



September 18, 2009

Mr. Frank Hagar
Northgate Environmental Management, Inc.
1100 Quail St., Suite 102
Newport Beach, California 92660

Re: Tronox Henderson
Work Order: 235782

Dear Mr. Hagar:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on August 21, 2009 and August 22, 2009. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 4453.

Sincerely,

Edith Kent
Project Manager

Chain of Custody: 2027.001.00464, 2027.001.00578, 2027.001.00593, 2027.001.00595, 2027.001.00599 and
2027.001.00607
Enclosures

Tronox LLC
Tronox Henderson
SDG:235782

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Case Narrative

CASE NARRATIVE
for
Tronox LLC
Tronox Henderson
SDG:235782

September 18, 2009

Laboratory Identification:

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

Summary

Sample receipt

The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on August 21, 2009 and August 22, 2009 for analysis. Shipping container temperatures were checked, documented, and within specifications. The sample ID for the equipment blank received on August 21, 2009 was incorrect on the chain of custody. Also, the soil sample that the equipment blank was associated with was incorrectly identified on the chain of custody. The corrections were made to the chain as approved by the client. Please refer to the attached e-mails for further details. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Items of Note

All samples under this SDG were logged as an open SDG until a sufficient amount of samples were received by the lab. The client was notified that the SDG was closed on August 22, 2009 and the turnaround time would start from then. The client was notified that the SDG would be reported late. Please refer to the attached e-mails for further details.

QC Issues

The following samples did not meet the Tronox QA program sample result uncertainty limit of <30% for Ra-226 with the results between 2 and 5 times the MDA and were counted for the maximum time: 235782003, 235782005 and 235782010. The following samples did not meet the Tronox QA program sample result uncertainty limit of <30% for Alpha Spec Uranium with the results between 2 and 5 times the MDA and were counted for the maximum time: 235782001, 235782002, 235782006, 235782012, 235782013 and 235782014. The following samples did not meet the Tronox QA program sample tracer yield requirements of 70-120% for Alpha Spec Uranium due to matrix issues: 235782003, 235782004, 235782005, 235782009, 235782017 and 235782018. The following samples did not meet the Tronox QA program sample tracer yield requirements of 70-120% for Alpha Spec Thorium due to matrix issues: 235782003 and 235782015. The method blank for the soil Thorium batch did not meet the contract tracer yield requirements of 70-120%. The method blank also did not meet the contract detection limit requirements. The LCS dup for the water Thorium batch did not meet the contract tracer yield requirements of 70-120%. The lab DUP for the soil Uranium batch did not meet the contract tracer yield requirements of 70-120%. For the soil Uranium batch, samples 235782005, 235782016, 235782018, and the lab DUP did not meet the contract detection limit requirements for U235/236 due to lack of U235/236 activity in the samples. The method blank did not meet the detection limits due to keeping the blank aliquot consistent with the sample aliquots. Please refer to the attached e-mail for further details on QC issues.

Sample Identification

The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
235782001	SA198-10B

235782002	SA198-27B
235782003	SA175-10B
235782004	SA175-28B
235782005	SA139-0.5B
235782006	SA139-10B
235782007	SA139-25B
235782008	SA139009-25B
235782009	SA139-35B
235782010	RSAT5-0.5B
235782011	RSAT5-10B
235782012	RSAT5-25B
235782013	RSAT5-40B
235782014	RSAT5-51B
235782015	EB082009-SO2
235782016	RSAO6-10B
235782017	RSAO6-20B
235782018	RSAO6-34B

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (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

235782%



1100 Quail Street, Suite 102, Newport Beach, CA 92660
(949) 260-9233

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

COC No. 2027.001.00599
Page: 1 of 1
Cooler # 1 of 1

Required Ship to Lab:		Required Project Information:		Required Invoice Information:		TAT: Standard 30 day		Rush		Mark One		
Lab Name: GEL Laboratories, LLC		Site ID #: TRONOX LLC, HENDERSON		Send Invoice to: Susan Crowley Tronox LLC				<input checked="" type="checkbox"/>				
Address: 2040 Savage Road		Project #: 2027.001		Address: PO Box 55								
City: Charleston, SC 29407		Site Address: 560 W. Lake Mead Drive		City/State: Henderson, NV 89009		Phone #: (949) 260-9293						
Lab P/I: Edith M. Kent		City: Henderson		State: NV		Reimbursement project? <input checked="" type="checkbox"/>		Non-reimbursement project? <input type="checkbox"/>		Mark one		
Phone/Fax: (843) 556-8171		Site PM Name: Derrick Willis		Send EDD to: Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com		Send EDD to: Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com		NJ Reduced Deliverable Package? <input type="checkbox"/>		EPA Stage: Mark one		
Lab PM email: emk@gel.com		Phone/Fax: (949) 375-7004		CC Hardcopy report to: PDF Electronic Version Only		CC Hardcopy report to: PDF Electronic Version Only		MA MCP Cert? <input type="checkbox"/>		CT RCP Cert? <input type="checkbox"/>		
Applicable Lab Quote #:		Site PM Email: derrick.willis@ngem.com		CC Hardcopy report to: see additional comments below		CC Hardcopy report to: see additional comments below				Mark One		
ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Samples IDs MUST BE UNIQUE	MATRIX CODES W: DRINKING WATER SW: SURFACE WATER GW: GROUND WATER P: PRECIPITATION S: SOIL A: AIR B: BIOMASS F: FISH T: TISSUE O: OTHER	MATRIX W: DRINKING WATER SW: SURFACE WATER GW: GROUND WATER P: PRECIPITATION S: SOIL A: AIR B: BIOMASS F: FISH T: TISSUE O: OTHER	SAMPLE TYPE G: GRAB C-O-M-P	SAMPLE DATE	SAMPLE TIME	#OF CONTAINERS	FIELD FILTERED? (Y/N)	PRESERVATIVES			Comments/Lab Sample I.D.
									H2SO4	HNO3	HCl	
1	SA198-10B			G	8/20/2009	9:35	1	N	X	X	X	250 ml Plastic Jar
2	SA198-27B			G	8/20/2009	9:57	1	N	X	X	X	250 ml Plastic Jar
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE RECEIPT CONDITIONS
Patrick Ziegler GEL	8/20/09	8:00	Patrick Ziegler GEL	8/20/09	08:43	Y/N Y/N Y/N Y/N Y/N Y/N
						Y/N Y/N Y/N Y/N Y/N Y/N
						Y/N Y/N Y/N Y/N Y/N Y/N
						Y/N Y/N Y/N Y/N Y/N Y/N
						Y/N Y/N Y/N Y/N Y/N Y/N

SHIPPING METHOD: (mark as appropriate)	SAMPLER NAME AND SIGNATURE
UPS COURIER <input checked="" type="checkbox"/>	Patrick Ferringier
US MAIL	
PRINT Name of SAMPLER:	DATE Signed: 8-20
SIGNATURE OF SAMPLER:	Time: 1330

Additional Comments/Special Instructions:
FULL DIGESTION SPECIFICATION
 Radionuclides* includes Thorium (isotopic) and Uranium (isotopic) by EML HASL 300 modified(alpha spectroscopy)

Samples are collected from **Area II**
 All PDF reports and EDDs will be uploaded to:
 Northgate Environmental Management, Inc.
 FTP site address provided to labs
 Notifications provided to:
 cindy.armold@ngem.com & frank.hagar@ngem.com

SAMPLE RECEIPT & REVIEW FORM

Client: Kerr / North Gate
Received By: mk

SDG/ARCO/Work Order: 2357827
Date Received: 8-21-09

Suspected Hazard Information

	Yes	No	
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	Maximum Counts Observed*: <u>cpm 10</u>
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		<input checked="" type="checkbox"/>		ice bags blue ice Preservation Method: dry ice <u>none</u> other (describe) <u>23°</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments:

FX 7978 6677 1124

PM (or PMA) review: Initials EM Date 8/21/09



1100 Quail Street, Suite 102, Newport Beach, CA 92680
(949) 260-9293

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

COC No. 2027.001.00578
Page: 1 of 1
Cooler #: 1 of 1

Required Ship to Lab:		Required Project Information:		Required Invoice Information:		TAT: Standard 30 day		Rush		Mark One													
Lab Name:	GEL Laboratories, LLC	Site ID #:	TRONOX LLC, HENDERSON	Send Invoice to:	Susan Crowley Tronox, LLC	Address:	PO Box 85																
Address:	2040 Savage Road	Project #:	2027.001	City/State:	Henderson, NV 89009	Phone #:	(949)260-9293																
City:	Henderson	State:	NV	Reimbursement project?	X	Non-reimbursement project?																	
Lab PM:	Edith M. Kent	Site PM Name:	Derrick Willis	Send EDD to:	Frank Hagar/Nortgate Environmental Management, Inc frank.hagar@ngem.com	CC Hardcopy report to:	PDF Electronic Version Only																
Phone/Fax:	(843)556-8171	Phone/Fax:	949-375-7004	CC Hardcopy report to:	see additional comments below																		
Lab PM email:	emk@gel.com	Site PM Email:	derrick.willis@ngem.com																				
Applicable Lab Quote #:																							
ITEM #	SAMPLE ID	Character per box. (A-Z, 0-9 / -)	One	Samples IDs MUST BE UNIQUE	Valid Matrix Codes SP: SPANISH WATER SW: SW BIRCH WATER OC: OIL FR: FRESH PRODUCE OR: OTHER AN: ANIMAL TISSUE AE: AIR WV: WASTE WATER BIO: BIOLOGICAL SL: SOLID SL: SOLID	MATRIX	FIELD FILTERED? (Y/N)	#OF CONTAINERS	SAMPLE TIME	SAMPLE DATE	DATE	TIME	ACCEPTED BY / AUTHORITY	DATE	TIME	Sample Receipt Conditions	Temp in OC	Samples on Ice?	Sample Intact?	Trip Blank?	Comments/Lab Sample I.D.		
																						Preservatives H2SO4 HNO3 HCl MnO4 MnSO4 Other	
1	RSAT5-0.5B						N	1	11:07	8/20/2009	20-AUG	14:00	DAVID ANA NGEM	20-AUG	14:00								
2	RSAT5-10B						N	1	11:25	8/20/2009													
3	RSAT5-25B						N	1	11:54	8/20/2009													
4	RSAT5-40B						N	1	12:33	8/20/2009													
5	RSAT5-51B						N	1	13:14	8/20/2009													
6																							
7																							
8																							
9																							
10																							
11																							
12																							
13																							

Additional Comments/Special Instructions:
Samples collected in Area IV.
FULL DIGESTION SPECIFICATION
Radionuclides* Includes Thorium (isotopic) and Uranium (isotopic) and EML
HASL 300 modified(alpha spectroscopy)

All PDF reports and EDDs will be uploaded to:
Nortgate Environmental Management, Inc.
FTP site address provided to labs
Notifications provided to:
clindv.arnold@ngem.com & frank.hagar@ngem.com

SHIPPING METHOD (Email, or other method):
UPS COURIER FEDEX
SIGNATURE OF SAMPLER: David R. Brown
DATE SIGNED: 8/20/2009
TIME: 14:00



Client: <u>Yere Northgate</u>		SDG/ARCOC/Work Order: <u>2351821</u>	
Received By: <u>MK</u>		Date Received: <u>8-21-08</u>	
Suspected Hazard Information	Yes	No	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Counts Observed*: <u>CFM - PD</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		<input checked="" type="checkbox"/>		ice bags blue ice Preservation Method: dry ice <u>none</u> other (describe) <u>24c</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments:

FX 7968 8003 5845

PM (or PMA) review: Initials ED Date 8/21/09



Client: <u>Kona/Northgate</u>		SDG/ARCOC/Work Order: <u>2357821</u>	
Received By: <u>mk</u>		Date Received: <u>8-21-09</u>	
Suspected Hazard Information	Yes	No	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Counts Observed*: <u>over 20</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		<input checked="" type="checkbox"/>		ice bags blue ice dry ice <u>none</u> other (describe) <u>29°C</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?	<input checked="" type="checkbox"/>			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	Are Encore containers present?			<input checked="" type="checkbox"/>	(if yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?			<input checked="" type="checkbox"/>	Sample ID's and containers affected: <u>* see Below</u>
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments:

* EB081909-S02 ON CHAIN
EB082209-S02 ON BOTTLES

FX 7978 6746 7678

PM (or PMA) review: Initials mk Date 8/21/09

20090852426

235782%



1100 Quail Street, Suite 102, Newport Beach, CA 92660
(949) 260-9293

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate.

COC No. 2027.001.00607
Page: 1 of 1
Cooler # 1 of 1
Collection Area: II

Required Ship to Lab:		Required Project Information:		Required Invoice Information:		TAT: Standard 30 day		Rush		Mark One																									
Lab Name: GEL Laboratories, LLC		Site ID #: TRONOX LLC, HENDERSON		Send Invoice to: Susan Crowley Tronox LLC																															
Address: 2049 Savage Road		Project #: 2027.001		Address: PO Box 55																															
Charleston, SC 29407		Site Address: 560 W. Lake Mead Drive		City/State: Henderson, NV 89009		Phone #: (949) 260-9293																													
Lab PM: Edith M. Kent		City: Henderson		State: NV		Reimbursement project? <input checked="" type="checkbox"/>		Non-reimbursement project? <input type="checkbox"/>		Mark one																									
Phone/Fax: (843) 586-8171		Site PM Name: Derrick Willis		Send EDD to: Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com		Send EDD to: Frank Hagar Northgate Environmental Management, Inc frank.hagar@ngem.com		MA MCP Cert? <input type="checkbox"/>		CT RCP Cert? <input type="checkbox"/>																									
Lab PM email: emk@gel.com		Phone/Fax: (949) 375-7004		CC Hardcopy report to: derrick.willis@ngem.com		CC Hardcopy report to: see additional comments below		Lab Project ID (lab use)		Mark One																									
Applicable Lab Quote #:		Site PM Email: derrick.willis@ngem.com																																	
#	ITEM	SAMPLE ID One Character per box. (A-Z, 0-9 / -)	MATRIX CODES	MATRIX	WATER	W	GROUND WATER	WF	SURFACE WATER	WS	SLUDGE	SL	SOLID	SO	BIOWASTE	BW	HAZARDOUS WASTE	HW	HAZARDOUS SOLID	HS	HAZARDOUS LIQUID	HL	HAZARDOUS GAS	HG	HAZARDOUS PARTICULATE	HP	HAZARDOUS TISSUE	HT	HAZARDOUS OTHER	HO	OTHER	OT	Comments/Lab Sample I.D.		
1	RSOA6-10B		SO	G	8/21/2009	6:26	1	N	X																								250 ml Plastic jar		
2	RSOA6-20B		SO	G	8/21/2009	6:51	1	N	X																								250 ml Plastic jar		
3	RSOA6-34B		SO	G	8/21/2009	9:43	1	N	X																								250 ml Plastic jar		
4	RSOA6-34BMS		SO	G	8/21/2009	9:43	1	N	X																								250 ml Plastic jar		
5	RSOA6-34BMSD		SO	G	8/21/2009	9:43	1	N	X																								250 ml Plastic jar		
6																																			
7																																			
8																																			
9																																			
10																																			
11																																			
12																																			
13																																			

Additional Comments/Special Instructions:
FULL DIGESTION SPECIFICATION
Radionuclides* includes Thorium (isotopic) and Uranium (isotopic)
by EML HASL 300 modified(alpha spectroscopy)

All PDF reports and EDDs will be uploaded to:
Northgate Environmental Management, Inc.
FTP site address provided to labs
Notifications provided to:
cinoy.armold@ngem.com & frank.hagar@ngem.com

RELINQUISHED BY / AFFILIATION: [Signature] DATE: 8-21-09 TIME: 16:00 ACCEPTED BY / AFFILIATION: [Signature] DATE: 8-21-09 TIME: 16:00

SHIPPING METHOD: (mark as appropriate)
UPS COURIER PRINT Name of SAMPLER: Patrick Ferringier DATE Signed: 8-21-09
US MAIL SIGNATURE of SAMPLER: [Signature] DATE Signed: 8-21-09

Temp in OC: [] Samples on: [] Sample Intact?: [] Trip Blank?: []



Client: <u>KERR / NORHEATE</u>		SDG/ARCOC/Work Order: <u>2357827.</u>	
Received By: <u>MK</u>		Date Received: <u>8-22-09</u>	
Suspected Hazard Information	Yes	No	*If Counts > x2 area background on samples not marked "radioactive", contact the Radiation Safety Group of further investigation.
COC/Samples marked as radioactive?		<input checked="" type="checkbox"/>	Maximum Counts Observed*: <u>0</u>
Classified Radioactive II or III by RSO?		<input checked="" type="checkbox"/>	
COC/Samples marked containing PCBs?		<input checked="" type="checkbox"/>	
Shipped as a DOT Hazardous?		<input checked="" type="checkbox"/>	Hazard Class Shipped: _____ UN#: _____
Samples identified as Foreign Soil?		<input checked="" type="checkbox"/>	

Sample Receipt Criteria		Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
2	Samples requiring cold preservation within 0 ≤ 6 deg. C?		<input checked="" type="checkbox"/>		ice bags blue ice dry ice <u>none</u> other (describe) <u>23</u>
3	Chain of custody documents included with shipment?	<input checked="" type="checkbox"/>			
4	Sample containers intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other (describe)
5	Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?		<input checked="" type="checkbox"/>		Sample ID's and containers affected:
7	Are Encore containers present?			<input checked="" type="checkbox"/>	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	<input checked="" type="checkbox"/>			Id's and tests affected:
9	Sample ID's on COC match ID's on bottles?	<input checked="" type="checkbox"/>			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	<input checked="" type="checkbox"/>			Sample ID's affected:
11	Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			Sample ID's affected:
12	COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments:

FX 7978 7086 8053

PM (or PMA) review: Initials ED Date 8/24/09 rec'd 8/22/09

Subject: COC# 2027.01.00595 - Please Advise

From: Edie Kent <emk@gel.com>

Date: Fri, 21 Aug 2009 11:20:26 -0400

To: Cindy Arnold <Cindy.Arnold@ngem.com>, Frank Hagar <Frank.Hagar@ngem.com>, Derrick Willis <Derrick.Willis@ngem.com>, Team Kent <Team.Kent@gel.com>

There is a discrepancy between the sample ID on the chain and on the sample containers. The chain has EB081909-SO2 collected 8/20/09 at 09:00. The ID on the containers is EB082009-SO2. Please let me know which ID is correct.

Edie

--

Edith M. Kent
Project Manager
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC (USA) 29407
Direct: 843.769.7385 x4453
Main: 843.556.8171
Fax: 843.766.1178
E-mail: emk@gel.com
Web: www.gel.com

Subject: Vivian RESOLUTION => RE: Re: COC# 2027.01.00595 - Please Advise

From: carnold@ngem.com

Date: Fri, 18 Sep 2009 13:29:52 +0000

To: emk@gel.com, vivian.willis@verdant-solutions.com

CC: Frank.Hagar@ngem.com, Cindy.Arnold@ngem.com, Derrick.Willis@ngem.com, Team.Kent@gel.com

Vivian - Please have the COC and the DQCR amended for 8/20/09 - The sample ID should be EB082009-SO2 - Confirmed with Frank this AM. Thanks, Cindy

----- Original Message ----- On 9/18/2009 12:06 PM Edie Kent wrote:

Vivian:

That is confusing to me. The equipment blank in question came in on 08/21/09 with samples collected on 08/20/09 and the soil sample it was associated with was collected on the 20th. The ID on the chain is EB081909-SO2 with a collection date on the chain of 08/20/09. The ID on the sample container was originally EB081909-SO2 but was crossed out and changed to EB082009-SO2. The collection date on the container was originally 08/19/09 and was crossed out on the container and changed to 08/20/09. It appears that the sample ID should be EB082009-SO2 but was not changed on the chain. Please let me know.

Edie

Vivian Willis wrote:

>This took a while to locate. Here is the deal, the equipment blank sample ID had the wrong date on it, the field team must have noticed it but didn't change it. It is accurately listed on the 8/20/09 DQCR as EB081909-SO2. I will leave this with you Frank, I could see this causing you the most problems with the database. Would you like us to correct the COC and the DQCR?

>

>

>Note to self: Area IV line 73.

>

>

>Vivian Willis

>Data Management

>

>

>-----Original Message-----

>From: Edie Kent [mailto:emk@gel.com]

>Sent: Thursday, September 17, 2009 10:10 AM

>To: Cindy Arnold; Frank Hagar; Derrick Willis; Team Kent; 'Vivian Willis'

>Subject: Re: COC# 2027.01.00595 - Please Advise

>

>I don't believe we ever received a response on this. If the correct ID is the ID on the containers, then we will need a revised COC. Please

>let me know.

>

>Thanks, Edie

>

>Edie Kent wrote:

>

>

>

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>>sample containers. The chain has EB081909-SO2 collected 8/20/09 at
>>09:00. The ID on the containers is EB082009-SO2. Please let me know
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>>Edie

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>

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Edith M. Kent

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Subject: RE: Re: Vivian RESOLUTION => RE: Re: COC# 2027.01.00595 - Please Advise
From: carnold@ngem.com
Date: Fri, 18 Sep 2009 13:42:18 +0000
To: emk@gel.com, carnold@ngem.com

Hand correction is fine - though I still want the amendments made by GES and submitted. Thanks, Cindy

----- Original Message ----- On 9/18/2009 1:39 PM Edie Kent wrote:

Cindy:

This is due out today. Do you want me to hand correct the COC if Vivian does not get this back to us in time?

Edie

carnold@ngem.com wrote:

>

> Vivian - Please have the COC and the DQCR amended for 8/20/09 - The
> sample ID should be EB082009-SO2 - Confirmed with Frank this AM.
> Thanks, Cindy

>

>

>

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> changed to EB082009-SO2. The collection date on the container was
> originally 08/19/09 and was crossed out on the container and changed to
> 08/20/09. It appears that the sample ID should be EB082009-SO2 but was
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>

> Edie

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> correct the COC and the DQCR?

>>

>>

>>Note to self: Area IV line 73.

>>

>>
>>Vivian Willis
>>Data Management
>>
>>
>>-----Original Message-----
>>From: Edie Kent [mailto:emk@gel.com]
>>Sent: Thursday, September 17, 2009 10:10 AM
>>To: Cindy Arnold; Frank Hagar; Derrick Willis; Team Kent; 'Vivian
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>>Subject: Re: COC# 2027.01.00595 - Please Advise
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>>>
>>>Edie
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> --
> Edith M. Kent
> Project Manager
> GEL Laboratories, LLC
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> Charleston, SC (USA) 29407
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>

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Subject: Equipment Blank correction
From: "Vivian Willis" <vivian.willis@verdant-solutions.com>
Date: Fri, 21 Aug 2009 00:04:24 -0700
To: "Edie Kent" <emk@gel.com>
CC: <frank.hagar@ngem.com>, <Cindy.Arnold@ngem.com>

For soil samples collected on 08-20-2009, COC # 2027.001.00578

Note the equipment blank COC references the wrong soil boring. The actual sample ID for the EB is RSAT5-51B.
Thanks!



Vivian Willis
Data Management

Verdant Solutions, Inc.

1000 Bristol Street North, Suite 17-165, Newport Beach, CA 92660

Main: **949.922.9730** | Fax: **949.209.2070** | Email: vivian.willis@verdant-solutions.com

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Subject: GEL Closed SDG 235782

From: Heather Shaffer <Heather.Shaffer@gel.com>

Date: Mon, 24 Aug 2009 12:49:39 -0400

To: Cindy Arnold <Cindy.Arnold@ngem.com>, Frank Hagar <Frank.Hagar@ngem.com>, Edie Kent <emk@gel.com>, Derrick Willis <Derrick.Willis@ngem.com>

CC: Heather Shaffer <hea01394@gel.com>

With Saturday's receipts, we closed soil SDG 235782. Attached is a list of the samples in the SDG. As soon as we have completed the login review, you will receive the full receipt package for this SDG.

--

Heather Shaffer
Project Manager Assistant
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC (USA) 29407
Main: 843.556.8171 x 4505
Fax: 843.766.1178
E-mail: heather.shaffer@gel.com
Web: www.gel.com

235782.xls	Content-Type: application/msexcel Content-Encoding: base64
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Subject: SDG 235782 QC Issues - Alpha Spec Th, Alpha Spec U, Ra-226

From: Edie Kent <emk@gel.com>

Date: Thu, 17 Sep 2009 17:38:28 -0400

To: Cindy Arnold <Cindy.Arnold@ngem.com>, Frank Hagar <Frank.Hagar@ngem.com>, Derrick Willis <Derrick.Willis@ngem.com>, Team Kent <Team.Kent@gel.com>

CC: Martha Harrison <Martha.Harrison@gel.com>

The following are the QC issues regarding this SDG for Alpha Spec Th, Alpha Spec U and Ra 226:

Ra 226 Issues:

The following samples do not meet the Tronox QA program sample result uncertainty limit of <30% with activity between 2 and 5 times the MDA and were counted for the maximum possible count time: 235782003, 235782005, 235782010.

Soil Thorium Issues:

The following samples did not meet the Tronox QA program tracer yield requirements of 70-120% but did meet GEL's limits: 235782003 and the method blank. The tracer yield is low for sample 235782003 due to matrix related issues. The first count of the method blank met the contract limits at 71.5% but the blank had to be recounted due to a Th-228 blank false positive and the tracer yield on the recount was 65.8%. GEL is reporting the second count of the blank with the slightly low tracer yield recovery and no detectable activity greater than the MDA.

The method blank did not meet the Tronox QA program detection limit requirements for Th-228 and Th-230 due to keeping the blank aliquot consistent with the sample aliquots. The blank was counted for 1000 minutes in order to achieve the lowest MDA's possible.

Water Thorium Issues:

Sample 235782015 and the LCS dup did not meet the Tronox QA program tracer yield requirements of 70-120%. With a value of 51.7%, the sample meets the GEL standard tracer yield requirements. The LCS dup also met the GEL requirements at 62%. The LCS dup spike recovery was within the contract limits and the method blank and LCS met the contract yield requirements.

***Soil Uranium Issues: ***

The following samples do not meet the Tronox QA program sample result uncertainty limit of <30% with activity between 2 and 5 times the MDA for U235/236 and were counted for the maximum possible count time: 235782001, 235782002, 235782006, 235782012, 235782013, 235782014.

The following samples do not meet the Tronox QA program tracer yield requirement of 70-120% due to matrix related issues: 235782003, 235782004, 235782005, 235782009, 235782017, 235782018, and the lab DUP. GEL's standard tracer yield requirements were met. The blank and LCS met the contract requirements.

The following samples did not meet the Tronox QA program detection limits for U-235/236 due to lack of U-235/236 activity in the samples: 235782005, 235782016, 235782018, and the lab DUP. The method blank does not meet the detection limits for U-233/234 and U-238 due to keeping the blank aliquot consistent with the sample aliquots. The samples were all counted the maximum count time of 1000 minutes to achieve the lowest MDA's possible.

This will be noted in the case narrative.

Edie

--

Edith M. Kent
Project Manager
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2040 Savage Road
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Fax: 843.766.1178
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Web: www.gel.com

Laboratory Certifications

List of current GEL Certifications as of 17 September 2009

State	Certification
Arizona	AZ0668
Arkansas	88-0651
CLIA	42D0904046
California – NELAP	01151CA
Colorado	GEL
Connecticut	PH-0169
Dept. of Navy	NFESC 413
EPA Region 5	WG-15J
Florida – NELAP	E87156
Georgia	E87156 (FL/NELAP)
Georgia DW	967
Hawaii	N/A
ISO 17025	2567.01
Idaho	SC00012
Illinois – NELAP	200029
Indiana	C-SC-01
Kansas – NELAP	E-10332
Kentucky	90129
Louisiana – NELAP	03046
Maryland	270
Massachusetts	M-SC012
Nevada	SC00012
New Jersey – NELAP	SC002
New Mexico	FL NELAP E87156
New York – NELAP	11501
North Carolina	233
North Carolina DW	45709
Oklahoma	9904
Pennsylvania – NELAP	68-00485
South Carolina	10120001/10120002
Tennessee	TN 02934
Texas – NELAP	T104704235-07B-TX
U.S. Dept. of Agriculture	S-52597
Utah – NELAP	GEL
Vermont	VT87156
Virginia	00151
Washington	C1641

RADIOLOGICAL ANALYSIS

**Radiochemistry Case Narrative
Tronox LLC (KERR)
SDG 235782**

Method/Analysis Information

Product: Alphaspec Th, Solid
Analytical Method: DOE EML HASL-300, Th-01-RC Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 898783
Prep Batch Number: 896638

Sample ID	Client ID
235782001	SA198-10B
235782002	SA198-27B
235782003	SA175-10B
235782004	SA175-28B
235782005	SA139-0.5B
235782006	SA139-10B
235782007	SA139-25B
235782008	SA139009-25B
235782009	SA139-35B
235782010	RSAT5-0.5B
235782011	RSAT5-10B
235782012	RSAT5-25B
235782013	RSAT5-40B
235782014	RSAT5-51B
235782016	RSAO6-10B
235782017	RSAO6-20B
235782018	RSAO6-34B
1201914488	Method Blank (MB)
1201914489	235782018(RSAO6-34B) Sample Duplicate (DUP)
1201914490	235782018(RSAO6-34B) Matrix Spike (MS)
1201914491	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in

accordance with GL-RAD-A-038 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 volumes in this batch.

Designated QC

The following sample was used for QC: 235782018 (RSAO6-34B).

QC Information

Refer to Non-Conformance Report.

Technical Information:

Holding Time

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

Sample Re-prep/Re-analysis

Sample 1201914488 (MB) was recounted due to a suspected blank false positive.

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 734189 was generated due to RDL less than MDA and Failed Recovery for Surrogate or Tracer.

1. The Method Blank 1201914488 does not meet the requested detection limits for Th-228 and Th-230 due to keeping the blank aliquot consistent with the sample aliquots. 2. Sample 235782003 and Method Blank 1201914488 do not meet the client tracer yield requirements of 70 to 120 percent, however they do meet the GEL standard tracer yield requirements of 15 to 125 percent. 1. The blank was counted for 1000 minutes in order to achieve the lowest MDA's possible. Group leader and Project Manager notified. Reporting results. 2. The tracer yield is low for sample 235782003 due to matrix related issues. The first count of the blank did meet the client tracer yield requirements with a tracer yield of 71.5%, however the blank had to be recounted due to a Th-228 blank false positive and the tracer yield dropped to 65.8%. GEL is reporting the second count of the blank with the slightly low tracer yield recovery and no detectable activity greater than MDA. GEL is also investigating the cause of the low blank and LCS tracer yield trend seen over the past few months. Group leader and Project Manager notified. Reporting results.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

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: 898785

Sample ID	Client ID
235782015	EB082009-SO2
1201914500	Method Blank (MB)
1201914501	Laboratory Control Sample (LCS)
1201914502	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

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

Designated QC

A laboratory duplicate was not run with the analytical batch since it was designated by the client as a field QC. A laboratory control sample duplicate was analyzed for precision. 1201914501 (LCS) and 1201914502 (LCSD).

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.

Sample Re-prep/Re-analysis

Samples were recounted due to a suspected blank false positive.

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 734512 was generated due to Failed Recovery for Surrogate or Tracer. 1. Sample 235782015 and LCSD 1201914502 do not meet the client's tracer yield requirement of 70 - 120%. 2. The GEL standard tracer yield requirements of 15 - 125% were met. The LCSD spike recovery is within the client's acceptance criteria and the method blank and LCS do meet the client's yield requirements. PM notified, reporting results.

Manual Integration

No manual integrations were performed on data in this batch.

Additional Comments

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product:	Alphaspec U, Solid
Analytical Method:	DOE EML HASL-300, U-02-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	898784
Prep Batch Number:	896638

Sample ID	Client ID
235782001	SA198-10B
235782002	SA198-27B
235782003	SA175-10B
235782004	SA175-28B
235782005	SA139-0.5B
235782006	SA139-10B
235782007	SA139-25B
235782008	SA139009-25B
235782009	SA139-35B
235782010	RSAT5-0.5B
235782011	RSAT5-10B
235782012	RSAT5-25B
235782013	RSAT5-40B
235782014	RSAT5-51B
235782016	RSAO6-10B
235782017	RSAO6-20B
235782018	RSAO6-34B
1201914492	Method Blank (MB)
1201914493	235782018(RSAO6-34B) Sample Duplicate (DUP)
1201914494	235782018(RSAO6-34B) Matrix Spike (MS)
1201914495	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 17.

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: 235782018 (RSAO6-34B).

QC Information

Refer to Non-Conformance Report.

