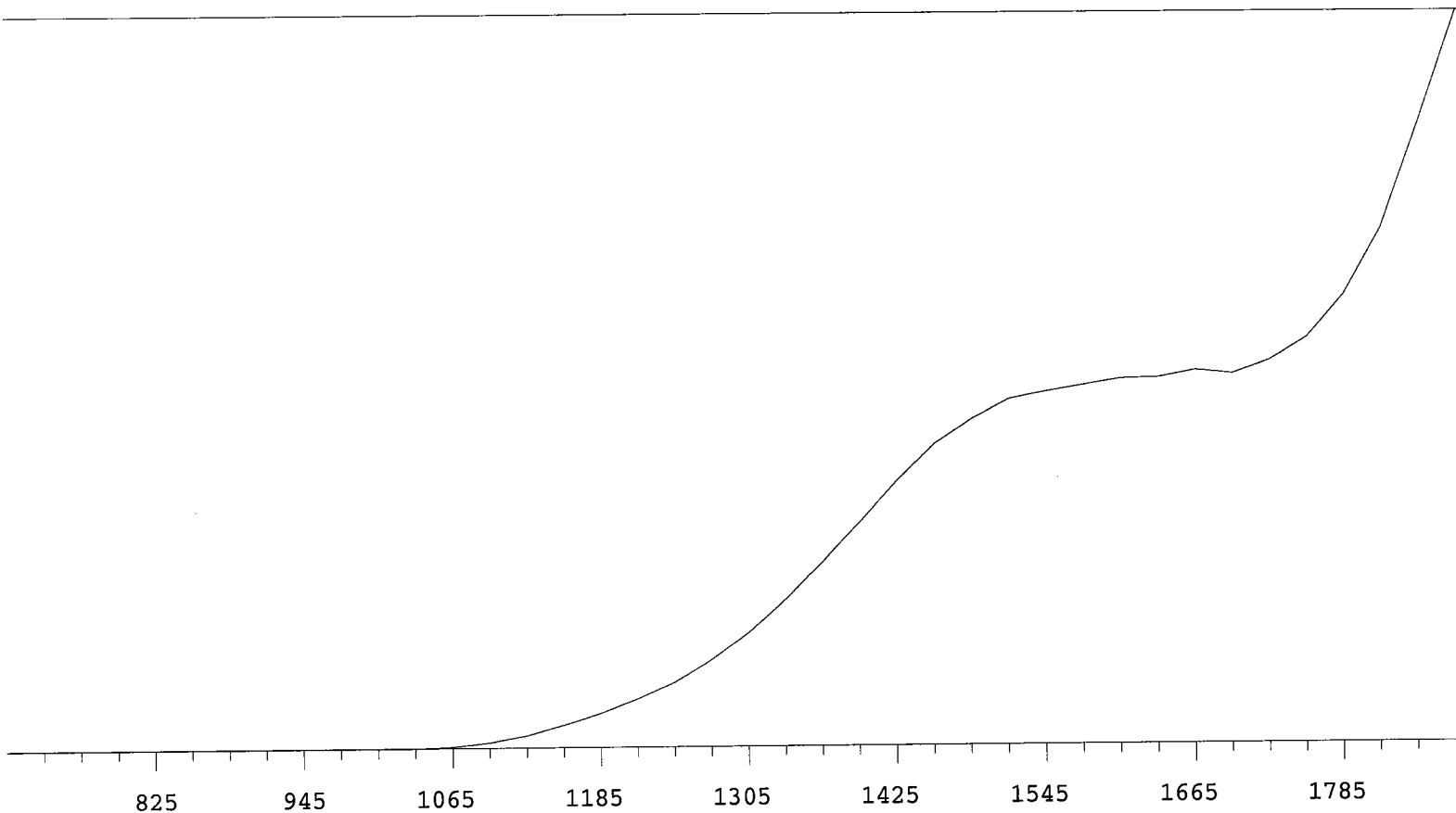
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	16022	+74.49
735	2		1335	19934	+67.06
765	3	+33.33	1365	24065	+57.27
795	2	-15.15	1395	28750	+45.17
825	2	-30.30	1425	32437	+31.43
855	2	+0.00	1455	34703	+19.63
885	2	+55.56	1485	35773	+11.94
915	2	+71.43	1515	37013	+7.34
945	4	>100	1545	37643	+5.08
975	4	>100	1575	37795	+2.85
1005	7	>100	1605	38223	+2.11
1035	115	>100	1635	38341	+2.22
1065	458	>100	1665	38578	+1.47
1095	1190	>100	1695	38896	+2.28
1125	2315	>100	1725	38794	+3.94
1155	3550	>100	1755	39562	+5.68
1185	5136	>100	1785	40569	+9.25
1215	7197	+97.45	1815	41402	+11.70
1245	9511	+89.47	1845	43531	
1275	12416	+81.91	1875	45470	

*Handwritten signature*  
7/18/05



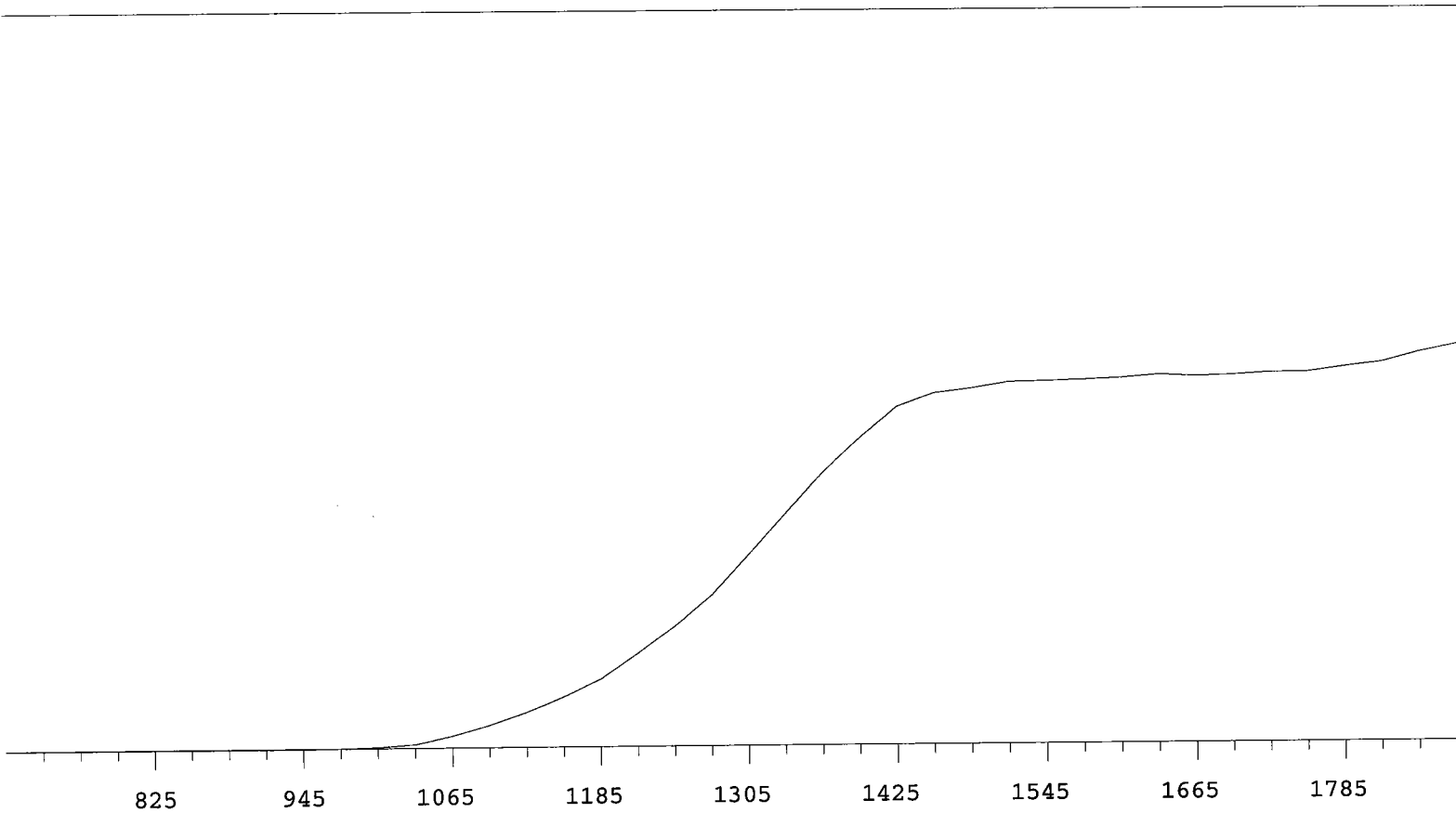
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16230	+74.23
735	0		1335	20402	+66.21
765	0		1365	24668	+55.06
795	1	>100	1395	28808	+42.90
825	0	>100	1425	32235	+30.71
855	2	+95.24	1455	34745	+19.08
885	2	>100	1485	36123	+11.26
915	2	+64.10	1515	36502	+6.50
945	3	>100	1545	37333	+3.68
975	4	>100	1575	37699	+2.82
1005	17	>100	1605	37570	+1.69
1035	154	>100	1635	37966	+2.25
1065	602	>100	1665	38158	+3.13
1095	1390	>100	1695	38687	+2.67
1125	2520	>100	1725	39009	+3.61
1155	3909	>100	1755	39083	+5.36
1185	5395	>100	1785	40069	+9.12
1215	7579	+92.75	1815	41344	+14.50
1245	9892	+86.09	1845	43429	
1275	12623	+79.89	1875	46557	

*per/col*



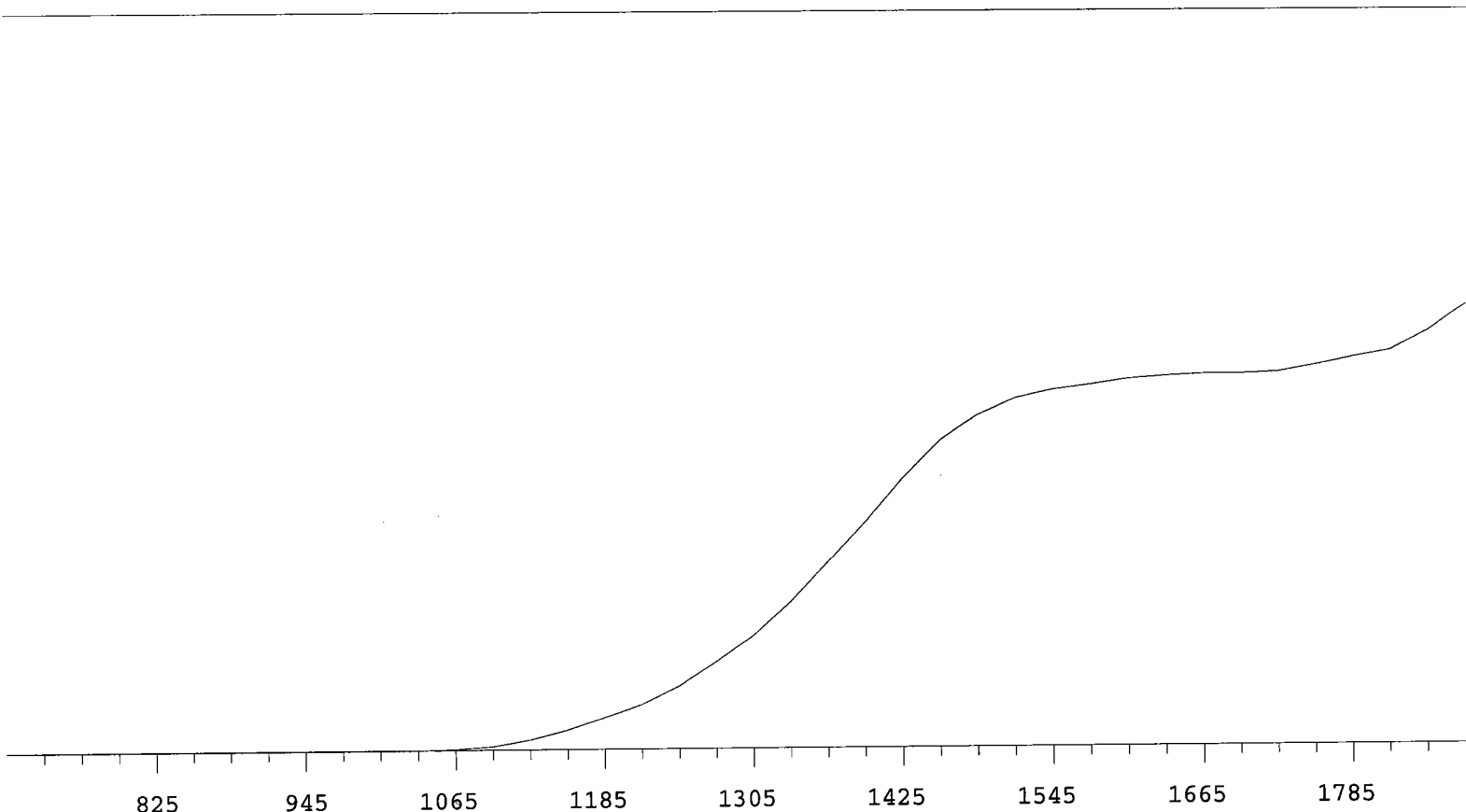
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	10971	+84.34
735	1		1335	14097	+75.14
765	2	+0.00	1365	17622	+66.59
795	1	-66.67	1395	21247	+57.12
825	0	>100	1425	25202	+45.74
855	1	+0.00	1455	28604	+34.50
885	0	+0.00	1485	30899	+22.78
915	1	+83.33	1515	32756	+13.99
945	0	>100	1545	33437	+8.81
975	2	>100	1575	34038	+5.07
1005	1	>100	1605	34638	+4.42
1035	13	>100	1635	34735	+2.60
1065	134	>100	1665	35372	+3.37
1095	511	>100	1695	35026	+7.70
1125	1129	>100	1725	36274	+15.84
1155	2134	>100	1755	38436	+28.19
1185	3197	>100	1785	42586	+41.27
1215	4542	>100	1815	48885	+52.29
1245	6086	+97.20	1845	58919	
1275	8291	+90.92	1875	71030	

*Y 7/25/05*



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	22314	+66.02
735	0		1335	27016	+56.65
765	0		1365	31730	+46.09
795	0	>100	1395	35861	+34.20
825	0	>100	1425	39521	+21.96
855	0	>100	1455	41096	+12.55
885	4	+33.33	1485	41618	+5.70
915	1	>100	1515	42360	+2.97
945	0	>100	1545	42428	+1.93
975	25	>100	1575	42562	+1.42
1005	123	>100	1605	42743	+1.15
1035	462	>100	1635	43108	+0.84
1065	1382	>100	1665	42891	+0.79
1095	2620	>100	1695	43031	+0.67
1125	4094	>100	1725	43288	+1.82
1155	5833	>100	1755	43345	+2.62
1185	7915	+97.20	1785	43916	+4.27
1215	10844	+88.32	1815	44430	+5.91
1245	14050	+81.59	1845	45569	
1275	17692	+73.63	1875	46488	

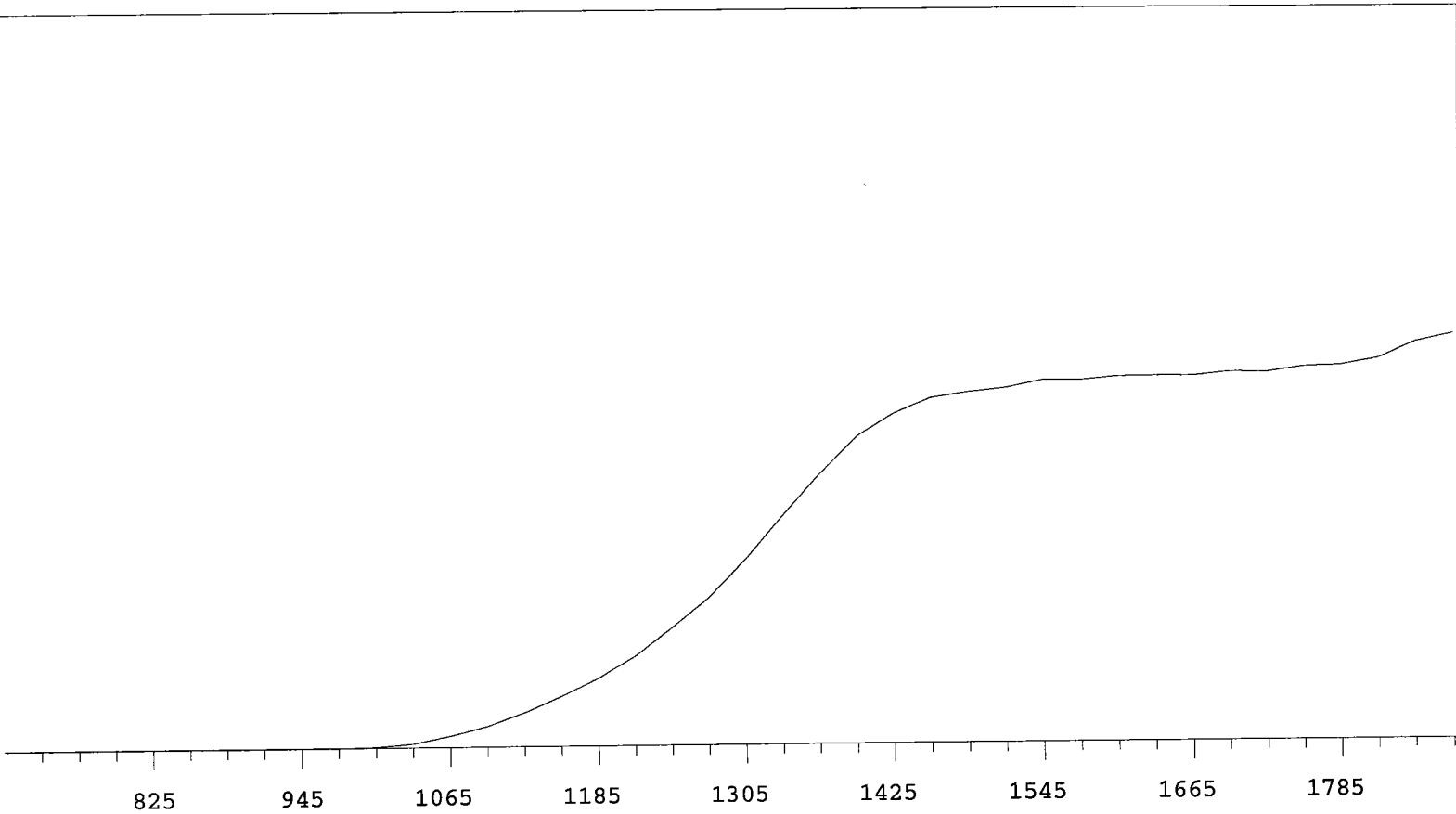
*Handwritten signature*



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	11504	+85.43
735	1		1335	14849	+76.81
765	2	+66.67	1365	18861	+68.80
795	1	-27.78	1395	22846	+58.63
825	1	+0.00	1425	27157	+46.27
855	1	>100	1455	30851	+34.04
885	2	+74.07	1485	33326	+22.12
915	3	+0.00	1515	34995	+13.15
945	2	+51.28	1545	35846	+7.97
975	1	>100	1575	36351	+4.94
1005	5	>100	1605	36888	+3.44
1035	11	>100	1635	37159	+2.18
1065	76	>100	1665	37334	+1.21
1095	354	>100	1695	37337	+1.96
1125	989	>100	1725	37477	+3.64
1155	1937	>100	1755	38192	+5.29
1185	3197	>100	1785	38972	+8.13
1215	4514	>100	1815	39629	+11.94
1245	6395	>100	1845	41535	
1275	8812	+93.25	1875	44161	

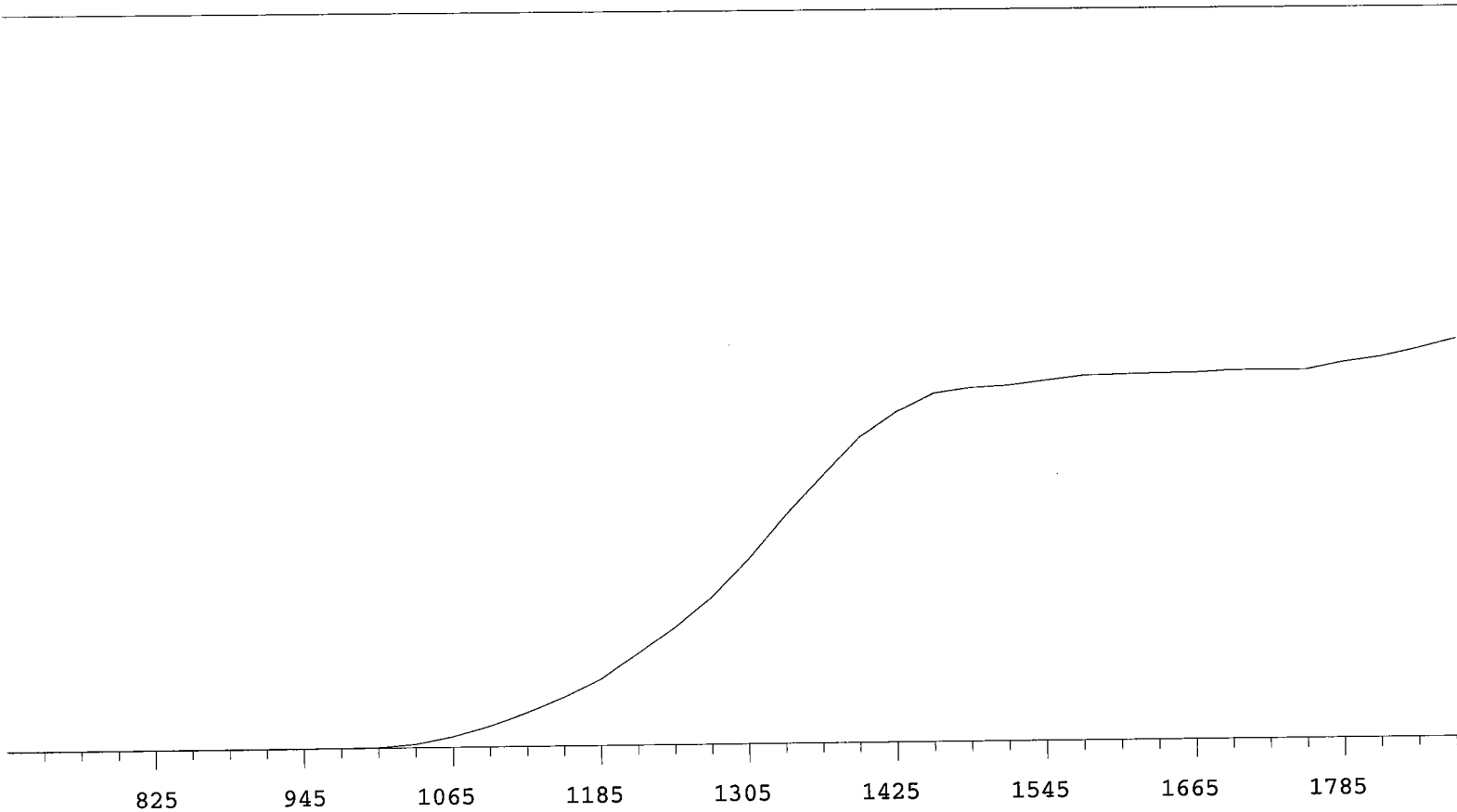
*gmk/ab*





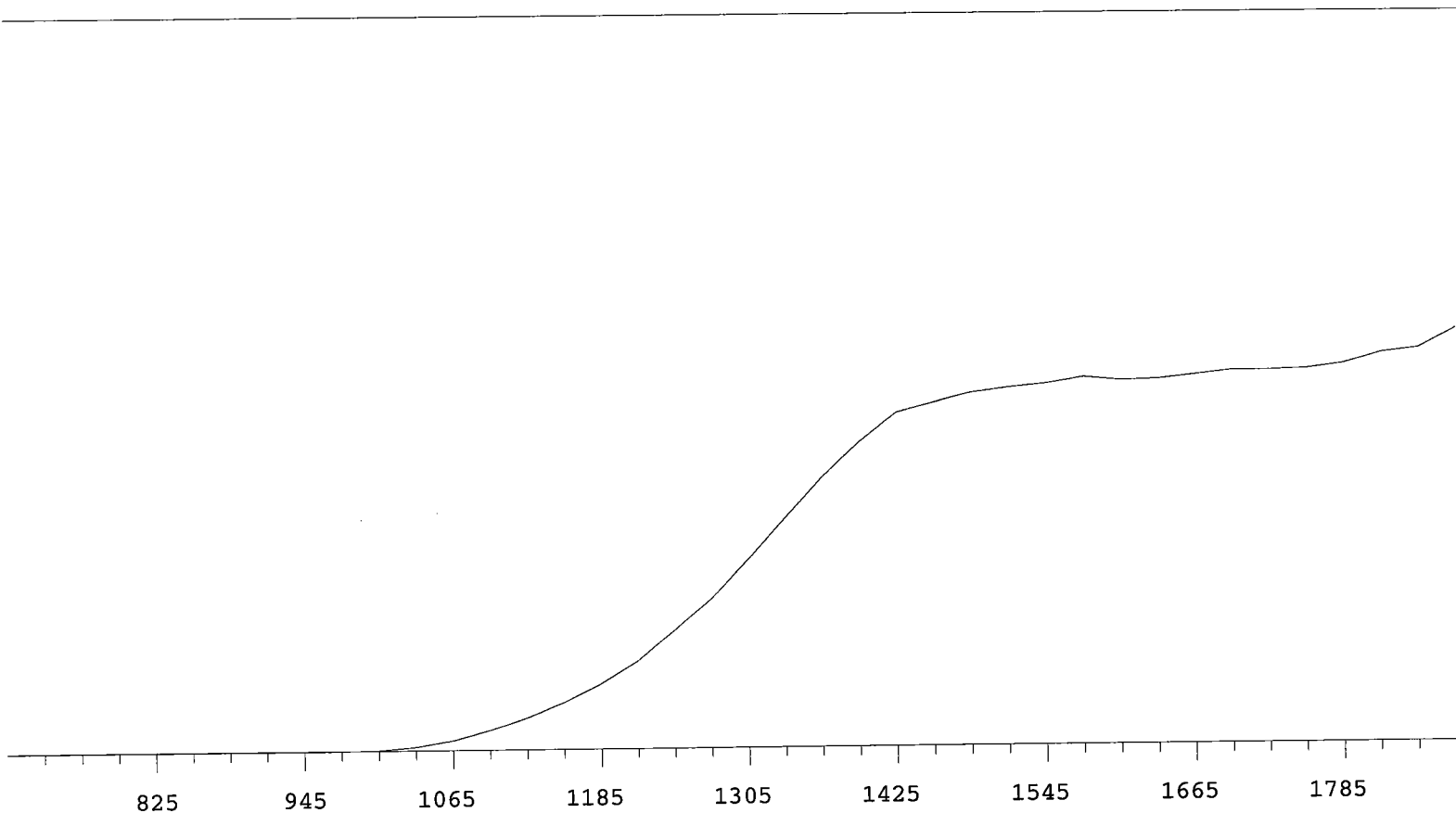
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	2		1305	16352	+67.34
735	6		1335	20077	+59.09
765	3	-20.83	1365	23789	+46.51
795	2	-58.82	1395	27076	+33.20
825	3	-41.67	1425	29091	+20.71
855	3	-66.67	1455	30421	+11.33
885	1	-30.30	1485	30894	+6.95
915	1	>100	1515	31231	+4.14
945	3	>100	1545	31889	+3.39
975	9	>100	1575	31864	+2.37
1005	87	>100	1605	32186	+0.96
1035	349	>100	1635	32217	+1.30
1065	1009	>100	1665	32174	+0.81
1095	1793	>100	1695	32499	+1.72
1125	2982	>100	1725	32437	+2.17
1155	4367	>100	1755	32922	+2.82
1185	5942	+97.04	1785	33023	+5.92
1215	7886	+87.16	1815	33599	+7.59
1245	10422	+80.66	1845	35066	
1275	13013	+74.57	1875	35778	

*pm 7/29/05*



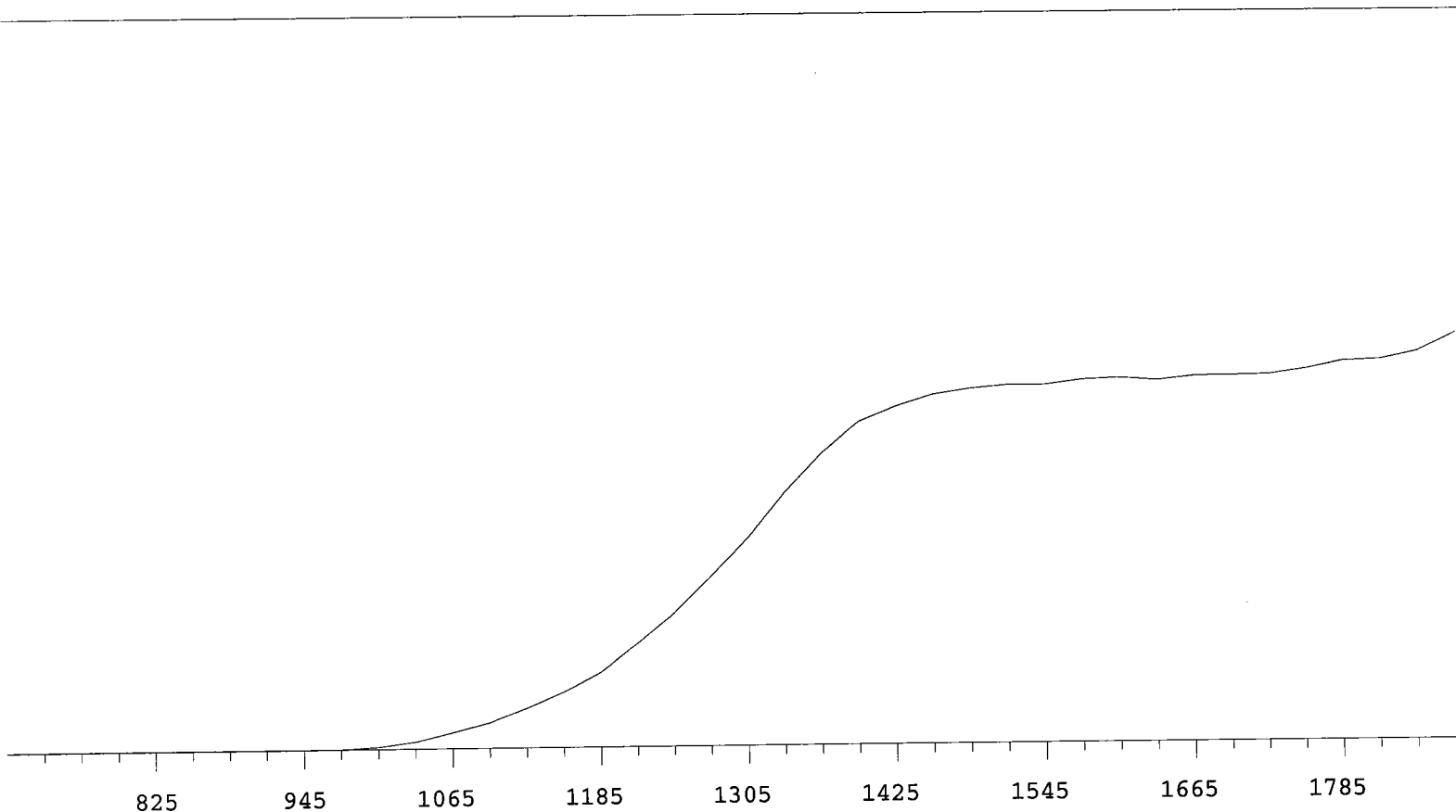
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	3		1305	22754	+66.54
735	1		1335	27979	+58.16
765	3	-55.56	1365	32713	+46.35
795	0	-23.81	1395	37461	+34.14
825	2	>100	1425	40450	+22.38
855	1	>100	1455	42675	+12.11
885	0	+66.67	1485	43308	+6.46
915	5	>100	1515	43568	+3.76
945	2	>100	1545	44157	+3.14
975	19	>100	1575	44714	+2.51
1005	86	>100	1605	44814	+1.32
1035	451	>100	1635	44910	+0.82
1065	1295	>100	1665	44945	+0.82
1095	2525	>100	1695	45204	+0.66
1125	4114	>100	1725	45222	+1.70
1155	5953	>100	1755	45215	+2.80
1185	8113	+98.45	1785	46095	+4.67
1215	11136	+88.70	1815	46688	+6.29
1245	14448	+81.12	1845	47723	
1275	18173	+74.07	1875	48829	

*Handwritten signature*



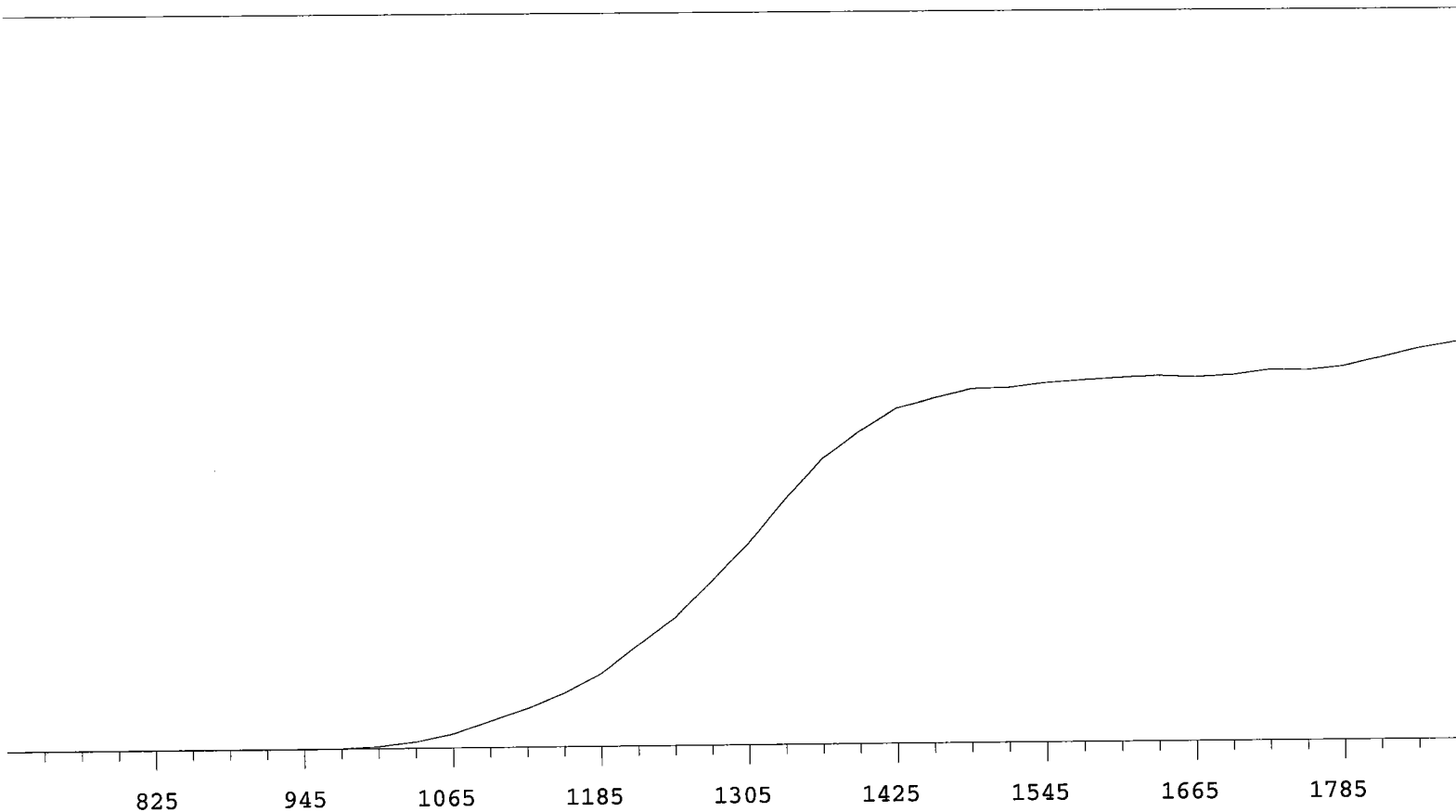
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	4		1305	19958	+67.03
735	4		1335	24246	+57.28
765	0		1365	28539	+46.21
795	0	+18.52	1395	32266	+33.26
825	1	>100	1425	35414	+21.60
855	4	+100.00	1455	36466	+12.52
885	3	-30.30	1485	37462	+6.66
915	2	+20.83	1515	37985	+5.29
945	1	>100	1545	38363	+3.02
975	6	>100	1575	39020	+1.64
1005	71	>100	1605	38677	+1.19
1035	402	>100	1635	38778	+1.48
1065	1048	>100	1665	39179	+2.33
1095	2130	>100	1695	39636	+2.03
1125	3384	>100	1725	39616	+1.90
1155	4976	>100	1755	39758	+3.40
1185	6855	>100	1785	40252	+4.91
1215	9208	+92.12	1815	41367	+7.87
1245	12454	+85.04	1845	41801	
1275	15798	+76.70	1875	43872	

*msk*



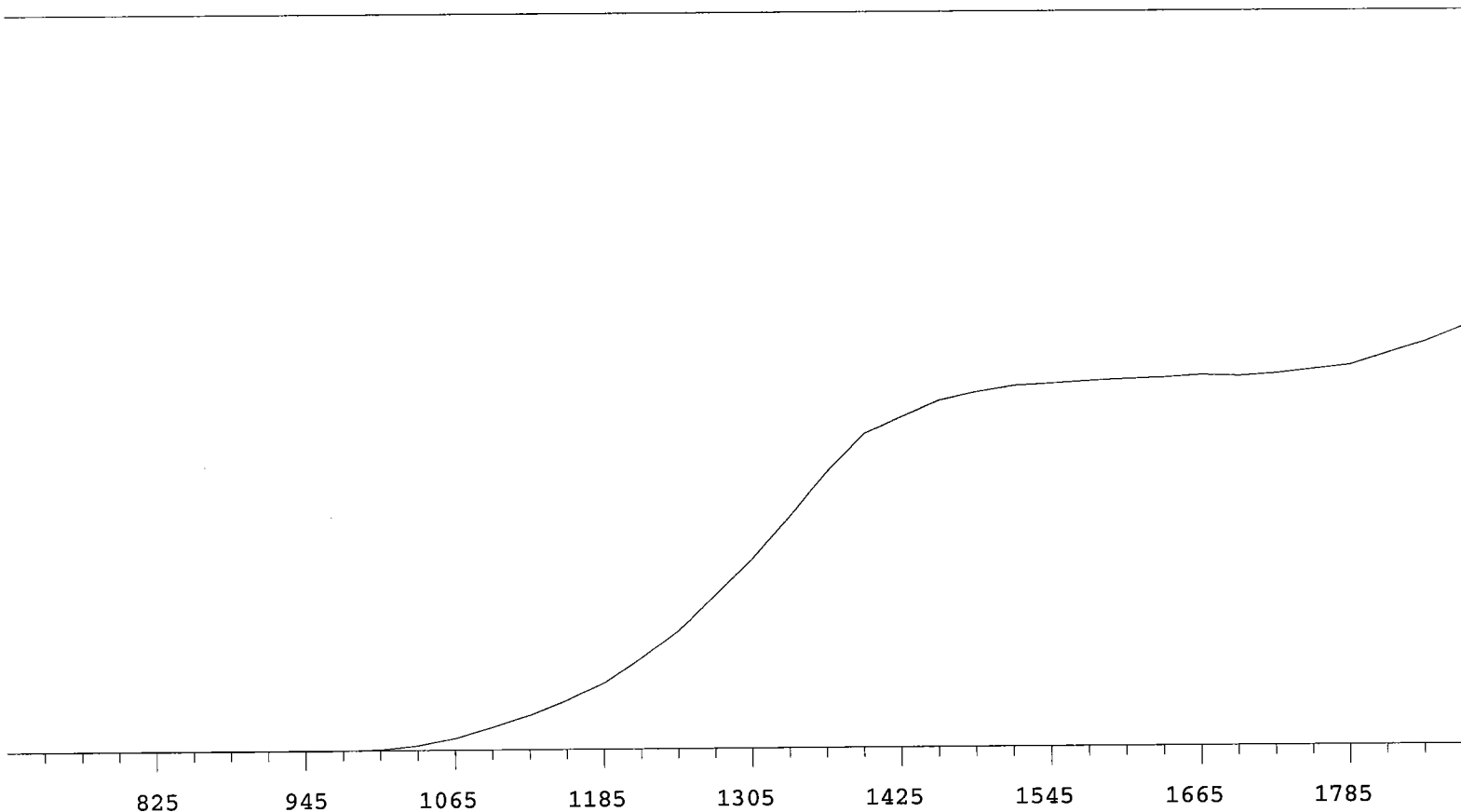
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	17371	+61.82
735	0		1335	21059	+51.03
765	1		1365	24146	+38.17
795	2	>100	1395	26716	+25.34
825	3	+0.00	1425	27972	+15.55
855	2	-33.33	1455	28941	+8.73
885	1	-33.33	1485	29433	+4.91
915	2	>100	1515	29724	+2.97
945	2	>100	1545	29727	+2.22
975	23	>100	1575	30112	+1.21
1005	188	>100	1605	30235	+1.21
1035	628	>100	1635	30012	+0.64
1065	1402	>100	1665	30324	+0.75
1095	2202	>100	1695	30358	+1.95
1125	3405	>100	1725	30404	+3.02
1155	4734	>100	1755	30862	+3.77
1185	6329	+95.04	1785	31464	+4.62
1215	8730	+88.10	1815	31575	+6.76
1245	11220	+79.46	1845	32217	
1275	14252	+70.70	1875	33728	

*mshab*



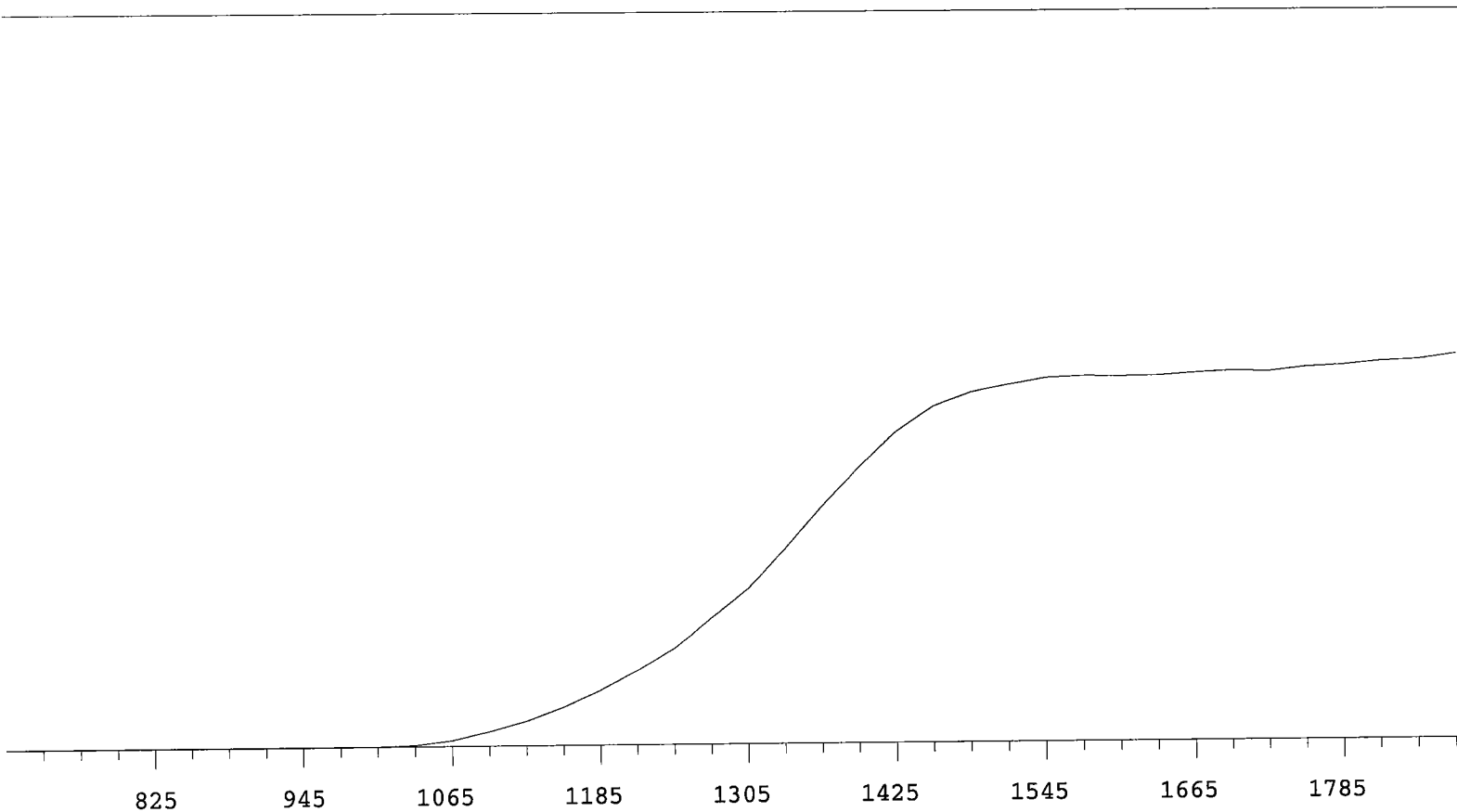
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19992	+64.10
735	1		1335	24434	+52.32
765	2	-55.56	1365	28341	+40.24
795	0	-83.33	1395	31016	+27.00
825	0	>100	1425	33244	+17.26
855	1	>100	1455	34234	+10.11
885	0	>100	1485	35116	+5.57
915	1	>100	1515	35198	+3.72
945	7	>100	1545	35658	+2.57
975	26	>100	1575	35928	+2.43
1005	201	>100	1605	36121	+1.20
1035	622	>100	1635	36271	+0.67
1065	1395	>100	1665	36135	+1.26
1095	2589	>100	1695	36285	+1.47
1125	3807	>100	1725	36799	+2.20
1155	5311	>100	1755	36745	+3.29
1185	7258	+96.60	1785	37112	+4.71
1215	10100	+88.77	1815	37953	+6.34
1245	12793	+79.49	1845	38842	
1275	16338	+71.46	1875	39499	

*Jan 12 2006*



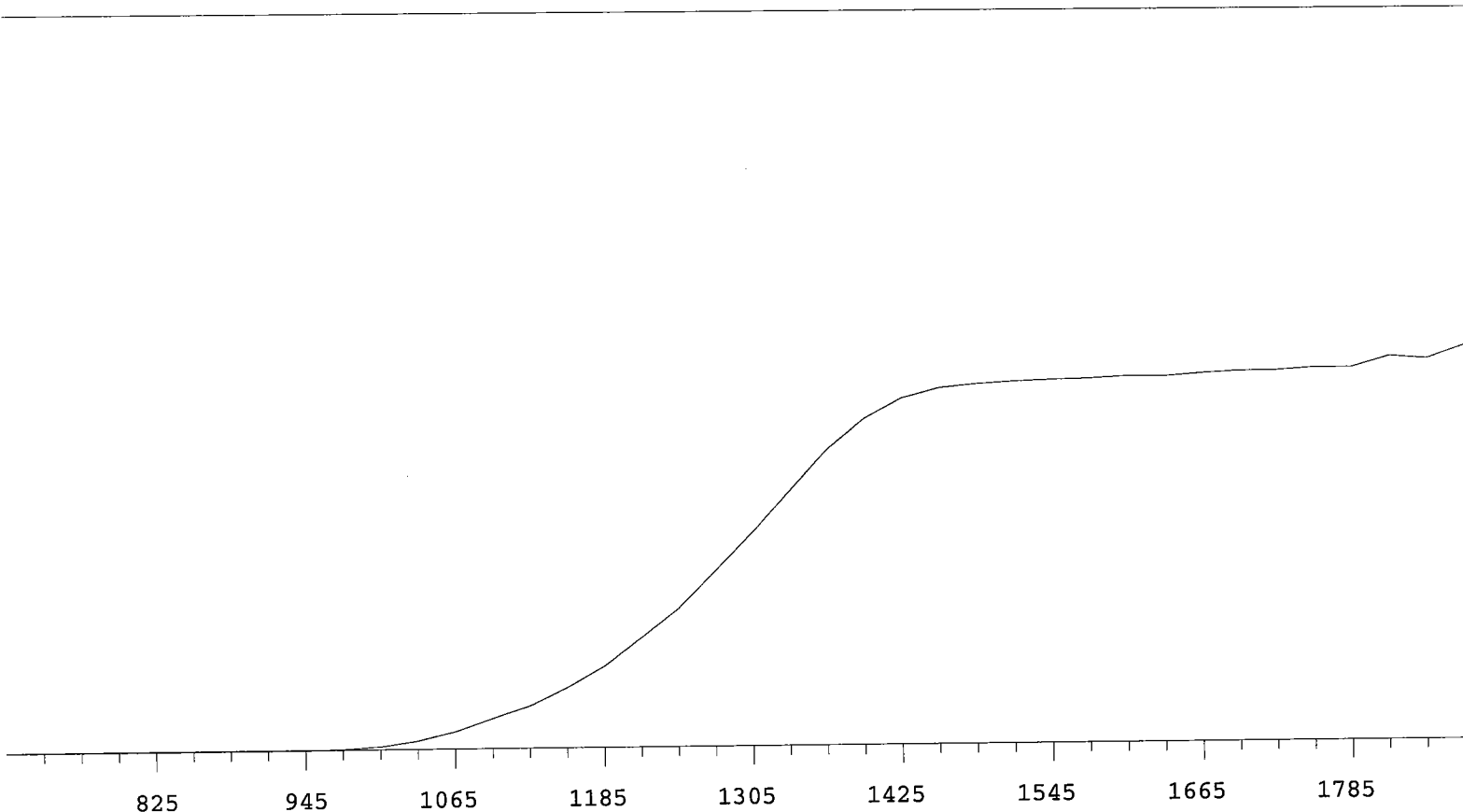
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	3		1305	20823	+66.52
735	0		1335	25209	+57.37
765	0	-27.78	1365	30058	+44.75
795	1	>100	1395	34207	+31.58
825	2	+41.67	1425	35961	+19.48
855	0	+27.78	1455	37712	+11.46
885	1	+0.00	1485	38621	+7.54
915	2	>100	1515	39266	+4.27
945	1	>100	1545	39505	+2.69
975	12	>100	1575	39765	+1.77
1005	101	>100	1605	39960	+1.71
1035	505	>100	1635	40095	+1.10
1065	1271	>100	1665	40363	+0.99
1095	2435	>100	1695	40227	+1.48
1125	3717	>100	1725	40494	+2.25
1155	5349	>100	1755	40925	+4.61
1185	7264	+98.50	1785	41387	+6.78
1215	9948	+91.79	1815	42624	+9.20
1245	13035	+83.57	1845	43902	
1275	16927	+74.29	1875	45583	

*m7/25/05*



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	2		1305	18669	+72.76
735	0		1335	23370	+64.55
765	0	+66.67	1365	28550	+55.91
795	0	>100	1395	33260	+43.78
825	3	+83.33	1425	37418	+31.11
855	0	-83.33	1455	40334	+20.16
885	1	>100	1485	41951	+12.02
915	0	>100	1515	42838	+6.74
945	1	>100	1545	43602	+3.50
975	3	>100	1575	43809	+1.61
1005	34	>100	1605	43735	+0.82
1035	190	>100	1635	43823	+1.13
1065	725	>100	1665	44134	+1.17
1095	1724	>100	1695	44358	+1.41
1125	2937	>100	1725	44239	+1.42
1155	4543	>100	1755	44705	+1.95
1185	6429	>100	1785	44909	+2.35
1215	8789	+94.33	1815	45328	+2.52
1245	11443	+85.00	1845	45509	
1275	15155	+78.33	1875	46116	

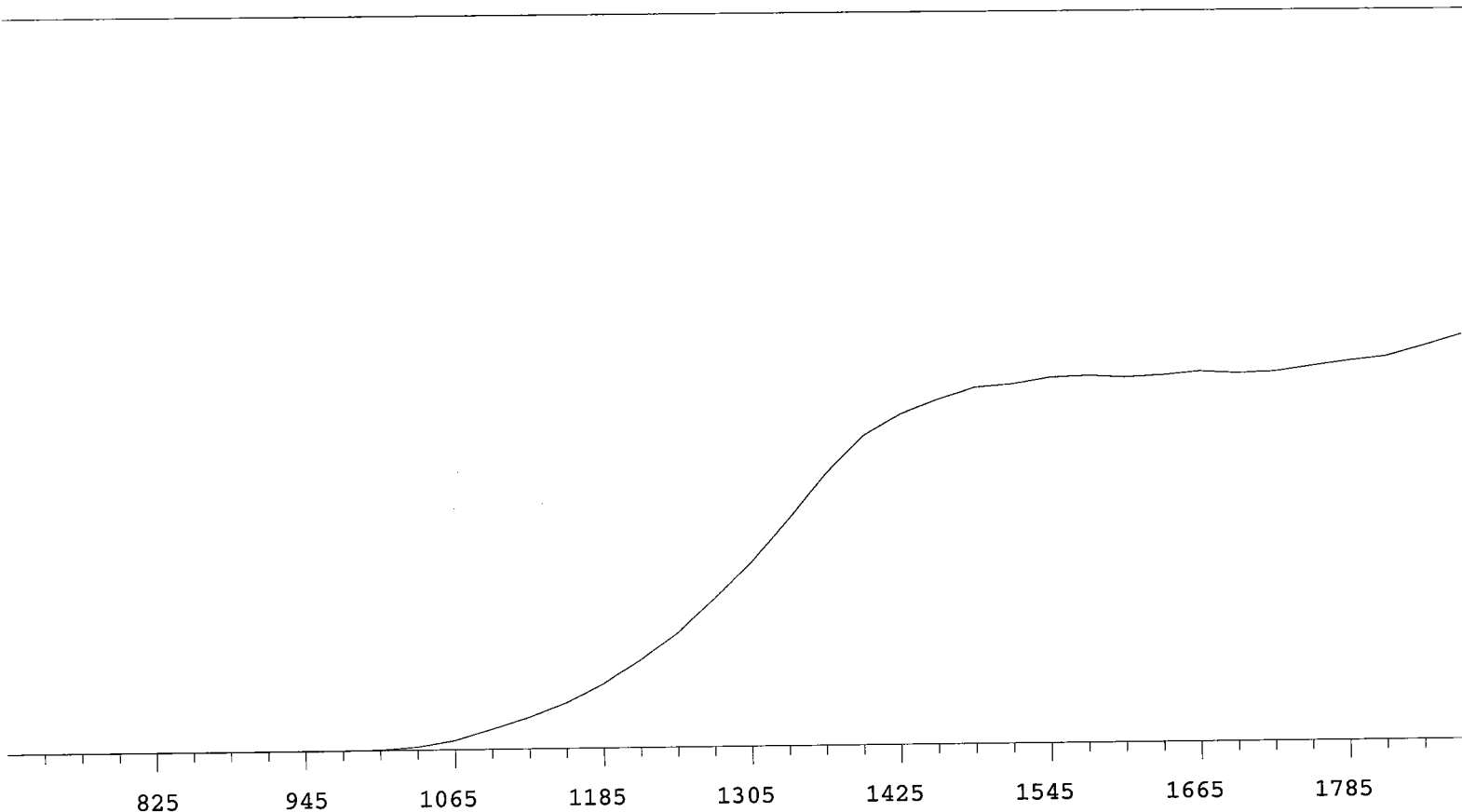
*msh*



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	3		1305	17564	+61.34
735	2		1335	20983	+50.92
765	1	-66.67	1365	24340	+39.30
795	4	+45.45	1395	26885	+26.88
825	0	+30.30	1425	28563	+15.81
855	4	+0.00	1455	29365	+8.25
885	2	>100	1485	29683	+3.89
915	3	>100	1515	29898	+2.00
945	6	>100	1545	30019	+1.51
975	42	>100	1575	30093	+1.01
1005	244	>100	1605	30263	+1.18
1035	697	>100	1635	30232	+1.46
1065	1429	>100	1665	30485	+1.36
1095	2487	>100	1695	30648	+1.63
1125	3483	>100	1725	30678	+1.10
1155	4980	>100	1755	30883	+2.70
1185	6683	+92.69	1785	30876	+2.89
1215	8988	+84.24	1815	31805	+4.51
1245	11345	+76.74	1845	31569	
1275	14366	+68.74	1875	32673	

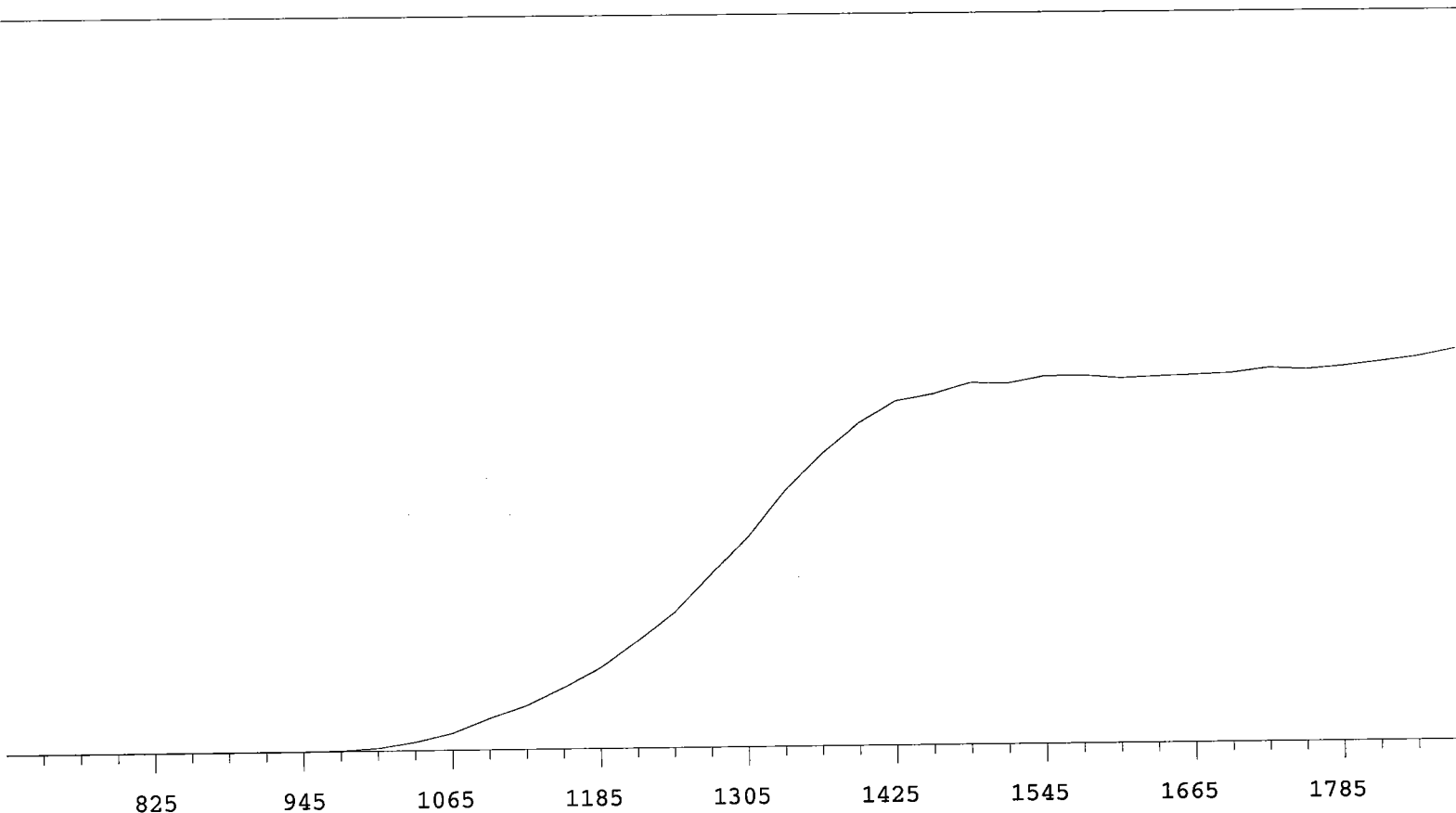
*Handwritten signature*





VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	17606	+68.88
735	0		1335	21599	+59.41
765	0		1365	25809	+47.05
795	0	>100	1395	29372	+33.37
825	2	>100	1425	31486	+21.76
855	0	+100.00	1455	32894	+12.91
885	1	>100	1485	34077	+8.33
915	2	>100	1515	34357	+5.14
945	4	>100	1545	34948	+2.35
975	10	>100	1575	35100	+1.39
1005	53	>100	1605	34930	+0.94
1035	327	>100	1635	35093	+0.78
1065	902	>100	1665	35444	+1.03
1095	1970	>100	1695	35257	+1.49
1125	3079	>100	1725	35393	+2.34
1155	4435	>100	1755	35908	+3.77
1185	6202	+99.16	1785	36373	+5.15
1215	8385	+91.20	1815	36800	+6.47
1245	10930	+83.12	1845	37764	
1275	14132	+75.94	1875	38815	

*Handwritten signature/initials*



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	4		1305	21893	+61.23
735	3		1335	26615	+50.22
765	1		1365	30345	+39.18
795	1	>100	1395	33570	+25.90
825	0	>100	1425	35845	+16.79
855	1	>100	1455	36520	+8.95
885	5	>100	1485	37628	+5.26
915	3	>100	1515	37539	+3.72
945	14	>100	1545	38268	+1.30
975	77	>100	1575	38301	+0.80
1005	298	>100	1605	37985	-0.13
1035	932	>100	1635	38135	+0.48
1065	1829	>100	1665	38276	+1.84
1095	3311	>100	1695	38429	+1.51
1125	4603	>100	1725	38899	+1.48
1155	6424	+96.24	1755	38695	+1.85
1185	8451	+88.86	1785	39003	+2.37
1215	11201	+83.16	1815	39457	+4.14
1245	14170	+76.31	1845	39914	
1275	18128	+69.83	1875	40696	

*mu 9/29/05*

# Pb-210 WATER

Batch : CALVER  
 Analyst : JMJ  
 Date : 7/28/2005

Procedure Code : GFC\_PBL  
 Parmname : Lead-210  
 Batch Counted On : PIC  
 Lead Carrier Weight : 14.65 mg/mL

Required MDA : 5.00 pCi/L  
 Bkg Count Time : 500 min

Sample ID	Sample Aliquot L	Sample Date/Time	Prep Date	Carrier Weight mg	Bi-210 Start Time	Bi-210 Ingrowth Factor	Detector Number#	Count Time min
V1	1.000	7/14/2005 0:00	7/14/2005	1.30	7/14/2005 8:00	0.858	1A	10
V2	1.000	7/14/2005 0:00	7/14/2005	2.10	7/14/2005 8:00	0.858	1B	10
V3	1.000	7/14/2005 0:00	7/14/2005	3.60	7/14/2005 8:00	0.858	1C	10
V4	1.000	7/14/2005 0:00	7/14/2005	5.00	7/14/2005 8:00	0.858	1D	10
V5	1.000	7/14/2005 0:00	7/14/2005	7.00	7/14/2005 8:00	0.858	2A	10
V6	1.000	7/14/2005 0:00	7/14/2005	8.80	7/14/2005 8:00	0.858	2B	10
V7	1.000	7/14/2005 0:00	7/14/2005	11.70	7/14/2005 8:00	0.858	2C	10
V8	1.000	7/14/2005 0:00	7/14/2005	13.40	7/14/2005 8:00	0.858	2D	10
V9	1.000	7/14/2005 0:00	7/14/2005	12.90	7/14/2005 8:00	0.858	3A	10
V10	1.000	7/14/2005 0:00	7/14/2005	15.30	7/14/2005 8:00	0.858	3B	10
V11	1.000	7/14/2005 0:00	7/14/2005	15.70	7/14/2005 8:00	0.858	3C	10
V12	1.000	7/14/2005 0:00	7/14/2005	19.80	7/14/2005 8:00	0.858	3D	10
V1	1.000	7/14/2005 0:00	7/14/2005	1.30	7/14/2005 8:00	0.858	4A	10
V2	1.000	7/14/2005 0:00	7/14/2005	2.10	7/14/2005 8:00	0.858	4B	10
V3	1.000	7/14/2005 0:00	7/14/2005	3.60	7/14/2005 8:00	0.858	4C	10
V4	1.000	7/14/2005 0:00	7/14/2005	5.00	7/14/2005 8:00	0.858	4D	10

*Handwritten signature*  
 7/28/05

Pb-210 0.1 ML  
 ET491-A 80900.6 DPM  
 3644.17 pCi/L

Total Beta Counts	Raw cpm	Detector Efficiency dec	BKG cpm	Counted Time	Sample Decay Factor	Test Rec. dec	Pb-210 MDA pCi/L	Pb-210 RESULT pCi/L	Pb-210 Recovery (%)
22806	2280.60	0.4191	0.362	7/28/2005 10:51	0.999	0.8874	1.636	3223.022	88.44%
23555	2355.50	0.4061	0.296	7/28/2005 10:51	0.999	0.7167	1.937	4252.948	116.71%
25567	2556.70	0.3977	0.36	7/28/2005 10:51	0.999	0.8191	1.864	4124.728	113.19%
23587	2358.70	0.3846	0.338	7/28/2005 10:51	0.999	0.8532	1.806	3777.228	103.65%
26230	2623.00	0.3682	0.348	7/28/2005 10:52	0.999	0.9556	1.703	3917.583	107.50%
25997	2599.70	0.3528	0.386	7/28/2005 10:52	0.999	1.0011	1.766	3868.023	106.14%
26435	2643.50	0.3237	0.42	7/28/2005 10:52	0.999	1.1409	1.745	3762.025	103.23%
26101	2610.10	0.3139	0.414	7/28/2005 10:52	0.999	1.1433	1.786	3822.424	104.89%
22288	2228.80	0.3046	0.32	7/28/2005 10:52	0.999	0.9784	1.948	3930.475	107.86%
24112	2411.20	0.2889	0.366	7/28/2005 10:52	0.999	1.0444	2.025	4199.302	115.23%
22831	2283.10	0.2864	0.402	7/28/2005 10:52	0.999	0.9742	2.271	4300.541	118.01%
21369	2136.90	0.2483	0.384	7/28/2005 10:53	0.999	1.0396	2.411	4349.436	119.35%
22530	2253.00	0.4156	0.334	7/28/2005 11:09	0.999	0.8874	1.600	3210.006	88.09%
24318	2431.80	0.4129	0.32	7/28/2005 11:09	0.999	0.7167	1.961	4317.153	118.47%
25689	2568.90	0.3967	0.35	7/28/2005 11:09	0.999	0.8191	1.848	4153.294	113.97%
23412	2341.20	0.3802	0.394	7/28/2005 11:09	0.999	0.8532	1.937	3791.786	104.05%

VERRAW.XLS

INSTR_ID	SAMPLE_ID	CNT_TIME	A	B	TIME	USER2
Instrument 1 - A	1	10	112	22806	7/28/2005 10:51	1575
Instrument 1 - B	2	10	88	23555	7/28/2005 10:51	1575
Instrument 1 - C	3	10	212	25567	7/28/2005 10:51	1575
Instrument 1 - D	4	10	331	23587	7/28/2005 10:51	1575
Instrument 2 - A	5	10	310	26230	7/28/2005 10:52	1575
Instrument 2 - B	6	10	14	25997	7/28/2005 10:52	1575
Instrument 2 - C	7	10	357	26435	7/28/2005 10:52	1575
Instrument 2 - D	8	10	314	26101	7/28/2005 10:52	1575
Instrument 3 - A	9	10	192	22288	7/28/2005 10:52	1575
Instrument 3 - B	10	10	240	24112	7/28/2005 10:52	1575
Instrument 3 - C	11	10	308	22831	7/28/2005 10:52	1575
Instrument 3 - D	12	10	276	21369	7/28/2005 10:53	1575
Instrument 4 - A	1	10	183	22530	7/28/2005 11:09	1575
Instrument 4 - B	2	10	30	24318	7/28/2005 11:09	1575
Instrument 4 - C	3	10	273	25689	7/28/2005 11:09	1575
Instrument 4 - D	4	10	602	23412	7/28/2005 11:09	1575

*for 2/2/06*

**General Engineering Laboratories  
Verification Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-018 Isotope Pb-210  
 Date Standards Prepared 7/14/05 Cocktail Type Used N/A  
 Standard ID ET491-A Matrix of Vial/Planchett Lead chromate precipitate on Tuffryn filter  
 Amount Used (g or ml) 0.1 Type of Scintillation Vial N/A  
 Standard Activity (DPM/g or ml) 112301.8 Pipette ID Used 1429303  
 Reference Date 1/1/95 Balance ID Used N/A  
 Expiration Date 11/1/05 Quenching Agent N/A  
 Residue/Carrier Agent Lead Carrier 14.65 <sup>ug</sup>/ml

Separation Date/Time: 7/14/05 0800

	Standard Number	Quenching Vol (uL)/ Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	V1	0.1	0.0839	<del>0.0843</del>	<del>0.4 <sup>ug</sup>/ml</del> 0.0852 1.3
	V2	0.2	0.0841	<del>0.0856</del>	<del>1.5 <sup>ug</sup>/ml</del> 0.0862 2.1
	V3	0.3	0.0840	0.0876	3.6
	V4	0.4	0.0856	0.0906	5.0
	V5	0.5	0.0846	0.0916	7.0
	V6	0.6	0.0844	0.0932	8.8
	V7	0.7	0.0839	0.0956	11.7
	V8	0.8	0.0859	0.0993	13.4
	V9	0.9	0.0879	0.1008	12.9
	V10	1.0	0.0844	0.0997	15.3
	V11	1.1	0.0867	0.1024	13.7
	V12	1.3	0.0840	0.1038	19.8
<i>[Signature]</i>					

Prepared By: *[Signature]*

Date

7/29/05

Reviewed By: *[Signature]*

Date

2/20/08

Rev 1 RLM 9/10/97

# DEUTSCHER KALIBRIERDIENST (DKD)

Kalibrierlaboratorium für Meßgrößen der Radioaktivität  
 Calibration laboratory for measurements of radioactivity

AKKREDITIERT DURCH DIE PHYSIKALISCH-TECHNISCHE BUNDESANSTALT (PTB)



**Amersham Buchler GmbH & Co KG**  
 Postfach 11 49 Gieselweg 1  
 D-38001 Braunschweig D-38110 Braunschweig

Telefon (05307) 930-0  
 Telefax (05307) 930-293  
 Telefax-Zentrale 930-237

## Kalibrierschein Calibration Certificate

Kalibrierzeichen  
 Calibration mark

02628
DKD-K- 06501
95-10

Gegenstand <i>Object</i>	Radioactive Reference Solution
Hersteller <i>Manufacturer</i>	Amersham Buchler GmbH & Co KG Postfach 11 49 Gieselweg 1 D-38001 Braunschweig D-38110 Braunschweig
Typ <i>Type</i>	RBZB44
Strahler-Nr. <i>Source number</i>	ET 491
Auftraggeber <i>Customer</i>	Amersham Corporation 2636 S. Clearbrook Drive Arlington Heights, IL 60005 USA-Arlington Heights, IL
Auftragsnummer <i>Work order number</i>	112116
Anzahl der Seiten des Kalibrierscheines <i>Number of pages of the certificate</i>	2
Referenzdatum <i>Reference date</i>	1 January 1995

Der Deutsche Kalibrierdienst ist Unterzeichner des multilateralen Übereinkommens der Western European Calibration Cooperation (WECC) zur gegenseitigen Anerkennung der Kalibrierscheine. Die Kalibrierung erfolgt auf der Grundlage des zwischen der Physikalisch-Technischen Bundesanstalt und dem Träger abgeschlossenen Vertrages. Dieser Kalibrierschein dokumentiert die Rückführbarkeit auf nationale Normale zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich. *The Deutscher Kalibrierdienst is signatory to the multilateral agreement of the Western European Calibration Cooperation (WECC) for the mutual recognition of calibration certificates. The calibration is performed according to the stipulations of the contract between the Physikalisch-Technische Bundesanstalt and the holder of the calibration laboratory. This calibration certificate documents the traceability to national standards, which realize the physical units of measurement according to the International System of Units (SI). The user is obliged to have the object recalibrated at appropriate intervals.*

Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung sowohl der Physikalisch-Technischen Bundesanstalt als auch des ausstellenden Kalibrierlaboratoriums. Kalibrierscheine ohne Unterschrift und Stempel haben keine Gültigkeit. *This calibration certificate may not be reproduced other than in full except with the permission of both the Physikalisch-Technische Bundesanstalt and the issuing laboratory. Calibration certificates without signature and seal are not valid.*

Stempel <i>Seal</i>	Datum <i>Date</i>	Leiter des Kalibrierlaboratoriums <i>Head of the calibration laboratory</i>	Stellvertreter <i>Deputy</i>	Bearbeiter <i>Person responsible</i>
	18 October 1995	Dr. Dornhöfer	Dr. Thieme	E. Schuber PC-5-013-4



# DEUTSCHER KALIBRIERDIENST (DKD)

PAGE 2 OF CALIBRATION CERTIFICATE FROM 18 October 1995

02628

DKD-K-  
06501

95-10

## Radioactive Reference Solution

Solution No.: ET 491  
Drawing No.: VZ-2058  
Nuclide: Lead-210  
Radioactive concentration: 38.1 kBq/g  
Reference date: 1 January 1995 at 12.00 GMT  
Mass of solution: (5.182 ± 0.001) g  
Volume of solution: approx. 5 ml  
Chemical composition: Solution in 1.2 M HNO<sub>3</sub>  
Carrier: Pb (NO<sub>3</sub>)<sub>2</sub>, Bi (NO<sub>3</sub>)<sub>3</sub>; each 20 mg/l of the corresponding element.  
Measuring method: The activity was determined by comparison with a reference solution by measurement with a Ge-detector with MCA.  
Traceability: Additional to the direct traceability to the PTB through the DKD this product satisfies the quality assurance requirements of USNRC Regulatory Guide 4.15 Revision 1, February 1979, for achieving NIST traceability through Amersham's participation in the NEI-NIST Measurements Assurance Program of the Nuclear Power Industry.  
Uncertainty: The relative uncertainty of the activity is ± 3 %.  
The declared uncertainty U is an expanded uncertainty  $U = k \cdot u_c$  with a coverage factor of  $k = 3$ . The combined uncertainty  $u_c$  is the sum of all uncertainties which can be evaluated by statistical means (uncertainty type A,  $u_A$ ) and all other uncertainties (uncertainty type B,  $u_B$ ) whereby  $u_c^2 = u_A^2 + u_B^2$ .  
(Ref.: NIST Technical Note 1297 / WECC-Doc. 19-1990)  
Radioactive impurities: Related to Pb-210 (equal 100 %) the following radioactive impurities were detected:  
Ra-226: 0.003 %



Handwritten signature and reference number: LC-5-013-47



## TRACEABILITY TO NIST

Amersham Corporation  
2636 S. Clearbrook Drive  
Arlington Heights, IL 60005  
tel (708) 593-6300  
fax (708) 593-8091



Traceability is the ability to relate the accuracy of measurement of radionuclides to the National Institute of Standards and Technology (NIST). Traceability is achieved by participation in a Measurements Assurance Program linked to NIST and production of certified materials in accordance with a quality assurance program.

Amersham participates in measurement assurance programs conducted by NIST in cooperation with the Nuclear Energy Institute (NEI, formerly USCEA). Additionally, our production facilities and measurement laboratories operate under routinely audited quality assurance programs.

Therefore, Amersham certified standardized products meet or exceed, the NRC requirements for measurements traceable to NIST.

278004C

*mu 7/25/06*

RC-S-013-4B



# Standard Traceability Log Rad

Source Material Info	
Parent Code:	ET491
Prepared By:	Garret Ray
Carrier Conc:	1.2M HNO3
Reference Date:	01/01/1995
Ampoule Mass (g):	5.182 g
Uncertainty:	+/- 3 %
LogBook No:	RC S 014 004

A Solution Material Info	
Isotope:	Lead-210
Prepared By:	Garret Ray
Prep Date:	03/01/1996
Verification Date:	07/12/2005
Expiration Date:	07/12/2006
Primary Code:	ET491-A
Dilution(mL):	100 mL
Mass of Parent(g):	5.0547 g
Density(g/mL):	1.0000

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(5.0547 \text{ g}) * (38.1 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 115550.4420 \text{ dpm/mL}$
$(5.0547 \text{ g}) * (38.1 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0000 \text{ g/mL}) / (100 \text{ mL}) = 115550.4420 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
10/20/1997	Richard Kinney	.467	100	ET491-B	524.45 dpm/ml	03/01/1997	03/01/1998
10/29/1997	Richard Kinney	3.0992	500	ET491-C	696.09 dpm/mL	10/29/1998	10/29/1999
04/03/2001	Angela Albee	.5184	100	ET491-D	582.17 dpm/mL	04/16/2003	04/16/2004
09/15/2003	Angela Albee	.5132	100	ET491-E	576.33 dpm/mL	11/11/2004	11/11/2005

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

*m 7/29/05*

# Verification for Pb-210 Standard ET491-A

A. Fehr  
7/12/2005

219  
7/29/05

Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Mass. Used (g)	Source DPM/ $\mu$ rc <sup>-2</sup> g
ET491-E N1	22785.6000	20.2000	22785.6000	2.63365	0.1038	83349.97114
ET491-E N2	22178.6000	20.2000	22178.6000	2.63365	0.1033	81522.24763
ET491-E N3	22065.7000	20.2000	22065.7000	2.63365	0.1031	81264.5963
					Average =	82045.60502

Mean Value (Counting) = 82045.60502  
Stdev = 1136.936355

Certificate Value = 80912.1  
Lower Limit = 79771.73231  
Upper Limit = 84319.47773  
Rule 1 Pass/Fail Pass  
Two sigma = 2273.872711  
10 % of Mean = 8204.560502  
Rule 2 (Pass/Fail) Pass

101.400909  
0.01385737 Rule 3 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three calibration sources for source ET491-A by transferring 0.1 mL portions of the standard to glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The calibration vials and background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 31 for Pb-210 standard verification. The efficiency calibration which was used for verification calculations was performed on 7/12/05 using source 0356-A (Pb-210). Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C/D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

7/29/05

Angela D. Johnson  
7/29/05

PROTOCOL : 31 Pb-210 Verification  
DATE : 2005/07/12  
TIME : 05:29  
ID : P31AS005

Wallac 1414 WinSpectral v1.40 S/N 4140127  
Counting mode : CPM  
Isotope(s) : Pb210  
Pb210 = 5- 520,21.00 y  
Protocol name : Pb-210 Verification  
Counting time : 300  
Repeats : 1  
Cycles : 1  
Replicates : 1  
2 sigma % : 0.01  
Minimum cpm : 0.00 Checking time: 10  
Advanced modes : Chemilum,PSA  
PSA level : 35  
Output to Display :  
POS,CTIME,DATE,TIME,RACKPOS,CPMw1,CPM,SQPI,CPM1  
Additions to Display : Spectrum,Header,Listing  
Spectrum : Alpha,Beta  
Window 1 : 685- 745 /Alpha  
Window 2 : 1-1024 /Beta  
Window 3 : 1-1024 /Beta  
Window 4 : 1-1024 /Beta  
Window 5 : 1-1024 /Beta  
Window 6 : 1-1024 /Beta  
FNCT1 = FNCT1 :  
FNCT2 = FNCT2 :  
FNCT3 = FNCT3 :  
FNCT4 = FNCT4 :

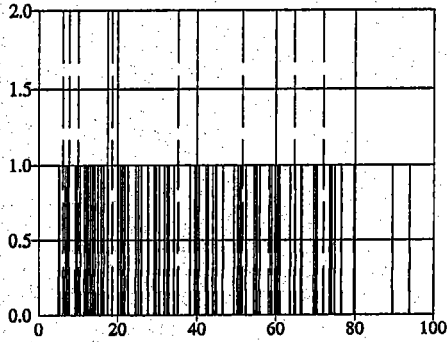
Total count rate:  
Pb210 72372.3 CPM

ast 7/12/05

*Handwritten signatures and dates:*  
7/29/05  
7/29/05

POS CTIME DATE TIME RACKPOS CPM

1 300 7/12/2005 5:29 AM 1 20.20

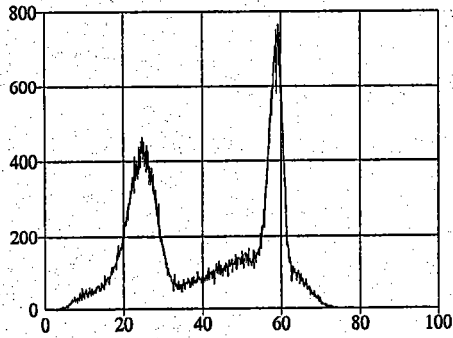


Counts Alpha

Counts Beta

Bkg

2 300 7/12/2005 5:35 AM 2 22785.60

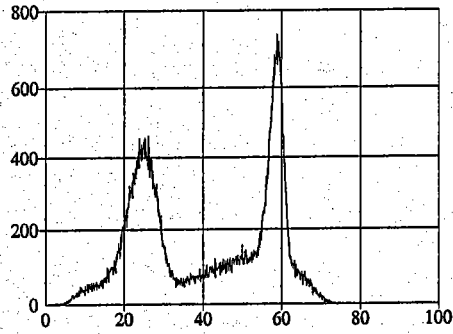


Counts Alpha

Counts Beta

ET491-A

3 300 7/12/2005 5:41 AM 3 22178.60



Counts Alpha

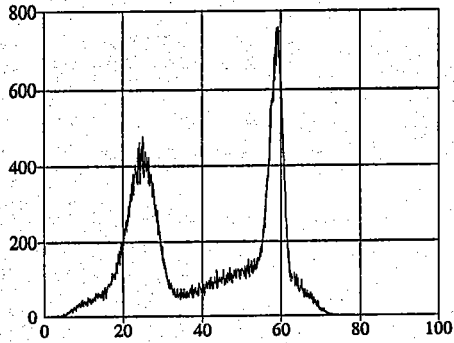
Counts Beta

ET491-A

acf 7/12/05

*m 7/24/05*  
*ADQ*  
*7/29/05*

POS	CTIME	DATE	TIME	RACKPOS	CPM
4	300	7/12/2005	5:46 AM	4	22065.70

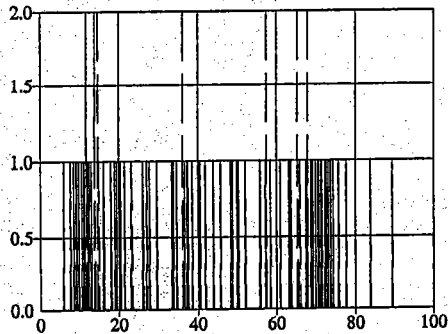


Counts Alpha

Counts Beta

ET491-A

5	300	7/12/2005	5:52 AM	5	21.70
---	-----	-----------	---------	---	-------

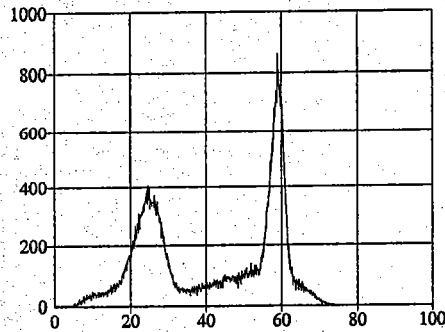


Counts Alpha

Counts Beta

Bkg

6	300	7/12/2005	5:58 AM	6	20294.00
---	-----	-----------	---------	---	----------



Counts Alpha

Counts Beta

0356-A

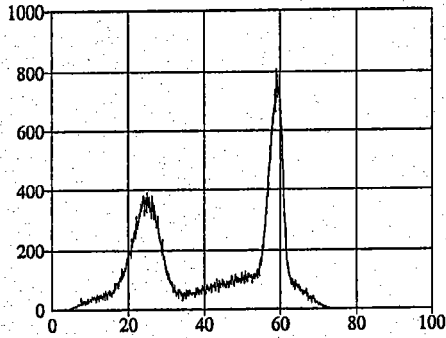
auF7112105

*Handwritten signature*

*Handwritten initials and date*  
JLQ  
7/29/05

POS CTIME DATE TIME RACKPOS CPM

7 300 7/12/2005 6:04 AM 7 20276.60

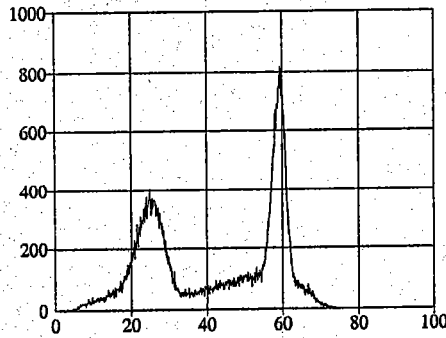


Counts Alpha

Counts Beta

0356-A

8 300 7/12/2005 6:09 AM 8 20079.70



Counts Alpha

Counts Beta

0356-A

AWF 7/12/05

*AWF 7/12/05*  
*AWF*  
*7/29/05*


**General Engineering Laboratories**

2040 Savage Road, Charleston, SC 29414  
(843)556-8171

**Gas Flow Proportional Counter Calibration Package**

Method: RA-228

	YES	NO	Comments
1) Is all calibration standard information enclosed for: primary standard certificate? second standard standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
2) Are the detector graphs included? beta absorption curves? beta plateau?			N/A
	<input checked="" type="checkbox"/>		
3) Is the raw count data included for: the plateau generation? the absorption curve generation? the calibration verification? the crosstalk calculations?	<input checked="" type="checkbox"/>		
			N/A
	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
4) Are the calibration verification calculations included? are verification recoveries 100% +/- 25%	<input checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
5) Is the method Carrier Standardization included?			N/A

Prepared By: 

Date: 4/22/05

Reviewed By: 

Date: 4/23/05

Effective Date: 4/22/05



# CERTIFICATE OF CALIBRATION

## Standard Radionuclide Source

68229-278

Ra-228 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-228
ACTIVITY (dps):	2.524 E4
HALF-LIFE:	5.75 years
CALIBRATION DATE:	April 26, 2004 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.3%

Impurities:  $\gamma$ -impurities (other than decay products) <0.1%

5.00087 grams 0.1M HCl solution with 25  $\mu$ g/g Ba carrier.

P O NUMBER 3240 RD, Item 1

SOURCE PREPARED BY:

M. Dimitrova  
M. Dimitrova, Radiochemist

Q A APPROVED:

ACM 4/28/04

RECEIVED  
4/29/04  
TCW

my 4/28/04



# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0683	Isotope:	Radium-228
Prepared By:	Amanda Fehr	Prepared By:	Amanda Fehr
Carrier Conc:	0.1M HCl	Prep Date:	02/03/2005
Reference Date:	04/26/2004	Verification Date:	02/04/2005
Ampoule Mass (g):	5.00087 g	Expiration Date:	02/04/2006
Uncertainty:	+/- 3.3 %	Primary Code:	0683-A
LogBook No:	RC-S-037-082	Dilution(mL):	100 mL
		Mass of Parent(g):	4.7315 g
		Density(g/mL):	0.9985

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parent Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parent Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.7315 \text{ g}) * (25240 \text{ dps}) * (59.9 \text{ dpm/dps}) / (5.00087 \text{ g} * 100 \text{ mL}) = 14304.3936 \text{ dpm/mL}$
$(4.7315 \text{ g}) * (25240 \text{ dps}) * (59.9 \text{ dpm/dps}) / (0.9985 \text{ g/mL}) / (5.00087 \text{ g} * 100 \text{ mL}) = 14325.2288 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
-----------	----------	--------------	---------------	------	-------------	-------------------	-----------------

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

*m4k205*

# Verification for Ra-228 Standard 0683-A

A. Fehr 2/4/2005	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Standard Source dPPM/mL
	0683-A N1	46898.2000	33.7000	46864.5000	3.5679424	1.0000 13134.88131
	0683-A N2	46663.7000	33.7000	46630.0000	3.5679424	1.0000 13069.15716
	0683-A N3	46478.8000	33.7000	46445.1000	3.5679424	1.0000 13017.33457
						Average = 13073.79102

Mean Value (Counting) = 13073.79102 dpm/mL 100.210719 % of known  
 Stdev = 58.91021579 dpm/mL 0.00450598

Certificate Value = 13046.3 dpm/mL  
 Lower Limit = 12955.97058 dpm/mL  
 Upper Limit = 13191.61145 dpm/mL  
 Rule 1 Pass/Fail Pass  
 Two sigma = 117.8204316  
 10 % of Mean = 1307.379102  
 Rule 2 (Pass/Fail) Pass

### Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

The analyst prepared three standard verification sources for Ra-228 source 0683-A by transferring portions of the standard into glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 23 for Ra-228 source standard verification. The Ra-228 efficiency calibration which was used for verification calculations was performed on 4/26/04 using Analytic's source 0503-A (Ra-228). Calibration data is recorded in this logbook under Ra-228 0503. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

*perdubor*

*Amanda D. Fehr 2/14/05*  
*[Signature]* 2/11/05

PROTOCOL : 23 Radium Std Ver.  
DATE : 2005/02/04  
TIME : 14:12  
ID : P23AS003

Wallac 1414 WinSpectral v1.40 S/N 4140127

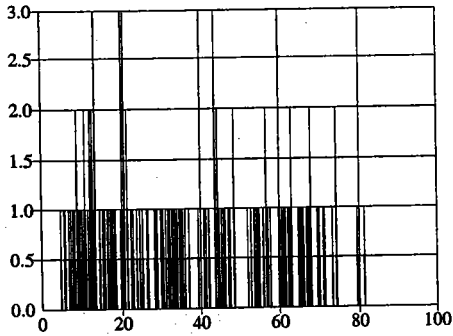
Counting mode : CPM  
Isotope(s) : H3  
H3 = 5- 350,12.43 y  
Protocol name : Radium Std Ver.  
Counting time : 300  
Repeats : 1  
Cycles : 1  
Replicates : 1  
2 sigma % : 0.01  
Minimum cpm : 0.00 Checking time: 10  
Output to Display :  
POS,CTIME,DATE,TIME,RACKPOS,CPMw1,CPM,SQPI,CPM1  
Additions to Display : Spectrum,Header,Listing  
Spectrum : Beta  
Window 1 : 1-1024 /Beta  
Window 2 : 1-1024 /Beta  
Window 3 : 1-1024 /Beta  
Window 4 : 1-1024 /Beta  
Window 5 : 1-1024 /Beta  
Window 6 : 1-1024 /Beta  
FNCT1 = FNCT1 :  
FNCT2 = FNCT2 :  
FNCT3 = FNCT3 :  
FNCT4 = FNCT4 :

Total count rate:  
H3 30936.7 CPM

*atf 2/4/05*

*proyector*

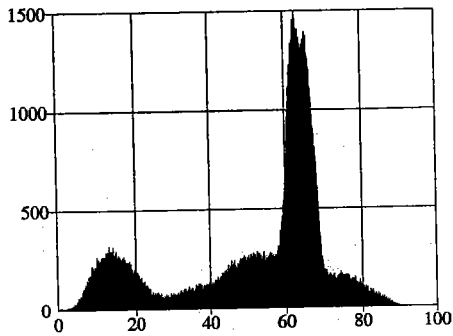
POS	CTIME	DATE	TIME	RACKPOS	CPMW1	CPM
1	300	2/4/2005	2:12 PM	1	33.70	33.70
					17.30	



Counts  
Beta

*Bkg*

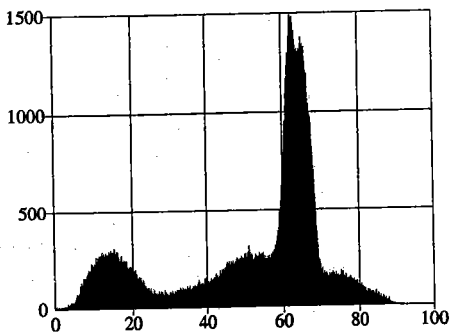
2	300	2/4/2005	2:18 PM	2	46899.00	46898.20
					9470.20	



Counts  
Beta

*0683-A*

3	300	2/4/2005	2:23 PM	3	46664.80	46663.70
					9499.90	



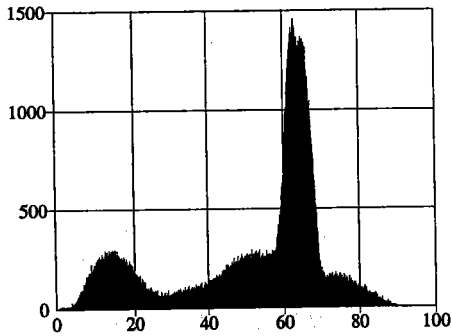
Counts  
Beta

*0683-A*

*ALF 2/4/05*

*[Handwritten signature]*

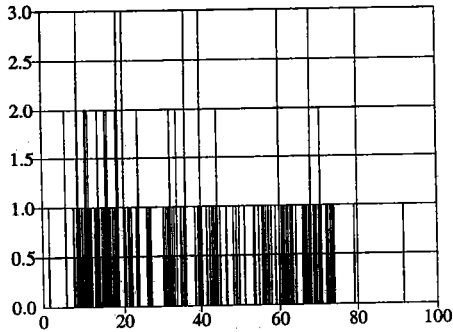
POS	CTIME	DATE	TIME	RACKPOS	CPMW1	CPM
4	300	2/4/2005	2:29 PM	4	46479.40	46478.80
					9454.60	



Counts  
Beta

0683-A

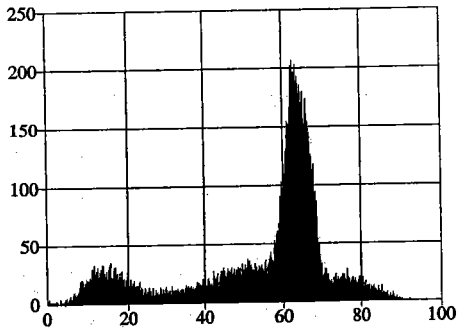
5	300	2/4/2005	2:34 PM	5	34.60	34.60
					19.00	



Counts  
Beta

BLG

6	300	2/4/2005	2:40 PM	6	5372.10	5371.90
					832.00	



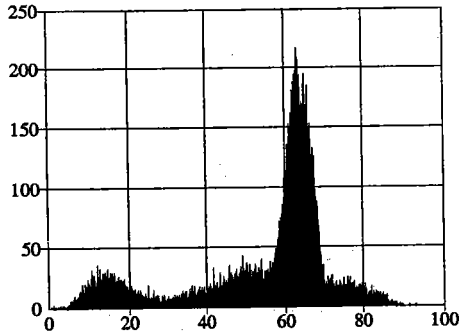
Counts  
Beta

0553-A

af 2/4/05

*Handwritten signature*

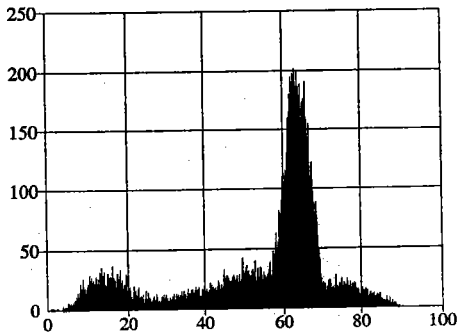
POS	CTIME	DATE	TIME	RACKPOS	CPMW1	CPM
7	300	2/4/2005	2:45 PM	7	5421.80	5421.80
					816.10	



Counts  
Beta

0553-A

8	300	2/4/2005	2:51 PM	8	5340.60	5340.60
					827.60	



Counts  
Beta

0553-A  
2/4/05  
0553-A

all 2/4/05

*Handwritten signature*





Ra-228		00683-A		69824.5		DPM									
				Separation Date/Time:		4/22/2005 6:15									
Detector	Pgm time	Sample I.D.	Alpha	Beta	CFM	Alpha Xlik	Beta Bkg.	Ac-228 Decay	Count decay	Corrected CPM	Voltage	Date/Time			
1-A	1	1	223	19612	19612.00	0.0749	0.49	0.55	1.00	36053.85	1470	4/22/2005 11:33			
1-A	1	2	221	19161	19161.00	0.0749	0.49	0.54	1.00	35362.42	1470	4/22/2005 11:40			
1-A	1	3	217	19209	19209.00	0.0749	0.49	0.54	1.00	35272.14	1470	4/22/2005 11:38			
1-A	1	4	190	19664	19664.00	0.0749	0.49	0.55	1.00	35956.27	1470	4/22/2005 11:35			
1-A	1	5	252	18527	18527.00	0.0749	0.49	0.54	1.00	34363.14	1470	4/22/2005 11:43			
1-A	1	6	270	20152	20152.00	0.0749	0.49	0.53	1.00	37881.23	1470	4/22/2005 11:50			
1-A	1	7	209	17009	17009.00	0.0749	0.49	0.53	1.00	31823.69	1470	Ra-228 Efficiency 4/22/2005 11:48			
1-A	1	8	226	21455	21455.00	0.0749	0.49	0.54	1.00	39671.91	1470	4/22/2005 11:45			
										Average	35835.58	0.5132			
1-B	1	1	193	19678	19678.00	0.1066	0.35	0.55	1.00	35978.46	1470	4/22/2005 11:36			
1-B	1	2	180	19041	19041.00	0.1066	0.35	0.55	1.00	34656.81	1470	4/22/2005 11:33			
1-B	1	3	169	19027	19027.00	0.1066	0.35	0.54	1.00	35117.99	1470	4/22/2005 11:41			
1-B	1	4	156	19202	19202.00	0.1066	0.35	0.54	1.00	35264.40	1470	4/22/2005 11:38			
1-B	1	5	168	18254	18254.00	0.1066	0.35	0.54	1.00	34006.14	1470	4/22/2005 11:45			
1-B	1	6	178	20148	20148.00	0.1066	0.35	0.54	1.00	37377.85	1470	4/22/2005 11:43			
1-B	1	7	159	16811	16811.00	0.1066	0.35	0.53	1.00	31602.88	1470	Ra-228 Efficiency 4/22/2005 11:50			
1-B	1	8	177	21320	21320.00	0.1066	0.35	0.53	1.00	39898.98	1470	4/22/2005 11:48			
										Average	35487.91	0.5082			
1-C	1	1	190	19929	19929.00	0.0686	0.35	0.54	1.00	36611.91	1470	4/22/2005 11:38			
1-C	1	2	222	18736	18736.00	0.0686	0.35	0.55	1.00	36097.79	1470	4/22/2005 11:36			
1-C	1	3	215	20230	20230.00	0.0686	0.35	0.55	1.00	36830.57	1470	4/22/2005 11:33			
1-C	1	4	198	19844	19844.00	0.0686	0.35	0.54	1.00	36641.31	1470	4/22/2005 11:41			
1-C	1	5	216	18760	18760.00	0.0686	0.35	0.53	1.00	35116.87	1470	4/22/2005 11:48			
1-C	1	6	247	20456	20456.00	0.0686	0.35	0.54	1.00	38122.61	1470	4/22/2005 11:48			
1-C	1	7	191	17262	17262.00	0.0686	0.35	0.54	1.00	32034.46	1470	Ra-228 Efficiency 4/22/2005 11:43			
1-C	1	8	228	21665	21665.00	0.0686	0.35	0.53	1.00	40748.67	1470	4/22/2005 11:50			
										Average	36525.52	0.5231			
1-D	1	1	38	19654	19654.00	0.0933	0.4	0.54	1.00	36312.08	1470	4/22/2005 11:41			
1-D	1	2	53	19466	19466.00	0.0933	0.4	0.54	1.00	35787.85	1470	4/22/2005 11:38			
1-D	1	3	56	19457	19457.00	0.0933	0.4	0.55	1.00	35607.52	1470	4/22/2005 11:36			
1-D	1	4	44	19353	19353.00	0.0933	0.4	0.55	1.00	35258.83	1470	4/22/2005 11:33			
1-D	1	5	53	18235	18235.00	0.0933	0.4	0.53	1.00	34321.21	1470	4/22/2005 11:51			
1-D	1	6	59	20122	20122.00	0.0933	0.4	0.53	1.00	37692.86	1470	4/22/2005 11:48			
1-D	1	7	49	17027	17027.00	0.0933	0.4	0.54	1.00	31756.71	1470	Ra-228 Efficiency 4/22/2005 11:46			
1-D	1	8	56	21170	21170.00	0.0933	0.4	0.54	1.00	39315.64	1470	4/22/2005 11:43			
										Average	35786.57	0.5121			
2-A	1	1	737	19237	19237.00	0.0440	0.48	0.54	1.00	35679.76	1470	4/22/2005 11:44			
2-A	1	2	696	18742	18742.00	0.0440	0.48	0.53	1.00	35240.34	1470	4/22/2005 11:51			
2-A	1	3	786	18800	18800.00	0.0440	0.48	0.53	1.00	35170.50	1470	4/22/2005 11:48			
2-A	1	4	671	19000	19000.00	0.0440	0.48	0.54	1.00	35393.11	1470	4/22/2005 11:46			
2-A	1	5	620	18971	18971.00	0.0440	0.48	0.55	1.00	34534.21	1470	4/22/2005 11:33			
2-A	1	6	767	20367	20367.00	0.0440	0.48	0.54	1.00	37583.13	1470	4/22/2005 11:41			
2-A	1	7	612	17288	17288.00	0.0440	0.48	0.54	1.00	31752.92	1470	Ra-228 Efficiency 4/22/2005 11:38			
2-A	1	8	717	21528	21528.00	0.0440	0.48	0.55	1.00	39354.09	1470	4/22/2005 11:36			
										Average	35588.51	0.5097			
2-B	1	1	158	19990	19990.00	0.1383	0.32	0.54	1.00	37257.13	1470	4/22/2005 11:46			
2-B	1	2	125	19577	19577.00	0.1383	0.32	0.54	1.00	36342.14	1470	4/22/2005 11:44			
2-B	1	3	114	19354	19354.00	0.1383	0.32	0.53	1.00	36425.99	1470	4/22/2005 11:51			
2-B	1	4	136	19264	19264.00	0.1383	0.32	0.53	1.00	36073.97	1470	4/22/2005 11:48			
2-B	1	5	144	18228	18228.00	0.1383	0.32	0.55	1.00	35168.92	1470	4/22/2005 11:36			
2-B	1	6	137	20676	20676.00	0.1383	0.32	0.55	1.00	38038.06	1470	4/22/2005 11:34			
2-B	1	7	114	17842	17842.00	0.1383	0.32	0.54	1.00	32587.93	1470	Ra-228 Efficiency 4/22/2005 11:41			
2-B	1	8	157	22249	22249.00	0.1383	0.32	0.54	1.00	40895.55	1470	4/22/2005 11:38			
										Average	36598.71	0.5242			
2-C	1	1	811	19238	19238.00	0.0902	0.33	0.53	1.00	35629.02	1470	4/22/2005 11:48			
2-C	1	2	821	18388	18388.00	0.0902	0.33	0.54	1.00	34173.85	1470	4/22/2005 11:46			
2-C	1	3	787	18847	18847.00	0.0902	0.33	0.54	1.00	34891.48	1470	4/22/2005 11:44			
2-C	1	4	783	18544	18544.00	0.0902	0.33	0.53	1.00	34804.54	1470	4/22/2005 11:51			
2-C	1	5	721	18272	18272.00	0.0902	0.33	0.54	1.00	33508.00	1470	4/22/2005 11:38			
2-C	1	6	861	20306	20306.00	0.0902	0.33	0.55	1.00	37045.50	1470	4/22/2005 11:36			
2-C	1	7	716	17078	17078.00	0.0902	0.33	0.55	1.00	31031.05	1470	Ra-228 Efficiency 4/22/2005 11:34			
2-C	1	8	850	20865	20865.00	0.0902	0.33	0.54	1.00	38442.66	1470	4/22/2005 11:41			
										Average	34978.26	0.5009			
2-D	1	1	764	18765	18765.00	0.0382	0.49	0.53	1.00	35307.52	1470	4/22/2005 11:51			
2-D	1	2	845	18699	18699.00	0.0382	0.49	0.53	1.00	34999.20	1470	4/22/2005 11:48			
2-D	1	3	879	18907	18907.00	0.0382	0.49	0.54	1.00	35223.04	1470	4/22/2005 11:46			
2-D	1	4	860	19182	19182.00	0.0382	0.49	0.54	1.00	35606.49	1470	4/22/2005 11:44			
2-D	1	5	832	18606	18606.00	0.0382	0.49	0.54	1.00	34352.15	1470	4/22/2005 11:41			
2-D	1	6	942	20333	20333.00	0.0382	0.49	0.54	1.00	37358.94	1470	4/22/2005 11:39			
2-D	1	7	739	17047	17047.00	0.0382	0.49	0.55	1.00	31173.05	1470	Ra-228 Efficiency 4/22/2005 11:36			
2-D	1	8	886	21415	21415.00	0.0382	0.49	0.55	1.00	38996.49	1470	4/22/2005 11:34			
										Average	35377.36	0.5067			
3-A	1	1	2133	17349	17349.00	0.0412	0.58	0.53	1.00	32668.12	1470	4/22/2005 11:53			
3-A	1	2	2284	16837	16837.00	0.0412	0.58	0.52	1.00	32119.14	1470	4/22/2005 12:01			
3-A	1	3	2165	16897	16897.00	0.0412	0.58	0.52	1.00	32083.42	1470	4/22/2005 11:58			
3-A	1	4	2100	17023	17023.00	0.0412	0.58	0.53	1.00	32191.58	1470	4/22/2005 11:56			
3-A	1	5	2111	16224	16224.00	0.0412	0.58	0.52	1.00	31118.25	1470	4/22/2005 12:03			
3-A	1	6	2324	17122	17122.00	0.0412	0.58	0.51	1.00	33328.52	1470	4/22/2005 12:11			
3-A	1	7	1975	14677	14677.00	0.0412	0.58	0.51	1.00	28423.14	1470	Ra-228 Efficiency 4/22/2005 12:09			
3-A	1	8	2513	18247	18247.00	0.0412	0.58	0.52	1.00	35176.62	1470	4/22/2005 12:06			
										Average	32138.60	0.4603			
3-B	1	1	1229	18301	18301.00	0.0492	0.28	0.53	1.00	34678.46	1470	4/22/2005 11:56			
3-B	1	2	1119	17820	17820.00	0.0492	0.28	0.53	1.00	33625.55	1470	4/22/2005 11:53			
3-B	1	3	1193	17468	17468.00	0.0492	0.28	0.52	1.00	33404.60	1470	4/22/2005 12:01			

*m/2/26/05*

3-B	1	4	1240	17817	17817.00	0.0482	0.28	0.52	1.00	33897.33	1470		4/22/2005 11:58
3-B	1	5	1178	16876	16876.00	0.0482	0.28	0.52	1.00	32222.98	1470		4/22/2005 12:06
3-B	1	6	1317	18221	18221.00	0.0482	0.28	0.52	1.00	35018.34	1470		4/22/2005 12:03
3-B	1	7	1089	15238	15238.00	0.0482	0.28	0.51	1.00	29723.59	1470	Ra-228	4/22/2005 12:11
3-B	1	8	1428	19248	19248.00	0.0482	0.28	0.51	1.00	37350.47	1470	Efficiency	4/22/2005 12:09
									Average	33739.92		0.4832	
3-C	1	1	739	18087	18087.00	0.0407	0.46	0.52	1.00	34445.09	1470		4/22/2005 11:58
3-C	1	2	681	17872	17872.00	0.0407	0.46	0.53	1.00	33548.15	1470		4/22/2005 11:56
3-C	1	3	702	17887	17887.00	0.0407	0.46	0.53	1.00	33824.18	1470		4/22/2005 11:53
3-C	1	4	747	17811	17811.00	0.0407	0.46	0.52	1.00	34118.75	1470		4/22/2005 12:01
3-C	1	5	731	17040	17040.00	0.0407	0.46	0.51	1.00	33137.20	1470		4/22/2005 12:09
3-C	1	6	855	18315	18315.00	0.0407	0.46	0.52	1.00	35455.36	1470		4/22/2005 12:06
3-C	1	7	687	15413	15413.00	0.0407	0.46	0.52	1.00	29678.59	1470	Ra-228	4/22/2005 12:04
3-C	1	8	838	19109	19109.00	0.0407	0.46	0.51	1.00	37349.86	1470	Efficiency	4/22/2005 12:11
									Average	33944.37		0.4961	
3-D	1	1	589	18431	18431.00	0.0429	0.73	0.52	1.00	35321.89	1470		4/22/2005 12:01
3-D	1	2	533	17875	17875.00	0.0429	0.73	0.52	1.00	34089.55	1470		4/22/2005 11:58
3-D	1	3	530	18135	18135.00	0.0429	0.73	0.53	1.00	34438.15	1470		4/22/2005 11:58
3-D	1	4	484	18298	18298.00	0.0429	0.73	0.53	1.00	34594.85	1470		4/22/2005 11:53
3-D	1	5	549	17038	17038.00	0.0429	0.73	0.51	1.00	33319.81	1470		4/22/2005 12:12
3-D	1	6	640	18362	18362.00	0.0429	0.73	0.51	1.00	35722.19	1470		4/22/2005 12:09
3-D	1	7	502	15895	15895.00	0.0429	0.73	0.52	1.00	30790.80	1470	Ra-228	4/22/2005 12:06
3-D	1	8	606	19562	19562.00	0.0429	0.73	0.52	1.00	37699.31	1470	Efficiency	4/22/2005 12:04
									Average	34495.77		0.4940	
4-A	1	1	436	18783	18783.00	0.0578	0.34	0.52	1.00	36202.39	1470		4/22/2005 12:04
4-A	1	2	442	17978	17978.00	0.0578	0.34	0.51	1.00	35180.82	1470		4/22/2005 12:12
4-A	1	3	410	18198	18198.00	0.0578	0.34	0.51	1.00	35418.59	1470		4/22/2005 12:09
4-A	1	4	379	18683	18683.00	0.0578	0.34	0.52	1.00	36204.68	1470		4/22/2005 12:07
4-A	1	5	398	18198	18198.00	0.0578	0.34	0.53	1.00	34416.71	1470		4/22/2005 11:54
4-A	1	6	437	19420	19420.00	0.0578	0.34	0.52	1.00	37227.02	1470		4/22/2005 12:01
4-A	1	7	377	16781	16781.00	0.0578	0.34	0.52	1.00	32007.32	1470	Ra-228	4/22/2005 11:58
4-A	1	8	451	20737	20737.00	0.0578	0.34	0.53	1.00	39388.88	1470	Efficiency	4/22/2005 11:56
									Average	35755.80		0.5121	
4-B	1	1	73	19059	19059.00	0.0800	0.37	0.52	1.00	36969.81	1470		4/22/2005 12:07
4-B	1	2	62	18836	18836.00	0.0800	0.37	0.52	1.00	35962.06	1470		4/22/2005 12:04
4-B	1	3	63	18870	18870.00	0.0800	0.37	0.51	1.00	36980.44	1470		4/22/2005 12:12
4-B	1	4	53	19050	19050.00	0.0800	0.37	0.51	1.00	37122.57	1470		4/22/2005 12:08
4-B	1	5	53	18583	18583.00	0.0800	0.37	0.53	1.00	35299.86	1470		4/22/2005 11:56
4-B	1	6	50	20222	20222.00	0.0800	0.37	0.53	1.00	38288.88	1470		4/22/2005 11:54
4-B	1	7	66	16906	16906.00	0.0800	0.37	0.52	1.00	32446.75	1470	Ra-228	4/22/2005 12:01
4-B	1	8	55	21570	21570.00	0.0800	0.37	0.52	1.00	41194.45	1470	Efficiency	4/22/2005 11:58
									Average	36783.12		0.5268	
4-C	1	1	749	18454	18454.00	0.0364	0.36	0.51	1.00	35919.42	1470		4/22/2005 12:09
4-C	1	2	710	18119	18119.00	0.0364	0.36	0.52	1.00	35111.47	1470		4/22/2005 12:07
4-C	1	3	706	18128	18128.00	0.0364	0.36	0.52	1.00	34943.12	1470		4/22/2005 12:04
4-C	1	4	731	18045	18045.00	0.0364	0.36	0.51	1.00	35325.39	1470		4/22/2005 12:12
4-C	1	5	688	17757	17757.00	0.0364	0.36	0.52	1.00	33883.05	1470		4/22/2005 11:58
4-C	1	6	755	19232	19232.00	0.0364	0.36	0.53	1.00	36532.89	1470		4/22/2005 11:56
4-C	1	7	583	16571	16571.00	0.0364	0.36	0.53	1.00	31349.77	1470	Ra-228	4/22/2005 11:54
4-C	1	8	619	20415	20415.00	0.0364	0.36	0.52	1.00	39142.72	1470	Efficiency	4/22/2005 12:01
									Average	35275.86		0.5052	
4-D	1	1	1271	18178	18178.00	0.0431	0.58	0.51	1.00	35563.92	1470		4/22/2005 12:12
4-D	1	2	1275	17622	17622.00	0.0431	0.58	0.51	1.00	34248.58	1470		4/22/2005 12:09
4-D	1	3	1334	18020	18020.00	0.0431	0.58	0.52	1.00	34863.03	1470		4/22/2005 12:07
4-D	1	4	1337	18346	18346.00	0.0431	0.58	0.52	1.00	35311.38	1470		4/22/2005 12:04
4-D	1	5	1245	17305	17305.00	0.0431	0.58	0.52	1.00	33129.96	1470		4/22/2005 12:01
4-D	1	6	1357	19186	19186.00	0.0431	0.58	0.52	1.00	36557.46	1470		4/22/2005 11:58
4-D	1	7	1108	16383	16383.00	0.0431	0.58	0.53	1.00	31041.97	1470	Ra-228	4/22/2005 11:56
4-D	1	8	1366	20538	20538.00	0.0431	0.58	0.53	1.00	36795.26	1470	Efficiency	4/22/2005 11:54
									Average	34937.70		0.5004	

*Handwritten signature*

## EFFRAW

INSTR_ID	SAMPLE_ID	CNT_TIME	A	B	TIME	USER2	BATCH_ID
Instrument 1 - A	1	1	223	19812	4/22/2005 11:33	1575	Ra2280422
Instrument 1 - A	2	1	221	19161	4/22/2005 11:40	1575	Ra2280422
Instrument 1 - A	3	1	217	19209	4/22/2005 11:38	1575	Ra2280422
Instrument 1 - A	4	1	190	19664	4/22/2005 11:35	1575	Ra2280422
Instrument 1 - A	5	1	252	18527	4/22/2005 11:43	1575	Ra2280422
Instrument 1 - A	6	1	270	20152	4/22/2005 11:50	1575	Ra2280422
Instrument 1 - A	7	1	209	17009	4/22/2005 11:48	1575	Ra2280422
Instrument 1 - A	8	1	226	21455	4/22/2005 11:45	1575	Ra2280422
Instrument 1 - B	1	1	193	19678	4/22/2005 11:36	1575	Ra2280422
Instrument 1 - B	2	1	160	19041	4/22/2005 11:33	1575	Ra2280422
Instrument 1 - B	3	1	169	19027	4/22/2005 11:41	1575	Ra2280422
Instrument 1 - B	4	1	156	19202	4/22/2005 11:38	1575	Ra2280422
Instrument 1 - B	5	1	168	18254	4/22/2005 11:45	1575	Ra2280422
Instrument 1 - B	6	1	178	20148	4/22/2005 11:43	1575	Ra2280422
Instrument 1 - B	7	1	159	16811	4/22/2005 11:50	1575	Ra2280422
Instrument 1 - B	8	1	177	21320	4/22/2005 11:48	1575	Ra2280422
Instrument 1 - C	1	1	190	19929	4/22/2005 11:38	1575	Ra2280422
Instrument 1 - C	2	1	222	19736	4/22/2005 11:36	1575	Ra2280422
Instrument 1 - C	3	1	215	20230	4/22/2005 11:33	1575	Ra2280422
Instrument 1 - C	4	1	198	19844	4/22/2005 11:41	1575	Ra2280422
Instrument 1 - C	5	1	216	18760	4/22/2005 11:48	1575	Ra2280422
Instrument 1 - C	6	1	247	20456	4/22/2005 11:46	1575	Ra2280422
Instrument 1 - C	7	1	191	17262	4/22/2005 11:43	1575	Ra2280422
Instrument 1 - C	8	1	228	21665	4/22/2005 11:50	1575	Ra2280422
Instrument 1 - D	1	1	38	19654	4/22/2005 11:41	1575	Ra2280422
Instrument 1 - D	2	1	53	19466	4/22/2005 11:38	1575	Ra2280422
Instrument 1 - D	3	1	56	19457	4/22/2005 11:36	1575	Ra2280422
Instrument 1 - D	4	1	44	19353	4/22/2005 11:33	1575	Ra2280422
Instrument 1 - D	5	1	53	18235	4/22/2005 11:51	1575	Ra2280422
Instrument 1 - D	6	1	59	20122	4/22/2005 11:48	1575	Ra2280422
Instrument 1 - D	7	1	49	17027	4/22/2005 11:46	1575	Ra2280422
Instrument 1 - D	8	1	56	21170	4/22/2005 11:43	1575	Ra2280422
Instrument 2 - A	1	1	737	19237	4/22/2005 11:44	1575	Ra2280422
Instrument 2 - A	2	1	698	18742	4/22/2005 11:51	1575	Ra2280422
Instrument 2 - A	3	1	766	18800	4/22/2005 11:48	1575	Ra2280422
Instrument 2 - A	4	1	671	19000	4/22/2005 11:46	1575	Ra2280422
Instrument 2 - A	5	1	620	18971	4/22/2005 11:33	1575	Ra2280422
Instrument 2 - A	6	1	767	20367	4/22/2005 11:41	1575	Ra2280422
Instrument 2 - A	7	1	612	17288	4/22/2005 11:38	1575	Ra2280422
Instrument 2 - A	8	1	717	21526	4/22/2005 11:36	1575	Ra2280422
Instrument 2 - B	1	1	158	19990	4/22/2005 11:46	1575	Ra2280422
Instrument 2 - B	2	1	125	19577	4/22/2005 11:44	1575	Ra2280422
Instrument 2 - B	3	1	114	19354	4/22/2005 11:51	1575	Ra2280422
Instrument 2 - B	4	1	136	19264	4/22/2005 11:48	1575	Ra2280422
Instrument 2 - B	5	1	144	19226	4/22/2005 11:36	1575	Ra2280422

## EFFRAW

Instrument 2 - B	6	1	137	20876	4/22/2005 11:34	1575	Ra2280422
Instrument 2 - B	7	1	114	17642	4/22/2005 11:41	1575	Ra2280422
Instrument 2 - B	8	1	157	22249	4/22/2005 11:38	1575	Ra2280422
Instrument 2 - C	1	1	811	19238	4/22/2005 11:48	1575	Ra2280422
Instrument 2 - C	2	1	821	18388	4/22/2005 11:46	1575	Ra2280422
Instrument 2 - C	3	1	787	18847	4/22/2005 11:44	1575	Ra2280422
Instrument 2 - C	4	1	783	18544	4/22/2005 11:51	1575	Ra2280422
Instrument 2 - C	5	1	721	18272	4/22/2005 11:38	1575	Ra2280422
Instrument 2 - C	6	1	861	20306	4/22/2005 11:36	1575	Ra2280422
Instrument 2 - C	7	1	716	17078	4/22/2005 11:34	1575	Ra2280422
Instrument 2 - C	8	1	850	20865	4/22/2005 11:41	1575	Ra2280422
Instrument 2 - D	1	1	764	18765	4/22/2005 11:51	1575	Ra2280422
Instrument 2 - D	2	1	845	18699	4/22/2005 11:48	1575	Ra2280422
Instrument 2 - D	3	1	879	18907	4/22/2005 11:46	1575	Ra2280422
Instrument 2 - D	4	1	860	19192	4/22/2005 11:44	1575	Ra2280422
Instrument 2 - D	5	1	832	18606	4/22/2005 11:41	1575	Ra2280422
Instrument 2 - D	6	1	942	20333	4/22/2005 11:39	1575	Ra2280422
Instrument 2 - D	7	1	739	17047	4/22/2005 11:36	1575	Ra2280422
Instrument 2 - D	8	1	886	21415	4/22/2005 11:34	1575	Ra2280422
Instrument 3 - A	1	1	2133	17349	4/22/2005 11:53	1575	Ra2280422
Instrument 3 - A	2	1	2284	16837	4/22/2005 12:01	1575	Ra2280422
Instrument 3 - A	3	1	2165	16897	4/22/2005 11:58	1575	Ra2280422
Instrument 3 - A	4	1	2100	17023	4/22/2005 11:56	1575	Ra2280422
Instrument 3 - A	5	1	2111	16224	4/22/2005 12:03	1575	Ra2280422
Instrument 3 - A	6	1	2324	17122	4/22/2005 12:11	1575	Ra2280422
Instrument 3 - A	7	1	1975	14677	4/22/2005 12:09	1575	Ra2280422
Instrument 3 - A	8	1	2513	18247	4/22/2005 12:06	1575	Ra2280422
Instrument 3 - B	1	1	1229	18301	4/22/2005 11:56	1575	Ra2280422
Instrument 3 - B	2	1	1119	17820	4/22/2005 11:53	1575	Ra2280422
Instrument 3 - B	3	1	1193	17468	4/22/2005 12:01	1575	Ra2280422
Instrument 3 - B	4	1	1240	17817	4/22/2005 11:58	1575	Ra2280422
Instrument 3 - B	5	1	1176	16676	4/22/2005 12:06	1575	Ra2280422
Instrument 3 - B	6	1	1317	18221	4/22/2005 12:03	1575	Ra2280422
Instrument 3 - B	7	1	1089	15236	4/22/2005 12:11	1575	Ra2280422
Instrument 3 - B	8	1	1428	19246	4/22/2005 12:09	1575	Ra2280422
Instrument 3 - C	1	1	739	18067	4/22/2005 11:58	1575	Ra2280422
Instrument 3 - C	2	1	661	17672	4/22/2005 11:56	1575	Ra2280422
Instrument 3 - C	3	1	702	17897	4/22/2005 11:53	1575	Ra2280422
Instrument 3 - C	4	1	747	17811	4/22/2005 12:01	1575	Ra2280422
Instrument 3 - C	5	1	731	17040	4/22/2005 12:09	1575	Ra2280422
Instrument 3 - C	6	1	855	18315	4/22/2005 12:06	1575	Ra2280422
Instrument 3 - C	7	1	687	15413	4/22/2005 12:04	1575	Ra2280422
Instrument 3 - C	8	1	838	19109	4/22/2005 12:11	1575	Ra2280422
Instrument 3 - D	1	1	569	18431	4/22/2005 12:01	1575	Ra2280422
Instrument 3 - D	2	1	533	17875	4/22/2005 11:58	1575	Ra2280422
Instrument 3 - D	3	1	530	18135	4/22/2005 11:56	1575	Ra2280422

## EFFRAW

Instrument 3 - D	4	1	484	18296	4/22/2005 11:53	1575	Ra2280422
Instrument 3 - D	5	1	549	17038	4/22/2005 12:12	1575	Ra2280422
Instrument 3 - D	6	1	640	18362	4/22/2005 12:09	1575	Ra2280422
Instrument 3 - D	7	1	502	15895	4/22/2005 12:06	1575	Ra2280422
Instrument 3 - D	8	1	606	19562	4/22/2005 12:04	1575	Ra2280422
Instrument 4 - A	1	1	436	18783	4/22/2005 12:04	1575	Ra2280422
Instrument 4 - A	2	1	442	17978	4/22/2005 12:12	1575	Ra2280422
Instrument 4 - A	3	1	410	18198	4/22/2005 12:09	1575	Ra2280422
Instrument 4 - A	4	1	379	18683	4/22/2005 12:07	1575	Ra2280422
Instrument 4 - A	5	1	398	18198	4/22/2005 11:54	1575	Ra2280422
Instrument 4 - A	6	1	437	19420	4/22/2005 12:01	1575	Ra2280422
Instrument 4 - A	7	1	377	16781	4/22/2005 11:58	1575	Ra2280422
Instrument 4 - A	8	1	451	20737	4/22/2005 11:56	1575	Ra2280422
Instrument 4 - B	1	1	73	19059	4/22/2005 12:07	1575	Ra2280422
Instrument 4 - B	2	1	62	18636	4/22/2005 12:04	1575	Ra2280422
Instrument 4 - B	3	1	63	18870	4/22/2005 12:12	1575	Ra2280422
Instrument 4 - B	4	1	53	19050	4/22/2005 12:09	1575	Ra2280422
Instrument 4 - B	5	1	53	18563	4/22/2005 11:56	1575	Ra2280422
Instrument 4 - B	6	1	50	20222	4/22/2005 11:54	1575	Ra2280422
Instrument 4 - B	7	1	66	16906	4/22/2005 12:01	1575	Ra2280422
Instrument 4 - B	8	1	55	21570	4/22/2005 11:58	1575	Ra2280422
Instrument 4 - C	1	1	749	18454	4/22/2005 12:09	1575	Ra2280422
Instrument 4 - C	2	1	710	18119	4/22/2005 12:07	1575	Ra2280422
Instrument 4 - C	3	1	706	18126	4/22/2005 12:04	1575	Ra2280422
Instrument 4 - C	4	1	731	18045	4/22/2005 12:12	1575	Ra2280422
Instrument 4 - C	5	1	688	17757	4/22/2005 11:58	1575	Ra2280422
Instrument 4 - C	6	1	755	19232	4/22/2005 11:56	1575	Ra2280422
Instrument 4 - C	7	1	583	16571	4/22/2005 11:54	1575	Ra2280422
Instrument 4 - C	8	1	819	20415	4/22/2005 12:01	1575	Ra2280422
Instrument 4 - D	1	1	1271	18178	4/22/2005 12:12	1575	Ra2280422
Instrument 4 - D	2	1	1275	17622	4/22/2005 12:09	1575	Ra2280422
Instrument 4 - D	3	1	1334	18020	4/22/2005 12:07	1575	Ra2280422
Instrument 4 - D	4	1	1337	18346	4/22/2005 12:04	1575	Ra2280422
Instrument 4 - D	5	1	1245	17305	4/22/2005 12:01	1575	Ra2280422
Instrument 4 - D	6	1	1357	19186	4/22/2005 11:59	1575	Ra2280422
Instrument 4 - D	7	1	1108	16363	4/22/2005 11:56	1575	Ra2280422
Instrument 4 - D	8	1	1366	20538	4/22/2005 11:54	1575	Ra2280422

Detector	Weight (mg)	Sample I.D.	Act. Time	Alpha	Beta	Voltage	Date/Time	Alpha Xtlk
1-A	0	1	4	123180	7004	1575	7/19/2004 12:45	0.05685988
1-A	2.6	2	4	132201	10981	1575	7/19/2004 13:05	0.083062912
1-A	6.6	3	4	138183	11002	1575	7/19/2004 12:59	0.079619056
1-A	9.7	4	4	118680	9570	1575	7/19/2004 12:51	0.080637007
1-A	13.8	5	4	143739	11066	1575	7/19/2004 14:06	0.076986761
1-A	16.5	6	4	153621	11776	1575	7/19/2004 14:23	0.076656186
1-A	24.4	7	4	128978	9363	1575	7/19/2004 14:17	0.072593776
1-A	34.5	8	4	123306	9830	1575	7/19/2004 14:11	0.07972037
1-A	54.1	9	4	120306	9399	1575	7/19/2004 13:40	0.078125779
1-A	75	10	4	96614	8151	1575	7/19/2004 13:58	0.084366655
1-A	108.1	11	4	101216	8301	1575	7/19/2004 13:51	0.082012725
1-A	128.6	12	4	99107	7975	1575	7/19/2004 13:45	0.080468584
1-B	0	1	4	120045	9546	1575	7/19/2004 12:51	0.07952018
1-B	2.6	2	4	126842	15082	1575	7/19/2004 12:45	0.118903833
1-B	6.6	3	4	131004	15988	1575	7/19/2004 13:05	0.122042075
1-B	9.7	4	4	114350	12711	1575	7/19/2004 12:59	0.111158723
1-B	13.8	5	4	138417	14961	1575	7/19/2004 14:11	0.108086434
1-B	16.5	6	4	150042	15386	1575	7/19/2004 14:06	0.102544621
1-B	24.4	7	4	125522	12682	1575	7/19/2004 14:23	0.101034082
1-B	34.5	8	4	119605	13034	1575	7/19/2004 14:17	0.108975377
1-B	54.1	9	4	116711	12671	1575	7/19/2004 13:45	0.108567316
1-B	75	10	4	92948	10714	1575	7/19/2004 13:40	0.115268752
1-B	108.1	11	4	97976	10862	1575	7/19/2004 13:58	0.110863885
1-B	128.6	12	4	96418	10100	1575	7/19/2004 13:51	0.104752225
1-C	0	1	4	124296	6464	1575	7/19/2004 12:59	0.052004892
1-C	2.6	2	4	133035	10258	1575	7/19/2004 12:51	0.077107528
1-C	6.6	3	4	138090	10531	1575	7/19/2004 12:45	0.076261858
1-C	9.7	4	4	120943	8343	1575	7/19/2004 13:05	0.068982909
1-C	13.8	5	4	144733	10074	1575	7/19/2004 14:18	0.069604029
1-C	16.5	6	4	155042	10804	1575	7/19/2004 14:11	0.069684344
1-C	24.4	7	4	130663	8868	1575	7/19/2004 14:06	0.067869251
1-C	34.5	8	4	125003	8910	1575	7/19/2004 14:23	0.071278289
1-C	54.1	9	4	121804	8748	1575	7/19/2004 13:51	0.071820301
1-C	75	10	4	98322	7255	1575	7/19/2004 13:45	0.073788165
1-C	108.1	11	4	102220	7796	1575	7/19/2004 13:40	0.076266875
1-C	128.6	12	4	101129	7164	1575	7/19/2004 13:58	0.070840214
1-D	0	1	4	123443	8458	1575	7/19/2004 13:05	0.068517453
1-D	2.6	2	4	132199	13898	1575	7/19/2004 12:59	0.105129388
1-D	6.6	3	4	135550	13902	1575	7/19/2004 12:51	0.102559941
1-D	9.7	4	4	120103	11392	1575	7/19/2004 12:45	0.094851919
1-D	13.8	5	4	143729	13676	1575	7/19/2004 14:23	0.095151292
1-D	16.5	6	4	154502	14607	1575	7/19/2004 14:18	0.094542465
								AVERAGE:
								0.077592474
								AVERAGE:
								0.107643125
								AVERAGE:
								0.070459055

AXTLK

1-D	24.4	7	4	129531	12207	1575	7/19/2004 14:11	0.094239989
1-D	34.5	8	4	123012	12757	1575	7/19/2004 14:06	0.10370533
1-D	54.1	9	4	120150	11613	1575	7/19/2004 13:58	0.096654182
1-D	75	10	4	98215	9779	1575	7/19/2004 13:51	0.099567276
1-D	108.1	11	4	101194	10974	1575	7/19/2004 13:45	0.108445165
1-D	128.6	12	4	99535	9759	1575	7/19/2004 13:40	0.098045913
2-A	0	1	4	124331	4254	1575	7/19/2004 13:12	0.034215119
2-A	2.6	2	4	134232	6233	1575	7/19/2004 13:32	0.046434531
2-A	6.6	2	4	140069	6405	1575	7/19/2004 13:26	0.045727463
2-A	9.7	3	4	122889	5590	1575	7/19/2004 13:20	0.045488205
2-A	13.8	5	4	146863	6837	1575	7/19/2004 12:45	0.046553591
2-A	16.5	6	4	156568	7018	1575	7/19/2004 13:05	0.044823974
2-A	24.4	7	4	131381	6012	1575	7/19/2004 12:59	0.045760041
2-A	34.5	8	4	127176	5984	1575	7/19/2004 12:51	0.047052903
2-A	54.1	9	4	123077	5740	1575	7/19/2004 14:06	0.046637471
2-A	75	10	4	98942	5507	1575	7/19/2004 14:23	0.055658871
2-A	108.1	11	4	104001	4825	1575	7/19/2004 14:18	0.046393785
2-A	128.6	12	4	101917	4956	1575	7/19/2004 14:11	0.048627805
2-B	0	2	4	120721	11567	1575	7/19/2004 13:20	0.095815972
2-B	2.6	3	4	126556	19106	1575	7/19/2004 13:12	0.150968741
2-B	6.6	3	4	132197	19354	1575	7/19/2004 13:32	0.146402717
2-B	9.7	4	4	115049	16847	1575	7/19/2004 13:26	0.146433259
2-B	13.8	5	4	138737	20181	1575	7/19/2004 12:52	0.145462278
2-B	16.5	6	4	148544	21207	1575	7/19/2004 12:46	0.14276578
2-B	24.4	7	4	124653	17331	1575	7/19/2004 13:05	0.139033958
2-B	34.5	8	4	120407	18554	1575	7/19/2004 12:59	0.154094031
2-B	54.1	9	4	116092	17170	1575	7/19/2004 14:11	0.147899941
2-B	75	10	4	93838	14131	1575	7/19/2004 14:06	0.150589313
2-B	108.1	11	4	96549	14386	1575	7/19/2004 14:23	0.149002061
2-B	128.6	12	4	95608	14028	1575	7/19/2004 14:18	0.146724124
2-C	0	1	4	123437	7996	1575	7/19/2004 13:26	0.064777984
2-C	2.6	3	4	130582	12877	1575	7/19/2004 13:21	0.098612366
2-C	6.6	4	4	135962	13321	1575	7/19/2004 13:12	0.097975905
2-C	9.7	4	4	117914	10926	1575	7/19/2004 13:32	0.092660753
2-C	13.8	5	4	142788	13288	1575	7/19/2004 12:59	0.093061042
2-C	16.5	6	4	152660	14110	1575	7/19/2004 12:52	0.092427617
2-C	24.4	7	4	128133	11613	1575	7/19/2004 12:46	0.09063239
2-C	34.5	8	4	123135	12371	1575	7/19/2004 13:05	0.100466967
2-C	54.1	9	4	119749	11112	1575	7/19/2004 14:18	0.092794094
2-C	75	10	4	96802	9106	1575	7/19/2004 14:11	0.094068304
2-C	108.1	11	4	99510	9531	1575	7/19/2004 14:06	0.095779319
2-C	128.6	12	4	99332	9346	1575	7/19/2004 14:23	0.094088511
2-D	0	1	4	124985	3697	1575	7/19/2004 13:32	0.02957955
								AVERAGE:
								0.096784193
								AVERAGE:
								0.142932681
								AVERAGE:
								0.092278771

2-D	2.6	1	4	134295	5262	1575	7/19/2004 13:27	0.039182397
2-D	6.6	2	4	139294	5598	1575	7/19/2004 13:21	0.040188379
2-D	9.7	4	4	120900	4856	1575	7/19/2004 13:12	0.040165426
2-D	13.8	5	4	146331	5790	1575	7/19/2004 13:05	0.039567829
2-D	16.5	6	4	156656	6547	1575	7/19/2004 12:59	0.041792207
2-D	24.4	7	4	131437	5001	1575	7/19/2004 12:52	0.038048647
2-D	34.5	8	4	127414	5150	1575	7/19/2004 12:46	0.04041942
2-D	54.1	9	4	122996	5076	1575	7/19/2004 14:24	0.041269635
2-D	75	10	4	98974	5113	1575	7/19/2004 14:18	0.051660032
2-D	108.1	11	4	103311	4367	1575	7/19/2004 14:11	0.042270426
2-D	128.6	12	4	101622	4274	1575	7/19/2004 14:06	0.042057822
3-A	0	1	4	122186	4445	1575	7/19/2004 13:40	0.036378963
3-A	2.6	2	4	130339	5572	1575	7/19/2004 13:58	0.042750059
3-A	6.6	3	4	140222	5810	1575	7/19/2004 13:51	0.041434297
3-A	9.7	4	4	119964	4894	1575	7/19/2004 13:45	0.040795572
3-A	13.8	5	4	143053	6082	1575	7/19/2004 13:12	0.042515711
3-A	16.5	6	4	153829	6793	1575	7/19/2004 13:33	0.044159424
3-A	24.4	7	4	126901	5289	1575	7/19/2004 13:27	0.041678159
3-A	34.5	8	4	123020	5105	1575	7/19/2004 13:21	0.041497318
3-A	54.1	9	4	120698	4933	1575	7/19/2004 12:46	0.040870603
3-A	75	10	4	97187	4395	1575	7/19/2004 13:05	0.045222098
3-A	108.1	11	4	101168	4293	1575	7/19/2004 13:00	0.042434367
3-A	128.6	12	4	99836	4174	1575	7/19/2004 12:52	0.041808566
3-B	0	1	4	121402	5014	1575	7/19/2004 13:45	0.041300802
3-B	2.6	2	4	129690	6779	1575	7/19/2004 13:40	0.0522708
3-B	6.6	3	4	138571	6967	1575	7/19/2004 13:58	0.050277475
3-B	9.7	4	4	120351	6116	1575	7/19/2004 13:51	0.050818024
3-B	13.8	5	4	143658	7295	1575	7/19/2004 13:21	0.050780325
3-B	16.5	6	4	153281	7805	1575	7/19/2004 13:12	0.050919553
3-B	24.4	7	4	127795	6233	1575	7/19/2004 13:33	0.048773426
3-B	34.5	8	4	123289	6301	1575	7/19/2004 13:27	0.05110756
3-B	54.1	9	4	120929	6014	1575	7/19/2004 12:52	0.049731661
3-B	75	10	4	96420	5434	1575	7/19/2004 12:46	0.056357602
3-B	108.1	11	4	101324	5330	1575	7/19/2004 13:05	0.052603529
3-B	128.6	12	4	99597	5094	1575	7/19/2004 13:00	0.051146119
3-C	0	1	4	117686	3645	1575	7/19/2004 13:51	0.030972248
3-C	2.6	2	4	126503	5098	1575	7/19/2004 13:45	0.04029944
3-C	6.6	3	4	137132	5930	1575	7/19/2004 13:40	0.043243007
3-C	9.7	4	4	117244	5109	1575	7/19/2004 13:59	0.043575791
3-C	13.8	5	4	140315	6224	1575	7/19/2004 13:27	0.044357339
3-C	16.5	6	4	149844	6728	1575	7/19/2004 13:21	0.044900029
3-C	24.4	7	4	124407	5022	1575	7/19/2004 13:12	0.040367503
3-C	34.5	8	4	120984	5272	1575	7/19/2004 13:33	0.04357601
AVERAGE:								0.040516814
AVERAGE:								0.041795428
AVERAGE:								0.05050724

*Handwritten signature*



3-C	54.1	9	4	118600	5424	1575	7/19/2004 13:00	0.045733558
3-C	75	10	4	94679	5251	1575	7/19/2004 12:52	0.055461084
3-C	108.1	11	4	98791	4743	1575	7/19/2004 12:46	0.048010446
3-C	128.6	12	4	98385	4632	1575	7/19/2004 13:05	0.047080348
3-D	0	1	4	116626	3829	1575	7/19/2004 13:59	0.032831444
3-D	2.6	2	4	120065	5035	1575	7/19/2004 13:51	0.041935618
3-D	6.6	3	4	133070	6019	1575	7/19/2004 13:45	0.045231833
3-D	9.7	4	4	112803	5203	1575	7/19/2004 13:40	0.04612466
3-D	13.8	5	4	135629	6272	1575	7/19/2004 13:33	0.046243797
3-D	16.5	6	4	145863	6984	1575	7/19/2004 13:27	0.047880545
3-D	24.4	7	4	121303	5235	1575	7/19/2004 13:21	0.043156393
3-D	34.5	8	4	118060	5449	1575	7/19/2004 13:12	0.046154498
3-D	54.1	9	4	114887	5495	1575	7/19/2004 13:05	0.047829606
3-D	75	10	4	91763	5562	1575	7/19/2004 13:00	0.060612665
3-D	108.1	11	4	96450	4792	1575	7/19/2004 12:52	0.049683774
3-D	128.6	12	4	93522	4729	1575	7/19/2004 12:46	0.050565642
4-A	0	1	4	120076	5726	1575	7/19/2004 14:05	0.047686465
4-A	2.6	2	4	129124	8209	1575	7/19/2004 14:24	0.063574548
4-A	6.6	3	4	135773	8094	1575	7/19/2004 14:18	0.059614209
4-A	9.7	4	4	117817	6776	1575	7/19/2004 14:12	0.057512923
4-A	13.8	5	4	140420	8331	1575	7/19/2004 13:40	0.059329155
4-A	16.5	6	4	150631	8981	1575	7/19/2004 13:59	0.059622521
4-A	24.4	7	4	126148	7123	1575	7/19/2004 13:51	0.056465422
4-A	34.5	8	4	121316	7207	1575	7/19/2004 13:46	0.059406838
4-A	54.1	9	4	118329	7059	1575	7/19/2004 13:13	0.059655706
4-A	75	10	4	94634	6413	1575	7/19/2004 13:33	0.067766342
4-A	108.1	11	4	99741	6120	1575	7/19/2004 13:27	0.06135892
4-A	128.6	12	4	98809	5913	1575	7/19/2004 13:21	0.059842727
4-B	0	1	4	114878	6464	1575	7/19/2004 14:12	0.056268389
4-B	2.6	2	4	120144	9787	1575	7/19/2004 14:05	0.081460581
4-B	6.6	3	4	130808	11221	1575	7/19/2004 14:24	0.085782215
4-B	9.7	4	4	112163	9518	1575	7/19/2004 14:18	0.084858643
4-B	13.8	5	4	134597	11874	1575	7/19/2004 13:46	0.088218905
4-B	16.5	6	4	140671	12325	1575	7/19/2004 13:40	0.087615784
4-B	24.4	7	4	119419	9576	1575	7/19/2004 13:59	0.080189245
4-B	34.5	8	4	115264	10105	1575	7/19/2004 13:52	0.087668309
4-B	54.1	9	4	114888	10477	1575	7/19/2004 13:21	0.091193162
4-B	75	10	4	88706	9932	1575	7/19/2004 13:13	0.111965369
4-B	108.1	11	4	94176	8845	1575	7/19/2004 13:33	0.093919895
4-B	128.6	12	4	93601	8766	1575	7/19/2004 13:27	0.093652846
4-C	0	1	4	118134	3354	1575	7/19/2004 14:18	0.028391488
4-C	2.6	2	4	125302	4459	1575	7/19/2004 14:12	0.035586024
4-C	6.6	3	4	135611	5208	1575	7/19/2004 14:05	0.038403964
AVERAGE:								0.043964734
AVERAGE:								0.046520873
AVERAGE:								0.059319648
AVERAGE:								0.086899362

AXTLK

4-C	9.7	4	4	116746	4631	1575	7/19/2004 14:24	0.0396667312
4-C	13.8	5	4	138550	5404	1575	7/19/2004 13:52	0.039000397
4-C	16.5	6	4	150017	6076	1575	7/19/2004 13:46	0.040502076
4-C	24.4	7	4	121173	4552	1575	7/19/2004 13:40	0.037566124
4-C	34.5	8	4	120766	4681	1575	7/19/2004 13:59	0.03876091
4-C	54.1	9	4	118850	4749	1575	7/19/2004 13:27	0.03995793
4-C	75	10	4	93892	4984	1575	7/19/2004 13:21	0.053082265
4-C	108.1	11	4	98070	4263	1575	7/19/2004 13:13	0.043468951
4-C	128.6	12	4	97189	4294	1575	7/19/2004 13:33	0.044181955
4-D	0	1	4	124733	4617	1575	7/19/2004 14:24	0.037015064
4-D	2.6	2	4	132301	5960	1575	7/19/2004 14:18	0.04504879
4-D	6.6	3	4	142954	6245	1575	7/19/2004 14:12	0.043685381
4-D	9.7	4	4	121909	5303	1575	7/19/2004 14:05	0.04349966
4-D	13.8	5	4	145491	6551	1575	7/19/2004 13:59	0.04502684
4-D	16.5	6	4	157710	7062	1575	7/19/2004 13:52	0.044778391
4-D	24.4	7	4	130628	5760	1575	7/19/2004 13:46	0.044094681
4-D	34.5	8	4	125691	5573	1575	7/19/2004 13:40	0.044338895
4-D	54.1	9	4	124488	5406	1575	7/19/2004 13:33	0.043425872
4-D	75	10	4	98537	4867	1575	7/19/2004 13:27	0.049992614
4-D	108.1	11	4	103586	4711	1575	7/19/2004 13:21	0.045479119
4-D	128.6	12	4	101025	4587	1575	7/19/2004 13:13	0.045404603
							AVERAGE:	0.039881081
							AVERAGE:	0.044265826

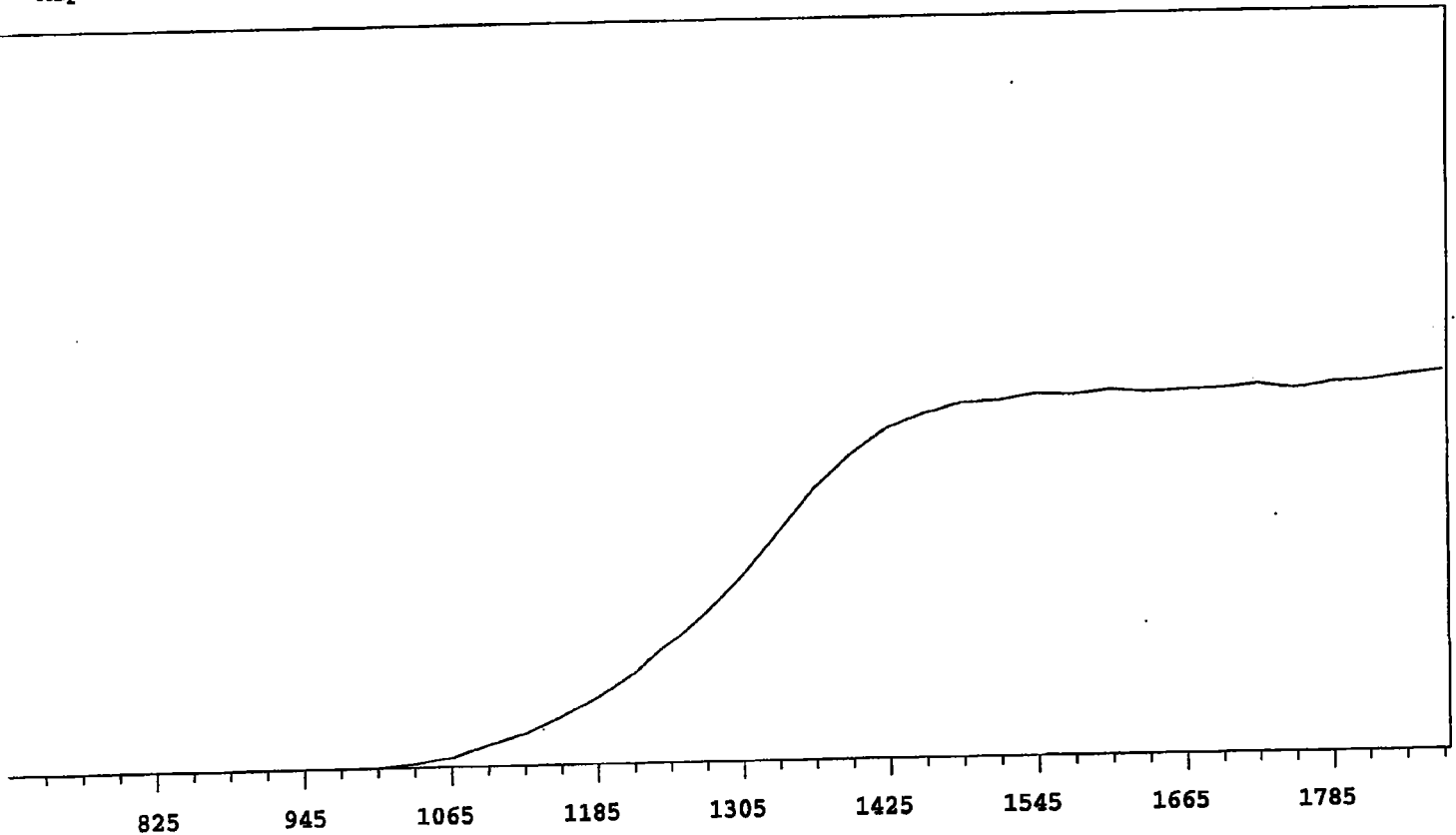
Plateau 07/04

Instrument 1 MPC 9604 Detector A

7/19/2004

Alpha Volts: 1575

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19647	+66.40
735	1		1335	24085	+56.97
765	0		1365	28472	+45.24
795	0	>100	1395	31886	+32.36
825	0	>100	1425	34566	+21.39
855	0	>100	1455	36094	+12.77
885	0	>100	1485	37160	+7.52
915	0	>100	1515	37374	+4.09
945	2	>100	1545	38060	+2.67
975	9	>100	1575	37933	+1.53
1005	93	>100	1605	38395	+0.47
1035	472	>100	1635	38079	+0.70
1065	1107	>100	1665	38254	+0.98
1095	2321	>100	1695	38405	+0.88
1125	3514	>100	1725	38794	+0.97
1155	5227	>100	1755	38316	+1.20
1185	7099	+98.30	1785	38858	+2.01
1215	9425	+88.55	1815	39067	+3.46
1245	12574	+81.27	1845	39590	
1275	15807	+74.39	1875	39984	

*Handwritten signature*

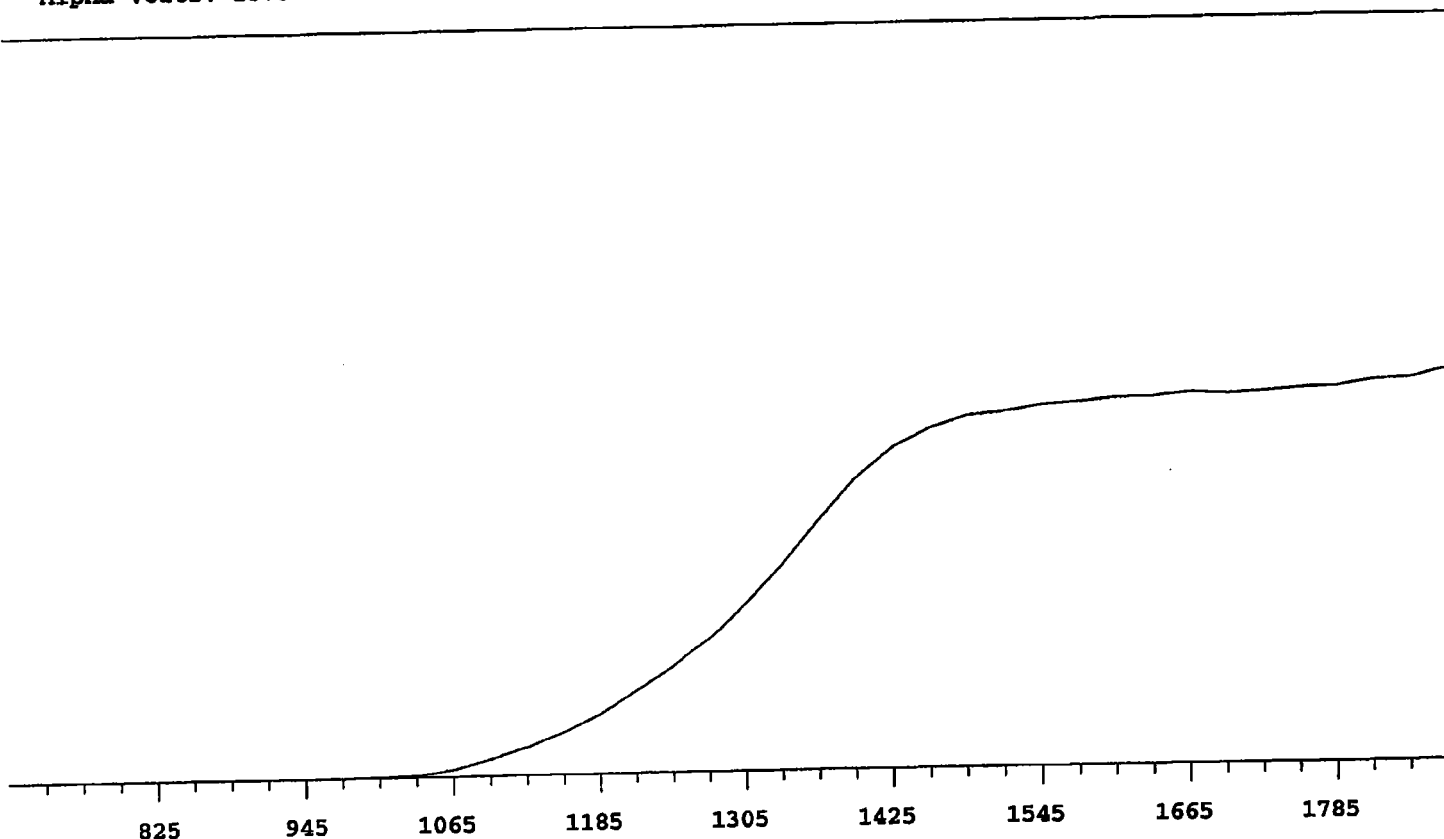
Plateau 07/04

Instrument 1 MPC 9604 Detector B

7/19/2004

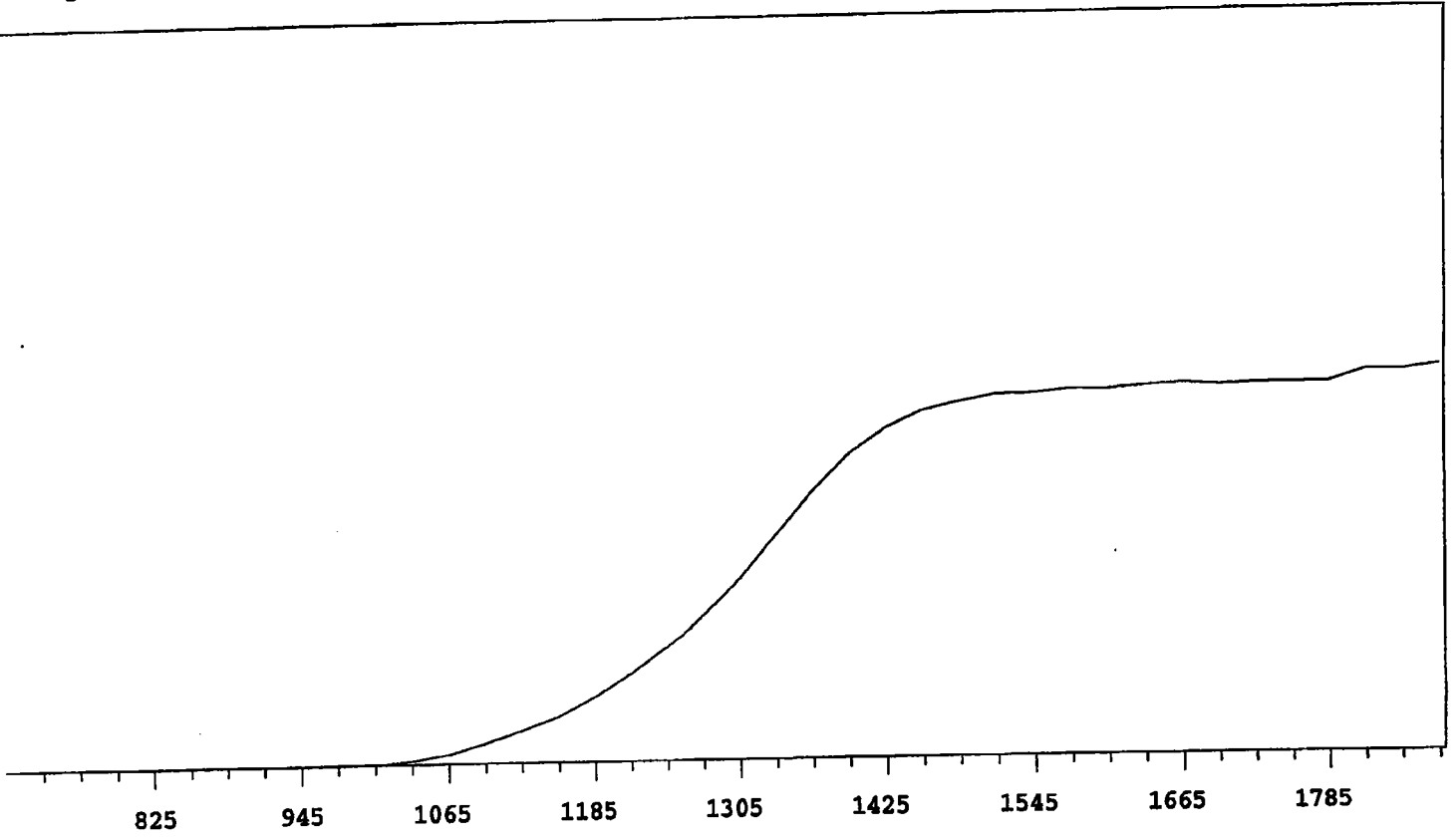
Alpha Volts: 1575

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	18233	+71.56
735	0		1335	22329	+63.09
765	0		1365	26957	+52.29
795	0	>100	1395	31333	+40.07
825	0	>100	1425	34676	+27.41
855	0	>100	1455	36745	+16.34
885	0	>100	1485	38047	+9.30
915	0	>100	1515	38436	+5.37
945	1	>100	1545	39049	+3.58
975	1	>100	1575	39332	+2.73
1005	28	>100	1605	39689	+2.17
1035	189	>100	1635	39721	+1.41
1065	694	>100	1665	40142	+0.97
1095	1704	>100	1695	39944	+1.22
1125	2895	>100	1725	40159	+1.15
1155	4335	>100	1755	40445	+2.43
1185	6174	>100	1785	40586	+2.67
1215	8490	+93.12	1815	41204	+3.66
1245	11048	+85.61	1845	41412	
1275	14282	+78.12	1875	42292	

*Handwritten signature*



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19843	+68.09
735	0		1335	24383	+58.12
765	0		1365	28965	+46.47
795	0	>100	1395	32739	+33.67
825	0	>100	1425	35363	+22.02
855	0	>100	1455	37211	+13.59
885	0	>100	1485	38118	+7.60
915	0	>100	1515	38793	+4.20
945	0	>100	1545	38869	+2.24
975	6	>100	1575	39257	+1.56
1005	67	>100	1605	39192	+1.77
1035	384	>100	1635	39548	+0.99
1065	1049	>100	1665	39770	+0.83
1095	2181	>100	1695	39557	+0.19
1125	3529	>100	1725	39678	+0.06
1155	4985	>100	1755	39708	+2.33
1185	7117	+98.92	1785	39728	+3.00
1215	9603	+91.00	1815	40929	+3.79
1245	12383	+81.78	1845	40873	
1275	16035	+75.02	1875	41442	

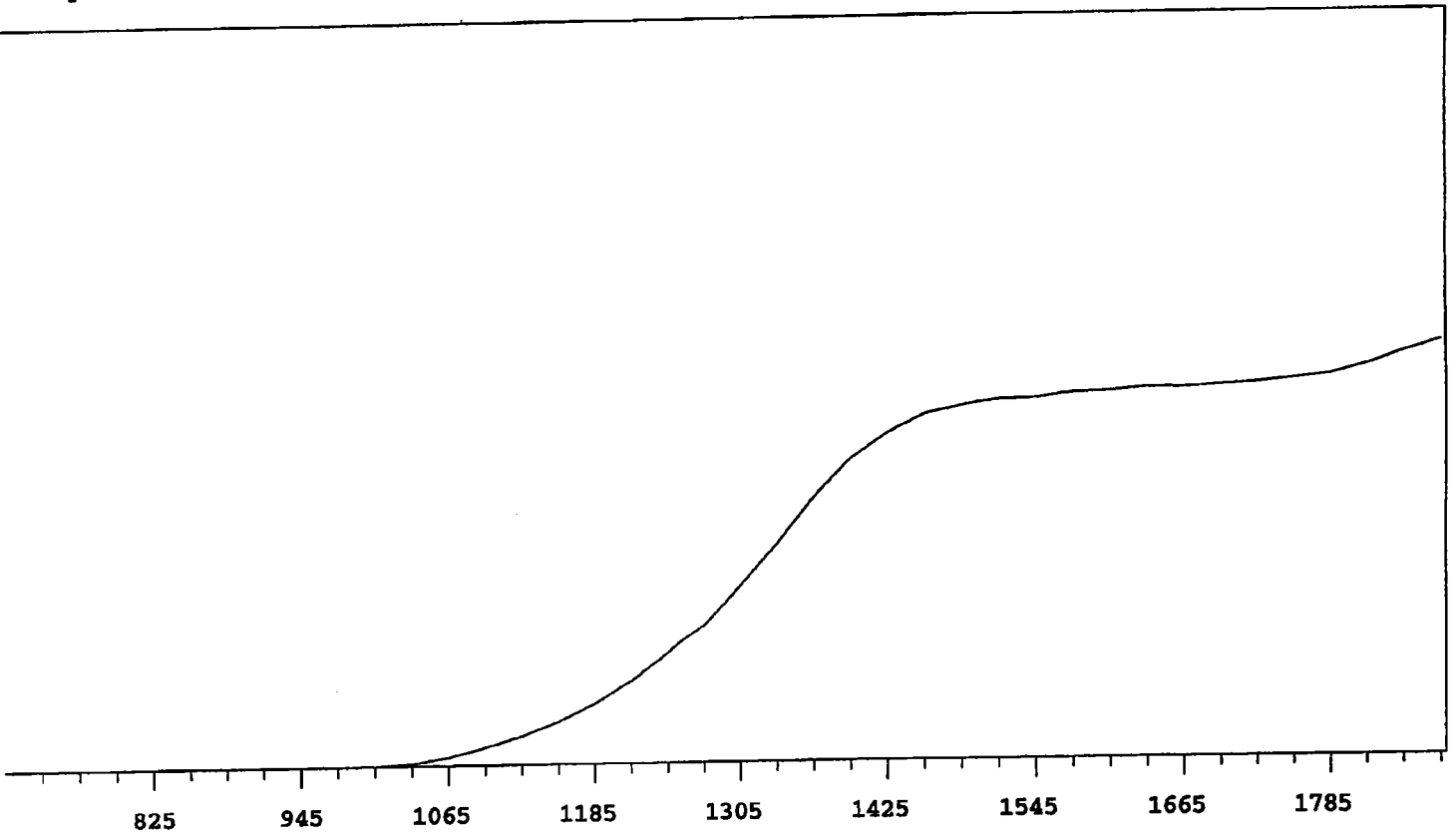
*7/19/04*

Plateau 07/04

Instrument 1 MPC 9604 Detector D

7/19/2004

Alpha Volts: 1575 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	18119	+70.98
735	0		1335	22262	+62.06
765	0		1365	26838	+49.29
795	0	>100	1395	30731	+36.23
825	0	>100	1425	33292	+23.33
855	0	>100	1455	35153	+13.90
885	1	>100	1485	35963	+7.60
915	0	>100	1515	36553	+4.34
945	1	>100	1545	36642	+2.93
975	3	>100	1575	37178	+2.39
1005	38	>100	1605	37266	+1.96
1035	235	>100	1635	37570	+1.40
1065	812	>100	1665	37540	+1.51
1095	1784	>100	1695	37829	+1.86
1125	2940	>100	1725	37991	+2.68
1155	4370	>100	1755	38402	+4.04
1185	6148	>100	1785	38788	+6.23
1215	8306	+93.10	1815	39767	+7.92
1245	11151	+85.86	1845	40972	
1275	14209	+78.51	1875	42061	

*Handwritten signature*

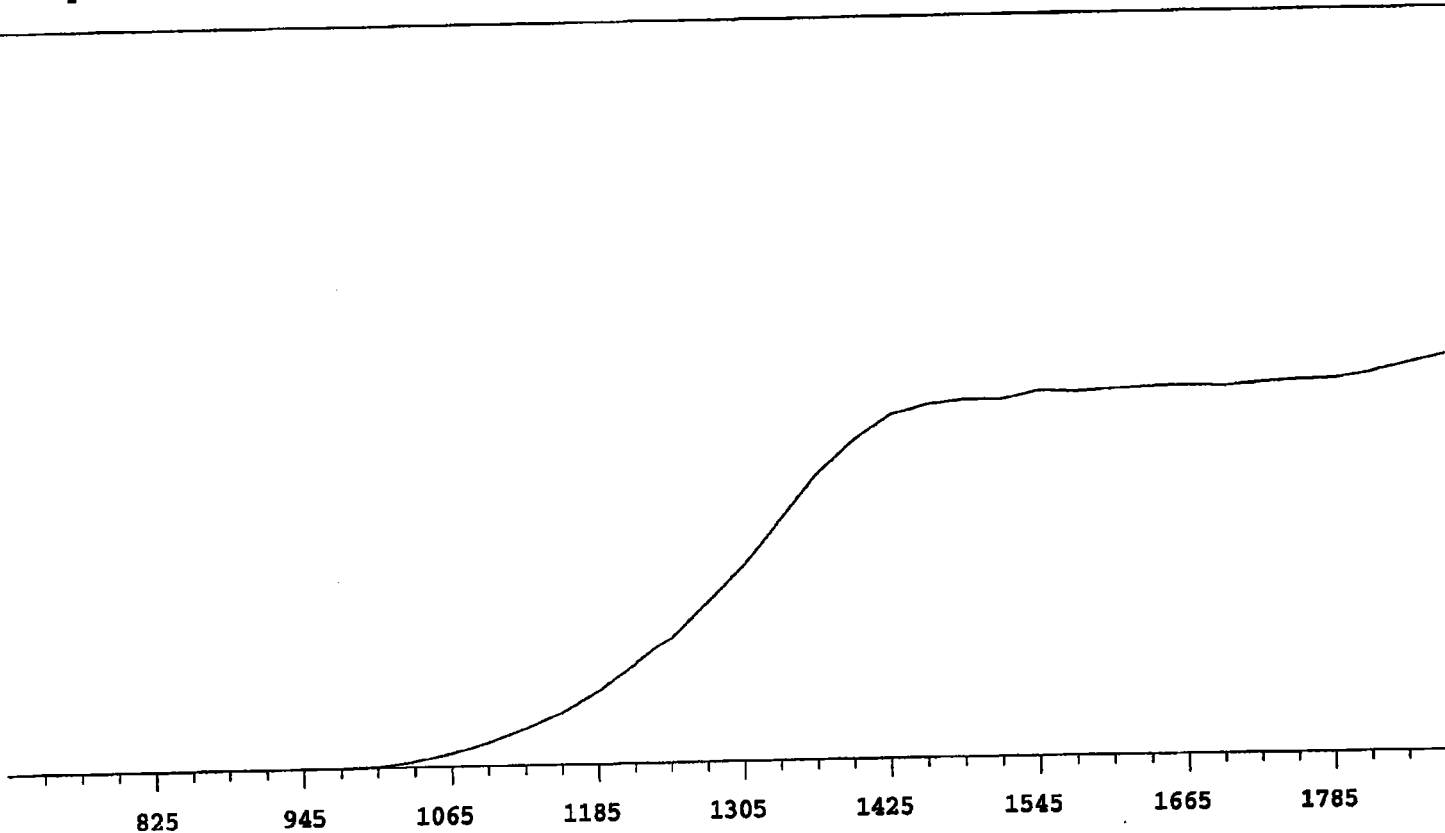
Plateau 07/04

Instrument 2 MPC 9604 Detector A

7/19/2004

Alpha Volts: 705

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	23851	+64.66
735	0		1335	29020	+54.28
765	0		1365	34107	+43.53
795	0	>100	1395	37915	+30.25
825	0	>100	1425	41080	+18.36
855	0	>100	1455	42265	+9.28
885	0	>100	1485	42852	+4.65
915	0	>100	1515	42788	+2.83
945	1	>100	1545	43789	+2.26
975	31	>100	1575	43625	+2.13
1005	186	>100	1605	43907	+1.05
1035	709	>100	1635	44123	+0.93
1065	1655	>100	1665	44235	+0.77
1095	2913	>100	1695	44074	+1.03
1125	4590	>100	1725	44441	+1.31
1155	6428	>100	1755	44707	+2.55
1185	8824	+94.92	1785	44790	+3.80
1215	11872	+87.83	1815	45612	+5.33
1245	15239	+79.24	1845	46564	
1275	19527	+71.87	1875	47485	

*Handwritten signature*

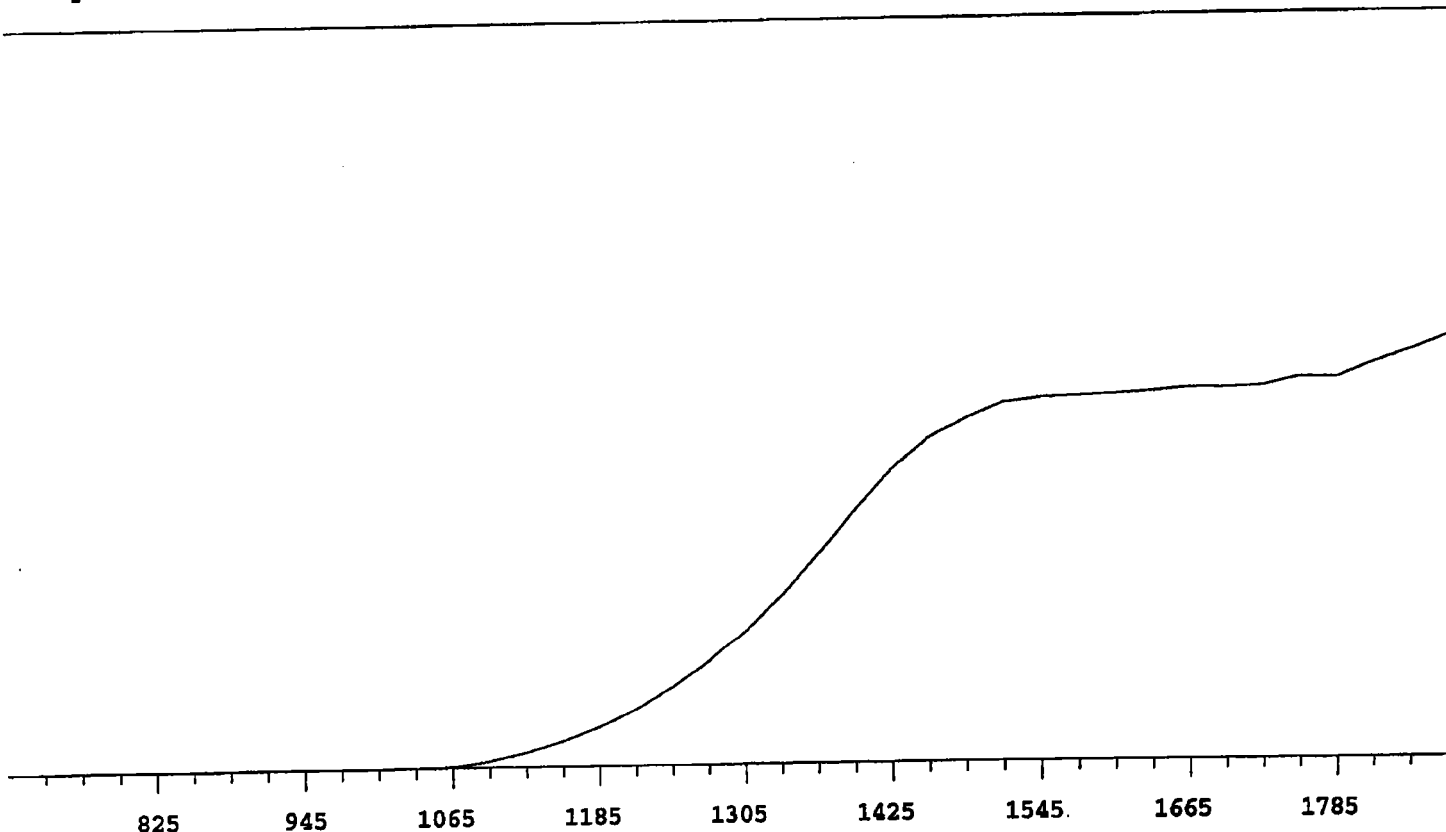
Plateau 07/04

Instrument 2 MPC 9604 Detector B

7/19/2004

Alpha Volts: 705

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	1	>100
1005	1	>100
1035	25	>100
1065	181	>100
1095	642	>100
1125	1508	>100
1155	2634	>100
1185	4092	>100
1215	5839	>100
1245	8055	+95.00
1275	10574	+86.26
1305	13796	+79.13
1335	17365	+72.79
1365	21609	+64.02
1395	26226	+52.97
1425	30369	+39.49
1455	33493	+27.22
1485	35403	+16.91
1515	36977	+9.40
1545	37438	+4.79
1575	37579	+2.09
1605	37762	+1.97
1635	37995	+1.78
1665	38346	+1.51
1695	38303	+2.41
1725	38472	+2.43
1755	39326	+4.86
1785	39246	+7.18
1815	40775	+8.99
1845	42052	
1875	43445	

VOLTS	COUNTS	%/100 Volts
1305	13796	+79.13
1335	17365	+72.79
1365	21609	+64.02
1395	26226	+52.97
1425	30369	+39.49
1455	33493	+27.22
1485	35403	+16.91
1515	36977	+9.40
1545	37438	+4.79
1575	37579	+2.09
1605	37762	+1.97
1635	37995	+1.78
1665	38346	+1.51
1695	38303	+2.41
1725	38472	+2.43
1755	39326	+4.86
1785	39246	+7.18
1815	40775	+8.99
1845	42052	
1875	43445	

*Handwritten signature*



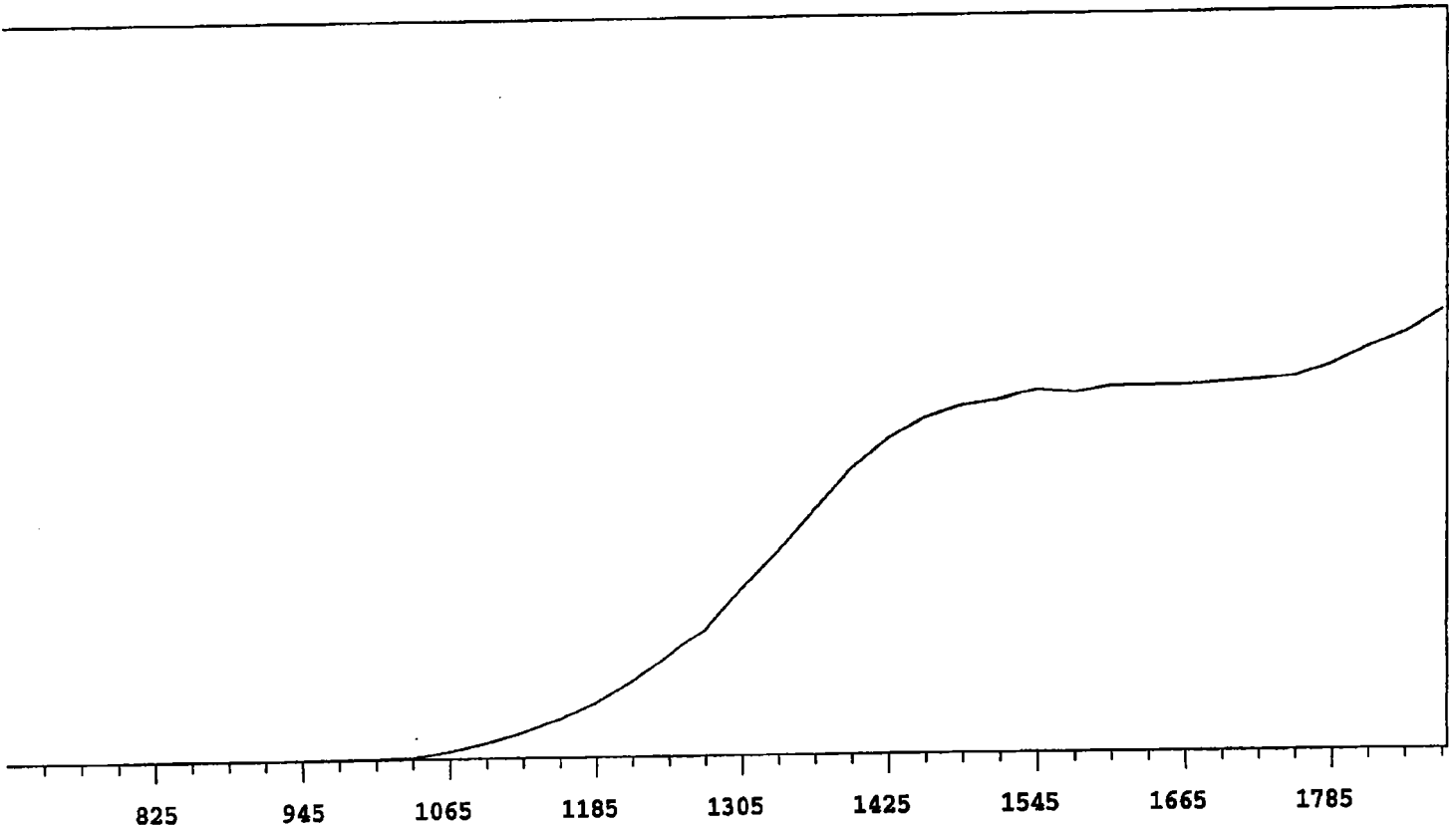
Plateau 07/04

Instrument 2 MPC 9604 Detector C

7/19/2004

Alpha Volts: 705

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15462	+71.07
735	0		1335	18841	+62.11
765	0		1365	22516	+50.11
795	0	>100	1395	26055	+38.36
825	0	>100	1425	28616	+26.36
855	0	>100	1455	30333	+16.13
885	0	>100	1485	31358	+10.48
915	0	>100	1515	31858	+5.90
945	0	>100	1545	32724	+4.01
975	2	>100	1575	32459	+2.65
1005	34	>100	1605	33001	+1.27
1035	198	>100	1635	33015	+1.78
1065	678	>100	1665	33071	+1.30
1095	1441	>100	1695	33306	+2.08
1125	2391	>100	1725	33504	+4.14
1155	3604	>100	1755	33840	+7.46
1185	5105	>100	1785	34896	+10.40
1215	7080	+93.85	1815	36461	+13.37
1245	9331	+87.10	1845	37695	
1275	11919	+78.91	1875	39769	

*Handwritten signature/initials*

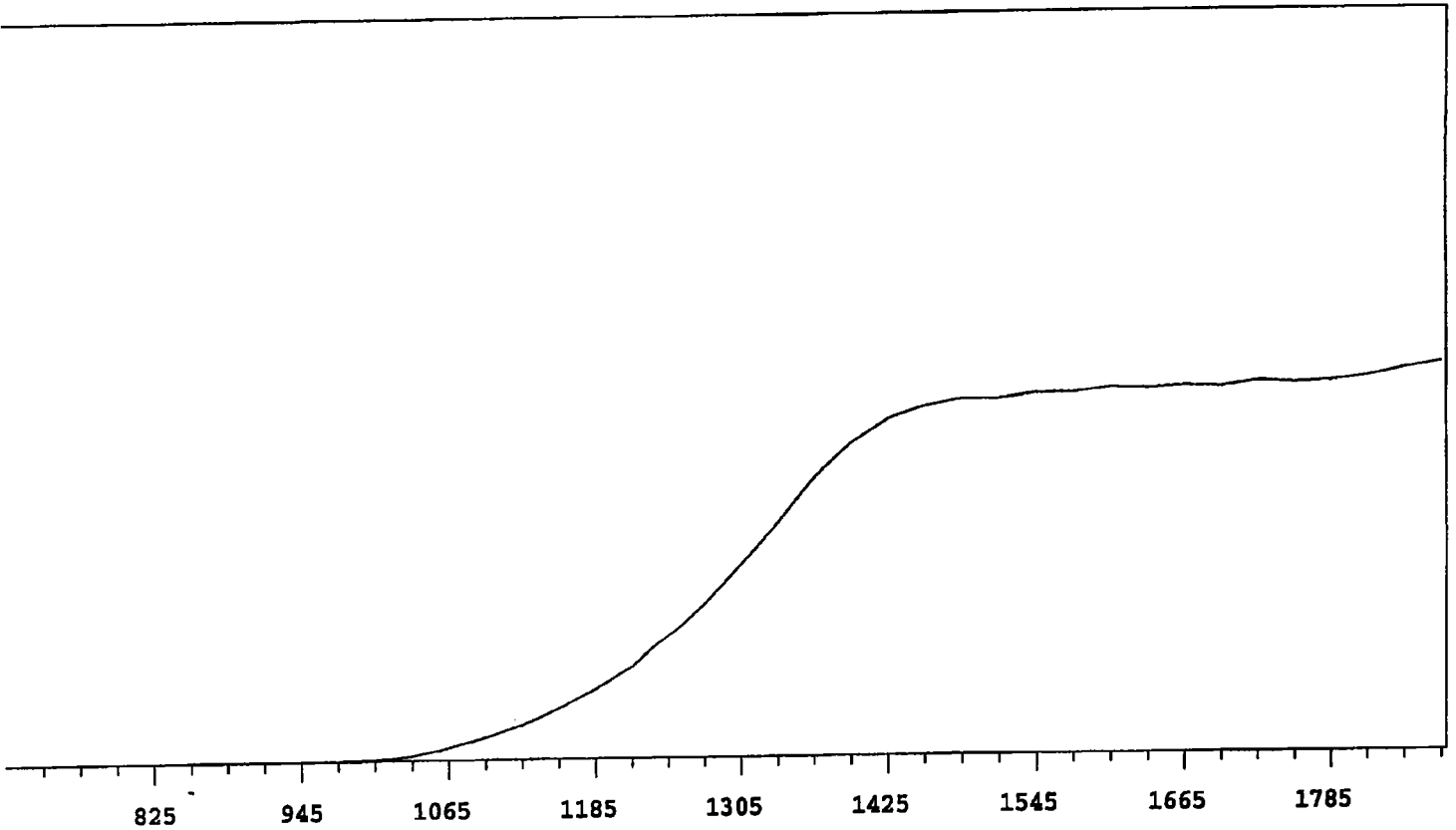
Plateau 07/04

Instrument 2 MPC 9604 Detector D

7/19/2004

Alpha Volts: 705

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	24635	+66.12
735	0		1335	29835	+56.19
765	0		1365	35285	+43.75
795	0	>100	1395	39469	+30.76
825	0	>100	1425	42337	+19.13
855	0	>100	1455	43919	+10.31
885	0	>100	1485	44875	+5.61
915	0	>100	1515	44862	+3.06
945	2	>100	1545	45596	+2.54
975	19	>100	1575	45621	+2.21
1005	153	>100	1605	46227	+1.45
1035	638	>100	1635	46064	+0.97
1065	1652	>100	1665	46372	+1.14
1095	2965	>100	1695	46217	+1.30
1125	4560	>100	1725	46942	+1.05
1155	6605	>100	1755	46688	+1.70
1185	9052	+95.03	1785	46874	+2.68
1215	11639	+87.08	1815	47445	+4.76
1245	15562	+81.12	1845	48467	
1275	19691	+74.76	1875	49304	

*Handwritten signature*  
7/19/2004

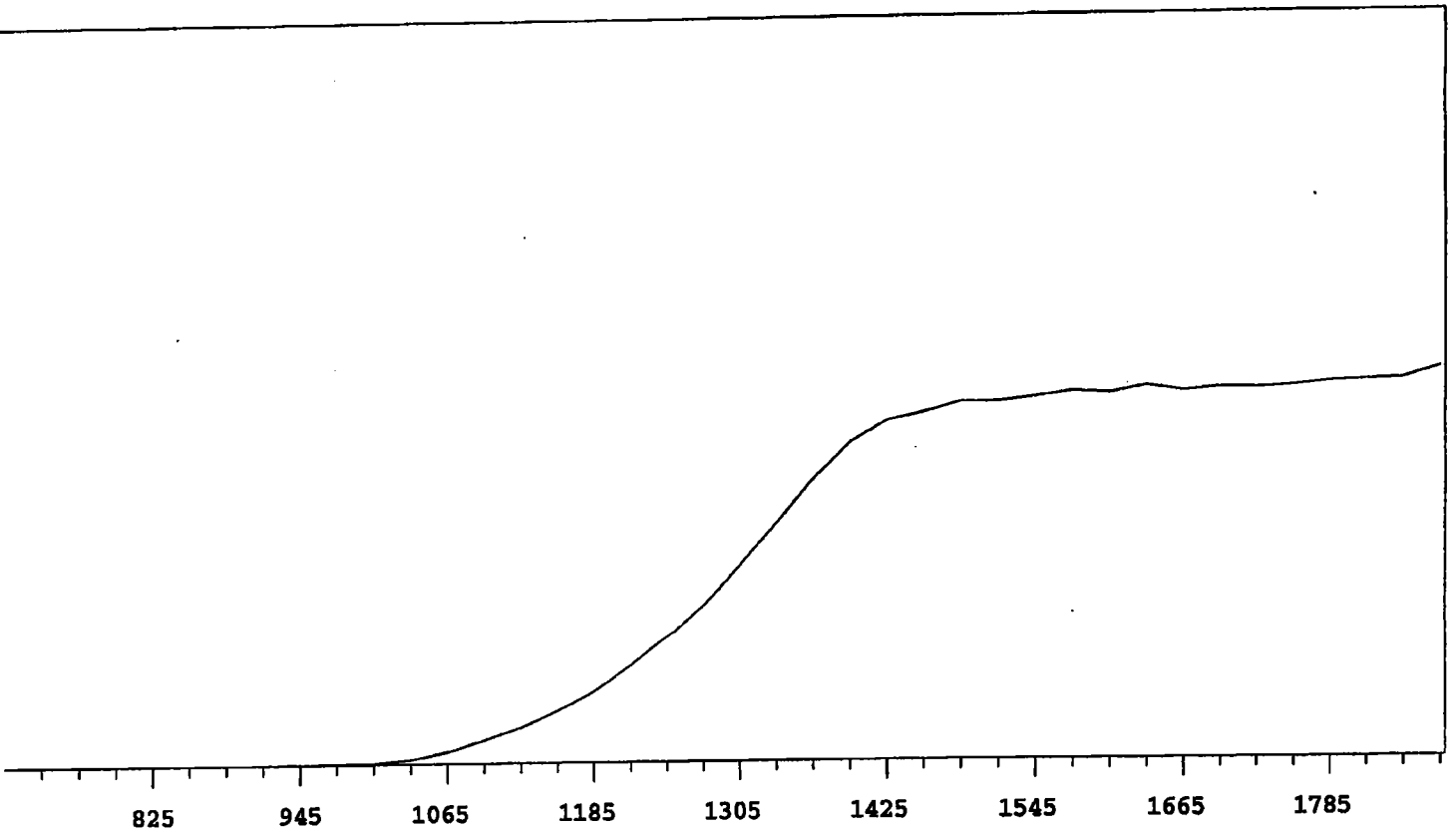
Plateau 07/04

Instrument 3 MPC 9604 Detector A

7/19/2004

Alpha Volts: 705

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	21575	+65.87
735	0		1335	26174	+56.59
765	0		1365	30896	+44.00
795	0	>100	1395	34809	+29.89
825	1	+0.00	1425	37134	+18.34
855	0	>100	1455	38035	+9.55
885	0	>100	1485	39191	+5.33
915	0	>100	1515	39178	+4.07
945	0	>100	1545	39651	+2.17
975	18	>100	1575	40203	+2.85
1005	109	>100	1605	39970	+1.23
1035	454	>100	1635	40729	+0.64
1065	1261	>100	1665	40127	+0.51
1095	2472	>100	1695	40509	+0.10
1125	3802	>100	1725	40387	+1.66
1155	5583	>100	1755	40662	+1.77
1185	7639	+99.85	1785	41060	+2.16
1215	10514	+89.69	1815	41255	+3.34
1245	13685	+81.66	1845	41417	
1275	17277	+73.24	1875	42557	

*g 7/22/04*

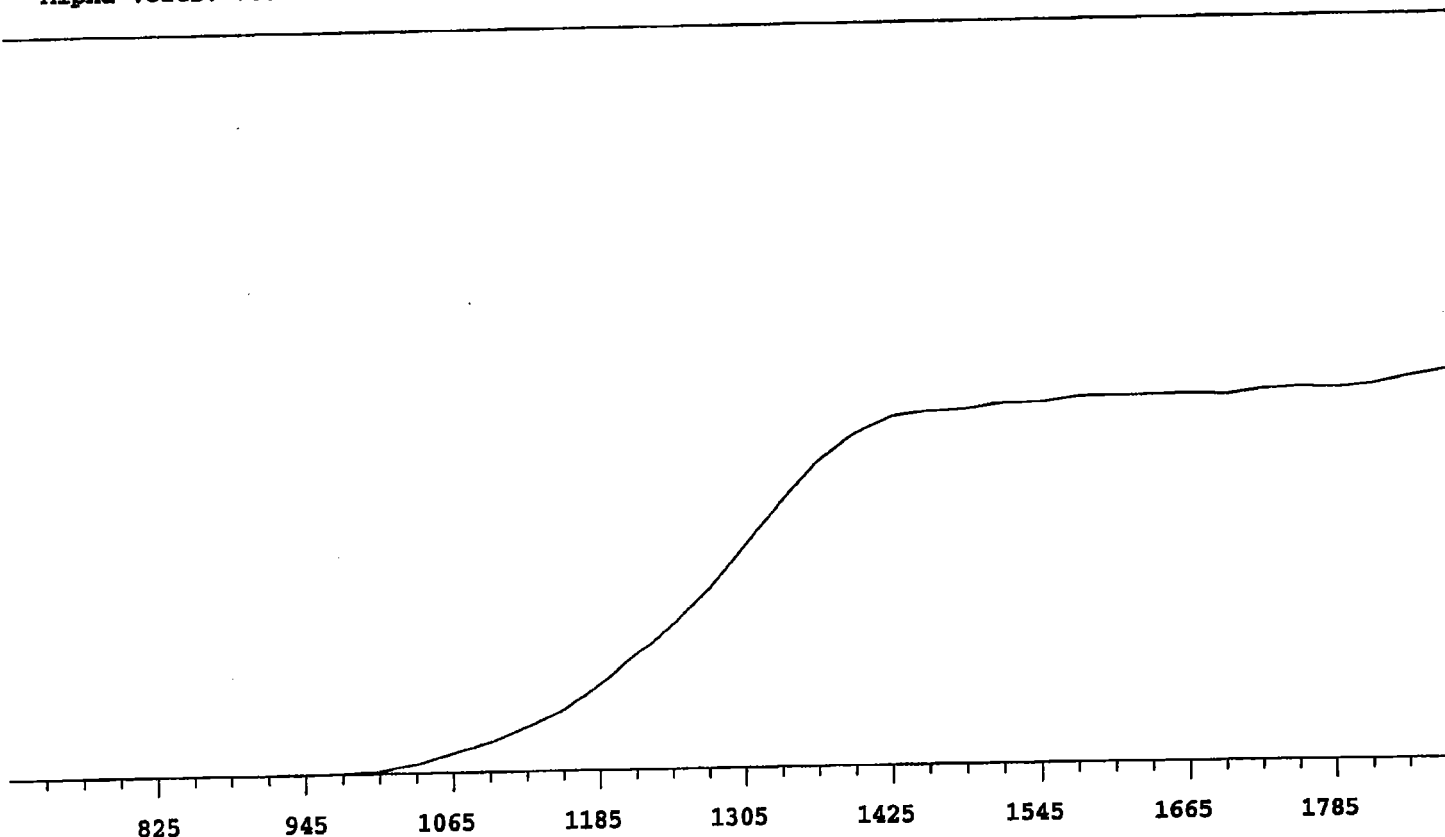
Plateau 07/04

Instrument 3 MPC 9604 Detector B

7/19/2004

Alpha Volts: 705

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19165	+59.15
735	0		1335	22642	+47.93
765	0		1365	25877	+34.84
795	0	>100	1395	28084	+22.41
825	0	>100	1425	29543	+12.08
855	0	>100	1455	29959	+6.28
885	0	>100	1485	30142	+3.11
915	0	>100	1515	30579	+2.97
945	4	>100	1545	30642	+2.65
975	46	>100	1575	31069	+1.73
1005	241	>100	1605	31120	+1.39
1035	763	>100	1635	31142	+0.31
1065	1642	>100	1665	31255	+0.92
1095	2578	>100	1695	31148	+1.60
1125	3908	>100	1725	31549	+1.43
1155	5339	>100	1755	31750	+1.73
1185	7437	+92.71	1785	31631	+2.34
1215	9881	+83.26	1815	31928	+3.75
1245	12503	+75.07	1845	32580	
1275	15447	+67.35	1875	33087	

*Jan 7/2004*

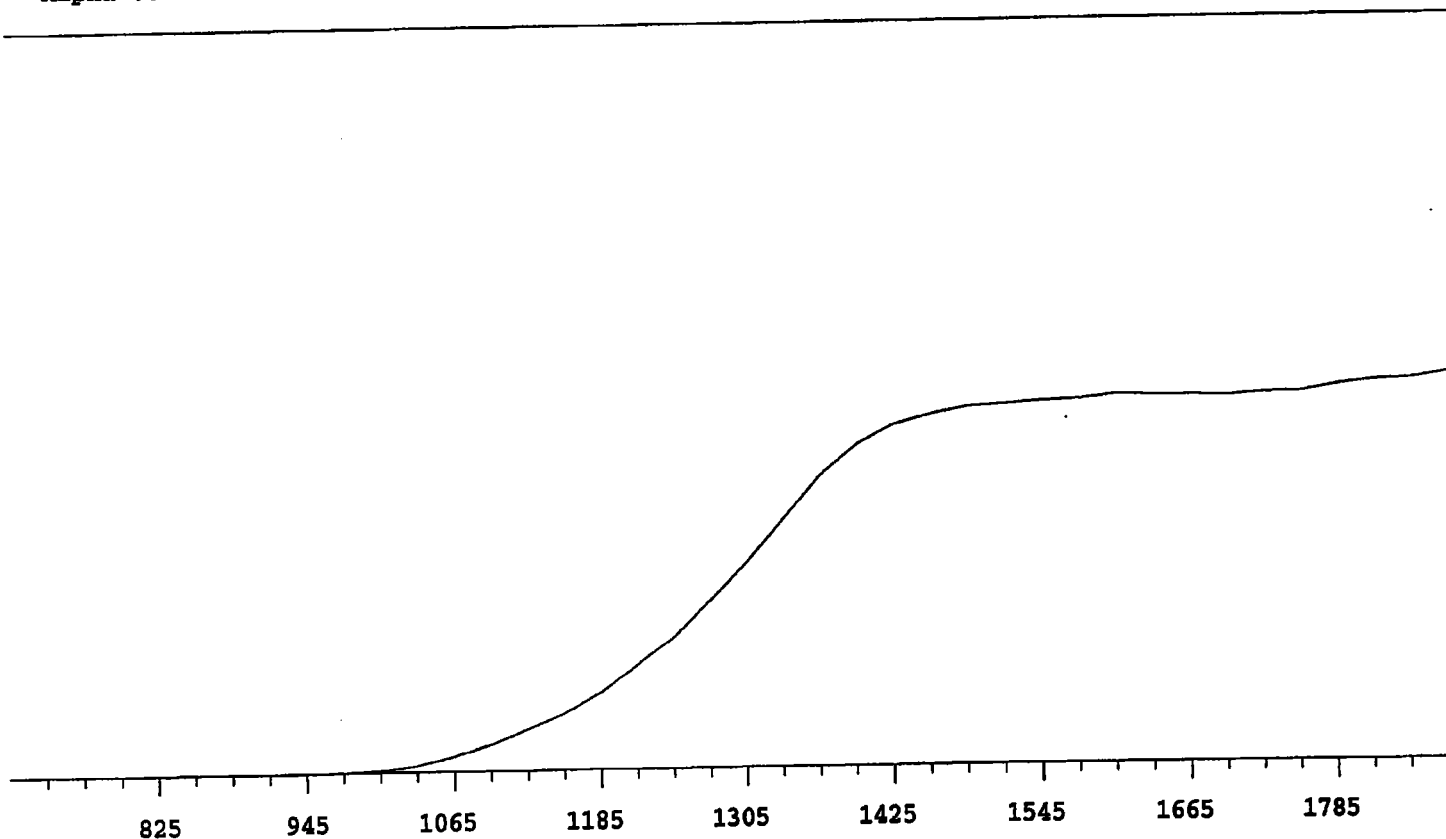
Plateau 07/04

Instrument 3 MPC 9604 Detector C

7/19/2004

Alpha Volts: 705

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	21337	+62.41
735	0		1335	25676	+51.87
765	0		1365	30007	+39.96
795	0	>100	1395	33079	+26.87
825	0	>100	1425	35034	+16.03
855	0	>100	1455	36048	+8.88
885	0	>100	1485	36739	+4.80
915	1	>100	1515	36965	+2.78
945	2	>100	1545	37198	+2.19
975	33	>100	1575	37358	+1.72
1005	226	>100	1605	37766	+1.06
1035	678	>100	1635	37648	+0.24
1065	1589	>100	1665	37650	+0.01
1095	2696	>100	1695	37553	+0.60
1125	4193	>100	1725	37820	+1.80
1155	5866	>100	1755	37904	+3.02
1185	7961	+94.24	1785	38499	+3.09
1215	10746	+87.02	1815	38941	+3.56
1245	13783	+78.35	1845	39086	
1275	17549	+69.99	1875	39684	

*Handwritten signature*

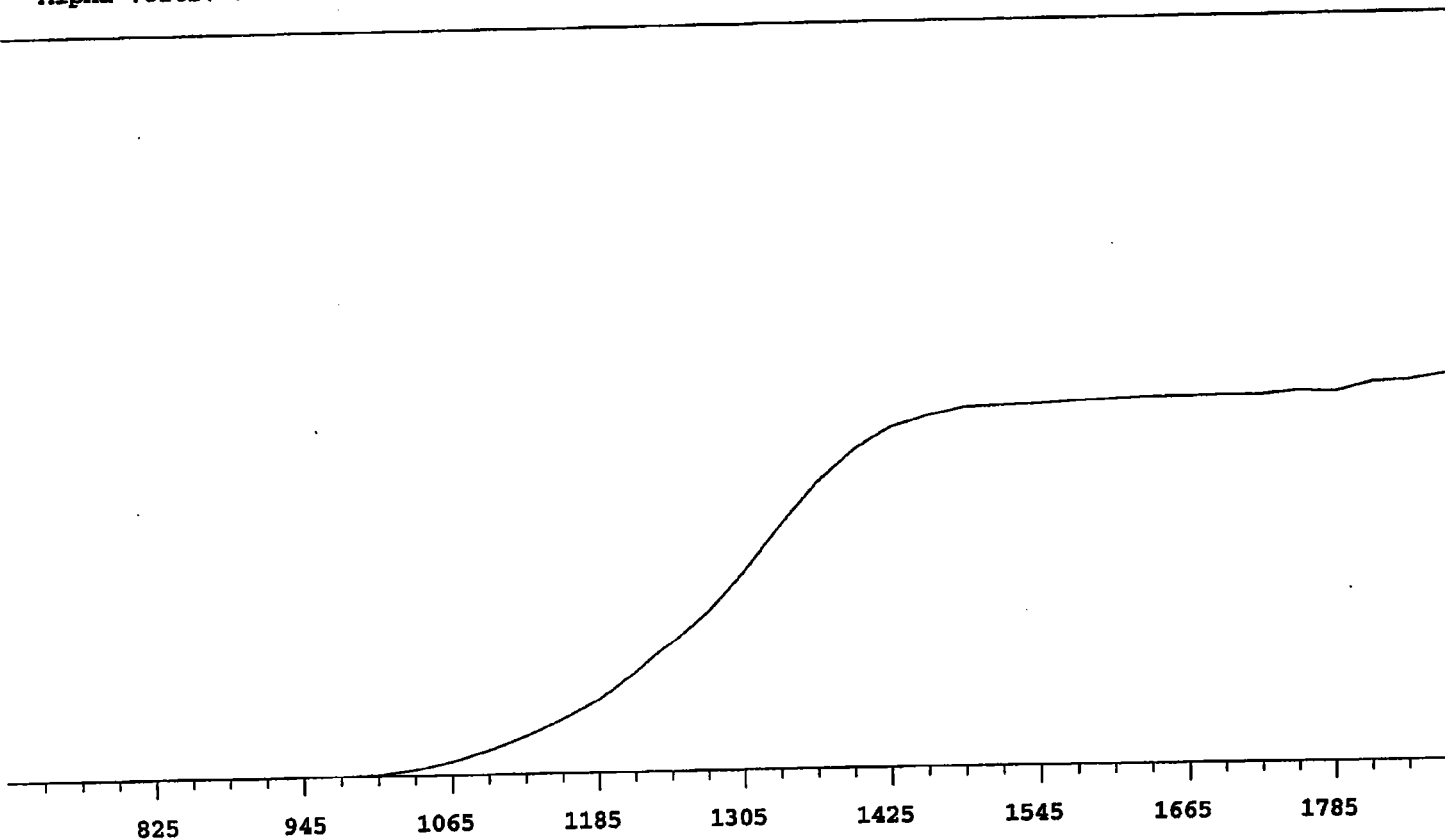
Plateau 07/04

Instrument 3 MPC 9604 Detector D

7/19/2004

Alpha Volts: 705

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	22384	+64.91
735	0		1335	27338	+55.29
765	0		1365	31944	+42.57
795	0	>100	1395	35658	+29.20
825	1	>100	1425	38071	+18.44
855	0	+0.00	1455	39378	+10.29
885	1	+0.00	1485	40341	+5.25
915	0	>100	1515	40508	+2.75
945	1	>100	1545	40640	+1.56
975	24	>100	1575	40893	+1.60
1005	140	>100	1605	41098	+1.34
1035	643	>100	1635	41263	+0.92
1065	1519	>100	1665	41279	+0.44
1095	2739	>100	1695	41369	+0.81
1125	4191	>100	1725	41320	+0.79
1155	6042	>100	1755	41747	+2.17
1185	8080	+96.76	1785	41579	+2.94
1215	10986	+87.61	1815	42600	+3.47
1245	14405	+80.38	1845	42748	
1275	17994	+72.82	1875	43368	

*Jan 7/2004*

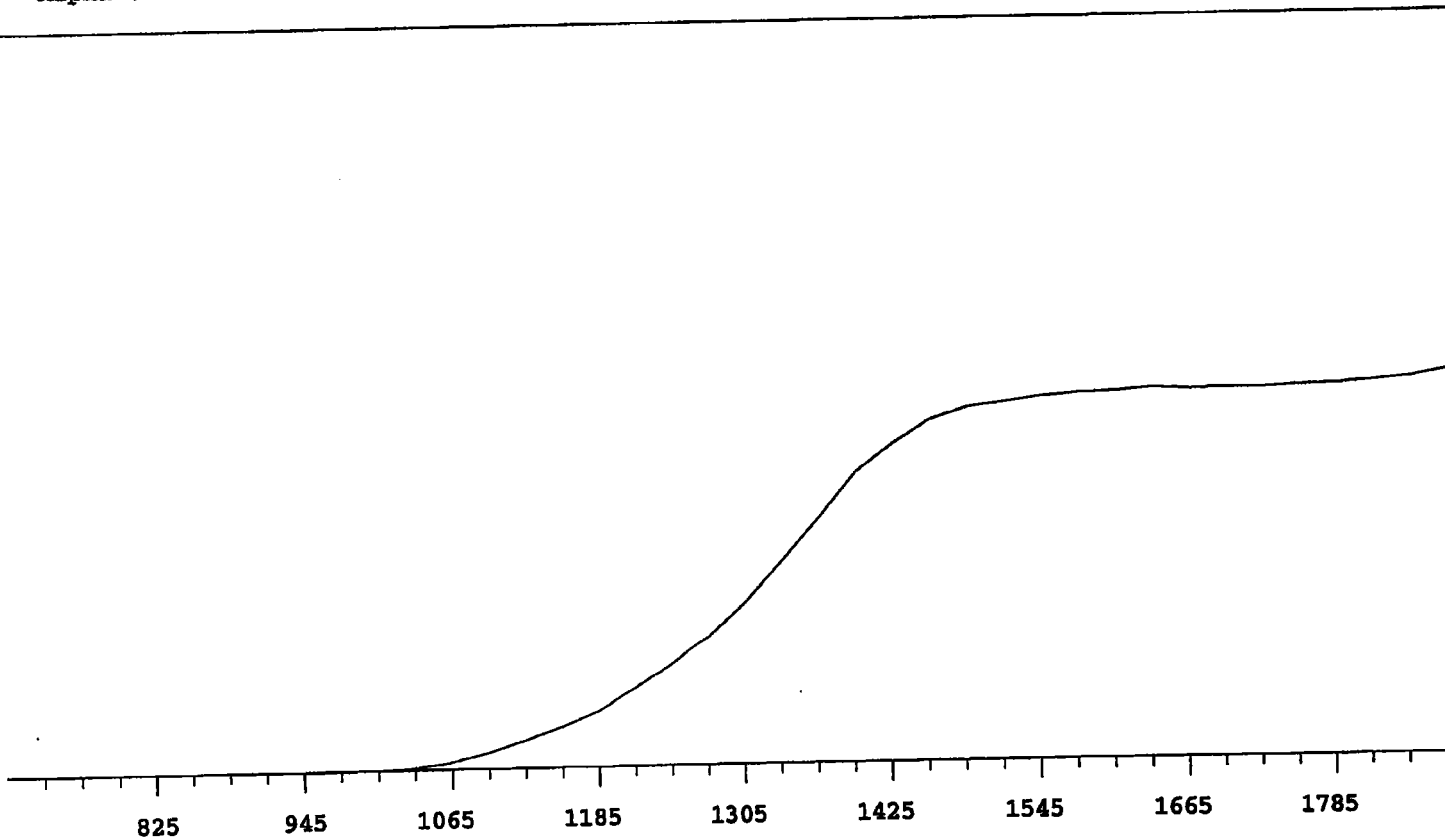
Plateau 07/04

Instrument 4 MPC 9604 Detector A

7/19/2004

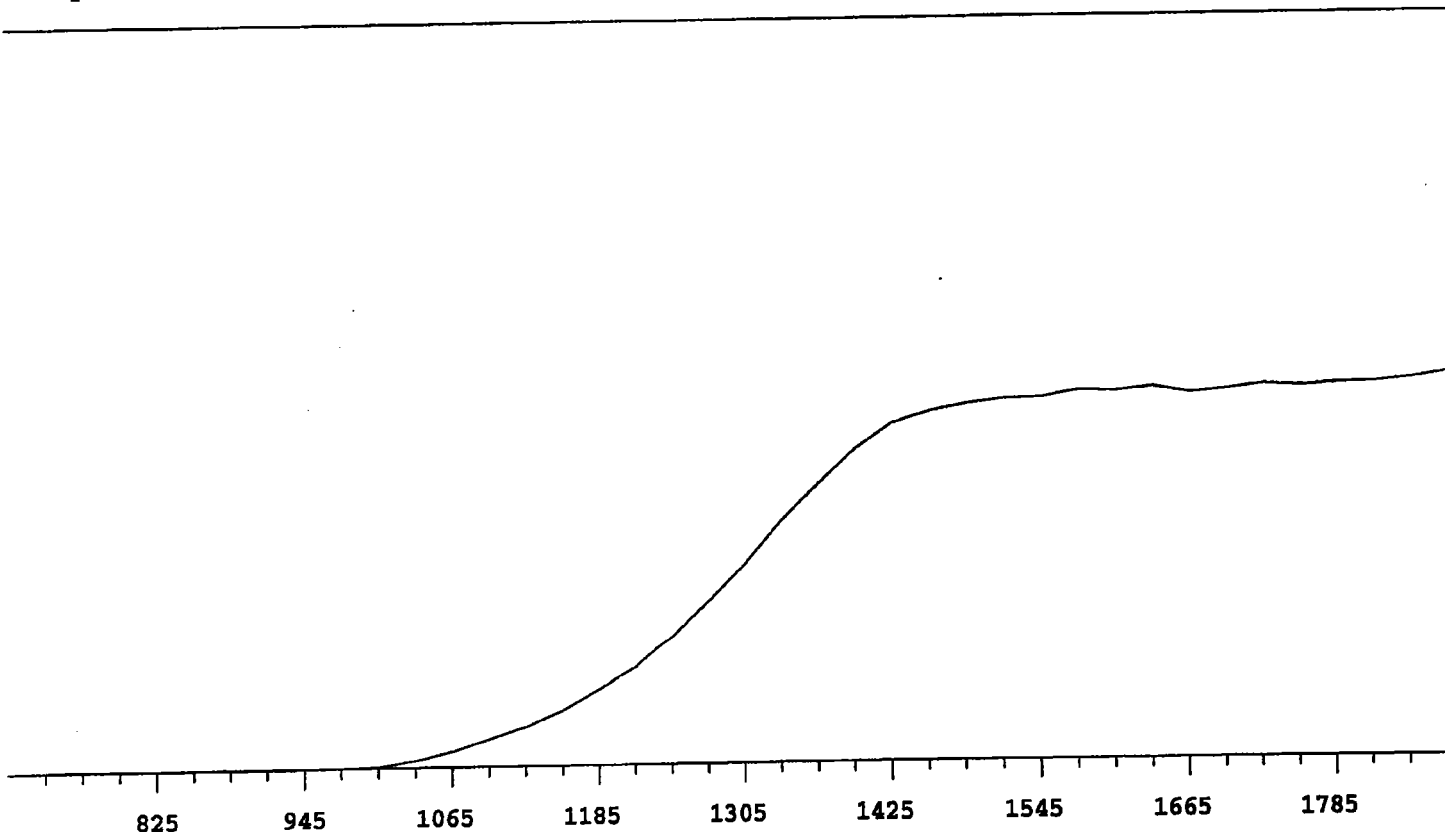
Alpha Volts: 705

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	20196	+70.92
735	0		1335	25093	+64.47
765	0		1365	30252	+53.89
795	0	>100	1395	35803	+41.42
825	0	>100	1425	39177	+28.43
855	0	>100	1455	42048	+16.73
885	0	>100	1485	43395	+9.95
915	0	>100	1515	43954	+5.33
945	1	>100	1545	44588	+3.24
975	3	>100	1575	44953	+2.66
1005	38	>100	1605	45053	+1.37
1035	245	>100	1635	45510	+0.69
1065	830	>100	1665	45235	+0.28
1095	1955	>100	1695	45331	+0.23
1125	3389	>100	1725	45336	+0.89
1155	4997	>100	1755	45617	+1.20
1185	6863	>100	1785	45696	+1.76
1215	9674	+92.94	1815	45975	+2.73
1245	12535	+84.46	1845	46363	
1275	16168	+76.69	1875	47175	

*7/19/04*



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16703	+61.95
735	0		1335	20386	+52.74
765	0		1365	23431	+42.22
795	0	>100	1395	26285	+29.61
825	0	>100	1425	28336	+19.32
855	0	>100	1455	29277	+11.04
885	0	>100	1485	29890	+5.68
915	0	>100	1515	30279	+4.18
945	2	>100	1545	30360	+2.81
975	36	>100	1575	30933	+2.50
1005	158	>100	1605	30845	+0.95
1035	577	>100	1635	31188	-0.15
1065	1316	>100	1665	30673	+0.82
1095	2298	>100	1695	30948	+0.70
1125	3318	>100	1725	31344	+1.72
1155	4684	>100	1755	31181	+1.01
1185	6422	+93.30	1785	31359	+1.04
1215	8326	+85.47	1815	31414	+2.60
1245	10922	+77.15	1845	31716	
1275	13740	+71.11	1875	32233	

*7/19/04*



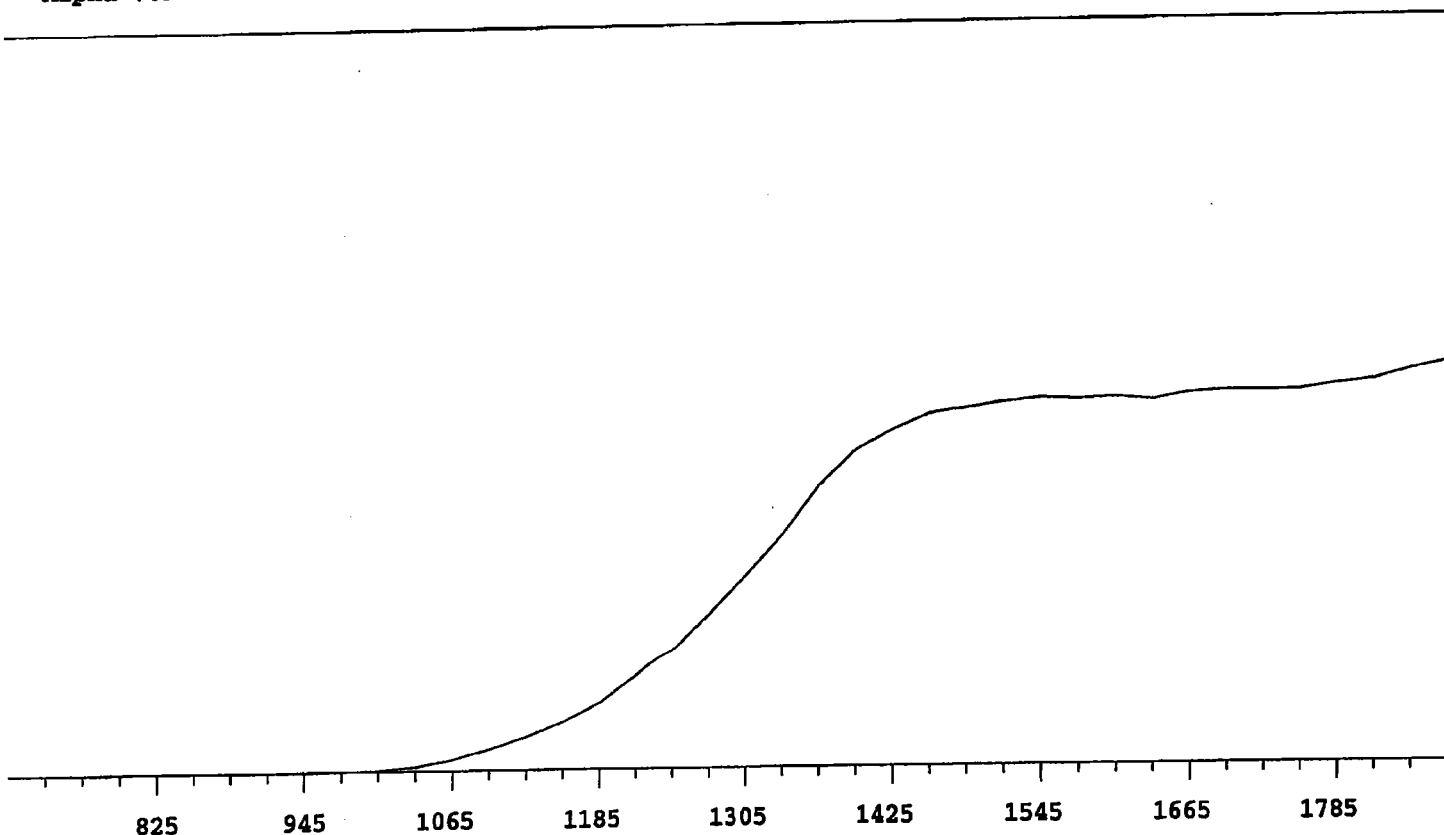
Plateau 07/04

Instrument 4 MPC 9604 Detector C

7/19/2004

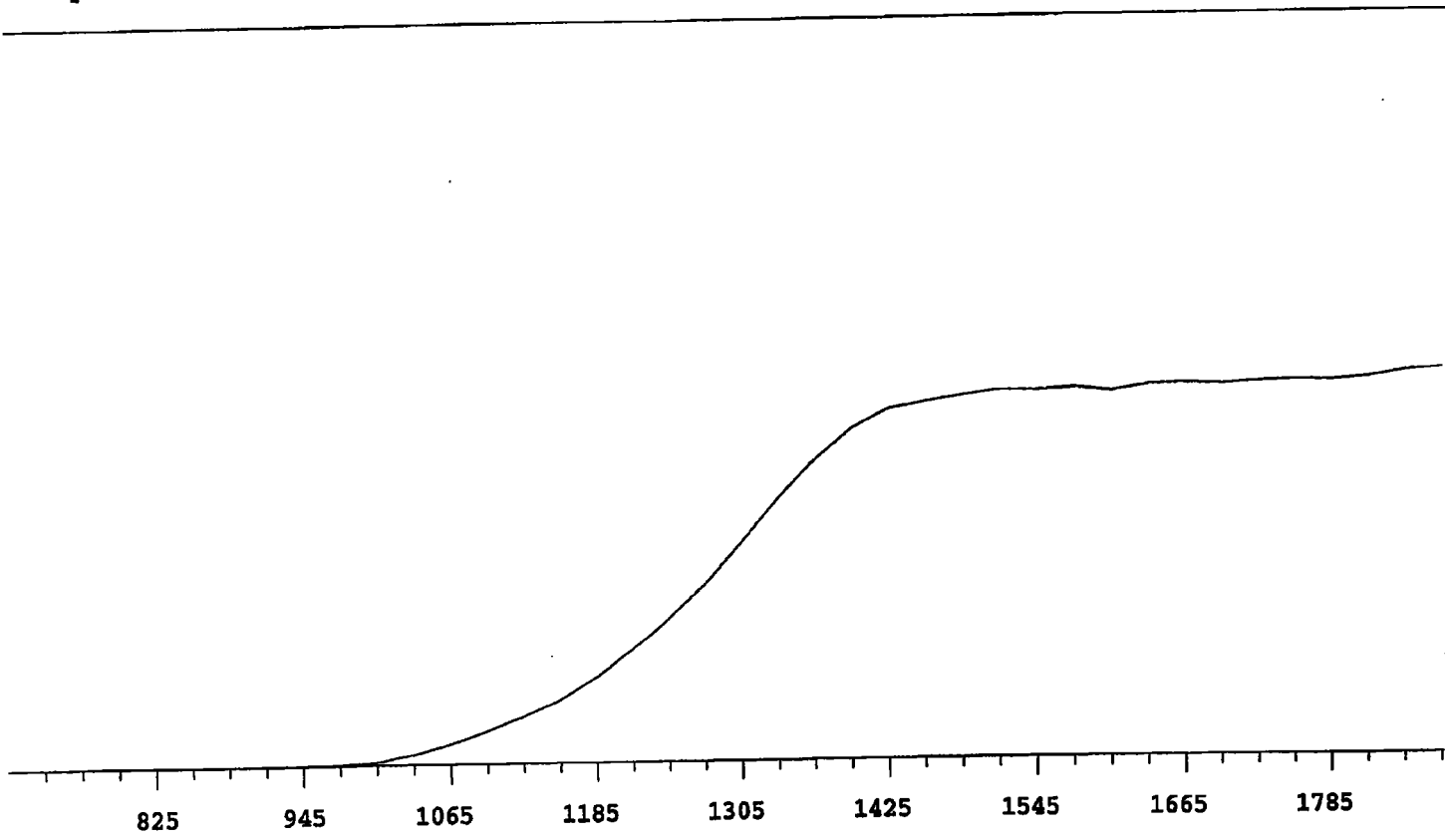
Alpha Volts: 705

Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	18839	+67.96
735	0		1335	22872	+57.68
765	0		1365	27407	+44.46
795	1	+0.00	1395	30682	+31.38
825	0	>100	1425	32591	+18.94
855	0	>100	1455	34190	+11.24
885	0	>100	1485	34722	+6.93
915	0	>100	1515	35262	+3.37
945	1	>100	1545	35641	+2.03
975	11	>100	1575	35504	+0.26
1005	103	>100	1605	35679	+0.69
1035	441	>100	1635	35382	+1.78
1065	1179	>100	1665	36072	+1.78
1095	2167	>100	1695	36265	+1.74
1125	3422	>100	1725	36194	+1.34
1155	4853	>100	1755	36262	+2.25
1185	6672	+97.47	1785	36803	+4.27
1215	9215	+89.47	1815	37192	+5.77
1245	11739	+81.79	1845	38095	
1275	15086	+73.77	1875	38856	

*per 7/19/04*



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	23556	+58.78
735	0		1335	28144	+48.66
765	0		1365	32003	+36.52
795	0	>100	1395	35174	+24.06
825	0	>100	1425	37136	+14.44
855	0	>100	1455	37870	+8.04
885	0	>100	1485	38481	+4.14
915	0	>100	1515	39029	+2.66
945	9	>100	1545	38936	+0.63
975	84	>100	1575	39184	+0.49
1005	395	>100	1605	38768	+1.21
1035	1117	>100	1635	39399	+0.95
1065	2179	>100	1665	39540	+1.39
1095	3536	>100	1695	39360	+0.69
1125	5088	>100	1725	39609	+0.58
1155	6883	+96.73	1755	39771	+1.08
1185	9282	+89.24	1785	39681	+1.80
1215	12161	+81.81	1815	39966	+2.60
1245	15561	+74.40	1845	40592	
1275	19236	+67.51	1875	40881	

*7/19/04*

VER4\_05  
RADIUM-228 WATER

Analyst : JMJ  
Batch : verification  
Date : 4/22/2005

Procedure Code : GFC28RAL

Parname : Radium-228

MDA : 1 pCi/L

Batch Counted on : PIC

Bkg Count Time: 1000 min

Sample I.D.	Sample Vol. L	Beta cpm	Ac 228 eff	Ba yield %	Ac-228		Ra-228		BKG cpm	Alpha cts	Beta cts
					Decay	Con	Decay	Con			
1A	1.000	7289.93	0.5132	100	0.58	1.00	1.000	0.49	505	36457	
1B	1.000	7542.79	0.5082	100	0.58	1.00	1.000	0.35	430	37720	
1C	1.000	7409.93	0.5231	100	0.58	1.00	1.000	0.35	500	37055	
1D	1.000	5865.16	0.5121	100	0.58	1.00	1.000	0.40	84	29327	
2A	1.000	5744.69	0.5097	100	0.58	1.00	1.000	0.48	1171	28748	
2B	1.000	7309.60	0.5242	100	0.58	1.00	1.000	0.32	302	36554	
2C	1.000	7315.97	0.5009	100	0.58	1.00	1.000	0.33	1759	36608	
2D	1.000	6912.80	0.5067	100	0.58	1.00	1.000	0.49	1600	34594	
3A	1.000	6638.33	0.4603	100	0.58	1.00	1.000	0.58	4839	33327	
3B	1.000	6177.63	0.4832	100	0.58	1.00	1.000	0.28	2355	30949	
3C	1.000	6140.98	0.4861	100	0.58	1.00	1.000	0.46	1449	30744	
3D	1.000	6727.78	0.4940	100	0.58	1.00	1.000	0.73	1195	33670	
4A	1.000	6135.16	0.5121	100	0.58	1.00	1.000	0.34	849	30684	
4B	1.000	7244.80	0.5268	100	0.58	1.00	1.000	0.37	154	36226	
4C	1.000	7153.96	0.5052	100	0.58	1.00	1.000	0.36	1434	35786	
4D	1.000	7365.57	0.5004	100	0.58	1.00	1.000	0.58	2976	36867	

*Mulatos*

Ac-228 0696-A 1mL NC 9369.54955

Count time	min	Sampling Date/Time	Ac-228 Elution Date/time	Starting count Date/Time	Ra-228 MDA pCi/L	Ra-228 result pCi/L	Ra-228 error pCi/L	Ra-228 % RECOVERY
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:26	3.050	11112.583	114.092	118.60%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:26	2.734	11617.226	117.254	123.99%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:26	2.657	11089.935	112.931	118.36%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:26	2.844	8968.322	102.653	95.72%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:26	3.052	8827.546	102.097	94.22%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:26	2.572	10924.735	112.009	116.60%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:27	2.721	11445.723	117.300	122.16%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:27	3.095	10693.248	112.742	114.13%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:27	3.627	11306.800	121.652	120.68%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:27	2.670	10027.006	111.828	107.02%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:27	3.156	9909.619	110.852	105.76%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:27	3.689	10685.237	114.200	114.04%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:27	2.693	9401.891	105.220	100.35%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:27	2.697	10794.986	111.174	115.21%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:27	2.786	11117.128	115.216	118.65%
5		4/22/2005 0:00	4/22/2005 7:35	4/22/2005 12:28	3.341	11558.337	118.059	123.36%

*yan u/2005*

VERRAW

INSTR_ID	SAMPLE_ID	CNT_TIME	A	B	TIME	USER2	BATCH_ID
Instrument 1 - A	1	5	505	36457	4/22/2005 12:26	1575	Ra2280422v
Instrument 1 - B	2	5	430	37720	4/22/2005 12:26	1575	Ra2280422v
Instrument 1 - C	3	5	500	37055	4/22/2005 12:26	1575	Ra2280422v
Instrument 1 - D	4	5	84	29327	4/22/2005 12:26	1575	Ra2280422v
Instrument 2 - A	5	5	1171	28748	4/22/2005 12:26	1575	Ra2280422v
Instrument 2 - B	6	5	302	36554	4/22/2005 12:26	1575	Ra2280422v
Instrument 2 - C	7	5	1759	36608	4/22/2005 12:27	1575	Ra2280422v
Instrument 2 - D	8	5	1600	34594	4/22/2005 12:27	1575	Ra2280422v
Instrument 3 - A	9	5	4839	33327	4/22/2005 12:27	1575	Ra2280422v
Instrument 3 - B	10	5	2355	30949	4/22/2005 12:27	1575	Ra2280422v
Instrument 3 - C	11	5	1449	30744	4/22/2005 12:27	1575	Ra2280422v
Instrument 3 - D	12	5	1195	33670	4/22/2005 12:27	1575	Ra2280422v
Instrument 4 - A	13	5	849	30684	4/22/2005 12:27	1575	Ra2280422v
Instrument 4 - B	14	5	154	36226	4/22/2005 12:27	1575	Ra2280422v
Instrument 4 - C	15	5	1434	35786	4/22/2005 12:27	1575	Ra2280422v
Instrument 4 - D	16	5	2976	36867	4/22/2005 12:28	1575	Ra2280422v

*Ym4/22/05*

**General Engineering Laboratories  
Verification Source Preparation Sheet**


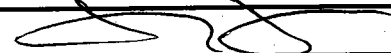
Applicable SOP Number GL-RAD-A-009 Isotope Ra-228  
 Date Standards Prepared 4/22/05 Cocktail Type Used NA  
 Standard ID 0696-A Matrix of Vial/Planchett 0.1M POLYPROPYLENE  
FILTED ATTACHED TO  
SS PLANCHETTE  
 Amount Used (g or ml) 1.0 Type of Scintillation Vial NA  
 Standard Activity (DPM/g or ml) 22558.26 Pipette ID Used 3001383  
 Reference Date 8/19/04 Balance ID Used NA  
 Expiration Date 4/21/06 Quenching Agent —  
 Residue/Carrier Agent —

Separation Date / Time: 4/22/05 / 0735

	Standard Number	Quenching Vol (uL)/ Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
	12				
	13				
	14				
	15				
	16				

*mg/22805*

*mg/22805*

Prepared By:  Date 4/22/05  
 Reviewed By:  Date 4/22/05

# CERTIFICATE OF CALIBRATION

## Standard Radionuclide Source

69008-278

Ra-228 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-228
ACTIVITY (dps):	3.882 E4
HALF-LIFE:	5.75 years
CALIBRATION DATE:	August 19, 2004 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.3%

Impurities:  $\gamma$ -impurities <0.1%

5.02035 grams 0.1M HCl solution with 50  $\mu$ g/g Ba carrier.

P O NUMBER 3244 RD, Item 1

SOURCE PREPARED BY:

M. Taskaeva  
M. Taskaeva, Radiochemist

Q A APPROVED:

UM MJS 8-24-04

RECEIVED  
8/24/04

*my/zelos*

# Verification for Ra-228 Standard 0696-A

Standard	Detector Eff Mass. Used (mL)	Source DPM/mL
	0.1078	20839.30285
	3.5679424	20927.70422
	0.1072	21021.83084
	3.5679424	20929.61264
	Average =	

Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Source DPM/mL
0696-A N1	8043.6000	28.3000	8015.3000	0.1078	20839.30285
0696-A N2	8032.8000	28.3000	8004.5000	0.1072	20927.70422
0696-A N3	8038.8000	28.3000	8010.5000	3.5679424	21021.83084
Mean Value (Counting) =	20929.61264	100.783034	Pass		
Stdev =	91.27896032	0.00436124	Rule 3 (Pass/Fail)		
Certificate Value =	20767.0	dpm/mL			
Lower Limit =	20747.05472	dpm/mL			
Upper Limit =	21112.17056	dpm/mL			
Rule 1 Pass/Fail	Pass				
Two sigma =	182.5579206				
10 % of Mean =	2092.961264				
Rule 2 (Pass/Fail)	Pass				

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-228 source 0696-A by transferring portions of the standard into glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 23 for Ra-228 source standard verification. The Ra-228 efficiency calibration which was used for verification calculations was performed on 4/27/04 using Analytic's source 0503-A (Ra-228). Calibration data is recorded in this logbook under Ra-228 0503. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

Amanda L. Fehr 4/27/05



PROTOCOL : 23 Radium Std Ver.  
DATE : 2005/04/27  
TIME : 04:53  
ID : P23AS011

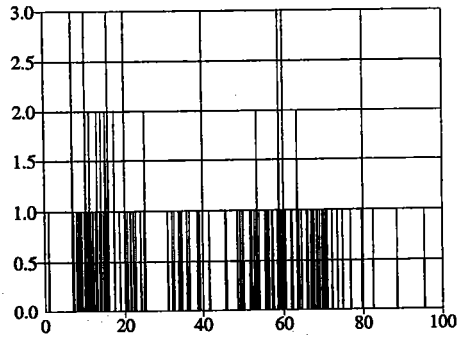
Wallac 1414 WinSpectral v1.40 S/N 4140127

Counting mode : CPM  
Isotope(s) : H3  
H3 = 5- 350,12.43 y  
Protocol name : Radium Std Ver.  
Counting time : 300  
Repeats : 1  
Cycles : 1  
Replicates : 1  
2 sigma % : 0.01  
Minimum cpm : 0.00 Checking time: 10  
Output to Display :  
POS,CTIME,DATE,TIME,RACKPOS,CPMw1,CPM,SQPI,CPM1  
Additions to Display : Spectrum,Header,Listing  
Spectrum : Beta  
Window 1 : 20- 80 /Beta  
Window 2 : 1-1024 /Beta  
Window 3 : 1-1024 /Beta  
Window 4 : 1-1024 /Beta  
Window 5 : 1-1024 /Beta  
Window 6 : 1-1024 /Beta  
FNCT1 = FNCT1 :  
FNCT2 = FNCT2 :  
FNCT3 = FNCT3 :  
FNCT4 = FNCT4 :

Total count rate:  
H3 5643.4 CPM

04/27/05

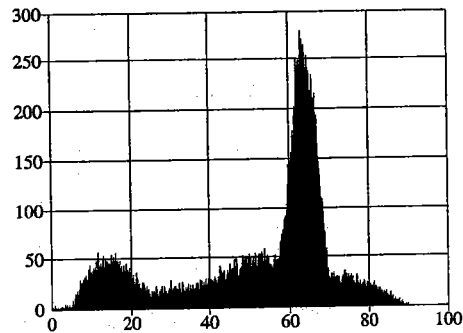
POS	CTIME	DATE	TIME	RACKPOS	CPMW1	CPM
1	300	4/27/2005	4:53 AM	1	1.20 13.50	28.30



■ Counts  
Beta

Bkg

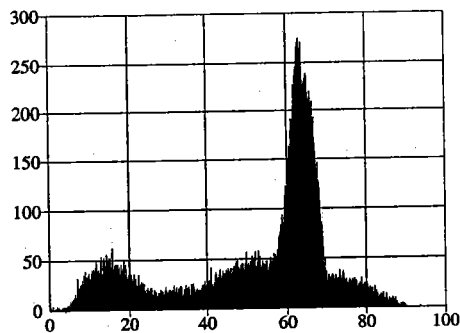
2	300	4/27/2005	4:59 AM	2	95.70 1590.80	8043.60
---	-----	-----------	---------	---	------------------	---------



■ Counts  
Beta

0696-A

3	300	4/27/2005	5:04 AM	3	88.40 1601.40	8032.80
---	-----	-----------	---------	---	------------------	---------



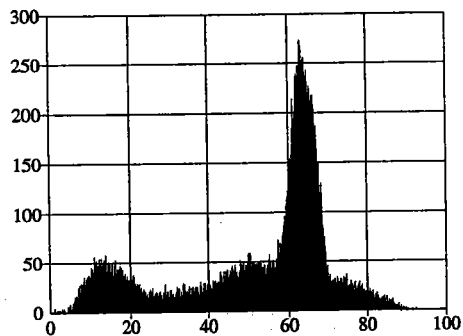
■ Counts  
Beta

0696-A

auF4127105

POS	CTIME	DATE	TIME	RACKPOS	CPMW1	CPM
-----	-------	------	------	---------	-------	-----

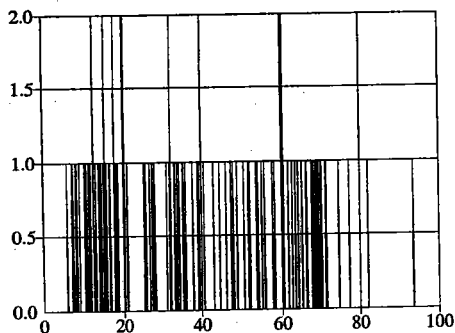
4	300	4/27/2005	5:10 AM	4	90.10	8038.80
					1615.60	



Counts  
Beta

0696-A

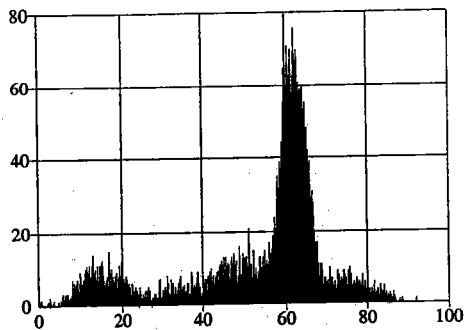
5	300	4/27/2005	5:15 AM	5	0.60	22.90
					11.90	



Counts  
Beta

Bkg

6	300	4/27/2005	5:21 AM	6	10.40	1711.00
					266.60	

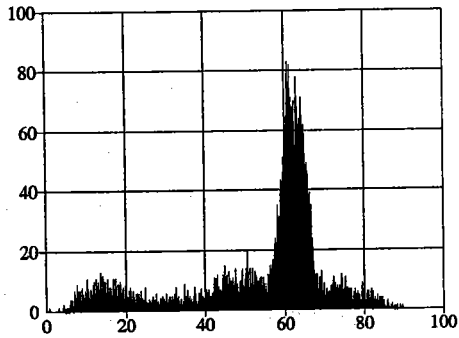


Counts  
Beta

0553-B

OLF 4/27/05

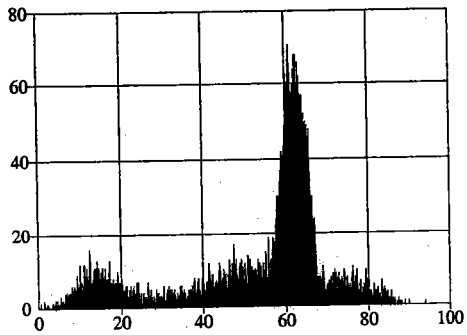
POS	CTIME	DATE	TIME	RACKPOS	CPMW1	CPM
7	300	4/27/2005	5:26 AM	7	18.10	1764.00
					275.10	



■ Counts  
Beta

0553-B

8	300	4/27/2005	5:32 AM	8	15.40	1715.80
					268.60	



■ Counts  
Beta

0553-B

QWF 4/27/05

## Alpha Spectroscopy Calibration Sources

The following is a summary of the procedure performed for preparing mixed alpha calibration standards:

A calibration stock solution was prepared by combining the following in a volumetric flask and diluting to 50 ml (51.4561 grams). These individual standards were first verified by direct precipitation of small aliquots of each standard (as described in Attachment I).

Isotope	Serial #	amount used (g)	dpm (note 1)
Gd-148	64445-278	0.2471	212.159287
Np-237	4341	1.8075	204.438594
Cm-244	4320A	7.2704	240.144737

Note 1: Dpm values are decay corrected to 2/7/2003.

Forty one weighted aliquots were then directly precipitated using Neodymium Flouride /HF system. The sources were then mounted on 0.1Poly-propylene filters and taped securely to 1 inch stainless steel planchettes for counting in an Alpha Spectroscopy system. The liquid fraction that passes through the filter is collected, traced with Am-241 and prepared for counting using the identical procedure. These samples are counted to ensure there is no more than 1% loss in the filtering processes. All sources pass this requirement. The DPM information for each source is listed in attachment II.

Certificate files were then created on the Alpha system used for acquisition and processing of data. Each source is assigned a name (AESS-001 through AESS-041). The information for the source activities is entered into the certificate files appropriate for the detector being used.

For example: If source AESS-001 is used for calibrating detector 25, the source data is entered into the certificate file name [env\_alpha.cer]U025.cer.

The computer software uses these certificate files to calculate an energy calibration and determine the efficiency of the detector after counting the source.

*Ante Hill*  
4/1/03

2002 Alpha Eff Source Stock Verification

Curium-244

Isotope	Value pCi/g
SSTOCK2002A2_AM	106.000
SSTOCK2002B2_AM	106.000
SSTOCK2002C2_AM	106.000

Mean Value (Counting) = 106.000 98.04%  
 Stdev = 0 pCi/g

Target = 108.1230  
 Lower Limit = 106  
 Upper Limit = 106  
 Rule 1 Pass/Fail Pass  
 Two sigma = 0  
 10 % of Mean = 10.6  
 Rule 2 (Pass/Fail) Pass

PASS  
 Fair 3/2/0

Neptunium-237

Isotope	Value pCi/g
SSTOCK2002A2_AM	90.100
SSTOCK2002B2_AM	87.200
SSTOCK2002C2_AM	93.500

Mean Value (Counting) = 90.267 98.02%  
 Stdev = 3.153305144 pCi/g

Target = 92.0900  
 Lower Limit = 83.96005638  
 Upper Limit = 96.57327696  
 Rule 1 Pass/Fail Pass  
 Two sigma = 6.306610289  
 10 % of Mean = 9.026666667  
 Rule 2 (Pass/Fail) Pass

Gadolinium-148

Isotope	Value pCi/g
SSTOCK2002A2_AM	95.080
SSTOCK2002B2_AM	93.750
SSTOCK2002C2_AM	96.560

Mean Value (Counting) = 95.463 99.81%  
 Stdev = 1.503074627 pCi/g

Target = 95.6460  
 Lower Limit = 92.45718408  
 Upper Limit = 98.46948259  
 Rule 1 Pass/Fail Pass  
 Two sigma = 3.006148253  
 10 % of Mean = 9.546333333  
 Rule 2 (Pass/Fail) Pass

The analyst prepared three standard verification sources for the mixed alpha stock standard using 0.1030 g for source #1, 0.1035 g for source #2 and 0.1028 g for source #3. Each standard was combined with 1.0 mL of Am-243 standard 0454-A and 0.1 mL of Nd carrier in a disposable centrifuge tube. Four mL of 2 M HCl was added to each standard and then diluted with 4 mL of DI water. 5 mL of ascorbic acid was added to each sample then one mL of 48% HF was added to precipitate Nd (and Curium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. pCi/L values for the Mixed Alpha Stock were calculated and compared to Am-243 certified values.

① The rule failed because the 3 results from 3 sources were the same. Therefore, the stdev was zero. The intent of this rule is to ensure an appropriate amount of counts are achieved for proper determinations. ~~Surfaces~~ For each standard the # of counts achieved was

Just under 10000 which has a counting error of nearly 1%. Because the standard's bias is < 2% from the known value the standard is acceptable.

Robertson 02/20/03

Attachment II

Mixed alpha Reference date = 2/7/2003		Stock Dpm/g	Reference date	Half-life (years)	amount used for mixed	Dpm/g mixed	Decay corr dpm/g
Isotope	Source						
Gd-148	64445-278 (0502)	44354.59289	9/5/2002	74.60	0.2471	212.9974853	212.159287
Np-237	Srm 4341 (0493)	5820	3/1/1992	2.14E+06	1.8075	204.4393182	204.438594
Cm-244	SRM 4320a (0490)	2223.6	2/1/1996	18.1	7.2704	314.1796879	240.144737
Source	Amount of standard used	dpm Gd-148	dpm Np-237	dpm Cm-244	dps Gd-148	dps Np-237	dps Cm-244
AESS-001	1.0362	219.839	211.839	248.838	3.664	3.531	4.147
AESS-002	1.0344	219.458	211.471	248.406	3.658	3.525	4.140
AESS-003	1.034	219.373	211.390	248.310	3.656	3.523	4.138
AESS-004	1.0331	219.182	211.206	248.094	3.653	3.520	4.135
AESS-005	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-006	1.0331	219.182	211.206	248.094	3.653	3.520	4.135
AESS-007	1.0348	219.542	211.553	248.502	3.659	3.526	4.142
AESS-008	1.0363	219.861	211.860	248.862	3.664	3.531	4.148
AESS-009	1.0352	219.627	211.635	248.598	3.660	3.527	4.143
AESS-010	1.0346	219.500	211.512	248.454	3.658	3.525	4.141
AESS-011	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-012	1.0367	219.946	211.941	248.958	3.666	3.532	4.149
AESS-013	1.0396	220.561	212.534	249.654	3.676	3.542	4.161
AESS-014	1.0368	219.967	211.962	248.982	3.666	3.533	4.150
AESS-015	1.0363	219.861	211.860	248.862	3.664	3.531	4.148
AESS-016	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-017	1.0356	219.712	211.717	248.694	3.662	3.529	4.145
AESS-018	1.0359	219.776	211.778	248.766	3.663	3.530	4.146
AESS-019	1.0349	219.564	211.574	248.526	3.659	3.526	4.142
AESS-020	1.0361	219.818	211.819	248.814	3.664	3.530	4.147
AESS-021	1.0348	219.542	211.553	248.502	3.659	3.526	4.142
AESS-022	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-023	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-024	1.0343	219.436	211.451	248.382	3.657	3.524	4.140
AESS-025	1.0364	219.882	211.880	248.886	3.665	3.531	4.148
AESS-026	1.0336	219.288	211.308	248.214	3.655	3.522	4.137
AESS-027	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-028	1.0366	219.924	211.921	248.934	3.665	3.532	4.149

Attachment II

AESS-029	1.0355	219.691	211.696	248.670	3.662	3.528	4.144
AESS-030	1.0349	219.564	211.574	248.526	3.659	3.526	4.142
AESS-031	1.0343	219.436	211.451	248.382	3.657	3.524	4.140
AESS-032	1.0326	219.076	211.103	247.973	3.651	3.518	4.133
AESS-033	1.0308	218.694	210.735	247.541	3.645	3.512	4.126
AESS-034	1.0314	218.821	210.858	247.685	3.647	3.514	4.128
AESS-035	1.0303	218.588	210.633	247.421	3.643	3.511	4.124
AESS-036	1.0343	219.436	211.451	248.382	3.657	3.524	4.140
AESS-037	1.0353	219.649	211.655	248.622	3.661	3.528	4.144
AESS-038	1.0373	220.073	212.064	249.102	3.668	3.534	4.152
AESS-039	1.0334	219.245	211.267	248.166	3.654	3.521	4.136
AESS-040	1.0346	219.500	211.512	248.454	3.658	3.525	4.141
AESS-041	1.0352	219.627	211.635	248.598	3.660	3.527	4.143





0490  
0491

# National Institute of Standards & Technology Certificate

## Standard Reference Material 4320A Curium-244 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive curium-244 nitrate and nitric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of alpha-particle counting instruments and for the monitoring of radiochemical procedures.

### Radiological Hazard

The SRM ampoule contains curium-244 with a total activity of approximately 200 Bq. Curium-244 decays by alpha-particle emission to plutonium-240, which also decays by alpha-particle emission. None of the alpha particles escape from the SRM ampoule. During the decay process X-rays and gamma rays with energies from 40 keV to 1100 keV are also emitted. Most of these photons escape from the SRM ampoule but their intensities are so small that they do not represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]\*. The SRM should be used only by persons qualified to handle radioactive material.

### Chemical Hazard

The SRM ampoule contains nitric acid ( $\text{HNO}_3$ ) with a concentration of 1 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

### Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least February 2006.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

### Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899  
February 1996 (Text only revised November 1997)

Thomas E. Gills, Chief  
Standard Reference Materials Program

### Recommended Procedure for Opening the SRM Ampoule

- 1) If the SRM solution is to be diluted, it is recommended that the diluting solution have a composition comparable to that of the SRM solution.
- 2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood. In addition to the radioactive material, the solution contains strong acid and is corrosive.
- 3) Shake the ampoule to wet all of the inside surface of the ampoule. Return the ampoule to the upright position.
- 4) Check that all of the liquid has drained out of the neck of the ampoule. If necessary, gently tap the neck to speed the process.
- 5) Holding the ampoule upright, score the narrowest part of the neck with a scribe or diamond pencil.
- 6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.
- 7) Hold the ampoule upright with a paper towel, a wiper, or a support jig. Position the scored line away from you. Using a paper towel or wiper to avoid contamination, snap off the top of the ampoule by pressing the narrowest part of the neck away from you while pulling the tip of the ampoule towards you.
- 8) Transfer the solution from the ampoule using a pycnometer or a pipet with dispenser handle.  
**NEVER PIPETTE BY MOUTH**
- 9) Seal any unused SRM solution in a flame-sealed glass ampoule, if possible, to minimize the evaporation loss.

See also reference [4]\*.

PROPERTIES OF SRM 4320A  
(Certified values are shown in bold type)

Source identification number	NIST SRM 4320A		
Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	(16.5 ± 0.5) mm	
	Wall Thickness	(0.60 ± 0.04) mm	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Solution density	(1.030 ± 0.002) g·mL <sup>-1</sup> at 22.8 °C [b]*		
Solution mass	Approximately 5.15 g		
Chemical Properties:			
Solution composition	Chemical Formula	Concentration (mol·L <sup>-1</sup> )	Mass Fraction (g·g <sup>-1</sup> )
	H <sub>2</sub> O	54	0.94
	HNO <sub>3</sub>	1.0	0.06
	HCl	<0.001	<4 × 10 <sup>-5</sup>
	<sup>244</sup> Cm +3	5 × 10 <sup>-11</sup>	1 × 10 <sup>-11</sup>
Radiological Properties:			
Radionuclide	Curium-244		
Reference time	1230 EST, 1 February 1996 [c]		
Massic activity of the solution [d]	37.06 Bq·g <sup>-1</sup> 24.12 Bq·g <sup>-1</sup>		
Relative expanded uncertainty (k=2)	0.68% [e] [f]		
Alpha-particle-emitting daughters	Plutonium-240: (0.22 ± 0.11) Bq·g <sup>-1</sup> [b] [c]		
Alpha-particle-emitting impurities	Curium-243: (0.005 ± 0.004) Bq·g <sup>-1</sup> [b] [g]		
Photon-emitting impurities	None detected [h]		
Half lives used in the decay corrections	Curium-244: (18.10 ± 0.02) a [i] Plutonium-240: (6563 ± 7) a [i]		
Calibration method	Two 4π liquid-scintillation counting systems		

- [i] The stated uncertainty is the standard uncertainty. See reference [5].
- [j] Relative standard uncertainty of the input quantity  $x_i$ .
- [k] The relative change in the output quantity  $y$  divided by the relative change in the input quantity  $x_i$ . If  $|\partial y/\partial x_i| \cdot (x_i/y) = 1.0$ , then a 1% change in  $x_i$  results in a 1% change in  $y$ . If  $|\partial y/\partial x_i| \cdot (x_i/y) = 0.05$ , then a 1% change in  $x_i$  results in a 0.05% change in  $y$ .
- [m] Relative component of combined standard uncertainty of output quantity  $y$ , rounded to two significant figures or less. The relative component of combined standard uncertainty of  $y$  is given by  $u_i(y)/y = |\partial y/\partial x_i| \cdot u(x_i)/y = |\partial y/\partial x_i| \cdot (x_i/y) \cdot u(x_i)/x_i$ . The numerical values of  $u(x_i)/x_i$ ,  $|\partial y/\partial x_i| \cdot (x_i/y)$ , and  $u_i(y)/y$ , all dimensionless quantities, are listed in columns 3, 4, and 5, respectively. Thus, the value in column 5 is equal to the value in column 4 multiplied by the value in column 3. The input quantities are independent, or very nearly so. Hence the covariances are zero or negligible.
- [n] The relative standard uncertainty of  $\lambda \cdot t$  is determined by the relative standard uncertainty of  $\lambda$  (i.e., of the half life). The relative standard uncertainty of  $t$  is negligible.
- [p]  $|\partial y/\partial x_i| \cdot (x_i/y) = |\lambda \cdot t|$
- [q] The live time is determined by counting the pulses from a gated oscillator.
- [r] The standard uncertainty given is for the detected Cm-243 impurity.  $|\partial y/\partial x_i| \cdot (x_i/y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of Cm-244})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of Cm-244})\}$ .
- [s] The standard uncertainty for each undetected impurity that might reasonably be expected to be present is estimated to be equal to the estimated limit of detection for that impurity, i.e.  $u(x_i)/x_i = 100\%$ .  $|\partial y/\partial x_i| \cdot (x_i/y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of Cm-244})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of Cm-244})\}$ . Thus  $u_i(y)/y$  is the relative change in  $y$  if the impurity were present with a massic activity equal to the estimated limit of detection.

#### REFERENCES

- [1] International Organization for Standardization (ISO), *ISO Standards Handbook - Quantities and Units*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900.
- [2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900. (Listed under ISO miscellaneous publications as "ISO Guide to the Expression 1993".)
- [3] B. N. Taylor and C. E. Kuyatt, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST Technical Note 1297, 1994. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20407, U.S.A.
- [4] National Council on Radiation Protection and Measurements Report No. 58, *A Handbook of Radioactivity Measurements Procedures*, Second Edition, 1985. Available from the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814 U.S.A.
- [5] Evaluated Nuclear Structure Data File (ENSDF), February 1996.



# CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

64445-278

Gd-148 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master liquid radionuclide solution source. The master source was calibrated by liquid scintillation counting.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ISOTOPE:	Gd-148
ACTIVITY (dps):	<u>3.759 E3</u>
HALF-LIFE:	<u>74.6 years</u>
CALIBRATION DATE:	September 5, 2002 12:00 EST
TOTAL UNCERTAINTY*:	2.7%
SYSTEMATIC:	1.9%
RANDOM:	0.8%

99% confidence level.

5.08493 grams 0.1M HCl solution.

P O NUMBER 3207RD, Item 1

SOURCE PREPARED BY:

M.D. Currie  
M.D. Currie, Radiochemist

Q A APPROVED:

100. [Signature] 9-6-02

25  
31  
30  
31  
31  
7:

0493



# National Institute of Standards & Technology

## Certificate

### Standard Reference Material 4341 Radioactivity Standard

Radionuclide	Neptunium-237
Source identification	SRM 4341
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule <sup>(1)</sup> *
Solution mass	Approximately 5 grams
Solution composition	Neptunium-237 in 2 mol·L <sup>-1</sup> nitric acid
Reference time	March 1992
Radioactivity concentration	97.0 Bq·g <sup>-1</sup>
Overall uncertainty	1.28 percent <sup>(2)</sup>
Photon-emitting impurities	None detected <sup>(3)</sup>
Alpha-particle-emitting impurities	None detected <sup>(4)</sup>
Half life	(2.14 ± 0.11) × 10 <sup>6</sup> years <sup>(5)</sup>
Measuring instrument	NIST "0.8π" α defined-solid-angle counter with scintillation detector

This standard reference material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M. Robin Hutchinson, Acting Group Leader.

Gaithersburg, MD  
January 1993

William P. Reed, Chief  
Standard Reference Materials Program

\*Notes on back

PC 5 075 000

## NOTES

(1) Approximately five milliliters of solution. Ampoule specifications:

body diameter	$16.5 \pm 0.5$ mm
wall thickness	$0.60 \pm 0.04$ mm
barium content	less than 2.5 percent
lead oxide content	less than 0.02 percent
other heavy elements	trace quantities

(2) The overall uncertainty was formed by taking three times the quadratic combination of the standard deviations of the mean, or approximations thereof, for the following:

a) alpha-particle-emission-rate measurements	0.34 percent
b) background	0.01 percent
c) livetime	0.10 percent
d) detection efficiency	0.16 percent
e) count-rate-vs-energy extrapolation to zero energy	0.10 percent
f) half life	0.00 percent
g) gravimetric measurements	0.10 percent
h) alpha-emitting impurities	0.10 percent

(3) The protactinium-233 daughter of neptunium-237 is approximately in equilibrium.  
The limit of detection for photon-emitting impurities is

$0.19 \gamma \cdot s^{-1} \cdot g^{-1}$  for energies between 30 and 307 keV and  
 $0.01 \gamma \cdot s^{-1} \cdot g^{-1}$  for energies between 317 and 1750 keV,

provided that the impurity photons are separated in energy by 5 keV or more from photons emitted in the decay of neptunium-237 and progeny.

(4) The limit of detection for alpha-particle-emitting impurities is

$0.10 \alpha \cdot s^{-1} \cdot g^{-1}$  for energies between 1.0 and 4.3 MeV and  
 $0.05 \alpha \cdot s^{-1} \cdot g^{-1}$  for energies between 4.9 and 10 MeV.

(5) Evaluated Nuclear Structure Data File (ENSDF), February 1990.

For further information please contact Dr. J.M. Robin Hutchinson at NIST.

Telephone: (301) 975-5532

FAX: (301) 926-7416

## Subsection 1: Energy Calibration

The Energy Calibration energy=Cal\_Zero+(e1\*C)+(e2\*C^2)

where : Cal\_Zero = Energy Calibration Zero  
 e1 = Energy Calibration Slope  
 e2 = Energy Calibration Quadratic  
 C = Channel

Instrument : CHAMBER 001  
 Detector : 33088  
 Calibration Date/Time : 3-APR-2006 16:30:52  
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.589
NP-237	4341	2/28/06	4768.800	4768.498
CM-244	4320A	2/28/06	5795.020	5794.859

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2394.447  
 Energy Calibration Slope : 4.976289  
 Energy Calibration Quadratic : 2.7050270E-04  
 Energy Calibration Range : 7774.000

Instrument : CHAMBER 003  
 Detector : 20659  
 Calibration Date/Time : 3-APR-2006 16:32:34  
 Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.813
NP-237	4341	2/28/06	4768.800	4768.688
CM-244	4320A	2/28/06	5795.020	5795.021

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2371.253  
 Energy Calibration Slope : 5.028544  
 Energy Calibration Quadratic : 2.5955989E-04  
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 004  
 Detector : 33077  
 Calibration Date/Time : 3-APR-2006 16:32:51  
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.835
NP-237	4341	2/28/06	4768.800	4768.419
CM-244	4320A	2/28/06	5795.020	5794.571

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2409.653  
 Energy Calibration Slope : 4.949907  
 Energy Calibration Quadratic : 2.7518670E-04  
 Energy Calibration Range : 7767.000



Instrument : CHAMBER 005  
 Detector : 28642  
 Calibration Date/Time : 3-APR-2006 16:33:05  
 Calibration Source Id : AESS-005  

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.800
CM-244	4320A	2/28/06	5795.020	5794.893

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2356.725  
 Energy Calibration Slope : 4.952652  
 Energy Calibration Quadratic : 3.0983411E-04  
 Energy Calibration Range : 7753.000

Instrument : CHAMBER 007  
 Detector : 30416  
 Calibration Date/Time : 3-APR-2006 16:35:21  
 Calibration Source Id : AESS-007  

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.624
CM-244	4320A	2/28/06	5795.020	5795.021

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2382.813  
 Energy Calibration Slope : 4.944474  
 Energy Calibration Quadratic : 3.1966669E-04  
 Energy Calibration Range : 7781.000

Instrument : CHAMBER 009  
 Detector : 13285  
 Calibration Date/Time : 3-APR-2006 16:39:51  
 Calibration Source Id : AESS-009  

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.700
NP-237	4341	2/28/06	4768.800	4768.800
CM-244	4320A	2/28/06	5795.020	5794.917

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2406.029  
 Energy Calibration Slope : 4.889740  
 Energy Calibration Quadratic : 3.3907106E-04  
 Energy Calibration Range : 7769.000

Instrument : CHAMBER 010  
 Detector : 33083  
 Calibration Date/Time : 3-APR-2006 16:40:04  
 Calibration Source Id : AESS-010  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.328  
 NP-237 4341 2/28/06 4768.800 4768.118  
 CM-244 4320A 2/28/06 5795.020 5795.011

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2382.230  
 Energy Calibration Slope : 4.964393  
 Energy Calibration Quadratic : 2.9206229E-04  
 Energy Calibration Range : 7772.000

Instrument : CHAMBER 011  
 Detector : 9537  
 Calibration Date/Time : 3-APR-2006 16:40:58  
 Calibration Source Id : AESS-011  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.722  
 NP-237 4341 2/28/06 4768.800 4768.758  
 CM-244 4320A 2/28/06 5795.020 5794.941

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2401.574  
 Energy Calibration Slope : 4.894418  
 Energy Calibration Quadratic : 3.3610439E-04  
 Energy Calibration Range : 7766.000

Instrument : CHAMBER 012  
 Detector : 33085  
 Calibration Date/Time : 3-APR-2006 16:41:13  
 Calibration Source Id : AESS-012  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.000  
 NP-237 4341 2/28/06 4768.800 4768.403  
 CM-244 4320A 2/28/06 5795.020 5794.958

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2403.072  
 Energy Calibration Slope : 4.959775  
 Energy Calibration Quadratic : 2.8419620E-04  
 Energy Calibration Range : 7780.000

Instrument : CHAMBER 013  
 Detector : 21084  
 Calibration Date/Time : 3-APR-2006 16:41:26  
 Calibration Source Id : AESS-013  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.603  
 NP-237 4341 2/28/06 4768.800 4769.678  
 CM-244 4320A 2/28/06 5795.020 5795.297  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2372.215  
 Energy Calibration Slope : 4.879492  
 Energy Calibration Quadratic : 3.3235765E-04  
 Energy Calibration Range : 7717.000

Instrument : CHAMBER 016  
 Detector : 21086  
 Calibration Date/Time : 3-APR-2006 16:45:33  
 Calibration Source Id : AESS-016  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.993  
 NP-237 4341 2/28/06 4768.800 4768.792  
 CM-244 4320A 2/28/06 5795.020 5794.887  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2373.788  
 Energy Calibration Slope : 4.866085  
 Energy Calibration Quadratic : 3.4461656E-04  
 Energy Calibration Range : 7718.000

Instrument : CHAMBER 017  
 Detector : 33203  
 Calibration Date/Time : 3-APR-2006 16:45:52  
 Calibration Source Id : AESS-017  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.753  
 NP-237 4341 2/28/06 4768.800 4768.686  
 CM-244 4320A 2/28/06 5795.020 5795.002  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2381.283  
 Energy Calibration Slope : 4.983909  
 Energy Calibration Quadratic : 2.9758285E-04  
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 018  
 Detector : 21063  
 Calibration Date/Time : 3-APR-2006 16:46:43  
 Calibration Source Id : AESS-018  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.678  
 NP-237 4341 2/28/06 4768.800 4768.731  
 CM-244 4320A 2/28/06 5795.020 5795.019  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2340.789  
 Energy Calibration Slope : 4.900531  
 Energy Calibration Quadratic : 3.0987556E-04  
 Energy Calibration Range : 7684.000

Instrument : CHAMBER 019  
 Detector : 23882  
 Calibration Date/Time : 3-APR-2006 16:46:59  
 Calibration Source Id : AESS-019  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.344  
 NP-237 4341 2/28/06 4768.800 4769.286  
 CM-244 4320A 2/28/06 5795.020 5795.346  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2328.678  
 Energy Calibration Slope : 5.011906  
 Energy Calibration Quadratic : 2.4903595E-04  
 Energy Calibration Range : 7722.000

Instrument : CHAMBER 020  
 Detector : 33093  
 Calibration Date/Time : 3-APR-2006 16:47:46  
 Calibration Source Id : AESS-020  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.000  
 NP-237 4341 2/28/06 4768.800 4768.523  
 CM-244 4320A 2/28/06 5795.020 5795.020  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2351.189  
 Energy Calibration Slope : 4.985672  
 Energy Calibration Quadratic : 2.7204608E-04  
 Energy Calibration Range : 7742.000

Instrument : CHAMBER 021  
 Detector : 33893  
 Calibration Date/Time : 3-APR-2006 16:48:06  
 Calibration Source Id : AESS-021

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.276
NP-237	4341	2/28/06	4768.800	4768.355
CM-244	4320A	2/28/06	5795.020	5794.907

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2374.427  
 Energy Calibration Slope : 4.951159  
 Energy Calibration Quadratic : 3.0070700E-04  
 Energy Calibration Range : 7760.000

Instrument : CHAMBER 023  
 Detector : 22873  
 Calibration Date/Time : 3-APR-2006 16:49:38  
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3180.453
NP-237	4341	2/28/06	4768.800	4764.511
CM-244	4320A	2/28/06	5795.020	5793.157

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2403.611  
 Energy Calibration Slope : 4.972397  
 Energy Calibration Quadratic : 2.1793865E-04  
 Energy Calibration Range : 7724.000

Instrument : CHAMBER 026  
 Detector : 34427  
 Calibration Date/Time : 4-APR-2006 12:02:00  
 Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.743
NP-237	4341	2/28/06	4768.800	4768.458
CM-244	4320A	2/28/06	5795.020	5794.860

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2367.357  
 Energy Calibration Slope : 4.926605  
 Energy Calibration Quadratic : 3.3364003E-04  
 Energy Calibration Range : 7762.000

Instrument : CHAMBER 027  
 Detector : 31436  
 Calibration Date/Time : 4-APR-2006 12:02:17  
 Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.368
NP-237	4341	2/28/06	4768.800	4769.435
CM-244	4320A	2/28/06	5795.020	5795.142

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2385.802  
 Energy Calibration Slope : 4.966618  
 Energy Calibration Quadratic : 2.6491811E-04  
 Energy Calibration Range : 7749.000

Instrument : CHAMBER 028  
 Detector : 21056  
 Calibration Date/Time : 4-APR-2006 12:02:41  
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.801
CM-244	4320A	2/28/06	5795.020	5795.020

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2320.544  
 Energy Calibration Slope : 4.935237  
 Energy Calibration Quadratic : 2.7769944E-04  
 Energy Calibration Range : 7665.000

Instrument : CHAMBER 029  
 Detector : 30419  
 Calibration Date/Time : 4-APR-2006 12:02:56  
 Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.690
NP-237	4341	2/28/06	4768.800	4770.051
CM-244	4320A	2/28/06	5795.020	5795.380

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2360.631  
 Energy Calibration Slope : 4.932264  
 Energy Calibration Quadratic : 2.8612607E-04  
 Energy Calibration Range : 7711.000

Instrument : CHAMBER 030  
 Detector : 30420  
 Calibration Date/Time : 4-APR-2006 12:03:11  
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.638
CM-244	4320A	2/28/06	5795.020	5794.905

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2379.492  
 Energy Calibration Slope : 4.942307  
 Energy Calibration Quadratic : 3.2948688E-04  
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 032  
 Detector : 33207  
 Calibration Date/Time : 4-APR-2006 12:04:09  
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.162
NP-237	4341	2/28/06	4768.800	4769.075
CM-244	4320A	2/28/06	5795.020	5795.066

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2332.264  
 Energy Calibration Slope : 4.962142  
 Energy Calibration Quadratic : 2.9673061E-04  
 Energy Calibration Range : 7725.000

Instrument : CHAMBER 033  
 Detector : 28647  
 Calibration Date/Time : 4-APR-2006 12:04:20  
 Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.737
CM-244	4320A	2/28/06	5795.020	5794.927

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2371.926  
 Energy Calibration Slope : 4.915609  
 Energy Calibration Quadratic : 3.0408576E-04  
 Energy Calibration Range : 7724.000

Instrument : CHAMBER 034  
 Detector : 32697  
 Calibration Date/Time : 4-APR-2006 12:04:32  
 Calibration Source Id : AESS-010  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.670  
 NP-237 4341 2/28/06 4768.800 4768.840  
 CM-244 4320A 2/28/06 5795.020 5795.021  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2340.410  
 Energy Calibration Slope : 4.974835  
 Energy Calibration Quadratic : 3.3510773E-04  
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 035  
 Detector : 29271  
 Calibration Date/Time : 4-APR-2006 12:04:44  
 Calibration Source Id : AESS-011  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.000  
 NP-237 4341 2/28/06 4768.800 4768.800  
 CM-244 4320A 2/28/06 5795.020 5795.020  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2347.646  
 Energy Calibration Slope : 4.986292  
 Energy Calibration Quadratic : 2.8726328E-04  
 Energy Calibration Range : 7755.000

Instrument : CHAMBER 036  
 Detector : 29275  
 Calibration Date/Time : 4-APR-2006 12:04:58  
 Calibration Source Id : AESS-012  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3181.797  
 NP-237 4341 2/28/06 4768.800 4767.041  
 CM-244 4320A 2/28/06 5795.020 5793.387  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2388.490  
 Energy Calibration Slope : 5.017391  
 Energy Calibration Quadratic : 3.2070087E-04  
 Energy Calibration Range : 7863.000



Instrument : CHAMBER 037  
 Detector : 32690  
 Calibration Date/Time : 4-APR-2006 12:05:37  
 Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.312
CM-244	4320A	2/28/06	5795.020	5794.990

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2422.263  
 Energy Calibration Slope : 4.994318  
 Energy Calibration Quadratic : 2.9049869E-04  
 Energy Calibration Range : 7841.000

Instrument : CHAMBER 038  
 Detector : 19323  
 Calibration Date/Time : 4-APR-2006 12:05:48  
 Calibration Source Id : AESS-014

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.338
NP-237	4341	2/28/06	4768.800	4769.033
CM-244	4320A	2/28/06	5795.020	5795.267

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2386.917  
 Energy Calibration Slope : 4.961154  
 Energy Calibration Quadratic : 3.4057652E-04  
 Energy Calibration Range : 7824.000

Instrument : CHAMBER 040  
 Detector : 30446  
 Calibration Date/Time : 4-APR-2006 12:06:33  
 Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.744
NP-237	4341	2/28/06	4768.800	4768.729
CM-244	4320A	2/28/06	5795.020	5794.990

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2361.522  
 Energy Calibration Slope : 4.912026  
 Energy Calibration Quadratic : 3.2777814E-04  
 Energy Calibration Range : 7735.000

Instrument : CHAMBER 041  
 Detector : 22834  
 Calibration Date/Time : 4-APR-2006 12:06:46  
 Calibration Source Id : AESS-017  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.000  
 NP-237 4341 2/28/06 4768.800 4769.004  
 CM-244 4320A 2/28/06 5795.020 5795.141  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2357.184  
 Energy Calibration Slope : 4.881192  
 Energy Calibration Quadratic : 3.4815943E-04  
 Energy Calibration Range : 7721.000

Instrument : CHAMBER 042  
 Detector : 32695  
 Calibration Date/Time : 4-APR-2006 12:07:02  
 Calibration Source Id : AESS-018  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.000  
 NP-237 4341 2/28/06 4768.800 4769.104  
 CM-244 4320A 2/28/06 5795.020 5795.107  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2418.706  
 Energy Calibration Slope : 4.890110  
 Energy Calibration Quadratic : 3.4867792E-04  
 Energy Calibration Range : 7792.000

Instrument : CHAMBER 043  
 Detector : 42470  
 Calibration Date/Time : 4-APR-2006 12:07:20  
 Calibration Source Id : AESS-019  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.000  
 NP-237 4341 2/28/06 4768.800 4769.388  
 CM-244 4320A 2/28/06 5795.020 5795.759  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2363.161  
 Energy Calibration Slope : 5.010756  
 Energy Calibration Quadratic : 2.3886505E-04  
 Energy Calibration Range : 7745.000

Instrument : CHAMBER 044  
 Detector : 34433  
 Calibration Date/Time : 4-APR-2006 12:07:31  
 Calibration Source Id : AESS-020

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.800
CM-244	4320A	2/28/06	5795.020	5795.020

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2381.287  
 Energy Calibration Slope : 4.986757  
 Energy Calibration Quadratic : 2.9497029E-04  
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 045  
 Detector : 34430  
 Calibration Date/Time : 4-APR-2006 12:07:49  
 Calibration Source Id : AESS-021

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.799
CM-244	4320A	2/28/06	5795.020	5795.021

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2396.370  
 Energy Calibration Slope : 4.975925  
 Energy Calibration Quadratic : 2.7766536E-04  
 Energy Calibration Range : 7783.000

Instrument : CHAMBER 046  
 Detector : 42471  
 Calibration Date/Time : 4-APR-2006 12:08:03  
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.981
NP-237	4341	2/28/06	4768.800	4768.475
CM-244	4320A	2/28/06	5795.020	5794.831

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2370.690  
 Energy Calibration Slope : 4.938850  
 Energy Calibration Quadratic : 3.0132200E-04  
 Energy Calibration Range : 7744.000

Instrument : CHAMBER 047  
 Detector : 30449  
 Calibration Date/Time : 4-APR-2006 12:08:14  
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.801
CM-244	4320A	2/28/06	5795.020	5795.020

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2367.885  
 Energy Calibration Slope : 4.977801  
 Energy Calibration Quadratic : 2.7243813E-04  
 Energy Calibration Range : 7751.000

Instrument : CHAMBER 048  
 Detector : 42483  
 Calibration Date/Time : 4-APR-2006 12:08:24  
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.800
CM-244	4320A	2/28/06	5795.020	5795.020

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2379.919  
 Energy Calibration Slope : 5.011742  
 Energy Calibration Quadratic : 2.4467456E-04  
 Energy Calibration Range : 7769.000

Instrument : CHAMBER 065  
 Detector : 21087  
 Calibration Date/Time : 3-APR-2006 12:05:24  
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.701
NP-237	4341	2/28/06	4768.800	4768.799
CM-244	4320A	2/28/06	5795.020	5795.020

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2381.709  
 Energy Calibration Slope : 4.966328  
 Energy Calibration Quadratic : 3.2913609E-04  
 Energy Calibration Range : 7812.000

Instrument : CHAMBER 066  
 Detector : 38159  
 Calibration Date/Time : 3-APR-2006 12:05:41  
 Calibration Source Id : AESS-002  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.194  
 NP-237 4341 2/28/06 4768.800 4769.460  
 CM-244 4320A 2/28/06 5795.020 5795.202

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2361.937  
 Energy Calibration Slope : 4.956664  
 Energy Calibration Quadratic : 3.0704346E-04  
 Energy Calibration Range : 7760.000

Instrument : CHAMBER 068  
 Detector : 33204  
 Calibration Date/Time : 3-APR-2006 12:06:11  
 Calibration Source Id : AESS-004  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.734  
 NP-237 4341 2/28/06 4768.800 4768.288  
 CM-244 4320A 2/28/06 5795.020 5794.885

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2340.602  
 Energy Calibration Slope : 4.952214  
 Energy Calibration Quadratic : 2.9989655E-04  
 Energy Calibration Range : 7726.000

Instrument : CHAMBER 069  
 Detector : 39172  
 Calibration Date/Time : 3-APR-2006 12:06:22  
 Calibration Source Id : AESS-005  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.678  
 NP-237 4341 2/28/06 4768.800 4768.439  
 CM-244 4320A 2/28/06 5795.020 5794.953

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2383.433  
 Energy Calibration Slope : 4.992626  
 Energy Calibration Quadratic : 3.0025930E-04  
 Energy Calibration Range : 7811.000

Instrument : CHAMBER 070  
 Detector : 33207  
 Calibration Date/Time : 3-APR-2006 12:06:32  
 Calibration Source Id : AESS-006  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.583  
 NP-237 4341 2/28/06 4768.800 4768.687  
 CM-244 4320A 2/28/06 5795.020 5794.788  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2397.668  
 Energy Calibration Slope : 4.915377  
 Energy Calibration Quadratic : 3.6479929E-04  
 Energy Calibration Range : 7814.000

Instrument : CHAMBER 072  
 Detector : 33210  
 Calibration Date/Time : 3-APR-2006 12:07:20  
 Calibration Source Id : AESS-008  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3185.797  
 NP-237 4341 2/28/06 4768.800 4771.520  
 CM-244 4320A 2/28/06 5795.020 5795.709  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2429.633  
 Energy Calibration Slope : 4.970463  
 Energy Calibration Quadratic : 2.6446831E-04  
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 073  
 Detector : 33211  
 Calibration Date/Time : 3-APR-2006 12:07:31  
 Calibration Source Id : AESS-009  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.651  
 NP-237 4341 2/28/06 4768.800 4768.479  
 CM-244 4320A 2/28/06 5795.020 5794.623  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2374.705  
 Energy Calibration Slope : 4.961344  
 Energy Calibration Quadratic : 3.4754534E-04  
 Energy Calibration Range : 7820.000

Instrument : CHAMBER 075  
 Detector : 29976  
 Calibration Date/Time : 3-APR-2006 12:07:53  
 Calibration Source Id : AESS-011

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.693
NP-237	4341	2/28/06	4768.800	4768.668
CM-244	4320A	2/28/06	5795.020	5794.923

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2362.553  
 Energy Calibration Slope : 4.960943  
 Energy Calibration Quadratic : 3.2853242E-04  
 Energy Calibration Range : 7787.000

Instrument : CHAMBER 076  
 Detector : 33213  
 Calibration Date/Time : 3-APR-2006 12:08:02  
 Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.644
NP-237	4341	2/28/06	4768.800	4768.760
CM-244	4320A	2/28/06	5795.020	5794.972

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2372.898  
 Energy Calibration Slope : 4.983890  
 Energy Calibration Quadratic : 3.3487112E-04  
 Energy Calibration Range : 7828.000

Instrument : CHAMBER 077  
 Detector : 28239  
 Calibration Date/Time : 3-APR-2006 12:08:16  
 Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.346
NP-237	4341	2/28/06	4768.800	4769.262
CM-244	4320A	2/28/06	5795.020	5795.317

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2368.874  
 Energy Calibration Slope : 4.931313  
 Energy Calibration Quadratic : 3.2203639E-04  
 Energy Calibration Range : 7756.000

Instrument : CHAMBER 078  
 Detector : 34425  
 Calibration Date/Time : 3-APR-2006 12:08:26  
 Calibration Source Id : AESS-014  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.993  
 NP-237 4341 2/28/06 4768.800 4768.645  
 CM-244 4320A 2/28/06 5795.020 5794.911  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2393.754  
 Energy Calibration Slope : 4.904502  
 Energy Calibration Quadratic : 3.5731806E-04  
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 079  
 Detector : 28408  
 Calibration Date/Time : 3-APR-2006 12:08:37  
 Calibration Source Id : AESS-015  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.266  
 NP-237 4341 2/28/06 4768.800 4768.567  
 CM-244 4320A 2/28/06 5795.020 5794.887  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2383.558  
 Energy Calibration Slope : 4.929332  
 Energy Calibration Quadratic : 3.0991141E-04  
 Energy Calibration Range : 7756.000

Instrument : CHAMBER 080  
 Detector : 29269  
 Calibration Date/Time : 3-APR-2006 12:08:46  
 Calibration Source Id : AESS-016  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.363  
 NP-237 4341 2/28/06 4768.800 4768.345  
 CM-244 4320A 2/28/06 5795.020 5794.711  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2360.141  
 Energy Calibration Slope : 5.008783  
 Energy Calibration Quadratic : 2.6339359E-04  
 Energy Calibration Range : 7765.000



Instrument : CHAMBER 081  
 Detector : 28243  
 Calibration Date/Time : 5-APR-2006 14:20:00  
 Calibration Source Id : AESS-017  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.000  
 NP-237 4341 2/28/06 4768.800 4769.124  
 CM-244 4320A 2/28/06 5795.020 5795.316  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2423.205  
 Energy Calibration Slope : 4.974538  
 Energy Calibration Quadratic : 2.3569762E-04  
 Energy Calibration Range : 7764.000

Instrument : CHAMBER 083  
 Detector : 34436  
 Calibration Date/Time : 3-APR-2006 12:09:35  
 Calibration Source Id : AESS-019  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.000  
 NP-237 4341 2/28/06 4768.800 4768.144  
 CM-244 4320A 2/28/06 5795.020 5794.581  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2370.701  
 Energy Calibration Slope : 5.018431  
 Energy Calibration Quadratic : 2.5893620E-04  
 Energy Calibration Range : 7781.000

Instrument : CHAMBER 084  
 Detector : 29953  
 Calibration Date/Time : 3-APR-2006 12:09:48  
 Calibration Source Id : AESS-020  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3182.067  
 NP-237 4341 2/28/06 4768.800 4768.425  
 CM-244 4320A 2/28/06 5795.020 5794.511  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2368.562  
 Energy Calibration Slope : 5.005028  
 Energy Calibration Quadratic : 3.0593007E-04  
 Energy Calibration Range : 7815.000

Instrument : CHAMBER 085  
 Detector : 30451  
 Calibration Date/Time : 3-APR-2006 12:10:02  
 Calibration Source Id : AESS-021

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.503
NP-237	4341	2/28/06	4768.800	4768.802
CM-244	4320A	2/28/06	5795.020	5795.019

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2385.228  
 Energy Calibration Slope : 4.990182  
 Energy Calibration Quadratic : 3.0125739E-04  
 Energy Calibration Range : 7811.000

Instrument : CHAMBER 086  
 Detector : 29278  
 Calibration Date/Time : 3-APR-2006 12:10:24  
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.313
CM-244	4320A	2/28/06	5795.020	5794.889

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2367.011  
 Energy Calibration Slope : 5.001186  
 Energy Calibration Quadratic : 2.4593988E-04  
 Energy Calibration Range : 7746.000

Instrument : CHAMBER 087  
 Detector : 34430  
 Calibration Date/Time : 3-APR-2006 12:10:36  
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.326
NP-237	4341	2/28/06	4768.800	4768.556
CM-244	4320A	2/28/06	5795.020	5794.574

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2363.815  
 Energy Calibration Slope : 5.009631  
 Energy Calibration Quadratic : 2.4977388E-04  
 Energy Calibration Range : 7756.000

Instrument : CHAMBER 088  
 Detector : 30434  
 Calibration Date/Time : 3-APR-2006 12:10:54  
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.313
NP-237	4341	2/28/06	4768.800	4767.746
CM-244	4320A	2/28/06	5795.020	5794.659

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2334.709  
 Energy Calibration Slope : 4.874549  
 Energy Calibration Quadratic : 2.1355411E-04  
 Energy Calibration Range : 7550.000

Instrument : CHAMBER 089  
 Detector : 21087  
 Calibration Date/Time : 3-APR-2006 23:05:32  
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.451
NP-237	4341	2/28/06	4768.800	4768.626
CM-244	4320A	2/28/06	5795.020	5794.917

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2349.260  
 Energy Calibration Slope : 4.948930  
 Energy Calibration Quadratic : 3.2322409E-04  
 Energy Calibration Range : 7756.000

Instrument : CHAMBER 090  
 Detector : 38159  
 Calibration Date/Time : 3-APR-2006 23:06:16  
 Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.800
CM-244	4320A	2/28/06	5795.020	5794.866

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2386.311  
 Energy Calibration Slope : 4.986774  
 Energy Calibration Quadratic : 3.3244080E-04  
 Energy Calibration Range : 7841.000

Instrument : CHAMBER 091  
 Detector : 33205  
 Calibration Date/Time : 4-APR-2006 21:06:36  
 Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.391
NP-237	4341	2/28/06	4768.800	4769.357
CM-244	4320A	2/28/06	5795.020	5795.305

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2363.386  
 Energy Calibration Slope : 4.961743  
 Energy Calibration Quadratic : 3.2066394E-04  
 Energy Calibration Range : 7780.000

Instrument : CHAMBER 092  
 Detector : 33204  
 Calibration Date/Time : 3-APR-2006 23:08:02  
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.867
CM-244	4320A	2/28/06	5795.020	5795.175

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2358.222  
 Energy Calibration Slope : 4.950097  
 Energy Calibration Quadratic : 3.0710385E-04  
 Energy Calibration Range : 7749.000

Instrument : CHAMBER 093  
 Detector : 33206  
 Calibration Date/Time : 3-APR-2006 23:08:14  
 Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4769.063
CM-244	4320A	2/28/06	5795.020	5795.298

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2375.739  
 Energy Calibration Slope : 4.926612  
 Energy Calibration Quadratic : 3.1170124E-04  
 Energy Calibration Range : 7747.000

Instrument : CHAMBER 094  
 Detector : 33207  
 Calibration Date/Time : 3-APR-2006 23:08:34  
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.993
NP-237	4341	2/28/06	4768.800	4768.799
CM-244	4320A	2/28/06	5795.020	5795.021

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2369.583  
 Energy Calibration Slope : 4.936423  
 Energy Calibration Quadratic : 3.2235958E-04  
 Energy Calibration Range : 7762.000

Instrument : CHAMBER 096  
 Detector : 30429  
 Calibration Date/Time : 3-APR-2006 23:09:48  
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.677
NP-237	4341	2/28/06	4768.800	4768.561
CM-244	4320A	2/28/06	5795.020	5794.869

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2346.092  
 Energy Calibration Slope : 4.863141  
 Energy Calibration Quadratic : 3.1486651E-04  
 Energy Calibration Range : 7656.000

Instrument : CHAMBER 098  
 Detector : 30431  
 Calibration Date/Time : 3-APR-2006 23:10:26  
 Calibration Source Id : AESS-010

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.647
NP-237	4341	2/28/06	4768.800	4768.514
CM-244	4320A	2/28/06	5795.020	5794.903

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2380.759  
 Energy Calibration Slope : 4.922705  
 Energy Calibration Quadratic : 3.2662629E-04  
 Energy Calibration Range : 7764.000

Instrument : CHAMBER 099  
 Detector : 30432  
 Calibration Date/Time : 4-APR-2006 21:07:16  
 Calibration Source Id : AESS-011  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.000  
 NP-237 4341 2/28/06 4768.800 4769.171  
 CM-244 4320A 2/28/06 5795.020 5795.241  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2411.170  
 Energy Calibration Slope : 4.859684  
 Energy Calibration Quadratic : 3.3678240E-04  
 Energy Calibration Range : 7741.000

Instrument : CHAMBER 101  
 Detector : 31696  
 Calibration Date/Time : 3-APR-2006 23:11:17  
 Calibration Source Id : AESS-013  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3181.759  
 NP-237 4341 2/28/06 4768.800 4767.478  
 CM-244 4320A 2/28/06 5795.020 5793.923  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2397.165  
 Energy Calibration Slope : 4.939373  
 Energy Calibration Quadratic : 2.7448736E-04  
 Energy Calibration Range : 7743.000

Instrument : CHAMBER 102  
 Detector : 30438  
 Calibration Date/Time : 3-APR-2006 23:11:38  
 Calibration Source Id : AESS-014  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3183.000  
 NP-237 4341 2/28/06 4768.800 4768.799  
 CM-244 4320A 2/28/06 5795.020 5795.021  
 Energy/Channel Equation : see above  
 Energy Calibration Zero : 2390.065  
 Energy Calibration Slope : 4.967123  
 Energy Calibration Quadratic : 3.3759646E-04  
 Energy Calibration Range : 7830.000

Instrument : CHAMBER 103  
 Detector : 30437  
 Calibration Date/Time : 3-APR-2006 23:11:50  
 Calibration Source Id : AESS-015

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.632
NP-237	4341	2/28/06	4768.800	4768.780
CM-244	4320A	2/28/06	5795.020	5795.021

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2378.634  
 Energy Calibration Slope : 4.949142  
 Energy Calibration Quadratic : 3.4029011E-04  
 Energy Calibration Range : 7803.000

Instrument : CHAMBER 104  
 Detector : 30436  
 Calibration Date/Time : 3-APR-2006 23:12:05  
 Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.656
NP-237	4341	2/28/06	4768.800	4768.710
CM-244	4320A	2/28/06	5795.020	5794.893

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2402.033  
 Energy Calibration Slope : 4.941638  
 Energy Calibration Quadratic : 3.3733863E-04  
 Energy Calibration Range : 7816.000

Instrument : CHAMBER 106  
 Detector : 45382  
 Calibration Date/Time : 3-APR-2006 23:13:35  
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.390
NP-237	4341	2/28/06	4768.800	4768.938
CM-244	4320A	2/28/06	5795.020	5795.081

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2377.948  
 Energy Calibration Slope : 4.942991  
 Energy Calibration Quadratic : 3.4093895E-04  
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 107  
 Detector : 31697  
 Calibration Date/Time : 3-APR-2006 23:13:46  
 Calibration Source Id : AESS-019

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.800
CM-244	4320A	2/28/06	5795.020	5795.020

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2398.373  
 Energy Calibration Slope : 4.985534  
 Energy Calibration Quadratic : 2.7872290E-04  
 Energy Calibration Range : 7796.000

Instrument : CHAMBER 109  
 Detector : 31693  
 Calibration Date/Time : 3-APR-2006 23:14:12  
 Calibration Source Id : AESS-021

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4769.000
CM-244	4320A	2/28/06	5795.020	5795.208

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2387.754  
 Energy Calibration Slope : 4.924148  
 Energy Calibration Quadratic : 3.0788378E-04  
 Energy Calibration Range : 7753.000

Instrument : CHAMBER 110  
 Detector : 30447  
 Calibration Date/Time : 4-APR-2006 21:08:36  
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.635
NP-237	4341	2/28/06	4768.800	4768.800
CM-244	4320A	2/28/06	5795.020	5795.020

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2419.221  
 Energy Calibration Slope : 4.999035  
 Energy Calibration Quadratic : 2.2320703E-04  
 Energy Calibration Range : 7772.000



Instrument : CHAMBER 111  
 Detector : 30448  
 Calibration Date/Time : 3-APR-2006 23:15:36  
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.627
NP-237	4341	2/28/06	4768.800	4768.799
CM-244	4320A	2/28/06	5795.020	5795.021

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2388.052  
 Energy Calibration Slope : 4.962283  
 Energy Calibration Quadratic : 2.9634466E-04  
 Energy Calibration Range : 7780.000

Instrument : CHAMBER 112  
 Detector : 30449  
 Calibration Date/Time : 3-APR-2006 23:15:47  
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.664
CM-244	4320A	2/28/06	5795.020	5795.019

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2375.519  
 Energy Calibration Slope : 4.935473  
 Energy Calibration Quadratic : 2.8306872E-04  
 Energy Calibration Range : 7726.000

Instrument : CHAMBER 113  
 Detector : 45-111B4  
 Calibration Date/Time : 4-APR-2006 17:02:58  
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3182.303
NP-237	4341	2/28/06	4768.800	4767.615
CM-244	4320A	2/28/06	5795.020	5794.404

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2393.614  
 Energy Calibration Slope : 4.990646  
 Energy Calibration Quadratic : 3.0610454E-04  
 Energy Calibration Range : 7825.000

Instrument : CHAMBER 114  
 Detector : 45-111B5  
 Calibration Date/Time : 4-APR-2006 17:03:22  
 Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.771
NP-237	4341	2/28/06	4768.800	4767.996
CM-244	4320A	2/28/06	5795.020	5794.695

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2391.292  
 Energy Calibration Slope : 4.957956  
 Energy Calibration Quadratic : 3.2139214E-04  
 Energy Calibration Range : 7805.000

Instrument : CHAMBER 115  
 Detector : 45-132EE5  
 Calibration Date/Time : 4-APR-2006 17:03:37  
 Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3183.000
NP-237	4341	2/28/06	4768.800	4768.468
CM-244	4320A	2/28/06	5795.020	5794.664

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2372.417  
 Energy Calibration Slope : 4.988519  
 Energy Calibration Quadratic : 2.9488039E-04  
 Energy Calibration Range : 7790.000

Instrument : CHAMBER 116  
 Detector : 45-132FF2  
 Calibration Date/Time : 4-APR-2006 17:03:51  
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.985
NP-237	4341	2/28/06	4768.800	4767.986
CM-244	4320A	2/28/06	5795.020	5794.612

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2377.594  
 Energy Calibration Slope : 4.965635  
 Energy Calibration Quadratic : 3.1974592E-04  
 Energy Calibration Range : 7798.000

Instrument : CHAMBER 117  
 Detector : 45-132FF3  
 Calibration Date/Time : 4-APR-2006 17:04:04  
 Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.825
NP-237	4341	2/28/06	4768.800	4767.294
CM-244	4320A	2/28/06	5795.020	5794.289

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2399.138  
 Energy Calibration Slope : 4.995797  
 Energy Calibration Quadratic : 2.8692893E-04  
 Energy Calibration Range : 7816.000

Instrument : CHAMBER 118  
 Detector : 45-132FF4  
 Calibration Date/Time : 4-APR-2006 17:04:21  
 Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.738
NP-237	4341	2/28/06	4768.800	4767.705
CM-244	4320A	2/28/06	5795.020	5794.733

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2382.726  
 Energy Calibration Slope : 4.977871  
 Energy Calibration Quadratic : 3.1087140E-04  
 Energy Calibration Range : 7806.000

Instrument : CHAMBER 119  
 Detector : 45-132FF5  
 Calibration Date/Time : 4-APR-2006 17:04:33  
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.725
NP-237	4341	2/28/06	4768.800	4768.406
CM-244	4320A	2/28/06	5795.020	5794.422

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2394.460  
 Energy Calibration Slope : 4.945233  
 Energy Calibration Quadratic : 3.2115451E-04  
 Energy Calibration Range : 7795.000

Instrument : CHAMBER 120  
 Detector : 45-142F1  
 Calibration Date/Time : 4-APR-2006 17:05:08  
 Calibration Source Id : AESS-010

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.702
NP-237	4341	2/28/06	4768.800	4767.716
CM-244	4320A	2/28/06	5795.020	5794.385

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2370.954  
 Energy Calibration Slope : 4.969444  
 Energy Calibration Quadratic : 2.9560321E-04  
 Energy Calibration Range : 7770.000

Instrument : CHAMBER 121  
 Detector : 45-142J4  
 Calibration Date/Time : 4-APR-2006 17:05:19  
 Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.854
NP-237	4341	2/28/06	4768.800	4767.926
CM-244	4320A	2/28/06	5795.020	5794.359

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2388.517  
 Energy Calibration Slope : 4.957601  
 Energy Calibration Quadratic : 3.2604721E-04  
 Energy Calibration Range : 7807.000

Instrument : CHAMBER 122  
 Detector : 45-142J5  
 Calibration Date/Time : 4-APR-2006 17:05:33  
 Calibration Source Id : AESS-011

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.708
NP-237	4341	2/28/06	4768.800	4767.643
CM-244	4320A	2/28/06	5795.020	5794.644

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2379.562  
 Energy Calibration Slope : 4.966173  
 Energy Calibration Quadratic : 3.1077259E-04  
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 123  
 Detector : 45-142V1  
 Calibration Date/Time : 4-APR-2006 17:05:57  
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3180.927
NP-237	4341	2/28/06	4768.800	4767.132
CM-244	4320A	2/28/06	5795.020	5794.117

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2393.486  
 Energy Calibration Slope : 4.981727  
 Energy Calibration Quadratic : 2.8783656E-04  
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 124  
 Detector : 45-142V2  
 Calibration Date/Time : 4-APR-2006 17:06:12  
 Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.329
NP-237	4341	2/28/06	4768.800	4767.124
CM-244	4320A	2/28/06	5795.020	5794.622

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2394.312  
 Energy Calibration Slope : 4.963425  
 Energy Calibration Quadratic : 3.1662040E-04  
 Energy Calibration Range : 7809.000

Instrument : CHAMBER 125  
 Detector : 45-142V3  
 Calibration Date/Time : 4-APR-2006 17:06:28  
 Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.749
NP-237	4341	2/28/06	4768.800	4766.709
CM-244	4320A	2/28/06	5795.020	5794.138

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2389.743  
 Energy Calibration Slope : 4.991052  
 Energy Calibration Quadratic : 2.6156937E-04  
 Energy Calibration Range : 7775.000

Instrument : CHAMBER 126  
 Detector : 45-142V5  
 Calibration Date/Time : 4-APR-2006 17:06:44  
 Calibration Source Id : AESS-019

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.536
NP-237	4341	2/28/06	4768.800	4766.676
CM-244	4320A	2/28/06	5795.020	5794.299

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2392.589  
 Energy Calibration Slope : 5.019009  
 Energy Calibration Quadratic : 2.5404955E-04  
 Energy Calibration Range : 7798.000

Instrument : CHAMBER 127  
 Detector : 45-142W1  
 Calibration Date/Time : 4-APR-2006 17:07:12  
 Calibration Source Id : AESS-014

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.047
NP-237	4341	2/28/06	4768.800	4767.379
CM-244	4320A	2/28/06	5795.020	5794.462

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2390.982  
 Energy Calibration Slope : 4.949072  
 Energy Calibration Quadratic : 3.2237647E-04  
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 128  
 Detector : 45-142W2  
 Calibration Date/Time : 4-APR-2006 17:07:27  
 Calibration Source Id : AESS-020

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.794
NP-237	4341	2/28/06	4768.800	4767.351
CM-244	4320A	2/28/06	5795.020	5794.426

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2376.436  
 Energy Calibration Slope : 4.990520  
 Energy Calibration Quadratic : 2.8923506E-04  
 Energy Calibration Range : 7790.000

Instrument : CHAMBER 129  
 Detector : 45-142W3  
 Calibration Date/Time : 4-APR-2006 17:07:43  
 Calibration Source Id : AESS-015  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3181.920  
 NP-237 4341 2/28/06 4768.800 4767.431  
 CM-244 4320A 2/28/06 5795.020 5794.286

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2397.947  
 Energy Calibration Slope : 4.950837  
 Energy Calibration Quadratic : 3.2286491E-04  
 Energy Calibration Range : 7806.000

Instrument : CHAMBER 130  
 Detector : 45-142W5  
 Calibration Date/Time : 4-APR-2006 17:07:58  
 Calibration Source Id : AESS-021  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3181.779  
 NP-237 4341 2/28/06 4768.800 4767.779  
 CM-244 4320A 2/28/06 5795.020 5794.289

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2390.948  
 Energy Calibration Slope : 5.005381  
 Energy Calibration Quadratic : 2.9957382E-04  
 Energy Calibration Range : 7831.000

Instrument : CHAMBER 131  
 Detector : 45-145K1  
 Calibration Date/Time : 4-APR-2006 17:08:16  
 Calibration Source Id : AESS-016  
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy  
 GD-148 6445-278 2/28/06 3183.000 3181.832  
 NP-237 4341 2/28/06 4768.800 4767.927  
 CM-244 4320A 2/28/06 5795.020 5794.474

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2383.200  
 Energy Calibration Slope : 4.971618  
 Energy Calibration Quadratic : 3.1435001E-04  
 Energy Calibration Range : 7804.000

Instrument : CHAMBER 132  
 Detector : 45-145K2  
 Calibration Date/Time : 4-APR-2006 17:08:32  
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.897
NP-237	4341	2/28/06	4768.800	4767.248
CM-244	4320A	2/28/06	5795.020	5794.594

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2374.090  
 Energy Calibration Slope : 5.015432  
 Energy Calibration Quadratic : 2.7181130E-04  
 Energy Calibration Range : 7795.000

Instrument : CHAMBER 133  
 Detector : 45-145K3  
 Calibration Date/Time : 4-APR-2006 17:09:47  
 Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.967
NP-237	4341	2/28/06	4768.800	4767.767
CM-244	4320A	2/28/06	5795.020	5794.419

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2364.883  
 Energy Calibration Slope : 4.958282  
 Energy Calibration Quadratic : 2.8459914E-04  
 Energy Calibration Range : 7741.000

Instrument : CHAMBER 134  
 Detector : 45-145K4  
 Calibration Date/Time : 4-APR-2006 17:11:02  
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.715
NP-237	4341	2/28/06	4768.800	4767.525
CM-244	4320A	2/28/06	5795.020	5794.621

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2384.888  
 Energy Calibration Slope : 4.989409  
 Energy Calibration Quadratic : 2.7175582E-04  
 Energy Calibration Range : 7779.000



Instrument : CHAMBER 135  
 Detector : 45-145K5  
 Calibration Date/Time : 4-APR-2006 17:11:53  
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.833
NP-237	4341	2/28/06	4768.800	4768.171
CM-244	4320A	2/28/06	5795.020	5794.435

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2394.605  
 Energy Calibration Slope : 4.968740  
 Energy Calibration Quadratic : 2.9795556E-04  
 Energy Calibration Range : 7795.000

Instrument : CHAMBER 136  
 Detector : 45-145L1  
 Calibration Date/Time : 4-APR-2006 17:12:12  
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/06	3183.000	3181.493
NP-237	4341	2/28/06	4768.800	4767.151
CM-244	4320A	2/28/06	5795.020	5794.044

Energy/Channel Equation : see above  
 Energy Calibration Zero : 2384.309  
 Energy Calibration Slope : 5.003936  
 Energy Calibration Quadratic : 2.5798104E-04  
 Energy Calibration Range : 7779.000

## Subsection 2: Background Calibration

Instrument : CHAMBER 001  
 Detector : 33088  
 Background Analysis Date/Time : 2-APR-2006 11:38:32  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.456	3298.943	2.000000	0.4799997	70.71068	95.00000
NP-237	4433.436	4903.018	13.00000	3.119998	27.73501	95.00000
CM-244	5530.638	5887.374	28.00000	6.719995	18.89822	95.00000

Instrument : CHAMBER 003  
 Detector : 20659  
 Background Analysis Date/Time : 2-APR-2006 11:38:32  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.599	3300.169	5.000000	1.199999	44.72136	95.00000
NP-237	4434.674	4902.844	22.00000	5.279996	21.32007	95.00000
CM-244	5535.248	5883.783	33.00000	7.919994	17.40777	95.00000

Instrument : CHAMBER 004  
 Detector : 33077  
 Background Analysis Date/Time : 2-APR-2006 11:38:32  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.545	3299.456	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4433.646	4906.400	4.000000	0.9599993	50.00000	95.00000
CM-244	5531.494	5886.867	18.00000	4.319997	23.57022	95.00000

Instrument : CHAMBER 005  
 Detector : 28642  
 Background Analysis Date/Time : 2-APR-2006 11:38:32  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.709	3298.775	3.000000	0.7199995	57.73503	95.00000
NP-237	4434.190	4905.248	19.00000	4.559997	22.94157	95.00000
CM-244	5530.463	5883.921	31.00000	7.439995	17.96053	95.00000

Instrument : CHAMBER 007  
 Detector : 30416  
 Background Analysis Date/Time : 2-APR-2006 11:38:33  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.797	3298.358	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.556	4903.394	25.00000	5.999996	20.00000	95.00000
CM-244	5533.897	5887.491	49.00000	11.75999	14.28572	95.00000

Instrument : CHAMBER 009  
 Detector : 13285  
 Background Analysis Date/Time : 2-APR-2006 11:38:33  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.740	3302.180	3.000000	0.7199995	57.73503	95.00000
NP-237	4436.826	4904.306	10.00000	2.399998	31.62278	95.00000
CM-244	5530.853	5882.488	30.00000	7.199995	18.25742	95.00000

Instrument : CHAMBER 010  
 Detector : 33083  
 Background Analysis Date/Time : 2-APR-2006 11:38:33  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.233	3300.495	1.000000	0.2399998	100.0000	95.00000
NP-237	4435.514	4905.914	11.00000	2.639998	30.15113	95.00000
CM-244	5535.151	5882.345	27.00000	6.479995	19.24501	95.00000

Instrument : CHAMBER 011  
 Detector : 9537  
 Background Analysis Date/Time : 2-APR-2006 11:38:33  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.769	3298.475	1.000000	0.2399998	100.0000	95.00000
NP-237	4433.776	4901.438	2.000000	0.4799997	70.71068	95.00000
CM-244	5533.457	5885.193	35.00000	8.399994	16.90309	95.00000

Instrument : CHAMBER 012  
 Detector : 33085  
 Background Analysis Date/Time : 2-APR-2006 11:38:33  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.283	3299.978	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.454	4901.598	3.000000	0.7199995	57.73503	95.00000
CM-244	5534.285	5885.751	13.00000	3.119998	27.73501	95.00000

Instrument : CHAMBER 013  
 Detector : 21084  
 Background Analysis Date/Time : 2-APR-2006 11:38:34  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.308	3301.307	1.000000	0.2399998	100.0000	95.00000
NP-237	4433.829	4905.476	4.000000	0.9599993	50.00000	95.00000
CM-244	5530.551	5886.625	27.00000	6.479995	19.24501	95.00000

Instrument : CHAMBER 016  
 Detector : 21086  
 Background Analysis Date/Time : 2-APR-2006 11:38:34  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.386	3300.792	3.000000	0.7199995	57.73503	95.00000
NP-237	4437.111	4903.407	9.000000	2.159998	33.33334	95.00000
CM-244	5533.819	5884.776	38.00000	9.119993	16.22214	95.00000

Instrument : CHAMBER 017  
 Detector : 33203  
 Background Analysis Date/Time : 2-APR-2006 11:38:34  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.693	3298.212	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.905	4905.400	9.000000	2.159998	33.33334	95.00000
CM-244	5532.198	5886.394	44.00000	10.55999	15.07557	95.00000

Instrument : CHAMBER 018  
 Detector : 21063  
 Background Analysis Date/Time : 2-APR-2006 11:38:34  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.076	3298.134	1.000000	0.2399998	100.0000	95.00000
NP-237	4433.036	4905.011	4.000000	0.9599993	50.00000	95.00000
CM-244	5535.243	5885.674	34.00000	8.159994	17.14986	95.00000

Instrument : CHAMBER 019  
 Detector : 23882  
 Background Analysis Date/Time : 2-APR-2006 11:38:35  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.511	3300.144	16916.00	4059.841	0.7688669	95.00000
NP-237	4435.855	4902.151	5184.000	1244.160	1.388889	95.00000
CM-244	5531.789	5884.041	1897.000	455.2801	2.295970	95.00000

Instrument : CHAMBER 020  
 Detector : 33093  
 Background Analysis Date/Time : 2-APR-2006 11:38:35  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.758	3298.111	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.838	4901.523	7.000000	1.680000	37.79645	95.00000
CM-244	5530.915	5883.311	45.00000	10.80000	14.90712	95.00000

Instrument : CHAMBER 021  
 Detector : 33893  
 Background Analysis Date/Time : 2-APR-2006 11:38:35  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.969	3300.683	1.000000	0.2400001	100.0000	95.00000
NP-237	4434.165	4904.181	5.000000	1.200000	44.72136	95.00000
CM-244	5533.125	5885.623	21.00000	5.040001	21.82179	95.00000

Instrument : CHAMBER 023  
 Detector : 22873  
 Background Analysis Date/Time : 2-APR-2006 11:38:35  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.365	3300.653	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.587	4902.786	9.000000	2.160001	33.33334	95.00000
CM-244	5533.585	5885.616	41.00000	9.840002	15.61738	95.00000

Instrument : CHAMBER 026  
 Detector : 34427  
 Background Analysis Date/Time : 2-APR-2006 11:38:36  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.396	3300.299	1.000000	0.2400001	100.0000	95.00000
NP-237	4432.951	4903.551	14.00000	3.360001	26.72612	95.00000
CM-244	5534.085	5882.486	27.00000	6.480001	19.24501	95.00000

Instrument : CHAMBER 027  
 Detector : 31436  
 Background Analysis Date/Time : 2-APR-2006 11:38:36  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.641	3298.501	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.554	4903.960	9.000000	2.160001	33.33334	95.00000
CM-244	5535.178	5885.600	13.00000	3.120001	27.73501	95.00000

Instrument : CHAMBER 028  
 Detector : 21056  
 Background Analysis Date/Time : 2-APR-2006 11:38:36  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.862	3298.519	1.000000	0.2400001	100.0000	95.00000
NP-237	4437.162	4904.527	5.000000	1.200000	44.72136	95.00000
CM-244	5534.678	5884.670	3.000000	0.7200001	57.73503	95.00000

Instrument : CHAMBER 029  
 Detector : 30419  
 Background Analysis Date/Time : 2-APR-2006 11:38:36  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.643	3298.009	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.124	4903.513	4.000000	0.9600002	50.00000	95.00000
CM-244	5533.909	5884.139	20.00000	4.800001	22.36068	95.00000

Instrument : CHAMBER 030  
 Detector : 30420  
 Background Analysis Date/Time : 2-APR-2006 11:38:36  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.381	3300.032	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.171	4901.399	1.000000	0.2400001	100.0000	95.00000
CM-244	5532.938	5887.226	28.00000	6.720002	18.89822	95.00000

Instrument : CHAMBER 032  
 Detector : 33207  
 Background Analysis Date/Time : 2-APR-2006 11:38:36  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.438	3301.011	4.000000	0.9599994	50.00000	95.00000
NP-237	4437.450	4903.298	8.000000	1.919999	35.35534	95.00000
CM-244	5533.518	5886.674	40.00000	9.599994	15.81139	95.00000

Instrument : CHAMBER 033  
 Detector : 28647  
 Background Analysis Date/Time : 2-APR-2006 11:38:36  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.128	3301.778	10.00000	2.399998	31.62278	95.00000
NP-237	4433.277	4905.752	9.000000	2.159999	33.33334	95.00000
CM-244	5531.202	5887.135	39.00000	9.359994	16.01282	95.00000

Instrument : CHAMBER 034  
 Detector : 32697  
 Background Analysis Date/Time : 2-APR-2006 11:38:36  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.740	3297.727	18.00000	4.319997	23.57022	95.00000
NP-237	4436.424	4906.295	31.00000	7.439995	17.96053	95.00000
CM-244	5532.067	5883.683	33.00000	7.919995	17.40777	95.00000

Instrument : CHAMBER 035  
 Detector : 29271  
 Background Analysis Date/Time : 2-APR-2006 11:38:36  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.597	3300.316	1.000000	0.2399998	100.0000	95.00000
NP-237	4435.093	4902.062	25.00000	5.999996	20.00000	95.00000
CM-244	5533.546	5887.289	24.00000	5.759996	20.41241	95.00000

Instrument : CHAMBER 036  
 Detector : 29275  
 Background Analysis Date/Time : 2-APR-2006 11:38:36  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.101	3302.011	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.212	4902.690	21.00000	5.039997	21.82179	95.00000
CM-244	5530.586	5883.211	28.00000	6.719995	18.89822	95.00000

Instrument : CHAMBER 037  
 Detector : 32690  
 Background Analysis Date/Time : 2-APR-2006 11:38:37  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.331	3300.070	3.000000	0.7200001	57.73503	95.00000
NP-237	4435.120	4902.289	15.00000	3.600001	25.81989	95.00000
CM-244	5534.121	5882.713	34.00000	8.160002	17.14986	95.00000



Instrument : CHAMBER 038  
 Detector : 19323  
 Background Analysis Date/Time : 2-APR-2006 11:38:37  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.203	3301.129	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.340	4904.950	11.00000	2.640001	30.15113	95.00000
CM-244	5534.574	5885.451	22.00000	5.280001	21.32007	95.00000

Instrument : CHAMBER 040  
 Detector : 30446  
 Background Analysis Date/Time : 2-APR-2006 11:38:37  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.636	3301.603	3.000000	0.7200001	57.73503	95.00000
NP-237	4435.733	4904.719	11.00000	2.640001	30.15113	95.00000
CM-244	5532.976	5885.423	19.00000	4.560001	22.94157	95.00000

Instrument : CHAMBER 041  
 Detector : 22834  
 Background Analysis Date/Time : 2-APR-2006 11:38:37  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.681	3302.193	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.502	4905.743	8.000000	1.920000	35.35534	95.00000
CM-244	5533.298	5885.604	23.00000	5.520001	20.85144	95.00000

Instrument : CHAMBER 042  
 Detector : 32695  
 Background Analysis Date/Time : 2-APR-2006 11:38:37  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.651	3300.194	4.000000	0.9600002	50.00000	95.00000
NP-237	4435.708	4903.810	19.00000	4.560001	22.94157	95.00000
CM-244	5531.417	5883.758	26.00000	6.240001	19.61161	95.00000

Instrument : CHAMBER 043  
 Detector : 42470  
 Background Analysis Date/Time : 2-APR-2006 11:38:38  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.168	3298.326	1.000000	0.2399998	100.0000	95.00000
NP-237	4436.901	4902.013	2.000000	0.4799997	70.71068	95.00000
CM-244	5535.121	5886.262	19.00000	4.559997	22.94157	95.00000

Instrument : CHAMBER 044  
 Detector : 34433  
 Background Analysis Date/Time : 2-APR-2006 11:38:38  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.004	3298.648	28.00000	6.719995	18.89822	95.00000
NP-237	4433.632	4906.174	35.00000	8.399995	16.90309	95.00000
CM-244	5532.967	5887.129	38.00000	9.119994	16.22214	95.00000

Instrument : CHAMBER 045  
 Detector : 34430  
 Background Analysis Date/Time : 2-APR-2006 11:38:38  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.438	3301.033	4.000000	0.9599994	50.00000	95.00000
NP-237	4436.365	4906.490	17.00000	4.079998	24.25356	95.00000
CM-244	5535.004	5886.982	17.00000	4.079998	24.25356	95.00000

Instrument : CHAMBER 046  
 Detector : 42471  
 Background Analysis Date/Time : 2-APR-2006 11:38:38  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.741	3299.741	14.00000	3.359998	26.72612	95.00000
NP-237	4435.900	4904.967	49.00000	11.75999	14.28572	95.00000
CM-244	5532.671	5884.488	25.00000	5.999996	20.00000	95.00000

Instrument : CHAMBER 047  
 Detector : 30449  
 Background Analysis Date/Time : 2-APR-2006 11:38:38  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.322	3298.103	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4433.780	4903.899	14.00000	3.359998	26.72612	95.00000
CM-244	5532.276	5884.114	29.00000	6.959996	18.56953	95.00000

Instrument : CHAMBER 048  
 Detector : 42483  
 Background Analysis Date/Time : 2-APR-2006 11:38:38  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.922	3300.161	1.000000	0.2399998	100.0000	95.00000
NP-237	4434.180	4904.923	20.00000	4.799997	22.36068	95.00000
CM-244	5533.436	5885.010	24.00000	5.759996	20.41241	95.00000

Instrument : CHAMBER 065  
 Detector : 21087  
 Background Analysis Date/Time : 2-APR-2006 11:38:39  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.500	3301.569	5.000000	1.199999	44.72136	95.00000
NP-237	4436.593	4904.814	10.00000	2.399998	31.62278	95.00000
CM-244	5533.641	5883.942	18.00000	4.319997	23.57022	95.00000

Instrument : CHAMBER 066  
 Detector : 38159  
 Background Analysis Date/Time : 2-APR-2006 11:38:39  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.351	3299.570	1.000000	0.2399998	100.0000	95.00000
NP-237	4435.367	4906.503	12.00000	2.879998	28.86751	95.00000
CM-244	5531.751	5885.195	19.00000	4.559997	22.94157	95.00000

Instrument : CHAMBER 068  
 Detector : 33204  
 Background Analysis Date/Time : 2-APR-2006 11:38:39  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.458	3302.482	2.000000	0.4799997	70.71068	95.00000
NP-237	4437.019	4902.188	5.000000	1.199999	44.72136	95.00000
CM-244	5531.579	5884.315	15.00000	3.599998	25.81989	95.00000

Instrument : CHAMBER 069  
 Detector : 39172  
 Background Analysis Date/Time : 2-APR-2006 11:38:39  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.937	3302.037	1.000000	0.2399998	100.0000	95.00000
NP-237	4433.758	4901.912	5.000000	1.199999	44.72136	95.00000
CM-244	5535.302	5884.863	13.00000	3.119998	27.73501	95.00000

Instrument : CHAMBER 070  
 Detector : 33207  
 Background Analysis Date/Time : 2-APR-2006 11:38:39  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.764	3299.302	3.000000	0.7199996	57.73503	95.00000
NP-237	4432.603	4904.338	13.00000	3.119998	27.73501	95.00000
CM-244	5531.790	5887.167	12.00000	2.879998	28.86751	95.00000

Instrument : CHAMBER 072  
 Detector : 33210  
 Background Analysis Date/Time : 2-APR-2006 11:38:40  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.642	3302.500	4.000000	0.9599994	50.00000	95.00000
NP-237	4434.229	4902.517	7.000000	1.679999	37.79645	95.00000
CM-244	5533.565	5883.889	14.00000	3.359998	26.72612	95.00000

Instrument : CHAMBER 073  
 Detector : 33211  
 Background Analysis Date/Time : 2-APR-2006 11:38:40  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.209	3299.359	1.000000	0.2399998	100.0000	95.00000
NP-237	4435.813	4905.119	6.000000	1.439999	40.82483	95.00000
CM-244	5530.447	5887.394	15.00000	3.599998	25.81989	95.00000

Instrument : CHAMBER 075  
 Detector : 29976  
 Background Analysis Date/Time : 2-APR-2006 11:38:40  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.804	3301.738	1.000000	0.2399998	100.0000	95.00000
NP-237	4436.078	4904.005	18.00000	4.319997	23.57022	95.00000
CM-244	5532.428	5882.500	16.00000	3.839998	25.00000	95.00000

Instrument : CHAMBER 076  
 Detector : 33213  
 Background Analysis Date/Time : 2-APR-2006 11:38:40  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.982	3301.271	1.000000	0.2399998	100.0000	95.00000
NP-237	4435.792	4906.032	9.000000	2.159999	33.33334	95.00000
CM-244	5532.284	5884.164	16.00000	3.839998	25.00000	95.00000

Instrument : CHAMBER 077  
 Detector : 28239  
 Background Analysis Date/Time : 2-APR-2006 11:38:41  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.320	3302.291	3.000000	0.7200001	57.73503	95.00000
NP-237	4434.458	4904.534	18.00000	4.320001	23.57022	95.00000
CM-244	5534.090	5887.188	14.00000	3.360001	26.72612	95.00000

Instrument : CHAMBER 078  
 Detector : 34425  
 Background Analysis Date/Time : 2-APR-2006 11:38:41  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.430	3298.209	2.000000	0.4800001	70.71068	95.00000
NP-237	4433.493	4903.776	8.000000	1.920000	35.35534	95.00000
CM-244	5534.483	5883.260	14.00000	3.360001	26.72612	95.00000

Instrument : CHAMBER 079  
 Detector : 28408  
 Background Analysis Date/Time : 2-APR-2006 11:38:41  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.549	3301.048	4.000000	0.9600002	50.00000	95.00000
NP-237	4435.951	4904.750	7.000000	1.680000	37.79645	95.00000
CM-244	5532.313	5884.158	23.00000	5.520001	20.85144	95.00000

Instrument : CHAMBER 080  
 Detector : 29269  
 Background Analysis Date/Time : 2-APR-2006 11:38:41  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.355	3300.887	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.124	4904.027	11.00000	2.640001	30.15113	95.00000
CM-244	5534.833	5882.541	24.00000	5.760001	20.41241	95.00000

Instrument : CHAMBER 081  
 Detector : 28243  
 Background Analysis Date/Time : 2-APR-2006 11:38:41  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.337	3300.967	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.244	4901.705	5.000000	1.199999	44.72136	95.00000
CM-244	5534.853	5883.115	9.000000	2.159999	33.33334	95.00000

Instrument : CHAMBER 083  
 Detector : 34436  
 Background Analysis Date/Time : 2-APR-2006 11:38:42  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.885	3297.745	2.000000	0.4799997	70.71068	95.00000
NP-237	4435.182	4902.448	13.00000	3.119998	27.73501	95.00000
CM-244	5533.629	5886.856	19.00000	4.559997	22.94157	95.00000

Instrument : CHAMBER 084  
 Detector : 29953  
 Background Analysis Date/Time : 2-APR-2006 11:38:42  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.809	3299.845	2.000000	0.4799997	70.71068	95.00000
NP-237	4435.274	4905.090	36.00000	8.639995	16.66667	95.00000
CM-244	5535.465	5886.345	11.00000	2.639998	30.15113	95.00000

Instrument : CHAMBER 085  
 Detector : 30451  
 Background Analysis Date/Time : 2-APR-2006 11:38:42  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.388	3298.321	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.734	4902.750	2.000000	0.4799997	70.71068	95.00000
CM-244	5530.623	5885.465	16.00000	3.839998	25.00000	95.00000

Instrument : CHAMBER 086  
 Detector : 29278  
 Background Analysis Date/Time : 2-APR-2006 11:38:42  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.939	3300.647	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4432.832	4902.859	8.000000	1.919999	35.35534	95.00000
CM-244	5530.458	5886.876	7.000000	1.679999	37.79645	95.00000

Instrument : CHAMBER 087  
 Detector : 34430  
 Background Analysis Date/Time : 2-APR-2006 11:38:42  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.850	3299.145	8.000000	1.919999	35.35534	95.00000
NP-237	4433.685	4904.783	101.0000	24.23998	9.950372	95.00000
CM-244	5533.892	5885.860	3.000000	0.7199996	57.73503	95.00000

Instrument : CHAMBER 088  
 Detector : 30434  
 Background Analysis Date/Time : 2-APR-2006 11:38:42  
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.733	3298.324	1.000000	0.2399998	100.0000	95.00000
NP-237	4434.854	4901.741	3.000000	0.7199996	57.73503	95.00000
CM-244	5531.597	5882.583	6.000000	1.439999	40.82483	95.00000

Instrument : CHAMBER 089  
 Detector : 21087  
 Background Analysis Date/Time : 2-APR-2006 11:38:43  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.018	3301.225	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4432.655	4904.531	3.000000	0.7199995	57.73503	95.00000
CM-244	5531.146	5885.550	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 090  
 Detector : 38159  
 Background Analysis Date/Time : 2-APR-2006 11:38:43  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.511	3299.809	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.211	4904.337	4.000000	0.9599993	50.00000	95.00000
CM-244	5530.381	5887.548	0.000000E+00	0.000000E+00	0.000000E+00	95.00000



Instrument : CHAMBER 091  
 Detector : 33205  
 Background Analysis Date/Time : 2-APR-2006 11:38:43  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.614	3302.446	1.000000	0.2399998	100.0000	95.00000
NP-237	4435.933	4903.299	6.000000	1.439999	40.82483	95.00000
CM-244	5530.786	5885.646	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 092  
 Detector : 33204  
 Background Analysis Date/Time : 2-APR-2006 11:38:43  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.837	3299.694	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.184	4904.789	3.000000	0.7199995	57.73503	95.00000
CM-244	5534.672	5882.398	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 093  
 Detector : 33206  
 Background Analysis Date/Time : 2-APR-2006 11:38:43  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.432	3297.831	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.503	4906.496	4.000000	0.9599993	50.00000	95.00000
CM-244	5534.120	5886.021	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 094  
 Detector : 33207  
 Background Analysis Date/Time : 2-APR-2006 11:38:43  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.673	3298.910	1.000000	0.2399998	100.0000	95.00000
NP-237	4437.305	4902.611	3.000000	0.7199995	57.73503	95.00000
CM-244	5532.741	5886.161	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 096  
 Detector : 30429  
 Background Analysis Date/Time : 2-APR-2006 11:38:44  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.567	3301.392	2.000000	0.4800001	70.71068	95.00000
NP-237	4433.899	4903.007	4.000000	0.9600002	50.00000	95.00000
CM-244	5534.841	5883.364	8.000000	1.920000	35.35534	95.00000

Instrument : CHAMBER 098  
 Detector : 30431  
 Background Analysis Date/Time : 2-APR-2006 11:38:44  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.193	3297.595	2.000000	0.4800001	70.71068	95.00000
NP-237	4433.217	4902.776	10.00000	2.400000	31.62278	95.00000
CM-244	5531.761	5884.598	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 099  
 Detector : 30432  
 Background Analysis Date/Time : 2-APR-2006 11:38:44  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.302	3301.806	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.583	4904.427	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5532.529	5887.439	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 101  
 Detector : 31696  
 Background Analysis Date/Time : 2-APR-2006 11:38:45  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.838	3300.184	2.000000	0.4800001	70.71068	95.00000
NP-237	4437.473	4904.200	4.000000	0.9600002	50.00000	95.00000
CM-244	5533.420	5882.862	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 102  
 Detector : 30438  
 Background Analysis Date/Time : 2-APR-2006 11:38:45  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.981	3300.175	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4436.167	4905.013	14.00000	3.360001	26.72612	95.00000
CM-244	5534.874	5885.847	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 103  
 Detector : 30437  
 Background Analysis Date/Time : 2-APR-2006 11:38:45  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.494	3300.797	2.000000	0.4800001	70.71068	95.00000
NP-237	4433.628	4906.553	4.000000	0.9600002	50.00000	95.00000
CM-244	5534.963	5885.168	3.000000	0.7200001	57.73503	95.00000

Instrument : CHAMBER 104  
 Detector : 30436  
 Background Analysis Date/Time : 2-APR-2006 11:38:45  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.844	3302.458	1.000000	0.2400000	100.0000	95.00000
NP-237	4432.663	4904.432	2.000000	0.4800001	70.71068	95.00000
CM-244	5531.252	5885.942	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 106  
 Detector : 45382  
 Background Analysis Date/Time : 2-APR-2006 11:38:45  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.094	3299.001	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.781	4902.986	7.000000	1.680000	37.79645	95.00000
CM-244	5530.755	5886.020	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 107  
 Detector : 31697  
 Background Analysis Date/Time : 2-APR-2006 11:38:46  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.547	3299.714	1.000000	0.2400000	100.0000	95.00000
NP-237	4437.183	4902.948	1.000000	0.2400000	100.0000	95.00000
CM-244	5532.612	5885.240	6.000000	1.440000	40.82483	95.00000

Instrument : CHAMBER 109  
 Detector : 31693  
 Background Analysis Date/Time : 2-APR-2006 11:38:46  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.084	3299.184	3.000000	0.7200001	57.73503	95.00000
NP-237	4432.535	4905.875	1.000000	0.2400000	100.0000	95.00000
CM-244	5532.554	5883.883	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 110  
 Detector : 30447  
 Background Analysis Date/Time : 2-APR-2006 11:38:46  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.012	3300.888	1.000000	0.2400000	100.0000	95.00000
NP-237	4433.842	4901.474	1.000000	0.2400000	100.0000	95.00000
CM-244	5530.607	5884.669	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 111  
 Detector : 30448  
 Background Analysis Date/Time : 2-APR-2006 11:38:46  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.793	3301.004	3.000000	0.7200001	57.73503	95.00000
NP-237	4435.981	4906.484	6.000000	1.440000	40.82483	95.00000
CM-244	5530.639	5883.341	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 112  
 Detector : 30449  
 Background Analysis Date/Time : 2-APR-2006 11:38:46  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.870	3298.269	1.000000	0.2400000	100.0000	95.00000
NP-237	4436.313	4903.586	3.000000	0.7200001	57.73503	95.00000
CM-244	5533.752	5883.818	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 113  
 Detector : 45-111B4  
 Background Analysis Date/Time : 2-APR-2006 10:57:16  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.835	3301.848	1.000000	0.2400000	100.0000	95.00000
NP-237	4433.613	4901.946	2.000000	0.4800001	70.71068	95.00000
CM-244	5530.358	5885.560	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 114  
 Detector : 45-111B5  
 Background Analysis Date/Time : 2-APR-2006 10:57:20  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.875	3299.211	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.329	4903.130	1.000000	0.2400000	100.0000	95.00000
CM-244	5535.235	5884.346	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 115  
 Detector : 45-132EE5  
 Background Analysis Date/Time : 2-APR-2006 10:57:23  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.466	3300.287	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.908	4903.427	1.000000	0.2400000	100.0000	95.00000
CM-244	5530.487	5884.796	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 116  
 Detector : 45-132FF2  
 Background Analysis Date/Time : 2-APR-2006 10:57:26  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.161	3302.097	1.000000	0.2400000	100.0000	95.00000
NP-237	4435.898	4903.366	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5530.965	5885.878	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 117  
 Detector : 45-132FF3  
 Background Analysis Date/Time : 2-APR-2006 10:57:29  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.574	3297.481	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.916	4905.417	3.000000	0.7200001	57.73503	95.00000
CM-244	5531.962	5885.886	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 118  
 Detector : 45-132FF4  
 Background Analysis Date/Time : 2-APR-2006 10:57:33  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.600	3298.996	1.000000	0.2400000	100.0000	95.00000
NP-237	4434.069	4901.807	2.000000	0.4800001	70.71068	95.00000
CM-244	5534.903	5884.430	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 119  
 Detector : 45-132FF5  
 Background Analysis Date/Time : 2-APR-2006 10:57:36  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.490	3300.068	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.344	4905.254	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5530.554	5884.197	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 120  
 Detector : 45-142F1  
 Background Analysis Date/Time : 2-APR-2006 10:57:39  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.710	3300.418	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4437.274	4903.259	1.000000	0.2400000	100.0000	95.00000
CM-244	5533.634	5886.862	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 121  
 Detector : 45-142J4  
 Background Analysis Date/Time : 2-APR-2006 10:57:42  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.124	3301.600	1.000000	0.2400000	100.0000	95.00000
NP-237	4434.163	4906.581	1.000000	0.2400000	100.0000	95.00000
CM-244	5533.976	5883.453	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 122  
 Detector : 45-142J5  
 Background Analysis Date/Time : 2-APR-2006 10:57:46  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.061	3298.780	1.000000	0.2400000	100.0000	95.00000
NP-237	4436.620	4903.419	1.000000	0.2400000	100.0000	95.00000
CM-244	5535.258	5884.098	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 123  
 Detector : 45-142V1  
 Background Analysis Date/Time : 2-APR-2006 10:57:49  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.387	3299.522	2.000000	0.4800001	70.71068	95.00000
NP-237	4437.442	4903.641	1.000000	0.2400000	100.0000	95.00000
CM-244	5534.110	5887.297	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 124  
 Detector : 45-142V2  
 Background Analysis Date/Time : 2-APR-2006 10:57:52  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.443	3297.987	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.559	4902.411	2.000000	0.4800001	70.71068	95.00000
CM-244	5534.467	5883.494	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 125  
 Detector : 45-142V3  
 Background Analysis Date/Time : 2-APR-2006 10:57:55  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.436	3301.693	1.000000	0.2400000	100.0000	95.00000
NP-237	4433.216	4903.410	2.000000	0.4800001	70.71068	95.00000
CM-244	5531.615	5883.226	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 126  
 Detector : 45-142V5  
 Background Analysis Date/Time : 2-APR-2006 10:57:59  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.369	3299.131	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.618	4902.366	1.000000	0.2400000	100.0000	95.00000
CM-244	5532.732	5885.449	3.000000	0.7200001	57.73503	95.00000

Instrument : CHAMBER 127  
 Detector : 45-142W1  
 Background Analysis Date/Time : 2-APR-2006 10:58:02  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.513	3302.392	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.606	4903.961	1.000000	0.2400000	100.0000	95.00000
CM-244	5535.216	5883.874	1.000000	0.2400000	100.0000	95.00000



Instrument : CHAMBER 128  
 Detector : 45-142W2  
 Background Analysis Date/Time : 2-APR-2006 10:58:05  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.584	3299.388	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.590	4901.786	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5533.622	5887.583	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 129  
 Detector : 45-142W3  
 Background Analysis Date/Time : 2-APR-2006 10:58:09  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.668	3299.558	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4435.149	4901.376	2.000000	0.4800001	70.71068	95.00000
CM-244	5532.751	5886.867	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 130  
 Detector : 45-142W5  
 Background Analysis Date/Time : 2-APR-2006 10:58:13  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.831	3301.623	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4435.787	4904.916	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5534.223	5884.439	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 131  
 Detector : 45-145K1  
 Background Analysis Date/Time : 2-APR-2006 10:58:17  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.369	3298.448	1.000000	0.2400000	100.0000	95.00000
NP-237	4432.591	4905.330	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5532.857	5887.665	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 132  
 Detector : 45-145K2  
 Background Analysis Date/Time : 2-APR-2006 10:58:20  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.018	3301.016	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.219	4902.195	2.000000	0.4800001	70.71068	95.00000
CM-244	5534.644	5883.351	4.000000	0.9600002	50.00000	95.00000

Instrument : CHAMBER 133  
 Detector : 45-145K3  
 Background Analysis Date/Time : 2-APR-2006 10:58:23  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.115	3302.033	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4435.237	4904.688	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5532.486	5884.151	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 134  
 Detector : 45-145K4  
 Background Analysis Date/Time : 2-APR-2006 10:58:26  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.530	3301.962	1.000000	0.2400000	100.0000	95.00000
NP-237	4434.547	4905.459	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5534.869	5887.271	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 135  
 Detector : 45-145K5  
 Background Analysis Date/Time : 2-APR-2006 10:58:30  
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.104	3298.632	1.000000	0.2400000	100.0000	95.00000
NP-237	4434.981	4906.088	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5531.074	5884.261	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 136  
Detector : 45-145L1  
Background Analysis Date/Time : 2-APR-2006 10:58:33  
Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.496	3298.473	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4437.582	4903.436	1.000000	0.240000	100.0000	95.00000
CM-244	5532.704	5884.860	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

### Subsection 3: Efficiency Calibration

Instrument : CHAMBER 001  
 Detector : 33088  
 Standard ID : AESS-001  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:15  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:30:52  
 Average Efficiency : 0.2781914  
 Average Efficiency Error : 7.6626688E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2990.456	3298.943	14076.00	0.2746735	1.1824497E-02	65.35928
NP-237	211.8600	28-FEB-2006	4433.436	4903.018	14340.00	0.2819934	1.4295015E-02	71.99430
CM-244	248.8200	28-FEB-2006	5530.638	5887.374	14794.00	0.2795064	1.4163047E-02	64.69388

Instrument : CHAMBER 003  
 Detector : 20659  
 Standard ID : AESS-003  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:15  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:32:34  
 Average Efficiency : 0.2880620  
 Average Efficiency Error : 7.9304650E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.3600	28-FEB-2006	2988.599	3300.169	14554.00	0.2846224	1.2245077E-02	49.78555
NP-237	211.3800	28-FEB-2006	4434.674	4902.844	14694.00	0.2895928	1.4675476E-02	61.61686
CM-244	248.2800	28-FEB-2006	5535.248	5883.783	15396.00	0.2915129	1.4763834E-02	53.23063

Instrument : CHAMBER 004  
 Detector : 33077  
 Standard ID : AESS-004  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:15  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:32:51  
 Average Efficiency : 0.3098668  
 Average Efficiency Error : 8.5239913E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.1800	28-FEB-2006	2987.545	3299.456	15401.00	0.3014340	1.2955099E-02	59.94693
NP-237	211.2000	28-FEB-2006	4433.646	4906.400	15919.00	0.3140544	1.5898786E-02	66.99142
CM-244	248.1000	28-FEB-2006	5531.494	5886.867	16816.00	0.3186174	1.6119311E-02	64.44215

Instrument : CHAMBER 005  
 Detector : 28642  
 Standard ID : AESS-005  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:15  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:33:05  
 Average Efficiency : 0.3158097  
 Average Efficiency Error : 8.6822659E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2990.709	3298.775	16078.00	0.3139968	1.3485039E-02	54.11107
NP-237	211.6800	28-FEB-2006	4434.190	4905.248	16264.00	0.3200765	1.6199514E-02	58.77632
CM-244	248.6400	28-FEB-2006	5530.463	5883.921	16620.00	0.3142197	1.5898999E-02	55.82949

Instrument : CHAMBER 007  
 Detector : 30416  
 Standard ID : AESS-007  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:16  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:35:21  
 Average Efficiency : 0.3047189  
 Average Efficiency Error : 8.3812820E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2990.797	3298.358	15695.00	0.3066845	1.3176420E-02	50.85197
NP-237	211.5600	28-FEB-2006	4432.556	4903.394	15403.00	0.3033007	1.5360770E-02	59.57014
CM-244	248.5200	28-FEB-2006	5533.897	5887.491	16043.00	0.3034657	1.5361345E-02	53.08852

Instrument : CHAMBER 009  
 Detector : 13285  
 Standard ID : AESS-009  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:16  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:39:51  
 Average Efficiency : 0.3341929  
 Average Efficiency Error : 9.1806399E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6000	28-FEB-2006	2987.740	3302.180	16955.00	0.3312147	1.4212075E-02	53.77267
NP-237	211.6200	28-FEB-2006	4436.826	4904.306	17080.00	0.3362575	1.7008657E-02	68.28894
CM-244	248.5800	28-FEB-2006	5530.853	5882.488	17788.00	0.3363935	1.7007809E-02	56.00669

Instrument : CHAMBER 010  
 Detector : 33083  
 Standard ID : AESS-010  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:16  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:40:04  
 Average Efficiency : 0.3340436  
 Average Efficiency Error : 9.1786785E-03  
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4800	28-FEB-2006	2992.233	3300.495	16676.00	0.3259426	1.3989601E-02	68.92194
NP-237	211.5000	28-FEB-2006	4435.514	4905.914	17301.00	0.3408116	1.7236479E-02	78.65460
CM-244	248.4600	28-FEB-2006	5535.151	5882.345	17946.00	0.3395274	1.7164614E-02	63.81354

Instrument : CHAMBER 011  
 Detector : 9537  
 Standard ID : AESS-011  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:16  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:40:58  
 Average Efficiency : 0.3105724  
 Average Efficiency Error : 8.5400529E-03  
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2988.769	3298.475	15819.00	0.3089387	1.3271471E-02	48.37308
NP-237	211.6800	28-FEB-2006	4433.776	4901.438	15834.00	0.3116739	1.5779305E-02	60.99158
CM-244	248.6400	28-FEB-2006	5533.457	5885.193	16490.00	0.3117799	1.5776988E-02	49.82006

Instrument : CHAMBER 012  
 Detector : 33085  
 Standard ID : AESS-012  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:16  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:41:13  
 Average Efficiency : 0.2681623  
 Average Efficiency Error : 7.3903115E-03  
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.9600	28-FEB-2006	2992.283	3299.978	13668.00	0.2665664	1.1482058E-02	61.90531
NP-237	211.9200	28-FEB-2006	4432.454	4901.598	13787.00	0.2710549	1.3747970E-02	71.13239
CM-244	248.9400	28-FEB-2006	5534.285	5885.751	14169.00	0.2675734	1.3566247E-02	62.43946

Instrument : CHAMBER 013  
 Detector : 21084  
 Standard ID : AESS-013  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:17  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:41:26  
 Average Efficiency : 0.3412675  
 Average Efficiency Error : 9.3716113E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	220.5600	28-FEB-2006	2992.308	3301.307	17507.00	0.3405094	1.4603521E-02	45.62738
NP-237	212.5200	28-FEB-2006	4433.829	4905.476	17346.00	0.3400816	1.7199026E-02	62.98444
CM-244	249.6600	28-FEB-2006	5530.551	5886.625	18245.00	0.3435482	1.7364752E-02	51.62660

Instrument : CHAMBER 016  
 Detector : 21086  
 Standard ID : AESS-016  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:17  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:45:33  
 Average Efficiency : 0.3303408  
 Average Efficiency Error : 9.0769110E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2992.386	3300.792	16669.00	0.3255388	1.3972365E-02	50.42868
NP-237	211.6800	28-FEB-2006	4437.111	4903.407	16820.00	0.3310585	1.6748626E-02	58.68690
CM-244	248.6400	28-FEB-2006	5533.819	5884.776	17810.00	0.3367283	1.7024504E-02	54.94007

Instrument : CHAMBER 017  
 Detector : 33203  
 Standard ID : AESS-017  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:17  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:45:52  
 Average Efficiency : 0.2902693  
 Average Efficiency Error : 7.9895537E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.7200	28-FEB-2006	2988.693	3298.212	15015.00	0.2931568	1.2605052E-02	49.49680
NP-237	211.7400	28-FEB-2006	4432.905	4905.400	14650.00	0.2882629	1.4608623E-02	61.60561
CM-244	248.7000	28-FEB-2006	5532.198	5886.394	15257.00	0.2883977	1.4607739E-02	50.89099

Instrument : CHAMBER 018  
 Detector : 21063  
 Standard ID : AESS-018  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:17  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 16:46:43  
 Average Efficiency : 0.2559204  
 Average Efficiency Error : 7.0582652E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.7800	28-FEB-2006	2988.076	3298.134	13144.00	0.2565568	1.1059588E-02	50.10976
NP-237	211.8000	28-FEB-2006	4433.036	4905.011	12933.00	0.2544221	1.2916340E-02	58.60687
CM-244	248.7600	28-FEB-2006	5535.243	5885.674	13576.00	0.2565605	1.3015677E-02	54.43167

Instrument : CHAMBER 019  
 Detector : 23882  
 Standard ID : AESS-019  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:18  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 16:46:59  
 Average Efficiency : 0.2848921  
 Average Efficiency Error : 7.8617986E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2989.511	3300.144	15017.00	0.2934360	1.2617028E-02	46.50811
NP-237	211.5600	28-FEB-2006	4435.855	4902.151	15150.00	0.2626681	1.3361575E-02	61.07557
CM-244	248.5200	28-FEB-2006	5531.789	5884.041	15932.00	0.3013749	1.5256786E-02	50.77583

Instrument : CHAMBER 020  
 Detector : 33093  
 Standard ID : AESS-020  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:18  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 16:47:46  
 Average Efficiency : 0.3374673  
 Average Efficiency Error : 9.2702135E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2988.758	3298.111	16991.00	0.3315554	1.4226208E-02	58.22562
NP-237	211.8000	28-FEB-2006	4435.838	4901.523	17420.00	0.3426790	1.7329575E-02	71.40521
CM-244	248.8200	28-FEB-2006	5530.915	5883.311	18048.00	0.3409902	1.7237470E-02	64.18688



Instrument : CHAMBER 021  
 Detector : 33893  
 Standard ID : AESS-021  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:18  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 16:48:06  
 Average Efficiency : 0.3097920  
 Average Efficiency Error : 8.5189342E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2987.969	3300.683	16019.00	0.3130153	1.3443721E-02	48.52213
NP-237	211.5600	28-FEB-2006	4434.165	4904.181	15665.00	0.3085031	1.5620876E-02	57.03367
CM-244	248.5200	28-FEB-2006	5533.125	5885.623	16217.00	0.3067660	1.5526365E-02	49.52942

Instrument : CHAMBER 023  
 Detector : 22873  
 Standard ID : AESS-023  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 12:02:18  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 16:49:38  
 Average Efficiency : 0.2765626  
 Average Efficiency Error : 7.6345578E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2988.365	3300.653	13199.00	0.2577709	1.1110976E-02	64.03100
NP-237	211.6800	28-FEB-2006	4432.587	4902.786	15014.00	0.2955187	1.4971492E-02	68.68533
CM-244	248.6400	28-FEB-2006	5533.585	5885.616	15406.00	0.2912842	1.4752124E-02	67.86546

Instrument : CHAMBER 026  
 Detector : 34427  
 Standard ID : AESS-002  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:51  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 12:02:00  
 Average Efficiency : 0.3111628  
 Average Efficiency Error : 5.9400578E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4800	28-FEB-2006	2988.396	3300.299	15946.00	0.3116805	7.0337788E-03	55.54451
NP-237	211.5000	28-FEB-2006	4432.951	4903.551	15774.00	0.3107190	1.5731754E-02	60.78556
CM-244	248.4000	28-FEB-2006	5534.085	5882.486	16328.00	0.3090416	1.5640259E-02	54.94981

Instrument : CHAMBER 027  
 Detector : 31436  
 Standard ID : AESS-003  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:51  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 12:02:17  
 Average Efficiency : 0.2851310  
 Average Efficiency Error : 5.4681562E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.3600	28-FEB-2006	2990.641	3298.501	14516.00	0.2838850	6.4452491E-03	62.80336
NP-237	211.3800	28-FEB-2006	4435.554	4903.960	14590.00	0.2875520	1.4573419E-02	61.53238
CM-244	248.2800	28-FEB-2006	5535.178	5885.600	15268.00	0.2891185	1.4644115E-02	66.27240

Instrument : CHAMBER 028  
 Detector : 21056  
 Standard ID : AESS-004  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:51  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 12:02:41  
 Average Efficiency : 0.2688177  
 Average Efficiency Error : 5.1718531E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.1800	28-FEB-2006	2991.862	3298.519	13660.00	0.2673638	6.0955230E-03	60.48663
NP-237	211.2000	28-FEB-2006	4437.162	4904.527	13850.00	0.2732216	1.3856977E-02	78.59827
CM-244	248.1000	28-FEB-2006	5534.678	5884.670	14348.00	0.2718943	1.3782959E-02	69.00627

Instrument : CHAMBER 029  
 Detector : 30419  
 Standard ID : AESS-005  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:51  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 12:02:56  
 Average Efficiency : 0.2803768  
 Average Efficiency Error : 5.3804033E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2991.643	3298.009	14347.00	0.2801967	6.3665169E-03	50.13651
NP-237	211.6800	28-FEB-2006	4436.124	4903.513	14180.00	0.2791024	1.4150602E-02	62.17907
CM-244	248.6400	28-FEB-2006	5533.909	5884.139	14945.00	0.2825924	1.4317507E-02	55.61591

Instrument : CHAMBER 030  
 Detector : 30420  
 Standard ID : AESS-006  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:51  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 12:03:11  
 Average Efficiency : 0.3032622  
 Average Efficiency Error : 5.7966388E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.1800	28-FEB-2006	2992.381	3300.032	15532.00	0.3040040	6.8717906E-03	53.70943
NP-237	211.2000	28-FEB-2006	4435.171	4901.399	15235.00	0.3005646	1.5224237E-02	63.92149
CM-244	248.1000	28-FEB-2006	5532.938	5887.226	15953.00	0.3023090	1.5303830E-02	56.83110

Instrument : CHAMBER 032  
 Detector : 33207  
 Standard ID : AESS-008  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:53  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:04:09  
 Average Efficiency : 0.3210600  
 Average Efficiency Error : 9.3805837E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2992.438	3301.011	16394.00	0.3199127	1.6193897E-02	48.92264
NP-237	211.8600	28-FEB-2006	4437.450	4903.298	16174.00	0.3180676	1.6098870E-02	62.34297
CM-244	248.8800	28-FEB-2006	5533.518	5886.674	17224.00	0.3253718	1.6456470E-02	58.56594

Instrument : CHAMBER 033  
 Detector : 28647  
 Standard ID : AESS-009  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:53  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:04:20  
 Average Efficiency : 0.3189350  
 Average Efficiency Error : 9.3192765E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6000	28-FEB-2006	2991.128	3301.778	16210.00	0.3166678	1.6031807E-02	50.20483
NP-237	211.6200	28-FEB-2006	4433.277	4905.752	16119.00	0.3173501	1.6063211E-02	65.81153
CM-244	248.5800	28-FEB-2006	5531.202	5887.135	17074.00	0.3229274	1.6334468E-02	56.14278

Instrument : CHAMBER 034  
 Detector : 32697  
 Standard ID : AESS-010  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:53  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:04:32  
 Average Efficiency : 0.3285644  
 Average Efficiency Error : 9.5973080E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4800	28-FEB-2006	2987.740	3297.727	16717.00	0.3267508	1.6536236E-02	46.19645
NP-237	211.5000	28-FEB-2006	4436.424	4906.295	16590.00	0.3267619	1.6533978E-02	65.57603
CM-244	248.4600	28-FEB-2006	5532.067	5883.683	17561.00	0.3322987	1.6803153E-02	52.60378

Instrument : CHAMBER 035  
 Detector : 29271  
 Standard ID : AESS-011  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:53  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:04:44  
 Average Efficiency : 0.3070081  
 Average Efficiency Error : 8.9746779E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2990.597	3300.316	15823.00	0.3090232	1.5649391E-02	58.07399
NP-237	211.6800	28-FEB-2006	4435.093	4902.062	15491.00	0.3048278	1.5437050E-02	77.73704
CM-244	248.6400	28-FEB-2006	5533.546	5887.289	16248.00	0.3072308	1.5549533E-02	61.23973

Instrument : CHAMBER 036  
 Detector : 29275  
 Standard ID : AESS-012  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:53  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:04:58  
 Average Efficiency : 0.3204660  
 Average Efficiency Error : 9.3638916E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.9600	28-FEB-2006	2990.101	3302.011	16111.00	0.3142187	1.5908994E-02	70.87608
NP-237	211.9200	28-FEB-2006	4436.212	4902.690	16497.00	0.3243046	1.6410707E-02	86.38094
CM-244	248.9400	28-FEB-2006	5530.586	5883.211	17117.00	0.3232544	1.6350558E-02	83.27386

Instrument : CHAMBER 037  
 Detector : 32690  
 Standard ID : AESS-013  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:55  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 12:05:37  
 Average Efficiency : 0.3298278  
 Average Efficiency Error : 6.2852711E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	220.5600	28-FEB-2006	2990.331	3300.070	16648.00	0.3238085	7.2884769E-03	65.32179
NP-237	212.5200	28-FEB-2006	4435.120	4902.289	17586.00	0.3447773	1.7433835E-02	73.49030
CM-244	249.6600	28-FEB-2006	5534.121	5882.713	18584.00	0.3498755	1.7681209E-02	65.58303

Instrument : CHAMBER 038  
 Detector : 19323  
 Standard ID : AESS-014  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:55  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 12:05:48  
 Average Efficiency : 0.3550652  
 Average Efficiency Error : 6.7386958E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.9600	28-FEB-2006	2992.203	3301.129	18140.00	0.3537907	7.9244133E-03	44.64486
NP-237	211.9800	28-FEB-2006	4436.340	4904.950	18294.00	0.3595673	1.8173877E-02	68.25054
CM-244	249.0000	28-FEB-2006	5534.574	5885.451	18924.00	0.3572362	1.8049749E-02	49.98671

Instrument : CHAMBER 040  
 Detector : 30446  
 Standard ID : AESS-016  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:55  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 12:06:33  
 Average Efficiency : 0.3232525  
 Average Efficiency Error : 6.1597549E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2990.636	3301.603	16579.00	0.3237876	7.2898054E-03	47.52289
NP-237	211.6800	28-FEB-2006	4435.733	4904.719	16163.00	0.3181213	1.6101720E-02	60.46703
CM-244	248.6400	28-FEB-2006	5532.976	5885.423	17235.00	0.3258936	1.6482741E-02	51.53939

Instrument : CHAMBER 041  
 Detector : 22834  
 Standard ID : AESS-017  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:55  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 12:06:46  
 Average Efficiency : 0.3322699  
 Average Efficiency Error : 6.3254358E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.7200	28-FEB-2006	2987.681	3302.193	16913.00	0.3302204	7.4258945E-03	49.34238
NP-237	211.7400	28-FEB-2006	4432.502	4905.743	17206.00	0.3385508	1.7123217E-02	64.06297
CM-244	248.7000	28-FEB-2006	5533.298	5885.604	17818.00	0.3368361	1.7029859E-02	51.09551

Instrument : CHAMBER 042  
 Detector : 32695  
 Standard ID : AESS-018  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:55  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 12:07:02  
 Average Efficiency : 0.3361240  
 Average Efficiency Error : 6.3955071E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.7800	28-FEB-2006	2990.651	3300.194	17115.00	0.3340732	7.5073489E-03	62.01425
NP-237	211.8000	28-FEB-2006	4435.708	4903.810	17181.00	0.3379442	1.7092843E-02	71.83335
CM-244	248.7600	28-FEB-2006	5531.417	5883.758	18276.00	0.3453112	1.7453661E-02	58.83952

Instrument : CHAMBER 043  
 Detector : 42470  
 Standard ID : AESS-019  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:57  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:07:20  
 Average Efficiency : 0.3229622  
 Average Efficiency Error : 6.1558355E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2988.168	3298.326	16460.00	0.3216395	7.2445576E-03	53.07267
NP-237	211.5600	28-FEB-2006	4436.901	4902.013	16611.00	0.3271490	1.6553231E-02	63.02407
CM-244	248.5200	28-FEB-2006	5535.121	5886.262	17214.00	0.3256539	1.6470846E-02	50.82504

Instrument : CHAMBER 044  
 Detector : 34433  
 Standard ID : AESS-020  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:57  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:07:31  
 Average Efficiency : 0.3240791  
 Average Efficiency Error : 6.1765807E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2989.004	3298.648	16495.00	0.3218836	7.2491337E-03	50.22718
NP-237	211.8000	28-FEB-2006	4433.632	4906.174	16705.00	0.3285425	1.6622754E-02	66.23325
CM-244	248.8200	28-FEB-2006	5532.967	5887.129	17532.00	0.3312699	1.6751442E-02	56.69666

Instrument : CHAMBER 045  
 Detector : 34430  
 Standard ID : AESS-021  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:57  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:07:49  
 Average Efficiency : 0.2941546  
 Average Efficiency Error : 5.6320531E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2992.438	3301.033	14988.00	0.2928756	6.6353632E-03	49.71279
NP-237	211.5600	28-FEB-2006	4436.365	4906.490	15086.00	0.2970952	1.5050440E-02	64.58119
CM-244	248.5200	28-FEB-2006	5535.004	5886.982	15743.00	0.2978074	1.5078431E-02	59.00225

Instrument : CHAMBER 046  
 Detector : 42471  
 Standard ID : AESS-022  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:57  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:08:03  
 Average Efficiency : 0.3344716  
 Average Efficiency Error : 6.3659614E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2987.741	3299.741	16999.00	0.3319905	7.4634906E-03	48.96851
NP-237	211.6800	28-FEB-2006	4435.900	4904.967	17273.00	0.3399139	1.7191468E-02	65.78371
CM-244	248.6400	28-FEB-2006	5532.671	5884.488	18104.00	0.3422939	1.7302830E-02	53.33138

Instrument : CHAMBER 047  
 Detector : 30449  
 Standard ID : AESS-023  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:57  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:08:14  
 Average Efficiency : 0.2966904  
 Average Efficiency Error : 5.6765815E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2989.322	3298.103	15222.00	0.2972857	6.7285444E-03	49.84683
NP-237	211.6800	28-FEB-2006	4433.780	4903.899	15016.00	0.2955441	1.4972775E-02	59.65280
CM-244	248.6400	28-FEB-2006	5532.276	5884.114	15597.00	0.2948985	1.4932883E-02	51.68388

Instrument : CHAMBER 048  
 Detector : 42483  
 Standard ID : AESS-024  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 07:45:57  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 12:08:24  
 Average Efficiency : 0.3119769  
 Average Efficiency Error : 5.9553082E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4200	28-FEB-2006	2989.922	3300.161	15954.00	0.3119224	7.0390208E-03	55.83012
NP-237	211.4400	28-FEB-2006	4434.180	4904.923	15787.00	0.3110589	1.5748808E-02	72.44879
CM-244	248.4000	28-FEB-2006	5533.436	5885.010	16547.00	0.3131823	1.5847316E-02	61.06746

Instrument : CHAMBER 065  
 Detector : 21087  
 Standard ID : AESS-001  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:10  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:05:24  
 Average Efficiency : 0.3027465  
 Average Efficiency Error : 5.7869283E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2992.500	3301.569	15511.00	0.3026739	6.8422910E-03	49.27271
NP-237	211.8600	28-FEB-2006	4436.593	4904.814	15341.00	0.3016613	1.5278513E-02	63.47648
CM-244	248.8200	28-FEB-2006	5533.641	5883.942	16102.00	0.3042169	1.5398668E-02	52.45229



Instrument : CHAMBER 066  
 Detector : 38159  
 Standard ID : AESS-002  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:10  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:05:41  
 Average Efficiency : 0.2898386  
 Average Efficiency Error : 5.5523221E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4800	28-FEB-2006	2991.351	3299.570	14848.00	0.2902116	6.5790205E-03	54.22055
NP-237	211.5000	28-FEB-2006	4435.367	4906.503	14731.00	0.2901337	1.4702437E-02	64.20898
CM-244	248.4000	28-FEB-2006	5531.751	5885.195	15203.00	0.2877176	1.4573953E-02	57.41096

Instrument : CHAMBER 068  
 Detector : 33204  
 Standard ID : AESS-004  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:10  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:06:11  
 Average Efficiency : 0.2982503  
 Average Efficiency Error : 5.7051168E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.1800	28-FEB-2006	2989.458	3302.482	15312.00	0.2996904	6.7803976E-03	66.72219
NP-237	211.2000	28-FEB-2006	4437.019	4902.188	15036.00	0.2966104	1.5026535E-02	82.73407
CM-244	248.1000	28-FEB-2006	5531.579	5884.315	15461.00	0.2929541	1.4836024E-02	72.39137

Instrument : CHAMBER 069  
 Detector : 39172  
 Standard ID : AESS-005  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:10  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:06:22  
 Average Efficiency : 0.2872442  
 Average Efficiency Error : 5.5063334E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2991.937	3302.037	14638.00	0.2858726	6.4867456E-03	52.69576
NP-237	211.6800	28-FEB-2006	4433.758	4901.912	14877.00	0.2928176	1.4836427E-02	60.78927
CM-244	248.6400	28-FEB-2006	5535.302	5884.863	15275.00	0.2888012	1.4627955E-02	53.21272

Instrument : CHAMBER 070  
 Detector : 33207  
 Standard ID : AESS-006  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:10  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:06:32  
 Average Efficiency : 0.3410026  
 Average Efficiency Error : 6.4845588E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.1800	28-FEB-2006	2987.764	3299.302	17333.00	0.3392459	7.6180245E-03	53.32024
NP-237	211.2000	28-FEB-2006	4432.603	4904.338	17596.00	0.3470635	1.7549409E-02	63.32718
CM-244	248.1000	28-FEB-2006	5531.790	5887.167	18166.00	0.3442082	1.7398918E-02	55.68260

Instrument : CHAMBER 072  
 Detector : 33210  
 Standard ID : AESS-008  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:11  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:07:20  
 Average Efficiency : 0.2718624  
 Average Efficiency Error : 5.2260533E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2989.642	3302.500	13882.00	0.2708864	6.1688591E-03	78.20691
NP-237	211.8600	28-FEB-2006	4434.229	4902.517	13764.00	0.2706604	1.3728318E-02	68.85778
CM-244	248.8800	28-FEB-2006	5533.565	5883.889	14730.00	0.2782284	1.4099089E-02	58.98390

Instrument : CHAMBER 073  
 Detector : 33211  
 Standard ID : AESS-009  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:11  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:07:31  
 Average Efficiency : 0.3248378  
 Average Efficiency Error : 6.1892127E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6000	28-FEB-2006	2990.209	3299.359	16628.00	0.3248250	7.3118629E-03	52.98417
NP-237	211.6200	28-FEB-2006	4435.813	4905.119	16178.00	0.3184740	1.6119437E-02	62.15504
CM-244	248.5800	28-FEB-2006	5530.447	5887.394	17545.00	0.3317996	1.6778087E-02	56.17911

Instrument : CHAMBER 075  
 Detector : 29976  
 Standard ID : AESS-011  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:11  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:07:53  
 Average Efficiency : 0.3238373  
 Average Efficiency Error : 6.1713755E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2987.804	3301.738	16526.00	0.3227443	7.2676861E-03	50.99773
NP-237	211.6800	28-FEB-2006	4436.078	4904.005	16602.00	0.3267108	1.6531264E-02	64.22369
CM-244	248.6400	28-FEB-2006	5532.428	5882.500	17275.00	0.3266147	1.6518781E-02	59.07774

Instrument : CHAMBER 076  
 Detector : 33213  
 Standard ID : AESS-012  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:11  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:08:02  
 Average Efficiency : 0.3136021  
 Average Efficiency Error : 5.9847333E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.9600	28-FEB-2006	2990.982	3301.271	16036.00	0.3127477	7.0554069E-03	52.31974
NP-237	211.9200	28-FEB-2006	4435.792	4906.032	16070.00	0.3159233	1.5991600E-02	63.89199
CM-244	248.9400	28-FEB-2006	5532.284	5884.164	16716.00	0.3156649	1.5971025E-02	56.41280

Instrument : CHAMBER 077  
 Detector : 28239  
 Standard ID : AESS-013  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:12  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 12:08:16  
 Average Efficiency : 0.3282876  
 Average Efficiency Error : 6.2494567E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	220.5600	28-FEB-2006	2990.320	3302.291	16964.00	0.3299461	7.4184034E-03	49.98071
NP-237	212.5200	28-FEB-2006	4434.458	4904.534	16485.00	0.3231252	1.6351206E-02	66.72607
CM-244	249.6600	28-FEB-2006	5534.090	5887.188	17279.00	0.3253554	1.6455045E-02	48.65668

Instrument : CHAMBER 078  
 Detector : 34425  
 Standard ID : AESS-014  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:12  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 12:08:26  
 Average Efficiency : 0.3266231  
 Average Efficiency Error : 6.2230360E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.9600	28-FEB-2006	2992.430	3298.209	16615.00	0.3240396	7.2945217E-03	49.76765
NP-237	211.9800	28-FEB-2006	4433.493	4903.776	16900.00	0.3321434	1.6802609E-02	62.23470
CM-244	249.0000	28-FEB-2006	5534.483	5883.260	17741.00	0.3349401	1.6934805E-02	53.02275

Instrument : CHAMBER 079  
 Detector : 28408  
 Standard ID : AESS-015  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:12  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 12:08:37  
 Average Efficiency : 0.3381511  
 Average Efficiency Error : 6.4334050E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2989.549	3301.048	17162.00	0.3348904	7.5245029E-03	58.89482
NP-237	211.8600	28-FEB-2006	4435.951	4904.750	17588.00	0.3458672	1.7488951E-02	69.24126
CM-244	248.8800	28-FEB-2006	5532.313	5884.158	18433.00	0.3481725	1.7596556E-02	62.07035

Instrument : CHAMBER 080  
 Detector : 29269  
 Standard ID : AESS-016  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:12  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 12:08:46  
 Average Efficiency : 0.3413618  
 Average Efficiency Error : 6.4887921E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2990.355	3300.887	17518.00	0.3421173	7.6778606E-03	54.84035
NP-237	211.6800	28-FEB-2006	4437.124	4904.027	17076.00	0.3360595	1.6998719E-02	70.53491
CM-244	248.6400	28-FEB-2006	5534.833	5882.541	18143.00	0.3430255	1.7339373E-02	59.19316

Instrument : CHAMBER 081  
 Detector : 28243  
 Standard ID : AESS-017  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 5-APR-2006 09:52:15  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 5-APR-2006 14:20:00  
 Average Efficiency : 0.2709154  
 Average Efficiency Error : 5.2182535E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.7200	28-FEB-2006	2988.337	3300.967	13526.00	0.2640979	6.0252789E-03	74.73094
NP-237	211.7400	28-FEB-2006	4435.244	4901.705	14659.00	0.2884400	1.4617478E-02	76.53771
CM-244	248.7000	28-FEB-2006	5534.853	5883.115	15575.00	0.2944268	1.4909291E-02	67.72768

Instrument : CHAMBER 083  
 Detector : 34436  
 Standard ID : AESS-019  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:13  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:09:35  
 Average Efficiency : 0.3063384  
 Average Efficiency Error : 5.8566006E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2991.885	3297.745	15476.00	0.3024036	6.8371557E-03	53.97715
NP-237	211.5600	28-FEB-2006	4435.182	4902.448	16168.00	0.3183721	1.6114395E-02	65.19810
CM-244	248.5200	28-FEB-2006	5533.629	5886.856	16706.00	0.3160093	1.5988560E-02	59.26429

Instrument : CHAMBER 084  
 Detector : 29953  
 Standard ID : AESS-020  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:13  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:09:48  
 Average Efficiency : 0.3377420  
 Average Efficiency Error : 6.4240936E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2988.809	3299.845	17241.00	0.3364322	7.5571463E-03	45.28139
NP-237	211.8000	28-FEB-2006	4435.274	4905.090	17241.00	0.3390163	1.7146526E-02	64.38337
CM-244	248.8200	28-FEB-2006	5535.465	5886.345	18173.00	0.3433445	1.7355187E-02	52.99788

Instrument : CHAMBER 085  
 Detector : 30451  
 Standard ID : AESS-021  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:13  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:10:02  
 Average Efficiency : 0.2997026  
 Average Efficiency Error : 5.7319975E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2988.388	3298.321	15330.00	0.2995507	6.7767296E-03	51.54943
NP-237	211.5600	28-FEB-2006	4434.734	4902.750	15266.00	0.3006592	1.5228639E-02	59.35664
CM-244	248.5200	28-FEB-2006	5530.623	5885.465	15834.00	0.2995146	1.5163762E-02	54.82895

Instrument : CHAMBER 086  
 Detector : 29278  
 Standard ID : AESS-022  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:13  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:10:24  
 Average Efficiency : 0.2629639  
 Average Efficiency Error : 5.0652758E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2990.939	3300.647	13365.00	0.2610116	5.9599294E-03	51.29673
NP-237	211.6800	28-FEB-2006	4432.832	4902.859	13621.00	0.2680805	1.3599468E-02	59.09101
CM-244	248.6400	28-FEB-2006	5530.458	5886.876	14175.00	0.2680037	1.3587984E-02	51.32809

Instrument : CHAMBER 087  
 Detector : 34430  
 Standard ID : AESS-023  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:13  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:10:36  
 Average Efficiency : 0.2783446  
 Average Efficiency Error : 5.3436500E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2988.850	3299.145	14228.00	0.2778656	6.3170986E-03	45.75569
NP-237	211.6800	28-FEB-2006	4433.685	4904.783	14271.00	0.2804829	1.4219985E-02	56.29552
CM-244	248.6400	28-FEB-2006	5533.892	5885.860	14737.00	0.2786293	1.4119316E-02	52.11374

Instrument : CHAMBER 088  
 Detector : 30434  
 Standard ID : AESS-024  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 06:54:13  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 12:10:54  
 Average Efficiency : 0.2708718  
 Average Efficiency Error : 5.2093272E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4200	28-FEB-2006	2991.733	3298.324	13762.00	0.2690588	6.1309491E-03	70.44978
NP-237	211.4400	28-FEB-2006	4434.854	4901.741	13876.00	0.2734241	1.3866881E-02	84.52332
CM-244	248.4000	28-FEB-2006	5531.597	5882.583	14679.00	0.2778009	1.4078071E-02	70.46585

Instrument : CHAMBER 089  
 Detector : 21087  
 Standard ID : AESS-001  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:42  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 23:05:32  
 Average Efficiency : 0.2906057  
 Average Efficiency Error : 8.5010817E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2988.018	3301.225	14810.00	0.2889985	1.4647639E-02	48.13472
NP-237	211.8600	28-FEB-2006	4432.655	4904.531	14711.00	0.2893088	1.4660804E-02	59.05686
CM-244	248.8200	28-FEB-2006	5531.146	5885.550	15539.00	0.2935953	1.4867556E-02	51.89399

Instrument : CHAMBER 090  
 Detector : 38159  
 Standard ID : AESS-002  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:42  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 23:06:16  
 Average Efficiency : 0.3262078  
 Average Efficiency Error : 9.5290253E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4800	28-FEB-2006	2989.511	3299.809	16611.00	0.3246745	1.6432377E-02	43.47319
NP-237	211.5000	28-FEB-2006	4434.211	4904.337	16570.00	0.3264199	1.6516838E-02	66.74939
CM-244	248.4000	28-FEB-2006	5530.381	5887.548	17307.00	0.3275529	1.6565884E-02	47.20604

Instrument : CHAMBER 091  
 Detector : 33205  
 Standard ID : AESS-003  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 16:38:39  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 21:06:36  
 Average Efficiency : 0.3295136  
 Average Efficiency Error : 9.6244970E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.3600	28-FEB-2006	2988.614	3302.446	16877.00	0.3300617	1.6701948E-02	49.16127
NP-237	211.3800	28-FEB-2006	4435.933	4903.299	16753.00	0.3302219	1.6707057E-02	67.62949
CM-244	248.2800	28-FEB-2006	5530.786	5885.646	17335.00	0.3282727	1.6601983E-02	54.15368

Instrument : CHAMBER 092  
 Detector : 33204  
 Standard ID : AESS-004  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:42  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 23:08:02  
 Average Efficiency : 0.3230760  
 Average Efficiency Error : 9.4387615E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.1800	28-FEB-2006	2991.837	3299.694	16466.00	0.3222808	1.6312918E-02	54.19599
NP-237	211.2000	28-FEB-2006	4434.184	4904.789	16328.00	0.3221140	1.6301801E-02	61.31636
CM-244	248.1000	28-FEB-2006	5534.672	5882.398	17144.00	0.3248603	1.6431469E-02	53.39663

Instrument : CHAMBER 093  
 Detector : 33206  
 Standard ID : AESS-005  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:42  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 23:08:14  
 Average Efficiency : 0.3278230  
 Average Efficiency Error : 9.5757600E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2991.432	3297.831	16618.00	0.3245451	1.6425749E-02	53.44844
NP-237	211.6800	28-FEB-2006	4432.503	4906.496	16789.00	0.3304530	1.6718345E-02	71.37048
CM-244	248.6400	28-FEB-2006	5534.120	5886.021	17378.00	0.3285792	1.6617021E-02	55.20338



Instrument : CHAMBER 094  
 Detector : 33207  
 Standard ID : AESS-006  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:42  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 3-APR-2006 23:08:34  
 Average Efficiency : 0.3064194  
 Average Efficiency Error : 8.9583928E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.1800	28-FEB-2006	2991.673	3298.910	15769.00	0.3086388	1.5630580E-02	47.47134
NP-237	211.2000	28-FEB-2006	4437.305	4902.611	15693.00	0.3095863	1.5675372E-02	59.32807
CM-244	248.1000	28-FEB-2006	5532.741	5886.161	15901.00	0.3013068	1.5253706E-02	48.40099

Instrument : CHAMBER 096  
 Detector : 30429  
 Standard ID : AESS-008  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:43  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:09:48  
 Average Efficiency : 0.3211957  
 Average Efficiency Error : 9.3840715E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2988.567	3301.392	16420.00	0.3204154	1.6219035E-02	48.33763
NP-237	211.8600	28-FEB-2006	4433.899	4903.007	16366.00	0.3218482	1.6287910E-02	62.84891
CM-244	248.8800	28-FEB-2006	5534.841	5883.364	17011.00	0.3213297	1.6254338E-02	53.34020

Instrument : CHAMBER 098  
 Detector : 30431  
 Standard ID : AESS-010  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:43  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:10:26  
 Average Efficiency : 0.3423861  
 Average Efficiency Error : 9.9960957E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4800	28-FEB-2006	2991.193	3297.595	17461.00	0.3412881	1.7263338E-02	48.27054
NP-237	211.5000	28-FEB-2006	4433.217	4902.776	17377.00	0.3422896	1.7310398E-02	71.89059
CM-244	248.4600	28-FEB-2006	5531.761	5884.598	18159.00	0.3435947	1.7367978E-02	56.75472

Instrument : CHAMBER 099  
 Detector : 30432  
 Standard ID : AESS-011  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 16:38:43  
 Calibration Count Time : 239.9998  
 Efficiency Calibration Date/Time : 4-APR-2006 21:07:16  
 Average Efficiency : 0.3424250  
 Average Efficiency Error : 9.9976454E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2989.302	3301.806	17277.00	0.3374230	1.7069872E-02	61.73035
NP-237	211.6800	28-FEB-2006	4434.583	4904.427	17554.00	0.3455301	1.7472234E-02	70.83485
CM-244	248.6400	28-FEB-2006	5532.529	5887.439	18221.00	0.3445468	1.7415471E-02	58.75341

Instrument : CHAMBER 101  
 Detector : 31696  
 Standard ID : AESS-013  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:44  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:11:17  
 Average Efficiency : 0.3289411  
 Average Efficiency Error : 6.2637404E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	220.5600	28-FEB-2006	2988.838	3300.184	16815.00	0.3270522	7.3571443E-03	74.97670
NP-237	212.5200	28-FEB-2006	4437.473	4904.200	16905.00	0.3314256	1.6766205E-02	82.64299
CM-244	249.6600	28-FEB-2006	5533.420	5882.862	17869.00	0.3364823	1.7011438E-02	82.36337

Instrument : CHAMBER 102  
 Detector : 30438  
 Standard ID : AESS-014  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:44  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:11:38  
 Average Efficiency : 0.3398052  
 Average Efficiency Error : 6.4618774E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.9600	28-FEB-2006	2990.981	3300.175	17329.00	0.3379689	7.5894571E-03	50.78636
NP-237	211.9800	28-FEB-2006	4436.167	4905.013	17442.00	0.3427780	1.7334390E-02	60.55743
CM-244	249.0000	28-FEB-2006	5534.874	5885.847	18355.00	0.3465500	1.7515350E-02	55.09371

Instrument : CHAMBER 103  
 Detector : 30437  
 Standard ID : AESS-015  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:44  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:11:50  
 Average Efficiency : 0.3428698  
 Average Efficiency Error : 6.5169050E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2987.494	3300.797	17526.00	0.3419976	7.6749846E-03	52.55986
NP-237	211.8600	28-FEB-2006	4433.628	4906.553	17575.00	0.3456304	1.7477097E-02	70.84139
CM-244	248.8800	28-FEB-2006	5534.963	5885.168	18244.00	0.3446204	1.7418953E-02	56.82663

Instrument : CHAMBER 104  
 Detector : 30436  
 Standard ID : AESS-016  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:44  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:12:05  
 Average Efficiency : 0.3178734  
 Average Efficiency Error : 6.0614208E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2989.844	3302.458	16342.00	0.3191546	7.1916869E-03	48.79966
NP-237	211.6800	28-FEB-2006	4432.663	4904.432	16000.00	0.3149317	1.5942214E-02	61.83171
CM-244	248.6400	28-FEB-2006	5531.252	5885.942	16635.00	0.3145305	1.5914533E-02	54.39241

Instrument : CHAMBER 106  
 Detector : 45382  
 Standard ID : AESS-018  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:44  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:13:35  
 Average Efficiency : 0.3366815  
 Average Efficiency Error : 6.4043794E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.7800	28-FEB-2006	2991.094	3299.001	17214.00	0.3360010	7.5481492E-03	67.49383
NP-237	211.8000	28-FEB-2006	4435.781	4902.986	17151.00	0.3373776	1.7064495E-02	78.07959
CM-244	248.7600	28-FEB-2006	5530.755	5886.020	17964.00	0.3394951	1.7162759E-02	66.37016

Instrument : CHAMBER 107  
 Detector : 31697  
 Standard ID : AESS-019  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:45  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:13:46  
 Average Efficiency : 0.3279476  
 Average Efficiency Error : 6.2480466E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2990.547	3299.714	16632.00	0.3249958	7.3156110E-03	56.35443
NP-237	211.5600	28-FEB-2006	4437.183	4902.948	17025.00	0.3353024	1.6960930E-02	65.36469
CM-244	248.5200	28-FEB-2006	5532.612	5885.240	17789.00	0.3365124	1.7013798E-02	57.27279

Instrument : CHAMBER 109  
 Detector : 31693  
 Standard ID : AESS-021  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:45  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:14:12  
 Average Efficiency : 0.3172656  
 Average Efficiency Error : 6.0536368E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2988.084	3299.184	16099.00	0.3145808	7.0950659E-03	55.32108
NP-237	211.5600	28-FEB-2006	4432.535	4905.875	16551.00	0.3259623	1.6493894E-02	66.04156
CM-244	248.5200	28-FEB-2006	5532.554	5883.883	17073.00	0.3229679	1.6336529E-02	53.16661

Instrument : CHAMBER 110  
 Detector : 30447  
 Standard ID : AESS-022  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 16:38:46  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 21:08:36  
 Average Efficiency : 0.2903691  
 Average Efficiency Error : 5.5707125E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2992.012	3300.888	14540.00	0.2839686	6.4464426E-03	65.21424
NP-237	211.6800	28-FEB-2006	4433.842	4901.474	15514.00	0.3053748	1.5464325E-02	67.45113
CM-244	248.6400	28-FEB-2006	5530.607	5884.669	16569.00	0.3133079	1.5853422E-02	61.19852

Instrument : CHAMBER 111  
 Detector : 30448  
 Standard ID : AESS-023  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:45  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:15:36  
 Average Efficiency : 0.3388006  
 Average Efficiency Error : 6.4431382E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2987.793	3301.004	17314.00	0.3381375	7.5936201E-03	56.34806
NP-237	211.6800	28-FEB-2006	4435.981	4906.484	17500.00	0.3444386	1.7417673E-02	71.36749
CM-244	248.6400	28-FEB-2006	5530.639	5883.341	17810.00	0.3367471	1.7025441E-02	55.06728

Instrument : CHAMBER 112  
 Detector : 30449  
 Standard ID : AESS-024  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 3-APR-2006 18:48:45  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 3-APR-2006 23:15:47  
 Average Efficiency : 0.3139323  
 Average Efficiency Error : 5.9938701E-03  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4200	28-FEB-2006	2991.870	3298.269	15891.00	0.3106862	7.0128250E-03	50.73674
NP-237	211.4400	28-FEB-2006	4436.313	4903.586	16308.00	0.3213587	1.6263809E-02	62.04948
CM-244	248.4000	28-FEB-2006	5533.752	5883.818	17126.00	0.3241271	1.6394578E-02	52.78824

Instrument : CHAMBER 113  
 Detector : 45-111B4  
 Standard ID : AESS-001  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:00:36  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:02:58  
 Average Efficiency : 0.3703099  
 Average Efficiency Error : 1.0161426E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2991.835	3301.848	18597.00	0.3629034	1.5549773E-02	64.50990
NP-237	211.8600	28-FEB-2006	4433.613	4901.946	18886.00	0.3714283	1.8767057E-02	90.91785
CM-244	248.8200	28-FEB-2006	5530.358	5885.560	20134.00	0.3804419	1.9210188E-02	71.11305

Instrument : CHAMBER 114  
 Detector : 45-111B5  
 Standard ID : AESS-007  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:00:40  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:03:22  
 Average Efficiency : 0.3901447  
 Average Efficiency Error : 1.0698882E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2990.875	3299.211	19570.00	0.3824124	1.6373768E-02	64.95810
NP-237	211.5600	28-FEB-2006	4436.329	4903.130	20139.00	0.3966328	2.0027624E-02	80.48977
CM-244	248.5200	28-FEB-2006	5535.235	5884.346	20889.00	0.3951845	1.9947579E-02	69.68978

Instrument : CHAMBER 115  
 Detector : 45-132EE5  
 Standard ID : AESS-002  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:00:44  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:03:37  
 Average Efficiency : 0.3799683  
 Average Efficiency Error : 1.0422695E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4800	28-FEB-2006	2990.466	3300.287	19152.00	0.3743467	1.6033292E-02	67.16986
NP-237	211.5000	28-FEB-2006	4435.908	4903.427	19268.00	0.3795908	1.9175535E-02	85.64700
CM-244	248.4000	28-FEB-2006	5530.487	5884.796	20541.00	0.3887886	1.9627862E-02	69.09605

Instrument : CHAMBER 116  
 Detector : 45-132FF2  
 Standard ID : AESS-008  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:00:47  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:03:51  
 Average Efficiency : 0.3906634  
 Average Efficiency Error : 1.0711731E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2988.161	3302.097	19763.00	0.3856568	1.6510434E-02	61.93254
NP-237	211.8600	28-FEB-2006	4435.898	4903.366	20060.00	0.3945222	1.9921809E-02	83.61416
CM-244	248.8800	28-FEB-2006	5530.965	5885.878	20861.00	0.3940839	1.9892277E-02	67.87167

Instrument : CHAMBER 117  
 Detector : 45-132FF3  
 Standard ID : AESS-003  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:00:52  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:04:04  
 Average Efficiency : 0.3838457  
 Average Efficiency Error : 1.0529065E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.3600	28-FEB-2006	2987.574	3297.481	19157.00	0.3746493	1.6046192E-02	69.46350
NP-237	211.3800	28-FEB-2006	4432.916	4905.417	19746.00	0.3892191	1.9657088E-02	87.03203
CM-244	248.2800	28-FEB-2006	5531.962	5885.886	20722.00	0.3924041	1.9808734E-02	73.89016

Instrument : CHAMBER 118  
 Detector : 45-132FF4  
 Standard ID : AESS-009  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:00:56  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:04:21  
 Average Efficiency : 0.3946549  
 Average Efficiency Error : 1.0820382E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6000	28-FEB-2006	2989.600	3298.996	19935.00	0.3894384	1.6670343E-02	63.05709
NP-237	211.6200	28-FEB-2006	4434.069	4901.807	20060.00	0.3949601	1.9943934E-02	82.03598
CM-244	248.5800	28-FEB-2006	5534.903	5884.430	21258.00	0.4020683	2.0291740E-02	65.29355

Instrument : CHAMBER 119  
 Detector : 45-132FF5  
 Standard ID : AESS-004  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:00:59  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:04:33  
 Average Efficiency : 0.3958072  
 Average Efficiency Error : 1.0851006E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.1800	28-FEB-2006	2987.490	3300.068	20085.00	0.3931205	1.6826242E-02	64.97130
NP-237	211.2000	28-FEB-2006	4434.344	4905.254	20104.00	0.3966229	2.0027457E-02	79.50690
CM-244	248.1000	28-FEB-2006	5530.554	5884.197	21046.00	0.3988287	2.0130115E-02	68.84389

Instrument : CHAMBER 120  
 Detector : 45-142F1  
 Standard ID : AESS-010  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:03  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:05:08  
 Average Efficiency : 0.3892356  
 Average Efficiency Error : 1.0674394E-02  
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4800	28-FEB-2006	2991.710	3300.418	19511.00	0.3813637	1.6329555E-02	65.80540
NP-237	211.5000	28-FEB-2006	4437.274	4903.259	19969.00	0.3933960	1.9865829E-02	87.35593
CM-244	248.4600	28-FEB-2006	5533.634	5886.862	20972.00	0.3968505	2.0030931E-02	68.58372

Instrument : CHAMBER 121  
 Detector : 45-142J4  
 Standard ID : AESS-005  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:07  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:05:19  
 Average Efficiency : 0.3879517  
 Average Efficiency Error : 1.0639026E-02  
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2988.124	3301.600	19515.00	0.3811294	1.6319472E-02	66.81467
NP-237	211.6800	28-FEB-2006	4434.163	4906.581	19891.00	0.3915263	1.9772179E-02	83.76527
CM-244	248.6400	28-FEB-2006	5533.976	5883.453	20862.00	0.3944832	1.9912424E-02	67.69315

Instrument : CHAMBER 122  
 Detector : 45-142J5  
 Standard ID : AESS-011  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:10  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:05:33  
 Average Efficiency : 0.3964319  
 Average Efficiency Error : 1.0868002E-02  
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2990.061	3298.780	20106.00	0.3926716	1.6806791E-02	65.77823
NP-237	211.6800	28-FEB-2006	4436.620	4903.419	20147.00	0.3965701	2.0024376E-02	83.48605
CM-244	248.6400	28-FEB-2006	5535.258	5884.098	21247.00	0.4017632	2.0276442E-02	70.88770



Instrument : CHAMBER 123  
 Detector : 45-142V1  
 Standard ID : AESS-006  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:15  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:05:57  
 Average Efficiency : 0.3805304  
 Average Efficiency Error : 1.0439763E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.1800	28-FEB-2006	2990.387	3299.522	18959.00	0.3710815	1.5895747E-02	68.66263
NP-237	211.2000	28-FEB-2006	4437.442	4903.641	19446.00	0.3836367	1.9378122E-02	86.99185
CM-244	248.1000	28-FEB-2006	5534.110	5887.297	20682.00	0.3919307	1.9785201E-02	66.84405

Instrument : CHAMBER 124  
 Detector : 45-142V2  
 Standard ID : AESS-012  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:18  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:06:12  
 Average Efficiency : 0.3873872  
 Average Efficiency Error : 1.0623961E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.9600	28-FEB-2006	2989.443	3297.987	19472.00	0.3797709	1.6261807E-02	64.41782
NP-237	211.9200	28-FEB-2006	4435.559	4902.411	19887.00	0.3909993	1.9745609E-02	86.15575
CM-244	248.9400	28-FEB-2006	5534.467	5883.494	20923.00	0.3951599	1.9946033E-02	70.30408

Instrument : CHAMBER 125  
 Detector : 45-142V3  
 Standard ID : AESS-013  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:21  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:06:28  
 Average Efficiency : 0.3867655  
 Average Efficiency Error : 1.0609177E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	220.5600	28-FEB-2006	2992.436	3301.693	19282.00	0.3750422	1.6061539E-02	55.83823
NP-237	212.5200	28-FEB-2006	4433.216	4903.410	20074.00	0.3935665	1.9873424E-02	88.64875
CM-244	249.6600	28-FEB-2006	5531.615	5883.226	21143.00	0.3981633	2.0095672E-02	68.92764

Instrument : CHAMBER 126  
 Detector : 45-142V5  
 Standard ID : AESS-019  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:25  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:06:44  
 Average Efficiency : 0.3776715  
 Average Efficiency Error : 1.0360188E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2988.369	3299.131	19021.00	0.3716846	1.5920833E-02	61.61137
NP-237	211.5600	28-FEB-2006	4435.618	4902.366	19293.00	0.3799706	1.9194474E-02	87.82700
CM-244	248.5200	28-FEB-2006	5532.732	5885.449	20309.00	0.3842119	1.9398922E-02	63.11655

Instrument : CHAMBER 127  
 Detector : 45-142W1  
 Standard ID : AESS-014  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:29  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:07:12  
 Average Efficiency : 0.3934290  
 Average Efficiency Error : 1.0787830E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.9600	28-FEB-2006	2989.513	3302.392	19757.00	0.3853294	1.6496489E-02	64.47871
NP-237	211.9800	28-FEB-2006	4432.606	4903.961	20292.00	0.3988588	2.0138543E-02	84.68309
CM-244	249.0000	28-FEB-2006	5535.216	5883.874	21190.00	0.4001061	2.0193312E-02	70.60645

Instrument : CHAMBER 128  
 Detector : 45-142W2  
 Standard ID : AESS-020  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:34  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:07:27  
 Average Efficiency : 0.3859246  
 Average Efficiency Error : 1.0586893E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2989.584	3299.388	19162.00	0.3739288	1.6015276E-02	59.93734
NP-237	211.8000	28-FEB-2006	4434.590	4901.786	20058.00	0.3945944	1.9925477E-02	79.19832
CM-244	248.8200	28-FEB-2006	5533.622	5887.583	20951.00	0.3958796	1.9982109E-02	66.89229

Instrument : CHAMBER 129  
 Detector : 45-142W3  
 Standard ID : AESS-015  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:38  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:07:43  
 Average Efficiency : 0.3895081  
 Average Efficiency Error : 1.0681822E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.8400	28-FEB-2006	2991.668	3299.558	19525.00	0.3810124	1.6314350E-02	61.82140
NP-237	211.8600	28-FEB-2006	4435.149	4901.376	20156.00	0.3964100	2.0016206E-02	81.45658
CM-244	248.8800	28-FEB-2006	5532.751	5886.867	20929.00	0.3953595	1.9956063E-02	71.15770

Instrument : CHAMBER 130  
 Detector : 45-142W5  
 Standard ID : AESS-021  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:42  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:07:58  
 Average Efficiency : 0.3877107  
 Average Efficiency Error : 1.0633443E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.5400	28-FEB-2006	2990.831	3301.623	19394.00	0.3789733	1.6228566E-02	61.42154
NP-237	211.5600	28-FEB-2006	4435.787	4904.916	20099.00	0.3958496	1.9988457E-02	82.39708
CM-244	248.5200	28-FEB-2006	5534.223	5884.439	20760.00	0.3927440	1.9825550E-02	67.39270

Instrument : CHAMBER 131  
 Detector : 45-145K1  
 Standard ID : AESS-016  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:46  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:08:16  
 Average Efficiency : 0.3897060  
 Average Efficiency Error : 1.0686211E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2989.369	3298.448	19647.00	0.3837073	1.6428316E-02	64.42750
NP-237	211.6800	28-FEB-2006	4432.591	4905.330	20018.00	0.3940307	1.9897401E-02	82.42314
CM-244	248.6400	28-FEB-2006	5532.857	5887.665	20846.00	0.3941807	1.9897297E-02	71.83934

Instrument : CHAMBER 132  
 Detector : 45-145K2  
 Standard ID : AESS-022  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:49  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:08:32  
 Average Efficiency : 0.3905833  
 Average Efficiency Error : 1.0710652E-02  
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2990.018	3301.016	19613.00	0.3830433	1.6400279E-02	65.20789
NP-237	211.6800	28-FEB-2006	4434.219	4902.195	20056.00	0.3947787	1.9934803E-02	89.44299
CM-244	248.6400	28-FEB-2006	5534.644	5883.351	21028.00	0.3976221	2.0069377E-02	68.53607

Instrument : CHAMBER 133  
 Detector : 45-145K3  
 Standard ID : AESS-017  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:52  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:09:47  
 Average Efficiency : 0.3868218  
 Average Efficiency Error : 1.0608377E-02  
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.7200	28-FEB-2006	2989.115	3302.033	19459.00	0.3799319	1.6268853E-02	67.58065
NP-237	211.7400	28-FEB-2006	4435.237	4904.688	19979.00	0.3931513	1.9853372E-02	78.76342
CM-244	248.7000	28-FEB-2006	5532.486	5884.151	20667.00	0.3907017	1.9723292E-02	68.61700

Instrument : CHAMBER 134  
 Detector : 45-145K4  
 Standard ID : AESS-023  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:56  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:11:02  
 Average Efficiency : 0.3909511  
 Average Efficiency Error : 1.0721575E-02  
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.6600	28-FEB-2006	2987.530	3301.962	19533.00	0.3814809	1.6334314E-02	58.87649
NP-237	211.6800	28-FEB-2006	4434.547	4905.459	20169.00	0.3970030	2.0046022E-02	84.02620
CM-244	248.6400	28-FEB-2006	5534.869	5887.271	21114.00	0.3992483	2.0150691E-02	67.90365

Instrument : CHAMBER 135  
 Detector : 45-145K5  
 Standard ID : AESS-018  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:01:59  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:11:53  
 Average Efficiency : 0.3932157  
 Average Efficiency Error : 1.0781703E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.7800	28-FEB-2006	2990.104	3298.632	19831.00	0.3870894	1.6570982E-02	66.57359
NP-237	211.8000	28-FEB-2006	4434.981	4906.088	20001.00	0.3934731	1.9869408E-02	92.58358
CM-244	248.7600	28-FEB-2006	5531.074	5884.261	21277.00	0.4021365	2.0295015E-02	73.11333

Instrument : CHAMBER 136  
 Detector : 45-145L1  
 Standard ID : AESS-024  
 Standard Reference Date : 7-FEB-2003 00:00:00  
 Calibration Analysis Date/Time : 4-APR-2006 12:02:04  
 Calibration Count Time : 240.0000  
 Efficiency Calibration Date/Time : 4-APR-2006 17:12:12  
 Average Efficiency : 0.3798372  
 Average Efficiency Error : 1.0422947E-02  
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	219.4200	28-FEB-2006	2988.496	3298.473	18764.00	0.3668631	1.5717393E-02	63.35145
NP-237	211.4400	28-FEB-2006	4437.582	4903.436	19751.00	0.3892161	1.9656880E-02	93.25786
CM-244	248.4000	28-FEB-2006	5532.704	5884.860	20649.00	0.3908328	1.9730078E-02	69.15901

# General Engineering Laboratories, LLC

2040 Savage Road, Charleston, SC 29414  
(803)556-8171

## Gamma Spectrometer Geometry Calibration Package

Detector: GAMMA 6

Geometry: ZL-MB

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? the nuclide library used? the VMS certificate file?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	N/A
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2) Is the detector efficiency curve printout included?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3) Is the efficiency calibration report included and reviewed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4) Is the raw count data included for: the calibration peak report? the calibration verification PEAK report? the calibration verification NID report? the last instrument background?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5) Are the calibration verification calculations included?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6) Are the instrument settings included: amp, HVPS, ADC settings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Prepared By: Michael Patton

Date: 12/29/05

Reviewed By: John J. Lavett

Date: 12/29/2005

Effective Date: 12/29/05

# General Engineering Laboratories, LLC

2040 Savage Road, Charleston, SC 29414  
(803)556-8171

## Gamma Spectrometer Front End Electronics Setup

Detector: GAMMA b

Date Performed: 12/27/05

Performed By: Mikhael Pitta

<p><b>High Voltage Power Supply</b></p> <p>Model No. <u>3106D</u> High Voltage <u>3000V</u></p>	<p><b>Spectroscopy Amplifier</b></p> <p>Model No. <u>2026</u> Course Gain <u>100</u> Fine Gain <u>0.577</u> Time Constant <u>6 <math>\mu</math>sec.</u> Input polarity <u>POSITIVE</u> BSLR rate <u>N/A</u> BSLR mode <u>N/A</u> Threshold <u>N/A</u></p>
<p><b>ADC</b></p> <p>Model No. <u>8701</u> Gain <u>4000</u></p>	
<p><b>AIM Module</b></p> <p>Model No. <u>ND556</u> Address <u>NI4DC:1</u></p>	

**Gamma Spectroscopy Calibration Verification**Instrument: Gamma 6Calibration Date: 12/29/2005Geometry: 2L\_MBStandard Id: 70528-278

Isotope		CALIBRATED ACTIVITY (PCI)	MEASURED ACTIVITY (PCI)	DIFFERENCE %
Pb-210		8.2015E+05	8.572E+05	4.52
Am-241		6.2561E+04	6.197E+04	-0.94
Cd-109		8.2579E+05	7.723E+05	-6.48
Co-57		1.9081E+04	1.907E+04	-0.06
Ce-139		2.8981E+04	3.023E+04	4.31
Sn-113		4.8349E+04	4.902E+04	1.39
Cs-137		2.4325E+04	2.423E+04	-0.39
Y-88	1836.06	8.6210E+04	8.618E+04	-0.03
Co-60	1332.5	3.8845E+04	3.974E+04	2.30

Prepared By: *Michael Nations*Date: 12/29/05Reviewed By: *Jh Lanoie*Date: 12/29/2005

Verified:



QA filename : DKA300:[CANBERRA.GAMMA]QC\_BKG\_GAMMA6.QAF;2

Sample ID : BKG\_GAMMA6 Sample quantity : 1.80 LITER  
Sample date : 24-DEC-2005 00:00:00 Acquisition date : 24-DEC-2005 19:01:51  
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:04.45

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
BACKGROUND (GROSS COUNTS)	1.07E+05	1.24E+05	1.10E+05	
BACKGROUND (CPS)	1.79	2.07	1.84	

Flags: "\*" means the out-of-range test is parameter-dependent

Approved by: SRB Approval Date: 12 / 25 / 05

\*\*\*\*\*  
 \* GENERAL ENG. LABS, LLC. \*  
 \* 2040 Savage Road \*  
 \* Charleston, SC 29414 \*  
 \*\*\*\*\*

Configuration : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER\_GAMMA6\_2LMB.CNF;1  
 Sample date : 1-APR-2005 12:00:00. Acquisition date : 29-DEC-2005 05:34:59  
 Sample ID : VER\_GAMMA6\_2LMB Sample quantity : 1.00000E+00 LITER  
 Detector name : GAMMA6 Detector geometry: 2L\_MB  
 Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:00:53.92 0.7%  
 Energy tolerance : 2.00000 KEV Analyst Initials : MJH1  
 Abundance limit : 75.00000 Sensitivity : 3.00000  
 Batch ID : Detector SN# : 1922827  
 Matrix Spike DPM : LCS DPM :  
 \*\*\*\*\*

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.40*	17259	33023	1.02	94.07	89	9	2.40E+00	2.0	
2	4	57.32	1924	15819	1.37	115.86	114	11	2.67E-01	9.2	2.72E+01
3	4	59.51	42854	20590	0.95	120.23	114	11	5.95E+00	0.7	
4	0	66.73*	615	25393	2.01	134.64	132	7	8.55E-02	43.0	
5	0	70.50	587	22915	1.80	142.16	140	6	8.15E-02	41.0	
6	0	88.01	99704	37187	0.99	177.10	172	11	1.38E+01	0.5	
7	0	122.04	51226	25234	1.01	245.03	239	12	7.11E+00	0.8	
8	0	136.48	6598	15797	1.05	273.83	270	9	9.16E-01	3.7	
9	0	165.87*	36739	19666	1.11	332.49	325	13	5.10E+00	0.9	
10	0	255.32	970	8225	1.14	511.02	508	8	1.35E-01	16.5	
11	0	279.23	3904	7800	1.18	558.75	555	9	5.42E-01	4.4	
12	0	341.00	156	5215	1.37	682.03	679	8	2.16E-02	80.8	
13	0	366.83	210	4201	1.61	733.60	731	7	2.92E-02	51.5	
14	0	391.77	22191	6497	1.26	783.38	778	11	3.08E+00	1.0	
15	0	446.46*	218	4180	1.84	892.55	889	8	3.03E-02	51.7	
16	0	465.52	216	4353	1.62	930.60	928	8	3.00E-02	53.3	
17	0	510.83*	157	4145	1.59	1021.05	1017	9	2.19E-02	74.7	
18	0	603.30	34	2613	0.56	1205.65	1203	7	4.72E-03	249.9	
19	0	661.72*	50415	5892	1.48	1322.28	1314	16	7.00E+00	0.6	
20	0	777.51	163	1908	1.25	1553.48	1551	7	2.27E-02	45.0	
21	0	814.25	382	2683	1.44	1626.84	1622	9	5.31E-02	25.0	
22	0	821.51	131	2062	1.46	1641.34	1639	7	1.82E-02	58.3	
23	0	898.08*	26605	5337	1.59	1794.24	1786	16	3.70E+00	0.9	
24	0	1086.05	76	1740	1.35	2169.62	2167	7	1.06E-02	91.8	
25	0	1173.20	54911	2988	1.82	2343.69	2334	19	7.63E+00	0.5	
26	0	1183.47	61	693	1.06	2364.20	2362	6	8.46E-03	69.8	
27	0	1325.19*	145	858	2.81	2647.28	2645	8	2.02E-02	36.6	
28	0	1332.41	50394	1355	1.91	2661.72	2652	18	7.00E+00	0.5	
29	0	1445.89	23	376	1.40	2888.40	2884	7	3.19E-03	141.6	
30	0	1594.55	79	466	2.05	3185.42	3182	7	1.10E-02	46.8	
31	0	1598.22	32	421	0.87	3192.75	3188	6	4.45E-03	102.7	
32	0	1617.97*	45	204	1.42	3232.21	3230	5	6.30E-03	49.8	
33	0	1727.18*	41	113	1.95	3450.44	3447	7	5.72E-03	45.6	
34	0	1836.18	16739	376	2.21	3668.26	3657	22	2.32E+00	0.8	
35	0	1877.53	39	61	2.42	3750.88	3747	10	5.47E-03	40.2	
36	0	1973.63	47	79	4.75	3942.95	3935	16	6.59E-03	44.5	
37	0	2000.75	22	21	1.37	3997.15	3995	5	3.05E-03	38.0	
38	1	2024.69	64	67	2.19	4045.00	4039	26	8.94E-03	25.1	4.79E+00

Peak Search Report (continued)  
Sample ID : VER\_GAMMA6\_2LMB

Page : 2  
Acquisition date : 29-DEC-2005 05:34:59

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
39	1	2027.19*	30	73	2.19	4050.00	4039	26	4.16E-03	63.0	

Flag: "\*" = Peak area was modified by background subtraction

VAX/VMS Nuclide Identification Report Generated

\*\*\*\*\*  
 \* General Eng. Labs, LLC. \*  
 \* 2040 Savage Road \*  
 \* Charleston, SC 29414 \*  
 \*\*\*\*\*

DETECTOR DATA

\* Configuration : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER GAMMA6\_2 \*  
 \* Acquisition date : 29-DEC-2005 05:34:59 Detector SN# : 1922827 \*  
 \* Detector ID : GAMMA6 Sensitivity : 3.000 \*  
 \* Geometry : 2L\_MB Energy tolerance: 2.000 \*  
 \* Elapsed live time: 0 02:00:00.00 Abundance limit : 75.000 \*  
 \* Elapsed real time: 0 02:00:53.92 Half life ratio : 8.000 \*  
 \*\*\*\*\*

SAMPLE DATA

\* Sample date : 1-APR-2005 12:00:00 Nuclide Library : FERMC \*  
 \* Sample ID : VER\_GAMMA6\_2LMB Analyst initials: MJH1 \*  
 \* Batch Number : Sample Quantity : 1.0000E+00 LITER \*  
 \* Recovery : 1.00000 Carrier Weight : 0.00000 \*  
 \*\*\*\*\*

QC DATA

\* Standard Weight : 0.00000 \*  
 \* CALIB. DATE/TIME : 29-DEC-2005 05:08:19 MS Isotope : \*  
 \* MSD DPM : \*\*\*\*\* MSD Isotope : \*  
 \* LCS DPM : 0.000 LCS Isotope : \*  
 \* LCSD DPM : 0.000 LCSD Isotope : \*  
 \*\*\*\*\*

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER )	Act error	MDA (pCi/LITER )	
CO-57	1.907E+04	2.909E+02	1.820E+02	0.000E+00
CO-60	3.974E+04	3.790E+02	1.098E+02	0.000E+00
Y-88	8.618E+04	1.426E+03	3.030E+02	0.000E+00
CD-109	7.723E+05	7.634E+03	4.738E+03	0.000E+00
SN-113	4.902E+04	9.538E+02	6.617E+02	0.000E+00
CS-137	2.423E+04	2.716E+02	1.211E+02	0.000E+00
CE-139	3.023E+04	5.702E+02	3.514E+02	0.000E+00
HG-203	6.460E+04	5.665E+03	5.695E+03	0.000E+00
PB-210	8.572E+05	3.512E+04	2.870E+04	0.000E+00
AM-241	6.197E+04	8.989E+02	8.638E+02	0.000E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER )	K.L. Act error ) Ided	MDA (pCi/LITER )
---------	--------------------------------------	--------------------------	---------------------

```

*****
*                                     GENERAL ENG. LABS, LLC.                               *
*                                     2040 Savage Road                                   *
*                                     Charleston, SC 29414                             *
*****
Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAMMA6_2LMB.CNF;1
Sample date        : 1-APR-2005 12:00:00. Acquisition date : 29-DEC-2005 05:34:59
Sample ID          : VER_GAMMA6_2LMB          Sample quantity : 1.00000E+00 LITER
Detector name     : GAMMA6                   Detector geometry: 2L_MB
Elapsed live time : 0 02:00:00.00           Elapsed real time: 0 02:00:53.92  0.7%
Energy tolerance  : 2.00000 KEV             Analyst Initials  : MJH1
Abundance limit   : 75.00000                Sensitivity       : 3.00000
Batch ID          :                          Detector SN#      : 1922827
Matrix Spike DPM  :                          LCS DPM       :
*****

```

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
CO-57	122.06	51226	85.51*	2.359E+00	9.534E+03	1.907E+04	1.53
	136.47	6598	10.47	2.355E+00	1.005E+04	2.009E+04	7.30
CO-60	1173.24	54911	99.90	5.826E-01	3.541E+04	3.906E+04	0.98
	1332.50	50394	99.98*	5.251E-01	3.603E+04	3.974E+04	0.95
Y-88	898.04	26605	93.40	7.308E-01	1.463E+04	8.561E+04	1.74
	1836.06	16739	99.38*	4.293E-01	1.473E+04	8.618E+04	1.65
CD-109	88.03	99704	3.79*	1.923E+00	5.134E+05	7.723E+05	0.99
SN-113	391.70	22191	64.90*	1.345E+00	9.539E+03	4.902E+04	1.95
CS-137	661.66	50415	85.12*	9.336E-01	2.381E+04	2.423E+04	1.12
CE-139	165.85	36739	80.35*	2.231E+00	7.693E+03	3.023E+04	1.89
HG-203	70.83	587	4.75	1.263E+00	3.674E+03	2.093E+05	82.05
	72.87	-----	8.00	1.371E+00	-----	Line Not Found	-----
	82.60	-----	3.55	1.756E+00	-----	Line Not Found	-----
	279.20	3904	77.30*	1.672E+00	1.134E+03	6.460E+04	8.77
PB-210	46.50	17259	4.05*	1.910E-01	8.376E+05	8.572E+05	4.10
AM-241	59.54	42854	35.90*	7.239E-01	6.190E+04	6.197E+04	1.45

Flag: "\*" = Keyline

Total number of lines in spectrum 39  
 Number of unidentified lines 25  
 Number of lines tentatively identified by NID 14 35.90%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	2.00	9.534E+03	1.907E+04	0.029E+04	1.53	
CO-60	5.27Y	1.10	3.603E+04	3.974E+04	0.038E+04	0.95	
Y-88	106.63D	5.85	1.473E+04	8.618E+04	0.143E+04	1.65	
CD-109	461.40D	1.50	5.134E+05	7.723E+05	0.076E+05	0.99	
SN-113	115.09D	5.14	9.539E+03	4.902E+04	0.095E+04	1.95	
CS-137	30.00Y	1.02	2.381E+04	2.423E+04	0.027E+04	1.12	
CE-139	137.64D	3.93	7.693E+03	3.023E+04	0.057E+04	1.89	
HG-203	46.60D	57.0	1.134E+03	6.460E+04	0.567E+04	8.77	
PB-210	22.26Y	1.02	8.376E+05	8.572E+05	0.351E+05	4.10	
AM-241	432.20Y	1.00	6.190E+04	6.197E+04	0.090E+04	1.45	
Total Activity :			1.515E+06	2.005E+06			

Grand Total Activity : 1.515E+06 2.005E+06

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	57.32	1924	15819	1.37	115.86	114	11	2.67E-01	18.5	6.19E-01	
0	66.73	615	25393	2.01	134.64	132	7	8.55E-02	86.0	1.08E+00	
0	255.32	970	8225	1.14	511.02	508	8	1.35E-01	33.0	1.77E+00	
0	341.00	156	5215	1.37	682.03	679	8	2.16E-02	****	1.47E+00	
0	366.83	210	4201	1.61	733.60	731	7	2.92E-02	****	1.40E+00	
0	446.46	218	4180	1.84	892.55	889	8	3.03E-02	****	1.23E+00	
0	465.52	216	4353	1.62	930.60	928	8	3.00E-02	****	1.20E+00	
0	510.83	157	4145	1.59	1021.05	1017	9	2.19E-02	****	1.13E+00	
0	603.30	34	2613	0.56	1205.65	1203	7	4.72E-03	****	1.00E+00	
0	777.51	163	1908	1.25	1553.48	1551	7	2.27E-02	90.0	8.23E-01	
0	814.25	382	2683	1.44	1626.84	1622	9	5.31E-02	50.0	7.93E-01	
0	821.51	131	2062	1.46	1641.34	1639	7	1.82E-02	****	7.87E-01	
0	1086.05	76	1740	1.35	2169.62	2167	7	1.06E-02	****	6.22E-01	
0	1183.47	61	693	1.06	2364.20	2362	6	8.46E-03	****	5.78E-01	
0	1325.19	145	858	2.81	2647.28	2645	8	2.02E-02	73.3	5.27E-01	
0	1445.89	23	376	1.40	2888.40	2884	7	3.19E-03	****	4.93E-01	
0	1594.55	79	466	2.05	3185.42	3182	7	1.10E-02	93.5	4.62E-01	
0	1598.22	32	421	0.87	3192.75	3188	6	4.45E-03	****	4.61E-01	
0	1617.97	45	204	1.42	3232.21	3230	5	6.30E-03	99.6	4.58E-01	
0	1727.18	41	113	1.95	3450.44	3447	7	5.72E-03	91.2	4.41E-01	
0	1877.53	39	61	2.42	3750.88	3747	10	5.47E-03	80.4	4.26E-01	
0	1973.63	47	79	4.75	3942.95	3935	16	6.59E-03	89.1	4.20E-01	
0	2000.75	22	21	1.37	3997.15	3995	5	3.05E-03	75.9	4.18E-01	
1	2024.69	64	67	2.19	4045.00	4039	26	8.94E-03	50.3	4.17E-01	
1	2027.19	30	73	2.19	4050.00	4039	26	4.16E-03	****	4.17E-01	

Flags: "T" = Tentatively associated

\*\*\*\*\*  
 \* GENERAL ENG. LABS, LLC. \*  
 \* 2040 Savage Road \*  
 \* Charleston, SC 29414 \*  
 \*\*\*\*\*

DETECTOR DATA

\* Configuration : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER\_GAMMA6\_2LMB.CNF;1\*  
 \* Acquisition date : 29-DEC-2005 05:34:59 Detector SN# : 1922827 \*  
 \* Detector ID : GAMMA6 Sensitivity : 3.00000 \*  
 \* Geometry : 2L\_MB Energy tolerance: 2.00000 \*  
 \* Elapsed live time: 0 02:00:00.00 Abundance limit : 75.00000 \*  
 \* Elapsed real time: 0 02:00:53.92 Half life ratio : 8.00000 \*  
 \*\*\*\*\*

SAMPLE DATA

\* Sample date : 1-APR-2005 12:00:00. Nuclide Library : CAL \*  
 \* Sample ID : VER\_GAMMA6\_2LMB Analyst initials: MJH1 \*  
 \* Batch Number : Sample Quantity : 1.00000E+00 LITER \*  
 \*\*\*\*\*

QC DATA

\* CALIB. DATE/TIME : 29-DEC-2005 05:08:19.2MS Isotope : \*  
 \* MSD DPM : MSD Isotope : \*  
 \* LCS DPM : LCS Isotope : \*  
 \*\*\*\*\*

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
CO-57	1.907E+04	2.909E+02	1.820E+02	0.000E+00	104.758
CO-60	3.974E+04	3.790E+02	1.098E+02	0.000E+00	361.821
Y-88	8.618E+04	1.426E+03	3.030E+02	0.000E+00	284.472
CD-109	7.723E+05	7.634E+03	4.738E+03	0.000E+00	163.003
SN-113	4.902E+04	9.538E+02	6.617E+02	0.000E+00	74.080
CS-137	2.423E+04	2.716E+02	1.211E+02	0.000E+00	200.130
CE-139	3.023E+04	5.702E+02	3.514E+02	0.000E+00	86.044
HG-203	6.460E+04	5.665E+03	5.695E+03	0.000E+00	11.342
PB-210	8.572E+05	3.512E+04	2.870E+04	0.000E+00	29.864
AM-241	6.197E+04	8.989E+02	8.638E+02	0.000E+00	71.739



\*\*\*\*\*  
 \* GENERAL ENG. LABS, LLC. \*  
 \* 2040 Savage Road \*  
 \* Charleston, SC 29414 \*  
 \*\*\*\*\*

Configuration : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]CAL\_GAMMA6\_2L\_MB.CNF;3  
 Sample date : 1-APR-2005 12:00:00. Acquisition date : 28-DEC-2005 16:02:00  
 Sample ID : CAL\_GAMMA6\_2L\_MB Sample quantity : 1.00000E+00 LITER  
 Detector name : GAMMA6 Detector geometry: 2L MB  
 Elapsed live time: 0 08:00:00.00 Elapsed real time: 0 08:03:35.88 0.7%  
 Energy tolerance : 2.00000 KEV Analyst Initials : MJH1  
 Abundance limit : 75.00000 Sensitivity : 3.00000  
 Batch ID : Detector SN# : 1922827  
 Matrix Spike DPM : LCS DPM :  
 \*\*\*\*\*

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.38*	65073	152559	1.04	94.03	88	10	2.26E+00	1.2	
2	2	55.89*	6858	78352	0.93	113.00	99	26	2.38E-01	6.7	4.54E+02
3	2	59.53	183650	73569	1.07	120.28	99	26	6.38E+00	0.3	
4	10	68.68*	6559	156832	2.48	138.53	133	19	2.28E-01	11.9	1.51E+01
5	10	72.49	2085	147084	1.71	146.13	133	19	7.24E-02	34.4	
6	10	81.50	11427	211154	2.54	164.12	156	27	3.97E-01	8.5	3.30E+02
7	10	84.38*	28152	161612	1.92	169.87	156	27	9.78E-01	2.9	
8	10	88.07	411454	68944	1.04	177.22	156	27	1.43E+01	0.2	
9	7	120.52*	4535	74408	2.04	241.98	238	13	1.57E-01	13.0	2.50E+00
10	7	122.12	197963	51209	1.00	245.17	238	13	6.87E+00	0.3	
11	0	136.51	26079	63217	1.02	273.90	270	9	9.06E-01	1.8	
12	0	165.92*	145537	72180	1.11	332.59	327	12	5.05E+00	0.5	
13	0	187.98*	484	31182	1.96	376.62	374	6	1.68E-02	58.1	
14	0	255.15	4015	32963	1.16	510.69	507	8	1.39E-01	8.0	
15	0	279.27	16778	34760	1.18	558.81	554	10	5.83E-01	2.2	
16	0	310.76	444	17697	1.49	621.68	619	6	1.54E-02	47.6	
17	0	391.76	88976	30447	1.26	783.36	777	13	3.09E+00	0.5	
18	0	398.67*	150	17944	1.23	797.16	794	8	5.20E-03	155.5	
19	0	443.59	299	17663	1.93	886.82	885	8	1.04E-02	77.1	
20	0	491.34	113	12841	0.83	982.13	979	7	3.92E-03	167.0	
21	0	510.92*	1995	21126	1.97	1021.22	1016	12	6.93E-02	14.9	
22	5	657.01	1426	13443	2.48	1312.87	1308	21	4.95E-02	14.7	2.06E+01
23	5	661.66*	200294	13106	1.46	1322.17	1308	21	6.95E+00	0.2	
24	0	743.72	257	8163	1.19	1486.02	1484	7	8.93E-03	58.6	
25	0	764.62*	135	6916	0.90	1527.73	1525	6	4.70E-03	97.8	
26	0	813.98	1335	10911	1.36	1626.30	1622	9	4.64E-02	14.4	
27	0	822.79	308	9724	0.70	1643.89	1641	8	1.07E-02	56.0	
28	0	875.78	178	6299	0.82	1749.69	1748	5	6.20E-03	67.1	
29	0	897.95*	105971	24434	1.61	1793.98	1785	18	3.68E+00	0.5	
30	0	1173.02	220671	11794	1.86	2343.34	2334	19	7.66E+00	0.2	
31	0	1204.15	82	3135	0.60	2405.50	2402	8	2.85E-03	118.8	
32	0	1230.90*	60	2565	0.70	2458.94	2457	8	2.08E-03	147.3	
33	4	1324.88*	2057	4244	2.78	2646.67	2639	31	7.14E-02	7.2	3.30E+01
34	4	1332.21	200753	3198	1.97	2661.31	2639	31	6.97E+00	0.2	
35	0	1391.50	154	1759	2.44	2779.76	2776	9	5.34E-03	49.7	
36	0	1608.53	110	2313	0.59	3213.36	3211	9	3.83E-03	79.4	
37	0	1645.52	96	1410	1.20	3287.26	3284	9	3.33E-03	71.3	
38	0	1650.94*	79	1444	1.32	3298.09	3295	9	2.76E-03	87.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
39	0	1742.50	51	430	0.98	3481.04	3478	6	1.78E-03	65.4	
40	2	1789.53	88	473	1.77	3575.03	3571	15	3.06E-03	45.6	1.25E+00
41	2	1792.94	87	409	1.70	3581.85	3571	15	3.03E-03	41.3	
42	0	1835.87	66461	1581	2.27	3667.64	3657	22	2.31E+00	0.4	
43	0	1921.94	33	275	1.72	3839.65	3835	9	1.15E-03	92.3	

Flag: "\*" = Peak area was modified by background subtraction

Configuration : MCA0:[GAMMA]GAMMA6\$1  
 Analyses by : CALIBRATE V1.7,PEAK V16.4  
 Detector Name : GAMMA6 Energy Calib Time: 28-DEC-2005 15:47:34  
 Efficiency type : Empirical Effncy Calib Time: 29-DEC-2005 05:08:19  
 Detector Geometry: GAMMA6 Shelf :

Energy Calibration Report

$$\text{Energy} = -0.7387 + 0.5011 \cdot \text{Channel} + -9.9579\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	94.29	46.50	46.51	-0.012
2	120.03	59.54	59.41	0.126
3	177.11	88.03	88.01	0.019
4	245.08	122.06	122.07	-0.009
5	332.57	165.85	165.91	-0.056
6	783.42	391.70	391.79	-0.089
7	1322.31	661.66	661.73	-0.070
8	1794.17	898.04	898.05	-0.007
9	2343.66	1173.24	1173.18	0.056
10	2661.69	1332.50	1332.40	0.103
11	3668.14	1836.06	1836.12	-0.062

FWHM Calibration Report

$$\text{FWHM} = 0.6805 + 3.3519\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.50	0.93	0.91	0.023
2	59.54	1.04	0.94	0.096
3	88.03	1.00	0.99	0.008
4	122.06	1.02	1.05	-0.031
5	165.85	1.12	1.11	0.006
6	391.70	1.28	1.34	-0.064
7	661.66	1.44	1.54	-0.104
8	898.04	1.65	1.68	-0.037
9	1173.24	1.81	1.83	-0.020
10	1332.50	1.94	1.90	0.035
11	1836.06	2.20	2.12	0.087

Efficiency Calibration Report

$$\text{Eff} = \exp(a_2 + a_3 \cdot x + a_4 \cdot x^2 + a_5 \cdot x^3 + a_6 \cdot x^4 + a_7 \cdot x^5), \quad x = \ln(a_1 / \text{energy})$$

a1      a2      a3      a4      a5      a6      a7  
 941.3   -4.958   0.8460   -6.6067E-02   -0.1874   0.1945   -5.7096E-02

Average Deviation = 2.69 %      Reduced Chi-Square = 2.29

Nbr	Energy (KEV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ Error	% Diff
-----	--------------	---------------------	------------------	---------------------	-------------	--------

1	46.50	1.88E-03	6.07E-05	1.94E-03	-0.90	-2.89
---	-------	----------	----------	----------	-------	-------

Nbr	Energy (KEV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
2	59.54	7.68E-03	2.32E-04	7.25E-03	1.85	5.60
3	88.03	1.85E-02	6.12E-04	1.92E-02	-1.16	-3.85
4	122.06	2.27E-02	6.86E-04	2.36E-02	-1.23	-3.70
5	165.85	2.30E-02	6.53E-04	2.23E-02	1.08	3.06
6	391.70	1.36E-02	3.62E-04	1.35E-02	0.50	1.32
7	661.66	9.23E-03	2.78E-04	9.34E-03	-0.36	-1.10
8	898.04	7.08E-03	1.87E-04	7.31E-03	-1.23	-3.25
9	1173.24	5.94E-03	1.61E-04	5.83E-03	0.72	1.94
10	1332.50	5.35E-03	1.40E-04	5.25E-03	0.70	1.83
11	1836.06	4.25E-03	1.12E-04	4.29E-03	-0.38	-1.01

Approved by: *Michael Hutton*

Approval Date: 12 / 29 / 05

```

Library Title      :
Library file name : DKA300:[CANBERRA.GAMMA]CAL.NLB;1
Date printed      : 6-DEC-2004 10:31:17.67
Number of nuclides : 10
Number of lines   : 17

```

Nuclide Name	Half-Life	Nuclide Type	Key Line	Energy	Abundance
CO-57	271.74D		*	122.06 keV	85.51 %
				136.47 keV	10.47 %
CO-60	5.27Y		*	1173.24 keV	99.90 %
				1332.50 keV	99.98 %
Y-88	106.63D		*	898.04 keV	93.40 %
				1836.06 keV	99.38 %
CD-109	461.40D		*	88.03 keV	3.79 %
SN-113	115.09D		*	391.70 keV	64.90 %
CS-137	30.00Y		*	661.66 keV	85.12 %
CE-139	137.64D		*	165.85 keV	80.35 %
HG-203	46.60D			70.83 keV	4.75 %
				72.87 keV	8.00 %
				82.60 keV	3.55 %
				279.20 keV	77.30 %
PB-210	22.26Y		*	46.50 keV	4.05 %
AM-241	432.20Y		*	59.54 keV	35.90 %

Print Time : 14-JUN-2005 17:33:53.22  
 Certificate file name : DKA300:[CANBERRA.GAMMA]70528-278.CER;1  
 Certificate title : 2L\_MB  
 Certificate date : 1-APR-2005 12:00:00.00  
 Certificate quantity : 1.00000E+00

Rcd	Nuclide	Halflife	CAL/ INIT	Energy	Rate	%Abun	Activity (uCi)
1	AM-241	432.20Y	Yes	59.54	8.3100E+02	35.90	6.2561E-02
2	CD-109	462.60D	No	88.03	1.1580E+03	3.79	8.2579E-01
3	Co-57	271.79D	No	122.06	6.0370E+02	85.51	1.9081E-02
4	CE-139	137.60D	No	165.85	8.6160E+02	80.35	2.8981E-02
5	SN-113	115.10D	No	391.70	1.1610E+03	64.90	4.8349E-02
6	CS-137	30.07Y	Yes	661.66	7.6610E+02	85.12	2.4325E-02
7	Y-88	106.60D	No	898.04	3.0350E+03	93.40	8.7823E-02
8	Y-88	106.60D	Yes	1836.06	3.1700E+03	99.38	8.6210E-02
9	CO-60	5.27Y	Yes	1173.24	1.4220E+03	99.90	3.8471E-02
10	CO-60	5.27Y	No	1332.50	1.4370E+03	99.98	3.8845E-02
11	PB-210	22.30Y	No	46.50	1.2290E+03	4.05	8.2015E-01

**CERTIFICATE OF CALIBRATION**  
**Standard Radionuclide Source**

70528-278

2.0 Liter Solid in 230G GA-MA Beaker

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 and Pb-210 were calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in US NRC Regulatory Guide 4.15, Revision 1, February 1979.