Technical Information:

Holding Time

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

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 733351 was generated due to RDL less than MDA, Failed Recovery for Surrogate or Tracer and Other. 1. Samples 235782003, 235782004, 235782005, 235782009, 235782017, 235782018, and 1201914493 do not meet the client tracer yield requirements of 70 to 120 percent due to matrix related issues. 2. Samples 235782005, 235782016, 235782018, and 120194493 do not meet the detection limits for U-235/236 due to lack of U-235/236 activity in the samples. The Method Blank, 1201914492, does not meet the detection limit for U-233/234 due to keeping the blank aliquot consistent with the sample aliquots. 3. Samples 235782001, 235782002, 235782006, 235782012, 235782013 and 235782014 have Uranium-235/236 activity between two and five times the MDA and uncertainty greater than 30% of that respective activity. 1. The GEL standard tracer yield requirements of 15 to 125 percent were met and the Method Blank and LCS do meet the client tracer yield requirements. Project Manager notified. Reporting results. 2. Samples were all counted the maximum count time of 1000 minutes to achieve the lowest MDA's possible. Project Manager notified. Reporting results. 3. Samples were all counted the maximum count time of 1000 minutes to achieve the best possible uncertainties. Project Manager notified. Reporting results.

Manual Integration

Manual integration of alpha spectroscopy spectra 235782016 (RSAO6-10B) was performed to fully separate counts in Regions of Interest which would have been biased.

Additional Comments

Additional comments were not required for this sample set.

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: 903039

Sample ID	Client ID
235782015	EB082009-SO2
1201924684	Method Blank (MB)
1201924687	Laboratory Control Sample (LCS)
1201924688	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 17.

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

A laboratory duplicate was not run with the analytical batch since it was designated by the client as a field QC. A laboratory control sample duplicate was analyzed for precision. 1201924687 (LCS) and 1201924688 (LCSD).

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.

Sample Re-prep/Re-analysis

Sample 235782015 (EB082009-SO2) was reprepared due to low carrier/tracer yield.

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

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Ra228, Liquid
Analytical Method: EPA 904.0/SW846 9320 Modified
Analytical Batch Number: 898628

Sample ID	Client ID
235782015	EB082009-SO2
1201914015	Method Blank (MB)
1201914016	Laboratory Control Sample (LCS)
1201914017	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-009 REV# 15.

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

A laboratory duplicate was not run with the analytical batch since it was designated by the client as a field QC. A laboratory control sample duplicate was analyzed for precision. 1201914016 (LCS) and 1201914017 (LCSD).

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.

Sample Re-prep/Re-analysis

Sample 1201914016 (LCS) was recounted due to high recovery. Sample 1201914015 (MB) was recounted due to high MDA.

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.

Additional Comments

The laboratory control sample and the laboratory control sample duplicate, 1201914016 (LCS) and 1201914017 (LCSD), did not meet the relative percent difference requirement. However they do meet the recovery requirement.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product: Gas Flow Radium 228
Analytical Method: EPA 904.0/SW846 9320 Modified
Prep Method: Dry Soil Prep
Analytical Batch Number: 899411
Prep Batch Number: 896638

Sample ID	Client ID
235782001	SA198-10B
235782002	SA198-27B
235782003	SA175-10B
235782004	SA175-28B
235782005	SA139-0.5B
235782006	SA139-10B
235782007	SA139-25B
235782008	SA139009-25B
235782009	SA139-35B
235782010	RSAT5-0.5B
235782011	RSAT5-10B
235782012	RSAT5-25B
235782013	RSAT5-40B
235782014	RSAT5-51B
235782016	RSAO6-10B
235782017	RSAO6-20B
235782018	RSAO6-34B
1201915944	Method Blank (MB)
1201915945	235782018(RSAO6-34B) Sample Duplicate (DUP)
1201915946	235782018(RSAO6-34B) Matrix Spike (MS)
1201915947	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-009 REV# 15.

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: 235782018 (RSAO6-34B).

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.

Sample Re-prep/Re-analysis

Samples were reprepared due to high MDAs. Sample 1201915945 (RSAO6-34B), 235782001 (SA198-10B), 235782005 (SA139-0.5B), 235782006 (SA139-10B), 235782008 (SA139009-25B), 235782013 (RSAT5-40B) and 235782017 (RSAO6-20B) recounted due to client uncertainty requirement.

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.

Additional Comments

The blank result 1201915944 (MB) is greater than the MDC but less than the detection limit.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product:	Lucas Cell, Ra226, liquid
Analytical Method:	EPA 903.1 Modified
Analytical Batch Number:	898657

Sample ID	Client ID
235782015	EB082009-SO2
1201914119	Method Blank (MB)
1201914120	Laboratory Control Sample (LCS)
1201914121	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

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

A laboratory duplicate was not run with the analytical batch since it was designated by the client as a field QC. A laboratory control sample duplicate was analyzed for precision. 1201914120 (LCS) and 1201914121 (LCSD).

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.

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

Additional comments were not required for this sample set.

Qualifier information

Manual qualifiers were not required.

Method/Analysis Information

Product:	Lucas Cell, Ra226, solid
Analytical Method:	EPA 903.1 Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	901480
Prep Batch Number:	896638

Sample ID	Client ID
235782001	SA198-10B
235782002	SA198-27B
235782003	SA175-10B
235782004	SA175-28B
235782005	SA139-0.5B
235782006	SA139-10B
235782007	SA139-25B
235782008	SA139009-25B
235782009	SA139-35B
235782010	RSAT5-0.5B
235782011	RSAT5-10B
235782012	RSAT5-25B
235782013	RSAT5-40B
235782014	RSAT5-51B
235782016	RSAO6-10B
235782017	RSAO6-20B
235782018	RSAO6-34B
1201920868	Method Blank (MB)
1201920869	235782018(RSAO6-34B) Sample Duplicate (DUP)
1201920870	235782018(RSAO6-34B) Matrix Spike (MS)
1201920871	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-008 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: 235782018 (RSAO6-34B).

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.

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 734496 was generated due to Other. 1. Samples 235782003, 235782005 and 235782010 have Radium-226 activity between two and five percent the MDA and uncertainty greater than 30% of that respective activity. Samples counted the maximum count time of 30 minute to achieve the best possible uncertainties. 1. Reporting results. PM notified.

Additional Comments

The sample and the duplicate, 1201920869 (RSAO6-34B) and 235782018 (RSAO6-34B), did not meet the relative percent difference requirement, however they do meet the relative error ratio

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr. 15-SEP-09	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, U-02-RC Modified	Matrix Type: Solid	Client Code: KERR
Batch ID: 898784	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 235782

Application Issues:

- RDL less than MDA
- Failed Recovery for Surrogate or Tracer
- Other

Specification and Requirements Nonconformance Description:	NRG Disposition:
<p>1. Samples 235782003, 235782004, 235782005, 235782009, 235782017, 235782018, and 1201914493 do not meet the client tracer yield requirements of 70 to 120 percent due to matrix related issues.</p> <p>2. Samples 235782005, 235782016, 235782018, and 120194493 do not meet the detection limits for U-235/236 due to lack of U-235/236 activity in the samples. The Method Blank, 1201914492, does not meet the detection limit for U-233/234 due to keeping the blank aliquot consistent with the sample aliquots.</p> <p>3. Samples 235782001, 235782002, 235782006, 235782012, 235782013 and 235782014 have Uranium-235/236 activity between two and five times the MDA and uncertainty greater than 30% of that respective activity.</p>	<p>1. The GEL standard tracer yield requirements of 15 to 125 percent were met and the Method Blank and LCS do meet the client tracer yield requirements. Project Manager notified. Reporting results.</p> <p>2. Samples were all counted the maximum count time of 1000 minutes to achieve the lowest MDA's possible. Project Manager notified. Reporting results.</p> <p>3. Samples were all counted the maximum count time of 1000 minutes to achieve the best possible uncertainties. Project Manager notified. Reporting results.</p>

Originator's Name:
Jessica Downey 15-SEP-09

Data Validator/Group Leader:
Joseph Moulden 16-SEP-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr. 16-SEP-09	Division: Radiochemistry	Quality Criteria: Drawing	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Th-01-RC Modified	Matrix Type: Solid	Client Code: KERR
Batch ID: 898783	Sample Numbers: See Below		

Potentially affected work order(s)(SDG): 235782

Application Issues:

RDL less than MDA
Failed Recovery for Surrogate or Tracer

**Specification and Requirements
Nonconformance Description:**

1. The Method Blank 1201914488 does not meet the requested detection limits for Th-228 and Th-230 due to keeping the blank aliquot consistent with the sample aliquots.
2. Sample 235782003 and Method Blank 1201914488 do not meet the client tracer yield requirements of 70 to 120 percent, however they do meet the GEL standard tracer yield requirements of 15 to 125 percent.

NRG Disposition:

1. The blank was counted for 1000 minutes in order to achieve the lowest MDA's possible. Group leader and Project Manager notified. Reporting results.
2. The tracer yield is low for sample 235782003 due to matrix related issues. The first count of the blank did meet the client tracer yield requirements with a tracer yield of 71.5%, however the blank had to be recounted due to a Th-228 blank false positive and the tracer yield dropped to 65.8%. GEL is reporting the second count of the blank with the slightly low tracer yield recovery and no detectable activity greater than MDA. GEL is also investigating the cause of the low blank and LCS tracer yield trend seen over the past few months. Group leader and Project Manager notified. Reporting results.

Originator's Name:

Jessica Downey 16-SEP-09

Data Validator/Group Leader:

Eric Brimstin 16-SEP-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr. 16-SEP-09	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: LUCAS CELL DETECTOR	Test / Method: EPA 903.1 Modified	Matrix Type: Solid	Client Code: KERR
Batch ID: 901480	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 235782			
Application Issues: Other			
Specification and Requirements Nonconformance Description:		NRG Disposition:	
1. Samples 235782003, 235782005 and 235782010 have Radium-226 activity between two and five percent the MDA and uncertainty greater than 30% of that respective activity. Samples counted the maximum count time of 30 minute to achieve the best possible uncertainties.		1. Reporting results. PM notified.	

Originator's Name:
Layota Yom 16-SEP-09

Data Validator/Group Leader:
Lesley Anderson 17-SEP-09

COMPANY - WIDE NONCONFORMANCE REPORT

Mo.Day Yr. 17-SEP-09	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: ALPHA SPECTROMETER	Test / Method: DOE EML HASL-300, Th-01-RC Modified	Matrix Type: Liquid	Client Code: KERR
Batch ID: 898785	Sample Numbers: See below		
Potentially affected work order(s)(SDG): 235782			
Application Issues: Failed Recovery for Surrogate or Tracer			
Specification and Requirements Nonconformance Description:		NRG Disposition:	
1. Sample 235782015 and LCSD 1201914502 do not meet the client's tracer yield requirement of 70 - 120%.		2. The GEL standard tracer yield requirements of 15 - 125% were met. The LCSD spike recovery is within the client's acceptance criteria and the method blank and LCS do meet the client's yield requirements. PM notified, reporting results.	

Originator's Name:
Joseph Moulden 17-SEP-09

Data Validator/Group Leader:
Jessica Downey 17-SEP-09

SAMPLE DATA SUMMARY

GEL LABORATORIES LLC

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

Certificate of Analysis Report for

KERR003 Tronox LLC

Client SDG: 235782 GEL Work Order: 235782

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

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.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the detection limit.

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



Reviewed by

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA198-10B	Project:	KERRHenderson
Sample ID:	235782001	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 09:35		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.86	+/-0.237	0.0599	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		2.64	+/-0.281	0.0233	0.050	pCi/g						
Thorium-232		1.64	+/-0.223	0.0743	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		2.36	+/-0.200	0.048	0.040	pCi/g		JXD2	09/05/09	1159	898784	2
Uranium-235/236		0.123	+/-0.0526	0.0411	0.040	pCi/g						
Uranium-238		2.21	+/-0.192	0.013	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		0.947	+/-0.179	0.218	0.500	pCi/g		MXS2	09/10/09	1006	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.39	+/-0.242	0.146	0.500	pCi/g		KSD1	09/16/09	1725	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			91.8	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			82.5	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			100	(25%-125%)

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	SA198-27B	Project:	KERRHenderson
Sample ID:	235782002	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 09:57		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.32	+/-0.237	0.184	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		2.33	+/-0.293	0.124	0.050	pCi/g						
Thorium-232		1.07	+/-0.203	0.124	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		2.28	+/-0.187	0.0485	0.040	pCi/g		JXD2	09/05/09	1159	898784	2
Uranium-235/236		0.112	+/-0.0496	0.0467	0.040	pCi/g						
Uranium-238		2.33	+/-0.189	0.0378	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.02	+/-0.294	0.292	0.500	pCi/g		MXS2	09/10/09	0723	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.75	+/-0.317	0.215	0.500	pCi/g		KSD1	09/16/09	1835	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			71.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			90.3	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			99.9	(25%-125%)

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA175-10B	Project:	KERRHenderson
Sample ID:	235782003	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 06:48		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.34	+/-0.334	0.195	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		1.05	+/-0.290	0.154	0.050	pCi/g						
Thorium-232		1.67	+/-0.360	0.0605	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.25	+/-0.268	0.182	0.040	pCi/g		JXD2	09/05/09	1159	898784	2
Uranium-235/236		0.0838	+/-0.0734	0.0503	0.040	pCi/g						
Uranium-238		1.10	+/-0.242	0.104	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.06	+/-0.194	0.232	0.500	pCi/g		MXS2	09/10/09	1006	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.449	+/-0.167	0.186	0.500	pCi/g		KSD1	09/16/09	1835	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			34.1	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			26.6	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			91.5	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	SA175-28B	Project:	KERRHenderson
Sample ID:	235782004	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 07:17		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.20	+/-0.202	0.103	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		4.67	+/-0.386	0.0248	0.050	pCi/g						
Thorium-232		0.969	+/-0.180	0.0916	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		3.75	+/-0.342	0.121	0.040	pCi/g		JXD2	09/05/09	1159	898784	2
Uranium-235/236		0.147	+/-0.0835	0.0936	0.040	pCi/g						
Uranium-238		3.38	+/-0.324	0.106	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		0.826	+/-0.338	0.440	0.500	pCi/g		MXS2	09/10/09	0724	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.91	+/-0.315	0.199	0.500	pCi/g		KSD1	09/16/09	1835	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			81.2	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			44.8	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			88.2	(25%-125%)

GEL LABORATORIES LLC

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA139-0.5B	Project:	KERRHenderson
Sample ID:	235782005	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 06:55		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.78	+/-0.242	0.102	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		1.24	+/-0.202	0.0906	0.050	pCi/g						
Thorium-232		1.47	+/-0.218	0.0785	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.30	+/-0.195	0.0814	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236	U	0.0364	+/-0.0505	0.0872	0.040	pCi/g						
Uranium-238		1.07	+/-0.177	0.0814	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.23	+/-0.247	0.341	0.500	pCi/g		MXS2	09/10/09	1006	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.621	+/-0.194	0.182	0.500	pCi/g		KSD1	09/16/09	1835	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			81.7	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			46.5	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			99.2	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	SA139-10B	Project:	KERRHenderson
Sample ID:	235782006	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 07:15		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.92	+/-0.267	0.145	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		1.28	+/-0.213	0.098	0.050	pCi/g						
Thorium-232		1.75	+/-0.246	0.0849	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		0.974	+/-0.120	0.050	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236		0.0461	+/-0.0286	0.0138	0.040	pCi/g						
Uranium-238		0.959	+/-0.117	0.0112	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.08	+/-0.215	0.284	0.500	pCi/g		MXS2	09/10/09	1006	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.994	+/-0.283	0.268	0.500	pCi/g		KSD1	09/16/09	1835	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			80.0	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			92.2	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			102	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	SA139-25B	Project:	KERRHenderson
Sample ID:	235782007	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 07:30		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.88	+/-0.255	0.0269	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		1.78	+/-0.250	0.0982	0.050	pCi/g						
Thorium-232		1.78	+/-0.249	0.0851	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.22	+/-0.136	0.0577	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236		0.0559	+/-0.0387	0.0515	0.040	pCi/g						
Uranium-238		1.12	+/-0.129	0.0417	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.16	+/-0.454	0.632	0.500	pCi/g		MXS2	09/10/09	0724	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.23	+/-0.251	0.187	0.500	pCi/g		KSD1	09/16/09	1835	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			79.2	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			93.5	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			85.2	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
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Address : 1100 Quail St., Suite 102
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Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	SA139009-25B	Project:	KERRHenderson
Sample ID:	235782008	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 07:30		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.97	+/-0.256	0.0818	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		1.75	+/-0.239	0.0254	0.050	pCi/g						
Thorium-232		1.48	+/-0.219	0.0254	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.33	+/-0.148	0.0769	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236		0.0696	+/-0.0436	0.055	0.040	pCi/g						
Uranium-238		1.06	+/-0.134	0.0795	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.16	+/-0.279	0.415	0.500	pCi/g		MXS2	09/10/09	1006	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.13	+/-0.268	0.223	0.500	pCi/g		KSD1	09/16/09	1910	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			83.9	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			87.4	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			104	(25%-125%)

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Company : Northgate Environmental Management, Inc.
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Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Report Date: September 17, 2009

Client Sample ID:	SA139-35B	Project:	KERRHenderson
Sample ID:	235782009	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 07:55		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		2.27	+/-0.283	0.118	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		2.69	+/-0.304	0.107	0.050	pCi/g						
Thorium-232		1.60	+/-0.235	0.0964	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.82	+/-0.188	0.0656	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236		0.0545	+/-0.0393	0.0463	0.040	pCi/g						
Uranium-238		1.73	+/-0.182	0.0602	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		0.770	+/-0.397	0.592	0.500	pCi/g		MXS2	09/10/09	0725	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.54	+/-0.278	0.189	0.500	pCi/g		KSD1	09/16/09	1910	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			79.9	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			69.7	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			95.9	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
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Address : 1100 Quail St., Suite 102
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Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	RSAT5-0.5B	Project:	KERRHenderson
Sample ID:	235782010	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 11:07		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.74	+/-0.258	0.127	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		1.13	+/-0.203	0.0716	0.050	pCi/g						
Thorium-232		1.52	+/-0.243	0.143	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		0.887	+/-0.114	0.0358	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236	U	0.0416	+/-0.0327	0.0443	0.040	pCi/g						
Uranium-238		0.923	+/-0.117	0.046	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.06	+/-0.311	0.342	0.500	pCi/g		MXS2	09/10/09	0725	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.590	+/-0.195	0.203	0.500	pCi/g		KSD1	09/16/09	1910	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			74.1	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			94.7	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			104	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	RSAT5-10B	Project:	KERRHenderson
Sample ID:	235782011	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 11:25		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		2.03	+/-0.259	0.102	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		1.23	+/-0.200	0.0789	0.050	pCi/g						
Thorium-232		1.51	+/-0.221	0.0789	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.04	+/-0.122	0.0351	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236	U	0.0362	+/-0.0307	0.0433	0.040	pCi/g						
Uranium-238		0.981	+/-0.117	0.011	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.40	+/-0.408	0.523	0.500	pCi/g		MXS2	09/10/09	0725	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.771	+/-0.224	0.215	0.500	pCi/g		KSD1	09/16/09	1910	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			81.1	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			96.6	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			104	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	RSAT5-25B	Project:	KERRHenderson
Sample ID:	235782012	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 11:54		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.71	+/-0.248	0.134	0.050	pCi/g		JXD2	09/12/09	1451	898783	1
Thorium-230		1.87	+/-0.253	0.0957	0.050	pCi/g						
Thorium-232		1.45	+/-0.222	0.0829	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.53	+/-0.151	0.0544	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236		0.0935	+/-0.043	0.0358	0.040	pCi/g						
Uranium-238		1.42	+/-0.144	0.0289	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.40	+/-0.390	0.455	0.500	pCi/g		MXS2	09/10/09	0725	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.66	+/-0.345	0.261	0.500	pCi/g		KSD1	09/16/09	1910	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			80.6	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			95.9	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			98.0	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
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Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	RSAT5-40B	Project:	KERRHenderson
Sample ID:	235782013	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 12:33		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		2.03	+/-0.261	0.0942	0.050	pCi/g		JXD2	09/14/09	2010	898783	1
Thorium-230		4.39	+/-0.378	0.0644	0.050	pCi/g						
Thorium-232		1.76	+/-0.240	0.0644	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		4.11	+/-0.252	0.105	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236		0.203	+/-0.0697	0.0721	0.040	pCi/g						
Uranium-238		4.62	+/-0.262	0.0675	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.20	+/-0.223	0.268	0.500	pCi/g		MXS2	09/10/09	1007	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.14	+/-0.239	0.181	0.500	pCi/g		KSD1	09/16/09	1910	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			83.1	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			96.3	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			85.8	(25%-125%)

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : Northgate Environmental Management, Inc.
 Address : 1100 Quail St., Suite 102
 Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
 Project: **Tronox Henderson**

Client Sample ID:	RSAT5-51B	Project:	KERRHenderson
Sample ID:	235782014	Client ID:	KERR003
Matrix:	SO		
Collect Date:	20-AUG-09 13:14		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.69	+/-0.246	0.0709	0.050	pCi/g		JXD2	09/14/09	2010	898783	1
Thorium-230		2.64	+/-0.307	0.0876	0.050	pCi/g						
Thorium-232		1.03	+/-0.192	0.070	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		2.48	+/-0.205	0.0622	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236		0.128	+/-0.0553	0.0511	0.040	pCi/g						
Uranium-238		2.60	+/-0.208	0.0414	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.47	+/-0.368	0.363	0.500	pCi/g		MXS2	09/10/09	0725	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.76	+/-0.317	0.214	0.500	pCi/g		KSD1	09/16/09	1945	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			78.8	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			81.6	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			93.5	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	EB082009-SO2	Project:	KERRHenderson
Sample ID:	235782015	Client ID:	KERR003
Matrix:	W		
Collect Date:	20-AUG-09 09:00		
Receive Date:	21-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	AnalystDate	Time	Batch	Method
Rad Alpha Spec Analysis											
<i>Alphaspec Th, Liquid "As Received"</i>											
Thorium-228		0.0523	+/-0.0319	0.0333	0.030	pCi/L		JXD2 09/15/09	2148	898785	1
Thorium-230	U	0.00	+/-0.00841	0.0129	0.030	pCi/L					
Thorium-232		0.0129	+/-0.0146	0.0129	0.030	pCi/L					
<i>Alphaspec U, Liquid "As Received"</i>											
Uranium-233/234	U	0.0133	+/-0.0118	0.0176	0.030	pCi/L		JXD2 09/16/09	0819	903039	2
Uranium-235/236	U	0.00591	+/-0.00863	0.0151	0.030	pCi/L					
Uranium-238	U	0.00318	+/-0.00883	0.0176	0.030	pCi/L					
Rad Gas Flow Proportional Counting											
<i>GFPC, Ra228, Liquid "As Received"</i>											
Radium-228	U	2.03	+/-1.51	2.39	3.00	pCi/L		JXC5 09/03/09	1240	898628	3
Rad Radium-226											
<i>Lucas Cell, Ra226, liquid "As Received"</i>											
Radium-226		0.428	+/-0.283	0.406	1.00	pCi/L		KSD1 09/08/09	1030	898657	4

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Liquid "As Received"			51.7	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Liquid "As Received"			94.8	(15%-125%)
Barium-133 Tracer	GFPC, Ra228, Liquid "As Received"			73.5	(15%-125%)

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	RSAO6-10B	Project:	KERRHenderson
Sample ID:	235782016	Client ID:	KERR003
Matrix:	SO		
Collect Date:	21-AUG-09 06:26		
Receive Date:	22-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		1.75	+/-0.242	0.158	0.050	pCi/g		JXD2	09/14/09	2010	898783	1
Thorium-230		1.13	+/-0.188	0.102	0.050	pCi/g						
Thorium-232		1.67	+/-0.224	0.0843	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.22	+/-0.139	0.0682	0.040	pCi/g		JXD2	09/05/09	1200	898784	2
Uranium-235/236	U	0.0381	+/-0.0349	0.0527	0.040	pCi/g						
Uranium-238		0.971	+/-0.121	0.0369	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.31	+/-0.334	0.302	0.500	pCi/g		MXS2	09/10/09	0726	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.785	+/-0.206	0.184	0.500	pCi/g		KSD1	09/16/09	1945	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			87.7	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			93.2	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			97.0	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	RSAO6-20B	Project:	KERRHenderson
Sample ID:	235782017	Client ID:	KERR003
Matrix:	SO		
Collect Date:	21-AUG-09 06:51		
Receive Date:	22-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		2.48	+/-0.284	0.080	0.050	pCi/g		JXD2	09/14/09	2010	898783	1
Thorium-230		3.02	+/-0.310	0.0631	0.050	pCi/g						
Thorium-232		1.90	+/-0.247	0.0631	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		3.21	+/-0.276	0.0675	0.040	pCi/g		JXD2	09/05/09	1242	898784	2
Uranium-235/236		0.113	+/-0.061	0.0577	0.040	pCi/g						
Uranium-238		2.80	+/-0.259	0.0818	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.08	+/-0.194	0.233	0.500	pCi/g		MXS2	09/10/09	1007	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		1.35	+/-0.283	0.216	0.500	pCi/g		KSD1	09/16/09	1945	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			83.6	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			56.9	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			98.0	(25%-125%)

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Certificate of Analysis

Company : Northgate Environmental
Management, Inc.
Address : 1100 Quail St., Suite 102
Newport Beach, California 92660

Report Date: September 17, 2009

Contact: Mr. Frank Hagar
Project: **Tronox Henderson**

Client Sample ID:	RSAO6-34B	Project:	KERRHenderson
Sample ID:	235782018	Client ID:	KERR003
Matrix:	SO		
Collect Date:	21-AUG-09 09:43		
Receive Date:	22-AUG-09		
Collector:	Client		

Parameter	Qualifier	Result	Uncertainty	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
<i>Alphaspec Th, Solid "Dry Weight Corrected"</i>												
Thorium-228		2.10	+/-0.261	0.0794	0.050	pCi/g		JXD2	09/14/09	2010	898783	1
Thorium-230		2.13	+/-0.260	0.0627	0.050	pCi/g						
Thorium-232		1.81	+/-0.240	0.0627	0.100	pCi/g						
<i>Alphaspec U, Solid "Dry Weight Corrected"</i>												
Uranium-233/234		1.68	+/-0.193	0.108	0.040	pCi/g		JXD2	09/05/09	1242	898784	2
Uranium-235/236	U	0.0326	+/-0.0424	0.0721	0.040	pCi/g						
Uranium-238		1.74	+/-0.193	0.0894	0.040	pCi/g						
Rad Gas Flow Proportional Counting												
<i>Gas Flow Radium 228 "Dry Weight Corrected"</i>												
Radium-228		1.26	+/-0.365	0.426	0.500	pCi/g		MXS2	09/10/09	0726	899411	3
Rad Radium-226												
<i>Lucas Cell, Ra226, solid "Dry Weight Corrected"</i>												
Radium-226		0.848	+/-0.234	0.217	0.500	pCi/g		KSD1	09/16/09	1945	901480	4

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	DRS1	08/24/09	1749	896638

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	DOE EML HASL-300, Th-01-RC Modified	
2	DOE EML HASL-300, U-02-RC Modified	
3	EPA 904.0/SW846 9320 Modified	
4	EPA 903.1 Modified	

Surrogate/Tracer recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Actinium-227 Tracer	Alphaspec Th, Solid "Dry Weight Corrected"			83.1	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			66.0	(15%-125%)
Barium-133 Tracer	Gas Flow Radium 228 "Dry Weight Corrected"			99.9	(25%-125%)

QUALITY CONTROL DATA

GEL LABORATORIES LLC

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

QC Summary

Report Date: September 17, 2009
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Northgate Environmental Management, Inc.
1100 Quail St., Suite 102
Newport Beach, California

Contact: Mr. Frank Hagar

Workorder: 235782

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	898783										
QC1201914489	235782018	DUP									
Thorium-228		2.10		1.74	pCi/g	18.8		(0% - 20%)	JXD2	09/14/09	20:10
		+/-0.261		+/-0.234							
Thorium-230		2.13		1.75	pCi/g	19.8		(0% - 20%)			
		+/-0.260		+/-0.233							
Thorium-232		1.81		1.66	pCi/g	8.57		(0% - 20%)			
		+/-0.240		+/-0.231							
QC1201914491	LCS										
Thorium-228			U	0.0652	pCi/g					09/04/09	14:07
				+/-0.0932							
Thorium-230	8.36			8.46	pCi/g		101	(75%-125%)			
				+/-0.516							
Thorium-232			U	0.0163	pCi/g			(75%-125%)			
				+/-0.0319							
QC1201914488	MB										
Thorium-228			U	0.0416	pCi/g					09/15/09	18:00
				+/-0.115							
Thorium-230			U	0.0103	pCi/g						
				+/-0.045							
Thorium-232			U	0.0103	pCi/g						
				+/-0.0349							
QC1201914490	235782018	MS									
Thorium-228		2.10		1.80	pCi/g					09/04/09	14:07
		+/-0.261		+/-0.244							
Thorium-230	8.43	2.13		10.7	pCi/g		102	(75%-125%)			
		+/-0.260		+/-0.576							
Thorium-232		1.81		1.68	pCi/g			(75%-125%)			
		+/-0.240		+/-0.228							
Batch	898784										
QC1201914493	235782018	DUP									
Uranium-233/234		1.68		1.62	pCi/g	4.00		(0% - 20%)	JXD2	09/05/09	12:42
		+/-0.193		+/-0.246							
Uranium-235/236		0.0326	U	0.0661	pCi/g	68.0		N/A			
		+/-0.0424		+/-0.0611							
Uranium-238		1.74		1.75	pCi/g	0.752		(0% - 20%)			
		+/-0.193		+/-0.248							
QC1201914495	LCS										
Uranium-233/234				4.85	pCi/g					09/04/09	14:41
				+/-0.239							
Uranium-235/236				0.256	pCi/g						
				+/-0.0627							
Uranium-238	4.95			4.98	pCi/g		101	(75%-125%)			

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QC Summary

Workorder: 235782

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	898784										
QC1201914492	MB			+/-0.242							
Uranium-233/234			U	-0.025	pCi/g				JXD2	09/05/09	12:42
				+/-0.0216							
Uranium-235/236			U	0.00	pCi/g						
				+/-0.00882							
Uranium-238			U	-0.00728	pCi/g						
				+/-0.0175							
QC1201914494	235782018	MS									
Uranium-233/234				1.68	pCi/g					09/04/09	14:41
				+/-0.193							
Uranium-235/236		U		0.0326	pCi/g						
				+/-0.0424							
Uranium-238	4.98			1.74	pCi/g		98.8	(75%-125%)			
				+/-0.193							
Batch	898785										
QC1201914501	LCS										
Thorium-228				0.0508	pCi/L				JXD2	09/15/09	21:48
				+/-0.0278							
Thorium-230	2.68			2.82	pCi/L		105	(75%-125%)			
				+/-0.184							
Thorium-232			U	0.00625	pCi/L			(75%-125%)			
				+/-0.015							
QC1201914502	LCSD										
Thorium-228				0.0761	pCi/L	40.0				09/15/09	21:48
				+/-0.0341							
Thorium-230	2.68			3.04	pCi/L	7.51	113	(0%-20%)			
				+/-0.204							
Thorium-232			U	0.00714	pCi/L	13.3		(0%-20%)			
				+/-0.0099							
QC1201914500	MB										
Thorium-228			U	0.0261	pCi/L					09/15/09	21:48
				+/-0.022							
Thorium-230			U	0.00286	pCi/L						
				+/-0.00971							
Thorium-232			U	0.00	pCi/L						
				+/-0.00793							
Batch	903039										
QC1201924687	LCS										
Uranium-233/234				2.95	pCi/L				JXD2	09/16/09	08:19
				+/-0.138							
Uranium-235/236				0.157	pCi/L						
				+/-0.0368							
Uranium-238	3.15			3.29	pCi/L		104	(75%-125%)			
				+/-0.145							

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QC Summary

Workorder: 235782

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch		903039									
QC1201924688		LCS									
Uranium-233/234				2.81	pCi/L	4.85			JXD2	09/16/09	08:19
				+/-0.130							
Uranium-235/236				0.185	pCi/L	16.4					
				+/-0.0379							
Uranium-238	3.15			3.01	pCi/L	8.89	95.6	(0%-20%)			
				+/-0.135							
QC1201924684		MB									
Uranium-233/234			U	-0.00116	pCi/L					09/16/09	08:19
				+/-0.007							
Uranium-235/236			U	0.00385	pCi/L						
				+/-0.00534							
Uranium-238			U	0.00156	pCi/L						
				+/-0.00808							
Rad Gas Flow											
Batch		898628									
QC1201914016		LCS									
Radium-228	40.3			47.6	pCi/L		118	(75%-125%)	JXC5	09/03/09	14:51
				+/-5.47							
QC1201914017		LCS									
Radium-228	40.3			38.2	pCi/L	21.8*	95	(0%-20%)		09/03/09	12:40
				+/-4.49							
QC1201914015		MB									
Radium-228			U	1.13	pCi/L					09/03/09	14:51
				+/-1.62							
Batch		899411									
QC1201915945		235782018	DUP								
Radium-228				1.26	pCi/g	6.00		(0% - 100%)	MXS2	09/10/09	10:07
				+/-0.365							
QC1201915947		LCS									
Radium-228	7.91			8.45	pCi/g		107	(75%-125%)		09/10/09	07:26
				+/-0.778							
QC1201915944		MB									
Radium-228				0.444	pCi/g					09/10/09	07:26
				+/-0.284							
QC1201915946		235782018	MS								
Radium-228	72.1			1.26	pCi/g		101	(75%-125%)		09/10/09	07:26
				+/-0.365							
				+/-6.46							
Rad Ra-226											
Batch		898657									
QC1201914120		LCS									
Radium-226	24.2			23.1	pCi/L		95.6	(75%-125%)	KSD1	09/08/09	11:00
				+/-1.50							
QC1201914121		LCS									
Radium-226	24.2			27.9	pCi/L	18.8	115	(0%-20%)		09/08/09	11:35
				+/-1.76							
QC1201914119		MB									

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QC Summary

Workorder: 235782

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Ra-226											
Batch		898657									
Radium-226			U	0.127	pCi/L					09/08/09	11:00
				+/-0.195							
Batch		901480									
QC1201920869		235782018	DUP								
Radium-226				0.848	pCi/g	27.8		(0% - 100%)	KSD1	09/16/09	20:45
				+/-0.234							
QC1201920871		LCS									
Radium-226	11.5			10.5	pCi/g		91.4	(75%-125%)		09/16/09	20:45
				+/-0.720							
QC1201920868		MB									
Radium-226			U	0.0915	pCi/g					09/16/09	19:45
				+/-0.112							
QC1201920870		235782018	MS								
Radium-226	11.5			0.848	pCi/g		97.1	(75%-125%)		09/16/09	20:45
				+/-0.234							

Notes:

The Qualifiers in this report are defined as follows:

- ** Analyte is a surrogate compound
- < Result is less than value reported
- > Result is greater than value reported
- A The TIC is a suspected aldol-condensation product
- B For General Chemistry and Organic analysis the target analyte was detected in the associated blank.
- BD Results are either below the MDC or tracer recovery is low
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of the sample
- F Estimated Value
- H Analytical holding time was exceeded
- J Value is estimated
- M M if above MDC and less than LLD
- M Matrix Related Failure
- N/A RPD or %Recovery limits do not apply.
- ND Analyte concentration is not detected above the detection limit
- NJ Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- R Sample results are rejected
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.
- UI Gamma Spectroscopy--Uncertain identification
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y QC Samples were not spiked with this compound

GEL LABORATORIES LLC

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

QC Summary

Workorder: 235782

Page 5 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.										
h	Preparation or preservation holding time was 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.