US Patent 4,430,258; UK Patent GB2,149,194B; CA Patent 1,196,776.  
Density of solid matrix 1.15 g/cc.

Calibration Date: April 1, 2005 12:00 EST

ISOTOPE	GAMMA ENERGY	HALF-LIFE		GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Pb-210	46.5	22.3	y	1229	3.0
Am-241	59.5	432.2	y	831.0	3.0
Cd-109	88	462.6	d	1158	3.3
Co-57	122	271.79	d	603.7	3.0
Ce-139	166	137.6	d	861.6	2.8
Hg-203	279	46.61	d	1864	2.7
Sn-113	392	115.1	d	1161	2.6
Cs-137	662	30.07	y	766.1	3.0
Y-88	898	106.6	d	3035	2.6
Co-60	1173	5.271	y	1422	2.7
Co-60	1332	5.271	y	1437	2.6
Y-88	1836	106.6	d	3170	2.6

P O NUMBER 2832RD, Item 1

SOURCE PREPARED BY: M. Dimitrova  
M. Dimitrova, Radiochemist

Q A APPROVED: W.M. [Signature] 5-12-05

This standard will expire one year after the calibration date.



# General Engineering Laboratories, LLC

2040 Savage Road, Charleston, SC 29414  
(843)556-8171

## Gamma Spectrometer Geometry Calibration Package

Detector: GAMMA 19

Geometry: 2L-MB

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the second standard(s) documentation? the nuclide library used? the VMS certificate file?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2) Is the detector efficiency curve printout included?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3) Is the efficiency calibration report included and reviewed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4) Is the raw count data included for: the calibration peak report? the calibration verification PEAK report? the calibration verification NID report? the last instrument background?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5) Are the calibration verification calculations included?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6) Are the instrument settings included: amp, HVPS, ADC settings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Prepared By: [Signature]

Date: 2/21/06

Reviewed By: [Signature]

Date: 3/23/06

Effective Date: 2/20/05 06  
3/23/06



**CERTIFICATE OF CALIBRATION**  
**Standard Radionuclide Source**

70528-278

2.0 Liter Solid in 230G GA-MA Beaker

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 and Pb-210 were calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma ray emission rates for the most intense gamma-ray lines are given. Analytical maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in US NRC Regulatory Guide 4.15, Revision 1, February 1979.

US Patent 4,430,258; UK Patent GB2,149,194B; CA Patent 1,196,776.  
Density of solid matrix 1.15 g/cc.

Calibration Date: April 1, 2005 12:00 EST

ISOTOPE	GAMMA ENERGY	HALF-LIFE		GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Pb-210	46.5	22.3	y	1229	3.0
Am-241	59.5	432.2	y	831.0	3.0
Cd-109	88	462.6	d	1158	3.3
Co-57	122	271.79	d	603.7	3.0
Ce-139	166	137.6	d	861.6	2.8
Hg-203	279	46.61	d	1864	2.7
Sn-113	392	115.1	d	1161	2.6
Cs-137	662	30.07	y	766.1	3.0
Y-88	898	106.6	d	3035	2.6
Co-60	1173	5.271	y	1422	2.7
Co-60	1332	5.271	y	1437	2.6
Y-88	1836	106.6	d	3170	2.6

P O NUMBER 2832RD, Item 1

SOURCE PREPARED BY: M. Dimitrova  
M. Dimitrova, Radiochemist

Q A APPROVED: LM. M. J. 5-12-05

This standard will expire one year after the calibration date.

*Handwritten signature and date: 12/10/06*

Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.51
					136.47	10.47
CO-60		5.27Y	*		1173.24	99.90
					1332.50	99.98
Y-88		106.63D	*		898.04	93.40
					1836.06	99.38
CD-109		461.40D	*		88.03	3.79
SN-113		115.09D	*		391.70	64.90
CS-137		30.00Y	*		661.66	85.12
CE-139		137.64D	*		165.85	80.35
HG-203		46.60D			70.83	4.75
					72.87	8.00
					82.60	3.55
PB-210		22.26Y	*		279.20	77.30
					46.50	4.05
AM-241		432.20Y	*		59.54	35.90
					0.00	0.00

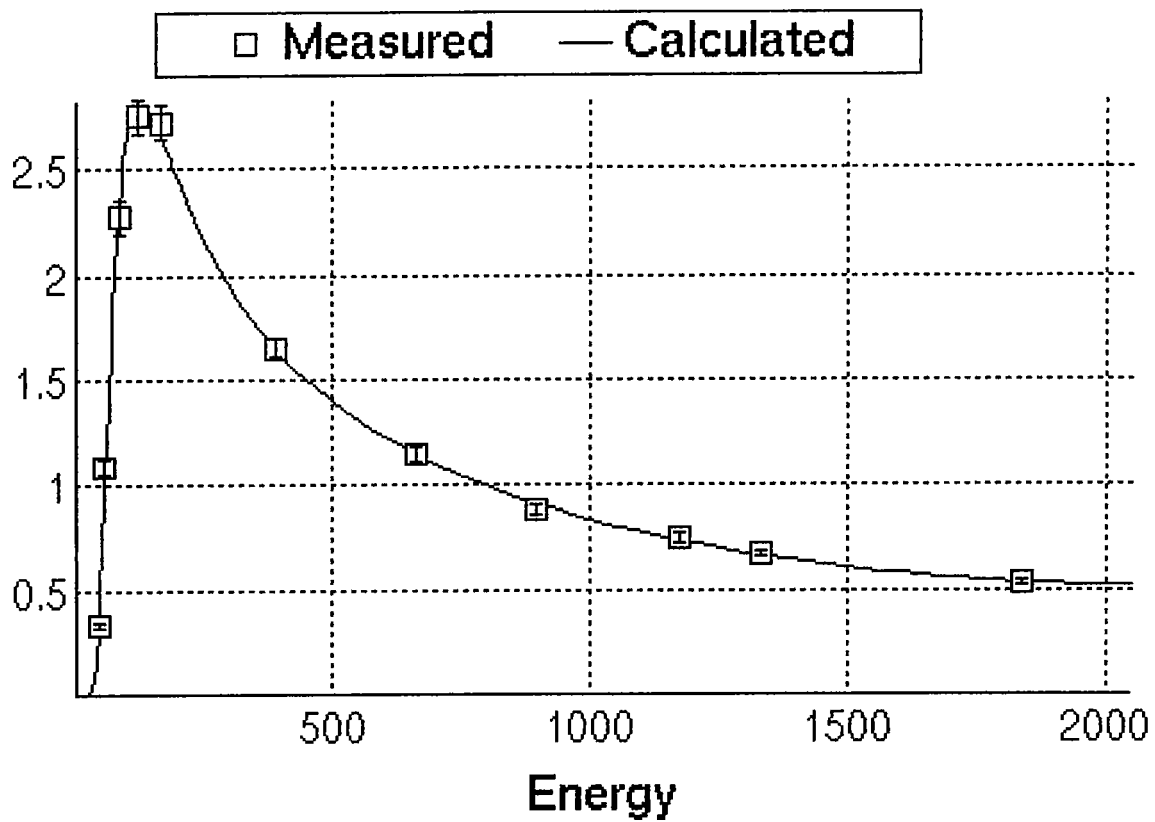
*Handwritten signature*

Title: 2L\_MB  
Quantity: 1.00

Assay date: 1-APR-2005 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
AM-241	432.20Y	59.5	831	3.00	35.9	Yes
CD-109	462.60D	88.0	1158	3.30	3.8	No
Co-57	271.79D	122.1	604	3.00	85.5	No
CE-139	137.60D	165.9	862	2.80	80.3	No
SN-113	115.10D	391.7	1161	2.60	64.9	No
CS-137	30.07Y	661.7	766	3.00	85.1	Yes
Y-88	106.60D	898.0	3035	2.60	93.4	No
Y-88	106.60D	1836.1	3170	2.60	99.4	Yes
CO-60	5.27Y	1173.2	1422	2.70	99.9	Yes
CO-60	5.27Y	1332.5	1437	2.60	100.0	No
PB-210	22.30Y	46.5	1229	3.00	4.1	No

*Handwritten signature*



Datasource: DKA0: [CANBERRA.GAMMA.SCUSR.ARCHIVE] CAL\_GAM19\_2LMB\_36.CNF;1  
 $\ln(\text{Eff}) = -4.739e+00 + 8.129e-01X + -5.933e-02X^2 + -1.512e-01X^3 + 1.529e-01X^4 + -4.565e-02X^5$   
 where:  $X = \ln(9.413e+02/E \text{ [keV]})$ ; [CHISQ = 1.288e+00]

*Handwritten signature*  
22/04

$$\text{Energy} = 0.1048 + 0.5006 * \text{Channel} + -9.3161\text{E-}08 * (\text{Channel} ** 2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.90	46.50	46.61	-0.112
2	118.77	59.54	59.56	-0.026
3	175.71	88.03	88.07	-0.032
4	243.60	122.06	122.05	0.011
5	331.05	165.85	165.82	0.029
6	781.92	391.70	391.48	0.217
7	1321.69	661.66	661.60	0.065
8	1794.43	898.04	898.12	-0.077
9	2344.55	1173.24	1173.30	-0.063
10	2663.01	1332.50	1332.58	-0.078
11	3669.79	1836.06	1836.00	0.067

FWHM Calibration Report

$$\text{FWHM} = 1.116 + 2.5220\text{E-}02 * (\text{Energy} ** 1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.50	1.30	1.29	0.007
2	59.54	1.38	1.31	0.071
3	88.03	1.38	1.35	0.027
4	122.06	1.37	1.40	-0.023
5	165.85	1.43	1.44	-0.008
6	391.70	1.55	1.62	-0.066
7	661.66	1.70	1.77	-0.066
8	898.04	1.85	1.87	-0.025
9	1173.24	1.98	1.98	0.000
10	1332.50	2.09	2.04	0.048
11	1836.06	2.23	2.20	0.035

*mgk  
2/23/06*

$$\text{Eff} = \exp(a_2 + a_3*x + a_4*x^{**2} + a_5*x^{**3} + a_6*x^{**4} + a_7*x^{**5}), \quad x=\ln(a_1/\text{energy})$$

a1	a2	a3	a	a5	a6	a7
941.3	-4.739	0.8129	-5.9331E-02	-0.1512	0.1529	-4.5650E-02

Average Deviation = 1.98 %      Reduced Chi-Square = 1.29

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.50	3.37E-03	1.14E-04	3.44E-03	-0.68	-2.29
2	59.54	1.08E-02	3.37E-04	1.04E-02	1.42	4.40
3	88.03	2.28E-02	7.60E-04	2.36E-02	-1.06	-3.54
4	122.06	2.74E-02	8.58E-04	2.80E-02	-0.63	-1.98
5	165.85	2.71E-02	8.13E-04	2.65E-02	0.73	2.20
6	391.70	1.66E-02	4.72E-04	1.65E-02	0.26	0.74
7	661.66	1.15E-02	3.50E-04	1.15E-02	0.00	-0.01
8	898.04	8.82E-03	2.46E-04	9.09E-03	-1.10	-3.07
9	1173.24	7.42E-03	2.03E-04	7.31E-03	0.55	1.52
10	1332.50	6.69E-03	1.76E-04	6.61E-03	0.49	1.29
11	1836.06	5.33E-03	1.46E-04	5.37E-03	-0.28	-0.76

Configuration : DKA0:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL\_GAM19\_2LMB\_36.CNF;1

----- Sample Information -----

Sample Title : 2L\_MB Calibration  
 Sample ID : 70528-278 Sample Quantity : 1.00000E+00 EACH  
 Sample Type : 2L\_MB Sample Geometry :  
 Sample Number : -3 Spctrm Collector : GAMMA  
 Sample Collector : Sample Analyst : GAMMA

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :  
 Deposition Start : Deposition End : 1-APR-2005 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2005 12:00:00. Acquisition date : 17-FEB-2006 14:03:15  
 Decay time : 322 02:03:15.27 % dead time : 0.8%  
 Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:00:59.10

----- Detector Parameters -----

Energy cal. time : 16-FEB-2006 08:01:15 Energy cal. oper.: GAMMA  
 Detector name : GAMMA19 Counting geometry: 2LMB  
 Effic. cal. time : 17-FEB-2006 16:09:06 Effic. cal. oper.: GAMMA

----- Processing Parameters -----

Start channel : 1 End channel : 4096  
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000  
 Critical level? : No Propagate Errors?: No  
 Efficiency Type : EMPIRICA Library-based eff: No  
 Energy tolerance : 2.00000 Half life ratio : 8.00000  
 Abundance limit : 75.00000 WTM error limit : 3.00000  
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	8.59	8365	43193	2.26	16.95	14	8	1.16E+00	4.4	
2	0	19.92	555	25436	1.49	39.58	37	6	7.71E-02	45.7	
3	0	46.47	28976	45324	1.40	92.62	86	12	4.02E+00	1.6	
4	0	59.52	64794	47535	1.43	118.69	111	13	9.00E+00	0.8	
5	0	66.67	880	29545	1.66	132.96	130	8	1.22E-01	33.9	
6	0	88.07	117061	50871	1.43	175.71	168	15	1.63E+01	0.5	
7	0	122.05	52420	32805	1.43	243.60	236	16	7.28E+00	0.9	
8	0	136.52	6709	18787	1.41	272.50	268	11	9.32E-01	4.1	
9	0	165.85	33231	20252	1.47	331.11	324	14	4.62E+00	1.1	
10	0	245.75	235	8771	1.52	490.73	488	8	3.27E-02	69.3	
11	0	255.09	1071	10274	1.78	509.40	505	10	1.49E-01	18.0	
12	0	271.30	268	5342	1.81	541.78	539	6	3.72E-02	43.6	
13	0	279.10	2407	8726	1.49	557.36	553	10	3.34E-01	7.5	
14	0	391.50	19916	7830	1.61	781.94	776	13	2.77E+00	1.2	
15	0	458.00	796	7253	2.64	914.83	909	12	1.11E-01	21.7	
16	0	510.99	621	5391	2.67	1020.72	1015	12	8.63E-02	24.0	
17	0	587.28	121	2130	1.28	1173.16	1171	6	1.69E-02	60.7	
18	0	647.71	110	2514	1.40	1293.93	1291	7	1.52E-02	76.5	
19	0	661.62	62216	6261	1.74	1321.73	1314	17	8.64E+00	0.5	
20	0	814.54	400	3365	1.44	1627.37	1622	11	5.56E-02	28.5	
21	0	888.42	204	3112	1.97	1775.05	1771	9	2.83E-02	49.9	

*Handwritten signature/initials*



Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	898.17	23719	6219	1.89	1794.52	1785	18	3.29E+00	1.0	
23	0	968.03	100	2653	1.68	1934.18	1932	8	1.38E-02	90.4	
24	0	1173.37	67643	3195	2.03	2344.68	2335	20	9.39E+00	0.4	
25	4	1325.44	447	1208	2.98	2648.73	2640	37	6.21E-02	17.6	5.22E+00
26	4	1332.65	61653	682	2.10	2663.15	2640	37	8.56E+00	0.4	
27	0	1390.45	31	471	1.53	2778.72	2771	11	4.33E-03	136.3	
28	0	1836.16	14975	326	2.28	3670.13	3660	22	2.08E+00	0.9	
29	0	1930.34	30	91	1.38	3858.52	3852	12	4.14E-03	67.0	
30	0	2032.34	41	82	4.00	4062.58	4056	13	5.73E-03	47.7	

Configuration : DKA0:[CANBERRA.GAMMA.SCUSR.ARCHIVE]SMP\_70528278\_GAM19\_2LMB\_38.CNF;1

---- Sample Information ----

Sample Title : 2L\_MB Calibration Verification  
 Sample ID : 70528-278 Sample Quantity : 1.00000E+00 ea  
 Sample Type : 2L Marinelli Sample Geometry :  
 Sample Number : 38 Spctrm Collector : GAMMA  
 Sample Collector : Sample Analyst : GAMMA

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :  
 Deposition Start : Deposition End : 1-APR-2005 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2005 12:00:00. Acquisition date : 20-FEB-2006 08:57:46  
 Decay time : 324 20:57:46.89 % dead time : 0.8%  
 Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:00:58.65

---- Detector Parameters ----

Energy cal. time : 16-FEB-2006 08:01:15 Energy cal. oper.: GAMMA  
 Detector name : GAMMA19 Counting geometry: 2LMB  
 Effic. cal. time : 17-FEB-2006 16:09:06 Effic. cal. oper.: GAMMA

---- Processing Parameters ----

Start channel : 1 End channel : 4080  
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000  
 Critical level? : No Propagate Errors?: Yes  
 Efficiency Type : EMPIRICA Library-based eff: No  
 Energy tolerance : 2.00000 Half life ratio : 8.00000  
 Abundance limit : 75.00000 WTM error limit : 3.00000  
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
10	7.16	18866	11319	2.26	14.09	9	20	3.6	1.44E+01	
10	8.88*	21801	31843	2.58	17.54	9	20	4.5		
10	11.05*	11969	48966	2.57	21.87	9	20	8.4		
0	46.46*	28986	44652	1.31	92.61	86	12	3.1		BI-210 PB-210
0	59.52	64043	49915	1.35	118.68	111	14	1.7		AM-241
0	67.03*	658	26288	1.85	133.69	131	7	81.8		
0	75.68*	442	29971	1.24	150.97	148		8136.2		
0	88.09	116197	50595	1.34	175.77	168	15	1.0		NP-237 SN-126 SN-126 CD-109
0	122.09	51997	27386	1.35	243.68	236	13	1.6		PM-147 CO-57
0	136.54	6349	17159	1.32	272.55	268	10	8.1		CO-57
0	165.88	32978	19831	1.37	331.16	324	14	2.1		CE-139
0	228.55	206	7558	0.58	456.38	454		6134.3		
0	255.01	769	9311	1.32	509.23	505	9	45.8		
0	279.07	2171	8742	1.41	557.30	553	10	16.7		HG-203

*Handwritten signature/initials*

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
0	379.35	299	4827	2.15	757.66	755	8	81.3		
0	391.58	19691	9597	1.53	782.10	773	16	2.6		SN-113
0	457.58	1089	10170	2.50	913.99	904	18	43.8		
0	480.70	144	3896	1.71	960.18	958		8151.4		
0	511.03*	420	4832	3.33	1020.79	1015	11	65.2		ANH-511
0	515.55	118	3360	1.45	1029.82	1026		8171.0		KR-85 SR-85
0	577.37	66	2996	0.96	1153.37	1150		8288.9		
0	661.80	61954	5716	1.65	1322.11	1313	16	1.0		BA-137M CS-137
0	667.58	126	2381	0.75	1333.64	1331		7129.6		
0	814.27	294	2746	2.19	1626.84	1623	9	65.2		
0	898.45	23525	6545	1.76	1795.09	1786	19	2.1		Y-88
0	1017.49	130	2288	0.65	2033.05	2030		8128.2		
0	1036.09	87	2227	1.18	2070.24	2068		8189.6		
0	1052.41	95	1899	2.31	2102.87	2102		7153.5		
0	1102.27	137	2179	1.22	2202.53	2200		8118.8		
0	1109.89	173	2424	3.31	2217.76	2214		9104.0		
0	1173.73	67361	2879	1.96	2345.40	2336	18	0.9		CO-60
4	1325.67	458	1131	2.98	2649.18	2641	33	32.2	4.16E+00	
4	1333.06	61340	713	2.03	2663.98	2641	33	0.8		CO-60
0	1510.27	16	751	3.39	3018.32	3011		14736.2		
0	1535.13	46	595	3.76	3068.04	3062		12212.3		
0	1614.39	8	498	0.90	3226.55	3220		10*****		
0	1675.18*	16	467	3.55	3348.13	3338		14584.8		
0	1742.02	21	222	3.85	3481.81	3476		15305.1		
0	1836.69	14792	232	2.31	3671.19	3659	21	1.7		Y-88
0	1946.10	66	124	4.73	3890.04	3880	19	85.0		

Total number of lines in spectrum 40  
 Number of unidentified lines 16  
 Number of lines tentatively identified by NID 24 60.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr	2-Sigma Error	%Error	
			pCi/ea	pCi/ea			
CO-57	270.90D	2.30	8.162E+03	1.874E+04	0.204E+04	10.91	
CO-60	5.27Y	1.12	3.477E+04	3.909E+04	0.171E+04	4.38	
KR-85	10.72Y	1.06	7.443E+03	7.884E+03	13.49E+03	171.09	
SR-85	64.84D	32.2	3.254E+01	1.049E+03	1.795E+03	171.09	
Y-88	106.60D	8.27	1.041E+04	8.608E+04	0.416E+04	4.84	
CD-109	464.00D	1.62	4.882E+05	7.932E+05	0.749E+05	9.44	
SN-113	115.10D	7.08	6.920E+03	4.896E+04	0.339E+04	6.92	
SN-126	1.00E+05Y	1.00	5.001E+04	5.001E+04	0.678E+04	13.56	
BA-137M	30.17Y	1.02	2.245E+04	2.292E+04	0.141E+04	6.16	
CS-137	30.17Y	1.02	2.374E+04	2.423E+04	0.150E+04	6.18	
CE-139	137.66D	5.13	5.804E+03	2.980E+04	0.235E+04	7.90	
PM-147	2.62Y	1.27	6.792E+05	8.595E+05	*****338796.75		
HG-203	46.61D	125.	5.195E+02	6.517E+04	1.197E+04	18.37	
BI-210	22.26Y	1.03	7.838E+05	8.059E+05	0.778E+05	9.65	
PB-210	22.26Y	1.03	7.838E+05	8.059E+05	0.778E+05	9.65	
NP-237	2.14E+06Y	1.00	1.469E+05	1.469E+05	0.333E+05	22.69	
AM-241	432.20Y	1.00	6.467E+04	6.476E+04	0.769E+04	11.87	
ANH-511	1.00E+09Y	1.00	1.142E+02	1.142E+02	0.748E+02	65.50	
Total Activity :			3.117E+06	3.870E+06			

Grand Total Activity : 3.117E+06 3.870E+06

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Configuration : DKA0:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG\_BKG\_GAM19\_\_37.CNF;1

---- Sample Information ----

Sample Title : Weekly Background  
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea  
 Sample Type : bkg Sample Geometry :  
 Sample Number : 37 Spctrm Collector : GAMMA  
 Sample Collector : Sample Analyst : GAMMA

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :  
 Deposition Start : Deposition End : 17-FEB-2006 00:00:00

---- Sample Decay/Count Information ----

Sample Date : 17-FEB-2006 00:00:00 Acquisition date : 17-FEB-2006 16:13:26  
 Decay time : 0 16:13:26.29 % dead time : 0.0%  
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:05.25

---- Detector Parameters ----

Energy cal. time : 16-FEB-2006 08:01:15 Energy cal. oper.: GAMMA  
 Detector name : GAMMA19 Counting geometry:  
 Effic. cal. time : 17-FEB-2006 16:09:06 Effic. cal. oper.: GAMMA

---- Processing Parameters ----

Start channel : 1 End channel : 4096  
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000  
 Critical level? : No Propagate Errors?: No  
 Efficiency Type : SPLINE Library-based eff: No  
 Energy tolerance : 2.00000 Half life ratio : 8.00000  
 Abundance limit : 75.00000 WTM error limit : 3.00000  
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4.87	22944	5059	1.20	9.52	6	10	3.82E-01	0.9	
2	0	10.77	503	3192	1.83	21.31	19	7	8.38E-03	19.5	
3	0	46.07	162	828	0.70	91.82	88	11	2.70E-03	35.3	
4	3	63.47	279	609	1.34	126.58	121	16	4.66E-03	16.4	4.64E-01
5	3	66.08	96	630	1.44	131.78	121	16	1.61E-03	50.8	
6	0	77.22	78	489	1.08	154.05	152	6	1.29E-03	46.6	
7	0	92.66	684	846	1.38	184.88	179	12	1.14E-02	9.3	
8	0	109.37	110	541	1.85	218.26	214	9	1.84E-03	39.2	
9	0	124.25	98	415	2.48	248.00	245	8	1.63E-03	37.5	
10	0	140.18	31	504	0.89	279.82	277	7	5.19E-04	121.0	
11	0	143.61	56	491	1.14	286.68	284	7	9.25E-04	67.6	
12	0	185.75	432	670	1.60	370.85	365	11	7.21E-03	12.6	
13	0	197.66	116	582	2.08	394.66	390	10	1.94E-03	39.8	
14	0	203.91	94	497	1.62	407.14	404	9	1.56E-03	44.0	
15	0	238.82	292	600	1.73	476.88	472	11	4.87E-03	17.3	
16	0	343.60	45	261	1.07	686.23	683	7	7.56E-04	61.4	
17	0	351.92	103	307	1.89	702.86	699	9	1.71E-03	32.3	
18	0	361.10	91	271	2.46	721.20	717	9	1.52E-03	34.1	
19	0	511.03	1376	426	2.54	1020.79	1012	19	2.29E-02	4.5	
20	0	567.19	56	191	1.18	1133.01	1129	8	9.41E-04	44.6	
21	0	583.57	99	224	1.51	1165.76	1161	10	1.65E-03	30.2	
22	0	608.13	63	323	3.71	1214.84	1209	13	1.05E-03	59.9	
23	0	626.63	45	174	2.11	1251.81	1248	10	7.58E-04	56.4	

*W. W. W. W. W.*

24	0	698.96	55	131	1.54	1396.36	1393	7	9.16E-04	37.2
25	0	771.13	26	73	1.38	1540.60	1539	6	4.31E-04	55.3
26	0	803.34	33	132	1.19	1604.98	1602	8	5.45E-04	63.6
27	0	822.83	25	156	3.42	1643.93	1638	13	4.10E-04	106.7
28	0	948.27	18	102	1.73	1894.68	1891	9	2.92E-04	106.4
29	0	970.17	36	139	3.54	1938.46	1930	14	6.02E-04	71.4
30	0	1001.96	48	98	1.56	2002.00	1997	10	7.96E-04	42.0
31	0	1042.67	40	112	1.68	2083.39	2074	14	6.70E-04	58.7
32	0	1048.72	76	125	6.87	2095.48	2087	19	1.27E-03	36.8
33	0	1176.74	22	68	3.74	2351.42	2345	10	3.63E-04	75.6
34	0	1193.55	26	60	1.92	2385.03	2379	9	4.36E-04	57.1
35	0	1258.51	26	68	0.64	2514.91	2507	12	4.29E-04	67.5
36	0	1376.00	38	65	2.57	2749.83	2745	13	6.41E-04	45.3
37	0	1387.60	85	50	7.25	2773.02	2763	22	1.42E-03	23.8
38	0	1661.33	25	54	0.63	3320.44	3310	18	4.17E-04	71.8
39	0	1673.84	34	61	2.90	3345.45	3335	17	5.70E-04	56.0
40	0	1757.47	12	39	1.37	3512.72	3506	11	1.99E-04	105.1
41	0	1765.51	35	52	2.17	3528.81	3523	14	5.83E-04	47.0
42	0	1810.02	14	50	0.98	3617.83	3610	11	2.25E-04	106.5
43	0	1915.09	24	33	3.17	3828.01	3823	13	3.93E-04	54.1
44	0	1956.19	20	24	0.83	3910.24	3903	11	3.36E-04	46.8
45	0	1966.94	7	23	1.26	3931.74	3927	9	1.18E-04	122.7

**Gamma Spectroscopy Calibration Verification**Instrument: Gamma 19Calibration Date: 2/20/2005Geometry: 2L\_MBStandard Id: 70528-278

Isotope		CALIBRATED ACTIVITY (PCI)	MEASURED ACTIVITY (PCI)	DIFFERENCE %
Pb-210		8.2015E+05	8.059E+05	-1.74
Am-241		6.2561E+04	6.476E+04	3.51
Cd-109		8.2579E+05	7.932E+05	-3.95
Co-57		1.9081E+04	1.874E+04	-1.79
Ce-139		2.8981E+04	2.980E+04	2.83
Sn-113		4.8349E+04	4.896E+04	1.26
Cs-137		2.4325E+04	2.423E+04	-0.39
Y-88	1836.06	8.6210E+04	8.608E+04	-0.15
Co-60	1332.5	3.8845E+04	3.909E+04	0.63

Prepared By: *[Signature]*Date: 2/20/06Reviewed By: *[Signature]*Date: 3/23/06

Preset Time and Totals Parameters

Preset Times

Live: 0 00:05:00.00  
Real:  
Maximum Live Time:

Preset Totals

Total: 0  
Start Channel: 1  
End Channel: 4096

Front-End Setup Summary

HVPS Address: NI82E1:1 HVPS ID: 0  
HVPS Voltage: 3000.000  
  
Amp Address: Amp Id: 0  
Amp Gain: 4.05204  
  
ADC Address: ADC Id: 0  
ADC Conv. Gain: 8192 ADC Range: 8192  
  
DSP Address: NI82E1:1 DSP ID: 0

Sample Changer Addr:  
Negative Sample Changer polarity No

ICB Nim Error: No Bad Calibration: No

High Voltage Power Supply Module

Address: NI82E1:1 Type: DSA-2000 ID: 0  
  
Limit: 4000.000 Overload latch enable No  
Voltage: 3000.000 Inhibit latch enable No  
Status: On Negative Output polarity No  
5V/12V inhibit: 5V Rely on module for ramp No

DSA-2000 HVPS Range: 5000.0

ADC Module

Address: Type: DSA-2000 ID: 0  
  
Conv. Gain: 8192 Acq. Mode: PHA  
Range: 8192 Coinc. Mode: Early  
Offset: 0 Peak Detect: Auto  
LLD: 0.10 Anti-coincidence No  
ULD: 100.00 Non-overlap transfer No  
Zero: 0.00



Amplifier Module

Address:                      Type: DSA-2000            ID: 0

Coarse gain: 5.0	BLR Mode: Auto
Fine gain: 0.80	LTC Mode: On
S-fine gain: 0.01	Input Mode: Normal
Shape Mode:	Input Polarity: Positive
Pole Zero: 3255	Inh. Polarity: Positive
Time Const: 0.0            usec	Pileup Reject: Off

DSP Module

Address: NI82E1:1            Type: DSA-2000            ID: 0

Coarse gain: 5.0	Gain Centroid: 7680
Fine gain: 0.7967	Gain Window: 8
S-fine gain: 0.013729	Gain Spacing: 64
Pole Zero: 3255	Gain Ratio: 1.000
Coinc. mode: Anti.	Zero Centroid: 512
Offset: 0	Zero Window: 8
LLD: 0.10	Zero Spacing: 64
Zero: 0.000	Zero Ratio: 1.000
Conv. Gain: 8192	Gain Rate div: 1
ADC Range: 8192	Zero Rate div: 1
FDisc Mode: Auto	Gain Corr. rng: Ge
Fast Disc.: 1.000	Zero Corr. rng: Ge
Inp. Polarity: Positive	Zero Mode: Off
Inh. Polarity: Positive	Gain Mode: Off
Rise Time: 18.400	Preamp Type: RC
Flat Top: 1.200	PUR Mode: On
BLR Mode: Auto	PUR Guard: 1.1
Live Time Trim: 250	TRP Inhibit: Reset

# General Engineering Laboratories, LLC

2040 Savage Road, Charleston, SC 29414  
(803)556-8171

## Gamma Spectrometer Geometry Calibration Package

Detector: WELL

Geometry: ZL\_MB

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondard standard(s) documentation? the nuclide library used? the VMS certificate file?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	N/A
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2) Is the detector efficiency curve printout included?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3) Is the efficiency calibration report included and reviewed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4) Is the raw count data included for: the calibration peak report? the calibration verification PEAK report? the calibration verification NID report? the last instrument background?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5) Are the calibration verification calculations included?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6) Are the instrument settings included: amp, HVPS, ADC settings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Prepared By: Michael J. [Signature]

Date: 12/14/05

Reviewed By: [Signature]

Date: 12/14/05

Effective Date: 12/13/05

# General Engineering Laboratories, LLC

2040 Savage Road, Charleston, SC 29414  
(803)556-8171

## Gamma Spectrometer Front End Electronics Setup

Detector: Well

Date Performed: 12/12/05

Performed By: Muhafitton

<p><b>High Voltage Power Supply</b></p> <p>Model No. <u>3106D</u> High Voltage <u>2.5KV</u></p>	<p><b>Spectroscopy Amplifier</b></p> <p>Model No. <u>2026</u> Course Gain <u>20</u> Fine Gain <u>0.542</u> Time Constant <u>4 <math>\mu</math> sec.</u> Input polarity <u>POSITIVE</u> BSLR rate <u>N/A</u> BSLR mode <u>N/A</u> Threshold <u>N/A</u></p>
<p><b>ADC</b></p> <p>Model No. <u>8701</u> Gain <u>4000</u></p>	
<p><b>AIM Module</b></p> <p>Model No. <u>556A</u> Address <u>NIE04:2</u></p>	

**Gamma Spectroscopy Calibration Verification**Instrument: WellCalibration Date: 12/13/2005Geometry: 2L\_MBStandard Id: 70528-278

Isotope		CALIBRATED ACTIVITY (PCI)	MEASURED ACTIVITY (PCI)	DIFFERENCE %
Pb-210		8.2015E+05	7.874E+05	-3.99
Am-241		6.2561E+04	6.587E+04	5.29
Cd-109		8.2579E+05	8.252E+05	-0.07
Co-57		1.9081E+04	1.870E+04	-2.00
Ce-139		2.8981E+04	2.896E+04	-0.07
Sn-113		4.8349E+04	4.870E+04	0.73
Cs-137		2.4325E+04	2.518E+04	3.51
Y-88	1836.06	8.6210E+04	8.641E+04	0.23
Co-60	1332.5	3.8845E+04	3.874E+04	-0.27

Prepared By: Muchup [Signature]Date: 12/13/05Reviewed By: [Signature]Date: 12/14/05

Verified:

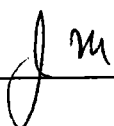
QA filename : DKA300:[CANBERRA.GAMMA]QC\_BKG\_WELL.QAF;2

Sample ID : BKG\_WELL Sample quantity : 1.80 LITER  
Sample date : 10-DEC-2005 00:00:00 Acquisition date : 10-DEC-2005 19:27:01  
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:12.72

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
BACKGROUND (GROSS COUNTS)	8.07E+04	1.24E+05	1.01E+05	
BACKGROUND (CPS)	1.34	2.06	1.68	

Flags: "\*" means the out-of-range test is parameter-dependent

Approved by:  Approval Date: 2 / 11 / 05

```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                       *
*                               Charleston, SC 29414                                   *
*****
Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_WELL_2LMB.CNF;2
Sample date       : 1-APR-2005 12:00:00. Acquisition date : 13-DEC-2005 11:29:45
Sample ID        : VER_WELL_2LMB           Sample quantity  : 1.00000E+00 LITER
Detector name    : WELL                    Detector geometry: 2L_MB
Elapsed live time: 0 02:30:00.00           Elapsed real time: 0 02:31:43.86  1.1%
Energy tolerance : 2.00000 KEV             Analyst Initials  : MJH1
Abundance limit  : 75.00000                Sensitivity       : 3.00000
Batch ID        :                          Detector SN#     : 3941466
Matrix Spike DPM :                          LCS DPM      :
*****

```

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	33.09	1432	52446	1.30	65.14	63	7	1.59E-01	26.6	
2	1	38.18*	1164	31197	1.37	75.25	73	24	1.29E-01	21.4	2.24E+02
3	1	40.69*	4583	61276	1.37	80.25	73	24	5.09E-01	9.5	
4	1	46.50*	52806	57740	1.39	91.79	73	24	5.87E+00	0.9	
5	0	50.00	934	50839	1.88	98.74	97	7	1.04E-01	40.1	
6	0	59.39	81406	92583	1.34	117.40	110	15	9.05E+00	0.9	
7	10	67.14	2659	27609	2.19	132.80	130	18	2.95E-01	9.6	3.07E+00
8	10	70.36	3216	100881	3.40	139.18	130	18	3.57E-01	23.3	
9	0	88.03*	137668	71721	1.33	174.29	167	15	1.53E+01	0.5	
10	0	122.11	63509	37512	1.37	242.00	236	13	7.06E+00	0.7	
11	0	136.53	7730	21196	1.33	270.65	266	9	8.59E-01	3.6	
12	0	165.91*	46765	29021	1.40	329.03	321	15	5.20E+00	0.9	
13	0	222.40	203	12987	1.28	441.27	438	8	2.25E-02	97.8	
14	0	254.88	1317	12753	1.71	505.82	502	10	1.46E-01	16.3	
15	0	279.30*	5604	11863	1.49	554.34	549	11	6.23E-01	4.0	
16	0	297.77*	75	6443	1.41	591.04	590	7	8.28E-03	179.3	
17	0	343.13*	75	5547	0.98	681.17	679	7	8.35E-03	165.1	
18	0	348.63	205	3815	1.43	692.11	690	5	2.27E-02	45.9	
19	0	391.73*	26457	9321	1.57	777.76	772	13	2.94E+00	1.0	
20	0	415.30	148	3973	1.43	824.61	823	6	1.65E-02	67.6	
21	0	432.51	223	5208	0.71	858.80	856	8	2.47E-02	56.5	
22	0	466.83*	289	5167	1.56	927.02	924	8	3.21E-02	43.5	
23	0	487.16	341	4927	1.64	967.42	964	9	3.79E-02	37.5	
24	0	510.88*	598	5898	2.43	1014.56	1009	11	6.65E-02	25.3	
25	0	661.65*	52330	7856	1.75	1314.25	1306	17	5.81E+00	0.6	
26	0	707.69	257	3271	1.59	1405.77	1402	9	2.86E-02	40.5	
27	0	770.29*	112	2701	0.85	1530.22	1527	8	1.24E-02	81.0	
28	0	774.63	183	2373	1.51	1538.86	1536	7	2.03E-02	44.8	
29	0	799.95*	68	2408	1.38	1589.19	1588	7	7.60E-03	119.7	
30	0	813.73*	624	3838	1.30	1616.58	1611	11	6.93E-02	19.7	
31	0	819.82*	79	2143	1.39	1628.69	1627	6	8.78E-03	93.2	
32	0	897.98*	29940	7548	1.92	1784.10	1774	19	3.33E+00	0.9	
33	0	924.35	149	2774	1.91	1836.53	1834	7	1.66E-02	59.0	
34	0	959.15	92	3358	0.67	1905.73	1904	8	1.02E-02	109.5	
35	0	1070.18	153	2302	1.40	2126.51	2123	8	1.70E-02	54.8	
36	0	1144.88*	21	1819	0.53	2275.07	2274	9	2.28E-03	375.5	
37	0	1173.19*	56593	3919	2.12	2331.38	2320	23	6.29E+00	0.5	
38	4	1325.83	897	1524	3.22	2634.98	2623	36	9.97E-02	11.5	2.33E+01

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
39	4	1332.46*	50796	1062	2.32	2648.17	2623	36	5.64E+00	0.5	
40	0	1686.14	76	324	2.38	3351.82	3349	9	8.41E-03	44.5	
41	0	1690.00	42	158	1.23	3359.49	3357	5	4.65E-03	47.7	
42	0	1744.42	28	148	1.19	3467.77	3464	9	3.16E-03	79.7	
43	0	1813.79	15	257	3.86	3605.82	3601	13	1.61E-03	229.0	
44	0	1836.05*	18059	625	2.51	3650.13	3638	24	2.01E+00	0.8	
45	0	1954.67	16	37	1.33	3886.21	3884	5	1.78E-03	62.5	

Flag: "\*" = Peak area was modified by background subtraction

VAX/VMS Nuclide Identification Report Generated

\*\*\*\*\*  
 \* General Eng. Labs, LLC. \*  
 \* 2040 Savage Road \*  
 \* Charleston, SC 29414 \*  
 \*\*\*\*\*

DETECTOR DATA

\* Configuration : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER\_WELL\_2LM \*  
 \* Acquisition date : 13-DEC-2005 11:29:45 Detector SN# : 3941466 \*  
 \* Detector ID : WELL Sensitivity : 3.000 \*  
 \* Geometry : 2L\_MB Energy tolerance: 2.000 \*  
 \* Elapsed live time: 0 02:30:00.00 Abundance limit : 75.000 \*  
 \* Elapsed real time: 0 02:31:43.86 Half life ratio : 8.000 \*  
 \*\*\*\*\*

SAMPLE DATA

\* Sample date : 1-APR-2005 12:00:00 Nuclide Library : FERMC \*  
 \* Sample ID : VER\_WELL\_2LMB Analyst initials: MJH1 \*  
 \* Batch Number : Sample Quantity : 1.0000E+00 LITER \*  
 \* Recovery : 1.00000 Carrier Weight : 0.00000 \*  
 \*\*\*\*\*

QC DATA

\* Standard Weight : 0.00000 \*  
 \* CALIB. DATE/TIME : 13-DEC-2005 09:34:01 MS Isotope : \*  
 \* MSD DPM : \*\*\*\*\* MSD Isotope : \*  
 \* LCS DPM : 0.000 LCS Isotope : \*  
 \* LCSD DPM : 0.000 LCSD Isotope : \*  
 \*\*\*\*\*

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER )	Act error	MDA (pCi/LITER )	
CO-57	1.870E+04	2.791E+02	1.953E+02	0.000E+00
CO-60	3.874E+04	3.608E+02	1.054E+02	0.000E+00
Y-88	8.641E+04	1.434E+03	3.479E+02	0.000E+00
CD-109	8.252E+05	8.358E+03	5.046E+03	0.000E+00
SN-113	4.870E+04	9.472E+02	6.806E+02	0.000E+00
CS-137	2.518E+04	2.947E+02	1.497E+02	0.000E+00
CE-139	2.896E+04	5.322E+02	3.423E+02	0.000E+00
HG-203	6.242E+04	4.989E+03	4.823E+03	0.000E+00
PB-210	7.874E+05	1.451E+04	1.518E+04	0.000E+00
AM-241	6.587E+04	1.177E+03	7.545E+02	0.000E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER )	K.L. Act error ( )	Ided	MDA (pCi/LITER )	
---------	--------------------------------	--------------------	------	------------------	--



```

*****
*                               GENERAL ENG. LABS, LLC.                               *
*                               2040 Savage Road                                   *
*                               Charleston, SC 29414                               *
*****
Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_WELL_2LMB.CNF;2
Sample date        : 1-APR-2005 12:00:00. Acquisition date : 13-DEC-2005 11:29:45
Sample ID          : VER_WELL_2LMB          Sample quantity  : 1.00000E+00 LITER
Detector name     : WELL                   Detector geometry: 2L_MB
Elapsed live time : 0 02:30:00.00          Elapsed real time: 0 02:31:43.86  1.1%
Energy tolerance  : 2.00000 KEV           Analyst Initials  : MJH1
Abundance limit   : 75.00000              Sensitivity       : 3.00000
Batch ID          :                       Detector SN#     : 3941466
Matrix Spike DPM  :                       LCS DPM       :
*****

```

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
CO-57	122.06	63509	85.51*	2.292E+00	9.731E+03	1.870E+04	1.49
	136.47	7730	10.47	2.297E+00	9.654E+03	1.855E+04	7.17
CO-60	1173.24	56593	99.90	4.757E-01	3.576E+04	3.922E+04	1.02
	1332.50	50796	99.98*	4.318E-01	3.533E+04	3.874E+04	0.93
Y-88	898.04	29940	93.40	5.833E-01	1.650E+04	8.717E+04	1.81
	1836.06	18059	99.38*	3.336E-01	1.636E+04	8.641E+04	1.66
CD-109	88.03	137668	3.79*	1.942E+00	5.617E+05	8.252E+05	1.01
SN-113	391.70	26457	64.90*	1.175E+00	1.042E+04	4.870E+04	1.95
CS-137	661.66	52330	85.12*	7.452E-01	2.478E+04	2.518E+04	1.17
CE-139	165.85	46765	80.35*	2.191E+00	7.976E+03	2.896E+04	1.84
HG-203	70.83	3216	4.75	1.453E+00	1.399E+04	6.305E+05	46.57
	72.87	-----	8.00	1.538E+00	-----	Line Not Found	-----
	82.60	-----	3.55	1.818E+00	-----	Line Not Found	-----
	279.20	5604	77.30*	1.572E+00	1.385E+03	6.242E+04	7.99
PB-210	46.50	52806	4.05*	5.082E-01	7.704E+05	7.874E+05	1.84
AM-241	59.54	81406	35.90*	1.035E+00	6.579E+04	6.587E+04	1.79

Flag: "\*" = Keyline

Summary of Nuclide Activity

Sample ID : VER\_WELL\_2LMB

Acquisition date : 13-DEC-2005 11:29:45

Total number of lines in spectrum 45  
 Number of unidentified lines 31  
 Number of lines tentatively identified by NID 14 31.11%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.92	9.731E+03	1.870E+04	0.028E+04	1.49	
CO-60	5.27Y	1.10	3.533E+04	3.874E+04	0.036E+04	0.93	
Y-88	106.63D	5.28	1.636E+04	8.641E+04	0.143E+04	1.66	
CD-109	461.40D	1.47	5.617E+05	8.252E+05	0.084E+05	1.01	
SN-113	115.09D	4.67	1.042E+04	4.870E+04	0.095E+04	1.95	
CS-137	30.00Y	1.02	2.478E+04	2.518E+04	0.029E+04	1.17	
CE-139	137.64D	3.63	7.976E+03	2.896E+04	0.053E+04	1.84	
HG-203	46.60D	45.1	1.385E+03	6.242E+04	0.499E+04	7.99	
PB-210	22.26Y	1.02	7.704E+05	7.874E+05	0.145E+05	1.84	
AM-241	432.20Y	1.00	6.579E+04	6.587E+04	0.118E+04	1.79	
Total Activity :			1.504E+06	1.988E+06			

Grand Total Activity : 1.504E+06 1.988E+06

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	33.09	1432	52446	1.30	65.14	63	7	1.59E-01	53.3	1.11E-01	
1	38.18	1164	31197	1.37	75.25	73	24	1.29E-01	42.7	2.29E-01	
1	40.69	4583	61276	1.37	80.25	73	24	5.09E-01	19.0	3.03E-01	
0	50.00	934	50839	1.88	98.74	97	7	1.04E-01	80.2	6.47E-01	
10	67.14	2659	27609	2.19	132.80	130	18	2.95E-01	19.1	1.34E+00	
0	222.40	203	12987	1.28	441.27	438	8	2.25E-02	****	1.87E+00	
0	254.88	1317	12753	1.71	505.82	502	10	1.46E-01	32.6	1.69E+00	
0	297.77	75	6443	1.41	591.04	590	7	8.28E-03	****	1.49E+00	
0	343.13	75	5547	0.98	681.17	679	7	8.35E-03	****	1.32E+00	
0	348.63	205	3815	1.43	692.11	690	5	2.27E-02	91.8	1.30E+00	
0	415.30	148	3973	1.43	824.61	823	6	1.65E-02	****	1.12E+00	
0	432.51	223	5208	0.71	858.80	856	8	2.47E-02	****	1.08E+00	
0	466.83	289	5167	1.56	927.02	924	8	3.21E-02	87.1	1.01E+00	
0	487.16	341	4927	1.64	967.42	964	9	3.79E-02	75.0	9.69E-01	
0	510.88	598	5898	2.43	1014.56	1009	11	6.65E-02	50.7	9.29E-01	
0	707.69	257	3271	1.59	1405.77	1402	9	2.86E-02	81.0	7.05E-01	
0	770.29	112	2701	0.85	1530.22	1527	8	1.24E-02	****	6.58E-01	
0	774.63	183	2373	1.51	1538.86	1536	7	2.03E-02	89.7	6.55E-01	
0	799.95	68	2408	1.38	1589.19	1588	7	7.60E-03	****	6.39E-01	
0	813.73	624	3838	1.30	1616.58	1611	11	6.93E-02	39.3	6.30E-01	
0	819.82	79	2143	1.39	1628.69	1627	6	8.78E-03	****	6.26E-01	
0	924.35	149	2774	1.91	1836.53	1834	7	1.66E-02	****	5.70E-01	
0	959.15	92	3358	0.67	1905.73	1904	8	1.02E-02	****	5.54E-01	
0	1070.18	153	2302	1.40	2126.51	2123	8	1.70E-02	****	5.10E-01	
0	1144.88	21	1819	0.53	2275.07	2274	9	2.28E-03	****	4.85E-01	
4	1325.83	897	1524	3.22	2634.98	2623	36	9.97E-02	23.0	4.33E-01	
0	1686.14	76	324	2.38	3351.82	3349	9	8.41E-03	89.0	3.58E-01	
0	1690.00	42	158	1.23	3359.49	3357	5	4.65E-03	95.3	3.58E-01	
0	1744.42	28	148	1.19	3467.77	3464	9	3.16E-03	****	3.48E-01	
0	1813.79	15	257	3.86	3605.82	3601	13	1.61E-03	****	3.37E-01	
0	1954.67	16	37	1.33	3886.21	3884	5	1.78E-03	****	3.16E-01	

Flags: "T" = Tentatively associated

```
*****
*                                     *
*                               GENERAL ENG. LABS, LLC.                       *
*                               2040 Savage Road                             *
*                               Charleston, SC 29414                         *
*****
```

```
*****
*                               DETECTOR DATA                               *
*****
* Configuration      : DKA300:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_WELL_2LMB.CNF;2 *
* Acquisition date   : 13-DEC-2005 11:29:45  Detector SN#      : 3941466      *
* Detector ID        : WELL                      Sensitivity      : 3.00000      *
* Geometry           : 2L_MB                     Energy tolerance: 2.00000      *
* Elapsed live time  : 0 02:30:00.00             Abundance limit  : 75.00000      *
* Elapsed real time  : 0 02:31:43.86             Half life ratio  : 8.00000      *
*****
```

```
*****
*                               SAMPLE DATA                               *
*****
* Sample date        : 1-APR-2005 12:00:00.  Nuclide Library  : CAL          *
* Sample ID          : VER_WELL_2LMB          Analyst initials: MJH1         *
* Batch Number       :                       Sample Quantity  : 1.00000E+00 LITER *
*****
```

```
*****
*                               QC DATA                               *
*****
* CALIB. DATE/TIME  : 13-DEC-2005 09:34:01.1MS Isotope      :          *
* MSD DPM           :                          MSD Isotope    :          *
* LCS DPM           :                          LCS Isotope    :          *
*****
```

Combined Activity-MDA Report

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act error	MDA (pCi/LITER)	MDA error	Act/MDA
CO-57	1.870E+04	2.791E+02	1.953E+02	0.000E+00	95.764
CO-60	3.874E+04	3.608E+02	1.054E+02	0.000E+00	367.458
Y-88	8.641E+04	1.434E+03	3.479E+02	0.000E+00	248.354
CD-109	8.252E+05	8.358E+03	5.046E+03	0.000E+00	163.524
SN-113	4.870E+04	9.472E+02	6.806E+02	0.000E+00	71.551
CS-137	2.518E+04	2.947E+02	1.497E+02	0.000E+00	168.230
CE-139	2.896E+04	5.322E+02	3.423E+02	0.000E+00	84.587
HG-203	6.242E+04	4.989E+03	4.823E+03	0.000E+00	12.942
PB-210	7.874E+05	1.451E+04	1.518E+04	0.000E+00	51.866
AM-241	6.587E+04	1.177E+03	7.545E+02	0.000E+00	87.303

\*\*\*\*\*  
 \* GENERAL ENG. LABS, LLC. \*  
 \* 2040 Savage Road \*  
 \* Charleston, SC 29414 \*  
 \*\*\*\*\*

Configuration : MCA0:[GAMMA]WELL\$1  
 Sample date : 1-APR-2005 12:00:00. Acquisition date : 12-DEC-2005 13:33:22  
 Sample ID : CAL\_WELL\_2LMB Sample quantity : 1.00000E+00 LITER  
 Detector name : WELL Detector geometry: WELL  
 Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:01:23.60 1.1%  
 Energy tolerance : 2.00000 KEV Analyst Initials : MJH1  
 Abundance limit : 75.00000 Sensitivity : 3.00000  
 Batch ID : Detector SN# : 3941466  
 Matrix Spike DPM : LCS DPM :  
 \*\*\*\*\*

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	32.59	1042	48353	1.44	64.15	63	8	1.45E-01	36.7	
2	1	39.69	1232	26337	1.37	78.25	76	21	1.71E-01	18.5	1.32E+02
3	1	46.49	42811	48105	1.39	91.77	76	21	5.95E+00	1.0	
4	0	59.42	65118	69944	1.33	117.44	110	14	9.04E+00	1.0	
5	10	68.76	3875	53665	3.39	136.01	130	20	5.38E-01	12.1	2.72E+00
6	10	72.74	1216	49822	1.84	143.92	130	20	1.69E-01	35.7	
7	0	88.04	108976	58670	1.33	174.31	167	15	1.51E+01	0.6	
8	0	122.09	52212	36478	1.37	241.97	234	16	7.25E+00	0.9	
9	0	136.53	6296	19037	1.33	270.66	266	10	8.74E-01	4.3	
10	0	165.93	37138	20508	1.39	329.06	322	13	5.16E+00	0.9	
11	0	184.11	120	10693	0.55	365.18	362	8	1.67E-02	149.3	
12	0	207.62	181	6366	1.28	411.90	410	5	2.51E-02	66.7	
13	0	255.23	1017	8126	1.42	506.51	503	8	1.41E-01	15.7	
14	0	279.22	4771	9449	1.41	554.17	549	11	6.63E-01	4.2	
15	0	310.35	183	3477	1.40	616.04	614	5	2.54E-02	48.9	
16	0	321.38	135	5518	0.91	637.96	636	8	1.87E-02	95.8	
17	0	391.76	21207	8213	1.53	777.81	771	14	2.95E+00	1.1	
18	0	419.40	180	3614	1.60	832.74	829	7	2.50E-02	55.8	
19	0	510.70	794	4500	1.82	1014.21	1009	11	1.10E-01	16.7	
20	0	532.76	51	2635	1.22	1058.06	1055	7	7.04E-03	168.5	
21	0	584.01	135	2080	1.29	1159.92	1157	6	1.88E-02	54.1	
22	0	639.97	247	2426	1.83	1271.16	1268	7	3.43E-02	33.6	
23	0	652.34	155	2536	0.91	1295.74	1293	7	2.15E-02	54.5	
24	0	661.67	41764	6504	1.76	1314.30	1305	17	5.80E+00	0.7	
25	0	813.96	451	2793	1.98	1617.04	1613	10	6.26E-02	22.5	
26	0	848.57	111	2636	0.92	1685.85	1683	9	1.54E-02	83.9	
27	0	854.51	160	2194	1.59	1697.67	1694	8	2.22E-02	51.3	
28	0	876.44	147	2353	1.97	1741.27	1737	8	2.04E-02	57.7	
29	0	898.03	23855	4660	1.92	1784.19	1777	14	3.31E+00	0.9	
30	0	981.35	217	2537	1.52	1949.86	1946	10	3.01E-02	44.0	
31	0	1082.73	96	1364	0.97	2151.46	2150	6	1.33E-02	61.9	
32	0	1128.22	173	1847	1.56	2241.95	2237	11	2.41E-02	48.6	
33	0	1173.19	44711	3264	2.09	2331.38	2320	21	6.21E+00	0.6	
34	0	1258.60	29	443	1.04	2501.25	2496	7	4.04E-03	122.0	
35	1	1325.06	439	1159	2.42	2633.44	2624	35	6.09E-02	16.2	1.61E+01
36	1	1332.49	40523	955	2.33	2648.23	2624	35	5.63E+00	0.5	
37	0	1489.27	31	301	0.53	2960.11	2958	6	4.28E-03	90.6	
38	1	1645.30	102	290	2.56	3270.54	3266	19	1.41E-02	31.0	3.60E+00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
39	1	1648.31	129	439	2.56	3276.54	3266	19	1.79E-02	37.8	
40	1	1651.29	117	132	2.57	3282.46	3266	19	1.63E-02	17.1	
41	0	1775.32	21	103	1.47	3529.28	3526	9	2.93E-03	90.0	
42	0	1836.09	14647	430	2.53	3650.20	3639	25	2.03E+00	0.9	
43	0	1933.32	17	91	1.46	3843.72	3843	13	2.35E-03	117.4	
44	0	1958.91	14	19	0.95	3894.64	3892	6	1.98E-03	56.3	
45	0	2008.67	27	23	0.68	3993.69	3990	8	3.68E-03	37.3	

Configuration : MCA0:[GAMMA]WELL\$1  
 Analyses by : CALIBRATE V1.7,PEAK V16.4  
 Detector Name : WELL Energy Calib Time: 13-DEC-2005 09:34:01  
 Efficiency type : Empirical Effncy Calib Time: 13-DEC-2005 09:34:01  
 Detector Geometry: WELL Shelf : 0

Energy Calibration Report

$$\text{Energy} = 0.2987 + 0.5034 * \text{Channel} + -1.2315E-07 * (\text{Channel} ** 2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	91.73	46.50	46.47	0.026
2	117.44	59.54	59.42	0.121
3	174.31	88.03	88.04	-0.006
4	242.00	122.06	122.11	-0.050
5	329.06	165.85	165.93	-0.073
6	777.81	391.70	391.76	-0.055
7	1314.30	661.66	661.67	-0.014
8	1784.19	898.04	898.03	0.016
9	2331.37	1173.24	1173.19	0.051
10	2648.23	1332.50	1332.49	0.008
11	3650.20	1836.06	1836.09	-0.024

FWHM Calibration Report

$$\text{FWHM} = 1.046 + 3.1639E-02 * (\text{Energy} ** 1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.50	1.48	1.26	0.215
2	59.54	1.33	1.29	0.036
3	88.03	1.33	1.34	-0.010
4	122.06	1.37	1.40	-0.028
5	165.85	1.39	1.45	-0.064
6	391.70	1.52	1.67	-0.148
7	661.66	1.76	1.86	-0.102
8	898.04	1.92	1.99	-0.075
9	1173.24	2.09	2.13	-0.043
10	1332.50	2.30	2.20	0.094
11	1836.06	2.53	2.40	0.124

Efficiency Calibration Report

$$\text{Eff} = \exp(a2 + a3 * x + a4 * x ** 2 + a5 * x ** 3 + a6 * x ** 4 + a7 * x ** 5), \quad x = \ln(a1 / \text{energy})$$

a1      a2      a3      a4      a5      a6      a7  
 941.3   -5.181   0.7697   6.0649E-02   7.6903E-02   -6.1801E-02   0.0000E+00

Average Deviation = 1.73 %      Reduced Chi-Square = 0.889

Nbr	Energy (KEV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ Error	% Diff
-----	--------------	---------------------	------------------	---------------------	-------------	--------

1	46.50	4.95E-03	1.58E-04	5.08E-03	-0.83	-2.65
---	-------	----------	----------	----------	-------	-------



Nbr	Energy (KEV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
2	59.54	1.09E-02	3.43E-04	1.04E-02	1.42	4.47
3	88.03	1.92E-02	6.42E-04	1.94E-02	-0.41	-1.39
4	122.06	2.28E-02	7.15E-04	2.29E-02	-0.15	-0.46
5	165.85	2.16E-02	6.40E-04	2.19E-02	-0.43	-1.27
6	391.70	1.18E-02	3.35E-04	1.18E-02	0.12	0.33
7	661.66	7.69E-03	2.36E-04	7.45E-03	1.03	3.16
8	898.04	5.73E-03	1.58E-04	5.83E-03	-0.62	-1.72
9	1173.24	4.79E-03	1.32E-04	4.76E-03	0.22	0.61
10	1332.50	4.24E-03	1.12E-04	4.32E-03	-0.72	-1.90
11	1836.06	3.37E-03	9.29E-05	3.34E-03	0.38	1.04

Approved by: *Michael P. ...*  
*Let's check*

Approval Date: 12 / 14 / 05  
*12/14/05*

Print Time : 14-JUN-2005 17:33:53.22  
 Certificate file name : DKA300:[CANBERRA.GAMMA]70528-278.CER;1  
 Certificate title : 2L MB  
 Certificate date : 1-APR-2005 12:00:00.00  
 Certificate quantity : 1.00000E+00

Rcd	Nuclide	Halflife	CAL/ INIT	Energy	Rate	%Abun	Activity (uCi)
1	AM-241	432.20Y	Yes	59.54	8.3100E+02	35.90	6.2561E-02
2	CD-109	462.60D	No	88.03	1.1580E+03	3.79	8.2579E-01
3	Co-57	271.79D	No	122.06	6.0370E+02	85.51	1.9081E-02
4	CE-139	137.60D	No	165.85	8.6160E+02	80.35	2.8981E-02
5	SN-113	115.10D	No	391.70	1.1610E+03	64.90	4.8349E-02
6	CS-137	30.07Y	Yes	661.66	7.6610E+02	85.12	2.4325E-02
7	Y-88	106.60D	No	898.04	3.0350E+03	93.40	8.7823E-02
8	Y-88	106.60D	Yes	1836.06	3.1700E+03	99.38	8.6210E-02
9	CO-60	5.27Y	Yes	1173.24	1.4220E+03	99.90	3.8471E-02
10	CO-60	5.27Y	No	1332.50	1.4370E+03	99.98	3.8845E-02
11	PB-210	22.30Y	No	46.50	1.2290E+03	4.05	8.2015E-01

Library Title :  
 Library file name : DKA300:[CANBERRA.GAMMA]CAL.NLB;1  
 Date printed : 6-DEC-2004 10:31:17.67  
 Number of nuclides : 10  
 Number of lines : 17

Nuclide Name	Half-Life	Nuclide Type	Key Line	Energy	Abundance
CO-57	271.74D		*	122.06 keV	85.51 %
				136.47 keV	10.47 %
CO-60	5.27Y		*	1173.24 keV	99.90 %
				1332.50 keV	99.98 %
Y-88	106.63D		*	898.04 keV	93.40 %
				1836.06 keV	99.38 %
CD-109	461.40D		*	88.03 keV	3.79 %
SN-113	115.09D		*	391.70 keV	64.90 %
CS-137	30.00Y		*	661.66 keV	85.12 %
CE-139	137.64D		*	165.85 keV	80.35 %
HG-203	46.60D			70.83 keV	4.75 %
				72.87 keV	8.00 %
				82.60 keV	3.55 %
PB-210	22.26Y		*	279.20 keV	77.30 %
				46.50 keV	4.05 %
AM-241	432.20Y		*	59.54 keV	35.90 %



**CERTIFICATE OF CALIBRATION**  
**Standard Radionuclide Source**

70528-278

2.0 Liter Solid in 230G GA-MA Beaker

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 and Pb-210 were calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma ray emission rates for the most intense gamma-ray lines are given. Analytical maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in US NRC Regulatory Guide 4.15, Revision 1, February 1979.

US Patent 4,430,258; UK Patent GB2,149,194B; CA Patent 1,196,776.  
Density of solid matrix 1.15 g/cc.

Calibration Date: April 1, 2005 12:00 EST

ISOTOPE	GAMMA ENERGY	HALF-LIFE		GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Pb-210	46.5	22.3	y	1229	3.0
Am-241	59.5	432.2	y	831.0	3.0
Cd-109	88	462.6	d	1158	3.3
Co-57	122	271.79	d	603.7	3.0
Ce-139	166	137.6	d	861.6	2.8
Hg-203	279	46.61	d	1864	2.7
Sn-113	392	115.1	d	1161	2.6
Cs-137	662	30.07	y	766.1	3.0
Y-88	898	106.6	d	3035	2.6
Co-60	1173	5.271	y	1422	2.7
Co-60	1332	5.271	y	1437	2.6
Y-88	1836	106.6	d	3170	2.6

P O NUMBER 2832RD, Item 1

SOURCE PREPARED BY: M. Dimitrova  
M. Dimitrova, Radiochemist

Q A APPROVED: W.M. [Signature] 5-12-05

This standard will expire one year after the calibration date.

# General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414

(843)556-8171

## Lucas Cell Calibration Package

101-112

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	<input checked="" type="checkbox"/>		
2) Is the efficiency calibration report included?	<input checked="" type="checkbox"/>		
3) Is the raw count data included for: Cell constant determination? Plateau generation?	<input checked="" type="checkbox"/>		
4) Are the calibration verifications included?	<input checked="" type="checkbox"/>		
5) Are the instrument settings included: HVPS settings?	<input checked="" type="checkbox"/>		
6) Has the CELLEFF.xls file been updated?	<input checked="" type="checkbox"/>		
7) Have the calibration dates been updated in ALPHALIMS?	<input checked="" type="checkbox"/>		

Prepared By: Alden Baul

Date: 3/14/06

Reviewed By: Amanda L. Lehn

Date: 3/27/06

Effective Date: 3/27/06

# Ra-226 Cell Constants

Standard ID: 0299-G  
Volume added (mL): 0.1  
Standard Reference Activity (DPM/mL): 2446.35

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/Time flushed to cell	Date/Time end of degas	Bkg Counts	cpm	Activity dpm	Known activity dpm	t1 (days) end-degas to flush	t2 (days) end-flush to count	t3 (days) Std Ref Date to count	Decay from Std Ref Date to count
101	1.835	Average 1.860	3/18/2006 10:15	3/18/2006 7:05	3/15/2006 10:20	6	0.200	176.97	244.63	2.86458	0.13194	2285	0.9973
101	2.017	Stdev 0.147	2/8/2006 12:50	2/8/2006 9:40	2/5/2006 11:00	8	0.267	198.73	244.63	2.94444	0.13194	2248	0.9973
101	1.727	1	2/13/2006 12:30	2/13/2006 8:35	2/10/2006 7:30	6	0.200	173.50	244.63	3.04514	0.16319	2253	0.9973
102	1.712	Average 1.873	2/3/2006 11:45	2/3/2006 8:40	1/31/2006 13:10	6	0.200	162.83	244.63	2.81250	0.12847	2242	0.9973
102	2.003	Stdev 0.148	3/18/2006 10:45	3/18/2006 7:35	3/15/2006 10:20	5	0.167	194.17	244.63	2.88542	0.13194	2285	0.9973
102	1.906	2	2/13/2006 13:05	2/13/2006 9:20	2/10/2006 7:30	7	0.233	579.4	244.63	3.07639	0.15625	2253	0.9973
103	1.864	Average 1.806	2/3/2006 17:10	2/3/2006 9:15	1/31/2006 13:10	5	0.167	172.13	244.63	2.83681	0.32966	2243	0.9973
103	1.773	Stdev 0.050	3/18/2006 14:34	3/18/2006 7:50	3/15/2006 10:20	7	0.233	503.7	244.63	2.89583	0.28056	2286	0.9973
103	1.782	3	2/13/2006 13:40	2/13/2006 10:00	2/10/2006 7:30	5	0.167	181.90	244.63	3.10417	0.15278	2253	0.9973
104	1.869	Average 1.957	2/3/2006 17:52	2/3/2006 9:40	1/31/2006 13:10	2	0.087	546.6	244.63	2.85417	0.34167	2243	0.9973
104	1.997	Stdev 0.048	2/8/2006 14:50	2/8/2006 11:50	2/5/2006 11:00	2	0.067	604.0	244.63	3.03472	0.12500	2248	0.9973
104	1.903	4	2/13/2006 14:15	2/13/2006 10:35	2/10/2006 7:30	5	0.167	195.40	244.63	3.12847	0.15278	2253	0.9973
105	1.486	Average 1.551	2/3/2006 18:37	2/3/2006 10:20	1/31/2006 13:10	1	0.033	415.1	244.63	2.88194	0.34514	2243	0.9973
105	1.581	Stdev 0.057	2/8/2006 15:30	2/8/2006 12:30	2/5/2006 11:00	1	0.033	481.4	244.63	3.06250	0.12500	2248	0.9973
105	1.587	2	2/23/2006 8:50	2/23/2006 5:45	2/20/2006 8:40	4	0.133	461.1	244.63	2.87847	0.12847	2262	0.9973
106	1.638	Average 1.718	3/18/2006 15:17	3/18/2006 8:15	3/15/2006 10:20	1	0.033	465.8	244.63	2.91319	0.28306	2266	0.9973
106	1.850	Stdev 0.115	2/8/2006 16:20	2/8/2006 13:15	2/5/2006 11:00	6	0.200	567.6	244.63	3.09375	0.12847	2248	0.9973
106	1.567	6	2/13/2006 15:55	2/13/2006 12:20	2/10/2006 7:30	5	0.167	522.5	244.63	3.20139	0.14931	2253	0.9973
107	1.658	Average 1.712	2/3/2006 19:45	2/3/2006 11:15	1/31/2006 13:10	4	0.133	467.6	244.63	2.92014	0.36417	2243	0.9973
107	1.733	Stdev 0.047	2/8/2006 17:00	2/8/2006 14:00	2/5/2006 11:00	4	0.133	535.8	244.63	3.12500	0.12500	2248	0.9973
107	1.745	7	2/13/2006 16:37	2/13/2006 13:15	2/10/2006 7:30	6	0.200	552.7	244.63	3.23958	0.14028	2253	0.9973
108	2.011	Average 1.910	3/18/2006 16:14	3/18/2006 8:45	3/15/2006 10:20	1	0.033	579.0	244.63	2.93403	0.31181	2286	0.9973
108	1.794	Stdev 0.109	2/9/2006 10:05	2/9/2006 6:55	2/5/2006 11:00	6	0.200	641.4	244.63	3.82986	0.13194	2248	0.9973
108	1.826	8	2/13/2006 17:10	2/13/2006 13:55	2/10/2006 7:30	8	0.267	614.7	244.63	3.26796	0.19542	2253	0.9973
109	1.784	Average 1.733	2/4/2006 9:05	2/3/2006 11:55	1/31/2006 13:10	6	0.200	460.7	244.63	2.84792	0.88194	2243	0.9973
109	1.851	Stdev 0.072	2/9/2006 10:45	2/9/2006 7:45	2/5/2006 11:00	6	0.200	594.8	244.63	3.86458	0.12500	2248	0.9973
109	1.764	9	2/13/2006 17:40	2/13/2006 14:20	2/10/2006 7:30	5	0.167	564.5	244.63	3.28472	0.13889	2253	0.9973
110	1.593	Average 1.647	2/4/2006 13:17	2/3/2006 12:15	1/31/2006 13:10	6	0.200	427.8	244.63	2.96181	1.04306	2244	0.9973
110	1.583	Stdev 0.053	2/20/2006 10:20	2/20/2006 7:25	2/14/2006 7:00	7	0.233	757.1	244.63	6.01736	0.12153	2259	0.9973
110	1.649	3	2/23/2006 9:30	2/23/2006 6:20	2/20/2006 8:40	8	0.267	482.3	244.63	2.90278	0.13194	2262	0.9973
111	1.537	Average 1.590	2/4/2006 14:06	2/3/2006 12:30	1/31/2006 13:10	4	0.133	386.2	244.63	2.97222	1.06667	2244	0.9973
111	1.583	Stdev 0.056	2/17/2006 15:10	2/17/2006 10:55	2/14/2006 7:00	7	0.233	489.6	244.63	3.16319	0.17708	2267	0.9973
111	1.649	4	2/23/2006 10:05	2/23/2006 6:55	2/20/2006 8:40	1	0.033	484.5	244.63	2.92708	0.13194	2262	0.9973
112	1.639	Average 1.639	2/23/2006 10:45	2/23/2006 7:30	2/20/2006 8:40	6	0.200	484.9	244.63	2.95139	0.13542	2262	0.9973
112	1.774	Stdev 0.136	2/17/2006 15:45	2/17/2006 11:50	2/14/2006 7:00	8	0.267	555.1	244.63	3.20139	0.16319	2257	0.9973
112	1.503	12	2/13/2006 20:40	2/13/2006 15:30	2/10/2006 7:30	6	0.200	479.8	244.63	3.33333	0.21628	2253	0.9973

Ad Bawl 3/14/06  
 Amanda J. Feh 3/27/06

Ra-226 Verification Sheet

Sample ID	Vol (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Bkg CPM	Total Counts
CAL 1	500	3-15-06 1020	3/18/06 705	3/18/06 1015	101	1	6	5309
CAL 2	500	3-15-06 1020	3/18/06 735	3/18/06 1045	102	1	5	5825
CAL 3	500	3-15-06 1020	3/18/06 750	3/18/06 1474	103	1	7	5037
CAL 4	500	3-15-06 1020	3/18/06 815	3/18/06 1577	106	1	1	4658
CAL 5	500	3-15-06 1020	3/18/06 845	3/18/06 1614	108	1	1	5730
CAL 6	500	3-15-06 1020						
CAL 7	500	3-15-06 1020						
CAL 8	500	3-15-06 1020						
CAL 9	500	3-15-06 1020						
CAL 10	500	3-15-06 1020						
CAL 11	500	3-15-06 1020						
CAL 12	500	3-15-06 1020						

AB1 3/14/06  
 AB1 3/12/06

20 min  
Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 1	500	1/31/06 1310	2/3/06 710	2/3/06 1040	101	1	1	24
Cal 2	500	1/21/04 1310	2/3/06 840	2/3/06 1145	102	1	6	4888
Cal 3	500	1/21/06 1310	2/3/06 845	2/3/06 1710	103	1	5	5164
Cal 4	500	1/21/06 1310	2/3/06 940	2/3/06 1752	104	1	2	5114
Cal 5	500	1/21/04 1310	2/3/06 1020	2/3/06 1637	105	1	1	5466
Cal 6	500	1/21/04 1310	2/3/06 1050	2/3/06 1911	106	1	6	5613
Cal 7	500	1/21/04 1310	2/3/06 1115	2/3/06 1945	107	1	4	4151
Cal 8	500	1/31/06 1310	2/3/06 1135	2/3/06 2015	108	1	6	4224
Cal 9	500	1/21/06 1310	2/3/06 1155	2/3/06 2040	109	1	6	4278
Cal 10	500	1/31/06 1310	2/3/06 1215	2/3/06 2140	110	1	6	3862
Cal 11	500	1/31/04 1310	2/3/06 1230	2/3/06 2106	111	1	4	3731
Cal 12	500	1/21/06 1310	2/3/06 1260	2/3/06 2106	112	1	8	

AB1 3/14/06

AB1 3/12/106

AB1 3/12/106

AB1 3/14/06

AB1 3/14/06

AB1 3/12/106



Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 1	500	<del>2-10-06 0730</del>	2/13/06 835	2/13/06 / 1230	101	1	6	5205
CAL 2	500	<del>2-10-06 0730</del>	2/13/06 920	2/13/06 / 1205	102	1	7	5794
CAL 3	500	<del>2-10-06 0730</del>	2/13/06 1000	2/13/06 / 1340	103	1	5	5457
CAL 4	500	<del>2-10-06 0730</del>	2/13/06 1035	2/13/06 / 1415	104	1	5	5862
CAL 5	500	<del>2-10-06 0730</del>	2/13/06 1120	2/13/06 / 1445	105	1	3	<del>4380</del> <sup>ABI 3/14/06</sup>
CAL 6	500	2-10-06 0730	2/13/06 1220	2/13/06 1555	106	1	5	5225
CAL 7	500	2-10-06 0730	2/13/06 1315	2/13/06 1637	107	1	6	5527
CAL 8	500	2-10-06 0730	2/13/06 1355	2/13/06 1710	108	1	8	6147
CAL 9	500	2-10-06 0730	2/13/06 1420	2/13/06 1740	109	1	5	5645
CAL 10	500	<del>2-10-06 0730</del>	2/13/06 1440	<del>2/13/06 1810</del>	110	1	5	<del>4774</del> <sup>ABI 3/14/06</sup>
CAL 11	500	<del>2-10-06 0730</del>	2/13/06 1510	2/13/06 2000	111	1	8	<del>4641</del> <sup>ABI 3/14/06</sup>
CAL 12	500	<del>2-10-06 0730</del>	2/13/06 1530	2/13/06 2040	112	1	6	4798
			ABI					
			3/14/06					

ABI 3/14/06  
 2/13/06  
 024277100

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 1	500	2/5/06 1100 <small>SXEL 9/10/06</small>	2/8/06 940	2/8/06 1250	101	1	8	5962
CAL 2	500	2/5/06 1100 <small>SXEL 11/00</small>	2/8/06 1020	2/8/06 1530	102	1	8	7256
CAL 3	500	2/5/06 1100	2/8/06 1105	2/8/06 1405	103	1	5	7066
CAL 4	500	2/5/06 1100 <small>SXEL 2/2/06</small>	2/8/06 1115 <small>AB1 3/14/06</small>	2/8/06 1450	104	1	2	6040
CAL 5	500	2/5/06 1100	2/8/06 1230	2/8/06 1530	105	1	1	4814
CAL 6	500	2/5/06 1100	2/8/06 1315	2/8/06 1620 <small>2/8/06</small>	106	1	6	5676 <del>6625</del> <small>SXEL 2/2/06</small>
CAL 7	500	2/5/06 1100	2/8/06 1400	2/8/06 1700	107	1	4	5358
CAL 8	500	2-5-06 1100	2-9-06 0655	2-9-06 1005	108	1	6	6414
CAL 9	500	2-5-06 1100	2-9-06 0745	2-9-06 1045	109	1	6	5948
CAL 10	500	2-5-06 1100	2-9-06 0815	2-9-06 1220	110	1	6	7216
CAL 11	500	2-5-06 1100	2-9-06 1010	2-9-06 1350	111	1	4	7447
CAL 12	500	2-5-06 1100	2-9-06 1100	2-9-06 1405	112	1	8	7363
			ABI					
			3/14/06					

ABI 3/14/06  
 90112137830  
 OSA43721106

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Ca 11	500	2/14/06 700	2/17/06 1055	2/17/06 1510	111	1	7	4896
Ca 12	500	2/14/06 700	2/17/06 1650	2/17/06 1545	112	1	8	5551
<del>Ca 4</del>	<del>500</del>	<del>2-14-06 0700</del> <del>2-20-06</del>	<del>2-20-06 0450</del>	<del>2-20-06 0750</del>	<del>101</del>	<del>1</del>	<del>5</del>	<del>7807</del>
Ca 6	500	2-14-06 0700	2-20-06 0515	2-20-06 0805	102	1	5	7189
Ca 7	500	2-14-06 0700	2-20-06 0600	2-20-06 0900 0935	103	1	6	7663
Ca 8	500	2-14-06 0700	2-20-06 0645	2-20-06 0955	105	1	3	5557
Ca 9	500	2-14-06 0700	2-20-06 0725	2-20-06 1020	110	1	7	7571
AB1								
3/14/06								

AP 3/27/06  
 AP 3/27/06  
 AP 3/27/06  
 AB1 3/14/06

AB1 3/14/06  
 7/1/2007 2730

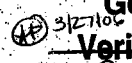
Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
<del>CAL 1</del>	<del>500</del>	<del>2-20-06 0840</del>	<del>2-23-06 0500</del>	<del>2-23-06 0940</del>	<del>101</del>	<del>1</del>	<del>8</del>	<del>4649</del>
<del>CAL 2</del>	<del>500</del>	<del>2-20-06 0840</del>	<del>2-23-06 0545</del>	<del>2-23-06 0950</del>	<del>105</del>	<del>1</del>	<del>4</del>	<del>4611</del>
<del>CAL 3</del>	<del>500</del>	<del>2-20-06 0840</del>	<del>2-23-06 0620</del>	<del>2-23-06 0950</del>	<del>110</del>	<del>1</del>	<del>8</del>	<del>4823</del>
<del>CAL 4</del>	<del>500</del>	<del>2-20-06 0840</del>	<del>2-23-06 0655</del>	<del>2-23-06 1005</del>	<del>111</del>	<del>1</del>	<del>1</del>	<del>4845</del>
<del>CAL 5</del>	<del>500</del>	<del>2-20-06 0840</del>	<del>2-23-06 0730</del>	<del>2-23-06 1045</del>	<del>112</del>	<del>1</del>	<del>6</del>	<del>4849</del>
<del>CAL 6</del>								
<del>CAL 7</del>								
<del>CAL 8</del>								
<del>CAL 9</del>								
<del>CAL 10</del>								
<del>CAL 11</del>				ABA				
<del>CAL 12</del>				3/14/06				

ABA 3/14/06

ABA 3/14/06

CAL 8  
14H  
3/14/06


**General Engineering Laboratories**  
**Verification Source Preparation Sheet**  
 Calibration

Applicable SOP Number GL-RAD-A-008 Isotope Po-226  
 Date Standards Prepared 4/5/05 Cocktail Type Used N/A  
 Standard ID 0299-6 Matrix of Vial/Planchett N/A  
 Amount Used (g or ml) 0.1 N/A  
 Standard Activity (DPM/g or ml) 2446.3471 Type of Scintillation Vial N/A  
 Reference Date 12/15/99 Pipette ID Used 1429303  
 Expiration Date 4/6/06 Balance ID Used 36040216  
 Residue/Carrier Agent 0.5 M HCL Quenching Agent N/A

	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	CAL 1				
2	CAL 2				
3	CAL 3				
4	CAL 4				
5	CAL 5				
6	CAL 6				
7	CAL 7		ABI		
8	CAL 8			3/14/06	
9	CAL 9				
10	CAL 10				
11	CAL 11				
12	CAL 12				
13	CAL 13				
14	CAL 14				
15	CAL 15				

Prepared By: Ad Bal Date: 3/14/06  
 Reviewed By: Amanda L. Tehe Date: 3/27/06

Rev 1 RLM 9/10/97

AP 31271a
**General Engineering Laboratories**  
**Verification Source Preparation Sheet**  
 Calibration

Applicable SOP Number <u>GL-RAD-A-008</u>	Isotope <u>Ra-226</u>
Date Standards Prepared <u>4/5/05</u>	Cocktail Type Used <u>NIA</u>
Standard ID <u>0299-G</u>	Matrix of Vial/Planchett <u>NIA</u>
Amount Used (g or ml) <u>0.1</u>	<u>NIA</u>
Standard Activity (DPM/g or ml) <u>2446.3471</u>	Type of Scintillation Vial <u>NIA</u>
Reference Date <u>12/15/99</u>	Pipette ID Used <u>1429303</u>
Expiration Date <u>4/6/06</u>	Balance ID Used <u>36040214</u>
Residue/Carrier Agent <u>0.5 M HCl</u>	Quenching Agent <u>NIA</u>

	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
16	CAL 16				
17	CAL 17				
18	CAL 18				
19	CAL 19				
20	CAL 20				
21	CAL 21	ABI			
22	CAL 22		3/14/06		
23	CAL 23				
24	CAL 24				

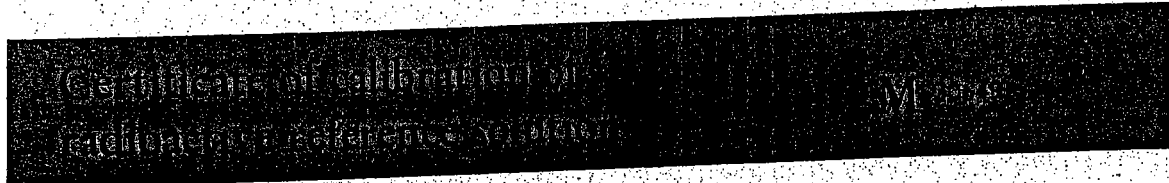
Prepared By: Ad Bail Date: 3/14/06

Reviewed By: \_\_\_\_\_ Date: \_\_\_\_\_

8-21-00

Nycomed Amersham plc  
Amersham Laboratories

0279



Nycomed Amersham plc  
Radiation & Radioactivity  
Calibration Laboratory  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ISSUED  
FOR:

AEA Technology plc  
Isotrak  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ion. Principal radionuclide: Radium-226

Product code: RAY44  
Solution number: R4/131/89

ment Reference time: 1200 GMT on 15 December 1999

data Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

ion of The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k = 2.00$ , which  
inties for a  $t$ -distribution with  $\nu_{eff} = \infty$  effective degrees of freedom corresponds to a coverage probability of approximately  
95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard  
uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated in the following examples;

6.5(21)	=	6.5 ± 2.1
6.54(21)	=	6.54 ± 0.21
6.543(21)	=	6.543 ± 0.021

ved  
ory

Page 542 of 913

Date of  
issue

17<sup>th</sup> December 1999

Nycomed  
Amersham

AGP  
3/27/00

0299

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Reference time for solution number R4/131/89:	1200 GMT on 15 December 1999
Radioactive concentration of radium-226:	43.75 kilobecquerels per gram of solution
which is equivalent to:	1.183 microcuries per gram of solution
Mass of solution:	5.0368 grams
Total activity of radium-226:	220.4 kilobecquerels
which is equivalent to:	5.956 microcuries
Recommended half life:	1600 years

Method of measurement:  
The activity of the solution was measured using a high pressure re-entrant ionisation chamber calibrated with a large number of absolutely standardised solutions.

Calibration date: 15 December 1999

The calibration date is provided for added information only, and must not be confused with the reference date on pages 1 and 2 of the certificate. It is the reference date that must be used in all calculations relating to the values of activity.

Expanded uncertainty in the radioactive concentration quoted above:  $\pm 2.5\%$

Combined Type A uncertainty:  $\pm 0.2\%$

Combined Type B uncertainty:  $\pm 1.3\%$

Radionuclidic The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Chemical Carrier free in 0.5M HCl  
position

Remarks This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

1 year = 365.25 days

At the reference date radium-226 was shown to be in radioactive equilibrium with its daughter nuclides down the decay chain to polonium-214 and thallium-210, the precursors of lead-210. The ionisation chamber was calibrated using a standard supplied by the National Institute of Standards and Technology, Washington DC, USA.





# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0299	Isotope:	Radium-226
Prepared By:	Angela Johnson	Prepared By:	Angela Johnson
Carrier Conc:	0.5 M HCL	Prep Date:	09/15/2000
Reference Date:	12/15/1999	Verification Date:	12/15/2005
Ampoule Mass (g):	5.0368 g	Expiration Date:	12/15/2006
Uncertainty:	+/- 2.5 %	Primary Code:	0299-A
LogBook No:	RC S 027 128	Dilution(mL):	100 mL
		Mass of Parent(g):	4.6634 g
		Density(g/mL):	1.0012

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
09/26/2000	Angela Johnson	2.1096	100	0299-C	2579.62 dpm/mL	10/10/2002	10/10/2003
09/15/2000	Angela Johnson	.2004	100	0299-B	245.05 dpm/mL	09/15/2000	09/15/2001
08/23/2002	Angela Johnson	2.0443	100	0299-D	2499.77 dpm/mL	08/23/2002	08/23/2003
08/26/2003	Angela Johnson	1.9909	100	0299-E	2434.34 dpm/mL	11/04/2004	11/04/2005
08/26/2003	Angela Johnson	1.9872	100	0299-F	2429.82 dpm/mL	08/26/2004	08/26/2005
04/05/2005	Amanda Fehr	5.0018	250	0299-G	2446.3471 dpm/mL	04/06/2005	04/06/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

# Verification for Ra-226 Standard 0299-G

4/6/2005	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Mass. Used (G)	Source DPM/G
A.Fehr	0299-G N1	515.6000	31.0000	484.6000	3.38485694	0.0626	2287.013657
	0299-G N2	531.0000	31.0000	500.0000	3.38485694	0.0621	2378.691308
	0299-G N3	534.1000	31.0000	503.1000	3.38485694	0.0624	2381.932275
						Average =	2349.212414

Mean Value (Counting) = 2349.212414      Pass  
 Stdev = 53.89007259      Rule 3 (Pass/Fail)

Certificate Value = 2440.7      dpm/mL  
 Lower Limit = 2241.432269      dpm/mL  
 Upper Limit = 2456.992559      dpm/mL  
 Rule 1 Pass/Fail      Pass  
 Two sigma = 107.7801452      dpm/mL  
 10 % of Mean = 234.9212414      dpm/mL  
 Rule 2 (Pass/Fail)      Pass

### Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0299-G by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and ten mLs of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 23 for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 8/26/04 using source 0321-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0321. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:  
 A = Ver. source cpm,  
 B = BKG cpm,  
 C = System efficiency, (cpm/dpm), and  
 D = mass used for standard verification.

IRAD.SOP.M-001

*Amanda L. Fehr 417105*  
*Alicia Tucker 417105*

PROTOCOL : 23 Radium Std Ver.  
DATE : 2005/04/06  
TIME : 17:42  
ID : P23AS008

Wallac 1414 WinSpectral v1.40 S/N 4140127

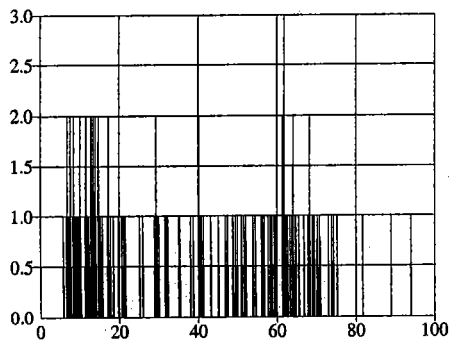
Counting mode : CPM  
Isotope(s) : H3  
H3 = 5- 350,12.43 y  
Protocol name : Radium Std Ver.  
Counting time : 300  
Repeats : 1  
Cycles : 1  
Replicates : 1  
2 sigma % : 0.01  
Minimum cpm : 0.00 Checking time: 10  
Output to Display :  
POS,CTIME,DATE,TIME,RACKPOS,CPMw1,CPM,SQPI,CPM1  
Additions to Display : Spectrum,Header,Listing  
Spectrum : Beta  
Window 1 : 1-1024 /Beta  
Window 2 : 1-1024 /Beta  
Window 3 : 1-1024 /Beta  
Window 4 : 1-1024 /Beta  
Window 5 : 1-1024 /Beta  
Window 6 : 1-1024 /Beta  
FNCT1 = FNCT1 :  
FNCT2 = FNCT2 :  
FNCT3 = FNCT3 :  
FNCT4 = FNCT4 :

Total count rate:

H3 284.2 CPM

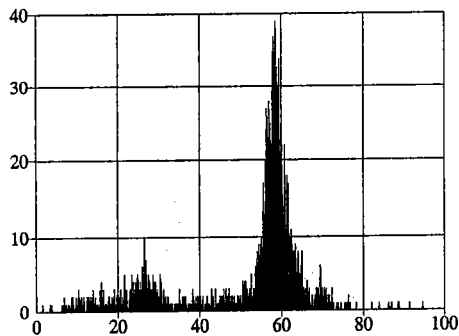
all 417105  
HU 417105

POS	CTIME	DATE	TIME	RACKPOS	CPMW1	CPM
1	300	4/6/2005	5:42 PM	1	31.00	31.00
					15.60	



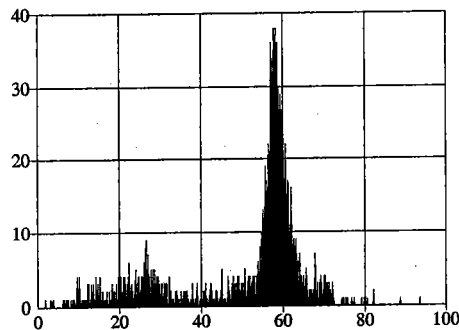
Counts Beta

2	300	4/6/2005	5:48 PM	2	515.60	515.60
					90.00	



Counts Beta

3	300	4/6/2005	5:53 PM	3	531.00	531.00
					92.50	



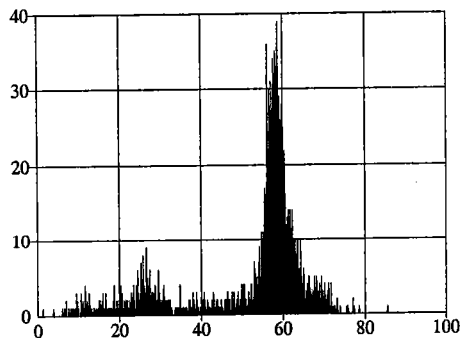
Counts Beta

ALF 417105

ALU 417105

---

POS	CTIME	DATE	TIME	RACKPOS	CPMW1	CPM
4	300	4/6/2005	5:59 PM	4	534.10	534.10
					86.20	



■ Counts  
Beta

OLF 417105

Hu 417105

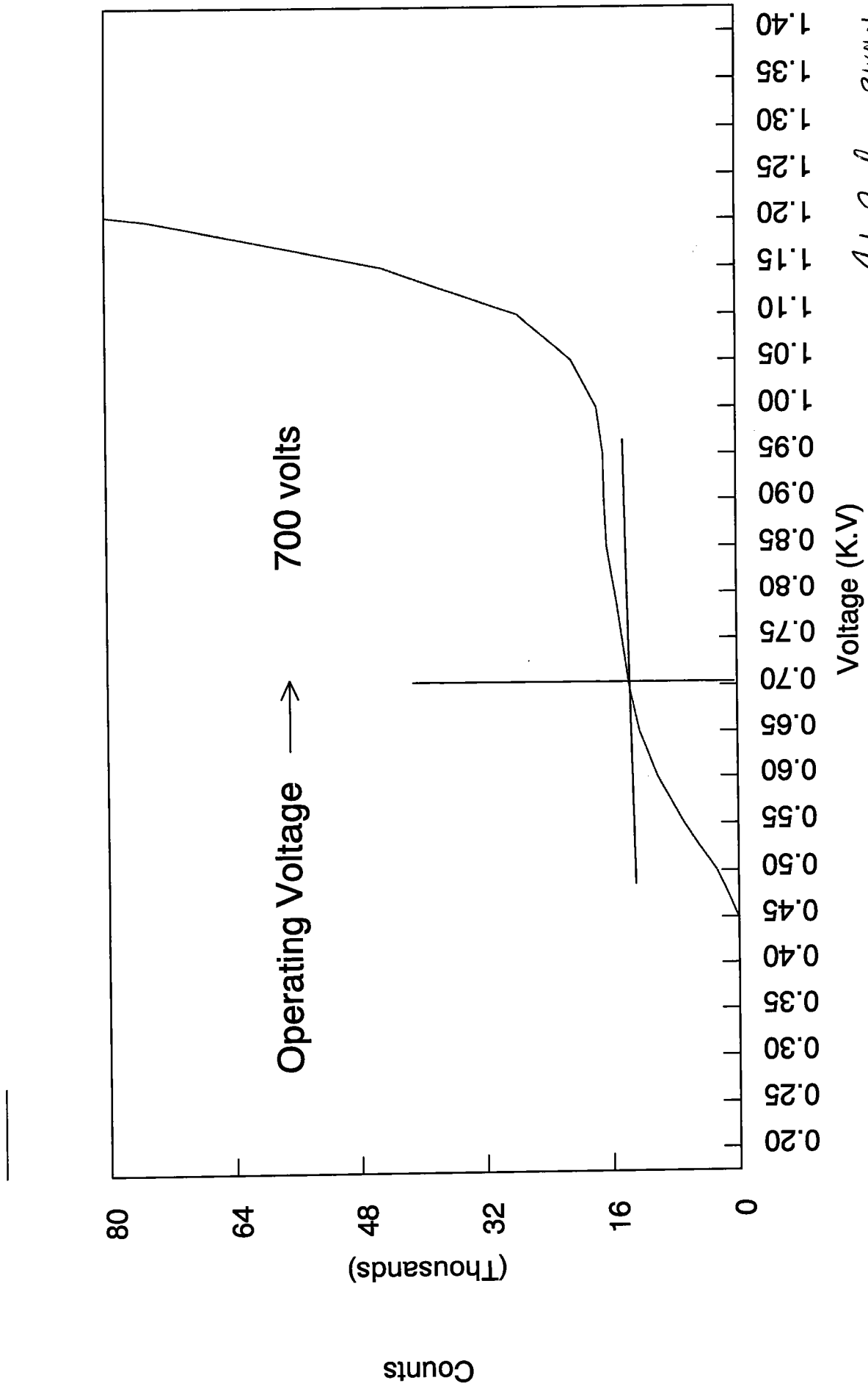
Voltage Curve Ludlum # 1				
Volts (K.V.)	Counts	Date	Time	Detector
0.20	0	2/1/2006	7:45	1
0.25	0	2/1/2006	7:45	1
0.30	0	2/1/2006	7:45	1
0.35	0	2/1/2006	7:45	1
0.40	0	2/1/2006	7:45	1
0.45	45	2/1/2006	7:45	1
0.50	2701	2/1/2006	7:46	1
0.55	6850	2/1/2006	7:46	1
0.60	10154	2/1/2006	7:46	1
0.65	12384	2/1/2006	7:46	1
0.70	13645	2/1/2006	7:46	1
0.75	14504	2/1/2006	7:46	1
0.80	15361	2/1/2006	7:46	1
0.85	16335	2/1/2006	7:47	1
0.90	16652	2/1/2006	7:47	1
0.95	16751	2/1/2006	7:47	1
1.00	17566	2/1/2006	7:47	1
1.05	20727	2/1/2006	7:47	1
1.10	27536	2/1/2006	7:47	1
1.15	44772	2/1/2006	7:47	1
1.20	74675	2/1/2006	7:47	1
1.25	121633	2/1/2006	7:48	1
1.30	182981	2/1/2006	7:48	1
1.35	243485	2/1/2006	7:48	1
1.40	307154	2/1/2006	7:48	1

Ad Baul 3/14/06

Amanda L. Lech 3/27/06

# Plateau February, 2006

Ludlum # 1



Adl Baid 3/14/06

Amanda D. Fuku 3/22/06

# Ra-226 WATER

Batch : LCSVER  
 Date : 3/2/2006  
 Analyst : AB1

Procedure Code : LUC26RAL  
 Parmname : Radium-226

MDA : 1 pCi/L  
 Instrument Used : LUCAS CELL DETECTOR

Bkg Count Time: 30 min

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG	BKG cpm	Ra-226 MDA pCi/L	Ra-226 RESULT pCi/L	Ra-226 ERROR pCi/L	COUNT DATE/TIME
V1	0.800	30	928	101	1.860	6	0.200	0.1941	12.6693	0.8231	3/2/2006 15:05
V2	0.800	30	485	102	1.873	5	0.167	0.3520	12.8686	1.1632	2/22/2006 8:30
V3	0.800	30	524	103	1.806	6	0.200	0.3912	14.3454	1.2496	2/22/2006 9:30
V4	0.800	30	671	104	1.957	3	0.100	0.2736	16.9491	1.2911	2/22/2006 10:00
V5	0.800	30	420	105	1.551	7	0.233	0.4780	13.1260	1.2872	2/22/2006 10:35
V6	0.800	30	510	106	1.718	8	0.267	0.4532	14.3158	1.2721	2/22/2006 11:15
V7	0.800	30	572	107	1.712	2	0.067	0.2638	16.1682	1.3320	2/22/2006 11:45
V8	0.800	30	596	108	1.910	4	0.133	0.3046	14.9906	1.2157	2/22/2006 12:30
V9	0.800	30	899	109	1.733	2	0.067	0.1388	13.3841	0.8778	3/2/2006 17:05
V10	0.800	30	544	110	1.647	8	0.267	0.4619	15.5819	1.3387	2/22/2006 13:40
V11	0.800	30	567	111	1.590	8	0.267	0.4781	16.8197	1.4141	2/22/2006 14:20
V12	0.800	30	592	112	1.639	3	0.100	0.3141	17.1591	1.3928	2/22/2006 14:55

*Ad Bail 3/14/06*  
*Amanda L. Fuhr 3/27/06*



Sample ID	Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
V1		1	3/2/2006 15:05	LCS	0638-B	15.70	pCi/L	81%
V2		1	2/22/2006 8:30	LCS	0638-B	15.70	pCi/L	82%
V3		1	2/22/2006 9:30	LCS	0638-B	15.70	pCi/L	91%
V4		1	2/22/2006 10:00	LCS	0638-B	15.70	pCi/L	108%
V5		1	2/22/2006 10:35	LCS	0638-B	15.70	pCi/L	84%
V6		1	2/22/2006 11:15	LCS	0638-B	15.70	pCi/L	91%
V7		1	2/22/2006 11:45	LCS	0638-B	15.70	pCi/L	103%
V8		1	2/22/2006 12:30	LCS	0638-B	15.70	pCi/L	96%
V9		1	3/2/2006 17:05	LCS	0638-B	15.70	pCi/L	85%
V10		1	2/22/2006 13:40	LCS	0638-B	15.70	pCi/L	99%
V11		1	2/22/2006 14:20	LCS	0638-B	15.70	pCi/L	107%
V12		1	2/22/2006 14:55	LCS	0638-B	15.70	pCi/L	109%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM cpm	Ingrowth constant
2/22/2006 13:25	3/2/2006 10:20	188.92	4.75	0.7598	0.9648	1.0019	30.7333	0.7344
2/19/2006 13:35	2/22/2006 5:20	63.75	3.17	0.3820	0.9764	1.0019	16.0000	0.3737
2/19/2006 13:35	2/22/2006 5:55	64.33	3.58	0.3847	0.9733	1.0019	17.2667	0.3752
2/19/2006 13:35	2/22/2006 6:30	64.92	3.50	0.3874	0.9739	1.0019	22.2667	0.3781
2/19/2006 13:35	2/22/2006 7:05	65.50	3.50	0.3901	0.9739	1.0019	13.7667	0.3807
2/19/2006 13:35	2/22/2006 7:40	66.08	3.58	0.3928	0.9733	1.0019	16.7333	0.3831
2/19/2006 13:35	2/22/2006 8:20	66.75	3.42	0.3959	0.9745	1.0019	19.0000	0.3865
2/19/2006 13:35	2/22/2006 8:50	67.25	3.67	0.3981	0.9727	1.0019	19.7333	0.3880
2/22/2006 13:25	3/2/2006 10:40	189.25	6.42	0.7604	0.9527	1.0019	29.9000	0.7258
2/19/2006 13:35	2/22/2006 9:50	68.25	3.83	0.4027	0.9715	1.0019	17.8667	0.3919
2/19/2006 13:35	2/22/2006 10:10	68.58	4.17	0.4042	0.9690	1.0019	18.6333	0.3924
2/19/2006 13:35	2/22/2006 10:30	68.92	4.42	0.4057	0.9672	1.0019	19.6333	0.3931

*Ad Bail 3/14/06*  
*Amanda F. Feh 3/17/06*

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
<del>VER 1</del>	<del>800</del>	<del>2-19-06 1335</del>	<del>2-22-06 0445</del>	<del>2-22-06 0755</del>	<del>101</del>	<del>1</del>	<del>5</del>	<del>425</del>
VER 2	800	2-19-06 1335	2-22-06 0520	2-22-06 0830	102	1	5	485
VER 3	800	2-19-06 1335	2-22-06 0555	2-22-06 0930	103	1	6	524
VER 4	800	2-19-06 1335	2-22-06 0630	2-22-06 1000	104	1	3	671
VER 5	800	2-19-06 1335	2-22-06 0705	2-22-06 1035	105	1	7	470
VER 6	800	2-19-06 1335	2-22-06 0740	2-22-06 1115	106	1	8	510
VER 7	800	2-19-06 1335	2-22-06 0820	2-22-06 1145	107	1	2	572
VER 8	800	2-19-06 1335	2-22-06 0850	2-22-06 1200	108	1	4	596
<del>VER 9</del>	<del>800</del>	<del>2-19-06 1335</del>	<del>2-22-06 0910</del>	<del>2-22-06 1300</del>	<del>109</del>	<del>1</del>	<del>5</del>	<del>742</del>
VER 10	800	2-19-06 1335	2-22-06 0950	2-22-06 1340	110	1	8	544
VER 11	800	2-19-06 1335	2-22-06 1010	2-22-06 1420	111	1	8	567
VER 12	800	2-19-06 1335	2-22-06 1030	2-22-06 1455	112	1	5	552
			ABI					
				3/14/06				

ABI 3/14/06

3/14/06 ABI

ABI 3/14/06  
021213+230  
3/17/06

# Ra-226 Verification Sheet

Sample ID	Vol (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Bkg CPM	Total Counts
VER 1	800	2/22/06 1325	3-2-06 1020	3/2/06 1505 <del>3/1/06 1505</del>	101	1	6	928
VER 2	800	2-22-06 1325	3-2-06 1040	3/2/06 1705	109	1	2	999

ABI  
3/14/06

AB1 3/14/06  
054127127106

**General Engineering Laboratories  
Verification Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-008 Isotope Ra-226

Date Standards Prepared 1/17/06 Cocktail Type Used NIA

Standard ID Abi 3/14/06  
032+0638-B Matrix of Vial/Planchett NIA

Amount Used (g or ml) 0.1 NIA

Standard Activity (DPM/g or ml) 279.0211 Type of Scintillation Vial NIA

Reference Date 1/23/04 Pipette ID Used 1429303

Expiration Date 1/17/07 Balance ID Used 36040216

Residue/Carrier Agent 0.5M HCl Quenching Agent NIA

	Standard Number	Quenching Vol (uL) Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	VER 1				
2	VER 2				
3	VER 3				
4	VER 4				
5	VER 5		Abi		
6	VER 6			3/14/06	
7	VER 7				
8	VER 8				
9	VER 9				
10	VER 10				
11	VER 11				
12	VER 12				
Abi					
	3/14/06				

Prepared By: Ad Bail Date 3/14/06

Reviewed By: Amanda L. Lehe Date 3/27/06

Rev 1 RLM 9/10/97

# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0638	Isotope:	Radium-226
Prepared By:	Amanda Fehr	Prepared By:	Amanda Fehr
Carrier Conc:	0.1M HCl	Prep Date:	01/16/2006
Reference Date:	01/23/2004	Verification Date:	01/16/2006
Ampoule Mass (g):	5.01065 g	Expiration Date:	01/16/2007
Uncertainty:	+/- 3.3 %	Primary Code:	0638-A
LogBook No:	RC-S-037-037	Dilution(mL):	100 mL
		Mass of Parent(g):	4.8398 g
		Density(g/mL):	1.0266

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.8398 \text{ g}) * (23530 \text{ dps}) * (59.9 \text{ dpm/dps}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13613.8856 \text{ dpm/mL}$
$(4.8398 \text{ g}) * (23530 \text{ dps}) * (59.9 \text{ dpm/dps}) / (1.0266 \text{ g/mL}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13260.8293 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/17/2006	Amanda Fehr	2.1041	100	0638-B	279.0211 dpm/mL	01/17/2006	01/17/2007

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

# Verification for Ra-226 Standard 0638-B

A. Fehr  
1/20/2006

Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass, Used (mL)	Standard Source DPM/mL
0638-B N1	534.4000	3.1000	531.3000	1.88956511	281.1758103
0638-B N2	544.4000	3.1000	541.3000	1.88956511	286.4680333
0638-B N3	539.1000	3.1000	536.0000	1.88956511	283.6631551
Average =					283.7689996

Mean Value (Counting) = 283.7689996      101.789218      Pass  
 Stdev = 2.647698713      0.00933047      Rule 3 (Pass/Fail)

Certificate Value = 278.8  
 Lower Limit = 278.4736022  
 Upper Limit = 289.064397  
 Rule 1 Pass/Fail Pass  
 Two sigma = 5.295397425  
 10 % of Mean = 28.37689996  
 Rule 2 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0638-B by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and 10 mL Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Green using source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 1/20/06 using source 0299-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 (0299-A). Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

*Amanda L. Fehr 1/20/06*

# General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414  
(843)556-8171

## Lucas Cell Calibration Package

CALIBRATION 201-212

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondard standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2) Is the efficiency calibration report included ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3) Is the raw count data included for: Cell constant determination? Plateau generation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4) Are the calibration verifications included?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5) Are the instrument settings included: HVPS settings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6) Has the CELLEFF.xls file been updated ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7) Have the calibration dates been updated in ALPHALIMS ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Prepared By: Ad Beal

Date: 5/6/05

Reviewed By: Cezela A. Johnson

Date: 5/9/05

Effective Date: 5/9/05

# Ra-226 Cell Constants

Standard Reference date: 12/15/1999  
 Standard ID: 0299-E  
 Volume added (mL): 0.1  
 Standard Reference Activity (DPM/mL): 2434.34

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/Time flushed to cell	Date/Time end of degas	bkg cpm	total counts	count time min	cpm	Known activity dpm	11 (days) end-degas to flush	12 (days) end-flush to count	13 (days) Std Ref Date to count	Decay from Std Ref Date to count		
201	1.890	Average	1.872	CAL 1	4/25/2005 14:05	4/25/2005 10:15	4/22/2005 17:15	0.267	5180	30	172.67	243.02	2.70833	0.15972	1959	0.9977
201	1.999	Stdev	0.137	CAL 7	5/2/2005 17:10	5/2/2005 14:10	4/29/2005 15:00	0.233	5908	30	196.83	243.02	2.96528	0.12500	1966	0.9977
201	1.727			CAL 1	4/28/2005 12:20	4/28/2005 9:05	4/25/2005 16:00	0.267	4759	30	158.63	243.02	2.71181	0.13542	1962	0.9977
202	1.855	Average	1.775	CAL 8	5/2/2005 17:45	5/2/2005 14:40	4/29/2005 15:00	0.233	5508	30	183.60	243.02	2.98611	0.12847	1966	0.9977
202	1.706	Stdev	0.075	CAL 14	4/26/2005 15:30	4/26/2005 11:40	4/22/2005 17:15	0.167	5960	30	198.67	243.02	3.76736	0.15972	1960	0.9977
202	1.763			CAL 13	4/29/2005 15:20	4/29/2005 12:05	4/26/2005 15:00	0.267	5086	30	169.53	243.02	2.87847	0.13542	1963	0.9977
203	1.910	Average	1.823	CAL 3	4/25/2005 15:40	4/25/2005 11:50	4/22/2005 17:15	0.267	5333	30	177.77	243.02	2.77431	0.15972	1959	0.9977
203	1.788	Stdev	0.076	CAL 9	5/2/2005 20:40	5/2/2005 15:15	4/29/2005 15:00	0.267	5249	30	174.97	243.02	3.01042	0.22569	1966	0.9977
203	1.771			CAL 14	4/29/2005 15:55	4/29/2005 12:45	4/26/2005 15:00	0.267	5149	30	171.63	243.02	2.90625	0.13194	1963	0.9977
204	1.713	Average	1.753	CAL 4	4/25/2005 16:15	4/25/2005 12:40	4/22/2005 17:15	0.167	4836	30	161.20	243.02	2.80903	0.14981	1959	0.9977
204	1.762	Stdev	0.036	CAL 16	4/26/2005 16:35	4/26/2005 12:50	4/22/2005 17:15	0.267	6218	30	207.27	243.02	3.81597	0.15625	1960	0.9977
204	1.783			CAL 10	5/2/2005 22:05	5/2/2005 15:45	4/29/2005 15:00	0.200	5222	30	174.07	243.02	3.03125	0.26389	1966	0.9977
205	1.949	Average	1.967	CAL 5	4/25/2005 16:50	4/25/2005 13:20	4/22/2005 17:15	0.200	5847	30	184.90	243.02	2.86881	0.14583	1959	0.9977
205	1.964	Stdev	0.020	CAL 17	4/26/2005 17:50	4/26/2005 13:30	4/22/2005 17:15	0.267	6932	30	231.07	243.02	3.84375	0.18056	1960	0.9977
205	1.989			CAL 16	4/29/2005 17:05	4/29/2005 14:00	4/26/2005 15:00	0.267	5865	30	195.50	243.02	2.95633	0.12847	1963	0.9977
206	1.840	Average	1.880	CAL 6	4/25/2005 17:35	4/25/2005 13:55	4/22/2005 17:15	0.133	5263	30	175.43	243.02	2.86111	0.15278	1959	0.9977
206	1.943	Stdev	0.056	CAL 11	5/3/2005 8:30	5/2/2005 16:20	4/29/2005 15:00	0.267	5319	30	177.30	243.02	3.05556	0.67361	1966	0.9977
206	1.855			CAL 17	4/29/2005 17:35	4/29/2005 14:35	4/26/2005 15:00	0.200	5505	30	183.50	243.02	2.98264	0.12500	1963	0.9977
207	1.805	Average	1.725	CAL 7	4/25/2005 18:05	4/25/2005 14:25	4/22/2005 17:15	0.200	5192	30	173.07	243.02	2.88194	0.15278	1959	0.9977
207	1.826	Stdev	0.081	CAL 19	4/27/2005 15:15	4/27/2005 11:10	4/22/2005 17:15	0.267	6615	30	220.50	243.02	4.74653	0.17014	1961	0.9977
207	1.743			CAL 1	5/2/2005 13:35	5/2/2005 9:20	4/29/2005 15:00	0.267	4838	30	161.27	243.02	2.76389	0.17708	1966	0.9977
208	1.796	Average	1.786	CAL 8	4/25/2005 18:45	4/25/2005 14:55	4/22/2005 17:15	0.267	5192	30	173.07	243.02	2.90278	0.15972	1959	0.9977
208	1.713	Stdev	0.068	CAL 2	5/2/2005 14:15	5/2/2005 10:05	4/29/2005 15:00	0.133	4794	30	159.80	243.02	2.79514	0.17361	1966	0.9977
208	1.848			CAL 8	4/28/2005 17:30	4/28/2005 14:20	4/25/2005 16:00	0.133	5403	30	180.10	243.02	2.93056	0.13194	1962	0.9977
209	1.832	Average	1.744	CAL 9	4/25/2005 21:45	4/25/2005 15:25	4/22/2005 17:15	0.267	5223	30	174.10	243.02	2.92361	0.26389	1959	0.9977
209	1.693	Stdev	0.076	CAL 21	4/27/2005 16:25	4/27/2005 12:15	4/22/2005 17:15	0.233	6921	30	230.70	243.02	4.79167	0.17361	1961	0.9977
209	1.707			CAL 6	5/2/2005 16:30	5/2/2005 13:15	4/29/2005 15:00	0.267	4988	30	166.27	243.02	2.92708	0.13542	1966	0.9977
210	1.702	Average	1.726	CAL 10	4/26/2005 12:45	4/26/2005 8:30	4/22/2005 17:15	0.033	5778	30	192.60	243.02	3.63542	0.17708	1960	0.9977
210	1.679	Stdev	0.063	CAL 22	4/27/2005 17:00	4/27/2005 12:45	4/22/2005 17:15	0.267	6879	30	229.30	243.02	4.81250	0.17708	1961	0.9977
210	1.798			CAL 3	5/2/2005 14:50	5/2/2005 10:50	4/29/2005 15:00	0.200	5084	30	169.47	243.02	2.82639	0.16667	1966	0.9977
211	1.559	Average	1.703	CAL 12	5/3/2005 14:35	5/3/2005 10:10	4/29/2005 15:00	0.267	5457	30	181.90	243.02	3.79861	0.18403	1967	0.9977
211	1.776	Stdev	0.124	CAL 4	5/2/2005 15:25	5/2/2005 11:40	4/29/2005 15:00	0.167	5078	30	169.27	243.02	2.86111	0.15625	1966	0.9977
211	1.772			CAL 11	4/29/2005 13:35	4/29/2005 10:25	4/26/2005 15:00	0.267	5021	30	167.37	243.02	2.80903	0.13194	1963	0.9977
212	1.708	Average	1.808	CAL 12	4/26/2005 14:10	4/26/2005 10:00	4/22/2005 17:15	0.133	5875	30	195.83	243.02	3.69792	0.17361	1960	0.9977
212	1.905	Stdev	0.098	CAL 5	5/2/2005 16:00	5/2/2005 12:30	4/29/2005 15:00	0.267	5509	30	183.63	243.02	2.89583	0.14583	1966	0.9977
212	1.809			CAL 12	4/29/2005 14:15	4/29/2005 11:15	4/26/2005 15:00	0.267	5181	30	172.70	243.02	2.84375	0.12500	1963	0.9977

*Angela D. Johnson*  
 5/19/05  
*Adl Bards*  
 5/19/05



Ka-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 1	500	4/22/05 1715	4/25/05 1015	4/25/05 1405	201	2	8=0.227	5180
<del>CAL 2</del>	<del>500</del>	<del>4/22/05 1715</del>	<del>4/25/05 1055</del>	<del>4/25/05 1410</del>	<del>202</del>	<del>2</del>	<del>7=0.220</del>	<del>47744</del>
CAL 3	500	4/22/05 1715	4/25/05 1150	4/25/05 <sup>1540</sup> <del>1445</del> AB1 4/25/05	203	2	8=0.227	5333
CAL 4	500	4/22/05 1715	4/25/05 1240	4/25/05 1615	204	2	5=0.167	4836
CAL 5	500	4/22/05 1715	4/25/05 1320	4/25/05 1650	205	2	6=0.200	5547
CAL 6	500	4/22/05 1715	4/25/05 1355	4/25/05 1735	206	2	4=0.133	5263
CAL 7	500	4/22/05 1715	4/25/05 1425	4/25/05 1805	207	2	6=0.200	5192
CAL 8	500	4/22/05 1715	4/25/05 1455	4/25/05 1845	208	2	8=0.227	5192
CAL 9	500	4/22/05 1715	4/25/05 1525	4/25/05 2145	209	2	8=0.227	8223
CAL 10	500	4/22/05 1715	<del>4/25/05 830</del> <sup>4/26/05</sup> AB1 4/26/05	<del>4/25/05 1245</del> <sup>4/26/05</sup> AB1 4/26/05	210	2	1=0.033	5778
<del>CAL 11</del>	<del>500</del>	<del>4/22/05 1715</del>	<del>4/26/05 915</del>	<del>4/26/05 1335</del>	<del>211</del>	<del>2</del>	<del>6=0.200</del>	<del>5261</del>
CAL 12	500	4/22/05 1715	4/26/05 1000	4/26/05 1410	212	2	4=0.133	5875

AB1 5/6/05

AB1 5/6/05

AB1 5/6/05

AB1 5/6/05  
ADT  
5/6/05

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
<del>CAL13</del>	<del>500</del>	<del>4/22/05 1715</del>	<del>4/26/05 1040</del>	<del>4/26/05 1455</del>	<del>201</del>	<del>2</del>	<del>5791 <sup>5:17</sup></del>	<del>5791</del>
CAL14	500	4/22/05 1715	4/26/05 1140	4/26/05 1530	202	2	5760 <sup>5:17</sup>	5960
<del>CAL15</del>	<del>500</del>	<del>4/22/05 1715</del>	<del>4/26/05 1220</del>	<del>4/26/05 1600</del>	<del>203</del>	<del>2</del>	<del>8=0.267</del>	<del>5854</del>
CAL16	500	4/22/05 1715	4/26/05 1250	4/26/05 1635	204	2	8=0.267	6218
CAL17	500	4/22/05 1715	4/26/05 1330	4/26/05 1750	205	2	8=0.267	6932
<del>CAL18</del>	<del>500</del>	<del>4/22/05 1715</del>	<del>4/27/05 1045</del>	<del>4/27/05 1440</del>	<del>206</del>	<del>2</del>	<del>8=0.267</del>	<del>6555</del>
CAL19	500	4/22/05 1715	4/27/05 1110	4/27/05 1515	207	2	8=0.267	6615
<del>CAL20</del>	<del>500</del>	<del>4/22/05 1715</del>	<del>4/27/05 1145</del>	<del>4/27/05 1550</del>	<del>208</del>	<del>2</del>	<del>6=0.260</del>	<del>3323</del>
CAL21	500	4/22/05 1715	4/27/05 1215	4/27/05 1625	209	2	7=0.233	6921
CAL22	500	4/22/05 1715	4/27/05 1245	4/27/05 1700	210	2	8=0.267	6879
<del>CAL23</del>	<del>500</del>	<del>4/22/05 1715</del>	<del>4/27/05 1315</del>	<del>4/27/05 1735</del>	<del>211</del>	<del>2</del>	<del>41=0.133</del>	<del>5863</del>
<del>CAL24</del>	<del>500</del>	<del>4/22/05 1715</del>	<del>4/27/05 1350</del>	<del>4/27/05 1815</del>	<del>212</del>	<del>2</del>	<del>7=0.233</del>	<del>6942</del>

APR 5/16/05

APR 5/16/05

APR 5/16/05

APR 5/16/05

APR 5/16/05

APR 5/16/05

APR 5/16/05

APR 5/16/05  
APR 5/16/05

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 1	500	4/25/05 1600	4/28/05 905	4/28/05 1220	201	2	8=0.267	41759
<del>CAL 2</del>	<del>500</del>	<del>4/25/05 1600</del>	<del>4/28/05 945</del>	<del>4/28/05 1310</del>	<del>202</del>	<del>2</del>	<del>8=0.267</del>	<del>3237</del>
<del>CAL 3</del>	<del>500</del>	<del>4/25/05 1600</del>	<del>4/28/05 1035</del>	<del>4/28/05 1350</del>	<del>203</del>	<del>2</del>	<del>8=0.267</del>	<del>38141</del>
<del>CAL 4</del>	<del>500</del>	<del>4/25/05 1600</del>	<del>4/28/05 1120</del>	<del>4/28/05 1425</del>	<del>204</del>	<del>2</del>	<del>8=0.267</del>	<del>3379</del>
<del>CAL 5</del>	<del>500</del>	<del>4/25/05 1600</del>	<del>4/28/05 1200</del>	<del>4/28/05 1505</del>	<del>205</del>	<del>2</del>	<del>8=0.267</del>	<del>3268</del>
<del>CAL 6</del>	<del>500</del>	<del>4/25/05 1600</del>	<del>4/28/05 1245</del>	<del>4/28/05 1545</del>	<del>206</del>	<del>2</del>	<del>5=0.112</del>	<del>3608</del>
<del>CAL 7</del>	<del>500</del>	<del>4/25/05 1600</del>	<del>4/28/05 1335</del>	<del>4/28/05 1635</del>	<del>207</del>	<del>2</del>	<del>8=0.267</del>	<del>41643</del>
CAL 8	500	4/25/05 1600	4/28/05 1420	4/28/05 1730	208	2	4=0.113	5403
<del>CAL 9</del>	<del>500</del>	<del>4/25/05 1600</del>	<del>4/28/05 1500</del>	<del>4/28/05 2120</del>	<del>209</del>	<del>2</del>	<del>8=0.267</del>	<del>4903</del>
<del>CAL 10</del>	<del>500</del>	<del>4/26/05 1500</del>	<del>4/29/05 920</del>	<del>4/29/05 1255</del>	<del>210</del>	<del>2</del>	<del>8=0.267</del>	<del>1113</del>
CAL 11	500	4/26/05 1500	4/29/05 1025	4/29/05 1335	211	2	8=0.267	5021
CAL 12	500	4/26/05 1500	4/29/05 1115	4/29/05 1415	212	2	8=0.267	5181
<del>AB1 5/16/05</del>								

AB1 5/16/05  
CAL 8/11/05

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 13	500	4/26/05 1500	4/29/05 1205	4/29/05 1520	202	2	8=0.267	5086
CAL 14	500	4/26/05 1500	4/29/05 1245	4/29/05 1555	203	2	8=0.267	5149
CAL 15	500	4/26/05 1500	4/29/05 1320	4/29/05 1630	204	2	8=0.267	4907
CAL 16	500	4/26/05 1500	4/29/05 1400	4/29/05 1705	205	2	8=0.267	5865
CAL 17	500	4/26/05 1500	4/29/05 1435	4/29/05 1735	206	2	6=0.200	5505
				5/2/05				
CAL 1	500	4/29/05 1500	5/2/05 920	5/2/05 1335	207	2	8=0.267	4838
CAL 2	500	4/29/05 1500	5/2/05 1005	5/2/05 1415	208	2	4=0.132	4774
CAL 3	500	4/29/05 1500	5/2/05 1050	5/2/05 1450	210	2	6=0.200	5084
CAL 4	500	4/29/05 1500	5/2/05 1140	5/2/05 1525	211	2	5=0.167	5078
CAL 5	500	4/29/05 1500	5/2/05 1230	5/2/05 1600	212	2	8=0.267	5509
CAL 6	500	4/29/05 1500	5/2/05 1315	5/2/05 1630	209	2	8=0.267	4989
CAL 7	500	4/29/05 1500	5/2/05 1410	5/2/05 1710	201	2	7=0.233	5908
CAL 8	500	4/29/05 1500	5/2/05 1440	5/2/05 1745	202	2	7=0.233	5508
CAL 9	500	4/29/05 1500	5/2/05 1515	5/2/05 2040	203	2	8=0.267	5249
CAL 10	500	4/29/05 1500	5/2/05 1545	5/2/05 2805	204	2	6=0.200	5222
CAL 11	500	4/29/05 1500	5/2/05 1620	5/2/05 2815	206	2	8=0.267	5319
				5/3/05 8:30				
CAL 12	500	4/29/05 1500	5/3/05 1010	5/3/05 1435	211	2	8=0.267	5457

ABI 5/6/05  
 ABI 5/6/05  
 ABI 5/6/05  
 ABI 5/6/05  
 ABI 5/6/05

## General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL-RAD-A-008, Rev. 2 Isotope Ra-226  
 Date Standards Prepared 8/26/03 Cocktail Type Used N/A  
 Standard ID 0299-E Matrix of Vial/Planchett N/A  
 Amount Used (g or ml) 0.1 N/A  
 Standard Activity (DPM/g or ml) 2434.34 Type of Scintillation Vial N/A  
 Reference Date 12/15/99 Pipette ID Used 1429303  
 Expiration Date 8/26/05 Balance ID Used 36040216  
 Residue/Carrier Agent 0.5 M HCl Quenching Agent N/A

	Standard Number	Quenching Vol (uL)/ Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	CAL 1				
2	CAL 2				
3	CAL 3				
4	CAL 4				
5	CAL 5				
6	CAL 6				
7	CAL 7				
8	CAL 8				
9	CAL 9				
10	CAL 10				
11	CAL 11				
12	CAL 12				
13	CAL 13				
14	CAL 14				
15	CAL 15				

ADL 5/6/05

Prepared By: Ad Beil Date: 5/6/05  
 Reviewed By: Angela A. Johnson Date: 5/9/05

Rev 1 RLM.9/10/97

## General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL-RAD-A-608, Rev. 8 Isotope Ra-226  
 Date Standards Prepared 8/26/03 Cocktail Type Used N/A  
 Standard ID 0299-E Matrix of Vial/Planchett N/A  
 Amount Used (g or ml) 0.1 N/A  
 Standard Activity (DPM/g or ml) 2434.34 Type of Scintillation Vial N/A  
 Reference Date 12/15/99 Pipette ID Used 1429303  
 Expiration Date 8/26/05 Balance ID Used 36040216  
 Residue/Carrier Agent 0.5 m HCl Quenching Agent N/A

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
16	CAL 16				
17	CAL 17				
18	CAL 18				
19	CAL 19				
20	CAL 20				
21	CAL 21				
22	CAL 22				
23	CAL 23				
24	CAL 24	ABJ 5/6/05			

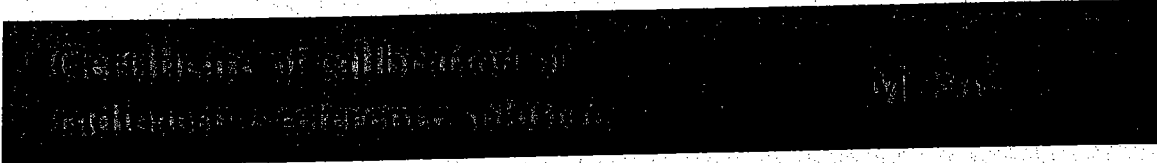
Prepared By: Ad Bail Date 5/6/05  
 Reviewed By: Angela A. Johnson Date 5/9/05

Rev 1 RLM 9/10/97

8-21-00

Nycomed Amersham plc  
Amersham Laboratories

029



Nycomed Amersham plc  
Radiation & Radioactivity  
Calibration Laboratory  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ISSUED  
FOR:

AEA Technology plc  
Isotrak  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ion Principal radionuclide: Radium-226

Product code: RAY44  
Solution number: R4/131/89

ment Reference time: 1200 GMT on 15 December 1999

data Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

ion of The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k = 2.00$ , which  
inties for a  $t$ -distribution with  $v_{eff} = \infty$  effective degrees of freedom corresponds to a coverage probability of approximately  
95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard  
uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated in the following examples;

6.5(21)	=	6.5 ± 2.1
6.54(21)	=	6.54 ± 0.21
6.543(21)	=	6.543 ± 0.021

ved  
ory

Page 566 of 913

Date of  
issue

17<sup>th</sup> December 1999

Nycomed  
Amersham

0299



UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Reference time for solution number R4/131/89:	1200 GMT on 15 December 1999
Radioactive concentration of radium-226:	43.75 kilobecquerels per gram of solution
which is equivalent to:	1.183 microcuries per gram of solution
Mass of solution:	5.0368 grams
Total activity of radium-226:	220.4 kilobecquerels
which is equivalent to:	5.956 microcuries
Recommended half life:	1600 years

Method of measurement:

The activity of the solution was measured using a high pressure re-entrant ionisation chamber calibrated with a large number of absolutely standardised solutions.

Calibration date: 15 December 1999

The calibration date is provided for added information only, and must not be confused with the reference date on pages 1 and 2 of the certificate. It is the reference date that must be used in all calculations relating to the values of activity.

Expanded uncertainty in the radioactive concentration quoted above:  $\pm 2.5\%$

Combined Type A uncertainty:  $\pm 0.2\%$

Combined Type B uncertainty:  $\pm 1.3\%$

The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Carrier free in 0.5M HCl.

This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

1 year = 365.25 days

At the reference date radium-226 was shown to be in radioactive equilibrium with its daughter nuclides down the decay chain to polonium-214 and thallium-210, the precursors of lead-210. The ionisation chamber was calibrated using a standard supplied by the National Institute of Standards and Technology, Washington DC, USA.





# Standard Traceability Log Rad

Source Material Info	
Parent Code:	0299
Prepared By:	Angela Albee
Carrier Conc:	0.5 M HCL
Reference Date:	12/15/1999
Ampoule Mass (g):	5.0368 g
Uncertainty:	+/- 2.5 %
LogBook No:	RC S 027 128

A Solution Material Info	
Isotope:	Radium-226
Prepared By:	Angela Albee
Prep Date:	09/15/2000
Verification Date:	08/26/2004
Expiration Date:	08/26/2005
Primary Code:	0299-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.6634 g
Density(g/mL):	1.0012

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
09/26/2000	Angela Albee	2.1096	100	0299-C	2579.62 dpm/mL	10/10/2002	10/10/2003
09/15/2000	Angela Albee	.2004	100	0299-B	245.05 dpm/mL	09/15/2000	09/15/2001
08/23/2002	Angela Albee	2.0443	100	0299-D	2499.77 dpm/mL	08/23/2002	08/23/2003
08/26/2003	Angela Albee	1.9909	100	0299-E	2434.34 dpm/mL	08/26/2004	08/26/2005
08/26/2003	Angela Albee	1.9872	100	0299-F	2429.82 dpm/mL	08/26/2004	08/26/2005

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

# Verification for Ra-226 Standard 0299-E

8/26/2004	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Mass. Used (G)	Source DPM/G
A. Fehr	0299-F N1	561.0000	26.9000	534.1000	3.38485694	0.0645	2446.372267
	0299-F N2	567.3000	26.9000	540.4000	3.38485694	0.0658	2426.325867
	0299-F N3	540.4000	26.9000	513.5000	3.38485694	0.0652	2326.765061

Mean Value (Counting) = 2399.821065 % of known  
 Stdev = 64.05739118 0.02669257

Certificate Value = 2429.4 dpm/mL  
 Lower Limit = 2271.706283 dpm/mL  
 Upper Limit = 2527.935847 dpm/mL  
 Rule 1 Pass/Fail Pass  
 Two sigma = 128.1147824 dpm/mL  
 10 % of Mean = 239.9821065 dpm/mL  
 Rule 2 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

The analyst prepared three standard verification sources for Ra-226 source 0299-E by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and ten mLs of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 23 for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 8/26/04 using source 0321-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0321. Each verification source calculation was performed as follows:

Source dpm/g = (A - B)/(C)(D)  
 where:  
 A = Ver. source cpm,  
 B = BKG cpm,  
 C = System efficiency, (cpm/dpm), and  
 D = mass used for standard verification.

RAD SOP M-001

Amanda L. Fehr 8/26/04  
 Heather W. Coe 8/26/04

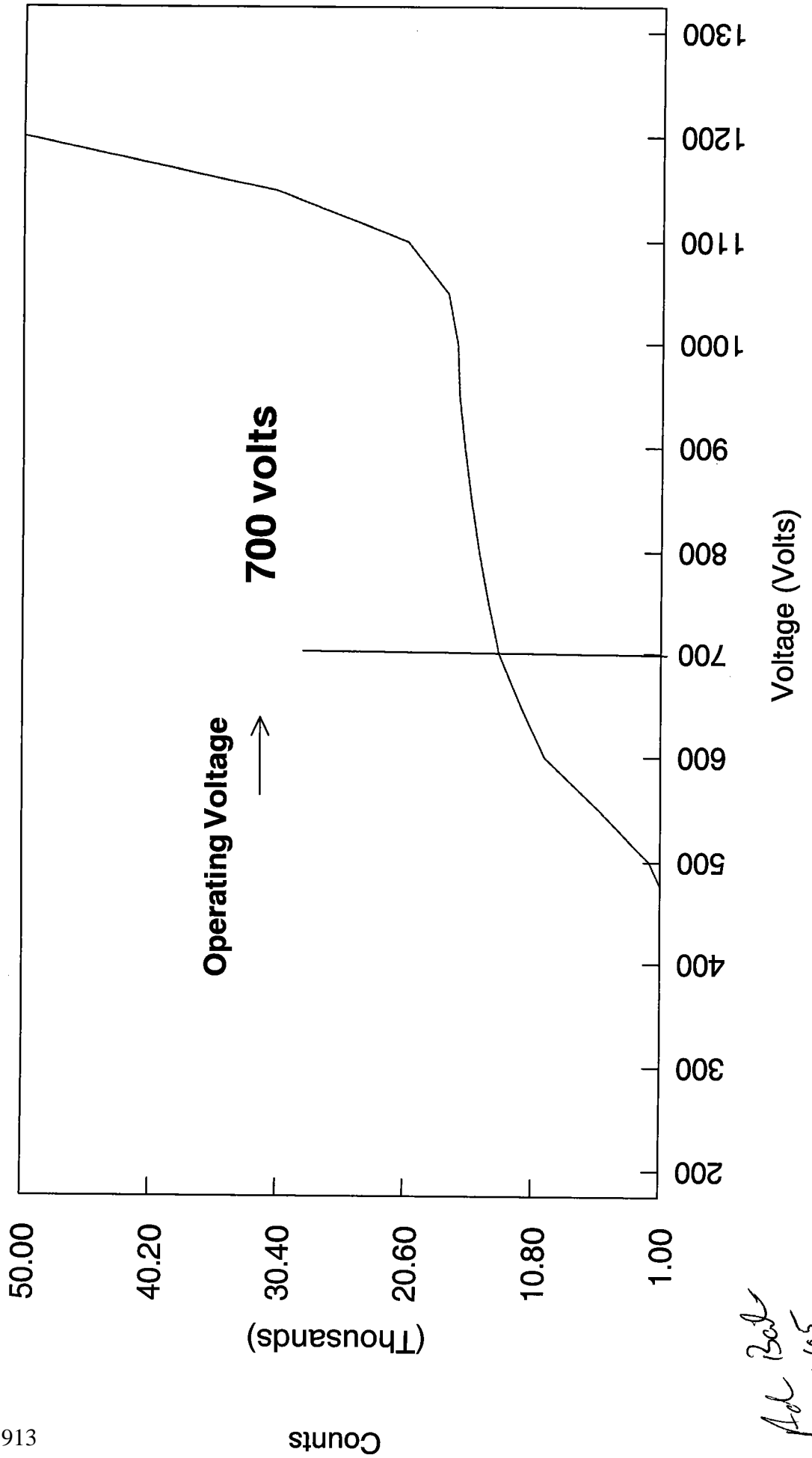
Voltage Curve Ludlum # 2				
Volts (K.V.)	Counts	Date	Time	Detector
0.20	0	4/22/2005	10:00	2
0.25	0	4/22/2005	10:00	2
0.30	0	4/22/2005	10:00	2
0.35	0	4/22/2005	10:00	2
0.40	0	4/22/2005	10:00	2
0.45	36	4/22/2005	10:00	2
0.50	1860	4/22/2005	10:00	2
0.55	5751	4/22/2005	10:00	2
0.60	9916	4/22/2005	10:00	2
0.65	11761	4/22/2005	10:00	2
0.70	13431	4/22/2005	10:00	2
0.75	14254	4/22/2005	10:00	2
0.80	14984	4/22/2005	10:00	2
0.85	15598	4/22/2005	10:00	2
0.90	16129	4/22/2005	10:00	2
0.95	16562	4/22/2005	10:00	2
1.00	16711	4/22/2005	10:00	2
1.05	17428	4/22/2005	10:00	2
1.10	20558	4/22/2005	10:00	2
1.15	30722	4/22/2005	10:00	2
1.20	49527	4/22/2005	10:00	2
1.25	71509	4/22/2005	10:00	2
1.30	115018	4/22/2005	10:00	2

*Ad Barb 5/6/05*

*AJ  
5/9/05*

# Plateau April, 2005

## Ludlum # 2



Ad. Beck  
5/6/05

ADD  
5/9/05

**Ra-226 WATER**

**Sample ID**

Batch : LCSVER  
 Date : 5/4/2005  
 Analyst : AB1

Procedure Code : LUC26RAL  
 Parmname : Radium-226  
 MDA : 1 pCi/L

Instrument Used : LUCAS CELL DETECTOR

Bkg Count Time: 30 min

201  
 202  
 203  
 204  
 205  
 206  
 207  
 208  
 209  
 210  
 211  
 212

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG cpm	Ra-226 MDA pCi/L	Ra-226 RESULT pCi/L	Ra-226 ERROR pCi/L	COUNT DATE/TIME	DEGASSING DATE/TIME
VER 1	0.500	30	506	201	1.87	0.267	0.6922	21.6828	1.9348	5/6/2005 12:10	5/3/2005 18:00
VER 8	0.500	30	780	202	1.78	0.167	0.3911	23.0678	1.6346	5/4/2005 13:00	4/29/2005 15:00
VER 2	0.500	30	544	203	1.82	0.267	0.7034	23.7135	2.0374	5/6/2005 12:45	5/3/2005 18:00
VER 10	0.500	30	797	204	1.75	0.200	0.4221	23.6367	1.6597	5/4/2005 14:35	4/29/2005 15:00
VER 2	0.500	30	766	205	1.97	0.167	0.4096	23.7204	1.6964	5/3/2005 16:00	4/29/2005 15:00
VER 11	0.500	30	860	206	1.88	0.167	0.3650	23.7490	1.6012	5/4/2005 15:10	4/29/2005 15:00
VER 3	0.500	30	732	207	1.73	0.267	0.5609	25.5427	1.8811	5/3/2005 16:30	4/29/2005 15:00
VER 3	0.500	30	484	208	1.79	0.233	0.6728	21.3535	1.9442	5/6/2005 13:20	5/3/2005 18:00
VER 4	0.500	30	582	209	1.74	0.267	0.7214	26.0445	2.1602	5/6/2005 13:55	5/3/2005 18:00
VER 6	0.500	30	663	210	1.73	0.267	0.5649	23.2734	1.8040	5/3/2005 22:05	4/29/2005 15:00
VER 5	0.500	30	545	211	1.70	0.067	0.4293	25.0218	2.1124	5/6/2005 15:10	5/3/2005 18:00
VER 6	0.500	30	610	212	1.81	0.067	0.4014	26.1947	2.0891	5/6/2005 15:40	5/3/2005 18:00

*AN Bob*  
 5/19/05

*Omega A. Johnson 5/19/05*

Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
	2	5/6/2005 12:10	LCS	0321-G	25.42	pCi/L	85%
	2	5/4/2005 13:00	LCS	0321-G	25.42	pCi/L	91%
	2	5/6/2005 12:45	LCS	0321-G	25.42	pCi/L	93%
	2	5/4/2005 14:35	LCS	0321-G	25.42	pCi/L	93%
	2	5/3/2005 16:00	LCS	0321-G	25.42	pCi/L	93%
	2	5/4/2005 15:10	LCS	0321-G	25.42	pCi/L	93%
	2	5/3/2005 16:30	LCS	0321-G	25.42	pCi/L	100%
	2	5/6/2005 13:20	LCS	0321-G	25.42	pCi/L	84%
	2	5/6/2005 13:55	LCS	0321-G	25.42	pCi/L	102%
	2	5/3/2005 22:05	LCS	0321-G	25.42	pCi/L	92%
	2	5/6/2005 15:10	LCS	0321-G	25.42	pCi/L	98%
	2	5/6/2005 15:40	LCS	0321-G	25.42	pCi/L	103%
DE-EMAN. DATE/TIME	DEGASS- DE-EM	dE-EM- COUNT	constant	constant	constant	Net CPM	Ingrowth constant
5/6/2005 8:45	62.75	3.42	0.3773	0.9745	1.0019	16.5997	0.3684
5/4/2005 10:00	115.00	3.00	0.5803	0.9776	1.0019	25.8330	0.5684
5/6/2005 9:30	63.50	3.25	0.3809	0.9758	1.0019	17.8663	0.3723
5/4/2005 11:35	116.58	3.00	0.5853	0.9776	1.0019	26.3667	0.5733
5/3/2005 11:55	92.92	4.08	0.5042	0.9696	1.0019	25.3663	0.4898
5/4/2005 12:10	117.17	3.00	0.5871	0.9776	1.0019	28.4997	0.5751
5/3/2005 12:40	93.67	3.83	0.5070	0.9715	1.0019	24.1330	0.4934
5/6/2005 10:10	64.17	3.17	0.3840	0.9764	1.0019	15.9003	0.3756
5/6/2005 10:55	64.92	3.00	0.3874	0.9776	1.0019	19.1330	0.3795
5/3/2005 15:00	96.00	7.08	0.5156	0.9479	1.0019	21.8330	0.4897
5/6/2005 11:50	65.83	3.33	0.3917	0.9751	1.0019	18.0997	0.3827
5/6/2005 12:25	66.42	3.25	0.3943	0.9758	1.0019	20.2663	0.3855

5/19/05  
Add Data

Angela J. Johnson 5/19/05

CALIBRATION STANDARD DETECTOR # 2

CELL #	END DEGAS TIME	END DE-EM TIME	COUNT TIME	DET #	BKG COUNTS	TOTAL COUNTS	SAMPLE #
201	4/29/05 1500	5/23/05 1055	5/30/05 1515	2	8	637	VER 1
202	4/29/05 1500	5/4/05 1000	5/4/05 1300	2	5	780	VER 8
203	4/29/05 1500	5/4/05 1045	5/4/05 1345	2	6	731	VER 9
204	4/29/05 1500	5/4/05 1135	5/4/05 1435	2	6	797	VER 10
205	4/29/05 1500	5/2/05 1155	5/2/05 1600	2	5	766	VER 2
206	4/29/05 1500	5/4/05 1210	5/4/05 1510	2	5	860	VER 11
207	4/29/05 1500	5/3/05 1240	5/3/05 1630	2	8	732	VER 3
208	4/29/05 1500	5/3/05 1330	5/3/05 1745	2	8	844	VER 4
209	4/29/05 1500	5/3/05 1430	5/3/05 1755	2	8	853	VER 5
210	4/29/05 1500	5/3/05 1500	5/3/05 2005	2	8	663	VER 6
211	4/29/05 1500	5/4/05 1240	5/4/05 1540	2	5	719	VER 12
212	5/2/05 1500	5/2/05 1540	5/2/05 2055	2	6	903	VER 7

ABI 5/6/05

ABI 5/6/05

ABI 5/6/05

ABI 5/6/05

ABI 5/6/05

ABI 5/6/05

ABI 5/6/05

ABI 5/6/05

AT 5/6/05

CALIBRATION STANDARD DETECTOR # 2

CELL #	END DEGAS TIME	END DE-EM TIME	COUNT TIME	DET #	BKG COUNTS	TOTAL COUNTS	SAMPLE #
201	5/2/05 18:00	5/6/05 845	5/6/05 1210	2	8	506	VER 1
203	5/3/05 18:00	5/6/05 930	5/6/05 1245	2	8	544	VER 2
208	5/3/05 1800	5/6/05 1010	5/6/05 1320	2	7	484	VER 3
209	5/3/05 1800	5/6/05 1055	5/6/05 1355	2	8	582	VER 4
211	5/3/05 1800	5/6/05 1150	5/6/05 1510	2	2	545	VER 5
212	5/3/05 1800	5/6/05 1225	5/6/05 1540	2	2	610	VER 6

ARI 5/6/05

ARI  
5/6/05



## General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL-RAD-A-008, Rev. 8 Isotope Ra-226  
 Date Standards Prepared 9/13/04 Cocktail Type Used N/A  
 Standard ID 0321-G Matrix of Vial/Planchett N/A  
 Amount Used (g or mL) 0.1 N/A  
 Standard Activity (DPM/g or mL) 283.81 Type of Scintillation Vial N/A  
 Reference Date 9/9/91 Pipette ID Used 1429303  
 Expiration Date 9/13/05 Balance ID Used 36040216  
 Residue/Carrier Agent 1 M HCl Quenching Agent N/A

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	VER 1				
2	VER 2				
3	VER 3				
4	VER 4				
5	VER 5				
6	VER 6				
7	VER 7				
8	VER 8				
9	VER 9		ABI 51615		
10	VER 10				
11	VER 11				
12	VER 12				
	ABI 516105				

Prepared By: Ade Baird Date: 5/6/05  
 Reviewed By: Angela J. Johnson Date: 5/9/05

Rev 1 RLM.9/10/97

# Verification for Ra-226 Standard 0321-G

A. Fehr  
9/14/2004

Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Mass. Used (g)	Standard	Source DPM/g
0321-E N1	1049.0000	68.4000	980.6000	3.416301	1.0000		287.0355979
0321-E N2	1051.6000	68.4000	983.2000	3.416301	1.0000		287.7966549
0321-E N3	1036.2000	68.4000	967.8000	3.416301	1.0000		283.2888554
					Average =		286.0403694

Mean Value (Counting) = 286.0403694  
 Stdev = 2.413073537

Certificate Value = 282.2  
 Lower Limit = 281.2142223  
 Upper Limit = 290.8665165  
 Rule 1 Pass/Fail Pass Pass  
 Two sigma = 4.826147074  
 10 % of Mean = 28.60403694  
 Rule 2 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

The analyst prepared three standard verification sources for Ra-226 source 0321-G by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and 10 mL Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Green using source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 1/9/04 using source 0299-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 (0299-A). Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:  
 A = Ver. source cpm,  
 B = BKG cpm,  
 C = System efficiency, (cpm/dpm), and  
 D = mass used for standard verification.

Reference RAD SOP M-001

*Amanda J. Fehr 9/14/04*

*Amelia S. Johnson 10/20/04*

**General Engineering Laboratories**

2040 Savage Road, Charleston, SC 29414  
(843)556-8171

Lucas Cell Calibration Package

301-311

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	✓		
	✓		
	✓		
	✓		
2) Is the efficiency calibration report included ?	✓		
3) Is the raw count data included for: Cell constant determination? Plateau generation?	✓		
	✓		
4) Are the calibration verifications included?	✓		
5) Are the instrument settings included: HVPS settings?	✓		
6) Has the CELLEFF.xls file been updated ?	✓		
7) Have the calibration dates been updated in ALPHALIMS ?	✓		

Prepared By: Angela L. Johnson

Date: 11/23/05

Reviewed By: [Signature]

Date: 11/23/05

Effective Date: 11/23/05

# Ra-226 Cell Constants

Standard Reference date: 12/15/1999  
 standard ID: 0299-E  
 Volume added (mL): 0.1  
 Standard Reference Activity (DPM/mL): 2434.34

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/time flushed to cell	Date/time end of degas	bkg cpm	total counts	count time min	Known activity dpm	t1 (days) end-degas to flush	t2 (days) end-flush to count	t3 (days) Std Ref Date to count	Decay from Std Ref Date to count
301	1.779	Average	11/15/2005 7:20	11/15/2005 4:20	11/9/2005 15:30	0.267	7998	30	266.60	5.53472	0.12500	2162	0.9974
301	1.673	Stdev	11/22/2005 16:50	11/22/2005 8:45	11/15/2005 12:40	0.267	8118	30	270.60	6.83681	0.33681	2170	0.9974
301	1.835		11/9/2005 6:30	11/9/2005 5:15	10/30/2005 13:15	0.267	6316	30	210.53	3.66667	0.13542	2150	0.9975
302	1.770	Average	11/15/2005 9:20	11/15/2005 5:00	11/9/2005 15:30	0.267	7901	30	263.37	5.56250	0.18056	2162	0.9974
302	1.796	Stdev	11/9/2005 8:50	11/9/2005 5:40	11/4/2005 14:20	0.133	7237	30	241.23	4.63889	0.13194	2156	0.9974
302	1.891		11/2/2005 11:25	11/2/2005 8:05	10/30/2005 13:15	0.267	5309	30	176.97	2.78472	0.13889	2149	0.9975
303	1.980	Average	11/22/2005 17:20	11/22/2005 9:25	11/15/2005 12:40	0.267	9639	30	321.30	6.86458	0.32986	2170	0.9974
303	2.103	Stdev	11/8/2005 7:50	11/8/2005 4:30	11/4/2005 14:20	0.267	7124	30	237.47	3.59028	0.13889	2155	0.9974
303	2.104		11/2/2005 10:50	11/2/2005 7:30	10/30/2005 13:15	0.267	5867	30	195.57	2.76042	0.13889	2149	0.9975
304	1.777	Average	11/15/2005 10:05	11/15/2005 5:30	11/9/2005 15:30	0.267	7935	30	264.50	5.58333	0.19097	2162	0.9974
304	1.867	Stdev	11/8/2005 11:35	11/8/2005 8:35	11/4/2005 14:20	0.200	6549	30	218.30	3.76042	0.12500	2155	0.9974
304	1.999		11/3/2005 10:40	11/3/2005 7:40	10/30/2005 13:15	0.267	7022	30	234.07	3.76736	0.12500	2150	0.9975
305	1.763	Average	10/31/2005 11:10	10/31/2005 7:30	10/16/2005 14:30	0.267	11585	30	386.17	14.70883	0.15278	2147	0.9975
305	1.787	Stdev	11/8/2005 8:25	11/8/2005 5:10	11/4/2005 14:20	0.133	6089	30	202.97	3.61806	0.13542	2155	0.9974
305	1.728		11/15/2005 10:40	11/15/2005 6:30	11/9/2005 15:30	0.267	7776	30	259.20	5.62500	0.17361	2162	0.9974
306	1.845	Average	11/15/2005 11:10	11/15/2005 7:10	11/9/2005 15:30	0.267	8332	30	277.73	5.65278	0.16667	2162	0.9974
306	1.779	Stdev	11/8/2005 12:10	11/8/2005 9:10	11/4/2005 14:20	0.267	6270	30	209.00	3.78472	0.12500	2156	0.9974
306	1.854		11/22/2005 17:35	11/22/2005 10:15	11/15/2005 12:40	0.267	9139	30	304.63	6.89931	0.30556	2170	0.9974
307	1.908	Average	11/15/2005 11:45	11/15/2005 7:45	11/9/2005 15:30	0.267	8637	30	287.90	5.67708	0.16667	2162	0.9974
307	1.850	Stdev	11/8/2005 9:55	11/8/2005 6:55	11/4/2005 14:20	0.267	6409	30	213.63	3.69097	0.12500	2155	0.9974
307	1.949		11/3/2005 10:10	11/3/2005 7:10	10/30/2005 13:15	0.267	6822	30	227.40	3.74653	0.12500	2150	0.9975
308	1.914	Average	11/15/2005 15:30	11/15/2005 8:20	11/9/2005 15:30	0.267	8483	30	282.77	5.70139	0.29861	2163	0.9974
308	1.746	Stdev	11/8/2005 10:25	11/8/2005 7:25	11/4/2005 14:20	0.133	6089	30	202.30	3.71181	0.12500	2155	0.9974
308	2.059		11/2/2005 9:30	11/2/2005 5:55	10/30/2005 13:15	0.267	5626	30	187.53	2.69444	0.14931	2149	0.9975
309	1.831	Average	11/15/2005 15:30	11/15/2005 9:00	11/9/2005 15:30	0.267	8177	30	272.57	5.72917	0.27083	2163	0.9974
309	1.921	Stdev	11/22/2005 19:30	11/22/2005 12:15	11/15/2005 12:40	0.267	9480	30	316.00	6.98264	0.30208	2170	0.9974
309	1.934		11/3/2005 13:10	11/3/2005 9:15	10/30/2005 13:15	0.267	6829	30	227.63	3.83333	0.16319	2151	0.9975
310	1.834	Average	11/22/2005 19:30	11/22/2005 14:50	11/15/2005 12:40	0.200	9298	30	309.93	7.09028	0.19444	2170	0.9974
310	2.007	Stdev	11/8/2005 13:10	11/8/2005 9:50	11/4/2005 14:20	0.267	7093	30	236.43	3.81250	0.13889	2156	0.9974
310	2.125		11/2/2005 7:50	11/2/2005 4:30	10/30/2005 13:15	0.267	5717	30	190.57	2.63542	0.13889	2149	0.9975
311	1.916	Average	11/18/2005 7:40	11/18/2005 7:40	11/15/2005 12:40	0.267	5527	30	184.23	2.79167	0.00000	2165	0.9974
311	1.783	Stdev	11/8/2005 14:15	11/8/2005 10:30	11/4/2005 14:20	0.267	6315	30	210.50	3.84028	0.15625	2156	0.9974
311	1.882		11/2/2005 8:25	11/2/2005 5:15	10/30/2005 13:15	0.267	5118	30	170.60	2.66667	0.13194	2149	0.9975

*Owensland Johnson*  
11/23/05

# CALS 3

AAQ  
11/23/05

## Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 12	500	10/16/05 1430	10/31/05 450	10/31/05 850	301	3	8	9387
CAL 13	500	10/16/05 1430	10/31/05 530	10/31/05 930	302	3	8	10818
CAL 17	500	10/16/05 1430	10/31/05 625	10/31/05 1010	303	3	8	12225
CAL 18	500	10/16/05 1430	10/31/05 700	10/31/05 1040	304	3	8	11119
CAL 19	500	10/16/05 1430	10/31/05 730	10/31/05 1110	305	3	8	11585
CAL 20	500	10/16/05 1430	10/31/05 800	10/31/05 1145	306	3	8	10159
CAL 21	500	10/16/05 1430	10/31/05 830	10/31/05 1230	307	3	8	9445
CAL 22	500	10/16/05 1430	10/31/05 930	10/31/05 1415	308	3	8	9343
CAL 24	500	10/16/05 1430	11/1/05 415	11/1/05 725	309	3	8	10301
CAL 14	500	10/16/05 1430	11/5/05 1030	11/5/05 1420 11/5/05 1110	310	3	6	7913
CAL 15	500	10/16/05 1430	11/5/05 1110	11/5/05 1550	311	3	8	6007
/								

AAQ 11/23/05  
AAQ 11/23/05  
AAQ 11/23/05  
AAQ 11/23/05  
AAQ 11/23/05  
AAQ 11/23/05  
AAQ 11/23/05  
AAQ 11/23/05  
AAQ 11/23/05  
AAQ 11/23/05  
AAQ 11/23/05  
AAQ 11/23/05

~~CALS 3~~

ADG 11/23/05 Ra-226 Verification Sheet

ADG 11/23/05

ADG 11/23/05

ADG 11/23/05

ADG 11/23/05

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 1		10/30/05 1315	11/21/05 430	11/21/05 750	310	3	8	5717
CAL 2		10/30/05 1315	11/21/05 515	11/21/05 825	311	3	8	5118
CAL 3		10/30/05 1315	11/21/05 555	11/21/05 930	308	3	8	5626
<del>CAL 4</del>		<del>10/30/05 1315</del>	<del>11/21/05 655</del>	<del>11/21/05 1005</del>	<del>306</del>	<del>3</del>	<del>8</del>	<del>6292</del>
CAL 5		10/30/05 1315	11/21/05 730	11/21/05 1050	303	3	8	5867
CAL 6		10/30/05 1315	11/21/05 805	11/21/05 1125	302	3	8	5309
CAL 7		10/30/05 1315	11/21/05 515	11/21/05 830	301	3	8	6316
<del>CAL 8</del>		<del>10/30/05 1315</del>	<del>11/21/05 630</del>	<del>11/21/05 930</del>	<del>305</del>	<del>3</del>	<del>8</del>	<del>7239</del>
CAL 9		10/30/05 1315	11/21/05 710	11/21/05 1010	307	3	8	4822
CAL 10		10/30/05 1315	11/21/05 740	11/21/05 1040	304	3	8	7022
CAL 11		10/30/05 1315	11/21/05 915	11/21/05 1310	309	3	8	6829

CAL-3 ADQ 11/23/05

Ra-226 Verification Sheet

ADQ 11/23/05

ADQ 11/23/05

ADQ 11/23/05

ADQ 11/23/05

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 1		11/4/05 1420	11/8/05 430	11/8/05 750	303	3	8	7124
CAL 2		11/4/05 1420	11/8/05 510	11/8/05 825	305	3	4	6089
<del>CAL 3</del>		<del>11/4/05 1420</del>	<del>11/8/05 545</del>	<del>11/8/05 900</del>	<del>307</del>	<del>3</del>	<del>2</del>	<del>6349</del>
CAL 4		11/4/05 1420	11/8/05 655	11/8/05 955	307	3	8	6409
CAL 5		11/4/05 1420	11/8/05 725	11/8/05 1025	308	3	4	6069
<del>CAL 6</del>		<del>11/4/05 1420</del>	<del>11/8/05 800</del>	<del>11/8/05 1105</del>	<del>309</del>	<del>3</del>	<del>7</del>	<del>6116</del>
CAL 7		11/4/05 1420	11/8/05 835	11/8/05 1135	304	3	6	6549
CAL 8		11/4/05 1420	11/8/05 910	11/8/05 1210	306	3	8	6270
CAL 9		11/4/05 1420	11/8/05 950	11/8/05 1310	310	3	8	7093
CAL 10		11/4/05 1420	11/8/05 1030	11/8/05 1415	311	3	8	6315
CAL 11		11/4/05 1420	11/9/05 540	11/9/05 850	302	3	4	7237
/								

CALS 3

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 10		11/9/05 1530	11/15/05 420	11/15/05 720	301	3	8	7998
CAL 12		11/9/05 1530	11/15/05 860	11/15/05 920	302	3	8	7901
CAL 14		11/9/05 1530	11/15/05 6530	11/15/05 1005	304	3	8	7935
CAL 15		11/9/05 1530	11/15/05 630	11/15/05 1040	305	3	8	7776
CAL 16		11/9/05 1530	11/15/05 710	11/15/05 1110	306	3	8	8332
CAL 17		11/9/05 1530	11/15/05 745	11/15/05 1145	307	3	8	8637
CAL 18		11/9/05 1530	11/15/05 820	11/15/05 1415	308	3	8	8483
CAL 19		11/9/05 1530	11/15/05 900	11/15/05 1530	309	3	8	9177
CAL 20		11/9/05 1530	11/15/05 950	11/15/05 1600	311	3	8	7127
/								

ADD  
11/23/05

ADD  
11/23/05

ADD 11/23/05



Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL1		11/15/05 1240	11/18/05 440	11/18/05 740	311	3	8	5527

AK  
11/23/05

AK  
11/23/05

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 12	500	11/15/05 1240	11/22/05 845	11/22/05 1650	301	3	8 = 0.267	8118
CAL 13	500	11/15/05 1240	11/22/05 925	11/22/05 1720	303	3	8 = 0.267	9639
CAL 14	500	11/15/05 1240	11/22/05 1015	11/22/05 1735	304	3	8 = 0.267	9139
<del>CAL 15</del>	<del>500</del>	<del>11/15/05 1240</del>	<del>11/22/05 1105</del>	<del>11/22/05 1840</del>	<del>308</del>	<del>3</del>	<del>8 = 0.267</del>	<del>8234</del>
CAL 16	500	11/15/05 1240	11/22/05 1215	11/22/05 1930	309	3	8 = 0.267	9480
CAL 17	500	11/15/05 1240	11/22/05 1450	11/22/05 2000	310	3	8 = 0.267	9298
/								

~~OK 11/23/05~~

OK 11/23/05

OK 11/23/05

**General Engineering Laboratories  
Calibration Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-008 Isotope Ra-226  
 Date Standards Prepared 8/26/03 Cocktail Type Used NA  
 Standard ID 0299-E Matrix of Vial/Planchett NA  
 Amount Used (g or  $\text{mL}$ ) 0.1 NA  
 Standard Activity (DPM/g or  $\text{mL}$ ) 2434.34 Type of Scintillation Vial NA  
 Reference Date 12/15/99 Pipette ID Used 1429303  
 Expiration Date 11/4/06 Balance ID Used 28488  
 Residue/Carrier Agent 0.5 M HCl Quenching Agent NA

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	CAL1				
2	CAL2				
3	CAL3				
4	CAL4				
5	CAL5				
6	CAL6				
7	CAL7				
8	CAL8				
9	CAL9				
10	CAL10				
11	CAL11				
12	CAL12				
13	CAL13				
14	CAL14				
15	CAL15				

JLQ 11/23/05

Prepared By: Angela J. Johnson Date 11/23/05  
 Reviewed By: Est. C. L. L. Date 11/2/06

Rev 1 RLM 9/10/97

**General Engineering Laboratories  
Calibration Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-008 Isotope Ra-226  
 Date Standards Prepared 8/26/03 Cocktail Type Used NA  
 Standard ID 0299-E Matrix of Vial/Planchett NA  
 Amount Used (g or ml) 0.1 NA  
 Standard Activity (DPM/g or ml) 2434.34 Type of Scintillation Vial NA  
 Reference Date 12/15/99 Pipette ID Used 1429303  
 Expiration Date 11/4/06 Balance ID Used 28488  
 Residue/Carrier Agent 0.5M HCl Quenching Agent NA

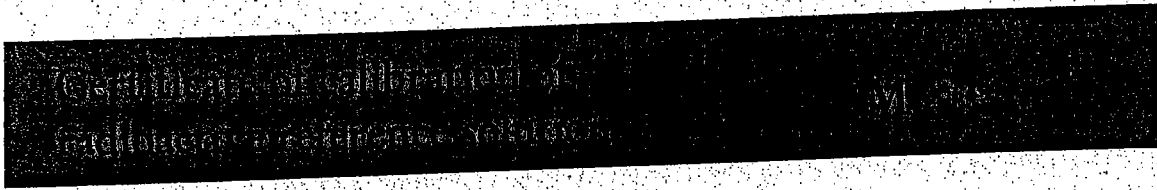
	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
16	CAL 16				
17	CAL 17				
18	CAL 18				
19	CAL 19				
20	CAL 20				
21	CAL 21				
22	CAL 22				
23	CAL 23				
24	CAL 24				

AQ 11/23/05

AQ 11/23/05

Prepared By: Angela F. Johnson Date 11/23/05  
 Reviewed By: Let C. ... Date 11/23/05

02.7



Nycomed Amersham plc  
Radiation & Radioactivity  
Calibration Laboratory  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ISSUED  
FOR:

AEA Technology plc  
Isotrak  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

Principal radionuclide: Radium-226

Product code: RAY44  
Solution number: R4/131/89

Reference time: 1200 GMT on 15 December 1999

Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k = 2.00$ , which for a  $t$ -distribution with  $\nu_{eff} = \infty$  effective degrees of freedom corresponds to a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated in the following examples;

6.5(21)	-	$6.5 \pm 2.1$
6.54(21)	-	$6.54 \pm 0.21$
6.543(21)	-	$6.543 \pm 0.021$

Page 688 of 913

17<sup>th</sup> December 1999

0299

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Reference time for solution number R4/131/89:	1200 GMT on 15 December 1999
Radioactive concentration of radium-226:	43.75 kilobecquerels per gram of solution
which is equivalent to:	1.183 microcuries per gram of solution
Mass of solution:	5.0368 grams
Total activity of radium-226:	220.4 kilobecquerels
which is equivalent to:	5.956 microcuries
Recommended half life:	1600 years

Method of measurement:  
The activity of the solution was measured using a high pressure re-entrant ionisation chamber calibrated with a large number of absolutely standardised solutions.

Calibration date: 15 December 1999  
The calibration date is provided for added information only, and must not be confused with the reference date on pages 1 and 2 of the certificate. It is the reference date that must be used in all calculations relating to the values of activity.

- Expanded uncertainty in the radioactive concentration quoted above:  $\pm 2.5 \%$
- Combined Type A uncertainty:  $\pm 0.2 \%$
- Combined Type B uncertainty:  $\pm 1.3 \%$

Radiochemical The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Chemical Carrier free in 0.5M HCl  
position

Remarks This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

1 year = 365.25 days

At the reference date radium-226 was shown to be in radioactive equilibrium with its daughter nuclides down the decay chain to polonium-214 and thallium-210, the precursors of lead-210. The ionisation chamber was calibrated using a standard supplied by the National Institute of Standards and Technology, Washington DC, USA.