* Indicates that a Quality Control parameter was not within specifications.

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

THORIUM

Radiochemistry Batch Checklist, Rev 9

Batch# 898783 Product: Tn Date: 9/14/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.	✓		N/A
Samples have been blank corrected (if required)			N/A
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.		✓	NON# 734189
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, 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.		✓	NON# 734189
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
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 line outs initialed and dated.	✓		
No transcription errors are apparent.	✓		
Aux data is correct.	✓		N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.			NON# 734189
Batch non-conformances second reviewed and disposition verified to be completed.	✓		NON# 734189
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: [Signature] 9/16/09

Secondary Review Performed By: [Signature] 9/16/09

9/17 - 9/18
KERR

f ✓

Thorium (Ac-227 Tracer) Que Sheet

31-AUG-09

Batch #: 898783 Analyst: JXD2 First Client Due Date: 18-SEP-09 Internal Due Date: 07-SEP-09
 Tracer Isotope: Ac-227 Tracer Code: 0327-B-102 Expiration Date: 07/23/09 Vol: 0.1 Ac-227 Separation Date/Time: 9/3/09 @ 0930 hrs
 LCS Isotope: Th-230 LCS Code: A 230-J Expiration Date: 04/13/10 Vol: 0.1
 Spike Isotope: Th-230 Spike Code: A 230-J Expiration Date: 04/13/10 Vol: 0.1
 Prep Date: 09/01/09 Initials: gao Pipet ID: 2991058 Balance ID: 5040272 Witness: N/A

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet Aliquot (g/l/f)	Th Det #
235782001-1	SA198-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	1	1	0.253	199
235782002-1	SA198-27B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	2	2	0.255	200
235782003-1	SA175-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	3	3	0.253	201
235782004-1	SA175-28B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	4	4	0.254	202
235782005-1	SA139-05B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	5	5	0.255	203
235782006-1	SA139-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	6	6	0.252	204
235782007-1	SA139-25B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	7	7	0.250	205
235782008-1	SA139009-25B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	8	8	0.250	206
235782009-1	SA139-35B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	9	9	0.252	207
235782010-1	RSAT5-05B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	10	10	0.254	208
235782011-1	RSAT5-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	11	11	0.253	18
235782012-1	RSAT5-25B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	12	12	0.252	196
235782013-1	RSAT5-40B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	13	13	0.251	197
235782014-1	RSAT5-51B	SAMPLE		.05 pCi/g	SOIL	KERR003	20-AUG-09	14	14	0.250	199
235782016-1	RSA06-10B	SAMPLE		.05 pCi/g	SOIL	KERR003	21-AUG-09	15	15	0.251	200
235782017-1	RSA06-20B	SAMPLE		.05 pCi/g	SOIL	KERR003	21-AUG-09	16	16	0.252	201
235782018-1	RSA06-34B	SAMPLE		.05 pCi/g	SOIL	KERR003	21-AUG-09	17	17	0.251	202
1201914488-1	MB for batch 898783	MB		.05 pCi/g	SOIL	QC ACCOUNT		18	18	0.256	173205
1201914489-1	RSA06-34B(235782018DUP)	DUP		.05 pCi/g	SOIL	QC ACCOUNT	21-AUG-09	19	19	0.256	204
1201914490-1	RSA06-34B(235782018MS)	MS		.05 pCi/g	SOIL	QC ACCOUNT	21-AUG-09	20	20	0.254	181
1201914491-1	LCS for batch 898783	LCS		.05 pCi/g	SOIL	QC ACCOUNT		21	21	0.256	182

Choose SOP Used: GL-RAD-A-038 ✓
 GL-RAD-A-045
 GL-RAD-A-043
 GL-RAD-A-032
 GEL Laboratories LLC, Radiochemistry Division

Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: Paul A 9/14/09

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782001_TH
SAMPLE QTY: 0.253 G

DETECTOR NUMBER :78896
AVERAGE %EFFICIENCY :25.0157
% YIELD : 91.793

COUNT DATE:12-SEP-2009 14:51:10
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

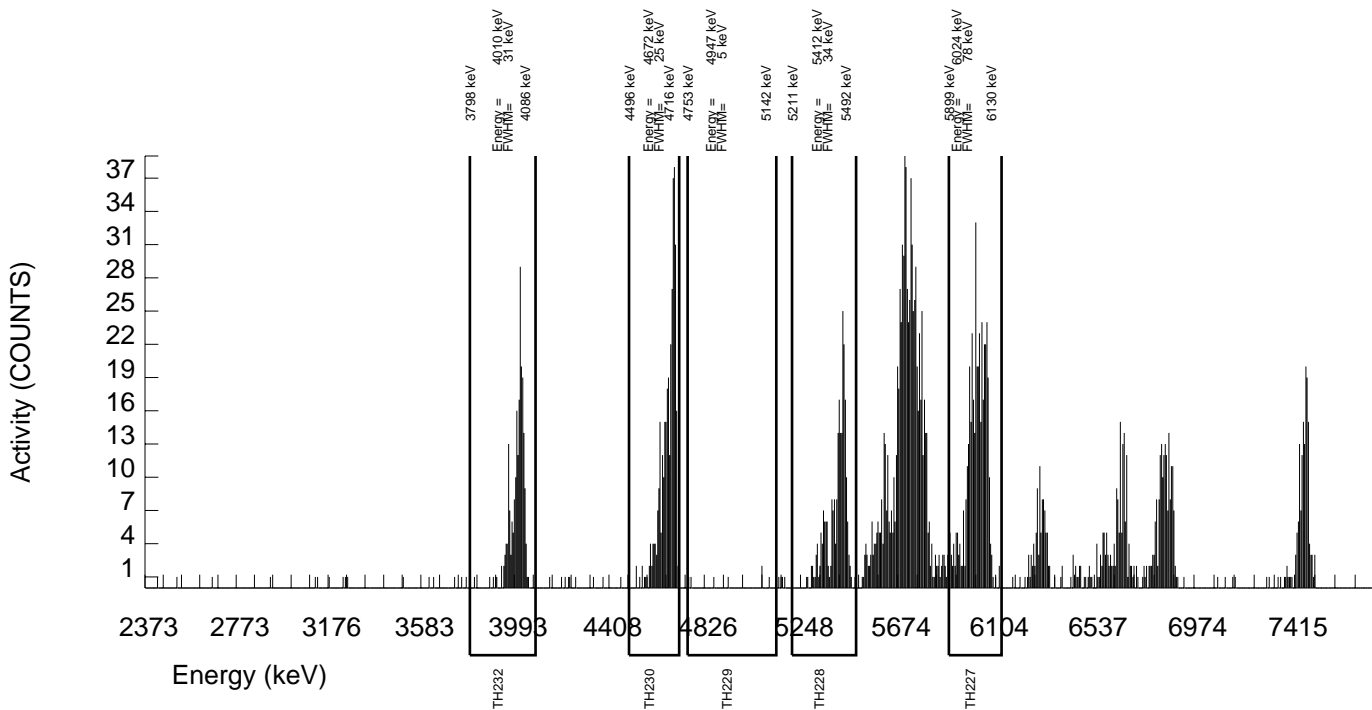
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.58906 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B199.CNF;52
BKG DATE : 6-SEP-2009
EFF FILE : W199.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	433.000	429.000	4.000	2.0000	68.10000	6.96E+00	7.84E-01	2.00E-01	7.55E-02	6.65E-01
TH-228	5363.000	238.000	237.000	1.000	1.0000	99.94000	1.86E+00	2.62E-01	5.99E-02	1.82E-02	2.37E-01
TH229	4900.000	7.000	6.000	1.000	1.0000	99.52000	4.67E-02	4.33E-02	5.96E-02	1.81E-02	4.32E-02
TH-230	4625.000	341.000	341.000	0.000	0.0000	100.0000	2.64E+00	3.22E-01	2.33E-02	0.00E+00	2.81E-01
TH-232	3972.000	214.000	212.000	2.000	1.4142	100.0000	1.64E+00	2.44E-01	7.43E-02	2.55E-02	2.23E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782002_TH
SAMPLE QTY: 0.255 G

DETECTOR NUMBER :78900
AVERAGE %EFFICIENCY :26.8457
% YIELD : 71.379

COUNT DATE:12-SEP-2009 14:51:13
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

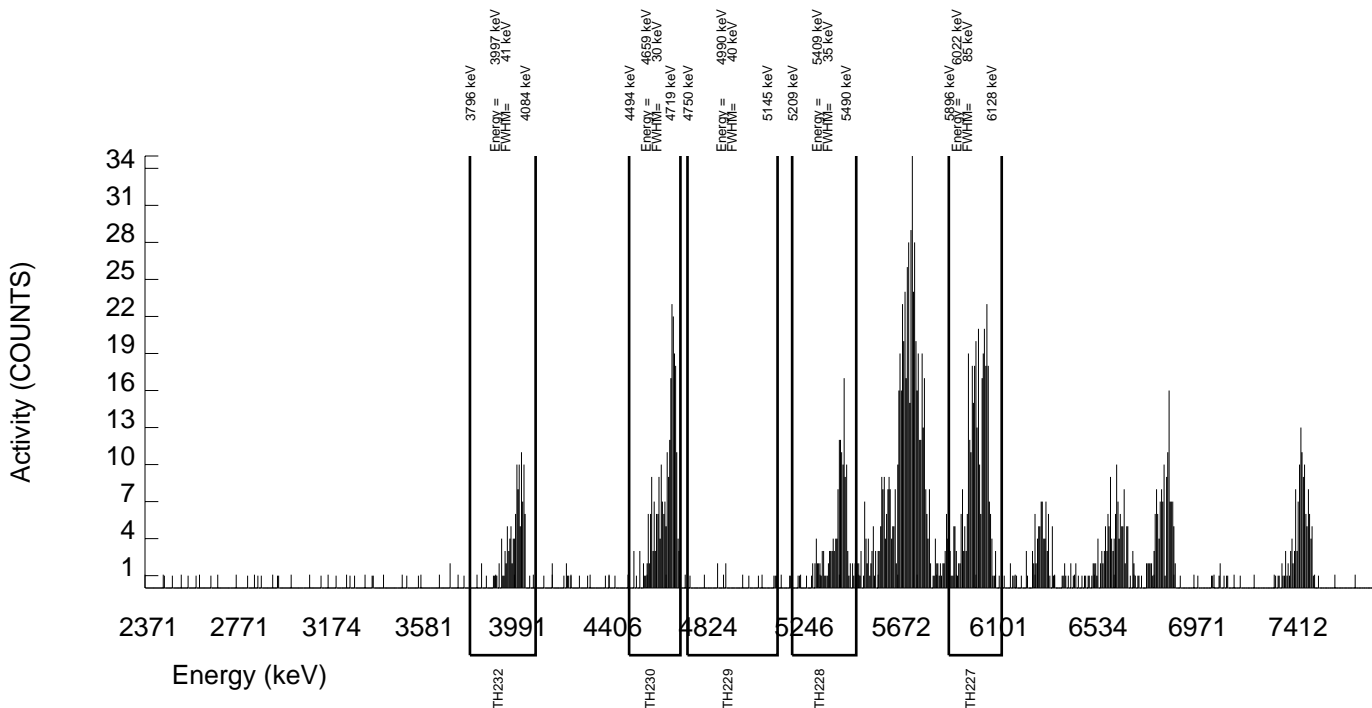
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 2.79091 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B200.CNF;52
BKG DATE : 6-SEP-2009
EFF FILE : W200.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	363.000	358.000	5.000	2.2361	68.10000	6.91E+00	8.34E-01	2.59E-01	1.00E-01	7.25E-01
TH-228	5363.000	155.000	142.000	13.000	3.6056	99.94000	1.32E+00	2.49E-01	1.84E-01	7.81E-02	2.37E-01
TH229	4900.000	10.000	3.000	7.000	2.6458	99.52000	2.78E-02	7.49E-02	1.42E-01	5.70E-02	7.49E-02
TH-230	4625.000	258.000	253.000	5.000	2.2361	100.0000	2.33E+00	3.24E-01	1.24E-01	4.80E-02	2.93E-01
TH-232	3972.000	121.000	116.000	5.000	2.2361	100.0000	1.07E+00	2.13E-01	1.24E-01	4.80E-02	2.03E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782003_TH
SAMPLE QTY: 0.253 G

DETECTOR NUMBER :78902
AVERAGE %EFFICIENCY :25.9222
% YIELD : 34.070

COUNT DATE:12-SEP-2009 14:51:15
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

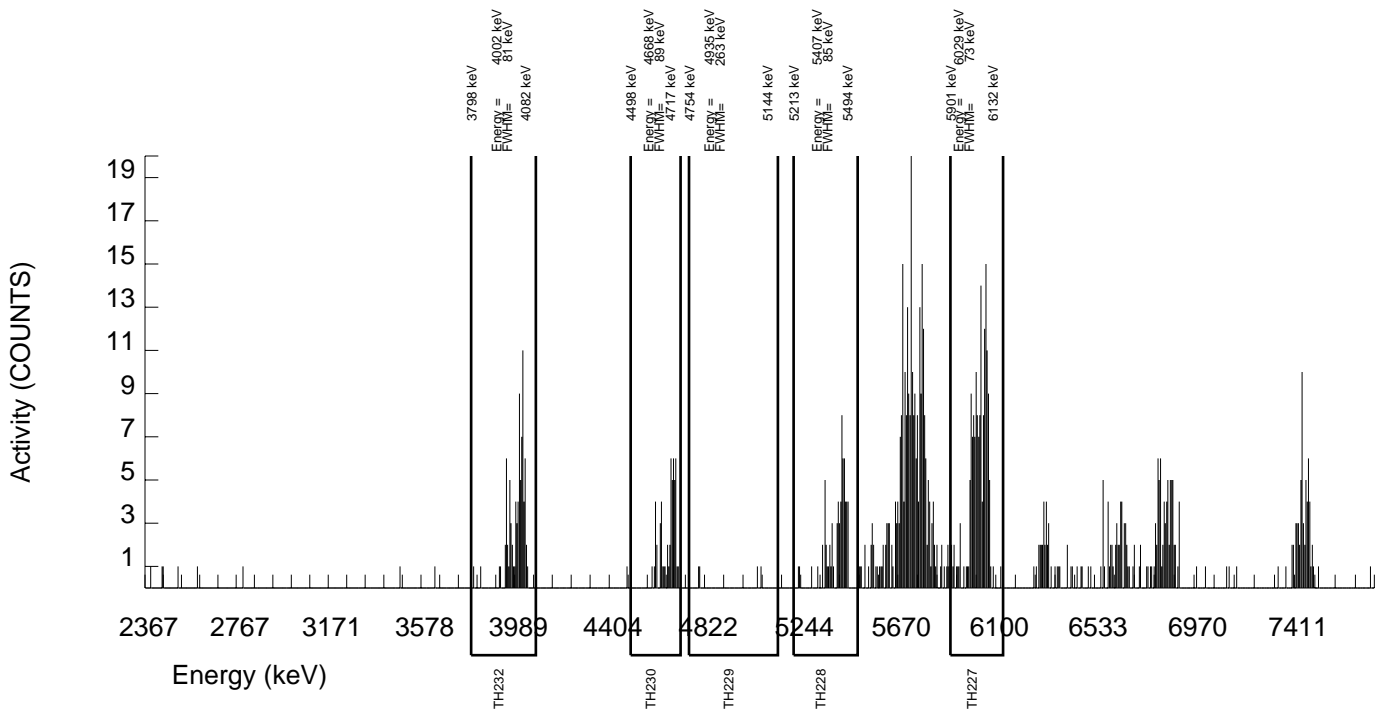
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 1.33214 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B201.CNF;52
BKG DATE : 6-SEP-2009
EFF FILE : W201.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	167.000	165.000	2.000	1.4142	68.10000	6.96E+00	1.15E+00	4.04E-01	1.39E-01	1.08E+00
TH-228	5363.000	68.000	66.000	2.000	1.4142	99.94000	1.34E+00	3.43E-01	1.95E-01	6.70E-02	3.34E-01
TH229	4900.000	4.000	3.000	1.000	1.0000	99.52000	6.08E-02	8.89E-02	1.55E-01	4.71E-02	8.88E-02
TH-230	4625.000	53.000	52.000	1.000	1.0000	100.0000	1.05E+00	2.97E-01	1.54E-01	4.69E-02	2.90E-01
TH-232	3972.000	83.000	83.000	0.000	0.0000	100.0000	1.67E+00	3.74E-01	6.05E-02	0.00E+00	3.60E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782004_TH
SAMPLE QTY: 0.254 G

DETECTOR NUMBER :78903
AVERAGE %EFFICIENCY :26.3611
% YIELD : 81.220

COUNT DATE:12-SEP-2009 14:51:18
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.426E+00

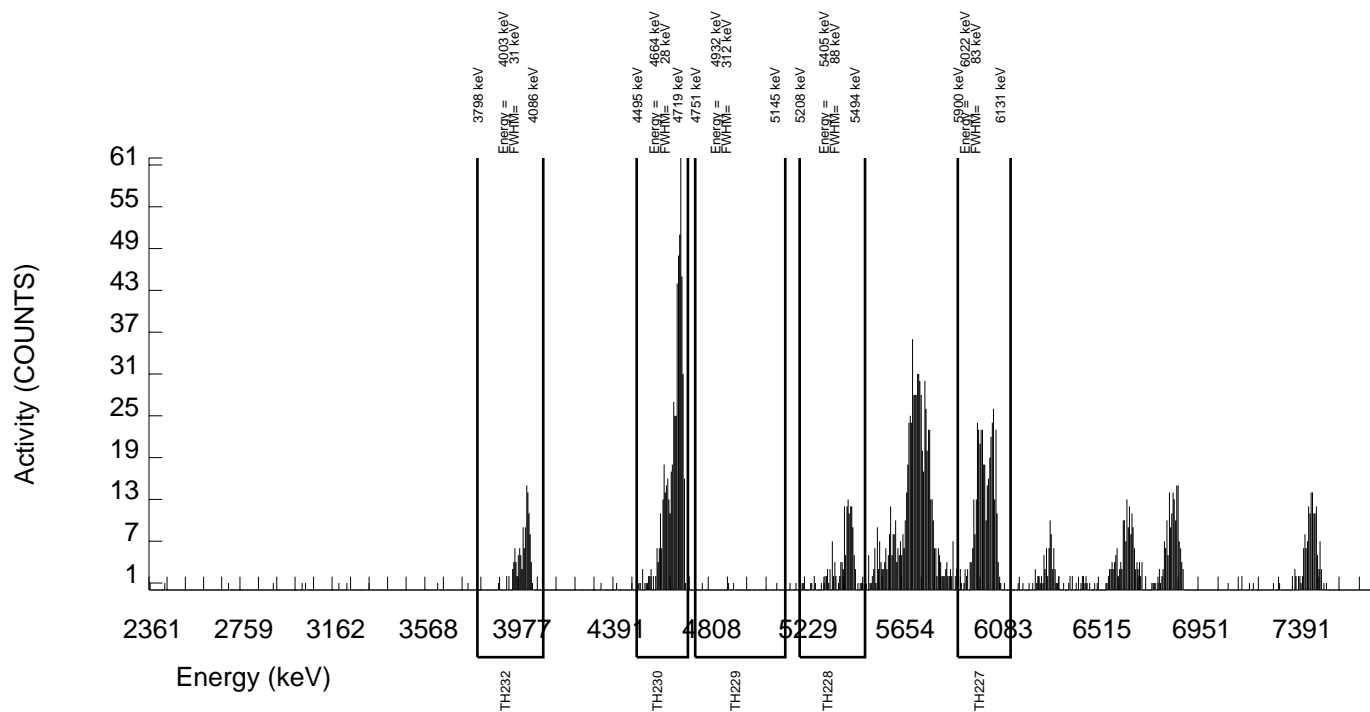
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.426E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.17567 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B202.CNF;52
BKG DATE : 6-SEP-2009
EFF FILE : W202.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	403.000	400.000	3.000	1.7321	68.10000	6.93E+00	8.00E-01	1.92E-01	6.99E-02	6.85E-01
TH-228	5363.000	147.000	143.000	4.000	2.0000	99.94000	1.20E+00	2.14E-01	1.03E-01	3.89E-02	2.02E-01
TH229	4900.000	4.000	3.000	1.000	1.0000	99.52000	2.50E-02	3.65E-02	6.37E-02	1.94E-02	3.65E-02
TH-230	4625.000	564.000	564.000	0.000	0.0000	100.0000	4.67E+00	4.76E-01	2.48E-02	0.00E+00	3.86E-01
TH-232	3972.000	120.000	117.000	3.000	1.7321	100.0000	9.69E-01	1.89E-01	9.16E-02	3.34E-02	1.80E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782005_TH
SAMPLE QTY: 0.255 G

DETECTOR NUMBER :78905
AVERAGE %EFFICIENCY :26.4008
% YIELD : 81.706

COUNT DATE:12-SEP-2009 14:51:20
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

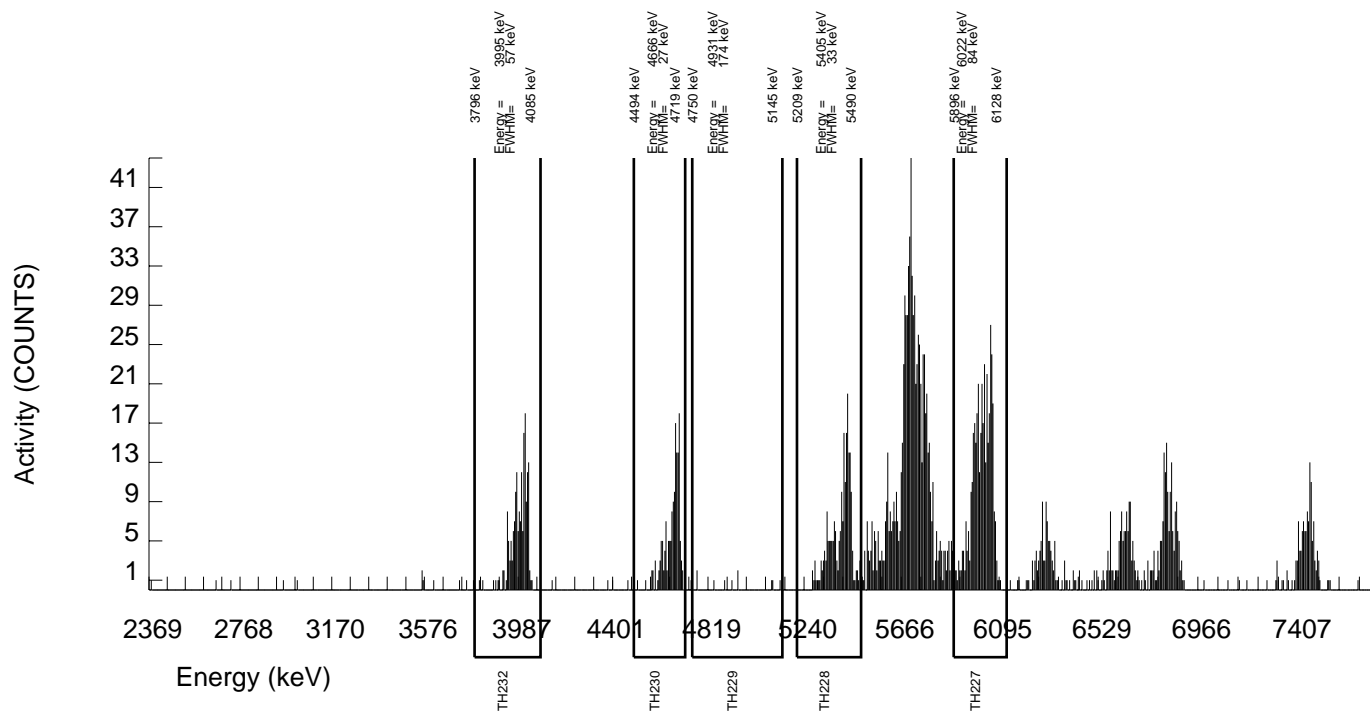
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.393E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.19468 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B203.CNF;52
BKG DATE : 6-SEP-2009
EFF FILE : W203.CNF;36
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	404.000	403.000	1.000	1.0000	68.10000	6.91E+00	7.91E-01	1.31E-01	3.99E-02	6.76E-01
TH-228	5363.000	219.000	215.000	4.000	2.0000	99.94000	1.78E+00	2.64E-01	1.02E-01	3.85E-02	2.42E-01
TH229	4900.000	11.000	4.000	7.000	2.6458	99.52000	3.29E-02	6.85E-02	1.26E-01	5.06E-02	6.84E-02
TH-230	4625.000	155.000	152.000	3.000	1.7321	100.0000	1.24E+00	2.15E-01	9.06E-02	3.30E-02	2.02E-01
TH-232	3972.000	182.000	180.000	2.000	1.4142	100.0000	1.47E+00	2.35E-01	7.85E-02	2.69E-02	2.18E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782006_TH
SAMPLE QTY: 0.252 G

DETECTOR NUMBER :78907
AVERAGE %EFFICIENCY :25.2346
% YIELD : 79.967

COUNT DATE:12-SEP-2009 14:51:22
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

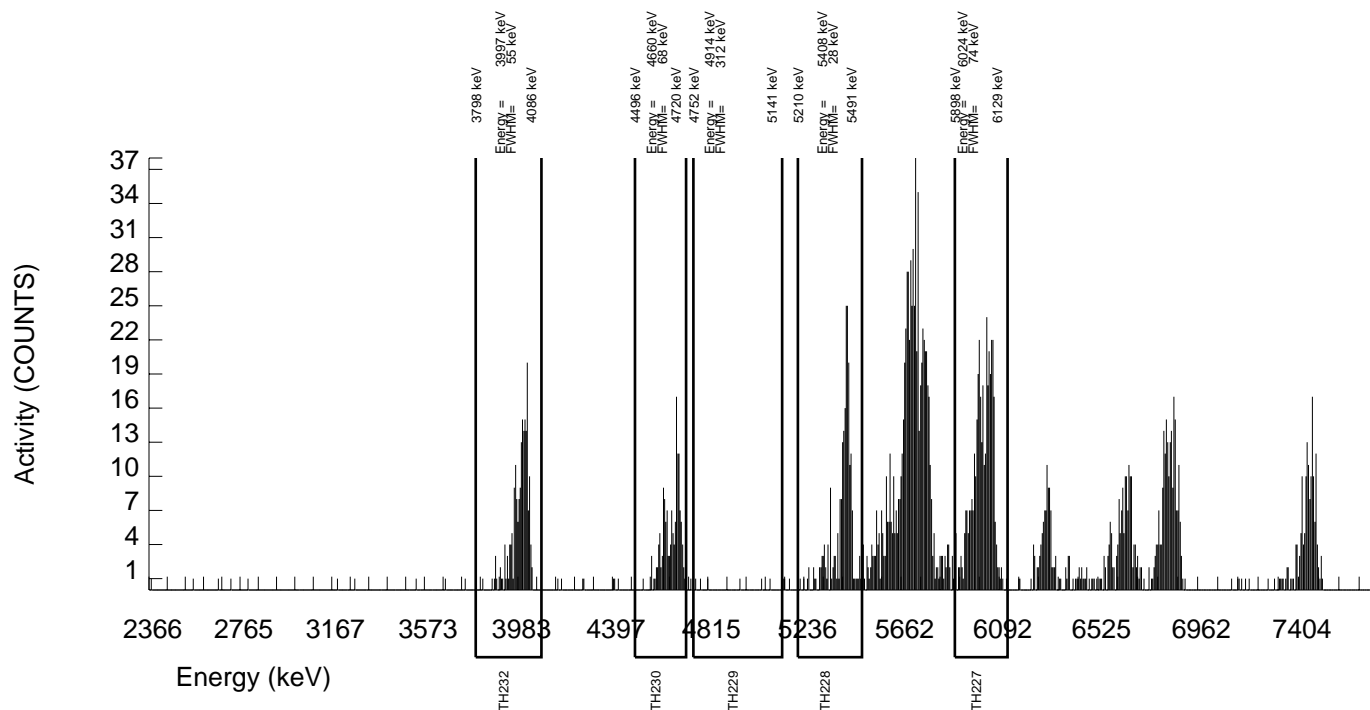
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.12668 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B204.CNF;52
BKG DATE : 6-SEP-2009
EFF FILE : W204.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	381.000	377.000	4.000	2.0000	68.10000	6.99E+00	8.26E-01	2.28E-01	8.63E-02	7.13E-01
TH-228	5363.000	223.000	215.000	8.000	2.8284	99.94000	1.92E+00	2.90E-01	1.45E-01	5.89E-02	2.67E-01
TH229	4900.000	6.000	-4.000	10.000	3.1623	99.52000	-3.56E-02	6.98E-02	1.58E-01	6.55E-02	6.98E-02
TH-230	4625.000	147.000	144.000	3.000	1.7321	100.0000	1.28E+00	2.26E-01	9.80E-02	3.57E-02	2.13E-01
TH-232	3972.000	199.000	197.000	2.000	1.4142	100.0000	1.75E+00	2.67E-01	8.49E-02	2.91E-02	2.46E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782007_TH
SAMPLE QTY: 0.250 G

DETECTOR NUMBER :78908
AVERAGE %EFFICIENCY :25.6002
% YIELD : 79.243

COUNT DATE:12-SEP-2009 14:51:26
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.561E+00