# Verification for Ra-226 Standard 0299-E

11/14/2005	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard mL used	Source DPM/G
A.Fehr	0299-F N1	1340.3000	0.6000	1339.7000	2.72177002	0.2000	2461.082289
	0299-F N2	1313.2000	0.6000	1312.6000	2.72177002	0.2000	2411.298509
	0299-F N3	1298.1000	0.6000	1297.5000	2.72177002	0.2000	2383.559208
				99.6090287	% of known		2418.646669

Mean Value (Counting) = 2418.646669  
 Stdev = 39.28044852

Certificate Value = 2428.1 dpm/mL  
 Lower Limit = 2340.085772 dpm/mL  
 Upper Limit = 2497.207566 dpm/mL  
 Rule 1 Pass/Fail Pass  
 Two sigma = 78.56089703 dpm/mL  
 10 % of Mean = 241.8646669 dpm/mL  
 Rule 2 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0299-E by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and ten mLs of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 8 for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 11/4/05 using source 0321-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0321. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

RAD SOP M-001

*Amenda L. Fehr 11/14/05  
 Amenda L. Fehr 11/14/05*

**PROTOCOL** : 8 Ra-226 ver  
**DATE** : 2005/11/04  
**TIME** : 11:47  
**ID** : P08AS001

**Ra226**

**Wallac 1414 WinSpectral v1.40 S/N 4140127**  
**Counting mode** : CPM  
**Isotope(s)** : Ra226  
**Ra226** = 400- 900,Alpha,1602.12 y  
**Protocol name** : Ra-226 ver  
**Counting time** : 300  
**Repeats** : 1  
**Cycles** : 1  
**Replicates** : 1  
**2 sigma %** : 0.01  
**Minimum cpm** : 0.00 **Checking time: 10**  
**Advanced modes** : Halflife,PSA,Chemilum  
**Halflife zerotime** : Start of assay  
**PSA level** : low  
**Output to Display** :  
**POS,DATE,CTIME,RACK,RACKPOS,ETIME,SQPE,CPM1,CPM**  
**Additions to Display** : Spectrum,Header,Listing  
**Header** : Ra226  
**Spectrum** : Rnd.Cos,Alpha  
**Window 1** : 1-1024 /Alpha  
**Window 2** : 1-1024 /Beta  
**Window 3** : 1-1024 /Beta  
**Window 4** : 1-1024 /Beta  
**Window 5** : 1-1024 /Beta  
**Window 6** : 1-1024 /Beta  
**FNCT1 = FNCT1** :  
**FNCT2 = FNCT2** :  
**FNCT3 = FNCT3** :  
**FNCT4 = FNCT4** :

**Total count rate:**  
**Ra226 10537.9 CPM**

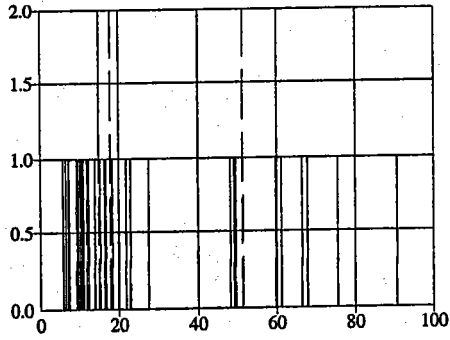
*Amanda L. Lehn*  
 11/4/05

*A/Q*  
 11/4/05



POS CTIME SQPI CPM CPM1

1 300 23.50 1.90

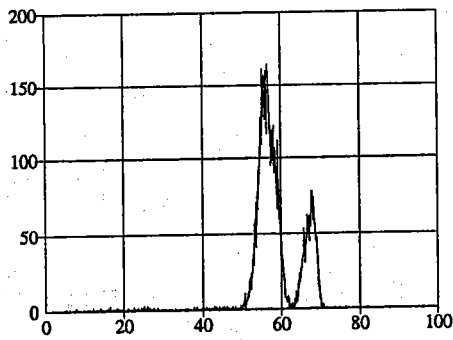


Counts Chem

Counts Alpha

*Blg*

2 300 4697.50 2217.70

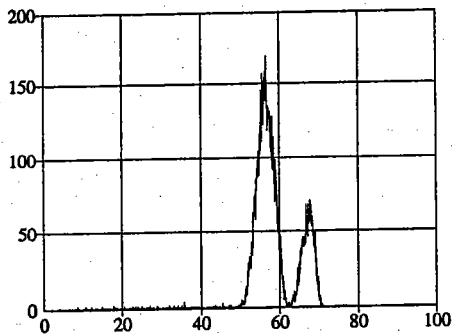


Counts Chem

Counts Alpha

*0321-A*

3 300 4542.00 2191.80



Counts Chem

Counts Alpha

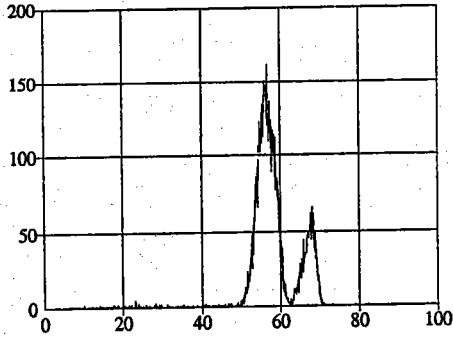
*0321-A*

*ALF 11/4/05*

*ALF  
11/4/05*

POS CTIME SQPI CPM CPM1

4 300 4376.00 2174.30

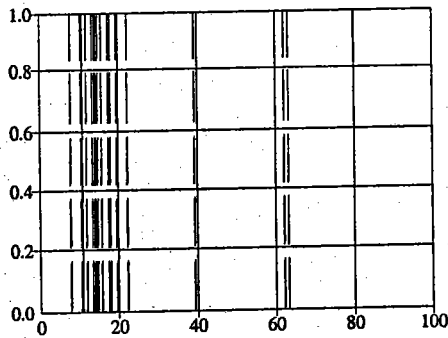


Counts Chem

Counts Alpha

0321-A

5 300 19.50 0.60

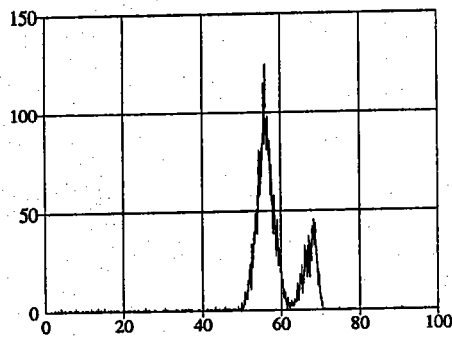


Counts Chem

Counts Alpha

Bkg

6 300 1930.20 1340.30



Counts Chem

Counts Alpha

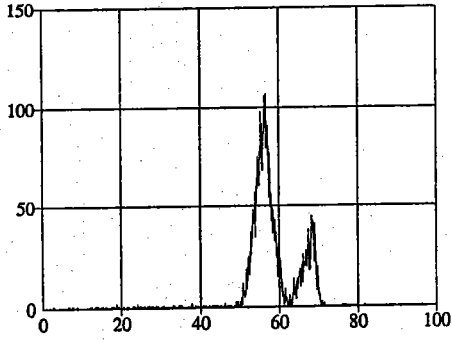
0299-E

ALF 11/4/05

AQ  
11/4/05

POS CTIME SQPI CPM CPM1

7 300 1906.90 1313.20

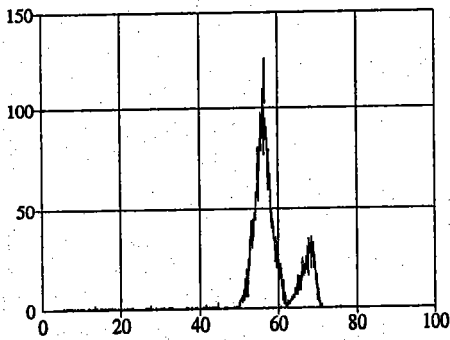


Counts Chem

Counts Alpha

0299-E

8 300 1835.40 1298.10



Counts Chem

Counts Alpha

0299-E

JLQ  
11/4/05

# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0299	Isotope:	Radium-226
Prepared By:	Angela Albee	Prepared By:	Angela Albee
Carrier Conc:	0.5 M HCL	Prep Date:	09/15/2000
Reference Date:	12/15/1999	Verification Date:	08/26/2004
Ampoule Mass (g):	5.0368 g	Expiration Date:	08/26/2005
Uncertainty:	+/- 2.5 %	Primary Code:	0299-A
LogBook No:	RC S 027 128	Dilution(mL):	100 mL
		Mass of Parent(g):	4.6634 g
		Density(g/mL):	1.0012

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
09/26/2000	Angela Albee	2.1096	100	0299-C	2579.62 dpm/mL	10/10/2002	10/10/2003
09/15/2000	Angela Albee	.2004	100	0299-B	245.05 dpm/mL	09/15/2000	09/15/2001
08/23/2002	Angela Albee	2.0443	100	0299-D	2499.77 dpm/mL	08/23/2002	08/23/2003
08/26/2003	Angela Albee	1.9909	100	0299-E	2434.34 dpm/mL	11/04/2004	11/04/2005
08/26/2003	Angela Albee	1.9872	100	0299-F	2429.82 dpm/mL	08/26/2004	08/26/2005
04/05/2005	Amanda Fehr	5.0018	250	0299-G	2446.3471 dpm/mL	04/06/2005	04/06/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

AIQ  
11/4/05

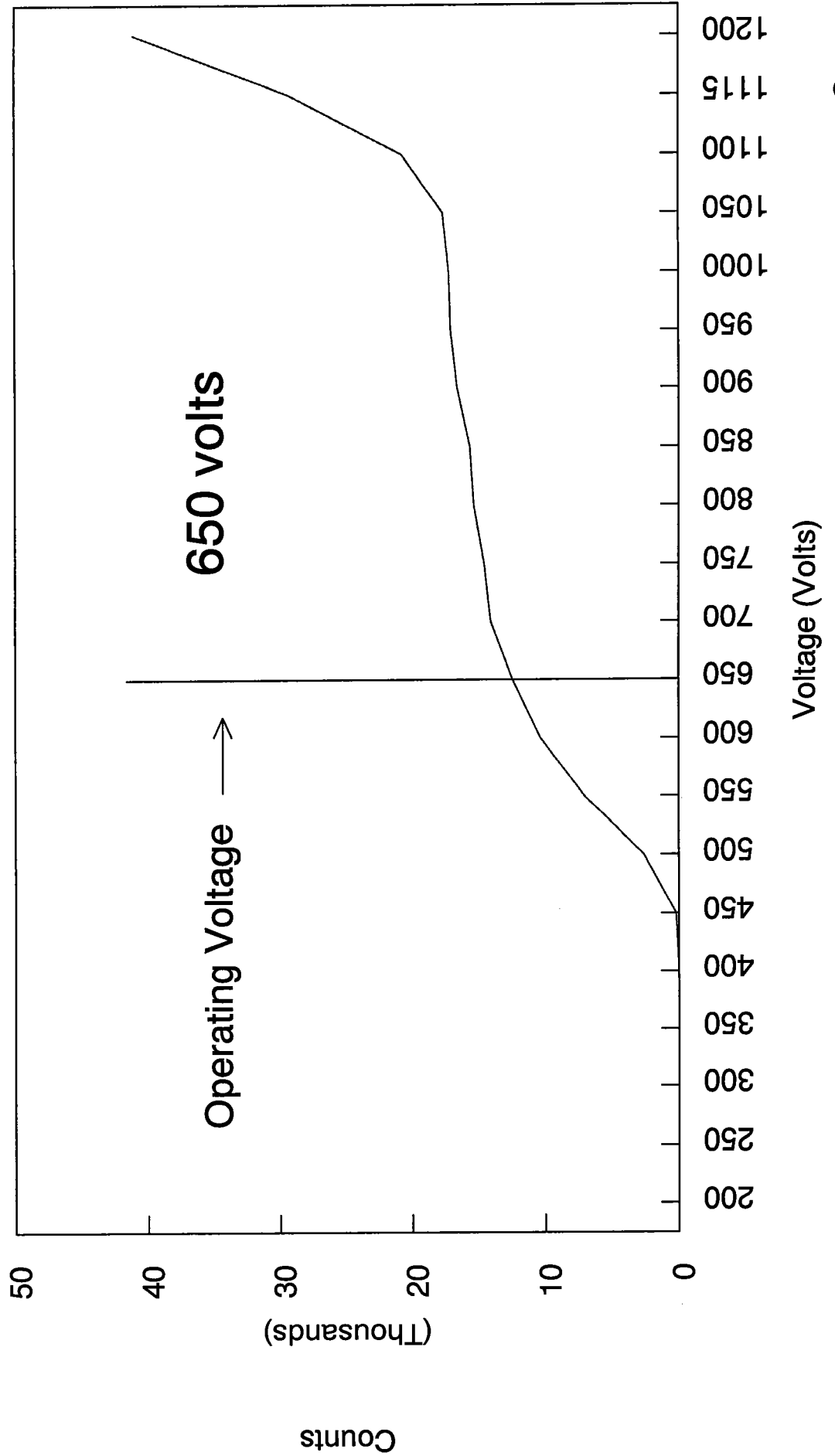
VOLTAGE CURVE DET 10-03

Voltage Curve Ludlum # 3				
Volts (K.V.)	Counts	Date	Time	Detector
0.20	0	11/14/2005	14:00	3
0.25	0	11/14/2005	14:01	3
0.30	0	11/14/2005	14:02	3
0.35	0	11/14/2005	14:03	3
0.40	0	11/14/2005	14:04	3
0.45	5	11/14/2005	14:05	3
0.50	235	11/14/2005	14:06	3
0.55	329	11/14/2005	14:07	3
0.60	412	11/14/2005	14:08	3
0.65	452	11/14/2005	14:09	3
0.70	463	11/14/2005	14:10	3
0.75	448	11/14/2005	14:11	3
0.80	483	11/14/2005	14:12	3
0.85	511	11/14/2005	14:13	3
0.90	465	11/14/2005	14:14	3
0.95	491	11/14/2005	14:15	3
1.00	495	11/14/2005	14:16	3
1.05	506	11/14/2005	14:17	3
1.10	733	11/14/2005	14:18	3
1.15	1398	11/14/2005	14:19	3
1.20	2869	11/14/2005	14:20	3

*Handwritten signature*  
11/23/05

# Plateau November, 2005

Ludlum # 3



AD  
11/23/05

# Ra-226 WATER

Sample ID

Batch : LCSVER  
 Date : 11/1/2005  
 Analyst : JMB1

Procedure Code : LUC26RAL  
 Parminame : Radium-226  
 MDA : 1 pCi/L

Instrument Used : LUCAS CELL DETECTOR

Bkg Count Time: 30 min

- 1
- 2
- 3
- 4
- 5
- 4
- 7
- 5
- 6
- 10
- 11

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG cpm	Ra-226 MDA pCi/L	Ra-226 RESULT pCi/L	Ra-226 ERROR pCi/L	COUNT DATE/TIME	DEGASSING DATE/TIME
1	0.500	30	694	301	1.762	0.267	0.5476	23.6277	1.7887	11/5/2005 13:14	11/1/2005 12:15
2	0.500	30	594	302	1.819	0.267	0.5181	19.0959	1.5671	11/5/2005 13:50	11/1/2005 12:15
3	0.500	30	911	303	2.062	0.200	0.4087	26.1845	1.7173	11/18/2005 13:00	11/14/2005 12:00
4	0.500	30	1120	304	1.881	0.233	0.3092	22.8964	1.3536	11/10/2005 7:30	11/1/2005 12:15
5	0.500	30	1017	305	1.759	0.267	0.3662	23.2385	1.4452	11/9/2005 10:45	11/1/2005 12:15
4	0.500	30	836	306	1.829	0.233	0.4975	27.4401	1.8836	11/18/2005 15:45	11/14/2005 12:00
7	0.500	30	987	307	1.902	0.267	0.3353	20.6474	1.3039	11/9/2005 10:25	11/1/2005 12:15
5	0.500	30	920	308	1.907	0.267	0.5062	29.0398	1.9012	11/18/2005 17:15	11/14/2005 12:00
6	0.500	30	885	309	1.895	0.267	0.5070	27.9649	1.8677	11/18/2005 17:46	11/14/2005 12:00
10	0.500	30	981	310	1.989	0.267	0.3079	18.8463	1.1939	11/10/2005 10:35	11/1/2005 12:15
11	0.500	30	965	311	1.861	0.233	0.3113	19.8446	1.2658	11/10/2005 9:55	11/1/2005 12:15

*Angela L. Johnson*  
 11/23/05

Cell #	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
301	3	11/5/2005 13:14	LCS	0321-H	24.14	pCi/L	98%
302	3	11/5/2005 13:50	LCS	0321-H	24.14	pCi/L	79%
303	3	11/18/2005 13:00	LCS	0321-H	24.14	pCi/L	108%
304	3	11/10/2005 7:30	LCS	0321-H	24.14	pCi/L	95%
305	3	11/9/2005 10:45	LCS	0321-H	24.14	pCi/L	96%
306	3	11/18/2005 15:45	LCS	0321-H	24.14	pCi/L	114%
307	3	11/9/2005 10:25	LCS	0321-H	24.14	pCi/L	86%
308	3	11/18/2005 17:15	LCS	0321-H	24.14	pCi/L	120%
309	3	11/18/2005 17:46	LCS	0321-H	24.14	pCi/L	116%
310	3	11/10/2005 10:35	LCS	0321-H	24.14	pCi/L	78%
311	3	11/10/2005 9:55	LCS	0321-H	24.14	pCi/L	82%

DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM	Ingrowth constant
11/5/2005 9:50	93.58	3.40	0.5067	0.9747	1.0019	22.8663	0.4948
11/5/2005 11:45	95.50	2.08	0.5137	0.9844	1.0019	19.5330	0.5067
11/18/2005 10:45	94.75	2.25	0.5110	0.9832	1.0019	30.1667	0.5033
11/10/2005 4:30	208.25	3.00	0.7924	0.9776	1.0019	37.1003	0.7761
11/9/2005 7:40	187.42	3.08	0.7571	0.9770	1.0019	33.6330	0.7411
11/18/2005 11:10	95.17	4.58	0.5125	0.9660	1.0019	27.6337	0.4960
11/9/2005 8:25	188.17	2.00	0.7584	0.9850	1.0019	32.6330	0.7485
11/18/2005 11:45	95.75	5.50	0.5147	0.9598	1.0019	30.3997	0.4947
11/18/2005 12:20	96.33	5.43	0.5168	0.9598	1.0019	29.2330	0.4970
11/10/2005 7:25	211.17	3.17	0.7970	0.9764	1.0019	32.4330	0.7796
11/10/2005 6:50	210.58	3.08	0.7961	0.9770	1.0019	31.9337	0.7792

*Angelica Johnson*  
11/23/05



Ra-226 Verification Sheet

AD 11/23/05

AD 11/23/05

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
VER 2	500	11/1/05 1215	11/5/05 950	11/5/05 1314	301	3	8	694
VER 3	500	11/1/05 1215	11/5/05 1145	11/5/05 1350	302	3	8	594
VER 4	500	11/1/05 1215	11/9/05 700	11/9/05 1000 11/9/05 1008	303	3	4	990
VER 5	500	11/1/05 1215	11/9/05 740	11/9/05 1045	305	3	8	1017
VER 6	500	11/1/05 1215	11/9/05 825	11/9/05 1025	307	3	8	987
VER 7	500	11/1/05 1215	11/9/05 900	11/9/05 1200	309	3	5	705
VER 8	500	11/1/05 1215	11/10/05 430	11/10/05 730	304	3	8	1120
VER 9	500	11/1/05 1215	11/10/05 505	11/10/05 820	306	3	8	951
VER 10	500	11/1/05 1215	11/10/05 540	11/10/05 900	309	3	8	888
VER 11	500	11/1/05 1215	11/10/05 650	11/10/05 955	311	3	8	966
VER 12	500	11/1/05 1215	11/10/05 725	11/10/05 1035	310	3	8	981

Ra-226 Verification Sheet

50/22/11  
JAF

50/22/11  
JAF

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
VER 1	500	11/14/05 1200	11/17/05 625	11/17/05 1030	302	3	8 = 0.267	954
VER 3	500	11/14/05 1200	11/18/05 1045	11/18/05 1300	303	3	8 = 0.267	911
VER 4	500	11/14/05 1200	11/18/05 1110	11/18/05 1545	306	3	8 = 0.267	834
VER 5	500	11/14/05 1200	11/18/05 1145	11/18/05 1715	308	3	8 = 0.267	920
VER 6	500	11/14/05 1200	11/18/05 1220	11/18/05 1746	309	3	8 = 0.267	885

**General Engineering Laboratories  
Verification Source Preparation Sheet**

Applicable SOP Number EL-RAD-A-008 Isotope Ra-226  
 Date Standards Prepared 5/18/05 Cocktail Type Used NA  
 Standard ID 0321-H Matrix of Vial/Planchett NA  
 Amount Used (g or ml) 0.1 NA  
 Standard Activity (DPM/g or ml) 269.6188 Type of Scintillation Vial NA  
 Reference Date 9/9/91 Pipette ID Used 1429303  
 Expiration Date 5/20/06 Balance ID Used 28488  
 Residue/Carrier Agent 1M HCl Quenching Agent NA

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	VER1				
2	VER2				
3	VER3				
4	VER4				
5	VER5				
6	VER6				
7	VER7				
8	VER8				
9	VER9				
10	VER10				
11	VER11				
12	VER12				

AQ 11/23/05

AQ 11/23/05

Prepared By: Angela J. Johnson Date 11/23/05  
 Reviewed By: HTC RLL Date 11/24/05

# Verification for Ra-226 Standard 0321-H

A. Fehr  
5/20/2005

Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Standard Source DPM/mL
0321-H N1	1170.1000	34.2000	1135.9000	4.20643586	270.0385881
0321-H N2	1137.8000	34.2000	1103.6000	4.20643586	262.3598783
0321-H N3	1149.6000	34.2000	1115.4000	4.20643586	265.1651036
					Average = 265.8545233

Mean Value (Counting) = 265.8545233  
Stdev = 3.885501322

99.1905663  
0.01461514 Rule 3 (Pass/Fail)

Certificate Value = 268.0  
Lower Limit = 258.0835207  
Upper Limit = 273.625526  
Rule 1 Pass/Fail Pass  
Two sigma = 7.771002644  
10 % of Mean = 26.58545233  
Rule 2 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0321-H by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and 10 mL Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Green using source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 5/20/05 using source 0299-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 (0299-A). Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

Amanda L. Fehr 5/20/05  
Angela A. Johnson 5/24/05

# General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414

(843)556-8171

## Lucas Cell Calibration Package

501-512

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2) Is the efficiency calibration report included ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3) Is the raw count data included for: Cell constant determination? Plateau generation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4) Are the calibration verifications included?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5) Are the instrument settings included: HVPS settings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6) Has the CELLEFF.xls file been updated ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7) Have the calibration dates been updated in ALPHALIMS ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Prepared By: Ad Bail

Date: 12/9/05

Reviewed By: Angela Johnson

Date: 12/8/05

Effective Date: 12/9/05

# Ra-226 Cell Constants

standard ID: 0299-E  
Volume added (mL): 0.1  
Standard Reference Activity (DPM/mL): 2434.34

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/time flushed to cell	Date/time end of degas	bkg cpm	total counts	count time min	cpm	Known activity dpm	t1 (days) end-degas to flush	t2 (days) end-flush to count	t3 (days) Std Ref Date to count	Decay from Std Ref Date to count
501	1.919	Average	11/14/2005 7:20	11/14/2005 4:20	11/19/2005 15:30	0.267	7643	30	254.77	243.03	4.53472	0.12500	2161	0.9974
501	1.814	Stdev	11/15/2005 9:20	11/15/2005 5:00	11/19/2005 15:30	0.267	8103	30	270.10	243.03	5.56250	0.18056	2162	0.9974
501	1.933		11/10/2005 7:30	11/10/2005 4:30	11/14/2005 14:20	0.233	8747	30	291.57	243.03	5.59028	0.12500	2157	0.9974
502	2.003	Average	11/18/2005 7:40	11/18/2005 4:40	11/15/2005 12:40	0.200	5456	30	181.87	243.03	2.66667	0.12500	2165	0.9974
502	1.878	Stdev	11/14/2005 8:15	11/14/2005 5:10	11/19/2005 15:30	0.267	7511	30	250.37	243.03	4.56944	0.12847	2161	0.9974
502	1.830		11/9/2005 8:50	11/9/2005 5:40	11/14/2005 14:20	0.133	7380	30	246.00	243.03	4.63889	0.13194	2156	0.9974
503	2.039	Average	11/18/2005 10:20	11/18/2005 5:15	11/15/2005 12:40	0.267	5507	30	183.57	243.03	2.89097	0.21181	2165	0.9974
503	1.891	Stdev	11/14/2005 9:00	11/14/2005 5:40	11/19/2005 15:30	0.267	7571	30	252.37	243.03	4.59028	0.13889	2161	0.9974
503	1.896		11/9/2005 10:00	11/9/2005 7:00	11/14/2005 14:20	0.200	7717	30	257.23	243.03	4.69444	0.12500	2156	0.9974
504	1.774	Average	11/18/2005 12:40	11/18/2005 5:50	11/15/2005 12:40	0.033	4757	30	158.57	243.03	2.71528	0.28472	2166	0.9974
504	1.742	Stdev	11/15/2005 7:20	11/15/2005 4:20	11/19/2005 15:30	0.267	7838	30	261.27	243.03	5.53472	0.12500	2162	0.9974
504	1.692		11/10/2005 8:20	11/10/2005 5:05	11/14/2005 14:20	0.133	7658	30	255.27	243.03	5.61458	0.13542	2157	0.9974
505	2.126	Average	11/18/2005 11:25	11/18/2005 7:00	11/15/2005 12:40	0.200	5826	30	194.20	243.03	2.76389	0.18403	2165	0.9974
505	2.090	Stdev	11/19/2005 10:45	11/19/2005 7:40	11/14/2005 14:20	0.267	8534	30	284.47	243.03	4.72222	0.12847	2156	0.9974
505	2.186		12/1/2005 9:50	12/1/2005 5:20	11/28/2005 15:15	0.267	5750	30	191.67	243.03	2.58681	0.18750	2178	0.9974
506	2.134	Average	11/18/2005 12:00	11/18/2005 7:45	11/15/2005 12:40	0.267	5973	30	199.10	243.03	2.79514	0.17708	2166	0.9974
506	2.038	Stdev	12/1/2005 11:10	12/1/2005 6:05	11/28/2005 15:15	0.267	5389	30	179.63	243.03	2.61806	0.21181	2178	0.9974
506	1.990		12/2/2005 12:20	12/2/2005 7:30	11/28/2005 15:15	0.267	6786	30	226.20	243.03	3.67708	0.20139	2180	0.9974
508	2.090	Average	11/18/2005 12:45	11/18/2005 8:20	11/15/2005 12:40	0.067	5874	30	195.80	243.03	2.81944	0.18403	2166	0.9974
508	1.847	Stdev	11/14/2005 10:35	11/14/2005 7:15	11/19/2005 15:30	0.267	7462	30	248.73	243.03	4.65625	0.13889	2161	0.9974
508	1.890		11/9/2005 10:25	11/9/2005 8:25	11/14/2005 14:20	0.200	7813	30	260.43	243.03	4.75347	0.08333	2156	0.9974
509	2.082	Average	11/18/2005 13:20	11/18/2005 9:20	11/15/2005 12:40	0.267	5942	30	198.07	243.03	2.86111	0.16667	2166	0.9974
509	1.906	Stdev	11/14/2005 11:10	11/14/2005 7:50	11/19/2005 15:30	0.267	7726	30	257.53	243.03	4.68056	0.13889	2161	0.9974
509	1.973		11/10/2005 9:00	11/10/2005 5:40	11/14/2005 14:20	0.267	8953	30	298.43	243.03	5.63889	0.13889	2157	0.9974
510	2.063	Average	11/18/2005 13:50	11/18/2005 10:05	11/15/2005 12:40	0.033	5942	30	198.07	243.03	2.89236	0.15625	2166	0.9974
510	2.009	Stdev	11/14/2005 11:40	11/14/2005 8:30	11/19/2005 15:30	0.267	8185	30	272.83	243.03	4.70833	0.13194	2161	0.9974
510	2.027		11/9/2005 12:00	11/9/2005 9:00	11/14/2005 14:20	0.167	8342	30	278.07	243.03	4.77778	0.12500	2157	0.9974
511	2.033	Average	12/1/2005 12:05	12/1/2005 6:45	11/28/2005 15:15	0.267	5409	30	180.30	243.03	2.64583	0.22222	2179	0.9974
511	2.112	Stdev	11/14/2005 12:10	11/14/2005 9:10	11/19/2005 15:30	0.267	8645	30	288.17	243.03	4.79611	0.12500	2162	0.9974
511	1.837		11/9/2005 15:00	11/9/2005 9:55	11/14/2005 14:20	0.133	7480	30	249.33	243.03	4.81597	0.21181	2157	0.9974
512	1.934	Average	12/1/2005 7:30	12/1/2005 12:40	11/28/2005 15:15	0.267	5966	30	198.87	243.03	2.89236	-0.21528	2178	0.9974
512	2.119	Stdev	11/14/2005 13:20	11/14/2005 10:00	11/19/2005 15:30	0.267	8693	30	289.77	243.03	4.77083	0.13889	2162	0.9974
512	1.809		11/10/2005 9:55	11/10/2005 6:50	11/14/2005 14:20	0.067	8259	30	275.30	243.03	5.68750	0.12847	2157	0.9974

*Adi Bat* 12/9/05  
*Onofre A. Johnson* 12/18/05

CAL 5 AB1 12/8/05

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 12	500	11/4/05 1420	11/4/05 540	11/4/05 850	502	5	4	7380
CAL 13	500	11/4/05 1420	11/4/05 700	11/4/05 1000	503	5	6	7717
CAL 17	500	11/4/05 1420	11/4/05 740	11/4/05 1045	505	5	8	8534
CAL 18	500	11/4/05 1420	11/4/05 825	11/4/05 1025	508	5	6	7813
CAL 19	500	11/4/05 1420	11/4/05 900	11/4/05 1200	510	5	5	8342
CAL 20	500	11/4/05 1420	11/4/05 955	11/4/05 1500	511	5	4	7480
CAL 21	500	11/4/05 1420	11/10/05 430	11/10/05 730	501	5	7	8747
CAL 22	500	11/4/05 1420	11/10/05 505	11/10/05 820	504	5	4	7658
CAL 23	500	11/4/05 1420	11/10/05 540	11/10/05 900	509	5	8	8953
CAL 24	500	11/4/05 1420	11/10/05 650	11/10/05 955	512	5	2	8259
/								

AB1 12/8/05

JAG 12/8/05

JAG 12/8/05

**CALS 5** *ADQ*  
12/18/05

Ra-226 Verification Sheet

*ADQ*  
12/19/05

*ADQ*  
12/19/05

*ADQ*  
12/19/05

*ADQ*  
12/18/05

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 1	500	11/9/05 1530	11/14/05 420	11/14/05 720	501	5	8	7643
CAL 2	500	11/9/05 1530	11/14/05 510	11/14/05 815	502	5	8	7511
CAL 3	500	11/9/05 1530	11/14/05 540	11/14/05 900	503	5	8	7571
<del>CAL 4</del>		<del>11/9/05 1530</del>	<del>11/14/05</del>					
CAL 5	500	11/9/05 1530	11/14/05 715	11/14/05 1035	508	5	8	7462
CAL 6	500	11/9/05 1530	11/14/05 750	11/14/05 1110	509	5	8	7726
CAL 7	500	11/9/05 1530	11/14/05 830	11/14/05 1140	510	5	8	8185
CAL 9	500	11/9/05 1530	11/14/05 910	11/14/05 1210	511	5	8	8645
CAL 8	500	11/9/05 1530	11/14/05 1000	11/14/05 1320	512	5	8	8693
CAL 11	500	11/9/05 1530	11/15/05 420	11/15/05 720	504	5	8	7828
CAL 13	500	11/9/05 1530	11/15/05 500	11/14/05 920	501	5	8	8103
/								



Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 2	500	11/15/05 1240	11/18/05 440	11/18/05 740	502	5	6	5456
CAL 3	500	11/15/05 1240	11/18/05 515	11/18/05 1020	503	5	8	5507
CAL 4	500	11/15/05 1240	11/18/05 550	11/18/05 1055	504	5	1	4757
CAL 5	500	11/15/05 1240	11/18/05 700	11/18/05 1125	505	5	6	5826
CAL 6	500	11/15/05 1240	11/18/05 745	11/18/05 1200	506	5	8	5973
CAL 7	500	11/15/05 1240	11/18/05 820	11/18/05 1245	508	5	2	5874
CAL 8	500	11/15/05 1240	11/18/05 920	11/16/05 1320	509	5	8	5942
CAL 9	500	11/15/05 1240	11/18/05 1005	11/18/05 1350	510	5	1	5942
CAL 10		11/15/05 1240	11/18/05 1045	11/18/05 1420	511	5	6	5942
CAL 11		11/15/05 1240	11/18/05 1110	11/18/05 1545	512	5	8	4618

4926  
12/18/05

4926  
12/18/05

AB1 12/18/05

12/18/05

12/18/05

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 18	500	11/28/05 1515	12/1/05 520	12/1/05 950	505	5	8	5750
CAL 19	500	11/28/05 1515	12/1/05 605	12/1/05 1110	506	5	8	5389
CAL 22	500	11/28/05 1515	12/1/05 6745	12/1/05 1205	511	5	8	56409
CAL 23	500	11/28/05 1515	12/1/05 730	12/1/05 1240	512	5	8	5964
CAL 24	500	11/28/05 1515	12/2/05 730	12/2/05 1220	506	5	8	6623
CAL 8	500	11/28/05 1515	12/2/05 650	12/2/05 1150	511	5	8	6786
CAL 12	500	11/28/05 1515	12/2/05 550	12/2/05 1110	512	5	8	6578
/								

Page 609 of 609

ADG 12/16/05  
ADG 12/16/05  
ADG 12/16/05

ADG 12/18/05

ADG 12/16/05

ADG 12/18/05

## General Engineering Laboratories Calibration Source Preparation Sheet

Applicable SOP Number GL-RAD-A-008 Isotope Ra-226  
 Date Standards Prepared 8/26/03 Cocktail Type Used NA  
 Standard ID 0299-E Matrix of Vial/Planchett NA  
 Amount Used (g or mL) 0.1 NA  
 Standard Activity (DPM/g or mL) 2434.34 Type of Scintillation Vial NA  
 Reference Date 12/15/99 Pipette ID Used 1429303  
 Expiration Date 11/4/06 Balance ID Used 28488  
 Residue/Carrier Agent NA Quenching Agent NA

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	CAL1				
2	CAL2				
3	CAL3				
4	CAL4				
5	CAL5				
6	CAL6				
7	CAL7				
8	CAL8				
9	CAL9				
10	CAL10				
11	CAL11				
12	CAL12				
13	CAL13				
14	CAL14				
15	CAL15				

Prepared By: Ad Burt Date 12/8/05  
 Reviewed By: Angela Johnson Date 12/8/05  
 Rev 1 RLM 9/10/97 12/8/05

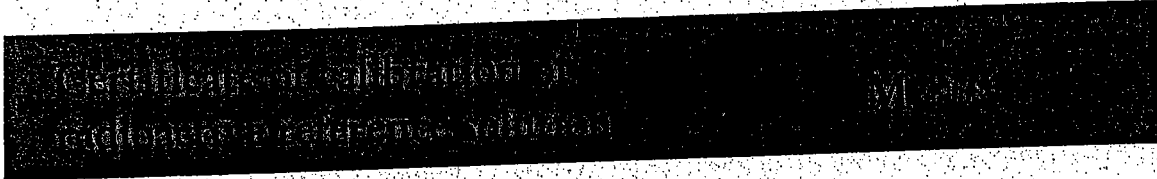
### General Engineering Laboratories Calibration Source Preparation Sheet

Applicable SOP Number <u>EL-RAD-A-008</u>	Isotope <u>Ra-226</u>
Date Standards Prepared <u>8/26/03</u>	Cocktail Type Used <u>NA</u>
Standard ID <u>0299-E</u>	Matrix of Vial/Planchett <u>NA</u>
Amount Used (g or mL) <u>0.1</u>	<u>NA</u>
Standard Activity (DPM/g or mL) <u>2434.34</u>	Type of Scintillation Vial <u>NA</u>
Reference Date <u>12/15/99</u>	Pipette ID Used <u>1429303</u>
Expiration Date <u>11/4/04</u>	Balance ID Used <u>28488</u>
Residue/Carrier Agent <u>NA</u>	Quenching Agent <u>NA</u>

	Standard Number	Quenching Vol (uL)/ Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
16	CAL 16				
17	CAL 17				
18	CAL 18				
19	CAL 19				
20	CAL 20				
21	CAL 21				
22	CAL 22				
23	CAL 23				
24	CAL 24				
<del>25</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>26</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>27</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>28</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>29</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>30</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>31</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>32</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>33</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>34</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>35</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>36</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>37</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>38</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>39</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>
<del>40</del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>	<del>          </del>

Prepared By: Adl Basil Date: 12/8/05  
Reviewed By: Angela F. Johnson Date: 12/8/05

02.9



Nycomed Amersham plc  
Radiation & Radioactivity  
Calibration Laboratory  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ISSUED FOR: AEA Technology plc  
Isotrak  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ion. Principal radionuclide: Radium-226

Product code: RAY44  
Solution number: R4/131/89

ment Reference time: 1200 GMT on 15 December 1999

data Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.  
ion of The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k = 2.00$ , which  
inties for a  $t$ -distribution with  $v_{eff} = \infty$  effective degrees of freedom corresponds to a coverage probability of approximately  
95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated in the following examples;

6.5(21)	-	6.5 ± 2.1
6.54(21)	-	6.54 ± 0.21
6.543(21)	-	6.543 ± 0.021

Date of issue

17<sup>th</sup> December 1999

0299

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Reference time for solution number R4/131/89:	1200 GMT on 15 December 1999
Radioactive concentration of radium-226:	43.75 kilobecquerels per gram of solution
which is equivalent to:	1.183 microcuries per gram of solution
Mass of solution:	5.0368 grams
Total activity of radium-226:	220.4 kilobecquerels
which is equivalent to:	5.956 microcuries
Recommended half life:	1600 years

Method of measurement:

The activity of the solution was measured using a high pressure re-entrant ionisation chamber calibrated with a large number of absolutely standardised solutions.

Calibration date: 15 December 1999

The calibration date is provided for added information only, and must not be confused with the reference date on pages 1 and 2 of the certificate. It is the reference date that must be used in all calculations relating to the values of activity.

Expanded uncertainty in the radioactive concentration quoted above:  $\pm 2.5\%$

Combined Type A uncertainty:  $\pm 0.2\%$

Combined Type B uncertainty:  $\pm 1.3\%$

The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Carrier free in 0.5M HCl

This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

1 year = 365.25 days

At the reference date radium-226 was shown to be in radioactive equilibrium with its daughter nuclides down the decay chain to polonium-214 and thallium-210, the precursors of lead-210. The ionisation chamber was calibrated using a standard supplied by the National Institute of Standards and Technology, Washington DC, USA.

# Verification for Ra-226 Standard 0299-E

11/4/2005	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard mL used	Source DPM/G
A.Fehr	0299-F N1	1340.3000	0.6000	1339.7000	2.72177002	0.2000	2461.082289
	0299-F N2	1313.2000	0.6000	1312.6000	2.72177002	0.2000	2411.298509
	0299-F N3	1298.1000	0.6000	1297.5000	2.72177002	0.2000	2383.559208
				99.6090287	% of known		2418.646669
				0.01624067			

Mean Value (Counting) = 2418.646669  
 Stdev = 39.28044852

Certificate Value = 2428.1 dpm/mL  
 Lower Limit = 2340.085772 dpm/mL  
 Upper Limit = 2497.207566 dpm/mL  
 Rule 1 Pass/Fail Pass  
 Two sigma = 78.56089703 dpm/mL  
 10 % of Mean = 241.8646669 dpm/mL  
 Rule 2 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0299-E by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and ten mLs of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 8 for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 11/4/05 using source 0321-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0321. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

RAD SOP M-001

*Amanda J. Feehe 11/4/05*  
*Amanda J. Feehe 11/4/05*

**PROTOCOL** : 8 Ra-226 ver  
**DATE** : 2005/11/04  
**TIME** : 11:47  
**ID** : P08AS001

**Ra226**

Wallac 1414 WinSpectral v1.40 S/N 4140127

**Counting mode** : CPM  
**Isotope(s)** : Ra226  
**Ra226** = 400- 900,Alpha,1602.12 y  
**Protocol name** : Ra-226 ver  
**Counting time** : 300  
**Repeats** : 1  
**Cycles** : 1  
**Replicates** : 1  
**2 sigma %** : 0.01  
**Minimum cpm** : 0.00 Checking time: 10  
**Advanced modes** : Halflife,PSA,Chemilum  
**Halflife zerotime** : Start of assay  
**PSA level** : low  
**Output to Display** :  
 POS,DATE,CTIME,RACK,RACKPOS,ETIME,SQPE,CPM1,CPM  
**Additions to Display** : Spectrum,Header,Listing  
**Header** : Ra226  
**Spectrum** : Rnd.Cos,Alpha  
**Window 1** : 1-1024 /Alpha  
**Window 2** : 1-1024 /Beta  
**Window 3** : 1-1024 /Beta  
**Window 4** : 1-1024 /Beta  
**Window 5** : 1-1024 /Beta  
**Window 6** : 1-1024 /Beta  
**FNCT1 = FNCT1** :  
**FNCT2 = FNCT2** :  
**FNCT3 = FNCT3** :  
**FNCT4 = FNCT4** :

**Total count rate:**  
 Ra226 10537.9 CPM

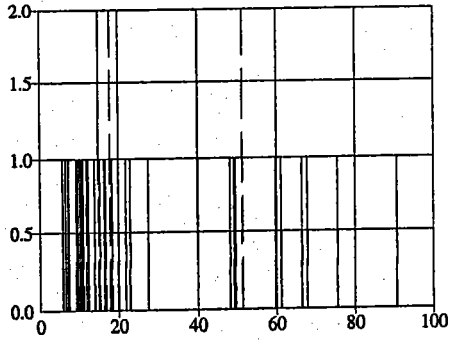
*Amanda L. Lehn*  
11/4/05

*ALQ*  
11/4/05



POS CTIME SQPI CPM CPM1

1 300 23.50 1.90

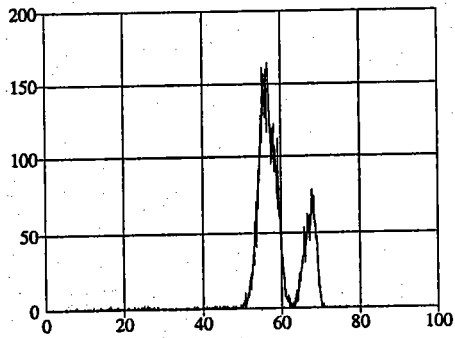


Counts Chem

Counts Alpha

*Blcg*

2 300 4697.50 2217.70

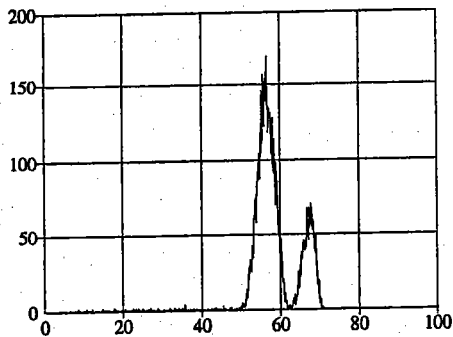


Counts Chem

Counts Alpha

*0321-A*

3 300 4542.00 2191.80



Counts Chem

Counts Alpha

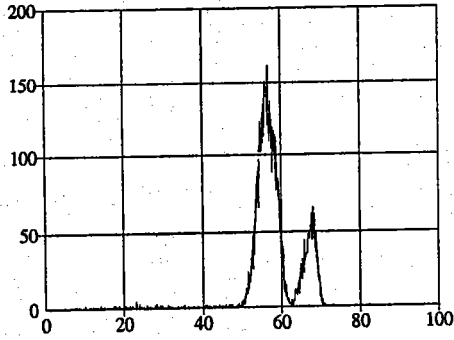
*0321-A*

*ALF 11/4/05*

*ALF  
11/4/05*

POS CTIME SQPI CPM CPM1

4 300 4376.00 2174.30

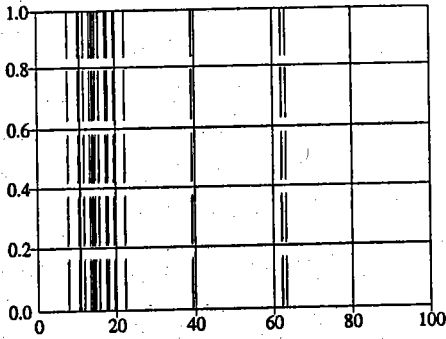


Counts Chem

Counts Alpha

0321-A

5 300 19.50 0.60

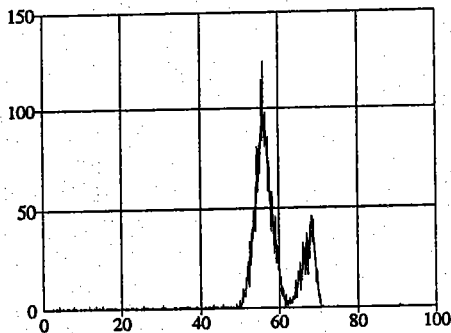


Counts Chem

Counts Alpha

Blky

6 300 1930.20 1340.30



Counts Chem

Counts Alpha

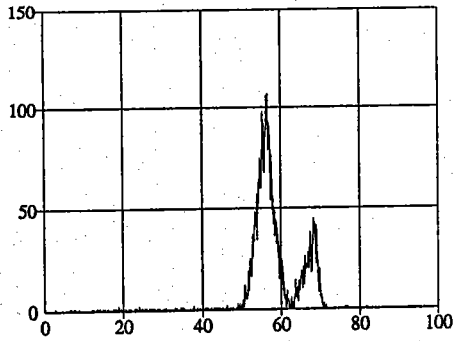
0299-E

ALF 11/4/05

AHQ  
11/4/05

POS CTIME SQPI CPM CPM1

7 300 1906.90 1313.20

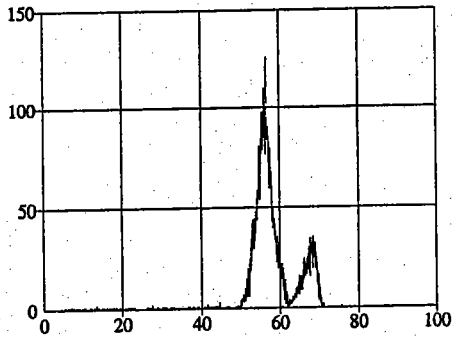


Counts Chem

Counts Alpha

0299-E

8 300 1835.40 1298.10



Counts Chem

Counts Alpha

0299-E

*Handwritten signature and date:*  
11/4/05



# Standard Traceability Log Rad

Source Material Info	
Parent Code:	0299
Prepared By:	Angela Albee
Carrier Conc:	0.5 M HCL
Reference Date:	12/15/1999
Ampoule Mass (g):	5.0368 g
Uncertainty:	+/- 2.5 %
LogBook No:	RC S 027 128

A Solution Material Info	
Isotope:	Radium-226
Prepared By:	Angela Albee
Prep Date:	09/15/2000
Verification Date:	08/26/2004
Expiration Date:	08/26/2005
Primary Code:	0299-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.6634 g
Density(g/mL):	1.0012

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
09/26/2000	Angela Albee	2.1096	100	0299-C	2579.62 dpm/mL	10/10/2002	10/10/2003
09/15/2000	Angela Albee	.2004	100	0299-B	245.05 dpm/mL	09/15/2000	09/15/2001
08/23/2002	Angela Albee	2.0443	100	0299-D	2499.77 dpm/mL	08/23/2002	08/23/2003
08/26/2003	Angela Albee	1.9909	100	0299-E	2434.34 dpm/mL	11/04/2004	11/04/2005
08/26/2003	Angela Albee	1.9872	100	0299-F	2429.82 dpm/mL	08/26/2004	08/26/2005
04/05/2005	Amanda Fehr	5.0018	250	0299-G	2446.3471 dpm/mL	04/06/2005	04/06/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

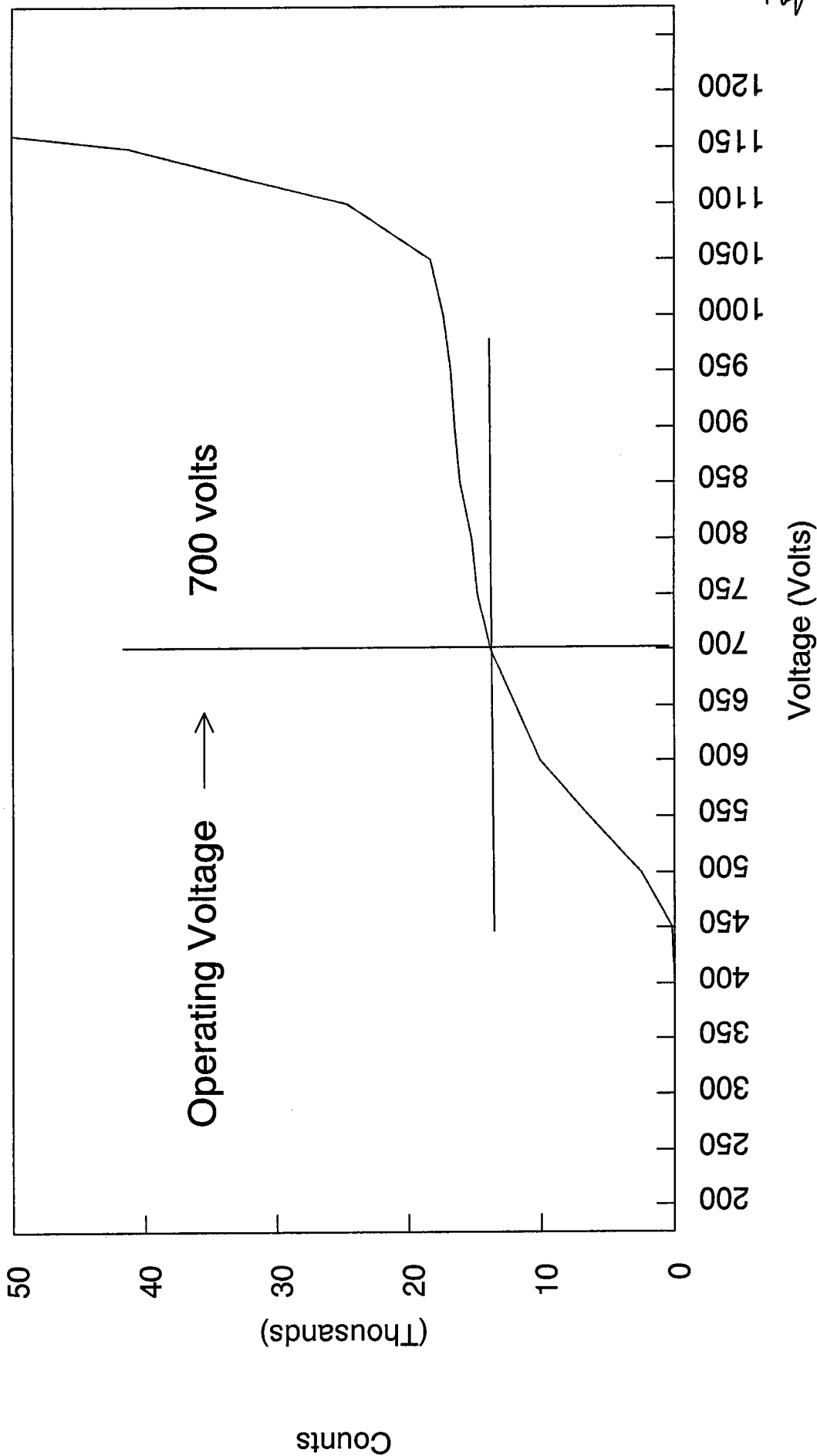
*Handwritten signature:* AJQ  
11/4/05

Voltage Curve Ludlum # 5				
Volts (K.V.)	Counts	Date	Time	Detector
0.20	0	11/4/2005	10:01	5
0.25	0	11/4/2005	10:02	5
0.30	0	11/4/2005	10:03	5
0.35	0	11/4/2005	10:04	5
0.40	0	11/4/2005	10:05	5
0.45	188	11/4/2005	10:06	5
0.50	2505	11/4/2005	10:07	5
0.55	6400	11/4/2005	10:08	5
0.60	10095	11/4/2005	10:09	5
0.65	11888	11/4/2005	10:10	5
0.70	13799	11/4/2005	10:11	5
0.75	14773	11/4/2005	10:12	5
0.80	15200	11/4/2005	10:13	5
0.85	16084	11/4/2005	10:14	5
0.90	16485	11/4/2005	10:15	5
0.95	16792	11/4/2005	10:16	5
1.00	17342	11/4/2005	10:17	5
1.05	18321	11/4/2005	10:18	5
1.10	24605	11/4/2005	10:19	5
1.15	41208	11/4/2005	10:20	5
1.20	79240	11/4/2005	10:21	5

ABI 12/8/05  
JBJ  
12/8/05

# Plateau Novemver, 2005

Ludlum # 5



12/18/05  
HBI  
5018/121  
ATP

# Ra-226 WATER

Batch : LCSVER  
 Date : 12/6/2005  
 Analyst : JMB1

Procedure Code : LUC26RAL  
 Parmname : Radium-226  
 MDA : 1 pCi/L

Instrument Used : LUCAS CELL DETECTOR

Bkg Count Time: 30 min

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG cpm	Ra-226 MDA pCi/L	Ra-226 RESULT pCi/L	Ra-226 ERROR pCi/L	COUNT DATE/TIME
VER 2	0.500	30	634	501	1.889	0.267	0.5139	20.2337	1.6052	12/6/2005 14:30
VER 3	0.500	30	784	502	1.904	0.133	0.3824	24.7965	1.7491	12/6/2005 15:00
VER 4	0.500	30	678	503	1.942	0.267	0.4931	20.7902	1.5930	12/6/2005 15:35
VER 5	0.500	30	650	504	1.736	0.200	0.4891	22.3018	1.7384	12/6/2005 16:15
VER 6	0.500	30	953	505	2.126	0.133	0.3308	26.0930	1.6671	12/6/2005 16:45
VER 12	0.500	30	951	506	2.054	0.267	0.3693	21.9160	1.4106	12/8/2005 13:05
VER 7	0.500	30	769	508	1.942	0.133	0.3321	21.1178	1.5043	12/7/2005 12:55
VER 8	0.500	30	778	509	1.987	0.267	0.4287	20.7621	1.4817	12/7/2005 13:50
VER 9	0.500	30	986	510	2.033	0.200	0.3706	25.7153	1.6199	12/7/2005 14:25
VER 10	0.500	30	915	511	1.994	0.267	0.4227	24.1275	1.5840	12/7/2005 15:05
VER 11	0.500	30	1016	512	1.954	0.267	0.4296	27.2513	1.6956	12/7/2005 15:50

*Ad Bail* 12/8/05  
~~12/9/05~~ 12/19/05  
*Angela Johnson* 12/18/05

Sample ID	Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
VER 2		5	12/6/2005 14:30	LCS	0321-H	24.14	pCi/L	84%
VER 3		5	12/6/2005 15:00	LCS	0321-H	24.14	pCi/L	103%
VER 4		5	12/6/2005 15:35	LCS	0321-H	24.14	pCi/L	86%
VER 5		5	12/6/2005 16:15	LCS	0321-H	24.14	pCi/L	92%
VER 6		5	12/6/2005 16:45	LCS	0321-H	24.14	pCi/L	108%
VER 12		5	12/8/2005 13:05	LCS	0321-H	24.14	pCi/L	91%
VER 7		5	12/7/2005 12:55	LCS	0321-H	24.14	pCi/L	87%
VER 8		5	12/7/2005 13:50	LCS	0321-H	24.14	pCi/L	86%
VER 9		5	12/7/2005 14:25	LCS	0321-H	24.14	pCi/L	107%
VER 10		5	12/7/2005 15:05	LCS	0321-H	24.14	pCi/L	100%
VER 11		5	12/7/2005 15:50	LCS	0321-H	24.14	pCi/L	113%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM	Ingrowth constant
12/2/2005 14:25	12/6/2005 11:10	92.75	3.33	0.5035	0.9751	1.0019	20.8663	0.4920
12/2/2005 14:25	12/6/2005 12:00	93.58	3.00	0.5067	0.9776	1.0019	26.0000	0.4962
12/2/2005 14:25	12/6/2005 12:35	94.17	3.00	0.5088	0.9776	1.0019	22.3333	0.4984
12/2/2005 14:25	12/6/2005 13:05	94.67	3.17	0.5107	0.9764	1.0019	21.4667	0.4996
12/2/2005 14:25	12/6/2005 15:15	96.83	1.50	0.5186	0.9887	1.0019	31.6333	0.5137
12/2/2005 14:25	12/8/2005 8:50	138.42	4.25	0.6483	0.9684	1.0019	31.4333	0.6290
12/2/2005 14:25	12/7/2005 8:35	114.17	4.33	0.5777	0.9678	1.0019	25.5000	0.5601
12/2/2005 14:25	12/7/2005 9:10	114.75	4.67	0.5795	0.9654	1.0019	25.6663	0.5605
12/2/2005 14:25	12/7/2005 9:50	115.42	4.58	0.5816	0.9660	1.0019	32.6667	0.5629
12/2/2005 14:25	12/7/2005 10:40	116.25	4.42	0.5843	0.9672	1.0019	30.2333	0.5662
12/2/2005 14:25	12/7/2005 11:25	117.00	4.42	0.5866	0.9672	1.0019	33.6000	0.5684

12/8/05  
~~12/9/05~~ #B1 12/9/05  
*Ad Bail*  
*Cingela S. Johnson 12/8/05*



Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
<del>VER 2</del>	<del>500</del>	12/2/05 1425	12/6/05 1110	12/6/05 1430	501	5	8	634
VER 3	500	12/2/05 1425	12/6/05 1200	12/6/05 1500	502	5	4	784
VER 4	500	12/2/05 1425	12/6/05 1235	12/6/05 1535	503	5	8	678
VER 5	500	12/2/05 1425	12/6/05 1305	12/6/05 1615	504	5	4	650
VER 6	500	12/2/05 1425	12/6/05 1315	12/6/05 1645	505	5	4	953
VER 7	500	12/2/05 1425	12/7/05 835 <small>12/7/05 835</small>	12/7/05 <small>12/7/05</small>	508	5	4	769
VER 8	500	12/2/05 1425	12/7/05 910 <small>12/7/05 910</small>	12/7/05 <small>12/7/05</small>	509	5	8	778
VER 9	500	12/2/05 1425	12/7/05 950	12/7/05 1425	510	5	6	986
VER 10	500	12/2/05 1425	12/7/05 1040	12/7/05 1505	511	5	8	915
VER 11	500	12/2/05 1425	12/7/05 1125	12/7/05 1550	512	5	8	1016
/								

AB 12/19/05

5018/21

5018/21/05

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
VER-12		12/2/05 1425	12/8/05 850	12/8/05 1305	506	5	8	951

AD 12/7/05

AD 11/8/05

AD 12/8/05

**General Engineering Laboratories  
Verification Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-008 Isotope Ra-226  
 Date Standards Prepared 5/18/05 Cocktail Type Used NA  
 Standard ID 0321-H Matrix of Vial/Planchett NA  
 Amount Used (g or ml) 0.1 NA  
 Standard Activity (DPM/g or ml) 269.6188 Type of Scintillation Vial NA  
 Reference Date 9/9/91 Pipette ID Used 1429303  
 Expiration Date 5/20/04 Balance ID Used 28488  
 Residue/Carrier Agent NA Quenching Agent NA

	Standard Number	Quenching Vol (uL)/ Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	VER 1				
2	VER 2				
3	VER 3				
4	VER 4				
5	VER 5				
6	VER 6				
7	VER 7				
8	VER 8				
9	VER 9				
10	VER 10				
11	VER 11				
12	VER 12				
<del>12/18/05</del>					

Prepared By: Adri Bail Date 12/9/05  
 Reviewed By: Angela Johnson Date 12/8/05

# Verification for Ra-226 Standard 0321-H

A. Fehr 5/20/2005	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Standard Source DPM/mL
	0321-H N1	1170.1000	34.2000	1135.9000	4.20643586	270.0385881
	0321-H N2	1137.8000	34.2000	1103.6000	4.20643586	262.3598783
	0321-H N3	1149.6000	34.2000	1115.4000	4.20643586	265.1651036
						Average = 265.8545233

Mean Value (Counting) = 265.8545233      99.1905663      Pass  
 Stdev = 3.895501322      0.01461514      Rule 3 (Pass/Fail)

Certificate Value = 268.0  
 Lower Limit = 258.0835207  
 Upper Limit = 273.625526  
 Rule 1 Pass/Fail = Pass  
 Two sigma = 7.771002644  
 10 % of Mean = 26.58545233  
 Rule 2 (Pass/Fail) = Pass

### Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0321-H by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and 10 mL Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Green using source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 5/20/05 using source 0299-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 (0299-A). Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

Amanda L. Fehr 5/20/05  
 Angela A. Johnson 5/24/05

# General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414  
(843)556-8171

## Lucas Cell Calibration Package

601-612

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the second standard(s) documentation? standard preparation information? standard < 1 Year old or verified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2) Is the efficiency calibration report included ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3) Is the raw count data included for: Cell constant determination? Plateau generation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4) Are the calibration verifications included?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5) Are the instrument settings included: HVPS settings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6) Has the CELLEFF.xls file been updated ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7) Have the calibration dates been updated in ALPHALIMS ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Prepared By: Ad Bait

Date: 12/29/05

Reviewed By: Angela Johnson

Date: 12/29/05

Effective Date: 12/29/05

# Ra-226 Cell Constants

standard ID: 0299-E  
Volume added (mL): 0.1  
Standard Reference Activity (DPM/mL): 2434.34

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/time flushed to cell	Date/time end of degas	bkg cpm	total counts	count time min	Known activity dpm	t1 (days) end-degas to flush	t2 (days) end-flush to count	t3 (days) Std Ref Date to count	Decay from Std Ref Date to count			
														degas	cpm	min
601	1.935	Average	2.064	10	12/9/2005 12:35	12/9/2005 6:40	12/2/2005 13:20	0.133	4742	15	316.13	243.02	6.72222	0.24653	2187	0.9974
601	2.050	Stdev	0.137	1	12/6/2005 15:05	12/6/2005 9:50	12/2/2005 13:20	0.033	7192	30	239.73	243.02	3.85417	0.21875	2184	0.9974
601	2.207			1	12/1/2005 11:00	12/1/2005 5:20	11/28/2005 15:15	0.267	5755	30	191.83	243.02	2.58681	0.23611	2178	0.9974
602	1.968	Average	1.884	11	12/9/2005 13:40	12/9/2005 6:00	12/2/2005 13:20	0.133	4750	15	316.67	243.02	6.69444	0.31944	2187	0.9974
602	1.842	Stdev	0.073	2	12/6/2005 15:35	12/6/2005 10:35	12/2/2005 13:20	0.133	6515	30	217.17	243.02	3.88542	0.20833	2184	0.9974
602	1.842			13	8/24/2005 7:30	8/24/2005 4:25	8/19/2005 16:30	0.133	7286	30	242.87	243.02	4.49653	0.12847	2079	0.9975
603	1.933	Average	1.798	3	12/6/2005 16:15	12/6/2005 11:10	12/2/2005 13:20	0.267	6864	30	228.80	243.02	3.90972	0.21181	2184	0.9974
603	1.754	Stdev	0.118	3	8/22/2005 17:40	8/22/2005 11:35	8/19/2005 16:30	0.267	4842	30	161.40	243.02	2.79514	0.25347	2078	0.9975
603	1.709			12	12/9/2005 13:25	12/9/2005 9:00	12/2/2005 13:20	0.200	4269	15	284.60	243.02	6.81944	0.18403	2187	0.9974
604	1.845	Average	1.798	13	12/9/2005 14:00	12/9/2005 9:40	12/2/2005 13:20	0.200	4620	15	308.00	243.02	6.84722	0.18056	2187	0.9974
604	1.750	Stdev	0.048	4	8/22/2005 18:15	8/22/2005 12:25	8/19/2005 16:30	0.267	4886	30	162.87	243.02	2.82986	0.24306	2078	0.9975
604	1.800			4	12/4/2005 9:00	12/2/2005 5:50	11/28/2005 15:15	0.267	4271	30	142.37	243.02	3.60764	2.13194	2181	0.9974
605	1.828	Average	1.843	11	8/19/2005 14:50	8/19/2005 10:35	8/12/2005 8:30	0.233	9306	30	310.20	243.02	7.06681	0.17708	2075	0.9975
605	1.909	Stdev	0.060	14	12/9/2005 14:30	12/9/2005 5:20	12/2/2005 13:20	0.200	4547	15	303.13	243.02	6.66667	0.38194	2187	0.9974
605	1.791			5	12/4/2005 11:50	12/2/2005 9:30	11/28/2005 15:15	0.267	4404	30	146.80	243.02	3.76042	2.09722	2181	0.9974
607	1.876	Average	1.985	15	12/9/2005 15:05	12/9/2005 7:25	12/2/2005 13:20	0.267	4551	15	303.40	243.02	6.75347	0.31944	2187	0.9974
607	1.886	Stdev	0.179	4	12/6/2005 16:45	12/6/2005 12:00	12/2/2005 13:20	0.267	6758	30	225.27	243.02	3.94444	0.19792	2184	0.9974
607	2.192			3	12/1/2005 12:15	12/1/2005 6:45	11/28/2005 15:15	0.267	5824	30	194.13	243.02	2.64583	0.22917	2179	0.9974
608	1.868	Average	1.958	16	12/9/2005 15:20	12/9/2005 11:00	12/2/2005 13:20	0.267	4899	15	313.27	243.02	6.90278	0.18056	2187	0.9974
608	2.036	Stdev	0.085	5	12/6/2005 17:20	12/6/2005 12:35	12/2/2005 13:20	0.267	7324	30	244.13	243.02	3.96875	0.19792	2184	0.9974
608	1.971			13	12/4/2005 12:25	12/2/2005 10:50	11/28/2005 15:15	0.267	4921	30	164.03	243.02	3.81597	2.06597	2182	0.9974
609	1.848	Average	1.984	17	12/9/2005 15:45	12/9/2005 11:25	12/2/2005 13:20	0.133	4651	15	310.07	243.02	6.92014	0.18056	2187	0.9974
609	2.015	Stdev	0.124	6	12/6/2005 18:00	12/6/2005 13:05	12/2/2005 13:20	0.267	7266	30	242.20	243.02	3.98958	0.20486	2184	0.9974
609	2.090			9	12/1/2005 13:25	12/1/2005 10:05	11/28/2005 15:15	0.267	5872	30	195.73	243.02	2.78472	0.13889	2179	0.9974
610	1.774	Average	1.792	7	12/6/2005 18:35	12/6/2005 15:15	12/2/2005 13:20	0.200	6570	30	219.00	243.02	4.07986	0.13889	2184	0.9974
610	1.762	Stdev	0.043	10	8/23/2005 11:15	8/23/2005 8:15	8/19/2005 16:30	0.267	6068	30	202.27	243.02	3.65625	0.12500	2078	0.9975
610	1.841			18	12/9/2005 16:05	12/9/2005 11:45	12/2/2005 13:20	0.067	4638	15	309.20	243.02	6.93403	0.18056	2187	0.9974
611	1.963	Average	1.944	8	12/7/2005 14:25	12/7/2005 8:35	12/2/2005 13:20	0.267	7936	30	264.53	243.02	4.80208	0.24306	2185	0.9974
611	1.843	Stdev	0.093	11	8/23/2005 15:10	8/23/2005 9:10	8/19/2005 16:30	0.233	6248	30	208.27	243.02	3.69444	0.25000	2079	0.9975
611	2.026			11	12/1/2005 14:10	12/1/2005 8:15	11/28/2005 15:15	0.267	5464	30	182.13	243.02	2.70633	0.24653	2179	0.9974
612	2.041	Average	1.927	16	12/2/2005 10:30	12/2/2005 11:30	11/28/2005 15:15	0.267	5223	30	174.10	243.02	3.84375	1.95833	2181	0.9974
612	1.867	Stdev	0.099	20	12/9/2005 16:25	12/9/2005 12:20	12/2/2005 13:20	0.067	4720	15	314.67	243.02	6.95833	0.17014	2187	0.9974
612	1.873			9	12/7/2005 13:50	12/7/2005 9:10	12/2/2005 13:20	0.267	7663	30	255.43	243.02	4.82639	0.19444	2185	0.9974

*Ad Baik 12/29/05*  
*Angela A. Johnson 12/29/05*

Ra-226 Verification Sheet

Count time 15 min

Abi 12/21/05  
 12/21/05  
 AT  
 12/21/05

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 10	500	12/2/05 1320	12/9/05 0640	12/9/05 1235	601	6	4	4742
<del>CAL 11</del>	<del>500</del>	<del>12/2/05 1320</del>	<del>12/9/05 0600</del>	<del>12/9/05 1340</del>	<del>602</del>	<del>6</del>	<del>4</del>	<del>4750</del>
CAL 12	500	12/2/05 1320	12/9/05 0900	12/9/05 1325	603	6	6	4269
CAL 13	500	12/2/05 1320	12/9/05 0940	12/9/05 1400	604	6	6	4620
CAL 14	500	12/2/05 1320	12/9/05 0520	12/9/05 1430	605	6	6	4547
CAL 15	500	12/2/05 1320	12/9/05 0725	12/9/05 1505	607	6	8	4551
CAL 16	500	12/2/05 1320	12/9/05 1100	12/9/05 1520	608	6	8	4699
CAL 17	500	12/2/05 1320	12/9/05 1125	12/9/05 1545	609	6	4	4651
CAL 18	500	12/2/05 1320	12/9/05 1145	12/9/05 1605	610	6	2	4638
CAL 19	500	12/2/05 1320	12/9/05 1220	12/9/05 1625	612	6	2	4720
Abi 12/20/05								

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 1	500	12/2/05 1320	12/6/05 950	12/6/05 1505	601	6	1	7192
CAL 2	500	12/2/05 1320	12/6/05 1035	12/6/05 1535	602	4	4	6515
CAL 3	500	12/2/05 1320	12/6/05 1110	12/6/05 1615	603	4	6	6864
CAL 4	500	12/2/05 1320	12/6/05 1200	12/6/05 1645	607	6	8	6708
CAL 5	500	12/2/05 1320	12/6/05 1235	12/6/05 1720	608	6	8	7324
CAL 6	500	12/2/05 1320	12/6/05 1305	12/6/05 1800	609	6	8	7266
CAL 7	500	12/2/05 1320	12/6/05 1515	12/6/05 1835	610	6	6	6570
CAL 8	500	12/2/05 1320	12/7/05 835	12/7/05 1255	611	6	6	7663
CAL 9	500	12/2/05 1320	12/7/05 910	12/7/05 1350	612	6	8	7936
CAL 10	500	12/2/05 1320	12/7/05 835	12/7/05 1425	611	6	8	7936
<div style="display: flex; justify-content: space-around;"> <span>15 mins Abi 12/20/05</span> <span>Abi 12/21/05</span> <span>Abi 12/21/05</span> </div>								

Page 63 of 100



Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 1	500	11/28/05 1515	12/1/05 520	12/1/05 1100	601	6	8	5755
CAL 4	500	11/28/05 1515	12/2/05 550	12/4/05 900	604	6	8	4271
CAL 5	500	11/28/05 1515	12/2/05 930	12/4/05 1150	605	6	8	4409
CAL 3	500	11/28/05 1515	12/1/05 645	12/1/05 1215	607	6	8	5824
CAL 13	500	11/28/05 1515	12/2/05 1050	12/4/05 1225	608	6	8	4921
CAL 9	500	11/28/05 1515	12/1/05 1005	12/1/05 1325	609	6	8	5872
CAL 11	500	11/28/05 1515	12/1/05 815	12/1/05 1410	611	6	8	5464
CAL 16	500	11/28/05 1515	12/2/05 1130	12/4/05 1030	612	6	8	5223

Page 632 of 913

12/29/05  
12/29/05  
12/29/05

AB1  
12/20/05

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
CAL 13	500	8/19/05 1630	8/24/05 425	8/24/05 730	602	6	4	7286
<del>CAL 14</del>	<del>500</del>	<del>8/24/05 1630</del>	<del>8/24/05 455</del>	<del>8/24/05 755</del>	<del>608</del>	<del>6</del>	<del>8</del>	<del>7449</del>
<del>CAL 1</del>	<del>500</del>	<del>8/24/05 1140</del>	<del>9/10/05 423</del>	<del>9/10/05 730</del>	<del>601</del>	<del>6</del>	<del>3</del>	<del>8623</del>
<del>CAL 2</del>	<del>500</del>	<del>8/24/05 1140</del>	<del>9/10/05 505</del>	<del>9/10/05 805</del>	<del>602</del>	<del>6</del>	<del>6</del>	<del>8178</del>
<del>CAL 3</del>	<del>500</del>	<del>8/24/05 1140</del>	<del>9/10/05 545</del>	<del>9/10/05 845</del>	<del>603</del>	<del>6</del>	<del>8</del>	<del>8730</del>
<del>CAL 4</del>	<del>500</del>	<del>8/24/05 1140</del>	<del>9/10/05 655</del>	<del>9/10/05 955</del>	<del>606</del>	<del>6</del>	<del>6</del>	<del>8603</del>
<del>CAL 5</del>	<del>500</del>	<del>8/24/05 1140</del>	<del>9/10/05 735</del>	<del>9/10/05 1035</del>	<del>607</del>	<del>6</del>	<del>7</del>	<del>8462</del>
<del>CAL 6</del>	<del>500</del>	<del>8/24/05 1140</del>	<del>9/10/05 810</del>	<del>9/10/05 1110</del>	<del>608</del>	<del>6</del>	<del>8</del>	<del>8080</del>
<del>CAL 7</del>	<del>500</del>	<del>8/24/05 1140</del>	<del>9/10/05 850</del>	<del>9/10/05 1150</del>	<del>609</del>	<del>6</del>	<del>8</del>	<del>7578</del>

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
<del>CAL 1</del>	<del>500</del>	<del>8/11/05 830</del>	<del>8/11/05 510</del>	<del>8/11/05 1005</del>	<del>607</del>	<del>6</del>	<del>8</del>	<del>6837</del>
<del>CAL 2</del>	<del>500</del>	<del>8/12/05 830</del>	<del>8/11/05 625</del>	<del>8/11/05 1045</del>	<del>608</del>	<del>6</del>	<del>9</del>	<del>7369</del>
<del>CAL 3</del>	<del>500</del>	<del>8/12/05 830</del>	<del>8/11/05 730</del>	<del>8/11/05 1120</del>	<del>609</del>	<del>6</del>	<del>2</del>	<del>6289</del>
<del>CAL 4</del>	<del>500</del>	<del>8/12/05 830</del>	<del>8/11/05 820</del>	<del>8/11/05 1155</del>	<del>610</del>	<del>6</del>	<del>6</del>	<del>6945</del>
<del>CAL 5</del>	<del>500</del>	<del>8/12/05 830</del>	<del>8/11/05 955</del>	<del>8/11/05 1315</del>	<del>611</del>	<del>6</del>	<del>8</del>	<del>6811</del>
<del>CAL 6</del>	<del>500</del>	<del>8/12/05 830</del>	<del>8/11/05 1020</del>	<del>8/11/05 1515</del>	<del>612</del>	<del>6</del>	<del>5</del>	<del>3752</del>
<del>CAL 7</del>	<del>500</del>	<del>8/12/05 830</del>	<del>8/11/05 1105</del>	<del>8/11/05 1600</del>	<del>601</del>	<del>6</del>	<del>1</del>	<del>7261</del>
<del>CAL 8</del>	<del>500</del>	<del>8/12/05 830</del>	<del>8/11/05 1140</del>	<del>8/11/05 1640</del>	<del>603</del>	<del>6</del>	<del>8</del>	<del>6542</del>
<del>CAL 9</del>	<del>500</del>	<del>8/12/05 830</del>	<del>8/19/05 910</del>	<del>8/19/05 1335</del>	<del>602</del>	<del>6</del>	<del>5</del>	<del>7636</del>
<del>CAL 10</del>	<del>500</del>	<del>8/12/05 830</del>	<del>8/19/05 955</del>	<del>8/19/05 1415</del>	<del>604</del>	<del>6</del>	<del>6</del>	<del>8361</del>
<del>CAL 11</del>	<del>500</del>	<del>8/12/05 836</del>	<del>8/19/05 1035</del>	<del>8/19/05 1450</del>	<del>605</del>	<del>6</del>	<del>7</del>	<del>9306</del>
<del>CAL 12</del>	<del>500</del>	<del>8/12/05 820</del>	<del>8/19/05 1105</del>	<del>8/19/05 1525</del>	<del>606</del>	<del>6</del>	<del>5</del>	<del>7361</del>

AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05  
 AB1 12/20/05

12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05  
 12/29/05

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
<del>CAL 1</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/20/05 1005</del>	<del>8/20/05 1305</del>	<del>601</del>	<del>6</del>	<del>8</del>	<del>5175</del>
<del>CAL 2</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/20/05 1040</del>	<del>8/20/05 1350</del>	<del>602</del>	<del>6</del>	<del>4</del>	<del>4515</del>
<del>CAL 3</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/22/05 1135</del>	<del>8/22/05 1740</del>	<del>603</del>	<del>6</del>	<del>8</del>	<del>4842</del>
<del>CAL 4</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/22/05 1225</del>	<del>8/22/05 1815</del>	<del>604</del>	<del>6</del>	<del>8</del>	<del>4886</del>
<del>CAL 5</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/22/05 1310</del>	<del>8/22/05 2340</del>	<del>605</del>	<del>6</del>	<del>8</del>	<del>4467</del>
<del>CAL 6</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/20/05 430</del>	<del>8/20/05 740</del>	<del>606</del>	<del>6</del>	<del>8</del>	<del>5573</del>
<del>CAL 7</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/20/05 510</del>	<del>8/23/05 815</del>	<del>607</del>	<del>6</del>	<del>8</del>	<del>5367</del>
<del>CAL 8</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/23/05 620</del>	<del>8/23/05 925</del>	<del>608</del>	<del>6</del>	<del>8</del>	<del>5786</del>
<del>CAL 9</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/23/05 715</del>	<del>8/23/05 1045</del>	<del>609</del>	<del>6</del>	<del>8</del>	<del>4991</del>
<del>CAL 10</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/23/05 815</del>	<del>8/23/05 1115</del>	<del>610</del>	<del>6</del>	<del>8</del>	<del>6068</del>
<del>CAL U</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/23/05 910</del>	<del>8/23/05 1245</del> <del>1510</del> <del>1245</del>	<del>611</del>	<del>6</del>	<del>7</del>	<del>6248</del>
<del>CAL 12</del>	<del>500</del>	<del>8/19/05 1630</del>	<del>8/20/05 1015</del>	<del>8/23/05 1420</del>	<del>612</del>	<del>6</del>	<del>7</del>	<del>5899</del>
<del>CAL</del>								

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

ABI 12/20/05

**General Engineering Laboratories  
Verification Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-008

Isotope Ra-226

Date Standards Prepared 8/26/03

Cocktail Type Used N/A

Standard ID 0299-E

Matrix of Vial/Planchett N/A

Amount Used (g or ml) 0.1

N/A  
N/A

Standard Activity (DPM/g or ml) 2434.34

Type of Scintillation Vial N/A

Reference Date 12/15/99

Pipette ID Used 1429303

Expiration Date 11/4/06

Balance ID Used 3640216

Residue/Carrier Agent 0.5 m HCl

Quenching Agent N/A

	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	CAL 1				
2	CAL 2				
3	CAL 3				
4	CAL 4				
5	CAL 5				
6	CAL 6				
7	CAL 7				
8	CAL 8				
9	CAL 9				
10	CAL 10				
11	CAL 11				
12	CAL 12				
13	CAL 13				
14	CAL 14				
15	CAL 15				

Prepared By: Ad Bail Date 12/29/05

Reviewed By: Angela A. Johnson Date 12/29/05

Rev 1 RLM 9/10/97

## General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL-RAD-A-009 Isotope Po-226  
 Date Standards Prepared 8/26/03 Cocktail Type Used N/A  
 Standard ID 0299-E Matrix of Vial/Planchett N/A  
 Amount Used (g or ml) 0.1 N/A  
 Standard Activity (DPM/g or ml) 2434.34 Type of Scintillation Vial N/A  
 Reference Date 12/15/99 Pipette ID Used 1429303  
 Expiration Date 11/4/06 Balance ID Used 36040216  
 Residue/Carrier Agent 0.5 M HCl Quenching Agent N/A

	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
16	CAL 16				
17	CAL 17				
18	CAL 18				
19	CAL 19				
20	CAL 20				
21	CAL 21				
22	CAL 22				
23	CAL 23				
24	CAL 24	<u>Abi</u>			
		<u>12/29/05</u>			

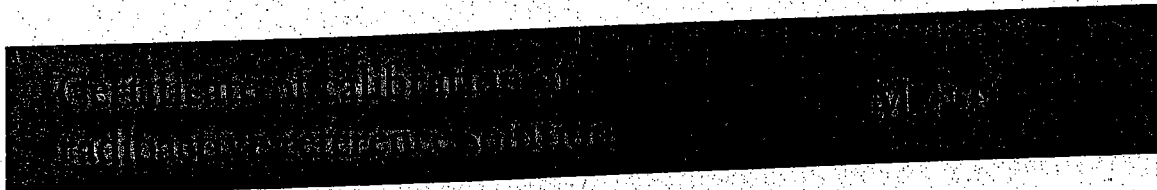
Prepared By: Ad Beck Date 12/29/05  
 Reviewed By: Angela A. Johnson Date 12/29/05

Rev 1 RLM 9/10/97

8-21-00

Nycomed Amersham plc  
Amersham Laboratories

0279



Nycomed Amersham plc  
Radiation & Radioactivity  
Calibration Laboratory  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ISSUED  
FOR:

AEA Technology plc  
Isotrak  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ion Principal radionuclide: Radium-226

Product code: RAY44  
Solution number: R4/131/89

ment Reference time: 1200 GMT on 15 December 1999

data Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

ion of The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k = 2.00$ , which  
inties for a  $t$ -distribution with  $v_{eff} = \infty$  effective degrees of freedom corresponds to a coverage probability of approximately  
95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard  
uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated in the following examples;

6.5(21)	-	6.5 ± 2.1
6.54(21)	-	6.54 ± 0.21
6.543(21)	-	6.543 ± 0.021

ved  
ory

Page 638 of 913

Date of  
issue

17<sup>th</sup> December 1999

**Nycomed  
Amersham**

0299

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

Reference time for solution number R4/131/89:	1200 GMT on 15 December 1999
Radioactive concentration of radium-226:	43.75 kilobecquerels per gram of solution
which is equivalent to:	1.183 microcuries per gram of solution
Mass of solution:	5.0368 grams
Total activity of radium-226:	220.4 kilobecquerels
which is equivalent to:	5.956 microcuries
Recommended half life:	1600 years

Method of measurement:  
The activity of the solution was measured using a high pressure re-entrant ionisation chamber calibrated with a large number of absolutely standardised solutions.

Calibration date: 15 December 1999  
The calibration date is provided for added information only, and must not be confused with the reference date on pages 1 and 2 of the certificate. It is the reference date that must be used in all calculations relating to the values of activity.

Expanded uncertainty in the radioactive concentration quoted above:  $\pm 2.5\%$   
Combined Type A uncertainty:  $\pm 0.2\%$   
Combined Type B uncertainty:  $\pm 1.3\%$

Radiochemical The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Carrier free in 0.5M HCl

This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

1 year = 365.25 days

At the reference date radium-226 was shown to be in radioactive equilibrium with its daughter nuclides down the decay chain to polonium-214 and thallium-210, the precursors of lead-210. The ionisation chamber was calibrated using a standard supplied by the National Institute of Standards and Technology, Washington DC, USA.





# Standard Traceability Log Rad

Source Material Info	
Parent Code:	0299
Prepared By:	Angela Albee
Carrier Conc:	0.5 M HCL
Reference Date:	12/15/1999
Ampoule Mass (g):	5.0368 g
Uncertainty:	+/- 2.5 %
LogBook No:	RC S 027 128

A Solution Material Info	
Isotope:	Radium-226
Prepared By:	Angela Albee
Prep Date:	09/15/2000
Verification Date:	08/26/2004
Expiration Date:	08/26/2005
Primary Code:	0299-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.6634 g
Density(g/mL):	1.0012

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Density (g/mL)}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
09/26/2000	Angela Albee	2.1096	100	0299-C	2579.62 dpm/mL	10/10/2002	10/10/2003
09/15/2000	Angela Albee	.2004	100	0299-B	245.05 dpm/mL	09/15/2000	09/15/2001
08/23/2002	Angela Albee	2.0443	100	0299-D	2499.77 dpm/mL	08/23/2002	08/23/2003
08/26/2003	Angela Albee	1.9909	100	0299-E	2434.34 dpm/mL	08/26/2004	08/26/2005
08/26/2003	Angela Albee	1.9872	100	0299-F	2429.82 dpm/mL	08/26/2004	08/26/2005

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

# Verification for Ra-226 Standard 0299-E

8/26/2004  
A. Fehr

Isotope  
0299-F N1  
0299-F N2  
0299-F N3

Detector CPM  
561.0000  
567.3000  
540.4000

BKG CPM  
26.9000  
26.9000  
26.9000

NET CPM  
534.1000  
540.4000  
513.5000

Detector Eff  
3.38485694  
3.38485694  
3.38485694

Mass. Used (G)  
0.0645  
0.0658  
0.0652

Source DPM/G  
2446.372267  
2426.325867  
2326.765061  
2399.821065

Mean Value (Counting) = 2399.821065  
Stdev = 64.05739118

Certificate Value = 2429.4 dpm/mL  
Lower Limit = 2271.706283 dpm/mL  
Upper Limit = 2527.935847 dpm/mL

Rule 1 Pass/Fail Pass  
Two sigma = 128.1147824 dpm/mL  
10 % of Mean = 239.9821065 dpm/mL

Rule 2 (Pass/Fail) Pass  
98.7828559 % of known  
0.02669257

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

The analyst prepared three standard verification sources for Ra-226 source 0299-E by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and ten mLs of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 23 for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 8/26/04 using source 0321-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0321. Each verification source calculation was performed as follows:

Source dpm/g = (A - B)/(C)(D)  
where:  
A = Ver. source cpm,  
B = BKG cpm,  
C = System efficiency, (cpm/dpm), and  
D = mass used for standard verification.

RAD SOP M-001

Amanda L. Fehr 8/26/04  
Heather B. Co  
8/26/04

Voltage Curve Ludlum # 6				
Volts (K.V.)	Counts	Date	Time	Detector
0.20	0	8/22/2005	9:15	6
0.25	0	8/22/2005	9:16	6
0.30	0	8/22/2005	9:17	6
0.35	0	8/22/2005	9:18	6
0.40	0	8/22/2005	9:19	6
0.45	0	8/22/2005	9:20	6
0.50	0	8/22/2005	9:21	6
0.55	76	8/22/2005	9:22	6
0.60	1407	8/22/2005	9:23	6
0.65	5153	8/22/2005	9:24	6
0.70	8502	8/22/2005	9:25	6
0.75	11150	8/22/2005	9:26	6
0.80	12291	8/22/2005	9:27	6
0.85	13641	8/22/2005	9:28	6
0.90	14585	8/22/2005	9:29	6
0.95	15162	8/22/2005	9:30	6
1.00	15489	8/22/2005	9:31	6
1.05	16151	8/22/2005	9:32	6
1.10	16340	8/22/2005	9:33	6
1.15	16607	8/22/2005	9:34	6
1.20	16845	8/22/2005	9:35	6
1.25	18048	8/22/2005	9:36	6
1.30	21465	8/22/2005	9:37	6
1.35	31258	8/22/2005	9:38	6

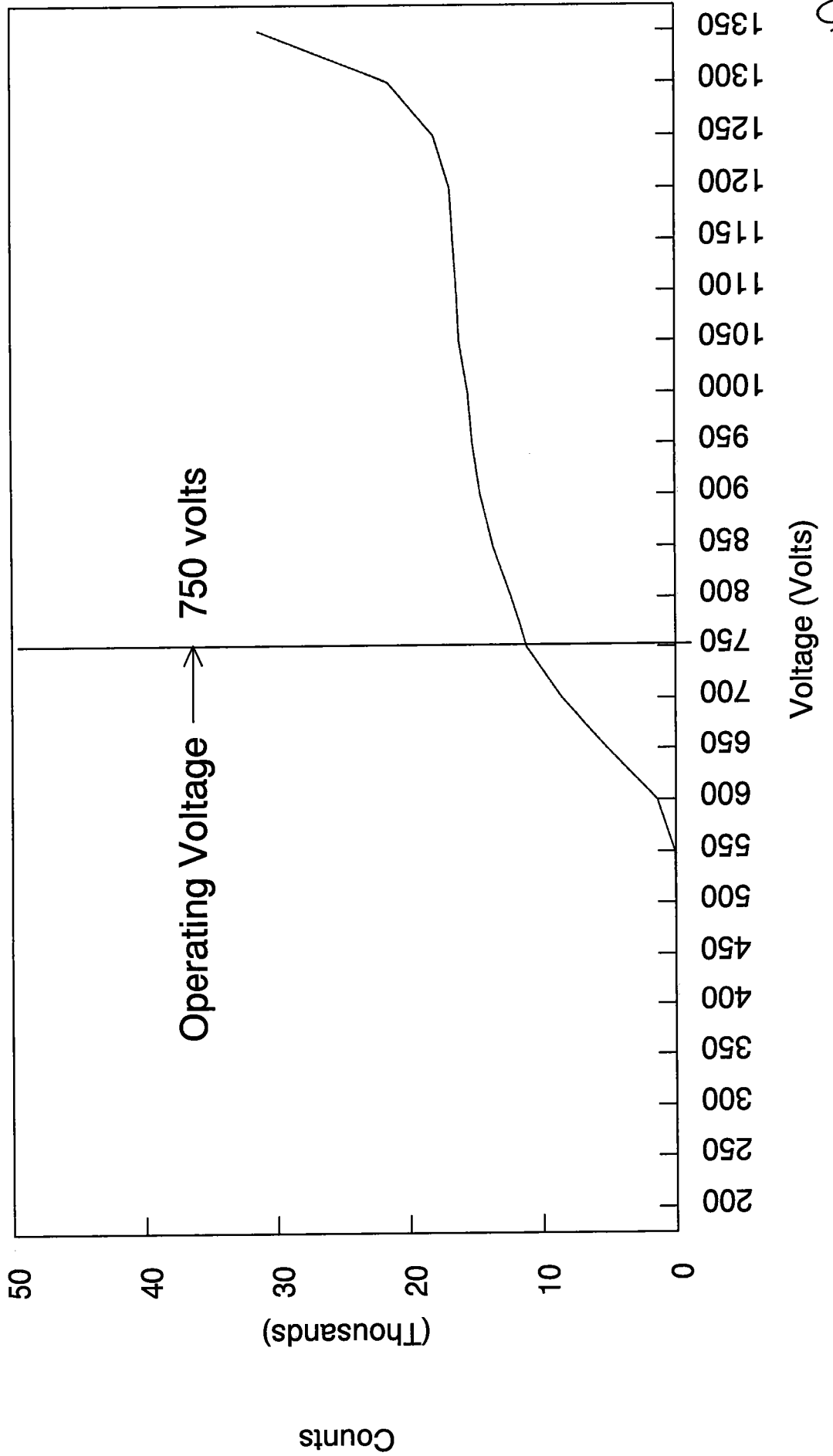
*Ad Bal - 12/29/05*

*AdQ  
12/29/05*

# Plateau August, 2005

## Ludlum # 6

*Hot Bank 12/29/05*



*ATD  
12/29/05*

# Ra-226 WATER

Batch : LCSVER  
 Date : 12/27/2005  
 Analyst : SSE

Procedure Code : LUC26RAL  
 Parmname : Radium-226  
 MDA : 1 pCi/L

Instrument Used : LUCAS CELL DETECTOR

Bkg Count Time: 30 min

Sample ID	Sample Vol L	Count Time min	Gross counts cts	Cell # num	Cell Const. num	BKG cpm	Ra-226 MDA pCi/L	Ra-226 RESULT pCi/L	Ra-226 ERROR pCi/L	COUNT DATE/TIME
5	0.500	30	967	601	2.064	0.267	0.3672	22.1465	1.4134	12/28/2005 17:20
7	0.500	30	1032	602	1.884	0.267	0.4018	25.8803	1.5975	12/28/2005 18:20
8	0.500	30	947	603	1.798	0.267	0.4161	24.5773	1.5854	12/22/2005 14:00
9	0.500	30	816	604	1.798	0.167	0.3429	21.1635	1.4656	12/22/2005 14:45
10	0.500	30	803	605	1.843	0.267	0.4043	20.2180	1.4195	12/22/2005 15:30
4	0.500	30	819	607	1.985	0.267	0.4100	20.9156	1.4537	12/27/2005 16:30
6	0.500	30	791	608	1.958	0.200	0.4514	25.0896	1.7685	12/20/2005 10:50
8	0.500	30	844	609	1.984	0.267	0.3807	20.0188	1.3700	12/28/2005 18:55
7	0.500	30	767	610	1.792	0.200	0.4913	26.4718	1.8956	12/20/2005 11:20
2	0.500	30	608	611	1.944	0.167	0.5458	25.0449	2.0156	12/19/2005 10:00
3	0.500	30	561	612	1.927	0.200	0.5861	23.0297	1.9366	12/19/2005 10:40

*Adl Bark* 12/29/05

*Angela D. Johnson* 12/29/05

Sample ID	Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
5		6	12/28/2005 17:20	LCS	0321-H	24.14	pCi/L	92%
7		6	12/28/2005 18:20	LCS	0321-H	24.14	pCi/L	107%
8		6	12/22/2005 14:00	LCS	0321-H	24.14	pCi/L	102%
9		6	12/22/2005 14:45	LCS	0321-H	24.14	pCi/L	88%
10		6	12/22/2005 15:30	LCS	0321-H	24.14	pCi/L	84%
4		6	12/27/2005 16:30	LCS	0321-H	24.14	pCi/L	87%
6		6	12/20/2005 10:50	LCS	0321-H	24.14	pCi/L	104%
8		6	12/28/2005 18:55	LCS	0321-H	24.14	pCi/L	83%
7		6	12/20/2005 11:20	LCS	0321-H	24.14	pCi/L	110%
2		6	12/19/2005 10:00	LCS	0321-H	24.14	pCi/L	104%
3		6	12/19/2005 10:40	LCS	0321-H	24.14	pCi/L	95%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	Net CPM	Ingrowth constant
12/22/2005 12:30	12/28/2005 11:05	142.58	6.25	0.6592	0.9539	31.9663	0.6300
12/22/2005 12:30	12/28/2005 11:50	143.33	6.50	0.6611	0.9521	34.1330	0.6307
12/16/2005 14:40	12/22/2005 10:45	140.08	3.25	0.6527	0.9758	31.2997	0.6381
12/16/2005 14:40	12/22/2005 11:30	140.83	3.25	0.6547	0.9758	27.0330	0.6400
12/16/2005 14:40	12/22/2005 12:05	141.42	3.42	0.6562	0.9745	26.4997	0.6407
12/22/2005 12:30	12/27/2005 13:30	121.00	3.00	0.5989	0.9776	27.0330	0.5866
12/16/2005 14:40	12/20/2005 7:50	89.17	3.00	0.4899	0.9776	26.1667	0.4799
12/22/2005 12:30	12/28/2005 12:25	143.92	6.50	0.6626	0.9521	27.8663	0.6321
12/16/2005 14:40	12/20/2005 8:20	89.67	3.00	0.4919	0.9776	25.3667	0.4817
12/16/2005 14:40	12/19/2005 6:20	63.67	3.67	0.3816	0.9727	20.0997	0.3719
12/16/2005 14:40	12/19/2005 7:05	64.42	3.58	0.3851	0.9733	18.5000	0.3756

*Ad Bail 12/29/05*

*Angela D. Johnson 12/29/05*

Ra-226 Verification Sheet

0

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
VER 1	500	12/14/05 1440	12/19/05 540	12/19/05 9:00	602	6	8	487
VER 2	500	12/16/05 1440	12/19/05 620	12/19/05 1000	611	6	5	608
VER 3	500	12/16/05 1440	12/19/05 705	12/19/05 1040	612	6	6	561
VER 4	500	12/16/05 1440	12/20/05 610	12/20/05 910	601	6	8	678
VER 5	500	12/16/05 1440	12/20/05 640	12/20/05 945	607	6	8	602
VER 6	500	12/16/05 1440	12/20/05 750	12/20/05 1050 1220 AB1 12/20/05	608	6	6	791
VER 7	500	12/16/05 1440	12/20/05 820	12/20/05 1120	610	6	6	767
VER 8	500	12/16/05 1440 12/22/05 AB1 12/22/05	12/22/05 1045	12/22/05 1400	603	6	8	947
VER 9	500	12/16/05 1440	12/22/05 1130	12/22/05 1445	604	6	5	816
VER 10	500	12/16/05 1440	12/22/05 1205	12/22/05 1530	605	6	8	803
VER 11					<del>607</del>	6		
VER 12						6		

AB1 12/27/05

AB1 12/27/05

AB1  
12/29/05

Ra-226 Verification Sheet

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
VER 1	500	12/22/05 1230	12/22/05 1135	12/22/05 1445	602	6	8	557
VER 2	500	12/22/05 1230	12/22/05 1210	12/22/05 1520	609	6	8	633
VER 3	500	12/22/05 1230	12/22/05 1250	12/22/05 1600	601	6	4	601
VER 4	500	12/22/05 1230	12/22/05 1330	12/22/05 1630	607	6	8	819
ABI								
12/29/05								
VER 5	500	12/22/05 1230	12/28/05 1105	12/20/05 1720	601	6	8	967
VER 6	500	12/22/05 1230	12/28/05 1150	12/28/05 1820	602	6	8	1032
VER 8	500	12/22/05 1230	12/28/05 1225	12/28/05 1855	609	6	8	844
ABI								
12/29/05								

ABI 12/27/05  
 ABI 12/29/05  
 ABI 12/29/05

ABI  
 12/29/05



**General Engineering Laboratories  
Verification Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-008

Isotope Ra-226

Date Standards Prepared 5/18/05

Cocktail Type Used N/A

Standard ID 0321-H

Matrix of Vial/Planchett N/A

Amount Used (g or ml) 0.1

N/A  
N/A

Standard Activity (DPM/g or ml) 269.6188

Type of Scintillation Vial N/A

Reference Date 9/9/91

Pipette ID Used 1429303

Expiration Date 5/20/06

Balance ID Used 36040216

Residue/Carrier Agent 1M HCl

Quenching Agent N/A

	Standard Number	Quenching Vol (uL) Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
1	VER 1				
2	VER 2				
3	VER 3				
4	VER 4				
5	VER 5				
6	VER 6				
7	VER 7				
8	VER 8				
9	VER 9				
10	VER 10				
11	VER 11				
12	VER 12				
	ABI				
	12/29/05				

Prepared By: Ad Bail Date 12/29/05

Reviewed By: Angela Johnson Date 12/29/05

Rev 1 RLM 9/10/97

# Verification for Ra-226 Standard 0321-H

A. Fehr  
5/20/05

Standard	Detector Eff Mass. Used (mL)	Source DPM/mL
1.0000	4.20643586	270.0385881
1.0000	4.20643586	262.3598783
1.0000	4.20643586	265.1651036
Average =		265.8545233

isotope	Detector CPM	BKG CPM	NET CPM	Pass
0321-H N1	1170.1000	34.2000	1135.9000	Rule 3 (Pass/Fail)
0321-H N2	1137.8000	34.2000	1103.6000	
0321-H N3	1149.6000	34.2000	1115.4000	
Mean Value (Counting) =	265.8545233	99.1905663		
Stdev =	3.885501322	0.01461514		

Certificate Value = 268.0  
 Lower Limit = 258.0835207  
 Upper Limit = 273.625526  
 Rule 1 Pass/Fail Pass  
 Two sigma = 7.771002644  
 10 % of Mean = 26.58545233  
 Rule 2 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ra-226 source 0321-H by transferring portions of the standard into tared glass liquid scintillation vials. One mL of DI Water and 10 mL Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Green using source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 5/20/05 using source 0299-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 (0299-A). Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

*Amanda L. Fehr 5/20/05*  
*Angela A. Johnson 5/24/05*

# CONTINUING CALIBRATION DATA



# Gas Flow Proportional Counter Checks for 20-APR-2006

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LB4100A1	ALPHA BKG	09:39	60	1.00	0.02	-1.2	GOOD	
	BETA BKG	09:39	60	62.0	1.03	0.7	GOOD	
	ALPHA EFF	10:13	30	22766	759	-1.1	GOOD	
	BETA EFF	10:13	30	1.80E+05	5980	1.04	GOOD	
LB4100A2	ALPHA BKG	09:39	60	2.00	0.03	-0.95	GOOD	
	BETA BKG	09:39	60	47.0	0.78	-0.47	GOOD	
	ALPHA EFF	10:13	30	15698	523	-0.72	GOOD	
	BETA EFF	10:13	30	1.31E+05	4370	0.96	GOOD	
LB4100A3	ALPHA BKG	09:39	60	4.00	0.07	-0.27	GOOD	
	BETA BKG	09:39	60	61.0	1.02	0.34	GOOD	
	ALPHA EFF	10:13	30	21452	715	-1.1	GOOD	
	BETA EFF	10:13	30	1.57E+05	5250	0.29	GOOD	
<u>LB4100A4</u>	ALPHA BKG	09:39	60	5.00	0.08	0.58	GOOD	
	BETA BKG	09:39	60	246	4.1	9.13	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:13	30	18563	619	3.3	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	10:13	30	1.71E+05	5700	1.12	GOOD	
LB4100B1	ALPHA BKG	09:40	60	3.00	0.05	0.38	GOOD	
	BETA BKG	09:40	60	41.0	0.68	-1.3	GOOD	
	ALPHA EFF	10:13	30	20904	697	-0.81	GOOD	
	BETA EFF	10:13	30	1.88E+05	6260	0.31	GOOD	
LB4100B2	ALPHA BKG	09:40	60	2.00	0.03	-0.25	GOOD	
	BETA BKG	09:40	60	42.0	0.7	-0.38	GOOD	
	ALPHA EFF	10:13	30	20383	679	-0.9	GOOD	
	BETA EFF	10:13	30	1.65E+05	5500	0.3	GOOD	
LB4100B3	ALPHA BKG	09:40	60	4.00	0.07	0.46	GOOD	
	BETA BKG	09:40	60	84.0	1.4	1.36	GOOD	
	ALPHA EFF	10:13	30	15711	524	-0.3	GOOD	
	BETA EFF	10:13	30	1.24E+05	4120	1.07	GOOD	
<u>LB4100B4</u>	ALPHA BKG	09:40	60	0	0	-1.3	GOOD	
	BETA BKG	09:40	60	236	3.93	26.7	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:13	30	18516	617	-0.53	GOOD	
	BETA EFF	10:13	30	1.58E+05	5250	1.63	GOOD	
LB4100C1	ALPHA BKG	09:40	60	14.0	0.23	-0.15	GOOD	
	BETA BKG	09:40	60	67.0	1.12	-0.56	GOOD	
	ALPHA EFF	10:13	30	20871	696	-0.2	GOOD	
	BETA EFF	10:13	30	1.36E+05	4550	0.74	GOOD	
LB4100C2	ALPHA BKG	09:40	60	5.00	0.08	0.21	GOOD	
	BETA BKG	09:40	60	50.0	0.83	-0.54	GOOD	
	ALPHA EFF	10:13	30	21538	718	0.29	GOOD	
	BETA EFF	10:13	30	1.94E+05	6470	0.98	GOOD	
LB4100C3	ALPHA BKG	09:40	60	1.00	0.02	-1.1	GOOD	
	BETA BKG	09:40	60	50.0	0.83	-0.38	GOOD	

*Handwritten notes:*  
 =  $\alpha$  only lockout  
 =  $\alpha$  B lockout

	ALPHA EFF	10:13	30	16509	550	-0.07	GOOD	
	BETA EFF	10:13	30	1.37E+05	4570	1.01	GOOD	
LB4100C4	ALPHA BKG	09:40	60	6.00	0.1	1.53	GOOD	
	BETA BKG	09:40	60	59.0	0.98	0.93	GOOD	
	ALPHA EFF	10:13	30	24178	806	0.52	GOOD	
	BETA EFF	10:13	30	2.22E+05	7410	0.99	GOOD	
<u>LB4100D1</u>	ALPHA BKG	09:40	60	18.0	0.3	<del>4.20</del>	DETL	Outside 2 sigma for >= 2 days
	BETA BKG	09:40	60	64.0	1.07	1.66	GOOD	
	ALPHA EFF	10:13	30	25768	859	-1.3	GOOD	
	BETA EFF	10:13	30	2.40E+05	8000	0.47	GOOD	
LB4100D2	ALPHA BKG	09:40	60	8.00	0.13	-0.23	GOOD	
	BETA BKG	09:40	60	49.0	0.82	-1.2	GOOD	
	ALPHA EFF	10:13	30	19178	639	-0.5	GOOD	
	BETA EFF	10:13	30	1.50E+05	5010	0.28	GOOD	
LB4100D3	ALPHA BKG	09:40	60	1.00	0.02	-0.76	GOOD	
	BETA BKG	09:40	60	54.0	0.9	1.07	GOOD	
	ALPHA EFF	10:13	30	17908	597	-1.4	GOOD	
	BETA EFF	10:13	30	1.51E+05	5040	1.57	GOOD	
LB4100D4	ALPHA BKG	09:40	60	3.00	0.05	-0.57	GOOD	
	BETA BKG	09:40	60	47.0	0.78	-0.73	GOOD	
	ALPHA EFF	10:13	30	20641	688	-1.1	DETL	Outside 3 sigma for > 2 days
	BETA EFF	10:13	30	1.84E+05	6130	1.09	GOOD	
LB4100E1	ALPHA BKG	09:44	60	14.0	0.23	0.89	GOOD	
	BETA BKG	09:44	60	77.0	1.28	-0.02	GOOD	
	ALPHA EFF	10:18	30	32139	1070	-1.8	GOOD	
	BETA EFF	10:18	30	2.15E+05	7170	1.07	GOOD	
LB4100E2	ALPHA BKG	09:44	60	8.00	0.13	0.13	GOOD	
	BETA BKG	09:44	60	86.0	1.43	-0.65	GOOD	
	ALPHA EFF	10:18	30	33843	1130	-1.2	GOOD	
	BETA EFF	10:18	30	2.94E+05	9800	1.21	GOOD	
LB4100E3	ALPHA BKG	09:44	60	2.00	0.03	-1.1	GOOD	
	BETA BKG	09:44	60	80.0	1.33	2.01	GOOD	
	ALPHA EFF	10:18	30	34496	1150	-1.2	GOOD	
	BETA EFF	10:18	30	2.30E+05	7680	-0.29	GOOD	
LB4100E4	ALPHA BKG	09:44	60	5.00	0.08	-0.83	GOOD	
	BETA BKG	09:44	60	115	1.92	0.26	GOOD	
	ALPHA EFF	10:18	30	29738	991	-0.98	GOOD	
	BETA EFF	10:18	30	2.29E+05	7620	0.82	GOOD	
LB4100F1	ALPHA BKG	09:44	60	7.00	0.12	1.09	GOOD	
	BETA BKG	09:44	60	64.0	1.07	0.99	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:18	30	28559	952	0	GOOD	
	BETA EFF	10:18	30	2.08E+05	6920	1.16	GOOD	
<u>LB4100F2</u>	ALPHA BKG	09:44	60	7.00	0.12	0	GOOD	
	BETA BKG	09:44	60	70.0	1.17	0.54	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:18	30	27755	925	<del>2.12</del>	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	10:18	30	2.20E+05	7325	-0.17	GOOD	
LB4100F3	ALPHA BKG	09:44	60	6.00	0.1	-1.1	GOOD	

not a lockout condition  
w/4/20/06

Not a lockout condition  
w/4/20/06

Beta BKG Not a lockout condition  
w/4/20/06

	BETA BKG	09:44	60	83.0	1.38	0.1	GOOD	
	ALPHA EFF	10:18	30	27842	928	0.78	GOOD	
	BETA EFF	10:18	30	2.60E+05	8680	1.18	GOOD	
LB4100F4	ALPHA BKG	09:44	60	1.00	0.02	-0.69	GOOD	
	BETA BKG	09:44	60	49.0	0.82	-0.26	GOOD	
	ALPHA EFF	10:18	30	24795	827	-1.7	GOOD	
	BETA EFF	10:18	30	2.02E+05	6740	1.38	GOOD	
LB4100G1	ALPHA BKG	09:44	60	3.00	0.05	-2	GOOD	
	BETA BKG	09:44	60	112	1.87	<del>2.63</del>	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:18	30	32748	1090	1.76	GOOD	
	BETA EFF	10:18	30	2.27E+05	7570	1.86	GOOD	
LB4100G2	ALPHA BKG	09:44	60	2.00	0.03	-0.79	GOOD	
	BETA BKG	09:44	60	55.0	0.92	1.21	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:18	30	30657	1020	-1.3	GOOD	
	BETA EFF	10:18	30	2.84E+05	9470	-0.03	GOOD	
LB4100G3	ALPHA BKG	09:44	60	6.00	0.1	-1.6	GOOD	
	BETA BKG	09:44	60	56.0	0.93	-0.48	GOOD	
	ALPHA EFF	10:18	30	22312	744	-0.55	GOOD	
	BETA EFF	10:18	30	2.44E+05	8140	-1.1	GOOD	
LB4100G4	ALPHA BKG	09:44	60	1.00	0.02	-0.85	GOOD	
	BETA BKG	09:44	60	43.0	0.72	-1.4	GOOD	
	ALPHA EFF	10:18	30	15225	508	0.18	GOOD	
	BETA EFF	10:18	30	1.53E+05	5080	1.35	GOOD	
LB4100H1	ALPHA BKG	09:44	60	9.00	0.15	1.42	GOOD	
	BETA BKG	09:44	60	53.0	0.88	1.77	GOOD	
	ALPHA EFF	10:18	30	28584	953	-1.3	GOOD	
	BETA EFF	10:18	30	1.45E+05	4840	0.51	GOOD	
LB4100H2	ALPHA BKG	09:44	60	2.00	0.03	-0.77	GOOD	
	BETA BKG	09:44	60	48.0	0.8	-0.72	GOOD	
	ALPHA EFF	10:18	30	17545	585	-1.1	GOOD	
	BETA EFF	10:18	30	1.51E+05	5020	0.94	GOOD	
LB4100H3	ALPHA BKG	09:44	60	6.00	0.1	-0.34	GOOD	
	BETA BKG	09:44	60	58.0	0.97	1.21	GOOD	
	ALPHA EFF	10:18	30	17996	600	-1.4	GOOD	
	BETA EFF	10:18	30	1.54E+05	5150	0.55	GOOD	
LB4100H4	ALPHA BKG	09:44	60	4.00	0.07	-0.2	GOOD	
	BETA BKG	09:44	60	24.0	0.4	<u>3.9</u>	RERUN	
	ALPHA EFF	10:18	30	17112	570	-1.7	GOOD	
	BETA EFF	10:18	30	1.26E+05	4190	0.95	GOOD	
PIC1A	ALPHA BKG	09:34	60	6.00	0.1	-0.77	GOOD	
	BETA BKG	09:34	60	25.0	0.42	-0.73	GOOD	
	ALPHA EFF	10:09	30	9218	307	-2.7	GOOD	
	BETA EFF	10:09	30	1.96E+05	6530	-0.22	GOOD	
PIC1B	ALPHA BKG	09:35	60	6.00	0.1	-0.0	GOOD	
	BETA BKG	09:35	60	19.0	0.32	-0.5	GOOD	
	ALPHA EFF	10:09	30	10729	358	-2.4	GOOD	
	BETA EFF	10:09	30	2.13E+05	7100	-1.3	GOOD	

*Not a lockout condition  
w/ y/ed/oc*

PIC1C	ALPHA BKG	09:35	60	6.00	0.1	-0.01	GOOD	
	BETA BKG	09:35	60	12.0	0.2	-1.1	GOOD	
	ALPHA EFF	10:10	30	15451	515	-0.99	GOOD	
	BETA EFF	10:10	30	2.45E+05	8170	-0.05	GOOD	
PIC1D	ALPHA BKG	09:35	60	7.00	0.12	-0.53	GOOD	
	BETA BKG	09:35	60	23.0	0.38	-0.44	GOOD	
	ALPHA EFF	10:10	30	15495	517	-1.8	GOOD	
	BETA EFF	10:10	30	1.89E+05	6310	0.55	GOOD	
PIC2A	ALPHA BKG	09:35	60	1.00	0.02	-1.5	GOOD	
	BETA BKG	09:35	60	21.0	0.35	-0.55	GOOD	
	ALPHA EFF	10:10	30	14996	500	-2.1	GOOD	
	BETA EFF	10:10	30	2.32E+05	7720	-0.01	GOOD	
PIC2B	ALPHA BKG	09:35	60	2.00	0.03	-1.1	GOOD	
	BETA BKG	09:35	60	18.0	0.3	-0.43	GOOD	
	ALPHA EFF	10:10	30	13427	448	2.4	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	10:10	30	2.30E+05	7650	0.67	GOOD	
PIC2C	ALPHA BKG	09:35	60	10.0	0.17	0.79	GOOD	
	BETA BKG	09:35	60	20.0	0.33	-0.28	GOOD	
	ALPHA EFF	10:10	30	18520	617	-1.3	GOOD	
	BETA EFF	10:10	30	1.94E+05	6470	1.11	GOOD	
PIC2D	ALPHA BKG	09:35	60	5.00	0.08	-0.57	GOOD	
	BETA BKG	09:35	60	33.0	0.55	0.95	GOOD	
	ALPHA EFF	10:10	30	16385	546	-2	GOOD	
	BETA EFF	10:10	30	2.25E+05	7500	1.66	GOOD	
PIC3A	ALPHA BKG	09:35	60	5.00	0.08	-0.87	GOOD	
	BETA BKG	09:35	60	33.0	0.55	0.54	GOOD	
	ALPHA EFF	10:10	30	20593	686	-2.6	GOOD	
	BETA EFF	10:10	30	1.79E+05	5960	1.47	GOOD	
PIC3B	ALPHA BKG	09:35	60	4.00	0.07	-1.2	GOOD	
	BETA BKG	09:35	60	21.0	0.35	-0.62	GOOD	
	ALPHA EFF	10:11	30	19841	661	-1.7	GOOD	
	BETA EFF	10:11	30	1.97E+05	6560	0.95	GOOD	
PIC3C	ALPHA BKG	09:35	60	3.00	0.05	-1.2	GOOD	
	BETA BKG	09:35	60	21.0	0.35	-0.47	GOOD	
	ALPHA EFF	10:11	30	16661	555	-2	GOOD	
	BETA EFF	10:11	30	2.12E+05	7070	0.47	GOOD	
PIC3D	ALPHA BKG	09:36	60	8.00	0.13	0.5	GOOD	
	BETA BKG	09:36	60	26.0	0.43	-0.0	GOOD	
	ALPHA EFF	10:11	30	24320	811	-2	GOOD	
	BETA EFF	10:11	30	2.14E+05	7130	-0.45	GOOD	
PIC4A	ALPHA BKG	09:36	60	0	0	-2	GOOD	
	BETA BKG	09:36	60	11.0	0.18	-1.8	GOOD	
	ALPHA EFF	10:11	30	12555	419	-1.6	GOOD	
	BETA EFF	10:11	30	1.75E+05	5830	-0.08	GOOD	
PIC4B	ALPHA BKG	09:36	60	6.00	0.1	0.18	GOOD	
	BETA BKG	09:36	60	28.0	0.47	0.09	GOOD	
	ALPHA EFF	10:11	30	17795	593	-1.8	GOOD	

	BETA EFF	10:11	30	2.23E+05	7430	-0.51	GOOD	
PIC4C	ALPHA BKG	09:36	60	1.00	0.02	-2	GOOD	
	BETA BKG	09:36	60	23.0	0.38	-0.38	GOOD	
	ALPHA EFF	10:11	30	19704	657	-2.2	GOOD	
	BETA EFF	10:11	30	2.03E+05	6770	1.8	GOOD	
PIC4D	ALPHA BKG	09:36	60	13.0	0.22	1.16	GOOD	
	BETA BKG	09:36	60	31.0	0.52	0.48	GOOD	
	ALPHA EFF	10:11	30	19424	647	-2.2	GOOD	
	BETA EFF	10:11	30	2.12E+05	7070	1.18	GOOD	
PIC5A	ALPHA BKG	09:36	60	4.00	0.07	-0.25	GOOD	
	BETA BKG	09:36	60	26.0	0.43	0	GOOD	
	ALPHA EFF	10:12	30	10748	358	-1.6	GOOD	
	BETA EFF	10:12	30	3.98E+05	13300	-1.7	DETL	Outside 2 sigma for >= 2 days
<u>PIC5B</u>	ALPHA BKG	09:36	60	2.00	0.03	-0.99	GOOD	
	BETA BKG	09:36	60	131	2.18	0.59	RERUN	
	ALPHA EFF	10:12	30	9851	328	-0.39	GOOD	
	BETA EFF	10:12	30	3.50E+05	11700	0.1	GOOD	
PIC5C	ALPHA BKG	09:37	60	0	0	-1.4	GOOD	
	BETA BKG	09:37	60	13.0	0.22	-1.7	GOOD	
	ALPHA EFF	10:12	30	9803	327	-1.4	GOOD	
	BETA EFF	10:12	30	3.86E+05	12900	-2.6	DETL	Outside 2 sigma for >= 2 days
<u>PIC5D</u>	ALPHA BKG	09:37	60	2.00	0.03	-0.36	GOOD	
	BETA BKG	09:37	60	35.0	0.58	2.89	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:12	30	8615	287	-1.2	GOOD	
	BETA EFF	10:12	30	3.09E+05	10300	-1.7	DETL	Outside 2 sigma for >= 2 days
PIC6A	ALPHA BKG	09:37	60	6.00	0.1	0.67	GOOD	
	BETA BKG	09:37	60	18.0	0.3	-0.6	GOOD	
	ALPHA EFF	10:12	30	7771	259	-0.97	GOOD	
	BETA EFF	10:12	30	2.80E+05	9330	-1.8	GOOD	
<u>PIC6B</u>	ALPHA BKG	09:37	60	5.00	0.08	1.44	GOOD	
	BETA BKG	09:37	60	15.0	0.25	-0.31	GOOD	
	ALPHA EFF	10:12	30	9813	327	-1.3	GOOD	
	BETA EFF	10:12	30	2.88E+05	9580	3.3	DETL	Outside 2 sigma for >= 2 days
PIC6C	ALPHA BKG	09:37	60	3.00	0.05	0.08	GOOD	
	BETA BKG	09:37	60	16.0	0.27	-0.25	GOOD	
	ALPHA EFF	10:13	30	13857	462	-1.2	GOOD	
	BETA EFF	10:13	30	3.51E+05	11700	-0.87	DETL	Outside 2 sigma for >= 2 days
PIC6D	ALPHA BKG	09:37	60	11.0	0.18	2.83	GOOD	
	BETA BKG	09:37	60	29.0	0.48	0.85	GOOD	
	ALPHA EFF	10:13	30	10673	356	-1.4	GOOD	
	BETA EFF	10:13	30	3.59E+05	12000	-1.5	GOOD	
PIC7A	ALPHA BKG	09:37	60	1.00	0.02	-1.1	GOOD	
	BETA BKG	09:37	60	31.0	0.52	-0.42	GOOD	
	ALPHA EFF	10:13	30	9430	314	-0.92	GOOD	
	BETA EFF	10:13	30	3.77E+05	12600	-1.4	DETL	Outside 2 sigma for >= 2 days
<u>PIC7B</u>	ALPHA BKG	09:38	60	19.0	0.5	-0.27	RERUN	
	BETA BKG	09:38	60	30.0	0.5	-0.53	GOOD	

Not a lockout condition  
w/4/20/06

Not a lockout condition  
w/4/20/06

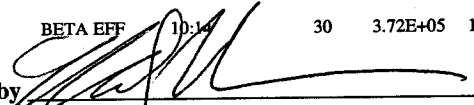
Not a lockout condition  
w/4/20/06

Not a lockout condition  
w/4/20/06



	ALPHA EFF	10:13	30	9584	319	-1.4	GOOD
	BETA EFF	10:13	30	3.18E+05	10600	-0.57	GOOD
PIC7C	ALPHA BKG	09:38	60	5.00	0.08	-0.7	GOOD
	BETA BKG	09:38	60	18.0	0.3	-0.94	GOOD
	ALPHA EFF	10:13	30	10776	359	-1.2	GOOD
	BETA EFF	10:13	30	3.82E+05	12700	-0.45	GOOD
PIC7D	ALPHA BKG	09:38	60	7.00	0.12	-0.68	GOOD
	BETA BKG	09:38	60	23.0	0.38	-0.57	GOOD
	ALPHA EFF	10:13	30	7780	259	-1.3	GOOD
	BETA EFF	10:13	30	2.82E+05	9390	-0.38	GOOD
PIC8A	ALPHA BKG	09:38	60	6.00	0.1	-0.52	GOOD
	BETA BKG	09:38	60	34.0	0.57	-0.7	GOOD
	ALPHA EFF	10:13	30	12620	421	-0.48	GOOD
	BETA EFF	10:13	30	3.73E+05	12400	-0.9	GOOD
PIC8B	ALPHA BKG	09:38	60	3.00	0.05	-0.54	GOOD
	BETA BKG	09:38	60	62.0	1.03	-0.22	GOOD
	ALPHA EFF	10:13	30	9260	309	-1.2	GOOD
	BETA EFF	10:13	30	3.70E+05	12300	-0.49	GOOD
PIC8C	ALPHA BKG	09:38	60	12.0	0.2	-0.74	GOOD
	BETA BKG	09:38	60	13.0	0.22	-0.96	GOOD
	ALPHA EFF	10:14	30	13962	465	-1	GOOD
	BETA EFF	10:14	30	4.27E+05	14200	-0.54	GOOD
PIC8D	ALPHA BKG	09:38	60	16.0	0.27	-0.11	GOOD
	BETA BKG	09:38	60	75.0	1.25	-0.38	GOOD
	ALPHA EFF	10:14	30	10607	354	0.89	DETL
	BETA EFF	10:14	30	3.72E+05	12400	0.15	GOOD

Outside 2 sigma for >= 2 days Not a lockout condition  
WY/20/06

Reviewed by 

Date 4/20/06

General Engineering Laboratories, LLC

# Gas Flow Proportional Counter Checks for 21-APR-2006

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LB4100A1	ALPHA BKG	08:25	60	3.00	0.05	-0.22	GOOD	
	BETA BKG	08:25	60	56.0	0.93	-0.04	GOOD	
	ALPHA EFF	09:10	30	22701	757	-1.1	GOOD	
	BETA EFF	09:10	30	1.80E+05	5990	1.08	GOOD	
LB4100A2	ALPHA BKG	08:25	60	10.0	0.17	2.57	GOOD	
	BETA BKG	08:25	60	49.0	0.82	-0.25	GOOD	
	ALPHA EFF	09:10	30	15482	516	-1	GOOD	
	BETA EFF	09:10	30	1.32E+05	4420	1.46	GOOD	
LB4100A3	ALPHA BKG	08:25	60	4.00	0.07	-0.27	GOOD	
	BETA BKG	08:25	60	51.0	0.85	-0.51	GOOD	
	ALPHA EFF	09:10	30	21690	723	-0.84	GOOD	
	BETA EFF	09:10	30	1.58E+05	5280	0.52	GOOD	
<u>LB4100A4</u>	ALPHA BKG	08:25	60	3.00	0.05	-0.08	GOOD	
	BETA BKG	08:25	60	68.0	1.13	0.56	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	09:10	30	18161	605	-4.1	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:10	30	1.72E+05	5740	1.63	GOOD	
LB4100B1	ALPHA BKG	08:25	60	3.00	0.05	0.38	GOOD	
	BETA BKG	08:25	60	59.0	0.98	0.55	GOOD	
	ALPHA EFF	09:10	30	21045	702	-0.47	GOOD	
	BETA EFF	09:10	30	1.89E+05	6310	0.68	GOOD	
LB4100B2	ALPHA BKG	08:25	60	2.00	0.03	-0.25	GOOD	
	BETA BKG	08:25	60	41.0	0.68	-0.4	GOOD	
	ALPHA EFF	09:10	30	20398	680	-0.88	GOOD	
	BETA EFF	09:10	30	1.66E+05	5540	0.42	GOOD	
LB4100B3	ALPHA BKG	08:25	60	2.00	0.03	-0.42	GOOD	
	BETA BKG	08:25	60	68.0	1.13	-0.52	GOOD	
	ALPHA EFF	09:10	30	15798	527	-0.11	GOOD	
	BETA EFF	09:10	30	1.25E+05	4160	1.58	GOOD	
<u>LB4100B4</u>	ALPHA BKG	08:25	60	4.00	0.07	0.86	GOOD	
	BETA BKG	08:25	60	318	5.3	41.5	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	09:10	30	18117	604	-1.3	GOOD	
	BETA EFF	09:10	30	1.58E+05	5260	1.71	GOOD	
LB4100C1	ALPHA BKG	08:25	60	15.0	0.25	0.12	GOOD	
	BETA BKG	08:25	60	68.0	1.13	-0.5	GOOD	
	ALPHA EFF	09:10	30	20740	691	-0.33	GOOD	
	BETA EFF	09:10	30	1.38E+05	4590	1.14	GOOD	
LB4100C2	ALPHA BKG	08:25	60	1.00	0.02	-1.2	GOOD	
	BETA BKG	08:25	60	60.0	1	0.7	GOOD	
	ALPHA EFF	09:10	30	21531	718	0.28	GOOD	
	BETA EFF	09:10	30	1.95E+05	6480	1.13	GOOD	

—— =  $\alpha$  only lockout  
 == =  $\alpha$  &  $\beta$  lockout

Beta BKG Not a lockout condition  
 w/ 4/21/06

LB4100C3	ALPHA BKG	08:25	60	5.00	0.08	0.64	GOOD	
	BETA BKG	08:25	60	49.0	0.82	-0.52	GOOD	
	ALPHA EFF	09:10	30	16464	549	-0.13	GOOD	
	BETA EFF	09:10	30	1.37E+05	4570	1.12	GOOD	
LB4100C4	ALPHA BKG	08:25	60	0	0	-1.8	GOOD	
	BETA BKG	08:25	60	59.0	0.98	0.93	GOOD	
	ALPHA EFF	09:10	30	24967	832	0.86	GOOD	
	BETA EFF	09:10	30	2.21E+05	7370	0.88	GOOD	
<u>LB4100D1</u>	ALPHA BKG	08:25	60	20.0	0.33	5.44	DETL	Outside 2 sigma for >= 2 days
	BETA BKG	08:25	60	63.0	1.05	1.55	GOOD	
	ALPHA EFF	09:10	30	26443	881	-0.53	GOOD	
	BETA EFF	09:10	30	2.40E+05	8010	0.51	GOOD	
LB4100D2	ALPHA BKG	08:25	60	13.0	0.22	1.01	GOOD	
	BETA BKG	08:25	60	57.0	0.95	-0.31	GOOD	
	ALPHA EFF	09:10	30	18683	623	-1.5	GOOD	
	BETA EFF	09:10	30	1.50E+05	5000	0.19	GOOD	
LB4100D3	ALPHA BKG	08:25	60	3.00	0.05	-0.05	GOOD	
	BETA BKG	08:25	60	51.0	0.85	0.66	GOOD	
	ALPHA EFF	09:10	30	17841	595	-1.5	GOOD	
	BETA EFF	09:10	30	1.51E+05	5020	1.35	GOOD	
LB4100D4	ALPHA BKG	08:25	60	2.00	0.03	-0.94	GOOD	
	BETA BKG	08:25	60	42.0	0.7	-1.2	GOOD	
	ALPHA EFF	09:10	30	20730	691	-1	DETL	Outside 3 sigma for > 2 days
	BETA EFF	09:10	30	1.85E+05	6160	1.31	GOOD	
LB4100E1	ALPHA BKG	08:29	60	16.0	0.27	1.48	GOOD	
	BETA BKG	08:29	60	58.0	0.97	-2.4	GOOD	
	ALPHA EFF	09:15	30	32231	1070	-1.7	GOOD	
	BETA EFF	09:15	30	2.15E+05	7180	1.16	GOOD	
LB4100E2	ALPHA BKG	08:29	60	4.00	0.07	-1.2	GOOD	
	BETA BKG	08:29	60	106	1.77	0.37	GOOD	
	ALPHA EFF	09:15	30	33579	1120	-1.4	GOOD	
	BETA EFF	09:15	30	2.94E+05	9800	1.23	GOOD	
LB4100E3	ALPHA BKG	08:29	60	1.00	0.02	-1.5	GOOD	
	BETA BKG	08:29	60	52.0	0.87	-1.5	GOOD	
	ALPHA EFF	09:15	30	34405	1150	-1.3	GOOD	
	BETA EFF	09:15	30	2.30E+05	7670	-0.35	GOOD	
LB4100E4	ALPHA BKG	08:29	60	3.00	0.05	-1.5	GOOD	
	BETA BKG	08:29	60	95.0	1.58	-1.3	GOOD	
	ALPHA EFF	09:15	30	29583	986	-1.2	GOOD	
	BETA EFF	09:15	30	2.28E+05	7590	0.53	GOOD	
LB4100F1	ALPHA BKG	08:29	60	4.00	0.07	-0.23	GOOD	
	BETA BKG	08:29	60	67.0	1.12	1.44	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	09:15	30	28890	963	0.44	GOOD	
	BETA EFF	09:15	30	2.07E+05	6900	1.06	GOOD	

Not a lockout condition w/4/21/06

Outside 3 sigma for > 2 days

Outside 2 sigma for >= 2 days

Not a lockout condition w/4/21/06

<u>LB4100F2</u>	ALPHA BKG	08:29	60	2.00	0.03	-1.6	GOOD	
	BETA BKG	08:29	60	72.0	1.2	0.8	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	09:15	30	27630	921	2.01	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:15	30	2.19E+05	7300	-0.27	GOOD	
LB4100F3	ALPHA BKG	08:29	60	6.00	0.1	-1.1	GOOD	
	BETA BKG	08:29	60	90.0	1.5	0.8	GOOD	
	ALPHA EFF	09:15	30	27659	922	0.52	GOOD	
	BETA EFF	09:15	30	2.60E+05	8670	1.13	GOOD	
LB4100F4	ALPHA BKG	08:29	60	1.00	0.02	-0.69	GOOD	
	BETA BKG	08:29	60	42.0	0.7	-0.62	GOOD	
	ALPHA EFF	09:15	30	24570	819	-1.9	GOOD	
	BETA EFF	09:15	30	2.02E+05	6730	1.32	GOOD	
<u>LB4100G1</u>	ALPHA BKG	08:29	60	2.00	0.03	-2.3	GOOD	
	BETA BKG	08:29	60	115	1.92	2.78	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	09:15	30	31000	1030	-0.62	GOOD	
	BETA EFF	09:15	30	2.24E+05	7470	0.79	GOOD	
LB4100G2	ALPHA BKG	08:29	60	2.00	0.03	-0.79	GOOD	
	BETA BKG	08:29	60	57.0	0.95	1.51	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	09:15	30	30791	1030	-1.1	GOOD	
	BETA EFF	09:15	30	2.84E+05	9480	0.01	GOOD	
LB4100G3	ALPHA BKG	08:29	60	11.0	0.18	-0.35	GOOD	
	BETA BKG	08:29	60	59.0	0.98	-0.11	GOOD	
	ALPHA EFF	09:15	30	22398	747	-0.2	GOOD	
	BETA EFF	09:15	30	2.46E+05	8210	0.13	GOOD	
LB4100G4	ALPHA BKG	08:29	60	4.00	0.07	0.31	GOOD	
	BETA BKG	08:29	60	37.0	0.62	-2	GOOD	
	ALPHA EFF	09:15	30	15293	510	0.63	GOOD	
	BETA EFF	09:15	30	1.52E+05	5070	1.04	GOOD	
LB4100H1	ALPHA BKG	08:29	60	3.00	0.05	-0.1	GOOD	
	BETA BKG	08:29	60	54.0	0.9	1.95	GOOD	
	ALPHA EFF	09:15	30	28255	942	-1.5	GOOD	
	BETA EFF	09:15	30	1.45E+05	4850	0.56	GOOD	
LB4100H2	ALPHA BKG	08:29	60	1.00	0.02	-1.1	GOOD	
	BETA BKG	08:29	60	49.0	0.82	-0.6	GOOD	
	ALPHA EFF	09:15	30	17035	568	-1.6	GOOD	
	BETA EFF	09:15	30	1.51E+05	5040	1.1	GOOD	
LB4100H3	ALPHA BKG	08:29	60	3.00	0.05	-1.3	GOOD	
	BETA BKG	08:29	60	47.0	0.78	-0.23	GOOD	
	ALPHA EFF	09:15	30	17782	593	-1.6	GOOD	
	BETA EFF	09:15	30	1.55E+05	5160	0.68	GOOD	
LB4100H4	ALPHA BKG	08:29	60	6.00	0.1	0.69	GOOD	
	BETA BKG	08:29	60	42.0	0.7	-0.73	PEND	
	ALPHA EFF	09:15	30	17032	568	-1.7	GOOD	
	BETA EFF	09:15	30	1.27E+05	4230	1.36	GOOD	

Beta BKG not a lockout condition w/4/21/06

Not a lockout condition w/4/21/06

<u>PIC1A</u>	ALPHA BKG	08:19	60	4.00	0.07	-1.4	GOOD	
	BETA BKG	08:19	60	15.0	0.25	-1.7	GOOD	
	ALPHA EFF	09:05	30	9212	307	-2.7	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:05	30	1.95E+05	6510	-1.1	GOOD	
<u>PIC1B</u>	ALPHA BKG	08:19	60	2.00	0.03	-1.4	GOOD	
	BETA BKG	08:19	60	12.0	0.2	-1.6	GOOD	
	ALPHA EFF	09:06	30	10727	358	-2.4	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:06	30	2.14E+05	7130	-0.28	GOOD	
PIC1C	ALPHA BKG	08:19	60	3.00	0.05	-0.89	GOOD	
	BETA BKG	08:19	60	15.0	0.25	-0.83	GOOD	
	ALPHA EFF	09:06	30	15483	516	-0.93	GOOD	
	BETA EFF	09:06	30	2.45E+05	8170	-0.11	GOOD	
PIC1D	ALPHA BKG	08:19	60	4.00	0.07	-1.2	GOOD	
	BETA BKG	08:19	60	22.0	0.37	-0.55	GOOD	
	ALPHA EFF	09:06	30	15477	516	-1.8	GOOD	
	BETA EFF	09:06	30	1.89E+05	6310	0.52	GOOD	
<u>PIC2A</u>	ALPHA BKG	08:19	60	2.00	0.03	-1.2	GOOD	
	BETA BKG	08:19	60	16.0	0.27	-0.82	GOOD	
	ALPHA EFF	09:06	30	14796	493	-2.4	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:06	30	2.32E+05	7750	0.72	GOOD	
<u>PIC2B</u>	ALPHA BKG	08:19	60	2.00	0.03	-1.1	GOOD	
	BETA BKG	08:19	60	18.0	0.3	-0.43	GOOD	
	ALPHA EFF	09:07	30	13088	436	-3.6	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:07	30	2.30E+05	7650	0.74	GOOD	
PIC2C	ALPHA BKG	08:20	60	3.00	0.05	-1.3	GOOD	
	BETA BKG	08:20	60	31.0	0.52	0.84	GOOD	
	ALPHA EFF	09:07	30	18127	604	-1.9	GOOD	
	BETA EFF	09:07	30	1.94E+05	6450	0.4	GOOD	
<u>PIC2D</u>	ALPHA BKG	08:20	60	7.00	0.12	0.11	GOOD	
	BETA BKG	08:20	60	27.0	0.45	0.28	GOOD	
	ALPHA EFF	09:07	30	16187	540	-2.3	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:07	30	2.25E+05	7490	1.33	GOOD	
<u>PIC3A</u>	ALPHA BKG	08:20	60	1.00	0.02	-2.3	GOOD	
	BETA BKG	08:20	60	20.0	0.33	-0.75	GOOD	
	ALPHA EFF	09:07	30	20368	679	-2.8	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:07	30	1.80E+05	5990	1.94	GOOD	
PIC3B	ALPHA BKG	08:20	60	2.00	0.03	-1.9	GOOD	
	BETA BKG	08:20	60	19.0	0.32	-0.84	GOOD	
	ALPHA EFF	09:07	30	19861	662	-1.7	GOOD	
	BETA EFF	09:07	30	1.97E+05	6570	1.12	GOOD	
PIC3C	ALPHA BKG	08:20	60	7.00	0.12	-0.09	GOOD	
	BETA BKG	08:20	60	25.0	0.42	0.05	GOOD	
	ALPHA EFF	09:08	30	16495	550	-2.2	GOOD	
	BETA EFF	09:08	30	2.12E+05	7070	0.57	GOOD	

PIC3D	ALPHA BKG	08:20	60	5.00	0.08	-0.68	GOOD	
	BETA BKG	08:20	60	27.0	0.45	0.13	GOOD	
	ALPHA EFF	09:08	30	24282	809	-2	GOOD	
	BETA EFF	09:08	30	2.15E+05	7160	0.13	GOOD	
PIC4A	ALPHA BKG	08:20	60	3.00	0.05	-1.2	GOOD	
	BETA BKG	08:20	60	21.0	0.35	-0.87	GOOD	
	ALPHA EFF	09:08	30	12349	412	-2.1	GOOD	
	BETA EFF	09:08	30	1.76E+05	5860	1.15	GOOD	
PIC4B	ALPHA BKG	08:20	60	10.0	0.17	1.31	GOOD	
	BETA BKG	08:20	60	25.0	0.42	-0.13	GOOD	
	ALPHA EFF	09:08	30	17679	589	-2.3	GOOD	
	BETA EFF	09:08	30	2.24E+05	7470	1.37	GOOD	
<u>PIC4C</u>	ALPHA BKG	08:21	60	1.00	0.02	-2	GOOD	
	BETA BKG	08:21	60	26.0	0.43	-0.19	GOOD	
	ALPHA EFF	09:09	30	19384	646	<u>2.6</u>	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:09	30	2.03E+05	6750	1.39	GOOD	
<u>PIC4D</u>	ALPHA BKG	08:21	60	11.0	0.18	0.72	GOOD	
	BETA BKG	08:21	60	32.0	0.53	0.59	GOOD	
	ALPHA EFF	09:09	30	19084	636	<u>2.5</u>	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:09	30	2.14E+05	7130	2.31	GOOD	
PIC5A	ALPHA BKG	08:21	60	6.00	0.1	0.35	GOOD	
	BETA BKG	08:21	60	22.0	0.37	-0.43	GOOD	
	ALPHA EFF	09:10	30	10647	355	-1.7	GOOD	
	BETA EFF	09:10	30	3.98E+05	13300	-2.3	DETL	Outside 2 sigma for >= 2 days
PIC5B	ALPHA BKG	08:21	60	4.00	0.07	-0.3	GOOD	
	BETA BKG	08:21	60	113	1.88	0.25	GOOD	
	ALPHA EFF	09:10	30	9784	326	-0.43	GOOD	
	BETA EFF	09:10	30	3.50E+05	11700	0.09	GOOD	
PIC5C	ALPHA BKG	08:21	60	6.00	0.1	2.19	GOOD	
	BETA BKG	08:21	60	28.0	0.47	1.05	GOOD	
	ALPHA EFF	09:10	30	9619	321	-1.7	GOOD	
	BETA EFF	09:10	30	3.87E+05	12900	-1.8	DETL	Outside 2 sigma for >= 2 days
<u>PIC5D</u>	ALPHA BKG	08:21	60	14.0	0.23	<u>5.82</u>	DETL	Outside 3 sigma for > 2 days
	BETA BKG	08:21	60	27.0	0.45	1.37	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	09:10	30	8423	281	-1.5	GOOD	
	BETA EFF	09:10	30	3.09E+05	10300	-1.4	DETL	Outside 2 sigma for >= 2 days
PIC6A	ALPHA BKG	08:21	60	2.00	0.03	-0.47	GOOD	
	BETA BKG	08:21	60	13.0	0.22	-1.4	GOOD	
	ALPHA EFF	09:10	30	7465	249	-1.6	GOOD	
	BETA EFF	09:10	30	2.80E+05	9330	-1.7	GOOD	
PIC6B	ALPHA BKG	08:21	60	3.00	0.05	0.22	GOOD	
	BETA BKG	08:21	60	21.0	0.35	1.07	GOOD	
	ALPHA EFF	09:10	30	9702	323	-1.4	GOOD	
	BETA EFF	09:10	30	2.90E+05	9660	-0.89	DETL	Outside 2 sigma for >= 2 days

Not a lockout condition  
w/ 4/21/06

Not a lockout condition  
w/ 4/21/06

Beta BKG+EFF  
Not a lockout condition  
w/ 4/21/06

Not a lockout condition  
w/ 4/21/06

PIC6C	ALPHA BKG	08:22	60	5.00	0.08	1.08	GOOD
	BETA BKG	08:22	60	18.0	0.3	0.13	GOOD
	ALPHA EFF	09:11	30	13473	449	-1.7	GOOD
	BETA EFF	09:11	30	3.49E+05	11600	-2.7	DETL
PIC6D	ALPHA BKG	08:22	60	6.00	0.1	1.09	GOOD
	BETA BKG	08:22	60	34.0	0.57	1.44	GOOD
	ALPHA EFF	09:11	30	10641	355	-1.4	GOOD
	BETA EFF	09:11	30	3.59E+05	11958	-1.4	GOOD
PIC7A	ALPHA BKG	08:22	60	3.00	0.05	-0.76	GOOD
	BETA BKG	08:22	60	29.0	0.48	-0.47	GOOD
	ALPHA EFF	09:11	30	9039	301	-1.3	GOOD
	BETA EFF	09:11	30	3.77E+05	12600	-1.5	DETL
<u>PIC7B</u>	ALPHA BKG	08:22	60	23.0	0.38	0.03	RERUN
	BETA BKG	08:22	60	32.0	0.53	-0.49	GOOD
	ALPHA EFF	09:11	30	9532	318	-1.5	GOOD
	BETA EFF	09:11	30	3.17E+05	10600	-0.74	GOOD
PIC7C	ALPHA BKG	08:22	60	7.00	0.12	-0.41	GOOD
	BETA BKG	08:22	60	23.0	0.38	-0.79	GOOD
	ALPHA EFF	09:11	30	10779	359	-1.2	GOOD
	BETA EFF	09:11	30	3.81E+05	12700	-0.58	GOOD
PIC7D	ALPHA BKG	08:23	60	5.00	0.08	-0.8	GOOD
	BETA BKG	08:23	60	25.0	0.42	-0.52	GOOD
	ALPHA EFF	09:12	30	7802	260	-1.3	GOOD
	BETA EFF	09:12	30	2.81E+05	9370	-0.44	GOOD
PIC8A	ALPHA BKG	08:23	60	5.00	0.08	-0.62	GOOD
	BETA BKG	08:23	60	41.0	0.68	-0.65	GOOD
	ALPHA EFF	09:12	30	12464	415	-0.67	GOOD
	BETA EFF	09:12	30	3.72E+05	12400	-2	GOOD
PIC8B	ALPHA BKG	08:23	60	1.00	0.02	-0.75	GOOD
	BETA BKG	08:23	60	58.0	0.97	-0.28	GOOD
	ALPHA EFF	09:12	30	9056	302	-1.6	GOOD
	BETA EFF	09:12	30	3.71E+05	12355	-0.32	GOOD
PIC8C	ALPHA BKG	08:23	60	11.0	0.18	-0.8	GOOD
	BETA BKG	08:23	60	29.0	0.48	-0.38	GOOD
	ALPHA EFF	09:12	30	13903	463	-1.1	GOOD
	BETA EFF	09:12	30	4.29E+05	14300	-0.31	GOOD
PIC8D	ALPHA BKG	08:23	60	8.00	0.13	-0.81	GOOD
	BETA BKG	08:23	60	99.0	1.65	-0.07	GOOD
	ALPHA EFF	09:12	30	10477	349	0.7	DETL
	BETA EFF	09:12	30	3.71E+05	12400	0.09	GOOD

Outside 2 sigma for >= 2 days  
 Not a lockout condition  
 w/4/21/06

Outside 2 sigma for >= 2 days  
 Not a lockout condition  
 w/4/21/06

Outside 2 sigma for >= 2 days  
 Not a lockout condition  
 w/4/21/06

Reviewed by 

Date 4/21/06

General Engineering Laboratories, LLC

# Gas Flow Proportional Counter Checks for 25-APR-2006

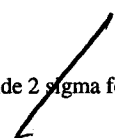
Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LB4100A1	ALPHA BKG	09:40	60	2.00	0.03	-0.7	GOOD	
	BETA BKG	09:40	60	63.0	1.05	0.82	GOOD	
	ALPHA EFF	10:15	30	24213	807	0.61	GOOD	
	BETA EFF	10:15	30	1.77E+05	5890	0.14	GOOD	
LB4100A2	ALPHA BKG	09:40	60	3.00	0.05	-0.51	GOOD	
	BETA BKG	09:40	60	56.0	0.93	0.51	GOOD	
	ALPHA EFF	10:15	30	16050	535	-0.21	GOOD	
	BETA EFF	10:15	30	1.29E+05	4290	0.11	GOOD	
LB4100A3	ALPHA BKG	09:40	60	2.00	0.03	-0.6	GOOD	
	BETA BKG	09:40	60	51.0	0.85	-0.51	GOOD	
	ALPHA EFF	10:15	30	22984	766	0.34	GOOD	
	BETA EFF	10:15	30	1.55E+05	5160	-0.36	GOOD	
<u>LB4100A4</u>	ALPHA BKG	09:40	60	0	0	-1.1	GOOD	
	BETA BKG	09:40	60	1169	19.5	53.5	DETL	Outside 3 sigma for > 2 days
	ALPHA EFF	10:15	30	19396	647	-1.6	GOOD	
	BETA EFF	10:15	30	1.73E+05	5780	2.05	DETL	Outside 2 sigma for >= 2 days
LB4100B1	ALPHA BKG	09:40	60	2.00	0.03	-0.11	GOOD	
	BETA BKG	09:40	60	49.0	0.82	-0.48	GOOD	
	ALPHA EFF	10:15	30	21400	713	0.37	DETL	Outside 3 sigma for > 2 days Not a lockout condition w/ 4/25/06
	BETA EFF	10:15	30	1.86E+05	6200	-0.11	GOOD	
LB4100B2	ALPHA BKG	09:40	60	0	0	-1.2	GOOD	
	BETA BKG	09:40	60	52.0	0.87	-0.16	GOOD	
	ALPHA EFF	10:15	30	20980	699	0	DETL	Outside 3 sigma for >= 2 days Not a lockout condition w/ 4/25/06
	BETA EFF	10:15	30	1.62E+05	5390	-0.14	GOOD	
LB4100B3	ALPHA BKG	09:40	60	2.00	0.03	-0.42	GOOD	
	BETA BKG	09:40	60	88.0	1.47	1.83	GOOD	
	ALPHA EFF	10:15	30	16244	541	0.86	DETL	Outside 3 sigma for > 2 days Not a lockout condition w/ 4/25/06
	BETA EFF	10:15	30	1.23E+05	4100	0.7	GOOD	
<u>LB4100B4</u>	ALPHA BKG	09:40	60	1.00	0.02	-0.74	GOOD	
	BETA BKG	09:40	60	238	3.97	29	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:15	30	19028	634	0.46	DETL	Outside 3 sigma for > 2 days
	BETA EFF	10:15	30	1.54E+05	5130	0.51	GOOD	
LB4100C1	ALPHA BKG	09:40	60	15.0	0.25	0.12	GOOD	
	BETA BKG	09:40	60	67.0	1.12	-0.56	GOOD	
	ALPHA EFF	10:15	30	22149	738	1.02	DETL	Outside 3 sigma for > 2 days Not a lockout condition w/ 4/25/06
	BETA EFF	10:15	30	1.34E+05	4470	-0.09	DETL	Outside 3 sigma for > 2 days
LB4100C2	ALPHA BKG	09:40	60	5.00	0.08	0.21	GOOD	
	BETA BKG	09:40	60	51.0	0.85	-0.41	GOOD	
	ALPHA EFF	10:15	30	21999	733	0.76	GOOD	
	BETA EFF	10:15	30	1.91E+05	6360	0.08	DETL	Outside 3 sigma for > 2 days Not a lockout condition w/ 4/25/06



LB4100C3	ALPHA BKG	09:40	60	1.00	0.02	-1.1	GOOD	
	BETA BKG	09:40	60	54.0	0.9	0.19	GOOD	
	ALPHA EFF	10:15	30	16882	563	0.44	GOOD	
	BETA EFF	10:15	30	1.36E+05	4550	0.72	GOOD	
LB4100C4	ALPHA BKG	09:40	60	3.00	0.05	-0.13	GOOD	
	BETA BKG	09:40	60	55.0	0.92	0.55	GOOD	
	ALPHA EFF	10:15	30	25090	836	0.91	GOOD	
	BETA EFF	10:15	30	2.17E+05	7244	0.44	GOOD	
<u>LB4100D1</u>	ALPHA BKG	09:40	60	17.0	0.28	4.4	DETL	Outside 2 sigma for >= 2 days
	BETA BKG	09:40	60	54.0	0.9	0.55	GOOD	
	ALPHA EFF	10:15	30	26568	886	-0.4	GOOD	
	BETA EFF	10:15	30	2.38E+05	7930	0.25	GOOD	
LB4100D2	ALPHA BKG	09:40	60	8.00	0.13	-0.23	GOOD	
	BETA BKG	09:40	60	64.0	1.07	0.49	GOOD	
	ALPHA EFF	10:15	30	19295	643	-0.26	GOOD	
	BETA EFF	10:15	30	1.49E+05	4960	-0.47	GOOD	
LB4100D3	ALPHA BKG	09:40	60	4.00	0.07	0.31	GOOD	
	BETA BKG	09:40	60	55.0	0.92	1.2	GOOD	
	ALPHA EFF	10:15	30	18683	623	0.12	GOOD	
	BETA EFF	10:15	30	1.48E+05	4950	0.19	GOOD	
LB4100D4	ALPHA BKG	09:40	60	3.00	0.05	-0.57	GOOD	
	BETA BKG	09:40	60	58.0	0.97	0.28	GOOD	
	ALPHA EFF	10:15	30	20867	696	-0.81	GOOD	
	BETA EFF	10:15	30	1.82E+05	6070	0.77	GOOD	
LB4100E1	ALPHA BKG	09:29	60	10.0	0.17	-0.3	GOOD	
	BETA BKG	09:29	60	73.0	1.22	-0.53	GOOD	
	ALPHA EFF	10:03	30	32731	1090	-1.2	GOOD	
	BETA EFF	10:03	30	2.12E+05	7080	0.25	GOOD	
LB4100E2	ALPHA BKG	09:29	60	3.00	0.05	-1.5	GOOD	
	BETA BKG	09:29	60	82.0	1.37	-0.86	GOOD	
	ALPHA EFF	10:03	30	34819	1160	-0.27	GOOD	
	BETA EFF	10:03	30	2.86E+05	9540	0.05	GOOD	
LB4100E3	ALPHA BKG	09:29	60	3.00	0.05	-0.61	GOOD	
	BETA BKG	09:29	60	54.0	0.9	-1.3	GOOD	
	ALPHA EFF	10:03	30	35785	1190	-0.04	GOOD	
	BETA EFF	10:03	30	2.26E+05	7520	-1.1	GOOD	
LB4100E4	ALPHA BKG	09:29	60	5.00	0.08	-0.83	GOOD	
	BETA BKG	09:29	60	105	1.75	-0.53	GOOD	
	ALPHA EFF	10:03	30	30084	1000	-0.58	GOOD	
	BETA EFF	10:03	30	2.24E+05	7470	-0.29	GOOD	
LB4100F1	ALPHA BKG	09:29	60	3.00	0.05	-0.67	GOOD	
	BETA BKG	09:29	60	65.0	1.08	1.14	GOOD	
	ALPHA EFF	10:03	30	29113	970	0.74	GOOD	
	BETA EFF	10:03	30	2.03E+05	6780	0.44	GOOD	

<u>LB4100F2</u>	ALPHA BKG	09:29	60	4.00	0.07	-0.98	GOOD	
	BETA BKG	09:29	60	95.0	1.58	3.77	RERUN	
	ALPHA EFF	10:03	30	28124	937	2.66	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	10:03	30	2.13E+05	7110	-1.2	GOOD	
LB4100F3	ALPHA BKG	09:29	60	14.0	0.23	0.76	GOOD	
	BETA BKG	09:29	60	101	1.68	1.89	GOOD	
	ALPHA EFF	10:03	30	27405	914	0.15	GOOD	
	BETA EFF	10:03	30	2.64E+05	8790	1.56	GOOD	
LB4100F4	ALPHA BKG	09:29	60	0	0	-1.1	GOOD	
	BETA BKG	09:29	60	41.0	0.68	-0.67	GOOD	
	ALPHA EFF	10:03	30	25176	839	-1.2	GOOD	
	BETA EFF	10:03	30	1.99E+05	6620	0.73	GOOD	
<u>LB4100G1</u>	ALPHA BKG	09:29	60	6.00	0.1	-1	GOOD	
	BETA BKG	09:29	60	121	2.02	3.08	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:03	30	31774	1060	0.43	GOOD	
	BETA EFF	10:03	30	2.22E+05	7390	-0.17	GOOD	
LB4100G2	ALPHA BKG	09:29	60	6.00	0.1	1.11	GOOD	
	BETA BKG	09:29	60	58.0	0.97	1.66	GOOD	
	ALPHA EFF	10:03	30	30870	1029	-1	GOOD	
	BETA EFF	10:03	30	2.81E+05	9350	-0.82	GOOD	
LB4100G3	ALPHA BKG	09:29	60	12.0	0.2	-0.09	GOOD	
	BETA BKG	09:29	60	75.0	1.25	1.87	GOOD	
	ALPHA EFF	10:03	30	22614	754	0.68	GOOD	
	BETA EFF	10:03	30	2.42E+05	8070	-2.2	GOOD	
LB4100G4	ALPHA BKG	09:29	60	1.00	0.02	-0.85	GOOD	
	BETA BKG	09:29	60	55.0	0.92	-0.2	GOOD	
	ALPHA EFF	10:03	30	15296	510	0.65	GOOD	
	BETA EFF	10:03	30	1.51E+05	5020	-0.36	GOOD	
LB4100H1	ALPHA BKG	09:29	60	6.00	0.1	0.21	GOOD	
	BETA BKG	09:29	60	40.0	0.67	-0.49	GOOD	
	ALPHA EFF	10:03	30	29921	997	-0.39	GOOD	
	BETA EFF	10:03	30	1.39E+05	4650	-0.81	GOOD	
LB4100H2	ALPHA BKG	09:29	60	4.00	0.07	-0.16	GOOD	
	BETA BKG	09:29	60	39.0	0.65	-1.8	PEND	
	ALPHA EFF	10:03	30	18632	621	-0.06	GOOD	
	BETA EFF	10:03	30	1.46E+05	4870	-0.41	GOOD	
LB4100H3	ALPHA BKG	09:29	60	6.00	0.1	-0.34	GOOD	
	BETA BKG	09:29	60	52.0	0.87	0.43	GOOD	
	ALPHA EFF	10:03	30	18916	631	-0.42	GOOD	
	BETA EFF	10:03	30	1.52E+05	5055	-0.28	GOOD	
LB4100H4	ALPHA BKG	09:29	60	5.00	0.08	0.25	GOOD	
	BETA BKG	09:29	60	32.0	0.53	-2.5	GOOD	
	ALPHA EFF	10:03	30	18286	610	-0.54	GOOD	
	BETA EFF	10:03	30	1.23E+05	4100	-0.06	GOOD	

<u>PIC1A</u>	ALPHA BKG	09:08	60	2.00	0.03	-2	DETL	Outside 2 sigma for >= 2 days
	BETA BKG	09:08	60	16.0	0.27	-1.6	GOOD	
	ALPHA EFF	09:43	30	9573	319	-1.6	GOOD	
	BETA EFF	09:43	30	1.93E+05	6440	-3.9	RERUN	
PIC1B	ALPHA BKG	09:08	60	1.00	0.02	-1.8	GOOD	
	BETA BKG	09:08	60	21.0	0.35	-0.19	GOOD	
	ALPHA EFF	09:43	30	11001	367	-1.6	GOOD	
	BETA EFF	09:43	30	2.13E+05	7100	-1.5	GOOD	
PIC1C	ALPHA BKG	09:08	60	1.00	0.02	-1.5	GOOD	
	BETA BKG	09:08	60	11.0	0.18	-1.2	GOOD	
	ALPHA EFF	09:43	30	15968	532	0.02	GOOD	
	BETA EFF	09:43	30	2.43E+05	8110	-2.2	GOOD	
PIC1D	ALPHA BKG	09:08	60	7.00	0.12	-0.53	GOOD	
	BETA BKG	09:08	60	36.0	0.6	1.11	GOOD	
	ALPHA EFF	09:43	30	16570	552	-0.47	GOOD	
	BETA EFF	09:43	30	1.88E+05	6270	-0.56	GOOD	
PIC2A	ALPHA BKG	09:08	60	5.00	0.08	-0.31	GOOD	
	BETA BKG	09:08	60	23.0	0.38	-0.44	GOOD	
	ALPHA EFF	09:44	30	15581	519	-1.4	GOOD	
	BETA EFF	09:44	30	2.31E+05	7710	-0.14	GOOD	
<u>PIC2B</u>	ALPHA BKG	09:08	60	5.00	0.08	0.02	GOOD	
	BETA BKG	09:08	60	21.0	0.35	-0.18	GOOD	
	ALPHA EFF	09:44	30	13366	446	-2.6	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:44	30	2.29E+05	7640	0.14	GOOD	
PIC2C	ALPHA BKG	09:08	60	3.00	0.05	-1.3	GOOD	
	BETA BKG	09:08	60	12.0	0.2	-1.1	GOOD	
	ALPHA EFF	09:44	30	18873	629	-0.84	GOOD	
	BETA EFF	09:44	30	1.93E+05	6430	-0.17	GOOD	
PIC2D	ALPHA BKG	09:09	60	7.00	0.12	0.11	GOOD	
	BETA BKG	09:09	60	28.0	0.47	0.39	GOOD	
	ALPHA EFF	09:44	30	16907	564	-1.4	GOOD	
	BETA EFF	09:44	30	2.23E+05	7450	0.06	GOOD	
PIC3A	ALPHA BKG	09:09	60	7.00	0.12	-0.14	GOOD	
	BETA BKG	09:09	60	19.0	0.32	-0.84	GOOD	
	ALPHA EFF	09:44	30	22073	736	-1.5	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:44	30	1.77E+05	5900	0.29	GOOD	
PIC3B	ALPHA BKG	09:09	60	7.00	0.12	-0.12	GOOD	
	BETA BKG	09:09	60	31.0	0.52	0.43	GOOD	
	ALPHA EFF	09:44	30	20635	688	-0.98	GOOD	
	BETA EFF	09:44	30	1.96E+05	6530	-0.01	GOOD	
PIC3C	ALPHA BKG	09:09	60	1.00	0.02	-1.8	GOOD	
	BETA BKG	09:09	60	24.0	0.4	-0.08	GOOD	
	ALPHA EFF	09:44	30	17594	586	-0.89	GOOD	
	BETA EFF	09:44	30	2.12E+05	7070	0.6	GOOD	



Not a lockout condition  
M 4/25/06

PIC3D	ALPHA BKG	09:09	60	6.00	0.1	-0.29	GOOD	
	BETA BKG	09:09	60	31.0	0.52	0.64	GOOD	
	ALPHA EFF	09:45	30	24886	830	-1.3	GOOD	
	BETA EFF	09:45	30	2.13E+05	7100	-1.3	GOOD	
PIC4A	ALPHA BKG	09:09	60	2.00	0.03	-1.5	GOOD	
	BETA BKG	09:09	60	22.0	0.37	-0.78	GOOD	
	ALPHA EFF	09:45	30	12971	432	-0.77	GOOD	
	BETA EFF	09:45	30	1.75E+05	5830	-0.2	GOOD	
PIC4B	ALPHA BKG	09:09	60	5.00	0.08	-0.11	GOOD	
	BETA BKG	09:09	60	19.0	0.32	-0.56	GOOD	
	ALPHA EFF	09:45	30	17555	585	-2.9	GOOD	
	BETA EFF	09:45	30	2.22E+05	7400	-1.6	GOOD	
PIC4C	ALPHA BKG	09:10	60	6.00	0.1	-0.57	GOOD	
	BETA BKG	09:10	60	25.0	0.42	-0.26	GOOD	
	ALPHA EFF	09:45	30	20181	673	-1.5	GOOD	
	BETA EFF	09:45	30	2.01E+05	6710	0.23	GOOD	
PIC4D	ALPHA BKG	09:10	60	7.00	0.12	-0.17	GOOD	
	BETA BKG	09:10	60	23.0	0.38	-0.38	GOOD	
	ALPHA EFF	09:45	30	20328	678	-1.4	GOOD	
	BETA EFF	09:45	30	2.12E+05	7080	1.3	GOOD	
<u>PIC5A</u>	ALPHA BKG	09:10	60	3.00	0.05	-0.55	GOOD	
	BETA BKG	09:10	60	31.0	0.52	0.54	GOOD	
	ALPHA EFF	09:46	30	11165	372	-0.91	GOOD	
	BETA EFF	09:46	30	3.97E+05	13200	-2.5	DETL	Outside 2 sigma for >= 2 days
PIC5B	ALPHA BKG	09:10	60	7.00	0.12	0.73	GOOD	
	BETA BKG	09:10	60	112	1.87	0.23	GOOD	
	ALPHA EFF	09:46	30	10069	336	-0.24	GOOD	
	BETA EFF	09:46	30	3.49E+05	11600	0.08	GOOD	
PIC5C	ALPHA BKG	09:10	60	2.00	0.03	-0.19	GOOD	
	BETA BKG	09:10	60	21.0	0.35	-0.24	GOOD	
	ALPHA EFF	09:46	30	10243	341	-0.68	GOOD	
	BETA EFF	09:46	30	3.86E+05	12900	-2.3	GOOD	
<u>PIC5D</u>	ALPHA BKG	09:10	60	7.00	0.12	2.22	DETL	Outside 2 sigma for >= 2 days
	BETA BKG	09:10	60	19.0	0.32	-0.15	GOOD	
	ALPHA EFF	09:46	30	8798	293	-0.84	GOOD	
	BETA EFF	09:46	30	3.07E+05	10200	-3.1	DETL	Outside 2 sigma for >= 2 days
PIC6A	ALPHA BKG	09:10	60	5.00	0.08	0.38	GOOD	
	BETA BKG	09:10	60	29.0	0.48	1.05	GOOD	
	ALPHA EFF	09:46	30	7782	259	-0.95	GOOD	
	BETA EFF	09:46	30	2.79E+05	9310	-2.3	DETL	Outside 2 sigma for >= 2 days
PIC6B	ALPHA BKG	09:11	60	2.00	0.03	-0.4	GOOD	
	BETA BKG	09:11	60	22.0	0.37	1.3	GOOD	
	ALPHA EFF	09:46	30	10154	338	-0.77	GOOD	
	BETA EFF	09:46	30	2.89E+05	9640	-1.5	GOOD	

*Not a lockup condition  
M 4/25/06*

PIC6C	ALPHA BKG	09:11	60	1.00	0.02	-0.93	GOOD	
	BETA BKG	09:11	60	19.0	0.32	0.32	GOOD	
	ALPHA EFF	09:46	30	14237	475	-0.82	GOOD	
	BETA EFF	09:46	30	3.49E+05	11600	-2.4	GOOD	
<u>PIC6D</u>	ALPHA BKG	09:11	60	1.00	0.02	-0.65	GOOD	
	BETA BKG	09:11	60	29.0	0.48	0.85	GOOD	
	ALPHA EFF	09:47	30	11072	369	-0.78	GOOD	
	BETA EFF	09:47	30	3.58E+05	11900	-2.1	DETL	Outside 2 sigma for >= 2 days
PIC7A	ALPHA BKG	09:11	60	4.00	0.07	-0.57	GOOD	
	BETA BKG	09:11	60	33.0	0.55	-0.36	GOOD	
	ALPHA EFF	09:47	30	9725	324	-0.61	GOOD	
	BETA EFF	09:47	30	3.77E+05	12600	-1.5	GOOD	
PIC7B	ALPHA BKG	09:11	60	18.0	0.3	-0.35	GOOD	
	BETA BKG	09:11	60	26.0	0.43	-0.59	GOOD	
	ALPHA EFF	09:47	30	10103	337	-0.75	GOOD	
	BETA EFF	09:47	30	3.16E+05	10500	-0.8	GOOD	
PIC7C	ALPHA BKG	09:11	60	4.00	0.07	-0.84	GOOD	
	BETA BKG	09:11	60	22.0	0.37	-0.82	GOOD	
	ALPHA EFF	09:47	30	11299	377	-0.69	GOOD	
	BETA EFF	09:47	30	3.80E+05	12700	-0.65	GOOD	
PIC7D	ALPHA BKG	09:12	60	6.00	0.1	-0.74	GOOD	
	BETA BKG	09:12	60	23.0	0.38	-0.57	GOOD	
	ALPHA EFF	09:47	30	8211	274	-0.6	GOOD	
	BETA EFF	09:47	30	2.82E+05	9390	-0.39	GOOD	
PIC8A	ALPHA BKG	09:12	60	3.00	0.05	-0.83	GOOD	
	BETA BKG	09:12	60	34.0	0.57	-0.7	GOOD	
	ALPHA EFF	09:47	30	12828	428	-0.22	GOOD	
	BETA EFF	09:47	30	3.72E+05	12400	-1.9	GOOD	
PIC8B	ALPHA BKG	09:12	60	2.00	0.03	-0.65	GOOD	
	BETA BKG	09:12	60	48.0	0.8	-0.44	GOOD	
	ALPHA EFF	09:47	30	9320	311	-1.1	GOOD	
	BETA EFF	09:47	30	3.70E+05	12300	-0.41	GOOD	
<u>PIC8C</u>	ALPHA BKG	09:12	60	20.0	0.33	-0.25	RERUN	
	BETA BKG	09:12	60	25.0	0.42	-0.53	GOOD	
	ALPHA EFF	09:48	30	14694	490	-0.23	GOOD	
	BETA EFF	09:48	30	4.28E+05	14300	-0.4	GOOD	
PIC8D	ALPHA BKG	09:12	60	15.0	0.25	-0.2	GOOD	
	BETA BKG	09:12	60	88.0	1.47	-0.21	GOOD	
	ALPHA EFF	09:48	30	10896	363	1.31	GOOD	
	BETA EFF	09:48	30	3.72E+05	12400	0.16	GOOD	

Reviewed by 

Date 4/25/06

General Engineering Laboratories, LLC

# Gas Flow Proportional Counter Checks for 26-APR-2006

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LB4100A1	ALPHA BKG	09:49	60	7.00	0.12	1.7	GOOD	<i>α only lockout</i>
	BETA BKG	09:49	60	64.0	1.07	0.94	GOOD	
	ALPHA EFF	10:21	30	23430	781	-0.3	GOOD	
	BETA EFF	10:21	30	1.78E+05	5930	0.54	GOOD	
LB4100A2	ALPHA BKG	09:49	60	2.00	0.03	-0.95	GOOD	
	BETA BKG	09:49	60	51.0	0.85	-0.04	GOOD	
	ALPHA EFF	10:21	30	15486	516	-1	GOOD	
	BETA EFF	10:21	30	1.31E+05	4370	1.02	GOOD	
LB4100A3	ALPHA BKG	09:49	60	7.00	0.12	0.22	GOOD	
	BETA BKG	09:49	60	49.0	0.82	-0.68	GOOD	
	ALPHA EFF	10:21	30	20122	671	-2.3	GOOD	
	BETA EFF	10:21	30	1.65E+05	5520	2.28	GOOD	
<u>LB4100A4</u>	ALPHA BKG	09:49	60	0	0	-1.1	GOOD	
	BETA BKG	09:49	60	70.0	1.17	0.65	PEND	
	ALPHA EFF	10:21	30	18130	604	-4.2	RERUN	
	BETA EFF	10:21	30	1.76E+05	5870	3.26	DETL	Outside 2 sigma for >= 2 days
LB4100B1	ALPHA BKG	09:49	60	0	0	-1.1	GOOD	
	BETA BKG	09:49	60	70.0	1.17	1.68	GOOD	
	ALPHA EFF	10:21	30	21364	712	0.29	PEND	
	BETA EFF	10:21	30	1.85E+05	6180	-0.29	GOOD	
LB4100B2	ALPHA BKG	09:49	60	1.00	0.02	-0.74	GOOD	
	BETA BKG	09:49	60	48.0	0.8	-0.25	GOOD	
	ALPHA EFF	10:21	30	20873	696	-0.16	GOOD	
	BETA EFF	10:21	30	1.62E+05	5410	-0.06	GOOD	
LB4100B3	ALPHA BKG	09:49	60	0	0	-1.3	GOOD	
	BETA BKG	09:49	60	60.0	1	-1.5	GOOD	
	ALPHA EFF	10:21	30	15856	529	0.01	PEND	
	BETA EFF	10:21	30	1.22E+05	4070	0.41	GOOD	
<u>LB4100B4</u>	ALPHA BKG	09:49	60	4.00	0.07	0.86	GOOD	
	BETA BKG	09:49	60	232	3.87	28.1	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:21	30	19133	638	0.67	PEND	
	BETA EFF	10:21	30	1.54E+05	5130	0.5	GOOD	
LB4100C1	ALPHA BKG	09:49	60	16.0	0.27	0.39	GOOD	
	BETA BKG	09:49	60	66.0	1.1	-0.62	GOOD	
	ALPHA EFF	10:21	30	22226	741	1.09	PEND	
	BETA EFF	10:21	30	1.35E+05	4500	0.22	PEND	
LB4100C2	ALPHA BKG	09:49	60	4.00	0.07	-0.14	GOOD	
	BETA BKG	09:49	60	43.0	0.72	-1.4	GOOD	
	ALPHA EFF	10:21	30	21916	731	0.68	GOOD	
	BETA EFF	10:21	30	1.91E+05	6360	0.13	PEND	

LB4100C3	ALPHA BKG	09:49	60	1.00	0.02	-1.1	GOOD	
	BETA BKG	09:49	60	55.0	0.92	0.33	GOOD	
	ALPHA EFF	10:21	30	16960	565	0.54	GOOD	
	BETA EFF	10:21	30	1.36E+05	4540	0.67	GOOD	
LB4100C4	ALPHA BKG	09:49	60	1.00	0.02	-1.2	GOOD	
	BETA BKG	09:49	60	28.0	0.47	-2.1	GOOD	
	ALPHA EFF	10:21	30	24728	824	0.75	GOOD	
	BETA EFF	10:21	30	2.20E+05	7320	0.71	GOOD	
LB4100D1	ALPHA BKG	09:49	60	22.0	0.37	6.14	DETL	Outside 2 sigma for >= 2 days
	BETA BKG	09:49	60	56.0	0.93	0.77	GOOD	
	ALPHA EFF	10:21	30	26583	886	-0.38	GOOD	
	BETA EFF	10:21	30	2.38E+05	7950	0.3	GOOD	
LB4100D2	ALPHA BKG	09:49	60	10.0	0.17	0.26	GOOD	
	BETA BKG	09:49	60	65.0	1.08	0.6	GOOD	
	ALPHA EFF	10:21	30	19466	649	0.1	GOOD	
	BETA EFF	10:21	30	1.47E+05	4920	-1	GOOD	
LB4100D3	ALPHA BKG	09:49	60	6.00	0.1	1.02	GOOD	
	BETA BKG	09:49	60	47.0	0.78	0.12	GOOD	
	ALPHA EFF	10:21	30	18434	614	-0.36	GOOD	
	BETA EFF	10:21	30	1.48E+05	4940	0.07	GOOD	
LB4100D4	ALPHA BKG	09:49	60	1.00	0.02	-1.3	GOOD	
	BETA BKG	09:49	60	39.0	0.65	-1.5	GOOD	
	ALPHA EFF	10:21	30	20767	692	-0.96	GOOD	
	BETA EFF	10:21	30	1.82E+05	6050	0.65	GOOD	
LB4100E1	ALPHA BKG	09:26	60	13.0	0.22	0.59	GOOD	
	BETA BKG	09:26	60	81.0	1.35	0.48	GOOD	
	ALPHA EFF	10:10	30	33167	1110	-0.69	GOOD	
	BETA EFF	10:10	30	2.13E+05	7100	0.43	GOOD	
LB4100E2	ALPHA BKG	09:26	60	6.00	0.1	-0.52	GOOD	
	BETA BKG	09:26	60	105	1.75	0.32	GOOD	
	ALPHA EFF	10:10	30	35074	1170	-0.03	GOOD	
	BETA EFF	10:10	30	2.88E+05	9600	0.28	GOOD	
LB4100E3	ALPHA BKG	09:26	60	2.00	0.03	-1.1	GOOD	
	BETA BKG	09:26	60	67.0	1.12	0.37	GOOD	
	ALPHA EFF	10:10	30	35451	1180	-0.34	GOOD	
	BETA EFF	10:10	30	2.26E+05	7540	-0.99	GOOD	
LB4100E4	ALPHA BKG	09:26	60	7.00	0.12	-0.21	GOOD	
	BETA BKG	09:26	60	108	1.8	-0.29	GOOD	
	ALPHA EFF	10:10	30	30748	1020	0.19	GOOD	
	BETA EFF	10:10	30	2.24E+05	7470	-0.28	GOOD	
LB4100F1	ALPHA BKG	09:26	60	1.00	0.02	-1.5	GOOD	
	BETA BKG	09:26	60	74.0	1.23	2.48	GOOD	
	ALPHA EFF	10:10	30	29117	971	0.74	GOOD	
	BETA EFF	10:10	30	207	6.9	-34	DETL	Outside 3 sigma for > 2 days

<u>LB4100F2</u>	ALPHA BKG	09:26	60	2.00	0.03	-1.6	GOOD	
	BETA BKG	09:26	60	79.0	1.32	1.7	PEND	
	ALPHA EFF	10:10	30	27901	930	<u>2.36</u>	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	10:10	30	2.14E+05	7130	-1.1	GOOD	
LB4100F3	ALPHA BKG	09:26	60	5.00	0.08	-1.3	GOOD	
	BETA BKG	09:26	60	100	1.67	1.79	GOOD	
	ALPHA EFF	10:10	30	27411	914	0.16	GOOD	
	BETA EFF	10:10	30	2.62E+05	8740	1.39	GOOD	
LB4100F4	ALPHA BKG	09:26	60	2.00	0.03	-0.25	GOOD	
	BETA BKG	09:26	60	53.0	0.88	-0.05	GOOD	
	ALPHA EFF	10:10	30	25102	837	-1.3	GOOD	
	BETA EFF	10:10	30	1.99E+05	6630	0.8	GOOD	
<u>LB4100G1</u>	ALPHA BKG	09:26	60	6.00	0.1	-1	GOOD	
	BETA BKG	09:26	60	120	2	<u>3.02</u>	DETL	Outside 2 sigma for >= 2 days
	ALPHA EFF	10:10	30	32099	1070	0.88	GOOD	
	BETA EFF	10:10	30	2.21E+05	7370	-0.4	GOOD	
LB4100G2	ALPHA BKG	09:26	60	2.00	0.03	-0.79	GOOD	
	BETA BKG	09:26	60	51.0	0.85	0.61	GOOD	
	ALPHA EFF	10:10	30	31533	1050	-0.21	GOOD	
	BETA EFF	10:10	30	2.81E+05	9370	-0.73	GOOD	
LB4100G3	ALPHA BKG	09:26	60	12.0	0.2	-0.09	GOOD	
	BETA BKG	09:26	60	61.0	1.02	0.14	GOOD	
	ALPHA EFF	10:10	30	22621	754	0.71	GOOD	
	BETA EFF	10:10	30	2.44E+05	8140	-1.1	GOOD	
LB4100G4	ALPHA BKG	09:26	60	8.00	0.13	1.84	GOOD	
	BETA BKG	09:26	60	57.0	0.95	0.01	GOOD	
	ALPHA EFF	10:10	30	15439	515	1.6	GOOD	
	BETA EFF	10:10	30	1.51E+05	5040	0.06	GOOD	
LB4100H1	ALPHA BKG	09:26	60	5.00	0.08	-0.19	GOOD	
	BETA BKG	09:26	60	46.0	0.77	0.55	GOOD	
	ALPHA EFF	10:10	30	29137	971	-0.92	GOOD	
	BETA EFF	10:10	30	1.39E+05	4630	-0.97	GOOD	
LB4100H2	ALPHA BKG	09:26	60	2.00	0.03	-0.77	GOOD	
	BETA BKG	09:26	60	51.0	0.85	-0.37	GOOD	
	ALPHA EFF	10:10	30	18262	609	-0.42	GOOD	
	BETA EFF	10:10	30	1.45E+05	4850	-0.6	GOOD	
LB4100H3	ALPHA BKG	09:26	60	6.00	0.1	-0.34	GOOD	
	BETA BKG	09:26	60	42.0	0.7	-0.89	GOOD	
	ALPHA EFF	10:10	30	19378	646	0.06	GOOD	
	BETA EFF	10:10	30	1.52E+05	5080	-0.04	GOOD	
LB4100H4	ALPHA BKG	09:26	60	7.00	0.12	1.14	GOOD	
	BETA BKG	09:26	60	41.0	0.68	-0.9	GOOD	
	ALPHA EFF	10:10	30	18492	616	-0.35	GOOD	
	BETA EFF	10:10	30	1.24E+05	4140	0.43	GOOD	



PIC1A	ALPHA BKG	09:15	60	3.00	0.05	-1.7	GOOD	
	BETA BKG	09:15	60	26.0	0.43	-0.63	GOOD	
	ALPHA EFF	09:56	30	9792	326	-0.99	GOOD	
	BETA EFF	09:56	30	1.95E+05	6510	-0.96	PEND	
PIC1B	ALPHA BKG	09:15	60	5.00	0.08	-0.36	GOOD	
	BETA BKG	09:15	60	15.0	0.25	-1.1	GOOD	
	ALPHA EFF	09:57	30	10974	366	-1.7	GOOD	
	BETA EFF	09:57	30	2.14E+05	7120	-0.64	GOOD	
PIC1C	ALPHA BKG	09:16	60	3.00	0.05	-0.89	GOOD	
	BETA BKG	09:16	60	34.0	0.57	1.08	GOOD	
	ALPHA EFF	09:57	30	15656	522	-0.59	GOOD	
	BETA EFF	09:57	30	2.44E+05	8130	-1.6	GOOD	
PIC1D	ALPHA BKG	09:16	60	5.00	0.08	-0.97	GOOD	
	BETA BKG	09:16	60	38.0	0.63	1.35	GOOD	
	ALPHA EFF	09:57	30	16272	542	-0.84	GOOD	
	BETA EFF	09:57	30	1.88E+05	6250	-0.94	GOOD	
PIC2A	ALPHA BKG	09:16	60	4.00	0.07	-0.61	GOOD	
	BETA BKG	09:16	60	28.0	0.47	-0.17	GOOD	
	ALPHA EFF	09:57	30	15445	515	-1.5	GOOD	
	BETA EFF	09:57	30	2.31E+05	7700	-0.47	GOOD	
<u>PIC2B</u>	ALPHA BKG	09:16	60	5.00	0.08	0.02	GOOD	
	BETA BKG	09:16	60	17.0	0.28	-0.51	GOOD	
	ALPHA EFF	09:57	30	13473	449	2.2	DETL	Outside 2 sigma for >= 2 days
	BETA EFF	09:57	30	2.28E+05	7600	-1.3	GOOD	
PIC2C	ALPHA BKG	09:16	60	5.00	0.08	-0.69	GOOD	
	BETA BKG	09:16	60	20.0	0.33	-0.28	GOOD	
	ALPHA EFF	09:57	30	19133	638	-0.48	GOOD	
	BETA EFF	09:57	30	1.93E+05	6430	-0.47	GOOD	
PIC2D	ALPHA BKG	09:16	60	2.00	0.03	-1.6	GOOD	
	BETA BKG	09:16	60	18.0	0.3	-0.74	GOOD	
	ALPHA EFF	09:57	30	16837	561	-1.4	GOOD	
	BETA EFF	09:57	30	2.24E+05	7460	0.37	GOOD	
PIC3A	ALPHA BKG	09:16	60	6.00	0.1	-0.51	GOOD	
	BETA BKG	09:16	60	18.0	0.3	-0.94	GOOD	
	ALPHA EFF	09:57	30	21922	731	-1.6	GOOD	
	BETA EFF	09:57	30	1.77E+05	5910	0.4	GOOD	
PIC3B	ALPHA BKG	09:16	60	3.00	0.05	-1.5	GOOD	
	BETA BKG	09:16	60	18.0	0.3	-0.94	GOOD	
	ALPHA EFF	09:58	30	20717	691	-0.91	GOOD	
	BETA EFF	09:58	30	1.96E+05	6550	0.47	GOOD	
PIC3C	ALPHA BKG	09:17	60	5.00	0.08	-0.66	GOOD	
	BETA BKG	09:17	60	19.0	0.32	-0.74	GOOD	
	ALPHA EFF	09:58	30	17513	584	-0.98	GOOD	
	BETA EFF	09:58	30	2.11E+05	7030	-0.4	GOOD	

PIC3D	ALPHA BKG	09:17	60	3.00	0.05	-1.5	GOOD	
	BETA BKG	09:17	60	16.0	0.27	-1.3	GOOD	
	ALPHA EFF	09:58	30	24881	829	-1.3	GOOD	
	BETA EFF	09:58	30	2.14E+05	7130	-0.67	GOOD	
PIC4A	ALPHA BKG	09:17	60	6.00	0.1	-0.25	GOOD	
	BETA BKG	09:17	60	23.0	0.38	-0.69	GOOD	
	ALPHA EFF	09:58	30	12769	426	-1.2	GOOD	
	BETA EFF	09:58	30	1.75E+05	5820	-0.35	GOOD	
PIC4B	ALPHA BKG	09:17	60	14.0	0.23	2.44	GOOD	
	BETA BKG	09:17	60	26.0	0.43	-0.06	GOOD	
	ALPHA EFF	09:58	30	17786	593	-1.9	GOOD	
	BETA EFF	09:58	30	2.22E+05	7410	-0.97	GOOD	
PIC4C	ALPHA BKG	09:17	60	10.0	0.17	0.57	GOOD	
	BETA BKG	09:17	60	18.0	0.3	-0.7	GOOD	
	ALPHA EFF	09:58	30	20086	670	-1.7	GOOD	
	BETA EFF	09:58	30	2.01E+05	6710	0.24	GOOD	
PIC4D	ALPHA BKG	09:17	60	5.00	0.08	-0.62	GOOD	
	BETA BKG	09:17	60	16.0	0.27	-1.1	GOOD	
	ALPHA EFF	09:59	30	20236	675	-1.5	GOOD	
	BETA EFF	09:59	30	2.11E+05	7050	0.66	GOOD	
<u>PIC5A</u>	ALPHA BKG	09:17	60	5.00	0.08	0.05	GOOD	
	BETA BKG	09:17	60	17.0	0.28	-0.97	GOOD	
	ALPHA EFF	09:59	30	11363	379	-0.6	GOOD	
	BETA EFF	09:59	30	3.97E+05	13200	-2.7	DETL	Outside 2 sigma for >= 2 days
<u>PIC5B</u>	ALPHA BKG	09:18	60	3.00	0.05	-0.64	GOOD	
	BETA BKG	09:18	60	129	2.15	0.55	RERUN	
	ALPHA EFF	09:59	30	10243	341	-0.13	GOOD	
	BETA EFF	09:59	30	3.48E+05	11600	0.06	GOOD	
<u>PIC5C</u>	ALPHA BKG	09:18	60	3.00	0.05	0.41	GOOD	
	BETA BKG	09:18	60	14.0	0.23	-1.5	GOOD	
	ALPHA EFF	09:59	30	10120	337	-0.87	GOOD	
	BETA EFF	09:59	30	3.85E+05	12800	3.1	DETL	Outside 2 sigma for >= 2 days
PIC5D	ALPHA BKG	09:18	60	2.00	0.03	-0.36	GOOD	
	BETA BKG	09:18	60	20.0	0.33	0.04	GOOD	
	ALPHA EFF	09:59	30	8726	291	-0.97	GOOD	
	BETA EFF	09:59	30	3.09E+05	10300	-1.1	GOOD	
<u>PIC6A</u>	ALPHA BKG	09:18	60	5.00	0.08	0.38	GOOD	
	BETA BKG	09:18	60	22.0	0.37	0	GOOD	
	ALPHA EFF	09:59	30	8019	267	-0.47	GOOD	
	BETA EFF	09:59	30	2.79E+05	9310	-2.5	DETL	Outside 2 sigma for >= 2 days
PIC6B	ALPHA BKG	09:18	60	3.00	0.05	0.22	GOOD	
	BETA BKG	09:18	60	21.0	0.35	1.07	GOOD	
	ALPHA EFF	10:00	30	10229	341	-0.66	GOOD	
	BETA EFF	10:00	30	2.89E+05	9630	-1.9	GOOD	

PIC6C	ALPHA BKG	09:18	60	2.00	0.03	-0.42	GOOD
	BETA BKG	09:18	60	22.0	0.37	0.89	GOOD
	ALPHA EFF	10:00	30	14504	483	-0.53	GOOD
	BETA EFF	10:00	30	3.50E+05	11700	-1.9	GOOD
PIC6D	ALPHA BKG	09:19	60	6.00	0.1	1.09	GOOD
	BETA BKG	09:19	60	29.0	0.48	0.85	GOOD
	ALPHA EFF	10:00	30	11114	370	-0.72	GOOD
	BETA EFF	10:00	30	3.58E+05	11900	-2	GOOD
PIC7A	ALPHA BKG	09:19	60	6.00	0.1	-0.2	GOOD
	BETA BKG	09:19	60	29.0	0.48	-0.47	GOOD
	ALPHA EFF	10:00	30	9833	328	-0.5	GOOD
	BETA EFF	10:00	30	3.76E+05	12500	-2.4	GOOD
PIC7B	ALPHA BKG	09:19	60	16.0	0.27	-0.5	GOOD
	BETA BKG	09:19	60	33.0	0.55	-0.47	GOOD
	ALPHA EFF	10:00	30	10200	340	-0.62	GOOD
	BETA EFF	10:00	30	3.17E+05	10600	-0.68	GOOD
PIC7C	ALPHA BKG	09:19	60	6.00	0.1	-0.56	GOOD
	BETA BKG	09:19	60	15.0	0.25	-1	GOOD
	ALPHA EFF	10:00	30	11661	389	-0.31	GOOD
	BETA EFF	10:00	30	3.79E+05	12600	-0.97	GOOD
PIC7D	ALPHA BKG	09:19	60	5.00	0.08	-0.8	GOOD
	BETA BKG	09:19	60	19.0	0.32	-0.66	GOOD
	ALPHA EFF	10:00	30	8179	273	-0.65	GOOD
	BETA EFF	10:00	30	2.81E+05	9380	-0.42	GOOD
PIC8A	ALPHA BKG	09:19	60	3.00	0.05	-0.83	GOOD
	BETA BKG	09:19	60	27.0	0.45	-0.75	GOOD
	ALPHA EFF	10:01	30	13226	441	0.28	GOOD
	BETA EFF	10:01	30	3.71E+05	12400	-2.2	GOOD
PIC8B	ALPHA BKG	09:19	60	2.00	0.03	-0.65	GOOD
	BETA BKG	09:19	60	61.0	1.02	-0.24	GOOD
	ALPHA EFF	10:01	30	9345	312	-1.1	GOOD
	BETA EFF	10:01	30	3.69E+05	12300	-0.52	GOOD
PIC8C	ALPHA BKG	09:20	60	16.0	0.27	-0.5	GOOD
	BETA BKG	09:20	60	30.0	0.5	-0.35	GOOD
	ALPHA EFF	10:01	30	14622	487	-0.31	GOOD
	BETA EFF	10:01	30	4.25E+05	14200	-0.86	GOOD
PIC8D	ALPHA BKG	09:20	60	12.0	0.2	-0.46	GOOD
	BETA BKG	09:20	60	61.0	1.02	-0.55	GOOD
	ALPHA EFF	10:01	30	10965	366	1.41	GOOD
	BETA EFF	10:01	30	3.70E+05	12300	-0.04	GOOD

Reviewed by 

Date 4/26/06

General Engineering Laboratories, LLC

Review of Alpha Spectrometer QA results ( Daily checks ) 20-APR-2006 16:16:43.17

Starting with bank 1

Ending with bank 19

	Detector	Parameter	Flag
20-APR-2006	6	PSFWHM-5000	Below
20-APR-2006	6	PSENERGY-5000	Above
20-APR-2006	6	PSCENTRD-5000	Above
20-APR-2006	14	PSFWHM-5000	Below
20-APR-2006	14	PSENERGY-5000	Above
20-APR-2006	22	PSENERGY-5000	Above
20-APR-2006	24	PSFWHM-5000	Below
20-APR-2006	25	PSFWHM-5000	Below
20-APR-2006	25	PSCENTRD-5000	Below
20-APR-2006	28	PSFWHM-5000	Above
20-APR-2006	39	PSENERGY-5000	Above
20-APR-2006	66	PSFWHM-5000	Above
20-APR-2006	67	PSFWHM-5000	Above
20-APR-2006	68	PSFWHM-5000	Above
20-APR-2006	71	PSFWHM-5000	Below
20-APR-2006	71	PSENERGY-5000	Above
20-APR-2006	74	PSENERGY-5000	Above
20-APR-2006	84	PSENERGY-5000	Above
20-APR-2006	97	PSENERGY-5000	Above
20-APR-2006	105	PSENERGY-5000	Above
20-APR-2006	106	PSFWHM-5000	Above
20-APR-2006	109	PSFWHM-5000	Above

*MA 4/20/06*

20-APR-2006

115

PSFVHM-5000

Above

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

APPROVAL DATE: 4/20/06

APPROVAL TIME: 1620

APPROVED BY: *GLD*

PROCEDURE # GL-RAD-I-009

Report completed at 20-APR-2006 16:17:59.07

Review of QA results ( Daily checks ) 20-APR-2006 16:18:00.20

Starting with bank 1

Ending with bank 19

This is a list of Detectors that may not have properly transferred to the QA file

APPROVAL DATE: 4/20/06 APPROVAL TIME: 1620

APPROVED BY: *JLD* PROCEDURE # GL-RAD-I-009

Report completed at 20-APR-2006 16:18:46.01

Review of Alpha Spectrometer QA results ( Daily checks ) 21-APR-2006 10:00:06.71

Starting with bank 1

Ending with bank 19

	Detector	Parameter	Flag
21-APR-2006	6	PSFWHM-5000	Below
21-APR-2006	6	PSENERGY-5000	Above
21-APR-2006	6	PSCENTRD-5000	Above
21-APR-2006	14	PSFWHM-5000	Below
21-APR-2006	14	PSENERGY-5000	Above
21-APR-2006	22	PSENERGY-5000	Above
21-APR-2006	24	PSFWHM-5000	Below
21-APR-2006	25	PSFWHM-5000	Below
21-APR-2006	25	PSCENTRD-5000	Below
21-APR-2006	28	PSFWHM-5000	Above
21-APR-2006	39	PSENERGY-5000	Above
21-APR-2006	66	PSFWHM-5000	Above
21-APR-2006	67	PSFWHM-5000	Above
21-APR-2006	68	PSFWHM-5000	Above
21-APR-2006	71	PSFWHM-5000	Below
21-APR-2006	71	PSENERGY-5000	Above
21-APR-2006	84	PSENERGY-5000	Above
21-APR-2006	96	PSFWHM-5000	Above
21-APR-2006	97	PSENERGY-5000	Above
21-APR-2006	99	PSFWHM-5000	Above
21-APR-2006	101	PSFWHM-5000	Above
21-APR-2006	105	PSENERGY-5000	Above

*gzo 4/21/06*

21-APR-2006	106	PSFWHM-5000	Above
21-APR-2006	108	PSFWHM-5000	Above
21-APR-2006	109	PSFWHM-5000	Above
21-APR-2006	115	PSFWHM-5000	Above
21-APR-2006	131	PSFWHM-5000	Above

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

APPROVAL DATE: *4/21/06* APPROVAL TIME: *1005*

APPROVED BY: *GLD* PROCEDURE # GL-RAD-I-009

Report completed at 21-APR-2006 10:01:23.18



Review of QA results ( Daily checks ) 21-APR-2006 10:01:24.55

Starting with bank 1

Ending with bank 19

This is a list of Detectors that may not have properly transferred to the QA file

APPROVAL DATE: 4/21/06 APPROVAL TIME: 1005

APPROVED BY: *GLD* PROCEDURE # GL-RAD-I-009

Report completed at 21-APR-2006 10:02:10.65

Starting with bank 1

Ending with bank 19

	Detector	Parameter	Flag
22-APR-2006	6	PSFWHM-5000	Below
22-APR-2006	6	PSENERGY-5000	Above
22-APR-2006	6	PSCENTRD-5000	Above
22-APR-2006	14	PSFWHM-5000	Below
22-APR-2006	14	PSENERGY-5000	Above
22-APR-2006	22	PSENERGY-5000	Above
22-APR-2006	24	PSFWHM-5000	Below
22-APR-2006	25	PSFWHM-5000	Below
22-APR-2006	25	PSCENTRD-5000	Below
22-APR-2006	28	PSFWHM-5000	Above
22-APR-2006	39	PSENERGY-5000	Above
22-APR-2006	66	PSFWHM-5000	Above
22-APR-2006	67	PSFWHM-5000	Above
22-APR-2006	68	PSFWHM-5000	Above
22-APR-2006	71	PSENERGY-5000	Above
22-APR-2006	84	PSENERGY-5000	Above
22-APR-2006	96	PSFWHM-5000	Above
22-APR-2006	97	PSENERGY-5000	Above
22-APR-2006	99	PSFWHM-5000	Above
22-APR-2006	101	PSFWHM-5000	Above
22-APR-2006	105	PSENERGY-5000	Above
22-APR-2006	106	PSFWHM-5000	Above

22-APR-2006	108	PSFWHM-5000	Above
22-APR-2006	109	PSFWHM-5000	Above
22-APR-2006	115	PSFWHM-5000	Above
22-APR-2006	131	PSFWHM-5000	Above

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

APPROVAL DATE: 4.22.06

APPROVAL TIME: 9:03

APPROVED BY: SRS

PROCEDURE # GL-RAD-I-009

Report completed at 22-APR-2006 08:57:38.65

Review of QA results ( Daily checks ) 22-APR-2006 08:57:39.83

Starting with bank 1

Ending with bank 19

This is a list of Detectors that may not have properly transferred to the QA file

APPROVAL DATE: 4.22.06

APPROVAL TIME: 9:03

APPROVED BY: SRS

PROCEDURE # GL-RAD-I-009

Report completed at 22-APR-2006 08:58:25.59

Starting with bank 1  
Ending with bank 19

	Detector	Parameter	Flag
24-APR-2006	6	PSFWHM-5000	Below
24-APR-2006	6	PSENERGY-5000	Above
24-APR-2006	6	PSCENTRD-5000	Above
24-APR-2006	14	PSFWHM-5000	Below
24-APR-2006	14	PSENERGY-5000	Above
24-APR-2006	22	PSENERGY-5000	Above
24-APR-2006	24	PSFWHM-5000	Below
24-APR-2006	25	PSFWHM-5000	Below
24-APR-2006	25	PSCENTRD-5000	Below
24-APR-2006	28	PSFWHM-5000	Above
24-APR-2006	39	PSENERGY-5000	Above
24-APR-2006	66	PSFWHM-5000	Above
24-APR-2006	67	PSFWHM-5000	Above
24-APR-2006	68	PSFWHM-5000	Above
24-APR-2006	71	PSENERGY-5000	Above
24-APR-2006	84	PSENERGY-5000	Above
24-APR-2006	96	PSFWHM-5000	Above
24-APR-2006	97	PSENERGY-5000	Above
24-APR-2006	105	PSFWHM-5000	Above
24-APR-2006	105	PSENERGY-5000	Above
24-APR-2006	106	PSFWHM-5000	Above
24-APR-2006	115	PSFWHM-5000	Above

*MD* 4/24/06

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

APPROVAL DATE: 4/24/06

APPROVAL TIME: 815

APPROVED BY: *CD*

PROCEDURE # GL-RAD-I-009

Report completed at 24-APR-2006 07:47:57.61

Review of QA results ( Daily checks ) 24-APR-2006 07:47:58.76

Starting with bank 1

Ending with bank 19

This is a list of Detectors that may not have properly transferred to the QA file

APPROVAL DATE: 4/24/06

APPROVAL TIME: 8/5

APPROVED BY: *MS*

PROCEDURE # GL-RAD-I-009

Report completed at 24-APR-2006 07:48:45.67

QA filename : DKA0:[CANBERRA.GAMMA.SCUSR.QA]QCC\_GAM19\_CAN.QAF;5

Sample ID : Calib Check Sample quantity : 1.00 EACH  
Sample date : 1-APR-2005 12:00:00 Acquisition date : 25-APR-2006 09:08:19  
Elapsed live time: 0 00:05:00.00 Elapsed real time: 0 00:05:02.95

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*DECAY CORRECTED ACTIVITY CD-109 [4.5528E+05+/-6559]	4.5325E+05	-0.31	
*DECAY CORRECTED ACTIVITY CS-137 [2.4788E+04+/-427.4]	2.5724E+04	2.19	Investigate
*DECAY CORRECTED ACTIVITY CO-60 [3.4880E+04+/-552.9]	3.4794E+04	-0.16	

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
*PEAK CENTROID CD-109	1.7400E+02	1.8200E+02	1.7592E+02	
*PEAK CENTROID CS-137	1.3170E+03	1.3250E+03	1.3228E+03	
*PEAK CENTROID CO-60	2.6590E+03	2.6670E+03	2.6654E+03	
*PEAK ENERGY CD-109	8.6030E+01	9.0030E+01	8.8170E+01	
*PEAK ENERGY CS-137	6.5964E+02	6.6364E+02	6.6216E+02	
*PEAK ENERGY CO-60	1.3305E+03	1.3345E+03	1.3338E+03	
*PEAK FWHM CD-109	1.0000E+00	1.5000E+00	1.2882E+00	
*PEAK FWHM CS-137	1.0000E+00	2.0000E+00	1.6613E+00	
*PEAK FWHM CO-60	1.5000E+00	2.5000E+00	2.0191E+00	

Flags: "\*" means the out-of-range test is parameter-dependent

Approved by:                      Approval Date: 4 / 25 / 06



QA filename : DKA300:[CANBERRA.GAMMA]QC\_WELL.QAF;4

Sample ID : QC\_WELL Sample quantity : 1.00 LITER  
 Sample date : 1-APR-2002 12:00:00 Acquisition date : 25-APR-2006 05:50:55  
 Elapsed live time: 0 00:05:00.00 Elapsed real time: 0 00:05:01.71

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
PEAK CENTROID (CHANS) CD-109	170	178	175	
PEAK CENTROID (CHANS) CS-137	1310	1318	1314	
PEAK CENTROID (CHANS) CO-60	2644	2652	2648	
*PEAK ENERGY (keV) CD-109	86	90	88	
*PEAK ENERGY (keV) CS-137	660	664	662	
*PEAK ENERGY (keV) CO-60	1330	1334	1332	
*PEAK FWHM (keV) CD-109	0.1	2.0	1.4	
*PEAK FWHM (keV) CS-137	0.1	3.0	1.7	
*PEAK FWHM (keV) CO-60	0.1	3.0	2.1	
*DECAY CORR. ACT. (pCi) CD-109	7.40E+05	9.90E+05	8.86E+05	
*DECAY CORR. ACT. (pCi) CS-137	2.50E+04	3.06E+04	2.88E+04	
*DECAY CORR. ACT. (pCi) CO-60	3.67E+04	4.49E+04	4.02E+04	

Flags: "\*" means the out-of-range test is parameter-dependent

Approved by:         ym        

Approval Date: 4 / 25 / 06

QA filename : DKA300:[CANBERRA.GAMMA]QC\_GAMMA6.QAF;5

Sample ID : QC\_GAMMA6 Sample quantity : 1.00 LITER  
 Sample date : 1-JAN-2001 12:00:00 Acquisition date : 26-APR-2006 04:52:35  
 Elapsed live time: 0 00:05:00.00 Elapsed real time: 0 00:05:00.98

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
PEAK CENTROID (CHANS) CD-109	172	180	177	
PEAK CENTROID (CHANS) CS-137	1319	1327	1323	
PEAK CENTROID (CHANS) CO-60	2661	2669	2662	
*PEAK ENERGY (keV) CD-109	86	90	88	
*PEAK ENERGY (keV) CS-137	660	664	662	
*PEAK ENERGY (keV) CO-60	1330	1334	1333	
*PEAK FWHM (keV) CD-109	0.1	2.0	1.1	
*PEAK FWHM (keV) CS-137	0.1	3.0	1.4	
*PEAK FWHM (keV) CO-60	0.1	3.0	2.0	
DECAY CORR ACTIVITY (pCi) CD-109	7.32E+05	8.94E+05	8.44E+05	
DECAY CORR ACTIVITY (pCi) CS-137	2.42E+04	2.96E+04	2.79E+04	
DECAY CORR. ACTIVITY (pCi) CO-60	3.64E+04	4.45E+04	4.07E+04	

Flags: "\*" means the out-of-range test is parameter-dependent

Approved by:                                  Approval Date: 4 / 26 / 06

QA filename : DKA0:[CANBERRA.GAMMA.SCUSR.QA]QCC\_GAM19\_CAN.QAF;5

Sample ID : Calib Check Sample quantity : 1.00 EACH  
Sample date : 1-APR-2005 12:00:00 Acquisition date : 26-APR-2006 05:16:13  
Elapsed live time: 0 00:05:00.00 Elapsed real time: 0 00:05:02.97

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*DECAY CORRECTED ACTIVITY CD-109 [4.5528E+05+/-6559]	4.5951E+05	0.64	
*DECAY CORRECTED ACTIVITY CS-137 [2.4788E+04+/-427.4]	2.5535E+04	1.75	
*DECAY CORRECTED ACTIVITY CO-60 [3.4880E+04+/-552.9]	3.4376E+04	-0.91	

Out-of-range Test: BOUNDARY

Parameter Description	Lower	Upper	Value	Flag
*PEAK CENTROID CD-109	1.7400E+02	1.8200E+02	1.7594E+02	
*PEAK CENTROID CS-137	1.3170E+03	1.3250E+03	1.3229E+03	
*PEAK CENTROID CO-60	2.6590E+03	2.6670E+03	2.6656E+03	
*PEAK ENERGY CD-109	8.6030E+01	9.0030E+01	8.8181E+01	
*PEAK ENERGY CS-137	6.5964E+02	6.6364E+02	6.6223E+02	
*PEAK ENERGY CO-60	1.3305E+03	1.3345E+03	1.3339E+03	
*PEAK FWHM CD-109	1.0000E+00	1.5000E+00	1.2784E+00	
*PEAK FWHM CS-137	1.0000E+00	2.0000E+00	1.6309E+00	
*PEAK FWHM CO-60	1.5000E+00	2.5000E+00	2.1150E+00	

Flags: "\*" means the out-of-range test is parameter-dependent

Approved by: *[Signature]* Approval Date: 4 / 26 / 04



# Ludlum Alpha Scintillation Counter Checks for 10-APR-2006

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LUCAS1	EFF	10:01	.1	12672	126720	0.96	GOOD	
LUCAS2	EFF	10:01	.1	12771	127710	1.81	GOOD	
LUCAS3	EFF	10:01	.1	12656	126560	0.66	GOOD	
LUCAS4	EFF	10:01	.1	13928	139280	1.18	GOOD	
LUCAS5	EFF	10:01	.1	13697	136970	0.79	GOOD	
LUCAS6	EFF	10:01	.1	12600	126000	1.25	GOOD	

Reviewed by

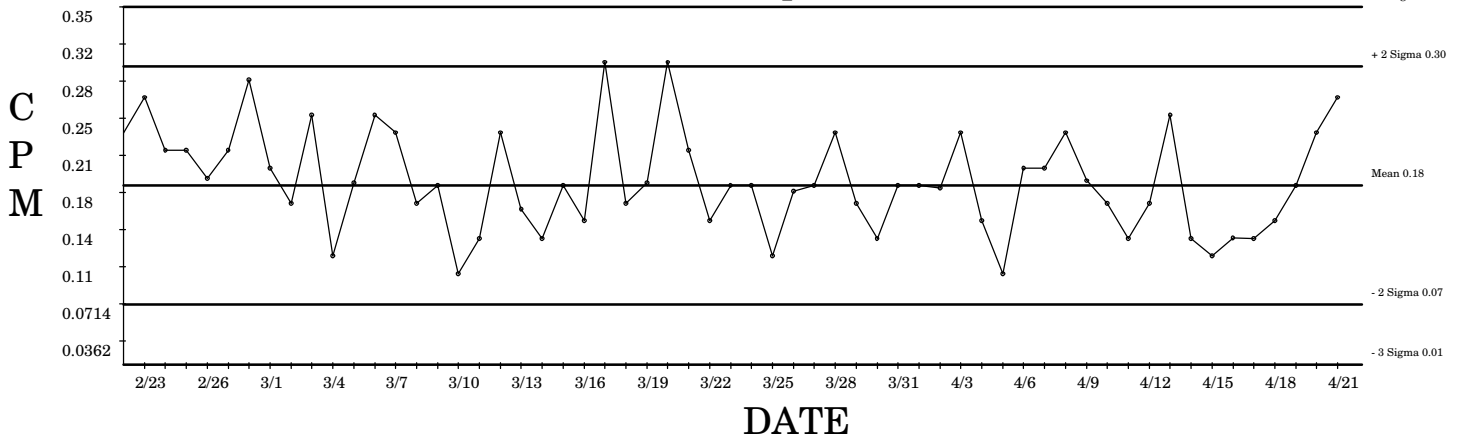
Date

4/10/06

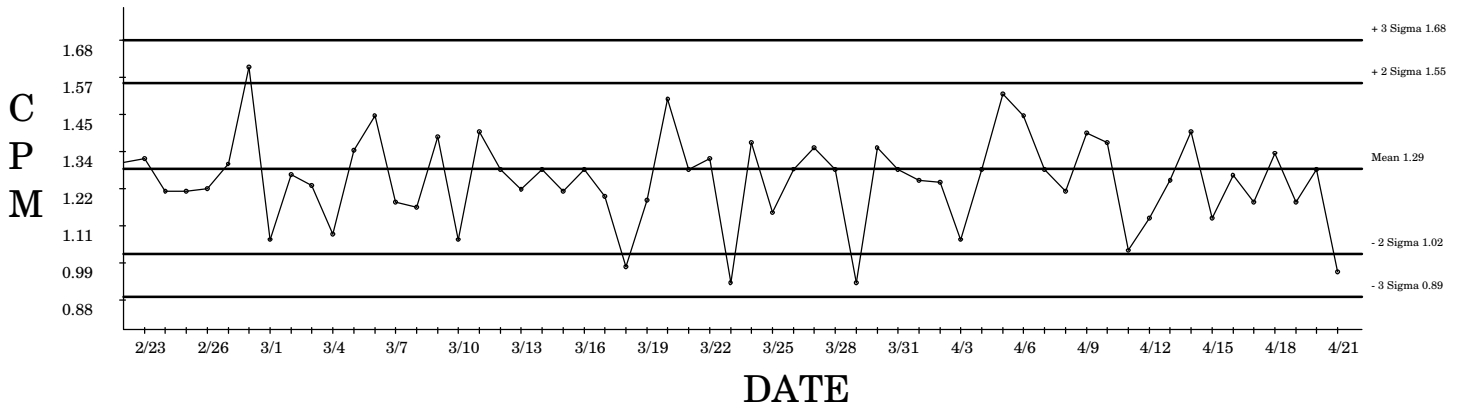
General Engineering Laboratories, LLC

# BACKGROUND AND EFFICIENCY DATA

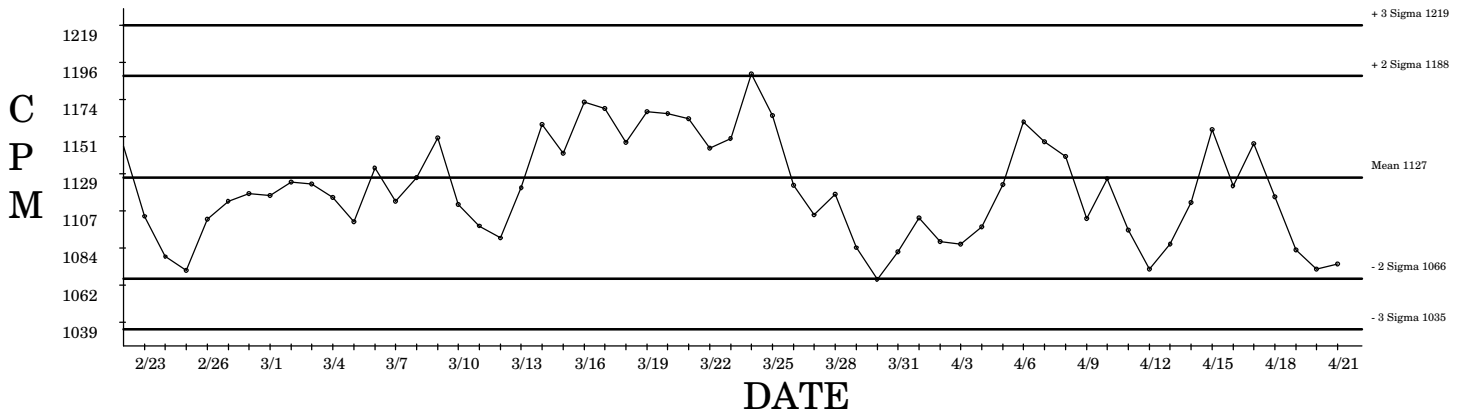
# LB4100E1 04/21/2006 Alpha BKG



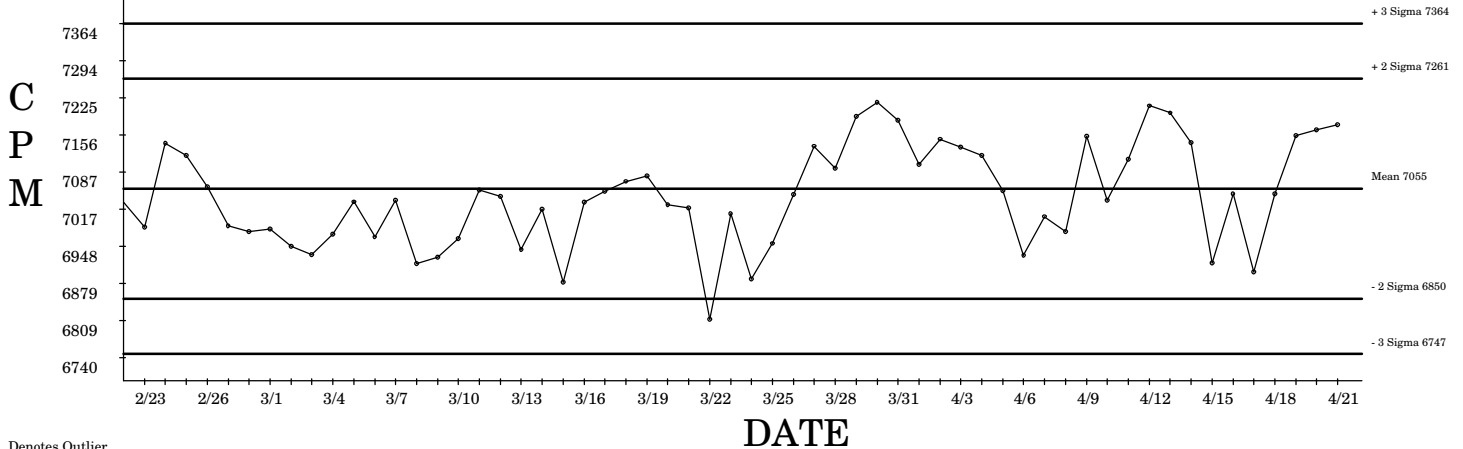
# Beta BKG



# Alpha EFF



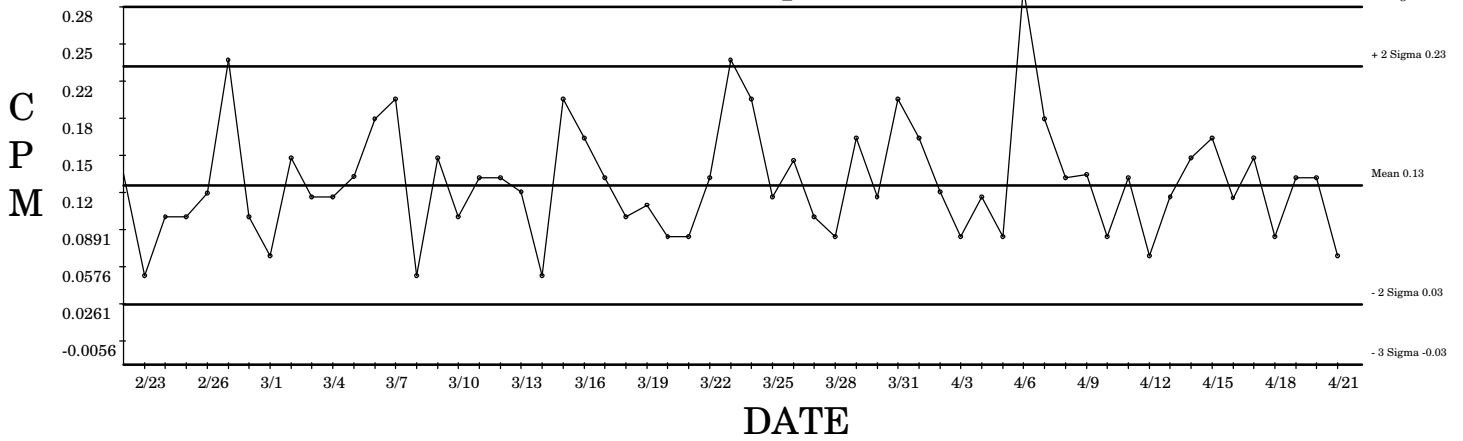
# Beta EFF



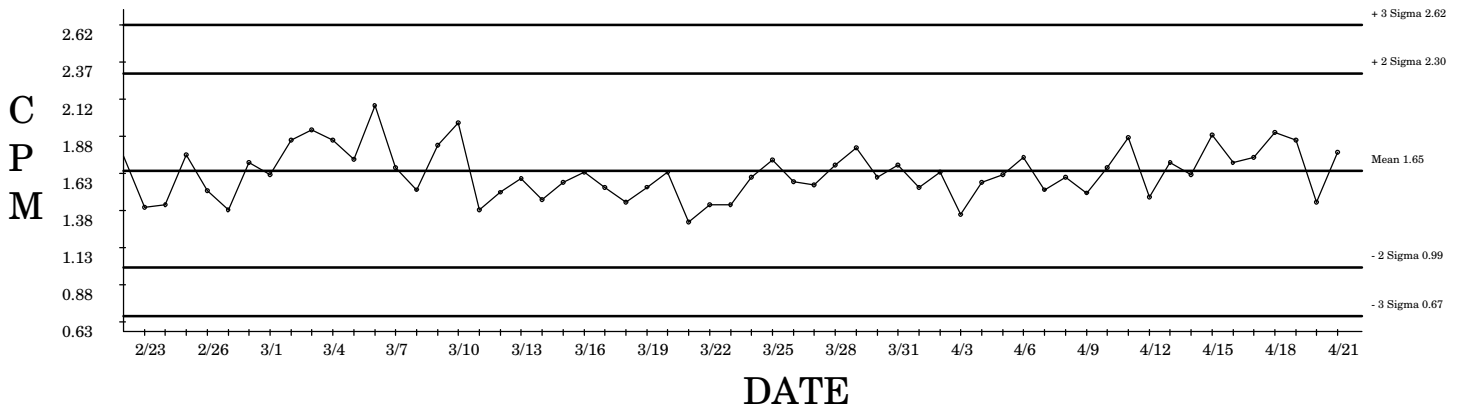
○ Denotes Outlier

# LB4100E2 04/21/2006

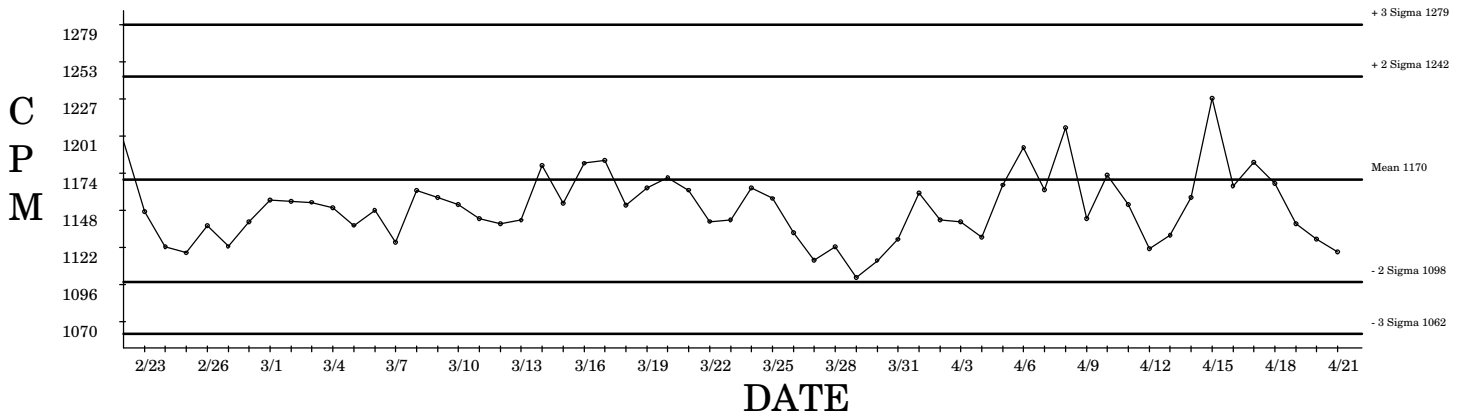
## Alpha BKG



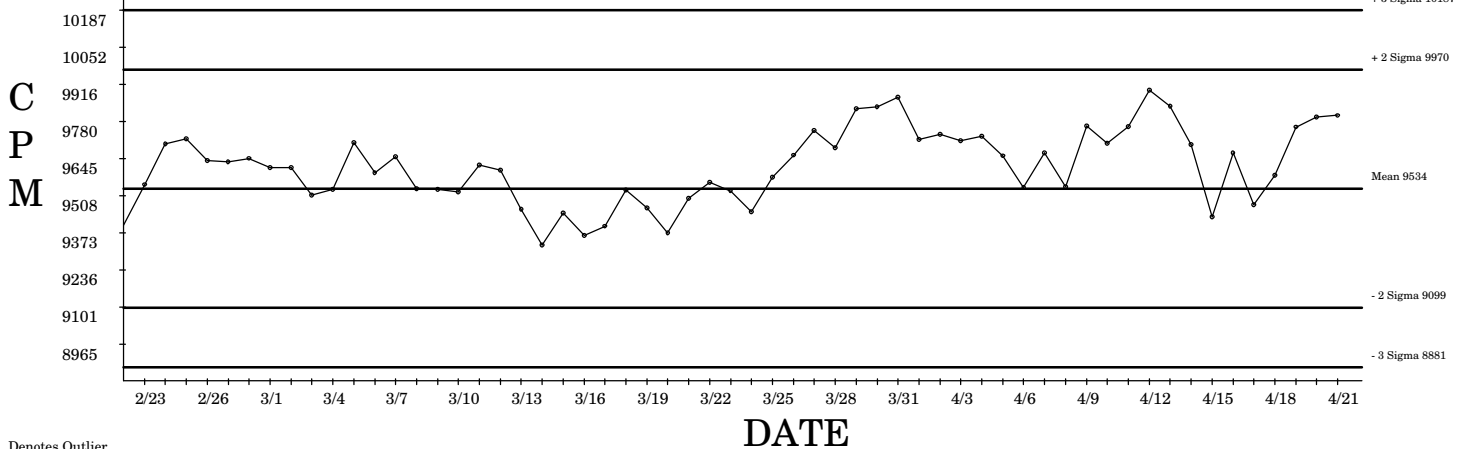
## Beta BKG



## Alpha EFF

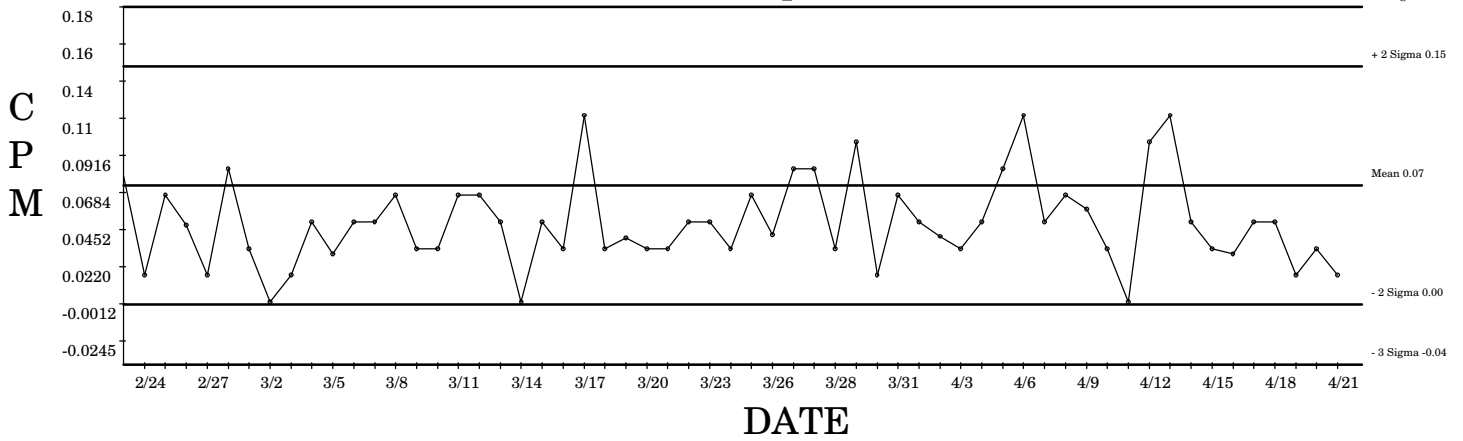


## Beta EFF

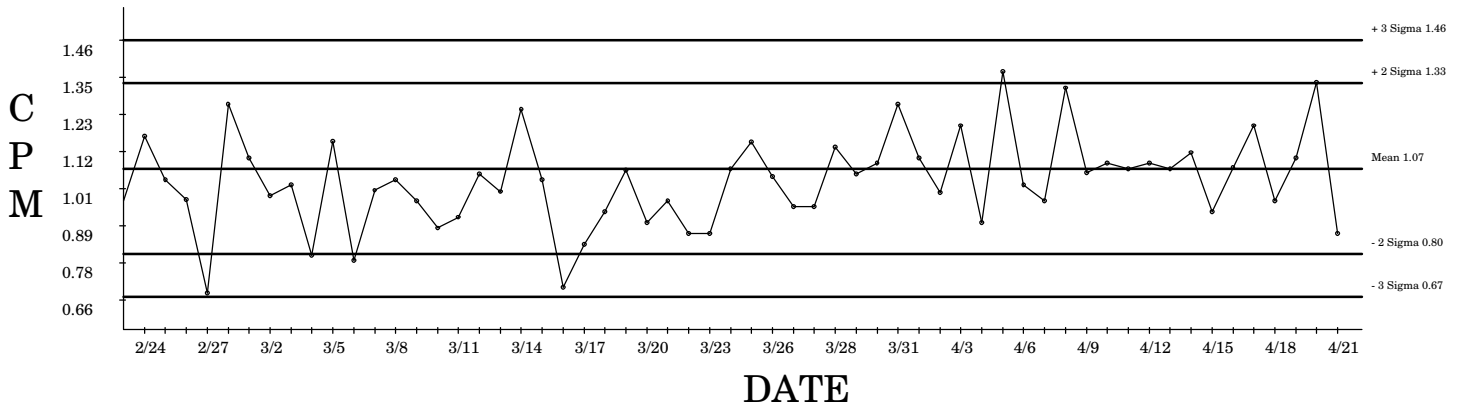


○ Denotes Outlier

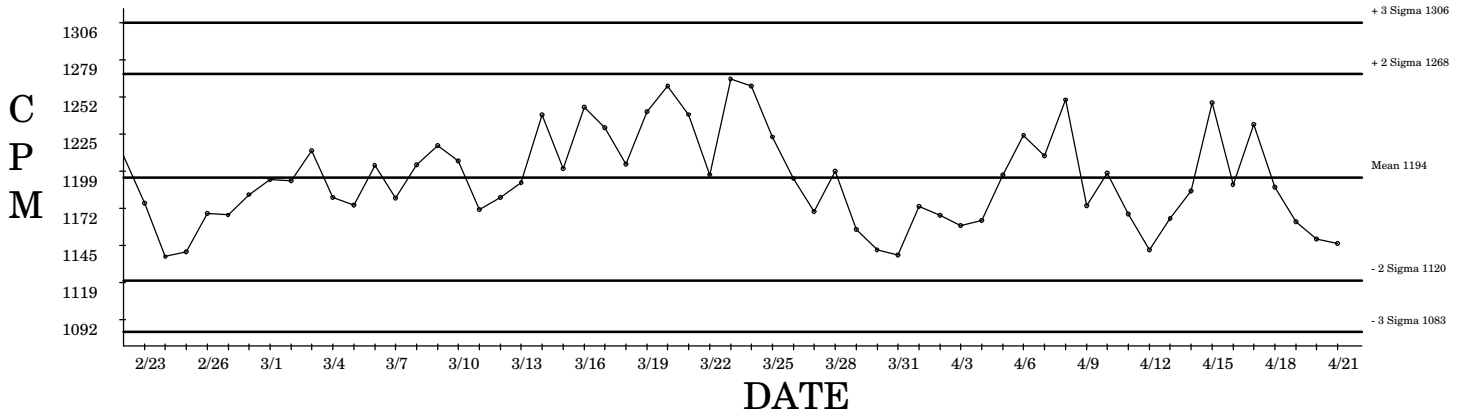
# LB4100E3 04/21/2006 Alpha BKG



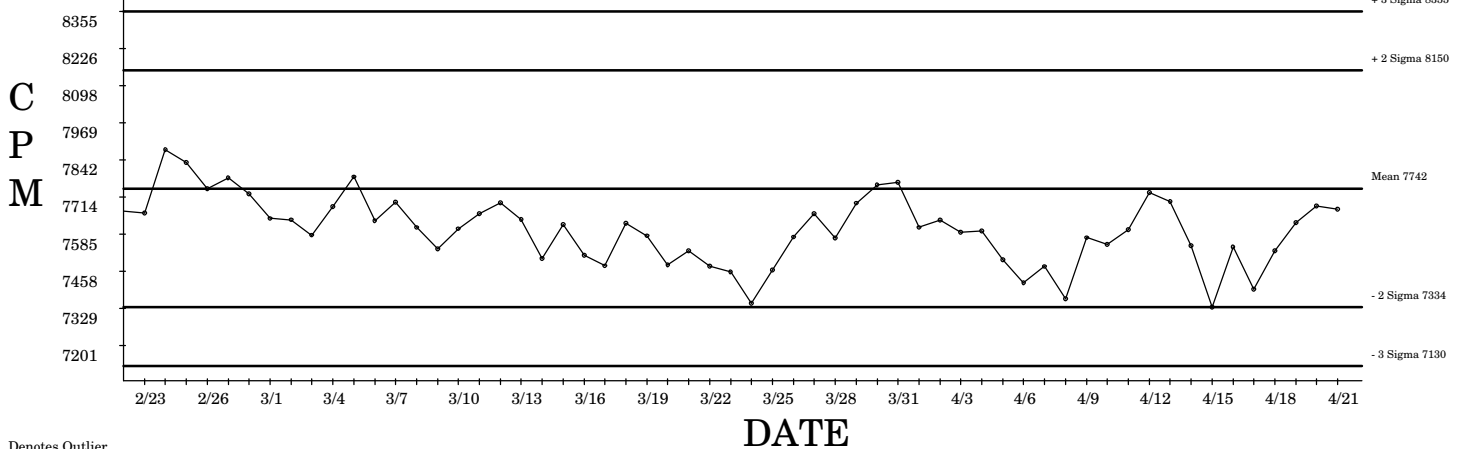
# Beta BKG



# Alpha EFF



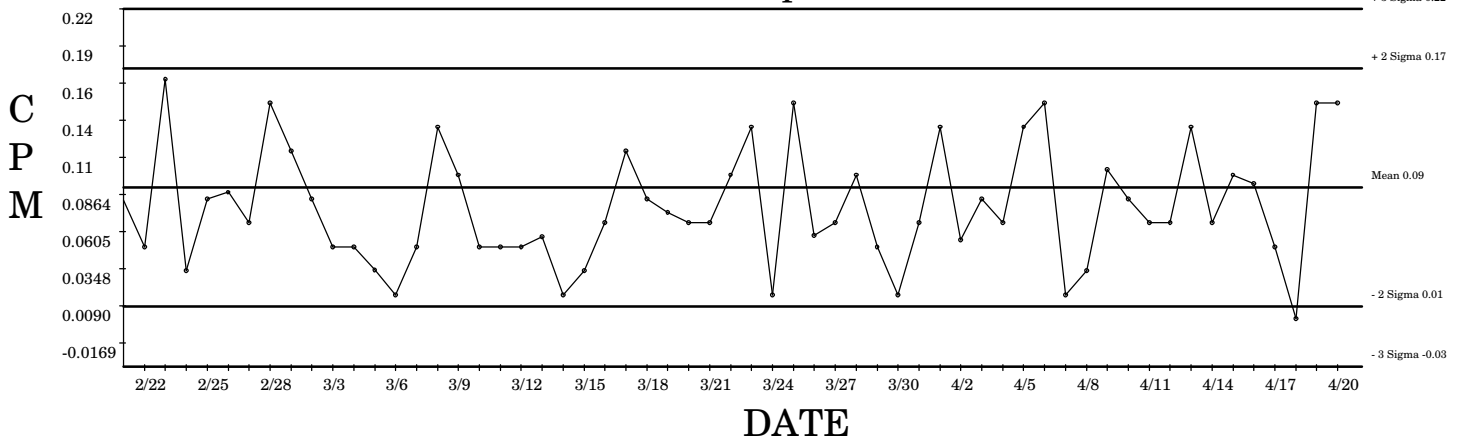
# Beta EFF



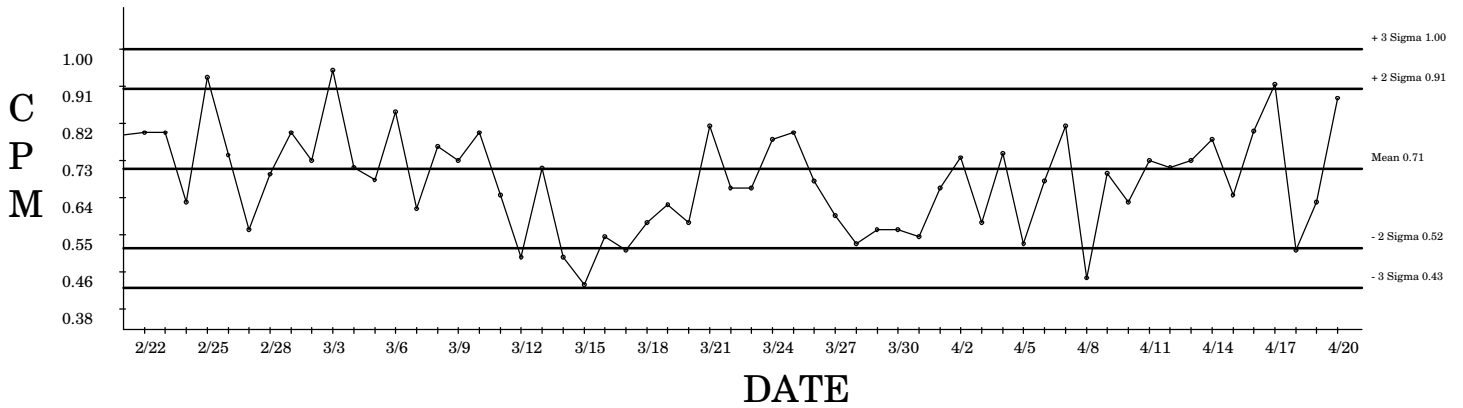
○ Denotes Outlier



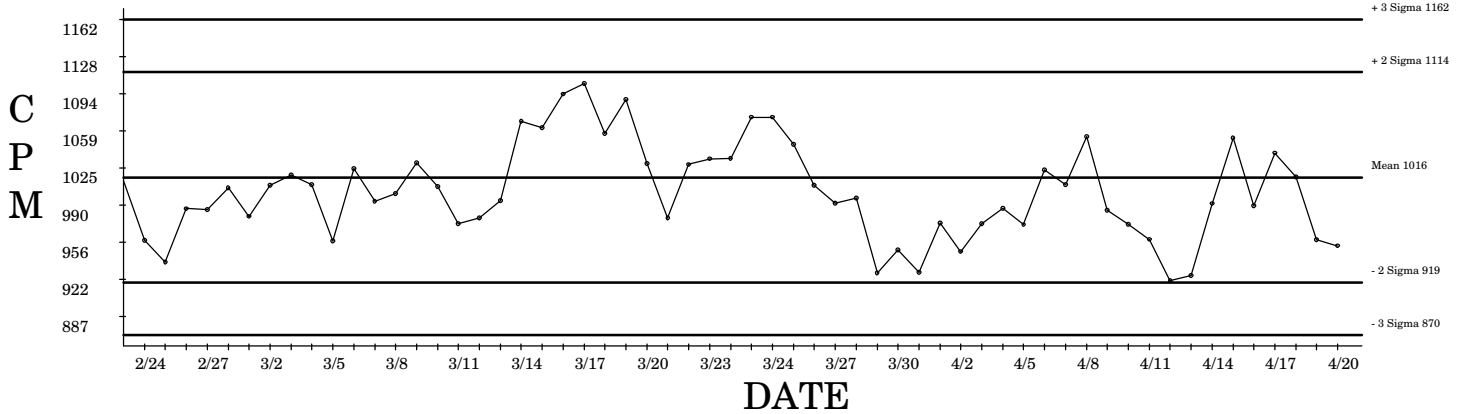
# LB4100H1 04/20/2006 Alpha BKG



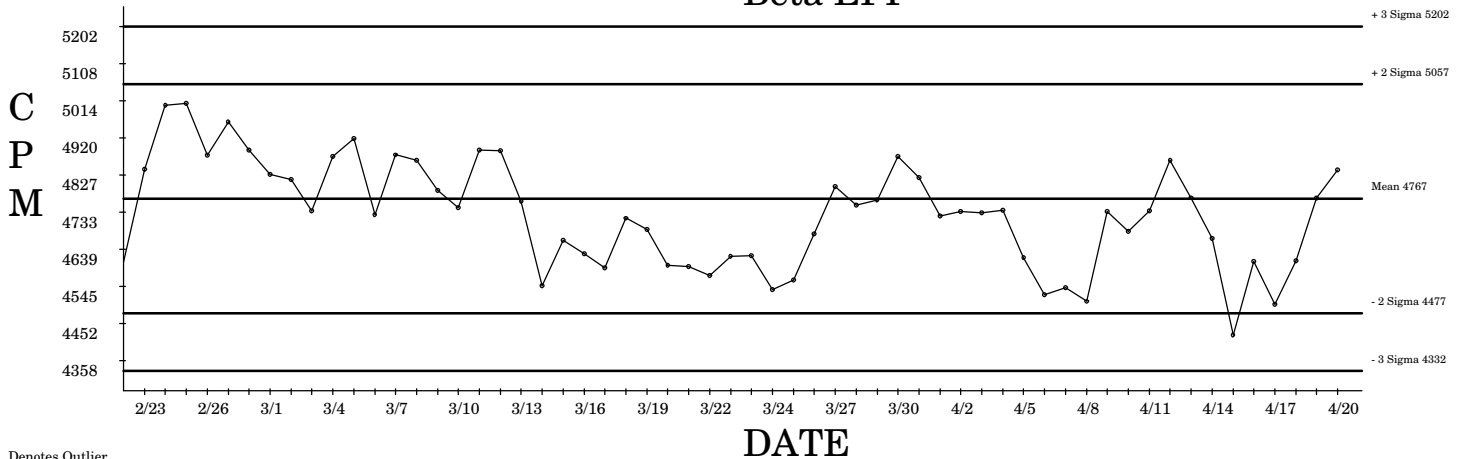
## Beta BKG



## Alpha EFF



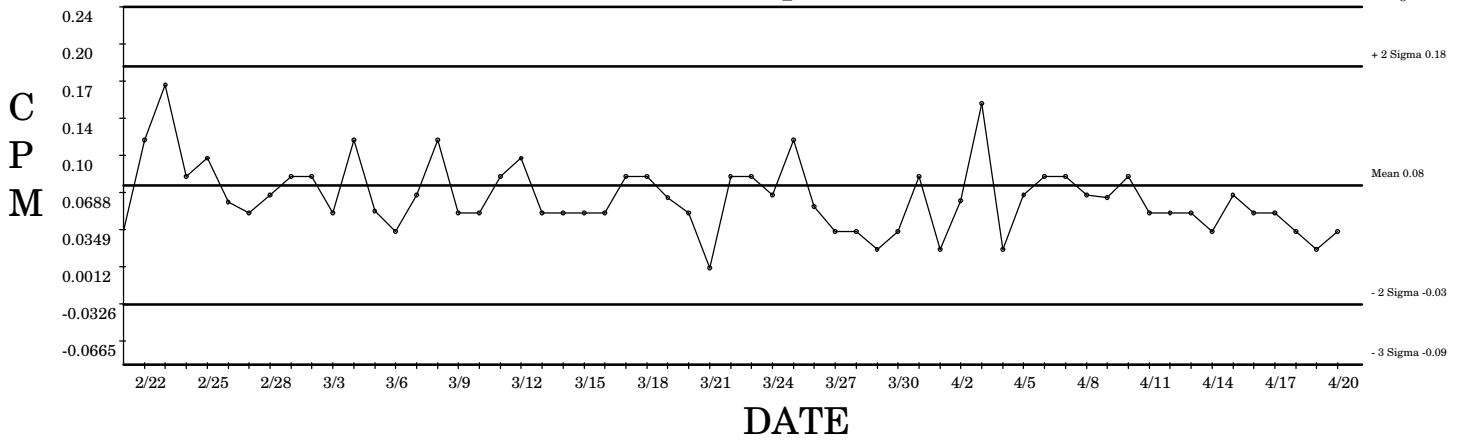
## Beta EFF



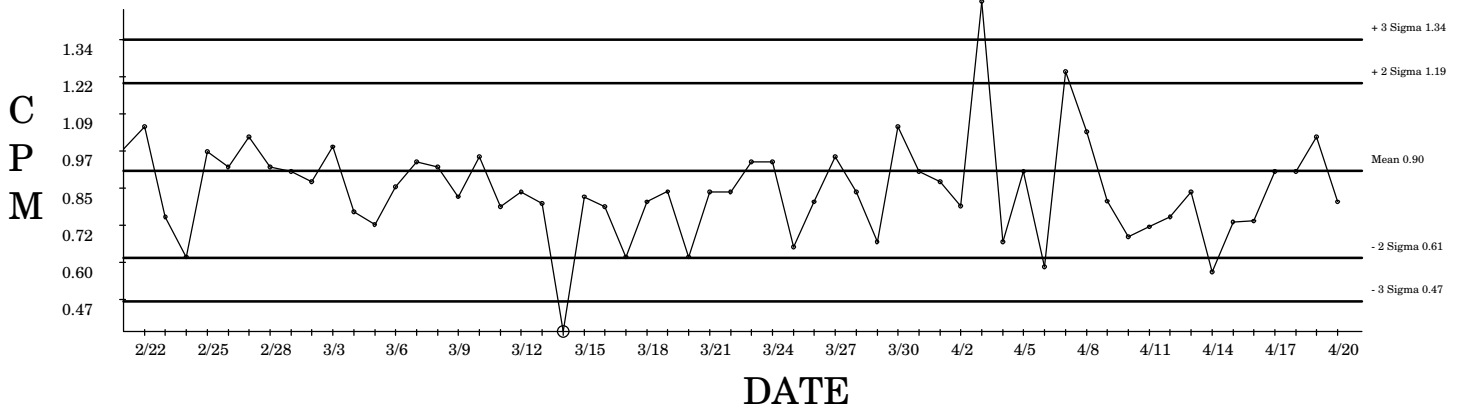
○ Denotes Outlier

# LB4100H2 04/20/2006

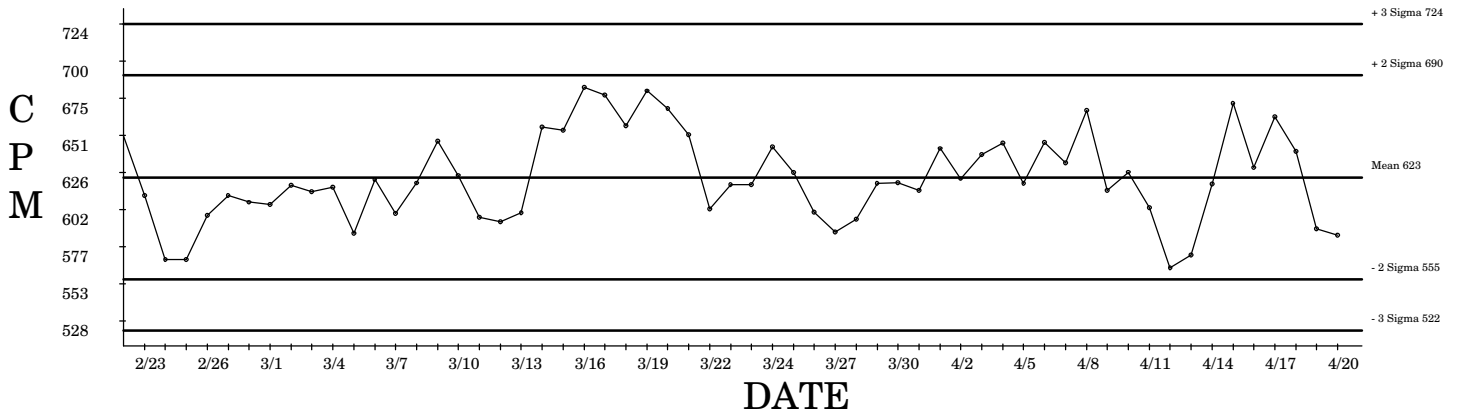
## Alpha BKG



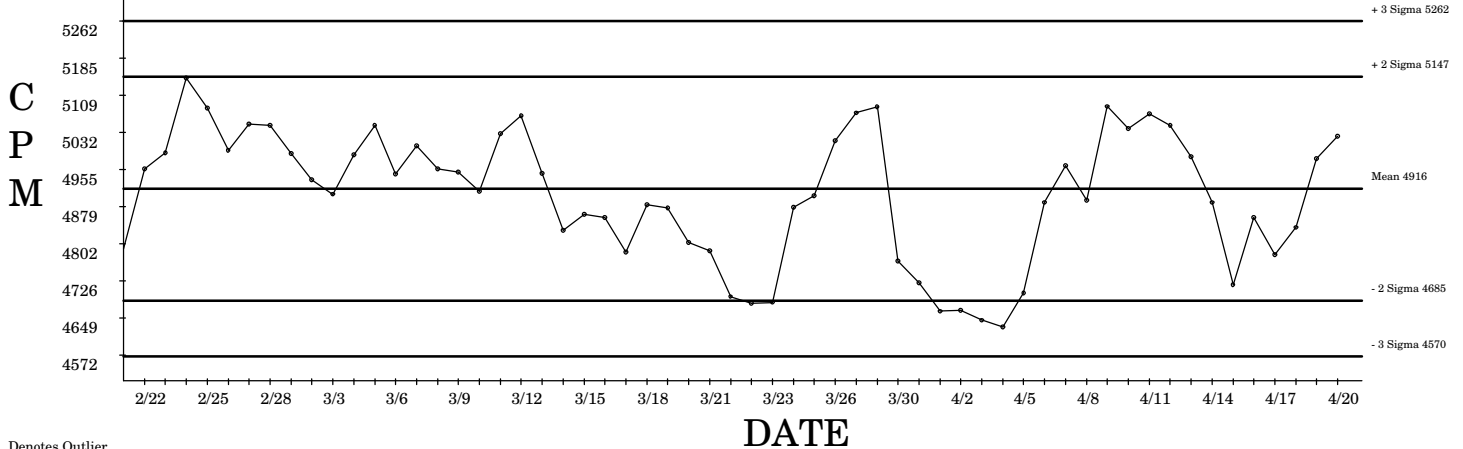
## Beta BKG



## Alpha EFF

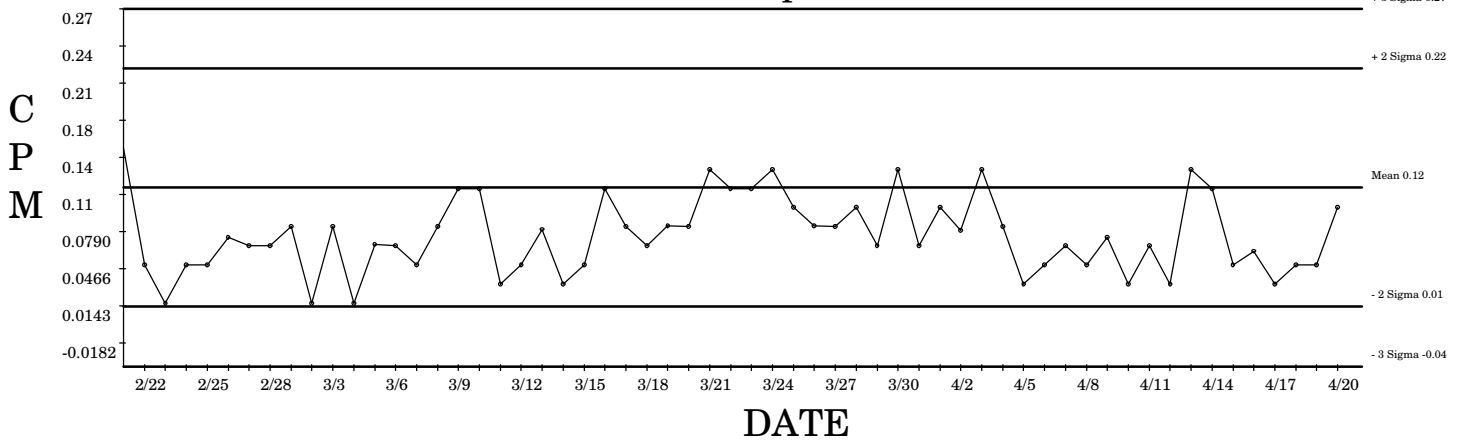


## Beta EFF

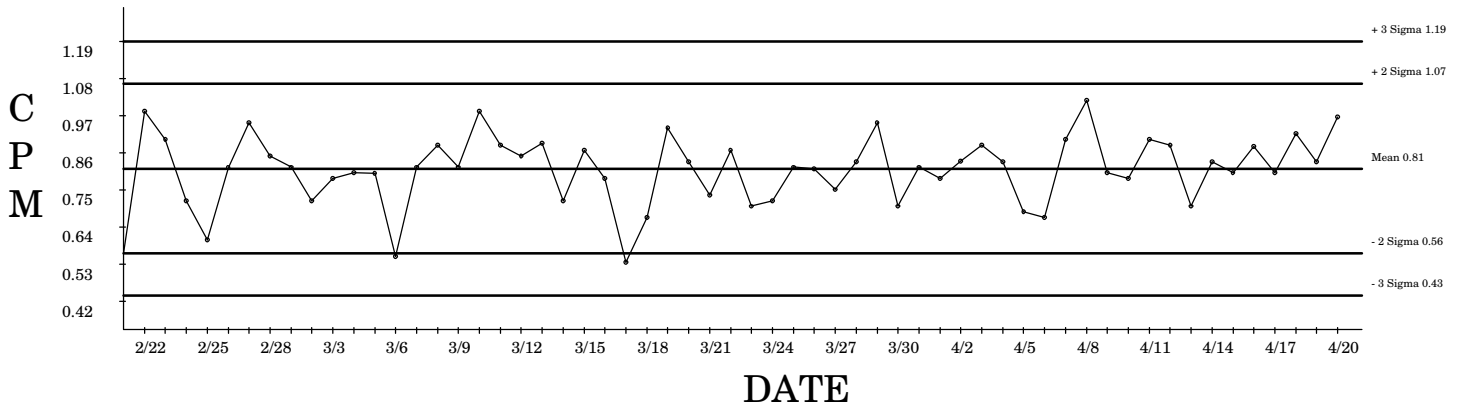


○ Denotes Outlier

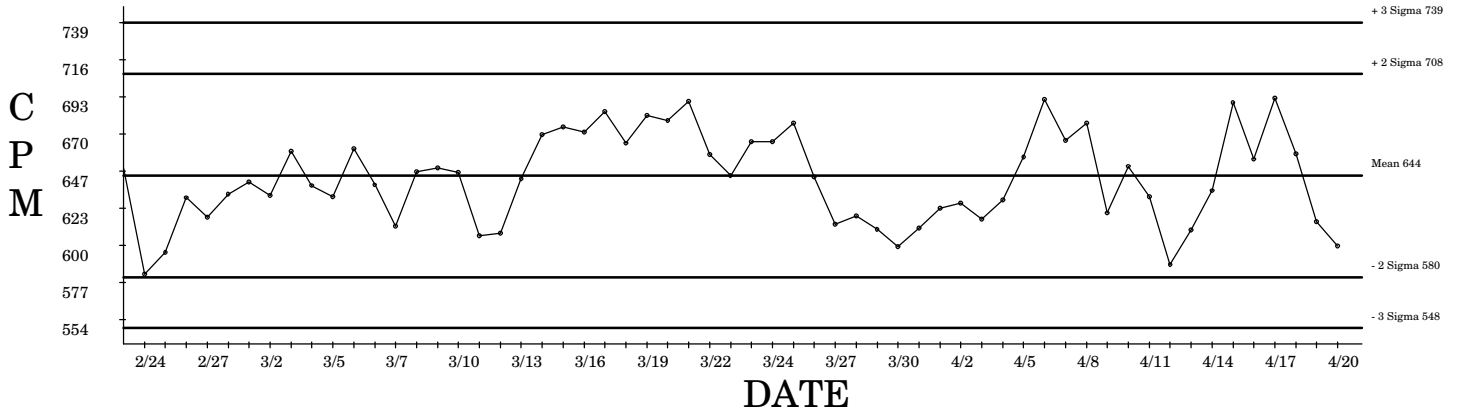
# LB4100H3 04/20/2006 Alpha BKG



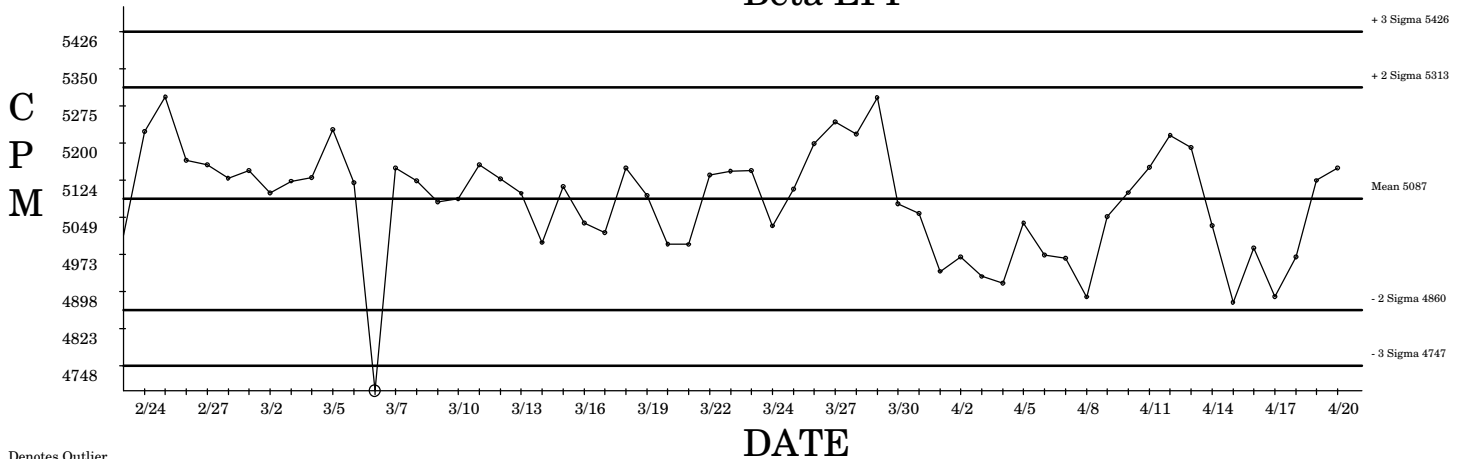
# Beta BKG



# Alpha EFF



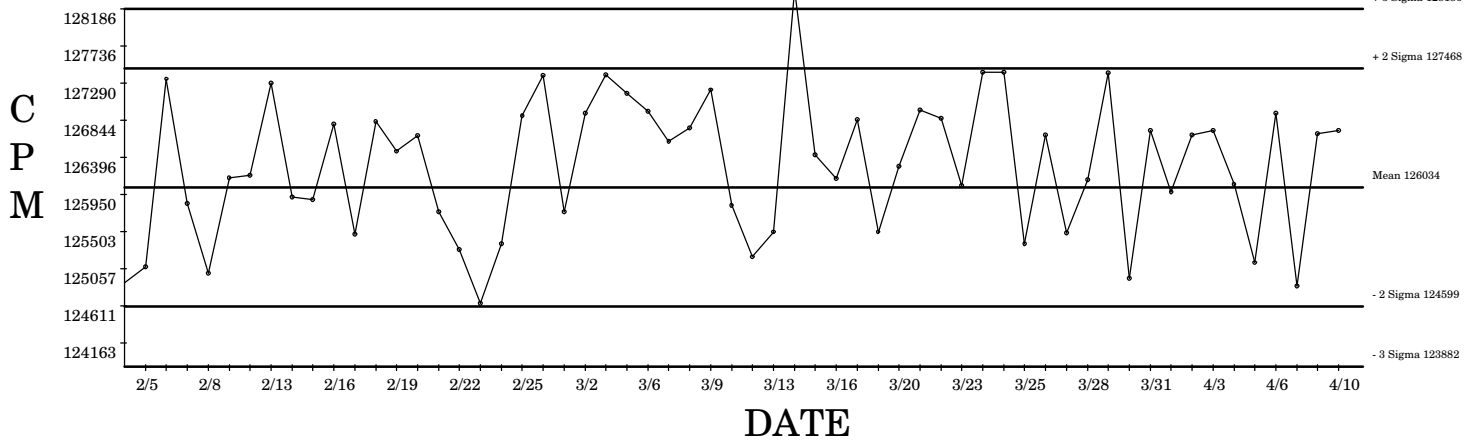
# Beta EFF



○ Denotes Outlier

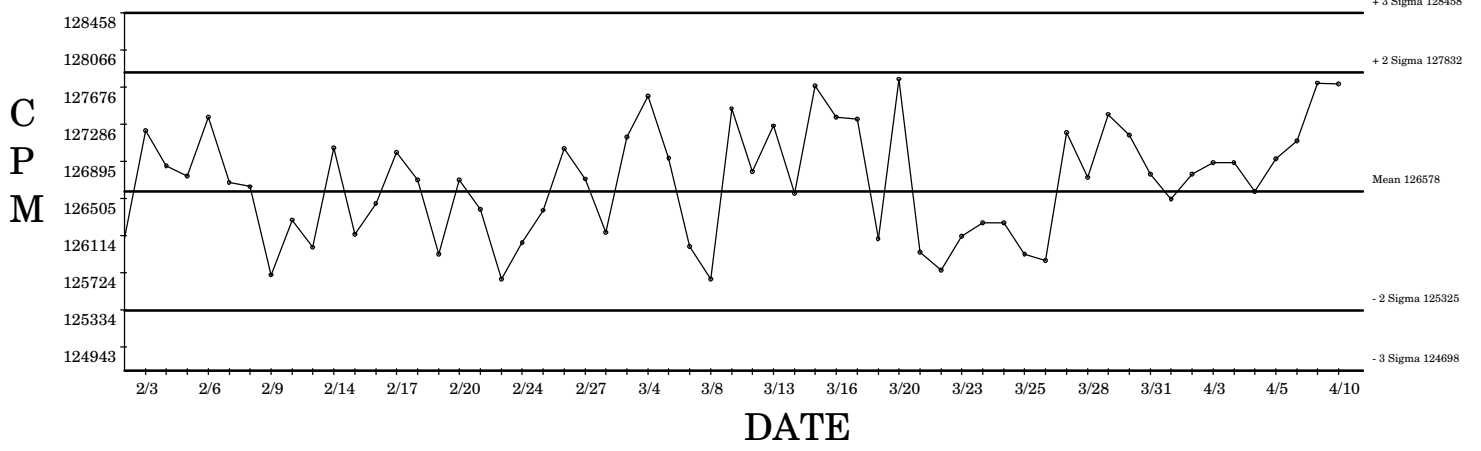
# LUCAS1 04/10/2006

## EFF

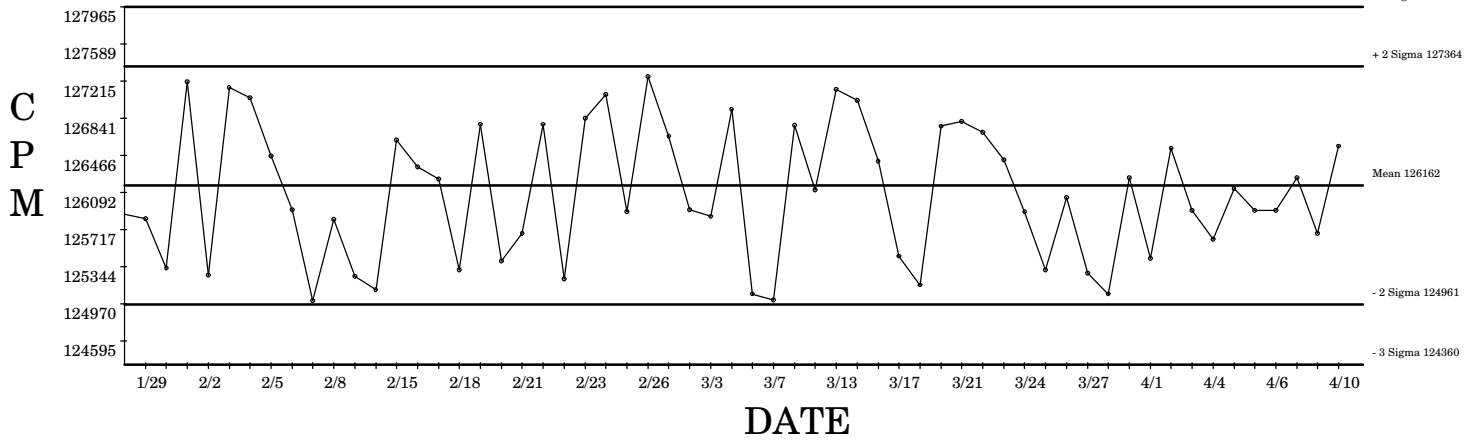


○ Denotes Outlier

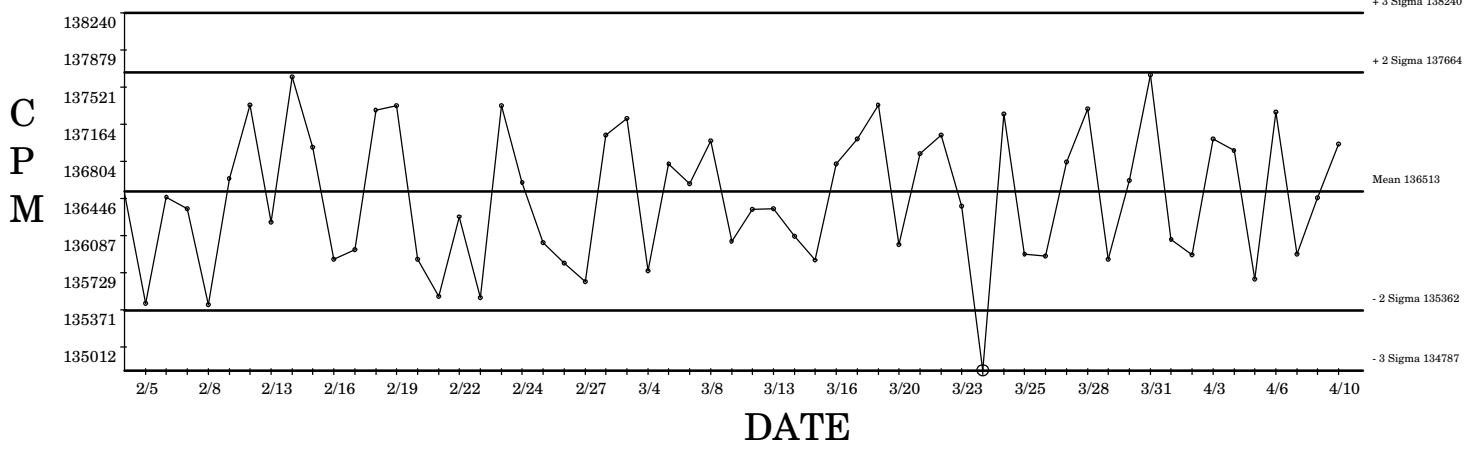
# LUCAS2 04/10/2006 EFF



# LUCAS3 04/10/2006 EFF

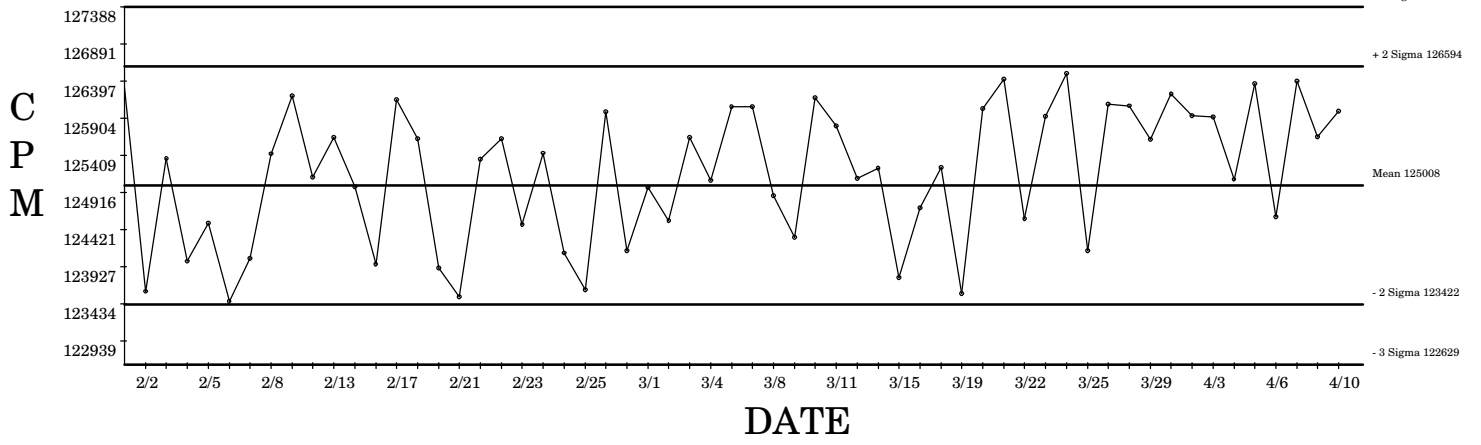


# LUCAS5 04/10/2006 EFF



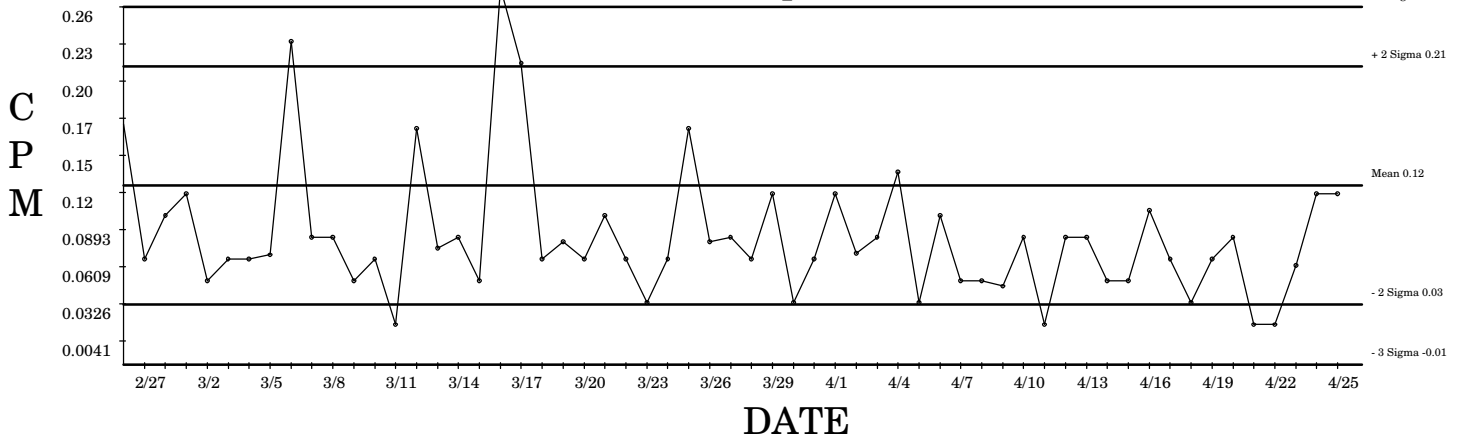
○ Denotes Outlier

# LUCAS6 04/10/2006 EFF

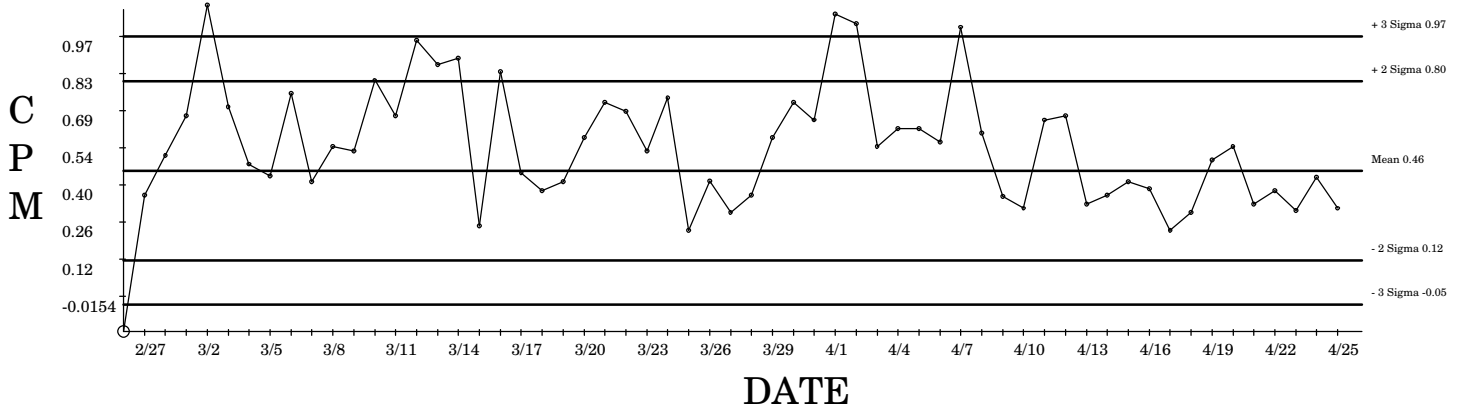




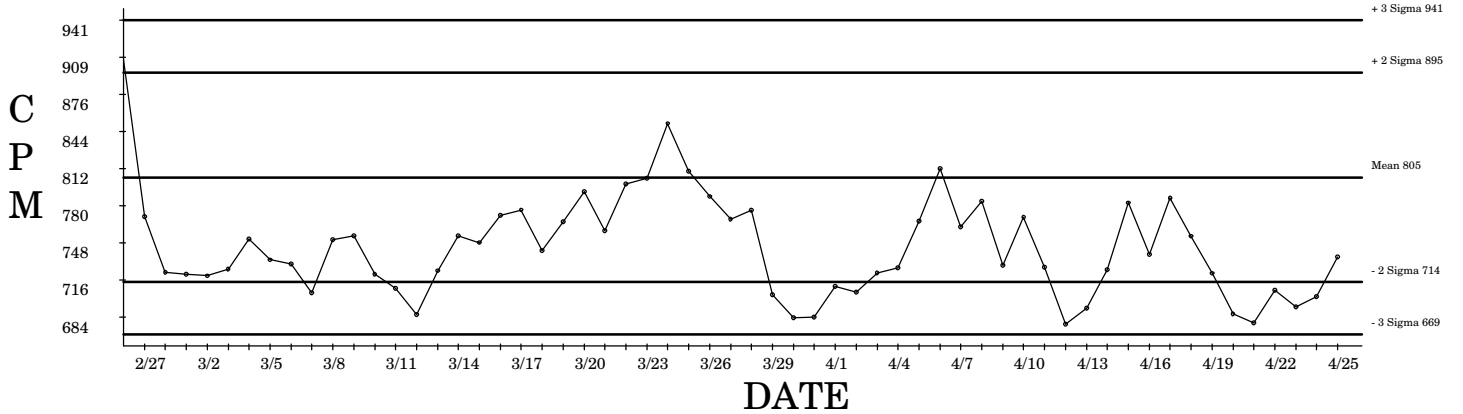
PIC3A 04/25/2006  
Alpha BKG



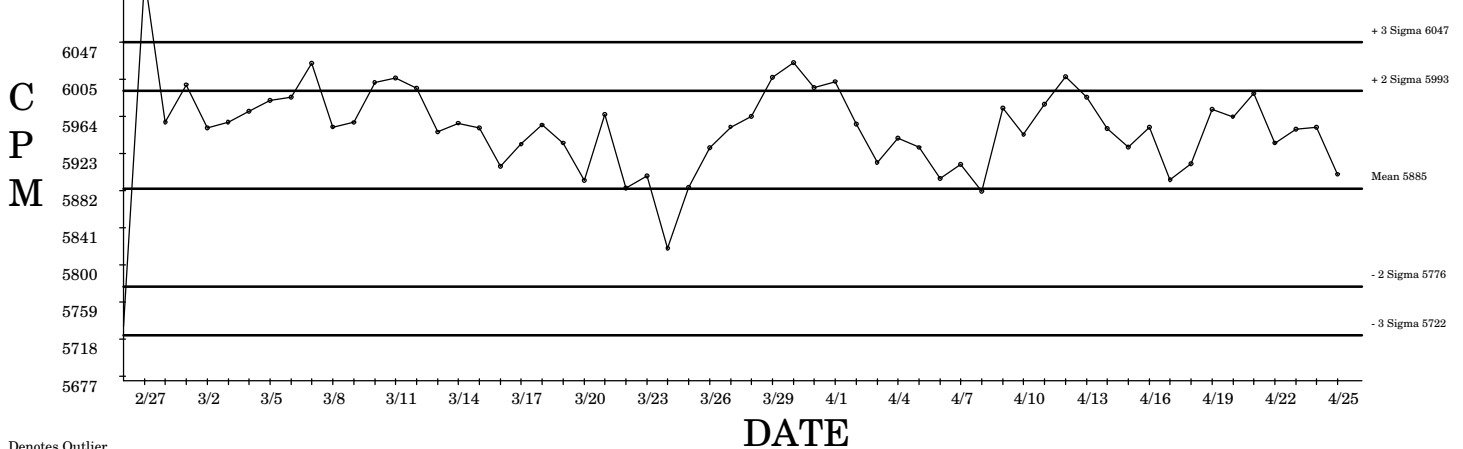
Beta BKG



Alpha EFF



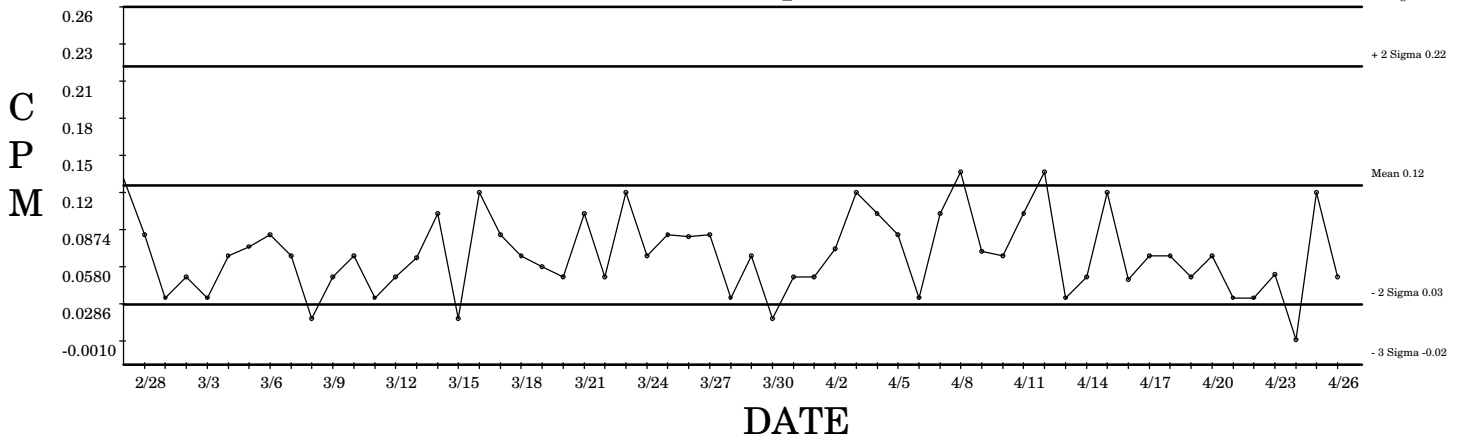
Beta EFF



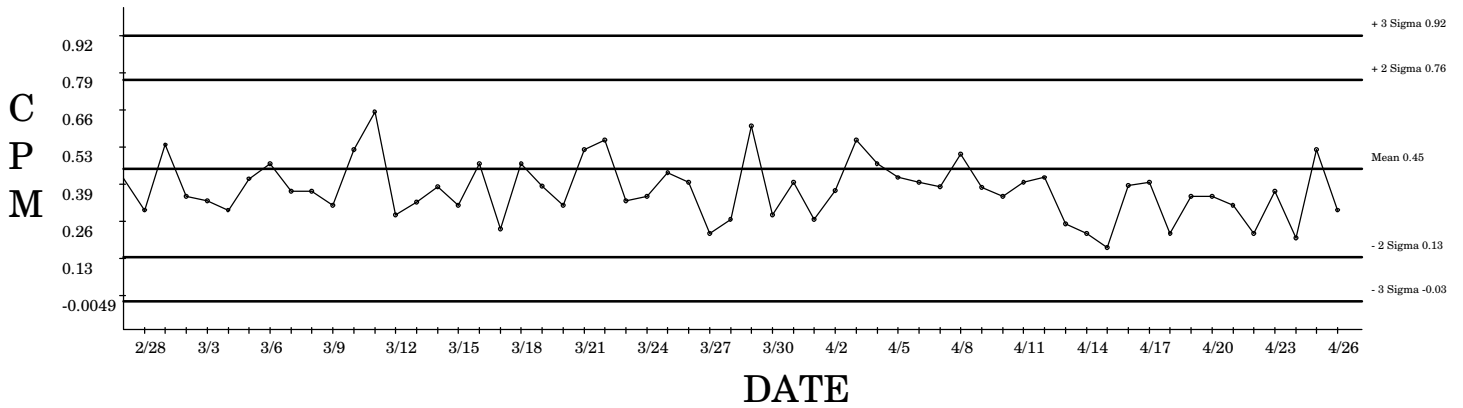
○ Denotes Outlier

# PIC3B 04/26/2006

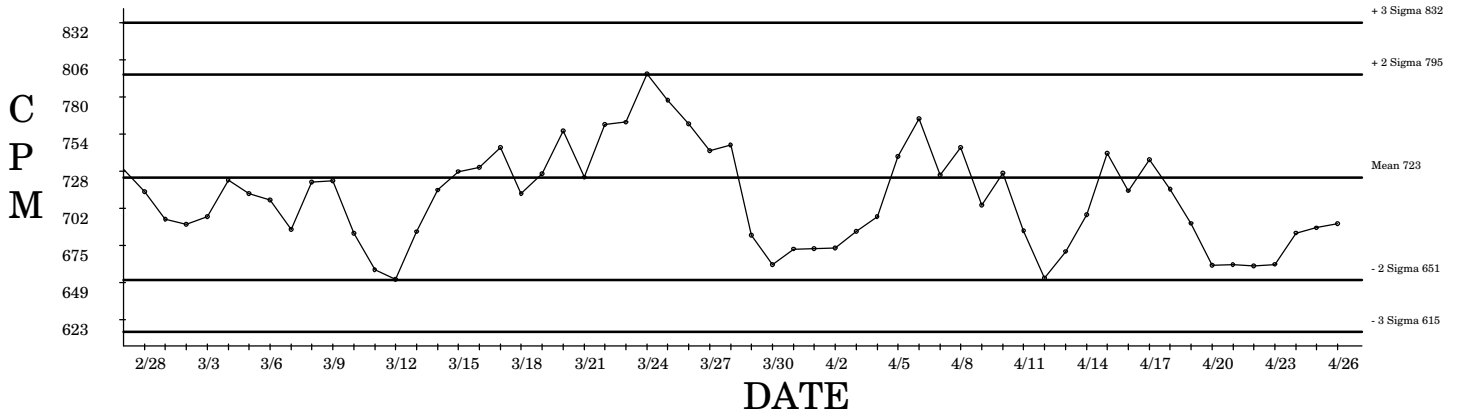
## Alpha BKG



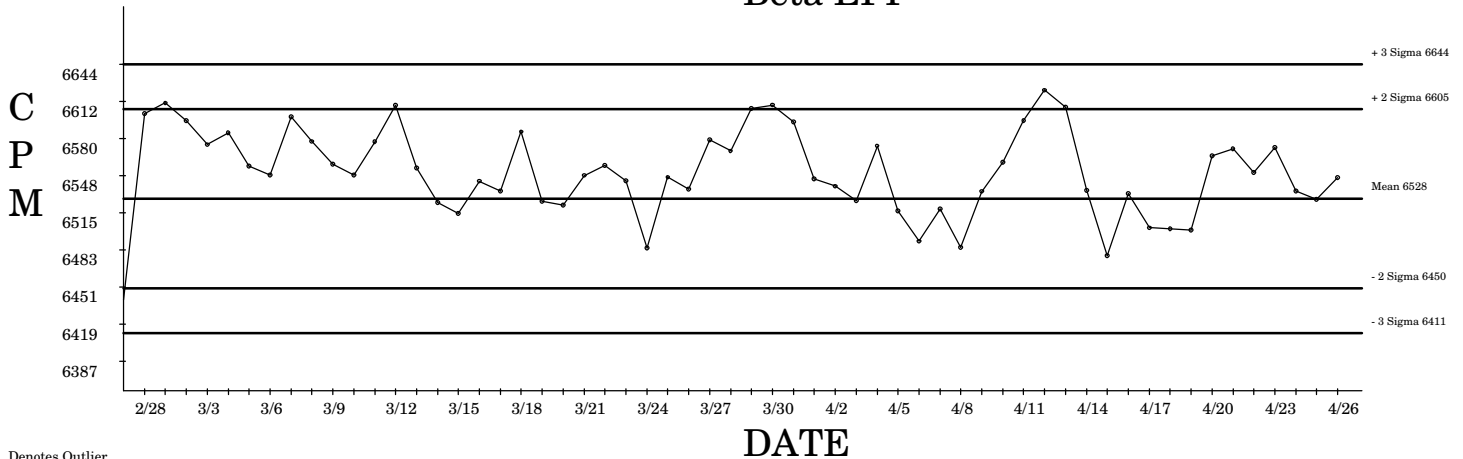
## Beta BKG



## Alpha EFF

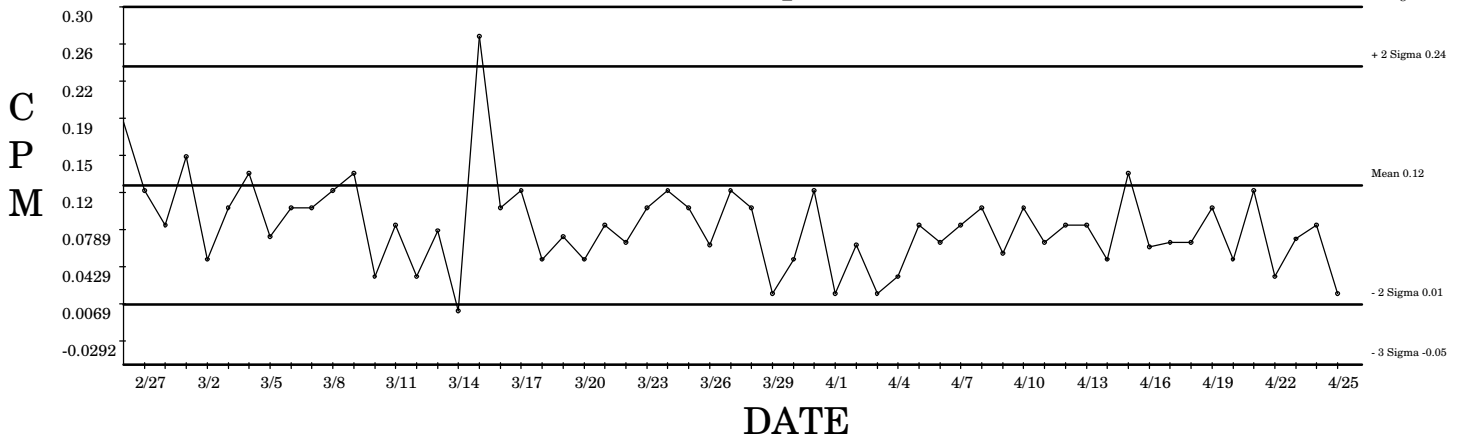


## Beta EFF

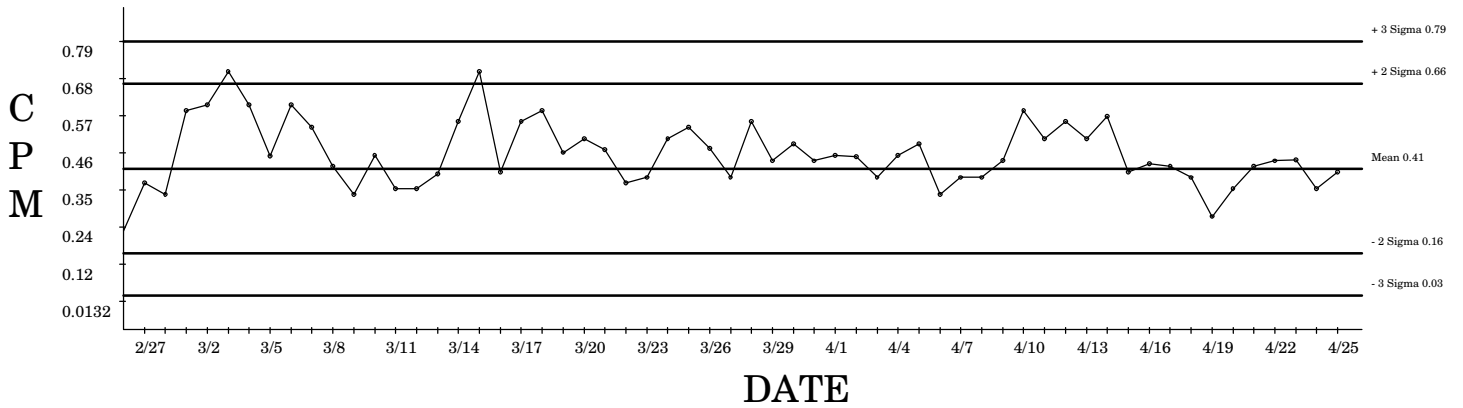


○ Denotes Outlier

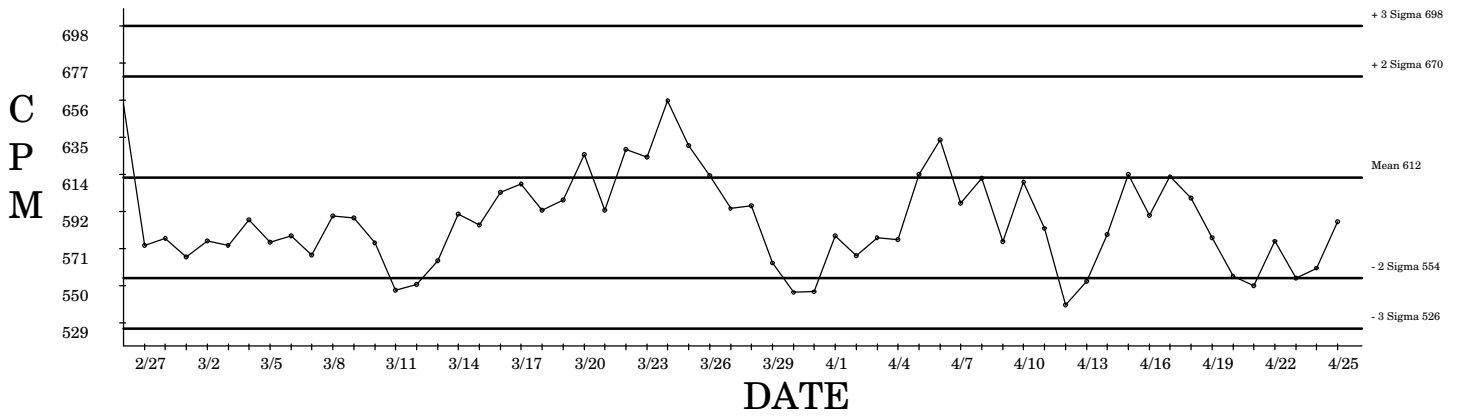
# PIC3C 04/25/2006 Alpha BKG



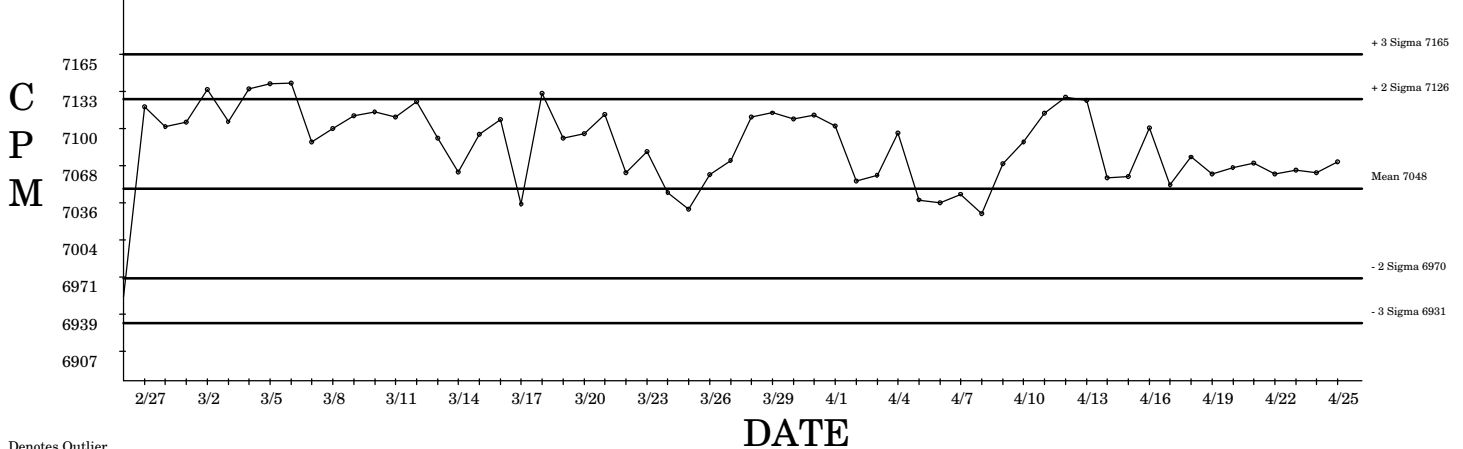
# Beta BKG



# Alpha EFF

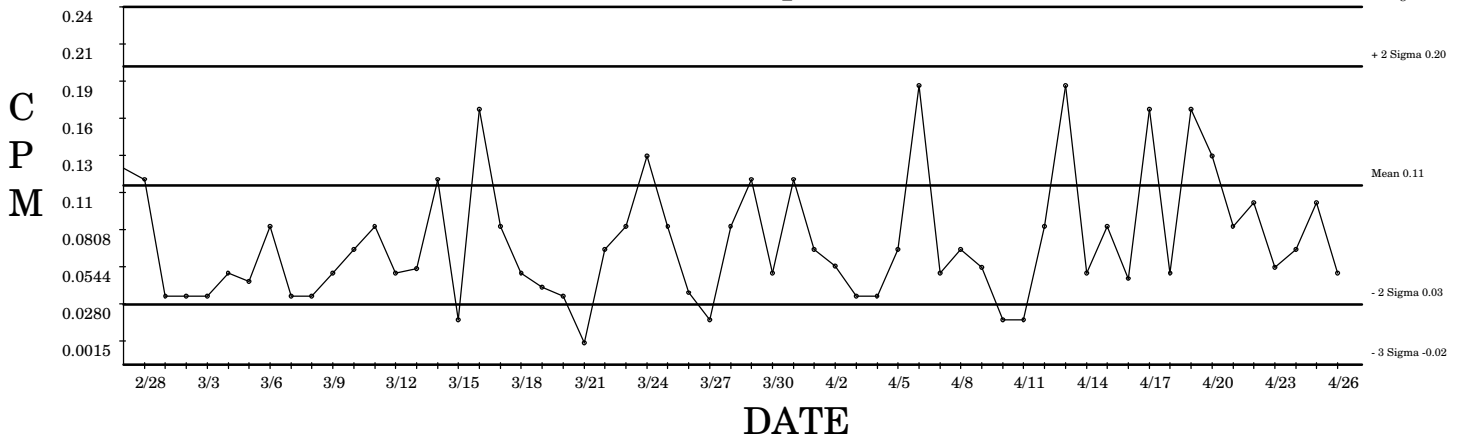


# Beta EFF

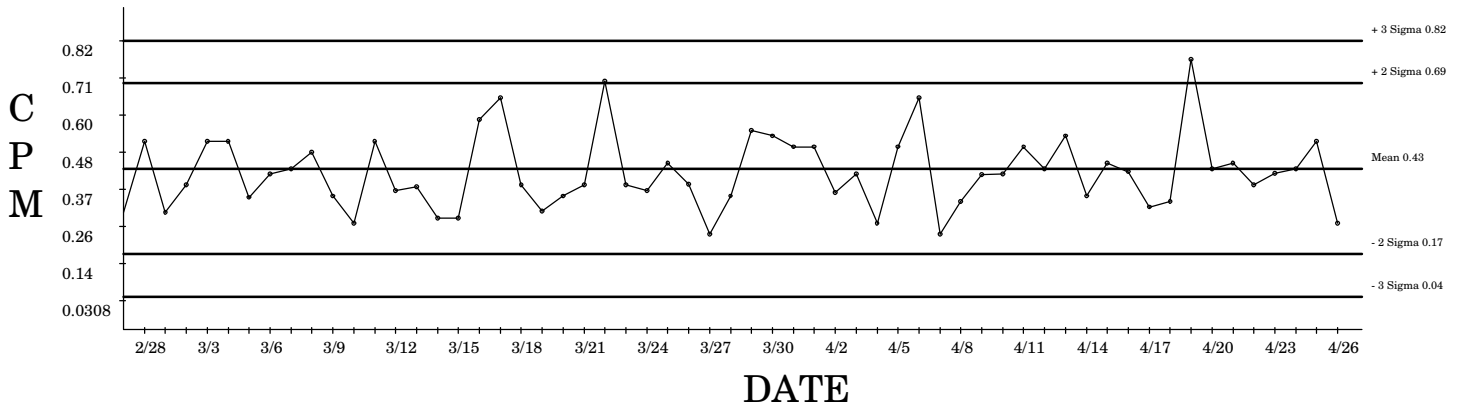


○ Denotes Outlier

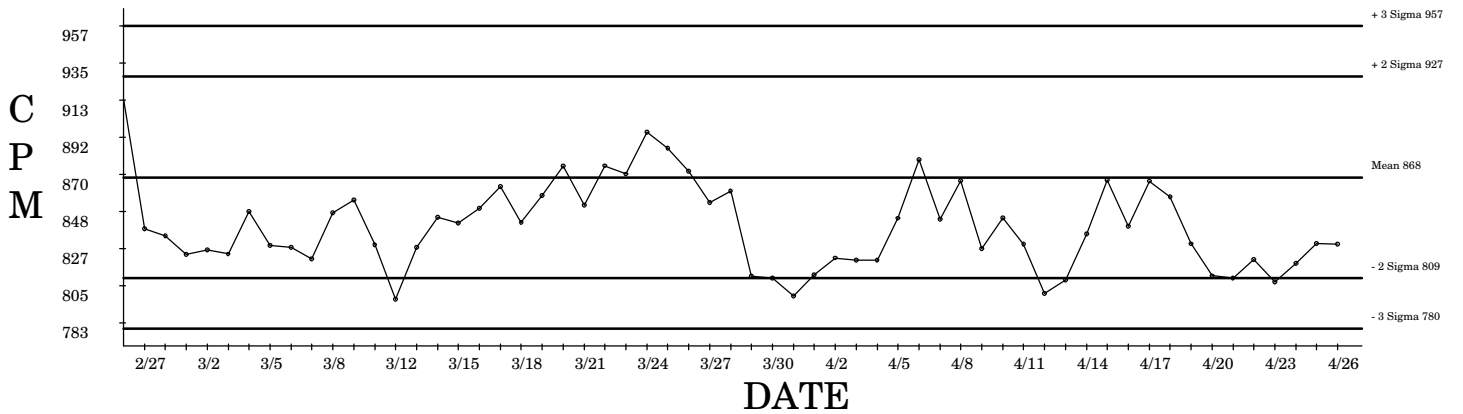
# PIC3D 04/26/2006 Alpha BKG



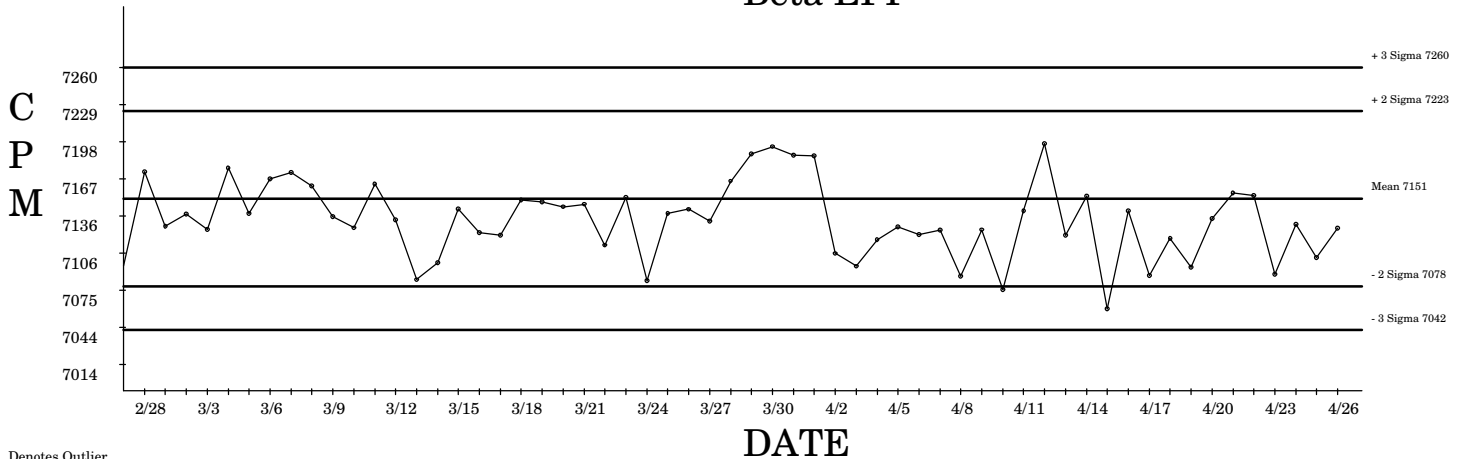
# Beta BKG



# Alpha EFF



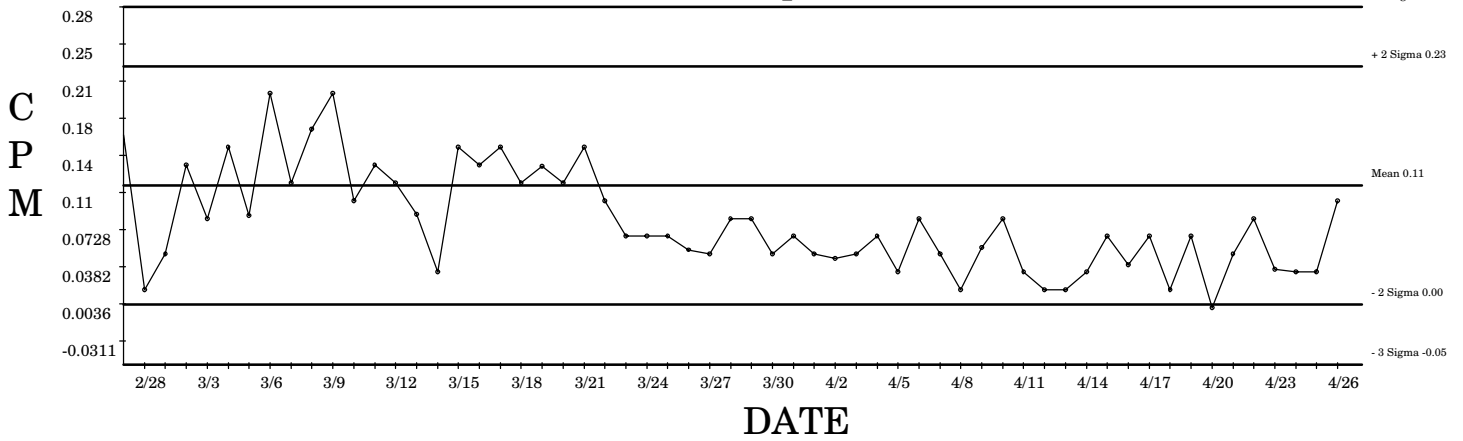
# Beta EFF



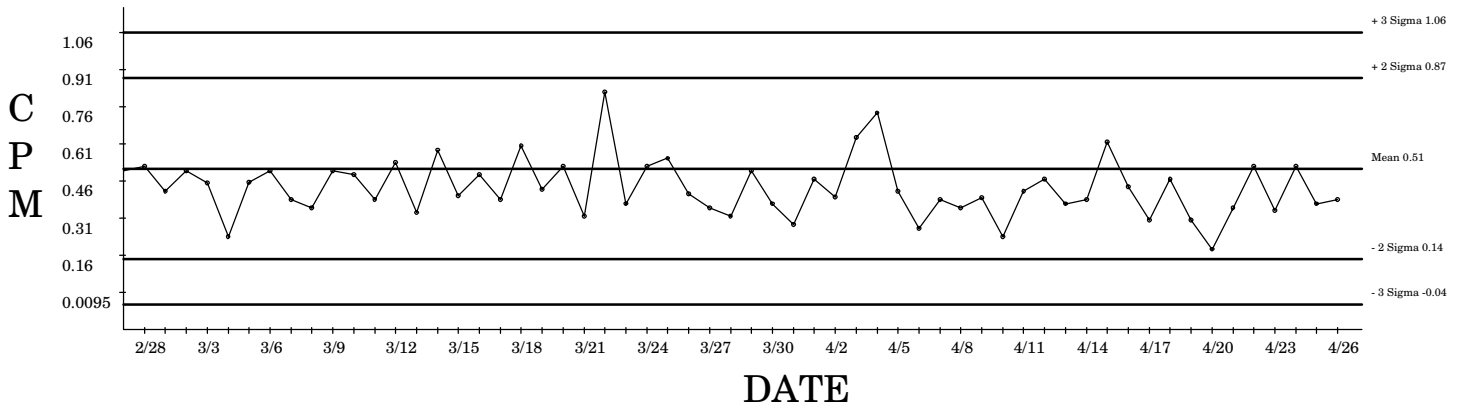
○ Denotes Outlier

# PIC4A 04/26/2006

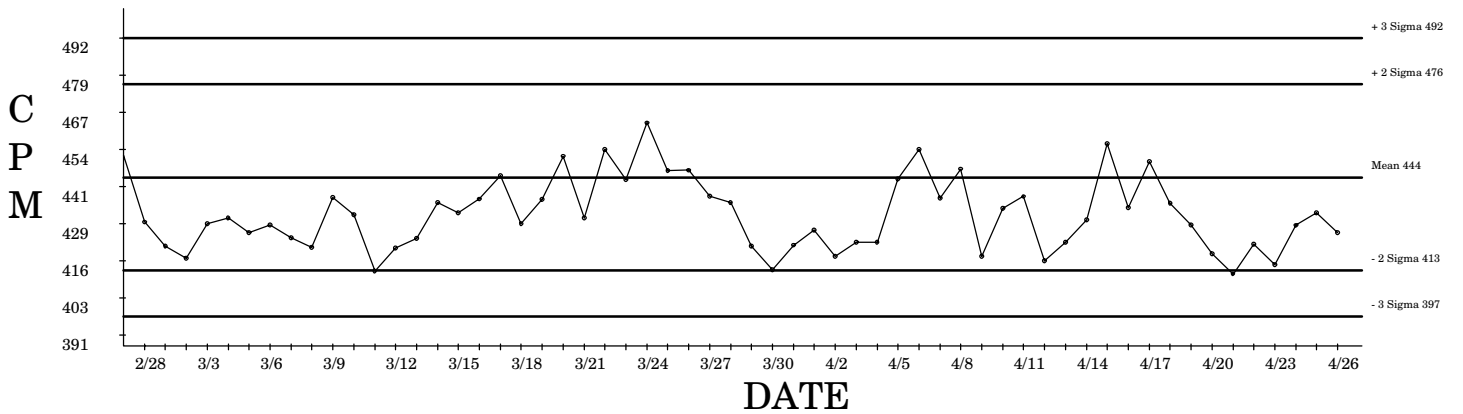
## Alpha BKG



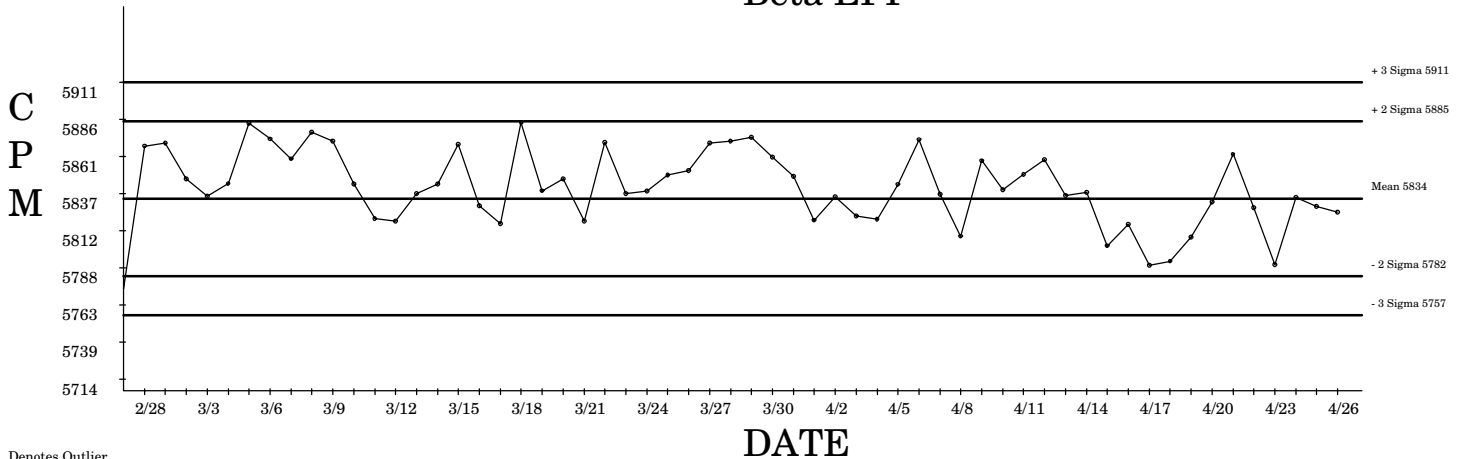
## Beta BKG



## Alpha EFF

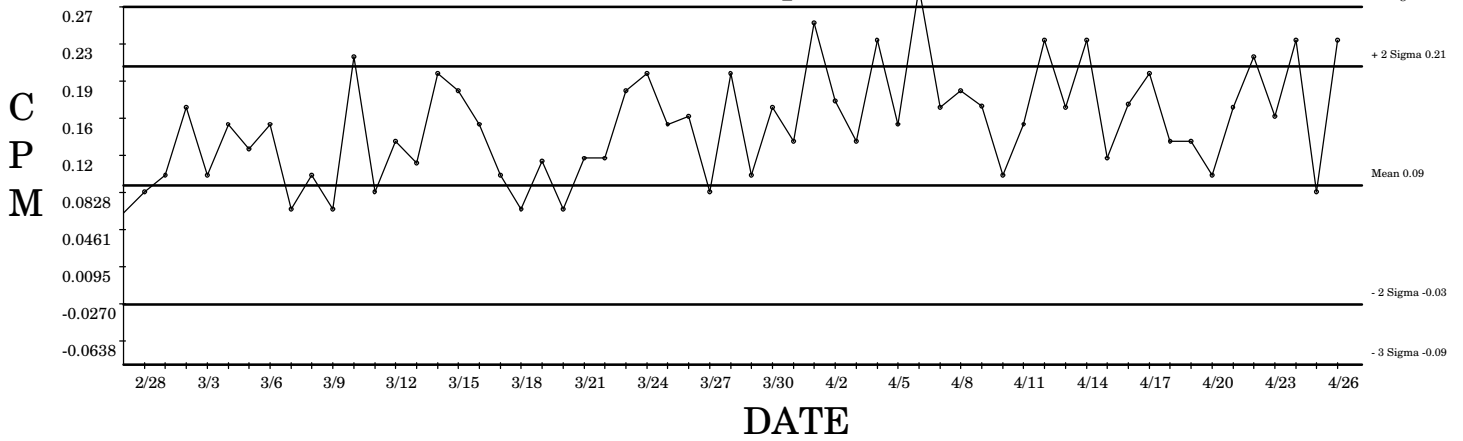


## Beta EFF

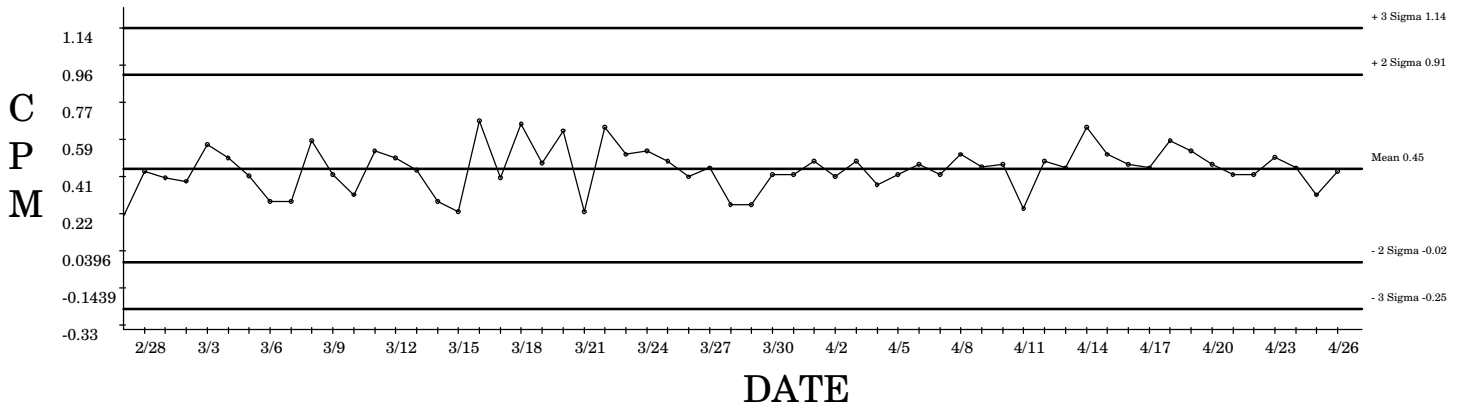


○ Denotes Outlier

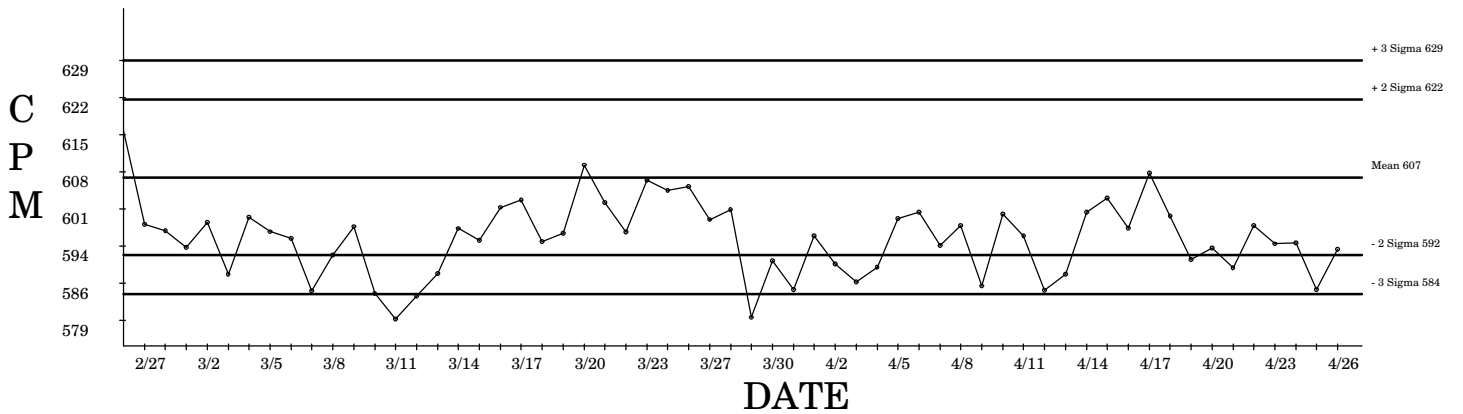
PIC4B 04/26/2006  
Alpha BKG



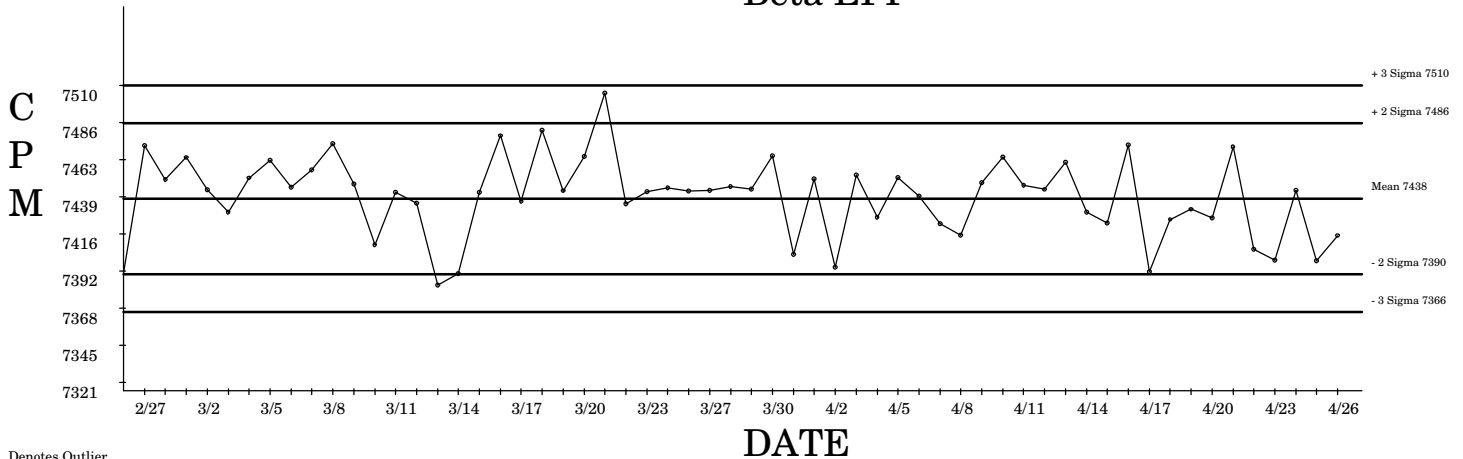
Beta BKG



Alpha EFF



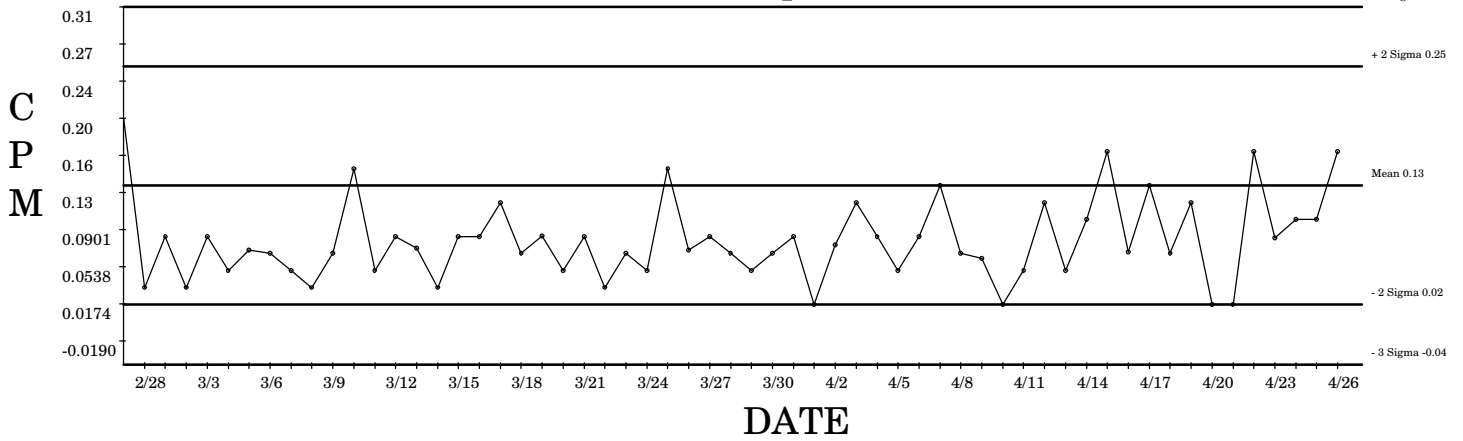
Beta EFF



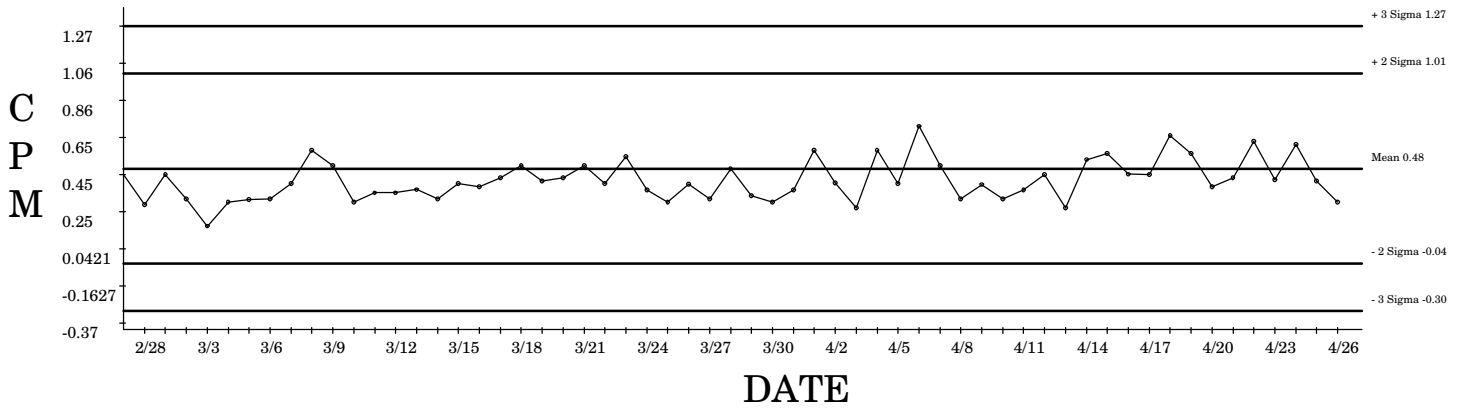
○ Denotes Outlier

# PIC4C 04/26/2006

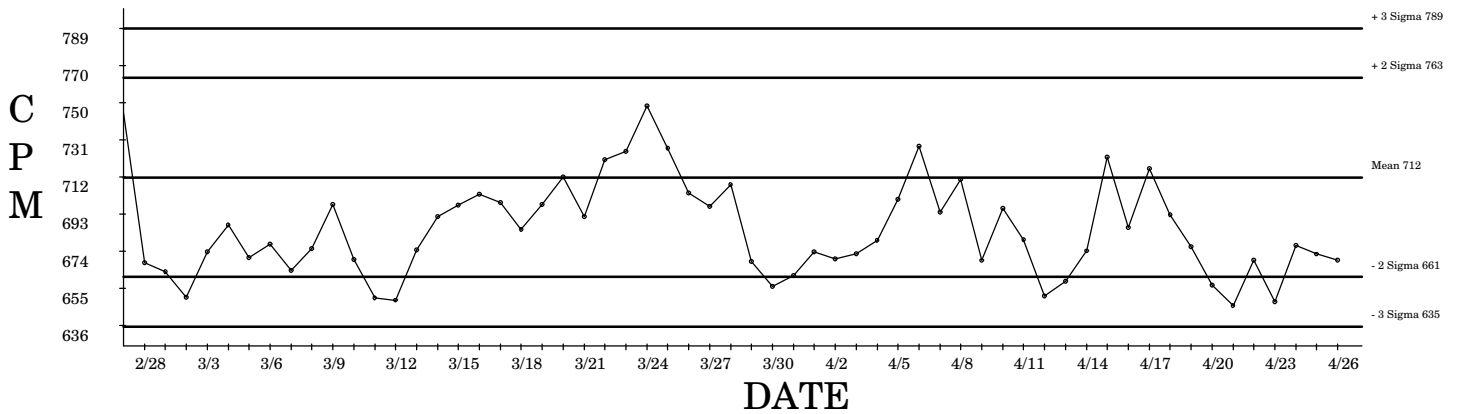
## Alpha BKG



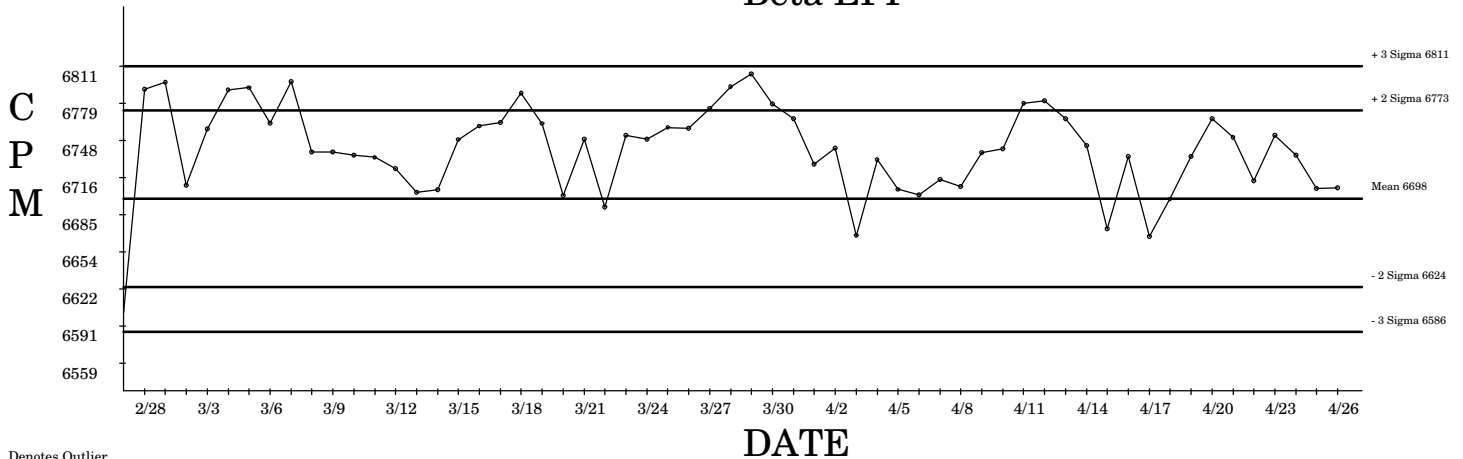
## Beta BKG



## Alpha EFF



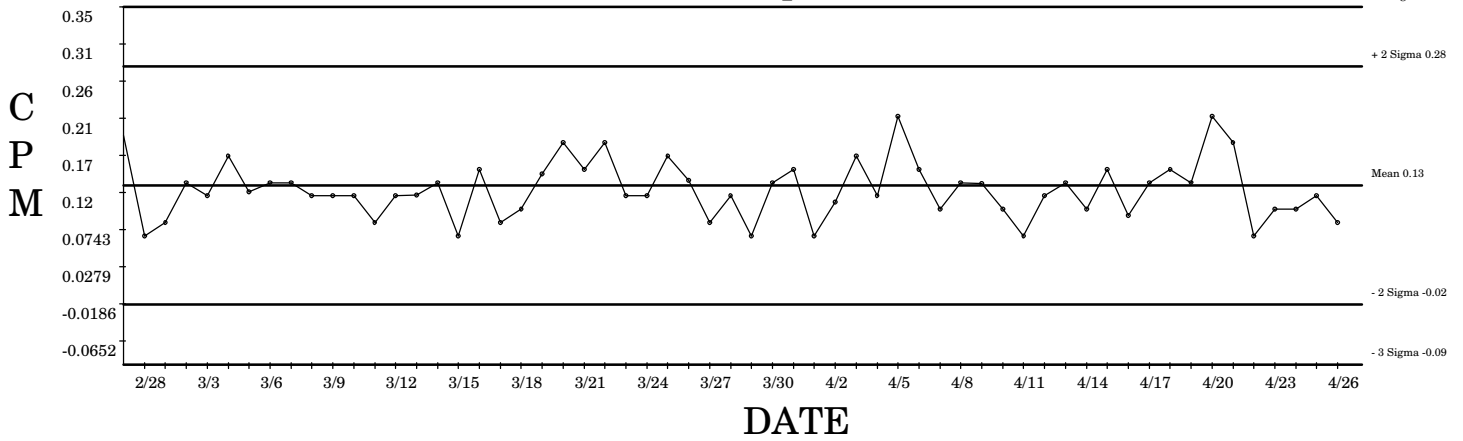
## Beta EFF



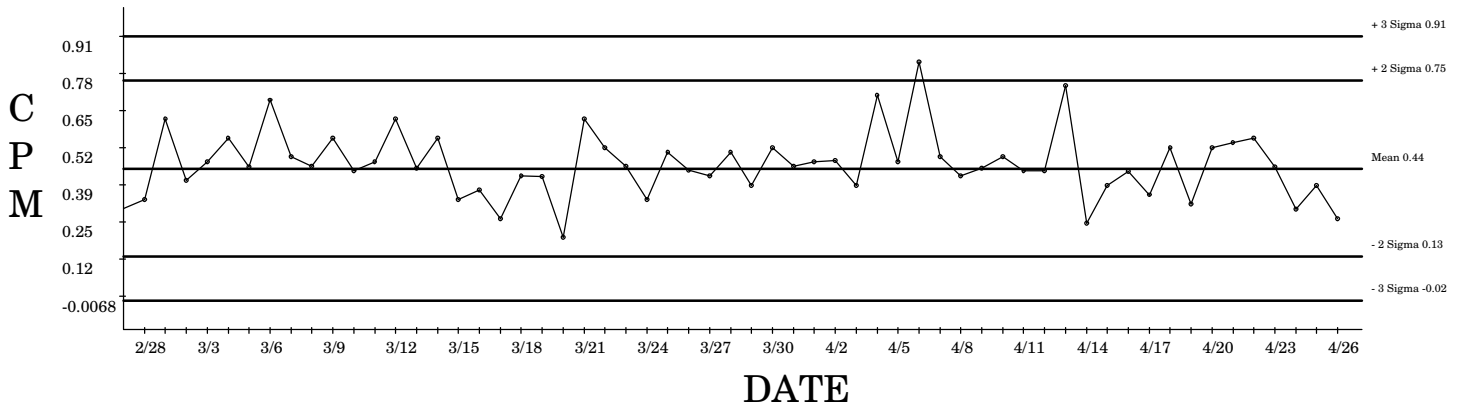
○ Denotes Outlier

# PIC4D 04/26/2006

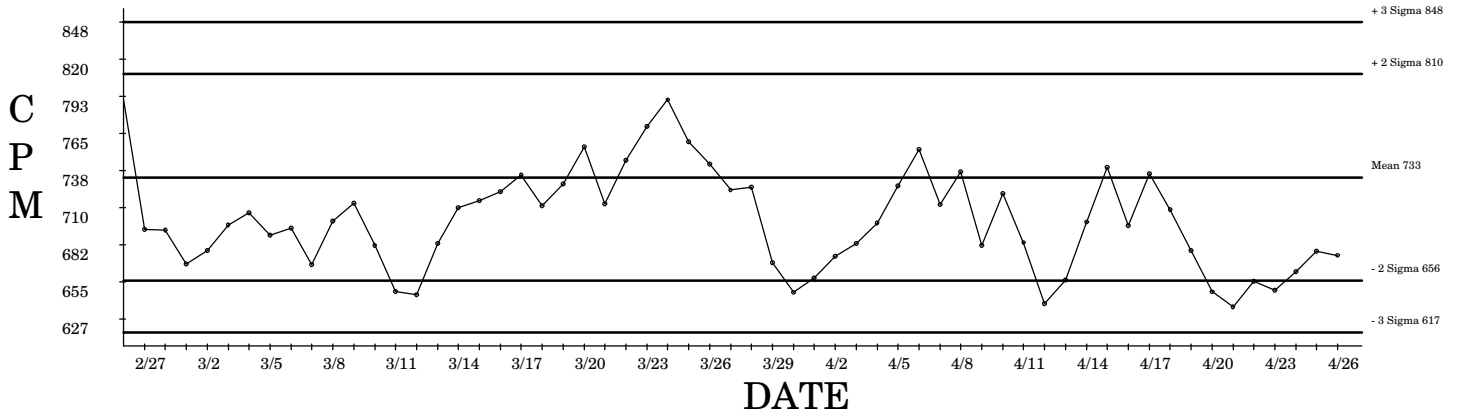
## Alpha BKG



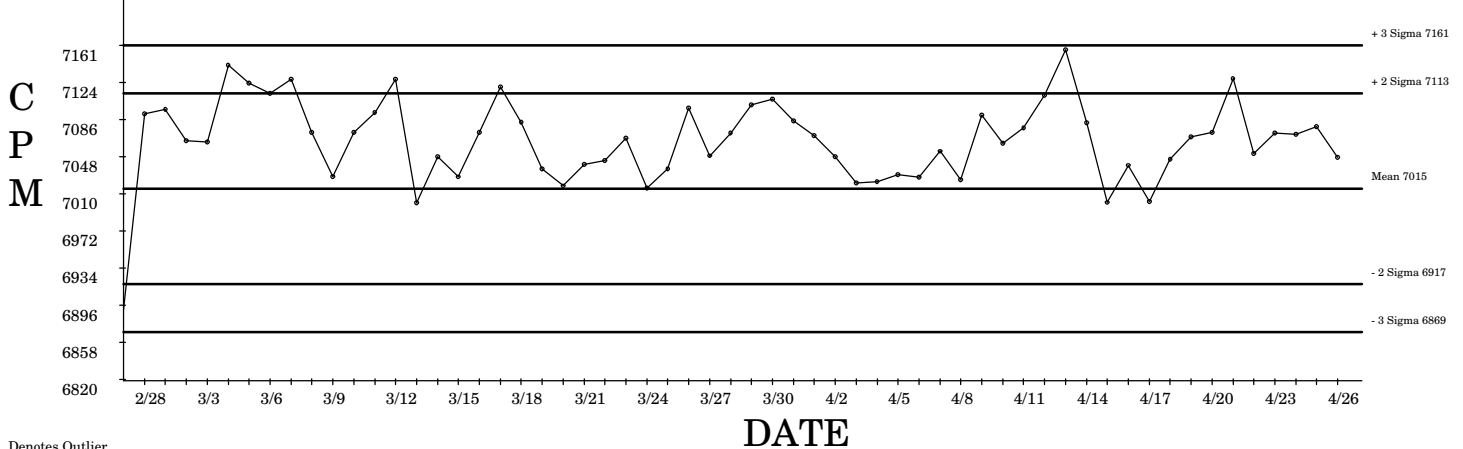
## Beta BKG



## Alpha EFF



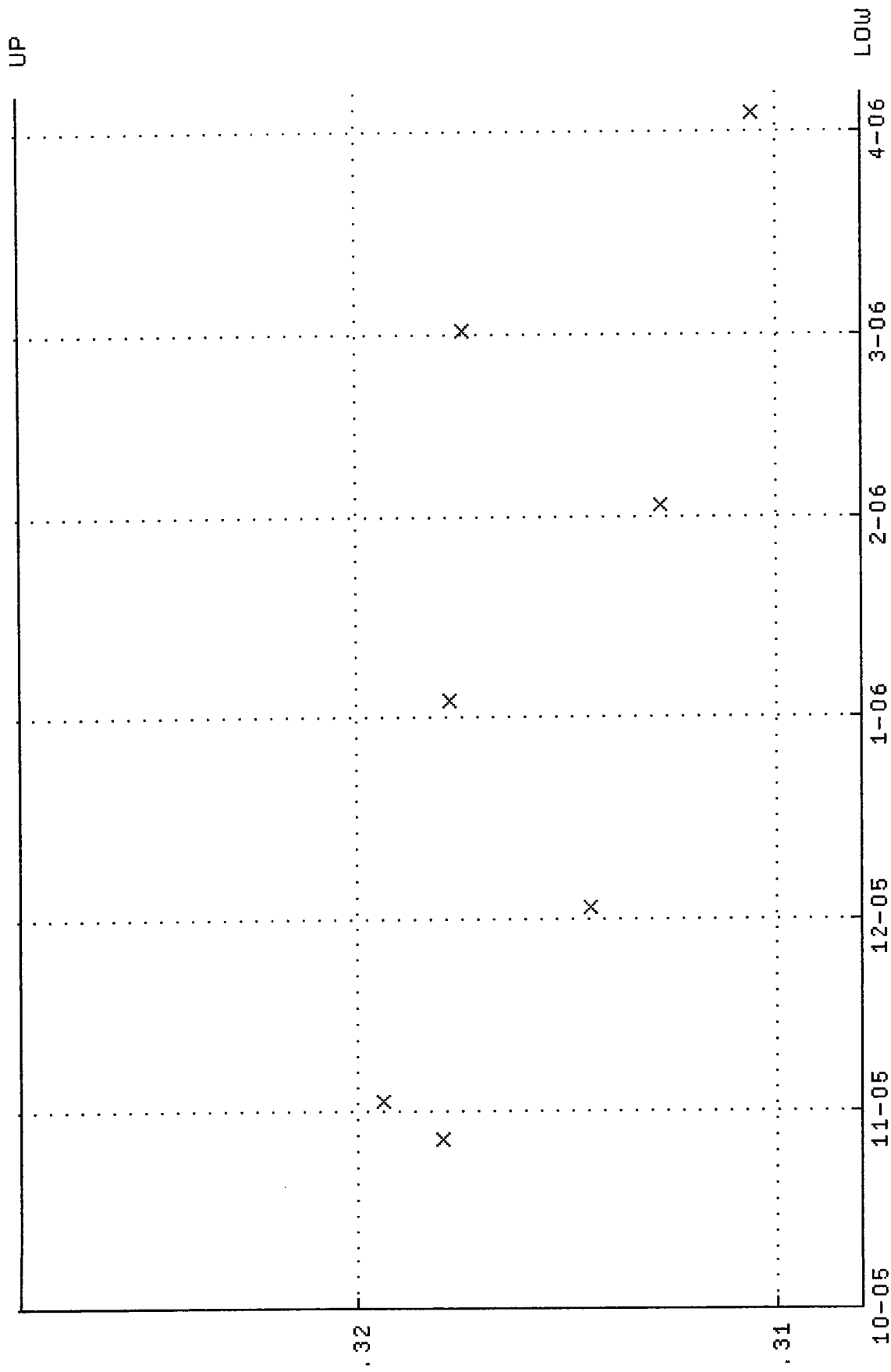
## Beta EFF



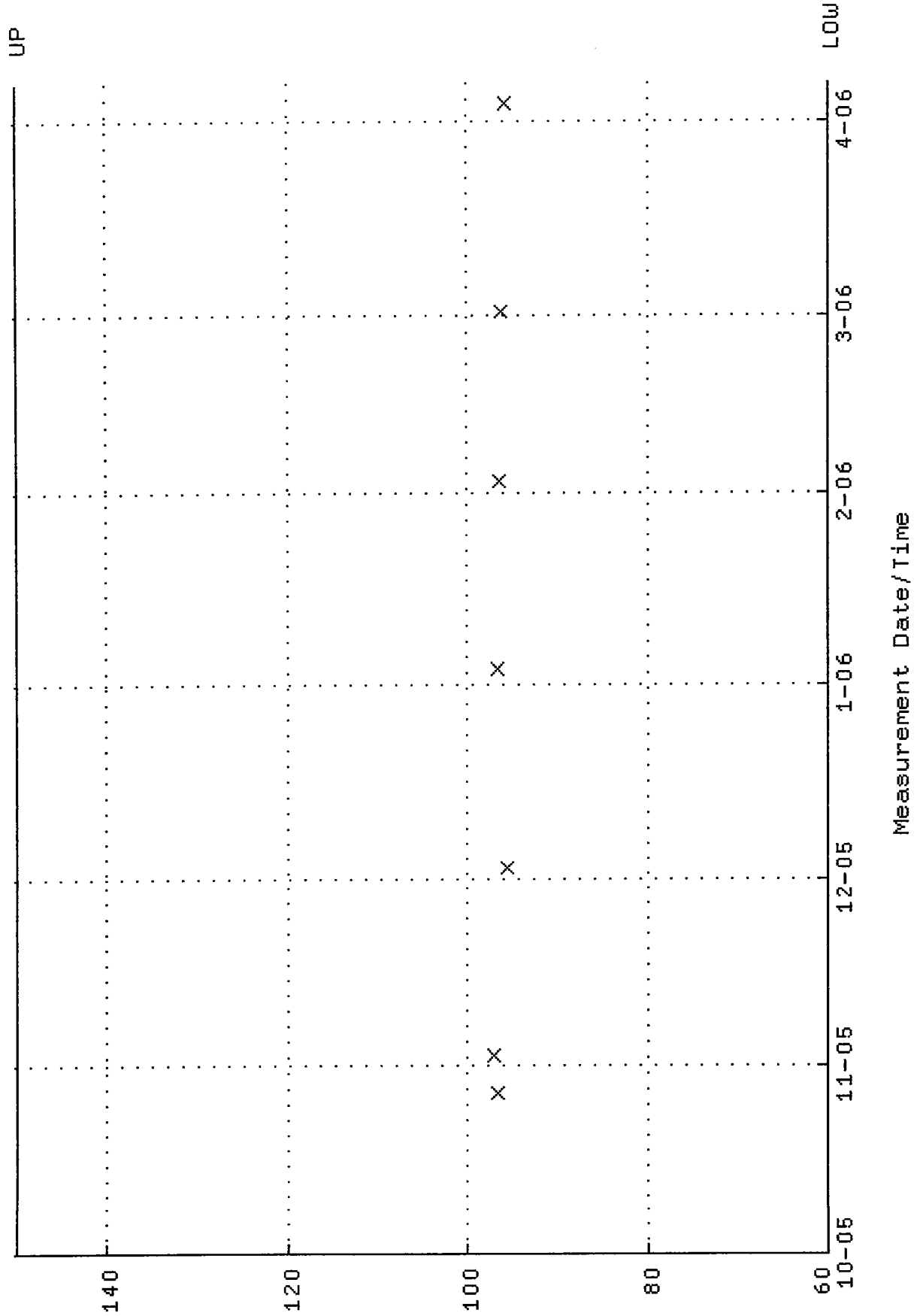
○ Denotes Outlier



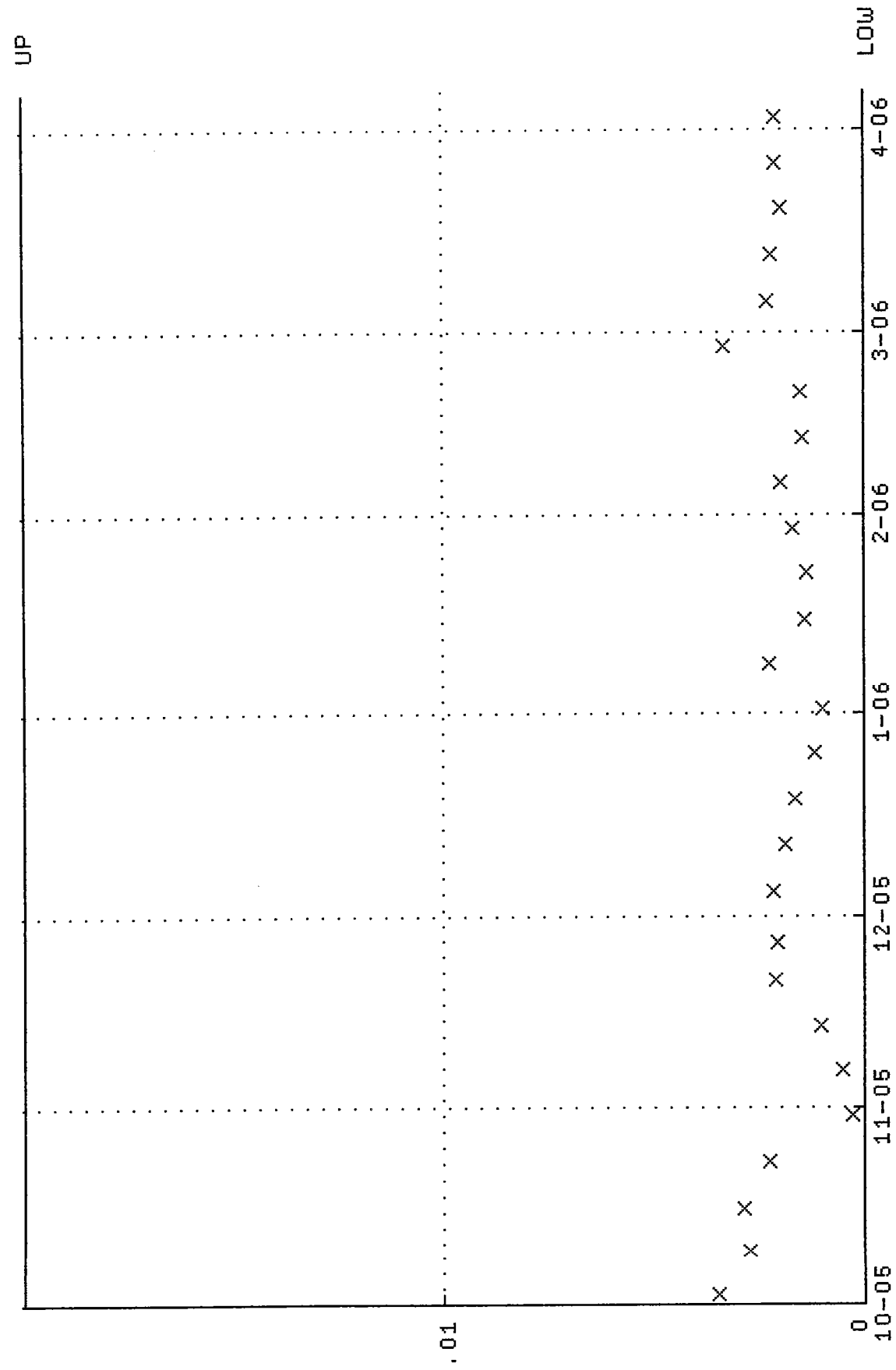
QA filename : DKA100:[ENV\_ALPHA.QA.W]W011.QAF;4  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 27-OCT-2005 08:48:47 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.308000 through 0.328000



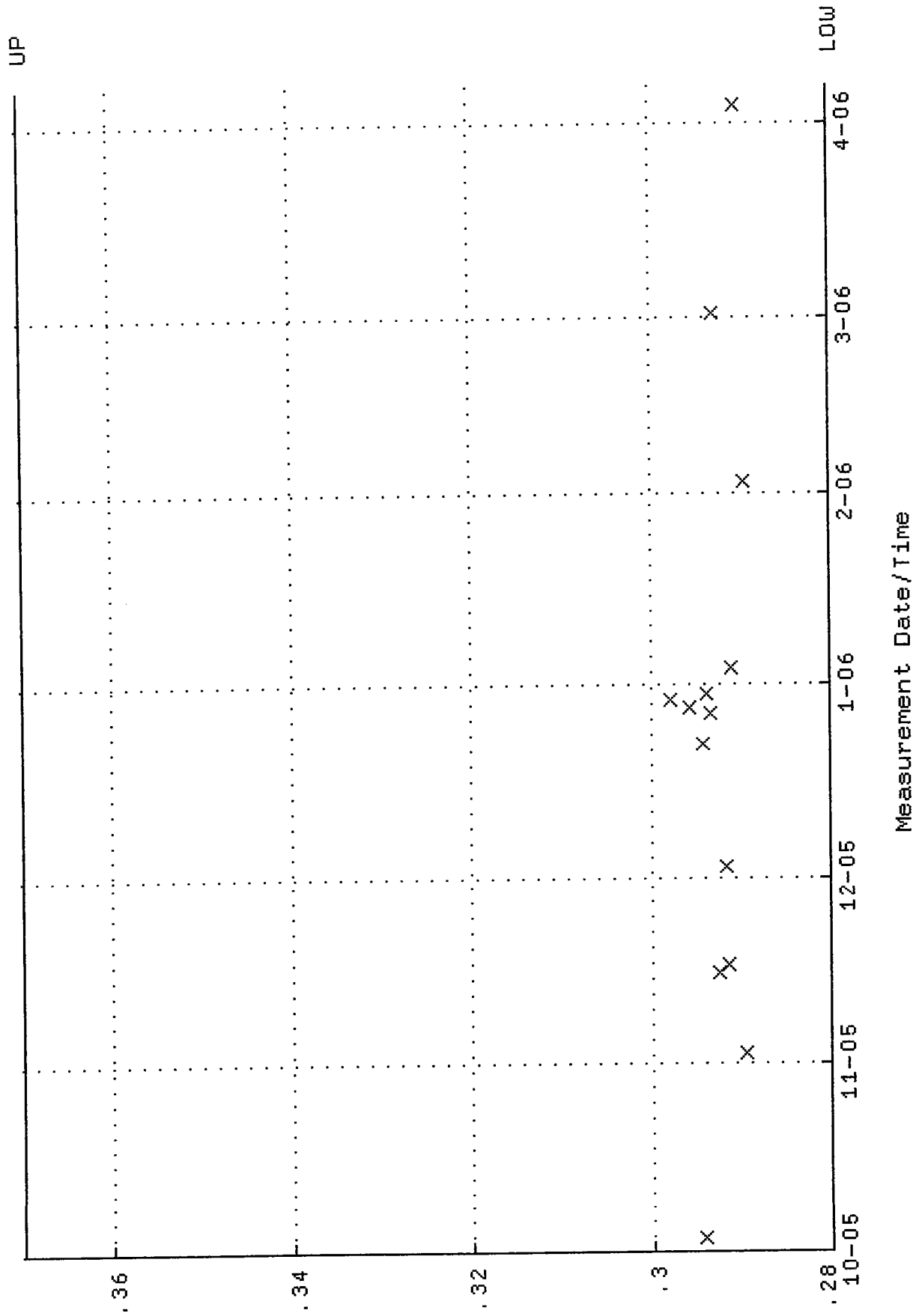
QA filename : DKA100:[ENV\_ALPHA.QA.W]W011.QAF;4  
 Parameter Name : NACTIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 27-OCT-2005 08:48:47 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.0000



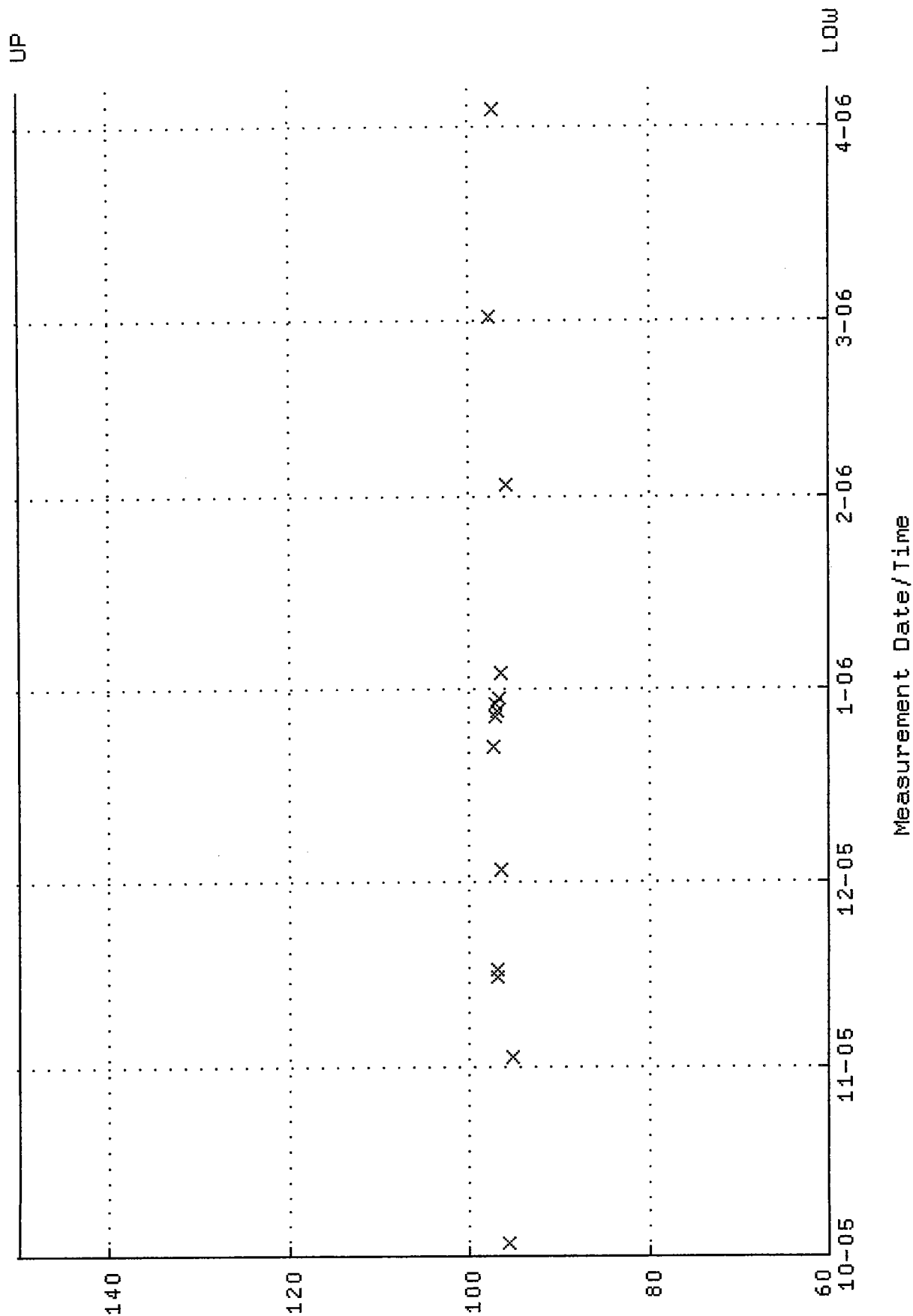
QA filename : DKA100:[ENV\_ALPHA.QA,B]B011.QAF;2  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:25:39 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



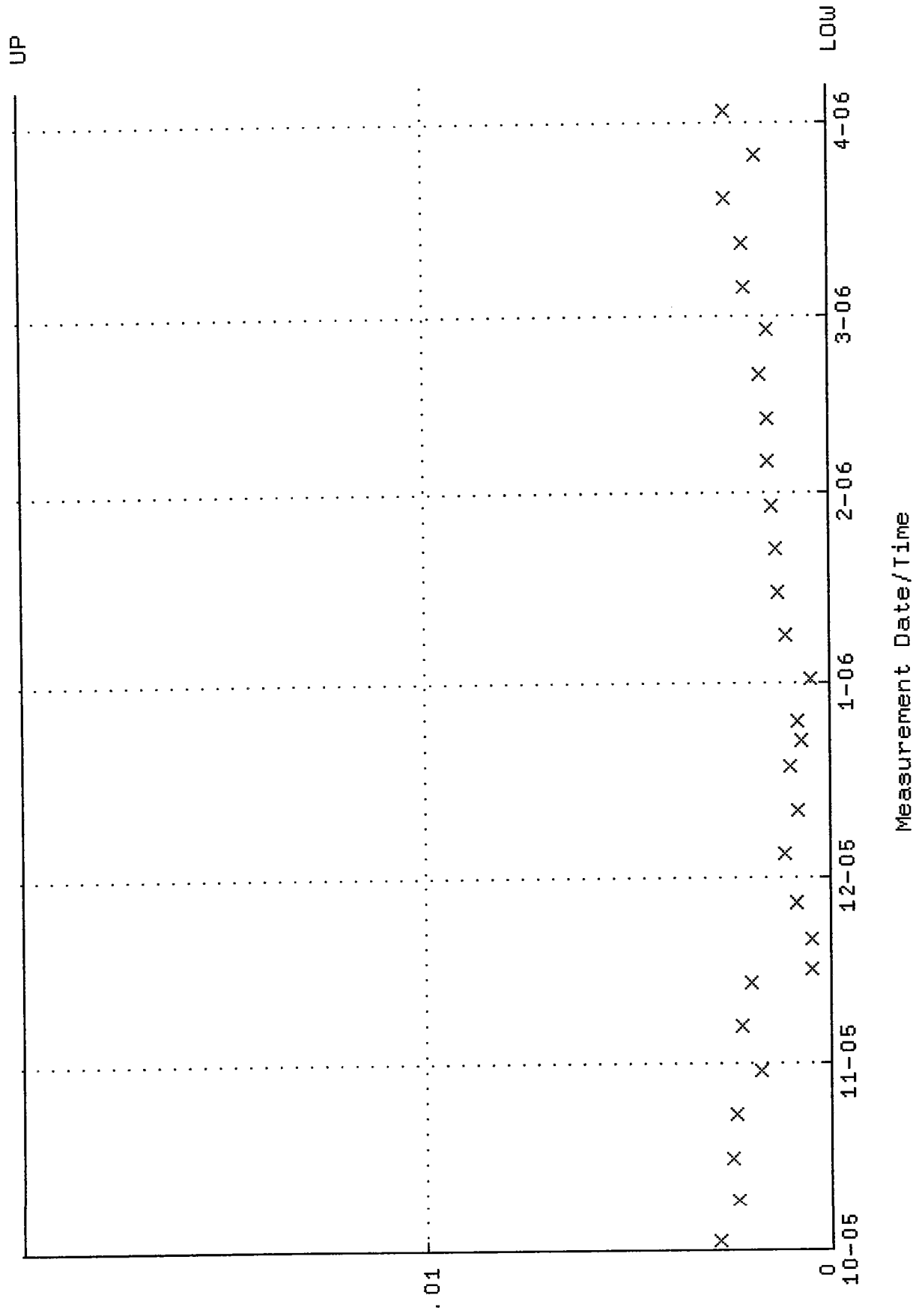
QA filename : DKA100:[ENV\_ALPHA.QA.W]W017.QAF;4  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 3-OCT-2005 07:10:41 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.280000 through 0.370000



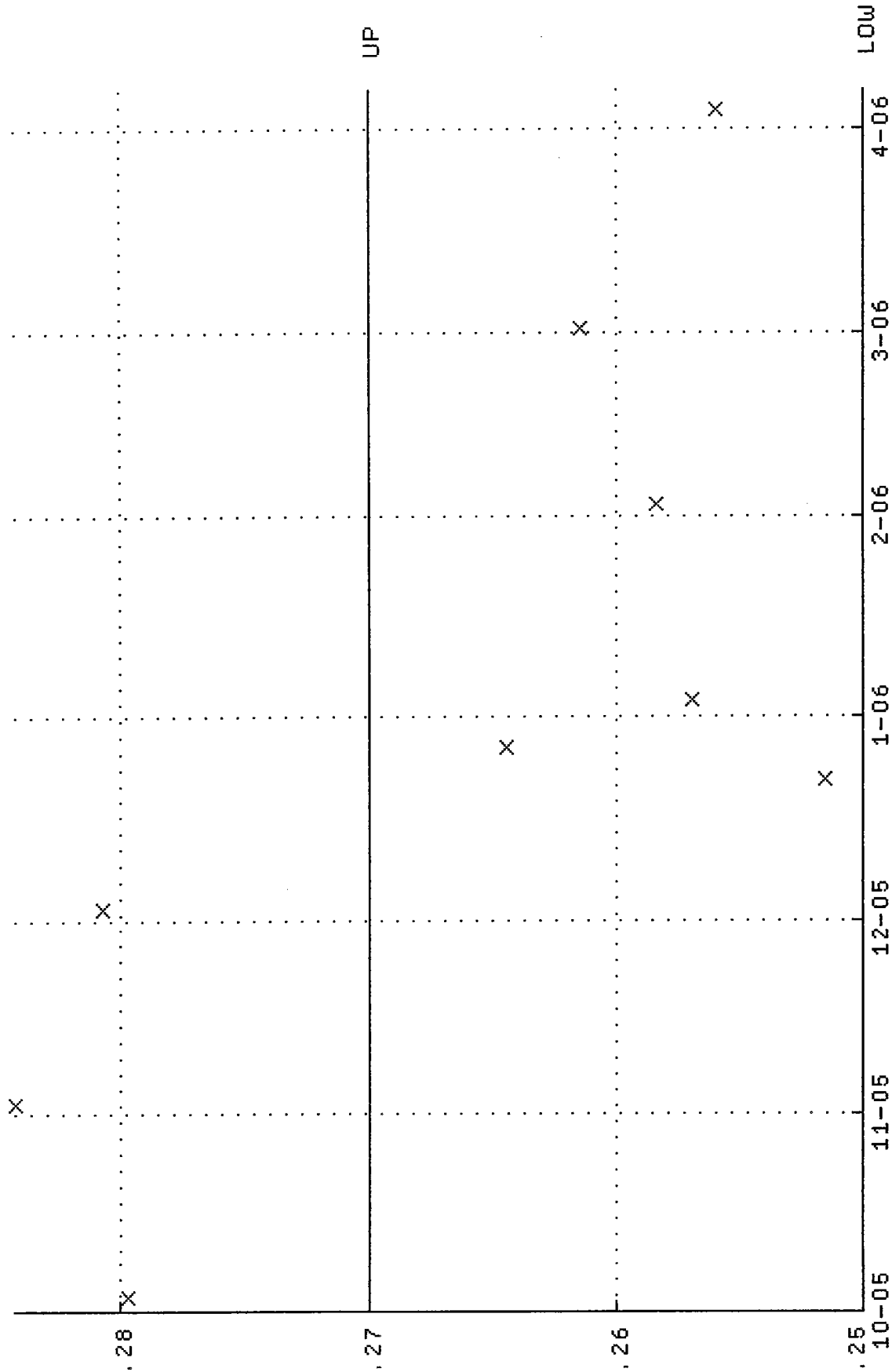
QA filename : DKA100:[ENV\_ALPHA.QA.W]W017.QAF;4  
 Parameter Name : NACTIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 3-OCT-2005 07:10:41 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.0000



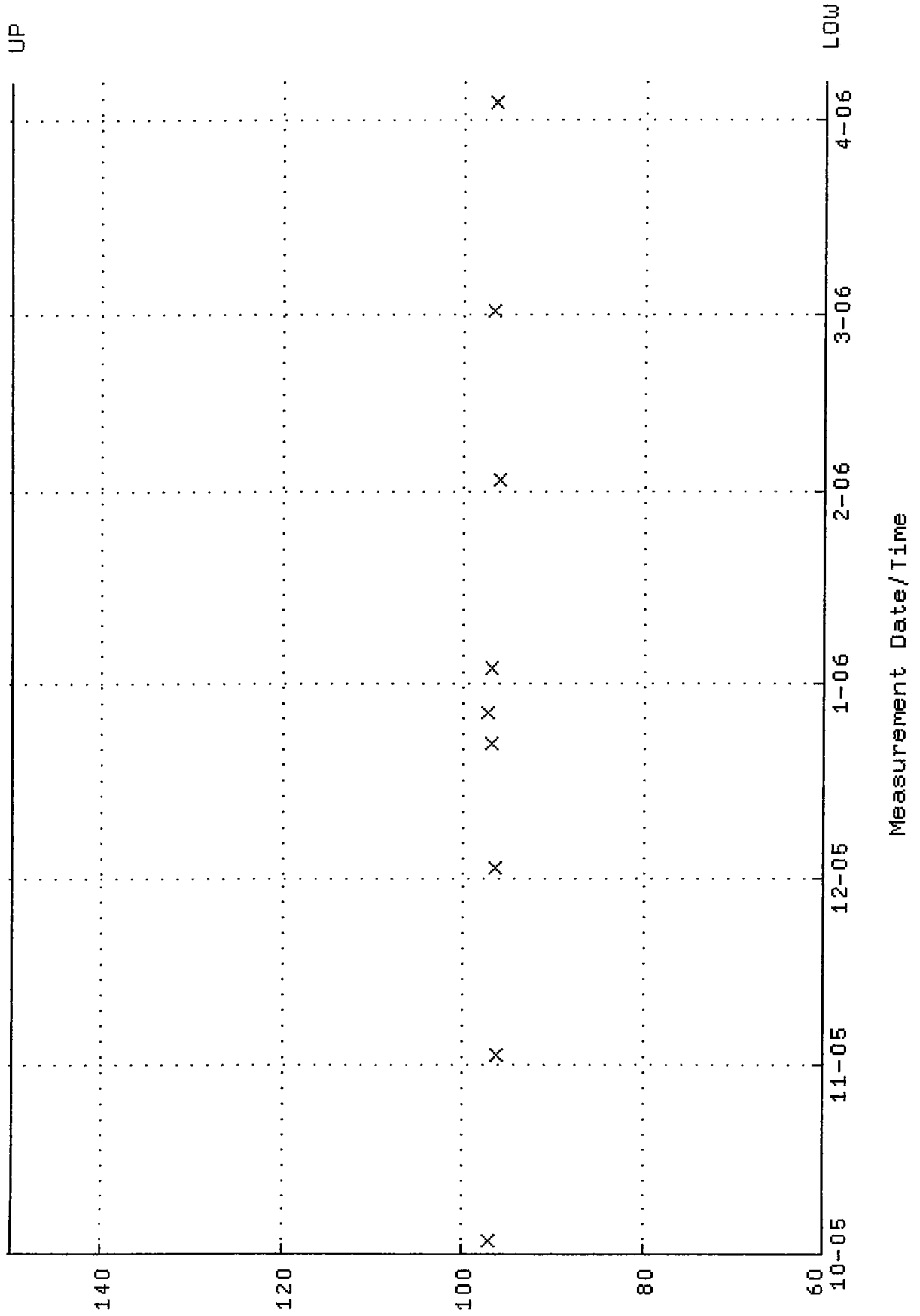
QA filename : DKA100:[ENV\_ALPHA.QA.B]B017.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:25:40 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



QA filename : DKA100:[ENV\_ALPHA.QA.W]W018.QAF;3  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 3-OCT-2005 07:10:41 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.250000 through 0.270000

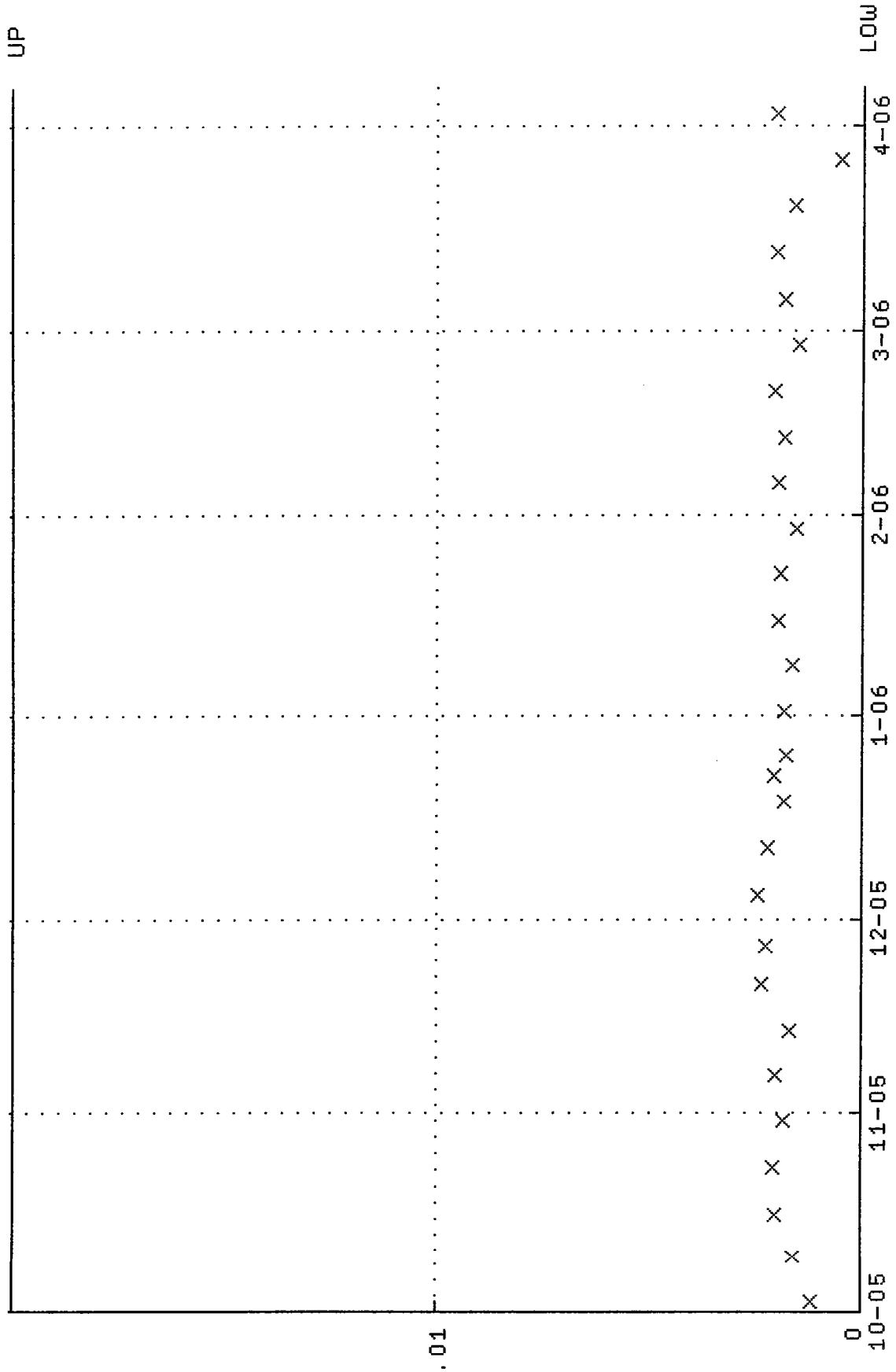


QA filename : DKA100:[ENV\_ALPHA,QA,W]W018.QAF;3  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 3-OCT-2005 07:10:41 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.0000

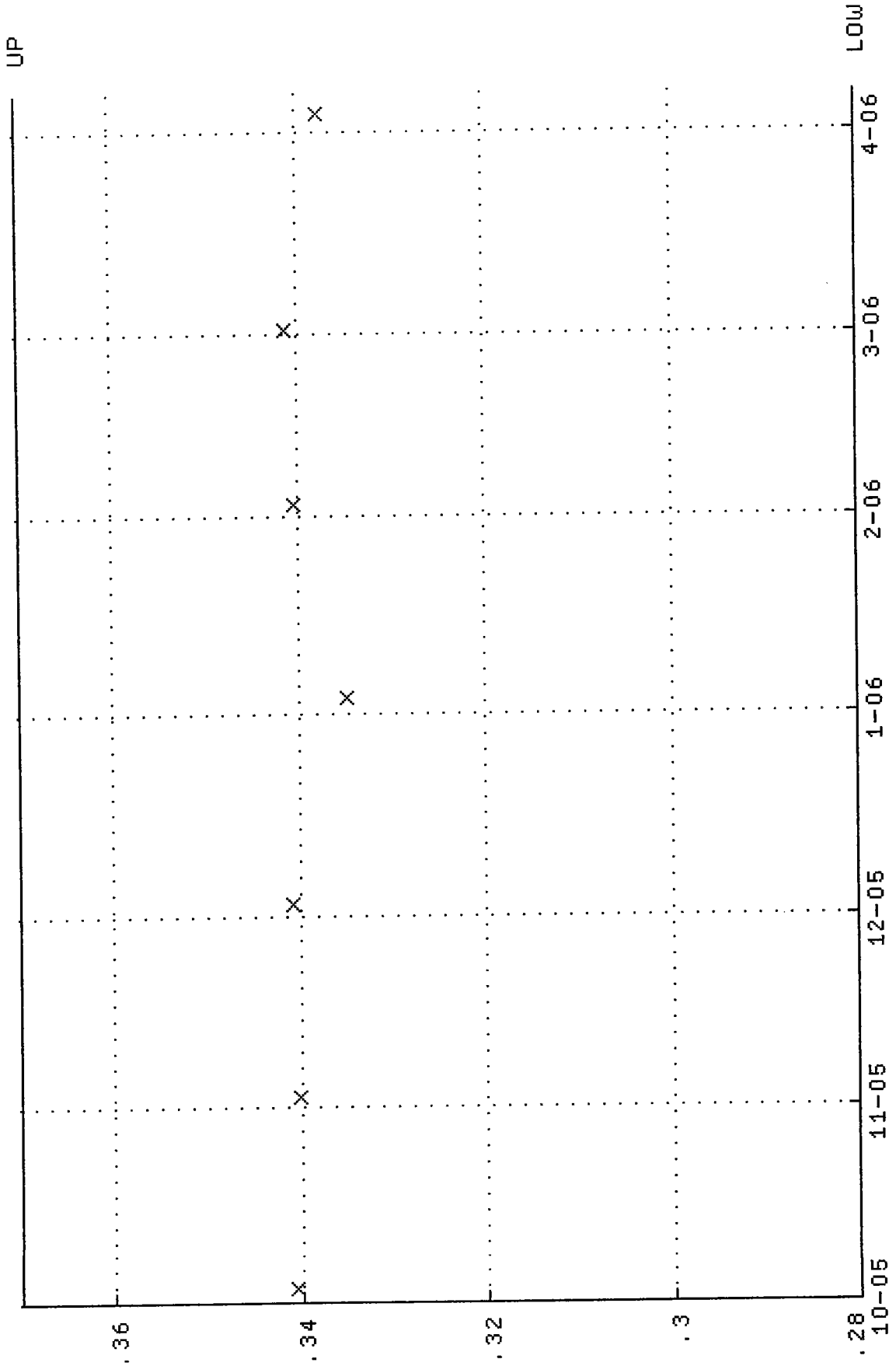




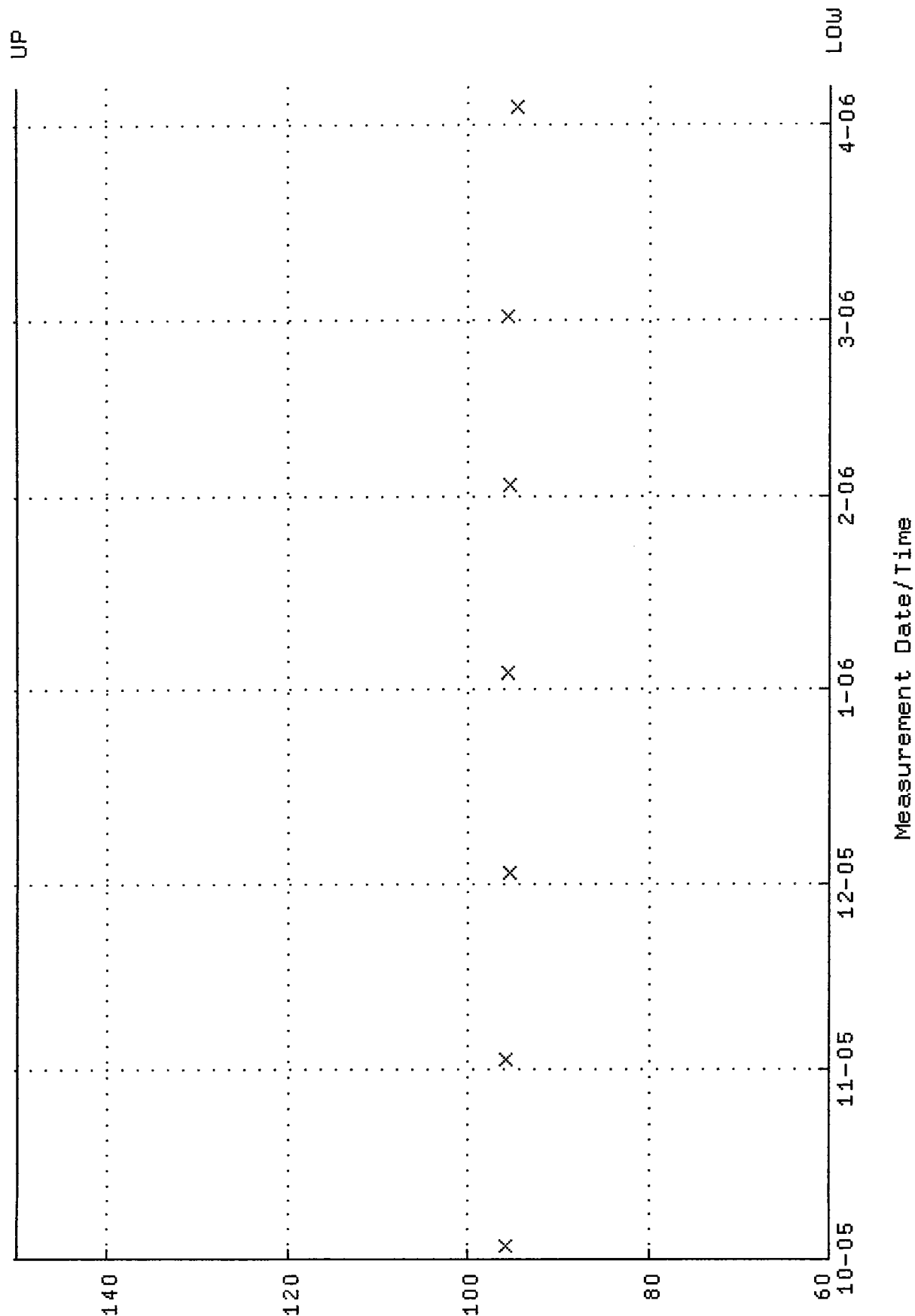
QA filename : DKA100:[ENV\_ALPHA,QA,B]B018.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:25:40 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



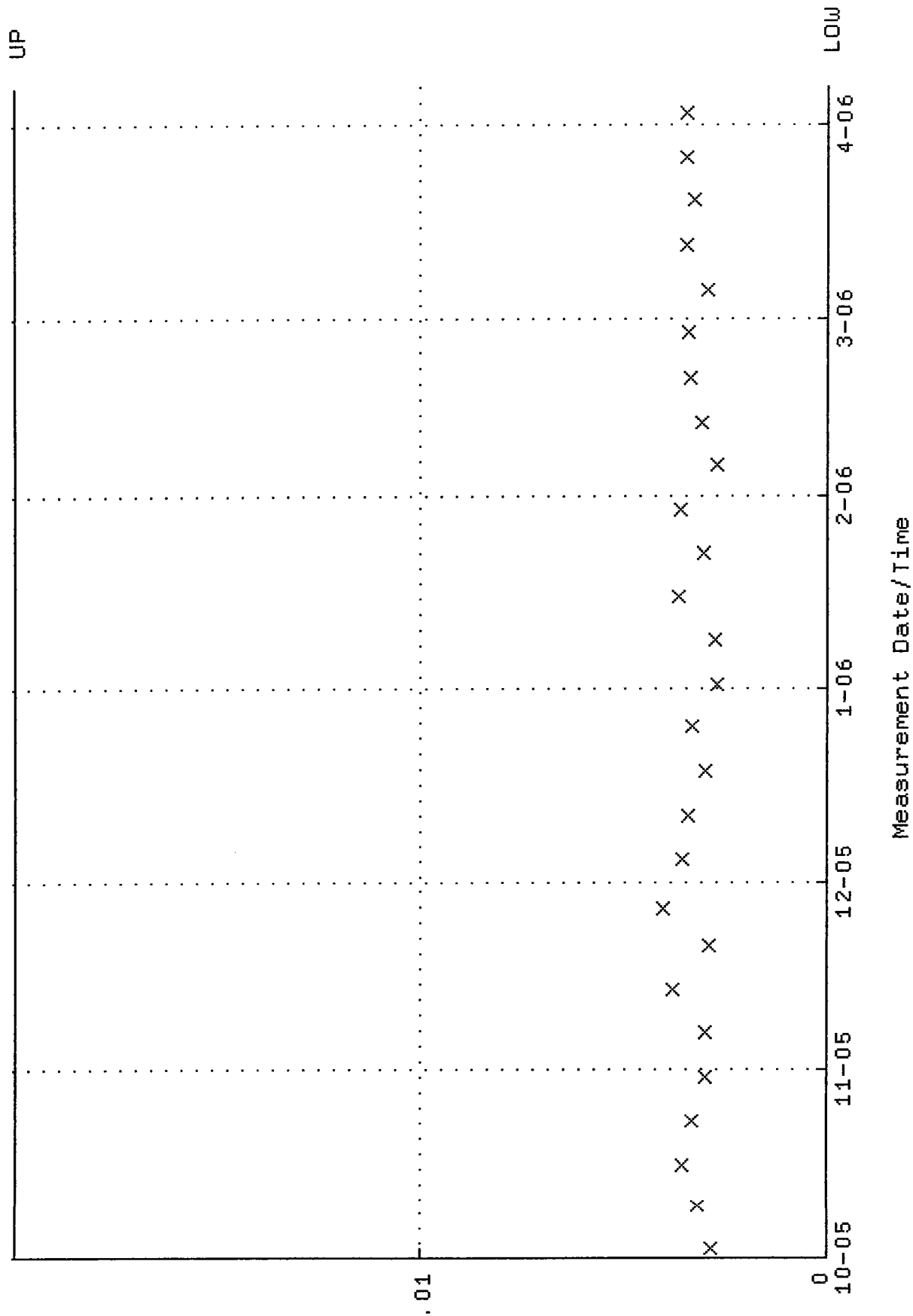
QA filename : DKA100:[ENV\_ALPHA.QA.W]W020.QAF;3  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 3-OCT-2005 07:10:43 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.280000 through 0.370000



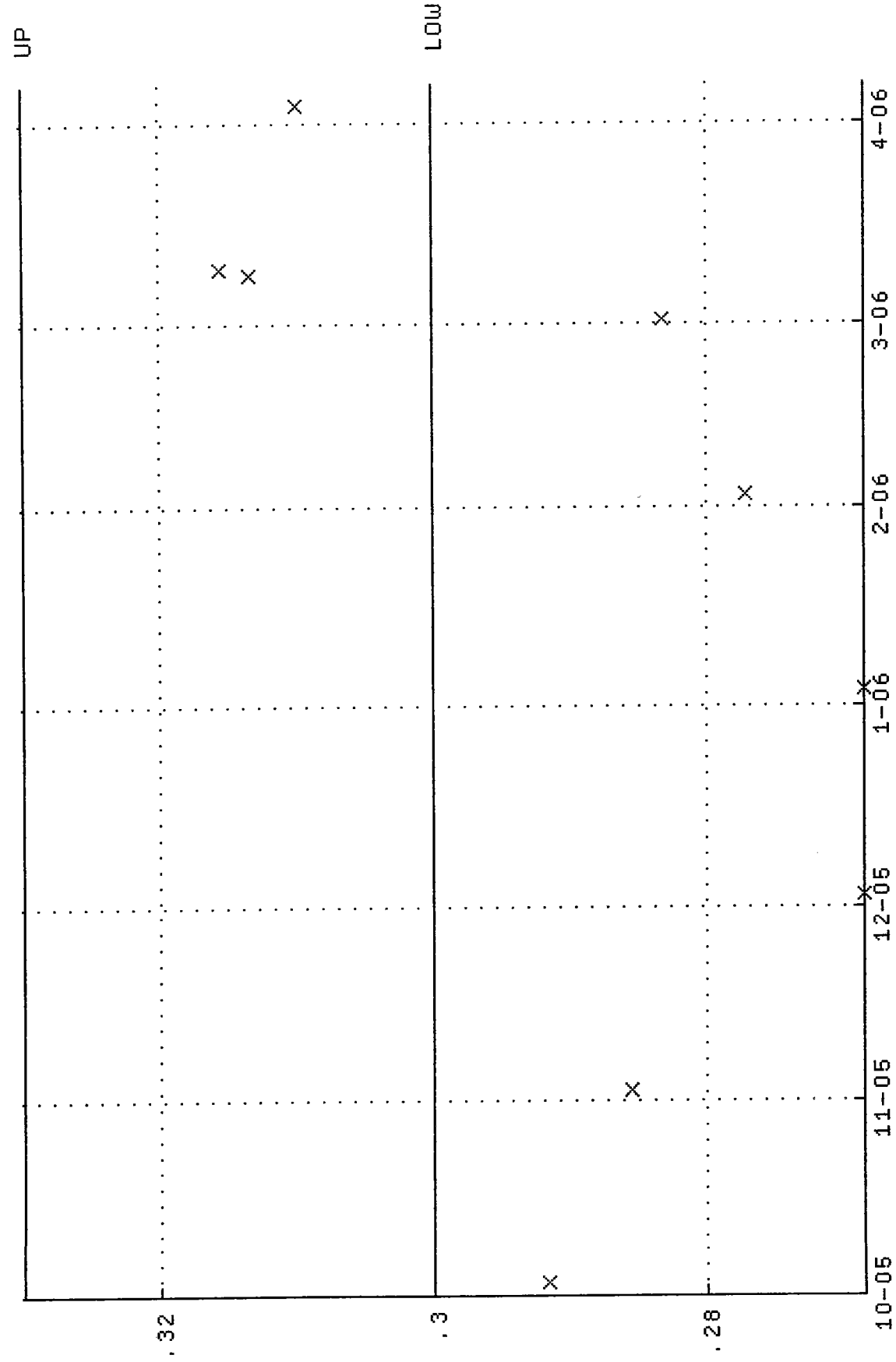
QA filename : DKA100:[ENV\_ALPHA.QA.W]W020.QAF;3  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 3-OCT-2005 07:10:43 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.000



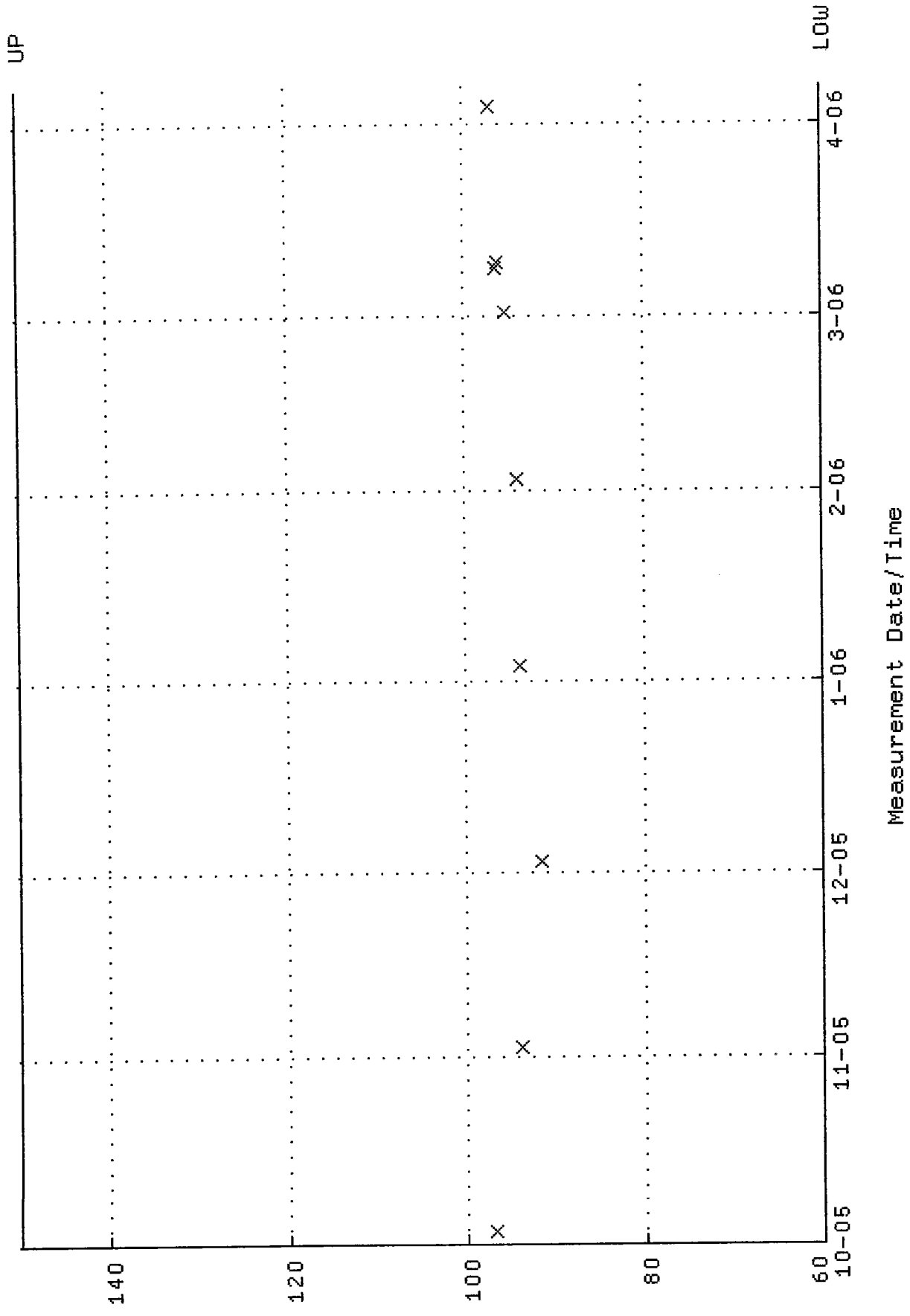
QA filename : DKA100:[ENV\_ALPHA.QA.B]B020.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:25:41 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



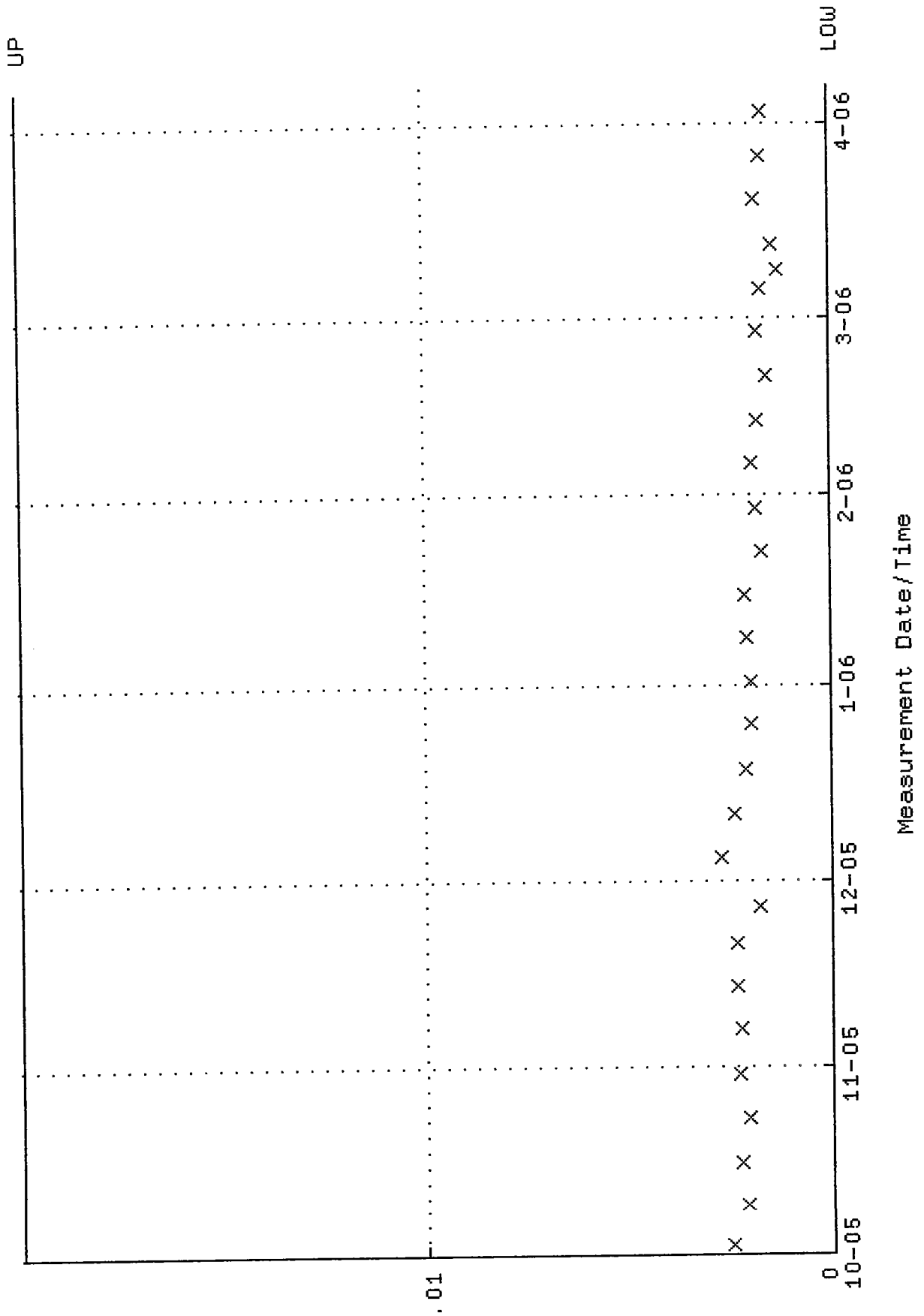
QA filename : DKA100:[ENV\_ALPHA.QA.W]W021.QAF;4  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 3-OCT-2005 07:10:43 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.300000 through 0.330000



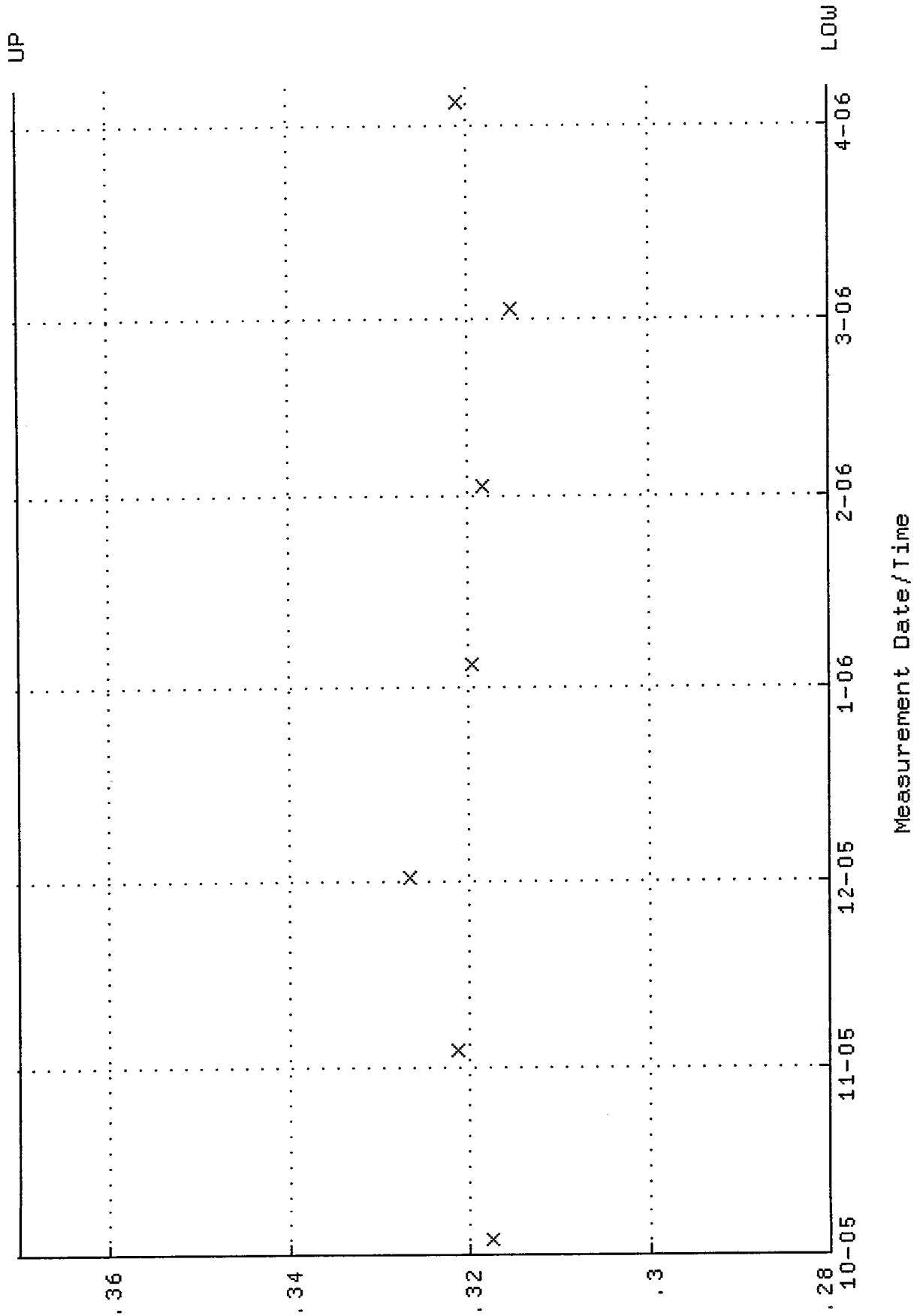
QA filename : DKA100:[ENV\_ALPHA.QA.W]W021.QAF;4  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 3-OCT-2005 07:10:43 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.0000



QA filename : DKA100:[ENV\_ALPHA.QA.B]B021.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:25:41 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02

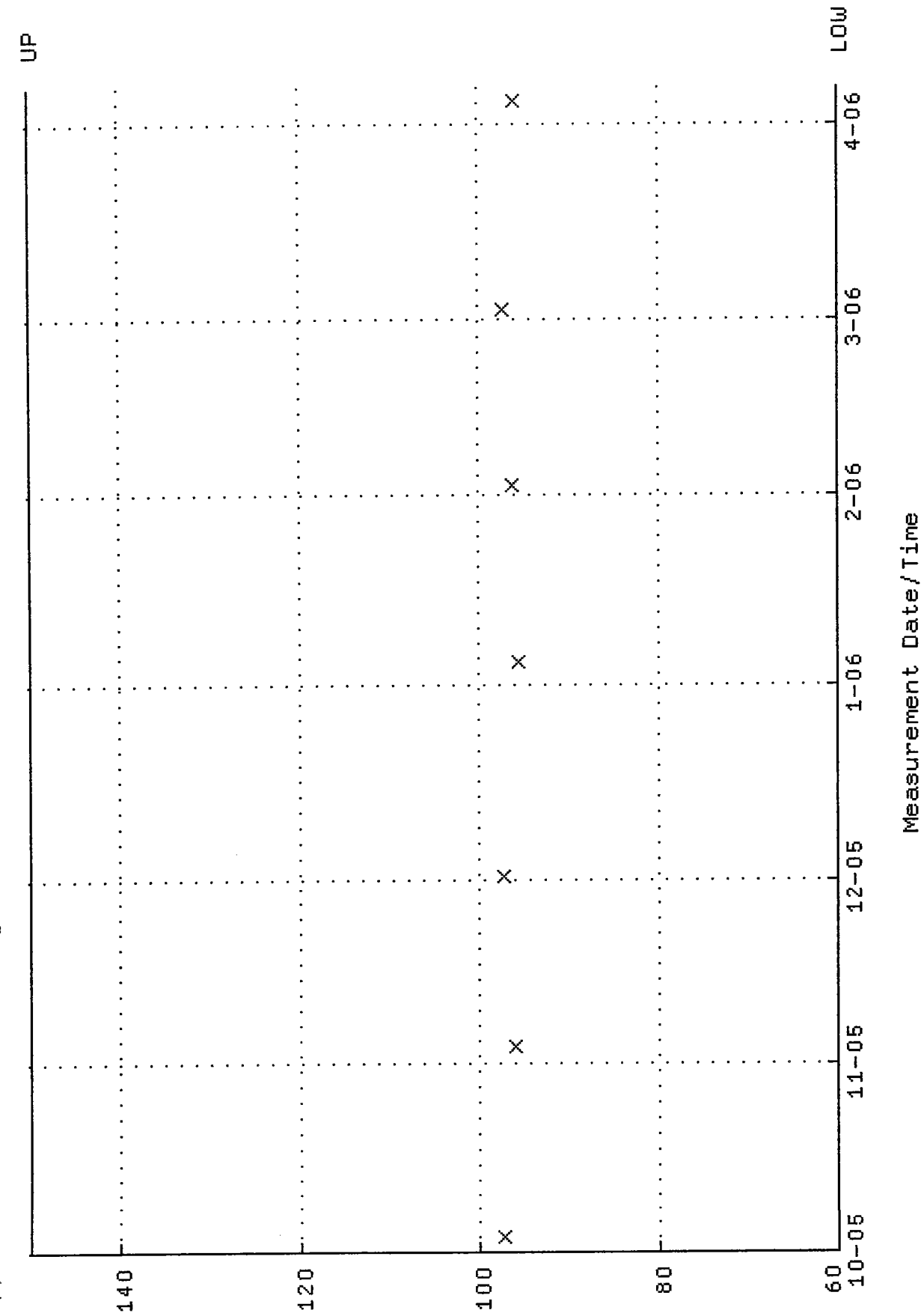


QA filename : DKA100:[ENV\_ALPHA.QA.W]W032.QAF;4  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 3-OCT-2005 12:02:09 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.280000 through 0.370000

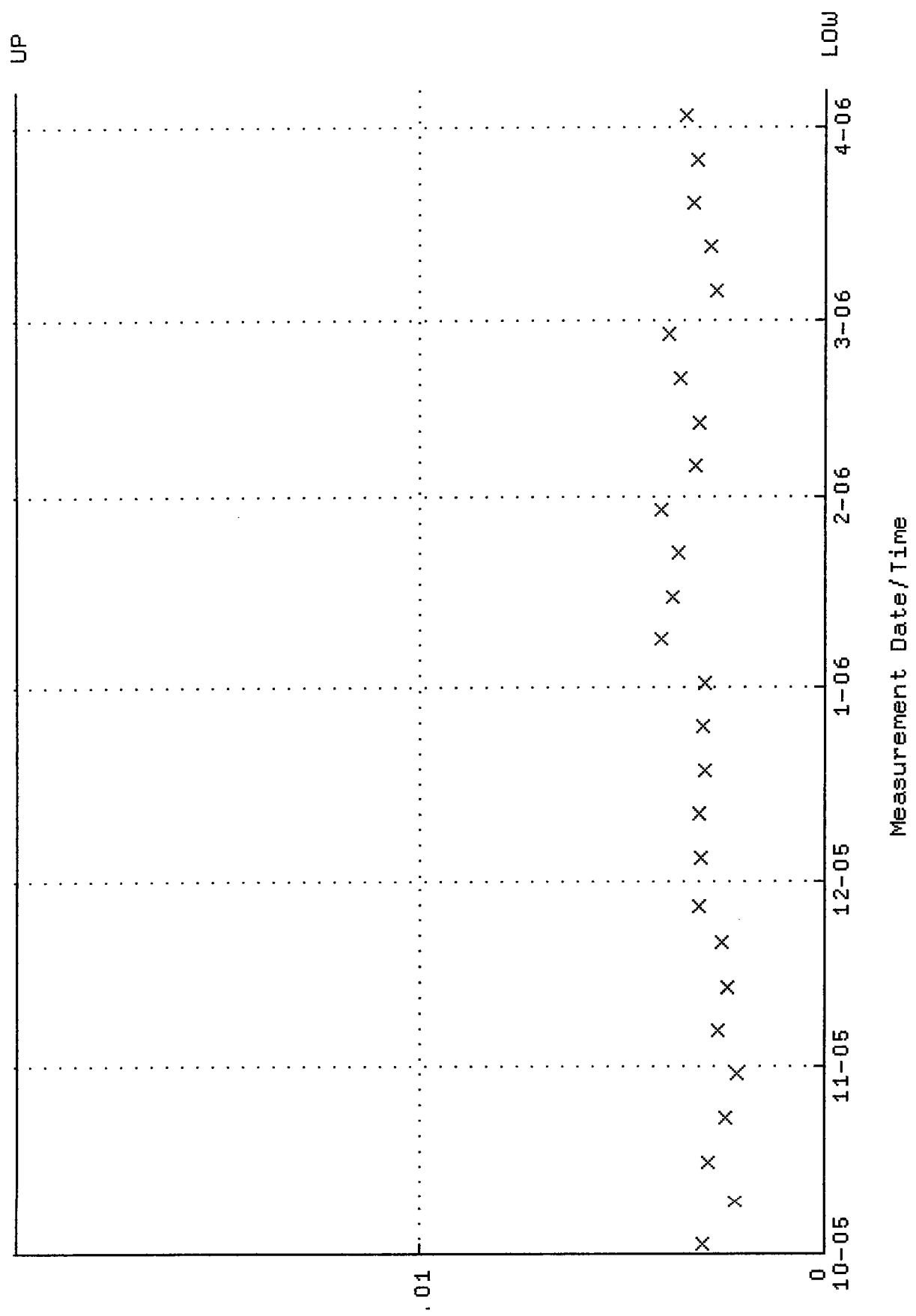




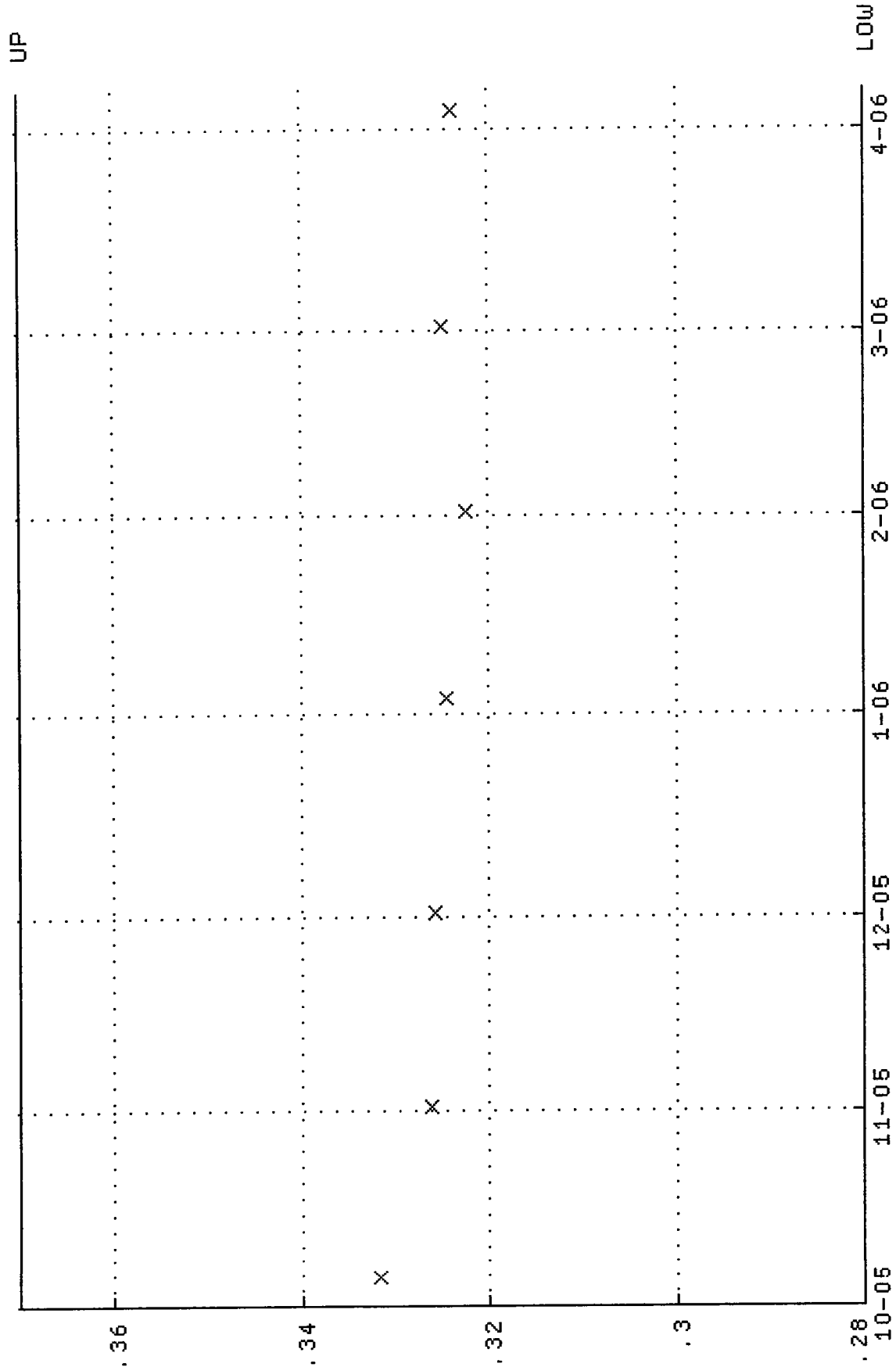
QA filename : DKA100:[ENVY\_ALPHA.QA.W]W032.QAF; 4  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 3-OCT-2005 12:02:09 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.0000



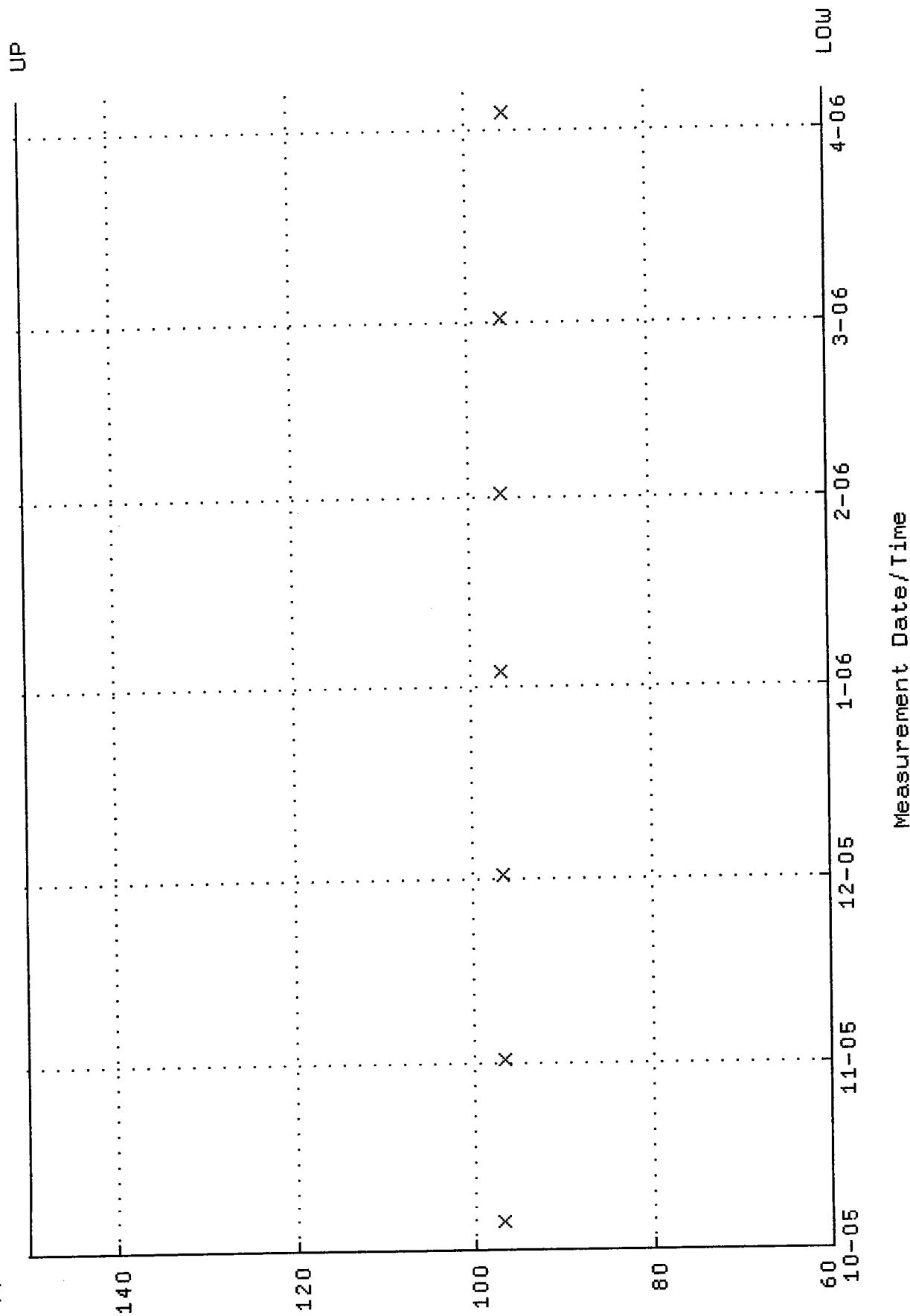
QA filename : DKA100: [ENV\_ALPHA.QA.B]B032.QAF; 2  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:25:42 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



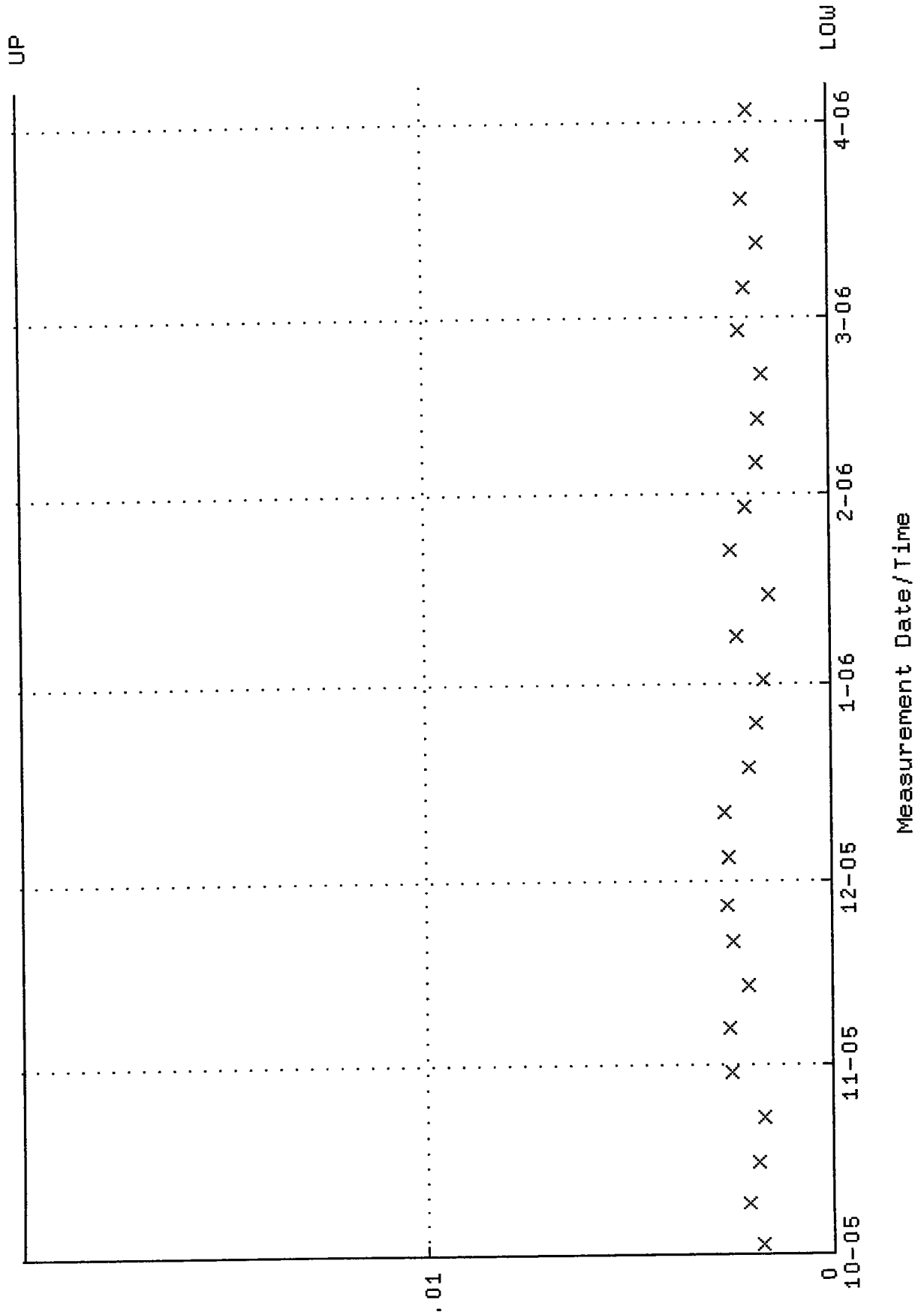
QA filename : DKA100:[ENV\_ALPHA.QA.W]W075.QAF;3  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 5-OCT-2005 12:08:52 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.280000 through 0.370000



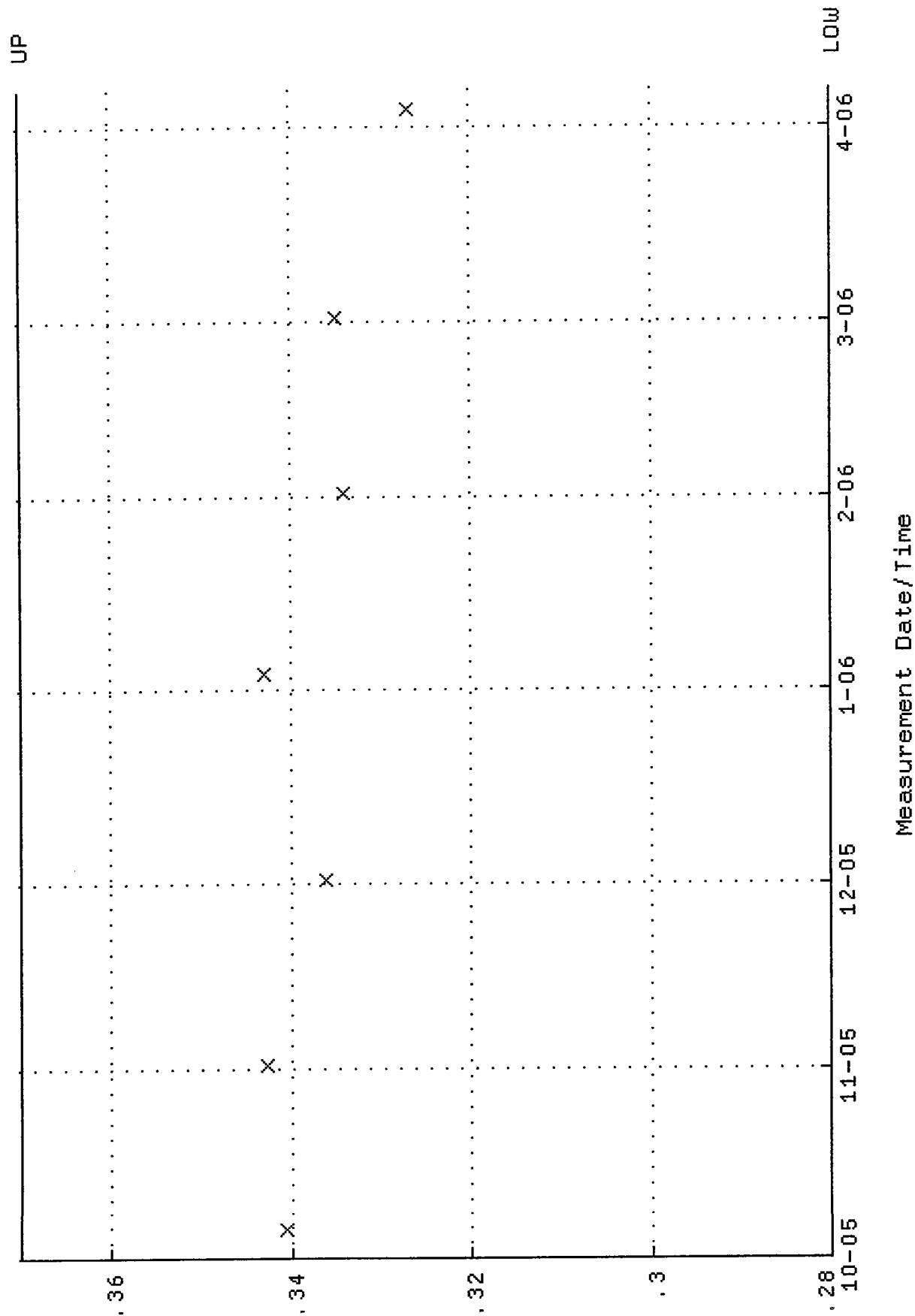
QA filename : DKA100:[ENV\_ALPHA.QA.W]U075.QAF;3  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 5-OCT-2005 12:08:52 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.0000