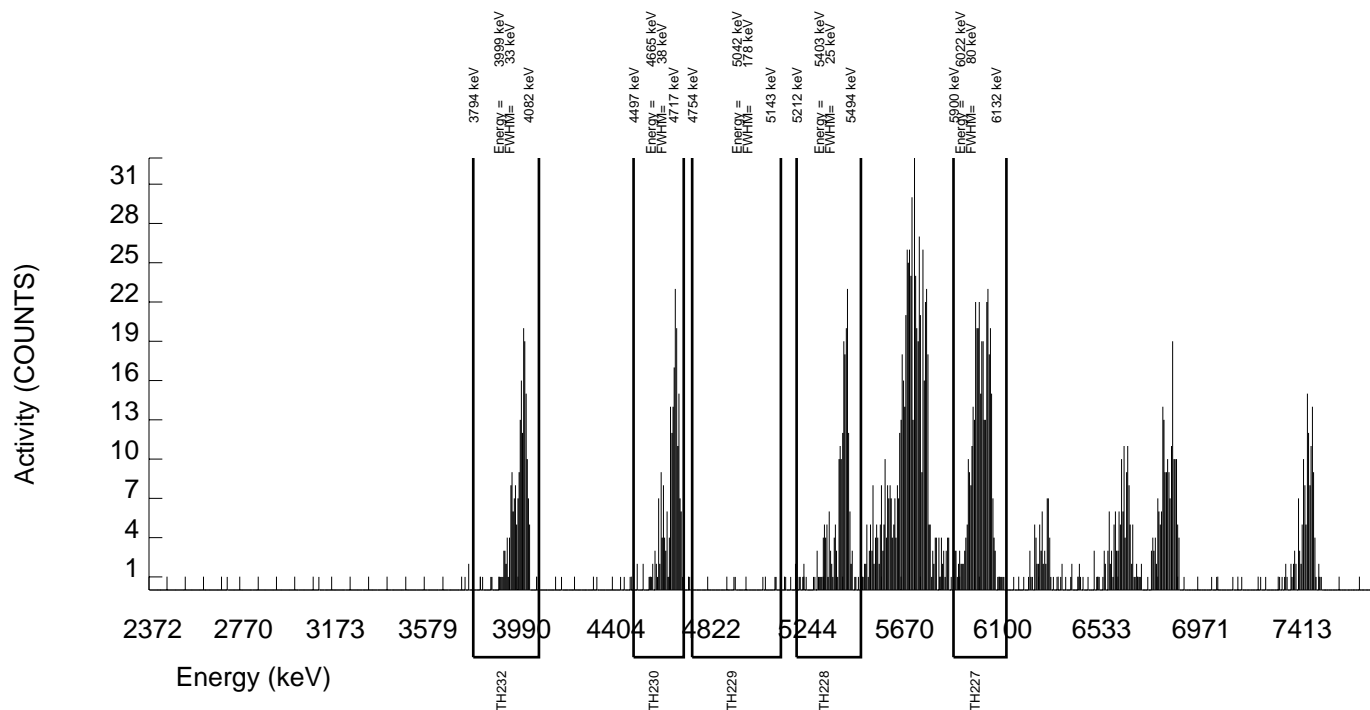
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.561E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.09838 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B205.CNF;52
BKG DATE : 6-SEP-2009
EFF FILE : W205.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	379.000	379.000	0.000	0.0000	68.10000	7.04E+00	8.25E-01	5.58E-02	0.00E+00	7.09E-01
TH-228	5363.000	210.000	210.000	0.000	0.0000	99.94000	1.88E+00	2.79E-01	2.69E-02	0.00E+00	2.55E-01
TH229	4900.000	5.000	-2.000	7.000	2.6458	99.52000	-1.78E-02	6.06E-02	1.37E-01	5.49E-02	6.06E-02
TH-230	4625.000	203.000	200.000	3.000	1.7321	100.0000	1.78E+00	2.71E-01	9.82E-02	3.58E-02	2.50E-01
TH-232	3972.000	202.000	200.000	2.000	1.4142	100.0000	1.78E+00	2.70E-01	8.51E-02	2.92E-02	2.49E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782008_TH
SAMPLE QTY: 0.250 G

DETECTOR NUMBER :78909
AVERAGE %EFFICIENCY :25.3986
% YIELD : 83.876

COUNT DATE:12-SEP-2009 14:51:28
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.561E+00

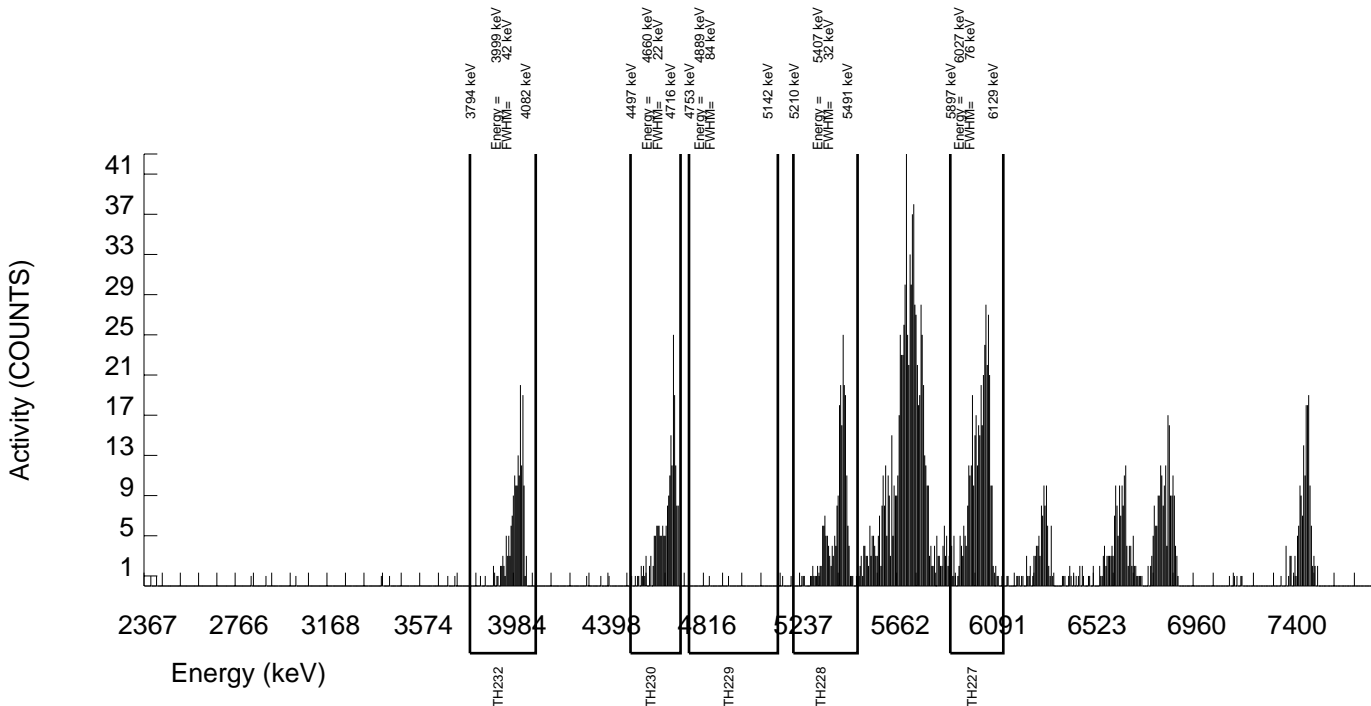
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.561E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.27954 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B206.CNF;52
BKG DATE : 6-SEP-2009
EFF FILE : W206.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	399.000	398.000	1.000	1.0000	68.10000	7.04E+00	8.12E-01	1.35E-01	4.12E-02	6.94E-01
TH-228	5363.000	232.000	230.000	2.000	1.4142	99.94000	1.97E+00	2.82E-01	8.18E-02	2.81E-02	2.56E-01
TH229	4900.000	2.000	1.000	1.000	1.0000	99.52000	8.50E-03	2.89E-02	6.50E-02	1.98E-02	2.89E-02
TH-230	4625.000	207.000	207.000	0.000	0.0000	100.0000	1.75E+00	2.60E-01	2.54E-02	0.00E+00	2.39E-01
TH-232	3972.000	175.000	175.000	0.000	0.0000	100.0000	1.48E+00	2.36E-01	2.54E-02	0.00E+00	2.19E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782009_TH
SAMPLE QTY: 0.252 G

DETECTOR NUMBER :78910
AVERAGE %EFFICIENCY :25.6717
% YIELD : 79.857

COUNT DATE:12-SEP-2009 14:51:31
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

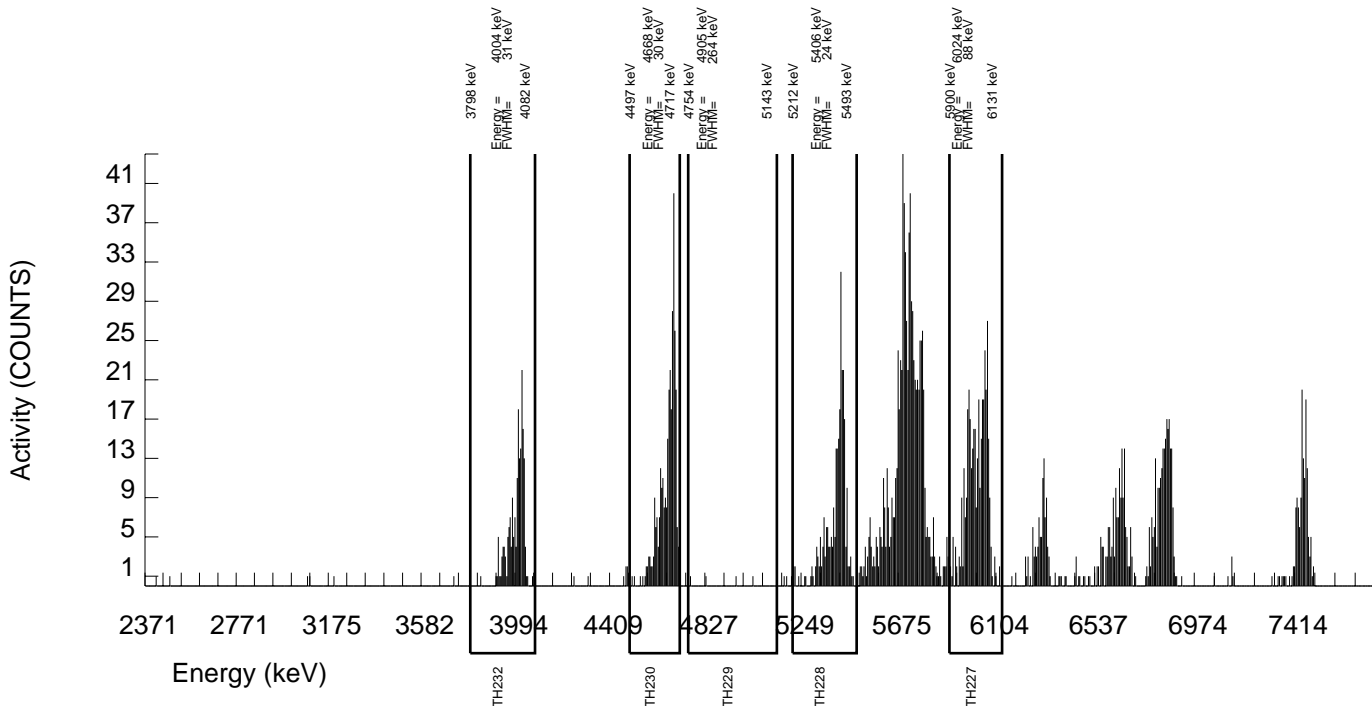
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.12238 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B207.CNF;52
BKG DATE : 6-SEP-2009
EFF FILE : W207.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	385.000	383.000	2.000	1.4142	68.10000	6.99E+00	8.18E-01	1.75E-01	6.00E-02	7.04E-01
TH-228	5363.000	263.000	258.000	5.000	2.2361	99.94000	2.27E+00	3.13E-01	1.18E-01	4.58E-02	2.83E-01
TH229	4900.000	4.000	-1.000	5.000	2.2361	99.52000	-8.76E-03	5.15E-02	1.17E-01	4.56E-02	5.15E-02
TH-230	4625.000	312.000	308.000	4.000	2.0000	100.0000	2.69E+00	3.43E-01	1.07E-01	4.06E-02	3.04E-01
TH-232	3972.000	186.000	183.000	3.000	1.7321	100.0000	1.60E+00	2.54E-01	9.64E-02	3.51E-02	2.35E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782010_TH
SAMPLE QTY: 0.254 G

DETECTOR NUMBER :78911
AVERAGE %EFFICIENCY :25.5872
% YIELD : 74.054

COUNT DATE:12-SEP-2009 14:51:34
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.426E+00

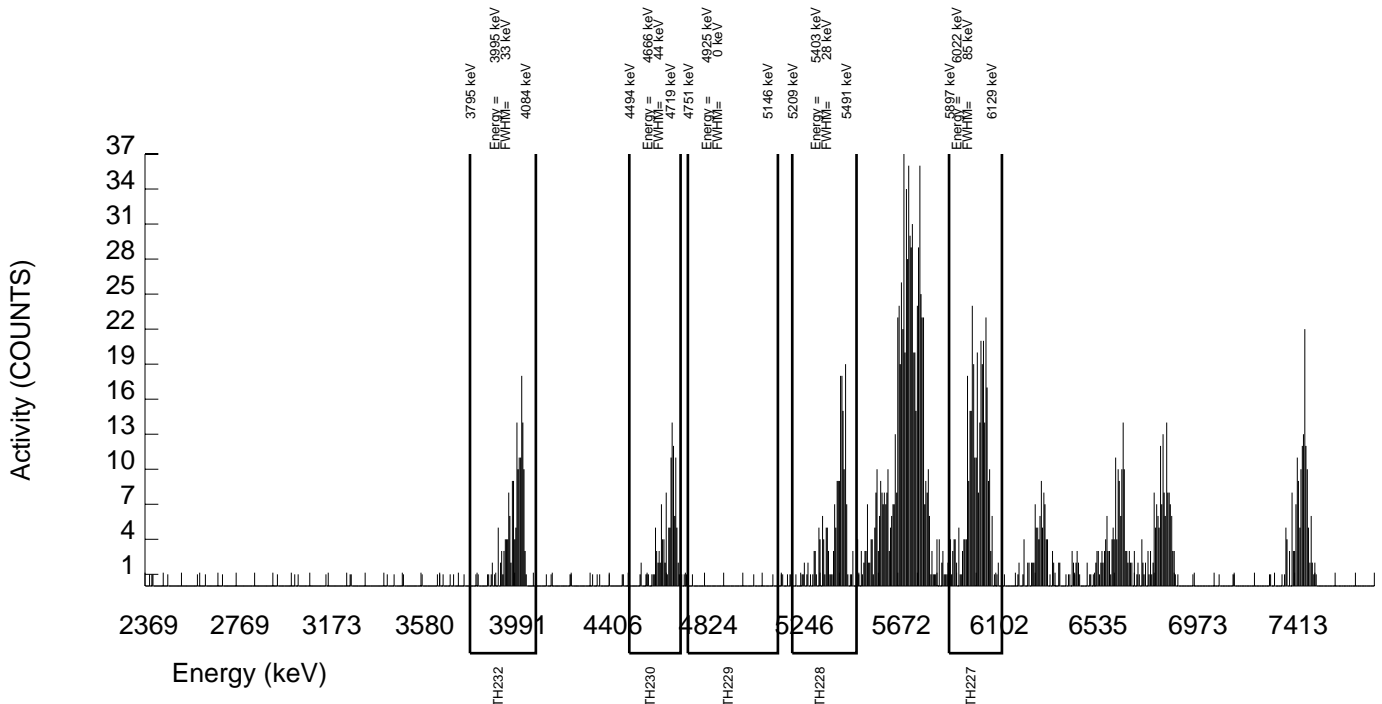
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.426E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 2.89549 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B208.CNF;52
BKG DATE : 6-SEP-2009
EFF FILE : W208.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	356.000	354.000	2.000	1.4142	68.10000	6.93E+00	8.36E-01	1.88E-01	6.44E-02	7.26E-01
TH-228	5363.000	189.000	184.000	5.000	2.2361	99.94000	1.74E+00	2.78E-01	1.27E-01	4.92E-02	2.58E-01
TH229	4900.000	4.000	-1.000	5.000	2.2361	99.52000	-9.40E-03	5.53E-02	1.26E-01	4.89E-02	5.53E-02
TH-230	4625.000	122.000	121.000	1.000	1.0000	100.0000	1.13E+00	2.14E-01	7.16E-02	2.18E-02	2.03E-01
TH-232	3972.000	169.000	162.000	7.000	2.6458	100.0000	1.52E+00	2.60E-01	1.43E-01	5.76E-02	2.43E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782011_TH
SAMPLE QTY: 0.253 G

DETECTOR NUMBER :68636
AVERAGE %EFFICIENCY :26.6707
% YIELD : 81.079

COUNT DATE:12-SEP-2009 14:51:01
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

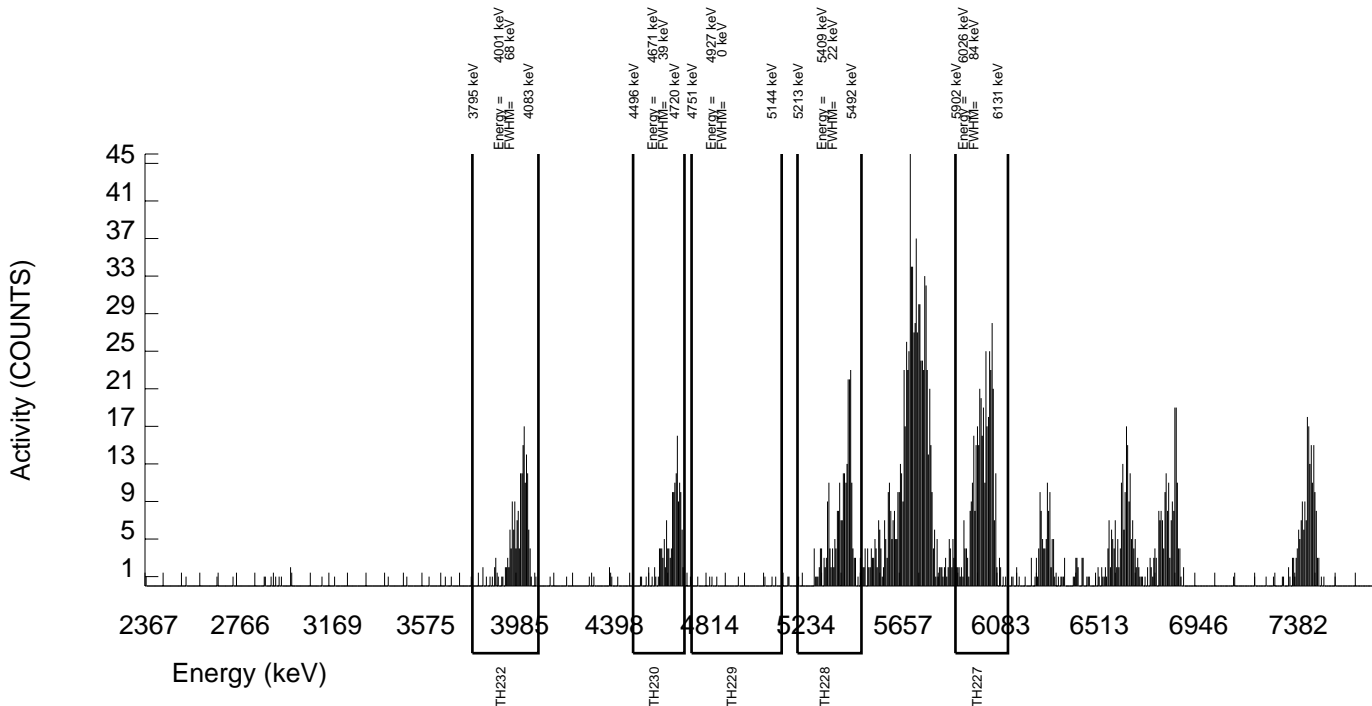
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.459E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.17018 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B195.CNF;112
BKG DATE : 6-SEP-2009
EFF FILE : W195.CNF;37
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	405.000	404.000	1.000	1.0000	68.10000	6.96E+00	8.08E-01	1.32E-01	4.01E-02	6.81E-01
TH-228	5363.000	248.000	244.000	4.000	2.0000	99.94000	2.03E+00	2.88E-01	1.02E-01	3.87E-02	2.59E-01
TH229	4900.000	9.000	4.000	5.000	2.2361	99.52000	3.31E-02	6.07E-02	1.11E-01	4.30E-02	6.07E-02
TH-230	4625.000	151.000	149.000	2.000	1.4142	100.0000	1.23E+00	2.14E-01	7.89E-02	2.71E-02	2.00E-01
TH-232	3972.000	185.000	183.000	2.000	1.4142	100.0000	1.51E+00	2.40E-01	7.89E-02	2.71E-02	2.21E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782012_TH
SAMPLE QTY: 0.252 G

DETECTOR NUMBER :68637
AVERAGE %EFFICIENCY :25.6349
% YIELD : 80.597

COUNT DATE:12-SEP-2009 14:51:03
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

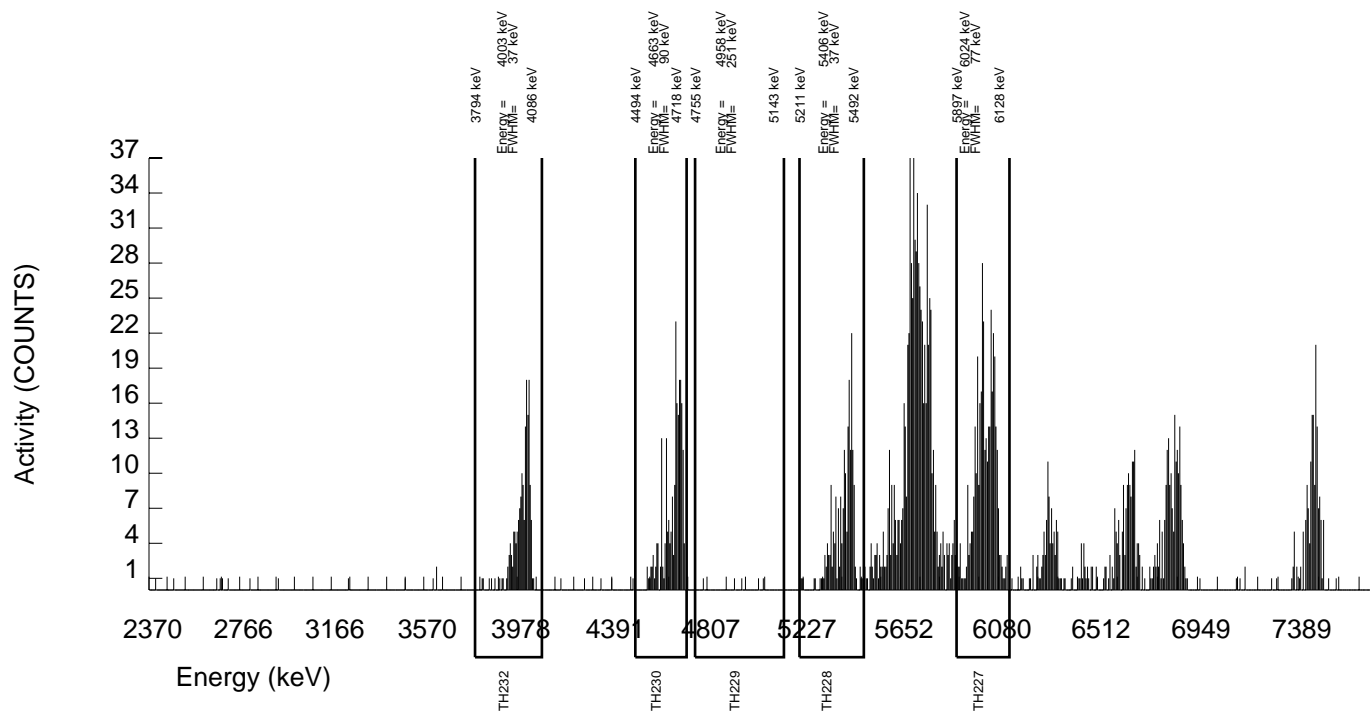
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.15131 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B196.CNF;107
BKG DATE : 6-SEP-2009
EFF FILE : W196.CNF;38
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	387.000	386.000	1.000	1.0000	68.10000	6.99E+00	8.14E-01	1.39E-01	4.21E-02	6.99E-01
TH-228	5363.000	203.000	196.000	7.000	2.6458	99.94000	1.71E+00	2.68E-01	1.34E-01	5.38E-02	2.48E-01
TH229	4900.000	5.000	3.000	2.000	1.4142	99.52000	2.61E-02	4.51E-02	8.33E-02	2.86E-02	4.51E-02
TH-230	4625.000	219.000	216.000	3.000	1.7321	100.0000	1.87E+00	2.76E-01	9.57E-02	3.49E-02	2.53E-01
TH-232	3972.000	170.000	168.000	2.000	1.4142	100.0000	1.45E+00	2.39E-01	8.29E-02	2.85E-02	2.22E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782013_TH
SAMPLE QTY: 0.251 G

DETECTOR NUMBER :78894
AVERAGE %EFFICIENCY :25.6555
% YIELD : 83.133

COUNT DATE:14-SEP-2009 20:10:18
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.527E+00

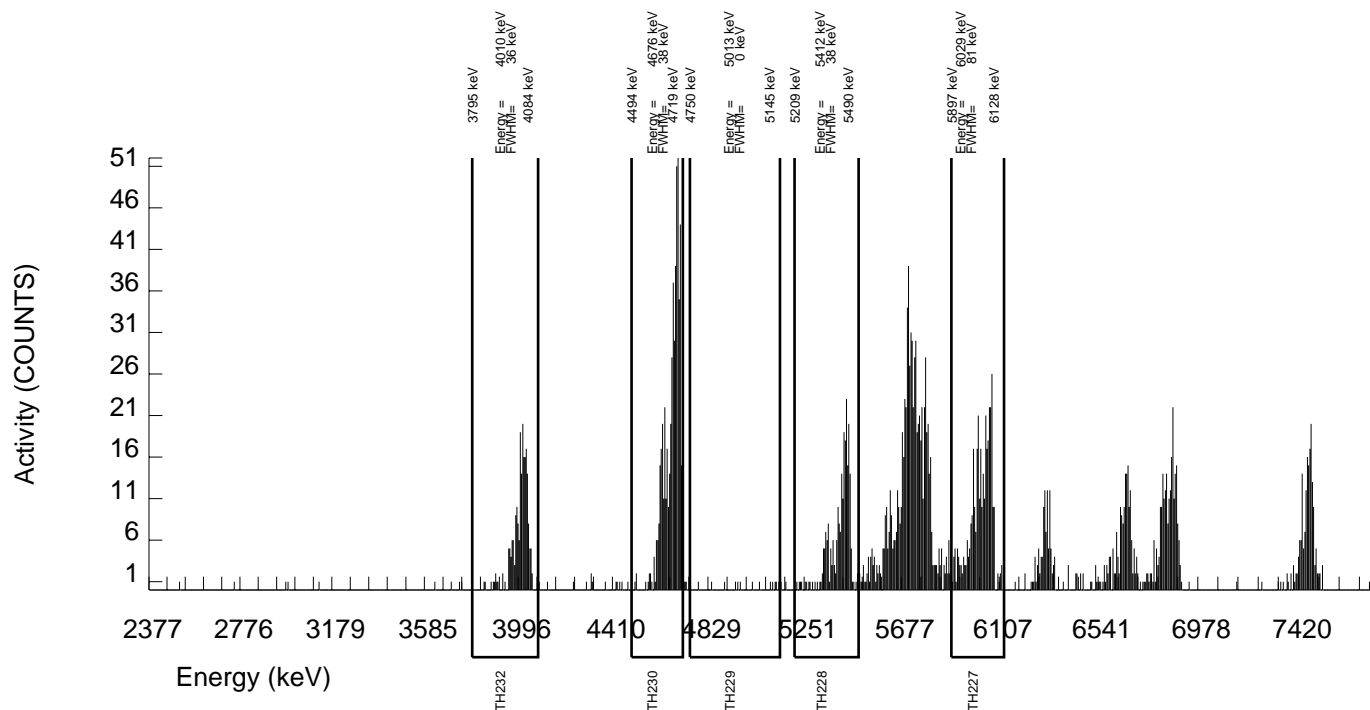
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.527E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.25048 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B197.CNF;54
BKG DATE : 13-SEP-2009
EFF FILE : W197.CNF;37
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	368.000	367.000	1.000	1.0000	68.10000	7.02E+00	8.33E-01	1.46E-01	4.45E-02	7.20E-01
TH-228	5363.000	241.000	238.000	3.000	1.7321	99.94000	2.03E+00	2.88E-01	9.42E-02	3.43E-02	2.61E-01
TH229	4900.000	13.000	13.000	0.000	0.0000	99.52000	1.10E-01	6.01E-02	2.54E-02	0.00E+00	5.97E-02
TH-230	4625.000	523.000	522.000	1.000	1.0000	100.0000	4.39E+00	4.60E-01	6.44E-02	1.96E-02	3.78E-01
TH-232	3972.000	210.000	209.000	1.000	1.0000	100.0000	1.76E+00	2.62E-01	6.44E-02	1.96E-02	2.40E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782014_TH
SAMPLE QTY: 0.250 G

DETECTOR NUMBER :78896
AVERAGE %EFFICIENCY :25.0157
% YIELD : 78.755

COUNT DATE:14-SEP-2009 20:10:23
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.561E+00

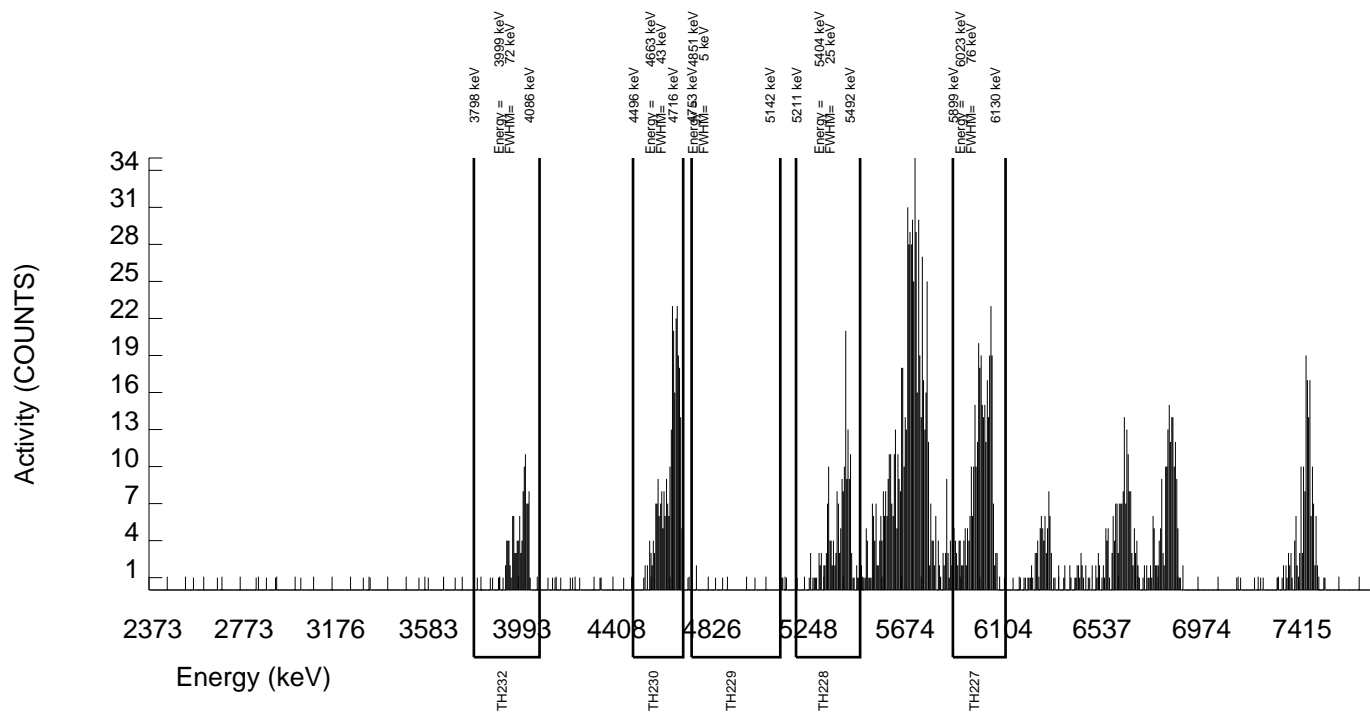
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.561E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.07928 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B199.CNF;54
BKG DATE : 13-SEP-2009
EFF FILE : W199.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	341.000	339.000	2.000	1.4142	68.10000	7.04E+00	8.64E-01	1.99E-01	6.84E-02	7.54E-01
TH-228	5363.000	183.000	182.000	1.000	1.0000	99.94000	1.69E+00	2.66E-01	7.09E-02	2.15E-02	2.46E-01
TH229	4900.000	6.000	2.000	4.000	2.0000	99.52000	1.84E-02	5.70E-02	1.13E-01	4.28E-02	5.70E-02
TH-230	4625.000	291.000	289.000	2.000	1.4142	100.0000	2.64E+00	3.45E-01	8.76E-02	3.01E-02	3.07E-01
TH-232	3972.000	114.000	113.000	1.000	1.0000	100.0000	1.03E+00	2.02E-01	7.00E-02	2.13E-02	1.92E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782016_TH
SAMPLE QTY: 0.251 G

DETECTOR NUMBER :78900
AVERAGE %EFFICIENCY :26.8457
% YIELD : 87.674

COUNT DATE:14-SEP-2009 20:10:26
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.527E+00

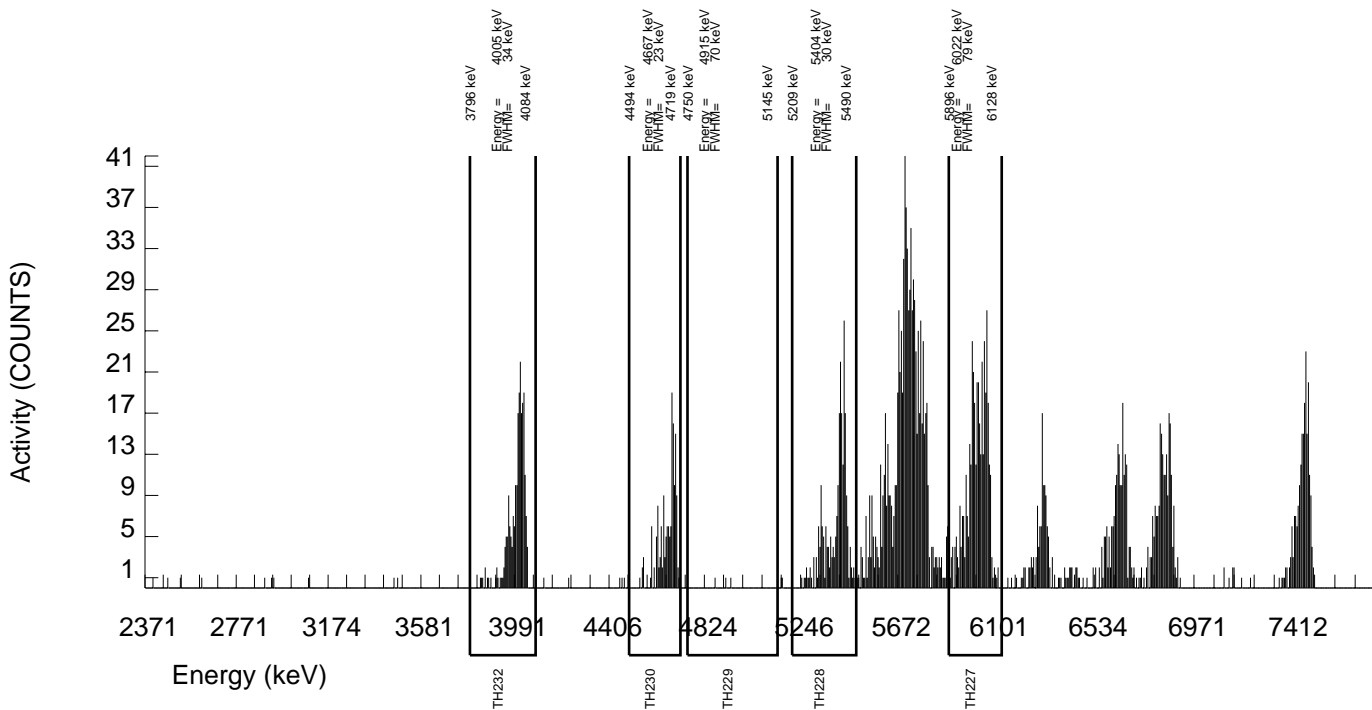
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.527E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.42803 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B200.CNF;54
BKG DATE : 13-SEP-2009
EFF FILE : W200.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	410.000	405.000	5.000	2.2361	68.10000	7.02E+00	8.09E-01	2.32E-01	9.01E-02	6.92E-01
TH-228	5363.000	241.000	227.000	14.000	3.7417	99.94000	1.75E+00	2.63E-01	1.58E-01	6.72E-02	2.42E-01
TH229	4900.000	3.000	-6.000	9.000	3.0000	99.52000	-4.60E-02	5.20E-02	1.30E-01	5.35E-02	5.20E-02
TH-230	4625.000	153.000	148.000	5.000	2.2361	100.0000	1.13E+00	2.00E-01	1.02E-01	3.97E-02	1.88E-01
TH-232	3972.000	222.000	219.000	3.000	1.7321	100.0000	1.67E+00	2.45E-01	8.43E-02	3.07E-02	2.24E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782017_TH
SAMPLE QTY: 0.252 G

DETECTOR NUMBER :78902
AVERAGE %EFFICIENCY :25.9222
% YIELD : 83.624

COUNT DATE:14-SEP-2009 20:10:28
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

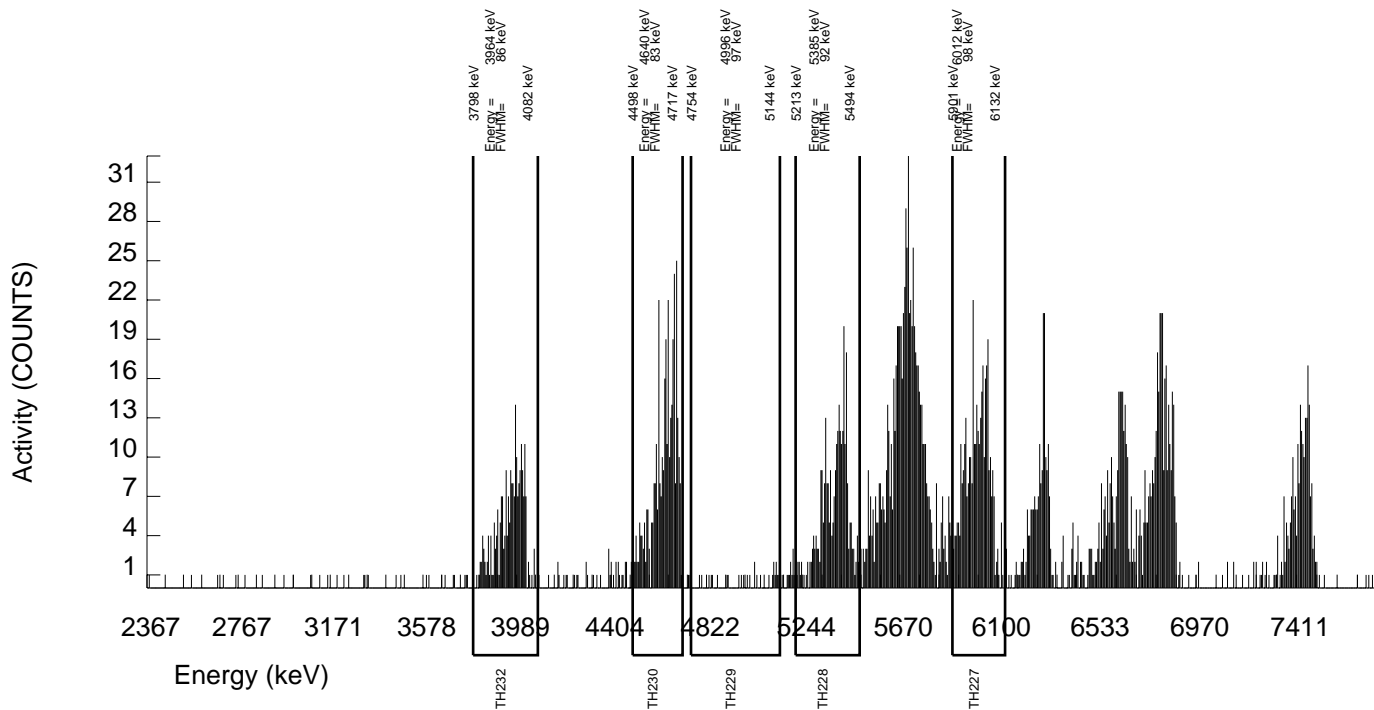
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.493E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.26966 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B201.CNF;54
BKG DATE : 13-SEP-2009
EFF FILE : W201.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	374.000	373.000	1.000	1.0000	68.10000	6.99E+00	8.24E-01	1.43E-01	4.36E-02	7.11E-01
TH-228	5363.000	299.000	297.000	2.000	1.4142	99.94000	2.48E+00	3.20E-01	8.00E-02	2.75E-02	2.84E-01
TH229	4900.000	27.000	26.000	1.000	1.0000	99.52000	2.15E-01	8.69E-02	6.34E-02	1.93E-02	8.59E-02
TH-230	4625.000	367.000	366.000	1.000	1.0000	100.0000	3.02E+00	3.59E-01	6.31E-02	1.92E-02	3.10E-01
TH-232	3972.000	232.000	231.000	1.000	1.0000	100.0000	1.90E+00	2.72E-01	6.31E-02	1.92E-02	2.47E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S0235782018_TH
SAMPLE QTY: 0.251 G

DETECTOR NUMBER :78903
AVERAGE %EFFICIENCY :26.3611
% YIELD : 83.113

COUNT DATE:14-SEP-2009 20:10:30
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.527E+00

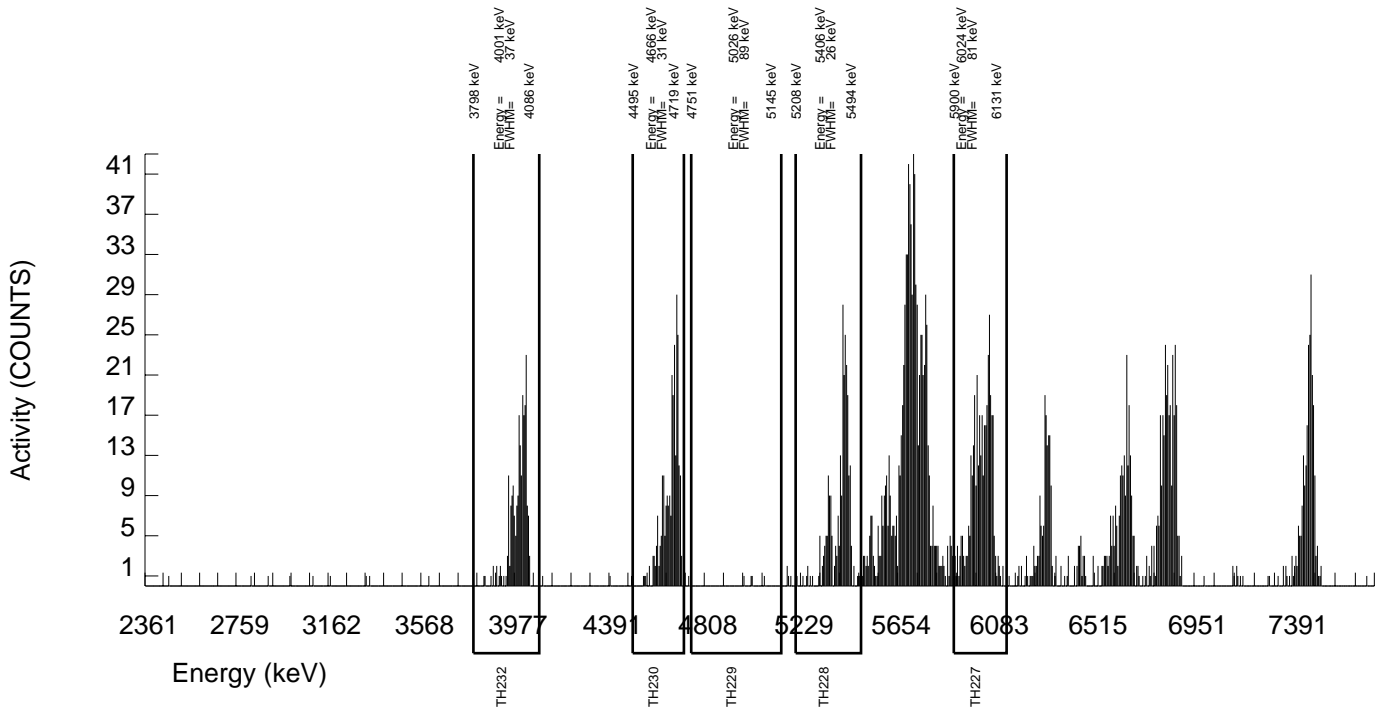
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.527E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.24970 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B202.CNF;54
BKG DATE : 13-SEP-2009
EFF FILE : W202.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	377.000	377.000	0.000	0.0000	68.10000	7.02E+00	8.23E-01	5.58E-02	0.00E+00	7.08E-01
TH-228	5363.000	255.000	253.000	2.000	1.4142	99.94000	2.10E+00	2.89E-01	7.94E-02	2.73E-02	2.61E-01
TH229	4900.000	4.000	3.000	1.000	1.0000	99.52000	2.47E-02	3.61E-02	6.30E-02	1.91E-02	3.61E-02
TH-230	4625.000	261.000	260.000	1.000	1.0000	100.0000	2.13E+00	2.89E-01	6.27E-02	1.91E-02	2.60E-01
TH-232	3972.000	222.000	221.000	1.000	1.0000	100.0000	1.81E+00	2.63E-01	6.27E-02	1.91E-02	2.40E-01



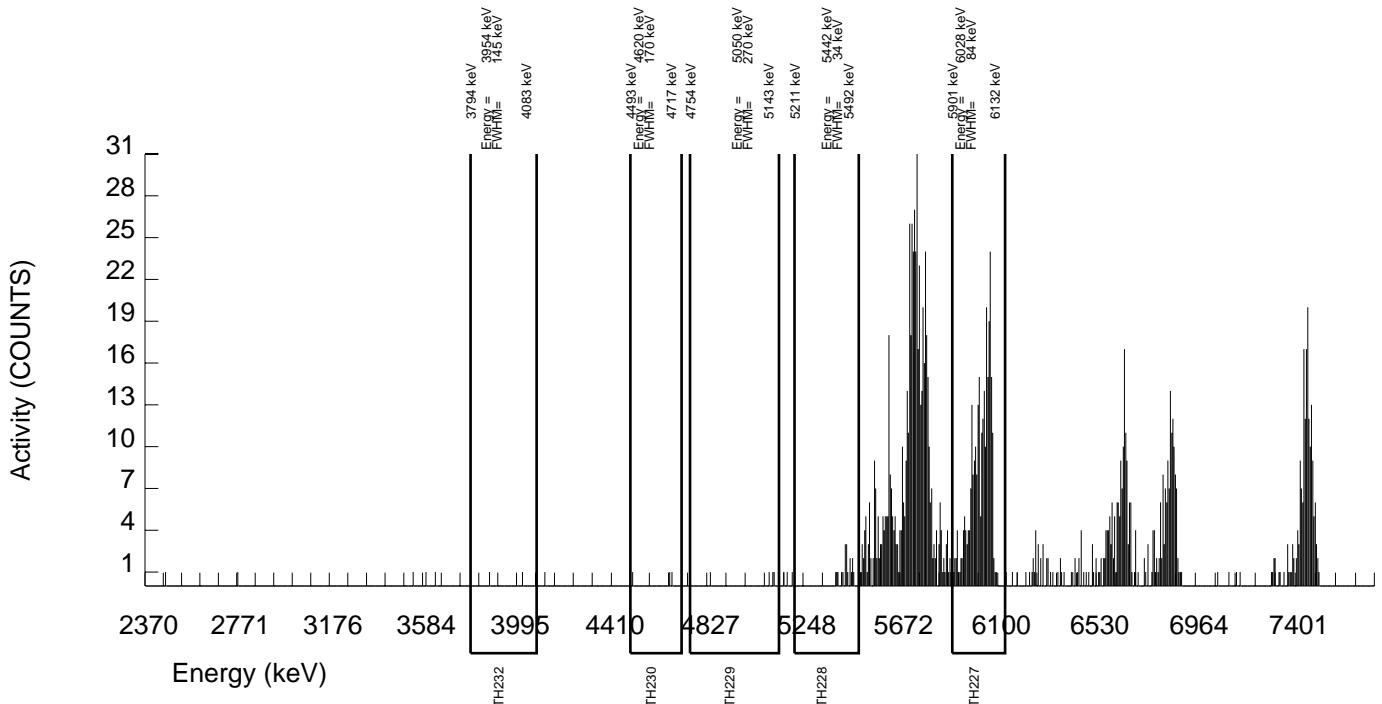
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783 SAMPLE DATE : 3-SEP-2009 09:30:00. AC-227 SEPARATION : 3-SEP-2009 09:30:00.		SAMPLE ID : S1201914488_TH SAMPLE QTY: 0.256 G	
DETECTOR NUMBER :74431 AVERAGE %EFFICIENCY :26.0173 % YIELD : 65.842		COUNT DATE:15-SEP-2009 18:00:46 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	LCS/LCSD ID : A2796-J ISOTOPE : TH-230 PCI/G : 8.360E+00	TRACER ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.90997 dpm RESULTS : 2.57441 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B173.CNF;126 BKG DATE : 13-SEP-2009 EFF FILE : W173.CNF;38 CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	287.000	285.000	2.000	1.4142	68.10000	6.88E+00	9.02E-01	2.31E-01	7.94E-02	8.04E-01
TH-228	5363.000	18.000	4.000	14.000	3.7417	99.94000	4.16E-02	1.15E-01	2.12E-01	9.06E-02	1.15E-01
TH229	4900.000	4.000	-5.000	9.000	3.0000	99.52000	-5.16E-02	7.29E-02	1.75E-01	7.20E-02	7.29E-02
TH-230	4625.000	3.000	1.000	2.000	1.4142	100.0000	1.03E-02	4.50E-02	9.84E-02	3.38E-02	4.50E-02
TH-232	3972.000	2.000	1.000	1.000	1.0000	100.0000	1.03E-02	3.49E-02	7.86E-02	2.39E-02	3.49E-02

NOTE: Ac-227 results decay corrected to separation date/time.



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S1201914489_TH
SAMPLE QTY: 0.256 G

DETECTOR NUMBER :78907
AVERAGE %EFFICIENCY :25.2346
% YIELD : 89.817

COUNT DATE:14-SEP-2009 20:10:35
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

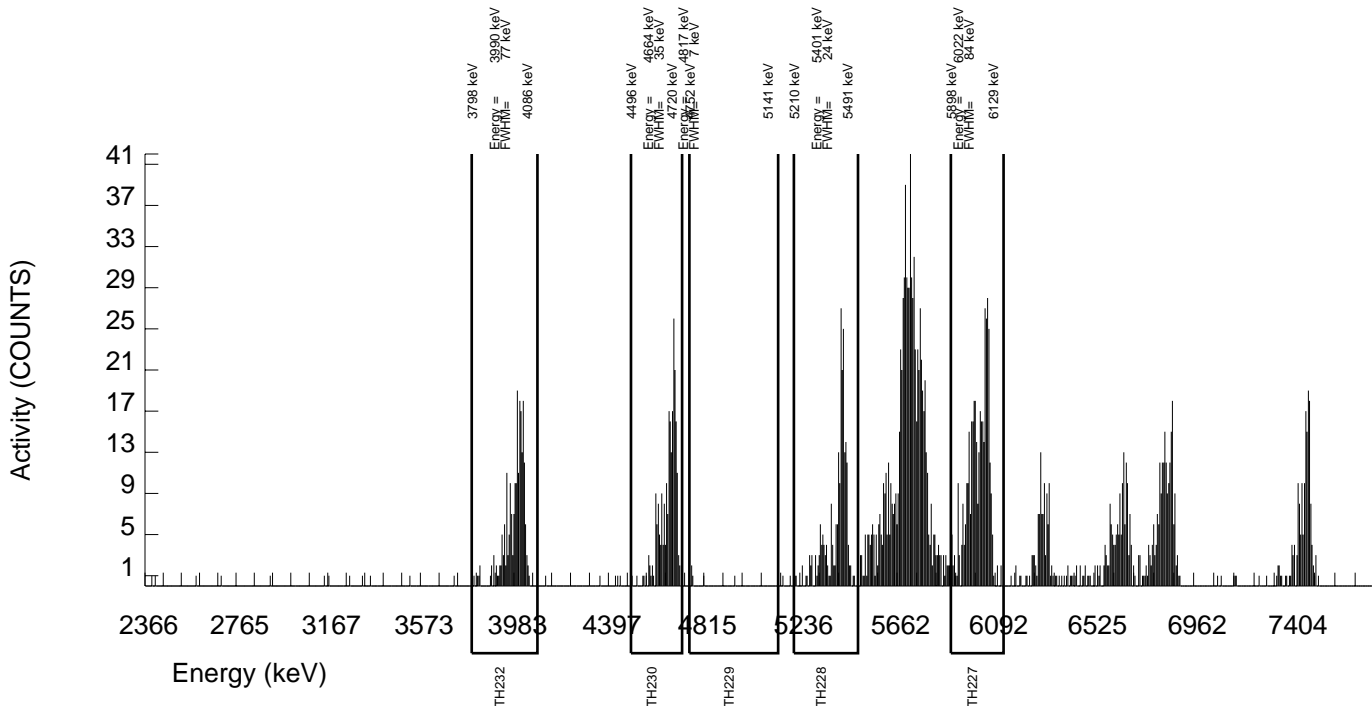
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.51182 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B204.CNF;54
BKG DATE : 13-SEP-2009
EFF FILE : W204.CNF;35
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	396.000	390.000	6.000	2.4495	68.10000	6.88E+00	8.05E-01	2.54E-01	1.01E-01	6.93E-01
TH-228	5363.000	226.000	221.000	5.000	2.2361	99.94000	1.74E+00	2.56E-01	1.05E-01	4.09E-02	2.34E-01
TH229	4900.000	5.000	-8.000	13.000	3.6056	99.52000	-6.24E-02	6.49E-02	1.54E-01	6.54E-02	6.49E-02
TH-230	4625.000	230.000	225.000	5.000	2.2361	100.0000	1.75E+00	2.55E-01	1.04E-01	4.04E-02	2.33E-01
TH-232	3972.000	222.000	214.000	8.000	2.8284	100.0000	1.66E+00	2.51E-01	1.25E-01	5.11E-02	2.31E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S1201914490_TH
SAMPLE QTY: 0.254 G

DETECTOR NUMBER :74439
AVERAGE %EFFICIENCY :25.6768
% YIELD : 85.937

COUNT DATE: 4-SEP-2009 14:07:25
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.426E+00

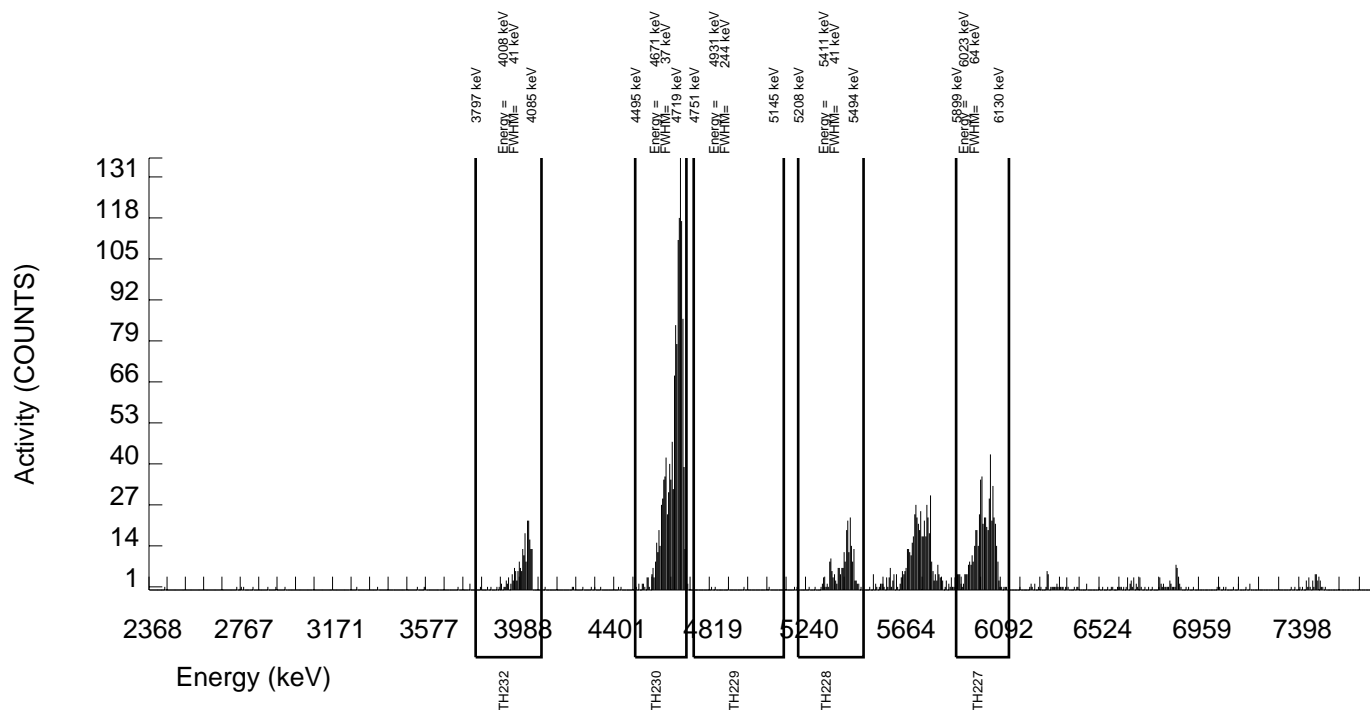
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.426E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.36013 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B181.CNF;122
BKG DATE : 30-AUG-2009
EFF FILE : W181.CNF;38
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	556.000	555.000	1.000	1.0000	68.10000	6.93E+00	7.10E-01	9.56E-02	2.91E-02	5.78E-01
TH-228	5363.000	231.000	223.000	8.000	2.8284	99.94000	1.80E+00	2.66E-01	1.30E-01	5.30E-02	2.44E-01
TH229	4900.000	5.000	2.000	3.000	1.7321	99.52000	1.62E-02	4.48E-02	8.93E-02	3.25E-02	4.48E-02
TH-230	4625.000	1333.000	1331.000	2.000	1.4142	100.0000	1.07E+01	8.58E-01	7.70E-02	2.64E-02	5.76E-01
TH-232	3972.000	209.000	209.000	0.000	0.0000	100.0000	1.68E+00	2.49E-01	2.41E-02	0.00E+00	2.28E-01



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898783
SAMPLE DATE : 3-SEP-2009 09:30:00.

SAMPLE ID : S1201914491_TH
SAMPLE QTY: 0.256 G

DETECTOR NUMBER :74440
AVERAGE %EFFICIENCY :25.3473
% YIELD : 85.329

COUNT DATE: 4-SEP-2009 14:07:27
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

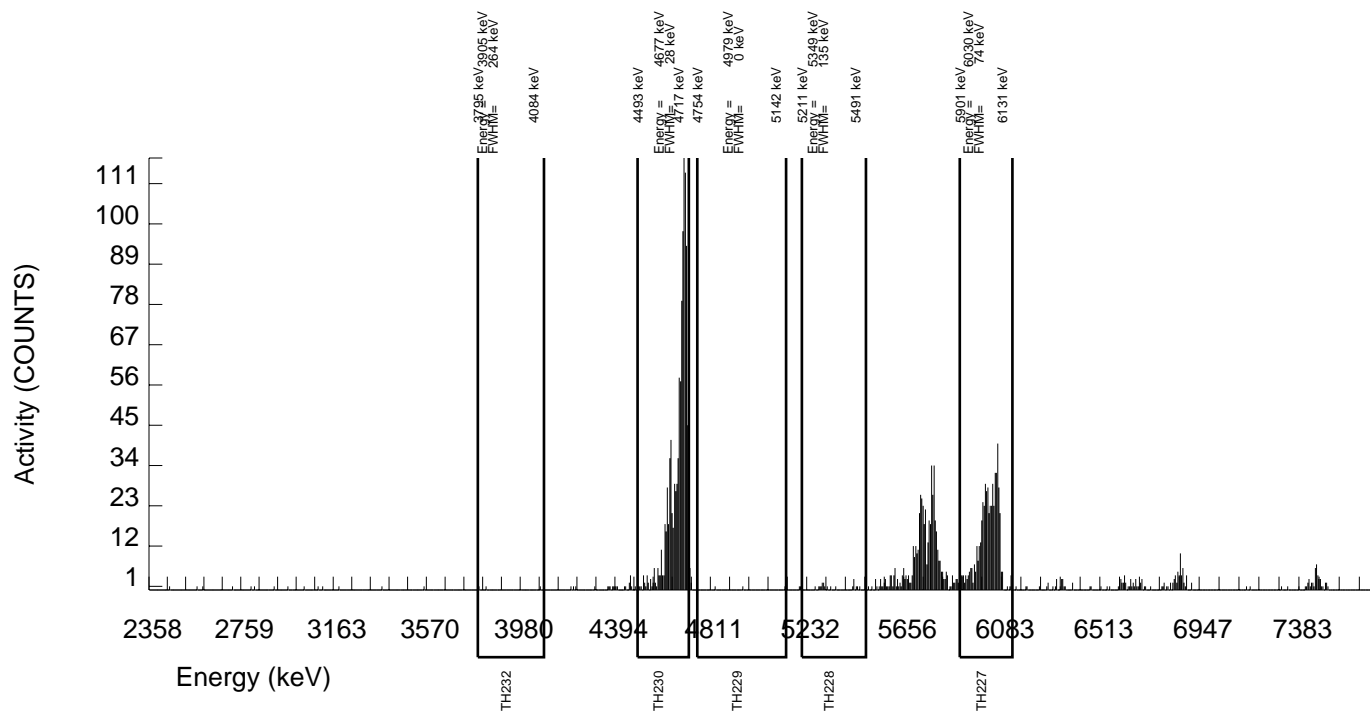
LCS/LCSD
ID : A2796-J
ISOTOPE : TH-230
PCI/G : 8.360E+00

TRACER
ID : 0387-B-102
ISOTOPE : AC227
NOMINAL : 3.90997 dpm
RESULTS : 3.33634 dpm

LIB FILE : ENV_ALPHA_TH.N
BKG FILE : B182.CNF;122
BKG DATE : 30-AUG-2009
EFF FILE : W182.CNF;38
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
AC-227	6038.010	545.000	544.000	1.000	1.0000	68.10000	6.88E+00	7.09E-01	9.68E-02	2.94E-02	5.79E-01
TH-228	5363.000	21.000	8.000	13.000	3.6056	99.94000	6.52E-02	9.33E-02	1.61E-01	6.84E-02	9.32E-02
TH229	4900.000	3.000	0.000	3.000	1.7321	99.52000	0.00E+00	3.92E-02	9.04E-02	3.29E-02	3.92E-02
TH-230	4625.000	1044.000	1040.000	4.000	2.0000	100.0000	8.46E+00	7.20E-01	1.00E-01	3.79E-02	5.16E-01
TH-232	3972.000	3.000	2.000	1.000	1.0000	100.0000	1.63E-02	3.19E-02	6.23E-02	1.89E-02	3.19E-02



Radiochemistry Batch Checklist, Rev 9

Batch# 898785 Product: Th Date: 9/17/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required)			N/A
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, 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.		✓	NCR 734512
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
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 line outs initialed and dated.	✓		
No transcription errors are apparent.			
Aux data is correct.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.	✓		N/A NCR 734512
Batch non-conformances second reviewed and disposition verified to be completed.	✓		N/A NCR 734512
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: Jar LM 9/17/09
 Secondary Review Performed By: [Signature] 9/17/09

[Signature]
9/17/09

sp

Thorium (Ac-227 Tracer) Que Sheet

Batch #: 898785 Analyst: JXD2 First Client Due Date: 18-SEP-09 Internal Due Date: 07-SEP-09
 Tracer Isotope: Ac-227 Tracer Code: 0182-β-Lo2 Expiration Date: 02/22/10 Vol: 0.1 Ac-227 Separation Date/Time: 09/01/09 17:05
 LCS Isotope: Th-230 LCS Code: A276-J Expiration Date: 04/13/10 Vol: 0.1
 Spike Isotope: Th-230 Spike Code: Expiration Date: Vol: ---
 Prep Date: 08/31/09 Initials: JAO Pipet ID: 29765X Balance ID: 16750207 Witness: 8/31/09 CMM

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Aliquot (g/μl)	Th Det #
235782015-1	EB082009-SO2	SAMPLE		.03 pCi/L	WATER	KERR003	20-AUG-09	1	1	0.800	197 198
1201914500-1	MB for batch 898785	MB		.03 pCi/L	WATER	QC ACCOUNT	20-AUG-09	2	2	0.800	196 197-
1201914501-1	LCS for batch 898785	LCS		.03 pCi/L	WATER	QC ACCOUNT	20-AUG-09	3	3	0.800	4B 205
1201914502-1	LCSD for batch 898785	LCSD		.03 pCi/L	WATER	QC ACCOUNT	20-AUG-09	4	4	0.800	195 206 94.09

9/17/09

9/17/09

Solid Sample Dissolution by: LEACH OF DIGESTION

Data Reviewed By: J. G. L. M. L. - 9/17/09

Choose SOP Used: GL-RAD-A-038 ✓

- GL-RAD-A-045
- GL-RAD-A-043
- GL-RAD-A-032

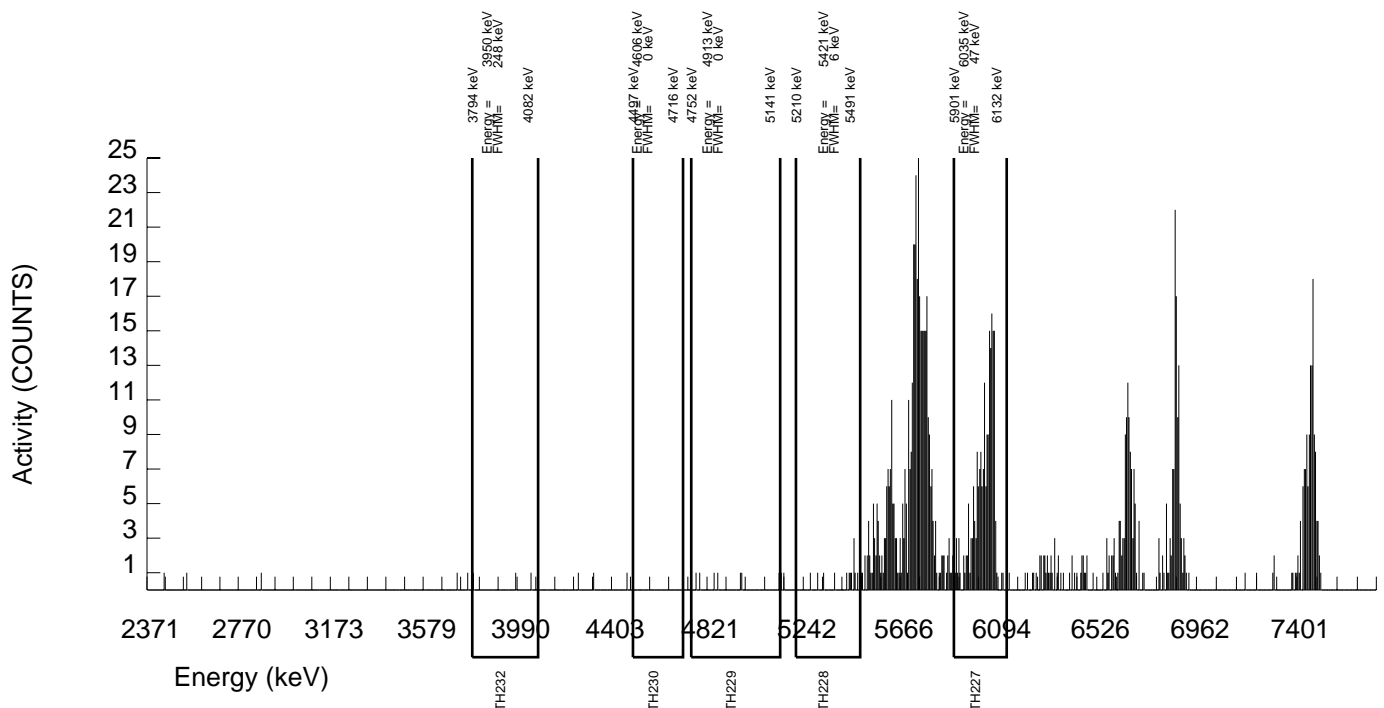
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898785 SAMPLE DATE : 1-SEP-2009 17:05:00. AC-227 SEPARATION : 1-SEP-2009 17:05:00.		SAMPLE ID : S0235782015_TH SAMPLE QTY: 0.800 L	
DETECTOR NUMBER :78895 AVERAGE %EFFICIENCY :25.4102 % YIELD : 51.654		COUNT DATE:15-SEP-2009 21:48:43 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	LCS/LCSD ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	TRACER ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.91054 dpm RESULTS : 2.01996 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B198.CNF;54 BKG DATE : 13-SEP-2009 EFF FILE : W198.CNF;35 CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
AC-227	6038.010	204.000	204.000	0.000	0.0000	68.10000	2.20E+00	3.25E-01	3.24E-02	0.00E+00	3.02E-01
TH-228	5363.000	13.000	12.000	1.000	1.0000	99.94000	5.23E-02	3.21E-02	3.33E-02	1.01E-02	3.19E-02
TH229	4900.000	7.000	6.000	1.000	1.0000	99.52000	2.59E-02	2.39E-02	3.30E-02	1.00E-02	2.39E-02
TH-230	4625.000	0.000	0.000	0.000	0.0000	100.0000	0.00E+00	8.41E-03	1.29E-02	0.00E+00	8.41E-03
TH-232	3972.000	3.000	3.000	0.000	0.0000	100.0000	1.29E-02	1.46E-02	1.29E-02	0.00E+00	1.46E-02

NOTE: Ac-227 results decay corrected to separation date/time.