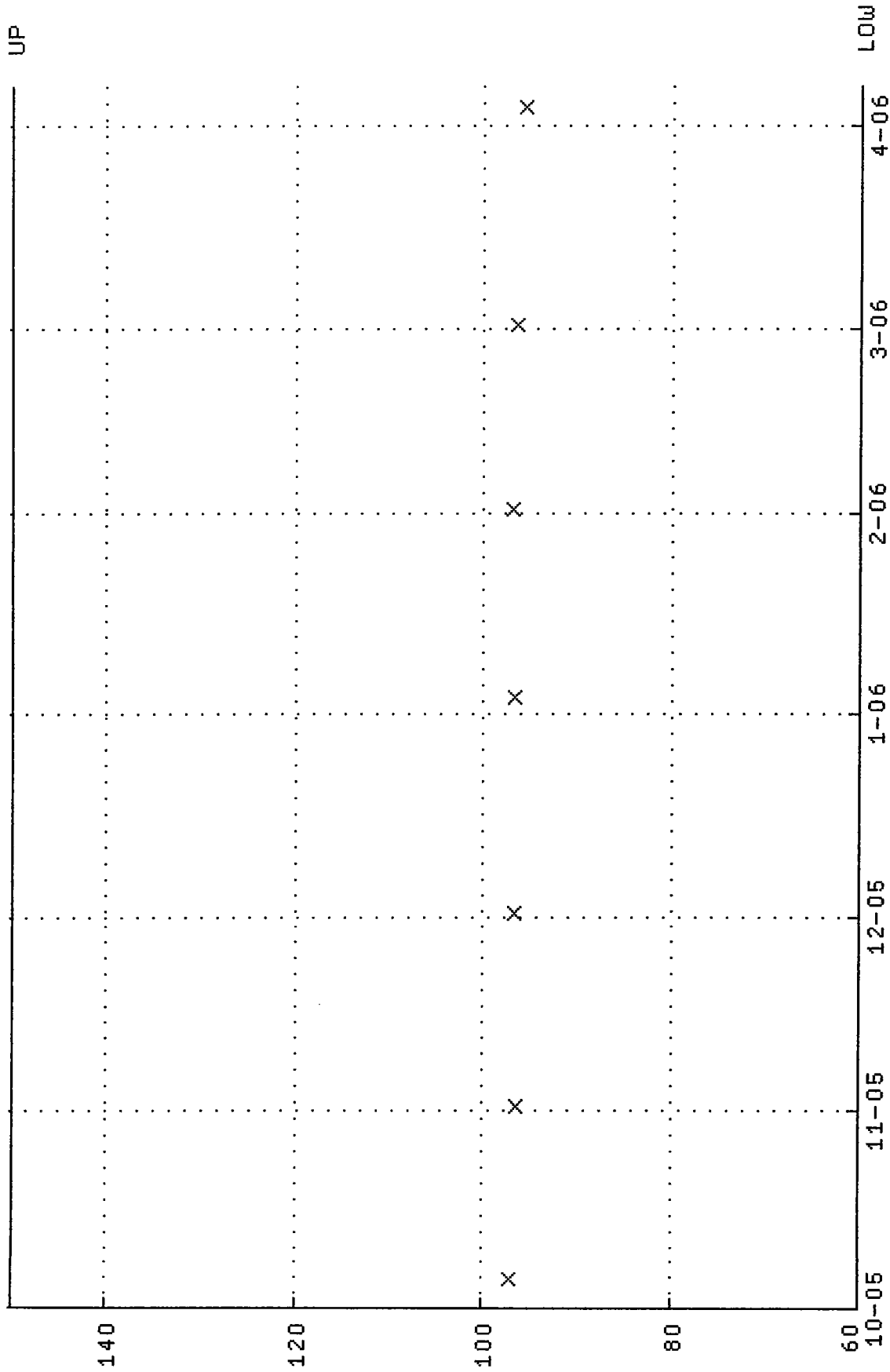
QA filename : DKA100:[ENV\_ALPHA.QA.B]B075.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:57:17 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



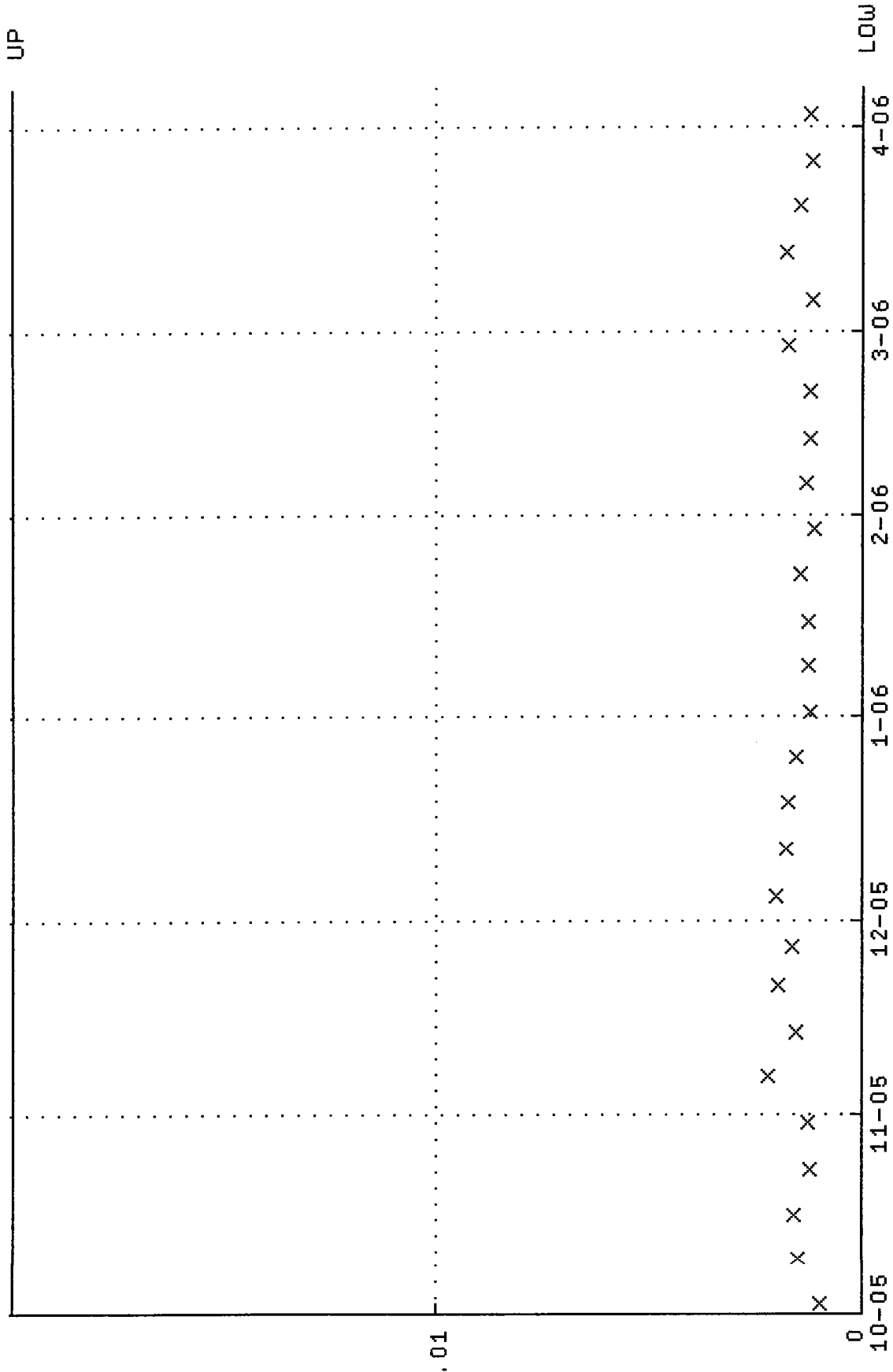
QA filename : DKA100:[ENV\_ALPHA.QA.W]W078.QAF;6  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 5-OCT-2005 12:08:53 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.280000 through 0.370000



QA filename : DKA100:[ENV\_ALPHA.QA.W]W078.QAF;6  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 5-OCT-2005 12:08:53 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.000

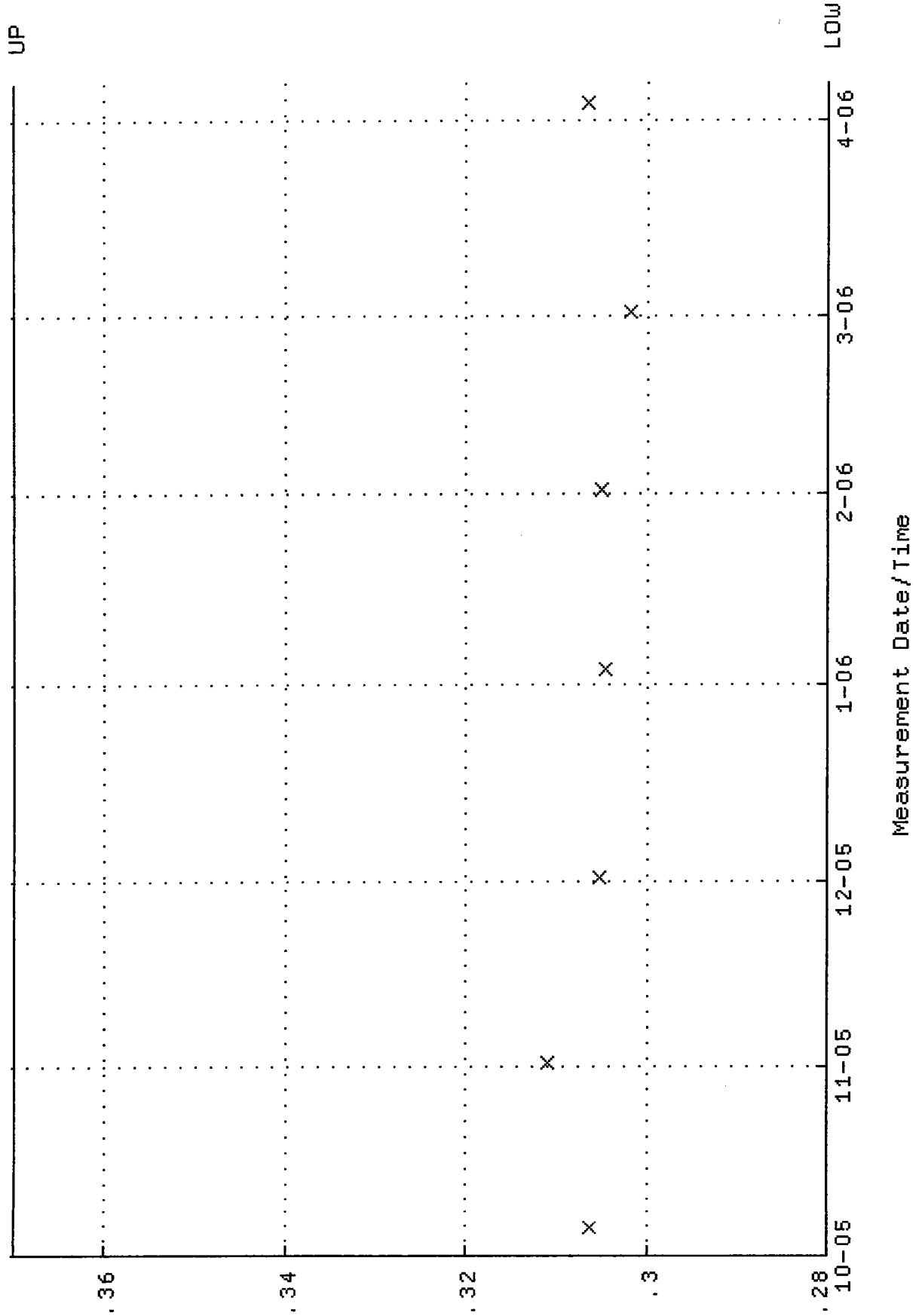


QA filename : DKA100:[ENV\_ALPHA.QA.B]B078.QAF;2  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:57:18 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02

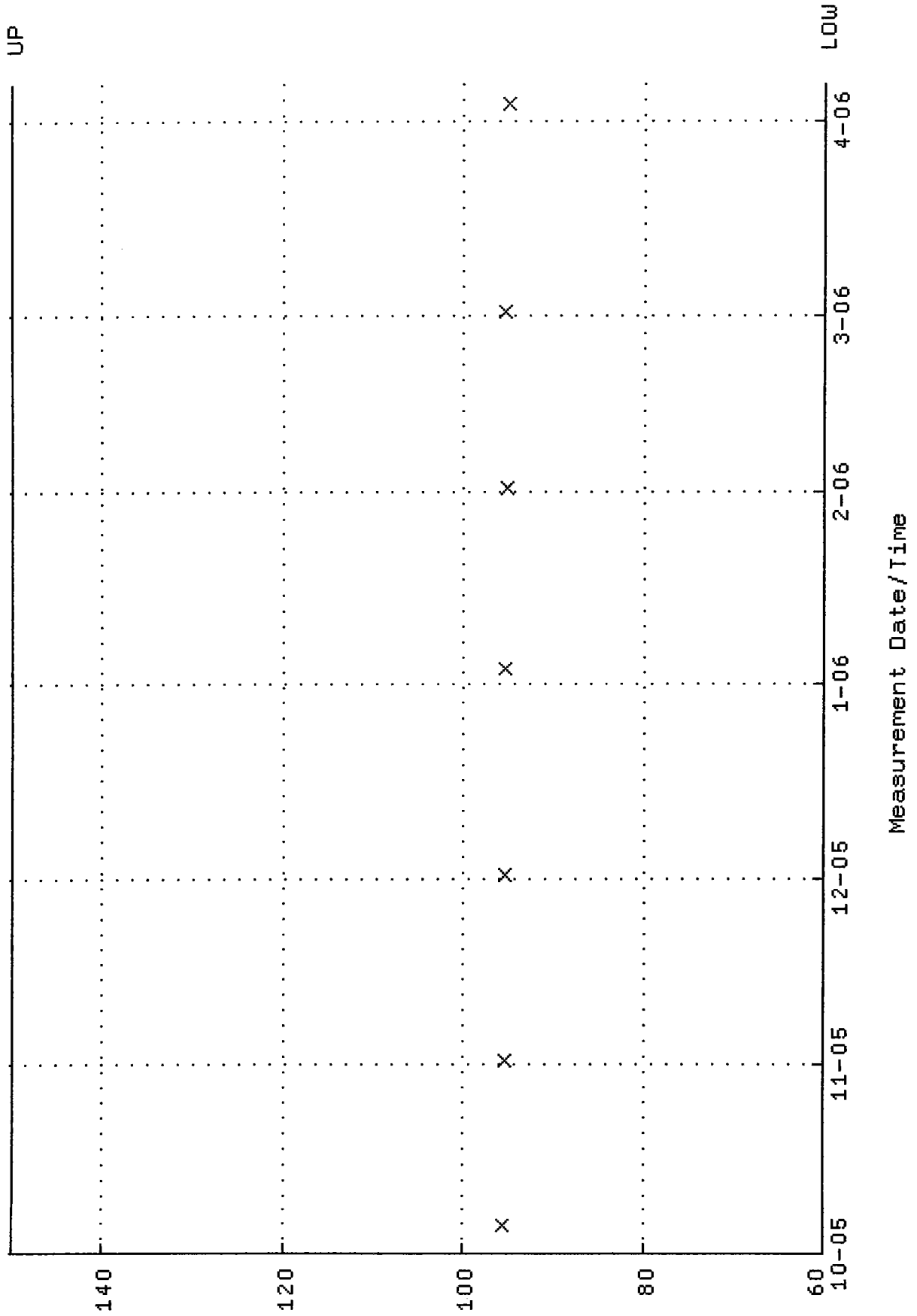




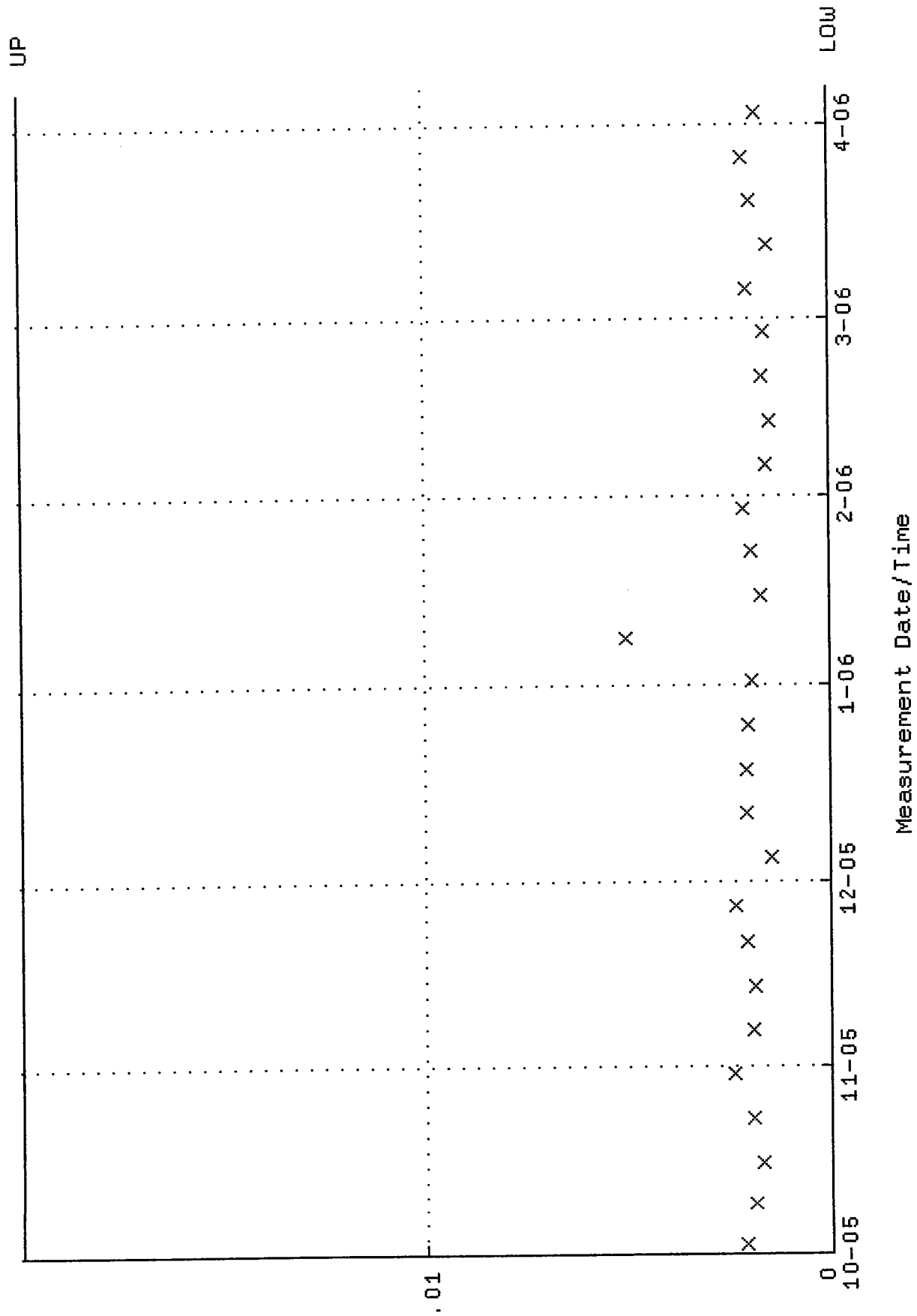
QA filename : DKA100:[ENV\_ALPHA.QA.W]W083.QAF;5  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 5-OCT-2005 12:08:55 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.280000 through 0.370000



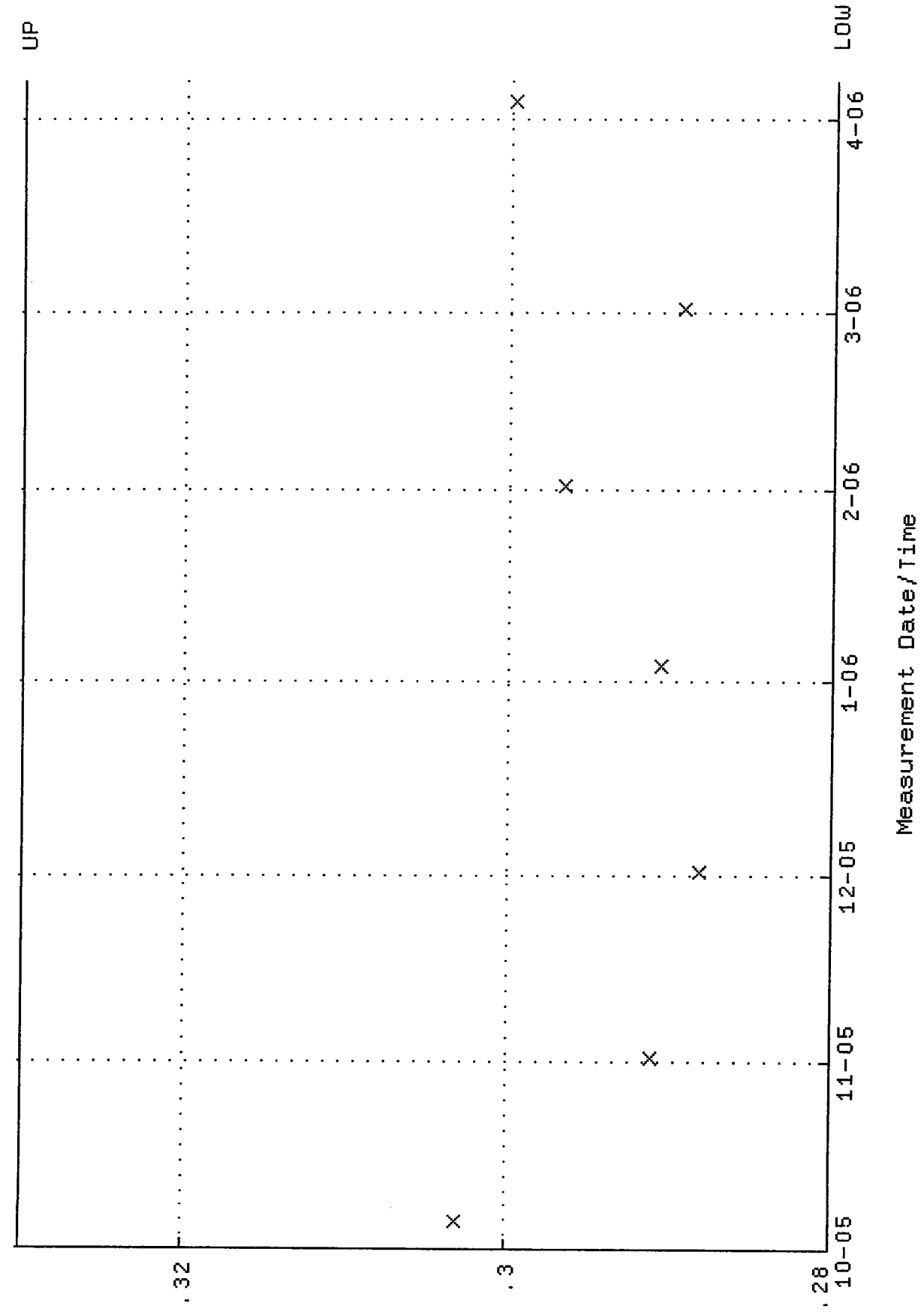
QA filename : DKA100:[ENV\_ALPHA.QA.W]W083.QAF;5  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 5-OCT-2005 12:08:55 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.0000



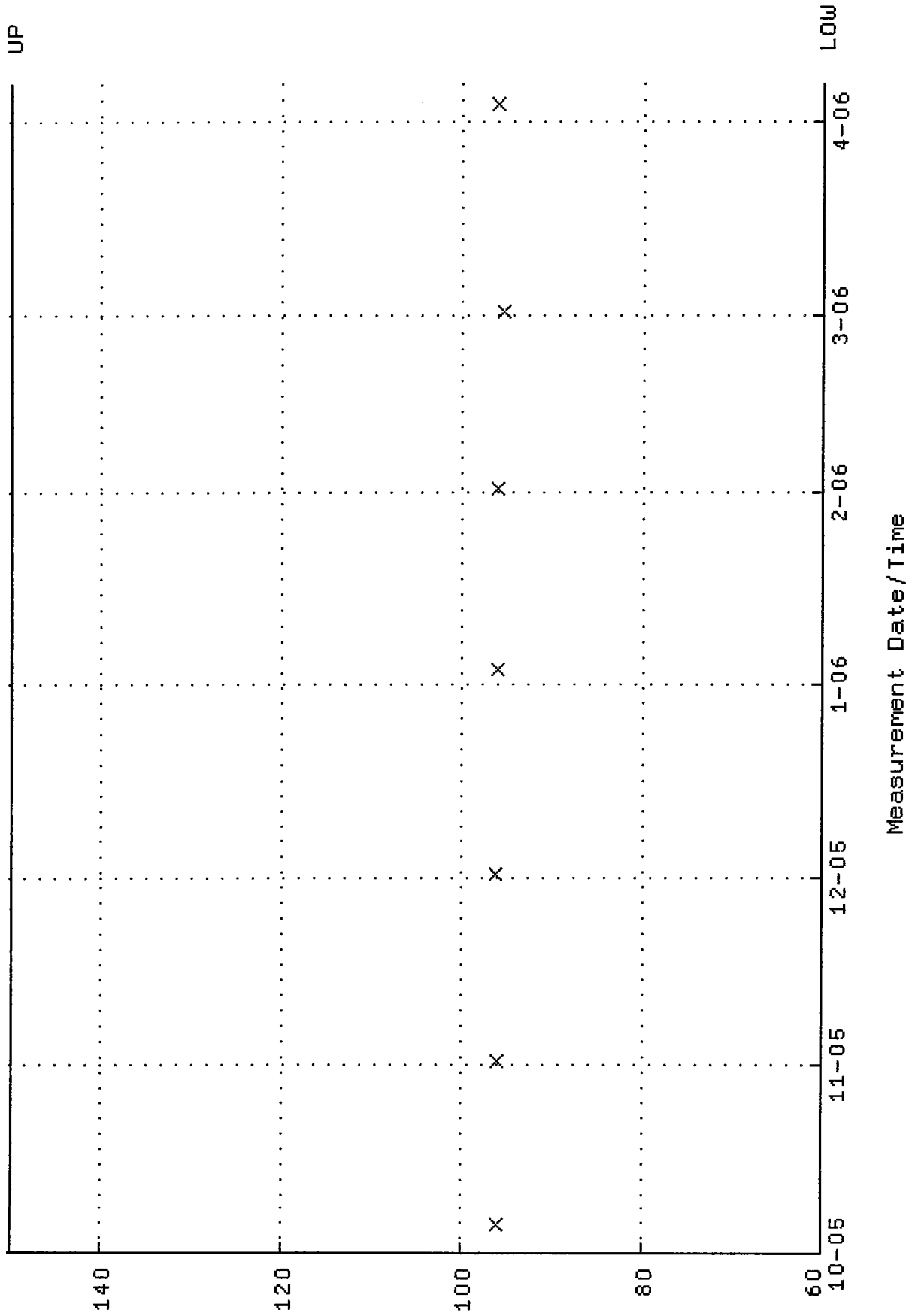
QA filename : DKA100: [ENV\_ALPHA,QA,B]B083.QAF; 3  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:57:19 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



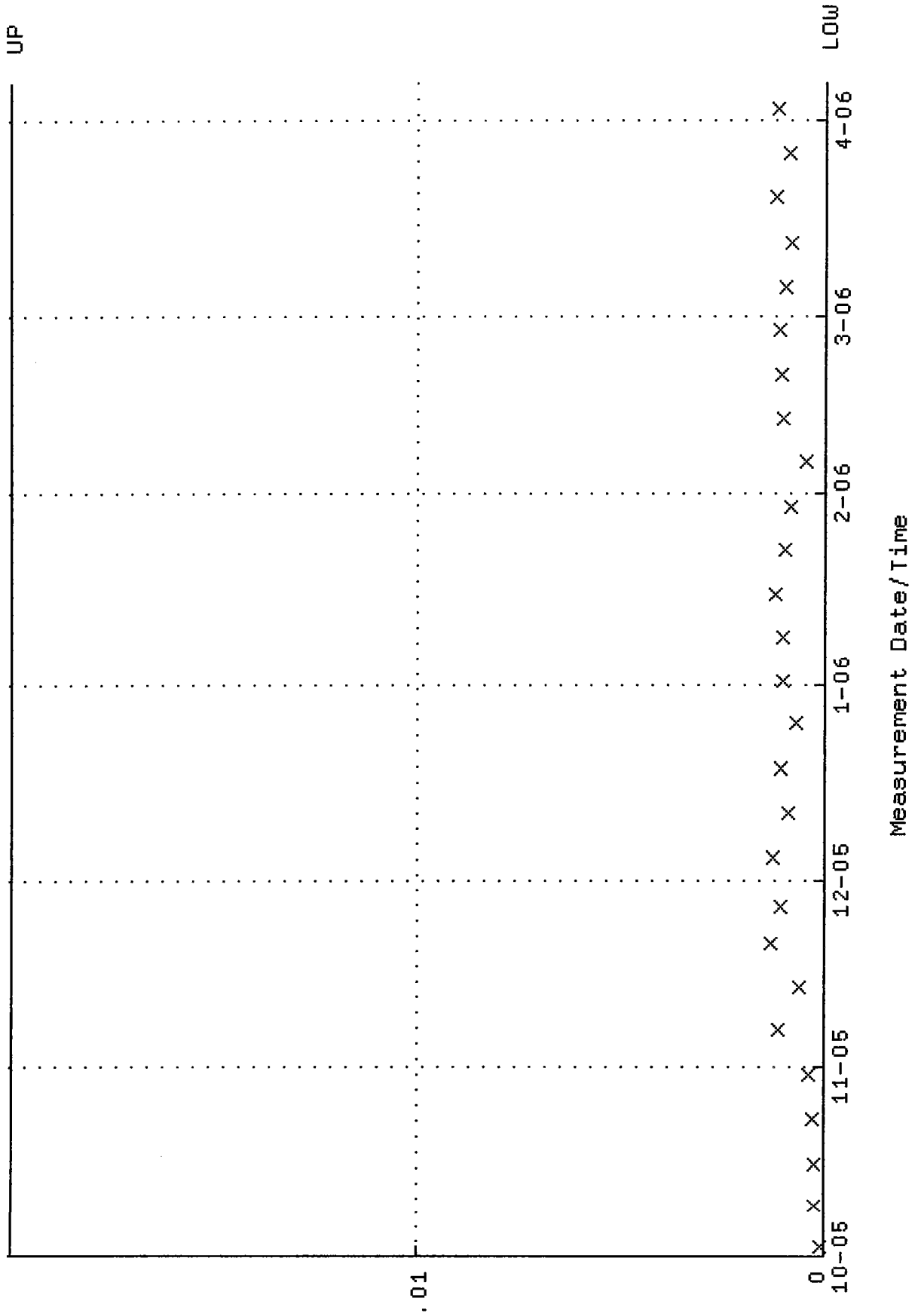
QA filename : DKA100:[ENV\_ALPHA.QA.W]W085.QAF;6  
 Parameter Name : AVREFF (Average Efficiency)  
 Start/End Dates : 5-OCT-2005 12:08:55 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.280000 through 0.330000



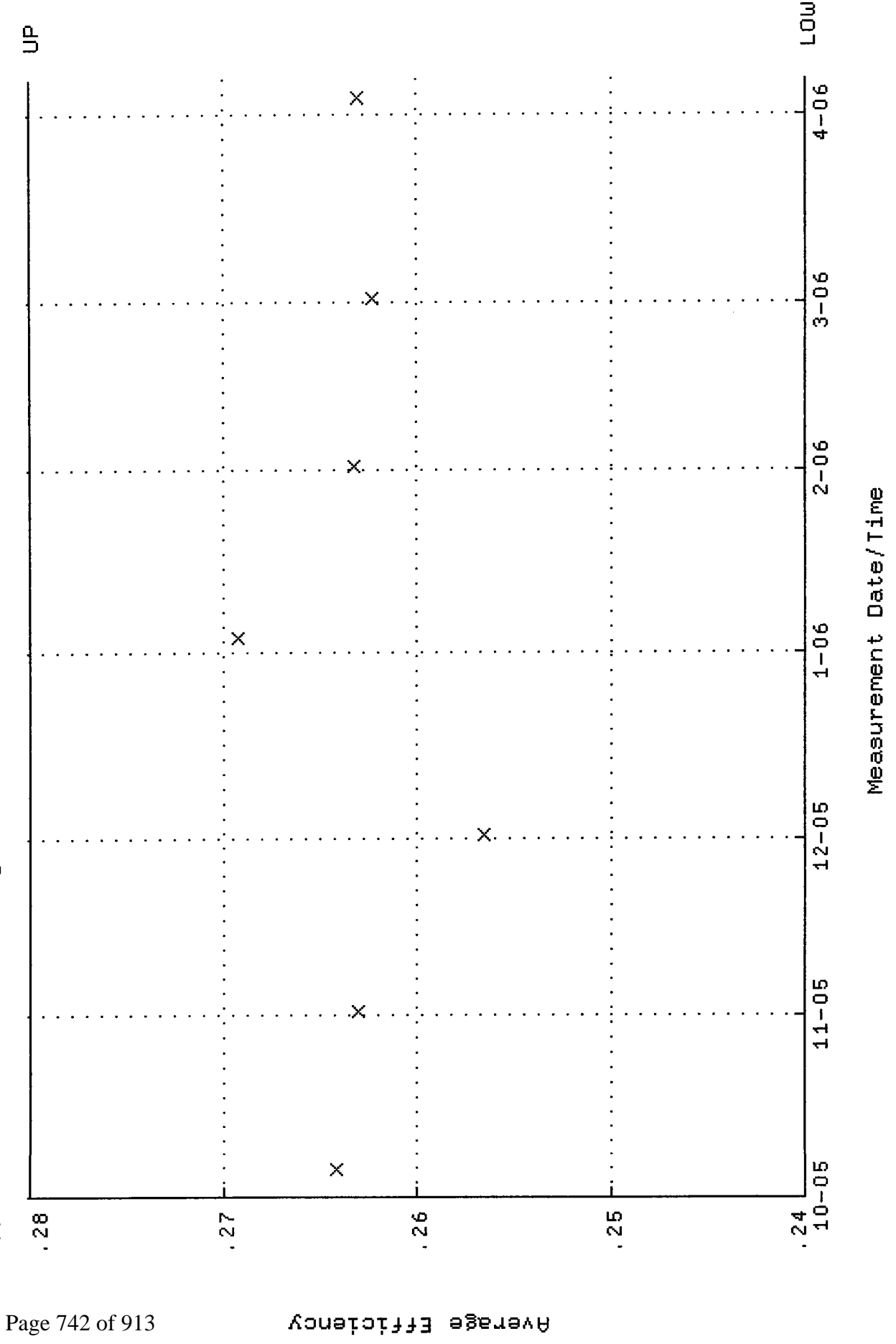
QA filename : DKA100:[ENV\_ALPHA.QA.W]W085.QAF;6  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 5-OCT-2005 12:08:55 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.0000



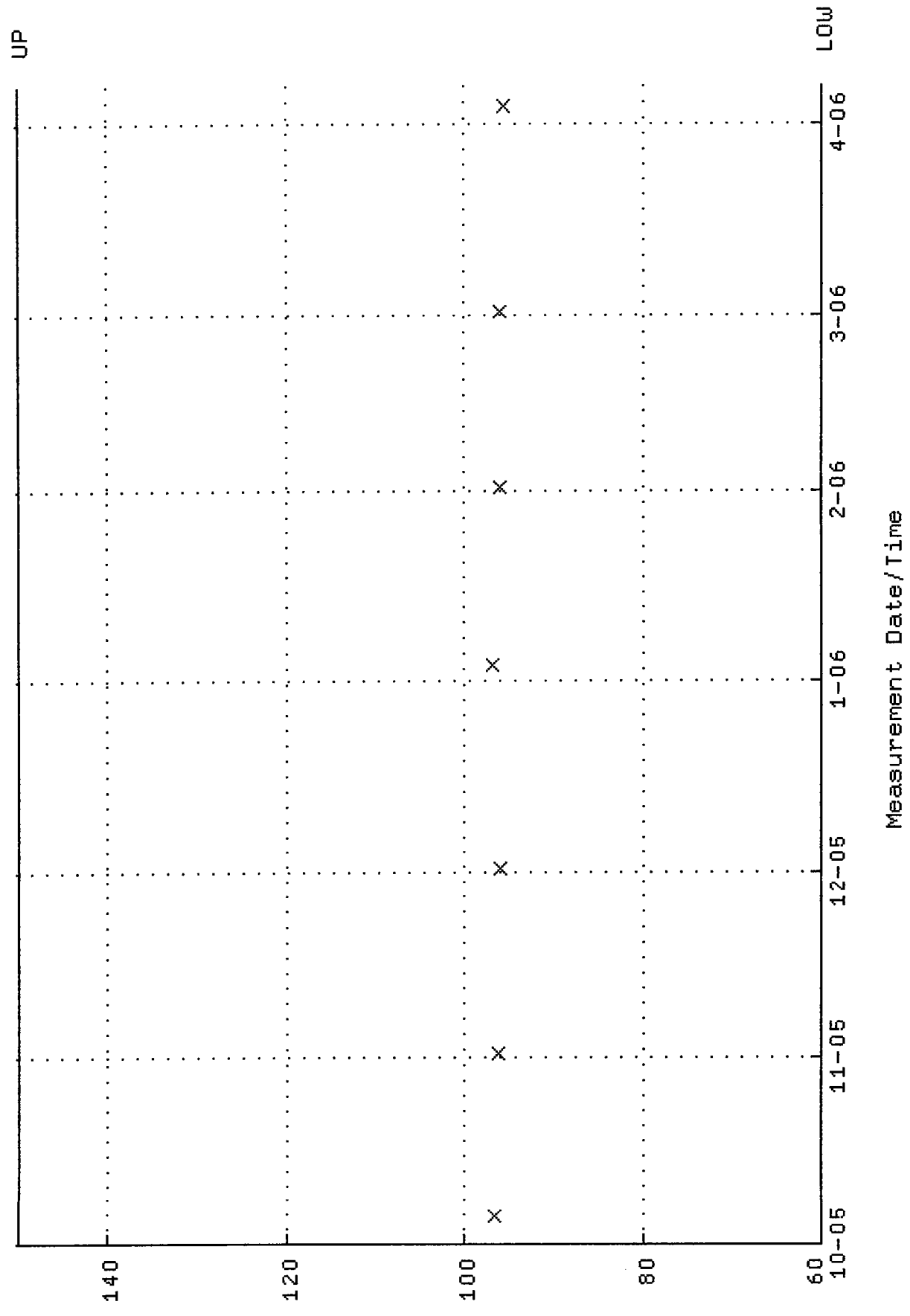
QA filename : DKA100:[ENV\_ALPHA.QA.B]B085.QAF;2  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:57:19 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



QA filename : DKA100:[ENVY\_ALPHA.QA.W]W086.QAF;4  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 5-OCT-2005 12:08:55 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.240000 through 0.280000



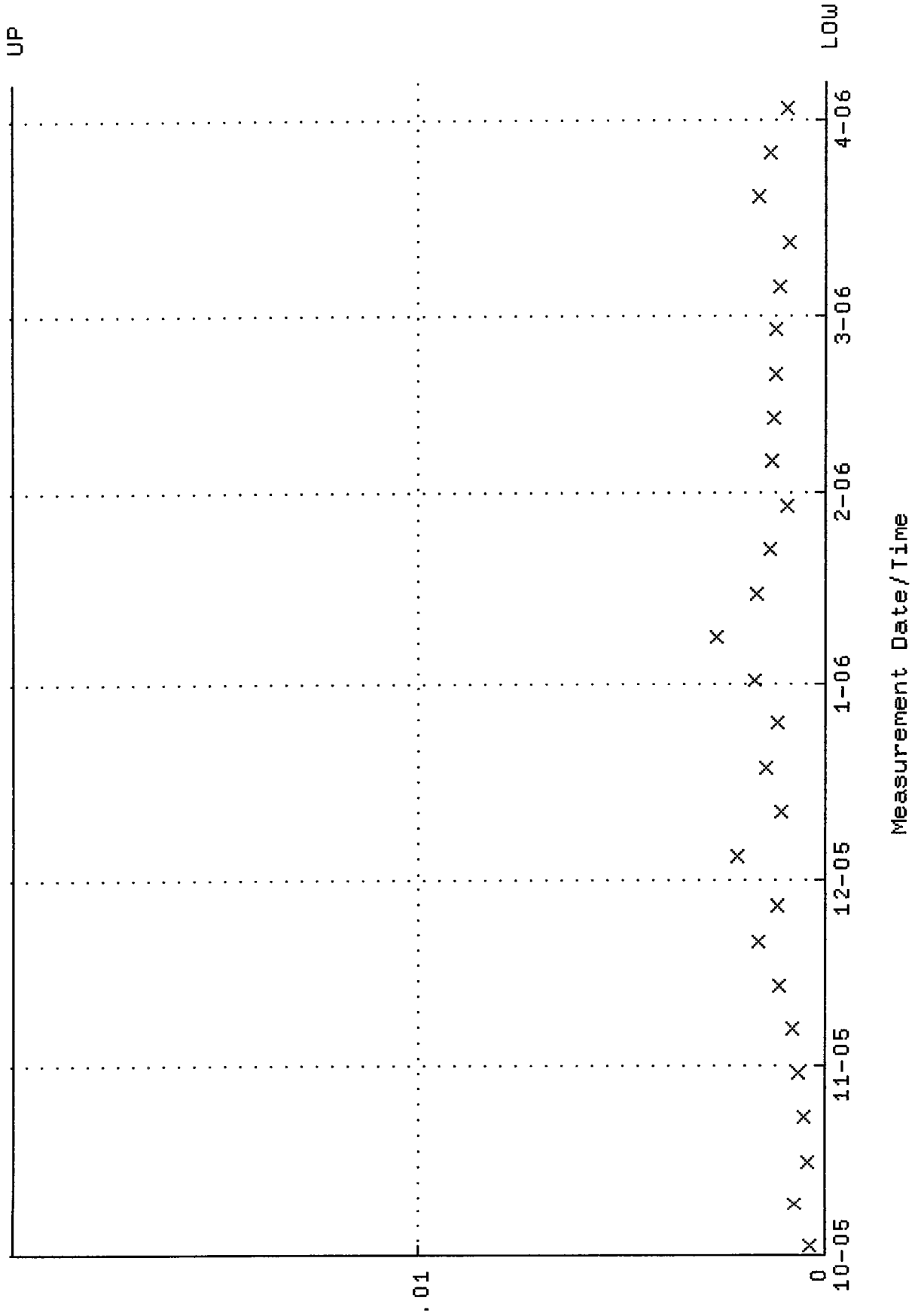
QA filename : DKA100:[ENV\_ALPHA.QA.W]W086.QAF;4  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 5-OCT-2005 12:08:55 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.0000



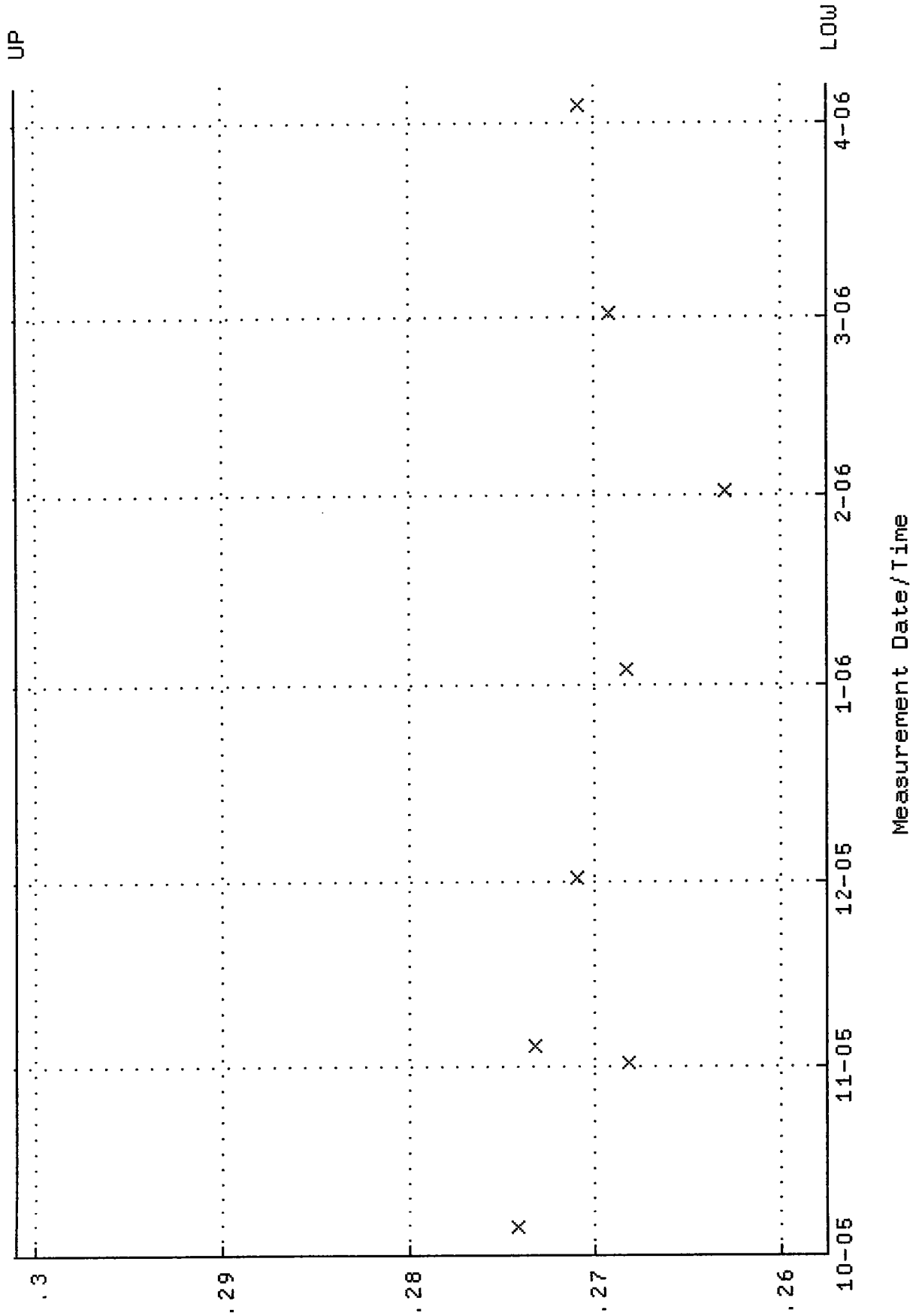


QA filename : DKA100:[ENV\_ALPHA.QA.B]B086.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:57:19 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02

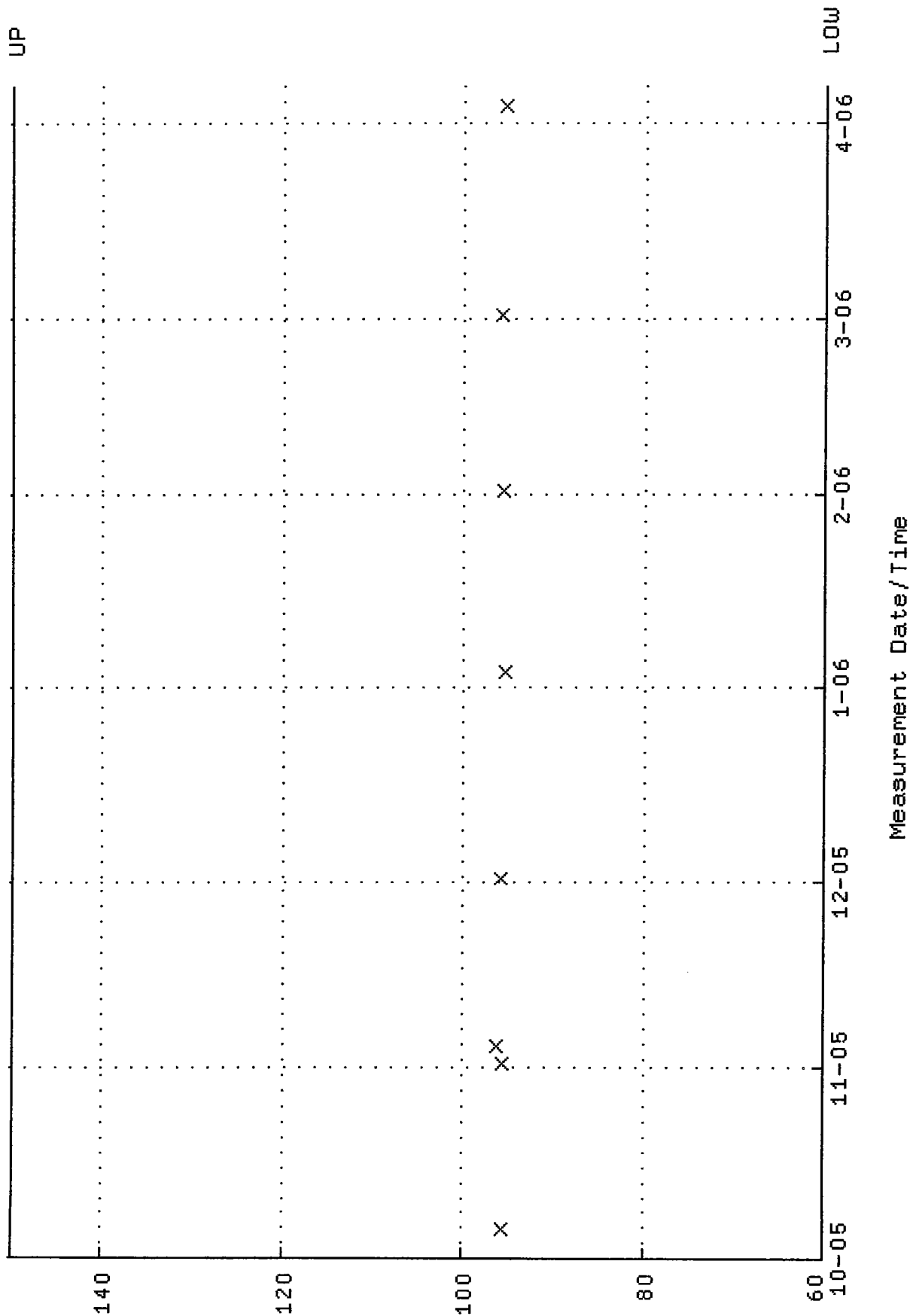
Background Rate



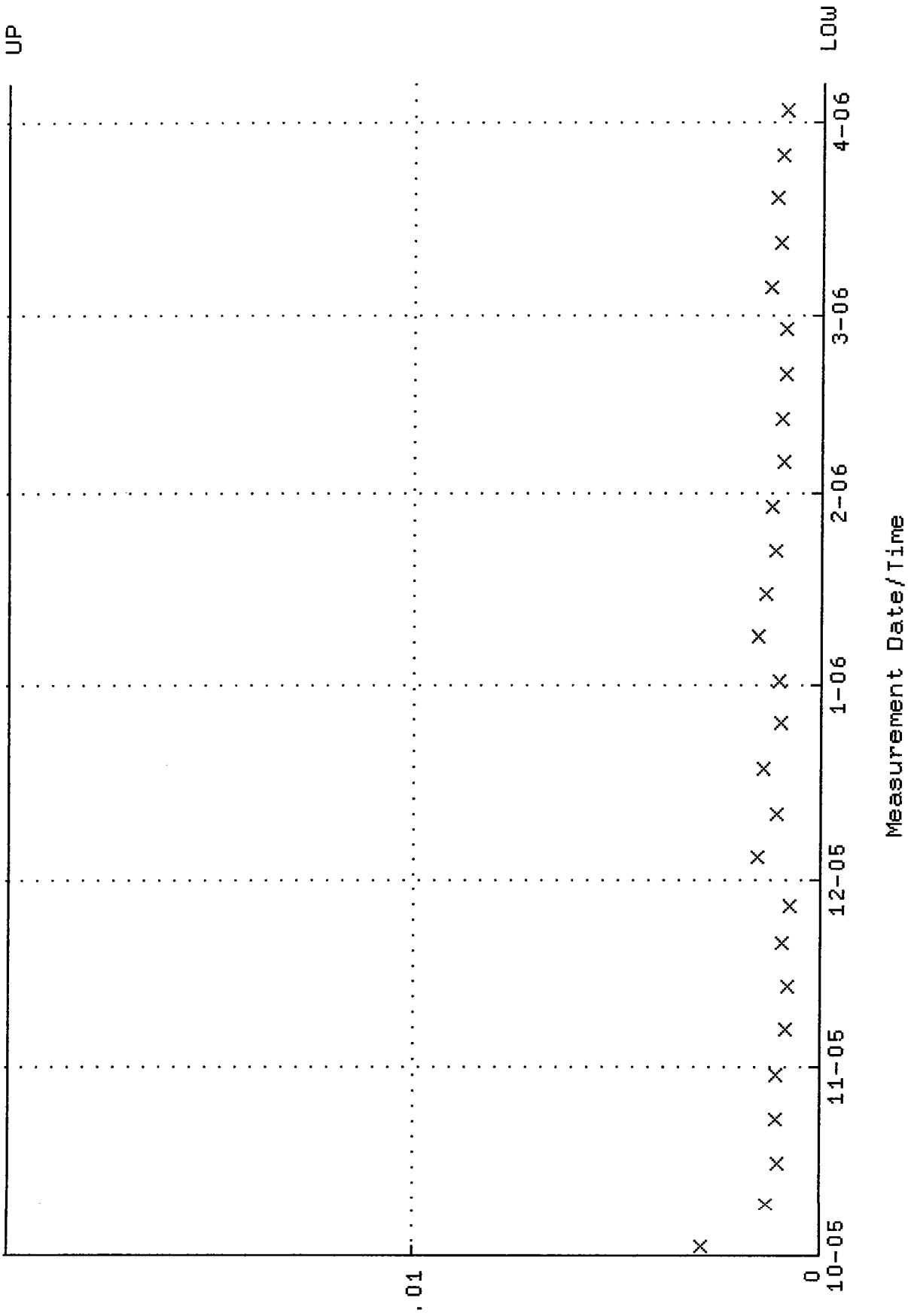
QA filename : DKA100:[ENV\_ALPHA.QA.W]W088.QAF;4  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 5-OCT-2005 12:08:55 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.257580 through 0.301020



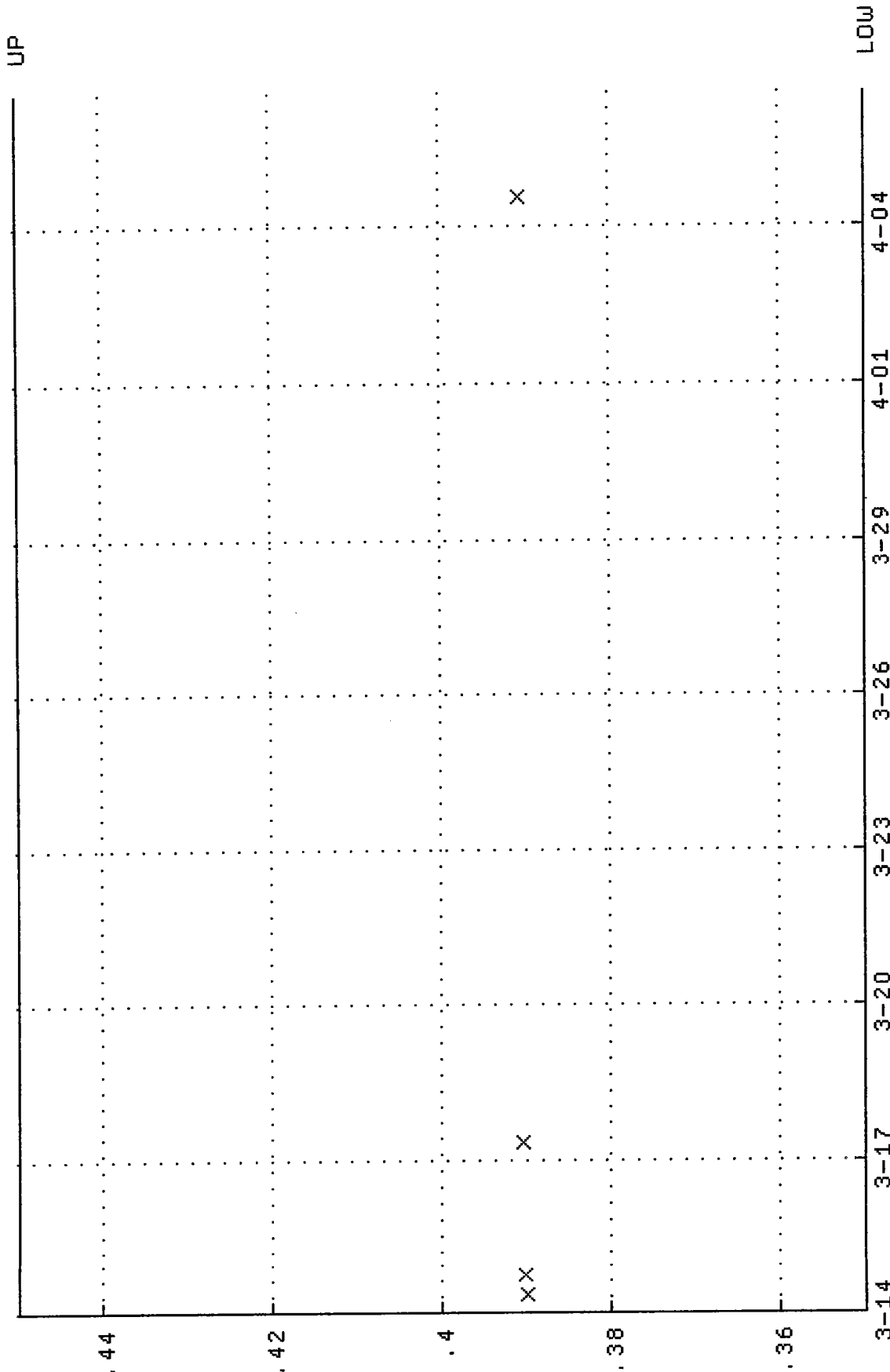
QA filename : DKA100:[ENV\_ALPHA,QA,W]W088.QAF;4  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 5-OCT-2005 12:08:55 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 60.0000 through 150.0000



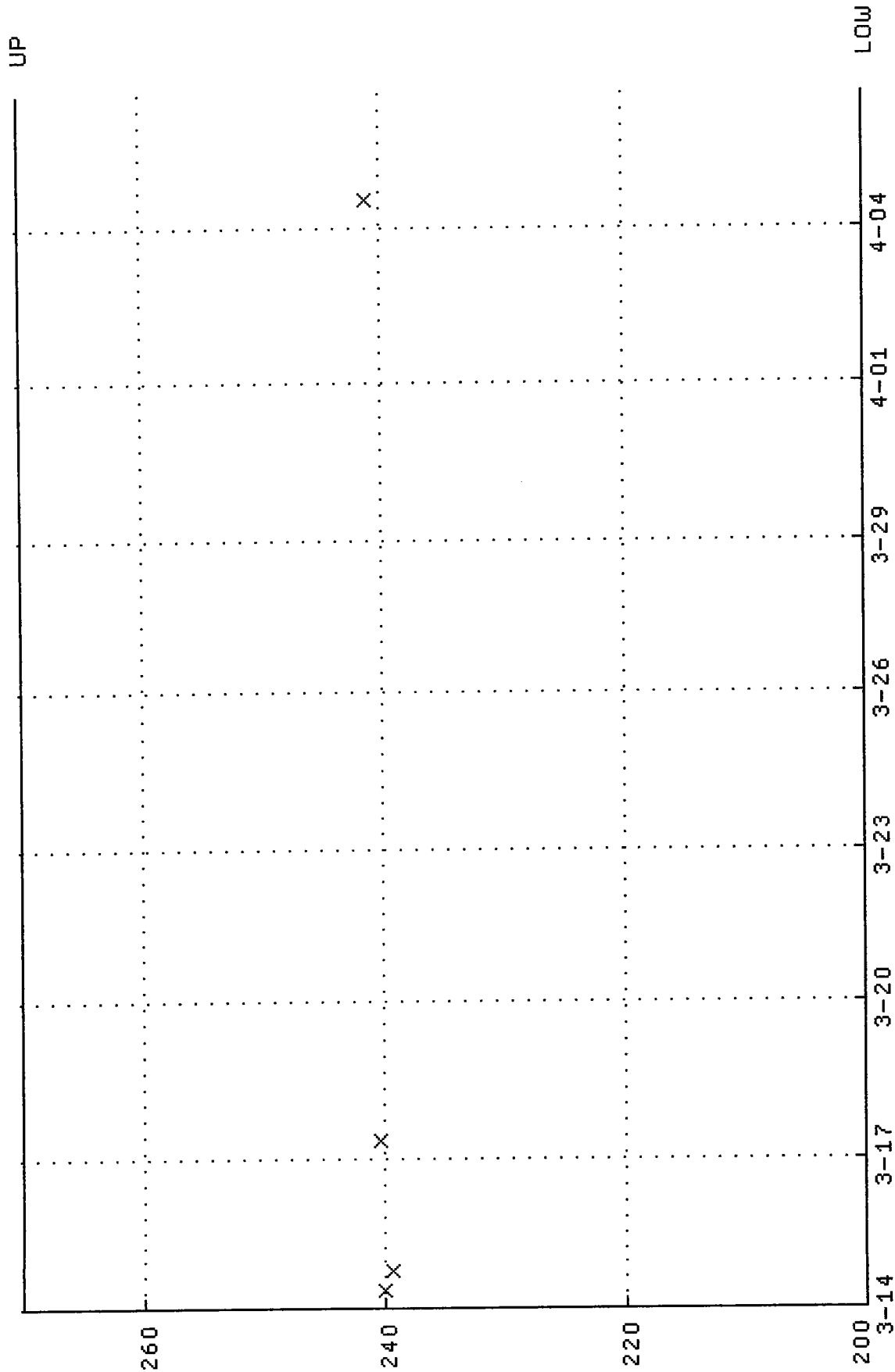
QA filename : DKA100:[ENV\_ALPHA.QA.B]B088.QAF;1  
 Parameter Name : BACKRATE (Background Rate)  
 Start/End Dates : 2-OCT-2005 13:57:19 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



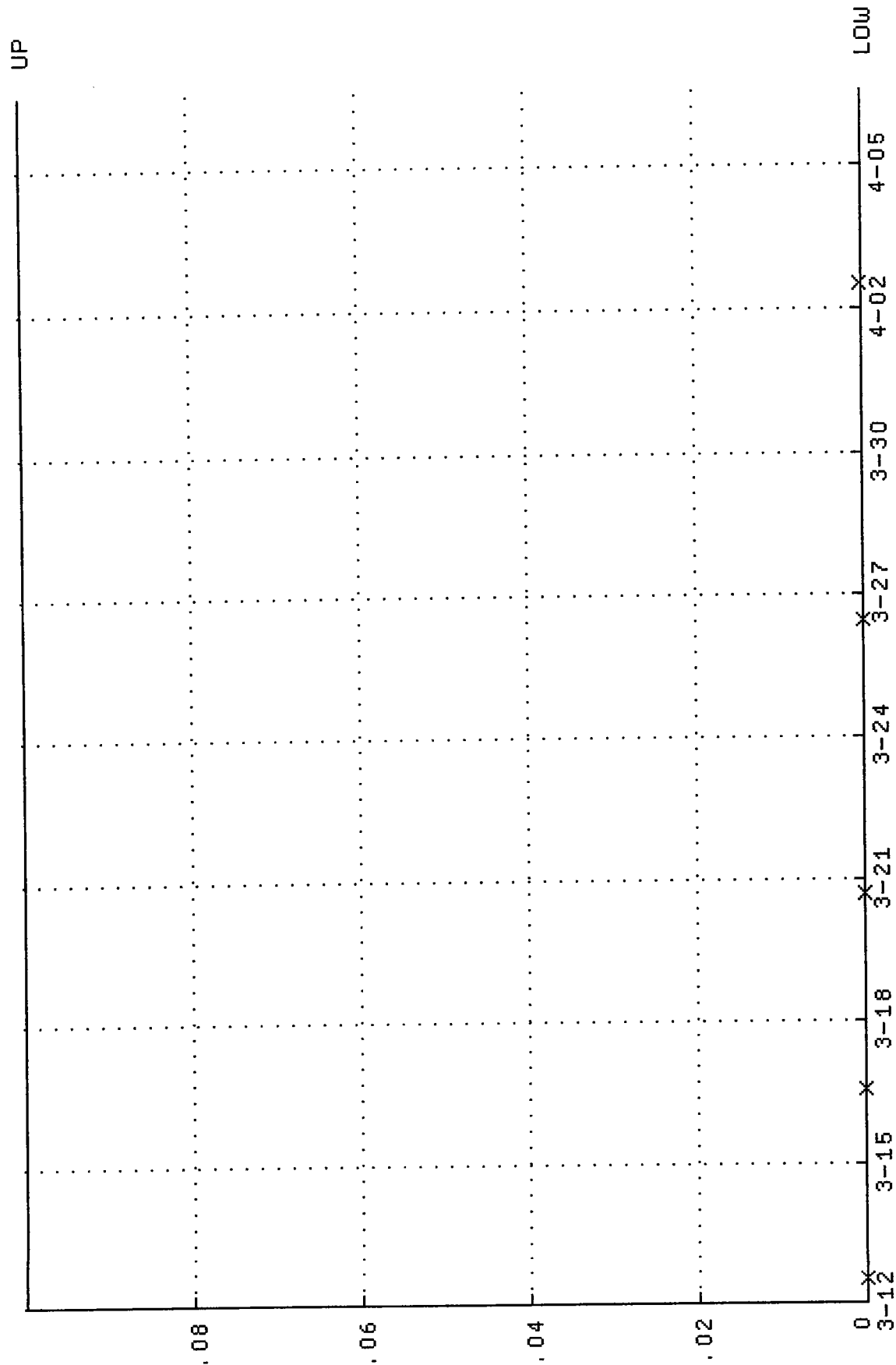
QA filename : DKA100:[ENV\_ALPHA.QA.W]W116.QAF;1  
 Parameter Name : AVRGEFF (Average Efficiency)  
 Start/End Dates : 14-MAR-2006 08:48:31 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 0.350000 through 0.450000



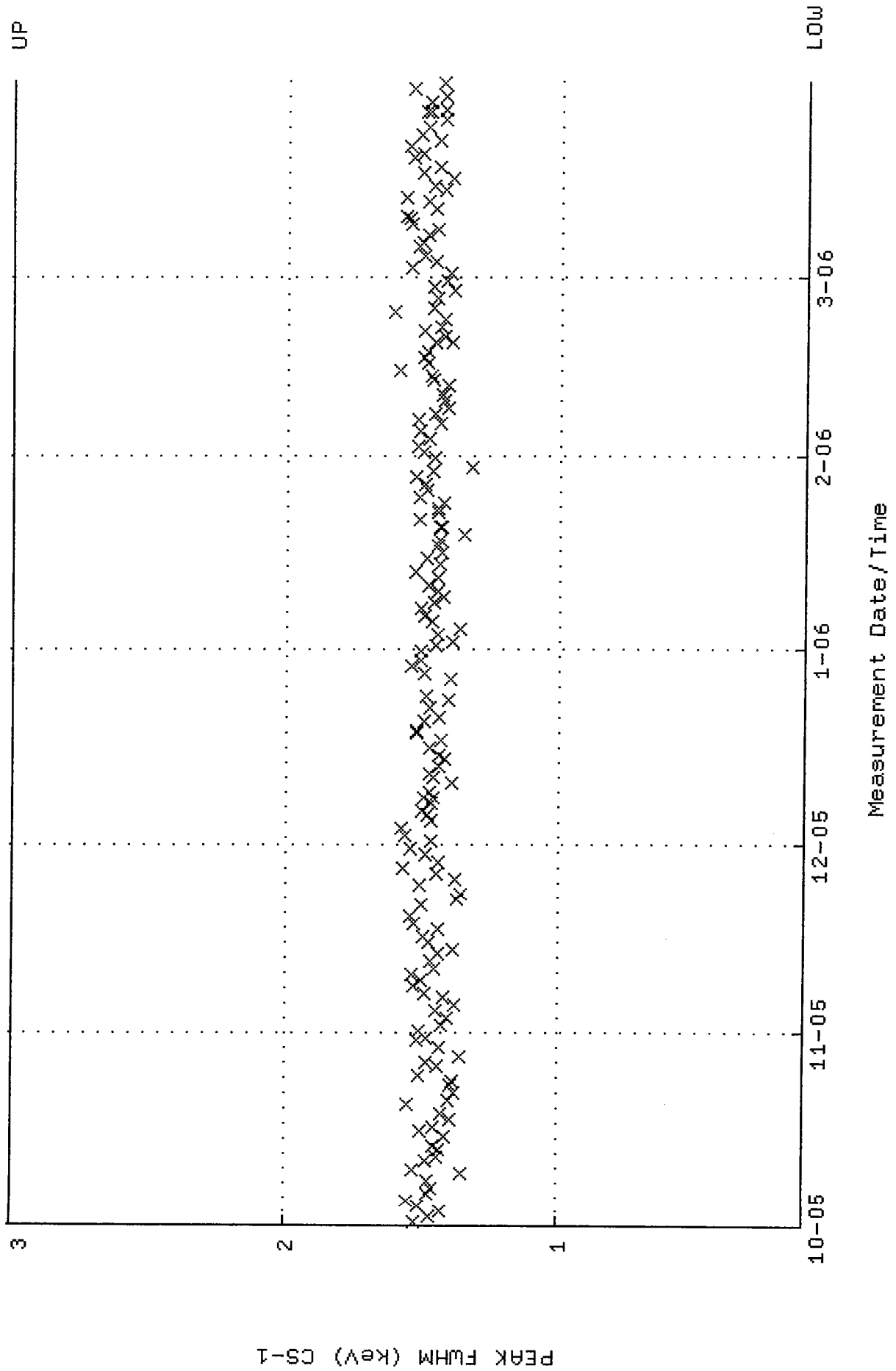
QA filename : DKA100:[ENV\_ALPHA.QA.W]W116.QAF;1  
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)  
 Start/End Dates : 14-MAR-2006 08:48:31 through 6-APR-2006 12:00:00  
 Lower/Upper Lmts: 200.000 through 270.000



QA filename : DKA100:[ENV\_ALPHA.QA.B]B116.QAF;1  
Parameter Name : BACKRATE (Background Rate)  
Start/End Dates : 12-MAR-2006 12:14:13 through 6-APR-2006 12:00:00  
Lower/Upper Lmts: 0.000000E+00 through 0.100000

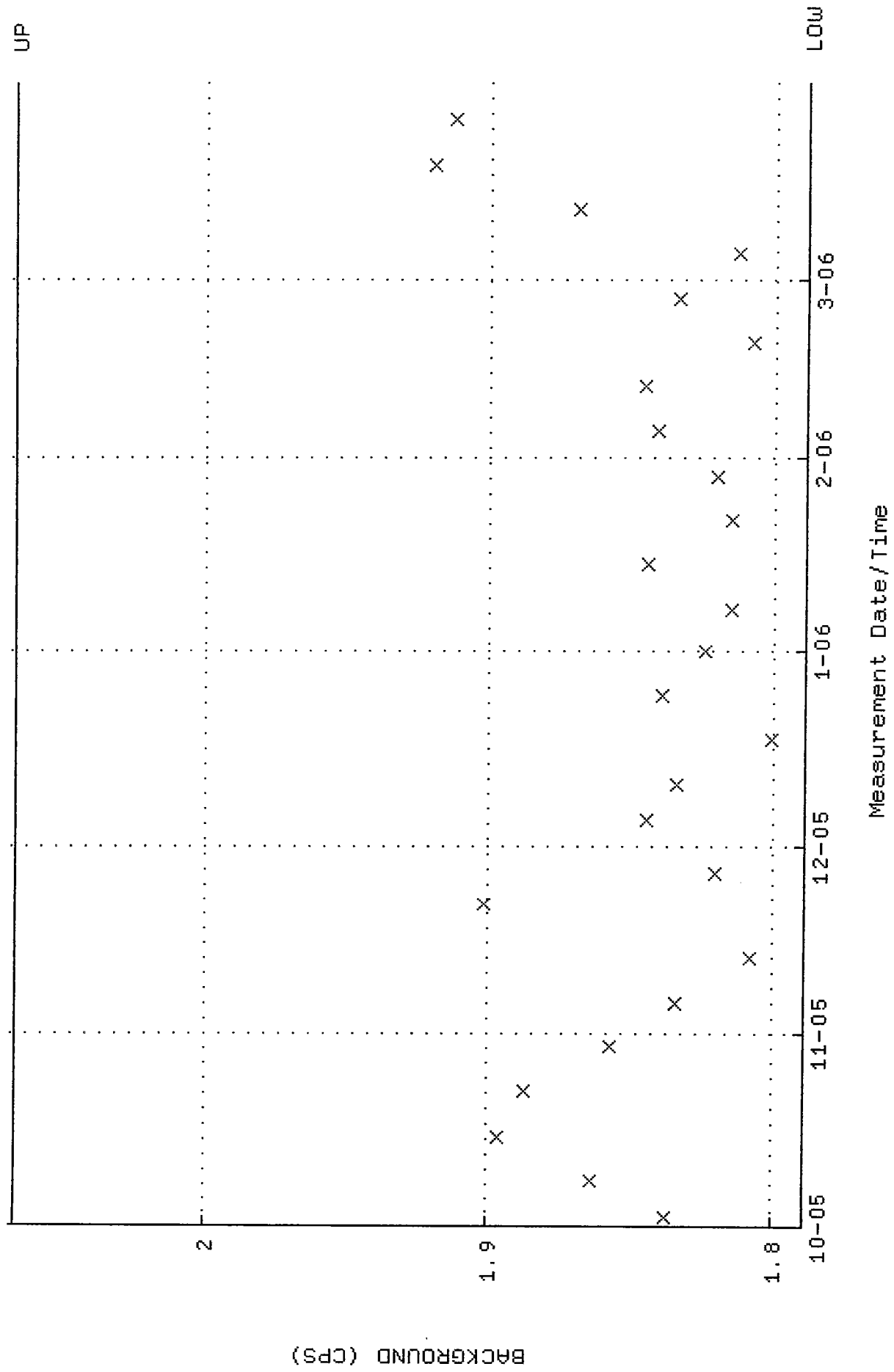


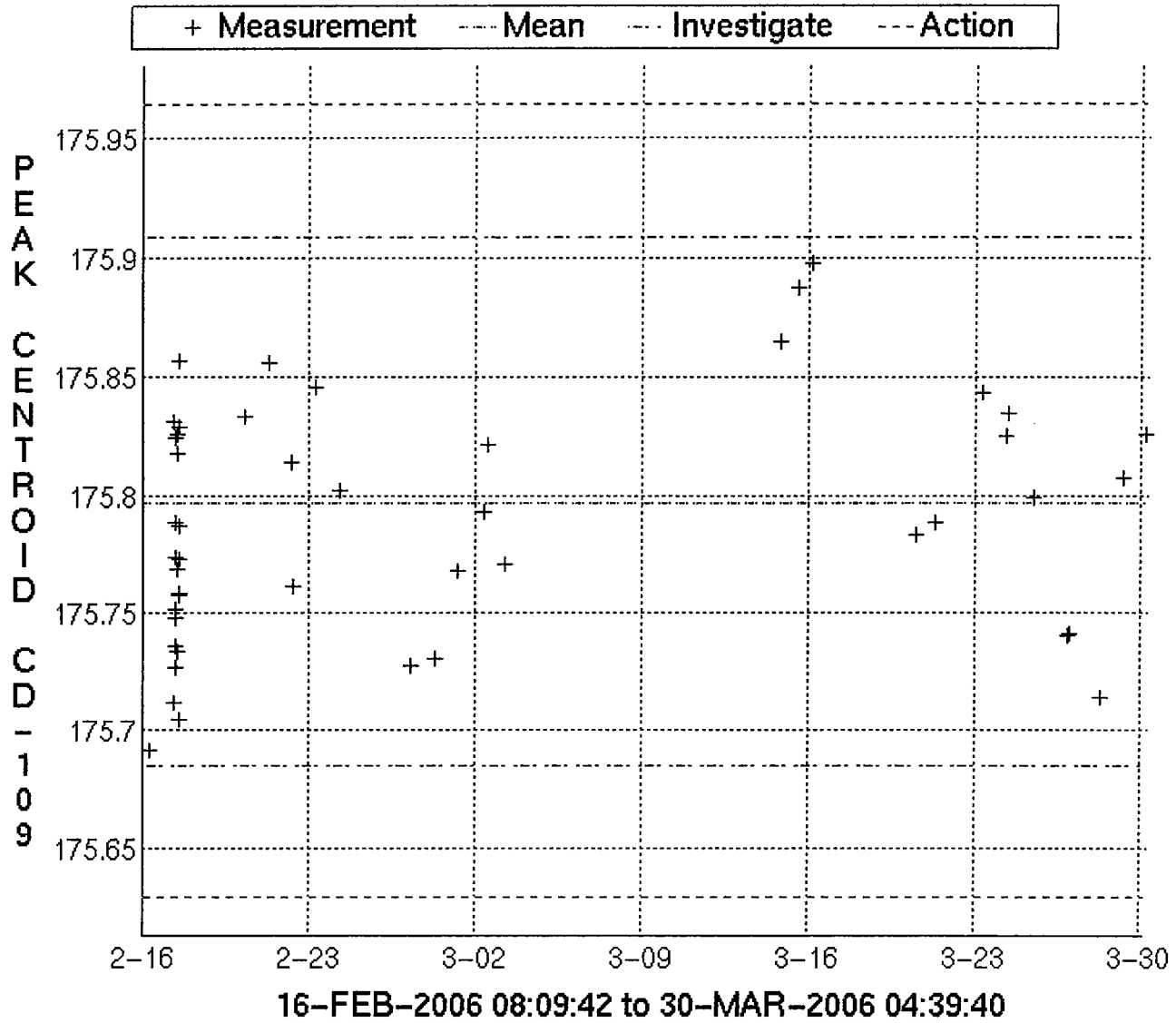
QA filename : DKA100:[ENV\_ALPHA]QC\_GAMMA6.QAF;5  
Parameter Name : PSFUHM-661 (PEAK FUHM (keV) CS-137)  
Start/End Dates : 1-OCT-2005 17:40:28 through 31-MAR-2006 12:00:00  
Lower/Upper Lmts: 0.100000 through 3.000000



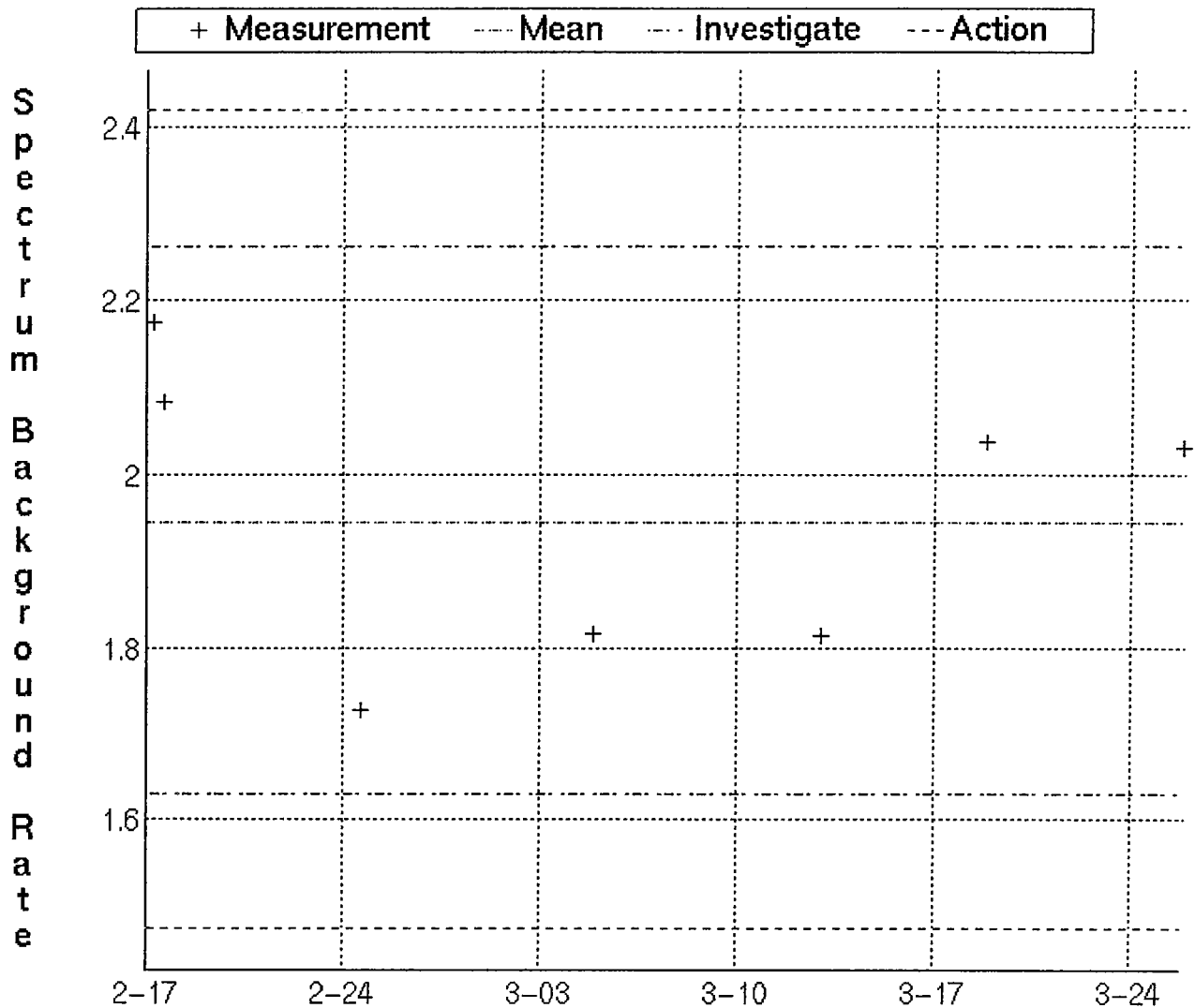


QA filename : DKA100:[ENV\_ALPHA]QC\_BKG\_GAMMA6.QAF;2  
 Parameter Name : BACKRATE (BACKGROUND (CPS))  
 Start/End Dates : 2-OCT-2005 11:51:15 through 31-MAR-2006 12:00:00  
 Lower/Upper Lmts: 1.78850 through 2.06800





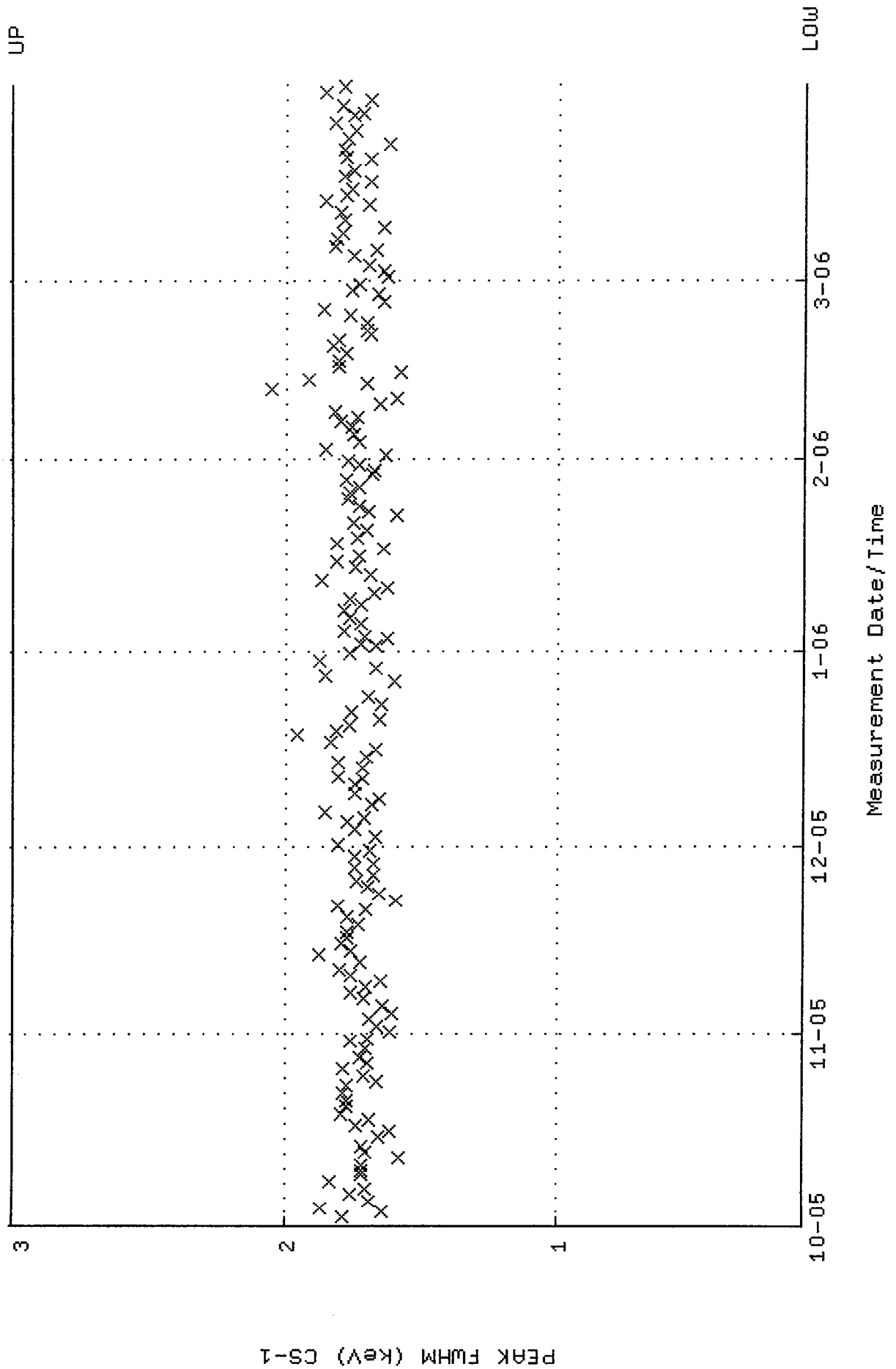
QA Filename: DKA0:[CANBERRA.GAMMA.SCUSR.QA]QCC\_GAM19\_CAN  
 Parameter Name: PSCENTRD-88 (PEAK CENTROID CD-109)  
 Statistics Start/End Dates: First data point through Last data point  
 Mean +/- Std Dev: 175.797 ± 0.0558654 (0.03 %)



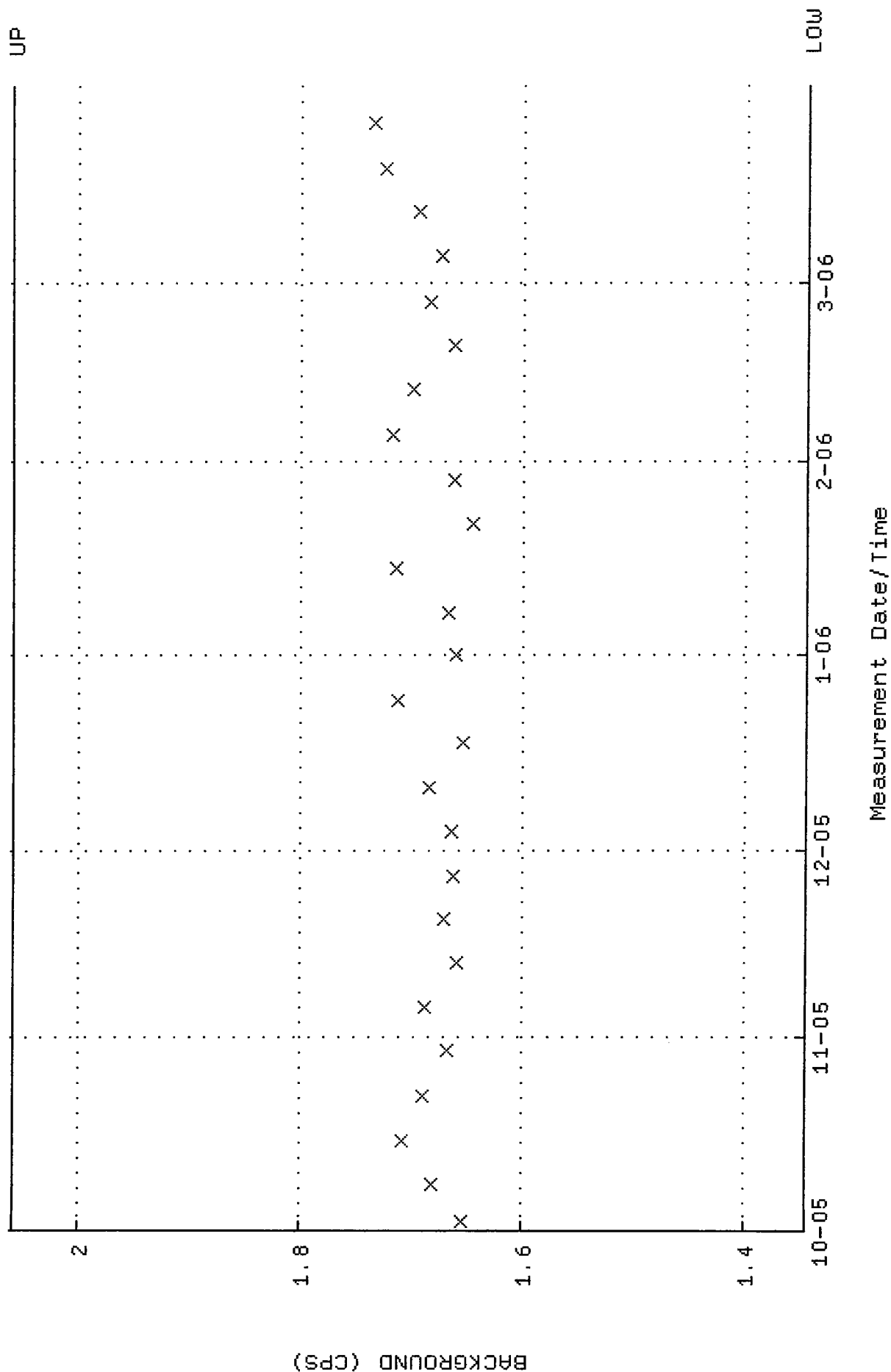
17-FEB-2006 07:20:41 to 25-MAR-2006 19:32:16

QA Filename: DKA0:[CANBERRA.GAMMA.SCUSR.QA]LBC\_GAM19.QAF;1  
 Parameter Name: BACKRATE (Spectrum Background Rate)  
 Statistics Start/End Dates: First data point through Last data point  
 Mean +/- Std Dev: 1.9459 ± 0.157399 (8.09 %)

QA filename : DKA100:[ENV\_ALPHA]QC\_WELL.QAF;4  
Parameter Name : PSFWHM-661 (PEAK FWHM (keV) CS-137)  
Start/End Dates : 2-OCT-2005 11:34:54 through 31-MAR-2006 12:00:00  
Lower/Upper Lmts: 0.100000 through 3.000000



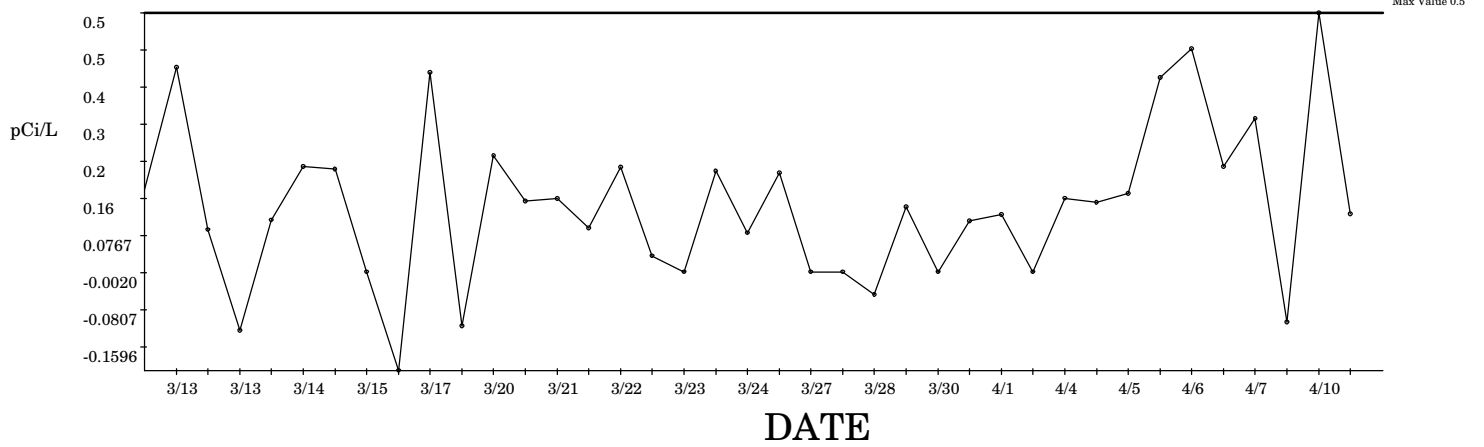
QA filename : DKA100:[ENV\_ALPHA]QC\_BKG\_WELL.QAF;2  
 Parameter Name : BACKRATE (BACKGROUND (CPS))  
 Start/End Dates : 2-OCT-2005 11:46:24 through 31-MAR-2006 12:00:00  
 Lower/Upper Lmts: 1.34470 through 2.05930



# QUALITY CONTROL CHARTS

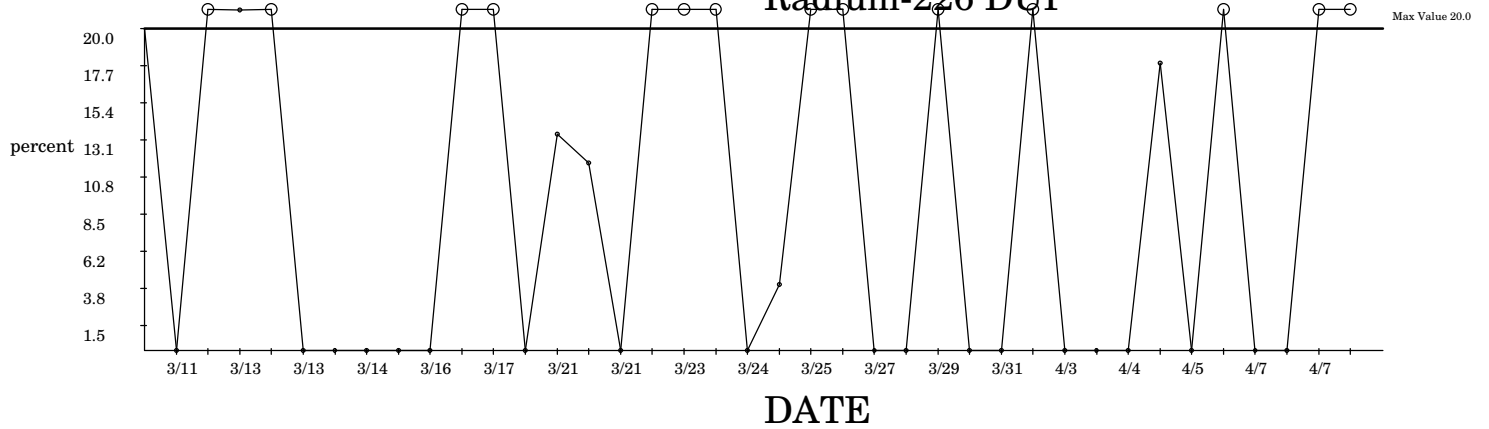
# SPC Graph for Lucas Cell Radium 226 in Liquids 4/11/2006

## Radium-226 BLANK



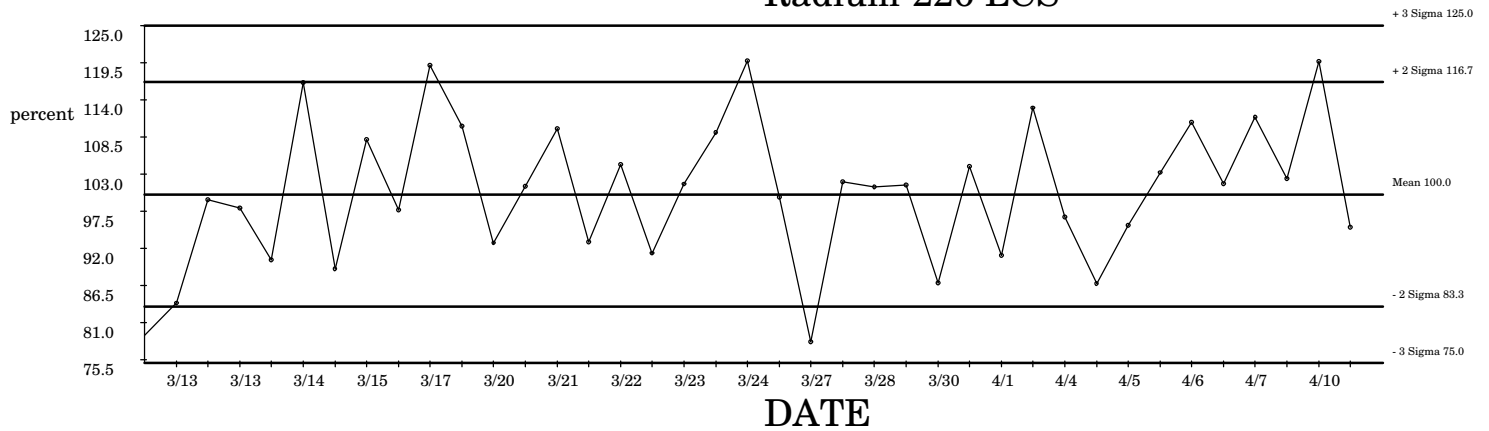
DATE

## Radium-226 DUP



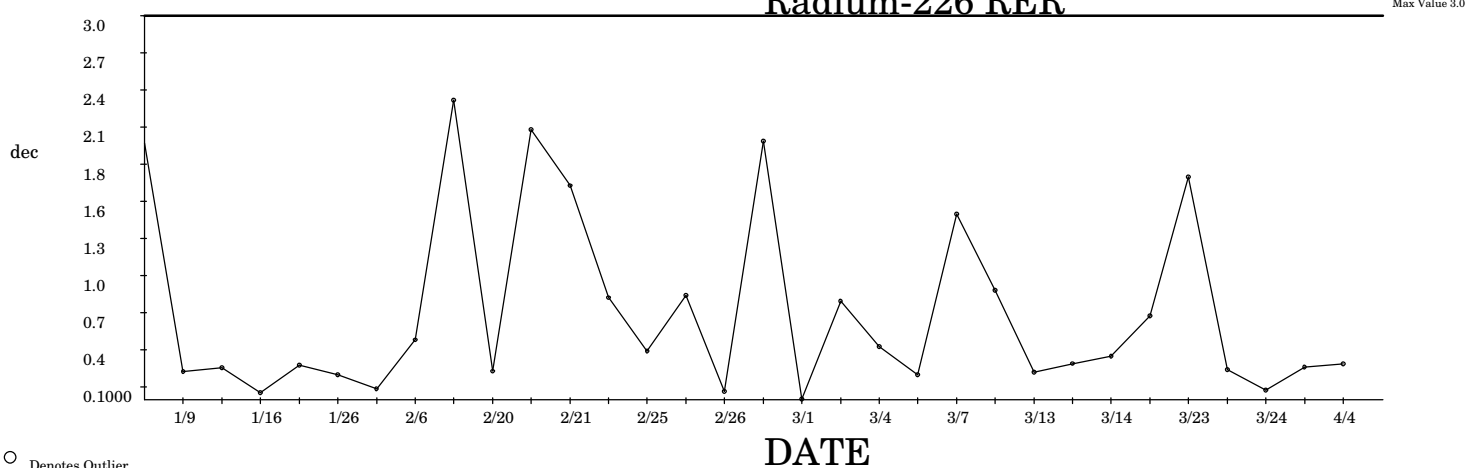
DATE

## Radium-226 LCS



DATE

## Radium-226 RER

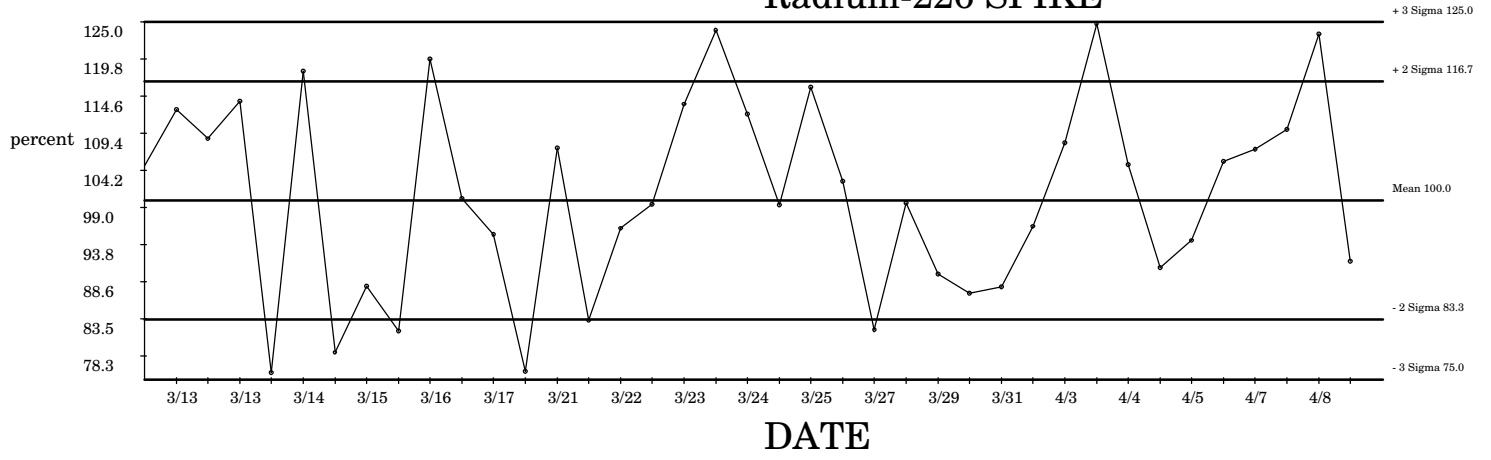


DATE

○ Denotes Outlier

# SPC Graph for Lucas Cell Radium 226 in Liquids 4/11/2006

## Radium-226 SPIKE



○ Denotes Outlier



# Data used for Lucas Cell Radium 226 in Liquids 12-APR-2006

Radium-226 BLANK: Limits LCL = -.4 UCL = .6

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
508193	1201043049	11-MAR-2006 18:30	DONE	0	0.16	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
510096	1201047336	13-MAR-2006 07:55	DONE	0	1.7	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
508847	1201044642	13-MAR-2006 09:00	DONE	0	-0.29	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
507422	1201041266	13-MAR-2006 23:05	DONE	0	-2	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
510100	1201047353	13-MAR-2006 23:05	DONE	0	-0.17	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
508848	1201044646	14-MAR-2006 10:35	DONE	0	0.5	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
508845	1201044630	14-MAR-2006 14:00	DONE	0	0.47	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
510098	1201047344	15-MAR-2006 21:20	DONE	0	-0.82	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
508846	1201044634	16-MAR-2006 15:05	DONE	0	-2	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
510099	1201047349	17-MAR-2006 09:45	DONE	0	1.7	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
510646	1201048626	17-MAR-2006 17:40	DONE	0	-1	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
510094	1201047328	20-MAR-2006 20:50	DONE	0	0.64	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
508851	1201044655	21-MAR-2006 09:30	DONE	0	0.07	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
511412	1201050383	21-MAR-2006 13:45	DONE	0	0.1	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
510095	1201047332	21-MAR-2006 15:30	DONE	0	-0.27	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
510101	1201047357	22-MAR-2006 09:20	DONE	0	0.49	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
511384	1201050305	23-MAR-2006 11:50	DONE	0	-0.62	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
511905	1201051483	23-MAR-2006 20:10	DONE	0	-0.82	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
513423	1201054876	24-MAR-2006 07:50	DONE	0	0.44	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
512638	1201053208	24-MAR-2006 08:30	DONE	0	-0.33	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
510097	1201047340	27-MAR-2006 12:05	DONE	0	0.42	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
508195	1201043053	27-MAR-2006 15:00	DONE	0	-0.82	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
512753	1201053461	27-MAR-2006 20:00	DONE	0	-0.82	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
513367	1201054753	28-MAR-2006 22:50	DONE	0	-1	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
512637	1201053204	29-MAR-2006 21:50	DONE	0	-0.01	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
514680	1201057530	30-MAR-2006 20:04	DONE	0	-0.82	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
514682	1201057534	31-MAR-2006 23:18	DONE	0	-0.18	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
512635	1201053196	01-APR-2006 13:00	DONE	0	-0.1	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
512634	1201053192	03-APR-2006 12:50	DONE	0	-0.82	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
516190	1201060833	04-APR-2006 05:15	DONE	0	0.1	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
511410	1201050375	04-APR-2006 10:50	DONE	0	0.05	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
511411	1201050379	05-APR-2006 11:40	DONE	0	0.16	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
514686	1201057554	05-APR-2006 12:40	DONE	0	1.6	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
514684	1201057546	06-APR-2006 11:30	DONE	0	2	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
516172	1201060797	07-APR-2006 09:15	DONE	0	0.5	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
516170	1201060793	07-APR-2006 09:55	DONE	0	1.1	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
516189	1201060829	07-APR-2006 23:50	DONE	0	-1	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
518058	1201064983	10-APR-2006 08:55	DONE	1	2.4	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17
515528	1201059359	10-APR-2006 23:50	DONE	0	-0.1	pCi/L	0.14	-0.371	-0.201	0.48	0.65	0.17

Radium-226 DUP: Limits LCL = 0 UCL = 20

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
507423	1201041271	10-MAR-2006 21:52	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
508193	1201043050	11-MAR-2006 18:30	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
510096	1201047337	13-MAR-2006 07:55	DONE	43	1	percent	17.8	0	-31	67	20.0	24.6
508847	1201044643	13-MAR-2006 09:00	DONE	21	0.14	percent	17.8	0	-31	67	20.0	24.6

510100	1201047354	13-MAR-2006 10:40	DONE	44	1.1	percent	17.8	0	-31	67	20.0	24.6
507422	1201041267	13-MAR-2006 23:05	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
508848	1201044647	14-MAR-2006 10:35	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
508845	1201044631	14-MAR-2006 14:00	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
510098	1201047345	15-MAR-2006 10:30	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
508846	1201044635	16-MAR-2006 13:15	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
510099	1201047350	17-MAR-2006 09:45	DONE	22	0.19	percent	17.8	0	-31	67	20.0	24.6
510646	1201048627	17-MAR-2006 17:40	DONE	40	0.9	percent	17.8	0	-31	67	20.0	24.6
510094	1201047329	20-MAR-2006 21:24	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
508851	1201044656	21-MAR-2006 11:30	DONE	13	-0.18	percent	17.8	0	-31	67	20.0	24.6
511412	1201050384	21-MAR-2006 13:45	DONE	12	-0.25	percent	17.8	0	-31	67	20.0	24.6
510095	1201047333	21-MAR-2006 16:10	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
510101	1201047358	22-MAR-2006 10:00	DONE	29	0.47	percent	17.8	0	-31	67	20.0	24.6
511384	1201050306	23-MAR-2006 11:50	DONE	50	1.3	percent	17.8	0	-31	67	20.0	24.6
511905	1201051484	23-MAR-2006 20:10	DONE	100	3.4	percent	17.8	0	-31	67	20.0	24.6
513423	1201054877	24-MAR-2006 07:50	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
512638	1201053209	24-MAR-2006 08:30	DONE	4	-0.56	percent	17.8	0	-31	67	20.0	24.6
508195	1201043054	25-MAR-2006 14:20	DONE	43	1	percent	17.8	0	-31	67	20.0	24.6
510097	1201047341	27-MAR-2006 12:05	DONE	36	0.75	percent	17.8	0	-31	67	20.0	24.6
512753	1201053462	27-MAR-2006 20:00	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
513367	1201054754	28-MAR-2006 22:50	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
512637	1201053205	29-MAR-2006 22:25	DONE	29	0.44	percent	17.8	0	-31	67	20.0	24.6
514680	1201057531	30-MAR-2006 20:04	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
514682	1201057535	31-MAR-2006 23:58	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
512635	1201053197	01-APR-2006 13:00	DONE	23	0.23	percent	17.8	0	-31	67	20.0	24.6
512634	1201053193	03-APR-2006 12:50	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
516190	1201060834	04-APR-2006 05:15	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
511410	1201050376	04-APR-2006 10:50	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
511411	1201050380	05-APR-2006 11:40	DONE	18	00	percent	17.8	0	-31	67	20.0	24.6
514686	1201057555	05-APR-2006 14:55	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
514684	1201057547	06-APR-2006 12:05	DONE	48	1.2	percent	17.8	0	-31	67	20.0	24.6
516172	1201060798	07-APR-2006 09:15	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
516170	1201060794	07-APR-2006 09:55	DONE	0	-0.72	percent	17.8	0	-31	67	20.0	24.6
516189	1201060830	07-APR-2006 23:19	DONE	83	2.6	percent	17.8	0	-31	67	20.0	24.6
518058	1201064984	10-APR-2006 09:30	DONE	35	0.72	percent	17.8	0	-31	67	20.0	24.6

**Radium-226 LCS: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
508193	1201043052	13-MAR-2006 08:30	DONE	121	2.5	percent	100	75.0	83.3	117	125	8.33
510096	1201047339	13-MAR-2006 08:30	DONE	84	-2	percent	100	75.0	83.3	117	125	8.33
508847	1201044645	13-MAR-2006 09:00	DONE	99	-0.1	percent	100	75.0	83.3	117	125	8.33
510100	1201047356	13-MAR-2006 11:45	DONE	98	-0.25	percent	100	75.0	83.3	117	125	8.33
507422	1201041269	13-MAR-2006 23:40	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
508848	1201044649	14-MAR-2006 10:35	DONE	117	2	percent	100	75.0	83.3	117	125	8.33
508845	1201044633	14-MAR-2006 14:40	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33
510098	1201047348	15-MAR-2006 10:30	DONE	108	0.97	percent	100	75.0	83.3	117	125	8.33
510099	1201047352	17-MAR-2006 10:20	DONE	98	-0.28	percent	100	75.0	83.3	117	125	8.33
508846	1201044637	17-MAR-2006 11:30	DONE	119	2.3	percent	100	75.0	83.3	117	125	8.33
510646	1201048629	17-MAR-2006 18:12	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
510094	1201047331	20-MAR-2006 20:50	DONE	93	-0.86	percent	100	75.0	83.3	117	125	8.33

508851	1201044658	21-MAR-2006 11:30	DONE	101	0.15	percent	100	75.0	83.3	117	125	8.33
511412	1201050386	21-MAR-2006 14:15	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
510095	1201047335	21-MAR-2006 16:50	DONE	93	-0.85	percent	100	75.0	83.3	117	125	8.33
510101	1201047360	22-MAR-2006 10:00	DONE	104	0.53	percent	100	75.0	83.3	117	125	8.33
511384	1201050308	23-MAR-2006 12:35	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
511905	1201051486	23-MAR-2006 20:10	DONE	102	0.18	percent	100	75.0	83.3	117	125	8.33
512638	1201053211	24-MAR-2006 08:30	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
513423	1201054879	24-MAR-2006 09:05	DONE	120	2.4	percent	100	75.0	83.3	117	125	8.33
508195	1201043056	25-MAR-2006 14:20	DONE	100	-0.05	percent	100	75.0	83.3	117	125	8.33
510097	1201047343	27-MAR-2006 12:45	DONE	78	-3	percent	100	75.0	83.3	117	125	8.33
512753	1201053464	27-MAR-2006 20:00	DONE	102	0.22	percent	100	75.0	83.3	117	125	8.33
513367	1201054756	28-MAR-2006 23:30	DONE	101	0.14	percent	100	75.0	83.3	117	125	8.33
512637	1201053207	29-MAR-2006 12:20	DONE	101	0.16	percent	100	75.0	83.3	117	125	8.33
514680	1201057533	30-MAR-2006 20:04	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
514682	1201057537	31-MAR-2006 23:58	DONE	104	0.49	percent	100	75.0	83.3	117	125	8.33
512635	1201053199	01-APR-2006 13:35	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
512634	1201053195	03-APR-2006 13:20	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
516190	1201060836	04-APR-2006 05:45	DONE	97	-0.4	percent	100	75.0	83.3	117	125	8.33
511410	1201050378	04-APR-2006 11:25	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
511411	1201050382	05-APR-2006 11:40	DONE	95	-0.55	percent	100	75.0	83.3	117	125	8.33
514686	1201057557	05-APR-2006 14:55	DONE	103	0.39	percent	100	75.0	83.3	117	125	8.33
514684	1201057549	06-APR-2006 12:05	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
516172	1201060800	07-APR-2006 09:15	DONE	102	0.19	percent	100	75.0	83.3	117	125	8.33
516170	1201060796	07-APR-2006 09:55	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
516189	1201060832	07-APR-2006 23:19	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33
518058	1201064986	10-APR-2006 09:30	DONE	120	2.4	percent	100	75.0	83.3	117	125	8.33
515528	1201059362	10-APR-2006 23:50	DONE	95	-0.58	percent	100	75.0	83.3	117	125	8.33

**Radium-226 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
491123	1201003602	06-JAN-2006 08:30	DONE	01	0.52	dec	0.65	0	-0.689	1.99	3.00	0.67
492281	1201006340	09-JAN-2006 14:10	DONE	0.22	-0.64	dec	0.65	0	-0.689	1.99	3.00	0.67
493744	1201009613	16-JAN-2006 12:35	DONE	0.25	-0.59	dec	0.65	0	-0.689	1.99	3.00	0.67
491603	1201004809	16-JAN-2006 17:40	DONE	0.05	-0.89	dec	0.65	0	-0.689	1.99	3.00	0.67
496175	1201015002	24-JAN-2006 12:30	DONE	0.27	-0.56	dec	0.65	0	-0.689	1.99	3.00	0.67
494116	1201010400	26-JAN-2006 11:30	DONE	0.19	-0.68	dec	0.65	0	-0.689	1.99	3.00	0.67
498307	1201019879	31-JAN-2006 11:50	DONE	0.09	-0.84	dec	0.65	0	-0.689	1.99	3.00	0.67
494113	1201010392	06-FEB-2006 12:23	DONE	0.47	-0.27	dec	0.65	0	-0.689	1.99	3.00	0.67
498877	1201021133	09-FEB-2006 14:10	DONE	2.34	2.5	dec	0.65	0	-0.689	1.99	3.00	0.67
502800	1201030385	20-FEB-2006 12:05	DONE	0.22	-0.64	dec	0.65	0	-0.689	1.99	3.00	0.67
502788	1201030379	20-FEB-2006 21:00	DONE	2.11	2.2	dec	0.65	0	-0.689	1.99	3.00	0.67
501470	1201027422	21-FEB-2006 12:05	DONE	1.67	1.5	dec	0.65	0	-0.689	1.99	3.00	0.67
504420	1201034005	22-FEB-2006 10:35	DONE	0.8	0.22	dec	0.65	0	-0.689	1.99	3.00	0.67
505540	1201036745	25-FEB-2006 12:15	DONE	0.38	-0.4	dec	0.65	0	-0.689	1.99	3.00	0.67
504418	1201033997	25-FEB-2006 13:50	DONE	0.81	0.25	dec	0.65	0	-0.689	1.99	3.00	0.67
505537	1201036733	26-FEB-2006 12:30	DONE	0.07	-0.87	dec	0.65	0	-0.689	1.99	3.00	0.67
504916	1201035200	28-FEB-2006 11:20	DONE	2.02	2.1	dec	0.65	0	-0.689	1.99	3.00	0.67
505541	1201036749	01-MAR-2006 11:00	DONE	00	-0.96	dec	0.65	0	-0.689	1.99	3.00	0.67
506091	1201038002	03-MAR-2006 11:15	DONE	0.77	0.18	dec	0.65	0	-0.689	1.99	3.00	0.67
506887	1201039889	04-MAR-2006 20:29	DONE	0.42	-0.35	dec	0.65	0	-0.689	1.99	3.00	0.67

506889	1201039897	06-MAR-2006 09:00	DONE	0.19	-0.68	dec	0.65	0	-0.689	1.99	3.00	0.67
506097	1201038018	07-MAR-2006 09:30	DONE	1.45	1.2	dec	0.65	0	-0.689	1.99	3.00	0.67
506099	1201038022	08-MAR-2006 09:55	DONE	0.85	0.31	dec	0.65	0	-0.689	1.99	3.00	0.67
508847	1201044643	13-MAR-2006 09:00	DONE	0.21	-0.65	dec	0.65	0	-0.689	1.99	3.00	0.67
510100	1201047354	13-MAR-2006 10:40	DONE	0.28	-0.55	dec	0.65	0	-0.689	1.99	3.00	0.67
508848	1201044647	14-MAR-2006 10:35	DONE	0.34	-0.46	dec	0.65	0	-0.689	1.99	3.00	0.67
510098	1201047345	15-MAR-2006 10:30	DONE	0.66	0.01	dec	0.65	0	-0.689	1.99	3.00	0.67
511905	1201051484	23-MAR-2006 20:10	DONE	1.74	1.6	dec	0.65	0	-0.689	1.99	3.00	0.67
513423	1201054877	24-MAR-2006 07:50	DONE	0.23	-0.62	dec	0.65	0	-0.689	1.99	3.00	0.67
512638	1201053209	24-MAR-2006 08:30	DONE	0.08	-0.85	dec	0.65	0	-0.689	1.99	3.00	0.67
510097	1201047341	27-MAR-2006 12:05	DONE	0.25	-0.59	dec	0.65	0	-0.689	1.99	3.00	0.67
511410	1201050376	04-APR-2006 10:50	DONE	0.28	-0.55	dec	0.65	0	-0.689	1.99	3.00	0.67

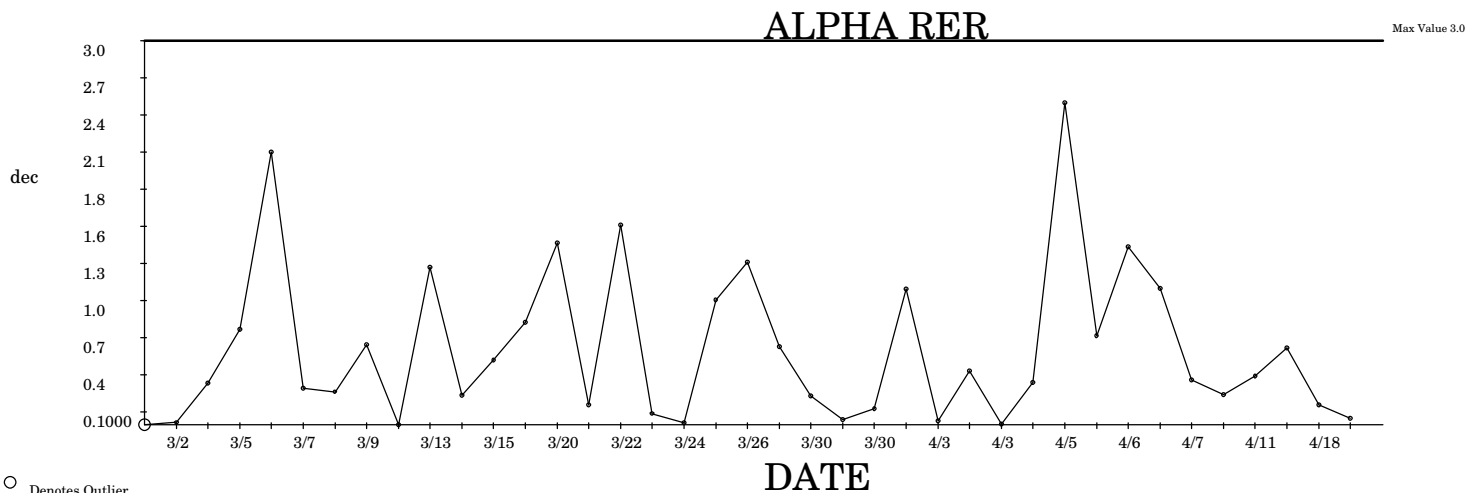
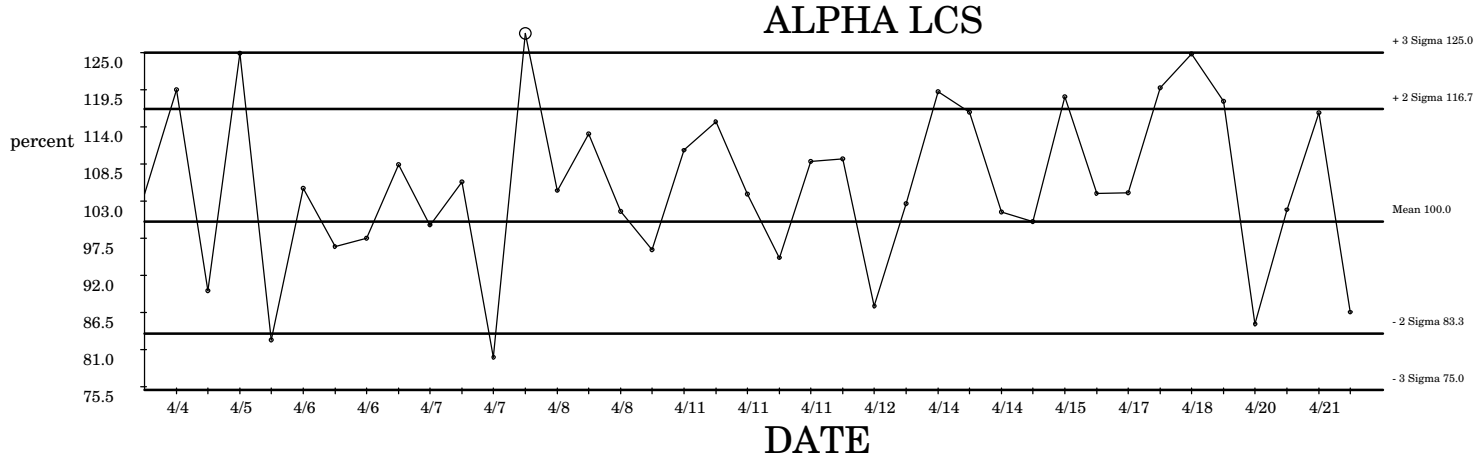
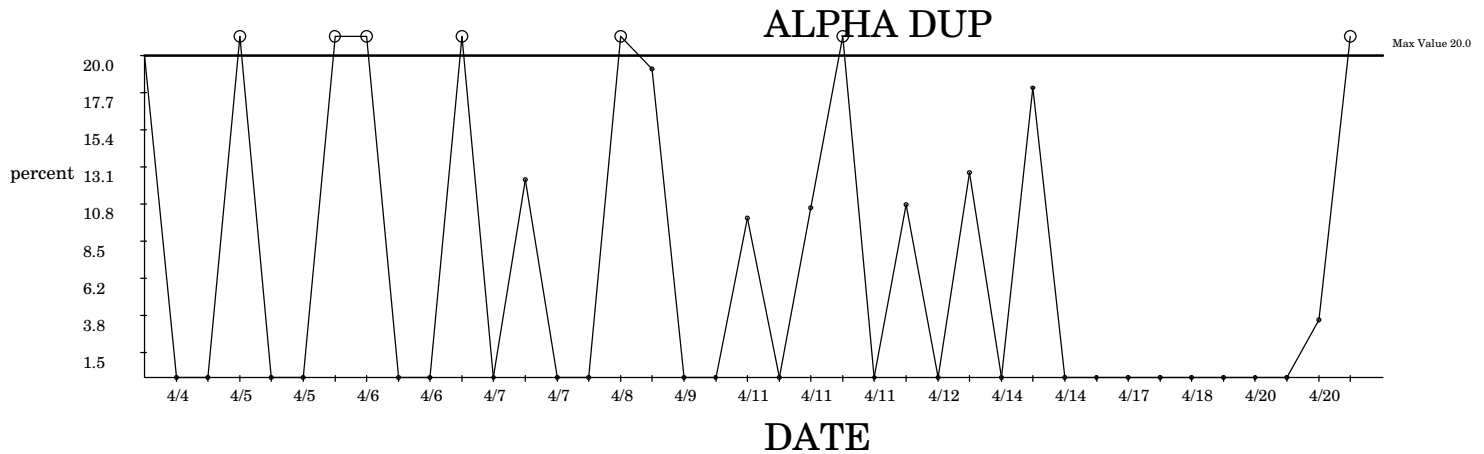
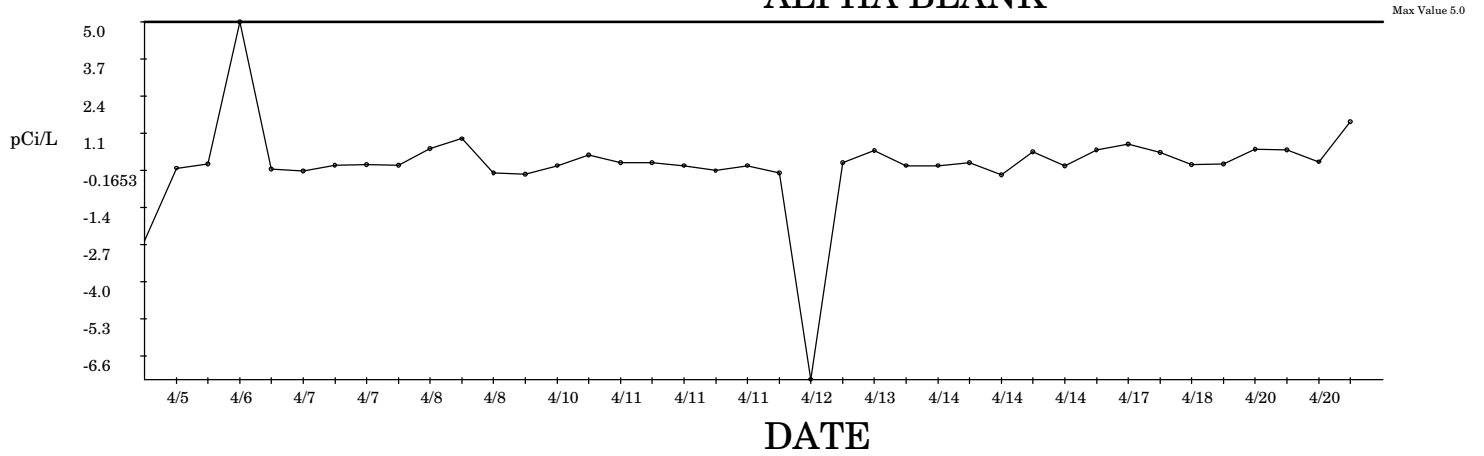
**Radium-226 SPIKE: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
508193	1201043051	11-MAR-2006 19:02	DONE	95	-0.58	percent	100	75.0	83.3	117	125	8.33
510096	1201047338	13-MAR-2006 07:55	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
508847	1201044644	13-MAR-2006 09:00	DONE	109	1	percent	100	75.0	83.3	117	125	8.33
510100	1201047355	13-MAR-2006 11:45	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
507422	1201041268	14-MAR-2006 07:25	DONE	76	-3	percent	100	75.0	83.3	117	125	8.33
508848	1201044648	14-MAR-2006 10:35	DONE	118	2.2	percent	100	75.0	83.3	117	125	8.33
508845	1201044632	14-MAR-2006 16:00	DONE	79	-3	percent	100	75.0	83.3	117	125	8.33
510098	1201047346	15-MAR-2006 10:30	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
510098	1201047347	15-MAR-2006 10:30	DONE	82	-2	percent	100	75.0	83.3	117	125	8.33
508846	1201044636	16-MAR-2006 13:15	DONE	120	2.4	percent	100	75.0	83.3	117	125	8.33
510099	1201047351	17-MAR-2006 09:45	DONE	100	0.04	percent	100	75.0	83.3	117	125	8.33
510646	1201048628	17-MAR-2006 18:12	DONE	95	-0.57	percent	100	75.0	83.3	117	125	8.33
510094	1201047330	21-MAR-2006 11:10	DONE	76	-3	percent	100	75.0	83.3	117	125	8.33
508851	1201044657	21-MAR-2006 11:30	DONE	107	0.88	percent	100	75.0	83.3	117	125	8.33
511412	1201050385	21-MAR-2006 14:15	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
510101	1201047359	22-MAR-2006 10:00	DONE	96	-0.46	percent	100	75.0	83.3	117	125	8.33
510095	1201047334	22-MAR-2006 11:05	DONE	99	-0.06	percent	100	75.0	83.3	117	125	8.33
511384	1201050307	23-MAR-2006 12:35	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33
511905	1201051485	23-MAR-2006 20:10	DONE	124	2.9	percent	100	75.0	83.3	117	125	8.33
513423	1201054878	24-MAR-2006 07:50	DONE	112	1.5	percent	100	75.0	83.3	117	125	8.33
512638	1201053210	24-MAR-2006 08:30	DONE	99	-0.07	percent	100	75.0	83.3	117	125	8.33
508195	1201043055	25-MAR-2006 14:20	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
510097	1201047342	27-MAR-2006 12:05	DONE	103	0.33	percent	100	75.0	83.3	117	125	8.33
512753	1201053463	27-MAR-2006 20:30	DONE	82	-2	percent	100	75.0	83.3	117	125	8.33
513367	1201054755	28-MAR-2006 22:50	DONE	100	-0.04	percent	100	75.0	83.3	117	125	8.33
512637	1201053206	29-MAR-2006 12:20	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
514680	1201057532	30-MAR-2006 20:04	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
514682	1201057536	31-MAR-2006 23:18	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
512635	1201053198	01-APR-2006 13:00	DONE	96	-0.43	percent	100	75.0	83.3	117	125	8.33
512634	1201053194	03-APR-2006 12:50	DONE	108	0.97	percent	100	75.0	83.3	117	125	8.33
516190	1201060835	04-APR-2006 05:45	DONE	125	3	percent	100	75.0	83.3	117	125	8.33
511410	1201050377	04-APR-2006 11:25	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
511411	1201050381	05-APR-2006 11:40	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
514686	1201057556	05-APR-2006 14:55	DONE	94	-0.67	percent	100	75.0	83.3	117	125	8.33
514684	1201057548	06-APR-2006 12:05	DONE	105	0.65	percent	100	75.0	83.3	117	125	8.33

516172	1201060799	07-APR-2006 09:15	DONE	107	0.86	percent	100	75.0	83.3	117	125	8.33
516170	1201060795	07-APR-2006 09:55	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
516189	1201060831	08-APR-2006 15:20	DONE	123	2.8	percent	100	75.0	83.3	117	125	8.33
518058	1201064985	10-APR-2006 09:30	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33

# SPC Graph for Gross AlphaNon Vol Beta in Liquids 4/23/2006

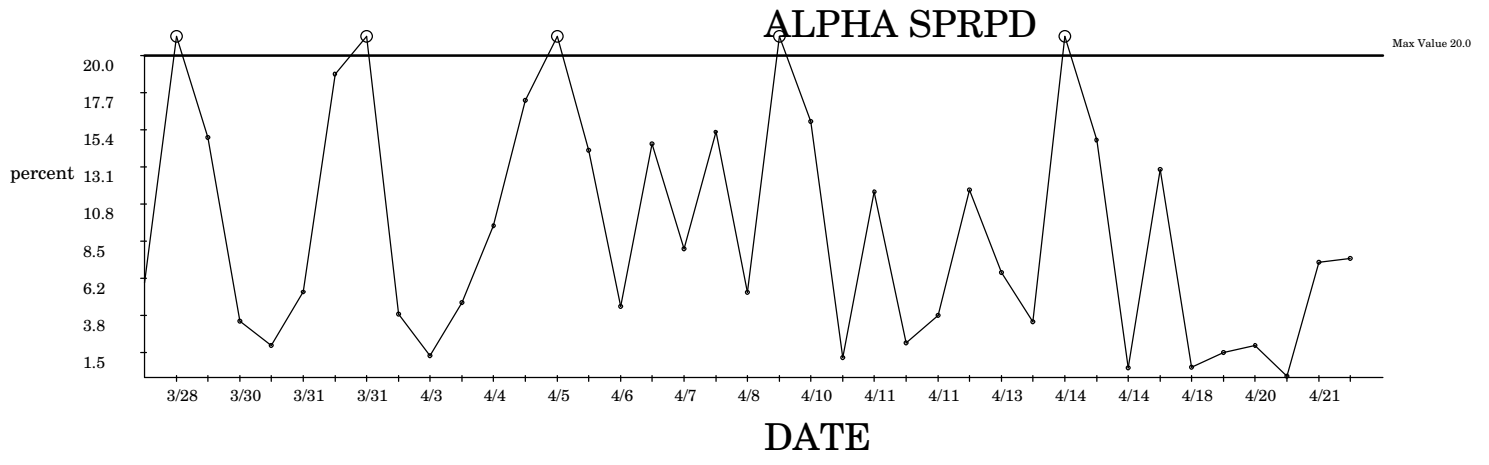
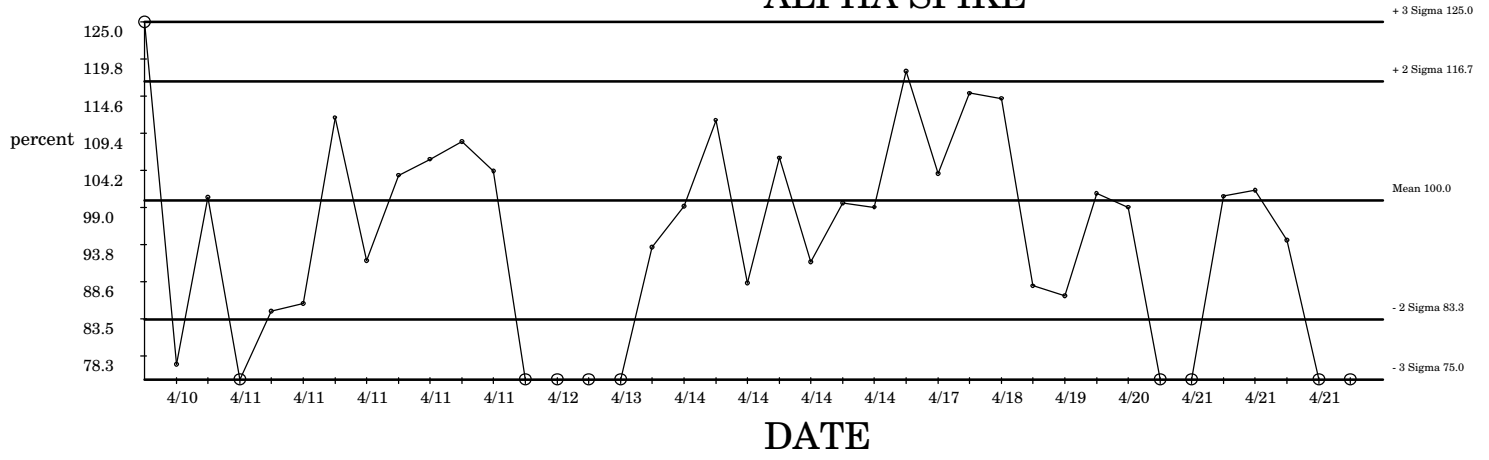
## ALPHA BLANK



○ Denotes Outlier

# SPC Graph for Gross AlphaNon Vol Beta in Liquids 4/23/2006

## ALPHA SPIKE



○ Denotes Outlier

# Data used for Gross AlphaNon Vol Beta in Liquids 24-APR-2006

ALPHA BLANK: Limits LCL = -4.4 UCL = 4.6

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
512345	1201052579	05-APR-2006 10:37	DONE	0	-0.19	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
517638	1201064048	05-APR-2006 17:57	DONE	0	-0.12	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
517414	1201063510	06-APR-2006 13:36	DONE	0	-0.02	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
518414	1201065760	06-APR-2006 22:25	DONE	5	3.3	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
517429	1201063581	06-APR-2006 23:52	DONE	0	-0.15	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
518054	1201064971	07-APR-2006 10:38	DONE	0	-0.18	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
516597	1201061658	07-APR-2006 13:29	DONE	0	-0.06	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
518421	1201065783	07-APR-2006 14:41	DONE	0	-0.04	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
518416	1201065775	07-APR-2006 23:35	DONE	0	-0.06	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
517822	1201064445	08-APR-2006 11:59	DONE	1	0.32	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
517424	1201063568	08-APR-2006 13:14	DUSE	1	0.56	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
517820	1201064433	08-APR-2006 14:53	DONE	0	-0.23	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
518877	1201066813	09-APR-2006 11:02	DONE	0	-0.26	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
519677	1201068639	10-APR-2006 15:50	DONE	0	-0.06	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
519306	1201067676	10-APR-2006 23:54	DUSE	0	0.18	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
519285	1201067617	11-APR-2006 00:02	DONE	0	-0	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
518886	1201066843	11-APR-2006 10:42	DUSE	0	00	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
519967	1201069270	11-APR-2006 15:48	DONE	0	-0.06	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
519714	1201068735	11-APR-2006 19:10	DONE	0	-0.18	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
519953	1201069253	11-APR-2006 22:24	DONE	0	-0.06	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
519281	1201067602	11-APR-2006 22:32	DONE	0	-0.23	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
519298	1201067653	12-APR-2006 13:16	DUSE	-7	-5	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
519715	1201068739	12-APR-2006 15:01	DUSE	0	0.01	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
519284	1201067612	13-APR-2006 10:15	DONE	1	0.28	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
520724	1201070985	13-APR-2006 15:14	DONE	0	-0.06	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
520726	1201070990	14-APR-2006 10:12	DONE	0	-0.06	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
520501	1201070427	14-APR-2006 13:14	DONE	0	0.01	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
520499	1201070417	14-APR-2006 13:40	DONE	0	-0.28	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
520512	1201070466	14-APR-2006 13:51	DUSE	0	0.26	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
521223	1201072195	14-APR-2006 23:46	DONE	0	-0.06	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
520967	1201071529	17-APR-2006 15:55	DUSE	1	0.3	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
520963	1201071507	17-APR-2006 20:42	DONE	1	0.43	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
521595	1201073053	18-APR-2006 18:36	DONE	0	0.24	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
520500	1201070422	18-APR-2006 19:55	DONE	0	-0.04	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
520511	1201070461	19-APR-2006 15:16	DONE	0	-0.03	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
521909	1201073913	20-APR-2006 12:05	DONE	1	0.31	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
520514	1201070471	20-APR-2006 22:54	DONE	1	0.3	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
521039	1201071723	20-APR-2006 22:57	DONE	0	0.03	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49
522372	1201075021	21-APR-2006 10:27	DONE	2	0.95	pCi/L	0.09	-4.4	-2.9	3.08	4.57	1.49

ALPHA DUP: Limits LCL = 0 UCL = 20

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
515770	1201060014	03-APR-2006 23:30	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
512357	1201052626	04-APR-2006 13:57	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5



516803	1201062204	04-APR-2006 22:06	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
515787	1201060059	05-APR-2006 14:53	DONE	51	1.7	percent	12.4	0	-35	59.4	20.0	23.5
512345	1201052580	05-APR-2006 16:17	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
517638	1201064049	05-APR-2006 17:57	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
517414	1201063511	06-APR-2006 13:36	DONE	23	0.45	percent	12.4	0	-35	59.4	20.0	23.5
517424	1201063569	06-APR-2006 19:39	DUSE	92	3.4	percent	12.4	0	-35	59.4	20.0	23.5
518414	1201065761	06-APR-2006 22:25	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
512358	1201052631	06-APR-2006 23:57	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
518054	1201064972	07-APR-2006 10:38	DONE	76	2.7	percent	12.4	0	-35	59.4	20.0	23.5
516597	1201061659	07-APR-2006 13:29	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
518421	1201065784	07-APR-2006 14:41	DONE	12	-0	percent	12.4	0	-35	59.4	20.0	23.5
518416	1201065776	07-APR-2006 23:35	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
517822	1201064446	08-APR-2006 11:59	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
517429	1201063582	08-APR-2006 16:09	DONE	27	0.61	percent	12.4	0	-35	59.4	20.0	23.5
517820	1201064434	08-APR-2006 16:11	DONE	19	0.29	percent	12.4	0	-35	59.4	20.0	23.5
518877	1201066814	09-APR-2006 11:08	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
519306	1201067677	10-APR-2006 23:54	DUSE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
519285	1201067618	11-APR-2006 00:02	DONE	10	-0.11	percent	12.4	0	-35	59.4	20.0	23.5
518886	1201066844	11-APR-2006 10:42	DUSE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
519677	1201068640	11-APR-2006 11:40	DONE	11	-0.08	percent	12.4	0	-35	59.4	20.0	23.5
519715	1201068740	11-APR-2006 17:55	DUSE	76	2.7	percent	12.4	0	-35	59.4	20.0	23.5
519714	1201068736	11-APR-2006 19:09	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
519281	1201067603	11-APR-2006 23:34	DONE	11	-0.07	percent	12.4	0	-35	59.4	20.0	23.5
519298	1201067654	12-APR-2006 13:16	DUSE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
519284	1201067613	14-APR-2006 10:12	DONE	13	0.01	percent	12.4	0	-35	59.4	20.0	23.5
520501	1201070428	14-APR-2006 13:14	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
520499	1201070418	14-APR-2006 13:40	DONE	18	0.24	percent	12.4	0	-35	59.4	20.0	23.5
520512	1201070467	14-APR-2006 13:51	DUSE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
520963	1201071508	14-APR-2006 16:22	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
520967	1201071530	17-APR-2006 15:55	DUSE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
521595	1201073054	18-APR-2006 18:36	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
520500	1201070423	18-APR-2006 21:57	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
520511	1201070462	19-APR-2006 15:27	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
521909	1201073914	20-APR-2006 12:05	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
520514	1201070472	20-APR-2006 22:54	DONE	0	-0.53	percent	12.4	0	-35	59.4	20.0	23.5
521039	1201071724	20-APR-2006 22:57	DONE	4	-0.38	percent	12.4	0	-35	59.4	20.0	23.5
522372	1201075022	21-APR-2006 10:27	DONE	41	1.2	percent	12.4	0	-35	59.4	20.0	23.5

ALPHA LCS: Limits LCL = 75 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
516803	1201062206	04-APR-2006 11:49	DONE	96	-0.48	percent	100	75.0	83.3	117	125	8.33
512359	1201052639	04-APR-2006 13:12	DONE	120	2.3	percent	100	75.0	83.3	117	125	8.33
512357	1201052629	04-APR-2006 13:57	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
512345	1201052581	05-APR-2006 10:37	DONE	125	3	percent	100	75.0	83.3	117	125	8.33
517638	1201064051	05-APR-2006 17:57	DONE	82	-2	percent	100	75.0	83.3	117	125	8.33
517414	1201063512	06-APR-2006 10:38	DONE	105	0.58	percent	100	75.0	83.3	117	125	8.33
512358	1201052634	06-APR-2006 20:53	DONE	96	-0.44	percent	100	75.0	83.3	117	125	8.33
518414	1201065763	06-APR-2006 22:15	DONE	98	-0.3	percent	100	75.0	83.3	117	125	8.33
518054	1201064974	07-APR-2006 10:24	DONE	108	1	percent	100	75.0	83.3	117	125	8.33
516597	1201061661	07-APR-2006 13:13	DONE	99	-0.07	percent	100	75.0	83.3	117	125	8.33

517429	1201063584	07-APR-2006 13:18	DONE	106	0.7	percent	100	75.0	83.3	117	125	8.33
518421	1201065785	07-APR-2006 13:24	DONE	80	-2	percent	100	75.0	83.3	117	125	8.33
517424	1201063571	07-APR-2006 22:29	DUSE	162	7.4	percent	100	75.0	83.3	117	125	8.33
517822	1201064448	08-APR-2006 11:58	DONE	105	0.55	percent	100	75.0	83.3	117	125	8.33
518416	1201065778	08-APR-2006 11:58	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33
517820	1201064436	08-APR-2006 16:05	DONE	101	0.17	percent	100	75.0	83.3	117	125	8.33
518877	1201066816	09-APR-2006 11:08	DONE	96	-0.51	percent	100	75.0	83.3	117	125	8.33
519306	1201067679	11-APR-2006 10:35	DUSE	111	1.3	percent	100	75.0	83.3	117	125	8.33
518886	1201066846	11-APR-2006 10:35	DUSE	115	1.8	percent	100	75.0	83.3	117	125	8.33
519285	1201067619	11-APR-2006 10:38	DONE	104	0.49	percent	100	75.0	83.3	117	125	8.33
519281	1201067605	11-APR-2006 17:34	DONE	95	-0.65	percent	100	75.0	83.3	117	125	8.33
519715	1201068742	11-APR-2006 17:56	DUSE	109	1.1	percent	100	75.0	83.3	117	125	8.33
519714	1201068738	11-APR-2006 19:09	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
519298	1201067656	12-APR-2006 13:01	DUSE	87	-2	percent	100	75.0	83.3	117	125	8.33
519284	1201067615	13-APR-2006 10:14	DONE	103	0.31	percent	100	75.0	83.3	117	125	8.33
520499	1201070420	14-APR-2006 12:37	DONE	119	2.3	percent	100	75.0	83.3	117	125	8.33
520501	1201070430	14-APR-2006 13:38	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
520512	1201070469	14-APR-2006 14:18	DUSE	101	0.17	percent	100	75.0	83.3	117	125	8.33
520963	1201071510	14-APR-2006 16:27	DONE	100	-0.01	percent	100	75.0	83.3	117	125	8.33
521223	1201072196	15-APR-2006 11:42	DONE	118	2.2	percent	100	75.0	83.3	117	125	8.33
521223	1201072197	15-APR-2006 11:42	DONE	104	0.5	percent	100	75.0	83.3	117	125	8.33
520967	1201071532	17-APR-2006 15:59	DUSE	104	0.51	percent	100	75.0	83.3	117	125	8.33
521595	1201073056	18-APR-2006 18:36	DONE	120	2.4	percent	100	75.0	83.3	117	125	8.33
520500	1201070425	18-APR-2006 21:57	DONE	125	3	percent	100	75.0	83.3	117	125	8.33
520511	1201070464	19-APR-2006 15:16	DONE	118	2.1	percent	100	75.0	83.3	117	125	8.33
521909	1201073916	20-APR-2006 12:04	DONE	85	-2	percent	100	75.0	83.3	117	125	8.33
520514	1201070474	21-APR-2006 10:57	DONE	102	0.21	percent	100	75.0	83.3	117	125	8.33
522372	1201075024	21-APR-2006 11:14	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
521039	1201071726	21-APR-2006 11:57	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33

ALPHA RER: Limits LCL = 0 UCL = 3

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stddev
504791	1201034937	02-MAR-2006 12:20	DONE	3.05	3.3	dec	0.67	0	-0.774	2.11	3.00	0.72
508151	1201042981	02-MAR-2006 15:47	DONE	0.02	-0.9	dec	0.67	0	-0.774	2.11	3.00	0.72
507328	1201040975	04-MAR-2006 14:29	DONE	0.33	-0.47	dec	0.67	0	-0.774	2.11	3.00	0.72
507334	1201041012	05-MAR-2006 12:39	DONE	0.75	0.11	dec	0.67	0	-0.774	2.11	3.00	0.72
509163	1201045368	06-MAR-2006 14:31	DONE	2.13	2	dec	0.67	0	-0.774	2.11	3.00	0.72
507727	1201041919	07-MAR-2006 10:20	DONE	0.29	-0.53	dec	0.67	0	-0.774	2.11	3.00	0.72
507322	1201040960	07-MAR-2006 23:48	DONE	0.26	-0.57	dec	0.67	0	-0.774	2.11	3.00	0.72
509609	1201046300	09-MAR-2006 10:41	DONE	0.63	-0.06	dec	0.67	0	-0.774	2.11	3.00	0.72
510679	1201048728	11-MAR-2006 13:09	DONE	00	-0.92	dec	0.67	0	-0.774	2.11	3.00	0.72
511290	1201050094	13-MAR-2006 19:39	DONE	1.23	0.78	dec	0.67	0	-0.774	2.11	3.00	0.72
507882	1201042399	13-MAR-2006 22:13	DONE	0.23	-0.61	dec	0.67	0	-0.774	2.11	3.00	0.72
508552	1201043913	15-MAR-2006 11:40	DONE	0.51	-0.22	dec	0.67	0	-0.774	2.11	3.00	0.72
513207	1201054443	20-MAR-2006 13:31	DONE	0.8	0.19	dec	0.67	0	-0.774	2.11	3.00	0.72
513323	1201054707	20-MAR-2006 23:27	DONE	1.42	1	dec	0.67	0	-0.774	2.11	3.00	0.72
513145	1201054305	22-MAR-2006 13:07	DONE	0.16	-0.71	dec	0.67	0	-0.774	2.11	3.00	0.72
512340	1201052566	22-MAR-2006 14:17	DONE	1.56	1.2	dec	0.67	0	-0.774	2.11	3.00	0.72
513715	1201055365	22-MAR-2006 17:14	DONE	0.09	-0.8	dec	0.67	0	-0.774	2.11	3.00	0.72
512320	1201052517	24-MAR-2006 11:03	DONE	0.02	-0.9	dec	0.67	0	-0.774	2.11	3.00	0.72

512211	1201052245	24-MAR-2006 12:04	DONE	0.97	0.43	dec	0.67	0	-0.774	2.11	3.00	0.72
512355	1201052621	26-MAR-2006 11:17	DONE	1.27	0.84	dec	0.67	0	-0.774	2.11	3.00	0.72
515350	1201058969	28-MAR-2006 18:43	DONE	0.61	-0.08	dec	0.67	0	-0.774	2.11	3.00	0.72
512342	1201052572	30-MAR-2006 10:36	DONE	0.23	-0.61	dec	0.67	0	-0.774	2.11	3.00	0.72
515347	1201059973	30-MAR-2006 14:29	DONE	0.04	-0.87	dec	0.67	0	-0.774	2.11	3.00	0.72
515780	1201060049	30-MAR-2006 22:54	DONE	0.13	-0.75	dec	0.67	0	-0.774	2.11	3.00	0.72
512338	1201052561	03-APR-2006 13:43	DUSE	1.06	0.55	dec	0.67	0	-0.774	2.11	3.00	0.72
517216	1201063048	03-APR-2006 16:14	DONE	0.03	-0.88	dec	0.67	0	-0.774	2.11	3.00	0.72
516282	1201061016	03-APR-2006 19:01	DONE	0.42	-0.34	dec	0.67	0	-0.774	2.11	3.00	0.72
512351	1201052604	03-APR-2006 22:37	DONE	0.01	-0.92	dec	0.67	0	-0.774	2.11	3.00	0.72
512357	1201052626	04-APR-2006 13:57	DONE	0.33	-0.47	dec	0.67	0	-0.774	2.11	3.00	0.72
515787	1201060059	05-APR-2006 14:53	DONE	2.51	2.6	dec	0.67	0	-0.774	2.11	3.00	0.72
512345	1201052580	05-APR-2006 16:17	DONE	0.7	0.04	dec	0.67	0	-0.774	2.11	3.00	0.72
517414	1201063511	06-APR-2006 13:36	DONE	1.39	1	dec	0.67	0	-0.774	2.11	3.00	0.72
518054	1201064972	07-APR-2006 10:38	DONE	1.06	0.55	dec	0.67	0	-0.774	2.11	3.00	0.72
516597	1201061659	07-APR-2006 13:29	DONE	0.35	-0.44	dec	0.67	0	-0.774	2.11	3.00	0.72
517429	1201063582	08-APR-2006 16:09	DONE	0.23	-0.6	dec	0.67	0	-0.774	2.11	3.00	0.72
519677	1201068640	11-APR-2006 11:40	DONE	0.38	-0.4	dec	0.67	0	-0.774	2.11	3.00	0.72
519715	1201068740	11-APR-2006 17:55	DUSE	0.6	-0.09	dec	0.67	0	-0.774	2.11	3.00	0.72
521595	1201073054	18-APR-2006 18:36	DONE	0.15	-0.71	dec	0.67	0	-0.774	2.11	3.00	0.72
520511	1201070462	19-APR-2006 15:27	DONE	0.05	-0.85	dec	0.67	0	-0.774	2.11	3.00	0.72

ALPHA SPIKE: Limits LCL = 75 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
517822	1201064447	10-APR-2006 15:50	DONE	71	-3	percent	100	75.0	83.3	117	125	8.33
517820	1201064435	10-APR-2006 19:10	DONE	77	-3	percent	100	75.0	83.3	117	125	8.33
517820	1201064437	10-APR-2006 19:10	DONE	100	0.05	percent	100	75.0	83.3	117	125	8.33
519306	1201067678	11-APR-2006 10:35	DUSE	72	-3	percent	100	75.0	83.3	117	125	8.33
518886	1201066845	11-APR-2006 10:35	DUSE	85	-2	percent	100	75.0	83.3	117	125	8.33
518886	1201066847	11-APR-2006 10:35	DUSE	86	-2	percent	100	75.0	83.3	117	125	8.33
519281	1201067604	11-APR-2006 17:34	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
519281	1201067611	11-APR-2006 17:34	DONE	92	-1	percent	100	75.0	83.3	117	125	8.33
519715	1201068741	11-APR-2006 17:56	DUSE	104	0.42	percent	100	75.0	83.3	117	125	8.33
519715	1201068743	11-APR-2006 17:56	DUSE	106	0.69	percent	100	75.0	83.3	117	125	8.33
519714	1201068744	11-APR-2006 19:09	DONE	108	0.99	percent	100	75.0	83.3	117	125	8.33
519714	1201068737	11-APR-2006 19:10	DONE	104	0.5	percent	100	75.0	83.3	117	125	8.33
519298	1201067655	12-APR-2006 13:01	DUSE	73	-3	percent	100	75.0	83.3	117	125	8.33
519298	1201067657	12-APR-2006 13:01	DUSE	65	-4	percent	100	75.0	83.3	117	125	8.33
519284	1201067614	13-APR-2006 10:14	DONE	62	-5	percent	100	75.0	83.3	117	125	8.33
519284	1201067616	13-APR-2006 10:14	DONE	67	-4	percent	100	75.0	83.3	117	125	8.33
520499	1201070419	14-APR-2006 12:37	DONE	93	-0.78	percent	100	75.0	83.3	117	125	8.33
520499	1201070421	14-APR-2006 12:37	DONE	99	-0.1	percent	100	75.0	83.3	117	125	8.33
520501	1201070431	14-APR-2006 13:38	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
520501	1201070429	14-APR-2006 13:38	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
520512	1201070468	14-APR-2006 14:18	DUSE	106	0.71	percent	100	75.0	83.3	117	125	8.33
520512	1201070470	14-APR-2006 14:18	DUSE	91	-1	percent	100	75.0	83.3	117	125	8.33
520963	1201071509	14-APR-2006 16:27	DONE	100	-0.04	percent	100	75.0	83.3	117	125	8.33
520963	1201071511	14-APR-2006 16:27	DONE	99	-0.11	percent	100	75.0	83.3	117	125	8.33
520967	1201071531	17-APR-2006 15:59	DUSE	118	2.2	percent	100	75.0	83.3	117	125	8.33
520967	1201071533	17-APR-2006 15:59	DUSE	104	0.45	percent	100	75.0	83.3	117	125	8.33

520500	1201070424	18-APR-2006 21:57	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
520500	1201070426	18-APR-2006 21:57	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
520511	1201070463	19-APR-2006 15:16	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
520511	1201070465	19-APR-2006 15:16	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
521909	1201073915	20-APR-2006 10:57	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
521909	1201073917	20-APR-2006 10:57	DONE	99	-0.11	percent	100	75.0	83.3	117	125	8.33
520514	1201070473	21-APR-2006 10:57	DONE	49	-6	percent	100	75.0	83.3	117	125	8.33
520514	1201070475	21-APR-2006 10:57	DONE	49	-6	percent	100	75.0	83.3	117	125	8.33
522372	1201075023	21-APR-2006 11:14	DONE	101	0.07	percent	100	75.0	83.3	117	125	8.33
521595	1201073055	21-APR-2006 11:19	DONE	101	0.18	percent	100	75.0	83.3	117	125	8.33
521595	1201075101	21-APR-2006 11:19	DONE	94	-0.66	percent	100	75.0	83.3	117	125	8.33
521039	1201071725	21-APR-2006 11:57	DONE	65	-4	percent	100	75.0	83.3	117	125	8.33
521039	1201071728	21-APR-2006 11:57	DONE	71	-3	percent	100	75.0	83.3	117	125	8.33

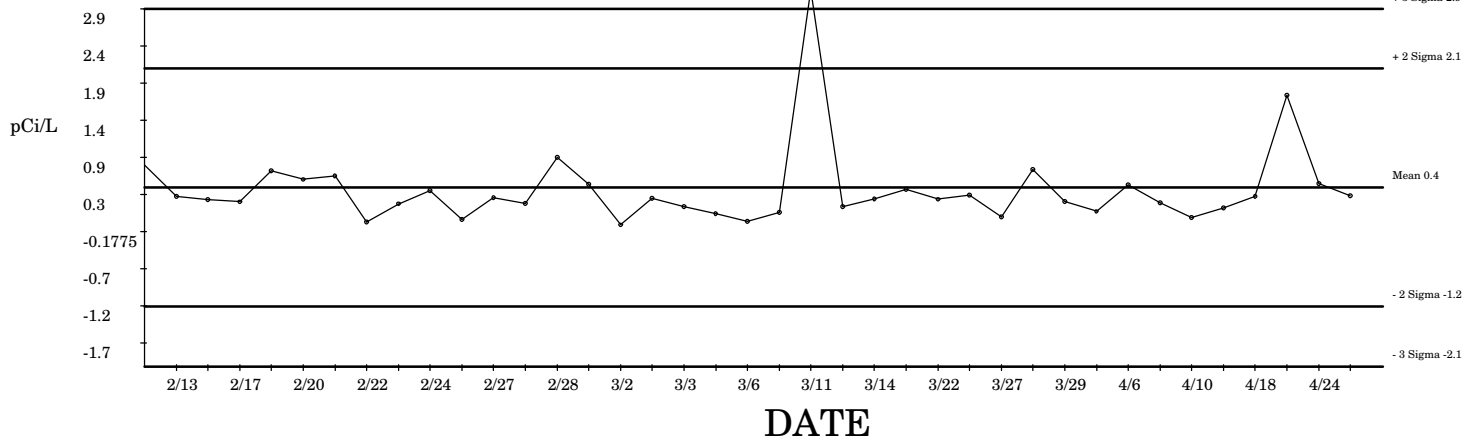
ALPHA SPRPD: Limits LCL = 0 UCL = 20

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
512353	1201052618	27-MAR-2006 18:05	DONE	14	0.53	percent	9.83	0	-6.2	25.9	20.0	8.04
514200	1201056423	28-MAR-2006 14:57	DUSE	22	1.6	percent	9.83	0	-6.2	25.9	20.0	8.04
512349	1201052596	30-MAR-2006 10:39	DONE	15	0.63	percent	9.83	0	-6.2	25.9	20.0	8.04
515227	1201058649	30-MAR-2006 21:22	DUSE	4	-0.79	percent	9.83	0	-6.2	25.9	20.0	8.04
512338	1201052563	31-MAR-2006 12:43	DUSE	2	-0.98	percent	9.83	0	-6.2	25.9	20.0	8.04
512342	1201052574	31-MAR-2006 19:15	DONE	5	-0.56	percent	9.83	0	-6.2	25.9	20.0	8.04
515770	1201060026	31-MAR-2006 23:24	DONE	19	1.1	percent	9.83	0	-6.2	25.9	20.0	8.04
516282	1201061019	31-MAR-2006 23:38	DONE	24	1.7	percent	9.83	0	-6.2	25.9	20.0	8.04
515787	1201060069	03-APR-2006 11:49	DONE	4	-0.73	percent	9.83	0	-6.2	25.9	20.0	8.04
516807	1201062232	03-APR-2006 20:57	DUSE	1	-1	percent	9.83	0	-6.2	25.9	20.0	8.04
516803	1201062207	04-APR-2006 11:49	DONE	5	-0.64	percent	9.83	0	-6.2	25.9	20.0	8.04
512357	1201052628	04-APR-2006 13:57	DONE	9	-0.05	percent	9.83	0	-6.2	25.9	20.0	8.04
512351	1201052606	04-APR-2006 21:58	DONE	17	0.92	percent	9.83	0	-6.2	25.9	20.0	8.04
517638	1201064061	05-APR-2006 17:57	DONE	22	1.5	percent	9.83	0	-6.2	25.9	20.0	8.04
512358	1201052633	06-APR-2006 20:53	DONE	14	0.53	percent	9.83	0	-6.2	25.9	20.0	8.04
518414	1201065764	06-APR-2006 22:15	DONE	4	-0.67	percent	9.83	0	-6.2	25.9	20.0	8.04
516597	1201061662	07-APR-2006 13:13	DONE	15	0.58	percent	9.83	0	-6.2	25.9	20.0	8.04
517429	1201063585	07-APR-2006 13:18	DONE	8	-0.23	percent	9.83	0	-6.2	25.9	20.0	8.04
517822	1201064449	08-APR-2006 11:58	DONE	15	0.68	percent	9.83	0	-6.2	25.9	20.0	8.04
518416	1201065779	08-APR-2006 11:58	DONE	5	-0.57	percent	9.83	0	-6.2	25.9	20.0	8.04
518877	1201066817	09-APR-2006 11:08	DONE	33	2.9	percent	9.83	0	-6.2	25.9	20.0	8.04
517820	1201064437	10-APR-2006 19:10	DONE	16	0.76	percent	9.83	0	-6.2	25.9	20.0	8.04
518886	1201066847	11-APR-2006 10:35	DUSE	1	-1	percent	9.83	0	-6.2	25.9	20.0	8.04
519281	1201067611	11-APR-2006 17:34	DONE	12	0.21	percent	9.83	0	-6.2	25.9	20.0	8.04
519715	1201068743	11-APR-2006 17:56	DUSE	2	-0.96	percent	9.83	0	-6.2	25.9	20.0	8.04
519714	1201068744	11-APR-2006 19:09	DONE	4	-0.75	percent	9.83	0	-6.2	25.9	20.0	8.04
519298	1201067657	12-APR-2006 13:01	DUSE	12	0.23	percent	9.83	0	-6.2	25.9	20.0	8.04
519284	1201067616	13-APR-2006 10:14	DONE	7	-0.41	percent	9.83	0	-6.2	25.9	20.0	8.04
520499	1201070421	14-APR-2006 12:37	DONE	3	-0.79	percent	9.83	0	-6.2	25.9	20.0	8.04
520501	1201070431	14-APR-2006 13:38	DONE	23	1.6	percent	9.83	0	-6.2	25.9	20.0	8.04
520512	1201070470	14-APR-2006 14:18	DUSE	15	0.61	percent	9.83	0	-6.2	25.9	20.0	8.04
520963	1201071511	14-APR-2006 16:27	DONE	1	-1	percent	9.83	0	-6.2	25.9	20.0	8.04
520967	1201071533	17-APR-2006 15:59	DUSE	13	0.38	percent	9.83	0	-6.2	25.9	20.0	8.04
520500	1201070426	18-APR-2006 21:57	DONE	1	-1	percent	9.83	0	-6.2	25.9	20.0	8.04

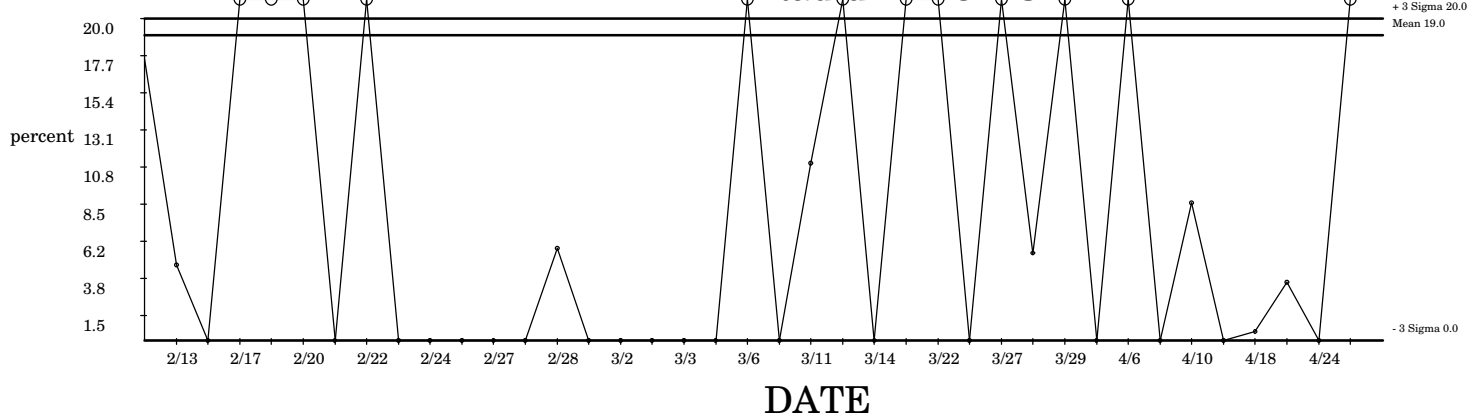
520511	1201070465	19-APR-2006 15:16	DONE	2	-1	percent	9.83	0	-6.2	25.9	20.0	8.04
521909	1201073917	20-APR-2006 10:57	DONE	2	-0.98	percent	9.83	0	-6.2	25.9	20.0	8.04
520514	1201070475	21-APR-2006 10:57	DONE	0	-1	percent	9.83	0	-6.2	25.9	20.0	8.04
521595	1201075101	21-APR-2006 11:19	DONE	7	-0.33	percent	9.83	0	-6.2	25.9	20.0	8.04
521039	1201071728	21-APR-2006 11:57	DONE	7	-0.3	percent	9.83	0	-6.2	25.9	20.0	8.04

# SPC Graph for Gas Flow Radium 228 in Liquids 4/25/2006

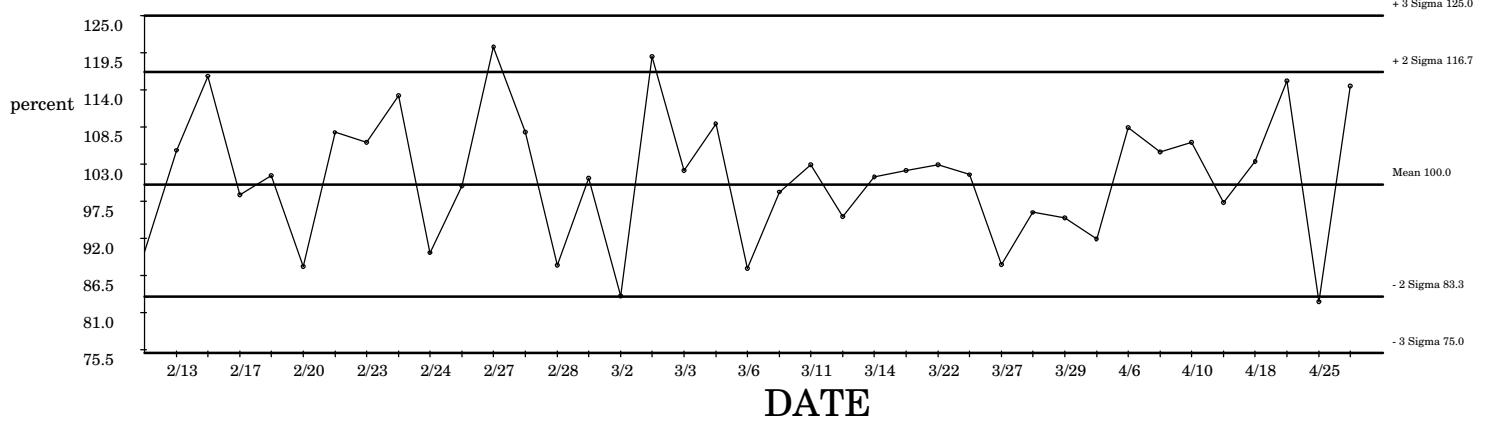
## Radium-228 BLANK



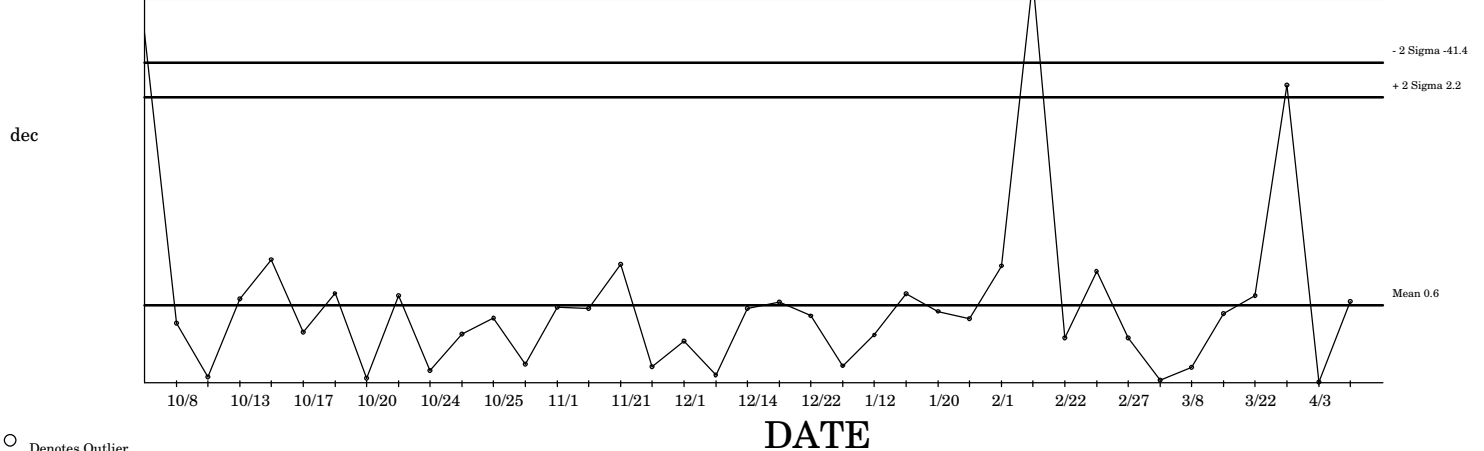
## Radium-228 DUP



## Radium-228 LCS



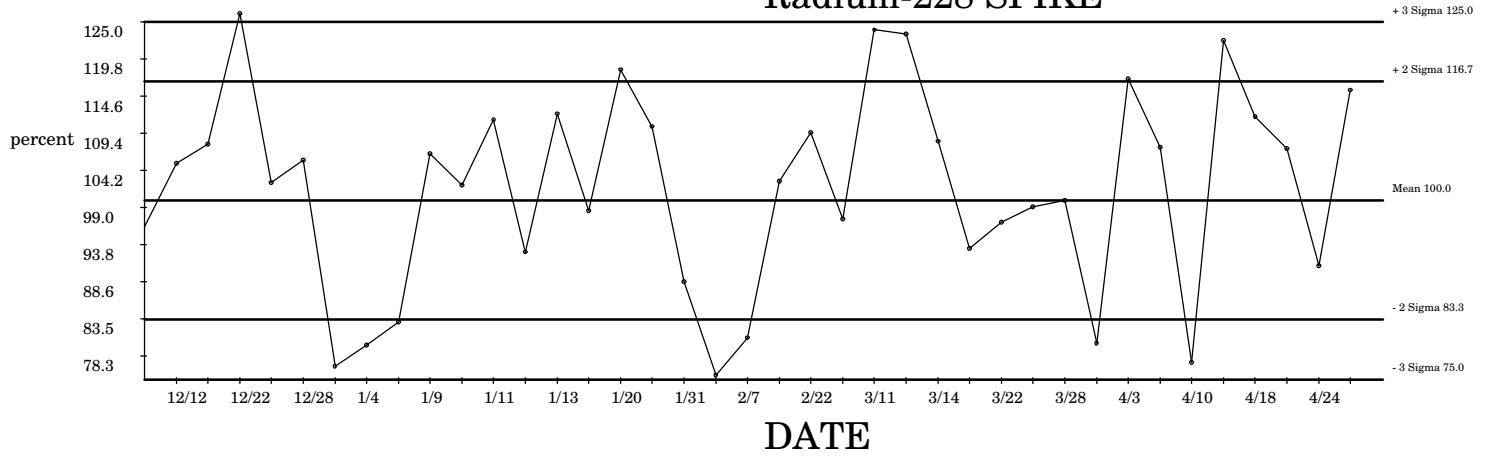
## Radium-228 RER



○ Denotes Outlier

# SPC Graph for Gas Flow Radium 228 in Liquids 4/25/2006

## Radium-228 SPIKE



# Data used for Gas Flow Radium 228 in Liquids 26-APR-2006

Radium-228 BLANK: Limits LCL = -2.1 UCL = 2.9

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
500104	1201024129	13-FEB-2006 14:44	DONE	0	-0.38	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
500102	1201024122	13-FEB-2006 22:54	DONE	0	-0.15	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
500103	1201024126	14-FEB-2006 12:33	DONE	0	-0.2	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
500107	1201024135	17-FEB-2006 19:06	DONE	0	-0.24	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
500106	1201024132	18-FEB-2006 20:37	DONE	1	0.28	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
500108	1201024138	20-FEB-2006 13:18	DONE	1	0.14	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
500109	1201024141	21-FEB-2006 21:51	DONE	1	0.19	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
503553	1201031967	22-FEB-2006 23:15	DONE	0	-0.58	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
500111	1201024147	24-FEB-2006 13:04	DONE	0	-0.27	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
504736	1201034726	24-FEB-2006 19:27	DONE	0	-0.05	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
505206	1201035921	24-FEB-2006 23:05	DONE	0	-0.53	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
502697	1201030163	27-FEB-2006 20:34	DONE	0	-0.17	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
505945	1201037656	27-FEB-2006 21:44	DONE	0	-0.27	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
500110	1201024144	28-FEB-2006 11:44	DONE	1	0.51	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
505426	1201036460	01-MAR-2006 23:28	DONE	0	0.06	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
505422	1201036449	02-MAR-2006 20:45	DONE	0	-0.63	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
507266	1201040783	03-MAR-2006 12:51	DONE	0	-0.18	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
507261	1201040773	03-MAR-2006 19:46	DONE	0	-0.32	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
507469	1201041345	04-MAR-2006 14:23	DONE	0	-0.44	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
507481	1201041382	06-MAR-2006 15:43	DONE	0	-0.57	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
507501	1201041440	08-MAR-2006 11:56	DONE	0	-0.42	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
507516	1201041476	11-MAR-2006 15:32	DONE	5	5.6	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
508232	1201043146	13-MAR-2006 12:33	DONE	0	-0.32	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
510236	1201047754	14-MAR-2006 13:30	DONE	0	-0.19	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
510245	1201047773	16-MAR-2006 14:08	DONE	0	-0.03	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
513331	1201054714	22-MAR-2006 15:10	DONE	0	-0.2	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
510589	1201048485	24-MAR-2006 11:47	DONE	0	-0.13	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
508234	1201043153	27-MAR-2006 12:04	DONE	0	-0.49	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
510590	1201048488	28-MAR-2006 12:34	DONE	1	0.3	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
513290	1201054636	29-MAR-2006 15:21	DONE	0	-0.24	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
513295	1201054648	03-APR-2006 23:15	DONE	0	-0.4	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
517809	1201064414	06-APR-2006 22:35	DONE	0	0.05	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
515247	1201058669	07-APR-2006 21:32	DONE	0	-0.26	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
513299	1201054652	10-APR-2006 13:30	DONE	0	-0.51	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
515325	1201058924	10-APR-2006 18:53	DONE	0	-0.34	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
513308	1201054680	18-APR-2006 17:10	DONE	0	-0.15	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
518844	1201066724	19-APR-2006 12:20	DONE	2	1.5	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
521944	1201074036	24-APR-2006 12:19	DONE	0	0.07	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83
515983	1201060416	26-APR-2006 13:29	DONE	0	-0.14	pCi/L	0.44	-2.1	-1.2	2.11	2.94	0.83

Radium-228 DUP: Limits LCL = 0 UCL = 20

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
500104	1201024130	13-FEB-2006 12:41	DONE	3	-0.54	percent	19	0	-41	79.3	20.0	30.2
500102	1201024123	13-FEB-2006 22:54	DONE	5	-0.47	percent	19	0	-41	79.3	20.0	30.2
500103	1201024127	14-FEB-2006 12:34	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
500107	1201024136	17-FEB-2006 19:06	DONE	23	0.14	percent	19	0	-41	79.3	20.0	30.2



500106	1201024133	18-FEB-2006 19:01	DONE	83	2.1	percent	19	0	-41	79.3	20.0	30.2
500108	1201024139	20-FEB-2006 12:19	DONE	27	0.25	percent	19	0	-41	79.3	20.0	30.2
500109	1201024142	21-FEB-2006 21:51	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
503553	1201031968	22-FEB-2006 23:14	DONE	64	1.5	percent	19	0	-41	79.3	20.0	30.2
500111	1201024148	24-FEB-2006 13:04	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
504736	1201034727	24-FEB-2006 19:27	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
505206	1201035922	24-FEB-2006 21:57	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
502697	1201030164	27-FEB-2006 20:34	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
505945	1201037657	27-FEB-2006 21:45	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
500110	1201024145	28-FEB-2006 11:44	DONE	6	-0.44	percent	19	0	-41	79.3	20.0	30.2
505426	1201036461	02-MAR-2006 00:22	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
505422	1201036450	02-MAR-2006 20:45	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
507266	1201040784	03-MAR-2006 12:51	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
507261	1201040774	03-MAR-2006 19:46	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
507469	1201041346	04-MAR-2006 13:18	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
507481	1201041383	06-MAR-2006 15:43	DONE	58	1.3	percent	19	0	-41	79.3	20.0	30.2
507501	1201041441	08-MAR-2006 13:57	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
507516	1201041477	11-MAR-2006 15:32	DONE	11	-0.26	percent	19	0	-41	79.3	20.0	30.2
508232	1201043147	13-MAR-2006 12:33	DONE	29	0.34	percent	19	0	-41	79.3	20.0	30.2
510236	1201047755	14-MAR-2006 12:29	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
510245	1201047774	16-MAR-2006 14:08	DONE	69	1.7	percent	19	0	-41	79.3	20.0	30.2
513331	1201054715	22-MAR-2006 15:10	DONE	68	1.6	percent	19	0	-41	79.3	20.0	30.2
510589	1201048486	24-MAR-2006 11:47	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
508234	1201043154	27-MAR-2006 12:04	DONE	42	0.76	percent	19	0	-41	79.3	20.0	30.2
510590	1201048489	28-MAR-2006 12:34	DONE	5	-0.45	percent	19	0	-41	79.3	20.0	30.2
513290	1201054637	29-MAR-2006 15:21	DONE	116	3.2	percent	19	0	-41	79.3	20.0	30.2
513295	1201054649	03-APR-2006 23:15	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
517809	1201064415	06-APR-2006 22:35	DONE	47	0.92	percent	19	0	-41	79.3	20.0	30.2
515247	1201058670	07-APR-2006 21:32	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
513299	1201054653	10-APR-2006 13:28	DONE	9	-0.34	percent	19	0	-41	79.3	20.0	30.2
515325	1201058925	10-APR-2006 18:53	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
513308	1201054681	18-APR-2006 17:10	DONE	1	-0.61	percent	19	0	-41	79.3	20.0	30.2
518844	1201066725	19-APR-2006 12:20	DONE	4	-0.51	percent	19	0	-41	79.3	20.0	30.2
521944	1201074037	24-APR-2006 14:55	DONE	0	-0.63	percent	19	0	-41	79.3	20.0	30.2
515983	1201060417	26-APR-2006 13:29	DONE	73	1.8	percent	19	0	-41	79.3	20.0	30.2

**Radium-228 LCS: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
500104	1201024131	13-FEB-2006 15:47	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
500102	1201024125	13-FEB-2006 22:54	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
500103	1201024128	14-FEB-2006 14:36	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
500107	1201024137	17-FEB-2006 17:26	DONE	98	-0.19	percent	100	75.0	83.3	117	125	8.33
500106	1201024134	18-FEB-2006 17:56	DONE	101	0.16	percent	100	75.0	83.3	117	125	8.33
500108	1201024140	20-FEB-2006 13:22	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
500109	1201024143	21-FEB-2006 22:53	DONE	108	0.92	percent	100	75.0	83.3	117	125	8.33
503553	1201031970	23-FEB-2006 11:45	DONE	106	0.75	percent	100	75.0	83.3	117	125	8.33
500111	1201024149	24-FEB-2006 13:04	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33
504736	1201034728	24-FEB-2006 19:27	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
505206	1201035923	24-FEB-2006 23:05	DONE	100	-0.03	percent	100	75.0	83.3	117	125	8.33
502697	1201030165	27-FEB-2006 20:34	DONE	120	2.4	percent	100	75.0	83.3	117	125	8.33

505945	1201037659	27-FEB-2006 22:08	DONE	108	0.93	percent	100	75.0	83.3	117	125	8.33
500110	1201024146	28-FEB-2006 16:07	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
505426	1201036462	02-MAR-2006 00:22	DONE	101	0.11	percent	100	75.0	83.3	117	125	8.33
505422	1201036451	02-MAR-2006 22:34	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
507266	1201040785	03-MAR-2006 13:59	DONE	119	2.3	percent	100	75.0	83.3	117	125	8.33
507261	1201040775	03-MAR-2006 19:46	DONE	102	0.25	percent	100	75.0	83.3	117	125	8.33
507469	1201041347	04-MAR-2006 13:19	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
507481	1201041384	06-MAR-2006 15:43	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
507501	1201041442	08-MAR-2006 13:57	DONE	99	-0.14	percent	100	75.0	83.3	117	125	8.33
507516	1201041479	11-MAR-2006 15:32	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
508232	1201043149	13-MAR-2006 12:33	DONE	95	-0.58	percent	100	75.0	83.3	117	125	8.33
510236	1201047757	14-MAR-2006 13:30	DONE	101	0.13	percent	100	75.0	83.3	117	125	8.33
510245	1201047776	16-MAR-2006 14:09	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
513331	1201054717	22-MAR-2006 15:10	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
510589	1201048487	24-MAR-2006 11:47	DONE	101	0.17	percent	100	75.0	83.3	117	125	8.33
508234	1201043156	27-MAR-2006 18:15	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
510590	1201048491	28-MAR-2006 12:34	DONE	96	-0.5	percent	100	75.0	83.3	117	125	8.33
513290	1201054639	29-MAR-2006 15:22	DONE	95	-0.59	percent	100	75.0	83.3	117	125	8.33
513295	1201054651	03-APR-2006 21:58	DONE	92	-0.98	percent	100	75.0	83.3	117	125	8.33
517809	1201064417	06-APR-2006 22:35	DONE	108	1	percent	100	75.0	83.3	117	125	8.33
515247	1201058671	07-APR-2006 21:32	DONE	105	0.57	percent	100	75.0	83.3	117	125	8.33
513299	1201054655	10-APR-2006 13:28	DONE	106	0.75	percent	100	75.0	83.3	117	125	8.33
515325	1201058927	10-APR-2006 18:53	DONE	97	-0.32	percent	100	75.0	83.3	117	125	8.33
513308	1201054683	18-APR-2006 17:09	DONE	103	0.41	percent	100	75.0	83.3	117	125	8.33
518844	1201066727	19-APR-2006 13:32	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
521944	1201074039	25-APR-2006 11:06	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
515983	1201060419	26-APR-2006 14:35	DONE	115	1.7	percent	100	75.0	83.3	117	125	8.33

**Radium-228 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
465675	1200943225	08-OCT-2005 10:52	DONE	0.27	-0.41	dec	0.61	0	-1	2.23	3.00	0.81
467327	1200947063	08-OCT-2005 11:05	DONE	0.47	-0.17	dec	0.61	0	-1	2.23	3.00	0.81
469671	1200952476	11-OCT-2005 15:48	DONE	0.05	-0.69	dec	0.61	0	-1	2.23	3.00	0.81
467329	1200947073	13-OCT-2005 12:07	DONE	0.66	0.06	dec	0.61	0	-1	2.23	3.00	0.81
470537	1200954570	14-OCT-2005 11:01	DONE	0.96	0.44	dec	0.61	0	-1	2.23	3.00	0.81
467333	1200947087	17-OCT-2005 12:10	DONE	0.39	-0.26	dec	0.61	0	-1	2.23	3.00	0.81
472059	1200958291	19-OCT-2005 13:47	DONE	0.7	0.11	dec	0.61	0	-1	2.23	3.00	0.81
472636	1200959672	20-OCT-2005 11:10	DONE	0.03	-0.7	dec	0.61	0	-1	2.23	3.00	0.81
473145	1200960959	24-OCT-2005 16:07	DUSE	0.68	0.09	dec	0.61	0	-1	2.23	3.00	0.81
474248	1200963592	24-OCT-2005 17:21	DONE	0.1	-0.63	dec	0.61	0	-1	2.23	3.00	0.81
471617	1200961158	25-OCT-2005 12:00	DONE	0.38	-0.28	dec	0.61	0	-1	2.23	3.00	0.81
473716	1200962428	25-OCT-2005 17:59	DONE	0.5	-0.12	dec	0.61	0	-1	2.23	3.00	0.81
473230	1200961166	01-NOV-2005 11:28	DONE	0.15	-0.56	dec	0.61	0	-1	2.23	3.00	0.81
476181	1200968154	01-NOV-2005 15:51	DONE	0.59	-0.02	dec	0.61	0	-1	2.23	3.00	0.81
480012	1200977648	14-NOV-2005 20:22	DONE	0.58	-0.03	dec	0.61	0	-1	2.23	3.00	0.81
479062	1200975199	21-NOV-2005 12:41	DONE	0.92	0.39	dec	0.61	0	-1	2.23	3.00	0.81
481985	1200982102	30-NOV-2005 23:53	DONE	0.13	-0.59	dec	0.61	0	-1	2.23	3.00	0.81
483514	1200985776	01-DEC-2005 12:05	DONE	0.33	-0.34	dec	0.61	0	-1	2.23	3.00	0.81
484248	1200987654	12-DEC-2005 12:09	DONE	0.06	-0.67	dec	0.61	0	-1	2.23	3.00	0.81
486611	1200993396	14-DEC-2005 22:44	DONE	0.58	-0.03	dec	0.61	0	-1	2.23	3.00	0.81

487788	1200996153	19-DEC-2005 14:38	DONE	0.63	0.03	dec	0.61	0	-1	2.23	3.00	0.81
488990	1200998922	22-DEC-2005 13:45	DONE	0.52	-0.1	dec	0.61	0	-1	2.23	3.00	0.81
490300	1201001796	06-JAN-2006 11:10	DONE	0.13	-0.58	dec	0.61	0	-1	2.23	3.00	0.81
491608	1201004824	12-JAN-2006 16:38	DONE	0.37	-0.29	dec	0.61	0	-1	2.23	3.00	0.81
493731	1201009556	17-JAN-2006 17:54	DONE	0.69	0.11	dec	0.61	0	-1	2.23	3.00	0.81
494613	1201011524	20-JAN-2006 21:32	DONE	0.56	-0.06	dec	0.61	0	-1	2.23	3.00	0.81
498305	1201019873	31-JAN-2006 18:16	DONE	0.5	-0.13	dec	0.61	0	-1	2.23	3.00	0.81
496468	1201015687	01-FEB-2006 14:45	DONE	0.91	0.38	dec	0.61	0	-1	2.23	3.00	0.81
500108	1201024139	20-FEB-2006 12:19	DONE	4.89	5.3	dec	0.61	0	-1	2.23	3.00	0.81
503553	1201031968	22-FEB-2006 23:14	DONE	0.35	-0.31	dec	0.61	0	-1	2.23	3.00	0.81
504736	1201034727	24-FEB-2006 19:27	DONE	0.87	0.32	dec	0.61	0	-1	2.23	3.00	0.81
505945	1201037657	27-FEB-2006 21:45	DONE	0.35	-0.31	dec	0.61	0	-1	2.23	3.00	0.81
505422	1201036450	02-MAR-2006 20:45	DONE	0.02	-0.72	dec	0.61	0	-1	2.23	3.00	0.81
507501	1201041441	08-MAR-2006 13:57	DONE	0.12	-0.6	dec	0.61	0	-1	2.23	3.00	0.81
510245	1201047774	16-MAR-2006 14:08	DONE	0.54	-0.08	dec	0.61	0	-1	2.23	3.00	0.81
513331	1201054715	22-MAR-2006 15:10	DONE	0.68	0.09	dec	0.61	0	-1	2.23	3.00	0.81
513290	1201054637	29-MAR-2006 15:21	DONE	2.32	2.1	dec	0.61	0	-1	2.23	3.00	0.81
513295	1201054649	03-APR-2006 23:15	DONE	00	-0.74	dec	0.61	0	-1	2.23	3.00	0.81
521944	1201074037	24-APR-2006 14:55	DONE	0.64	0.04	dec	0.61	0	-1	2.23	3.00	0.81

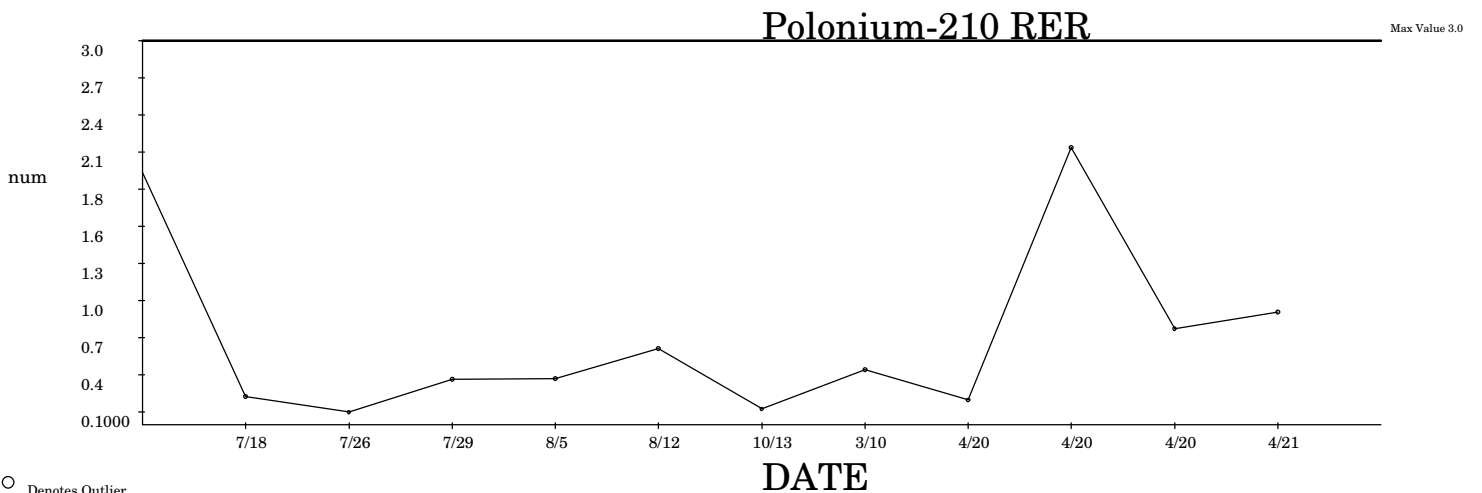
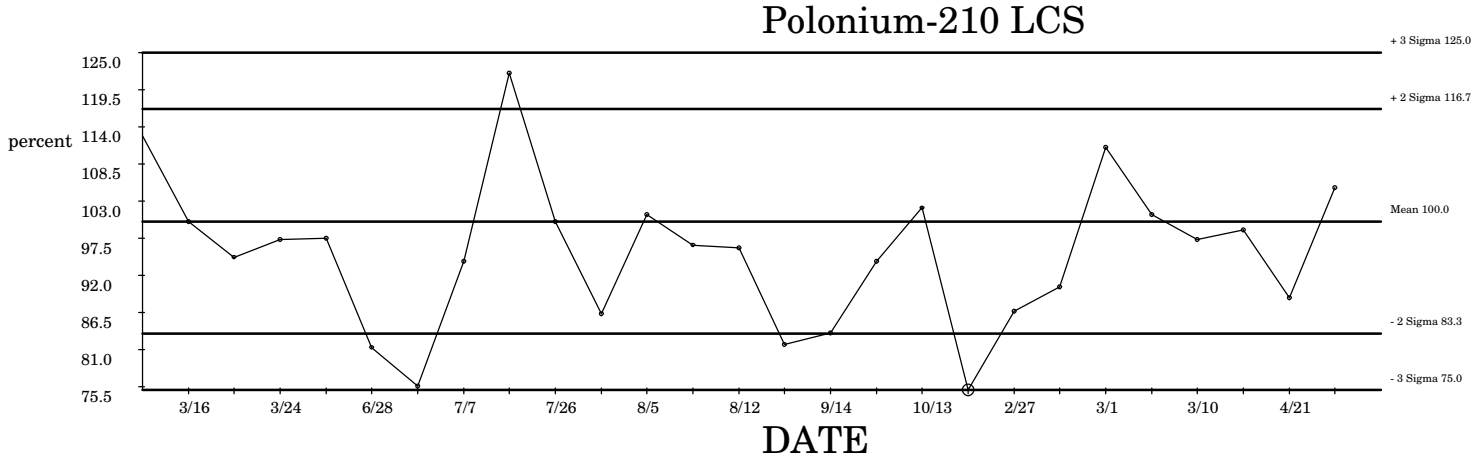
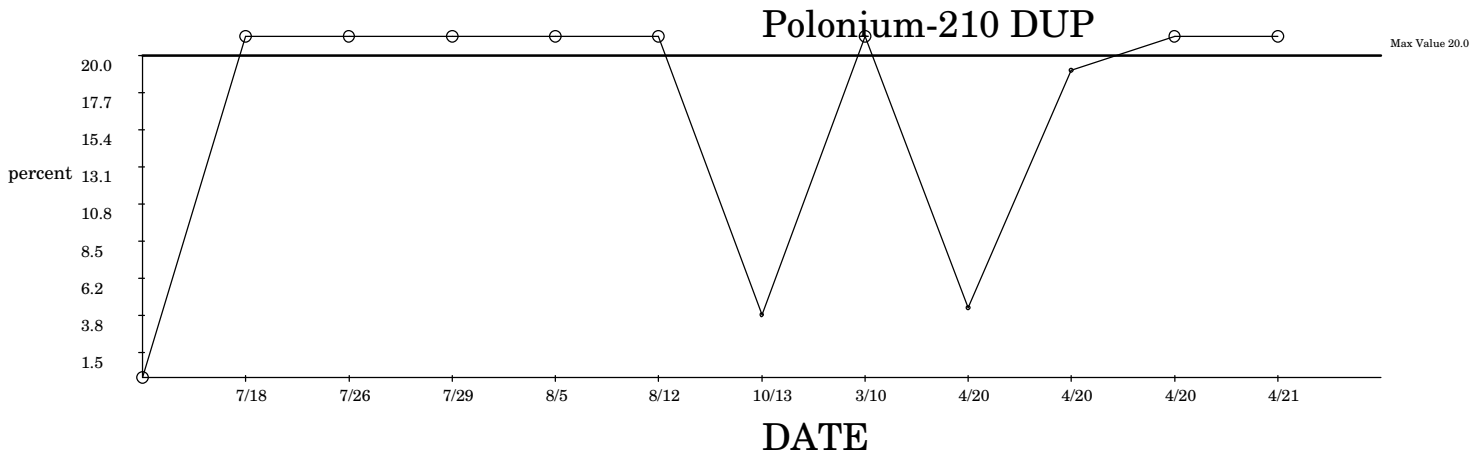
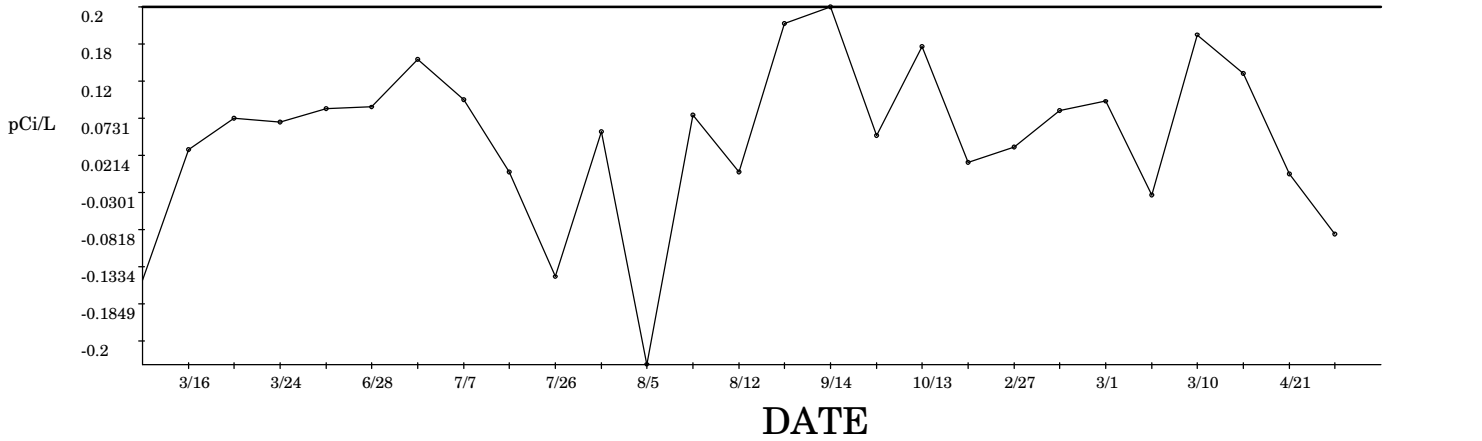
**Radium-228 SPIKE: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
484226	1200987599	05-DEC-2005 12:48	DONE	104	0.43	percent	100	75.0	83.3	117	125	8.33
484248	1200987655	12-DEC-2005 12:10	DONE	105	0.62	percent	100	75.0	83.3	117	125	8.33
486633	1200993447	16-DEC-2005 13:32	DONE	108	0.95	percent	100	75.0	83.3	117	125	8.33
488990	1200998923	22-DEC-2005 13:45	DONE	126	3.1	percent	100	75.0	83.3	117	125	8.33
485415	1200990577	22-DEC-2005 18:38	DONE	103	0.31	percent	100	75.0	83.3	117	125	8.33
487960	1200996652	28-DEC-2005 22:36	DONE	106	0.68	percent	100	75.0	83.3	117	125	8.33
486030	1200992037	29-DEC-2005 20:57	DONE	77	-3	percent	100	75.0	83.3	117	125	8.33
490306	1201001825	04-JAN-2006 23:08	DONE	80	-2	percent	100	75.0	83.3	117	125	8.33
488686	1200998269	06-JAN-2006 15:12	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
487814	1200996255	09-JAN-2006 13:54	DONE	107	0.79	percent	100	75.0	83.3	117	125	8.33
491352	1201004143	10-JAN-2006 13:01	DONE	102	0.26	percent	100	75.0	83.3	117	125	8.33
486289	1200992718	11-JAN-2006 17:36	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
491608	1201004825	12-JAN-2006 16:38	DONE	93	-0.86	percent	100	75.0	83.3	117	125	8.33
492834	1201007534	13-JAN-2006 12:48	DONE	112	1.5	percent	100	75.0	83.3	117	125	8.33
493731	1201009557	17-JAN-2006 17:54	DONE	99	-0.17	percent	100	75.0	83.3	117	125	8.33
494613	1201011525	20-JAN-2006 21:33	DONE	118	2.2	percent	100	75.0	83.3	117	125	8.33
496446	1201015668	24-JAN-2006 23:12	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
495884	1201014389	31-JAN-2006 14:37	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33
498305	1201019874	31-JAN-2006 18:16	DONE	76	-3	percent	100	75.0	83.3	117	125	8.33
492836	1201007542	07-FEB-2006 10:39	DONE	81	-2	percent	100	75.0	83.3	117	125	8.33
500102	1201024124	13-FEB-2006 22:54	DONE	103	0.32	percent	100	75.0	83.3	117	125	8.33
503553	1201031969	22-FEB-2006 23:15	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
505945	1201037658	27-FEB-2006 22:09	DONE	97	-0.31	percent	100	75.0	83.3	117	125	8.33
507516	1201041478	11-MAR-2006 15:32	DONE	124	2.9	percent	100	75.0	83.3	117	125	8.33
508232	1201043148	13-MAR-2006 12:33	DONE	123	2.8	percent	100	75.0	83.3	117	125	8.33
510236	1201047756	14-MAR-2006 13:30	DONE	108	01	percent	100	75.0	83.3	117	125	8.33
510245	1201047775	16-MAR-2006 14:09	DONE	93	-0.81	percent	100	75.0	83.3	117	125	8.33
513331	1201054716	22-MAR-2006 15:10	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33

508234	1201043155	27-MAR-2006 18:14	DONE	99	-0.11	percent	100	75.0	83.3	117	125	8.33
510590	1201048490	28-MAR-2006 12:34	DONE	100	00	percent	100	75.0	83.3	117	125	8.33
513290	1201054638	29-MAR-2006 15:22	DONE	80	-2	percent	100	75.0	83.3	117	125	8.33
513295	1201054650	03-APR-2006 21:58	DONE	117	2	percent	100	75.0	83.3	117	125	8.33
517809	1201064416	06-APR-2006 22:35	DONE	107	0.9	percent	100	75.0	83.3	117	125	8.33
513299	1201054654	10-APR-2006 14:51	DONE	77	-3	percent	100	75.0	83.3	117	125	8.33
515325	1201058926	10-APR-2006 18:53	DONE	122	2.7	percent	100	75.0	83.3	117	125	8.33
513308	1201054682	18-APR-2006 17:09	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
518844	1201066726	19-APR-2006 12:21	DONE	107	0.87	percent	100	75.0	83.3	117	125	8.33
521944	1201074038	24-APR-2006 14:55	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
515983	1201060418	26-APR-2006 13:44	DONE	115	1.9	percent	100	75.0	83.3	117	125	8.33

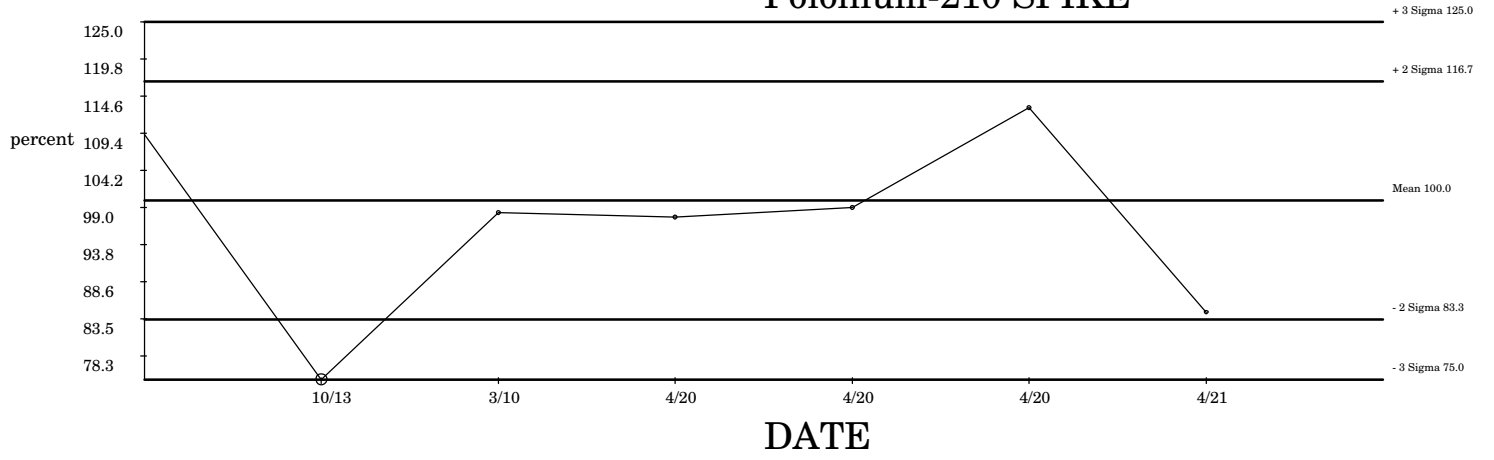
# SPC Graph for Alpha SpecPolonium in Liquids 4/24/2006

## Polonium-210 BLANK



○ Denotes Outlier

# SPC Graph for Alpha SpecPolonium in Liquids 4/24/2006 Polonium-210 SPIKE



# Data used for Alpha SpecPolonium in Liquids 25-APR-2006

Polonium-210 BLANK: Limits LCL = -.3 UCL = .4

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
397764	1200779718	05-FEB-2005 12:15	DONE	0	0.52	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
406809	1200803894	16-MAR-2005 16:27	DONE	0	-0.25	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
406811	1200803896	21-MAR-2005 16:29	DONE	0	0.16	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
406813	1200801315	24-MAR-2005 15:42	DONE	0	0.12	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
414077	1200818591	13-APR-2005 07:07	DONE	0	0.28	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
433980	1200867419	28-JUN-2005 15:42	DONE	0	0.31	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
433982	1200867423	06-JUL-2005 08:26	DONE	0	0.93	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
433981	1200867421	07-JUL-2005 14:54	DONE	0	0.41	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
442273	1200887239	18-JUL-2005 23:36	DONE	0	-0.54	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
443251	1200889465	26-JUL-2005 07:01	DONE	0	-2	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
444420	1200892273	29-JUL-2005 12:59	DONE	0	-0.01	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
447760	1200900344	05-AUG-2005 14:30	DONE	0	-3	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
447873	1200900654	11-AUG-2005 07:47	DONE	0	0.21	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
450922	1200907708	12-AUG-2005 12:35	DONE	0	-0.54	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
454472	1200916006	14-SEP-2005 08:16	DONE	0	1.4	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
454474	1200916012	14-SEP-2005 08:18	DONE	0	1.6	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
454476	1200916014	14-SEP-2005 13:29	DONE	0	-0.06	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
469918	1200953039	13-OCT-2005 22:13	DONE	0	1.1	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
502166	1201029027	16-FEB-2006 07:55	DUSE	0	-0.41	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
502673	1201030093	27-FEB-2006 09:14	DONE	0	-0.21	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
502674	1201030095	28-FEB-2006 10:35	DONE	0	0.27	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
502676	1201030099	01-MAR-2006 11:35	DONE	0	0.38	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
508623	1201044091	10-MAR-2006 07:39	DONE	0	-0.84	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
507964	1201042560	10-MAR-2006 13:42	DONE	0	1.2	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
514344	1201056714	29-MAR-2006 08:32	DONE	0	0.74	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
521957	1201074052	21-APR-2006 23:46	DONE	0	-0.56	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11
520802	1201071152	24-APR-2006 14:21	DONE	0	-1	pCi/L	0.06	-0.266	-0.159	0.27	0.38	0.11

Polonium-210 DUP: Limits LCL = 0 UCL = 20

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
414077	1200818592	13-APR-2005 07:07	DONE	348	-0.14	percent	514	0	-1900	2950	20.0	1220
442273	1200887240	18-JUL-2005 23:36	DONE	486	-0.02	percent	514	0	-1900	2950	20.0	1220
443251	1200889466	26-JUL-2005 07:01	DONE	154	-0.29	percent	514	0	-1900	2950	20.0	1220
444420	1200892274	29-JUL-2005 12:59	DONE	47	-0.38	percent	514	0	-1900	2950	20.0	1220
447760	1200900345	05-AUG-2005 14:30	DONE	39	-0.39	percent	514	0	-1900	2950	20.0	1220
450922	1200907709	12-AUG-2005 12:35	DONE	493	-0.02	percent	514	0	-1900	2950	20.0	1220
469918	1200953040	13-OCT-2005 22:13	DONE	4	-0.42	percent	514	0	-1900	2950	20.0	1220
508623	1201044092	10-MAR-2006 07:39	DONE	161	-0.29	percent	514	0	-1900	2950	20.0	1220
521957	1201074053	20-APR-2006 12:32	DONE	4	-0.42	percent	514	0	-1900	2950	20.0	1220
521957	1201074174	20-APR-2006 12:32	DONE	19	-0.41	percent	514	0	-1900	2950	20.0	1220
521957	1201074175	20-APR-2006 12:32	DONE	64	-0.37	percent	514	0	-1900	2950	20.0	1220
520802	1201071153	21-APR-2006 19:21	DONE	4345	3.1	percent	514	0	-1900	2950	20.0	1220

Polonium-210 LCS: Limits LCL = 75 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
397764	1200779719	05-FEB-2005 12:16	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33

406809	1200803895	16-MAR-2005 16:27	DONE	100	0	percent	100	75.0	83.3	117	125	8.33
406811	1200803897	21-MAR-2005 16:29	DONE	95	-0.64	percent	100	75.0	83.3	117	125	8.33
406813	1200801316	24-MAR-2005 15:42	DONE	97	-0.32	percent	100	75.0	83.3	117	125	8.33
414077	1200818594	13-APR-2005 07:07	DONE	98	-0.3	percent	100	75.0	83.3	117	125	8.33
433980	1200867420	28-JUN-2005 15:42	DONE	81	-2	percent	100	75.0	83.3	117	125	8.33
433982	1200867424	06-JUL-2005 08:26	DONE	76	-3	percent	100	75.0	83.3	117	125	8.33
433981	1200867422	07-JUL-2005 14:55	DONE	94	-0.71	percent	100	75.0	83.3	117	125	8.33
442273	1200887241	19-JUL-2005 07:35	DONE	122	2.6	percent	100	75.0	83.3	117	125	8.33
443251	1200889467	26-JUL-2005 07:01	DONE	100	0	percent	100	75.0	83.3	117	125	8.33
444420	1200892275	29-JUL-2005 12:59	DONE	86	-2	percent	100	75.0	83.3	117	125	8.33
447760	1200900346	05-AUG-2005 14:30	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
447873	1200900655	11-AUG-2005 07:47	DONE	97	-0.42	percent	100	75.0	83.3	117	125	8.33
450922	1200907710	12-AUG-2005 12:35	DONE	96	-0.47	percent	100	75.0	83.3	117	125	8.33
454472	1200916007	14-SEP-2005 08:16	DONE	82	-2	percent	100	75.0	83.3	117	125	8.33
454474	1200916013	14-SEP-2005 08:19	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
454476	1200916015	14-SEP-2005 13:29	DONE	94	-0.71	percent	100	75.0	83.3	117	125	8.33
469918	1200953042	13-OCT-2005 22:13	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
502166	1201029028	16-FEB-2006 07:55	DUSE	25	-9	percent	100	75.0	83.3	117	125	8.33
502673	1201030094	27-FEB-2006 09:15	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
502674	1201030096	28-FEB-2006 10:35	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
502676	1201030100	01-MAR-2006 11:35	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
507964	1201042561	09-MAR-2006 12:10	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
508623	1201044094	10-MAR-2006 07:39	DONE	97	-0.32	percent	100	75.0	83.3	117	125	8.33
514344	1201056715	29-MAR-2006 08:32	DONE	99	-0.16	percent	100	75.0	83.3	117	125	8.33
520802	1201071155	21-APR-2006 19:21	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33
521957	1201074055	21-APR-2006 23:46	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33

**Polonium-210 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
414077	1200818592	13-APR-2005 07:07	DONE	1.03	0.74	num	0.6	0	-0.555	1.75	3.00	0.58
442273	1200887240	18-JUL-2005 23:36	DONE	0.22	-0.66	num	0.6	0	-0.555	1.75	3.00	0.58
443251	1200889466	26-JUL-2005 07:01	DONE	0.1	-0.87	num	0.6	0	-0.555	1.75	3.00	0.58
444420	1200892274	29-JUL-2005 12:59	DONE	0.35	-0.42	num	0.6	0	-0.555	1.75	3.00	0.58
447760	1200900345	05-AUG-2005 14:30	DONE	0.36	-0.41	num	0.6	0	-0.555	1.75	3.00	0.58
450922	1200907709	12-AUG-2005 12:35	DONE	0.6	-0	num	0.6	0	-0.555	1.75	3.00	0.58
469918	1200953040	13-OCT-2005 22:13	DONE	0.12	-0.83	num	0.6	0	-0.555	1.75	3.00	0.58
508623	1201044092	10-MAR-2006 07:39	DONE	0.43	-0.3	num	0.6	0	-0.555	1.75	3.00	0.58
521957	1201074053	20-APR-2006 12:32	DONE	0.19	-0.71	num	0.6	0	-0.555	1.75	3.00	0.58
521957	1201074174	20-APR-2006 12:32	DONE	0.75	0.26	num	0.6	0	-0.555	1.75	3.00	0.58
521957	1201074175	20-APR-2006 12:32	DONE	2.16	2.7	num	0.6	0	-0.555	1.75	3.00	0.58
520802	1201071153	21-APR-2006 19:21	DONE	0.88	0.48	num	0.6	0	-0.555	1.75	3.00	0.58

**Polonium-210 SPIKE: Limits LCL = 75 UCL = 125**

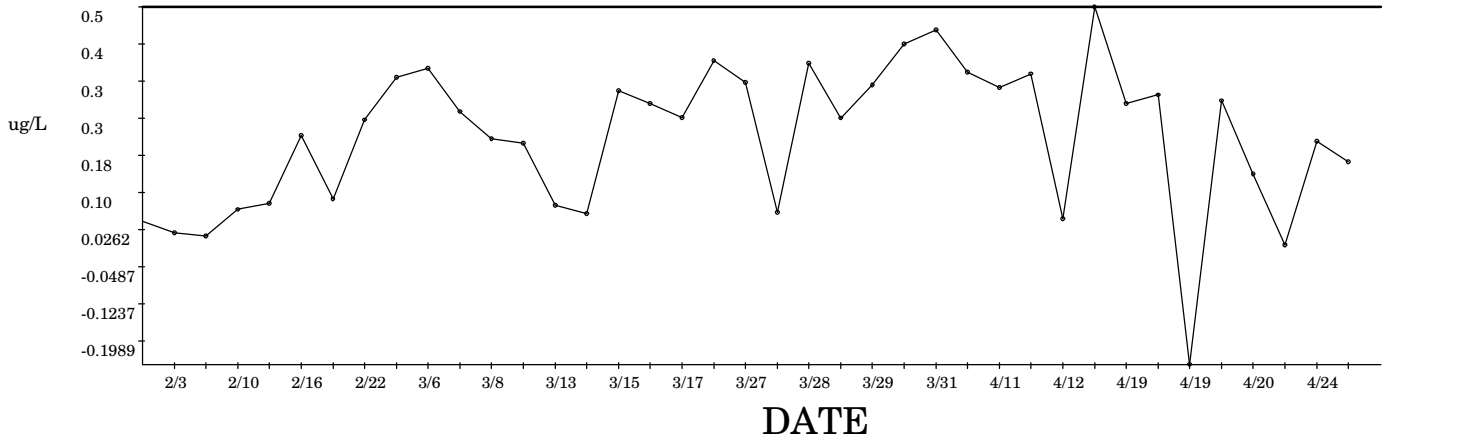
Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
414077	1200818593	13-APR-2005 07:07	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
469918	1200953041	13-OCT-2005 22:13	DONE	46	-7	percent	100	75.0	83.3	117	125	8.33
508623	1201044093	10-MAR-2006 07:39	DONE	98	-0.2	percent	100	75.0	83.3	117	125	8.33
521957	1201074054	20-APR-2006 12:32	DONE	98	-0.28	percent	100	75.0	83.3	117	125	8.33
521957	1201074176	20-APR-2006 12:32	DONE	99	-0.12	percent	100	75.0	83.3	117	125	8.33
521957	1201074177	20-APR-2006 12:32	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33



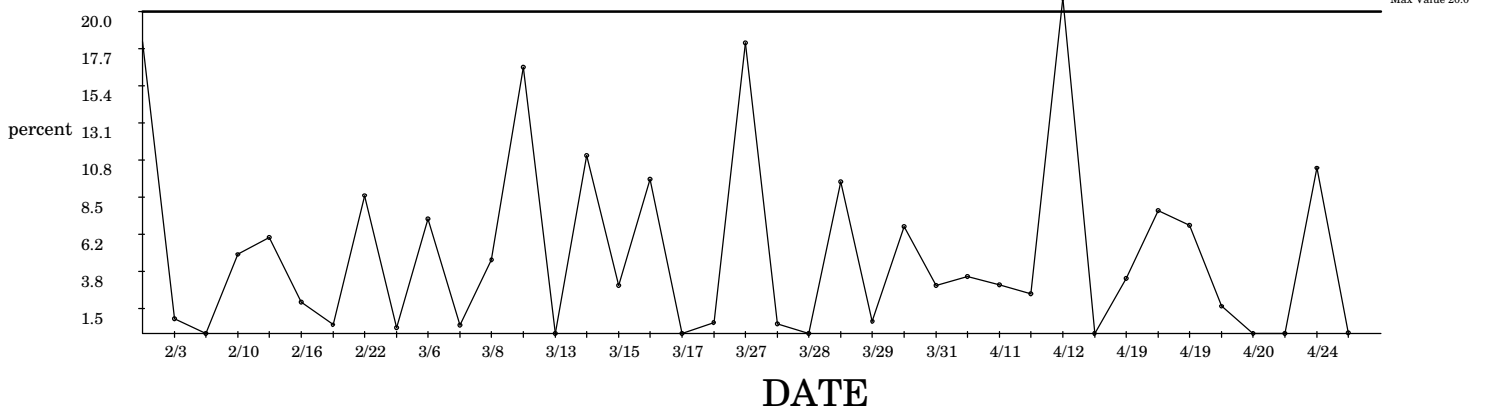
520802	1201071154	21-APR-2006 19:21	DONE	84	-2	percent	100	75.0	83.3	117	125	8.33
--------	------------	-------------------	------	----	----	---------	-----	------	------	-----	-----	------

# SPC Graph for Total Uranium KPA in Liquids 4/25/2006

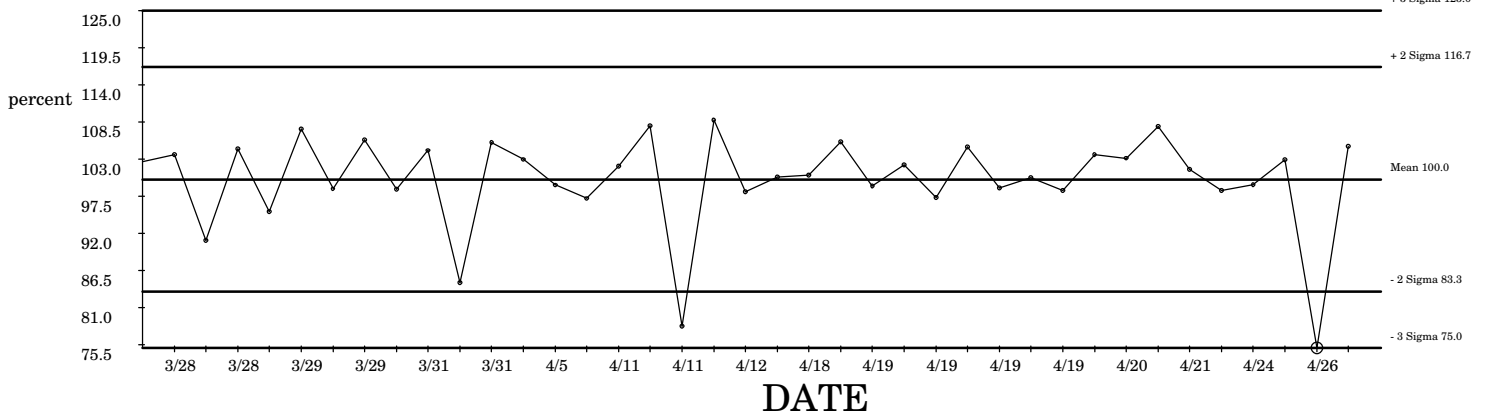
## Total Uranium BLANK



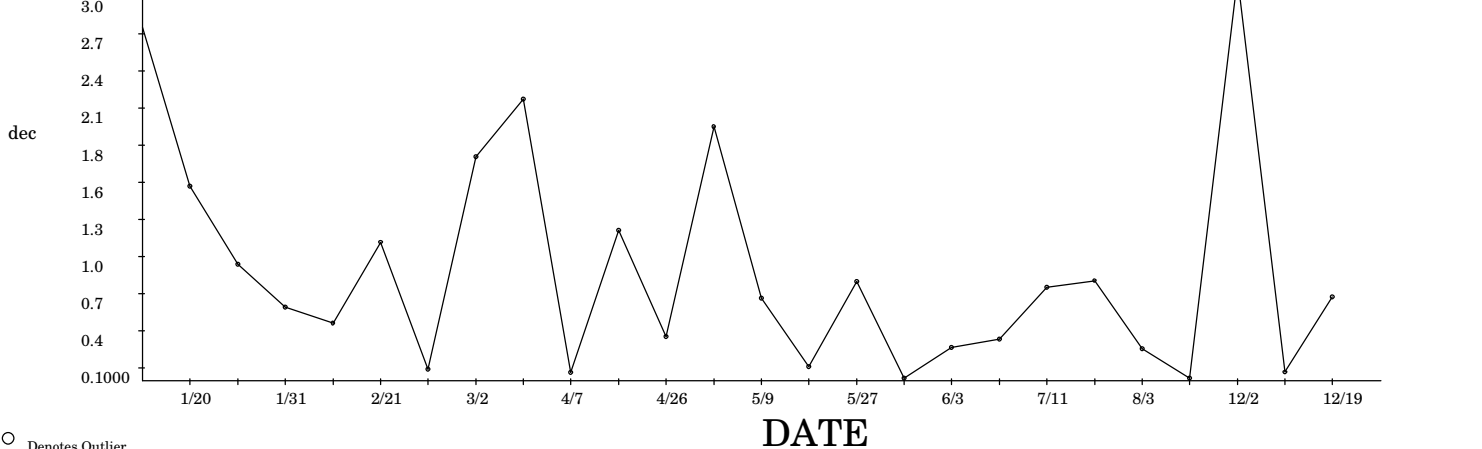
## Total Uranium DUP



## Total Uranium LCS



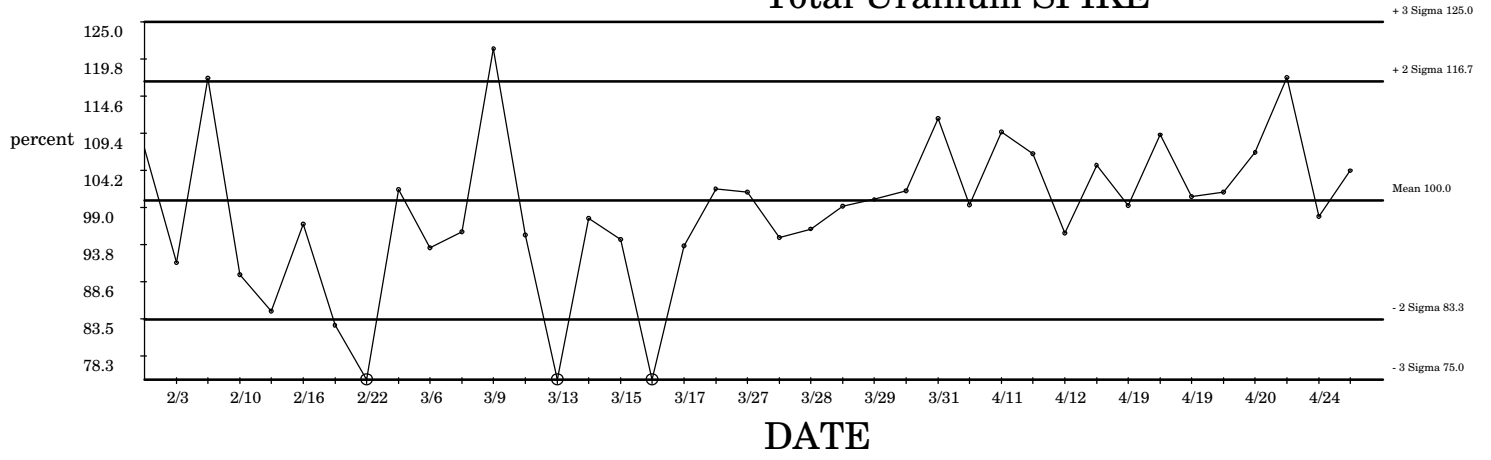
## Total Uranium RER



○ Denotes Outlier

# SPC Graph for Total Uranium KPA in Liquids 4/25/2006

## Total Uranium SPIKE



○ Denotes Outlier

# Data used for Total Uranium KPA in Liquids 26-APR-2006

Total Uranium BLANK: Limits LCL = -1.2 UCL = 1.7

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
497797	1201018820	30-JAN-2006 10:02	DONE	3	5.8	ug/L	0.29	-1.2	-0.678	1.26	1.74	0.48
496182	1201015020	31-JAN-2006 10:03	DONE	0	-0.28	ug/L	0.29	-1.2	-0.678	1.26	1.74	0.48
499318	1201022161	01-FEB-2006 10:19	DONE	0	-0.21	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
499606	1201022799	03-FEB-2006 15:14	DONE	0	-0.56	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
495499	1201013559	09-FEB-2006 11:32	DONE	0	-0.57	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
499607	1201022804	10-FEB-2006 14:09	DONE	0	-0.46	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
502226	1201029167	14-FEB-2006 13:21	DONE	0	-0.44	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
502227	1201029172	16-FEB-2006 15:06	DONE	0	-0.14	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
503735	1201032418	17-FEB-2006 14:35	DONE	0	-0.42	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
505123	1201035708	22-FEB-2006 14:58	DONE	0	-0.08	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
505124	1201035713	23-FEB-2006 16:00	DONE	0	0.1	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
507732	1201041932	06-MAR-2006 14:19	DONE	0	0.14	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
509089	1201045163	08-MAR-2006 11:11	DONE	0	-0.04	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
509091	1201045172	08-MAR-2006 13:41	DONE	0	-0.16	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
509093	1201045181	10-MAR-2006 10:26	DONE	0	-0.18	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
510519	1201048339	13-MAR-2006 13:18	DONE	0	-0.44	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
510315	1201048003	13-MAR-2006 15:02	DONE	0	-0.48	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
510361	1201048009	15-MAR-2006 10:13	DONE	0	0.05	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
512099	1201051952	17-MAR-2006 09:23	DONE	0	-0.01	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
511794	1201051265	17-MAR-2006 10:39	DONE	0	-0.07	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
513427	1201054892	23-MAR-2006 09:42	DONE	0	0.18	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
514308	1201056608	27-MAR-2006 10:53	DONE	0	0.08	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
514304	1201056593	28-MAR-2006 11:58	DONE	0	-0.47	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
514306	1201056599	28-MAR-2006 15:01	DONE	0	0.16	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
514311	1201056621	29-MAR-2006 10:40	DONE	0	-0.07	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
514314	1201056626	29-MAR-2006 11:19	DONE	0	0.07	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
515691	1201059799	31-MAR-2006 09:48	DONE	0	0.25	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
515693	1201059808	31-MAR-2006 10:42	DONE	0	0.31	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
515695	1201059813	05-APR-2006 10:15	DONE	0	0.13	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
518894	1201066876	11-APR-2006 10:02	DONE	0	0.06	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
518888	1201066855	11-APR-2006 11:40	DONE	0	0.12	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
518891	1201066864	12-APR-2006 10:57	DUSE	0	-0.5	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
519925	1201069158	18-APR-2006 11:22	DONE	0	0.41	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
519934	1201069195	19-APR-2006 10:39	DONE	0	-0.01	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
519938	1201069200	19-APR-2006 12:45	DONE	0	0.03	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
519939	1201069206	19-APR-2006 13:28	DONE	0	-1	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
519940	1201069211	19-APR-2006 15:31	DONE	0	0.01	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
519941	1201069216	20-APR-2006 11:50	DONE	0	-0.31	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
519942	1201069226	21-APR-2006 11:45	DUSE	0	-0.61	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
522696	1201075707	24-APR-2006 10:06	DONE	0	-0.17	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47
523680	1201077880	26-APR-2006 10:15	DONE	0	-0.26	ug/L	0.28	-1.1	-0.659	1.23	1.7	0.47

Total Uranium DUP: Limits LCL = 0 UCL = 20

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
495497	1201013546	20-JAN-2006 10:32	DONE	1	-0.73	percent	4.41	0	-6	14.8	20.0	5.21
497797	1201018821	30-JAN-2006 10:05	DONE	6	0.23	percent	4.41	0	-6	14.8	20.0	5.21

496182	1201015021	31-JAN-2006 10:06	DONE	2	-0.5	percent	4.45	0	-6	14.9	20.0	5.21
499606	1201022800	03-FEB-2006 15:19	DONE	1	-0.68	percent	4.45	0	-6	14.9	20.0	5.21
495499	1201013560	09-FEB-2006 11:34	DONE	0	-0.85	percent	4.45	0	-6	14.9	20.0	5.21
499607	1201022805	10-FEB-2006 14:12	DONE	5	0.09	percent	4.45	0	-6	14.9	20.0	5.21
502226	1201029168	14-FEB-2006 13:25	DONE	6	0.29	percent	4.45	0	-6	14.9	20.0	5.21
502227	1201029173	16-FEB-2006 15:09	DONE	2	-0.48	percent	4.45	0	-6	14.9	20.0	5.21
503735	1201032419	17-FEB-2006 14:40	DONE	1	-0.75	percent	4.45	0	-6	14.9	20.0	5.21
505123	1201035709	22-FEB-2006 15:03	DONE	9	0.79	percent	4.45	0	-6	14.9	20.0	5.21
505124	1201035714	23-FEB-2006 16:03	DONE	0	-0.79	percent	4.45	0	-6	14.9	20.0	5.21
507732	1201041933	06-MAR-2006 14:22	DONE	7	0.51	percent	4.45	0	-6	14.9	20.0	5.21
509089	1201045164	08-MAR-2006 11:14	DONE	0	-0.76	percent	4.45	0	-6	14.9	20.0	5.21
509091	1201045173	08-MAR-2006 13:47	DONE	5	0.02	percent	4.45	0	-6	14.9	20.0	5.21
509093	1201045182	10-MAR-2006 10:29	DONE	17	2.3	percent	4.45	0	-6	14.9	20.0	5.21
510519	1201048340	13-MAR-2006 13:21	DONE	0	-0.85	percent	4.45	0	-6	14.9	20.0	5.21
510315	1201048004	13-MAR-2006 15:05	DONE	11	1.3	percent	4.45	0	-6	14.9	20.0	5.21
510361	1201048010	15-MAR-2006 10:16	DONE	3	-0.28	percent	4.45	0	-6	14.9	20.0	5.21
512099	1201051953	17-MAR-2006 09:27	DONE	10	0.99	percent	4.45	0	-6	14.9	20.0	5.21
511794	1201051266	17-MAR-2006 10:43	DONE	0	-0.85	percent	4.45	0	-6	14.9	20.0	5.21
513427	1201054893	23-MAR-2006 09:47	DONE	1	-0.72	percent	4.45	0	-6	14.9	20.0	5.21
514308	1201056609	27-MAR-2006 10:56	DONE	18	2.6	percent	4.45	0	-6	14.9	20.0	5.21
514304	1201056594	28-MAR-2006 12:03	DONE	1	-0.74	percent	4.45	0	-6	14.9	20.0	5.21
514306	1201056600	28-MAR-2006 15:04	DONE	0	-0.85	percent	4.45	0	-6	14.9	20.0	5.21
514311	1201056622	29-MAR-2006 10:01	DONE	9	0.96	percent	4.45	0	-6	14.9	20.0	5.21
514314	1201056627	29-MAR-2006 11:22	DONE	1	-0.71	percent	4.45	0	-6	14.9	20.0	5.21
515691	1201059800	31-MAR-2006 09:51	DONE	7	0.42	percent	4.45	0	-6	14.9	20.0	5.21
515693	1201059809	31-MAR-2006 10:47	DONE	3	-0.28	percent	4.45	0	-6	14.9	20.0	5.21
515695	1201059814	05-APR-2006 10:18	DONE	4	-0.18	percent	4.45	0	-6	14.9	20.0	5.21
518894	1201066877	11-APR-2006 10:07	DONE	3	-0.28	percent	4.45	0	-6	14.9	20.0	5.21
518888	1201066856	11-APR-2006 11:45	DONE	2	-0.38	percent	4.45	0	-6	14.9	20.0	5.21
518891	1201066865	12-APR-2006 13:12	DUSE	21	3.1	percent	4.45	0	-6	14.9	20.0	5.21
519925	1201069159	18-APR-2006 11:24	DONE	0	-0.85	percent	4.45	0	-6	14.9	20.0	5.21
519934	1201069196	19-APR-2006 10:41	DONE	3	-0.2	percent	4.45	0	-6	14.9	20.0	5.21
519938	1201069201	19-APR-2006 12:49	DONE	8	0.61	percent	4.45	0	-6	14.9	20.0	5.21
519939	1201069207	19-APR-2006 13:30	DONE	7	0.44	percent	4.45	0	-6	14.9	20.0	5.21
519940	1201069212	19-APR-2006 15:34	DONE	2	-0.53	percent	4.45	0	-6	14.9	20.0	5.21
519941	1201069217	20-APR-2006 11:53	DONE	0	-0.85	percent	4.45	0	-6	14.9	20.0	5.21
519942	1201069227	21-APR-2006 11:48	DUSE	0	-0.85	percent	4.45	0	-6	14.9	20.0	5.21
522696	1201075708	24-APR-2006 10:09	DONE	10	1.1	percent	4.45	0	-6	14.9	20.0	5.21
523680	1201077881	26-APR-2006 10:18	DONE	0	-0.85	percent	4.45	0	-6	14.9	20.0	5.21

Total Uranium LCS: Limits LCL = 75 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
511794	1201051269	17-MAR-2006 10:52	DONE	102	0.25	percent	100	75.0	83.3	117	125	8.33
513427	1201054896	23-MAR-2006 09:54	DONE	99	-0.13	percent	100	75.0	83.3	117	125	8.33
513427	1201054895	23-MAR-2006 09:56	DONE	106	0.71	percent	100	75.0	83.3	117	125	8.33
514308	1201056611	27-MAR-2006 11:02	DONE	103	0.3	percent	100	75.0	83.3	117	125	8.33
514308	1201056612	27-MAR-2006 11:06	DONE	97	-0.31	percent	100	75.0	83.3	117	125	8.33
514304	1201056597	28-MAR-2006 12:08	DONE	104	0.44	percent	100	75.0	83.3	117	125	8.33
514304	1201056596	28-MAR-2006 12:13	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
514306	1201056602	28-MAR-2006 15:10	DONE	105	0.55	percent	100	75.0	83.3	117	125	8.33

514306	1201056603	28-MAR-2006 15:15	DONE	95	-0.57	percent	100	75.0	83.3	117	125	8.33
514311	1201056625	29-MAR-2006 10:07	DONE	107	0.89	percent	100	75.0	83.3	117	125	8.33
514311	1201056624	29-MAR-2006 10:11	DONE	99	-0.17	percent	100	75.0	83.3	117	125	8.33
514314	1201056630	29-MAR-2006 11:28	DONE	106	0.71	percent	100	75.0	83.3	117	125	8.33
514314	1201056629	29-MAR-2006 11:32	DONE	99	-0.18	percent	100	75.0	83.3	117	125	8.33
515691	1201059803	31-MAR-2006 09:57	DONE	104	0.51	percent	100	75.0	83.3	117	125	8.33
515691	1201059802	31-MAR-2006 10:02	DONE	85	-2	percent	100	75.0	83.3	117	125	8.33
515693	1201059812	31-MAR-2006 10:52	DONE	105	0.65	percent	100	75.0	83.3	117	125	8.33
515693	1201059811	31-MAR-2006 10:56	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
515695	1201059817	05-APR-2006 10:24	DONE	99	-0.1	percent	100	75.0	83.3	117	125	8.33
515695	1201059816	05-APR-2006 10:28	DONE	97	-0.34	percent	100	75.0	83.3	117	125	8.33
518894	1201066879	11-APR-2006 10:14	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
518894	1201066880	11-APR-2006 10:16	DONE	108	0.95	percent	100	75.0	83.3	117	125	8.33
518888	1201066858	11-APR-2006 11:52	DONE	78	-3	percent	100	75.0	83.3	117	125	8.33
518888	1201066859	11-APR-2006 11:54	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
518891	1201066867	12-APR-2006 11:08	DUSE	98	-0.22	percent	100	75.0	83.3	117	125	8.33
518891	1201066868	12-APR-2006 11:09	DUSE	100	0.04	percent	100	75.0	83.3	117	125	8.33
519925	1201069161	18-APR-2006 11:33	DONE	101	0.08	percent	100	75.0	83.3	117	125	8.33
519925	1201069162	18-APR-2006 11:34	DONE	106	0.67	percent	100	75.0	83.3	117	125	8.33
519934	1201069198	19-APR-2006 10:50	DONE	99	-0.12	percent	100	75.0	83.3	117	125	8.33
519934	1201069199	19-APR-2006 10:51	DONE	102	0.25	percent	100	75.0	83.3	117	125	8.33
519938	1201069203	19-APR-2006 12:54	DONE	97	-0.32	percent	100	75.0	83.3	117	125	8.33
519938	1201069204	19-APR-2006 12:57	DONE	105	0.58	percent	100	75.0	83.3	117	125	8.33
519939	1201069209	19-APR-2006 13:36	DONE	99	-0.15	percent	100	75.0	83.3	117	125	8.33
519939	1201069210	19-APR-2006 13:38	DONE	100	0.03	percent	100	75.0	83.3	117	125	8.33
519940	1201069214	19-APR-2006 15:42	DONE	98	-0.2	percent	100	75.0	83.3	117	125	8.33
519940	1201069215	19-APR-2006 15:43	DONE	104	0.44	percent	100	75.0	83.3	117	125	8.33
519941	1201069219	20-APR-2006 11:59	DONE	103	0.38	percent	100	75.0	83.3	117	125	8.33
519941	1201069220	20-APR-2006 12:02	DONE	108	0.94	percent	100	75.0	83.3	117	125	8.33
519942	1201069229	21-APR-2006 11:56	DUSE	101	0.17	percent	100	75.0	83.3	117	125	8.33
519942	1201069230	21-APR-2006 11:58	DUSE	98	-0.2	percent	100	75.0	83.3	117	125	8.33
522696	1201075710	24-APR-2006 10:15	DONE	99	-0.1	percent	100	75.0	83.3	117	125	8.33
522696	1201075711	24-APR-2006 10:18	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
523680	1201077883	26-APR-2006 10:26	DONE	75	-3	percent	100	75.0	83.3	117	125	8.33
523680	1201077884	26-APR-2006 10:27	DONE	105	0.59	percent	100	75.0	83.3	117	125	8.33

**Total Uranium RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
392624	1200767846	10-JAN-2005 18:44	DONE	0.24	-0.55	dec	0.87	0	-1.4	3.2	3.00	1.16
395311	1200774051	20-JAN-2005 21:49	DONE	1.52	0.56	dec	0.87	0	-1.4	3.2	3.00	1.16
395311	1200774052	20-JAN-2005 21:52	DONE	0.91	0.03	dec	0.87	0	-1.4	3.2	3.00	1.16
397297	1200778619	31-JAN-2005 22:54	DONE	0.57	-0.26	dec	0.87	0	-1.4	3.2	3.00	1.16
399308	1200783560	10-FEB-2005 16:19	DONE	0.45	-0.37	dec	0.87	0	-1.4	3.2	3.00	1.16
403160	1200792687	21-FEB-2005 21:08	DONE	1.08	0.18	dec	0.87	0	-1.4	3.2	3.00	1.16
403533	1200793661	23-FEB-2005 14:20	DONE	0.09	-0.67	dec	0.87	0	-1.4	3.2	3.00	1.16
405087	1200797348	02-MAR-2005 18:20	DONE	1.75	0.75	dec	0.87	0	-1.4	3.2	3.00	1.16
410228	1200809516	25-MAR-2005 16:27	DONE	2.2	1.1	dec	0.87	0	-1.4	3.2	3.00	1.16
412929	1200815959	07-APR-2005 17:04	DONE	0.07	-0.7	dec	0.87	0	-1.4	3.2	3.00	1.16
413613	1200817441	11-APR-2005 16:50	DONE	1.18	0.26	dec	0.87	0	-1.4	3.2	3.00	1.16
419672	1200832042	26-APR-2005 16:51	DONE	0.35	-0.45	dec	0.87	0	-1.4	3.2	3.00	1.16

421104	1200835563	06-MAY-2005 16:48	DONE	1.98	0.96	dec	0.87	0	-1.4	3.2	3.00	1.16
423658	1200842019	09-MAY-2005 13:16	DONE	0.64	-0.2	dec	0.87	0	-1.4	3.2	3.00	1.16
425652	1200846824	21-MAY-2005 01:38	DONE	0.11	-0.66	dec	0.87	0	-1.4	3.2	3.00	1.16
429170	1200855475	27-MAY-2005 21:41	DONE	0.78	-0.08	dec	0.87	0	-1.4	3.2	3.00	1.16
428525	1200853979	28-MAY-2005 02:24	DONE	0.02	-0.74	dec	0.87	0	-1.4	3.2	3.00	1.16
430767	1200859375	03-JUN-2005 14:38	DONE	0.26	-0.53	dec	0.87	0	-1.4	3.2	3.00	1.16
439503	1200880211	05-JUL-2005 22:09	DONE	0.33	-0.47	dec	0.87	0	-1.4	3.2	3.00	1.16
437544	1200875750	11-JUL-2005 11:14	DONE	0.73	-0.12	dec	0.87	0	-1.4	3.2	3.00	1.16
439502	1200880206	11-JUL-2005 17:17	DONE	0.78	-0.08	dec	0.87	0	-1.4	3.2	3.00	1.16
447932	1200900828	03-AUG-2005 16:59	DONE	0.25	-0.54	dec	0.87	0	-1.4	3.2	3.00	1.16
473187	1200961069	25-OCT-2005 08:47	DONE	0.02	-0.73	dec	0.87	0	-1.4	3.2	3.00	1.16
483935	1200986716	02-DEC-2005 16:03	DONE	5.7	4.2	dec	0.87	0	-1.4	3.2	3.00	1.16
486185	1200992391	12-DEC-2005 11:32	DONE	0.07	-0.69	dec	0.87	0	-1.4	3.2	3.00	1.16
486203	1200992443	19-DEC-2005 11:48	DONE	0.65	-0.19	dec	0.87	0	-1.4	3.2	3.00	1.16

Total Uranium SPIKE: Limits LCL = 75 UCL = 125

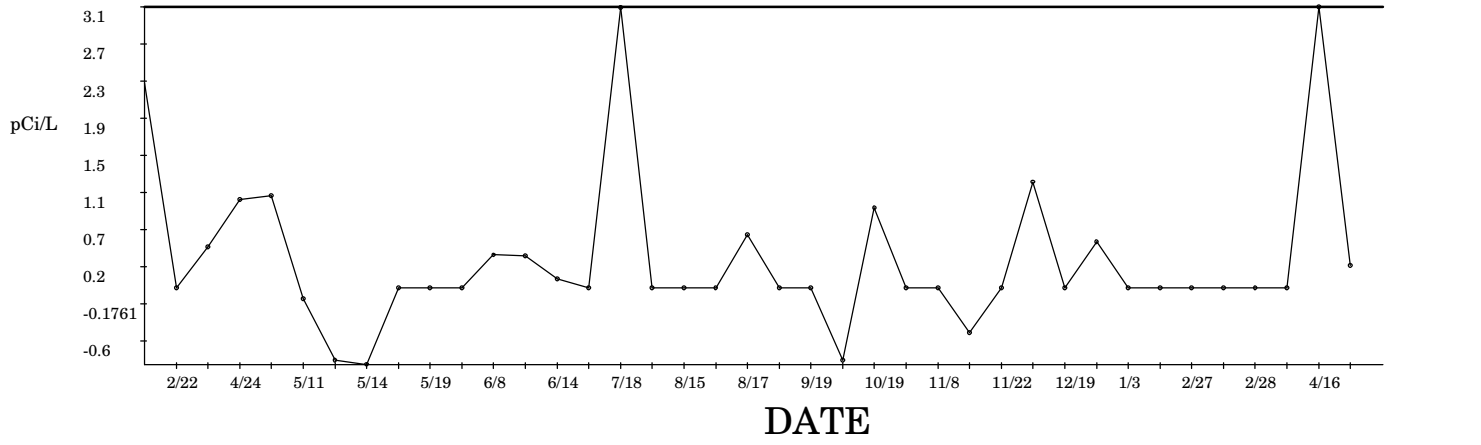
Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
496182	1201015022	31-JAN-2006 10:09	DONE	93	-0.79	percent	100	75.0	83.3	117	125	8.33
499318	1201022162	01-FEB-2006 10:24	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33
499318	1201022163	01-FEB-2006 10:27	DONE	93	-0.87	percent	100	75.0	83.3	117	125	8.33
499606	1201022801	03-FEB-2006 15:22	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
495499	1201013561	09-FEB-2006 11:38	DONE	117	2.1	percent	100	75.0	83.3	117	125	8.33
499607	1201022806	10-FEB-2006 14:16	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
502226	1201029169	14-FEB-2006 13:29	DONE	85	-2	percent	100	75.0	83.3	117	125	8.33
502227	1201029174	16-FEB-2006 15:13	DONE	97	-0.4	percent	100	75.0	83.3	117	125	8.33
503735	1201032420	17-FEB-2006 14:43	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
505123	1201035710	22-FEB-2006 15:06	DONE	75	-3	percent	100	75.0	83.3	117	125	8.33
505124	1201035715	23-FEB-2006 16:07	DONE	102	0.18	percent	100	75.0	83.3	117	125	8.33
507732	1201041934	06-MAR-2006 14:26	DONE	93	-0.8	percent	100	75.0	83.3	117	125	8.33
509089	1201045165	08-MAR-2006 11:18	DONE	96	-0.53	percent	100	75.0	83.3	117	125	8.33
509091	1201045174	09-MAR-2006 11:10	DONE	121	2.5	percent	100	75.0	83.3	117	125	8.33
509093	1201045183	10-MAR-2006 10:33	DONE	95	-0.58	percent	100	75.0	83.3	117	125	8.33
510519	1201048341	13-MAR-2006 13:25	DONE	71	-4	percent	100	75.0	83.3	117	125	8.33
510315	1201048005	13-MAR-2006 15:09	DONE	97	-0.3	percent	100	75.0	83.3	117	125	8.33
510361	1201048011	15-MAR-2006 10:21	DONE	95	-0.65	percent	100	75.0	83.3	117	125	8.33
512099	1201051954	17-MAR-2006 09:31	DONE	63	-4	percent	100	75.0	83.3	117	125	8.33
511794	1201051267	17-MAR-2006 10:47	DONE	94	-0.76	percent	100	75.0	83.3	117	125	8.33
513427	1201054894	23-MAR-2006 09:50	DONE	102	0.19	percent	100	75.0	83.3	117	125	8.33
514308	1201056610	27-MAR-2006 11:00	DONE	101	0.15	percent	100	75.0	83.3	117	125	8.33
514304	1201056595	28-MAR-2006 12:06	DONE	95	-0.62	percent	100	75.0	83.3	117	125	8.33
514306	1201056601	28-MAR-2006 15:08	DONE	96	-0.48	percent	100	75.0	83.3	117	125	8.33
514311	1201056623	29-MAR-2006 10:05	DONE	99	-0.1	percent	100	75.0	83.3	117	125	8.33
514314	1201056628	29-MAR-2006 11:26	DONE	100	0.02	percent	100	75.0	83.3	117	125	8.33
515691	1201059801	31-MAR-2006 09:55	DONE	101	0.17	percent	100	75.0	83.3	117	125	8.33
515693	1201059810	31-MAR-2006 10:50	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
515695	1201059815	05-APR-2006 10:22	DONE	99	-0.07	percent	100	75.0	83.3	117	125	8.33
518894	1201066878	11-APR-2006 10:11	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
518888	1201066857	11-APR-2006 11:49	DONE	107	0.78	percent	100	75.0	83.3	117	125	8.33
518891	1201066866	12-APR-2006 11:04	DUSE	95	-0.54	percent	100	75.0	83.3	117	125	8.33
519925	1201069160	18-APR-2006 11:29	DONE	105	0.59	percent	100	75.0	83.3	117	125	8.33

519934	1201069197	19-APR-2006 10:46	DONE	99	-0.08	percent	100	75.0	83.3	117	125	8.33
519938	1201069202	19-APR-2006 12:51	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
519939	1201069208	19-APR-2006 13:35	DONE	101	0.07	percent	100	75.0	83.3	117	125	8.33
519940	1201069213	19-APR-2006 15:39	DONE	101	0.14	percent	100	75.0	83.3	117	125	8.33
519941	1201069218	20-APR-2006 11:56	DONE	107	0.81	percent	100	75.0	83.3	117	125	8.33
519942	1201069228	21-APR-2006 11:53	DUSE	117	2.1	percent	100	75.0	83.3	117	125	8.33
522696	1201075709	24-APR-2006 10:12	DONE	98	-0.27	percent	100	75.0	83.3	117	125	8.33
523680	1201077882	26-APR-2006 10:22	DONE	104	0.5	percent	100	75.0	83.3	117	125	8.33

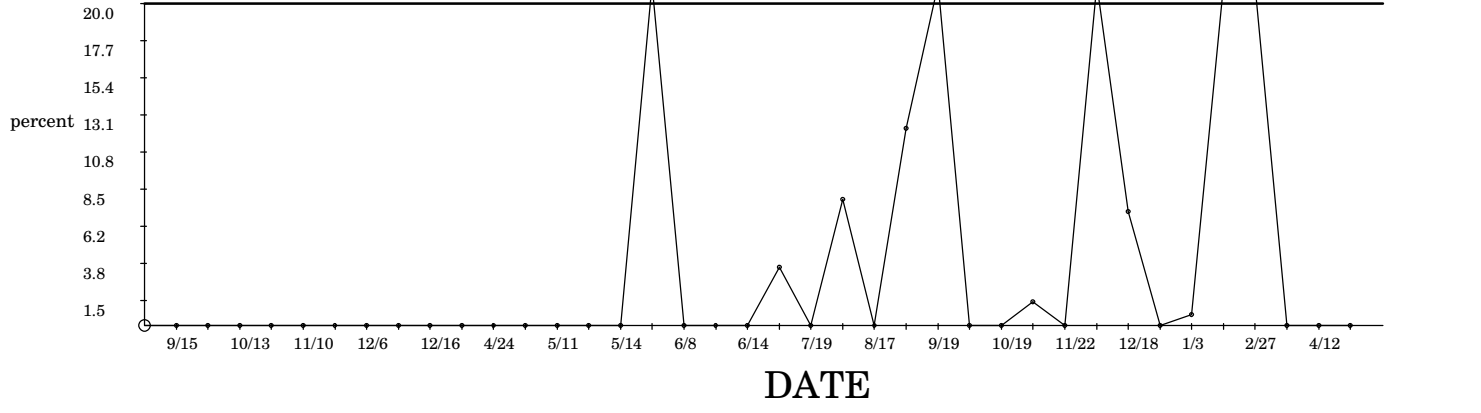


# SPC Graph for Gas Flow Lead-210 in Liquids 4/25/2006

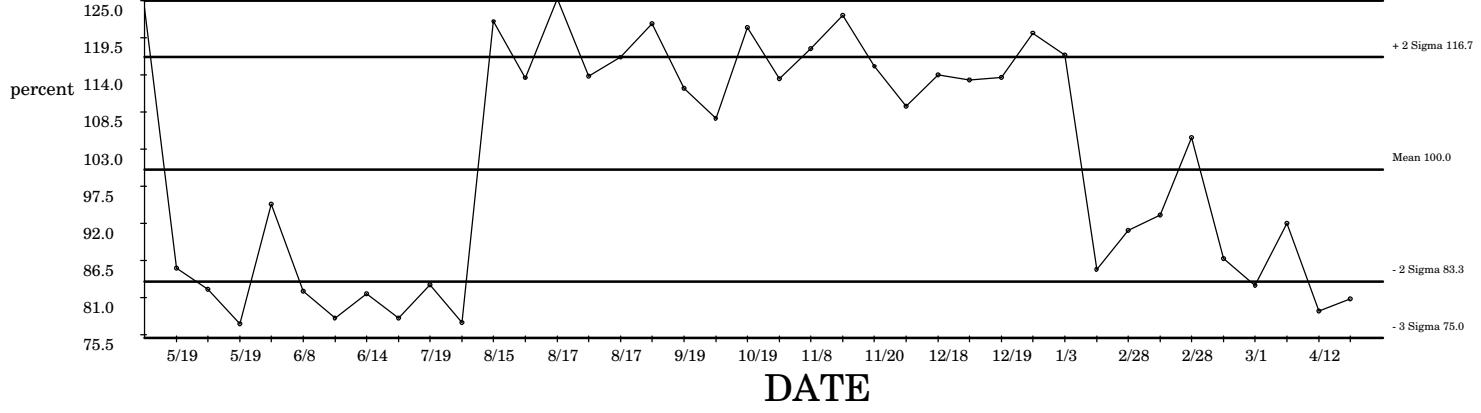
## Lead-210 BLANK



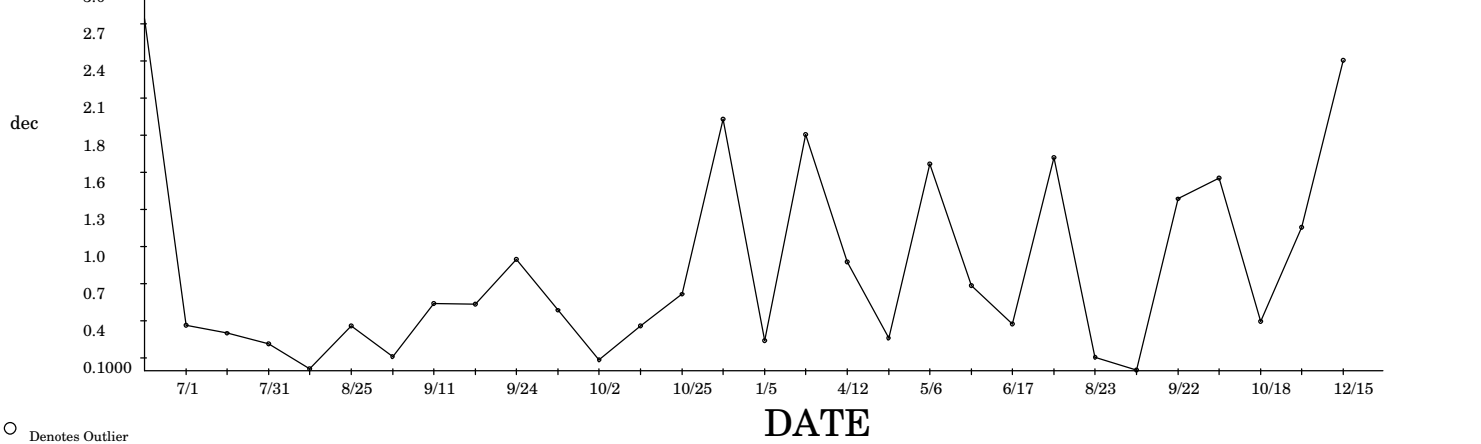
## Lead-210 DUP



## Lead-210 LCS



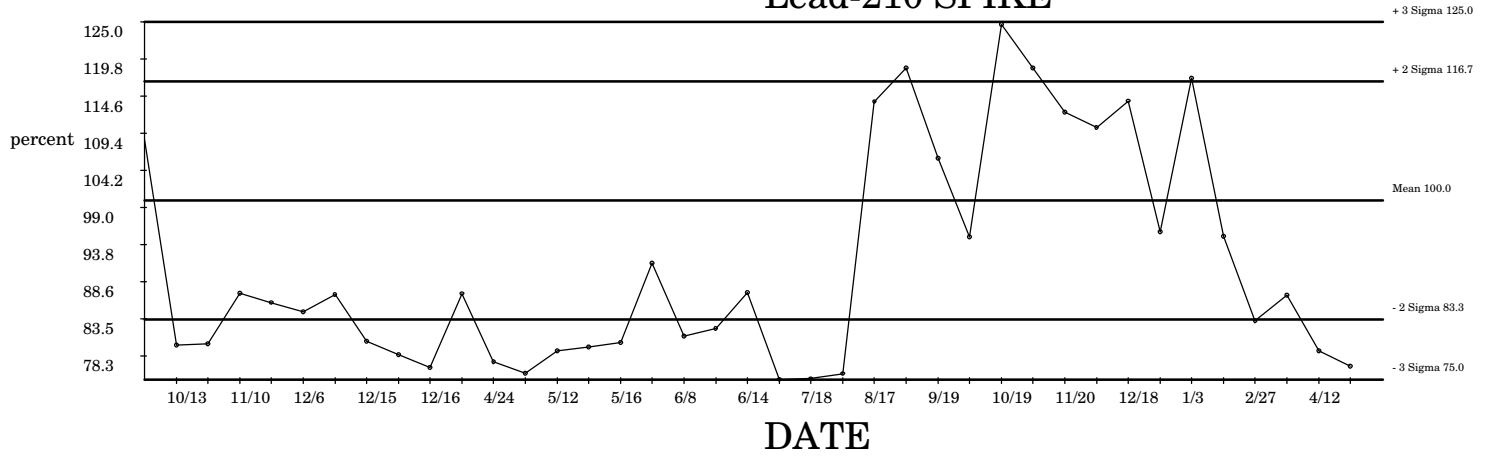
## Lead-210 RER



○ Denotes Outlier

# SPC Graph for Gas Flow Lead-210 in Liquids 4/25/2006

## Lead-210 SPIKE



○ Denotes Outlier

# Data used for Gas Flow Lead-210 in Liquids 26-APR-2006

Lead-210 BLANK: Limits LCL = -2.2 UCL = 2.7

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
400110	1200785595	21-FEB-2005 16:38	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
400109	1200785591	22-FEB-2005 07:24	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
415571	1200822191	18-APR-2005 00:50	DONE	0	0.25	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
417543	1200827004	24-APR-2005 19:55	DONE	1	0.91	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
419557	1200831804	30-APR-2005 15:21	DONE	1	0.96	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
422332	1200838732	11-MAY-2005 07:18	DONE	0	-0.46	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
419558	1200831808	14-MAY-2005 20:57	DONE	-1	-1	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
422819	1200839939	14-MAY-2005 21:00	DONE	-1	-1	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
419559	1200831812	19-MAY-2005 08:43	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
419560	1200831815	19-MAY-2005 10:21	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
421692	1200836959	25-MAY-2005 08:55	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
430106	1200857690	08-JUN-2005 09:03	DONE	0	0.14	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
430764	1200859365	13-JUN-2005 11:29	DONE	0	0.13	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
431616	1200861663	14-JUN-2005 06:26	DONE	0	-0.19	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
430541	1200858801	26-JUN-2005 18:15	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
441104	1200884260	18-JUL-2005 19:15	DONE	3	3.6	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
437246	1200875105	21-JUL-2005 22:20	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
450347	1200906423	15-AUG-2005 21:26	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
450351	1200906426	17-AUG-2005 11:33	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
450354	1200906438	17-AUG-2005 14:19	DONE	1	0.42	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
450352	1200906430	18-AUG-2005 14:14	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
461613	1200933183	19-SEP-2005 13:53	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
461895	1200933942	22-SEP-2005 10:16	DONE	-1	-1	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
471295	1200956478	19-OCT-2005 10:39	DONE	1	0.79	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
470692	1200954937	19-OCT-2005 16:56	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
475222	1200965926	08-NOV-2005 10:52	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
481294	1200980553	22-NOV-2005 09:21	DONE	0	-0.93	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
479208	1200975628	22-NOV-2005 14:07	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
486637	1200993457	18-DEC-2005 21:40	DONE	1	1.1	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
485399	1200990514	19-DEC-2005 12:14	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
489016	1200998991	25-DEC-2005 19:10	DONE	1	0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
487146	1200994636	03-JAN-2006 10:19	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
495993	1201014597	05-FEB-2006 14:34	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
504804	1201034958	27-FEB-2006 11:25	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
503558	1201031984	28-FEB-2006 10:50	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
503559	1201031987	28-FEB-2006 23:10	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
512214	1201052258	21-MAR-2006 11:45	DONE	0	-0.32	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
517808	1201064410	16-APR-2006 23:19	DONE	3	3.6	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81
520607	1201070733	25-APR-2006 14:15	DONE	0	-0	pCi/L	0.25	-2.2	-1.4	1.87	2.68	0.81

Lead-210 DUP: Limits LCL = 0 UCL = 20

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
356233	1200680261	17-AUG-2004 11:19	DONE	28	1.4	percent	6.62	0	-25	38.6	20.0	16
364294	1200699138	15-SEP-2004 09:13	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
364295	1200699143	15-SEP-2004 10:11	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
371366	1200716015	13-OCT-2004 08:24	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16

371367	1200716019	18-OCT-2004 07:44	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
378642	1200734036	10-NOV-2004 09:46	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
378641	1200734032	15-NOV-2004 09:35	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
383936	1200746759	06-DEC-2004 09:02	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
383918	1200746688	06-DEC-2004 10:34	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
385729	1200751075	16-DEC-2004 04:06	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
415571	1200822192	18-APR-2005 00:50	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
417543	1200827005	24-APR-2005 19:55	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
419557	1200831805	30-APR-2005 15:21	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
422332	1200838733	11-MAY-2005 07:18	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
419558	1200831809	14-MAY-2005 20:57	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
422819	1200839940	14-MAY-2005 21:01	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
421692	1200836960	25-MAY-2005 10:35	DONE	22	0.93	percent	6.62	0	-25	38.6	20.0	16
430106	1200857691	08-JUN-2005 09:03	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
430764	1200859366	13-JUN-2005 11:29	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
431616	1200861664	14-JUN-2005 06:26	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
430541	1200858802	26-JUN-2005 18:15	DONE	4	-0.19	percent	6.62	0	-25	38.6	20.0	16
441104	1200884261	19-JUL-2005 15:04	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
437246	1200875106	21-JUL-2005 22:20	DONE	8	0.08	percent	6.62	0	-25	38.6	20.0	16
450354	1200906439	17-AUG-2005 14:19	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
450352	1200906431	18-AUG-2005 14:14	DONE	12	0.35	percent	6.62	0	-25	38.6	20.0	16
461613	1200933184	19-SEP-2005 13:52	DONE	28	1.3	percent	6.62	0	-25	38.6	20.0	16
461895	1200933943	22-SEP-2005 10:16	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
471295	1200956479	19-OCT-2005 11:41	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
470692	1200954938	19-OCT-2005 16:56	DONE	1	-0.32	percent	6.62	0	-25	38.6	20.0	16
481294	1200980554	22-NOV-2005 09:21	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
479208	1200975629	22-NOV-2005 14:07	DONE	34	1.7	percent	6.62	0	-25	38.6	20.0	16
486637	1200993458	18-DEC-2005 21:39	DONE	7	0.03	percent	6.62	0	-25	38.6	20.0	16
489016	1200998992	25-DEC-2005 19:10	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
487146	1200994637	03-JAN-2006 10:19	DONE	1	-0.37	percent	6.62	0	-25	38.6	20.0	16
495993	1201014598	05-FEB-2006 14:34	DONE	84	4.8	percent	6.62	0	-25	38.6	20.0	16
504804	1201034959	27-FEB-2006 11:25	DONE	30	1.4	percent	6.62	0	-25	38.6	20.0	16
512214	1201052259	21-MAR-2006 11:45	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
517808	1201064411	12-APR-2006 10:37	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16
520607	1201070734	25-APR-2006 14:15	DONE	0	-0.41	percent	6.62	0	-25	38.6	20.0	16

Lead-210 LCS: Limits LCL = 75 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
419559	1200831813	19-MAY-2005 08:42	DONE	76	-3	percent	100	75.0	83.3	117	125	8.33
419559	1200831814	19-MAY-2005 08:42	DONE	85	-2	percent	100	75.0	83.3	117	125	8.33
419560	1200831817	19-MAY-2005 10:20	DONE	82	-2	percent	100	75.0	83.3	117	125	8.33
419560	1200831816	19-MAY-2005 10:21	DONE	77	-3	percent	100	75.0	83.3	117	125	8.33
421692	1200836962	25-MAY-2005 10:35	DONE	95	-0.62	percent	100	75.0	83.3	117	125	8.33
430106	1200857693	08-JUN-2005 09:03	DONE	82	-2	percent	100	75.0	83.3	117	125	8.33
430764	1200859368	13-JUN-2005 11:29	DONE	78	-3	percent	100	75.0	83.3	117	125	8.33
431616	1200861666	14-JUN-2005 06:26	DONE	82	-2	percent	100	75.0	83.3	117	125	8.33
430541	1200858804	27-JUN-2005 11:34	DONE	78	-3	percent	100	75.0	83.3	117	125	8.33
441104	1200884263	19-JUL-2005 15:04	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
437246	1200875108	21-JUL-2005 13:20	DONE	77	-3	percent	100	75.0	83.3	117	125	8.33
450347	1200906424	15-AUG-2005 21:26	DONE	122	2.6	percent	100	75.0	83.3	117	125	8.33

450347	1200906425	15-AUG-2005 22:29	DONE	114	1.6	percent	100	75.0	83.3	117	125	8.33
450351	1200906427	17-AUG-2005 11:33	DONE	125	3	percent	100	75.0	83.3	117	125	8.33
450351	1200906428	17-AUG-2005 11:33	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
450354	1200906441	17-AUG-2005 14:19	DONE	117	2	percent	100	75.0	83.3	117	125	8.33
450352	1200906433	18-AUG-2005 14:14	DONE	122	2.6	percent	100	75.0	83.3	117	125	8.33
461613	1200933186	19-SEP-2005 14:56	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
461895	1200933945	22-SEP-2005 10:16	DONE	108	0.9	percent	100	75.0	83.3	117	125	8.33
471295	1200956481	19-OCT-2005 10:40	DONE	121	2.5	percent	100	75.0	83.3	117	125	8.33
470692	1200954940	19-OCT-2005 17:59	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33
475222	1200965928	08-NOV-2005 10:52	DONE	118	2.1	percent	100	75.0	83.3	117	125	8.33
475222	1200965927	08-NOV-2005 10:52	DONE	123	2.7	percent	100	75.0	83.3	117	125	8.33
479208	1200975631	20-NOV-2005 23:00	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
481294	1200980556	22-NOV-2005 09:21	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
486637	1200993460	18-DEC-2005 21:40	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
485399	1200990515	19-DEC-2005 12:14	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33
485399	1200990516	19-DEC-2005 12:14	DONE	114	1.6	percent	100	75.0	83.3	117	125	8.33
489016	1200998994	25-DEC-2005 19:10	DONE	120	2.4	percent	100	75.0	83.3	117	125	8.33
487146	1200994639	03-JAN-2006 10:19	DONE	117	2	percent	100	75.0	83.3	117	125	8.33
495993	1201014600	04-FEB-2006 17:44	DONE	85	-2	percent	100	75.0	83.3	117	125	8.33
503558	1201031985	28-FEB-2006 15:18	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
503558	1201031986	28-FEB-2006 15:19	DONE	93	-0.82	percent	100	75.0	83.3	117	125	8.33
503559	1201031988	28-FEB-2006 23:10	DONE	105	0.57	percent	100	75.0	83.3	117	125	8.33
503559	1201031989	28-FEB-2006 23:10	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
504804	1201034961	01-MAR-2006 21:40	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
512214	1201052261	21-MAR-2006 11:45	DONE	92	-0.96	percent	100	75.0	83.3	117	125	8.33
517808	1201064413	12-APR-2006 10:37	DONE	79	-3	percent	100	75.0	83.3	117	125	8.33
520607	1201070736	25-APR-2006 14:15	DONE	81	-2	percent	100	75.0	83.3	117	125	8.33

Lead-210 RER: Limits LCL = 0 UCL = 3

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
259157	1200444733	01-JUL-2003 03:49	DONE	0.25	-0.69	dec	0.71	0	-0.612	2.04	3.00	0.66
259156	1200444730	01-JUL-2003 13:35	DONE	0.35	-0.54	dec	0.71	0	-0.612	2.04	3.00	0.66
260891	1200449200	08-JUL-2003 03:35	DONE	0.29	-0.63	dec	0.71	0	-0.612	2.04	3.00	0.66
263853	1200456689	31-JUL-2003 12:42	DONE	0.21	-0.76	dec	0.71	0	-0.612	2.04	3.00	0.66
268208	1200467300	05-AUG-2003 20:11	DONE	0.02	-1	dec	0.71	0	-0.612	2.04	3.00	0.66
270119	1200472396	25-AUG-2003 17:29	DONE	0.35	-0.55	dec	0.71	0	-0.612	2.04	3.00	0.66
273714	1200481578	09-SEP-2003 12:10	DONE	0.11	-0.91	dec	0.71	0	-0.612	2.04	3.00	0.66
274534	1200483528	11-SEP-2003 03:42	DONE	0.52	-0.28	dec	0.71	0	-0.612	2.04	3.00	0.66
276187	1200487560	18-SEP-2003 16:35	DONE	0.52	-0.29	dec	0.71	0	-0.612	2.04	3.00	0.66
277706	1200491283	24-SEP-2003 14:13	DONE	0.87	0.24	dec	0.71	0	-0.612	2.04	3.00	0.66
277704	1200491269	29-SEP-2003 09:58	DONE	0.47	-0.36	dec	0.71	0	-0.612	2.04	3.00	0.66
278927	1200494421	02-OCT-2003 05:44	DONE	0.09	-0.95	dec	0.71	0	-0.612	2.04	3.00	0.66
280680	1200498873	13-OCT-2003 19:59	DONE	0.35	-0.55	dec	0.71	0	-0.612	2.04	3.00	0.66
284404	1200508164	25-OCT-2003 10:17	DONE	0.6	-0.17	dec	0.71	0	-0.612	2.04	3.00	0.66
290245	1200523078	17-NOV-2003 18:45	DONE	1.96	1.9	dec	0.71	0	-0.612	2.04	3.00	0.66
299278	1200545020	05-JAN-2004 20:33	DONE	0.23	-0.72	dec	0.71	0	-0.612	2.04	3.00	0.66
301230	1200549730	13-JAN-2004 05:57	DONE	1.84	1.7	dec	0.71	0	-0.612	2.04	3.00	0.66
322627	1200600723	12-APR-2004 12:50	DONE	0.85	0.21	dec	0.71	0	-0.612	2.04	3.00	0.66
323105	1200601878	14-APR-2004 14:15	DONE	0.25	-0.69	dec	0.71	0	-0.612	2.04	3.00	0.66
328142	1200613508	06-MAY-2004 19:34	DONE	1.62	1.4	dec	0.71	0	-0.612	2.04	3.00	0.66

332226	1200623069	18-MAY-2004 21:56	DONE	0.67	-0.07	dec	0.71	0	-0.612	2.04	3.00	0.66
339666	1200640332	17-JUN-2004 20:36	DONE	0.36	-0.53	dec	0.71	0	-0.612	2.04	3.00	0.66
344859	1200653027	14-JUL-2004 01:14	DONE	1.67	1.4	dec	0.71	0	-0.612	2.04	3.00	0.66
355308	1200678102	23-AUG-2004 04:40	DONE	0.11	-0.91	dec	0.71	0	-0.612	2.04	3.00	0.66
356146	1200680029	25-AUG-2004 15:24	DONE	00	-1	dec	0.71	0	-0.612	2.04	3.00	0.66
365746	1200702829	22-SEP-2004 05:21	DONE	1.34	0.95	dec	0.71	0	-0.612	2.04	3.00	0.66
365744	1200702821	22-SEP-2004 06:27	DONE	1.51	1.2	dec	0.71	0	-0.612	2.04	3.00	0.66
372794	1200719620	18-OCT-2004 14:02	DONE	0.39	-0.49	dec	0.71	0	-0.612	2.04	3.00	0.66
385730	1200751079	15-DEC-2004 06:46	DONE	1.12	0.62	dec	0.71	0	-0.612	2.04	3.00	0.66
382363	1200742867	15-DEC-2004 13:22	DONE	2.42	2.6	dec	0.71	0	-0.612	2.04	3.00	0.66

Lead-210 SPIKE: Limits LCL = 75 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
365744	1200702822	22-SEP-2004 06:27	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
371366	1200716016	13-OCT-2004 08:24	DONE	80	-2	percent	100	75.0	83.3	117	125	8.33
371367	1200716020	18-OCT-2004 07:44	DONE	80	-2	percent	100	75.0	83.3	117	125	8.33
378642	1200734037	10-NOV-2004 08:46	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
378641	1200734033	16-NOV-2004 18:49	DONE	86	-2	percent	100	75.0	83.3	117	125	8.33
383918	1200746689	06-DEC-2004 18:46	DONE	84	-2	percent	100	75.0	83.3	117	125	8.33
383936	1200746760	06-DEC-2004 19:50	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
385730	1200751080	15-DEC-2004 07:21	DONE	80	-2	percent	100	75.0	83.3	117	125	8.33
382363	1200742868	15-DEC-2004 13:22	DONE	78	-3	percent	100	75.0	83.3	117	125	8.33
385729	1200751076	16-DEC-2004 04:06	DONE	77	-3	percent	100	75.0	83.3	117	125	8.33
415571	1200822193	17-APR-2005 23:35	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
417543	1200827006	24-APR-2005 19:56	DONE	77	-3	percent	100	75.0	83.3	117	125	8.33
419557	1200831806	30-APR-2005 15:21	DONE	76	-3	percent	100	75.0	83.3	117	125	8.33
422332	1200838734	12-MAY-2005 10:27	DONE	79	-3	percent	100	75.0	83.3	117	125	8.33
422819	1200839941	14-MAY-2005 21:00	DONE	80	-2	percent	100	75.0	83.3	117	125	8.33
419558	1200831810	16-MAY-2005 13:46	DONE	80	-2	percent	100	75.0	83.3	117	125	8.33
421692	1200836961	25-MAY-2005 10:35	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
430106	1200857692	08-JUN-2005 09:03	DONE	81	-2	percent	100	75.0	83.3	117	125	8.33
430764	1200859367	13-JUN-2005 20:45	DONE	82	-2	percent	100	75.0	83.3	117	125	8.33
431616	1200861665	14-JUN-2005 06:26	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
430541	1200858803	27-JUN-2005 11:34	DONE	75	-3	percent	100	75.0	83.3	117	125	8.33
441104	1200884262	18-JUL-2005 19:44	DONE	75	-3	percent	100	75.0	83.3	117	125	8.33
437246	1200875107	21-JUL-2005 13:20	DONE	76	-3	percent	100	75.0	83.3	117	125	8.33
450354	1200906440	17-AUG-2005 14:19	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
450352	1200906432	18-AUG-2005 14:14	DONE	119	2.2	percent	100	75.0	83.3	117	125	8.33
461613	1200933185	19-SEP-2005 13:52	DONE	106	0.71	percent	100	75.0	83.3	117	125	8.33
461895	1200933944	22-SEP-2005 10:16	DONE	95	-0.61	percent	100	75.0	83.3	117	125	8.33
471295	1200956480	19-OCT-2005 10:39	DONE	125	3	percent	100	75.0	83.3	117	125	8.33
470692	1200954939	19-OCT-2005 16:56	DONE	119	2.2	percent	100	75.0	83.3	117	125	8.33
479208	1200975630	20-NOV-2005 23:00	DONE	112	1.5	percent	100	75.0	83.3	117	125	8.33
481294	1200980555	22-NOV-2005 09:21	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
486637	1200993459	18-DEC-2005 21:39	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
489016	1200998993	25-DEC-2005 19:10	DONE	96	-0.52	percent	100	75.0	83.3	117	125	8.33
487146	1200994638	03-JAN-2006 10:19	DONE	117	2.1	percent	100	75.0	83.3	117	125	8.33
495993	1201014599	04-FEB-2006 17:44	DONE	95	-0.6	percent	100	75.0	83.3	117	125	8.33
504804	1201034960	27-FEB-2006 11:26	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
512214	1201052260	21-MAR-2006 11:45	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33

517808	1201064412	12-APR-2006 10:37	DONE	79	-3	percent	100	75.0	83.3	117	125	8.33
520607	1201070735	25-APR-2006 14:15	DONE	77	-3	percent	100	75.0	83.3	117	125	8.33

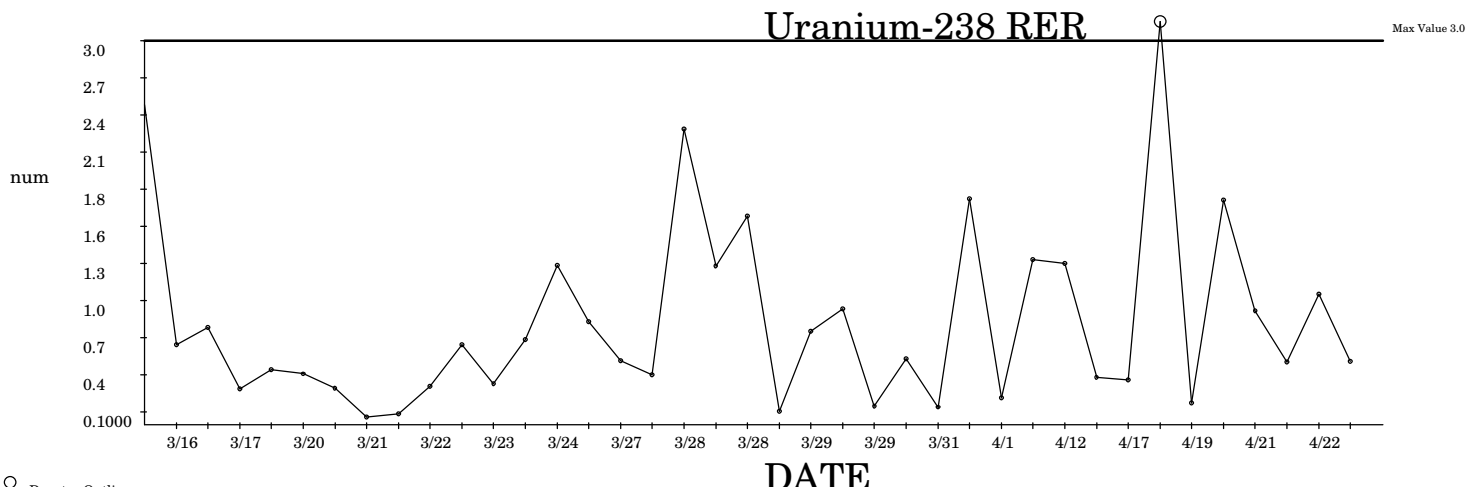
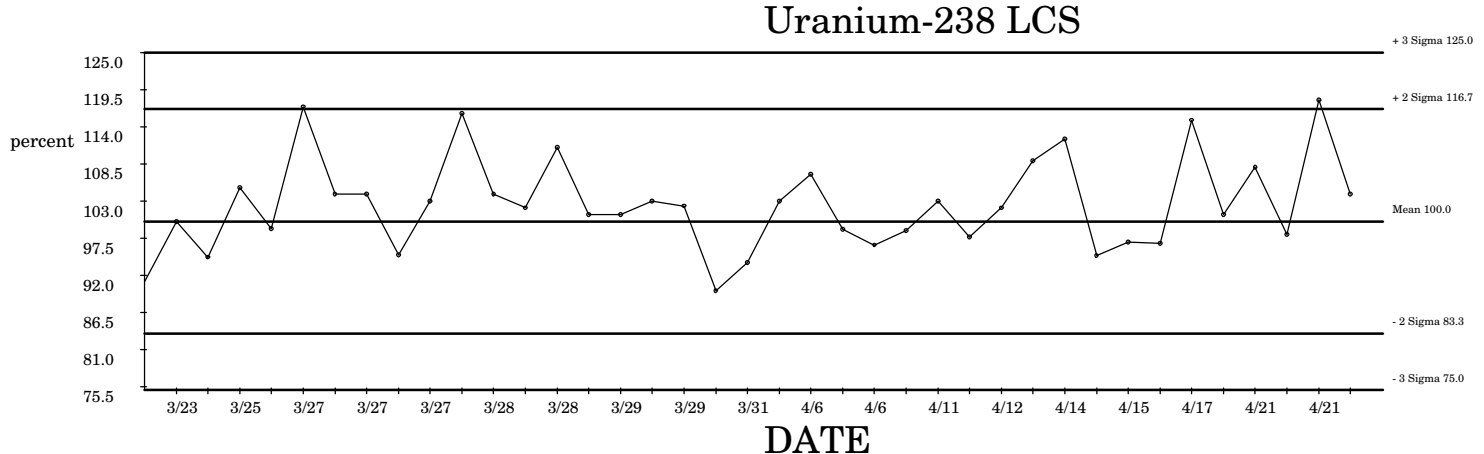
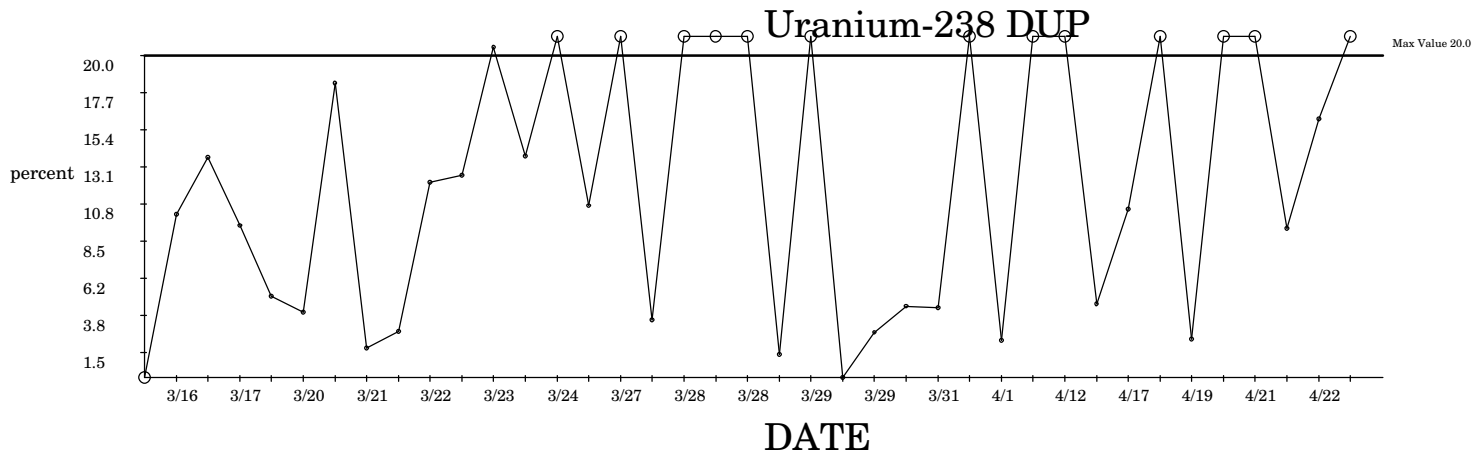
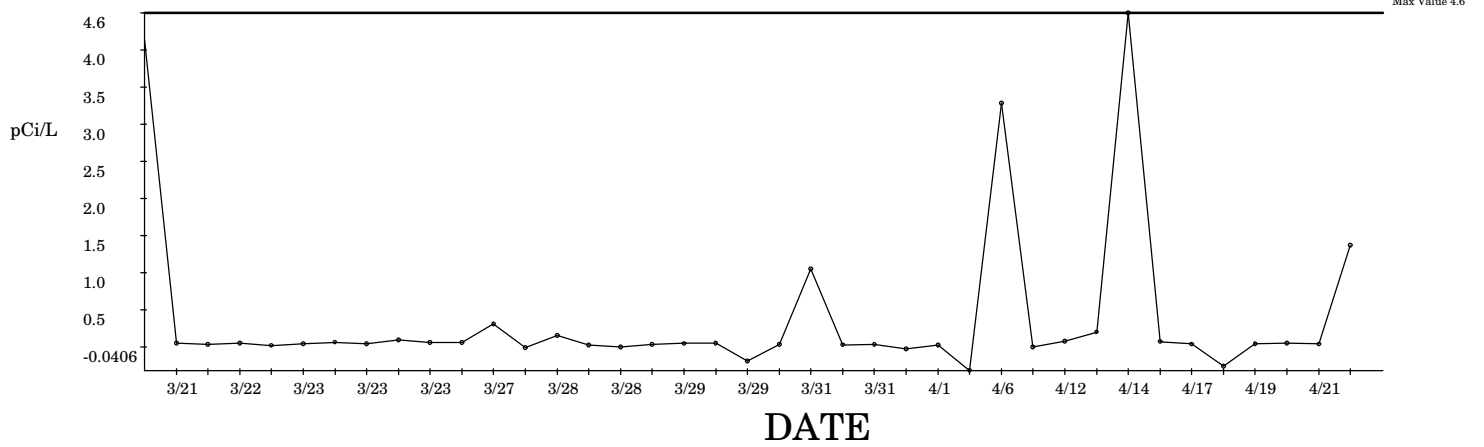






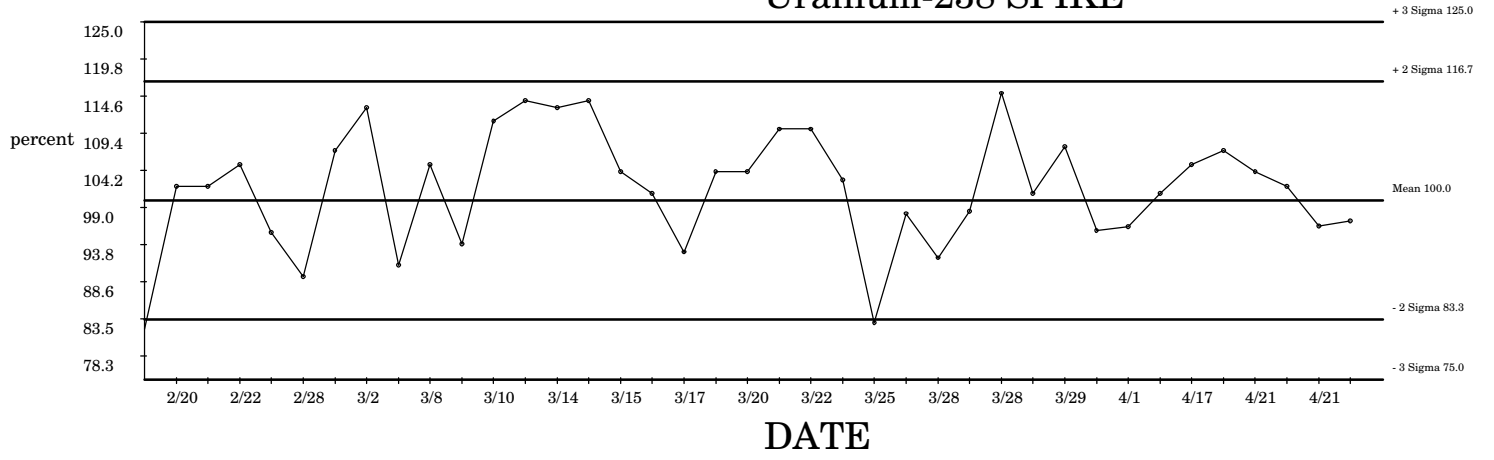
# SPC Graph for Alpha SpecUranium in Liquids 4/24/2006

## Uranium-238 BLANK



○ Denotes Outlier

# SPC Graph for Alpha SpecUranium in Liquids 4/24/2006 Uranium-238 SPIKE



○ Denotes Outlier

# Data used for Alpha Spec Uranium in Liquids 25-APR-2006

Uranium-233/234 BLANK: Limits LCL = -5.2 UCL = 6.4

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
510723	1201048836	20-MAR-2006 16:57	DONE	0	-0.29	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
510734	1201048867	21-MAR-2006 16:38	DONE	0	-0.3	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
511648	1201050949	21-MAR-2006 16:38	DONE	0	-0.3	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
511653	1201050964	22-MAR-2006 12:29	DONE	0	-0.3	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
512077	1201051899	22-MAR-2006 14:23	DONE	0	-0.31	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
511616	1201050865	23-MAR-2006 08:32	DONE	0	-0.29	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
511988	1201051682	23-MAR-2006 13:27	DONE	0	-0.26	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
510728	1201048852	23-MAR-2006 13:27	DONE	0	-0.38	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
511552	1201050721	23-MAR-2006 16:14	DONE	1	-0.02	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
511560	1201050747	23-MAR-2006 18:20	DONE	0	-0.33	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
511709	1201051079	25-MAR-2006 15:09	DONE	0	-0.29	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
511201	1201049856	27-MAR-2006 08:14	DONE	0	-0.06	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
514936	1201057981	27-MAR-2006 14:43	DONE	0	-0.4	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
512777	1201053518	28-MAR-2006 07:34	DONE	0	-0.24	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
512076	1201051895	28-MAR-2006 07:39	DONE	0	-0.31	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
515153	1201058496	28-MAR-2006 12:29	DONE	0	-0.21	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
514141	1201056267	28-MAR-2006 16:43	DONE	0	-0.29	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
514267	1201056533	29-MAR-2006 07:59	DONE	0	-0.33	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
511652	1201050960	29-MAR-2006 16:04	DONE	0	-0.3	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
511564	1201050754	29-MAR-2006 19:53	DONE	0	-0.25	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
514277	1201056551	29-MAR-2006 22:27	DONE	0	-0.3	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
514320	1201056638	31-MAR-2006 08:29	DONE	1	0.37	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
512070	1201051881	31-MAR-2006 15:55	DONE	0	-0.28	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
515540	1201059382	31-MAR-2006 19:27	DONE	0	-0.31	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
514261	1201056520	01-APR-2006 09:22	DONE	0	-0.21	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
516131	1201060706	01-APR-2006 16:30	DONE	0	-0.3	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
516497	1201061514	06-APR-2006 08:42	DONE	4	1.6	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
516532	1201061530	06-APR-2006 13:23	DONE	-1	-0.72	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
518879	1201066818	11-APR-2006 16:43	DONE	0	-0.28	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
518911	1201066929	12-APR-2006 14:20	DONE	0	-0.24	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
517717	1201064212	12-APR-2006 17:24	DONE	0	-0.26	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
519218	1201067494	14-APR-2006 09:06	DONE	5	2.5	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
520706	1201070943	15-APR-2006 09:12	DONE	0	-0.23	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
518916	1201066938	17-APR-2006 07:52	DUSE	0	-0.3	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
519428	1201067985	17-APR-2006 16:05	DONE	1	0.1	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
521040	1201071729	19-APR-2006 14:49	DONE	0	-0.22	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
520799	1201071144	21-APR-2006 07:38	DONE	0	-0.27	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
521962	1201074073	21-APR-2006 10:18	DONE	0	-0.3	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95
520373	1201070134	21-APR-2006 19:20	DUSE	11	5.1	pCi/L	0.59	-5.2	-3.3	4.48	6.43	1.95

Uranium-233/234 DUP: Limits LCL = 0 UCL = 20

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
510661	1201048686	15-MAR-2006 10:56	DONE	15	-0.32	percent	41.6	0	-120	207	20.0	82.5
511878	1201051444	16-MAR-2006 12:58	DONE	13	-0.35	percent	41.6	0	-120	207	20.0	82.5
510654	1201048653	17-MAR-2006 13:41	DONE	27	-0.18	percent	41.6	0	-120	207	20.0	82.5
510724	1201048841	17-MAR-2006 13:41	DONE	4	-0.46	percent	41.6	0	-120	207	20.0	82.5

510738	1201048878	20-MAR-2006 07:42	DONE	23	-0.22	percent	41.6	0	-120	207	20.0	82.5
510723	1201048837	20-MAR-2006 16:57	DONE	5	-0.44	percent	41.6	0	-120	207	20.0	82.5
510734	1201048868	21-MAR-2006 16:38	DONE	5	-0.44	percent	41.6	0	-120	207	20.0	82.5
511648	1201050950	21-MAR-2006 16:38	DONE	2	-0.48	percent	41.6	0	-120	207	20.0	82.5
511653	1201050965	22-MAR-2006 12:29	DONE	2	-0.48	percent	41.6	0	-120	207	20.0	82.5
512077	1201051900	22-MAR-2006 14:23	DONE	40	-0.02	percent	41.6	0	-120	207	20.0	82.5
511988	1201051683	23-MAR-2006 13:27	DONE	10	-0.38	percent	41.6	0	-120	207	20.0	82.5
511552	1201050722	23-MAR-2006 16:14	DONE	74	0.39	percent	41.6	0	-120	207	20.0	82.5
511560	1201050748	23-MAR-2006 18:20	DONE	0	-0.5	percent	41.6	0	-120	207	20.0	82.5
511616	1201050866	24-MAR-2006 14:52	DONE	7	-0.42	percent	41.6	0	-120	207	20.0	82.5
511709	1201051080	25-MAR-2006 15:09	DONE	2	-0.49	percent	41.6	0	-120	207	20.0	82.5
514141	1201056268	27-MAR-2006 16:25	DONE	84	0.51	percent	41.6	0	-120	207	20.0	82.5
511652	1201050961	27-MAR-2006 16:59	DONE	1	-0.49	percent	41.6	0	-120	207	20.0	82.5
512777	1201053519	28-MAR-2006 07:34	DONE	35	-0.08	percent	41.6	0	-120	207	20.0	82.5
514320	1201056639	28-MAR-2006 07:34	DONE	3	-0.46	percent	41.6	0	-120	207	20.0	82.5
512076	1201051896	28-MAR-2006 07:39	DONE	33	-0.11	percent	41.6	0	-120	207	20.0	82.5
515153	1201058497	28-MAR-2006 12:29	DONE	7	-0.42	percent	41.6	0	-120	207	20.0	82.5
514267	1201056534	29-MAR-2006 07:59	DONE	90	0.59	percent	41.6	0	-120	207	20.0	82.5
514261	1201056521	29-MAR-2006 07:59	DONE	363	3.9	percent	41.6	0	-120	207	20.0	82.5
511564	1201050755	29-MAR-2006 19:53	DONE	35	-0.08	percent	41.6	0	-120	207	20.0	82.5
514277	1201056552	29-MAR-2006 22:27	DONE	0	-0.5	percent	41.6	0	-120	207	20.0	82.5
512070	1201051882	31-MAR-2006 15:55	DONE	2	-0.48	percent	41.6	0	-120	207	20.0	82.5
515540	1201059383	31-MAR-2006 19:27	DONE	4	-0.45	percent	41.6	0	-120	207	20.0	82.5
516131	1201060707	01-APR-2006 16:30	DONE	1	-0.49	percent	41.6	0	-120	207	20.0	82.5
518879	1201066819	11-APR-2006 16:43	DONE	74	0.39	percent	41.6	0	-120	207	20.0	82.5
518911	1201066930	12-APR-2006 14:20	DONE	4	-0.45	percent	41.6	0	-120	207	20.0	82.5
520706	1201070944	15-APR-2006 09:12	DONE	10	-0.38	percent	41.6	0	-120	207	20.0	82.5
519428	1201067986	17-APR-2006 07:52	DONE	67	0.31	percent	41.6	0	-120	207	20.0	82.5
518916	1201066939	18-APR-2006 14:03	DUSE	103	0.74	percent	41.6	0	-120	207	20.0	82.5
521040	1201071730	19-APR-2006 14:49	DONE	15	-0.32	percent	41.6	0	-120	207	20.0	82.5
521962	1201074074	21-APR-2006 10:18	DONE	378	4.1	percent	41.6	0	-120	207	20.0	82.5
521962	1201074159	21-APR-2006 10:18	DONE	1	-0.49	percent	41.6	0	-120	207	20.0	82.5
520373	1201070135	21-APR-2006 19:20	DUSE	29	-0.15	percent	41.6	0	-120	207	20.0	82.5
520799	1201071145	22-APR-2006 07:38	DONE	9	-0.4	percent	41.6	0	-120	207	20.0	82.5
521962	1201074160	22-APR-2006 09:26	DONE	43	0.01	percent	41.6	0	-120	207	20.0	82.5

**Uranium-233/234 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
510661	1201048686	15-MAR-2006 10:56	DONE	0.58	-0.25	num	0.89	0	-1.6	3.41	3.00	1.26
511878	1201051444	16-MAR-2006 12:58	DONE	0.91	0.02	num	0.89	0	-1.6	3.41	3.00	1.26
510654	1201048653	17-MAR-2006 13:41	DONE	1.6	0.56	num	0.89	0	-1.6	3.41	3.00	1.26
510724	1201048841	17-MAR-2006 13:41	DONE	0.14	-0.59	num	0.89	0	-1.6	3.41	3.00	1.26
510738	1201048878	20-MAR-2006 07:42	DONE	2.02	0.9	num	0.89	0	-1.6	3.41	3.00	1.26
510723	1201048837	20-MAR-2006 16:57	DONE	0.53	-0.28	num	0.89	0	-1.6	3.41	3.00	1.26
510734	1201048868	21-MAR-2006 16:38	DONE	0.12	-0.61	num	0.89	0	-1.6	3.41	3.00	1.26
511648	1201050950	21-MAR-2006 16:38	DONE	0.07	-0.64	num	0.89	0	-1.6	3.41	3.00	1.26
511653	1201050965	22-MAR-2006 12:29	DONE	0.08	-0.64	num	0.89	0	-1.6	3.41	3.00	1.26
512077	1201051900	22-MAR-2006 14:23	DONE	1.17	0.23	num	0.89	0	-1.6	3.41	3.00	1.26
511988	1201051683	23-MAR-2006 13:27	DONE	0.65	-0.18	num	0.89	0	-1.6	3.41	3.00	1.26
511552	1201050722	23-MAR-2006 16:14	DONE	1.63	0.59	num	0.89	0	-1.6	3.41	3.00	1.26

511560	1201050748	23-MAR-2006 18:20	DONE	0.03	-0.68	num	0.89	0	-1.6	3.41	3.00	1.26
511616	1201050866	24-MAR-2006 14:52	DONE	0.47	-0.33	num	0.89	0	-1.6	3.41	3.00	1.26
511709	1201051080	25-MAR-2006 15:09	DONE	0.12	-0.6	num	0.89	0	-1.6	3.41	3.00	1.26
514141	1201056268	27-MAR-2006 16:25	DONE	0.21	-0.53	num	0.89	0	-1.6	3.41	3.00	1.26
511652	1201050961	27-MAR-2006 16:59	DONE	0.12	-0.6	num	0.89	0	-1.6	3.41	3.00	1.26
512777	1201053519	28-MAR-2006 07:34	DONE	0.59	-0.24	num	0.89	0	-1.6	3.41	3.00	1.26
514320	1201056639	28-MAR-2006 07:34	DONE	0.07	-0.65	num	0.89	0	-1.6	3.41	3.00	1.26
512076	1201051896	28-MAR-2006 07:39	DONE	0.68	-0.16	num	0.89	0	-1.6	3.41	3.00	1.26
515153	1201058497	28-MAR-2006 12:29	DONE	0.57	-0.25	num	0.89	0	-1.6	3.41	3.00	1.26
514267	1201056534	29-MAR-2006 07:59	DONE	0.39	-0.4	num	0.89	0	-1.6	3.41	3.00	1.26
514261	1201056521	29-MAR-2006 07:59	DONE	2.78	1.5	num	0.89	0	-1.6	3.41	3.00	1.26
511564	1201050755	29-MAR-2006 19:53	DONE	1.68	0.63	num	0.89	0	-1.6	3.41	3.00	1.26
514277	1201056552	29-MAR-2006 22:27	DONE	0.04	-0.67	num	0.89	0	-1.6	3.41	3.00	1.26
512070	1201051882	31-MAR-2006 15:55	DONE	0.07	-0.65	num	0.89	0	-1.6	3.41	3.00	1.26
515540	1201059383	31-MAR-2006 19:27	DONE	0.43	-0.36	num	0.89	0	-1.6	3.41	3.00	1.26
516131	1201060707	01-APR-2006 16:30	DONE	0.13	-0.6	num	0.89	0	-1.6	3.41	3.00	1.26
518879	1201066819	11-APR-2006 16:43	DONE	1.61	0.58	num	0.89	0	-1.6	3.41	3.00	1.26
518911	1201066930	12-APR-2006 14:20	DONE	0.23	-0.52	num	0.89	0	-1.6	3.41	3.00	1.26
520706	1201070944	15-APR-2006 09:12	DONE	0.96	0.06	num	0.89	0	-1.6	3.41	3.00	1.26
519428	1201067986	17-APR-2006 07:52	DONE	2.36	1.2	num	0.89	0	-1.6	3.41	3.00	1.26
518916	1201066939	18-APR-2006 14:03	DUSE	7.25	5	num	0.89	0	-1.6	3.41	3.00	1.26
521040	1201071730	19-APR-2006 14:49	DONE	1.12	0.18	num	0.89	0	-1.6	3.41	3.00	1.26
521962	1201074074	21-APR-2006 10:18	DONE	1.37	0.39	num	0.89	0	-1.6	3.41	3.00	1.26
521962	1201074159	21-APR-2006 10:18	DONE	0.01	-0.7	num	0.89	0	-1.6	3.41	3.00	1.26
520373	1201070135	21-APR-2006 19:20	DUSE	0.91	0.02	num	0.89	0	-1.6	3.41	3.00	1.26
520799	1201071145	22-APR-2006 07:38	DONE	0.63	-0.2	num	0.89	0	-1.6	3.41	3.00	1.26
521962	1201074160	22-APR-2006 09:26	DONE	0.2	-0.54	num	0.89	0	-1.6	3.41	3.00	1.26

**Uranium-235/236 BLANK: Limits LCL = -2.2 UCL = 2.5**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
510723	1201048836	20-MAR-2006 16:57	DONE	0	-0.14	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
510734	1201048867	21-MAR-2006 16:38	DONE	0	-0.15	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
511648	1201050949	21-MAR-2006 16:38	DONE	0	-0.12	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
511653	1201050964	22-MAR-2006 12:29	DONE	0	-0.14	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
512077	1201051899	22-MAR-2006 14:23	DONE	0	-0.12	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
511616	1201050865	23-MAR-2006 08:32	DONE	0	-0.17	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
511988	1201051682	23-MAR-2006 13:27	DONE	0	-0.08	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
510728	1201048852	23-MAR-2006 13:27	DONE	0	-0.19	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
511552	1201050721	23-MAR-2006 16:14	DONE	0	-0.15	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
511560	1201050747	23-MAR-2006 18:20	DONE	0	-0.17	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
511709	1201051079	25-MAR-2006 15:09	DONE	0	-0.12	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
511201	1201049856	27-MAR-2006 08:14	DONE	0	-0.3	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
514936	1201057981	27-MAR-2006 14:43	DONE	0	-0.05	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
512777	1201053518	28-MAR-2006 07:34	DONE	0	-0.13	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
512076	1201051895	28-MAR-2006 07:39	DONE	0	-0.14	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
515153	1201058496	28-MAR-2006 12:29	DONE	0	-0.14	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
514141	1201056267	28-MAR-2006 16:43	DONE	0	-0.15	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
514267	1201056533	29-MAR-2006 07:59	DONE	0	-0.19	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
511652	1201050960	29-MAR-2006 16:04	DONE	0	-0.16	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
511564	1201050754	29-MAR-2006 19:53	DONE	0	-0.75	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79

514277	1201056551	29-MAR-2006 22:27	DONE	0	-0.15	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
514320	1201056638	31-MAR-2006 08:29	DONE	0	-0.57	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
512070	1201051881	31-MAR-2006 15:55	DONE	0	-0.16	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
515540	1201059382	31-MAR-2006 19:27	DONE	0	-0.15	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
514261	1201056520	01-APR-2006 09:22	DONE	0	-0.18	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
516131	1201060706	01-APR-2006 16:30	DONE	0	-0.15	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
516497	1201061514	06-APR-2006 08:42	DONE	-2	-2	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
516532	1201061530	06-APR-2006 13:23	DONE	3	3.4	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
518879	1201066818	11-APR-2006 16:43	DONE	0	-0.16	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
518911	1201066929	12-APR-2006 14:20	DONE	0	-0.11	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
517717	1201064212	12-APR-2006 17:24	DONE	0	-0.47	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
519218	1201067494	14-APR-2006 09:06	DONE	4	4.4	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
520706	1201070943	15-APR-2006 09:12	DONE	0	-0.15	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
518916	1201066938	17-APR-2006 07:52	DUSE	0	-0.14	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
519428	1201067985	17-APR-2006 16:05	DONE	0	0.09	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
521040	1201071729	19-APR-2006 14:49	DONE	0	0.02	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
520799	1201071144	21-APR-2006 07:38	DONE	0	-0.08	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
521962	1201074073	21-APR-2006 10:18	DONE	0	-0.15	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79
520373	1201070134	21-APR-2006 19:20	DUSE	0	0.41	pCi/L	0.12	-2.2	-1.5	1.69	2.47	0.79

**Uranium-235/236 DUP: Limits LCL = 0 UCL = 20**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
510661	1201048686	15-MAR-2006 10:56	DONE	1226	3.4	percent	150	0	-490	790	20.0	320
511878	1201051444	16-MAR-2006 12:58	DONE	88	-0.19	percent	150	0	-490	790	20.0	320
510654	1201048653	17-MAR-2006 13:41	DONE	56	-0.29	percent	150	0	-490	790	20.0	320
510724	1201048841	17-MAR-2006 13:41	DONE	23	-0.4	percent	150	0	-490	790	20.0	320
510738	1201048878	20-MAR-2006 07:42	DONE	6	-0.45	percent	150	0	-490	790	20.0	320
510723	1201048837	20-MAR-2006 16:57	DONE	44	-0.33	percent	150	0	-490	790	20.0	320
510734	1201048868	21-MAR-2006 16:38	DONE	142	-0.02	percent	150	0	-490	790	20.0	320
511648	1201050950	21-MAR-2006 16:38	DONE	56	-0.29	percent	150	0	-490	790	20.0	320
511653	1201050965	22-MAR-2006 12:29	DONE	0	-0.47	percent	150	0	-490	790	20.0	320
512077	1201051900	22-MAR-2006 14:23	DONE	56	-0.29	percent	150	0	-490	790	20.0	320
511988	1201051683	23-MAR-2006 13:27	DONE	15	-0.42	percent	150	0	-490	790	20.0	320
511552	1201050722	23-MAR-2006 16:14	DONE	48	-0.32	percent	150	0	-490	790	20.0	320
511560	1201050748	23-MAR-2006 18:20	DONE	125	-0.08	percent	150	0	-490	790	20.0	320
511616	1201050866	24-MAR-2006 14:52	DONE	28	-0.38	percent	150	0	-490	790	20.0	320
511709	1201051080	25-MAR-2006 15:09	DONE	22	-0.4	percent	150	0	-490	790	20.0	320
514141	1201056268	27-MAR-2006 16:25	DONE	20	-0.41	percent	150	0	-490	790	20.0	320
511652	1201050961	27-MAR-2006 16:59	DONE	26	-0.39	percent	150	0	-490	790	20.0	320
512777	1201053519	28-MAR-2006 07:34	DONE	780	2	percent	150	0	-490	790	20.0	320
514320	1201056639	28-MAR-2006 07:34	DONE	1	-0.46	percent	150	0	-490	790	20.0	320
512076	1201051896	28-MAR-2006 07:39	DONE	190	0.13	percent	150	0	-490	790	20.0	320
515153	1201058497	28-MAR-2006 12:29	DONE	59	-0.28	percent	150	0	-490	790	20.0	320
514267	1201056534	29-MAR-2006 07:59	DONE	254	0.32	percent	150	0	-490	790	20.0	320
514261	1201056521	29-MAR-2006 07:59	DONE	1526	4.3	percent	150	0	-490	790	20.0	320
511564	1201050755	29-MAR-2006 19:53	DONE	5	-0.45	percent	150	0	-490	790	20.0	320
514277	1201056552	29-MAR-2006 22:27	DONE	16	-0.42	percent	150	0	-490	790	20.0	320
512070	1201051882	31-MAR-2006 15:55	DONE	44	-0.33	percent	150	0	-490	790	20.0	320
515540	1201059383	31-MAR-2006 19:27	DONE	9	-0.44	percent	150	0	-490	790	20.0	320
516131	1201060707	01-APR-2006 16:30	DONE	43	-0.33	percent	150	0	-490	790	20.0	320

518879	1201066819	11-APR-2006 16:43	DONE	200	0.16	percent	150	0	-490	790	20.0	320
518911	1201066930	12-APR-2006 14:20	DONE	108	-0.13	percent	150	0	-490	790	20.0	320
520706	1201070944	15-APR-2006 09:12	DONE	8	-0.44	percent	150	0	-490	790	20.0	320
519428	1201067986	17-APR-2006 07:52	DONE	68	-0.25	percent	150	0	-490	790	20.0	320
518916	1201066939	18-APR-2006 14:03	DUSE	77	-0.23	percent	150	0	-490	790	20.0	320
521040	1201071730	19-APR-2006 14:49	DONE	4	-0.45	percent	150	0	-490	790	20.0	320
521962	1201074074	21-APR-2006 10:18	DONE	301	0.47	percent	150	0	-490	790	20.0	320
521962	1201074159	21-APR-2006 10:18	DONE	29	-0.38	percent	150	0	-490	790	20.0	320
520373	1201070135	21-APR-2006 19:20	DUSE	56	-0.29	percent	150	0	-490	790	20.0	320
520799	1201071145	22-APR-2006 07:38	DONE	15	-0.42	percent	150	0	-490	790	20.0	320
521962	1201074160	22-APR-2006 09:26	DONE	63	-0.27	percent	150	0	-490	790	20.0	320

**Uranium-235/236 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stddev
510661	1201048686	15-MAR-2006 10:56	DONE	2.08	2	num	0.79	0	-0.463	2.05	3.00	0.63
511878	1201051444	16-MAR-2006 12:58	DONE	1.9	1.8	num	0.79	0	-0.463	2.05	3.00	0.63
510654	1201048653	17-MAR-2006 13:41	DONE	0.75	-0.07	num	0.79	0	-0.463	2.05	3.00	0.63
510724	1201048841	17-MAR-2006 13:41	DONE	0.29	-0.79	num	0.79	0	-0.463	2.05	3.00	0.63
510738	1201048878	20-MAR-2006 07:42	DONE	0.27	-0.84	num	0.79	0	-0.463	2.05	3.00	0.63
510723	1201048837	20-MAR-2006 16:57	DONE	1.59	1.3	num	0.79	0	-0.463	2.05	3.00	0.63
510734	1201048868	21-MAR-2006 16:38	DONE	0.43	-0.58	num	0.79	0	-0.463	2.05	3.00	0.63
511648	1201050950	21-MAR-2006 16:38	DONE	0.55	-0.38	num	0.79	0	-0.463	2.05	3.00	0.63
511653	1201050965	22-MAR-2006 12:29	DONE	00	-1	num	0.79	0	-0.463	2.05	3.00	0.63
512077	1201051900	22-MAR-2006 14:23	DONE	0.53	-0.41	num	0.79	0	-0.463	2.05	3.00	0.63
511988	1201051683	23-MAR-2006 13:27	DONE	0.21	-0.94	num	0.79	0	-0.463	2.05	3.00	0.63
511552	1201050722	23-MAR-2006 16:14	DONE	0.7	-0.14	num	0.79	0	-0.463	2.05	3.00	0.63
511560	1201050748	23-MAR-2006 18:20	DONE	1.64	1.4	num	0.79	0	-0.463	2.05	3.00	0.63
511616	1201050866	24-MAR-2006 14:52	DONE	0.23	-0.9	num	0.79	0	-0.463	2.05	3.00	0.63
511709	1201051080	25-MAR-2006 15:09	DONE	0.58	-0.35	num	0.79	0	-0.463	2.05	3.00	0.63
514141	1201056268	27-MAR-2006 16:25	DONE	0.04	-1	num	0.79	0	-0.463	2.05	3.00	0.63
511652	1201050961	27-MAR-2006 16:59	DONE	1.09	0.47	num	0.79	0	-0.463	2.05	3.00	0.63
512777	1201053519	28-MAR-2006 07:34	DONE	0.75	-0.07	num	0.79	0	-0.463	2.05	3.00	0.63
514320	1201056639	28-MAR-2006 07:34	DONE	0.01	-1	num	0.79	0	-0.463	2.05	3.00	0.63
512076	1201051896	28-MAR-2006 07:39	DONE	0.62	-0.27	num	0.79	0	-0.463	2.05	3.00	0.63
515153	1201058497	28-MAR-2006 12:29	DONE	1.13	0.53	num	0.79	0	-0.463	2.05	3.00	0.63
514267	1201056534	29-MAR-2006 07:59	DONE	1.55	1.2	num	0.79	0	-0.463	2.05	3.00	0.63
514261	1201056521	29-MAR-2006 07:59	DONE	2.2	2.2	num	0.79	0	-0.463	2.05	3.00	0.63
511564	1201050755	29-MAR-2006 19:53	DONE	0.06	-1	num	0.79	0	-0.463	2.05	3.00	0.63
514277	1201056552	29-MAR-2006 22:27	DONE	0.73	-0.11	num	0.79	0	-0.463	2.05	3.00	0.63
512070	1201051882	31-MAR-2006 15:55	DONE	1.17	0.6	num	0.79	0	-0.463	2.05	3.00	0.63
515540	1201059383	31-MAR-2006 19:27	DONE	0.44	-0.56	num	0.79	0	-0.463	2.05	3.00	0.63
516131	1201060707	01-APR-2006 16:30	DONE	1.17	0.6	num	0.79	0	-0.463	2.05	3.00	0.63
518879	1201066819	11-APR-2006 16:43	DONE	0.61	-0.29	num	0.79	0	-0.463	2.05	3.00	0.63
518911	1201066930	12-APR-2006 14:20	DONE	1.1	0.48	num	0.79	0	-0.463	2.05	3.00	0.63
520706	1201070944	15-APR-2006 09:12	DONE	0.43	-0.58	num	0.79	0	-0.463	2.05	3.00	0.63
519428	1201067986	17-APR-2006 07:52	DONE	1.21	0.65	num	0.79	0	-0.463	2.05	3.00	0.63
518916	1201066939	18-APR-2006 14:03	DUSE	1.94	1.8	num	0.79	0	-0.463	2.05	3.00	0.63
521040	1201071730	19-APR-2006 14:49	DONE	0.11	-1	num	0.79	0	-0.463	2.05	3.00	0.63
521962	1201074074	21-APR-2006 10:18	DONE	1.53	1.2	num	0.79	0	-0.463	2.05	3.00	0.63
521962	1201074159	21-APR-2006 10:18	DONE	0.14	-1	num	0.79	0	-0.463	2.05	3.00	0.63



520373	1201070135	21-APR-2006 19:20	DUSE	0.61	-0.29	num	0.79	0	-0.463	2.05	3.00	0.63
520799	1201071145	22-APR-2006 07:38	DONE	0.28	-0.82	num	0.79	0	-0.463	2.05	3.00	0.63
521962	1201074160	22-APR-2006 09:26	DONE	0.29	-0.81	num	0.79	0	-0.463	2.05	3.00	0.63

**Uranium-238 BLANK: Limits LCL = -2.5 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
510723	1201048836	20-MAR-2006 16:57	DONE	0	-0.26	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
510734	1201048867	21-MAR-2006 16:38	DONE	0	-0.26	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
511648	1201050949	21-MAR-2006 16:38	DONE	0	-0.28	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
511653	1201050964	22-MAR-2006 12:29	DONE	0	-0.26	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
512077	1201051899	22-MAR-2006 14:23	DONE	0	-0.29	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
511616	1201050865	23-MAR-2006 08:32	DONE	0	-0.27	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
511988	1201051682	23-MAR-2006 13:27	DONE	0	-0.25	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
510728	1201048852	23-MAR-2006 13:27	DONE	0	-0.27	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
511552	1201050721	23-MAR-2006 16:14	DONE	0	-0.22	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
511560	1201050747	23-MAR-2006 18:20	DONE	0	-0.25	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
511709	1201051079	25-MAR-2006 15:09	DONE	0	-0.25	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
511201	1201049856	27-MAR-2006 08:14	DONE	0	0.02	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
514936	1201057981	27-MAR-2006 14:43	DONE	0	-0.33	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
512777	1201053518	28-MAR-2006 07:34	DONE	0	-0.15	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
512076	1201051895	28-MAR-2006 07:39	DONE	0	-0.29	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
515153	1201058496	28-MAR-2006 12:29	DONE	0	-0.31	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
514141	1201056267	28-MAR-2006 16:43	DONE	0	-0.28	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
514267	1201056533	29-MAR-2006 07:59	DONE	0	-0.27	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
511652	1201050960	29-MAR-2006 16:04	DONE	0	-0.26	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
511564	1201050754	29-MAR-2006 19:53	DONE	0	-0.53	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
514277	1201056551	29-MAR-2006 22:27	DONE	0	-0.28	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
514320	1201056638	31-MAR-2006 08:29	DONE	1	0.84	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
512070	1201051881	31-MAR-2006 15:55	DONE	0	-0.29	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
515540	1201059382	31-MAR-2006 19:27	DONE	0	-0.28	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
514261	1201056520	01-APR-2006 09:22	DONE	0	-0.35	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
516131	1201060706	01-APR-2006 16:30	DONE	0	-0.29	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
516497	1201061514	06-APR-2006 08:42	DONE	0	-0.67	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
516532	1201061530	06-APR-2006 13:23	DONE	3	3.3	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
518879	1201066818	11-APR-2006 16:43	DONE	0	-0.32	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
518911	1201066929	12-APR-2006 14:20	DONE	0	-0.23	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
517717	1201064212	12-APR-2006 17:24	DONE	0	-0.09	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
519218	1201067494	14-APR-2006 09:06	DONE	5	4.6	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
520706	1201070943	15-APR-2006 09:12	DONE	0	-0.24	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
518916	1201066938	17-APR-2006 07:52	DUSE	0	-0.28	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
519428	1201067985	17-APR-2006 16:05	DONE	0	-0.6	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
521040	1201071729	19-APR-2006 14:49	DONE	0	-0.27	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
520799	1201071144	21-APR-2006 07:38	DONE	0	-0.26	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
521962	1201074073	21-APR-2006 10:18	DONE	0	-0.28	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92
520373	1201070134	21-APR-2006 19:20	DUSE	1	1.2	pCi/L	0.25	-2.5	-1.6	2.1	3.03	0.92

**Uranium-238 DUP: Limits LCL = 0 UCL = 20**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
510661	1201048686	15-MAR-2006 10:56	DONE	23	-0.23	percent	82.3	0	-430	592	20.0	255
511878	1201051444	16-MAR-2006 12:58	DONE	10	-0.28	percent	82.3	0	-430	592	20.0	255

510654	1201048653	17-MAR-2006 13:41	DONE	14	-0.27	percent	82.3	0	-430	592	20.0	255
510724	1201048841	17-MAR-2006 13:41	DONE	9	-0.29	percent	82.3	0	-430	592	20.0	255
510738	1201048878	20-MAR-2006 07:42	DONE	5	-0.3	percent	82.3	0	-430	592	20.0	255
510723	1201048837	20-MAR-2006 16:57	DONE	4	-0.31	percent	82.3	0	-430	592	20.0	255
510734	1201048868	21-MAR-2006 16:38	DONE	18	-0.25	percent	82.3	0	-430	592	20.0	255
511648	1201050950	21-MAR-2006 16:38	DONE	2	-0.32	percent	82.3	0	-430	592	20.0	255
511653	1201050965	22-MAR-2006 12:29	DONE	3	-0.31	percent	82.3	0	-430	592	20.0	255
512077	1201051900	22-MAR-2006 14:23	DONE	12	-0.28	percent	82.3	0	-430	592	20.0	255
511988	1201051683	23-MAR-2006 13:27	DONE	13	-0.27	percent	82.3	0	-430	592	20.0	255
511552	1201050722	23-MAR-2006 16:14	DONE	21	-0.24	percent	82.3	0	-430	592	20.0	255
511560	1201050748	23-MAR-2006 18:20	DONE	14	-0.27	percent	82.3	0	-430	592	20.0	255
511616	1201050866	24-MAR-2006 14:52	DONE	24	-0.23	percent	82.3	0	-430	592	20.0	255
511709	1201051080	25-MAR-2006 15:09	DONE	11	-0.28	percent	82.3	0	-430	592	20.0	255
514141	1201056268	27-MAR-2006 16:25	DONE	124	0.16	percent	82.3	0	-430	592	20.0	255
511652	1201050961	27-MAR-2006 16:59	DONE	4	-0.31	percent	82.3	0	-430	592	20.0	255
512777	1201053519	28-MAR-2006 07:34	DONE	162	0.31	percent	82.3	0	-430	592	20.0	255
514320	1201056639	28-MAR-2006 07:34	DONE	126	0.17	percent	82.3	0	-430	592	20.0	255
512076	1201051896	28-MAR-2006 07:39	DONE	147	0.25	percent	82.3	0	-430	592	20.0	255
515153	1201058497	28-MAR-2006 12:29	DONE	1	-0.32	percent	82.3	0	-430	592	20.0	255
514267	1201056534	29-MAR-2006 07:59	DONE	1593	5.9	percent	82.3	0	-430	592	20.0	255
514261	1201056521	29-MAR-2006 07:59	DONE	0	-0.32	percent	82.3	0	-430	592	20.0	255
511564	1201050755	29-MAR-2006 19:53	DONE	3	-0.31	percent	82.3	0	-430	592	20.0	255
514277	1201056552	29-MAR-2006 22:27	DONE	4	-0.31	percent	82.3	0	-430	592	20.0	255
512070	1201051882	31-MAR-2006 15:55	DONE	4	-0.31	percent	82.3	0	-430	592	20.0	255
515540	1201059383	31-MAR-2006 19:27	DONE	82	-0	percent	82.3	0	-430	592	20.0	255
516131	1201060707	01-APR-2006 16:30	DONE	2	-0.31	percent	82.3	0	-430	592	20.0	255
518879	1201066819	11-APR-2006 16:43	DONE	101	0.07	percent	82.3	0	-430	592	20.0	255
518911	1201066930	12-APR-2006 14:20	DONE	45	-0.15	percent	82.3	0	-430	592	20.0	255
520706	1201070944	15-APR-2006 09:12	DONE	5	-0.3	percent	82.3	0	-430	592	20.0	255
519428	1201067986	17-APR-2006 07:52	DONE	10	-0.28	percent	82.3	0	-430	592	20.0	255
518916	1201066939	18-APR-2006 14:03	DUSE	140	0.23	percent	82.3	0	-430	592	20.0	255
521040	1201071730	19-APR-2006 14:49	DONE	2	-0.31	percent	82.3	0	-430	592	20.0	255
521962	1201074074	21-APR-2006 10:18	DONE	201	0.47	percent	82.3	0	-430	592	20.0	255
521962	1201074159	21-APR-2006 10:18	DONE	104	0.09	percent	82.3	0	-430	592	20.0	255
520373	1201070135	21-APR-2006 19:20	DUSE	9	-0.29	percent	82.3	0	-430	592	20.0	255
520799	1201071145	22-APR-2006 07:38	DONE	16	-0.26	percent	82.3	0	-430	592	20.0	255
521962	1201074160	22-APR-2006 09:26	DONE	140	0.23	percent	82.3	0	-430	592	20.0	255

Uranium-238 LCS: Limits LCL = 75 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
510728	1201048853	23-MAR-2006 13:27	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
510728	1201048854	23-MAR-2006 13:27	DONE	100	0	percent	100	75.0	83.3	117	125	8.33
511560	1201050749	23-MAR-2006 18:20	DONE	95	-0.64	percent	100	75.0	83.3	117	125	8.33
511709	1201051082	25-MAR-2006 15:09	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
514936	1201057982	27-MAR-2006 08:13	DONE	99	-0.13	percent	100	75.0	83.3	117	125	8.33
514936	1201057983	27-MAR-2006 08:13	DONE	117	2	percent	100	75.0	83.3	117	125	8.33
511201	1201049858	27-MAR-2006 08:14	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
511201	1201049857	27-MAR-2006 08:14	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
514141	1201056269	27-MAR-2006 16:25	DONE	95	-0.59	percent	100	75.0	83.3	117	125	8.33
511652	1201050963	27-MAR-2006 16:59	DONE	103	0.37	percent	100	75.0	83.3	117	125	8.33

512777	1201053521	28-MAR-2006 07:34	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
514320	1201056641	28-MAR-2006 07:34	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
512076	1201051898	28-MAR-2006 07:44	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
515153	1201058498	28-MAR-2006 12:29	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
514267	1201056535	29-MAR-2006 07:59	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
514261	1201056522	29-MAR-2006 07:59	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
511564	1201050757	29-MAR-2006 19:53	DONE	103	0.36	percent	100	75.0	83.3	117	125	8.33
514277	1201056554	29-MAR-2006 22:27	DONE	102	0.27	percent	100	75.0	83.3	117	125	8.33
512070	1201051883	31-MAR-2006 15:55	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
515540	1201059385	31-MAR-2006 19:27	DONE	94	-0.73	percent	100	75.0	83.3	117	125	8.33
516131	1201060709	01-APR-2006 16:30	DONE	103	0.36	percent	100	75.0	83.3	117	125	8.33
516497	1201061515	06-APR-2006 08:42	DONE	107	0.84	percent	100	75.0	83.3	117	125	8.33
516497	1201061516	06-APR-2006 08:42	DONE	99	-0.14	percent	100	75.0	83.3	117	125	8.33
516532	1201061531	06-APR-2006 13:23	DONE	97	-0.42	percent	100	75.0	83.3	117	125	8.33
516532	1201061532	06-APR-2006 13:23	DONE	99	-0.17	percent	100	75.0	83.3	117	125	8.33
518879	1201066820	11-APR-2006 16:43	DONE	103	0.36	percent	100	75.0	83.3	117	125	8.33
518911	1201066931	12-APR-2006 14:20	DONE	98	-0.28	percent	100	75.0	83.3	117	125	8.33
517717	1201064213	12-APR-2006 17:24	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
517717	1201064214	12-APR-2006 17:24	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
519218	1201067495	14-APR-2006 09:06	DONE	112	1.5	percent	100	75.0	83.3	117	125	8.33
519218	1201067496	14-APR-2006 09:06	DONE	95	-0.61	percent	100	75.0	83.3	117	125	8.33
520706	1201070946	15-APR-2006 09:12	DONE	97	-0.37	percent	100	75.0	83.3	117	125	8.33
518916	1201066940	17-APR-2006 07:52	DUSE	97	-0.4	percent	100	75.0	83.3	117	125	8.33
519428	1201067988	17-APR-2006 07:52	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
521040	1201071732	19-APR-2006 14:49	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
520799	1201071147	21-APR-2006 07:38	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
521962	1201074076	21-APR-2006 10:18	DONE	98	-0.23	percent	100	75.0	83.3	117	125	8.33
520373	1201070136	21-APR-2006 19:20	DUSE	118	2.2	percent	100	75.0	83.3	117	125	8.33
522160	1201074581	22-APR-2006 12:03	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33

**Uranium-238 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
510661	1201048686	15-MAR-2006 10:56	DONE	0.5	-0.28	num	0.9	0	-1.9	3.73	3.00	1.42
511878	1201051444	16-MAR-2006 12:58	DONE	0.63	-0.19	num	0.9	0	-1.9	3.73	3.00	1.42
510654	1201048653	17-MAR-2006 13:41	DONE	0.76	-0.1	num	0.9	0	-1.9	3.73	3.00	1.42
510724	1201048841	17-MAR-2006 13:41	DONE	0.28	-0.44	num	0.9	0	-1.9	3.73	3.00	1.42
510738	1201048878	20-MAR-2006 07:42	DONE	0.43	-0.33	num	0.9	0	-1.9	3.73	3.00	1.42
510723	1201048837	20-MAR-2006 16:57	DONE	0.4	-0.35	num	0.9	0	-1.9	3.73	3.00	1.42
510734	1201048868	21-MAR-2006 16:38	DONE	0.29	-0.43	num	0.9	0	-1.9	3.73	3.00	1.42
511648	1201050950	21-MAR-2006 16:38	DONE	0.06	-0.59	num	0.9	0	-1.9	3.73	3.00	1.42
511653	1201050965	22-MAR-2006 12:29	DONE	0.08	-0.57	num	0.9	0	-1.9	3.73	3.00	1.42
512077	1201051900	22-MAR-2006 14:23	DONE	0.3	-0.42	num	0.9	0	-1.9	3.73	3.00	1.42
511988	1201051683	23-MAR-2006 13:27	DONE	0.63	-0.19	num	0.9	0	-1.9	3.73	3.00	1.42
511552	1201050722	23-MAR-2006 16:14	DONE	0.32	-0.41	num	0.9	0	-1.9	3.73	3.00	1.42
511560	1201050748	23-MAR-2006 18:20	DONE	0.67	-0.16	num	0.9	0	-1.9	3.73	3.00	1.42
511616	1201050866	24-MAR-2006 14:52	DONE	1.25	0.25	num	0.9	0	-1.9	3.73	3.00	1.42
511709	1201051080	25-MAR-2006 15:09	DONE	0.8	-0.07	num	0.9	0	-1.9	3.73	3.00	1.42
514141	1201056268	27-MAR-2006 16:25	DONE	0.5	-0.28	num	0.9	0	-1.9	3.73	3.00	1.42
511652	1201050961	27-MAR-2006 16:59	DONE	0.39	-0.36	num	0.9	0	-1.9	3.73	3.00	1.42
512777	1201053519	28-MAR-2006 07:34	DONE	2.31	0.1	num	0.9	0	-1.9	3.73	3.00	1.42

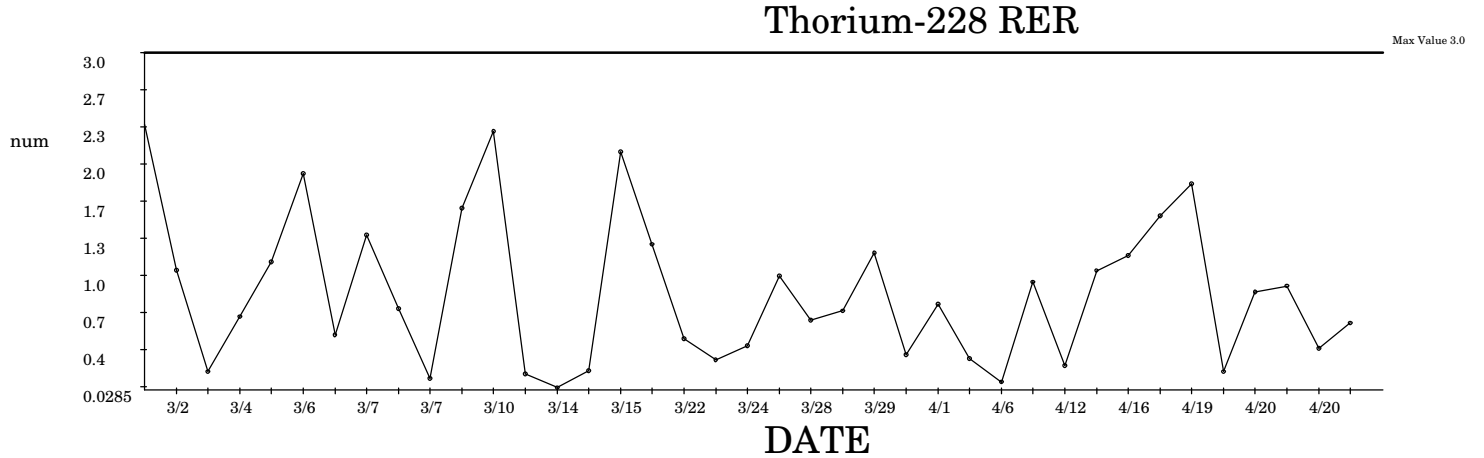
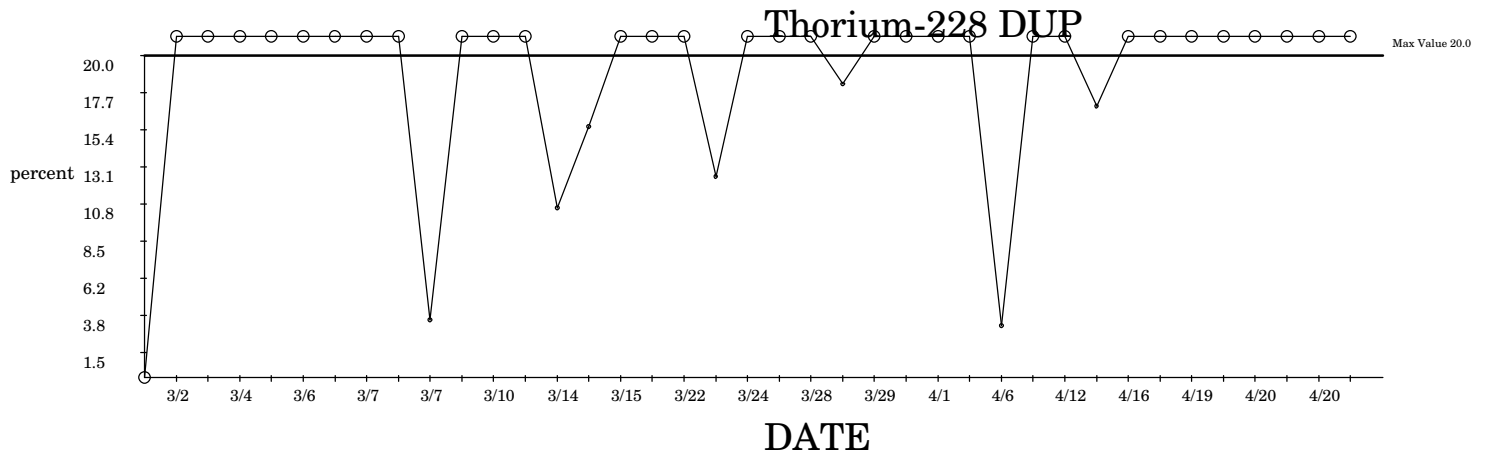
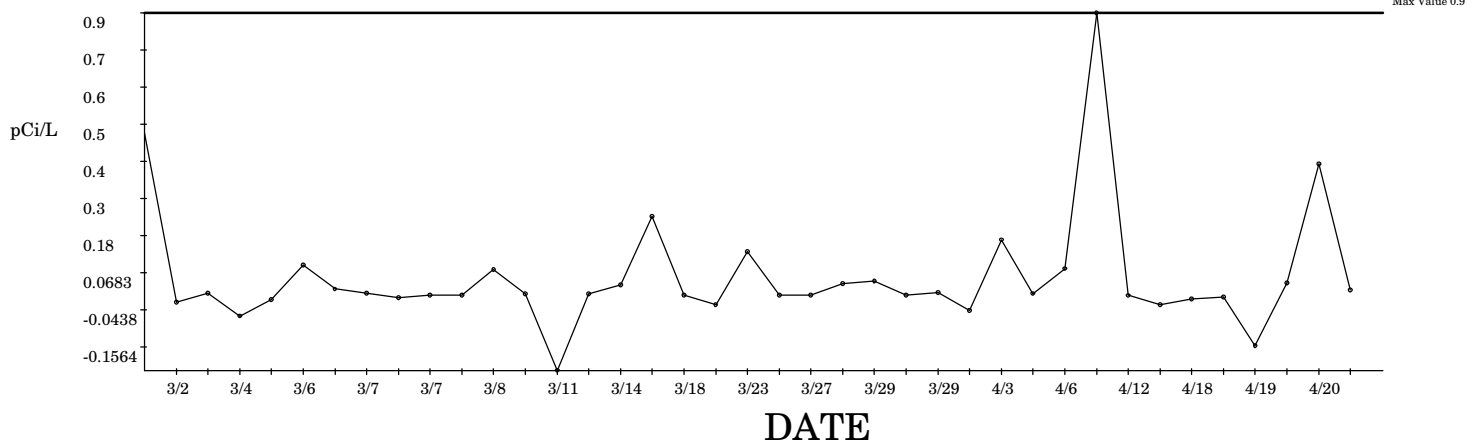
514320	1201056639	28-MAR-2006 07:34	DONE	1.24	0.24	num	0.9	0	-1.9	3.73	3.00	1.42
512076	1201051896	28-MAR-2006 07:39	DONE	1.63	0.52	num	0.9	0	-1.9	3.73	3.00	1.42
515153	1201058497	28-MAR-2006 12:29	DONE	0.11	-0.56	num	0.9	0	-1.9	3.73	3.00	1.42
514267	1201056534	29-MAR-2006 07:59	DONE	0.73	-0.12	num	0.9	0	-1.9	3.73	3.00	1.42
514261	1201056521	29-MAR-2006 07:59	DONE	0.9	0.01	num	0.9	0	-1.9	3.73	3.00	1.42
511564	1201050755	29-MAR-2006 19:53	DONE	0.14	-0.53	num	0.9	0	-1.9	3.73	3.00	1.42
514277	1201056552	29-MAR-2006 22:27	DONE	0.52	-0.27	num	0.9	0	-1.9	3.73	3.00	1.42
512070	1201051882	31-MAR-2006 15:55	DONE	0.14	-0.54	num	0.9	0	-1.9	3.73	3.00	1.42
515540	1201059383	31-MAR-2006 19:27	DONE	1.77	0.62	num	0.9	0	-1.9	3.73	3.00	1.42
516131	1201060707	01-APR-2006 16:30	DONE	0.21	-0.49	num	0.9	0	-1.9	3.73	3.00	1.42
518879	1201066819	11-APR-2006 16:43	DONE	1.29	0.28	num	0.9	0	-1.9	3.73	3.00	1.42
518911	1201066930	12-APR-2006 14:20	DONE	1.26	0.26	num	0.9	0	-1.9	3.73	3.00	1.42
520706	1201070944	15-APR-2006 09:12	DONE	0.37	-0.37	num	0.9	0	-1.9	3.73	3.00	1.42
519428	1201067986	17-APR-2006 07:52	DONE	0.35	-0.39	num	0.9	0	-1.9	3.73	3.00	1.42
518916	1201066939	18-APR-2006 14:03	DUSE	8.87	5.6	num	0.9	0	-1.9	3.73	3.00	1.42
521040	1201071730	19-APR-2006 14:49	DONE	0.17	-0.51	num	0.9	0	-1.9	3.73	3.00	1.42
521962	1201074074	21-APR-2006 10:18	DONE	1.76	0.61	num	0.9	0	-1.9	3.73	3.00	1.42
521962	1201074159	21-APR-2006 10:18	DONE	0.89	-0	num	0.9	0	-1.9	3.73	3.00	1.42
520373	1201070135	21-APR-2006 19:20	DUSE	0.49	-0.29	num	0.9	0	-1.9	3.73	3.00	1.42
520799	1201071145	22-APR-2006 07:38	DONE	1.02	0.09	num	0.9	0	-1.9	3.73	3.00	1.42
521962	1201074160	22-APR-2006 09:26	DONE	0.5	-0.28	num	0.9	0	-1.9	3.73	3.00	1.42

**Uranium-238 SPIKE: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
502573	1201029916	20-FEB-2006 16:13	DONE	118	2.2	percent	100	75.0	83.3	117	125	8.33
504887	1201035136	20-FEB-2006 16:14	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
505235	1201036018	21-FEB-2006 23:51	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
504424	1201034014	22-FEB-2006 09:56	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
504435	1201034050	24-FEB-2006 20:19	DONE	96	-0.54	percent	100	75.0	83.3	117	125	8.33
504458	1201034119	28-FEB-2006 15:46	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33
506041	1201037899	01-MAR-2006 20:40	DONE	107	0.84	percent	100	75.0	83.3	117	125	8.33
506022	1201037840	02-MAR-2006 16:44	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33
507076	1201040302	07-MAR-2006 10:22	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
507403	1201041222	08-MAR-2006 06:44	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
509051	1201045064	09-MAR-2006 07:20	DONE	94	-0.73	percent	100	75.0	83.3	117	125	8.33
509092	1201045179	10-MAR-2006 15:56	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
509841	1201046806	10-MAR-2006 23:12	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
509802	1201046704	14-MAR-2006 11:55	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33
509797	1201046682	14-MAR-2006 13:07	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
510658	1201048669	15-MAR-2006 09:16	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
511878	1201051445	16-MAR-2006 12:58	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
510654	1201048654	17-MAR-2006 13:41	DONE	93	-0.86	percent	100	75.0	83.3	117	125	8.33
510738	1201048879	20-MAR-2006 07:42	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
511552	1201050723	20-MAR-2006 07:42	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
510723	1201048838	20-MAR-2006 16:57	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
512077	1201051901	22-MAR-2006 14:23	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
511988	1201051684	23-MAR-2006 13:27	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
511709	1201051081	25-MAR-2006 15:09	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
511652	1201050962	27-MAR-2006 16:59	DONE	98	-0.22	percent	100	75.0	83.3	117	125	8.33
512777	1201053520	28-MAR-2006 07:34	DONE	92	-0.96	percent	100	75.0	83.3	117	125	8.33

514320	1201056640	28-MAR-2006 07:34	DONE	99	-0.18	percent	100	75.0	83.3	117	125	8.33
512076	1201051897	28-MAR-2006 07:44	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
511564	1201050756	29-MAR-2006 19:53	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
514277	1201056553	29-MAR-2006 22:27	DONE	108	0.91	percent	100	75.0	83.3	117	125	8.33
515540	1201059384	31-MAR-2006 19:27	DONE	96	-0.5	percent	100	75.0	83.3	117	125	8.33
516131	1201060708	01-APR-2006 16:30	DONE	96	-0.44	percent	100	75.0	83.3	117	125	8.33
520706	1201070945	15-APR-2006 09:12	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
519428	1201067987	17-APR-2006 07:52	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
521040	1201071731	19-APR-2006 14:49	DONE	107	0.84	percent	100	75.0	83.3	117	125	8.33
520799	1201071146	21-APR-2006 07:38	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
521962	1201074075	21-APR-2006 10:18	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
521962	1201074161	21-APR-2006 10:18	DONE	96	-0.43	percent	100	75.0	83.3	117	125	8.33
521962	1201074162	21-APR-2006 10:18	DONE	97	-0.34	percent	100	75.0	83.3	117	125	8.33

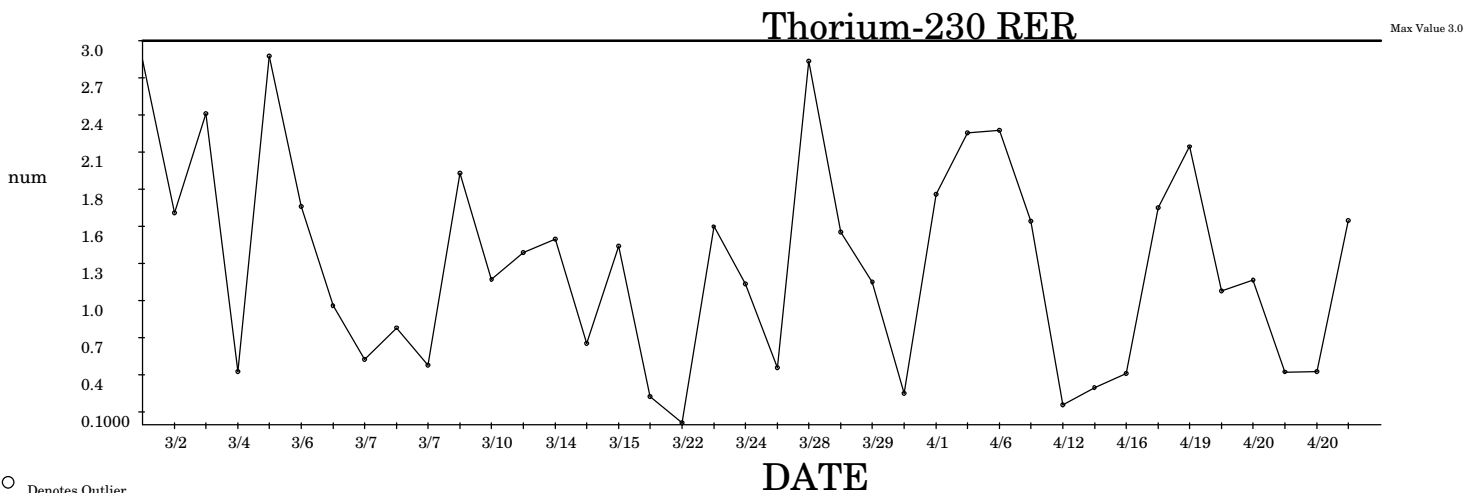
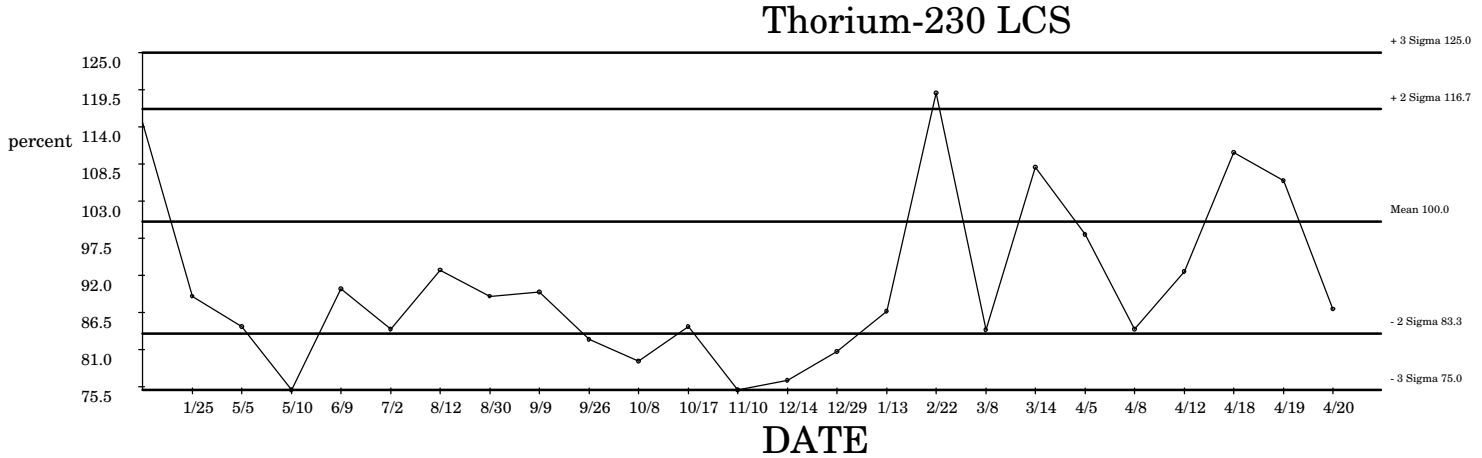
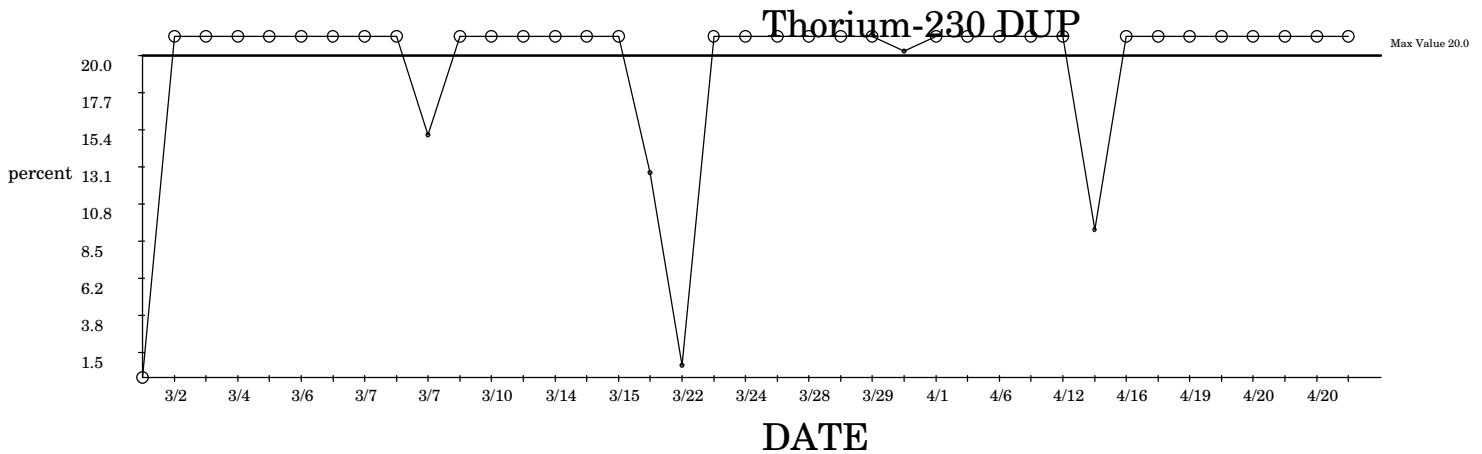
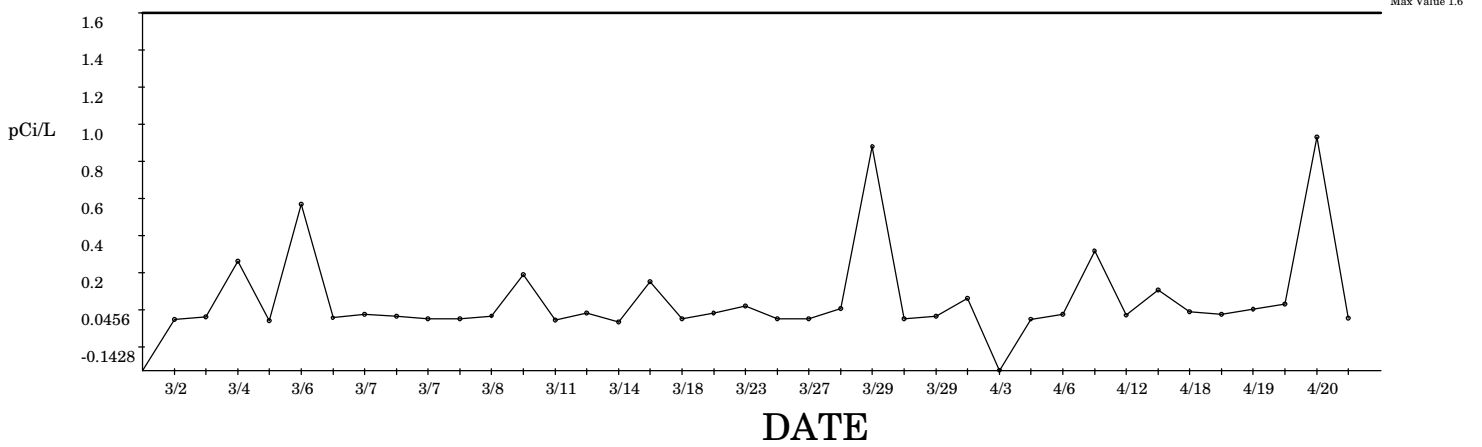
# SPC Graph for Alpha SpecThorium in Liquids 4/24/2006 Thorium-228 BLANK



○ Denotes Outlier

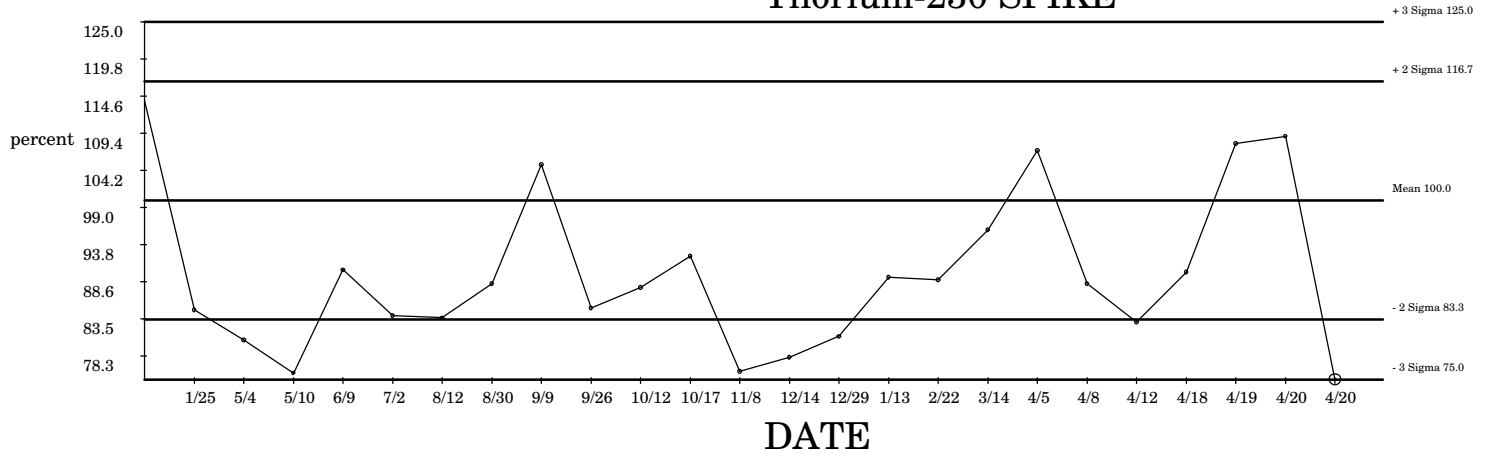
# SPC Graph for Alpha SpecThorium in Liquids 4/24/2006

## Thorium-230 BLANK



○ Denotes Outlier

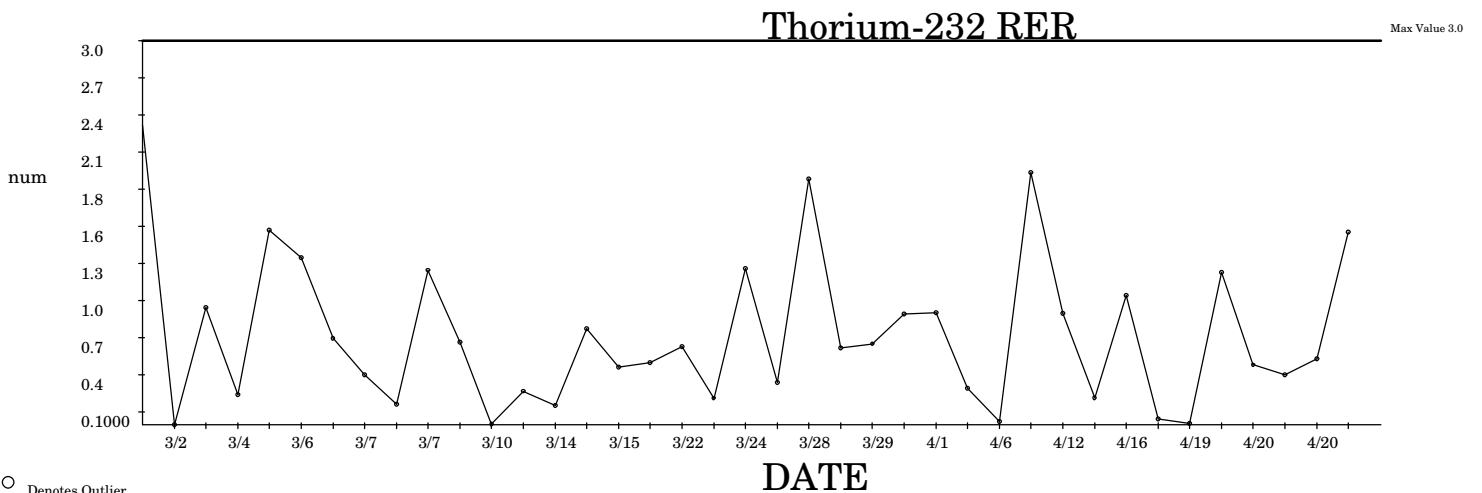
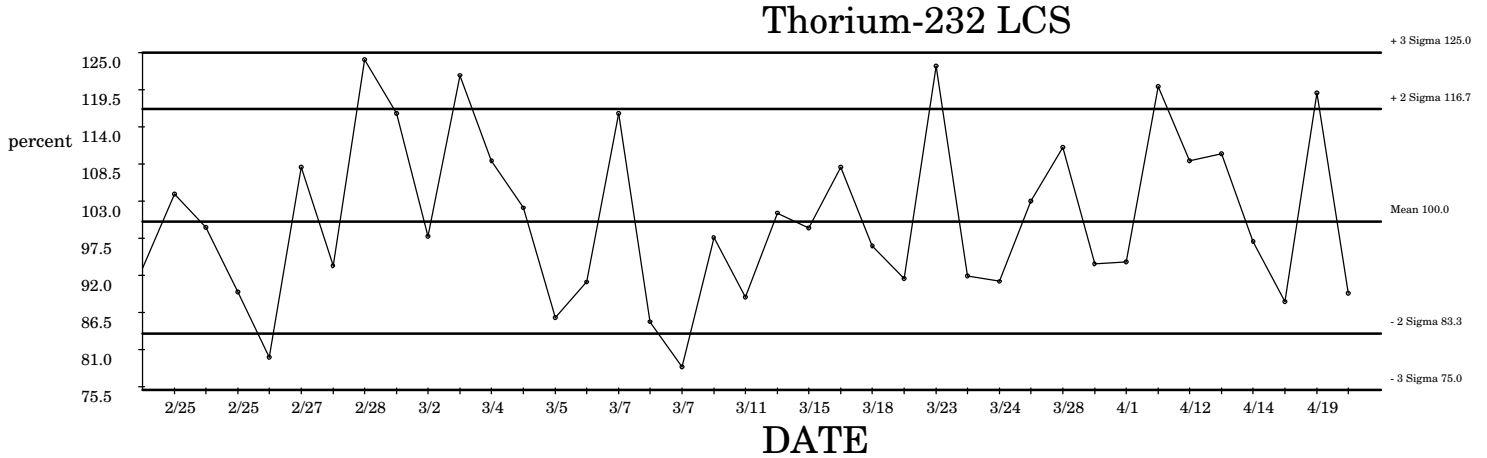
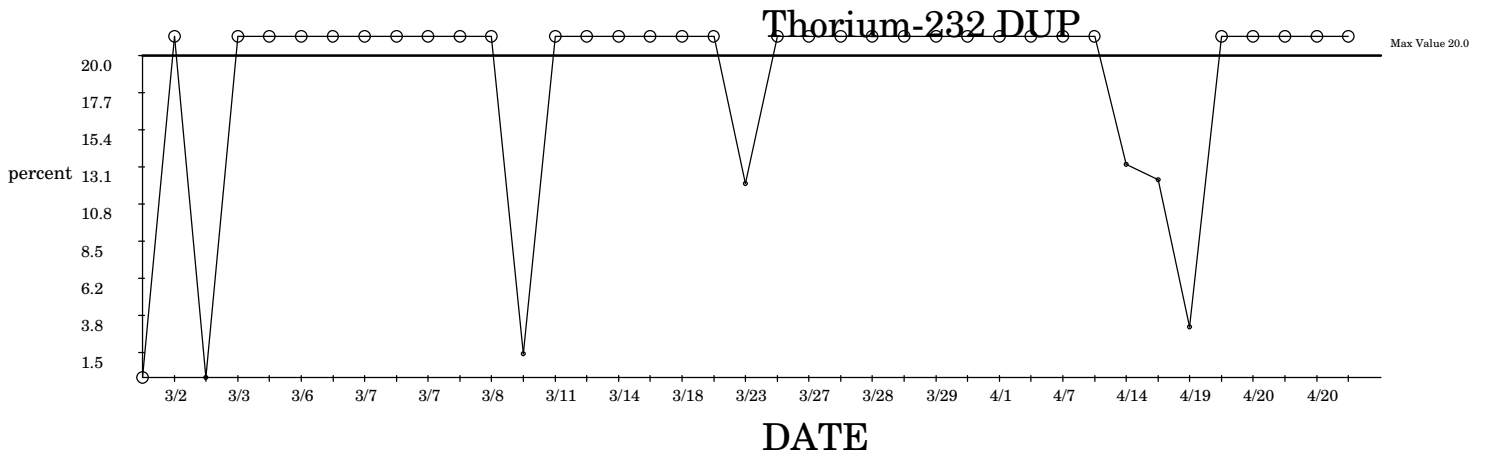
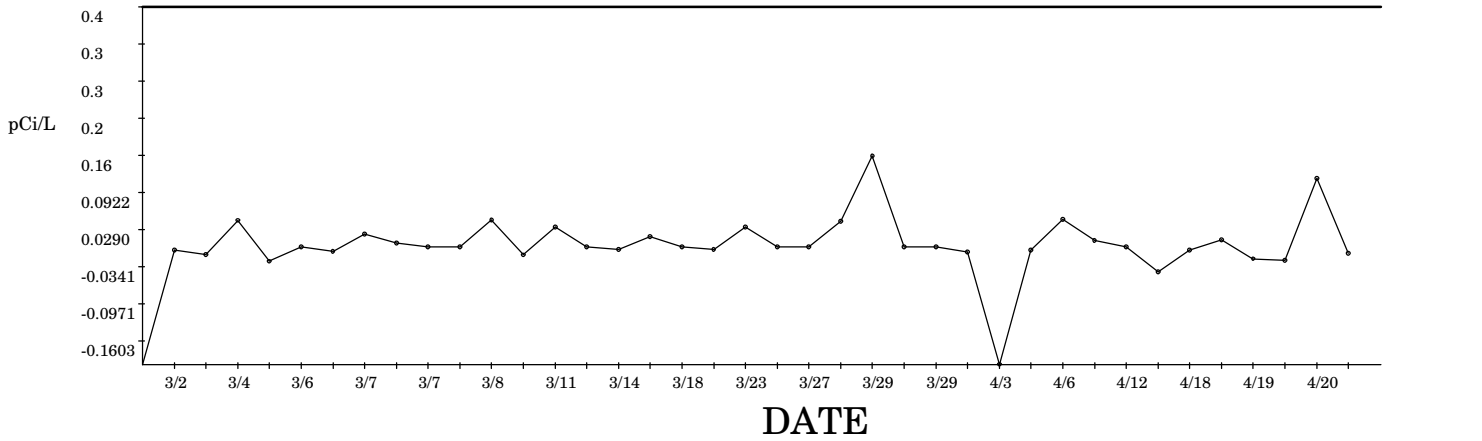
# SPC Graph for Alpha SpecThorium in Liquids 4/24/2006 Thorium-230 SPIKE



○ Denotes Outlier

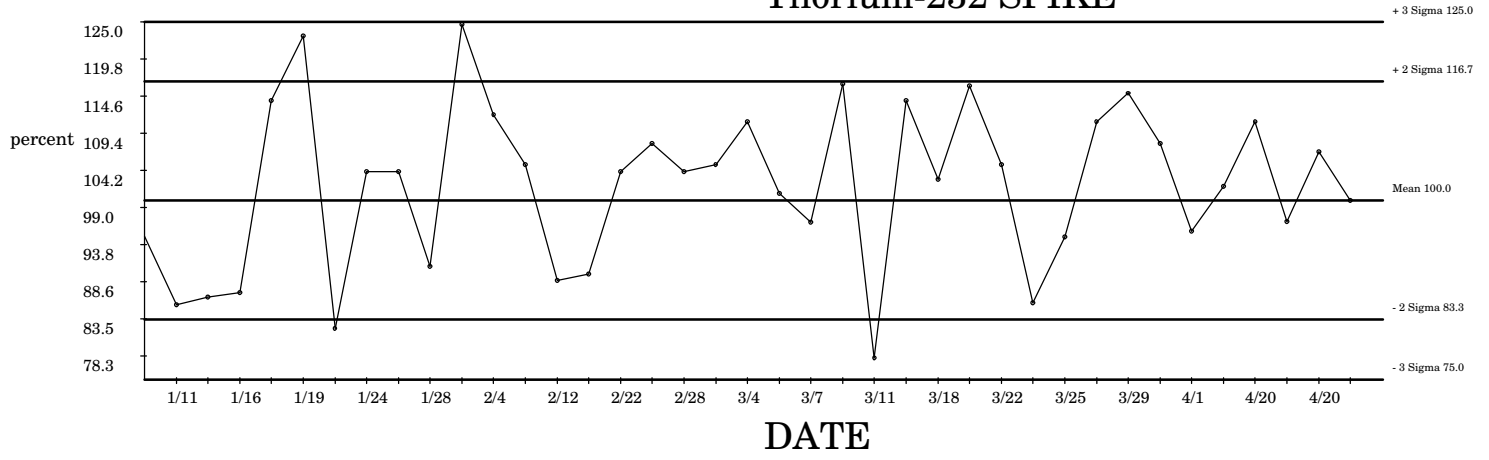


# SPC Graph for Alpha SpecThorium in Liquids 4/24/2006 Thorium-232 BLANK



○ Denotes Outlier

# SPC Graph for Alpha SpecThorium in Liquids 4/24/2006 Thorium-232 SPIKE



○ Denotes Outlier

# Data used for Alpha SpecThorium in Liquids 25-APR-2006

Thorium-228 BLANK: Limits LCL = -.4 UCL = .5

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
504484	1201034197	01-MAR-2006 16:22	DUSE	0	0.56	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
506015	1201037821	02-MAR-2006 07:38	DONE	0	-0.41	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
504514	1201034271	02-MAR-2006 12:09	DONE	0	-0.24	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
507079	1201040312	04-MAR-2006 21:34	DONE	0	-0.66	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
506064	1201037940	06-MAR-2006 08:00	DONE	0	-0.35	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
508121	1201042933	06-MAR-2006 16:33	DONE	0	0.27	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
507094	1201040358	07-MAR-2006 01:33	DONE	0	-0.16	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
506047	1201037914	07-MAR-2006 10:21	DONE	0	-0.24	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
507087	1201040340	07-MAR-2006 14:56	DONE	0	-0.33	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
507398	1201041204	07-MAR-2006 23:35	DONE	0	-0.28	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
507401	1201041212	07-MAR-2006 23:35	DONE	0	-0.28	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
509582	1201046244	08-MAR-2006 08:59	DONE	0	0.2	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
509840	1201046800	10-MAR-2006 11:48	DONE	0	-0.25	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
509118	1201045258	11-MAR-2006 09:34	DONE	0	-2	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
511062	1201049578	14-MAR-2006 17:18	DUSE	0	-0.26	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
509796	1201046675	14-MAR-2006 17:43	DONE	0	-0.09	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
510660	1201048675	15-MAR-2006 10:56	DONE	0	1.2	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
511207	1201049870	18-MAR-2006 12:05	DONE	0	-0.28	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
512010	1201051735	22-MAR-2006 20:59	DONE	0	-0.45	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
511986	1201051678	23-MAR-2006 08:32	DONE	0	0.53	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
512003	1201051718	25-MAR-2006 10:35	DONE	0	-0.28	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
512008	1201051727	27-MAR-2006 09:42	DUSE	0	-0.28	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
512781	1201053532	28-MAR-2006 07:34	DONE	0	-0.07	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
511549	1201050713	29-MAR-2006 08:24	DONE	0	-0.01	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
515678	1201059766	29-MAR-2006 10:23	DONE	0	-0.28	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
514263	1201056523	29-MAR-2006 22:27	DUSE	0	-0.23	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
515544	1201059406	01-APR-2006 09:22	DONE	0	-0.55	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
515266	1201058728	03-APR-2006 16:59	DONE	0	0.74	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
517136	1201062871	05-APR-2006 21:54	DUSE	0	-0.25	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
517718	1201064215	06-APR-2006 13:23	DONE	0	0.21	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
517716	1201064208	12-APR-2006 12:14	DUSE	1	4.9	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
518887	1201066848	12-APR-2006 19:27	DUSE	0	-0.28	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
518909	1201066925	16-APR-2006 08:06	DONE	0	-0.45	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
519439	1201068031	18-APR-2006 12:58	DUSE	0	-0.35	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
520797	1201071136	19-APR-2006 14:45	DUSE	0	-0.31	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
521038	1201071719	19-APR-2006 14:47	DONE	0	-1	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
520798	1201071140	20-APR-2006 07:49	DONE	0	-0.05	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
519427	1201067981	20-APR-2006 12:32	DONE	0	2.1	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17
521959	1201074063	20-APR-2006 21:36	DONE	0	-0.18	pCi/L	0.05	-0.45	-0.284	0.38	0.54	0.17

Thorium-228 DUP: Limits LCL = 0 UCL = 20

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
506015	1201037822	02-MAR-2006 07:38	DONE	107	-0.27	percent	247	0	-790	1280	20.0	516
504514	1201034272	02-MAR-2006 12:09	DONE	183	-0.13	percent	247	0	-790	1280	20.0	516
507398	1201041205	03-MAR-2006 22:26	DONE	203	-0.09	percent	247	0	-790	1280	20.0	516
507079	1201040313	04-MAR-2006 21:34	DONE	62	-0.36	percent	247	0	-790	1280	20.0	516

506064	1201037941	06-MAR-2006 08:00	DONE	187	-0.12	percent	247	0	-790	1280	20.0	516
508121	1201042934	06-MAR-2006 16:33	DONE	418	0.33	percent	247	0	-790	1280	20.0	516
506047	1201037915	07-MAR-2006 01:33	DONE	168	-0.15	percent	247	0	-790	1280	20.0	516
507094	1201040359	07-MAR-2006 01:33	DONE	402	0.3	percent	247	0	-790	1280	20.0	516
507087	1201040341	07-MAR-2006 14:56	DONE	93	-0.3	percent	247	0	-790	1280	20.0	516
507401	1201041213	07-MAR-2006 23:35	DONE	4	-0.47	percent	247	0	-790	1280	20.0	516
509582	1201046245	08-MAR-2006 08:59	DONE	145	-0.2	percent	247	0	-790	1280	20.0	516
509840	1201046801	10-MAR-2006 11:48	DONE	589	0.66	percent	247	0	-790	1280	20.0	516
509118	1201045259	11-MAR-2006 09:34	DONE	23	-0.43	percent	247	0	-790	1280	20.0	516
511062	1201049579	14-MAR-2006 17:18	DUSE	11	-0.46	percent	247	0	-790	1280	20.0	516
509796	1201046676	14-MAR-2006 17:43	DONE	16	-0.45	percent	247	0	-790	1280	20.0	516
510660	1201048676	15-MAR-2006 10:56	DONE	209	-0.07	percent	247	0	-790	1280	20.0	516
511207	1201049871	18-MAR-2006 12:05	DONE	61	-0.36	percent	247	0	-790	1280	20.0	516
512010	1201051736	22-MAR-2006 20:59	DONE	26	-0.43	percent	247	0	-790	1280	20.0	516
511986	1201051679	23-MAR-2006 08:32	DONE	12	-0.45	percent	247	0	-790	1280	20.0	516
512003	1201051719	24-MAR-2006 08:00	DONE	293	0.09	percent	247	0	-790	1280	20.0	516
512008	1201051728	27-MAR-2006 18:58	DUSE	81	-0.32	percent	247	0	-790	1280	20.0	516
512781	1201053533	28-MAR-2006 07:34	DONE	394	0.29	percent	247	0	-790	1280	20.0	516
511549	1201050714	28-MAR-2006 11:48	DONE	18	-0.44	percent	247	0	-790	1280	20.0	516
515678	1201059767	29-MAR-2006 10:23	DONE	68	-0.35	percent	247	0	-790	1280	20.0	516
514263	1201056524	29-MAR-2006 22:27	DUSE	185	-0.12	percent	247	0	-790	1280	20.0	516
515544	1201059407	01-APR-2006 09:22	DONE	269	0.04	percent	247	0	-790	1280	20.0	516
515266	1201058729	01-APR-2006 11:30	DONE	39	-0.4	percent	247	0	-790	1280	20.0	516
517718	1201064216	06-APR-2006 13:23	DONE	3	-0.47	percent	247	0	-790	1280	20.0	516
517136	1201062872	07-APR-2006 07:28	DUSE	348	0.19	percent	247	0	-790	1280	20.0	516
518887	1201066849	12-APR-2006 19:27	DUSE	230	-0.03	percent	247	0	-790	1280	20.0	516
519427	1201067982	14-APR-2006 14:34	DONE	17	-0.45	percent	247	0	-790	1280	20.0	516
518909	1201066926	16-APR-2006 08:06	DONE	748	0.97	percent	247	0	-790	1280	20.0	516
519439	1201068032	18-APR-2006 12:58	DUSE	225	-0.04	percent	247	0	-790	1280	20.0	516
520797	1201071137	19-APR-2006 14:45	DUSE	247	-0	percent	247	0	-790	1280	20.0	516
521038	1201071720	19-APR-2006 14:47	DONE	45	-0.39	percent	247	0	-790	1280	20.0	516
520798	1201071141	20-APR-2006 07:49	DONE	56	-0.37	percent	247	0	-790	1280	20.0	516
521959	1201074064	20-APR-2006 21:36	DONE	3215	5.7	percent	247	0	-790	1280	20.0	516
521959	1201074155	20-APR-2006 21:36	DONE	30	-0.42	percent	247	0	-790	1280	20.0	516
521075	1201071845	20-APR-2006 21:36	DUSE	215	-0.06	percent	247	0	-790	1280	20.0	516

**Thorium-228 RER:** Limits LCL = 0 UCL = 3

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
506015	1201037822	02-MAR-2006 07:38	DONE	0.64	-0.29	num	0.82	0	-0.395	2.03	3.00	0.61
504514	1201034272	02-MAR-2006 12:09	DONE	1.06	0.41	num	0.82	0	-0.395	2.03	3.00	0.61
507398	1201041205	03-MAR-2006 22:26	DONE	0.16	-1	num	0.82	0	-0.395	2.03	3.00	0.61
507079	1201040313	04-MAR-2006 21:34	DONE	0.65	-0.27	num	0.82	0	-0.395	2.03	3.00	0.61
506064	1201037941	06-MAR-2006 08:00	DONE	1.14	0.54	num	0.82	0	-0.395	2.03	3.00	0.61
508121	1201042934	06-MAR-2006 16:33	DONE	1.92	1.8	num	0.82	0	-0.395	2.03	3.00	0.61
506047	1201037915	07-MAR-2006 01:33	DONE	0.49	-0.54	num	0.82	0	-0.395	2.03	3.00	0.61
507094	1201040359	07-MAR-2006 01:33	DONE	1.38	0.93	num	0.82	0	-0.395	2.03	3.00	0.61
507087	1201040341	07-MAR-2006 14:56	DONE	0.72	-0.15	num	0.82	0	-0.395	2.03	3.00	0.61
507401	1201041213	07-MAR-2006 23:35	DONE	0.1	-1	num	0.82	0	-0.395	2.03	3.00	0.61
509582	1201046245	08-MAR-2006 08:59	DONE	1.62	1.3	num	0.82	0	-0.395	2.03	3.00	0.61
509840	1201046801	10-MAR-2006 11:48	DONE	2.3	2.5	num	0.82	0	-0.395	2.03	3.00	0.61

509118	1201045259	11-MAR-2006 09:34	DONE	0.15	-1	num	0.82	0	-0.395	2.03	3.00	0.61
511062	1201049579	14-MAR-2006 17:18	DUSE	0.02	-1	num	0.82	0	-0.395	2.03	3.00	0.61
509796	1201046676	14-MAR-2006 17:43	DONE	0.17	-1	num	0.82	0	-0.395	2.03	3.00	0.61
510660	1201048676	15-MAR-2006 10:56	DONE	2.12	2.2	num	0.82	0	-0.395	2.03	3.00	0.61
511207	1201049871	18-MAR-2006 12:05	DONE	1.3	0.79	num	0.82	0	-0.395	2.03	3.00	0.61
512010	1201051736	22-MAR-2006 20:59	DONE	0.46	-0.59	num	0.82	0	-0.395	2.03	3.00	0.61
511986	1201051679	23-MAR-2006 08:32	DONE	0.27	-0.91	num	0.82	0	-0.395	2.03	3.00	0.61
512003	1201051719	24-MAR-2006 08:00	DONE	0.39	-0.7	num	0.82	0	-0.395	2.03	3.00	0.61
512008	1201051728	27-MAR-2006 18:58	DUSE	1.02	0.33	num	0.82	0	-0.395	2.03	3.00	0.61
512781	1201053533	28-MAR-2006 07:34	DONE	0.62	-0.32	num	0.82	0	-0.395	2.03	3.00	0.61
511549	1201050714	28-MAR-2006 11:48	DONE	0.7	-0.18	num	0.82	0	-0.395	2.03	3.00	0.61
515678	1201059767	29-MAR-2006 10:23	DONE	1.22	0.67	num	0.82	0	-0.395	2.03	3.00	0.61
514263	1201056524	29-MAR-2006 22:27	DUSE	0.31	-0.83	num	0.82	0	-0.395	2.03	3.00	0.61
515544	1201059407	01-APR-2006 09:22	DONE	0.76	-0.09	num	0.82	0	-0.395	2.03	3.00	0.61
515266	1201058729	01-APR-2006 11:30	DONE	0.28	-0.89	num	0.82	0	-0.395	2.03	3.00	0.61
517718	1201064216	06-APR-2006 13:23	DONE	0.07	-1	num	0.82	0	-0.395	2.03	3.00	0.61
517136	1201062872	07-APR-2006 07:28	DUSE	0.96	0.24	num	0.82	0	-0.395	2.03	3.00	0.61
518887	1201066849	12-APR-2006 19:27	DUSE	0.22	-0.99	num	0.82	0	-0.395	2.03	3.00	0.61
519427	1201067982	14-APR-2006 14:34	DONE	1.06	0.41	num	0.82	0	-0.395	2.03	3.00	0.61
518909	1201066926	16-APR-2006 08:06	DONE	1.2	0.63	num	0.82	0	-0.395	2.03	3.00	0.61
519439	1201068032	18-APR-2006 12:58	DUSE	1.55	1.2	num	0.82	0	-0.395	2.03	3.00	0.61
520797	1201071137	19-APR-2006 14:45	DUSE	1.83	1.7	num	0.82	0	-0.395	2.03	3.00	0.61
521038	1201071720	19-APR-2006 14:47	DONE	0.16	-1	num	0.82	0	-0.395	2.03	3.00	0.61
520798	1201071141	20-APR-2006 07:49	DONE	0.87	0.09	num	0.82	0	-0.395	2.03	3.00	0.61
521959	1201074064	20-APR-2006 21:36	DONE	0.93	0.18	num	0.82	0	-0.395	2.03	3.00	0.61
521959	1201074155	20-APR-2006 21:36	DONE	0.37	-0.74	num	0.82	0	-0.395	2.03	3.00	0.61
521075	1201071845	20-APR-2006 21:36	DUSE	0.6	-0.36	num	0.82	0	-0.395	2.03	3.00	0.61

**Thorium-230 BLANK: Limits LCL = -8 UCL = 1.1**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
504484	1201034197	01-MAR-2006 16:22	DUSE	2	4.3	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
506015	1201037821	02-MAR-2006 07:38	DONE	0	-0.43	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
504514	1201034271	02-MAR-2006 12:09	DONE	0	-0.4	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
507079	1201040312	04-MAR-2006 21:34	DONE	0	0.48	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
506064	1201037940	06-MAR-2006 08:00	DONE	0	-0.46	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
508121	1201042933	06-MAR-2006 16:33	DONE	1	1.4	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
507094	1201040358	07-MAR-2006 01:33	DONE	0	-0.41	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
506047	1201037914	07-MAR-2006 10:21	DONE	0	-0.35	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
507087	1201040340	07-MAR-2006 14:56	DONE	0	-0.39	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
507398	1201041204	07-MAR-2006 23:35	DONE	0	-0.43	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
507401	1201041212	07-MAR-2006 23:35	DONE	0	-0.43	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
509582	1201046244	08-MAR-2006 08:59	DONE	0	-0.38	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
509840	1201046800	10-MAR-2006 11:48	DONE	0	0.26	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
509118	1201045258	11-MAR-2006 09:34	DONE	0	-0.45	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
511062	1201049578	14-MAR-2006 17:18	DONE	0	-0.33	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
509796	1201046675	14-MAR-2006 17:43	DONE	0	-0.48	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
510660	1201048675	15-MAR-2006 10:56	DONE	0	0.16	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
511207	1201049870	18-MAR-2006 12:05	DUSE	0	-0.43	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
512010	1201051735	22-MAR-2006 20:59	DONE	0	-0.34	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
511986	1201051678	23-MAR-2006 08:32	DUSE	0	-0.23	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32

512003	1201051718	25-MAR-2006 10:35	DONE	0	-0.43	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
512008	1201051727	27-MAR-2006 09:42	DUSE	0	-0.43	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
512781	1201053532	28-MAR-2006 07:34	DONE	0	-0.26	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
511549	1201050713	29-MAR-2006 08:24	DONE	1	2.3	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
515678	1201059766	29-MAR-2006 10:23	DONE	0	-0.43	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
514263	1201056523	29-MAR-2006 22:27	DUSE	0	-0.39	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
515544	1201059406	01-APR-2006 09:22	DONE	0	-0.1	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
515266	1201058728	03-APR-2006 16:59	DUSE	0	-1	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
517136	1201062871	05-APR-2006 21:54	DONE	0	-0.43	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
517718	1201064215	06-APR-2006 13:23	DONE	0	-0.36	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
517716	1201064208	12-APR-2006 12:14	DUSE	0	0.63	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
518887	1201066848	12-APR-2006 19:27	DONE	0	-0.37	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
518909	1201066925	16-APR-2006 08:06	DONE	0	0.03	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
519439	1201068031	18-APR-2006 12:58	DONE	0	-0.31	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
520797	1201071136	19-APR-2006 14:45	DONE	0	-0.35	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
521038	1201071719	19-APR-2006 14:47	DONE	0	-0.27	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
520798	1201071140	20-APR-2006 07:49	DONE	0	-0.2	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
519427	1201067981	20-APR-2006 12:32	DONE	1	2.4	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32
521959	1201074063	20-APR-2006 21:36	DONE	0	-0.42	pCi/L	0.14	-0.836	-0.511	0.79	1.11	0.32

**Thorium-230 DUP: Limits LCL = 0 UCL = 20**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
506015	1201037822	02-MAR-2006 07:38	DONE	24	-0.46	percent	241	0	-700	1180	20.0	470
504514	1201034272	02-MAR-2006 12:09	DONE	154	-0.18	percent	241	0	-700	1180	20.0	470
507398	1201041205	03-MAR-2006 22:26	DONE	365	0.26	percent	241	0	-700	1180	20.0	470
507079	1201040313	04-MAR-2006 21:34	DONE	28	-0.45	percent	241	0	-700	1180	20.0	470
506064	1201037941	06-MAR-2006 08:00	DONE	186	-0.12	percent	241	0	-700	1180	20.0	470
508121	1201042934	06-MAR-2006 16:33	DONE	455	0.45	percent	241	0	-700	1180	20.0	470
506047	1201037915	07-MAR-2006 01:33	DONE	51	-0.4	percent	241	0	-700	1180	20.0	470
507094	1201040359	07-MAR-2006 01:33	DONE	62	-0.38	percent	241	0	-700	1180	20.0	470
507087	1201040341	07-MAR-2006 14:56	DONE	66	-0.37	percent	241	0	-700	1180	20.0	470
507401	1201041213	07-MAR-2006 23:35	DONE	15	-0.48	percent	241	0	-700	1180	20.0	470
509582	1201046245	08-MAR-2006 08:59	DONE	2795	5.4	percent	241	0	-700	1180	20.0	470
509840	1201046801	10-MAR-2006 11:48	DONE	106	-0.29	percent	241	0	-700	1180	20.0	470
509118	1201045259	11-MAR-2006 09:34	DONE	574	0.71	percent	241	0	-700	1180	20.0	470
511062	1201049579	14-MAR-2006 17:18	DONE	494	0.54	percent	241	0	-700	1180	20.0	470
509796	1201046676	14-MAR-2006 17:43	DONE	76	-0.35	percent	241	0	-700	1180	20.0	470
510660	1201048676	15-MAR-2006 10:56	DONE	913	1.4	percent	241	0	-700	1180	20.0	470
511207	1201049871	18-MAR-2006 12:05	DUSE	13	-0.49	percent	241	0	-700	1180	20.0	470
512010	1201051736	22-MAR-2006 20:59	DONE	1	-0.51	percent	241	0	-700	1180	20.0	470
511986	1201051679	23-MAR-2006 08:32	DUSE	33	-0.44	percent	241	0	-700	1180	20.0	470
512003	1201051719	24-MAR-2006 08:00	DONE	714	1	percent	241	0	-700	1180	20.0	470
512008	1201051728	27-MAR-2006 18:58	DUSE	32	-0.44	percent	241	0	-700	1180	20.0	470
512781	1201053533	28-MAR-2006 07:34	DONE	180	-0.13	percent	241	0	-700	1180	20.0	470
511549	1201050714	28-MAR-2006 11:48	DONE	60	-0.38	percent	241	0	-700	1180	20.0	470
515678	1201059767	29-MAR-2006 10:23	DONE	509	0.57	percent	241	0	-700	1180	20.0	470
514263	1201056524	29-MAR-2006 22:27	DUSE	20	-0.47	percent	241	0	-700	1180	20.0	470
515544	1201059407	01-APR-2006 09:22	DONE	192	-0.1	percent	241	0	-700	1180	20.0	470
515266	1201058729	01-APR-2006 11:30	DUSE	82	-0.34	percent	241	0	-700	1180	20.0	470
517718	1201064216	06-APR-2006 13:23	DONE	158	-0.18	percent	241	0	-700	1180	20.0	470

517136	1201062872	07-APR-2006 07:28	DONE	82	-0.34	percent	241	0	-700	1180	20.0	470
518887	1201066849	12-APR-2006 19:27	DONE	30	-0.45	percent	241	0	-700	1180	20.0	470
519427	1201067982	14-APR-2006 14:34	DONE	9	-0.49	percent	241	0	-700	1180	20.0	470
518909	1201066926	16-APR-2006 08:06	DONE	32	-0.44	percent	241	0	-700	1180	20.0	470
519439	1201068032	18-APR-2006 12:58	DONE	114	-0.27	percent	241	0	-700	1180	20.0	470
520797	1201071137	19-APR-2006 14:45	DONE	271	0.06	percent	241	0	-700	1180	20.0	470
521038	1201071720	19-APR-2006 14:47	DONE	102	-0.3	percent	241	0	-700	1180	20.0	470
520798	1201071141	20-APR-2006 07:49	DONE	131	-0.23	percent	241	0	-700	1180	20.0	470
521959	1201074064	20-APR-2006 21:36	DONE	23	-0.46	percent	241	0	-700	1180	20.0	470
521959	1201074155	20-APR-2006 21:36	DONE	115	-0.27	percent	241	0	-700	1180	20.0	470
521075	1201071845	20-APR-2006 21:36	DONE	140	-0.22	percent	241	0	-700	1180	20.0	470

**Thorium-230 LCS: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
394997	1200773390	19-JAN-2005 19:21	DONE	85	-2	percent	100	75.0	83.3	117	125	8.33
396381	1200776551	25-JAN-2005 17:25	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33
421139	1200835683	05-MAY-2005 13:31	DONE	84	-2	percent	100	75.0	83.3	117	125	8.33
423378	1200841265	10-MAY-2005 17:51	DONE	75	-3.0	percent	100	75.0	83.3	117	125	8.33
430938	1200859789	09-JUN-2005 13:47	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
438579	1200878052	02-JUL-2005 21:23	DONE	84	-2	percent	100	75.0	83.3	117	125	8.33
450934	1200907752	12-AUG-2005 03:24	DONE	93	-0.86	percent	100	75.0	83.3	117	125	8.33
456441	1200920836	30-AUG-2005 17:32	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33
457053	1200922083	09-SEP-2005 14:49	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
465256	1200942286	26-SEP-2005 15:33	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
468593	1200949998	08-OCT-2005 11:20	DONE	79	-2	percent	100	75.0	83.3	117	125	8.33
471081	1200955896	17-OCT-2005 21:18	DONE	84	-2	percent	100	75.0	83.3	117	125	8.33
478002	1200972583	10-NOV-2005 02:16	DONE	75	-3.0	percent	100	75.0	83.3	117	125	8.33
486414	1200993009	14-DEC-2005 08:11	DONE	76	-3	percent	100	75.0	83.3	117	125	8.33
490270	1201001730	29-DEC-2005 14:39	DONE	81	-2	percent	100	75.0	83.3	117	125	8.33
492212	1201006211	13-JAN-2006 08:17	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
505245	1201036055	22-FEB-2006 23:48	DONE	119	2.3	percent	100	75.0	83.3	117	125	8.33
509582	1201046246	08-MAR-2006 08:59	DONE	84	-2	percent	100	75.0	83.3	117	125	8.33
511062	1201049581	14-MAR-2006 17:18	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
517136	1201062874	05-APR-2006 21:54	DONE	98	-0.23	percent	100	75.0	83.3	117	125	8.33
517718	1201064218	08-APR-2006 08:43	DONE	84	-2	percent	100	75.0	83.3	117	125	8.33
518887	1201066851	12-APR-2006 19:25	DONE	93	-0.89	percent	100	75.0	83.3	117	125	8.33
519439	1201068034	18-APR-2006 12:58	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
520797	1201071139	19-APR-2006 14:45	DONE	106	0.72	percent	100	75.0	83.3	117	125	8.33
520798	1201071143	20-APR-2006 07:49	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33

**Thorium-230 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
506015	1201037822	02-MAR-2006 07:38	DONE	0.15	-1	num	1.18	0	-0.394	2.76	3.00	0.79
504514	1201034272	02-MAR-2006 12:09	DONE	1.65	0.6	num	1.18	0	-0.394	2.76	3.00	0.79
507398	1201041205	03-MAR-2006 22:26	DONE	2.43	1.6	num	1.18	0	-0.394	2.76	3.00	0.79
507079	1201040313	04-MAR-2006 21:34	DONE	0.42	-0.97	num	1.18	0	-0.394	2.76	3.00	0.79
506064	1201037941	06-MAR-2006 08:00	DONE	2.88	2.2	num	1.18	0	-0.394	2.76	3.00	0.79
508121	1201042934	06-MAR-2006 16:33	DONE	1.71	0.66	num	1.18	0	-0.394	2.76	3.00	0.79
506047	1201037915	07-MAR-2006 01:33	DONE	0.93	-0.32	num	1.18	0	-0.394	2.76	3.00	0.79
507094	1201040359	07-MAR-2006 01:33	DONE	0.51	-0.85	num	1.18	0	-0.394	2.76	3.00	0.79

507087	1201040341	07-MAR-2006 14:56	DONE	0.76	-0.54	num	1.18	0	-0.394	2.76	3.00	0.79
507401	1201041213	07-MAR-2006 23:35	DONE	0.47	-0.91	num	1.18	0	-0.394	2.76	3.00	0.79
509582	1201046245	08-MAR-2006 08:59	DONE	1.97	0.99	num	1.18	0	-0.394	2.76	3.00	0.79
509840	1201046801	10-MAR-2006 11:48	DONE	1.14	-0.06	num	1.18	0	-0.394	2.76	3.00	0.79
509118	1201045259	11-MAR-2006 09:34	DONE	1.35	0.21	num	1.18	0	-0.394	2.76	3.00	0.79
511062	1201049579	14-MAR-2006 17:18	DONE	1.45	0.34	num	1.18	0	-0.394	2.76	3.00	0.79
509796	1201046676	14-MAR-2006 17:43	DONE	0.64	-0.69	num	1.18	0	-0.394	2.76	3.00	0.79
510660	1201048676	15-MAR-2006 10:56	DONE	1.4	0.27	num	1.18	0	-0.394	2.76	3.00	0.79
511207	1201049871	18-MAR-2006 12:05	DUSE	0.22	-1	num	1.18	0	-0.394	2.76	3.00	0.79
512010	1201051736	22-MAR-2006 20:59	DONE	0.01	-1	num	1.18	0	-0.394	2.76	3.00	0.79
511986	1201051679	23-MAR-2006 08:32	DUSE	1.55	0.46	num	1.18	0	-0.394	2.76	3.00	0.79
512003	1201051719	24-MAR-2006 08:00	DONE	1.1	-0.1	num	1.18	0	-0.394	2.76	3.00	0.79
512008	1201051728	27-MAR-2006 18:58	DUSE	0.44	-0.94	num	1.18	0	-0.394	2.76	3.00	0.79
512781	1201053533	28-MAR-2006 07:34	DONE	2.84	2.1	num	1.18	0	-0.394	2.76	3.00	0.79
511549	1201050714	28-MAR-2006 11:48	DONE	1.5	0.41	num	1.18	0	-0.394	2.76	3.00	0.79
515678	1201059767	29-MAR-2006 10:23	DONE	1.12	-0.08	num	1.18	0	-0.394	2.76	3.00	0.79
514263	1201056524	29-MAR-2006 22:27	DUSE	0.24	-1	num	1.18	0	-0.394	2.76	3.00	0.79
515544	1201059407	01-APR-2006 09:22	DONE	1.8	0.78	num	1.18	0	-0.394	2.76	3.00	0.79
515266	1201058729	01-APR-2006 11:30	DUSE	2.28	1.4	num	1.18	0	-0.394	2.76	3.00	0.79
517718	1201064216	06-APR-2006 13:23	DONE	2.3	1.4	num	1.18	0	-0.394	2.76	3.00	0.79
517136	1201062872	07-APR-2006 07:28	DONE	1.59	0.52	num	1.18	0	-0.394	2.76	3.00	0.79
518887	1201066849	12-APR-2006 19:27	DONE	0.16	-1	num	1.18	0	-0.394	2.76	3.00	0.79
519427	1201067982	14-APR-2006 14:34	DONE	0.29	-1	num	1.18	0	-0.394	2.76	3.00	0.79
518909	1201066926	16-APR-2006 08:06	DONE	0.4	-0.99	num	1.18	0	-0.394	2.76	3.00	0.79
519439	1201068032	18-APR-2006 12:58	DONE	1.69	0.65	num	1.18	0	-0.394	2.76	3.00	0.79
520797	1201071137	19-APR-2006 14:45	DONE	2.17	1.3	num	1.18	0	-0.394	2.76	3.00	0.79
521038	1201071720	19-APR-2006 14:47	DONE	1.05	-0.17	num	1.18	0	-0.394	2.76	3.00	0.79
520798	1201071141	20-APR-2006 07:49	DONE	1.13	-0.07	num	1.18	0	-0.394	2.76	3.00	0.79
521959	1201074155	20-APR-2006 21:36	DONE	0.41	-0.98	num	1.18	0	-0.394	2.76	3.00	0.79
521959	1201074064	20-APR-2006 21:36	DONE	0.42	-0.97	num	1.18	0	-0.394	2.76	3.00	0.79
521075	1201071845	20-APR-2006 21:36	DONE	1.59	0.52	num	1.18	0	-0.394	2.76	3.00	0.79

**Thorium-230 SPIKE: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
394997	1200773389	19-JAN-2005 19:21	DONE	86	-2	percent	100	75.0	83.3	117	125	8.33
396381	1200776550	25-JAN-2005 22:09	DONE	85	-2	percent	100	75.0	83.3	117	125	8.33
421139	1200835681	04-MAY-2005 20:43	DONE	81	-2	percent	100	75.0	83.3	117	125	8.33
423378	1200841264	10-MAY-2005 17:51	DONE	76	-3	percent	100	75.0	83.3	117	125	8.33
430938	1200859788	09-JUN-2005 13:47	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
438579	1200878051	02-JUL-2005 21:23	DONE	84	-2	percent	100	75.0	83.3	117	125	8.33
450934	1200907751	12-AUG-2005 03:24	DONE	84	-2	percent	100	75.0	83.3	117	125	8.33
456441	1200920835	30-AUG-2005 17:32	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
457053	1200922082	09-SEP-2005 14:49	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
465256	1200942285	26-SEP-2005 15:33	DONE	85	-2	percent	100	75.0	83.3	117	125	8.33
468593	1200949997	12-OCT-2005 08:29	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
471081	1200955895	17-OCT-2005 21:18	DONE	92	-0.94	percent	100	75.0	83.3	117	125	8.33
478002	1200972582	08-NOV-2005 08:03	DONE	76	-3	percent	100	75.0	83.3	117	125	8.33
486414	1200993008	14-DEC-2005 08:11	DONE	78	-3	percent	100	75.0	83.3	117	125	8.33
490270	1201001729	29-DEC-2005 14:39	DONE	81	-2	percent	100	75.0	83.3	117	125	8.33
492212	1201006210	13-JAN-2006 08:17	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33



505245	1201036054	22-FEB-2006 23:48	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33
511062	1201049580	14-MAR-2006 17:18	DONE	96	-0.49	percent	100	75.0	83.3	117	125	8.33
517136	1201062873	05-APR-2006 21:54	DONE	107	0.84	percent	100	75.0	83.3	117	125	8.33
517718	1201064217	08-APR-2006 08:43	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
518887	1201066850	12-APR-2006 19:27	DONE	83	-2	percent	100	75.0	83.3	117	125	8.33
519439	1201068033	18-APR-2006 12:58	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
520797	1201071138	19-APR-2006 14:45	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
520798	1201071142	20-APR-2006 07:49	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
521075	1201071846	20-APR-2006 21:36	DONE	74	-3	percent	100	75.0	83.3	117	125	8.33

**Thorium-232 BLANK: Limits LCL = -.2 UCL = .3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
504484	1201034197	01-MAR-2006 16:22	DUSE	0	4.8	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
506015	1201037821	02-MAR-2006 07:38	DONE	0	-0.26	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
504514	1201034271	02-MAR-2006 12:09	DONE	0	-0.36	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
507079	1201040312	04-MAR-2006 21:34	DONE	0	0.36	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
506064	1201037940	06-MAR-2006 08:00	DONE	0	-0.49	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
508121	1201042933	06-MAR-2006 16:33	DONE	0	-0.19	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
507094	1201040358	07-MAR-2006 01:33	DONE	0	-0.28	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
506047	1201037914	07-MAR-2006 10:21	DONE	0	0.08	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
507087	1201040340	07-MAR-2006 14:56	DONE	0	-0.11	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
507398	1201041204	07-MAR-2006 23:35	DONE	0	-0.19	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
507401	1201041212	07-MAR-2006 23:35	DONE	0	-0.19	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
509582	1201046244	08-MAR-2006 08:59	DONE	0	0.37	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
509840	1201046800	10-MAR-2006 11:48	DONE	0	-0.36	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
509118	1201045258	11-MAR-2006 09:34	DONE	0	0.22	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
511062	1201049578	14-MAR-2006 17:18	DUSE	0	-0.19	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
509796	1201046675	14-MAR-2006 17:43	DONE	0	-0.25	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
510660	1201048675	15-MAR-2006 10:56	DONE	0	0.02	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
511207	1201049870	18-MAR-2006 12:05	DONE	0	-0.19	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
512010	1201051735	22-MAR-2006 20:59	DONE	0	-0.25	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
511986	1201051678	23-MAR-2006 08:32	DONE	0	0.22	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
512003	1201051718	25-MAR-2006 10:35	DONE	0	-0.19	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
512008	1201051727	27-MAR-2006 09:42	DUSE	0	-0.19	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
512781	1201053532	28-MAR-2006 07:34	DONE	0	0.35	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
511549	1201050713	29-MAR-2006 08:24	DONE	0	1.7	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
515678	1201059766	29-MAR-2006 10:23	DONE	0	-0.19	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
514263	1201056523	29-MAR-2006 22:27	DUSE	0	-0.19	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
515544	1201059406	01-APR-2006 09:22	DONE	0	-0.3	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
515266	1201058728	03-APR-2006 16:59	DONE	0	-3	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
517136	1201062871	05-APR-2006 21:54	DUSE	0	-0.26	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
517718	1201064215	06-APR-2006 13:23	DONE	0	0.38	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
517716	1201064208	12-APR-2006 12:14	DONE	0	-0.06	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
518887	1201066848	12-APR-2006 19:27	DUSE	0	-0.19	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
518909	1201066925	16-APR-2006 08:06	DONE	0	-0.72	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
519439	1201068031	18-APR-2006 12:58	DUSE	0	-0.26	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
520797	1201071136	19-APR-2006 14:45	DUSE	0	-0.05	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
521038	1201071719	19-APR-2006 14:47	DONE	0	-0.44	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
520798	1201071140	20-APR-2006 07:49	DONE	0	-0.48	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
519427	1201067981	20-APR-2006 12:32	DONE	0	1.2	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08

521959	1201074063	20-APR-2006 21:36	DONE	0	-0.33	pCi/L	0.02	-0.228	-0.147	0.18	0.26	0.08
--------	------------	-------------------	------	---	-------	-------	------	--------	--------	------	------	------