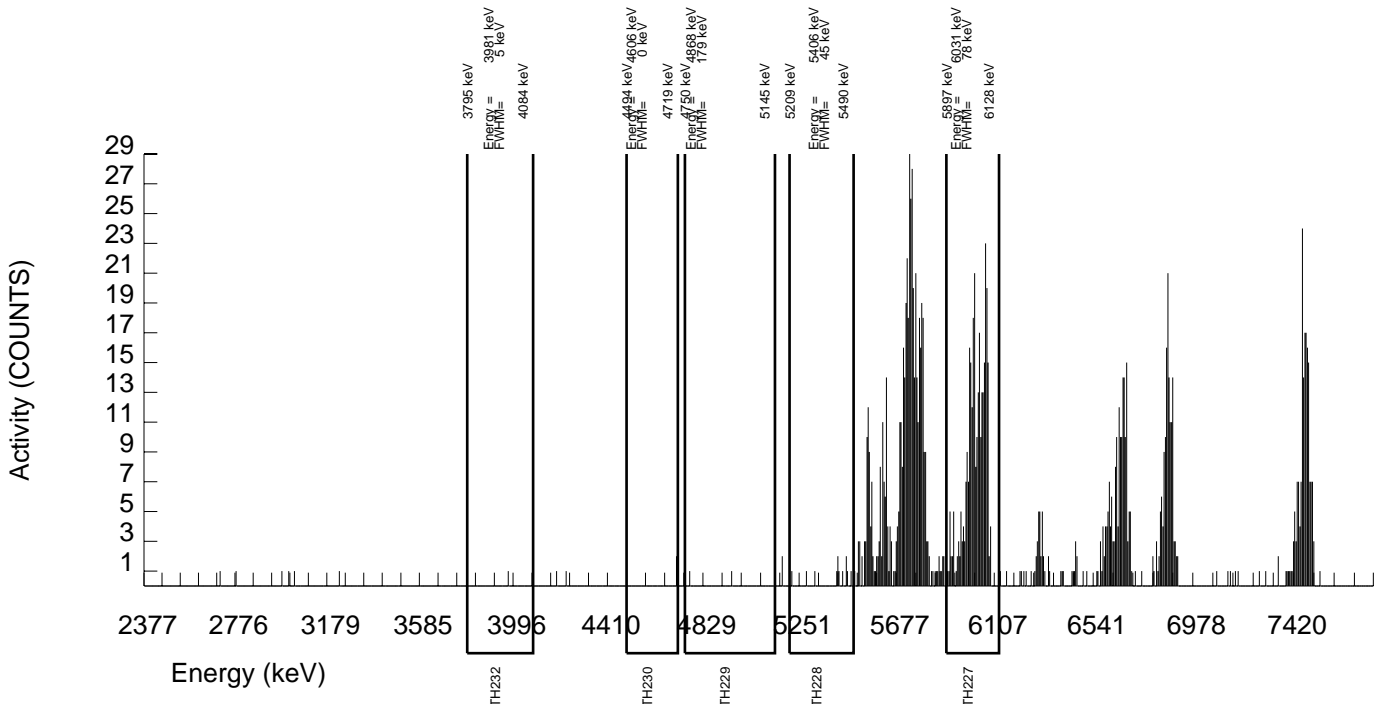
GEL Laboratories LLC
 ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898785 SAMPLE DATE : 1-SEP-2009 17:05:00. AC-227 SEPARATION : 1-SEP-2009 17:05:00.		SAMPLE ID : S1201914500_TH SAMPLE QTY: 0.800 L	
DETECTOR NUMBER :78894 AVERAGE %EFFICIENCY :25.6555 % YIELD : 76.741		COUNT DATE:15-SEP-2009 21:48:41 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	LCS/LCSD ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	TRACER ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.91054 dpm RESULTS : 3.00097 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B197.CNF;54 BKG DATE : 13-SEP-2009 EFF FILE : W197.CNF;37 CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
AC-227	6038.010	307.000	306.000	1.000	1.0000	68.10000	2.20E+00	2.75E-01	5.51E-02	1.67E-02	2.48E-01
TH-228	5363.000	12.000	9.000	3.000	1.7321	99.94000	2.61E-02	2.21E-02	3.21E-02	1.17E-02	2.20E-02
TH229	4900.000	2.000	2.000	0.000	0.0000	99.52000	5.75E-03	7.97E-03	8.62E-03	0.00E+00	7.97E-03
TH-230	4625.000	2.000	1.000	1.000	1.0000	100.0000	2.86E-03	9.71E-03	2.19E-02	6.65E-03	9.71E-03
TH-232	3972.000	1.000	0.000	1.000	1.0000	100.0000	0.00E+00	7.93E-03	2.19E-02	6.65E-03	7.93E-03

NOTE: Ac-227 results decay corrected to separation date/time.



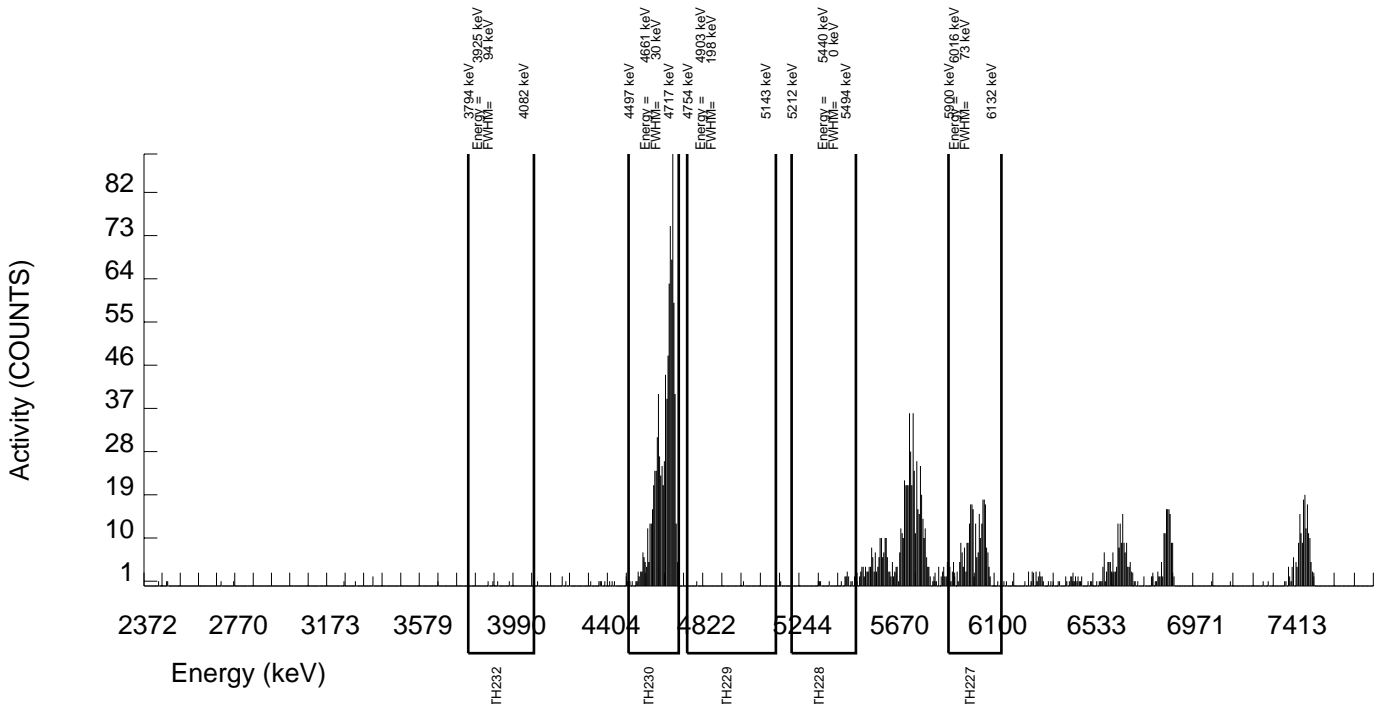
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898785 SAMPLE DATE : 1-SEP-2009 17:05:00. AC-227 SEPARATION : 1-SEP-2009 17:05:00.		SAMPLE ID : S1201914501_TH SAMPLE QTY: 0.800 L	
DETECTOR NUMBER :78908 AVERAGE %EFFICIENCY :25.6002 % YIELD : 70.372		COUNT DATE:15-SEP-2009 21:48:48 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	LCS/LCSD ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	TRACER ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.91054 dpm RESULTS : 2.75194 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B205.CNF;54 BKG DATE : 13-SEP-2009 EFF FILE : W205.CNF;35 CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
AC-227	6038.010	283.000	280.000	3.000	1.7321	68.10000	2.20E+00	2.87E-01	8.70E-02	3.17E-02	2.61E-01
TH-228	5363.000	18.000	16.000	2.000	1.4142	99.94000	5.08E-02	2.79E-02	3.04E-02	1.04E-02	2.78E-02
TH229	4900.000	2.000	-1.000	3.000	1.7321	99.52000	-3.14E-03	1.38E-02	3.47E-02	1.27E-02	1.38E-02
TH-230	4625.000	903.000	901.000	2.000	1.4142	100.0000	2.82E+00	2.39E-01	2.99E-02	1.03E-02	1.84E-01
TH-232	3972.000	4.000	2.000	2.000	1.4142	100.0000	6.25E-03	1.50E-02	2.99E-02	1.03E-02	1.50E-02

NOTE: Ac-227 results decay corrected to separation date/time.



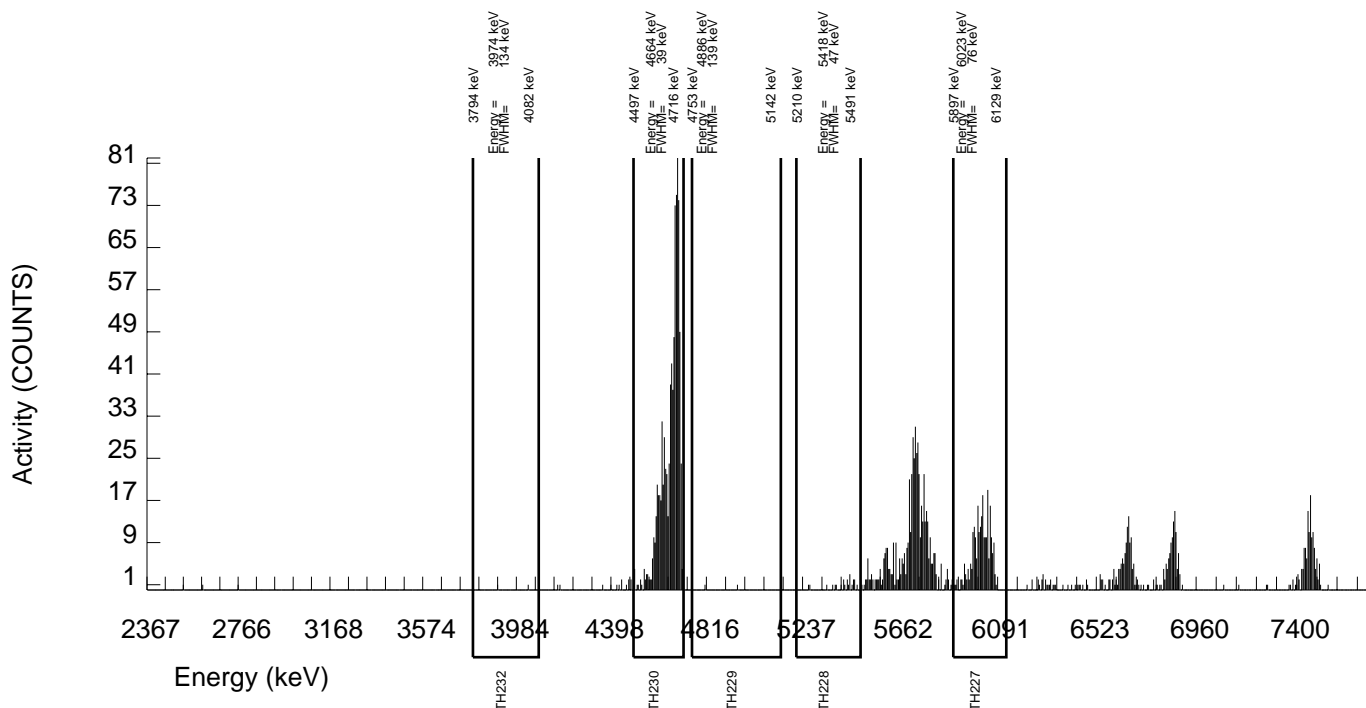
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898785 SAMPLE DATE : 1-SEP-2009 17:05:00. AC-227 SEPARATION : 1-SEP-2009 17:05:00.		SAMPLE ID : S1201914502_TH SAMPLE QTY: 0.800 L	
DETECTOR NUMBER :78909 AVERAGE %EFFICIENCY :25.3986 % YIELD : 62.064		COUNT DATE:15-SEP-2009 21:48:50 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	LCS/LCSD ID : A2796-J ISOTOPE : TH-230 PCI/L : 2.675E+00	TRACER ID : 0387-B-102 ISOTOPE : AC227 NOMINAL : 3.91054 dpm RESULTS : 2.42705 dpm	LIB FILE : ENV_ALPHA_TH.N BKG FILE : B206.CNF;54 BKG DATE : 13-SEP-2009 EFF FILE : W206.CNF;35 CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
AC-227	6038.010	247.000	245.000	2.000	1.4142	68.10000	2.20E+00	3.02E-01	8.61E-02	2.96E-02	2.78E-01
TH-228	5363.000	22.000	21.000	1.000	1.0000	99.94000	7.61E-02	3.43E-02	2.77E-02	8.44E-03	3.41E-02
TH229	4900.000	2.000	0.000	2.000	1.4142	99.52000	0.00E+00	1.41E-02	3.44E-02	1.18E-02	1.41E-02
TH-230	4625.000	852.000	851.000	1.000	1.0000	100.0000	3.04E+00	2.62E-01	2.73E-02	8.31E-03	2.04E-01
TH-232	3972.000	2.000	2.000	0.000	0.0000	100.0000	7.14E-03	9.91E-03	1.07E-02	0.00E+00	9.90E-03

NOTE: Ac-227 results decay corrected to separation date/time.



URANIUM

Radiochemistry Batch Checklist, Rev 9

Batch# 898784 Product: U Date: 9/15/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required)			NA
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.		✓	NCL# 7333S1
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	✓		
Or meets the client's required RER acceptance criteria.		✓	NCL# 7333S1
Tracer yield is 15-125% . Carrier yield 25-125%.		✓	
Or meets the client's contract acceptance criteria.		✓	
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
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 line outs initialed and dated.	✓		
No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.	✓		NCL# 7333S1
Batch non-conformances second reviewed and disposition verified to be completed.	✓		NCL# 7333S1
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: _____

[Signature]
9/15/09

Secondary Review Performed By: _____

[Signature]
9/16/09

9/17-9/18
KER

✓ p

Uranium Que Sheet

31-AUG-09

Batch #: 898784 Analyst: JXD2 First Client Due Date: 18-SEP-09 Internal Due Date: 07-SEP-09

Tracer Isotope: U-232 U-232 Tracer Code: 1233-ε Expiration Date: 05/15/10 Vol: 0.1

LCS Isotope: U-238 LCS Code: 1163-G Expiration Date: 04/14/10 Vol: 0.1

Spike Isotope: U-238 Spike Code: 1163-G Expiration Date: 04/14/10 Vol: 0.1

Prep Date: 07/01/09 Initials: JXD Pipet ID: 29205Y Balance ID: 504/0232 Witness: NAA

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (D1/f)	U Det #
235782001-1	SA198-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	1	1	0.502	113
235782002-1	SA198-27B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	2	2	0.501	117
235782003-1	SA175-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	3	3	0.505	121
235782004-1	SA175-28B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	4	4	0.506	122
235782005-1	SA139-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	5	5	0.501	124
235782006-1	SA139-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	6	6	0.508	125
235782007-1	SA139-25B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	7	7	0.506	126
235782008-1	SA139009-25B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	8	8	0.501	120
235782009-1	SA139-35B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	9	9	0.501	129
235782010-1	RSAT5-0.5B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	10	10	0.509	130
235782011-1	RSAT5-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	11	11	0.509	132
235782012-1	RSAT5-25B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	12	12	0.508	133
235782013-1	RSAT5-40B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	13	13	0.502	134
235782014-1	RSAT5-51B	SAMPLE		.04 pCi/g	SOIL	KERR003	20-AUG-09	14	14	0.502	135
235782016-1	RSAO6-10B	SAMPLE		.04 pCi/g	SOIL	KERR003	21-AUG-09	15	15	0.507	136
235782017-1	RSAO6-20B	SAMPLE		.04 pCi/g	SOIL	KERR003	21-AUG-09	16	16	0.508	137
235782018-1	RSAO6-34B	SAMPLE		.04 pCi/g	SOIL	KERR003	21-AUG-09	17	17	0.507	138
1201914492-1	MB for batch 898784	MB		.04 pCi/g	SOIL	QC ACCOUNT	21-AUG-09	18	18	0.507	139
1201914493-1	RSAO6-34B(235782018DUP)	DUP		.04 pCi/g	SOIL	QC ACCOUNT	21-AUG-09	19	19	0.507	140
1201914494-1	RSAO6-34B(235782018MS)	MS		.04 pCi/g	SOIL	QC ACCOUNT	21-AUG-09	20	20	0.506	11
1201914495-1	LCS for batch 898784	LCS		.04 pCi/g	SOIL	QC ACCOUNT	21-AUG-09	21	21	0.505	12

Handwritten signature

Data Reviewed By:

LEACH OR DIGESTION
Circle One

Solid Sample Dissolution by: LEACH OR DIGESTION

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

GEL Laboratories LLC, Radiochemistry Division

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 21-AUG-2009 00:00:00		SAMPLE ID : S0235782016_UU SAMPLE QTY: 0.507 G	
DETECTOR NUMBER :68549 AVERAGE %EFFICIENCY :24.7600 % YIELD : 89.241		COUNT DATE: 5-SEP-2009 12:00:31 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.968E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.968E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26108 dpm RESULTS : 4.69502 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B136.CNF;388 BKG DATE : 30-AUG-2009 EFF FILE : W136.CNF;127 CAL DATE : 17-AUG-2009

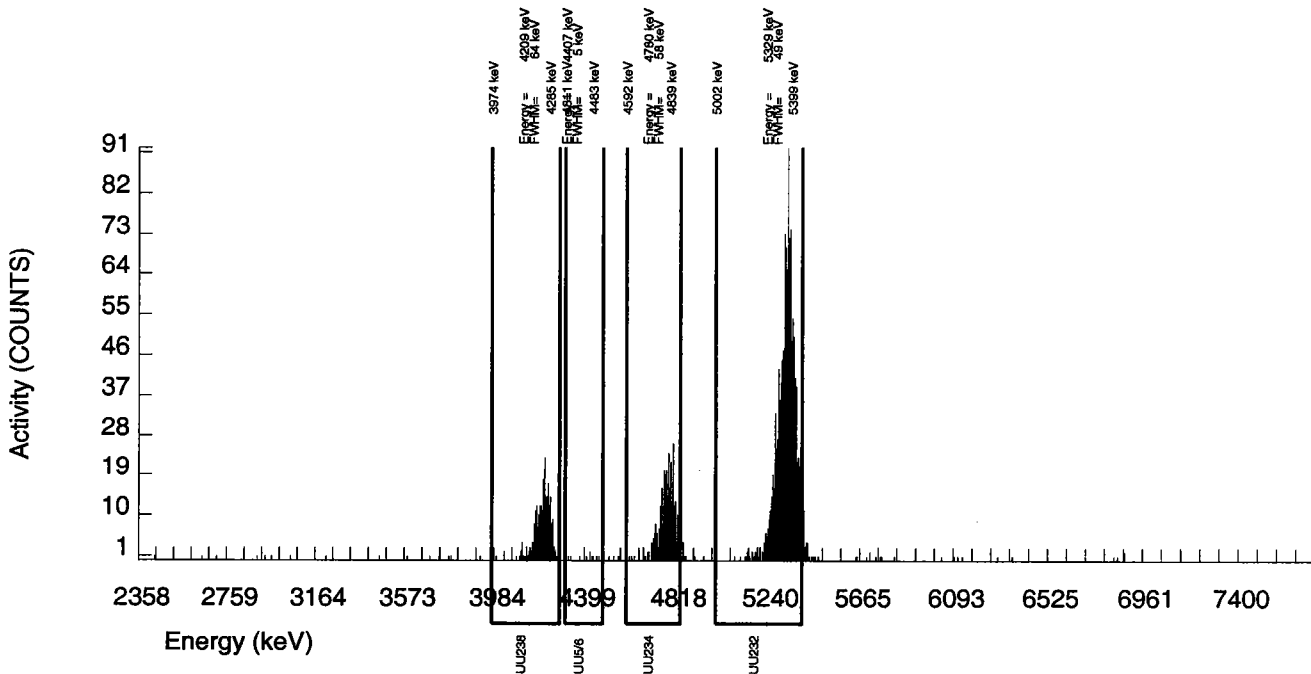
NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	314.000	302.489	8.000	2.8284	100.0000	1.22E+00	2.19E-01	6.50E-02	2.65E-02	1.41E-01
U232	5302.100	1169.000	1162.000	7.000	2.6458	100.0000	4.67E+00	6.98E-01	6.16E-02	2.48E-02	2.70E-01
U-235	4391.000	11.000	8.000	3.000	1.7321	80.90000	3.98E-02	3.69E-02	5.50E-02	2.00E-02	3.65E-02
U-238	4184.730	254.000	252.000	2.000	1.4142	100.0000	1.01E+00	1.88E-01	3.85E-02	1.32E-02	1.26E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity

DO NOT REPORT

Integrated



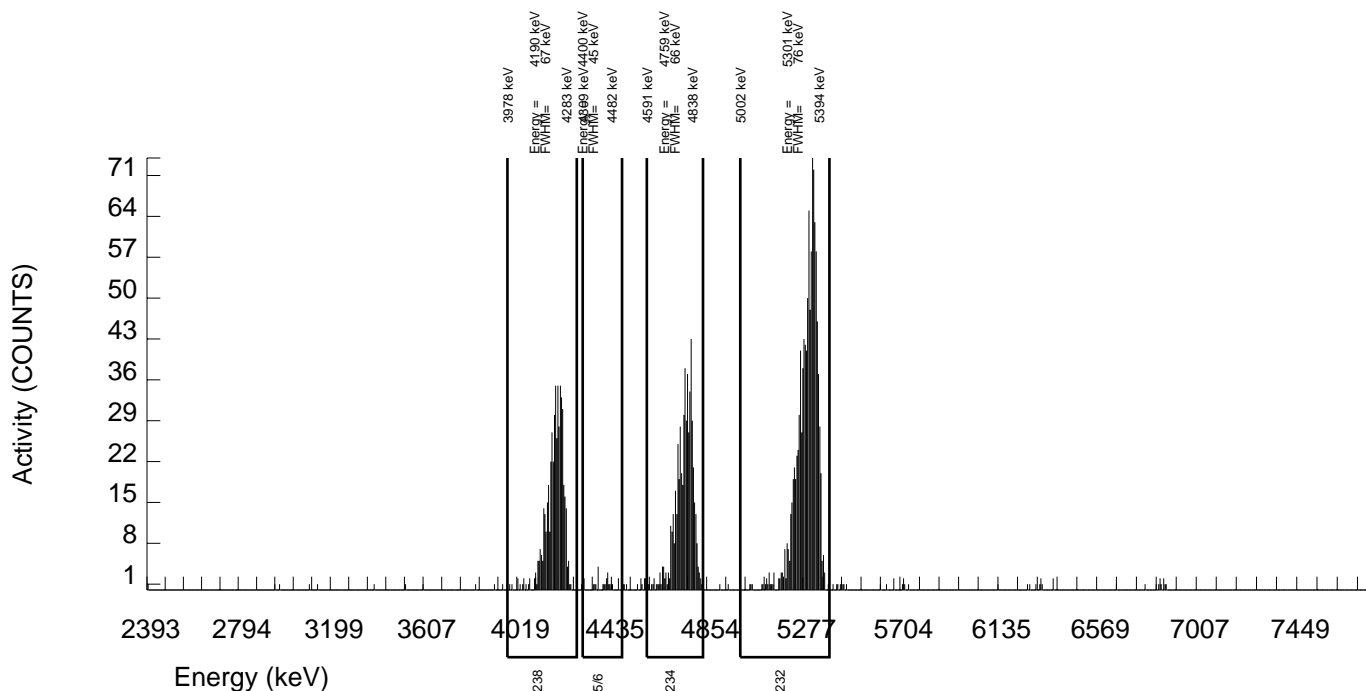
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782001_UU SAMPLE QTY: 0.502 G	
DETECTOR NUMBER :45-111B4 AVERAGE %EFFICIENCY :25.0567 % YIELD : 82.492		COUNT DATE: 5-SEP-2009 11:59:34 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.018E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.018E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 4.34009 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B113.CNF;390 BKG DATE : 30-AUG-2009 EFF FILE : W113.CNF;112 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	551.000	544.716	3.000	1.7321	100.0000	2.36E+00	3.83E-01	4.80E-02	1.75E-02	2.00E-01
U232	5302.100	1089.000	1087.000	2.000	1.4142	100.0000	4.72E+00	7.12E-01	4.16E-02	1.43E-02	2.81E-01
U-235	4391.000	24.000	23.000	1.000	1.0000	80.90000	1.23E-01	5.53E-02	4.11E-02	1.25E-02	5.26E-02
U-238	4184.730	510.000	510.000	0.000	0.0000	100.0000	2.21E+00	3.62E-01	1.30E-02	0.00E+00	1.92E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



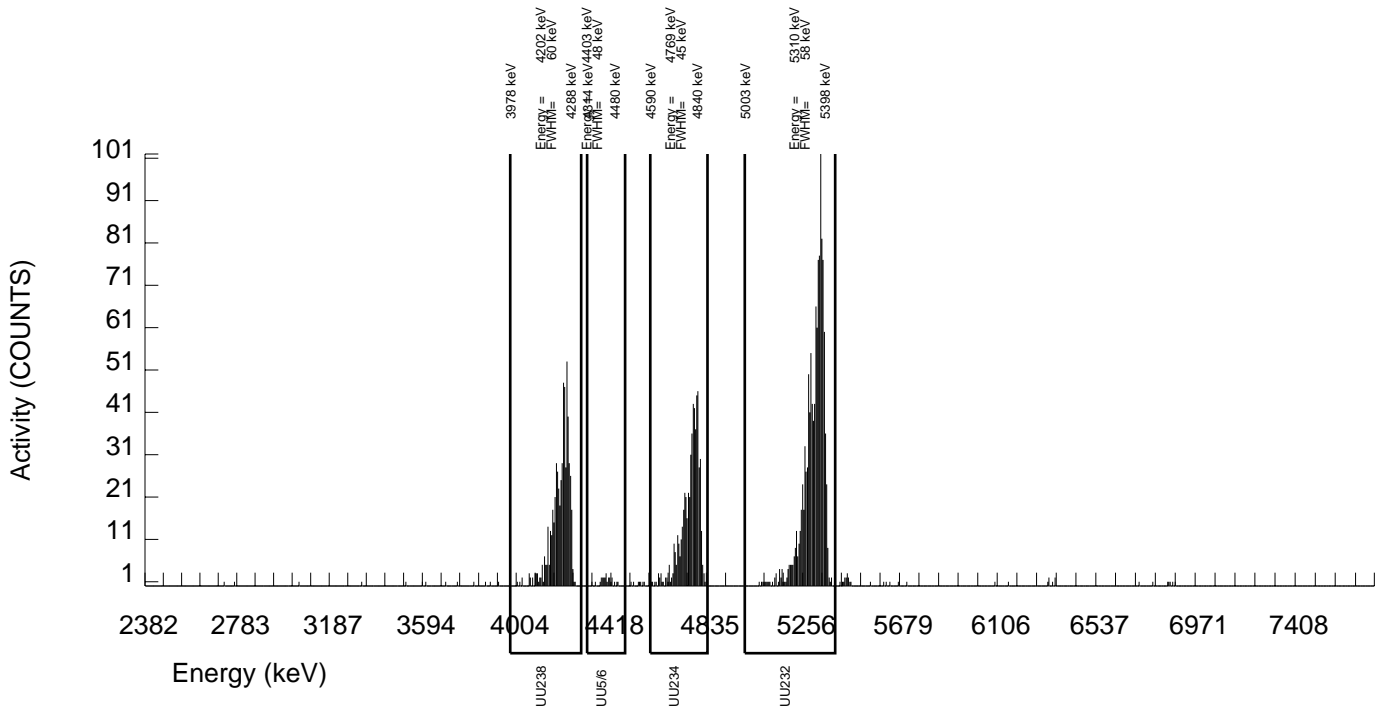
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782002_UU SAMPLE QTY: 0.501 G	
DETECTOR NUMBER :33450 AVERAGE %EFFICIENCY :25.2558 % YIELD : 90.274		COUNT DATE: 5-SEP-2009 11:59:43 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 4.74954 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B117.CNF;395 BKG DATE : 30-AUG-2009 EFF FILE : W117.CNF;108 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	587.000	579.377	4.000	2.0000	100.0000	2.28E+00	3.66E-01	4.85E-02	1.83E-02	1.87E-01
U232	5302.100	1211.000	1199.000	12.000	3.4641	100.0000	4.73E+00	7.04E-01	7.54E-02	3.18E-02	2.70E-01
U-235	4391.000	25.000	23.000	2.000	1.4142	80.90000	1.12E-01	5.20E-02	4.67E-02	1.60E-02	4.96E-02
U-238	4184.730	593.000	591.000	2.000	1.4142	100.0000	2.33E+00	3.72E-01	3.78E-02	1.30E-02	1.89E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