**Thorium-232 DUP: Limits LCL = 0 UCL = 20**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
505915	1201037583	01-MAR-2006 13:35	DONE	71	-0.18	percent	2180	0	-22000	26300	20.0	12000
506015	1201037822	02-MAR-2006 07:38	DONE	126	-0.17	percent	2180	0	-22000	26300	20.0	12000
504514	1201034272	02-MAR-2006 12:09	DONE	0	-0.18	percent	2180	0	-22000	26300	20.0	12000
507398	1201041205	03-MAR-2006 22:26	DONE	200	-0.16	percent	2180	0	-22000	26300	20.0	12000
507079	1201040313	04-MAR-2006 21:34	DONE	24	-0.18	percent	2180	0	-22000	26300	20.0	12000
506064	1201037941	06-MAR-2006 08:00	DONE	153	-0.17	percent	2180	0	-22000	26300	20.0	12000
508121	1201042934	06-MAR-2006 16:33	DONE	484	-0.14	percent	2180	0	-22000	26300	20.0	12000
506047	1201037915	07-MAR-2006 01:33	DONE	156	-0.17	percent	2180	0	-22000	26300	20.0	12000
507094	1201040359	07-MAR-2006 01:33	DONE	58	-0.18	percent	2180	0	-22000	26300	20.0	12000
507087	1201040341	07-MAR-2006 14:56	DONE	200	-0.16	percent	2180	0	-22000	26300	20.0	12000
507401	1201041213	07-MAR-2006 23:35	DONE	44	-0.18	percent	2180	0	-22000	26300	20.0	12000
509582	1201046245	08-MAR-2006 08:59	DONE	91	-0.17	percent	2180	0	-22000	26300	20.0	12000
509840	1201046801	10-MAR-2006 11:48	DONE	1	-0.18	percent	2180	0	-22000	26300	20.0	12000
509118	1201045259	11-MAR-2006 09:34	DONE	37	-0.18	percent	2180	0	-22000	26300	20.0	12000
511062	1201049579	14-MAR-2006 17:18	DUSE	184	-0.17	percent	2180	0	-22000	26300	20.0	12000
509796	1201046676	14-MAR-2006 17:43	DONE	75	-0.17	percent	2180	0	-22000	26300	20.0	12000
510660	1201048676	15-MAR-2006 10:56	DONE	56	-0.18	percent	2180	0	-22000	26300	20.0	12000
511207	1201049871	18-MAR-2006 12:05	DONE	58	-0.18	percent	2180	0	-22000	26300	20.0	12000
512010	1201051736	22-MAR-2006 20:59	DONE	49	-0.18	percent	2180	0	-22000	26300	20.0	12000
511986	1201051679	23-MAR-2006 08:32	DONE	12	-0.18	percent	2180	0	-22000	26300	20.0	12000
512003	1201051719	24-MAR-2006 08:00	DONE	486	-0.14	percent	2180	0	-22000	26300	20.0	12000
512008	1201051728	27-MAR-2006 18:58	DUSE	22	-0.18	percent	2180	0	-22000	26300	20.0	12000
512781	1201053533	28-MAR-2006 07:34	DONE	282	-0.16	percent	2180	0	-22000	26300	20.0	12000
511549	1201050714	28-MAR-2006 11:48	DONE	70	-0.18	percent	2180	0	-22000	26300	20.0	12000
515678	1201059767	29-MAR-2006 10:23	DONE	72	-0.18	percent	2180	0	-22000	26300	20.0	12000
514263	1201056524	29-MAR-2006 22:27	DUSE	1828	-0.03	percent	2180	0	-22000	26300	20.0	12000
515544	1201059407	01-APR-2006 09:22	DONE	193	-0.17	percent	2180	0	-22000	26300	20.0	12000
515266	1201058729	01-APR-2006 11:30	DONE	41	-0.18	percent	2180	0	-22000	26300	20.0	12000
517718	1201064216	06-APR-2006 13:23	DONE	200	-0.16	percent	2180	0	-22000	26300	20.0	12000
517136	1201062872	07-APR-2006 07:28	DUSE	75400	6.1	percent	2180	0	-22000	26300	20.0	12000
518887	1201066849	12-APR-2006 19:27	DUSE	116	-0.17	percent	2180	0	-22000	26300	20.0	12000
519427	1201067982	14-APR-2006 14:34	DONE	13	-0.18	percent	2180	0	-22000	26300	20.0	12000
519439	1201068032	18-APR-2006 12:58	DUSE	12	-0.18	percent	2180	0	-22000	26300	20.0	12000
520797	1201071137	19-APR-2006 14:45	DUSE	3	-0.18	percent	2180	0	-22000	26300	20.0	12000
521038	1201071720	19-APR-2006 14:47	DONE	684	-0.12	percent	2180	0	-22000	26300	20.0	12000
520798	1201071141	20-APR-2006 07:49	DONE	64	-0.18	percent	2180	0	-22000	26300	20.0	12000
521959	1201074064	20-APR-2006 21:36	DONE	212	-0.16	percent	2180	0	-22000	26300	20.0	12000
521959	1201074155	20-APR-2006 21:36	DONE	112	-0.17	percent	2180	0	-22000	26300	20.0	12000
521075	1201071845	20-APR-2006 21:36	DUSE	3168	0.08	percent	2180	0	-22000	26300	20.0	12000

**Thorium-232 LCS: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
506508	1201038991	25-FEB-2006 18:04	DONE	107	0.84	percent	100	75.0	83.3	117	125	8.33
502229	1201029181	25-FEB-2006 18:05	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
505996	1201037774	25-FEB-2006 18:05	DONE	99	-0.11	percent	100	75.0	83.3	117	125	8.33
505996	1201037775	25-FEB-2006 18:05	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33

506001	1201037788	27-FEB-2006 08:26	DONE	80	-2	percent	100	75.0	83.3	117	125	8.33
506001	1201037789	27-FEB-2006 08:26	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
504486	1201034206	28-FEB-2006 15:46	DONE	93	-0.79	percent	100	75.0	83.3	117	125	8.33
504484	1201034200	28-FEB-2006 15:47	DUSE	124	2.9	percent	100	75.0	83.3	117	125	8.33
507036	1201040184	01-MAR-2006 20:40	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
506015	1201037823	02-MAR-2006 07:38	DONE	98	-0.26	percent	100	75.0	83.3	117	125	8.33
504514	1201034273	02-MAR-2006 12:09	DONE	122	2.6	percent	100	75.0	83.3	117	125	8.33
507398	1201041207	04-MAR-2006 12:45	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
508121	1201042936	04-MAR-2006 13:40	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
507079	1201040315	05-MAR-2006 08:42	DONE	86	-2	percent	100	75.0	83.3	117	125	8.33
506064	1201037942	06-MAR-2006 08:00	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
506047	1201037916	07-MAR-2006 01:33	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
507094	1201040360	07-MAR-2006 01:33	DONE	85	-2	percent	100	75.0	83.3	117	125	8.33
507087	1201040342	07-MAR-2006 14:56	DONE	78	-3	percent	100	75.0	83.3	117	125	8.33
507401	1201041215	07-MAR-2006 23:35	DONE	98	-0.29	percent	100	75.0	83.3	117	125	8.33
509118	1201045261	11-MAR-2006 09:34	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33
509840	1201046803	11-MAR-2006 14:29	DONE	101	0.15	percent	100	75.0	83.3	117	125	8.33
509796	1201046678	15-MAR-2006 12:44	DONE	99	-0.12	percent	100	75.0	83.3	117	125	8.33
510660	1201048677	16-MAR-2006 10:10	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
511207	1201049873	18-MAR-2006 12:05	DONE	96	-0.43	percent	100	75.0	83.3	117	125	8.33
511549	1201050716	20-MAR-2006 07:43	DONE	92	-1	percent	100	75.0	83.3	117	125	8.33
511986	1201051681	23-MAR-2006 08:32	DONE	123	2.8	percent	100	75.0	83.3	117	125	8.33
512003	1201051721	24-MAR-2006 07:55	DONE	92	-0.97	percent	100	75.0	83.3	117	125	8.33
512010	1201051738	24-MAR-2006 08:00	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
512008	1201051730	27-MAR-2006 09:42	DUSE	103	0.36	percent	100	75.0	83.3	117	125	8.33
512781	1201053535	28-MAR-2006 07:34	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
515678	1201059769	29-MAR-2006 10:23	DONE	94	-0.76	percent	100	75.0	83.3	117	125	8.33
515266	1201058731	01-APR-2006 11:31	DONE	94	-0.72	percent	100	75.0	83.3	117	125	8.33
515544	1201059409	01-APR-2006 11:47	DONE	120	2.4	percent	100	75.0	83.3	117	125	8.33
517716	1201064210	12-APR-2006 12:14	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
517716	1201064211	12-APR-2006 12:14	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
519427	1201067984	14-APR-2006 14:35	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
518909	1201066927	16-APR-2006 08:06	DONE	88	-1	percent	100	75.0	83.3	117	125	8.33
521038	1201071722	19-APR-2006 14:47	DONE	119	2.3	percent	100	75.0	83.3	117	125	8.33
521959	1201074066	20-APR-2006 21:36	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33

**Thorium-232 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
506015	1201037822	02-MAR-2006 07:38	DONE	0.66	00	num	0.66	0	-0.383	1.69	3.00	0.52
504514	1201034272	02-MAR-2006 12:09	DONE	0	-1	num	0.66	0	-0.383	1.69	3.00	0.52
507398	1201041205	03-MAR-2006 22:26	DONE	0.92	0.5	num	0.66	0	-0.383	1.69	3.00	0.52
507079	1201040313	04-MAR-2006 21:34	DONE	0.24	-0.81	num	0.66	0	-0.383	1.69	3.00	0.52
506064	1201037941	06-MAR-2006 08:00	DONE	1.52	1.7	num	0.66	0	-0.383	1.69	3.00	0.52
508121	1201042934	06-MAR-2006 16:33	DONE	1.3	1.2	num	0.66	0	-0.383	1.69	3.00	0.52
506047	1201037915	07-MAR-2006 01:33	DONE	0.68	0.04	num	0.66	0	-0.383	1.69	3.00	0.52
507094	1201040359	07-MAR-2006 01:33	DONE	0.39	-0.51	num	0.66	0	-0.383	1.69	3.00	0.52
507087	1201040341	07-MAR-2006 14:56	DONE	0.16	-0.96	num	0.66	0	-0.383	1.69	3.00	0.52
507401	1201041213	07-MAR-2006 23:35	DONE	1.21	1.1	num	0.66	0	-0.383	1.69	3.00	0.52
509582	1201046245	08-MAR-2006 08:59	DONE	0.64	-0.02	num	0.66	0	-0.383	1.69	3.00	0.52
509840	1201046801	10-MAR-2006 11:48	DONE	00	-1	num	0.66	0	-0.383	1.69	3.00	0.52

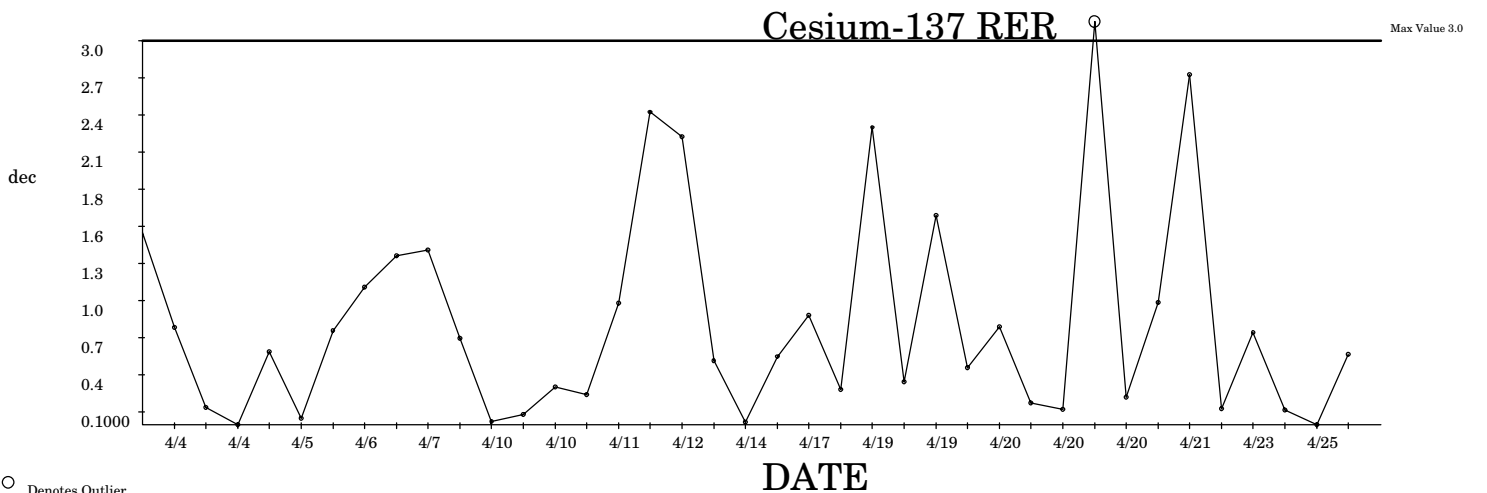
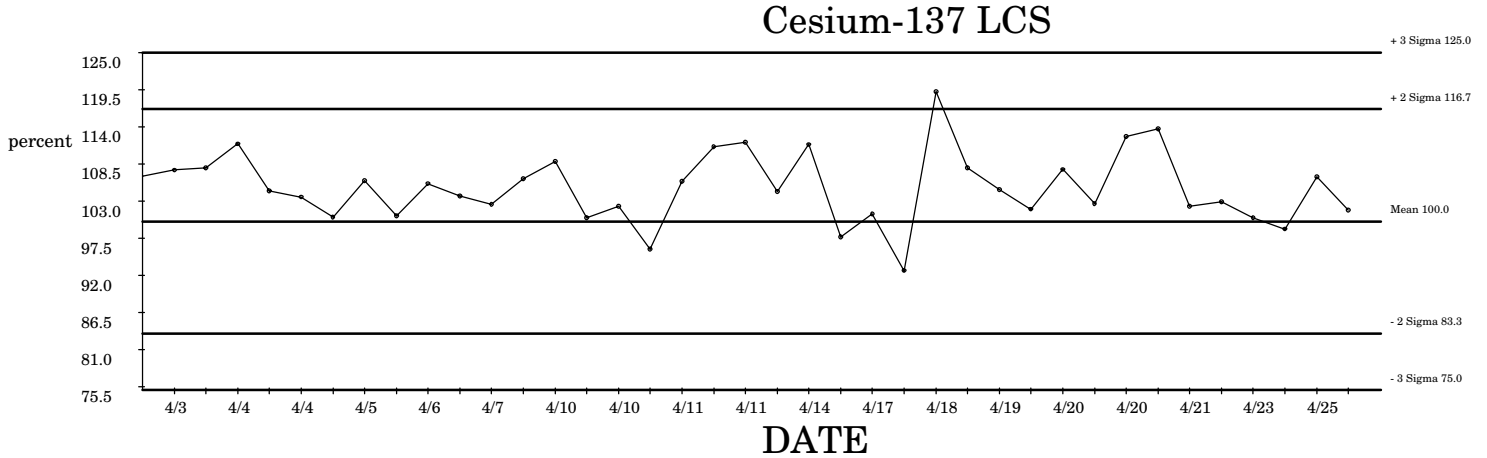
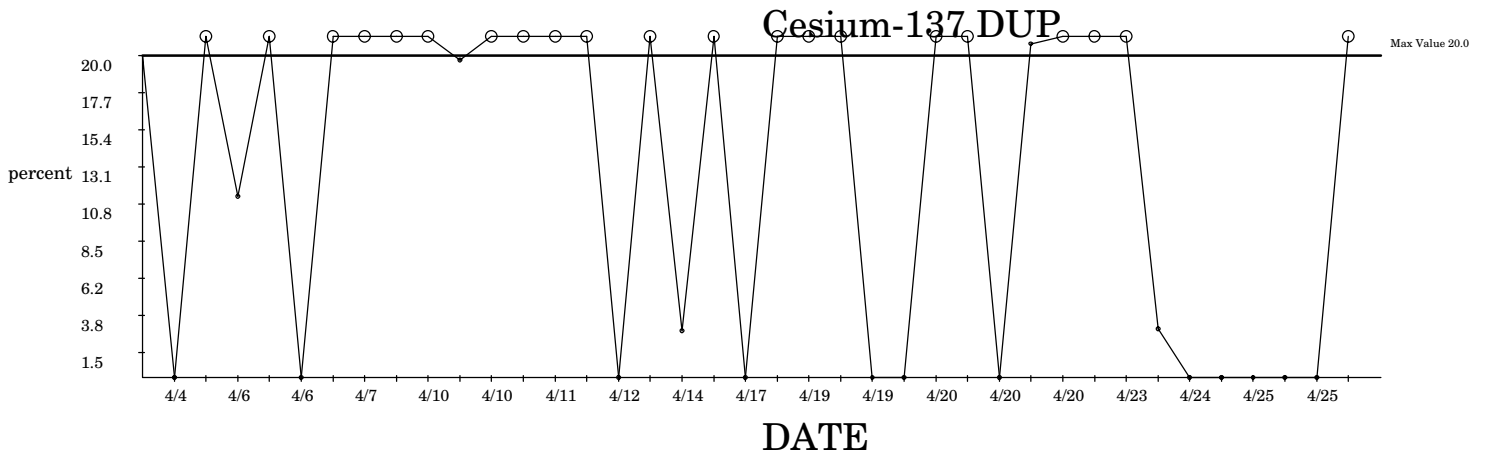
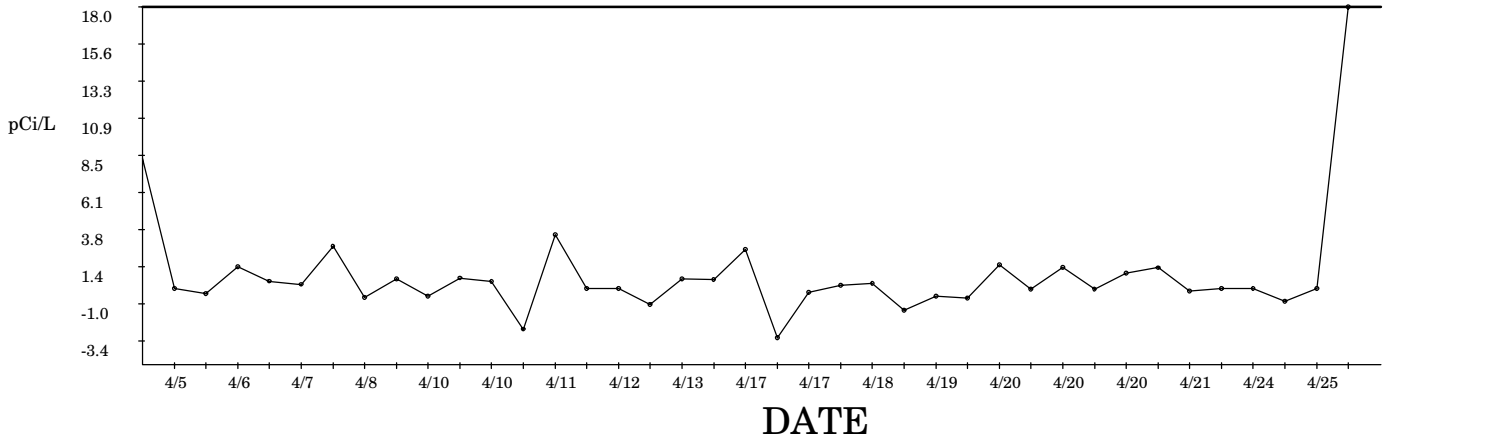
509118	1201045259	11-MAR-2006 09:34	DONE	0.26	-0.76	num	0.66	0	-0.383	1.69	3.00	0.52
511062	1201049579	14-MAR-2006 17:18	DUSE	0.15	-0.97	num	0.66	0	-0.383	1.69	3.00	0.52
509796	1201046676	14-MAR-2006 17:43	DONE	0.75	0.18	num	0.66	0	-0.383	1.69	3.00	0.52
510660	1201048676	15-MAR-2006 10:56	DONE	0.45	-0.39	num	0.66	0	-0.383	1.69	3.00	0.52
511207	1201049871	18-MAR-2006 12:05	DONE	0.49	-0.33	num	0.66	0	-0.383	1.69	3.00	0.52
512010	1201051736	22-MAR-2006 20:59	DONE	0.61	-0.09	num	0.66	0	-0.383	1.69	3.00	0.52
511986	1201051679	23-MAR-2006 08:32	DONE	0.21	-0.86	num	0.66	0	-0.383	1.69	3.00	0.52
512003	1201051719	24-MAR-2006 08:00	DONE	1.22	1.1	num	0.66	0	-0.383	1.69	3.00	0.52
512008	1201051728	27-MAR-2006 18:58	DUSE	0.33	-0.63	num	0.66	0	-0.383	1.69	3.00	0.52
512781	1201053533	28-MAR-2006 07:34	DONE	1.92	2.4	num	0.66	0	-0.383	1.69	3.00	0.52
511549	1201050714	28-MAR-2006 11:48	DONE	0.6	-0.11	num	0.66	0	-0.383	1.69	3.00	0.52
515678	1201059767	29-MAR-2006 10:23	DONE	0.63	-0.05	num	0.66	0	-0.383	1.69	3.00	0.52
514263	1201056524	29-MAR-2006 22:27	DUSE	0.87	0.41	num	0.66	0	-0.383	1.69	3.00	0.52
515544	1201059407	01-APR-2006 09:22	DONE	0.87	0.42	num	0.66	0	-0.383	1.69	3.00	0.52
515266	1201058729	01-APR-2006 11:30	DONE	0.28	-0.71	num	0.66	0	-0.383	1.69	3.00	0.52
517718	1201064216	06-APR-2006 13:23	DONE	0.02	-1	num	0.66	0	-0.383	1.69	3.00	0.52
517136	1201062872	07-APR-2006 07:28	DUSE	1.97	2.5	num	0.66	0	-0.383	1.69	3.00	0.52
518887	1201066849	12-APR-2006 19:27	DUSE	0.87	0.42	num	0.66	0	-0.383	1.69	3.00	0.52
519427	1201067982	14-APR-2006 14:34	DONE	0.21	-0.86	num	0.66	0	-0.383	1.69	3.00	0.52
518909	1201066926	16-APR-2006 08:06	DONE	1.01	0.68	num	0.66	0	-0.383	1.69	3.00	0.52
519439	1201068032	18-APR-2006 12:58	DUSE	0.05	-1	num	0.66	0	-0.383	1.69	3.00	0.52
520797	1201071137	19-APR-2006 14:45	DUSE	0.01	-1	num	0.66	0	-0.383	1.69	3.00	0.52
521038	1201071720	19-APR-2006 14:47	DONE	1.19	1	num	0.66	0	-0.383	1.69	3.00	0.52
520798	1201071141	20-APR-2006 07:49	DONE	0.47	-0.36	num	0.66	0	-0.383	1.69	3.00	0.52
521959	1201074064	20-APR-2006 21:36	DONE	0.39	-0.51	num	0.66	0	-0.383	1.69	3.00	0.52
521959	1201074155	20-APR-2006 21:36	DONE	0.52	-0.27	num	0.66	0	-0.383	1.69	3.00	0.52
521075	1201071845	20-APR-2006 21:36	DUSE	1.51	1.6	num	0.66	0	-0.383	1.69	3.00	0.52

**Thorium-232 SPIKE: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
491004	1201003363	09-JAN-2006 18:55	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
491923	1201005543	11-JAN-2006 12:43	DONE	85	-2	percent	100	75.0	83.3	117	125	8.33
491189	1201003738	12-JAN-2006 18:04	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
494226	1201010637	16-JAN-2006 16:49	DONE	87	-2	percent	100	75.0	83.3	117	125	8.33
494966	1201012326	19-JAN-2006 12:40	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
494595	1201011443	19-JAN-2006 12:40	DONE	123	2.8	percent	100	75.0	83.3	117	125	8.33
495880	1201014377	21-JAN-2006 10:02	DONE	82	-2	percent	100	75.0	83.3	117	125	8.33
496372	1201015511	24-JAN-2006 08:37	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
494599	1201011459	26-JAN-2006 14:49	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
497833	1201018880	28-JAN-2006 13:16	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
498151	1201019511	04-FEB-2006 07:58	DONE	125	3	percent	100	75.0	83.3	117	125	8.33
497915	1201019037	04-FEB-2006 12:32	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
500802	1201025782	10-FEB-2006 17:25	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
500664	1201025410	12-FEB-2006 08:45	DONE	89	-1	percent	100	75.0	83.3	117	125	8.33
504422	1201034010	22-FEB-2006 09:56	DONE	90	-1	percent	100	75.0	83.3	117	125	8.33
502229	1201029180	22-FEB-2006 23:48	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
505915	1201037584	25-FEB-2006 18:04	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
504484	1201034199	28-FEB-2006 15:47	DUSE	104	0.48	percent	100	75.0	83.3	117	125	8.33
507398	1201041206	03-MAR-2006 22:26	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
508121	1201042935	04-MAR-2006 13:40	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33

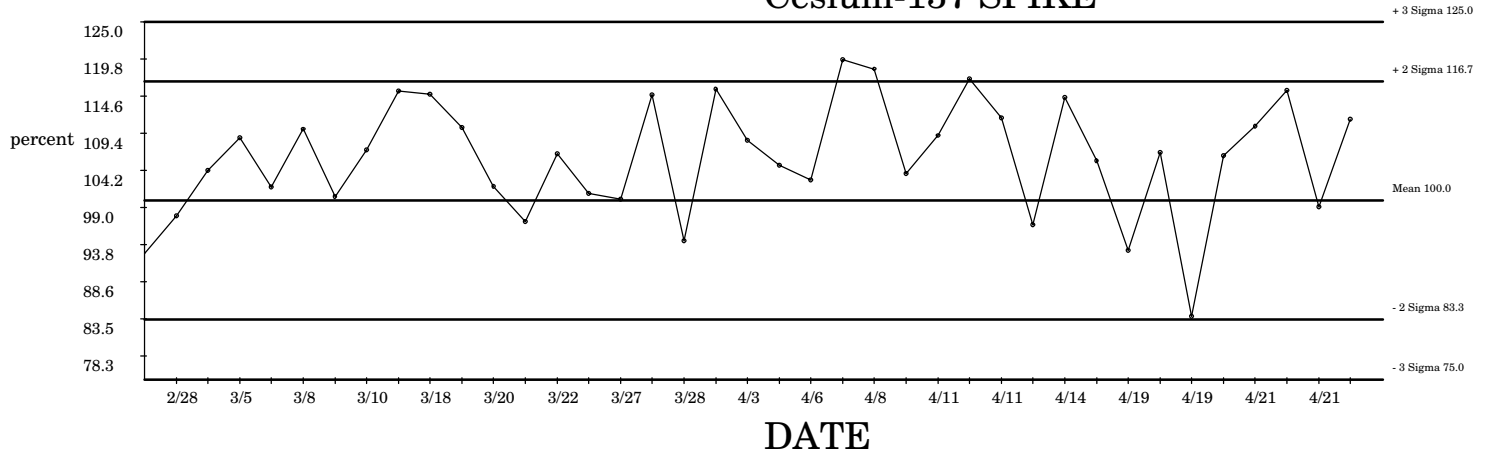
507079	1201040314	04-MAR-2006 21:34	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
507401	1201041214	07-MAR-2006 23:35	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
509840	1201046802	10-MAR-2006 11:48	DONE	116	2	percent	100	75.0	83.3	117	125	8.33
509118	1201045260	11-MAR-2006 09:34	DONE	78	-3	percent	100	75.0	83.3	117	125	8.33
509796	1201046677	14-MAR-2006 17:43	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
511207	1201049872	18-MAR-2006 12:05	DONE	103	0.36	percent	100	75.0	83.3	117	125	8.33
511549	1201050715	20-MAR-2006 07:43	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
512010	1201051737	22-MAR-2006 20:59	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
511986	1201051680	23-MAR-2006 08:32	DONE	86	-2	percent	100	75.0	83.3	117	125	8.33
512003	1201051720	25-MAR-2006 10:35	DONE	95	-0.61	percent	100	75.0	83.3	117	125	8.33
512781	1201053534	28-MAR-2006 07:34	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
515678	1201059768	29-MAR-2006 10:23	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
515544	1201059408	01-APR-2006 09:22	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
515266	1201058730	01-APR-2006 11:31	DONE	96	-0.52	percent	100	75.0	83.3	117	125	8.33
519427	1201067983	14-APR-2006 14:35	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
521038	1201071721	20-APR-2006 12:32	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
521959	1201074065	20-APR-2006 21:36	DONE	97	-0.35	percent	100	75.0	83.3	117	125	8.33
521959	1201074157	20-APR-2006 21:36	DONE	107	0.82	percent	100	75.0	83.3	117	125	8.33
521959	1201074158	20-APR-2006 21:36	DONE	100	00	percent	100	75.0	83.3	117	125	8.33

# SPC Graph for Gamma Spec inLiquid 4/25/2006 Cesium-137 BLANK



○ Denotes Outlier

# SPC Graph for Gamma Spec inLiquid 4/25/2006 Cesium-137 SPIKE



○ Denotes Outlier

# Data used for Gamma Spec inLiquid 26-APR-2006

Americium-241 LCS: Limits LCL = 75 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
511298	1201050112	03-APR-2006 22:07	DONE	90.7	-1	percent	100	75.0	83.3	117	125	8.33
512870	1201053698	03-APR-2006 23:54	DUSE	104	0.47	percent	100	75.0	83.3	117	125	8.33
511297	1201050109	04-APR-2006 06:47	DONE	108	0.94	percent	100	75.0	83.3	117	125	8.33
516974	1201062509	04-APR-2006 07:59	DONE	94.4	-0.67	percent	100	75.0	83.3	117	125	8.33
516284	1201061022	04-APR-2006 10:09	DUSE	90.8	-1	percent	100	75.0	83.3	117	125	8.33
516477	1201061403	04-APR-2006 11:44	DONE	95.9	-0.49	percent	100	75.0	83.3	117	125	8.33
516727	1201061913	04-APR-2006 21:44	DONE	91.8	-0.98	percent	100	75.0	83.3	117	125	8.33
511296	1201050106	05-APR-2006 19:38	DONE	104	0.52	percent	100	75.0	83.3	117	125	8.33
515679	1201059782	06-APR-2006 21:11	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
516333	1201061132	06-APR-2006 22:33	DONE	103	0.31	percent	100	75.0	83.3	117	125	8.33
516981	1201062535	07-APR-2006 13:55	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
516331	1201061128	07-APR-2006 16:56	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
517019	1201062620	08-APR-2006 17:13	DONE	106	0.71	percent	100	75.0	83.3	117	125	8.33
516976	1201062516	10-APR-2006 08:10	DONE	106	0.76	percent	100	75.0	83.3	117	125	8.33
517034	1201062660	10-APR-2006 20:35	DONE	98.7	-0.16	percent	100	75.0	83.3	117	125	8.33
516982	1201062538	10-APR-2006 21:32	DONE	88.8	-1	percent	100	75.0	83.3	117	125	8.33
517023	1201062632	10-APR-2006 22:38	DONE	93.4	-0.79	percent	100	75.0	83.3	117	125	8.33
517024	1201062641	11-APR-2006 06:58	DONE	106	0.68	percent	100	75.0	83.3	117	125	8.33
519523	1201068262	11-APR-2006 10:58	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33
519011	1201067124	11-APR-2006 22:38	DUSE	107	0.83	percent	100	75.0	83.3	117	125	8.33
516978	1201062524	14-APR-2006 06:31	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
516977	1201062520	14-APR-2006 10:17	DONE	96.4	-0.43	percent	100	75.0	83.3	117	125	8.33
520998	1201071625	17-APR-2006 19:03	DONE	101	0.13	percent	100	75.0	83.3	117	125	8.33
517253	1201063139	17-APR-2006 22:49	DONE	93.9	-0.73	percent	100	75.0	83.3	117	125	8.33
520996	1201071617	18-APR-2006 05:54	DONE	91.9	-0.97	percent	100	75.0	83.3	117	125	8.33
520754	1201071041	18-APR-2006 19:10	DUSE	113	1.6	percent	100	75.0	83.3	117	125	8.33
516979	1201062528	19-APR-2006 13:02	DONE	117	2	percent	100	75.0	83.3	117	125	8.33
516657	1201061779	19-APR-2006 18:10	DUSE	110	1.1	percent	100	75.0	83.3	117	125	8.33
516980	1201062532	19-APR-2006 22:50	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
521937	1201074024	20-APR-2006 06:04	DUSE	110	1.2	percent	100	75.0	83.3	117	125	8.33
519545	1201068320	20-APR-2006 09:41	DONE	88.3	-1	percent	100	75.0	83.3	117	125	8.33
517257	1201063155	20-APR-2006 12:11	DONE	98.4	-0.19	percent	100	75.0	83.3	117	125	8.33
519535	1201068291	21-APR-2006 06:15	DONE	92.2	-0.93	percent	100	75.0	83.3	117	125	8.33
517255	1201063147	21-APR-2006 07:39	DONE	108	0.9	percent	100	75.0	83.3	117	125	8.33
519516	1201068251	21-APR-2006 09:58	DONE	97.3	-0.32	percent	100	75.0	83.3	117	125	8.33
522386	1201075056	23-APR-2006 21:45	DONE	96.4	-0.44	percent	100	75.0	83.3	117	125	8.33
523018	1201076449	24-APR-2006 05:38	DONE	92.7	-0.88	percent	100	75.0	83.3	117	125	8.33



523017	1201076445	25-APR-2006 06:13	DONE	118	2.1	percent	100	75.0	83.3	117	125	8.33
519510	1201068238	26-APR-2006 05:24	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33

**Americium-241 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
511295	1201050102	03-APR-2006 05:16	DONE	0.59	-0.31	dec	1.37	0	-3.7	6.45	3.00	2.54
515677	1201059771	03-APR-2006 10:09	DUSE	1.06	-0.12	dec	1.37	0	-3.7	6.45	3.00	2.54
511297	1201050108	04-APR-2006 05:50	DONE	1.15	-0.09	dec	1.37	0	-3.7	6.45	3.00	2.54
516974	1201062507	04-APR-2006 11:01	DONE	1.03	-0.13	dec	1.37	0	-3.7	6.45	3.00	2.54
512870	1201053697	04-APR-2006 12:02	DUSE	0.49	-0.35	dec	1.37	0	-3.7	6.45	3.00	2.54
516477	1201061402	04-APR-2006 12:18	DONE	0.97	-0.16	dec	1.37	0	-3.7	6.45	3.00	2.54
516284	1201061021	04-APR-2006 17:27	DUSE	0.07	-0.51	dec	1.37	0	-3.7	6.45	3.00	2.54
511296	1201050105	05-APR-2006 18:16	DUSE	0.6	-0.3	dec	1.37	0	-3.7	6.45	3.00	2.54
515679	1201059780	06-APR-2006 11:54	DONE	0.08	-0.51	dec	1.37	0	-3.7	6.45	3.00	2.54
516981	1201062534	06-APR-2006 23:55	DONE	0.18	-0.47	dec	1.37	0	-3.7	6.45	3.00	2.54
516976	1201062514	07-APR-2006 11:18	DONE	0.8	-0.22	dec	1.37	0	-3.7	6.45	3.00	2.54
516333	1201061130	07-APR-2006 16:54	DONE	1.47	0.04	dec	1.37	0	-3.7	6.45	3.00	2.54
517034	1201062659	10-APR-2006 18:58	DONE	11.8	4.1	dec	1.37	0	-3.7	6.45	3.00	2.54
517023	1201062631	10-APR-2006 19:02	DONE	1.24	-0.05	dec	1.37	0	-3.7	6.45	3.00	2.54
517019	1201062618	10-APR-2006 19:13	DUSE	0.34	-0.41	dec	1.37	0	-3.7	6.45	3.00	2.54
516982	1201062537	10-APR-2006 21:49	DONE	0.81	-0.22	dec	1.37	0	-3.7	6.45	3.00	2.54
517024	1201062639	11-APR-2006 10:13	DONE	0.46	-0.36	dec	1.37	0	-3.7	6.45	3.00	2.54
519523	1201068260	11-APR-2006 10:15	DONE	0.89	-0.19	dec	1.37	0	-3.7	6.45	3.00	2.54
516331	1201061126	12-APR-2006 13:16	DONE	0.02	-0.53	dec	1.37	0	-3.7	6.45	3.00	2.54
516977	1201062518	13-APR-2006 21:04	DONE	2.14	0.31	dec	1.37	0	-3.7	6.45	3.00	2.54
516978	1201062522	14-APR-2006 06:30	DONE	0.92	-0.18	dec	1.37	0	-3.7	6.45	3.00	2.54
517253	1201063138	17-APR-2006 11:51	DONE	0.96	-0.16	dec	1.37	0	-3.7	6.45	3.00	2.54
520754	1201071040	17-APR-2006 23:56	DUSE	0.03	-0.52	dec	1.37	0	-3.7	6.45	3.00	2.54
520996	1201071615	18-APR-2006 05:53	DONE	1.28	-0.03	dec	1.37	0	-3.7	6.45	3.00	2.54
520998	1201071623	19-APR-2006 06:01	DONE	12	4.2	dec	1.37	0	-3.7	6.45	3.00	2.54
516979	1201062526	19-APR-2006 07:25	DONE	0.76	-0.24	dec	1.37	0	-3.7	6.45	3.00	2.54
516657	1201061778	19-APR-2006 17:52	DUSE	2.12	0.3	dec	1.37	0	-3.7	6.45	3.00	2.54
516980	1201062530	19-APR-2006 23:19	DONE	0.33	-0.41	dec	1.37	0	-3.7	6.45	3.00	2.54
521937	1201074023	20-APR-2006 06:04	DUSE	0.38	-0.39	dec	1.37	0	-3.7	6.45	3.00	2.54
517257	1201063153	20-APR-2006 10:21	DONE	0.21	-0.45	dec	1.37	0	-3.7	6.45	3.00	2.54
519545	1201068318	20-APR-2006 15:32	DONE	0.49	-0.35	dec	1.37	0	-3.7	6.45	3.00	2.54
519011	1201067123	20-APR-2006 23:49	DUSE	0.39	-0.39	dec	1.37	0	-3.7	6.45	3.00	2.54
517255	1201063145	20-APR-2006 23:50	DONE	0.13	-0.49	dec	1.37	0	-3.7	6.45	3.00	2.54
519535	1201068296	20-APR-2006 23:55	DUSE	1.46	0.04	dec	1.37	0	-3.7	6.45	3.00	2.54
519516	1201068249	21-APR-2006 09:09	DONE	1.37	-0	dec	1.37	0	-3.7	6.45	3.00	2.54
522386	1201075055	23-APR-2006 23:51	DUSE	1.09	-0.11	dec	1.37	0	-3.7	6.45	3.00	2.54
523018	1201076447	23-APR-2006 23:56	DONE	1.06	-0.12	dec	1.37	0	-3.7	6.45	3.00	2.54

523017	1201076444	25-APR-2006 06:13	DUSE	1.94	0.23	dec	1.37	0	-3.7	6.45	3.00	2.54
519510	1201068237	26-APR-2006 05:28	DUSE	0.22	-0.45	dec	1.37	0	-3.7	6.45	3.00	2.54

**Americium-241 SPIKE: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
503740	1201032437	27-FEB-2006 06:22	DONE	101	0.08	percent	100	75.0	83.3	117	125	8.33
506274	1201038473	28-FEB-2006 09:00	DONE	95.9	-0.49	percent	100	75.0	83.3	117	125	8.33
506282	1201038480	03-MAR-2006 11:15	DONE	100	0.05	percent	100	75.0	83.3	117	125	8.33
507258	1201040767	05-MAR-2006 19:50	DONE	93.9	-0.74	percent	100	75.0	83.3	117	125	8.33
507638	1201041726	07-MAR-2006 10:55	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
508355	1201043465	08-MAR-2006 11:21	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
507632	1201041716	10-MAR-2006 10:00	DONE	106	0.71	percent	100	75.0	83.3	117	125	8.33
510364	1201048016	10-MAR-2006 17:46	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
507647	1201041742	11-MAR-2006 15:34	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
507649	1201041746	18-MAR-2006 13:45	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33
507650	1201041750	18-MAR-2006 13:46	DONE	104	0.53	percent	100	75.0	83.3	117	125	8.33
507640	1201041730	20-MAR-2006 18:44	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33
512038	1201051800	21-MAR-2006 11:50	DONE	99.3	-0.08	percent	100	75.0	83.3	117	125	8.33
508908	1201044773	22-MAR-2006 17:05	DONE	118	2.2	percent	100	75.0	83.3	117	125	8.33
507641	1201041734	23-MAR-2006 09:11	DONE	95.2	-0.58	percent	100	75.0	83.3	117	125	8.33
510369	1201048027	27-MAR-2006 06:50	DONE	102	0.18	percent	100	75.0	83.3	117	125	8.33
508910	1201044781	27-MAR-2006 19:42	DONE	103	0.36	percent	100	75.0	83.3	117	125	8.33
511246	1201049992	28-MAR-2006 11:43	DONE	106	0.76	percent	100	75.0	83.3	117	125	8.33
508909	1201044777	29-MAR-2006 08:15	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
507644	1201041738	03-APR-2006 12:47	DONE	107	0.81	percent	100	75.0	83.3	117	125	8.33
516974	1201062508	04-APR-2006 09:02	DONE	98.4	-0.19	percent	100	75.0	83.3	117	125	8.33
515679	1201059781	06-APR-2006 21:11	DONE	104	0.52	percent	100	75.0	83.3	117	125	8.33
516333	1201061131	06-APR-2006 22:34	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
517019	1201062619	08-APR-2006 18:42	DONE	105	0.56	percent	100	75.0	83.3	117	125	8.33
516976	1201062515	10-APR-2006 06:39	DONE	99.1	-0.11	percent	100	75.0	83.3	117	125	8.33
517024	1201062640	11-APR-2006 05:39	DONE	89.0	-1	percent	100	75.0	83.3	117	125	8.33
519523	1201068261	11-APR-2006 08:15	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
516331	1201061127	11-APR-2006 12:05	DONE	118	2.1	percent	100	75.0	83.3	117	125	8.33
516977	1201062519	13-APR-2006 21:04	DONE	107	0.82	percent	100	75.0	83.3	117	125	8.33
516978	1201062523	14-APR-2006 06:30	DONE	108	0.98	percent	100	75.0	83.3	117	125	8.33
520996	1201071616	18-APR-2006 05:54	DONE	105	0.61	percent	100	75.0	83.3	117	125	8.33
520998	1201071624	19-APR-2006 06:01	DONE	468	44	percent	100	75.0	83.3	117	125	8.33
516979	1201062527	19-APR-2006 07:26	DONE	121	2.5	percent	100	75.0	83.3	117	125	8.33
516980	1201062531	19-APR-2006 11:25	DONE	103	0.36	percent	100	75.0	83.3	117	125	8.33
517255	1201063146	21-APR-2006 06:23	DONE	103	0.37	percent	100	75.0	83.3	117	125	8.33
519516	1201068250	21-APR-2006 09:10	DONE	103	0.3	percent	100	75.0	83.3	117	125	8.33

517257	1201063154	21-APR-2006 12:55	DONE	99.1	-0.11	percent	100	75.0	83.3	117	125	8.33
519535	1201068297	21-APR-2006 13:59	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
523018	1201076448	21-APR-2006 20:25	DONE	96.7	-0.39	percent	100	75.0	83.3	117	125	8.33

**Cesium-137 BLANK: Limits LCL = -9.2 UCL = 10.2**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
516727	1201061912	04-APR-2006 21:43	DUSE	-4.9	-2	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
508904	1201044759	05-APR-2006 10:31	DUSE	0	-0.16	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
511296	1201050104	05-APR-2006 18:15	DONE	-0.309	-0.26	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516981	1201062533	06-APR-2006 16:41	DONE	1.39	0.27	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
515679	1201059779	06-APR-2006 20:00	DONE	0.47	-0.02	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516333	1201061129	07-APR-2006 16:54	DONE	0.27	-0.08	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516331	1201061125	07-APR-2006 16:55	DONE	2.7	0.67	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
517023	1201062630	08-APR-2006 01:11	DONE	-0.56	-0.34	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
517019	1201062617	08-APR-2006 17:58	DONE	0.62	0.03	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
517034	1201062658	10-APR-2006 14:44	DONE	-0.471	-0.31	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516976	1201062513	10-APR-2006 15:40	DONE	0.67	0.04	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516982	1201062536	10-APR-2006 19:45	DONE	0.45	-0.02	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
517024	1201062638	10-APR-2006 23:56	DONE	-2.6	-0.97	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
519523	1201068259	11-APR-2006 06:19	DONE	3.46	0.91	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
512920	1201053810	11-APR-2006 17:05	DUSE	0	-0.16	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
513067	1201054116	12-APR-2006 12:55	DUSE	0	-0.16	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516977	1201062517	13-APR-2006 12:23	DONE	-1	-0.48	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516978	1201062521	13-APR-2006 23:22	DONE	0.6	0.02	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
520998	1201071622	16-APR-2006 20:07	DONE	0.58	0.01	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
517253	1201063137	17-APR-2006 19:16	DONE	2.52	0.61	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
520996	1201071614	17-APR-2006 23:10	DONE	-3.2	-1	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
520754	1201071039	17-APR-2006 23:45	DONE	-0.253	-0.24	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
519011	1201067122	18-APR-2006 19:02	DONE	0.19	-0.1	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516657	1201061777	18-APR-2006 19:37	DONE	0.32	-0.06	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516979	1201062525	19-APR-2006 11:15	DONE	-1.4	-0.6	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516980	1201062529	19-APR-2006 22:49	DONE	-0.499	-0.32	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
521937	1201074022	20-APR-2006 06:03	DONE	-0.61	-0.35	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
517257	1201063152	20-APR-2006 10:17	DONE	1.53	0.31	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
519545	1201068317	20-APR-2006 12:30	DONE	-0.03	-0.17	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
517255	1201063144	20-APR-2006 17:02	DONE	1.35	0.25	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
519535	1201068288	20-APR-2006 21:41	DONE	-0.02	-0.17	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
519516	1201068248	20-APR-2006 23:48	DONE	0.98	0.14	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
523018	1201076446	21-APR-2006 17:26	DONE	1.33	0.25	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
522386	1201075054	21-APR-2006 23:16	DONE	-0.16	-0.21	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
515884	1201060218	23-APR-2006 17:45	DUSE	0	-0.16	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
516457	1201061353	24-APR-2006 17:09	DUSE	0	-0.16	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23

523017	1201076443	24-APR-2006 23:31	DUSE	-0.822	-0.42	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
517021	1201062624	25-APR-2006 09:46	DONE	0	-0.16	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23
519510	1201068236	25-APR-2006 18:43	DUSE	18	5.4	pCi/L	0.53	-9.2	-5.9	6.99	10.2	3.23

**Cesium-137 DUP: Limits LCL = 0 UCL = 20**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
510984	1201049365	04-APR-2006 17:17	DONE	0	-0.46	percent	166	0	-560	889	20.0	362
516284	1201061021	04-APR-2006 17:27	DONE	0	-0.46	percent	166	0	-560	889	20.0	362
511296	1201050105	05-APR-2006 18:16	DONE	36	-0.36	percent	166	0	-560	889	20.0	362
515679	1201059780	06-APR-2006 11:54	DONE	11.3	-0.43	percent	166	0	-560	889	20.0	362
516981	1201062534	06-APR-2006 23:55	DONE	786	1.7	percent	166	0	-560	889	20.0	362
508904	1201044760	06-APR-2006 23:56	DUSE	0	-0.46	percent	166	0	-560	889	20.0	362
516976	1201062514	07-APR-2006 11:18	DONE	162	-0.01	percent	166	0	-560	889	20.0	362
516333	1201061130	07-APR-2006 16:54	DONE	126	-0.11	percent	166	0	-560	889	20.0	362
517034	1201062659	10-APR-2006 18:58	DONE	64.3	-0.28	percent	166	0	-560	889	20.0	362
517023	1201062631	10-APR-2006 19:02	DONE	24	-0.39	percent	166	0	-560	889	20.0	362
517019	1201062618	10-APR-2006 19:13	DONE	19.7	-0.4	percent	166	0	-560	889	20.0	362
516982	1201062537	10-APR-2006 21:49	DONE	135	-0.09	percent	166	0	-560	889	20.0	362
517024	1201062639	11-APR-2006 10:13	DONE	24.7	-0.39	percent	166	0	-560	889	20.0	362
519523	1201068260	11-APR-2006 10:15	DONE	110	-0.15	percent	166	0	-560	889	20.0	362
516331	1201061126	12-APR-2006 13:16	DONE	120	-0.13	percent	166	0	-560	889	20.0	362
513067	1201054117	12-APR-2006 16:58	DUSE	0	-0.46	percent	166	0	-560	889	20.0	362
516977	1201062518	13-APR-2006 21:04	DONE	59.9	-0.29	percent	166	0	-560	889	20.0	362
516978	1201062522	14-APR-2006 06:30	DONE	2.89	-0.45	percent	166	0	-560	889	20.0	362
517253	1201063138	17-APR-2006 11:51	DONE	1580	3.9	percent	166	0	-560	889	20.0	362
520754	1201071040	17-APR-2006 23:56	DONE	0	-0.46	percent	166	0	-560	889	20.0	362
520996	1201071615	18-APR-2006 05:53	DONE	65.6	-0.28	percent	166	0	-560	889	20.0	362
520998	1201071623	19-APR-2006 06:01	DONE	1520	3.8	percent	166	0	-560	889	20.0	362
516979	1201062526	19-APR-2006 07:25	DONE	48.4	-0.32	percent	166	0	-560	889	20.0	362
516657	1201061778	19-APR-2006 17:52	DONE	0	-0.46	percent	166	0	-560	889	20.0	362
521937	1201074023	20-APR-2006 06:04	DONE	0	-0.46	percent	166	0	-560	889	20.0	362
517257	1201063153	20-APR-2006 10:21	DONE	82	-0.23	percent	166	0	-560	889	20.0	362
519545	1201068318	20-APR-2006 15:32	DONE	180	0.04	percent	166	0	-560	889	20.0	362
519011	1201067123	20-APR-2006 23:49	DONE	0	-0.46	percent	166	0	-560	889	20.0	362
517255	1201063145	20-APR-2006 23:50	DONE	20.7	-0.4	percent	166	0	-560	889	20.0	362
519535	1201068296	20-APR-2006 23:55	DONE	279	0.31	percent	166	0	-560	889	20.0	362
519516	1201068249	21-APR-2006 09:09	DONE	425	0.72	percent	166	0	-560	889	20.0	362
522386	1201075055	23-APR-2006 23:51	DONE	114	-0.14	percent	166	0	-560	889	20.0	362
523018	1201076447	23-APR-2006 23:56	DONE	3	-0.45	percent	166	0	-560	889	20.0	362
515884	1201060219	24-APR-2006 05:36	DUSE	0	-0.46	percent	166	0	-560	889	20.0	362
516457	1201061354	24-APR-2006 19:50	DUSE	0	-0.46	percent	166	0	-560	889	20.0	362

516457	1201061354	25-APR-2006 09:11	DUSE	0	-0.46	percent	166	0	-560	889	20.0	362
517021	1201062625	25-APR-2006 09:46	DONE	0	-0.46	percent	166	0	-560	889	20.0	362
516457	1201061354	25-APR-2006 16:01	DUSE	0	-0.46	percent	166	0	-560	889	20.0	362
519510	1201068237	26-APR-2006 05:28	DUSE	459	0.81	percent	166	0	-560	889	20.0	362

**Cesium-137 LCS: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
511298	1201050112	03-APR-2006 22:07	DONE	93.3	-0.8	percent	100	75.0	83.3	117	125	8.33
512870	1201053698	03-APR-2006 23:54	DONE	108	0.91	percent	100	75.0	83.3	117	125	8.33
511297	1201050109	04-APR-2006 06:47	DONE	108	0.95	percent	100	75.0	83.3	117	125	8.33
516974	1201062509	04-APR-2006 07:59	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
516284	1201061022	04-APR-2006 10:09	DONE	105	0.54	percent	100	75.0	83.3	117	125	8.33
516477	1201061403	04-APR-2006 11:44	DONE	104	0.43	percent	100	75.0	83.3	117	125	8.33
516727	1201061913	04-APR-2006 21:44	DONE	101	0.07	percent	100	75.0	83.3	117	125	8.33
511296	1201050106	05-APR-2006 19:38	DONE	106	0.72	percent	100	75.0	83.3	117	125	8.33
515679	1201059782	06-APR-2006 21:11	DONE	101	0.1	percent	100	75.0	83.3	117	125	8.33
516333	1201061132	06-APR-2006 22:33	DONE	106	0.67	percent	100	75.0	83.3	117	125	8.33
516981	1201062535	07-APR-2006 13:55	DONE	104	0.45	percent	100	75.0	83.3	117	125	8.33
516331	1201061128	07-APR-2006 16:56	DONE	103	0.3	percent	100	75.0	83.3	117	125	8.33
517019	1201062620	08-APR-2006 17:13	DONE	106	0.76	percent	100	75.0	83.3	117	125	8.33
516976	1201062516	10-APR-2006 08:10	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
517034	1201062660	10-APR-2006 20:35	DONE	101	0.06	percent	100	75.0	83.3	117	125	8.33
516982	1201062538	10-APR-2006 21:32	DONE	102	0.27	percent	100	75.0	83.3	117	125	8.33
517023	1201062632	10-APR-2006 22:38	DONE	95.9	-0.49	percent	100	75.0	83.3	117	125	8.33
517024	1201062641	11-APR-2006 06:58	DONE	106	0.71	percent	100	75.0	83.3	117	125	8.33
519523	1201068262	11-APR-2006 10:58	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
519011	1201067124	11-APR-2006 22:38	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
516978	1201062524	14-APR-2006 06:31	DONE	104	0.53	percent	100	75.0	83.3	117	125	8.33
516977	1201062520	14-APR-2006 10:17	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
520998	1201071625	17-APR-2006 19:03	DONE	97.7	-0.28	percent	100	75.0	83.3	117	125	8.33
517253	1201063139	17-APR-2006 22:49	DONE	101	0.13	percent	100	75.0	83.3	117	125	8.33
520996	1201071617	18-APR-2006 05:54	DONE	92.7	-0.88	percent	100	75.0	83.3	117	125	8.33
520754	1201071041	18-APR-2006 19:10	DONE	119	2.3	percent	100	75.0	83.3	117	125	8.33
516979	1201062528	19-APR-2006 13:02	DONE	108	0.95	percent	100	75.0	83.3	117	125	8.33
516657	1201061779	19-APR-2006 18:10	DONE	105	0.56	percent	100	75.0	83.3	117	125	8.33
516980	1201062532	19-APR-2006 22:50	DONE	102	0.22	percent	100	75.0	83.3	117	125	8.33
521937	1201074024	20-APR-2006 06:04	DONE	108	0.92	percent	100	75.0	83.3	117	125	8.33
519545	1201068320	20-APR-2006 09:41	DONE	103	0.31	percent	100	75.0	83.3	117	125	8.33
517257	1201063155	20-APR-2006 12:11	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
519535	1201068291	21-APR-2006 06:15	DONE	114	1.6	percent	100	75.0	83.3	117	125	8.33
517255	1201063147	21-APR-2006 07:39	DONE	102	0.26	percent	100	75.0	83.3	117	125	8.33
519516	1201068251	21-APR-2006 09:58	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33

522386	1201075056	23-APR-2006 21:45	DONE	101	0.06	percent	100	75.0	83.3	117	125	8.33
523018	1201076449	24-APR-2006 05:38	DONE	98.9	-0.14	percent	100	75.0	83.3	117	125	8.33
523017	1201076445	25-APR-2006 06:13	DONE	107	0.79	percent	100	75.0	83.3	117	125	8.33
519510	1201068238	26-APR-2006 05:24	DONE	102	0.2	percent	100	75.0	83.3	117	125	8.33

**Cesium-137 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
516974	1201062507	04-APR-2006 11:01	DONE	1.5	0.47	dec	0.9	0	-1.6	3.45	3.00	1.27
512870	1201053697	04-APR-2006 12:02	DONE	0.76	-0.11	dec	0.9	0	-1.6	3.45	3.00	1.27
516477	1201061402	04-APR-2006 12:18	DONE	0.14	-0.6	dec	0.9	0	-1.6	3.45	3.00	1.27
510984	1201049365	04-APR-2006 17:17	DONE	0	-0.71	dec	0.9	0	-1.6	3.45	3.00	1.27
516284	1201061021	04-APR-2006 17:27	DONE	0.57	-0.26	dec	0.9	0	-1.6	3.45	3.00	1.27
511296	1201050105	05-APR-2006 18:16	DONE	0.05	-0.67	dec	0.9	0	-1.6	3.45	3.00	1.27
515679	1201059780	06-APR-2006 11:54	DONE	0.74	-0.13	dec	0.9	0	-1.6	3.45	3.00	1.27
516981	1201062534	06-APR-2006 23:55	DONE	1.08	0.14	dec	0.9	0	-1.6	3.45	3.00	1.27
516976	1201062514	07-APR-2006 11:18	DONE	1.32	0.33	dec	0.9	0	-1.6	3.45	3.00	1.27
516333	1201061130	07-APR-2006 16:54	DONE	1.37	0.37	dec	0.9	0	-1.6	3.45	3.00	1.27
517034	1201062659	10-APR-2006 18:58	DONE	0.67	-0.18	dec	0.9	0	-1.6	3.45	3.00	1.27
517023	1201062631	10-APR-2006 19:02	DONE	0.03	-0.68	dec	0.9	0	-1.6	3.45	3.00	1.27
517019	1201062618	10-APR-2006 19:13	DONE	0.08	-0.65	dec	0.9	0	-1.6	3.45	3.00	1.27
516982	1201062537	10-APR-2006 21:49	DONE	0.29	-0.48	dec	0.9	0	-1.6	3.45	3.00	1.27
517024	1201062639	11-APR-2006 10:13	DONE	0.23	-0.52	dec	0.9	0	-1.6	3.45	3.00	1.27
519523	1201068260	11-APR-2006 10:15	DONE	0.95	0.04	dec	0.9	0	-1.6	3.45	3.00	1.27
512920	1201053811	11-APR-2006 19:17	DUSE	2.44	1.2	dec	0.9	0	-1.6	3.45	3.00	1.27
516331	1201061126	12-APR-2006 13:16	DONE	2.25	1.1	dec	0.9	0	-1.6	3.45	3.00	1.27
516977	1201062518	13-APR-2006 21:04	DONE	0.5	-0.31	dec	0.9	0	-1.6	3.45	3.00	1.27
516978	1201062522	14-APR-2006 06:30	DONE	0.02	-0.69	dec	0.9	0	-1.6	3.45	3.00	1.27
517253	1201063138	17-APR-2006 11:51	DONE	0.53	-0.29	dec	0.9	0	-1.6	3.45	3.00	1.27
520754	1201071040	17-APR-2006 23:56	DONE	0.85	-0.04	dec	0.9	0	-1.6	3.45	3.00	1.27
520996	1201071615	18-APR-2006 05:53	DONE	0.28	-0.49	dec	0.9	0	-1.6	3.45	3.00	1.27
520998	1201071623	19-APR-2006 06:01	DONE	2.32	1.1	dec	0.9	0	-1.6	3.45	3.00	1.27
516979	1201062526	19-APR-2006 07:25	DONE	0.34	-0.44	dec	0.9	0	-1.6	3.45	3.00	1.27
516657	1201061778	19-APR-2006 17:52	DONE	1.63	0.58	dec	0.9	0	-1.6	3.45	3.00	1.27
516980	1201062530	19-APR-2006 23:19	DONE	0.44	-0.36	dec	0.9	0	-1.6	3.45	3.00	1.27
521937	1201074023	20-APR-2006 06:04	DONE	0.77	-0.11	dec	0.9	0	-1.6	3.45	3.00	1.27
517257	1201063153	20-APR-2006 10:21	DONE	0.17	-0.57	dec	0.9	0	-1.6	3.45	3.00	1.27
519545	1201068318	20-APR-2006 15:32	DONE	0.12	-0.61	dec	0.9	0	-1.6	3.45	3.00	1.27
519011	1201067123	20-APR-2006 23:49	DONE	7.26	5	dec	0.9	0	-1.6	3.45	3.00	1.27
517255	1201063145	20-APR-2006 23:50	DONE	0.21	-0.54	dec	0.9	0	-1.6	3.45	3.00	1.27
519535	1201068296	20-APR-2006 23:55	DONE	0.95	0.04	dec	0.9	0	-1.6	3.45	3.00	1.27
519516	1201068249	21-APR-2006 09:09	DONE	2.73	1.4	dec	0.9	0	-1.6	3.45	3.00	1.27

522386	1201075055	23-APR-2006 23:51	DONE	0.13	-0.61	dec	0.9	0	-1.6	3.45	3.00	1.27
523018	1201076447	23-APR-2006 23:56	DONE	0.72	-0.14	dec	0.9	0	-1.6	3.45	3.00	1.27
523017	1201076444	25-APR-2006 06:13	DUSE	0.11	-0.62	dec	0.9	0	-1.6	3.45	3.00	1.27
517021	1201062625	25-APR-2006 09:46	DONE	0	-0.71	dec	0.9	0	-1.6	3.45	3.00	1.27
519510	1201068237	26-APR-2006 05:28	DUSE	0.55	-0.27	dec	0.9	0	-1.6	3.45	3.00	1.27

**Cesium-137 SPIKE: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
503740	1201032437	27-FEB-2006 06:22	DONE	107	0.89	percent	100	75.0	83.3	117	125	8.33
506274	1201038473	28-FEB-2006 09:00	DONE	97.9	-0.25	percent	100	75.0	83.3	117	125	8.33
506282	1201038480	03-MAR-2006 11:15	DONE	104	0.5	percent	100	75.0	83.3	117	125	8.33
507258	1201040767	05-MAR-2006 19:50	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
507638	1201041726	07-MAR-2006 10:55	DONE	102	0.23	percent	100	75.0	83.3	117	125	8.33
508355	1201043465	08-MAR-2006 11:21	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
507632	1201041716	10-MAR-2006 10:00	DONE	101	0.07	percent	100	75.0	83.3	117	125	8.33
510364	1201048016	10-MAR-2006 17:46	DONE	107	0.85	percent	100	75.0	83.3	117	125	8.33
507647	1201041742	11-MAR-2006 15:34	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
507649	1201041746	18-MAR-2006 13:45	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
507650	1201041750	18-MAR-2006 13:46	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
507640	1201041730	20-MAR-2006 18:44	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
512038	1201051800	21-MAR-2006 11:50	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
508908	1201044773	22-MAR-2006 17:05	DONE	107	0.79	percent	100	75.0	83.3	117	125	8.33
507641	1201041734	23-MAR-2006 09:11	DONE	101	0.12	percent	100	75.0	83.3	117	125	8.33
510369	1201048027	27-MAR-2006 06:50	DONE	100	0.02	percent	100	75.0	83.3	117	125	8.33
508910	1201044781	27-MAR-2006 19:42	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
511246	1201049992	28-MAR-2006 11:43	DONE	94.4	-0.67	percent	100	75.0	83.3	117	125	8.33
508909	1201044777	29-MAR-2006 08:15	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
507644	1201041738	03-APR-2006 12:47	DONE	108	1	percent	100	75.0	83.3	117	125	8.33
516974	1201062508	04-APR-2006 09:02	DONE	105	0.59	percent	100	75.0	83.3	117	125	8.33
515679	1201059781	06-APR-2006 21:11	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
516333	1201061131	06-APR-2006 22:34	DONE	120	2.4	percent	100	75.0	83.3	117	125	8.33
517019	1201062619	08-APR-2006 18:42	DONE	118	2.2	percent	100	75.0	83.3	117	125	8.33
516976	1201062515	10-APR-2006 06:39	DONE	104	0.46	percent	100	75.0	83.3	117	125	8.33
517024	1201062640	11-APR-2006 05:39	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
519523	1201068261	11-APR-2006 08:15	DONE	117	2	percent	100	75.0	83.3	117	125	8.33
516331	1201061127	11-APR-2006 12:05	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
516977	1201062519	13-APR-2006 21:04	DONE	96.6	-0.41	percent	100	75.0	83.3	117	125	8.33
516978	1201062523	14-APR-2006 06:30	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
520996	1201071616	18-APR-2006 05:54	DONE	106	0.67	percent	100	75.0	83.3	117	125	8.33
520998	1201071624	19-APR-2006 06:01	DONE	93.0	-0.84	percent	100	75.0	83.3	117	125	8.33
516979	1201062527	19-APR-2006 07:26	DONE	107	0.8	percent	100	75.0	83.3	117	125	8.33
516980	1201062531	19-APR-2006 11:25	DONE	83.8	-2	percent	100	75.0	83.3	117	125	8.33

519535	1201068297	21-APR-2006 13:59	DONE	99.1	-0.1	percent	100	75.0	83.3	117	125	8.33
523018	1201076448	21-APR-2006 20:25	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33

**Cobalt-60 BLANK: Limits LCL = -4 UCL = 5.4**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stddev
511298	1201050110	02-APR-2006 22:50	DONE	0.15	-0.38	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
512870	1201053696	02-APR-2006 23:54	DONE	1.6	0.54	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
512910	1201053787	03-APR-2006 16:51	DUSE	3.83	2	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516974	1201062506	04-APR-2006 06:44	DONE	0.2	-0.35	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516284	1201061020	04-APR-2006 10:08	DONE	-1.7	-2	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516477	1201061401	04-APR-2006 10:18	DONE	6.83	3.9	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516727	1201061912	04-APR-2006 21:43	DUSE	-0.858	-1	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
511296	1201050104	05-APR-2006 18:15	DONE	1.32	0.37	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516981	1201062533	06-APR-2006 16:41	DONE	1.36	0.4	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
515679	1201059779	06-APR-2006 20:00	DONE	2.14	0.89	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516333	1201061129	07-APR-2006 16:54	DONE	-0.153	-0.57	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516331	1201061125	07-APR-2006 16:55	DONE	-0.15	-0.57	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
517023	1201062630	08-APR-2006 01:11	DONE	1.56	0.52	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
517019	1201062617	08-APR-2006 17:58	DUSE	-0.436	-0.75	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
517034	1201062658	10-APR-2006 14:44	DONE	0.67	-0.05	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516976	1201062513	10-APR-2006 15:40	DONE	0.01	-0.47	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516982	1201062536	10-APR-2006 19:45	DONE	1.45	0.45	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
517024	1201062638	10-APR-2006 23:56	DONE	1.64	0.57	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
519523	1201068259	11-APR-2006 06:19	DONE	0.58	-0.1	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516977	1201062517	13-APR-2006 12:23	DONE	-2.2	-2	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516978	1201062521	13-APR-2006 23:22	DONE	1.76	0.65	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
520998	1201071622	16-APR-2006 20:07	DONE	0.61	-0.09	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
517253	1201063137	17-APR-2006 19:16	DONE	0.44	-0.2	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
520996	1201071614	17-APR-2006 23:10	DONE	-1	-1	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
520754	1201071039	17-APR-2006 23:45	DONE	0.48	-0.17	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
519011	1201067122	18-APR-2006 19:02	DONE	0.29	-0.29	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516657	1201061777	18-APR-2006 19:37	DONE	1.16	0.26	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516979	1201062525	19-APR-2006 11:15	DONE	0.47	-0.18	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
516980	1201062529	19-APR-2006 22:49	DONE	-0.125	-0.55	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
521937	1201074022	20-APR-2006 06:03	DUSE	0.05	-0.44	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
517257	1201063152	20-APR-2006 10:17	DONE	-0.245	-0.63	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
519545	1201068317	20-APR-2006 12:30	DONE	1.06	0.2	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
517255	1201063144	20-APR-2006 17:02	DONE	0.43	-0.2	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57



519535	1201068288	20-APR-2006 21:41	DONE	1.97	0.78	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
519516	1201068248	20-APR-2006 23:48	DONE	0.35	-0.25	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
523018	1201076446	21-APR-2006 17:26	DONE	-0.582	-0.85	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
522386	1201075054	21-APR-2006 23:16	DONE	2.89	1.4	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
523017	1201076443	24-APR-2006 23:31	DUSE	-0.982	-1	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57
519510	1201068236	25-APR-2006 18:43	DUSE	2.14	0.89	pCi/L	0.74	-4	-2.4	3.88	5.44	1.57

**Cobalt-60 DUP: Limits LCL = 0 UCL = 20**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
514861	1201057810	01-APR-2006 20:22	DONE	184	-0.22	percent	282	0	-610	1170	20.0	445
511298	1201050111	02-APR-2006 22:51	DONE	78.7	-0.46	percent	282	0	-610	1170	20.0	445
511295	1201050102	03-APR-2006 05:16	DONE	73	-0.47	percent	282	0	-610	1170	20.0	445
515677	1201059771	03-APR-2006 10:09	DONE	711	0.96	percent	282	0	-610	1170	20.0	445
511297	1201050108	04-APR-2006 05:50	DONE	1210	2.1	percent	282	0	-610	1170	20.0	445
516974	1201062507	04-APR-2006 11:01	DONE	211	-0.16	percent	282	0	-610	1170	20.0	445
512870	1201053697	04-APR-2006 12:02	DONE	0	-0.63	percent	282	0	-610	1170	20.0	445
516477	1201061402	04-APR-2006 12:18	DONE	133	-0.33	percent	282	0	-610	1170	20.0	445
516284	1201061021	04-APR-2006 17:27	DONE	0	-0.63	percent	282	0	-610	1170	20.0	445
511296	1201050105	05-APR-2006 18:16	DONE	274	-0.02	percent	282	0	-610	1170	20.0	445
515679	1201059780	06-APR-2006 11:54	DONE	36.6	-0.55	percent	282	0	-610	1170	20.0	445
516981	1201062534	06-APR-2006 23:55	DONE	11.5	-0.61	percent	282	0	-610	1170	20.0	445
516976	1201062514	07-APR-2006 11:18	DONE	87	-0.44	percent	282	0	-610	1170	20.0	445
516333	1201061130	07-APR-2006 16:54	DONE	67.7	-0.48	percent	282	0	-610	1170	20.0	445
517034	1201062659	10-APR-2006 18:58	DONE	42.7	-0.54	percent	282	0	-610	1170	20.0	445
517023	1201062631	10-APR-2006 19:02	DONE	36.6	-0.55	percent	282	0	-610	1170	20.0	445
517019	1201062618	10-APR-2006 19:13	DUSE	214	-0.15	percent	282	0	-610	1170	20.0	445
516982	1201062537	10-APR-2006 21:49	DONE	259	-0.05	percent	282	0	-610	1170	20.0	445
517024	1201062639	11-APR-2006 10:13	DONE	301	0.04	percent	282	0	-610	1170	20.0	445
519523	1201068260	11-APR-2006 10:15	DONE	152	-0.29	percent	282	0	-610	1170	20.0	445
516331	1201061126	12-APR-2006 13:16	DONE	1660	3.1	percent	282	0	-610	1170	20.0	445
516977	1201062518	13-APR-2006 21:04	DONE	650	0.83	percent	282	0	-610	1170	20.0	445
516978	1201062522	14-APR-2006 06:30	DONE	65.3	-0.49	percent	282	0	-610	1170	20.0	445
517253	1201063138	17-APR-2006 11:51	DONE	1480	2.7	percent	282	0	-610	1170	20.0	445
520754	1201071040	17-APR-2006 23:56	DONE	0	-0.63	percent	282	0	-610	1170	20.0	445
520996	1201071615	18-APR-2006 05:53	DONE	102	-0.4	percent	282	0	-610	1170	20.0	445
520998	1201071623	19-APR-2006 06:01	DONE	688	0.91	percent	282	0	-610	1170	20.0	445
516979	1201062526	19-APR-2006 07:25	DONE	308	0.06	percent	282	0	-610	1170	20.0	445
516657	1201061778	19-APR-2006 17:52	DONE	0	-0.63	percent	282	0	-610	1170	20.0	445
521937	1201074023	20-APR-2006 06:04	DUSE	0	-0.63	percent	282	0	-610	1170	20.0	445
517257	1201063153	20-APR-2006 10:21	DONE	107	-0.39	percent	282	0	-610	1170	20.0	445
519545	1201068318	20-APR-2006 15:32	DONE	36	-0.55	percent	282	0	-610	1170	20.0	445
519011	1201067123	20-APR-2006 23:49	DONE	0	-0.63	percent	282	0	-610	1170	20.0	445

519011	1201067125	20-APR-2006 23:47	DONE	51.8	-0.52	percent	282	0	-610	1170	20.0	445
517255	1201063145	20-APR-2006 23:50	DONE	51.8	-0.52	percent	282	0	-610	1170	20.0	445
519535	1201068296	20-APR-2006 23:55	DONE	1510	2.7	percent	282	0	-610	1170	20.0	445
519516	1201068249	21-APR-2006 09:09	DONE	75.8	-0.46	percent	282	0	-610	1170	20.0	445
522386	1201075055	23-APR-2006 23:51	DONE	155	-0.28	percent	282	0	-610	1170	20.0	445
523018	1201076447	23-APR-2006 23:56	DONE	17.1	-0.6	percent	282	0	-610	1170	20.0	445
519510	1201068237	26-APR-2006 05:28	DUSE	28.5	-0.57	percent	282	0	-610	1170	20.0	445

## Cobalt-60 LCS: Limits LCL = 75 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
511298	1201050112	03-APR-2006 22:07	DONE	94.3	-0.69	percent	100	75.0	83.3	117	125	8.33
512870	1201053698	03-APR-2006 23:54	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
511297	1201050109	04-APR-2006 06:47	DONE	107	0.8	percent	100	75.0	83.3	117	125	8.33
516974	1201062509	04-APR-2006 07:59	DONE	97.7	-0.28	percent	100	75.0	83.3	117	125	8.33
516284	1201061022	04-APR-2006 10:09	DONE	94.2	-0.7	percent	100	75.0	83.3	117	125	8.33
516477	1201061403	04-APR-2006 11:44	DONE	97.7	-0.28	percent	100	75.0	83.3	117	125	8.33
516727	1201061913	04-APR-2006 21:44	DONE	96.2	-0.46	percent	100	75.0	83.3	117	125	8.33
511296	1201050106	05-APR-2006 19:38	DONE	99.8	-0.03	percent	100	75.0	83.3	117	125	8.33
515679	1201059782	06-APR-2006 21:11	DONE	108	0.98	percent	100	75.0	83.3	117	125	8.33
516333	1201061132	06-APR-2006 22:33	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33
516981	1201062535	07-APR-2006 13:55	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
516331	1201061128	07-APR-2006 16:56	DONE	98.8	-0.14	percent	100	75.0	83.3	117	125	8.33
517019	1201062620	08-APR-2006 17:13	DUSE	106	0.71	percent	100	75.0	83.3	117	125	8.33
516976	1201062516	10-APR-2006 08:10	DONE	108	0.95	percent	100	75.0	83.3	117	125	8.33
517034	1201062660	10-APR-2006 20:35	DONE	107	0.8	percent	100	75.0	83.3	117	125	8.33
516982	1201062538	10-APR-2006 21:32	DONE	96.7	-0.4	percent	100	75.0	83.3	117	125	8.33
517023	1201062632	10-APR-2006 22:38	DONE	96.1	-0.47	percent	100	75.0	83.3	117	125	8.33
517024	1201062641	11-APR-2006 06:58	DONE	106	0.72	percent	100	75.0	83.3	117	125	8.33
519523	1201068262	11-APR-2006 10:58	DONE	105	0.62	percent	100	75.0	83.3	117	125	8.33
519011	1201067124	11-APR-2006 22:38	DONE	97.4	-0.31	percent	100	75.0	83.3	117	125	8.33
516978	1201062524	14-APR-2006 06:31	DONE	103	0.3	percent	100	75.0	83.3	117	125	8.33
516977	1201062520	14-APR-2006 10:17	DONE	117	2	percent	100	75.0	83.3	117	125	8.33
520998	1201071625	17-APR-2006 19:03	DONE	93.8	-0.74	percent	100	75.0	83.3	117	125	8.33
517253	1201063139	17-APR-2006 22:49	DONE	95.4	-0.55	percent	100	75.0	83.3	117	125	8.33
520996	1201071617	18-APR-2006 05:54	DONE	97.2	-0.34	percent	100	75.0	83.3	117	125	8.33
520754	1201071041	18-APR-2006 19:10	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
516979	1201062528	19-APR-2006 13:02	DONE	105	0.56	percent	100	75.0	83.3	117	125	8.33
516657	1201061779	19-APR-2006 18:10	DONE	105	0.56	percent	100	75.0	83.3	117	125	8.33
516980	1201062532	19-APR-2006 22:50	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
521937	1201074024	20-APR-2006 06:04	DUSE	101	0.16	percent	100	75.0	83.3	117	125	8.33
519545	1201068320	20-APR-2006 09:41	DONE	92.5	-0.9	percent	100	75.0	83.3	117	125	8.33
517257	1201063155	20-APR-2006 12:11	DONE	102	0.18	percent	100	75.0	83.3	117	125	8.33

519535	1201068291	21-APR-2006 06:15	DONE	103	0.37	percent	100	75.0	83.3	117	125	8.33
517255	1201063147	21-APR-2006 07:39	DONE	104	0.5	percent	100	75.0	83.3	117	125	8.33
519516	1201068251	21-APR-2006 09:58	DONE	97.5	-0.3	percent	100	75.0	83.3	117	125	8.33
522386	1201075056	23-APR-2006 21:45	DONE	97.2	-0.34	percent	100	75.0	83.3	117	125	8.33
523018	1201076449	24-APR-2006 05:38	DONE	90.9	-1	percent	100	75.0	83.3	117	125	8.33
523017	1201076445	25-APR-2006 06:13	DONE	99.1	-0.11	percent	100	75.0	83.3	117	125	8.33
519510	1201068238	26-APR-2006 05:24	DONE	98.0	-0.24	percent	100	75.0	83.3	117	125	8.33

**Cobalt-60 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
511295	1201050102	03-APR-2006 05:16	DONE	0.13	-0.98	dec	0.76	0	-0.518	2.03	3.00	0.64
515677	1201059771	03-APR-2006 10:09	DONE	0.5	-0.4	dec	0.76	0	-0.518	2.03	3.00	0.64
511297	1201050108	04-APR-2006 05:50	DONE	2.13	2.2	dec	0.76	0	-0.518	2.03	3.00	0.64
516974	1201062507	04-APR-2006 11:01	DONE	1.99	1.9	dec	0.76	0	-0.518	2.03	3.00	0.64
512870	1201053697	04-APR-2006 12:02	DONE	0.84	0.14	dec	0.76	0	-0.518	2.03	3.00	0.64
516477	1201061402	04-APR-2006 12:18	DONE	0.39	-0.57	dec	0.76	0	-0.518	2.03	3.00	0.64
516284	1201061021	04-APR-2006 17:27	DONE	0.85	0.14	dec	0.76	0	-0.518	2.03	3.00	0.64
511296	1201050105	05-APR-2006 18:16	DONE	0.4	-0.56	dec	0.76	0	-0.518	2.03	3.00	0.64
515679	1201059780	06-APR-2006 11:54	DONE	0.9	0.22	dec	0.76	0	-0.518	2.03	3.00	0.64
516981	1201062534	06-APR-2006 23:55	DONE	0.11	-1	dec	0.76	0	-0.518	2.03	3.00	0.64
516976	1201062514	07-APR-2006 11:18	DONE	0.88	0.2	dec	0.76	0	-0.518	2.03	3.00	0.64
516333	1201061130	07-APR-2006 16:54	DONE	0.46	-0.46	dec	0.76	0	-0.518	2.03	3.00	0.64
517034	1201062659	10-APR-2006 18:58	DONE	0.22	-0.84	dec	0.76	0	-0.518	2.03	3.00	0.64
517023	1201062631	10-APR-2006 19:02	DONE	0.09	-1	dec	0.76	0	-0.518	2.03	3.00	0.64
517019	1201062618	10-APR-2006 19:13	DUSE	0.89	0.2	dec	0.76	0	-0.518	2.03	3.00	0.64
516982	1201062537	10-APR-2006 21:49	DONE	1.57	1.3	dec	0.76	0	-0.518	2.03	3.00	0.64
517024	1201062639	11-APR-2006 10:13	DONE	2.34	2.5	dec	0.76	0	-0.518	2.03	3.00	0.64
519523	1201068260	11-APR-2006 10:15	DONE	1.95	1.9	dec	0.76	0	-0.518	2.03	3.00	0.64
516331	1201061126	12-APR-2006 13:16	DONE	0.63	-0.2	dec	0.76	0	-0.518	2.03	3.00	0.64
516977	1201062518	13-APR-2006 21:04	DONE	0.38	-0.59	dec	0.76	0	-0.518	2.03	3.00	0.64
516978	1201062522	14-APR-2006 06:30	DONE	0.37	-0.61	dec	0.76	0	-0.518	2.03	3.00	0.64
517253	1201063138	17-APR-2006 11:51	DONE	0.29	-0.73	dec	0.76	0	-0.518	2.03	3.00	0.64
520754	1201071040	17-APR-2006 23:56	DONE	0.02	-1	dec	0.76	0	-0.518	2.03	3.00	0.64
520996	1201071615	18-APR-2006 05:53	DONE	1.12	0.58	dec	0.76	0	-0.518	2.03	3.00	0.64
520998	1201071623	19-APR-2006 06:01	DONE	1.52	1.2	dec	0.76	0	-0.518	2.03	3.00	0.64
516979	1201062526	19-APR-2006 07:25	DONE	1.2	0.7	dec	0.76	0	-0.518	2.03	3.00	0.64
516657	1201061778	19-APR-2006 17:52	DONE	0.11	-1	dec	0.76	0	-0.518	2.03	3.00	0.64
516980	1201062530	19-APR-2006 23:19	DONE	0.08	-1	dec	0.76	0	-0.518	2.03	3.00	0.64
521937	1201074023	20-APR-2006 06:04	DUSE	0.61	-0.22	dec	0.76	0	-0.518	2.03	3.00	0.64
517257	1201063153	20-APR-2006 10:21	DONE	0.84	0.13	dec	0.76	0	-0.518	2.03	3.00	0.64
519545	1201068318	20-APR-2006 15:32	DONE	0.15	-0.95	dec	0.76	0	-0.518	2.03	3.00	0.64
519011	1201067132	20-APR-2006 22:40	DONE	0.75	-0.01	dec	0.76	0	-0.518	2.03	3.00	0.64

519011	1201067125	20-APR-2006 23:47	DONE	0.75	-0.01	dec	0.76	0	-0.518	2.03	3.00	0.64
517255	1201063145	20-APR-2006 23:50	DONE	0.43	-0.51	dec	0.76	0	-0.518	2.03	3.00	0.64
519535	1201068296	20-APR-2006 23:55	DONE	1.94	1.9	dec	0.76	0	-0.518	2.03	3.00	0.64
519516	1201068249	21-APR-2006 09:09	DONE	0.46	-0.46	dec	0.76	0	-0.518	2.03	3.00	0.64
522386	1201075055	23-APR-2006 23:51	DONE	0.53	-0.36	dec	0.76	0	-0.518	2.03	3.00	0.64
523018	1201076447	23-APR-2006 23:56	DONE	0.55	-0.32	dec	0.76	0	-0.518	2.03	3.00	0.64
523017	1201076444	25-APR-2006 06:13	DUSE	0.8	0.07	dec	0.76	0	-0.518	2.03	3.00	0.64
519510	1201068237	26-APR-2006 05:28	DUSE	0.08	-1	dec	0.76	0	-0.518	2.03	3.00	0.64

**Cobalt-60 SPIKE: Limits LCL = 75 UCL = 125**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
503740	1201032437	27-FEB-2006 06:22	DONE	96.9	-0.37	percent	100	75.0	83.3	117	125	8.33
506274	1201038473	28-FEB-2006 09:00	DONE	93.0	-0.84	percent	100	75.0	83.3	117	125	8.33
506282	1201038480	03-MAR-2006 11:15	DONE	103	0.38	percent	100	75.0	83.3	117	125	8.33
507258	1201040767	05-MAR-2006 19:50	DONE	107	0.82	percent	100	75.0	83.3	117	125	8.33
507638	1201041726	07-MAR-2006 10:55	DONE	90.5	-1	percent	100	75.0	83.3	117	125	8.33
508355	1201043465	08-MAR-2006 11:21	DONE	102	0.23	percent	100	75.0	83.3	117	125	8.33
507632	1201041716	10-MAR-2006 10:00	DONE	104	0.49	percent	100	75.0	83.3	117	125	8.33
510364	1201048016	10-MAR-2006 17:46	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
507647	1201041742	11-MAR-2006 15:34	DONE	86.8	-2	percent	100	75.0	83.3	117	125	8.33
507649	1201041746	18-MAR-2006 13:45	DONE	108	0.94	percent	100	75.0	83.3	117	125	8.33
507650	1201041750	18-MAR-2006 13:46	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
507640	1201041730	20-MAR-2006 18:44	DONE	99.4	-0.07	percent	100	75.0	83.3	117	125	8.33
512038	1201051800	21-MAR-2006 11:50	DONE	103	0.41	percent	100	75.0	83.3	117	125	8.33
508908	1201044773	22-MAR-2006 17:05	DONE	105	0.63	percent	100	75.0	83.3	117	125	8.33
507641	1201041734	23-MAR-2006 09:11	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33
510369	1201048027	27-MAR-2006 06:50	DONE	88.6	-1	percent	100	75.0	83.3	117	125	8.33
508910	1201044781	27-MAR-2006 19:42	DONE	94.2	-0.7	percent	100	75.0	83.3	117	125	8.33
511246	1201049992	28-MAR-2006 11:43	DONE	105	0.54	percent	100	75.0	83.3	117	125	8.33
508909	1201044777	29-MAR-2006 08:15	DONE	102	0.2	percent	100	75.0	83.3	117	125	8.33
507644	1201041738	03-APR-2006 12:47	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
516974	1201062508	04-APR-2006 09:02	DONE	104	0.52	percent	100	75.0	83.3	117	125	8.33
515679	1201059781	06-APR-2006 21:11	DONE	103	0.31	percent	100	75.0	83.3	117	125	8.33
516333	1201061131	06-APR-2006 22:34	DONE	100	-0	percent	100	75.0	83.3	117	125	8.33
517019	1201062619	08-APR-2006 18:42	DUSE	106	0.73	percent	100	75.0	83.3	117	125	8.33
516976	1201062515	10-APR-2006 06:39	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33
517024	1201062640	11-APR-2006 05:39	DONE	97.6	-0.29	percent	100	75.0	83.3	117	125	8.33
519523	1201068261	11-APR-2006 08:15	DONE	91.7	-01	percent	100	75.0	83.3	117	125	8.33
516331	1201061127	11-APR-2006 12:05	DONE	96.6	-0.41	percent	100	75.0	83.3	117	125	8.33
516977	1201062519	13-APR-2006 21:04	DONE	102	0.26	percent	100	75.0	83.3	117	125	8.33
516978	1201062523	14-APR-2006 06:30	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
520996	1201071616	18-APR-2006 05:54	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33

520998	1201071624	19-APR-2006 06:01	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
516979	1201062527	19-APR-2006 07:26	DONE	99.4	-0.08	percent	100	75.0	83.3	117	125	8.33
516980	1201062531	19-APR-2006 11:25	DONE	98.6	-0.17	percent	100	75.0	83.3	117	125	8.33
517255	1201063146	21-APR-2006 06:23	DONE	106	0.76	percent	100	75.0	83.3	117	125	8.33
519516	1201068250	21-APR-2006 09:10	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
517257	1201063154	21-APR-2006 12:55	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
519535	1201068297	21-APR-2006 13:59	DONE	105	0.58	percent	100	75.0	83.3	117	125	8.33
523018	1201076448	21-APR-2006 20:25	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33

**Lead-212 RER: Limits LCL = 0 UCL = 3**

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
511295	1201050102	03-APR-2006 05:16	DUSE	0.22	-0.82	dec	0.59	0	-0.313	1.49	3.00	0.45
515677	1201059771	03-APR-2006 10:09	DUSE	0.36	-0.5	dec	0.59	0	-0.313	1.49	3.00	0.45
511297	1201050108	04-APR-2006 05:50	DONE	2.15	3.5	dec	0.59	0	-0.313	1.49	3.00	0.45
516974	1201062507	04-APR-2006 11:01	DUSE	0.07	-1	dec	0.59	0	-0.313	1.49	3.00	0.45
512870	1201053697	04-APR-2006 12:02	DUSE	0.58	-0.01	dec	0.59	0	-0.313	1.49	3.00	0.45
516477	1201061402	04-APR-2006 12:18	DUSE	0.47	-0.27	dec	0.59	0	-0.313	1.49	3.00	0.45
516284	1201061021	04-APR-2006 17:27	DUSE	0.65	0.14	dec	0.59	0	-0.313	1.49	3.00	0.45
511296	1201050105	05-APR-2006 18:16	DUSE	0.33	-0.58	dec	0.59	0	-0.313	1.49	3.00	0.45
515679	1201059780	06-APR-2006 11:54	DONE	0.58	-0.03	dec	0.59	0	-0.313	1.49	3.00	0.45
516981	1201062534	06-APR-2006 23:55	DUSE	0.59	0.01	dec	0.59	0	-0.313	1.49	3.00	0.45
516976	1201062514	07-APR-2006 11:18	DUSE	0.33	-0.58	dec	0.59	0	-0.313	1.49	3.00	0.45
516333	1201061130	07-APR-2006 16:54	DONE	0.28	-0.69	dec	0.59	0	-0.313	1.49	3.00	0.45
517034	1201062659	10-APR-2006 18:58	DONE	1	0.91	dec	0.59	0	-0.313	1.49	3.00	0.45
517023	1201062631	10-APR-2006 19:02	DUSE	0.12	-1	dec	0.59	0	-0.313	1.49	3.00	0.45
517019	1201062618	10-APR-2006 19:13	DONE	0.87	0.62	dec	0.59	0	-0.313	1.49	3.00	0.45
516982	1201062537	10-APR-2006 21:49	DUSE	0.39	-0.45	dec	0.59	0	-0.313	1.49	3.00	0.45
517024	1201062639	11-APR-2006 10:13	DONE	0.15	-0.98	dec	0.59	0	-0.313	1.49	3.00	0.45
519523	1201068260	11-APR-2006 10:15	DONE	0.82	0.51	dec	0.59	0	-0.313	1.49	3.00	0.45
516331	1201061126	12-APR-2006 13:16	DONE	0.41	-0.39	dec	0.59	0	-0.313	1.49	3.00	0.45
516977	1201062518	13-APR-2006 21:04	DUSE	0.65	0.13	dec	0.59	0	-0.313	1.49	3.00	0.45
516978	1201062522	14-APR-2006 06:30	DUSE	1.35	1.7	dec	0.59	0	-0.313	1.49	3.00	0.45
517253	1201063138	17-APR-2006 11:51	DONE	0.64	0.11	dec	0.59	0	-0.313	1.49	3.00	0.45
520754	1201071040	17-APR-2006 23:56	DUSE	1.26	1.5	dec	0.59	0	-0.313	1.49	3.00	0.45
520996	1201071615	18-APR-2006 05:53	DONE	0.84	0.55	dec	0.59	0	-0.313	1.49	3.00	0.45
520998	1201071623	19-APR-2006 06:01	DONE	0.07	-1	dec	0.59	0	-0.313	1.49	3.00	0.45
516979	1201062526	19-APR-2006 07:25	DUSE	1.28	1.5	dec	0.59	0	-0.313	1.49	3.00	0.45
516657	1201061778	19-APR-2006 17:52	DUSE	0.3	-0.64	dec	0.59	0	-0.313	1.49	3.00	0.45
516980	1201062530	19-APR-2006 23:19	DUSE	0.33	-0.58	dec	0.59	0	-0.313	1.49	3.00	0.45
521937	1201074023	20-APR-2006 06:04	DUSE	0.65	0.14	dec	0.59	0	-0.313	1.49	3.00	0.45
517257	1201063153	20-APR-2006 10:21	DONE	1.11	1.1	dec	0.59	0	-0.313	1.49	3.00	0.45
519545	1201068238	20-APR-2006 15:22	DONE	0.22	-1	dec	0.59	0	-0.313	1.49	3.00	0.45

519545	1201068318	20-APR-2006 15:32	DONE	0.03	-1	dec	0.59	0	-0.313	1.49	3.00	0.45
519011	1201067123	20-APR-2006 23:49	DUSE	0.07	-1	dec	0.59	0	-0.313	1.49	3.00	0.45
517255	1201063145	20-APR-2006 23:50	DONE	0.29	-0.66	dec	0.59	0	-0.313	1.49	3.00	0.45
519535	1201068296	20-APR-2006 23:55	DUSE	0.3	-0.65	dec	0.59	0	-0.313	1.49	3.00	0.45
519516	1201068249	21-APR-2006 09:09	DONE	1.04	1	dec	0.59	0	-0.313	1.49	3.00	0.45
522386	1201075055	23-APR-2006 23:51	DUSE	0.64	0.12	dec	0.59	0	-0.313	1.49	3.00	0.45
523018	1201076447	23-APR-2006 23:56	DUSE	0.01	-1	dec	0.59	0	-0.313	1.49	3.00	0.45
523017	1201076444	25-APR-2006 06:13	DONE	0.73	0.3	dec	0.59	0	-0.313	1.49	3.00	0.45
519510	1201068237	26-APR-2006 05:28	DONE	1.03	0.97	dec	0.59	0	-0.313	1.49	3.00	0.45

# STANDARDS DATA

0133

**Certificate of calibration of absolutely standardised radioactive solution**

P 35174

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

**Measurement** Reference time for solution number S6/7/19:

1200 GMT on 1 April 1996

Radioactive concentration of strontium-90:

477.1 kilobecquerels per gram of solution

which is equivalent to:

12.89 microcuries per gram of solution

Mass of solution:

5.0669 grams

Total activity of strontium-90:

2.417 megabecquerels

which is equivalent to:

65.3 microcuries

Method of measurement used (see page 3 of the certificate): K

Calibration dates: 25 March 1996 to 27 March 1996

The calibration date is provided for added information only, and must not be confused with the reference date on pages 1 and 2 of the certificate. It is the reference date that must be used in all calculations relating to the values of activity.

**Accuracy**

Expanded uncertainty in the radioactive concentration quoted above:  $\pm 0.80\%$

Combined Type A uncertainty :  $\pm 0.05\%$

Combined Type B uncertainty :  $\pm 0.40\%$

**Radionuclidic purity**

The estimated activities of any radioactive impurities found by high-resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time.

Other radionuclides 0.0005(3) %

**Chemical composition**

0.1 M HCl containing 100 micrograms of strontium and 100 micrograms of yttrium per ml.

**Physical data**

Recommended half life:  $29.12 \pm 0.24$  years (1 year = 365.25 days)

Strontium-90: 100% beta particle emission.

Yttrium-90: 100% beta particle emission. Half life  $64.1 \pm 0.1$  hours.

The activity of the yttrium-90 is equal to the activity of the strontium-90.

**Remarks**

This product meets the quality assurance requirements for achieving traceability to NIST as defined in ANSI N42.22-1995.

Tests made over a period of 2 years on standardised solutions of strontium-90 stored in glass ampoules have shown that loss of strontium-90 from solution is negligible other than by radioactive decay.

21-5-073-060



Certificate of calibration of absolutely  
standardised radioactive solution

P 35374



ISSUED  
BY:

Nycomed Amersham plc  
Radiation & Radioactivity  
Calibration Laboratory  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

ISSUED  
FOR:

AEA Technology plc  
Isotrak  
Amersham Laboratories  
White Lion Road  
Amersham  
Buckinghamshire  
HP7 9LL

Description Principal radionuclide: Strontium-90

Product code: SIZ64  
Solution number: S6/7/19

Measurement Reference time: 1200 GMT on 1 April 1996

Nuclear data Nuclear data quoted on this certificate are taken from the Joint European File, Version 2.2.

Expression of uncertainties The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k = 2.00$ , which for a  $t$ -distribution with  $\nu_{\text{eff}} = \infty$  effective degrees of freedom corresponds to a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Unless indicated, all other uncertainties are expressed at the confidence level associated with one standard uncertainty.

The format used for the uncertainties in the values of radionuclidic purity is illustrated by the following examples;

6.5(21)	=	$6.5 \pm 2.1$
6.54(21)	=	$6.54 \pm 0.21$
6.543(21)	=	$6.543 \pm 0.021$

Approved  
Signatory

*W. F. Case*  
Page 848 of 913

Date of  
issue

11 May 1999

LC-S-073-060A

Nycomed

# Certificate of calibration of absolutely standardised radioactive solution

P 35374

UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

**Methods of measurement** The measurement techniques listed below are currently in use at Nycomed Amersham for the absolute standardisation of radioactive solutions. The methods used for this standardisation are indicated on page 2 of the certificate.

Using a gas flow proportional counter

- A 4 pi beta counting
- B 4 pi alpha counting
- C 4 pi internal conversion electron counting
- D 4 pi coincidence counting
- E 4 pi anticoincidence counting
- F 4 pi coincidence and anticoincidence counting

Using a liquid scintillation counter

- G 4 pi coincidence counting
- H 4 pi anticoincidence counting
- J 4 pi coincidence and anticoincidence counting
- K 4 pi efficiency tracing

**SI unit of radioactivity** The S.I. unit of radioactivity is the becquerel

- 1 becquerel (Bq) = 1 nuclear transformation per second, therefore
- 1 curie (Ci) =  $3.7 \times 10^{10}$  becquerels exactly

Useful conversion factors are:

- 1 microcurie ( $\mu$ Ci) =  $3.7 \times 10^4$  Bq = 37 kilobecquerels (kBq)
- 1 millicurie (mCi) =  $3.7 \times 10^7$  Bq = 37 megabecquerels (MBq)
- 1 kilobecquerel (kBq) = 27.027 nanocuries (nCi)
- 1 megabecquerel (MBq) = 27.027 microcuries ( $\mu$ Ci)

RC-5-023-060A



# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0133	Isotope:	Strontium-90
Prepared By:	Joe Davis	Prepared By:	Joe Davis
Carrier Conc:	0.1 M HCL	Prep Date:	09/25/1999
Reference Date:	04/01/1996	Verification Date:	12/20/2005
Ampoule Mass (g):	5.0669 g	Expiration Date:	12/20/2006
Uncertainty:	+/- .8 %	Primary Code:	0133-A
LogBook No:	RC S 023 060	Dilution(mL):	100 mL
		Mass of Parent(g):	4.8374 g
		Density(g/mL):	1.0041

### Calculations Converting parent activity to dpm/mL|dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$$

$$(4.8374 \text{ g}) * (12.89 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (100 \text{ mL}) = 1384260.7092 \text{ dpm/mL}$$

$$(4.8374 \text{ g}) * (12.89 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (1.0041 \text{ g/mL}) / (100 \text{ mL}) = 1378622.1492 \text{ dpm/g}$$

## Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
09/06/2000	Joe Davis	.0899	1000	0133-F	124.445 dpm/mL	09/06/2000	09/06/2001
12/05/1999	Joe Davis	.9937	100	0133-C	13699.37 dpm/mL	12/05/1999	12/05/2000
12/05/1999	Joe Davis	.0995	100	0133-B	1371.73 dpm/mL	12/05/1999	12/05/2000
02/16/2000	Richard Kinney	.0349	500	0133-D	96.23 dpm/mL	02/16/2000	02/16/2001
03/09/2000	Richard Kinney	.0282	250	0133-E	155.51 dpm/mL	03/09/2000	03/09/2001
10/13/2000	Robert Timm	.3194	1000	0133-G-104	440.332 dpm/mL	10/09/2001	10/09/2002
10/13/2000	Robert Timm	1.0865	100	0133-H	14978.73 dpm/mL	10/09/2002	10/09/2003
10/13/2000	Robert Timm	.3194	1000	0133-G-204	440.332 dpm/mL	10/09/2001	10/09/2002
10/13/2000	Robert Timm	.3194	1000	0133-G-304	440.332 dpm/mL	10/09/2001	10/09/2002
10/13/2000	Robert Timm	.3194	1000	0133-G-404	440.332 dpm/mL	10/09/2001	10/09/2002
05/10/2001	Angela Johnson	1.0005	1000	0133-I	1379.311 dpm/mL	05/11/2001	05/11/2002
05/06/2002	Angela Johnson	.3738	1000	0133-J	515.329 dpm/mL	05/09/2002	05/09/2003
06/07/2002	Angela Johnson	.1816	1000	0133-K	250.358 dpm/mL	06/07/2002	06/07/2003
01/16/2003	Angela Johnson	.2964	1000	0133-L	408.624 dpm/mL	01/16/2003	01/16/2004
04/18/2003	Lonnie Morris	.3247	1000	0133-M	447.6386 dpm/mL	04/16/2004	04/16/2005
10/31/2002	Angela Johnson	10.11	1000	0133-G		10/31/2002	10/31/2003
05/25/2004	Amanda Fehr	.361	1000	0133-N	497.6826 dpm/mL	05/24/2005	05/24/2006
07/22/2005	Brenda Burke	.098	500	0133-O	270.2099 dpm/mL	08/16/2005	08/16/2006
08/15/2005	Amanda Fehr	.1582	500	0133-P	436.196 dpm/mL	08/15/2005	08/15/2006
12/20/2005	Amanda Fehr	.3248	100	0133-Q	447.78 dpm/mL	12/20/2005	12/20/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

# CERTIFICATE OF CALIBRATION ALPHA STANDARD SOLUTION

0159

Radionuclide: Th-230  
Half Life:  $(7.54 \pm 0.03) \times 10^4$  years  
Catalog No.: 7230  
Source No.: 678-28-1  
Customer: GENERAL ENGINEERING LABS  
P.O.No.: 2507 RD  
Reference Date: 1 Sep 99 12:00 PST.  
Contained Radioactivity: Th-230: 9.740  $\mu$ Ci (360.4 kBq)

### Description of Solution

- a. Mass of solution: 4.89252 grams in 5 mL flame sealed ampoule
- b. Chemical form: Thorium nitrate in 0.1M nitric acid
- c. Carrier content: 10  $\mu$ g Th/mL of solution
- d. Density: 1.0016

gram/ml @ 20°C.

### Radioimpurities

Am-241: See Technical Data Sheet

### Radioactive Daughters

Ra-226: See Technical Data Sheet

### Radionuclide Concentration

Th-230: 1.991  $\mu$ Ci/gram of solution (73.67 kBq/gram of solution)

### Method of Calibration

Weighed aliquots of the solution were assayed using a liquid scintillation counter.

### Uncertainty of Measurement

- a. Systematic uncertainty in instrument calibration:  $\pm 2.0\%$
- b. Random uncertainty in assay:  $\pm 0.8\%$
- c. Random uncertainty in weighing(s):  $\pm 0.0\%$
- d. Total uncertainty at the 99% confidence level:  $\pm 2.2\%$

### NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

### Leak Test(s)

See reverse side for Leak Test(s) applied to this source.

### Notes

1. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)
2. Nuclear data were taken from Table of Radioactive Isotopes (1986), edited by Virginia Shirley.

*Daniel James Van Dalsen*  
QUALITY CONTROL

26-Aug-99  
Date Signed



ISOTOPE PRODUCTS LABORATORIES

1800 N. KEYSTONE STREET  
BURBANK, CALIFORNIA 91504

818-843-7000 FAX 818-843-6168

0159



### Th-230 TECHNICAL DATA

The Th-230 used to prepare your order was taken from Isotope Products Laboratories Lot #6481 and had the following composition as of December 15, 1994.

<u>NUCLIDE</u>	<u>ATOM%</u>	<u>ACTIVITY%</u>
Th-229	<0.001	<1.23 x 10 <sup>-2</sup>
Th-230	83.71	99.79
Th-232	16.29	1.08 x 10 <sup>-4</sup>
Ra-226 (daughter Th-230)	----	0.15
Am-241	----	0.05

Isotopic composition provided by Oak Ridge National Laboratory.

No other alpha emitting nuclides were detected.

If you have any questions, please contact Technical Service.

Corporate and  
Sales Offices  
1800 N. Keystone Street  
Folsom, California  
91504  
818-843-7000  
818-843-6168



# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0159	Isotope:	Thorium-230
Prepared By:	Joe Davis	Prepared By:	Joe Davis
Carrier Conc:	0.1M HNO <sub>3</sub>	Prep Date:	09/21/1999
Reference Date:	09/01/1999	Verification Date:	06/19/2004
Ampoule Mass (g):	4.89252 g	Expiration Date:	06/19/2005
Uncertainty:	+/- 2.2 %	Primary Code:	0159-A
LogBook No:	RC S 023 102	Dilution(mL):	100 mL
		Mass of Parent(g):	4.7484 g
		Density(g/mL):	0.9992

## Calculations Converting parent activity to dpm/mL | dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parent Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parent Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$$

$$(4.7484 \text{ g}) * (1.991 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (100 \text{ mL}) = 209880.2297 \text{ dpm/mL}$$

$$(4.7484 \text{ g}) * (1.991 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (0.9992 \text{ g/mL}) / (100 \text{ mL}) = 210051.8397 \text{ dpm/g}$$

## Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/29/2001	Angela Albee	.0992	100	0159-H	208.37 dpm/mL	01/29/2001	01/29/2002
02/28/2001	Angela Albee	1.0451	1000	0159-I-102	219.525 dpm/mL	03/06/2002	03/06/2003
02/28/2001	Angela Albee	1.0451	1000	0159-I-202	219.525 dpm/mL	03/12/2002	03/12/2003
09/21/1999	Joe Davis	.1172	100	0159-B	246.18 dpm/mL	09/21/1999	09/21/2000
09/23/1999	Joe Davis	.1016	100	0159-C	213.41 dpm/mL	09/23/1999	09/23/2000
01/10/2000	Joe Davis	.1008	100	0159-D	211.56 dpm/mL	01/10/2000	01/10/2001
02/16/2000	Richard Kinney	.2422	500	0159-E	101.75 dpm/mL	02/16/2000	02/16/2001
03/20/2000	Joe Davis	.0998	100	0159-F	209.63 dpm/mL	03/20/2000	03/20/2001
07/28/2000	Robert Timm	1.0046	1000	0159-G	211.02 dpm/mL	07/28/2000	07/28/2001
05/10/2001	Angela Albee	.0987	1000	0159-J	210.1569 dpm/mL	05/10/2001	05/10/2002
08/31/2001	Lonnie Morris	.0416	100	0159-K	87.31 dpm/mL	09/23/2002	09/23/2003
06/07/2002	Angela Albee	1.0002	1000	0159-L	207.278 dpm/mL	06/07/2002	06/07/2003
01/16/2003	Angela Albee	4.5144	1000	0159-M	947.483 dpm/mL	01/16/2003	01/16/2004
02/27/2003	Angela Albee	1.1079	1000	0159-N	232.526 dpm/mL	02/27/2004	02/27/2005
06/23/2004	Amanda Fehr	1.14	1000	0159-O	239.459 dpm/mL	07/03/2005	07/03/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000



## Verification for Th-230 Standard 0159-O

A. Fehr  
7/3/2005

Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Amt Used (mL)	Source DPM/mL
0159-N N1	258.0000	23.3000	234.7000	0.9696	1.0000	242.0585809
0159-N N2	259.3000	23.3000	236.0000	0.9696	1.0000	243.3993399
0159-N N3	255.4000	23.3000	232.1000	0.9696	1.0000	239.3770627

Mean Value (Counting) =	241.6116612	dpm/mL	100.903182	% of known
Stdev =	2.048043318	dpm/mL	0.00847659	
Certificate Value =	239.449	dpm/mL		
Lower Limit =	237.5155745	dpm/mL		
Upper Limit =	245.7077478	dpm/mL		
Rule 1 Pass/Fail	Pass	Pass	Pass	
Two sigma =	4.096086636			
10 % of Mean =	24.16116612			
Rule 2 (Pass/Fail)	Pass			

### Verification Rules

Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements

Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

The analyst prepared three standard verification sources for Th-230 source 0159-O by transferring 1.0 mL portions of the standard to glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 26 for alpha source standard verification. The alpha efficiency calibration which was used for verification calculations was performed using NIST source 0556-A (Th-230). Calibration data is recorded in this logbook under Th-230 0556-A. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

Amanda L. Fehr 7/3/05

Angela A. Johnson  
7/5/05

# CERTIFICATE OF CALIBRATION

## Standard Radionuclide Source

61762-278

Ac-227 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked by alpha spectroscopy. The nuclear decay rate and assay date for this source are given below.

Analytics maintains traceability to the National Institute of Standards and Technology through participation in a Measurements Assurance Program as described in USNRC Reg. Guide 4.15, Revision 1, February 1979.

ISOTOPE:	Ac-227
ACTIVITY (dps):	2.085 E5
HALF-LIFE:	21.77 years
CALIBRATION DATE:	June 8, 2001 12:00 EST
TOTAL UNCERTAINTY*:	5.0%
SYSTEMATIC:	2.0%
RANDOM:	3.0%

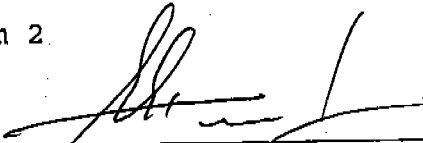
\*99% Confidence Level

Impurities:  $\gamma$ -impurities (other than decay products) <0.1%  
 $\alpha$ -impurities <0.3%

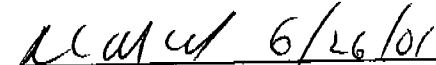
5.3136 grams 2M HNO<sub>3</sub> solution, carrier free.

P O NUMBER 2533RD, Item 2

SOURCE PREPARED BY:

  
E. A. Taskaev, Production Manager

Q A APPROVED:

  
6/26/01



# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0387	Isotope:	Actinium-227
Prepared By:	Angela Johnson	Prepared By:	Angela Johnson
Carrier Conc:	2 M HNO3	Prep Date:	07/17/2001
Reference Date:	06/08/2001	Verification Date:	07/01/2002
Ampoule Mass (g):	5.3136 g	Expiration Date:	07/01/2003
Uncertainty:	+/- 5 %	Primary Code:	0387-A
LogBook No:	RC S 034	Dilution(mL):	100 mL
		Mass of Parent(g):	4.7794 g
		Density(g/mL):	1.0370

### Calculations Converting parent activity to dpm/mL|dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parent Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parent Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$$

$$(4.7794 \text{ g}) * (208500 \text{ dps}) * (59.9 \text{ dpm/dps}) / (5.3136 \text{ g} * 100 \text{ mL}) = 112335.5983 \text{ dpm/mL}$$

$$(4.7794 \text{ g}) * (208500 \text{ dps}) * (59.9 \text{ dpm/dps}) / (1.0370 \text{ g/mL}) / (5.3136 \text{ g} * 100 \text{ mL}) = 108330.3019 \text{ dpm/g}$$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
07/17/2001	Lonnie Morris	.4684	1000	0387-B-102	50.8266 dpm/mL	07/11/2005	07/11/2006
07/17/2001	Lonnie Morris	.4684	1000	0387-B-202	50.827 dpm/mL	07/11/2004	07/11/2005

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

## Verification for Ac-227 Standard 0387-B

A. Fehr 7/13/2005	Isotope	Value	Uncertainty
	0387-B #1	193.600	38.1000
	0387-B #2	181.200	36.2000
	0387-B #3	192.900	52.4000

Mean Value (Counting) = 189.233 0.9416936  
 Stdev = 6.965869173

Target = 200.95  
 Lower Limit = 175.301595  
 Upper Limit = 203.1650717  
 Rule 1 Pass/Fail **Pass Pass Pass**  
 Two sigma = 13.93173835  
 10 % of Mean = 18.92333333  
 Rule 2 (Pass/Fail) **Pass**

The analyst prepared three standard verification sources for standard 0387-B using 0.1 mL for each source. Each standard was combined with 0.1 mL of Th-230 standard 0159-K and 50 micrograms of cerium carrier in a disposable centrifuge tube. Each standard was diluted to 20 mL with 0.1 M HCl. Three mL of 48% HF was added to precipitate cerium (and Thorium) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for Ac-227 were calculated by comparison to Th-230 certified values.

*Amanda L. Fehr*  
 7/13/05

## STANDARDIZATION OF LEAD CARRIER

DATE: 1/30/2006  
 LOT NUMBER: 1006864

	LEAD PRECIPITATES				Average	Std. Dev.	
	1	2	3	4			
Weight of carrier added	1.00	1.01	1.00	1.01	13.88	± 0.05	0.003604
Aliquot (1.00 mL)	1	1	1	1	13.81	± 0.12	0.008355
filter + ppt	0.0975	0.0970	0.0979	0.0978			
filter	0.0836	0.0832	0.0840	0.0839			
Wt. of ppt., g	0.0139	0.0138	0.0139	0.0139	<b>13.88</b>	<b>mg Pb/mL</b>	
					<b>13.81</b>	<b>mg Pb/g</b>	
mg Ca/mL	13.90	13.80	13.90	13.90			
mg Ca/g	13.90	13.66	13.90	13.76			

0.5% of Mean Value = 0.069 Pass

A satisfactory standardization is obtained when results give a standard deviation of less than 0.5% of the mean value.

# DEUTSCHER KALIBRIERDIENST (DKD)

Kalibrierlaboratorium für Meßgrößen der Radioaktivität  
*Calibration laboratory for measurements of radioactivity*

AKKREDITIERT DURCH DIE PHYSIKALISCH-TECHNISCHE BUNDESANSTALT (PTB)



**Amersham Buchler GmbH & Co KG**  
Postfach 11 49 Gieselweg 1  
D-38001 Braunschweig D-38110 Braunschweig

Telefon (05307) 930-0  
Telefax (05307) 930-293  
Telefax-Zentrale 930-237

## Kalibrierschein *Calibration Certificate*

Kalibrierzeichen  
*Calibration mark*

02628
DKD-K- 06501
95-10

Gegenstand <i>Object</i>	Radioactive Reference Solution
Hersteller <i>Manufacturer</i>	Amersham Buchler GmbH & Co KG Postfach 11 49 Gieselweg 1 D-38001 Braunschweig D-38110 Braunschweig
Typ <i>Type</i>	RBZB44
Strahler-Nr. <i>Source number</i>	ET 491
Auftraggeber <i>Customer</i>	Amersham Corporation 2636 S. Clearbrook Drive Arlington Heights, IL 60005 USA-Arlington Heights, IL
Auftragsnummer <i>Work order number</i>	112116
Anzahl der Seiten des Kalibrierscheines <i>Number of pages of the certificate</i>	2
Referenzdatum <i>Reference date</i>	1 January 1995

Der Deutsche Kalibrierdienst ist Unterzeichner des multilateralen Übereinkommens der Western European Calibration Cooperation (WECC) zur gegenseitigen Anerkennung der Kalibrierscheine. Die Kalibrierung erfolgt auf der Grundlage des zwischen der Physikalisch-Technischen Bundesanstalt und dem Träger abgeschlossenen Vertrages. Dieser Kalibrierschein dokumentiert die Rückführbarkeit auf nationale Normale zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

*The Deutscher Kalibrierdienst is signatory to the multilateral agreement of the Western European Calibration Cooperation (WECC) for the mutual recognition of calibration certificates. The calibration is performed according to the stipulations of the contract between the Physikalisch-Technische Bundesanstalt and the holder of the calibration laboratory. This calibration certificate documents the traceability to national standards, which realize the physical units of measurement according to the International System of Units (SI). The user is obliged to have the object recalibrated at appropriate intervals.*

Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung sowohl der Physikalisch-Technischen Bundesanstalt als auch des ausstellenden Kalibrierlaboratoriums.  
Kalibrierscheine ohne Unterschrift und Stempel haben keine Gültigkeit.  
*This calibration certificate may not be reproduced other than in full except with the permission of both the Physikalisch-Technische Bundesanstalt and the issuing laboratory. Calibration certificates without signature and seal are not valid.*

Stempel Seal	Datum Date	Leiter des Kalibrierlaboratoriums Head of the calibration laboratory	Stellvertreter Deputy	Bearbeiter Person responsible
	18 October 1995	Dr. Dornhöfer	 Dr. Thieme	 E. Schuber 20-5-013-4

02628
DKD-K-06501
95-10

## Radioactive Reference Solution

Solution No.: ET 491

Drawing No.: VZ-2058

Nuclide: Lead-210

Radioactive concentration: 38.1 kBq/g

Reference date: 1 January 1995 at 12.00 GMT

Mass of solution: (5.182 ± 0.001) g

Volume of solution: approx. 5 ml

Chemical composition: Solution in 1.2 M HNO<sub>3</sub>  
Carrier: Pb (NO<sub>3</sub>)<sub>2</sub>, Bi (NO<sub>3</sub>)<sub>3</sub>; each 20 mg/l of the corresponding element.

Measuring method: The activity was determined by comparison with a reference solution by measurement with a Ge-detector with MCA.

Traceability: Additional to the direct traceability to the PTB through the DKD this product satisfies the quality assurance requirements of USNRC Regulatory Guide 4.15 Revision 1, February 1979, for achieving NIST traceability through Amersham's participation in the NEI-NIST Measurements Assurance Program of the Nuclear Power Industry.

Uncertainty: The relative uncertainty of the activity is ± 3 %.

The declared uncertainty U is an expanded uncertainty  $U = k * u_c$  with a coverage factor of  $k = 3$ . The combined uncertainty  $u_c$  is the sum of all uncertainties which can be evaluated by statistical means (uncertainty type A,  $u_A$ ) and all other uncertainties (uncertainty type B,  $u_B$ ) whereby  $u_c^2 = u_A^2 + u_B^2$ .  
(Ref.: NIST Technical Note 1297 / WECC-Doc. 19-1990)

Radioactive impurities: Related to Pb-210 (equal 100 %) the following radioactive impurities were detected:  
Ra-226: 0.003 %



LC-5-013-47

## TRACEABILITY TO NIST

Amersham Corporation  
2636 S. Clearbrook Drive  
Arlington Heights, IL 60005  
tel (708) 593-6300  
fax (708) 593-8091



Traceability is the ability to relate the accuracy of measurement of radionuclides to the National Institute of Standards and Technology (NIST). Traceability is achieved by participation in a Measurements Assurance Program linked to NIST and production of certified materials in accordance with a quality assurance program.

Amersham participates in measurement assurance programs conducted by NIST in cooperation with the Nuclear Energy Institute (NEI, formerly USCEA). Additionally, our production facilities and measurement laboratories operate under routinely audited quality assurance programs.

Therefore, Amersham certified standardized products meet or exceed, the NRC requirements for measurements traceable to NIST.

278004C





# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	ET491	Isotope:	Lead-210
Prepared By:	Garret Ray	Prepared By:	Garret Ray
Carrier Conc:	1.2M HNO3	Prep Date:	03/01/1996
Reference Date:	01/01/1995	Verification Date:	07/12/2005
Ampoule Mass (g):	5.182 g	Expiration Date:	07/12/2006
Uncertainty:	+/- 3 %	Primary Code:	ET491-A
LogBook No:	RC S 014 004	Dilution(mL):	100 mL
		Mass of Parent(g):	5.0547 g
		Density(g/mL):	1.0000

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(5.0547 \text{ g}) * (38.1 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 115550.4420 \text{ dpm/mL}$
$(5.0547 \text{ g}) * (38.1 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0000 \text{ g/mL}) / (100 \text{ mL}) = 115550.4420 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
10/20/1997	Richard Kinney	.467	100	ET491-B	524.45 dpm/ml	03/01/1997	03/01/1998
10/29/1997	Richard Kinney	3.0992	500	ET491-C	696.09 dpm/mL	10/29/1998	10/29/1999
04/03/2001	Angela Johnson	.5184	100	ET491-D	582.17 dpm/mL	04/16/2003	04/16/2004
09/15/2003	Angela Johnson	.5132	100	ET491-E	576.33 dpm/mL	11/11/2005	11/11/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

# Verification for Pb-210 Standard ET491-E

A. Fehr  
11/11/2005

Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Source DPM/mL
ET491-E N1	1098.1000	21.6000	1098.1000	1.0000	416.9502415
ET491-E N2	1124.3000	21.6000	1124.3000	1.0000	426.8984214
ET491-E N3	1105.2000	21.6000	1105.2000	1.0000	419.6461223
Average =					421.1649284

Mean Value (Counting) = 421.1649284 % of known  
 Stdev = 5.145060708 0.01221626

Certificate Value = 410.9  
 Lower Limit = 410.874807  
 Upper Limit = 431.4550498  
 Rule 1 Pass/Fail Pass Pass  
 Two sigma = 10.29012142  
 10 % of Mean = 42.11649284  
 Rule 2 (Pass/Fail) Pass

## Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

The analyst prepared three calibration sources for source ET491-E by transferring 1.0 mL portions of the standard to glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The calibration vials and background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 31 for Pb-210 standard verification. The efficiency calibration which was used for verification calculations was performed on 4/19/04 using source 0356-A (Pb-210). Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

*Amanda L. Fehr 11/11/05*

0112



UKAS ACCREDITED CALIBRATION LABORATORY No. 0146

**Methods of measurement** The measurement techniques listed below are currently in use at Nycomed Amersham for the absolute standardisation of radioactive solutions. The methods used for this standardisation are indicated on page 2 of the certificate.

Using a gas flow proportional counter

- A 4 pi beta counting
- B 4 pi alpha counting
- C 4 pi internal conversion electron counting
- D 4 pi coincidence counting
- E 4 pi anticoincidence counting
- F 4 pi coincidence and anticoincidence counting

Using a liquid scintillation counter

- G 4 pi coincidence counting
- H 4 pi anticoincidence counting
- J 4 pi coincidence and anticoincidence counting
- K 4 pi efficiency tracing

**SI unit of radioactivity** The S.I. unit of radioactivity is the becquerel

1 becquerel (Bq) = 1 nuclear transformation per second, therefore

1 curie (Ci) =  $3.7 \times 10^{10}$  becquerels exactly

Useful conversion factors are:

- 1 microcurie ( $\mu$ Ci) =  $3.7 \times 10^4$  Bq = 37 kilobecquerels (kBq)
- 1 millicurie (mCi) =  $3.7 \times 10^7$  Bq = 37 megabecquerels (MBq)
- 1 kilobecquerel (kBq) = 27.027 nanocuries (nCi)
- 1 megabecquerel (MBq) = 27.027 microcuries ( $\mu$ Ci)

RC-5-024-038B



# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0112	Isotope:	Barium-133
Prepared By:	Richard Kinney	Prepared By:	Richard Kinney
Carrier Conc:	0.1M HCL	Prep Date:	04/09/1999
Reference Date:	06/20/1997	Verification Date:	01/21/2004
Ampoule Mass (g):	5.129 g	Expiration Date:	01/21/2005
Uncertainty:	+/- 1.8 %	Primary Code:	0112-A
LogBook No:	RC S 023 038A	Dilution(mL):	100 mL
		Mass of Parent(g):	5.0881 g
		Density(g/mL):	0.9935

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(5.0881 \text{ g}) * (474 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 1447055.6400 \text{ dpm/mL}$
$(5.0881 \text{ g}) * (474 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (0.9935 \text{ g/mL}) / (100 \text{ mL}) = 1456575.8226 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
04/09/1999	Joe Davis	.5846	100	0112-B	8514.6 dpm/ml	04/09/1999	04/09/2000
07/09/1999	Joe Davis	.5027	100	0112-C	7321.7 dpm/mL	07/09/1999	07/09/2000
11/11/1999	Joe Davis	.4993	100	0112-D	7272.22 dpm/mL	11/11/1999	11/11/2000
01/28/2000	Aadli Abdul-Kareem	5.2157	1000	0112-E	7596.58 dpm/mL	02/17/2001	02/17/2002
06/08/2001	Angela Johnson	10.6972	1000	0112-F-102	15580.3 dpm/mL	06/11/2002	06/11/2003
06/08/2001	Angela Johnson	10.6972	1000	0112-F-202	15580.3 dpm/mL	06/11/2002	06/11/2003
10/31/2002	Angela Johnson	10.11	1000	0112-G	14725.049 dpm/mL	10/31/2003	10/31/2004
01/19/2005	Amanda Fehr	10.431	1000	0112-H	15193.542 dpm/mL	01/18/2006	01/18/2007

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

# Verification for Ba-133 Standard 0112-H

A. Fehr	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Vol. Used (mL)	Source DPM/mL
1/18/2006	0112-H N1	707.9000	39.2000	668.7000	0.7442	0.1000	8985.12049
	0112-H N2	685.8000	39.2000	646.6000	0.7442	0.1000	8688.169447
	0112-H N3	693.1000	39.2000	653.9000	0.7442	0.1000	8786.257348
						Average =	8819.849095

Mean Value (Counting) = 8819.849095      **102.144245**      **Pass**  
 Stdev = 151.2986605      0.01715434      **Rule 3 (Pass/Fail)**

Certificate Value = 8634.7  
 Lower Limit = 8517.251774  
 Upper Limit = 9122.446416  
 Rule 1 Pass/Fail      **Pass**  
 Two sigma = 302.597321  
 10 % of Mean = 881.9849095  
 Rule 2 (Pass/Fail)      **Pass**

### Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 10% of the certificate value.

The analyst prepared three standard verification sources for Ba-133 source 0112-H by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 24 for Ba-133 source standard verification. The Ba-133 efficiency calibration which was used for verification calculations was performed on 1/18/06 using source 0487-A (Ba-133). Calibration data is recorded in this logbook under Ba-133 0487. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

RAD SOP M-001

*Amanda L. Fehr* 2/2/06  
 Amanda L. Fehr 1/19/06

# CERTIFICATE OF CALIBRATION

## Standard Radionuclide Source

64673-278

Ra-228 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Ra-228
ACTIVITY (dps):	1.939 E4
HALF-LIFE:	5.75 years
CALIBRATION DATE:	October 1, 2002 12:00 EST
TOTAL UNCERTAINTY*:	3.6%
SYSTEMATIC:	3.4%
RANDOM:	1.1%

\*99% Confidence Level

Impurities:  $\gamma$ -impurities <0.1%5.02617 grams 0.1M HCl solution with 110  $\mu$ g/g Ba carrier.

P O NUMBER 3208RD, Item 2

SOURCE PREPARED BY:

M. Taskaeva  
M. Taskaeva, Radiochemist

Q A APPROVED:

M. M. 10-2-02



# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0503	Isotope:	Radium-228
Prepared By:	Angela Albee	Prepared By:	Angela Albee
Carrier Conc:	0.1 M HCL	Prep Date:	02/20/2003
Reference Date:	10/01/2002	Verification Date:	04/09/2004
Ampoule Mass (g):	5.02617 g	Expiration Date:	04/09/2005
Uncertainty:	+/- 3.6 %	Primary Code:	0503-A
LogBook No:	RC S 035 018	Dilution(mL):	100 mL
		Mass of Parent(g):	4.4737 g
		Density(g/mL):	0.9992

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.4737 \text{ g}) * (19390 \text{ dps}) * (59.9 \text{ dpm/dps}) / (5.02617 \text{ g} * 100 \text{ mL}) = 10337.9473 \text{ dpm/mL}$
$(4.4737 \text{ g}) * (19390 \text{ dps}) * (59.9 \text{ dpm/dps}) / (0.9992 \text{ g/mL}) / (5.02617 \text{ g} * 100 \text{ mL}) = 10345.8102 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
04/02/2003	Lonnie Morris	39.71	1000	0503-B	411.518 dpm/mL	09/09/2005	09/09/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

# Verification for Ra-228 Standard 0503-B

A. Fehr 9/9/2005	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Standard Source DPM/mL
	0503-B N1	252.8000	14.4000	238.4000	0.8260783	1.0000 288.5924962
	0503-B N2	267.0000	14.4000	252.6000	0.8260783	1.0000 305.7821499
	0503-B N3	266.0000	14.4000	251.6000	0.8260783	1.0000 304.5716109
						Average = 299.6487523

Mean Value (Counting) = 299.6487523 dpm/mL 103.79387 % of known  
 Stdev = 9.594110231 dpm/mL 0.03201785

Certificate Value = 288.7 dpm/mL  
 Lower Limit = 280.4605319 dpm/mL  
 Upper Limit = 318.8369728 dpm/mL  
 Rule 1 Pass/Fail Pass  
 Two sigma = 19.18822046  
 10 % of Mean = 29.96487523  
 Rule 2 (Pass/Fail) Pass

### Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

The analyst prepared three standard verification sources for Ra-228 source 0503-B by transferring portions of the standard into glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 23 for Ra-228 source standard verification. The Ra-228 efficiency calibration which was used for verification calculations was performed on 2/20/03 using Analytic's source 0503(Ra-228). Calibration data is recorded in this logbook under Ra-228 0503. Each verification source calculation was performed as follows:

Source dpm/g = (A - B)/(C)(D)

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

Reference RAD SOP M-001

Amanda D. Fehr 9/9/05  
 Heather B. Urow 9/9/05



0638

**CERTIFICATE OF CALIBRATION**  
**Standard Radionuclide Source**

67519-278

Ra-226 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated using a germanium gamma spectrometer system.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

Analytics maintains traceability to the National Institute of Standards and Technology through participation in a Measurements Assurance Program as described in USNRC Reg. Guide 4.15, Revision 1, February 1979.

ISOTOPE:	Ra-226
ACTIVITY (dps):	2.353 E4
HALF-LIFE:	1.600 E3 years
CALIBRATION DATE:	January 23, 2004 12:00 EST
RELATIVE EXPANDED UNCERTAINTY (k=2):	3.3%

Impurities:  $\gamma$ -impurities (other than decay products) <0.1%

5.01065 grams 0.1M HCl solution with 50  $\mu$ g/g Ba carrier.

P O NUMBER 3231RD, Item 5

SOURCE PREPARED BY:

M. D. Currie  
M. D. Currie, Radiochemist

Q A APPROVED:

ACUW 1/26/04



# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0638	Isotope:	Radium-226
Prepared By:	Amanda Fehr	Prepared By:	Amanda Fehr
Carrier Conc:	0.1M HCl	Prep Date:	01/16/2006
Reference Date:	01/23/2004	Verification Date:	01/16/2006
Ampoule Mass (g):	5.01065 g	Expiration Date:	01/16/2007
Uncertainty:	+/- 3.3 %	Primary Code:	0638-A
LogBook No:	RC-S-037-037	Dilution(mL):	100 mL
		Mass of Parent(g):	4.8398 g
		Density(g/mL):	1.0266

### Calculations Converting parent activity to dpm/mL|dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$$

$$(4.8398 \text{ g}) * (23530 \text{ dps}) * (59.9 \text{ dpm/dps}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13613.8856 \text{ dpm/mL}$$

$$(4.8398 \text{ g}) * (23530 \text{ dps}) * (59.9 \text{ dpm/dps}) / (1.0266 \text{ g/mL}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13260.8293 \text{ dpm/g}$$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/17/2006	Amanda Fehr	2.1041	100	0638-B	279.0211 dpm/mL	01/17/2006	01/17/2007

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

# Certificate of Analysis

0903

Catalog No: 060092-16

Lot No: 1006930

Storage: Ambient

Matrix: 1M HNO<sub>3</sub>

Container: 250 ml Narrow Mouth, HDPE

Description: Uranium 250 µg/L ± 0.5% in 1M HNO<sub>3</sub>

Quality System  
Audited & Registered  
by NSF-ISR to ISO 9001:2000

Received: 2/7/06

Issue Date: 3/1/2007

Element	Symbol	CAS No	Source Lot No	Purity %	Concentration ug/L
Uranium Total	U	7440-61-1	7075.42.5	100	250



Mark Filla

This standard was prepared gravimetrically using balances calibrated with NIST traceable weights (NIST Test Number 1000). Only calibrated Class A volumetric glassware was used to prepare this standard. Sub-boiled distilled acid and deionized water were used to stabilize the product. All raw materials were checked for stoichiometry and purity. This standard has been spectrometrically certified by an independent source, which is directly traceable to NIST.

**CERTIFICATE OF CALIBRATION**  
Standard Radionuclide Source

68509-278

U-232 5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared using an aliquot measured gravimetrically from a master radionuclide solution standard. The master radionuclide solution standard was calibrated by the Department Des Applications Et De La Metrologie Des Rayonnements Ionisants (DAMRI), Paris, France, as Number 23236.

Radionuclide purity and calibration were checked using a germanium gamma spectrometer system. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	U-232
ACTIVITY (dps):	3.779 E3
CALIBRATION DATE:	June 18, 2004 12:00 EST
HALF-LIFE:	68.9 years
RELATIVE EXPANDED: UNCERTAINTY (k=2):	3.3%

Impurities: Am-241 <0.15%  
U-233 <0.3%

5.20343 grams 1M HNO<sub>3</sub> solution.

P O NUMBER 3243 RD, Item 1

SOURCE PREPARED BY:

M. Dimitrova  
M. Dimitrova, Radiochemist

Q A APPROVED:

ACU/6/23/04

RECEIVED  
11/26/04



# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0688	Isotope:	Uranium-232
Prepared By:	Amanda Fehr	Prepared By:	Amanda Fehr
Carrier Conc:	1M HNO3	Prep Date:	06/25/2004
Reference Date:	06/18/2004	Verification Date:	01/12/2006
Ampoule Mass (g):	5.20343 g	Expiration Date:	01/12/2007
Uncertainty:	+/- 3.3 %	Primary Code:	0688-A
LogBook No:	RC-S-037-087	Dilution(mL):	100 mL
		Mass of Parent(g):	4.9894 g
		Density(g/mL):	1.0276

### Calculations Converting parent activity to dpm/mL|dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$$

$$(4.9894 \text{ g}) * (3779 \text{ dps}) * (59.9 \text{ dpm/dps}) / (5.20343 \text{ g} * 100 \text{ mL}) = 2170.5126 \text{ dpm/mL}$$

$$(4.9894 \text{ g}) * (3779 \text{ dps}) * (59.9 \text{ dpm/dps}) / (1.0276 \text{ g/mL}) / (5.20343 \text{ g} * 100 \text{ mL}) = 2112.2178 \text{ dpm/g}$$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
06/18/2004	Brenda Burke	2.203	250	0688-B	18.6439 g/mL	06/28/2005	06/28/2006
07/06/2004	Tim Chandler	2.2243	250	0688-C	18.8242 dpm/mL	08/14/2004	08/14/2005
07/06/2004	Amanda Fehr	26.03	1000	0688-D	55.0728 dpm/mL	07/06/2004	07/06/2005
04/19/2005	Amanda Fehr	26.01	1000	0688-E	55.0305 dpm/mL	05/04/2005	05/04/2006
05/27/2005	Brenda Burke	.612	250	0688-F	5.17934 dpm/mL	05/31/2005	05/31/2006
06/23/2005	Brenda Burke	2.227	250	0688-G	18.847 dpm/mL	06/28/2005	06/28/2006
01/06/2006	Mary Avins	26.01	1000	0688-H	55.0305 dpm/mL	01/12/2006	01/12/2007

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

## Verification for Uranium-232 Standard 0688-H

Analyst: M Avins	Isotope	Value	Uncertainty	
Date: 1/12/06	0688-H N1	2.46	pCi/L 0.292	pCi/L
	0688-H N2	2.49	pCi/L 0.383	pCi/L
	0688-H N3	2.48	pCi/L 0.315	pCi/L
<b>Mean Value (Counting) =</b>	2.477	pCi/L	<b>0.9992767</b>	<b>% of known</b>
<b>Stdev =</b>	0.015275252	pCi/L		
<b>Target =</b>	2.48	pCi/L		
<b>Lower Limit =</b>	2.446116162	pCi/L		
<b>Upper Limit =</b>	2.507217171	pCi/L		
<b>Rule 1 Pass/Fail</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>	
<b>Two sigma =</b>	0.030550505			
<b>10 % of Mean =</b>	0.247666667			
<b>Rule 2 (Pass/Fail)</b>	<b>Pass</b>			

The analyst prepared three standard verification sources for standard **0688-H** using 0.1 mL for each source. Each standard was combined with 0.1 mL of **U-238** standard **0858-B** and 50 micrograms of Nd carrier in a disposable centrifuge tube. Each standard was diluted to 4 mL with 2 M HCl, and 2 mL of DI water. One mL of TiCl<sub>3</sub> was added. Two mL of 48% HF was added to precipitate Nd (and **Uranium**) fluoride. After 30 minutes, each sample was filtered following routine procedures for alpha spectroscopy source preparation. Each source was counted using routine alpha spec procedures. DPM values for **U-232** were calculated by comparison to **U-238** certified values.

Reference SOP RAD M-001

*Mary L. Avins*  
1/12/06

*Amanda L. Loh*  
1/24/06



# National Institute of Standards & Technology

## Certificate

### Standard Reference Material 4321C Natural Uranium Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive natural uranium nitrate and nitric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of alpha-particle counting instruments and for the monitoring of radiochemical procedures.

#### Radiological Hazard

The SRM ampoule contains uranium-238, uranium-235, and uranium-234 with a total activity of approximately 2600 Bq. Uranium decays by alpha-particle emission. The progeny of uranium-238, uranium-235, and uranium-234 have a total activity of approximately 2600 Bq and decay by alpha- and beta-particle emission. None of the alpha or beta particles escape from the SRM ampoule. During the decay process X-rays and gamma rays with energies from 11 keV to 2.0 MeV are also emitted. Most of these photons escape from the SRM ampoule but their intensities are so small that they do not represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]\*. The SRM should be used only by persons qualified to handle radioactive material.

#### Chemical Hazard

The SRM ampoule contains nitric acid ( $\text{HNO}_3$ ) with a concentration of 1 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

#### Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least August 2007.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

#### Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899  
November 1997

Thomas E. Gills, Chief  
Standard Reference Materials Program

### Recommended Procedure for Opening the SRM Ampoule

- 1) If the SRM solution is to be diluted, it is recommended that the diluting solution have a composition comparable to that of the SRM solution.
- 2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood. In addition to the radioactive material, the solution contains strong acid and is corrosive.
- 3) Shake the ampoule to wet all of the inside surface of the ampoule. Return the ampoule to the upright position.
- 4) Check that all of the liquid has drained out of the neck of the ampoule. If necessary, gently tap the neck to speed the process.
- 5) Holding the ampoule upright, score the narrowest part of the neck with a scribe or diamond pencil.
- 6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.
- 7) Hold the ampoule upright with a paper towel, a wiper, or a support jig. Position the scored line away from you. Using a paper towel or wiper to avoid contamination, snap off the top of the ampoule by pressing the narrowest part of the neck away from you while pulling the tip of the ampoule towards you.
- 8) Transfer the solution from the ampoule using a pycnometer or a pipet with dispenser handle. **NEVER PIPETTE BY MOUTH.**
- 9) Seal any unused SRM solution in a flame-sealed glass ampoule, if possible, to minimize the evaporation loss.

See also reference [4]\*.



**PROPERTIES OF SRM 4321C**  
(Certified values are shown in bold type)

Source identification number	NIST SRM 4321C		
<b>Physical Properties:</b>			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	(16.5 ± 0.5) mm	
	Wall Thickness	(0.60 ± 0.04) mm	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Solution density	(1.053 ± 0.001) g·mL <sup>-1</sup> at 21.4 °C [b]*		
Solution mass	(5.258 ± 0.002) g [b]		
<b>Chemical Properties:</b>			
Solution composition	Chemical Formula	Concentration (mol·L <sup>-1</sup> )	Mass Fraction (g·g <sup>-1</sup> )
	H <sub>2</sub> O	53	0.91
	HNO <sub>3</sub>	1.0	0.06
	UO <sub>2</sub> (NO <sub>3</sub> ) <sub>2</sub>	0.09	0.03
<b>Radiological Properties:</b>			
Radionuclide	Natural Uranium (Mixture of U-238, U-235, and U-234)		
Reference time	1200 EST, 1 August 1997		
Massic activity of the solution [c]	U-238: 242.0 Bq·g <sup>-1</sup> U-235: 11.14 Bq·g <sup>-1</sup> U-234: 233.1 Bq·g <sup>-1</sup>		
Relative expanded uncertainty (k=2)	U-238: 0.60% [d] [e] U-235: 0.62% [d] [e] U-234: 0.98% [d] [e]		
Mass fraction of uranium	(0.01960 ± 0.00010) g·g <sup>-1</sup> [b]		
Photon-emitting impurities	None detected [f]		
Half lives used	Uranium-238: (4.468 ± 0.003) × 10 <sup>9</sup> a [g] Uranium-235: (7.038 ± 0.005) × 10 <sup>8</sup> a [g] Uranium-234: (2.455 ± 0.006) × 10 <sup>5</sup> a [g]		
Measuring instruments	Mass spectrometer, silicon surface-barrier detector, and 4π(α+β) liquid-scintillation counting systems.		

EVALUATION OF THE UNCERTAINTY OF THE MASSIC ACTIVITY [d]\*

Input Quantity $x_i$ , the source of uncertainty  (and individual uncertainty components where appropriate)	Method Used To Evaluate $u(x_i)$ , the standard uncertainty of $x_i$ (A) denotes evaluation by statistical methods (B) denotes evaluation by other methods	Relative Uncertainty Of Input Quantity, $u(x_i)/x_i$ , (%) [h]	Relative Sensitivity Factor, $ \partial y/\partial x_i  \cdot$ $(x_i/y)$ [i]	Relative Uncertainty Of Output Quantity, $u_i(y)/y$ , (%) [j]
Isotopic uranium atom fraction in SRM 960	Standard deviation of the mean for repeated mass-spectrometric measurements (A)	U-238: 0.001	1.0	0.001
		U-235: 0.07	1.0	0.07
		U-234: 0.31	1.0	0.31
Half life	Standard uncertainty of the half life (A)	U-238: 0.07	1.0	0.07
		U-235: 0.07	1.0	0.07
		U-234: 0.25	1.0	0.25
Uranium mass fraction in SRM 960	Certificate value (B)	0.003	1.0	0.003
Quantitative dissolution	Estimated (B)	0.25	1.0	0.25
Gravimetric measurements	Estimated (B)	0.10	1.0	0.10
Photon-emitting impurities	Limit of detection (B) [k]	100.	0.001	0.10
Relative Combined Standard Uncertainty of the Output Quantity, $u_c(y)/y$ , (%)			U-238:	0.30
			U-235:	0.31
			U-234:	0.49
Coverage Factor, $k$				<u>x 2</u>
Relative Expanded Uncertainty of the Output Quantity, $U/y$ , (%)			U-238:	0.60
			U-235:	0.62
			U-234:	0.98

## NOTES

- [a] The Sievert is the SI unit for dose equivalent. See reference [1]. One  $\mu\text{Sv}$  is equal to 0.1 mrem.  
 Distance from Ampoule (cm): 1 30 100  
 Approximate Dose Rate ( $\mu\text{Sv/h}$ ): <0.1
- [b] The stated uncertainty is two times the standard uncertainty.
- [c] **Massic activity** is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].
- [d] The reported value,  $y$ , of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as  $y = f(x_1, x_2, x_3, \dots, x_n)$ , where  $f$  is a mathematical function derived from the assumed model of the measurement process.
- The value,  $x_i$ , used for each input quantity  $i$  has a **standard uncertainty**,  $u(x_i)$ , that generates a corresponding uncertainty in  $y$ ,  $u_i(y) \equiv |\partial y / \partial x_i| \cdot u(x_i)$ , called a **component of combined standard uncertainty** of  $y$ .
- The **combined standard uncertainty** of  $y$ ,  $u_c(y)$ , is the positive square root of the sum of the squares of the components of combined standard uncertainty.
- The combined standard uncertainty is multiplied by a coverage factor of  $k = 2$  to obtain  $U$ , the **expanded uncertainty** of  $y$ .
- Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation  $u_c(y)$ , the unknown value of the massic activity is believed to lie in the interval  $y \pm U$  with a level of confidence of approximately 95 percent.
- For further information on the expression of uncertainties, see references [2] and [3].
- [e] The value of each standard uncertainty component, and hence the value of the expanded uncertainty itself, is a best estimate based upon all available information, but is only approximately known. That is to say, the "uncertainty of the uncertainty" is large and not well known. This is true for uncertainties evaluated by statistical methods (e.g., the relative standard deviation of the standard deviation of the mean for the massic count rate is approximately 50%) and for uncertainties evaluated by other methods (which could easily be over estimated or under estimated by substantial amounts). The unknown value of the expanded uncertainty is believed to lie in the interval  $U/2$  to  $2U$  (i.e., within a factor of 2 of the estimated value).
- [f] Estimated limits of detection for photon-emitting impurities are:  
 $1.4 \gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$  for energies between 8 and 59 keV,  
 $1.1 \gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$  for energies between 67 and 88 keV,  
 $0.5 \gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$  for energies between 102 and 197 keV,  
 $0.3 \gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$  for energies between 205 and 762 keV,  
 $0.2 \gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$  for energies between 770 and 996 keV, and  
 $0.1 \gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$  for energies between 1006 and 1900 keV,  
 provided that the photons are separated in energy by 4 keV or more from photons emitted in the decay of uranium-238, uranium-235, uranium-234, or their progeny.
- [g] The stated uncertainty is the standard uncertainty. See reference [5].

- [h] Relative standard uncertainty of the input quantity  $x_i$ .
- [i] The relative change in the output quantity  $y$  divided by the relative change in the input quantity  $x_i$ . If  $|\partial y/\partial x_i| \cdot (x_i/y) = 1.0$ , then a 1% change in  $x_i$  results in a 1% change in  $y$ . If  $|\partial y/\partial x_i| \cdot (x_i/y) = 0.05$ , then a 1% change in  $x_i$  results in a 0.05% change in  $y$ .
- [j] Relative component of combined standard uncertainty of output quantity  $y$ , rounded to two significant figures or less. The relative component of combined standard uncertainty of  $y$  is given by  $u_i(y)/y \equiv |\partial y/\partial x_i| \cdot u(x_i)/y = |\partial y/\partial x_i| \cdot (x_i/y) \cdot u(x_i)/x_i$ . The numerical values of  $u(x_i)/x_i$ ,  $|\partial y/\partial x_i| \cdot (x_i/y)$ , and  $u_i(y)/y$ , all dimensionless quantities, are listed in columns 3, 4, and 5, respectively. Thus, the value in column 5 is equal to the value in column 4 multiplied by the value in column 3. The input quantities are independent, or very nearly so. Hence the covariances are zero or negligible.
- [k] The standard uncertainty for each undetected impurity that might reasonably be expected to be present is estimated to be equal to the estimated limit of detection for that impurity, i.e.  $u(x_i)/x_i = 100\%$ .  $|\partial y/\partial x_i| \cdot (x_i/y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of U-238})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of U-238})\}$ . Thus  $u_i(y)/y$  is the relative change in  $y$  if the impurity were present with a massic activity equal to the estimated limit of detection.

#### REFERENCES

- [1] International Organization for Standardization (ISO), *ISO Standards Handbook - Quantities and Units*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900.
- [2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900. (Listed under ISO miscellaneous publications as "ISO Guide to the Expression 1993".)
- [3] B. N. Taylor and C. E. Kuyatt, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST Technical Note 1297, 1994. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20407, U.S.A.
- [4] National Council on Radiation Protection and Measurements Report No. 58, *A Handbook of Radioactivity Measurements Procedures*, Second Edition, 1985. Available from the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814 U.S.A.
- [5] Evaluated Nuclear Structure Data File (ENSDF), August 1997.



# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0858	Isotope:	Uranium-238
Prepared By:	Mary Avins	Prepared By:	Mary Avins
Carrier Conc:	HNO3	Prep Date:	11/21/2005
Reference Date:	08/01/1997	Verification Date:	11/21/2005
Ampoule Mass (g):	5.258 g	Expiration Date:	11/21/2006
Uncertainty:	+/- .6 %	Primary Code:	0858-A
LogBook No:	RC-S-041-034	Dilution(mL):	100 mL
		Mass of Parent(g):	4.972 g
		Density(g/mL):	1.0155

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq/g)}) * (\text{conversion dpm to Bq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.972 \text{ g}) * (242 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (100 \text{ mL}) = 721.9344 \text{ dpm/mL}$
$(4.972 \text{ g}) * (242 \text{ Bq/g}) * (60 \text{ dpm/Bq}) / (1.0155 \text{ g/mL}) / (100 \text{ mL}) = 710.9460 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
11/21/2005	Mary Avins	8.2104	100	0858-B	58.3715 dpm/mL	11/21/2005	11/21/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

# CERTIFICATE OF CALIBRATION

## Standard Radionuclide Source

70361-278

5 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytix maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: April 1, 2005 12:00 EST

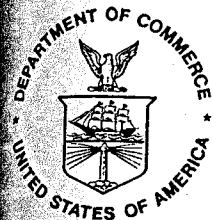
ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE	GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432 Y	3372	4.5
Cd-109	88	462.6 d	4698	3.3
Co-57	122	271.79 d	2450	3.0
Ce-139	166	137.6 d	3496	2.8
Hg-203	279	46.61 d	7565	2.7
Sn-113	392	115.1 d	4711	2.6
Cs-137	662	30.07 Y	3109	3.0
Y-88	898	106.6 d	12320	2.6
Co-60	1173	5.2714 Y	5769	2.7
Co-60	1332	5.2714 Y	5830	2.6
Y-88	1836	106.6 d	12860	2.6

5.32720 grams 4M HCl solution.  
P O NUMBER 2704RD, Item 1

SOURCE PREPARED BY: M. Taskaeva  
M. Taskaeva, Radiochemist

Q A APPROVED: [Signature] 04-11-2005

This standard will expire one year after the calibration date.



U.S. DEPARTMENT OF COMMERCE  
National Institute of Standards & Technology  
Gaithersburg, MD 20899

## Certificate of Participation

*Analytics, Incorporated*  
*Atlanta, Georgia*

is a participant for the period January 1, 2005, through December 31, 2005, in a radioactivity measurements assurance program conducted by the National Institute of Standards and Technology, in cooperation with the Nuclear Energy Institute. Continued participation is evidenced by dated Reports of Traceability issued for particular radionuclides, which indicate the deviation of the participant's reported value from that measured by the National Institute of Standards and Technology. The significance of these Reports is addressed below.\*

For the Director,

A handwritten signature in black ink, appearing to read "Michael P. Unterweger".

Michael P. Unterweger, Acting Leader  
Radioactivity Group  
Physics Laboratory

\* As guidance for the proper use of Reports of Traceability, it should be emphasized that the National Institute of Standards and Technology is concerned only with fostering good measurements capability and consistency with the national measurements system. The assurance of the proper application of that capability to the ultimate consumer products is the responsibility of each manufacturer of these products and of the Federal regulatory agencies.

A continuing traceability program in radioactivity demonstrates, to the degree established by the periodic assays of calibrated radioactivity samples, a continuing competence to maintain the methods and standards necessary for accurate measurement. Such a program cannot, however, endorse each and every measurement nor the final product, any more than a spot check can vouch for every unchecked item. Care should be taken, therefore, not to imply such endorsement. The proper use of this Report is governed by section 200.114 of Title 15 of the Code of Federal Regulations. These regulations may be met if Reports are quoted only in their entirety. Excerpts out of context may be misleading.

# ANALYTICS

1380 Seaboard Industrial Blvd.  
Atlanta, Georgia 30318-U.S.A.

Phone (404) 352-8677  
Fax (404) 352-2837  
customerservice@analytinc.com  
www.analytinc.com

## ANALYSIS OF UNCERTAINTY FOR MIXED GAMMA STANDARDS

### BATCH 120

**CALIBRATION DATE: April 1, 2005 12:00 EST**

Isotope	Energy (keV)	Calibration Method <sup>1</sup>	Statistics <sup>2</sup>	Calibration <sup>2</sup>	Peak Fitting <sup>2</sup>	Geometry <sup>2</sup>	Impurities <sup>2</sup>	Weighing <sup>2</sup>	Combined Standard Uncertainty <sup>2</sup>	Relative Expanded Uncertainty <sup>2</sup> (k=2)
Cd-109	88	HPGe	0.16	1.1	0.88	0.8	0	0.2	1.64	3.3
Co-57	122	HPGe	0.23	1.1	0.71	0.7	0	0.2	1.52	3.0
Ce-139	166	HPGe	0.17	1.0	0.58	0.7	0	0.2	1.38	2.8
Hg-203	279	HPGe	0.11	1.1	0.34	0.7	0	0.2	1.37	2.7
Sn-113	392	HPGe	0.21	1.0	0.35	0.7	0	0.2	1.30	2.6
Cs-137	662	HPGe	0.36	1.1	0.60	0.7	0	0.2	1.49	3.0
Y-88	898	HPGe	0.19	1.0	0.33	0.7	0	0.2	1.29	2.6
Co-60	1173	HPGe	0.31	.97	0.45	0.7	0	0.2	1.33	2.7
Co-60	1332	HPGe	0.33	.93	0.48	0.7	0	0.2	1.32	2.6
Y-88	1836	HPGe	0.24	1.0	0.35	0.7	0	0.2	1.31	2.6

#### Optional Additional Isotopes

Pb-210	46.5	4π LS	0.33	1.1	0	0.9	0.30	0.2	1.50	3.0
Am-241	59.5	4π LS	0.33	1.1	0	0.9	0.30	0.2	1.50	3.0
Sr-85	514	IC	0.30	1.1	0	0.7	0.17	0.2	1.36	2.7
Cs-134	605	IC	0.30	1.0	0	0.8	0.17	0.2	1.34	2.7
Cs-134	796	IC	0.30	1.0	0	0.8	0.17	0.2	1.34	2.7
Mn-54	835	IC	0.30	1.0	0	0.8	0.17	0.2	1.34	2.7
Zn-65	1116	IC	0.30	1.0	0	0.8	0.17	0.2	1.34	2.7

#### Calibration Methods:

- 4π LS (4 pi Liquid Scintillation Counting)
- HPGe (High Purity Germanium Gamma Ray Spectrometer)
- IC (Gamma Ray Ionization Chamber)

<sup>2</sup>As Percent (%) from counting data

No interfering gamma emitting impurities were detected during calibration. Depending on the resolution and energy dispersion (keV/channel) of the measuring system, the following spectral conflicts may occur: (1) between the 88 keV gamma-ray and the X-rays emitted in the decay of Hg-203, (2) between the 1333 keV gamma-ray and the 1325 keV single escape peak from the 1836 keV gamma-ray.





# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0781	Isotope:	Mixed Gamma
Prepared By:	Amanda Fehr	Prepared By:	Amanda Fehr
Carrier Conc:	4M HCL	Prep Date:	04/26/2005
Reference Date:	04/01/2005	Verification Date:	04/27/2005
Ampoule Mass (g):	5.3272 g	Expiration Date:	04/27/2006
Uncertainty:	+/- 3 %	Primary Code:	0781-A
LogBook No:	RC-S-039-065	Dilution(mL):	100 mL
		Mass of Parent(g):	5.1233 g
		Density(g/mL):	5.4962

## Calculations Converting parent activity to dpm/mL|dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (dpm)}) * (\text{conversion dpm to dpm}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (dpm)}) * (\text{conversion dpm to dpm}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$$

$$(5.1233 \text{ g}) * (219149.436 \text{ dpm}) * (1 \text{ dpm/dpm}) / (5.3272 \text{ g} * 100 \text{ mL}) = 2107.6143 \text{ dpm/mL}$$

$$(5.1233 \text{ g}) * (219149.436 \text{ dpm}) * (1 \text{ dpm/dpm}) / (5.4962 \text{ g/mL}) / (5.3272 \text{ g} * 100 \text{ mL}) = 383.4709 \text{ dpm/g}$$

## Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
-----------	----------	--------------	---------------	------	-------------	-------------------	-----------------

General Engineering Laboratories, LLC

Version 1.0 9/18/2000

## Verification for Mixed Gamma Standard 0781-A (AM-241 & Cs-137)

A. Fehr  
4/29/2005

Am-241			Cs-137		
	Isotope	Result		Isotope	Result
	Mixed Gamma N1	9796		Mixed Gamma N1	3753
	Mixed Gamma N2	9930		Mixed Gamma N2	4015
	Mixed Gamma N3	10290		Mixed Gamma N3	3878
<b>Mean Value (Counting) =</b>	10005.33	<b>102.47</b>	<b>Pass</b>	3882.00	<b>102.39</b>
<b>Stdev =</b>	255.471	<b>Rule 3 (Pass/Fail)</b>		131.046	<b>Pass</b>
<b>Certificate Value =</b>	9764.6			3791.3	
<b>Lower Limit =</b>	9494.391719			3619.908413	
<b>Upper Limit =</b>	10516.27495			4144.091587	
<b>Rule 1 (Pass/Fail)</b>	<b>Pass</b>			<b>Pass</b>	
<b>Two sigma =</b>	510.9416144			262.091587	
<b>10 % of Mean =</b>	1000.53333333			388.20000000	
<b>Rule 2 (Pass/Fail)</b>	<b>Pass</b>			<b>Pass</b>	

### Verification Rules

Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements

Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule 3 = The determined mean value shall be within 10% of the certificate value.

*Amanda L. Fehr 4/29/05*

*Angela L. Johnson 5/6/05*

## Verification for Mixed Gamma Standard 0781-A (Co-60)

A. Fehr 4/29/2005	Isotope	Result pCi/L	
	Mixed Gamma N1	6132	
	Mixed Gamma N2	6073	
	Mixed Gamma N3	6240	
<b>Mean Value (Counting) =</b>	6148.33	pCi/L	<b>102.365 Pass</b>
<b>Stdev =</b>	84.690	pCi/L	<b>Rule 3 (Pass/Fail)</b>
<b>Certificate Value =</b>	6006.3	pCi/L	
<b>Lower Limit =</b>	5978.954074	pCi/L	
<b>Upper Limit =</b>	6317.712592	pCi/L	
<b>Rule 1 Pass/Fail</b>	<b>Pass</b>		
<b>Two sigma =</b>	169.3792589		
<b>10 % of Mean =</b>	614.8333333		
<b>Rule 2 (Pass/Fail)</b>	<b>Pass</b>		

### Verification Rules

**Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements**

**Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.**

**Rule 3 = The determined mean value shall be within 10% of the certificate value.**

*Amanda L. Fehr 4/29/05*

*Angela L. Johnson  
5/6/05*



# National Institute of Standards & Technology

## Certificate

### Standard Reference Material 4326 Polonium-209 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive polonium-209 chloride and hydrochloric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of alpha-particle counting instruments and for the monitoring of radiochemical procedures.

#### Radiological Hazard

The SRM ampoule contains polonium-209 with a total activity of approximately 500 Bq. Polonium-209 decays by alpha-particle emission. None of the alpha particles escape from the SRM ampoule. During the decay process X-rays and gamma rays with energies from 10 to 900 keV are also emitted. Most of these photons escape from the SRM ampoule but their intensities are so small that they do not represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]\*. The SRM should be used only by persons qualified to handle radioactive material.

#### Chemical Hazard

The SRM ampoule contains hydrochloric acid (HCl) with a concentration of 2 moles per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

#### Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least June 2004. Refer to reference [5] for details on the long-term stability of polonium solution standards.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

#### Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by R. Collé of the Radioactivity Group and Z. Lin, Guest Researcher.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899  
January 1995 (Text only revised November 1997)

Thomas E. Gills, Chief  
Standard Reference Materials Program

### Liquid-Scintillation Counting Warning

Polonium-209 decays primarily by alpha-particle emission. One of the principal alpha-particle transitions feeds a low-energy, delayed, isomeric state in the lead-205 daughter. Liquid-scintillation measurements of polonium-209 activity can include some of the activity of this isomeric state. Refer to reference [6] for further information about the effect of this isomeric transition on routine liquid-scintillation counting of polonium-209.

#### Recommended Procedure for Opening the SRM Ampoule

- 1) If the SRM solution is to be diluted, it is recommended that the diluting solution have an acid concentration comparable to that of the SRM solution.
- 2) Wear eye protection, gloves, and protective clothing and work over a tray with absorbent paper in it. Work in a fume hood. In addition to the radioactive material, the solution contains strong acid and is corrosive.
- 3) Shake the ampoule to wet all of the inside surface of the ampoule. Return the ampoule to the upright position.
- 4) Check that all of the liquid has drained out of the neck of the ampoule. If necessary, gently tap the neck to speed the process.
- 5) Holding the ampoule upright, score the narrowest part of the neck with a scribe or diamond pencil.
- 6) Lightly wet the scored line. This reduces the crack propagation velocity and makes for a cleaner break.
- 7) Hold the ampoule upright with a paper towel, a wiper, or a support jig. Position the scored line away from you. Using a paper towel or wiper to avoid contamination, snap off the top of the ampoule by pressing the narrowest part of the neck away from you while pulling the tip of the ampoule towards you.
- 8) Transfer the solution from the ampoule using a pycnometer or a pipet with dispenser handle. **NEVER PIPETTE BY MOUTH.**
- 9) Seal any unused SRM solution in a flame-sealed glass ampoule, if possible, to minimize the evaporation loss.

See also reference [4]\*.

PROPERTIES OF SRM 4326  
(Certified values are shown in bold type)

Source identification number	NIST SRM 4326		
<b>Physical Properties:</b>			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	(16.5 ± 0.5) mm	
	Wall Thickness	(0.60 ± 0.04) mm	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Solution density	(1.031 ± 0.004) g·mL <sup>-1</sup> at 22 °C [b]*		
Solution mass	(5.160 ± 0.003) g [b]		
<b>Chemical Properties:</b>			
Solution composition	Chemical Formula	Concentration (mol·L <sup>-1</sup> )	Mass Fraction (g·g <sup>-1</sup> )
	H <sub>2</sub> O	53	0.93
	HCl	2	0.07
	HNO <sub>3</sub>	<3 × 10 <sup>-3</sup>	<2 × 10 <sup>-4</sup>
	PoCl <sub>4</sub>	7 × 10 <sup>-10</sup>	2 × 10 <sup>-10</sup>
<b>Radiological Properties:</b>			
Radionuclide	Polonium-209		
Reference time	1200 EST, 15 March 1994		
Massic alpha-particle-emission rate of the solution [c]	85.42 α·s <sup>-1</sup> ·g <sup>-1</sup> (Polonium-209 only) [d]		
Relative expanded uncertainty (k=2)	0.42% [e]		
Alpha-particle-emitting impurities	Polonium-208: (0.106 ± 0.017) α·s <sup>-1</sup> ·g <sup>-1</sup> [b, f]		
Photon-emitting impurities	None detected [g]		
Half lives used	Polonium-209: (102 ± 5) a [h] Polonium-208: (2.898 ± 0.002) a [h]		
Measuring instruments	Two 4π liquid-scintillation counting systems, 2π gas-flow proportional counter, and silicon surface-barrier detector		

EVALUATION OF THE UNCERTAINTY OF THE MASSIC ALPHA-PARTICLE-EMISSION RATE  
[e]\*

Input Quantity $x_i$ , the source of uncertainty  (and individual uncertainty components where appropriate)	Method Used To Evaluate $u(x_i)$ , the standard uncertainty of $x_i$ (A) denotes evaluation by statistical methods (B) denotes evaluation by other methods	Relative Uncertainty Of Input Quantity, $u(x_i)/x_i$ , (%) [i]	Relative Sensitivity Factor, $ \partial y/\partial x_i  \cdot$ $(x_i/y)$ [j]	Relative Uncertainty Of Output Quantity, $u_i(y)/y$ , (%) [k]
Massic liquid-scintillation count rate, corrected for background and decay	Standard deviation for repeated measurements. Six degrees of freedom. (A)	0.06	1.0	0.06
Background variability	Multiple comparisons (A) [7]	0.20	0.02 [m]	0.004
Liquid-scintillator quench corrections	Multiple comparisons (A) [7]	0.12	1.0	0.12
Liquid-scintillation- cocktail stability	Multiple comparisons (A) [7]	0.7	0.007	0.005
Gravimetric measurements	Estimated (B)	0.05	1.0	0.05
Half life of Po-208 Half life of Po-209	Standard uncertainty of the half life (A)	0.07 [n] 4.9 [n]	0.0003 [p] 0.004 [p]	0.00002 0.02
Extrapolation of alpha- particle-count-rate- versus-energy to zero energy	Estimated (B) [7]	0.06	1.0	0.06
Live-time [q]	Estimated (B) [7]	0.04	1.0	0.04
Alpha-particle detection efficiency of scintillator	Estimated (B) [7]	0.10	1.0	0.10
Correction for non- alpha-particle decay modes	Estimated (B) [7]	0.06	1.0	0.06
Alpha-particle-emitting impurities	Estimated (B) [r] Limit of detection (B) [s]	8.1 100.	0.001 0.0006	0.01 0.06
Photon-emitting impurities	Limit of detection (B) [s]	100.	0.0002	0.02
Relative Combined Standard Uncertainty of the Output Quantity, $u_c(y)/y$ , (%)				0.21
Coverage Factor, $k$				<u>x 2</u>
Relative Expanded Uncertainty of the Output Quantity, $U/y$ , (%)				0.42

## NOTES

- [a] The Sievert is the SI unit for dose equivalent. See reference [1]. One  $\mu\text{Sv}$  is equal to 0.1 mrem.  
 Distance from Ampoule (cm):           1       30       100  
 Approximate Dose Rate ( $\mu\text{Sv/h}$ ):   <0.1       -       -
- [b] The stated uncertainty is two times the standard uncertainty.
- [c] **Massic alpha-particle-emission rate** is the preferred name for the quantity alpha-particle-emission rate divided by the total mass of the sample. **Massic activity** is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].
- [d] The polonium-209 massic activity of the solution is  $85.83 \text{ Bq}\cdot\text{g}^{-1}$ , assuming an alpha-particle branching ratio of  $(0.9952 \pm 0.0004) \alpha\cdot\text{s}^{-1}\cdot\text{Bq}^{-1}$  [h].
- [e] The reported value,  $y$ , of massic alpha-particle-emission rate (alpha-particle-emission rate per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as  $y = f(x_1, x_2, x_3, \dots, x_n)$ , where  $f$  is a mathematical function derived from the assumed model of the measurement process.
- The value,  $x_i$ , used for each input quantity  $i$  has a **standard uncertainty**,  $u(x_i)$ , that generates a corresponding uncertainty in  $y$ ,  $u_i(y) \equiv |\partial y/\partial x_i| \cdot u(x_i)$ , called a **component of combined standard uncertainty** of  $y$ .
- The **combined standard uncertainty** of  $y$ ,  $u_c(y)$ , is the positive square root of the sum of the squares of the components of combined standard uncertainty.
- The combined standard uncertainty is multiplied by a **coverage factor** of  $k = 2$  to obtain  $U$ , the **expanded uncertainty** of  $y$ .
- Since it can be assumed that the possible estimated values of the massic alpha-particle-emission rate are approximately normally distributed with approximate standard deviation  $u_c(y)$ , the unknown value of the massic alpha-particle-emission rate is believed to lie in the interval  $y \pm U$  with a level of confidence of approximately 95 percent.
- For further information on the expression of uncertainties, see references [2] and [3]. See reference [7] for further information on uncertainties related to this calibration.
- [f] Estimated limits of detection for alpha-particle-emitting impurities are:  
 $0.002 \alpha\cdot\text{s}^{-1}\cdot\text{g}^{-1}$  for energies less than 3.5 MeV,  
 $0.05 \alpha\cdot\text{s}^{-1}\cdot\text{g}^{-1}$  for energies between 3.5 and 4.2 MeV, and  
 $0.0002 \alpha\cdot\text{s}^{-1}\cdot\text{g}^{-1}$  for energies greater than 5.18 MeV.
- [g] Estimated limits of detection for photon-emitting impurities are:  
 $2 \times 10^{-4} \gamma\cdot\text{s}^{-1}\cdot\text{g}^{-1}$  for energies between 15 and 68 keV,  
 $2 \times 10^{-4} \gamma\cdot\text{s}^{-1}\cdot\text{g}^{-1}$  for energies between 81 and 256 keV,  
 $6 \times 10^{-5} \gamma\cdot\text{s}^{-1}\cdot\text{g}^{-1}$  for energies between 266 and 892 keV, and  
 $4 \times 10^{-6} \gamma\cdot\text{s}^{-1}\cdot\text{g}^{-1}$  for energies between 900 and 3300 keV,  
 provided that the photons are separated in energy by 4 keV or more from photons emitted in the decay of polonium-209. See reference [7] for further information about the impurity analyses.
- [h] The stated uncertainty is the standard uncertainty. See reference [8].



- [i] Relative standard uncertainty of the input quantity  $x_i$ .
- [j] The relative change in the output quantity  $y$  divided by the relative change in the input quantity  $x_i$ . If  $|\partial y/\partial x_i| \cdot (x_i/y) = 1.0$ , then a 1% change in  $x_i$  results in a 1% change in  $y$ . If  $|\partial y/\partial x_i| \cdot (x_i/y) = 0.05$ , then a 1% change in  $x_i$  results in a 0.05% change in  $y$ .
- [k] Relative component of combined standard uncertainty of output quantity  $y$ , rounded to two significant figures or less. The relative component of combined standard uncertainty of  $y$  is given by  $u_i(y)/y \approx |\partial y/\partial x_i| \cdot u(x_i)/y = |\partial y/\partial x_i| \cdot (x_i/y) \cdot u(x_i)/x_i$ . The numerical values of  $u(x_i)/x_i$ ,  $|\partial y/\partial x_i| \cdot (x_i/y)$ , and  $u_i(y)/y$ , all dimensionless quantities, are listed in columns 3, 4, and 5, respectively. Thus, the value in column 5 is equal to the value in column 4 multiplied by the value in column 3. The input quantities are independent, or very nearly so. Hence the covariances are zero or negligible.
- [m]  $|\partial y/\partial x_i| \cdot (x_i/y) = (\text{average background count rate})/(\text{average net sample count rate})$ .
- [n] The relative standard uncertainty of  $\lambda \cdot t$  is determined by the relative standard uncertainty of  $\lambda$  (i.e., of the half life). The relative standard uncertainty of  $t$  is negligible.
- [p]  $|\partial y/\partial x_i| \cdot (x_i/y) = |\lambda \cdot t| \cdot \{(\text{response per Bq of impurity})/(\text{response per Bq of Po-209})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of Po-209})\}$ .
- [q] The live time is determined by counting the pulses from a gated oscillator.
- [r] The standard uncertainty given is for the detected Po-208 impurity.  $|\partial y/\partial x_i| \cdot (x_i/y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of Po-209})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of Po-209})\}$ .
- [s] The standard uncertainty for each undetected impurity that might reasonably be expected to be present is estimated to be equal to the estimated limit of detection for that impurity, i.e.  $u(x_i)/x_i = 100\%$ .  $|\partial y/\partial x_i| \cdot (x_i/y) = \{(\text{response per Bq of impurity})/(\text{response per Bq of Po-209})\} \cdot \{(\text{Bq of impurity})/(\text{Bq of Po-209})\}$ . Thus  $u_i(y)/y$  is the relative change in  $y$  if the impurity were present with a massic activity equal to the estimated limit of detection.

## REFERENCES

- [1] International Organization for Standardization (ISO), *ISO Standards Handbook - Quantities and Units*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900.
- [2] International Organization for Standardization (ISO), *Guide to the Expression of Uncertainty in Measurement*, 1993. Available from the American National Standards Institute, 11 West 42nd Street, New York, NY 10036, U.S.A. 1-212-642-4900. (Listed under ISO miscellaneous publications as "ISO Guide to the Expression 1993".)
- [3] B. N. Taylor and C. E. Kuyatt, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, NIST Technical Note 1297, 1994. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20407, U.S.A.
- [4] National Council on Radiation Protection and Measurements Report No. 58, *A Handbook of Radioactivity Measurements Procedures*, Second Edition, 1985. Available from the National Council on Radiation Protection and Measurements, 7910 Woodmont Avenue, Bethesda, MD 20814 U.S.A.
- [5] R. Collé, Long-term Stability of Carrier-Free Polonium Solution Standards, *Radioactivity and Radiochemistry*, 4 (1993) 18.
- [6] R. Collé, Z. Lin, J.M.R. Hutchinson, and F.J. Schima, A Delayed Isomeric State in  $^{205}\text{Pb}$  and Its Implications for  $4\pi\alpha$  Liquid-Scintillation Spectrometry of  $^{209}\text{Po}$ , *Appl. Radiat. Isot.*, 45 (1994) 1165.
- [7] R. Collé, Z. Lin, F.J. Schima, P.A. Hodge, J.W.L. Thomas, J.M.R. Hutchinson, and B.M. Coursey, Preparation and Calibration of Carrier-free  $^{209}\text{Po}$  Solution Standards, *J. Res. NIST*, 100 (1995) 1.
- [8] Evaluated Nuclear Structure Data File (ENSDF), July 1994.



# Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0546	Isotope:	Polonium-209
Prepared By:	Lonnie Morris	Prepared By:	Lonnie Morris
Carrier Conc:	2M HCl	Prep Date:	12/21/2004
Reference Date:	03/15/1994	Verification Date:	12/28/2004
Ampoule Mass (g):	5.16 g	Expiration Date:	12/28/2005
Uncertainty:	+/- .42 %	Primary Code:	0546-A
LogBook No:	RC-S-035-061	Dilution(mL):	100 mL
		Mass of Parent(g):	4.9457 g
		Density(g/mL):	1.0006

### Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps/g)}) * (\text{conversion dpm to dps}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps/g)}) * (\text{conversion dpm to dps}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.9457 \text{ g}) * (85.42 \text{ dps/g}) * (59.9 \text{ dpm/dps}) / (100 \text{ mL}) = 253.0546 \text{ dpm/mL}$
$(4.9457 \text{ g}) * (85.42 \text{ dps/g}) * (59.9 \text{ dpm/dps}) / (1.0006 \text{ g/mL}) / (100 \text{ mL}) = 252.9148 \text{ dpm/g}$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
12/21/2004	Amanda Fehr	20.0158	100	0546-B	50.71 dpm/mL	12/21/2004	12/21/2005
12/28/2004	Amanda Fehr	20.0112	100	0546-C	50.7 dpm/mL	12/28/2004	12/28/2005
08/31/2005	Mary Avins	20.0649	100	0546-D	50.83 dpm/mL	11/30/2005	11/30/2006

General Engineering Laboratories, LLC  
Version 1.0 9/18/2000

## Verification for Po-209 Standard 0546-D

M. Avins	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Amt Used (mL)	Source DPM/mL
11/30/2005	0546-D N1	41.2000	1.4000	39.8000	0.93038064	1.0000	42.77819
	0546-D N2	44.9000	1.4000	43.5000	0.93038064	1.0000	46.75506
	0546-D N3	42.4000	1.4000	41.0000	0.93038064	1.0000	44.06798
						Average =	44.53374

Mean Value (Counting) = 44.53374386  
 Stdev = 2.02893231  
 94.7119405 % of known  
 0.04555944

Certificate Value = 47.0  
 Lower Limit = 40.47587924  
 Upper Limit = 48.59160848  
 Rule 1 Pass/Fail Pass  
 Two sigma = 4.057864621  
 10 % of Mean = 4.453374386  
 Rule 2 (Pass/Fail) Pass

### Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

The analyst prepared three standard verification sources for Po-209 source 0546-D by transferring 1.0 mL portions of the standard by pipette to glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1.0 mL of DI water and 10 mL of Ready Gel liquid scintillation cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 32 for Po-210 source standard verification. The Po-210 efficiency calibration which was used for verification calculations was performed on 11/30/2005 using source 0685-A. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

*M. Avins*  
 11/30/05  
 Amanda F. Ehn 12/1/05

Isotope Products  
Laboratories

24937 Avenue Tibbitts  
Valencia, California 91355

0904

An Eckert & Ziegler Company

Tel 661-309-1010  
Fax 661-257-8303

# CERTIFICATE OF CALIBRATION ALPHA STANDARD SOLUTION

Radionuclide: Po-210

Half-life: 138.376 ± 0.002 days

Catalog No.: 7310

Source No.: 1168-48

Customer:

P.O. No.:

Reference Date:

Contained Radioactivity:

GENERAL ENGINEERING LABS  
2719RD

1-Mar-06 12:00 PST

10.10 μCi 373.7 kBq

**Physical Description:**

- A. Mass of solution: 5.16414 g in 5 mL flame-sealed ampoule
- B. Chemical form: PoCl<sub>4</sub> in 2M HCl
- C. Carrier content: None
- D. Density: 1.033 g/mL @ 20°C

**Radioimpurities:**

None detected

Radionuclide Concentration: 1.956 μCi/g, 72.37 kBq/g

**Method of Calibration:**

This source was prepared from a weighed aliquot of solution whose activity in μCi/g was determined using a liquid scintillation counter.

**Uncertainty of Measurement:**

- A. Type A (random) uncertainty: ± 0.7 %
- B. Type B (systematic) uncertainty: ± 3.0 %
- C. Uncertainty in aliquot weighing: ± 0.4 %
- D. Total uncertainty at the 99% confidence level: ± 3.1 %

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (as in NRC Regulatory Guide 4.15).
- Nuclear data was taken from NCRP Report No. 58, 1985.
- This solution has a working life of 9 months.

*Daniel James Van Dalsam*  
Quality Control

26-Jan-06  
Date

IPL Ref. No.: 1168-48

ISO 9001 CERTIFIED

RC-S-041-080

**Standard Wipe Test**

The source was wiped over its entire surface with a moistened filter paper disk. After drying, the disk was checked for activity using a scintillation detector. There was  $<0.001 \mu\text{Ci}$  beta-gamma and  $<0.0001 \mu\text{Ci}$  alpha of removable activity.

**Special Wipe Test**

The source was wiped over its entire surface with moistened polystyrene. The polystyrene was then dissolved in a liquid scintillation cocktail and counted in a liquid scintillation counter. There was  $<0.001 \mu\text{Ci}$  beta-gamma and  $<0.0001 \mu\text{Ci}$  alpha of removable activity.

**Distilled Water Soak Test**

The source was immersed in distilled water and maintained at  $50^\circ\text{C} \pm 5^\circ\text{C}$  for a minimum of four hours or room temperature ( $20^\circ\text{C} \pm 5^\circ\text{C}$ ) for 24 hours. After removal of the source, the liquid was **a)** checked for activity using a liquid scintillation counter, or **b)** evaporated in a planchet and the residue checked for activity using a windowless proportional counter or end-window G.M. tube. There was  $<0.001 \mu\text{Ci}$  beta-gamma and  $<0.0001 \mu\text{Ci}$  alpha of removable activity.

**Liquid Scintillation Soak Test**

The source was immersed for a minimum of 3 hours at room temperature in a liquid scintillation cocktail, which does not attack the source's outer surface material. The source was stored away from light to avoid photoluminescence. The sealed source was then removed and the activity of the liquid scintillation cocktail was measured. There was  $<0.001 \mu\text{Ci}$  beta-gamma and  $<0.0001 \mu\text{Ci}$  alpha of removable activity.

**Gas Source Test**

The source was placed in a vacuum desiccator and maintained at a pressure of  $<10 \text{ mm Hg}$  for not less than 12 hours. The activity was checked by introducing air into the desiccator and monitoring the air with an end-window G.M. tube. There was  $<0.001 \mu\text{Ci}$  beta-gamma of removable activity.

**Ampoule Leak Test**

The ampoule was kept in an inverted position on a filter paper disk or polystyrene wipe for a minimum of 16 hours. The wipe was then checked for activity using a scintillation detector or liquid scintillation counter. There was  $<0.001 \mu\text{Ci}$  beta-gamma and  $<0.0001 \mu\text{Ci}$  alpha of removable activity.

**Bubble Leak Test**

The container was pressurized to its fill pressure; then soapy water was applied over its valve and neck or, the valve and neck of the vessel were immersed in water. If no growing bubbles were observed, the container was considered leak free.

**Wipe Test for Industrial Ni-63 Sources**

The sources were wipe tested by an approved sampling plan, which called for either 100% of the batch to be individually wipe tested, or, a subset thereof. The wipe test(s) used to test for removable contamination and the results of those tests are recorded on the front of this form.

**Pressure Test for Triotech Kr-85 Sources**

Prior to filling the vessel with Kr-85 gas, the vessel was evacuated to  $<5 \text{ mm Hg}$ , the gas manifold system shut off and the system allowed to stand for a minimum of 30 minutes. A vacuum difference not greater than the known vacuum loss of the manifold system, itself signified the vessel did not leak.

**Leak Test Not Applicable**

The active area of the source is uncovered or is protected by a very thin coating. Although the deposit is adherent, it is not designed or certified to pass a standard leak test. The inactive portions of the source have been checked using the standard wipe test or special wipe test depending on the nuclide. There was  $<0.001 \mu\text{Ci}$  beta-gamma and  $<0.0001 \mu\text{Ci}$  alpha of removable activity.

**Other Leak Test**



## Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0904	Isotope:	Polonium-210
Prepared By:	Mary Aders	Prepared By:	Mary Aders
Carrier Conc:	2M HCL	Prep Date:	03/31/2006
Reference Date:	03/01/2006	Verification Date:	04/10/2006
Ampoule Mass (g):	5.16414 g	Expiration Date:	04/10/2007
Uncertainty:	+/- 3.1 %	Primary Code:	0904-A
LogBook No:	RC-S-041-080	Dilution(mL):	100 mL
		Mass of Parent(g):	4.9346 g
		Density(g/mL):	1.0330

### Calculations Converting parent activity to dpm/mL|dpm/g

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (uCi/g)}) * (\text{conversion dpm to uCi}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$$

$$(4.9346 \text{ g}) * (1.956 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (100 \text{ mL}) = 214276.1227 \text{ dpm/mL}$$

$$(4.9346 \text{ g}) * (1.956 \text{ uCi/g}) * (2220000 \text{ dpm/uCi}) / (1.0330 \text{ g/mL}) / (100 \text{ mL}) = 207430.9029 \text{ dpm/g}$$

### Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
03/31/2006	Mary Aders	.0952	100	0904-B	198.6267 dpm/mL	04/10/2006	04/10/2007

General Engineering Laboratories, LLC

Version 1.0 9/18/2000

## Verification for Po-210 Standard 0904-B

M. Aders 4/10/2006	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard	Source DPM/ml
						Vol. Used (ml)	
	0904-B N1	193.5000	21.7000	171.8000	1.06503385	1.0000	161.3094273
	0904-B N2	196.9000	21.7000	175.2000	1.06503385	1.0000	164.5018141
	0904-B N3	191.1000	21.7000	169.4000	1.06503385	1.0000	159.0559777

Mean Value (Counting) = 161.6224063  
 Stdev = 2.736375379  
 97.44% % of known

Certificate Value = 165.87  
 Lower Limit = 156.1496556  
 Upper Limit = 167.0951571  
 Rule 1 Pass/Fail **Pass** **Pass**  
 Two sigma = 5.472750758  
 10 % of Mean = 16.16224063  
 Rule 2 (Pass/Fail) **Pass**

### Verification Rules

Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements

Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

The analyst prepared three standard verification sources for Po-210 source 0904-B by transferring portions of the standard by pipette to glass liquid scintillation vials. Ten mL of Ready Gel liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 1.0 mL of DI water and 10 mL of Ready Gel cocktail. The standard verification vials and Background source were dark adapted for two hours and counted on LSC Yellow (Wallac) using Protocol 32 for Po-210 source standard verification. The Po-210 efficiency calibration which was used for verification calculations was performed on 4/4/06 using source 0685-A (Po-210). Calibration data is recorded in this logbook under Po-210 0685-A. Each verification source calculation was performed as follows:

$$\text{Source dpm/g} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency, (cpm/dpm), and
- D = mass used for standard verification.

*Mary R. Iders 4/10/06*  
*Amanda L. Lehr 4/19/06*



# RUNLOGS



# Instrument Run Log

ID	Sample Type	Analyst	Instrument	Dil	Run Date	Batch Id	Status	Geometry	Cal Date
158272001	SAMPLE	BJB1	1026		20-APR-2006 07:49	520798	DONE		
158275001	SAMPLE	BJB1	1027		20-APR-2006 07:49	520798	DONE		
158276001	SAMPLE	BJB1	1029		20-APR-2006 07:49	520798	DONE		
158277001	SAMPLE	BJB1	1030		20-APR-2006 07:49	520798	DONE		
158436001	SAMPLE	BJB1	1065		20-APR-2006 07:49	520798	DONE		
158971001	SAMPLE	BJB1	1069		20-APR-2006 07:49	520798	DONE		
158971002	SAMPLE	BJB1	1070		20-APR-2006 07:49	520798	DONE		
158971004	SAMPLE	BJB1	1073		20-APR-2006 07:49	520798	DONE		
159242001	SAMPLE	BJB1	1075		20-APR-2006 07:49	520798	DONE		
159242002	SAMPLE	BJB1	1077		20-APR-2006 07:49	520798	DONE		
159242003	SAMPLE	BJB1	1078		20-APR-2006 07:49	520798	DONE		
159243001	SAMPLE	BJB1	1079		20-APR-2006 07:49	520798	DONE		
159244001	SAMPLE	BJB1	1080		20-APR-2006 07:49	520798	DONE		
1201071140	MB	BJB1	1083		20-APR-2006 07:49	520798	DONE		
1201071141	DUP	BJB1	1085		20-APR-2006 07:49	520798	DONE		
1201071142	MS	BJB1	1086		20-APR-2006 07:49	520798	DONE		
1201071143	LCS	BJB1	1088		20-APR-2006 07:49	520798	DONE		
158971003	SAMPLE	BJB1	1010		21-APR-2006 11:47	520798	DONE		
159247001	SAMPLE	BJB1	1011		21-APR-2006 11:47	520798	DONE		

Version 1.1 9/5/05

General Engineering Laboratories, LLC



# Instrument Run Log

ID	Sample Type	Analyst	Instrument	Dil	Run Date	Batch Id	Status	Geometry	Cal Date
158272001	SAMPLE	BJB1	1019		20-APR-2006 17:29	520799	DONE		
158275001	SAMPLE	BJB1	1020		20-APR-2006 17:29	520799	DONE		
158276001	SAMPLE	BJB1	1021		20-APR-2006 17:29	520799	DONE		
158277001	SAMPLE	BJB1	1023		20-APR-2006 17:29	520799	DONE		
158436001	SAMPLE	BJB1	1001		21-APR-2006 07:38	520799	DONE		
158971001	SAMPLE	BJB1	1003		21-APR-2006 07:38	520799	DONE		
158971002	SAMPLE	BJB1	1004		21-APR-2006 07:38	520799	DONE		
158971003	SAMPLE	BJB1	1005		21-APR-2006 07:38	520799	DONE		
158971004	SAMPLE	BJB1	1007		21-APR-2006 07:38	520799	DONE		
159242001	SAMPLE	BJB1	1009		21-APR-2006 07:38	520799	DONE		
159242002	SAMPLE	BJB1	1010		21-APR-2006 07:38	520799	DONE		
159242003	SAMPLE	BJB1	1011		21-APR-2006 07:38	520799	DONE		
159243001	SAMPLE	BJB1	1013		21-APR-2006 07:38	520799	DONE		
159244001	SAMPLE	BJB1	1016		21-APR-2006 07:38	520799	DONE		
159247001	SAMPLE	BJB1	1017		21-APR-2006 07:38	520799	DONE		
1201071144	MB	BJB1	1018		21-APR-2006 07:38	520799	DONE		
1201071146	MS	BJB1	1020		21-APR-2006 07:38	520799	DONE		
1201071147	LCS	BJB1	1021		21-APR-2006 07:38	520799	DONE		
1201071145	DUP	BJB1	1116		22-APR-2006 07:38	520799	DONE		

Version 1.1 9/5/05

General Engineering Laboratories, LLC



# Instrument Run Log

<b>ID</b>	<b>Sample Type</b>	<b>Analyst</b>	<b>Instrument</b>	<b>Dil</b>	<b>Run Date</b>	<b>Batch Id</b>	<b>Status</b>	<b>Geometry</b>	<b>Cal Date</b>
159247001	SAMPLE	LCW1	1075		21-APR-2006 19:21	520802	DONE		
1201071153	DUP	LCW1	1085		21-APR-2006 19:21	520802	DONE		
1201071154	MS	LCW1	1086		21-APR-2006 19:21	520802	DONE		
1201071155	LCS	LCW1	1088		21-APR-2006 19:21	520802	DONE		
1201071152	MB	LCW1	1032		24-APR-2006 14:21	520802	DONE		

Version 1.1 9/5/05

General Engineering Laboratories, LLC



# Instrument Run Log

ID	Sample Type	Analyst	Instrument	Dil	Run Date	Batch Id	Status	Geometry	Cal Date
158272001	SAMPLE	MJH1	GAMMA1		25-APR-2006 18:37	519510	DONE	2L_MB	13-FEB-2006
158275001	SAMPLE	MJH1	GAMMA3		25-APR-2006 18:37	519510	DONE	2L_MB	24-MAR-2006
158276001	SAMPLE	MJH1	GAMMA4		25-APR-2006 18:37	519510	DONE	2L_MB	23-FEB-2006
158277001	SAMPLE	MJH1	GAMMA6		25-APR-2006 18:38	519510	DONE	2L_MB	04-JAN-2006
158436001	SAMPLE	MJH1	GAMMA7		25-APR-2006 18:38	519510	DONE	2L_MB	03-JAN-2006
158971001	SAMPLE	MJH1	GAMMA8		25-APR-2006 18:38	519510	DONE	2L_MB	23-SEP-2005
158971002	SAMPLE	MJH1	GAMMA9		25-APR-2006 18:39	519510	DONE	2L_MB	08-JUL-2005
158971003	SAMPLE	MJH1	GAMMA10		25-APR-2006 18:39	519510	DONE	2L_MB	15-FEB-2006
158971004	SAMPLE	MJH1	GAMMA11		25-APR-2006 18:39	519510	DONE	2L_MB	25-MAR-2006
159242001	SAMPLE	MJH1	GAMMA12		25-APR-2006 18:40	519510	DONE	2L_MB	10-JAN-2006
159242003	SAMPLE	MJH1	GAMMA15		25-APR-2006 18:42	519510	DONE	2L_MB	09-JUL-2005
159244001	SAMPLE	MJH1	GAMMA17		25-APR-2006 18:42	519510	DONE	2L_MB	06-JAN-2006
159242002	SAMPLE	MJH1	GAM14		25-APR-2006 18:43	519510	DONE	2LMB	22-FEB-2006
1201068236	MB	MJH1	WELL		25-APR-2006 18:43	519510	DONE	2L_MB	29-DEC-2005
159247001	SAMPLE	MJH1	GAM19		25-APR-2006 18:46	519510	DONE	2LMB	22-FEB-2006
1201068238	LCS	MJH1	GAMMA6		26-APR-2006 05:24	519510	DONE	2L_MB	04-JAN-2006
159243001	SAMPLE	MJH1	GAM14		26-APR-2006 05:26	519510	DONE	2LMB	22-FEB-2006
1201068237	DUP	MJH1	GAM19		26-APR-2006 05:28	519510	DONE	2LMB	22-FEB-2006

Version 1.1 9/5/05

General Engineering Laboratories, LLC



# Instrument Run Log

ID	Sample Type	Analyst	Instrument	Dil	Run Date	Batch Id	Status	Geometry	Cal Date
1201060416	MB	KSD1	PIC4C		26-APR-2006 13:29	515983	DONE	CeF on 25mm Filter	22-APR-2005
1201060417	DUP	KSD1	PIC4D		26-APR-2006 13:29	515983	DONE	CeF on 25mm Filter	22-APR-2005
158783003	SAMPLE	KSD1	PIC1A		26-APR-2006 13:29	515983	DONE	CeF on 25mm Filter	22-APR-2005
158783004	SAMPLE	KSD1	PIC1B		26-APR-2006 13:29	515983	DONE	CeF on 25mm Filter	22-APR-2005
158783005	SAMPLE	KSD1	PIC1C		26-APR-2006 13:29	515983	DONE	CeF on 25mm Filter	22-APR-2005
158971001	SAMPLE	KSD1	PIC1D		26-APR-2006 13:30	515983	DONE	CeF on 25mm Filter	22-APR-2005
158971002	SAMPLE	KSD1	PIC2A		26-APR-2006 13:30	515983	DONE	CeF on 25mm Filter	22-APR-2005
158971003	SAMPLE	KSD1	PIC2B		26-APR-2006 13:30	515983	DONE	CeF on 25mm Filter	22-APR-2005
158971004	SAMPLE	KSD1	PIC2C		26-APR-2006 13:30	515983	DONE	CeF on 25mm Filter	22-APR-2005
159242001	SAMPLE	KSD1	PIC2D		26-APR-2006 13:30	515983	DONE	CeF on 25mm Filter	22-APR-2005
159242002	SAMPLE	KSD1	PIC3A		26-APR-2006 13:30	515983	DONE	CeF on 25mm Filter	22-APR-2005
159242003	SAMPLE	KSD1	PIC3B		26-APR-2006 13:30	515983	DONE	CeF on 25mm Filter	22-APR-2005
159243001	SAMPLE	KSD1	PIC3C		26-APR-2006 13:30	515983	DONE	CeF on 25mm Filter	22-APR-2005
159244001	SAMPLE	KSD1	PIC4A		26-APR-2006 13:30	515983	DONE	CeF on 25mm Filter	22-APR-2005
159247001	SAMPLE	KSD1	PIC4B		26-APR-2006 13:32	515983	DONE	CeF on 25mm Filter	22-APR-2005
1201060418	MS	KSD1	PIC3D		26-APR-2006 13:44	515983	DONE	CeF on 25mm Filter	22-APR-2005
1201060419	LCS	KSD1	PIC3B		26-APR-2006 14:35	515983	DONE	CeF on 25mm Filter	22-APR-2005

Version 1.1 9/5/05

General Engineering Laboratories, LLC



# Instrument Run Log

ID	Sample Type	Analyst	Instrument	Dil	Run Date	Batch Id	Status	Geometry	Cal Date
158272001	SAMPLE	BXF1	PIC1B		25-APR-2006 11:02	520607	DONE	Tuffryn Filter	29-JUL-2005
158275001	SAMPLE	BXF1	PIC1C		25-APR-2006 11:02	520607	DONE	Tuffryn Filter	29-JUL-2005
158276001	SAMPLE	BXF1	PIC1D		25-APR-2006 11:02	520607	DONE	Tuffryn Filter	29-JUL-2005
158277001	SAMPLE	BXF1	PIC2A		25-APR-2006 11:02	520607	DONE	Tuffryn Filter	29-JUL-2005
158436001	SAMPLE	BXF1	PIC2B		25-APR-2006 11:02	520607	DONE	Tuffryn Filter	29-JUL-2005
158971001	SAMPLE	BXF1	PIC2C		25-APR-2006 11:03	520607	DONE	Tuffryn Filter	29-JUL-2005
158971003	SAMPLE	BXF1	PIC3A		25-APR-2006 11:03	520607	DONE	Tuffryn Filter	29-JUL-2005
158971004	SAMPLE	BXF1	PIC3B		25-APR-2006 11:03	520607	DONE	Tuffryn Filter	29-JUL-2005
159242001	SAMPLE	BXF1	PIC3C		25-APR-2006 11:03	520607	DONE	Tuffryn Filter	29-JUL-2005
159242002	SAMPLE	BXF1	PIC3D		25-APR-2006 11:03	520607	DONE	Tuffryn Filter	29-JUL-2005
159242003	SAMPLE	BXF1	PIC4A		25-APR-2006 11:03	520607	DONE	Tuffryn Filter	29-JUL-2005
159243001	SAMPLE	BXF1	PIC4B		25-APR-2006 11:03	520607	DONE	Tuffryn Filter	29-JUL-2005
159244001	SAMPLE	BXF1	PIC4C		25-APR-2006 11:03	520607	DONE	Tuffryn Filter	29-JUL-2005
159247001	SAMPLE	BXF1	PIC4D		25-APR-2006 11:03	520607	DONE	Tuffryn Filter	29-JUL-2005
158971002	SAMPLE	BXF1	PIC2D		25-APR-2006 12:32	520607	DONE	Tuffryn Filter	29-JUL-2005
1201070733	MB	BXF1	PIC3A		25-APR-2006 14:15	520607	DONE	Tuffryn Filter	29-JUL-2005
1201070735	MS	BXF1	PIC3C		25-APR-2006 14:15	520607	DONE	Tuffryn Filter	29-JUL-2005
1201070734	DUP	BXF1	PIC3B		25-APR-2006 14:15	520607	DONE	Tuffryn Filter	29-JUL-2005
1201070736	LCS	BXF1	PIC3D		25-APR-2006 14:15	520607	DONE	Tuffryn Filter	29-JUL-2005

Version 1.1 9/5/05

General Engineering Laboratories, LLC



# Instrument Run Log

<b>ID</b>	<b>Sample Type</b>	<b>Analyst</b>	<b>Instrument</b>	<b>Dil</b>	<b>Run Date</b>	<b>Batch Id</b>	<b>Status</b>	<b>Geometry</b>	<b>Cal Date</b>
159247001	SAMPLE	JXS4	LB4100H1		20-APR-2006 22:57	521039	DONE	2 inch Planchett	18-AUG-2005
1201071723	MB	JXS4	LB4100H2		20-APR-2006 22:57	521039	DONE	2 inch Planchett	18-AUG-2005
1201071724	DUP	JXS4	LB4100H3		20-APR-2006 22:57	521039	DONE	2 inch Planchett	18-AUG-2005
1201071725	MS	JXS4	LB4100E1		21-APR-2006 11:57	521039	DONE	2 inch Planchett	18-AUG-2005
1201071726	LCS	JXS4	LB4100E3		21-APR-2006 11:57	521039	DONE	2 inch Planchett	18-AUG-2005
1201071728	MSD	JXS4	LB4100E2		21-APR-2006 11:57	521039	DONE	2 inch Planchett	18-AUG-2005

Version 1.1 9/5/05

General Engineering Laboratories, LLC





# Instrument Run Log

ID	Sample Type	Analyst	Instrument	Dil	Run Date	Batch Id	Status	Geometry	Cal Date
1201077880	MB	DRS1	KPA11AUTO2		26-APR-2006 10:15	523680	DONE		
1201077881	DUP	DRS1	KPA11AUTO2		26-APR-2006 10:18	523680	DONE		
1201077882	MS	DRS1	KPA11AUTO2		26-APR-2006 10:22	523680	DONE		
1201077883	LCS	DRS1	KPA11AUTO2		26-APR-2006 10:26	523680	DONE		
1201077884	LCSD	DRS1	KPA11AUTO2		26-APR-2006 10:27	523680	DONE		
158272001	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:30	523680	DONE		
158275001	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:32	523680	DONE		
158276001	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:34	523680	DONE		
158277001	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:36	523680	DONE		
158436001	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:38	523680	DONE		
158971001	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:40	523680	DONE		
158971002	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:43	523680	DONE		
158971003	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:45	523680	DONE		
158971004	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:47	523680	DONE		
159242001	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:49	523680	DONE		
159242002	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:51	523680	DONE		
159242003	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:53	523680	DONE		
159243001	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:55	523680	DONE		
159244001	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 10:57	523680	DONE		
159247001	SAMPLE	DRS1	KPA11AUTO2		26-APR-2006 11:01	523680	DONE		

Version 1.1 9/5/05

General Engineering Laboratories, LLC



# Instrument Run Log

<b>ID</b>	<b>Sample Type</b>	<b>Analyst</b>	<b>Instrument</b>	<b>Dil</b>	<b>Run Date</b>	<b>Batch Id</b>	<b>Status</b>	<b>Geometry</b>	<b>Cal Date</b>
158272001	SAMPLE	SG	LUCAS6		10-APR-2006 08:20	518058	DONE	Lucas Cell	29-DEC-2005
159242001	SAMPLE	SG	LUCAS1		10-APR-2006 08:55	518058	DONE	Lucas Cell	27-MAR-2006
159242002	SAMPLE	SG	LUCAS2		10-APR-2006 08:55	518058	DONE	Lucas Cell	09-MAY-2005
159243001	SAMPLE	SG	LUCAS3		10-APR-2006 08:55	518058	DONE	Lucas Cell	23-NOV-2005
159244001	SAMPLE	SG	LUCAS4		10-APR-2006 08:55	518058	DONE	Lucas Cell	04-NOV-2005
159247001	SAMPLE	SG	LUCAS5		10-APR-2006 08:55	518058	DONE	Lucas Cell	09-DEC-2005
1201064983	MB	SG	LUCAS6		10-APR-2006 08:55	518058	DONE	Lucas Cell	29-DEC-2005
1201064984	DUP	SG	LUCAS1		10-APR-2006 09:30	518058	DONE	Lucas Cell	27-MAR-2006
1201064985	MS	SG	LUCAS2		10-APR-2006 09:30	518058	DONE	Lucas Cell	09-MAY-2005
1201064986	LCS	SG	LUCAS3		10-APR-2006 09:30	518058	DONE	Lucas Cell	23-NOV-2005

Version 1.1 9/5/05

General Engineering Laboratories, LLC