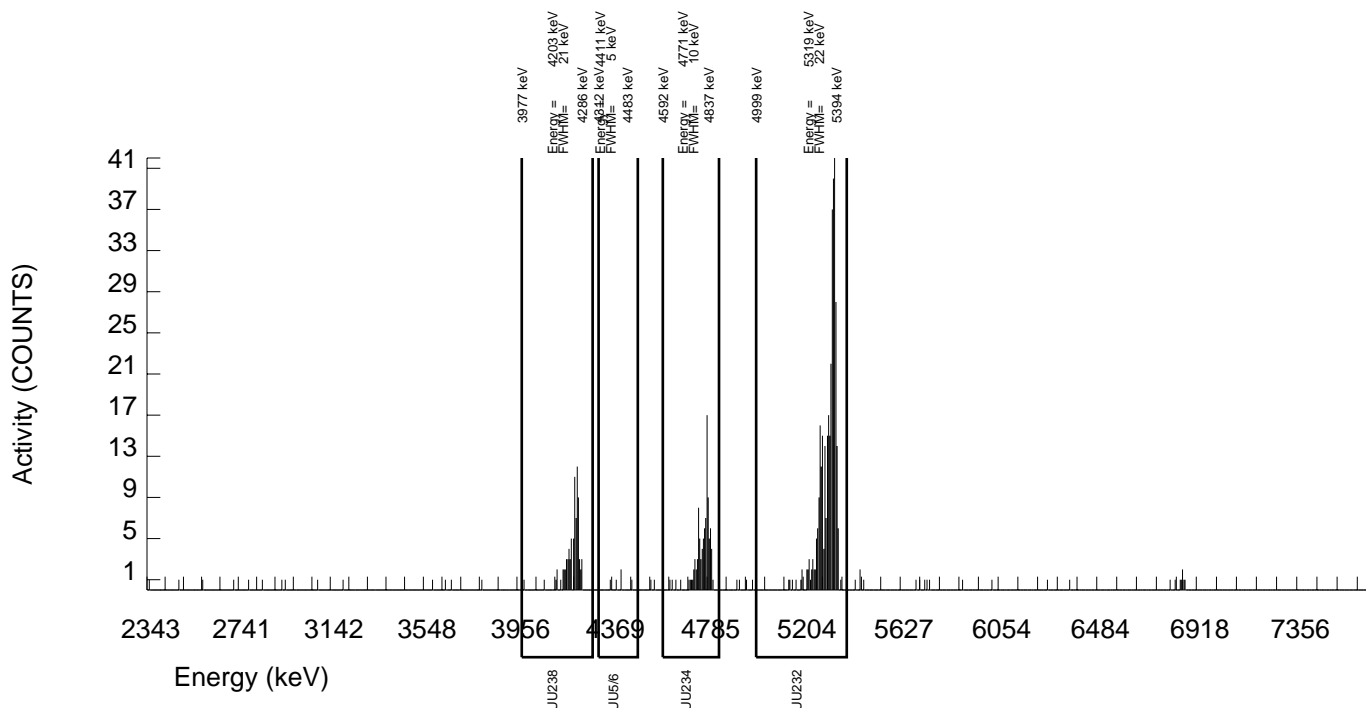
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782003_UU SAMPLE QTY: 0.505 G	
DETECTOR NUMBER :75545 AVERAGE %EFFICIENCY :24.7799 % YIELD : 26.551		COUNT DATE: 5-SEP-2009 11:59:53 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.988E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.988E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 1.39691 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B121.CNF;390 BKG DATE : 30-AUG-2009 EFF FILE : W121.CNF;106 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	98.000	91.955	5.000	2.2361	100.0000	1.25E+00	3.37E-01	1.82E-01	7.05E-02	2.68E-01
U232	5302.100	349.000	346.000	3.000	1.7321	100.0000	4.69E+00	9.17E-01	1.50E-01	5.47E-02	4.99E-01
U-235	4391.000	5.000	5.000	0.000	0.0000	80.90000	8.38E-02	7.47E-02	5.03E-02	0.00E+00	7.34E-02
U-238	4184.730	82.000	81.000	1.000	1.0000	100.0000	1.10E+00	3.02E-01	1.04E-01	3.15E-02	2.42E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



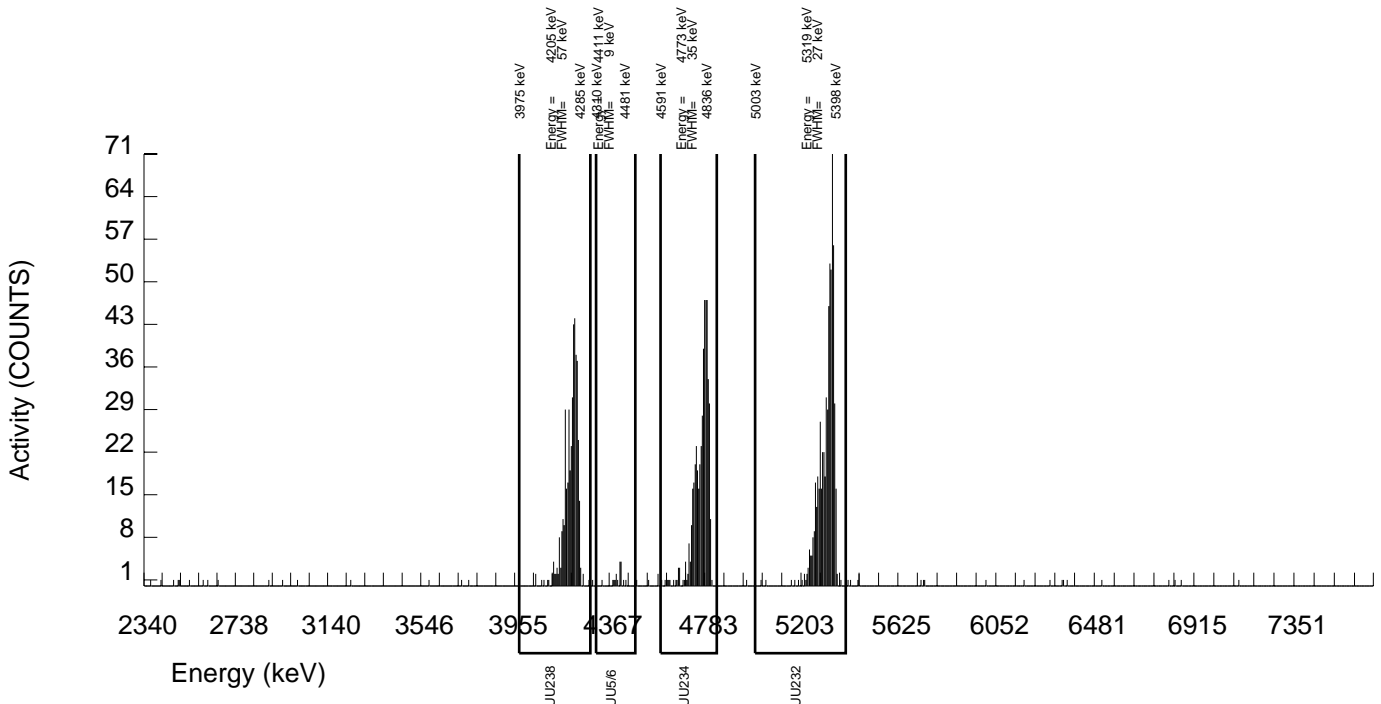
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782004_UU SAMPLE QTY: 0.506 G	
DETECTOR NUMBER :75546 AVERAGE %EFFICIENCY :25.1153 % YIELD : 44.822		COUNT DATE: 5-SEP-2009 11:59:55 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.978E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.978E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 2.35818 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B122.CNF;392 BKG DATE : 30-AUG-2009 EFF FILE : W122.CNF;109 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	483.000	474.211	7.000	2.6458	100.0000	3.75E+00	6.57E-01	1.21E-01	4.87E-02	3.42E-01
U232	5302.100	603.000	592.000	11.000	3.3166	100.0000	4.68E+00	7.98E-01	1.46E-01	6.10E-02	3.84E-01
U-235	4391.000	17.000	15.000	2.000	1.4142	80.90000	1.47E-01	8.63E-02	9.36E-02	3.22E-02	8.35E-02
U-238	4184.730	433.000	428.000	5.000	2.2361	100.0000	3.38E+00	6.01E-01	1.06E-01	4.11E-02	3.24E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



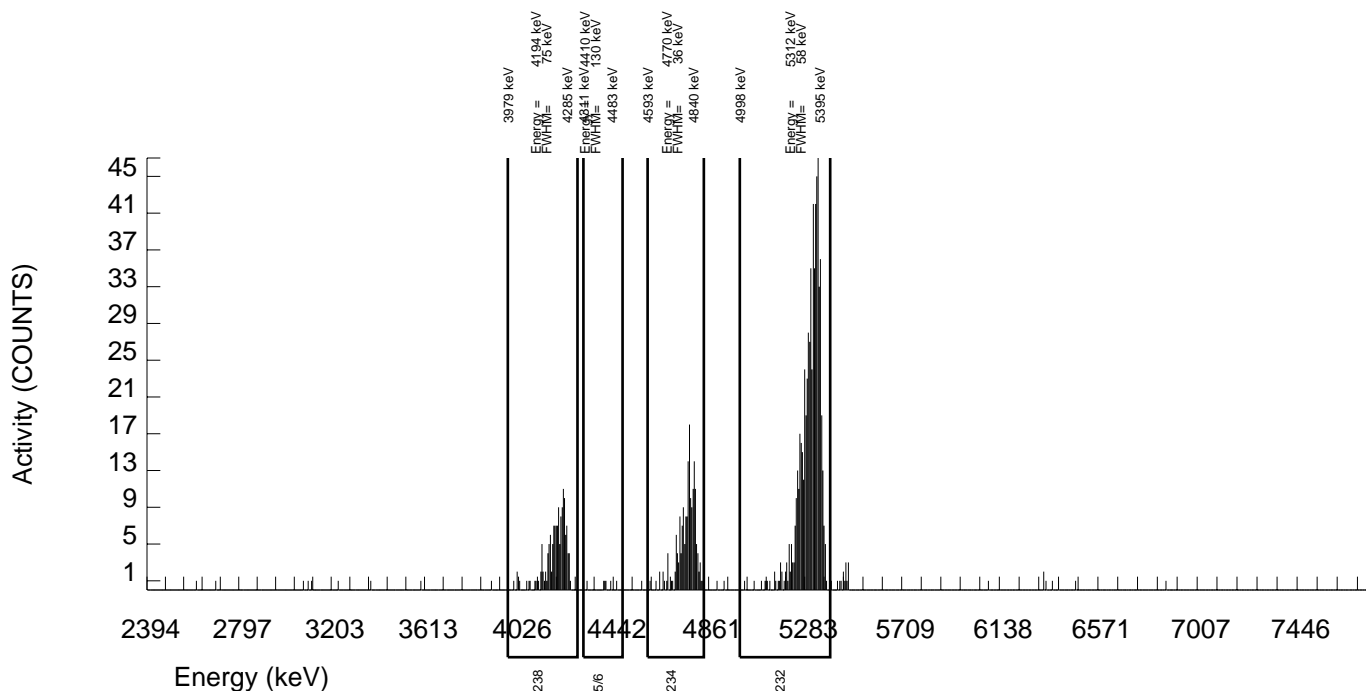
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782005_UU SAMPLE QTY: 0.501 G	
DETECTOR NUMBER :45-142V2 AVERAGE %EFFICIENCY :26.2275 % YIELD : 46.546		COUNT DATE: 5-SEP-2009 12:00:01 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 2.44891 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B124.CNF;386 BKG DATE : 30-AUG-2009 EFF FILE : W124.CNF;101 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	181.000	176.060	3.000	1.7321	100.0000	1.30E+00	2.73E-01	8.14E-02	2.97E-02	1.95E-01
U232	5302.100	648.000	642.000	6.000	2.4495	100.0000	4.73E+00	7.88E-01	1.06E-01	4.20E-02	3.69E-01
U-235	4391.000	6.000	4.000	2.000	1.4142	80.90000	3.64E-02	5.08E-02	8.72E-02	3.00E-02	5.05E-02
U-238	4184.730	148.000	145.000	3.000	1.7321	100.0000	1.07E+00	2.37E-01	8.14E-02	2.97E-02	1.77E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784
SAMPLE DATE : 20-AUG-2009 00:00:00

SAMPLE ID : S0235782006_UU
SAMPLE QTY: 0.508 G

DETECTOR NUMBER :75547
AVERAGE %EFFICIENCY :25.7713
% YIELD : 92.232

COUNT DATE: 5-SEP-2009 12:00:03
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.958E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.958E+00

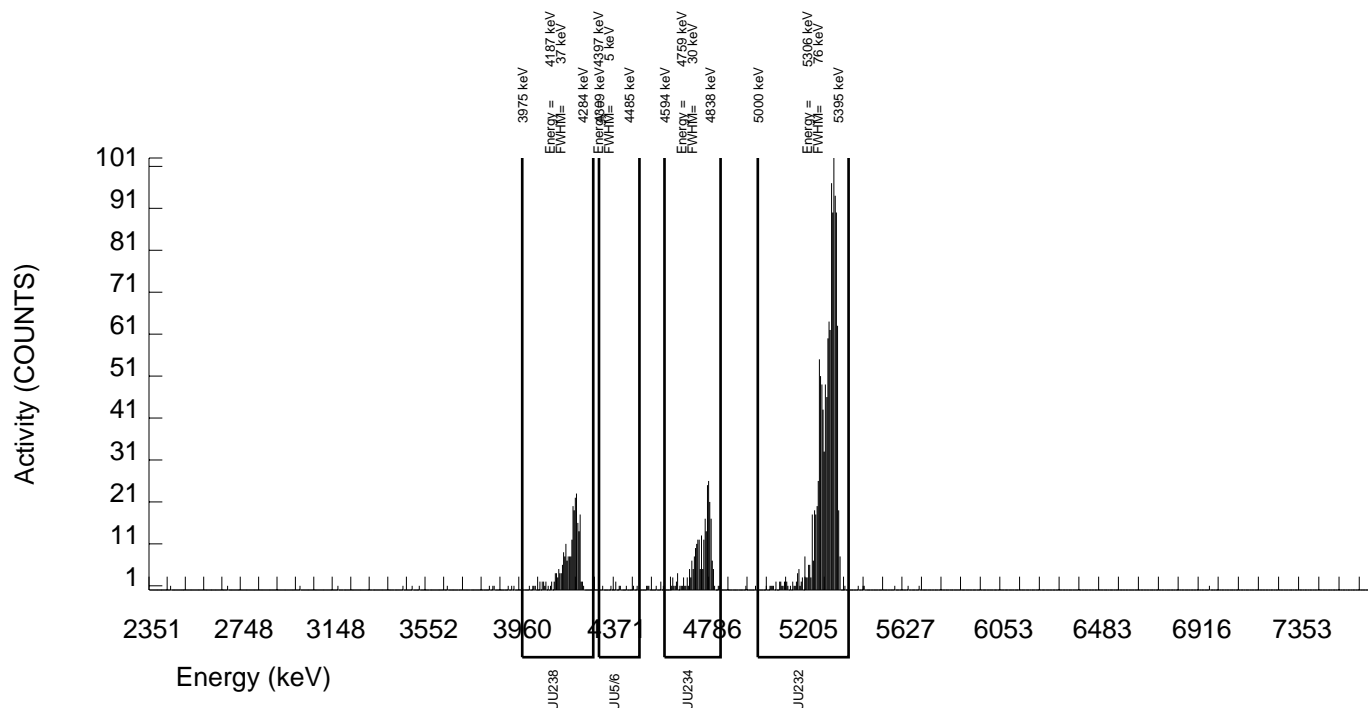
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.26122 dpm
RESULTS : 4.85251 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B125.CNF;396
BKG DATE : 30-AUG-2009
EFF FILE : W125.CNF;119
CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	270.000	261.223	5.000	2.2361	100.0000	9.74E-01	1.80E-01	5.00E-02	1.94E-02	1.20E-01
U232	5302.100	1256.000	1250.000	6.000	2.4495	100.0000	4.67E+00	6.89E-01	5.37E-02	2.13E-02	2.60E-01
U-235	4391.000	10.000	10.000	0.000	0.0000	80.90000	4.61E-02	2.93E-02	1.38E-02	0.00E+00	2.86E-02
U-238	4184.730	257.000	257.000	0.000	0.0000	100.0000	9.59E-01	1.76E-01	1.12E-02	0.00E+00	1.17E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



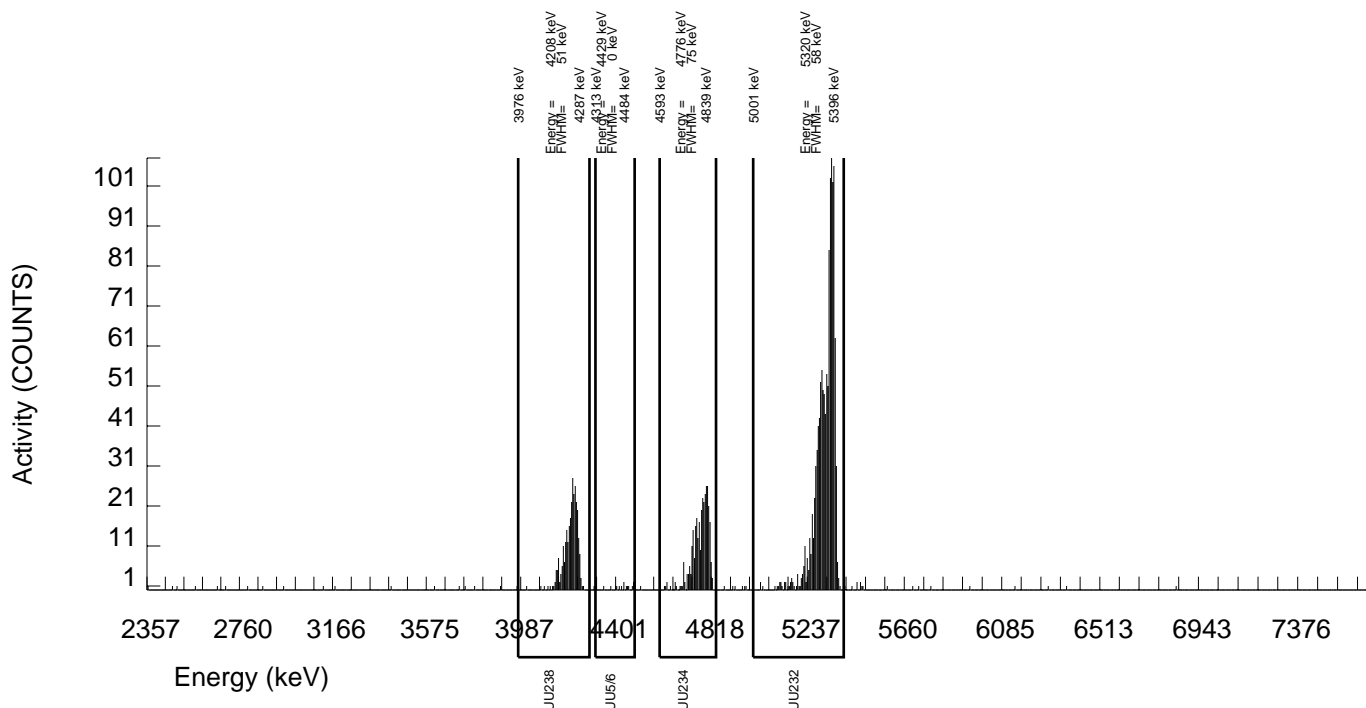
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782007_UU SAMPLE QTY: 0.506 G	
DETECTOR NUMBER :75548 AVERAGE %EFFICIENCY :25.2825 % YIELD : 93.488		COUNT DATE: 5-SEP-2009 12:00:05 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.978E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.978E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 4.91863 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B126.CNF;395 BKG DATE : 30-AUG-2009 EFF FILE : W126.CNF;121 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	335.000	324.244	7.000	2.6458	100.0000	1.22E+00	2.16E-01	5.77E-02	2.32E-02	1.36E-01
U232	5302.100	1262.000	1243.000	19.000	4.3589	100.0000	4.68E+00	6.94E-01	8.77E-02	3.82E-02	2.64E-01
U-235	4391.000	15.000	12.000	3.000	1.7321	80.90000	5.59E-02	3.95E-02	5.15E-02	1.88E-02	3.87E-02
U-238	4184.730	300.000	297.000	3.000	1.7321	100.0000	1.12E+00	2.00E-01	4.17E-02	1.52E-02	1.28E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



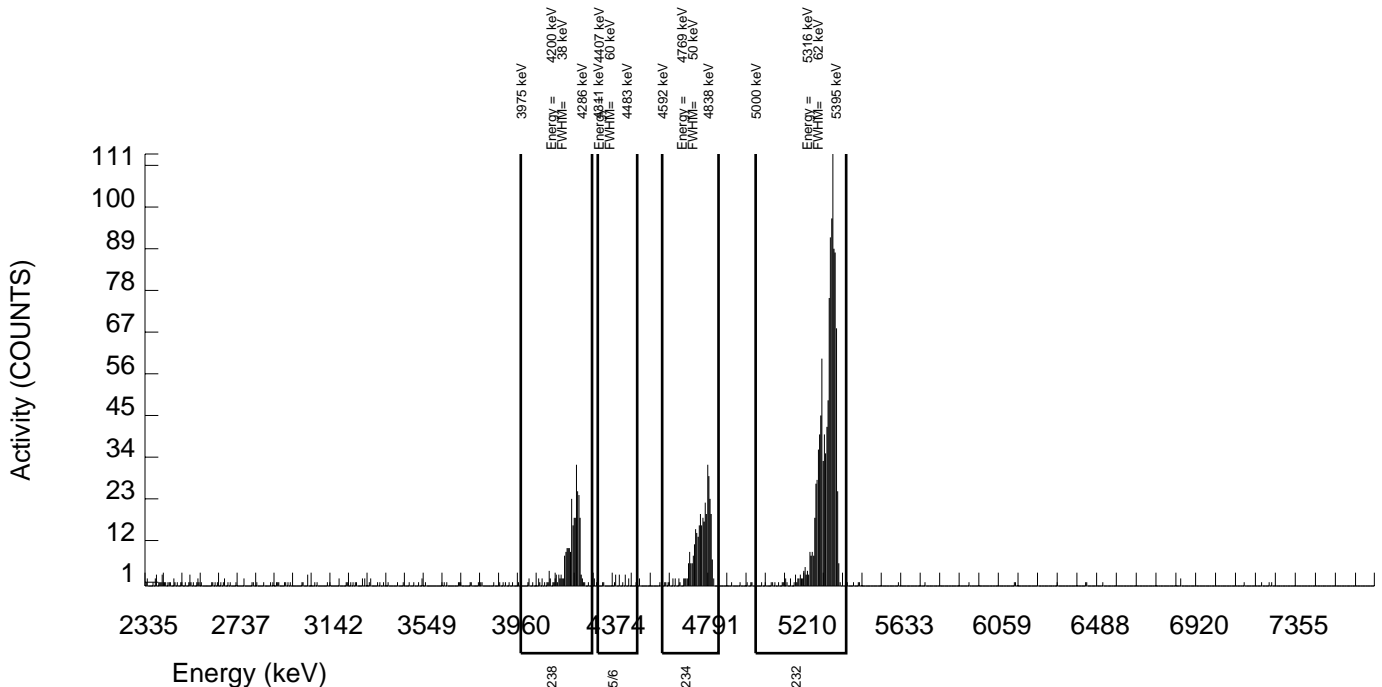
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782008_UU SAMPLE QTY: 0.501 G	
DETECTOR NUMBER :75549 AVERAGE %EFFICIENCY :25.5798 % YIELD : 87.421		COUNT DATE: 5-SEP-2009 12:00:10 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 4.59943 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B128.CNF;405 BKG DATE : 30-AUG-2009 EFF FILE : W128.CNF;122 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	346.000	330.447	12.000	3.4641	100.0000	1.33E+00	2.36E-01	7.69E-02	3.24E-02	1.48E-01
U232	5302.100	1192.000	1176.000	16.000	4.0000	100.0000	4.73E+00	7.07E-01	8.69E-02	3.74E-02	2.74E-01
U-235	4391.000	17.000	14.000	3.000	1.7321	80.90000	6.96E-02	4.46E-02	5.50E-02	2.00E-02	4.36E-02
U-238	4184.730	276.000	263.000	13.000	3.6056	100.0000	1.06E+00	1.98E-01	7.95E-02	3.37E-02	1.34E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



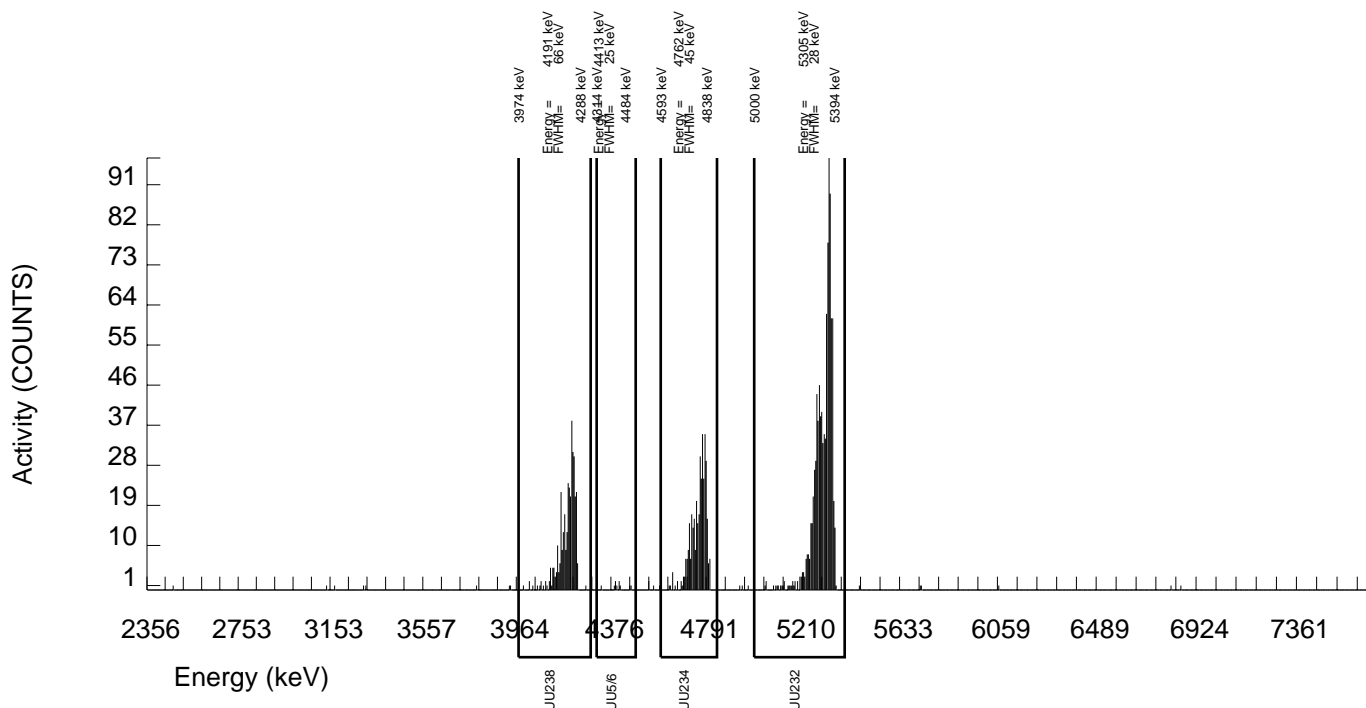
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782009_UU SAMPLE QTY: 0.501 G	
DETECTOR NUMBER :76227 AVERAGE %EFFICIENCY :26.3617 % YIELD : 69.680		COUNT DATE: 5-SEP-2009 12:00:13 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.028E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 3.66604 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B129.CNF;394 BKG DATE : 30-AUG-2009 EFF FILE : W129.CNF;117 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	380.000	372.081	5.000	2.2361	100.0000	1.82E+00	3.16E-01	6.56E-02	2.55E-02	1.88E-01
U232	5302.100	969.000	966.000	3.000	1.7321	100.0000	4.73E+00	7.27E-01	5.42E-02	1.97E-02	2.99E-01
U-235	4391.000	10.000	9.000	1.000	1.0000	80.90000	5.45E-02	4.01E-02	4.63E-02	1.41E-02	3.93E-02
U-238	4184.730	357.000	353.000	4.000	2.0000	100.0000	1.73E+00	3.03E-01	6.02E-02	2.28E-02	1.82E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



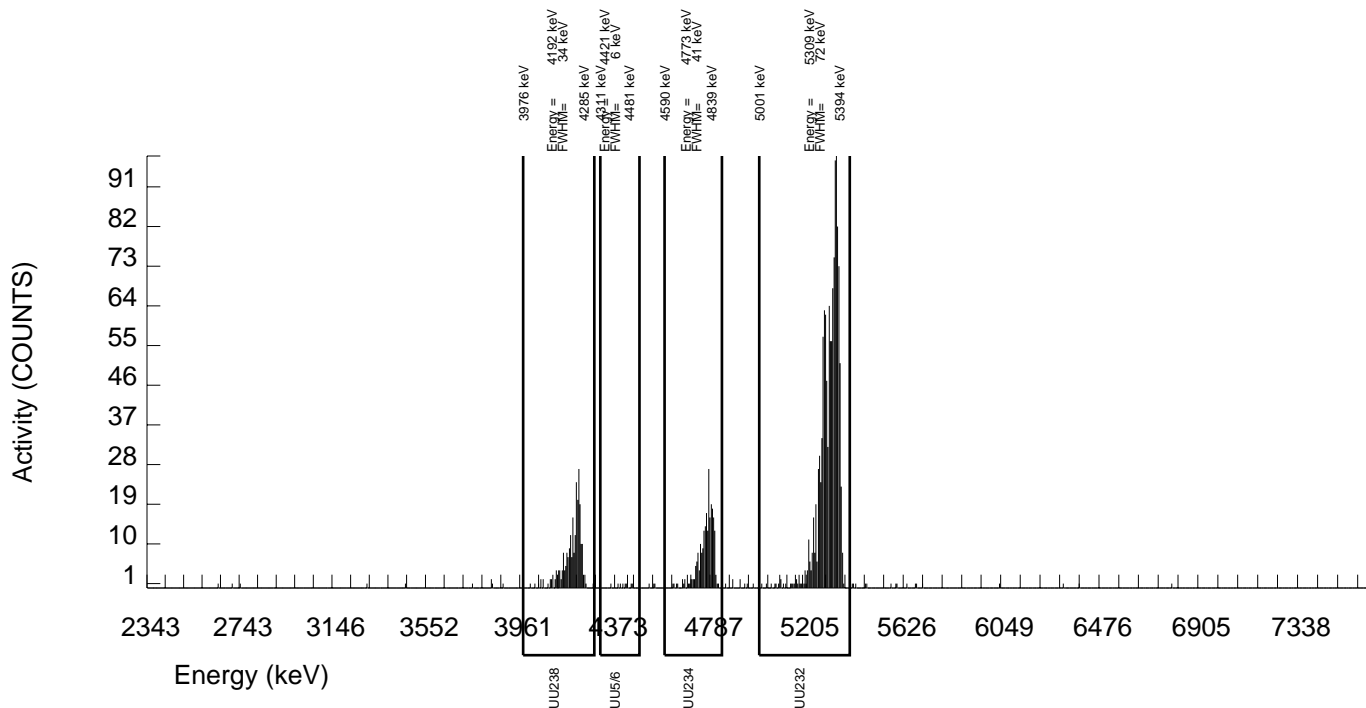
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782010_UU SAMPLE QTY: 0.509 G	
DETECTOR NUMBER :76228 AVERAGE %EFFICIENCY :25.0017 % YIELD : 94.690		COUNT DATE: 5-SEP-2009 12:00:15 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.949E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.949E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 4.98187 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B130.CNF;394 BKG DATE : 30-AUG-2009 EFF FILE : W130.CNF;119 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	243.000	237.238	2.000	1.4142	100.0000	8.87E-01	1.66E-01	3.58E-02	1.23E-02	1.14E-01
U232	5302.100	1247.000	1245.000	2.000	1.4142	100.0000	4.66E+00	6.87E-01	3.58E-02	1.23E-02	2.59E-01
U-235	4391.000	11.000	9.000	2.000	1.4142	80.90000	4.16E-02	3.31E-02	4.43E-02	1.52E-02	3.27E-02
U-238	4184.730	251.000	247.000	4.000	2.0000	100.0000	9.23E-01	1.72E-01	4.60E-02	1.74E-02	1.17E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



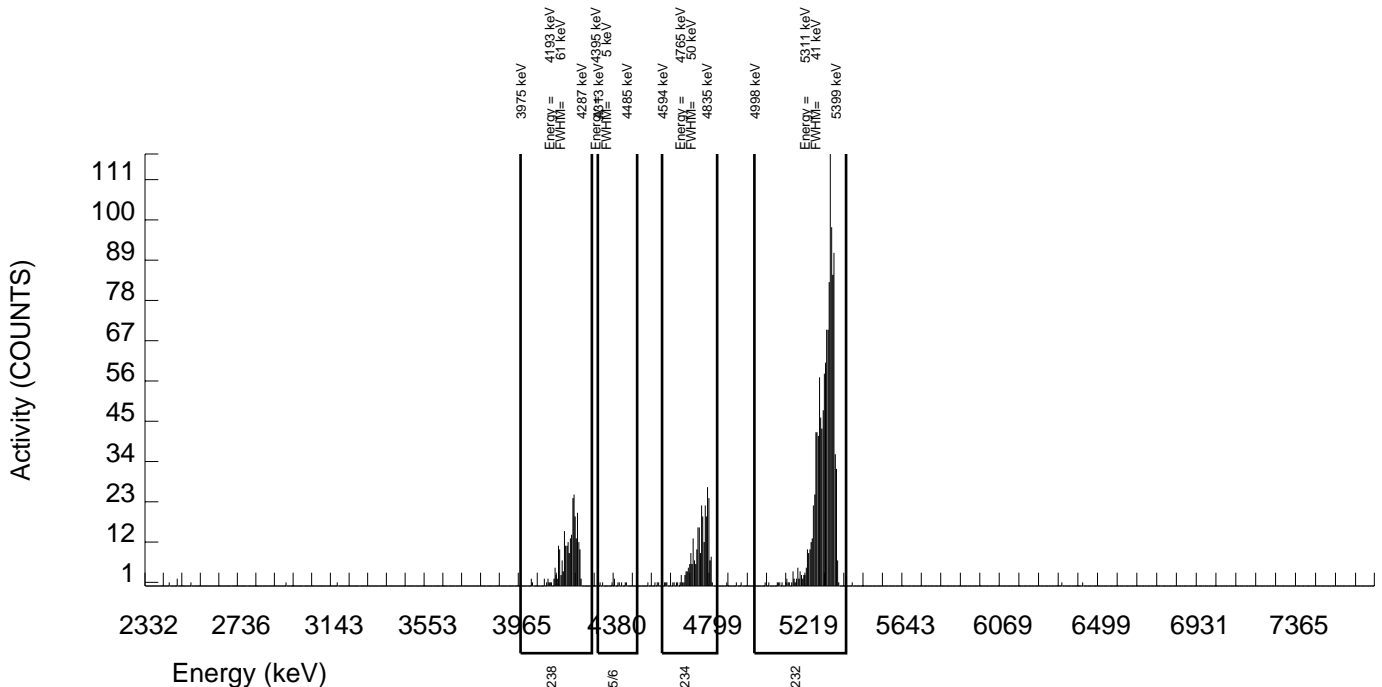
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782011_UU SAMPLE QTY: 0.509 G	
DETECTOR NUMBER :67579 AVERAGE %EFFICIENCY :25.0315 % YIELD : 96.629		COUNT DATE: 5-SEP-2009 12:00:21 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.949E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.949E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 5.08386 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B132.CNF;386 BKG DATE : 30-AUG-2009 EFF FILE : W132.CNF;119 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	290.000	284.157	2.000	1.4142	100.0000	1.04E+00	1.87E-01	3.51E-02	1.20E-02	1.22E-01
U232	5302.100	1278.000	1272.000	6.000	2.4495	100.0000	4.66E+00	6.86E-01	5.27E-02	2.09E-02	2.57E-01
U-235	4391.000	10.000	8.000	2.000	1.4142	80.90000	3.62E-02	3.11E-02	4.33E-02	1.49E-02	3.07E-02
U-238	4184.730	268.000	268.000	0.000	0.0000	100.0000	9.81E-01	1.78E-01	1.10E-02	0.00E+00	1.17E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784
SAMPLE DATE : 20-AUG-2009 00:00:00

SAMPLE ID : S0235782012_UU
SAMPLE QTY: 0.508 G

DETECTOR NUMBER :76229
AVERAGE %EFFICIENCY :24.4492
% YIELD : 95.897

COUNT DATE: 5-SEP-2009 12:00:23
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.958E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.958E+00

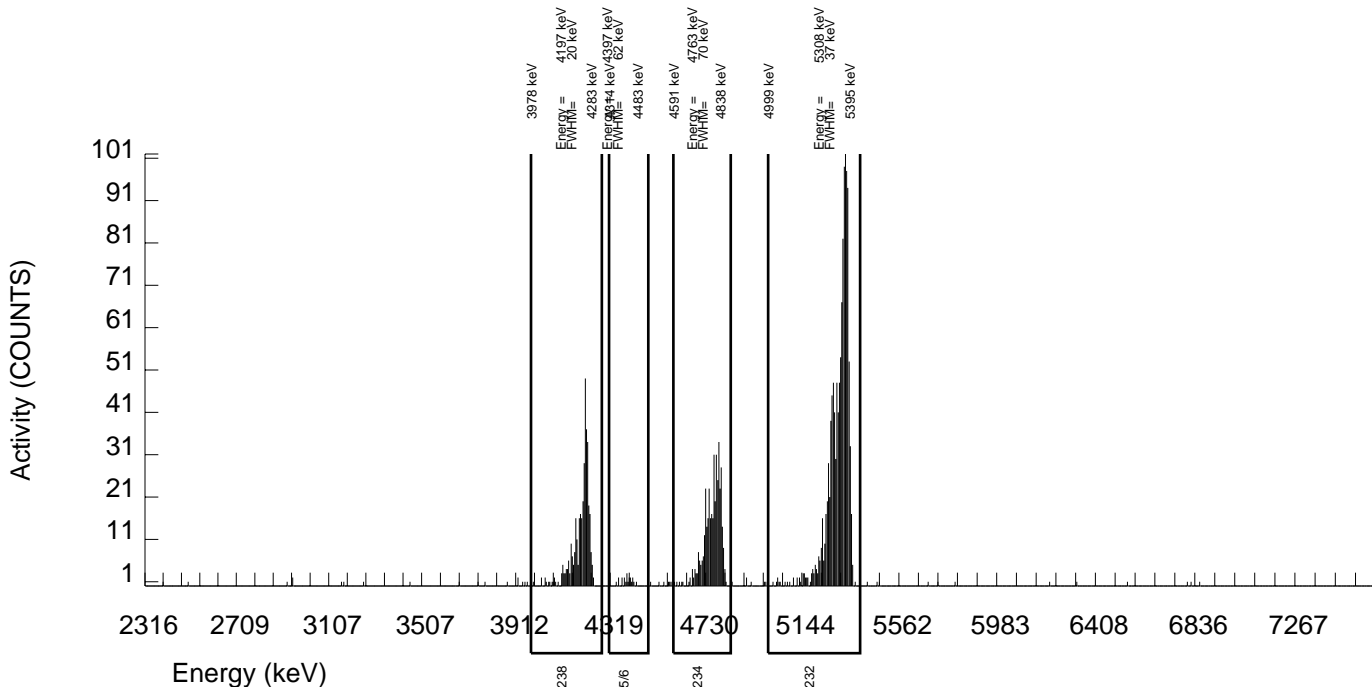
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.26122 dpm
RESULTS : 5.04536 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B133.CNF;378
BKG DATE : 30-AUG-2009
EFF FILE : W133.CNF;111
CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	414.000	404.275	6.000	2.4495	100.0000	1.53E+00	2.58E-01	5.44E-02	2.16E-02	1.51E-01
U232	5302.100	1237.000	1233.000	4.000	2.0000	100.0000	4.67E+00	6.90E-01	4.66E-02	1.76E-02	2.61E-01
U-235	4391.000	21.000	20.000	1.000	1.0000	80.90000	9.35E-02	4.48E-02	3.58E-02	1.09E-02	4.30E-02
U-238	4184.730	376.000	375.000	1.000	1.0000	100.0000	1.42E+00	2.42E-01	2.89E-02	8.80E-03	1.44E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



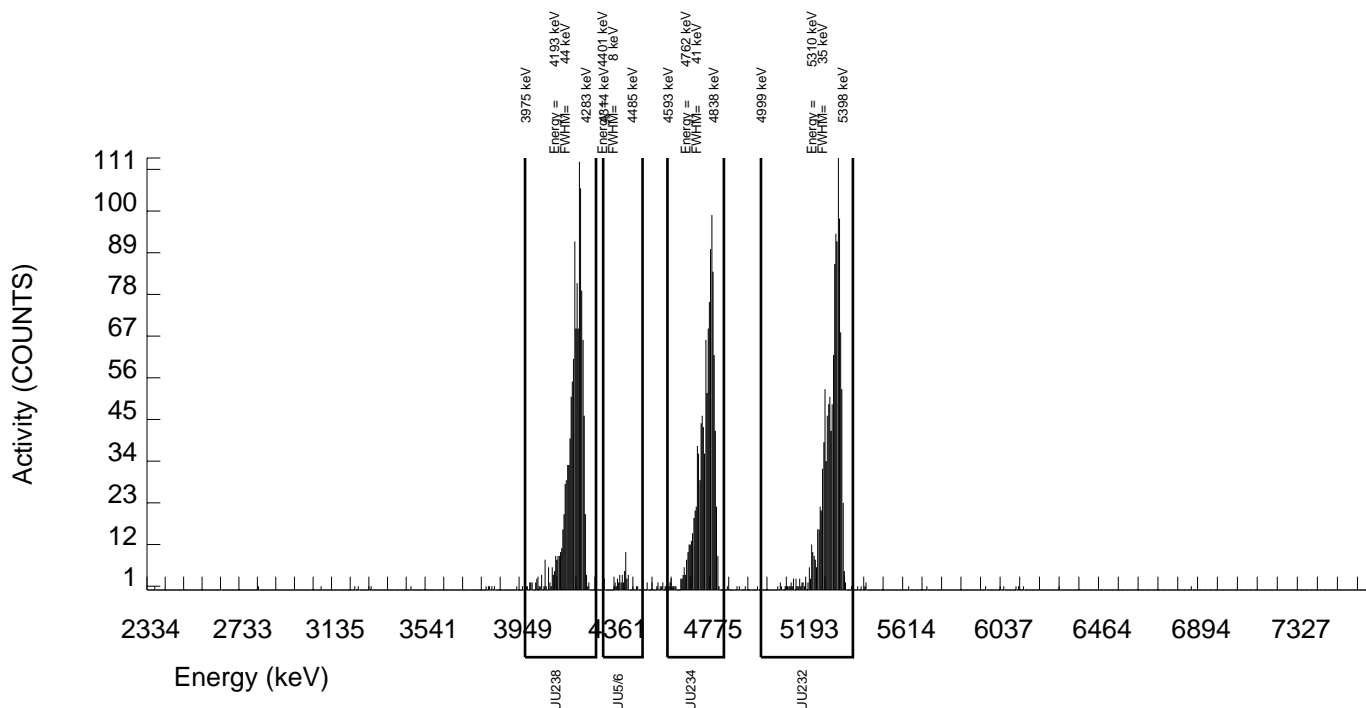
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782013_UU SAMPLE QTY: 0.502 G	
DETECTOR NUMBER :76230 AVERAGE %EFFICIENCY :24.4472 % YIELD : 96.294		COUNT DATE: 5-SEP-2009 12:00:26 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.018E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.018E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 5.06622 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B134.CNF;377 BKG DATE : 30-AUG-2009 EFF FILE : W134.CNF;115 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	1111.000	1079.259	28.000	5.2915	100.0000	4.11E+00	6.18E-01	1.05E-01	4.69E-02	2.52E-01
U232	5302.100	1255.000	1238.000	17.000	4.1231	100.0000	4.72E+00	7.00E-01	8.46E-02	3.66E-02	2.67E-01
U-235	4391.000	50.000	43.000	7.000	2.6458	80.90000	2.03E-01	7.50E-02	7.21E-02	2.90E-02	6.97E-02
U-238	4184.730	1223.000	1213.000	10.000	3.1623	100.0000	4.62E+00	6.86E-01	6.75E-02	2.80E-02	2.62E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



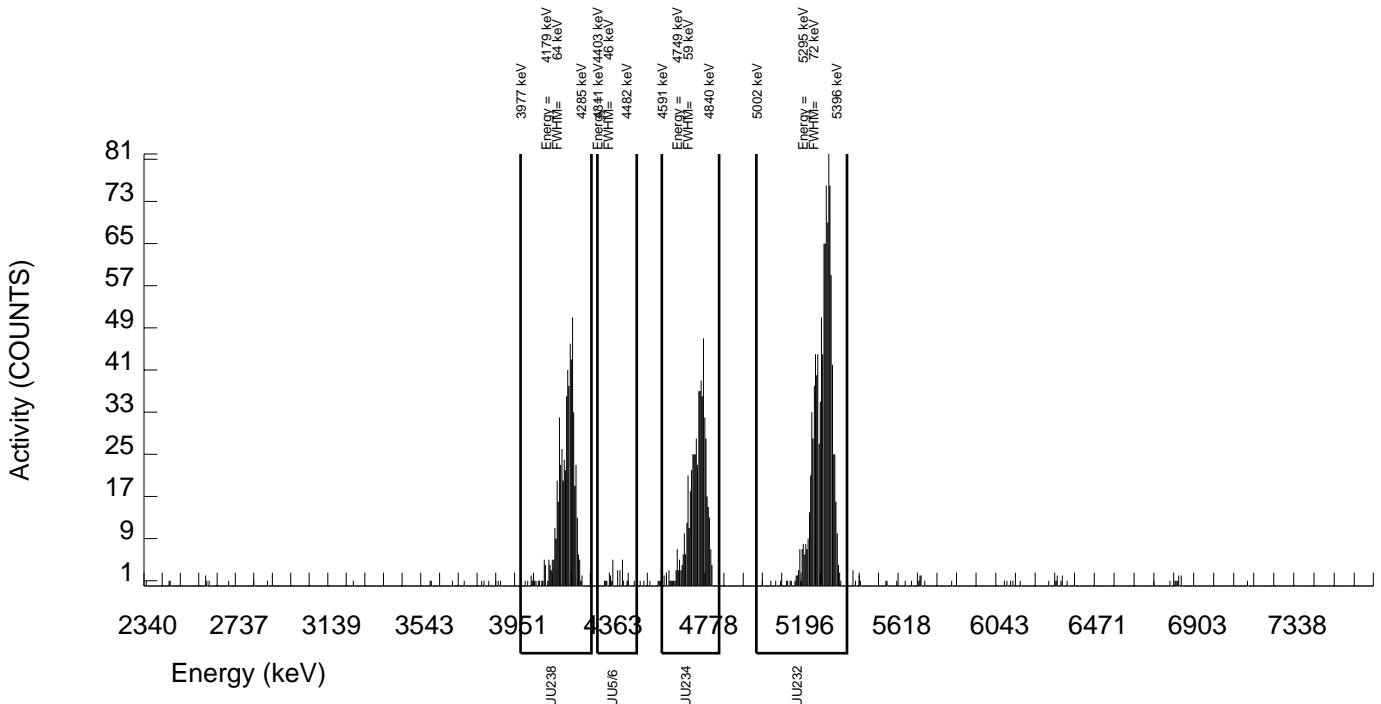
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782014_UU SAMPLE QTY: 0.502 G	
DETECTOR NUMBER :64270 AVERAGE %EFFICIENCY :25.4688 % YIELD : 81.605		COUNT DATE: 5-SEP-2009 12:00:28 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.018E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 5.018E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 4.29344 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B135.CNF;389 BKG DATE : 30-AUG-2009 EFF FILE : W135.CNF;126 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	583.000	573.698	6.000	2.4495	100.0000	2.48E+00	3.99E-01	6.22E-02	2.46E-02	2.05E-01
U232	5302.100	1103.000	1093.000	10.000	3.1623	100.0000	4.72E+00	7.12E-01	7.65E-02	3.18E-02	2.82E-01
U-235	4391.000	26.000	24.000	2.000	1.4142	80.90000	1.28E-01	5.81E-02	5.11E-02	1.76E-02	5.53E-02
U-238	4184.730	605.000	603.000	2.000	1.4142	100.0000	2.60E+00	4.16E-01	4.14E-02	1.42E-02	2.08E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784
SAMPLE DATE : 21-AUG-2009 00:00:00

SAMPLE ID : S0235782016_UU
SAMPLE QTY: 0.507 G

DETECTOR NUMBER :68549
AVERAGE %EFFICIENCY :24.7600
% YIELD : 93.157

COUNT DATE: 5-SEP-2009 12:00:31
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.968E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.968E+00

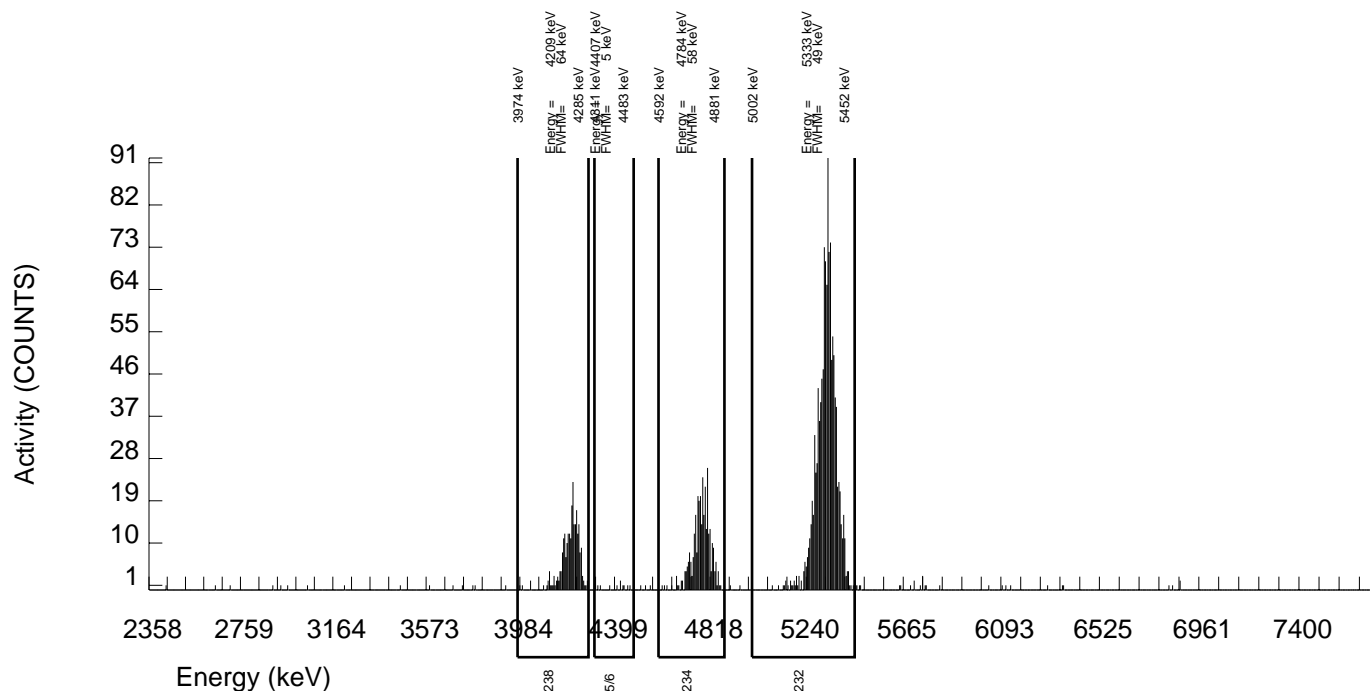
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.26108 dpm
RESULTS : 4.90108 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B136.CNF;388
BKG DATE : 30-AUG-2009
EFF FILE : W136.CNF;127
CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	331.000	317.335	10.000	3.1623	100.0000	1.22E+00	2.18E-01	6.82E-02	2.83E-02	1.39E-01
U232	5302.100	1221.000	1213.000	8.000	2.8284	100.0000	4.67E+00	6.94E-01	6.23E-02	2.54E-02	2.65E-01
U-235	4391.000	11.000	8.000	3.000	1.7321	80.90000	3.81E-02	3.53E-02	5.27E-02	1.92E-02	3.49E-02
U-238	4184.730	254.000	252.000	2.000	1.4142	100.0000	9.71E-01	1.80E-01	3.69E-02	1.27E-02	1.21E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784
SAMPLE DATE : 21-AUG-2009 00:00:00

SAMPLE ID : S0235782017_UU
SAMPLE QTY: 0.508 G

DETECTOR NUMBER :64288
AVERAGE %EFFICIENCY :25.5523
% YIELD : 56.855

COUNT DATE: 5-SEP-2009 12:42:49
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.958E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.958E+00

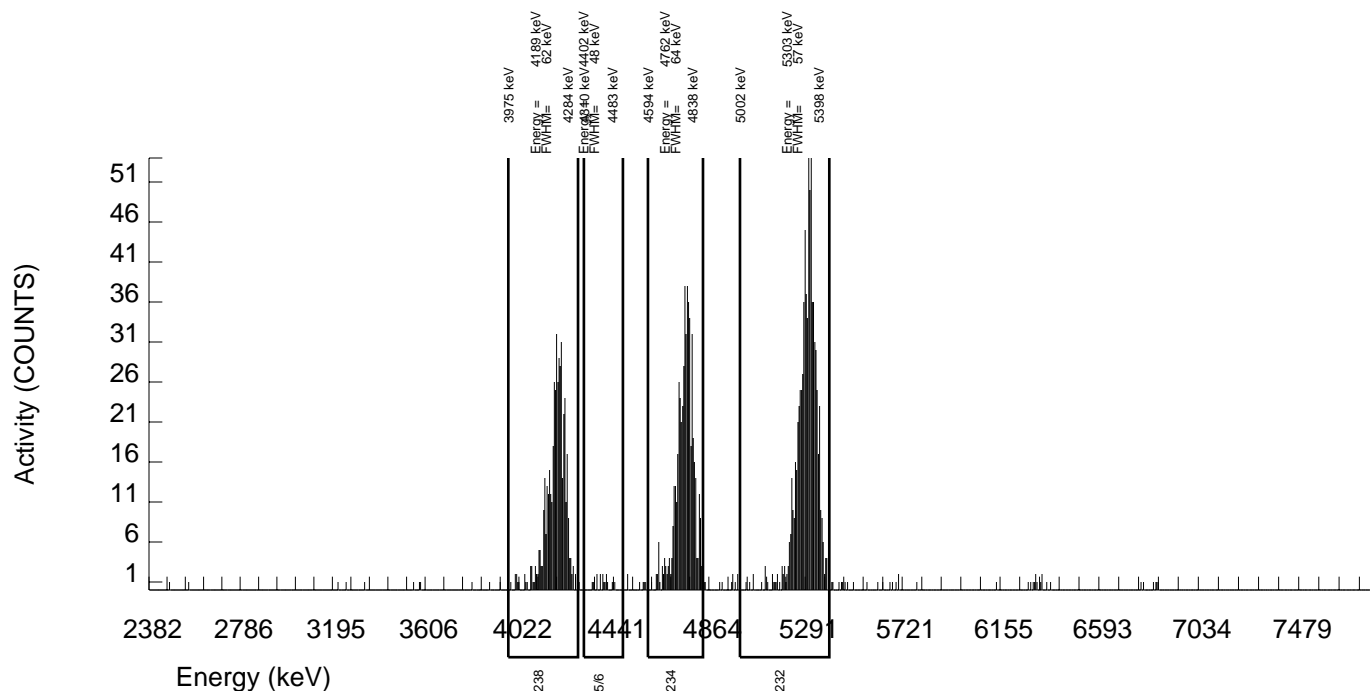
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.26108 dpm
RESULTS : 2.99119 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B137.CNF;343
BKG DATE : 30-AUG-2009
EFF FILE : W137.CNF;94
CAL DATE : 18-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	532.000	526.692	3.000	1.7321	100.0000	3.21E+00	5.39E-01	6.75E-02	2.46E-02	2.76E-01
U232	5302.100	772.000	764.000	8.000	2.8284	100.0000	4.67E+00	7.51E-01	9.87E-02	4.02E-02	3.34E-01
U-235	4391.000	16.000	15.000	1.000	1.0000	80.90000	1.13E-01	6.31E-02	5.77E-02	1.76E-02	6.10E-02
U-238	4184.730	463.000	458.000	5.000	2.2361	100.0000	2.80E+00	4.79E-01	8.18E-02	3.18E-02	2.59E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784
SAMPLE DATE : 21-AUG-2009 00:00:00

SAMPLE ID : S0235782018_UU
SAMPLE QTY: 0.507 G

DETECTOR NUMBER :65877
AVERAGE %EFFICIENCY :25.5083
% YIELD : 66.048

COUNT DATE: 5-SEP-2009 12:42:50
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.968E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.968E+00

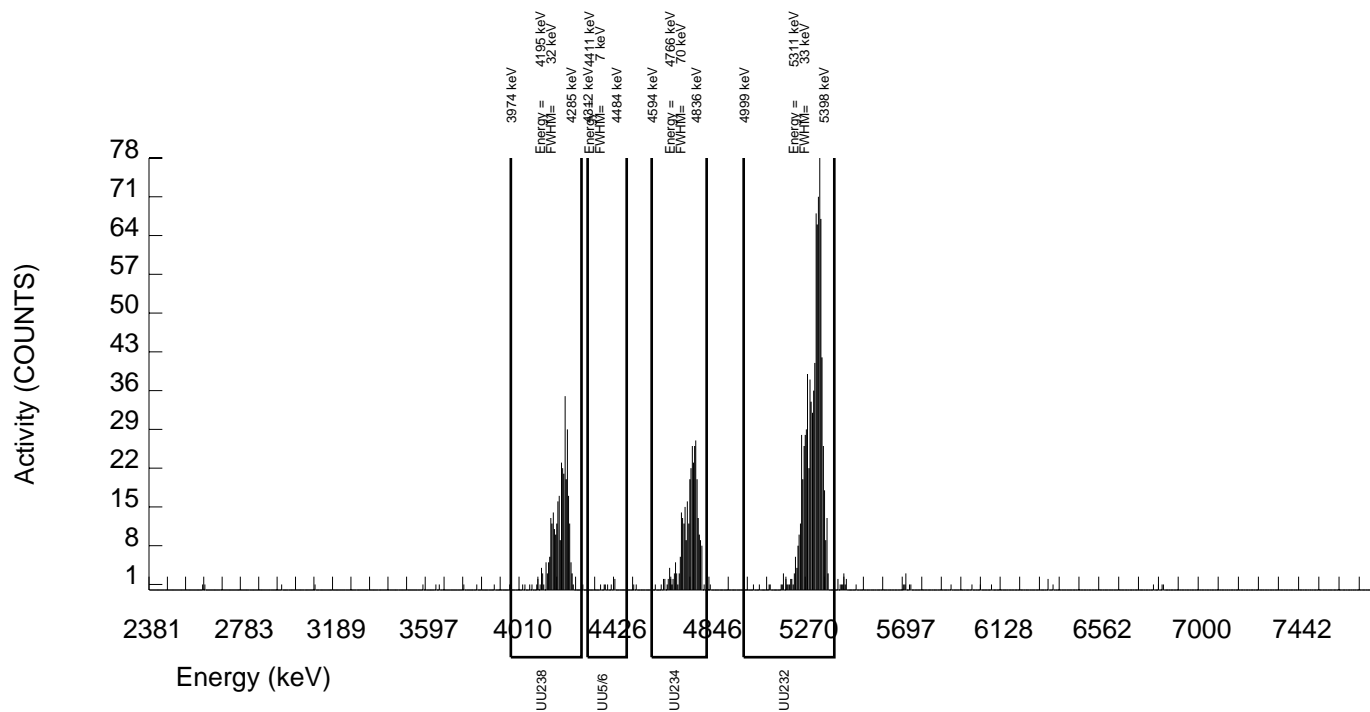
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.26108 dpm
RESULTS : 3.47483 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B138.CNF;348
BKG DATE : 30-AUG-2009
EFF FILE : W138.CNF;92
CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	336.000	319.323	14.000	3.7417	100.0000	1.68E+00	3.07E-01	1.08E-01	4.59E-02	1.93E-01
U232	5302.100	896.000	886.000	10.000	3.1623	100.0000	4.67E+00	7.32E-01	9.35E-02	3.88E-02	3.11E-01
U-235	4391.000	8.000	5.000	3.000	1.7321	80.90000	3.26E-02	4.26E-02	7.21E-02	2.63E-02	4.24E-02
U-238	4184.730	338.000	329.000	9.000	3.0000	100.0000	1.73E+00	3.12E-01	8.94E-02	3.68E-02	1.93E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



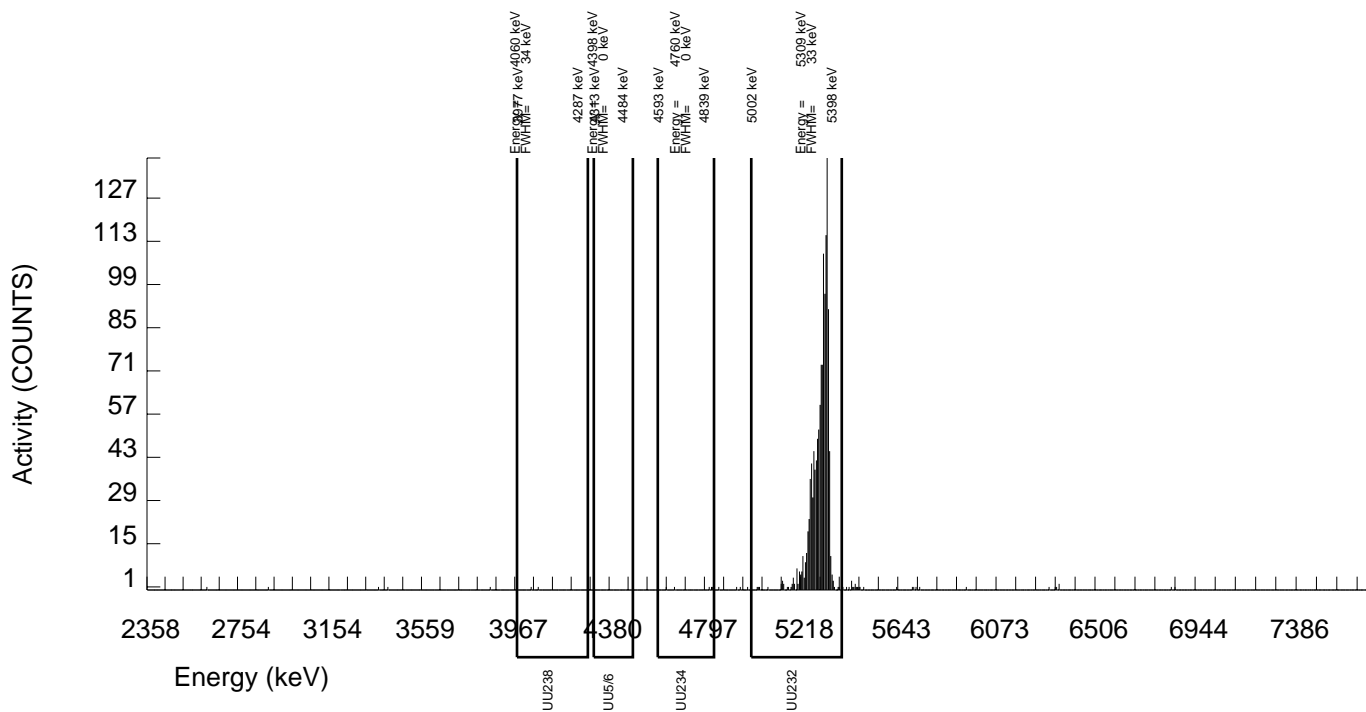
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 1-SEP-2009 00:00:00.		SAMPLE ID : S1201914492_UU SAMPLE QTY: 0.509 G	
DETECTOR NUMBER :76231 AVERAGE %EFFICIENCY :24.9377 % YIELD : 97.526		COUNT DATE: 5-SEP-2009 12:42:55 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.949E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.949E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25955 dpm RESULTS : 5.12944 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B139.CNF;345 BKG DATE : 30-AUG-2009 EFF FILE : W139.CNF;92 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	5.000	-6.864	8.000	2.8284	100.0000	-2.50E-02	2.16E-02	5.88E-02	2.39E-02	2.16E-02
U232	5302.100	1284.000	1279.000	5.000	2.2361	100.0000	4.65E+00	6.97E-01	4.88E-02	1.89E-02	2.56E-01
U-235	4391.000	0.000	0.000	0.000	0.0000	80.90000	0.00E+00	8.84E-03	1.35E-02	0.00E+00	8.82E-03
U-238	4184.730	2.000	-2.000	4.000	2.0000	100.0000	-7.28E-03	1.75E-02	4.48E-02	1.69E-02	1.75E-02

NOTE: Corrections made to U-3/4 net area due to tracer impurity



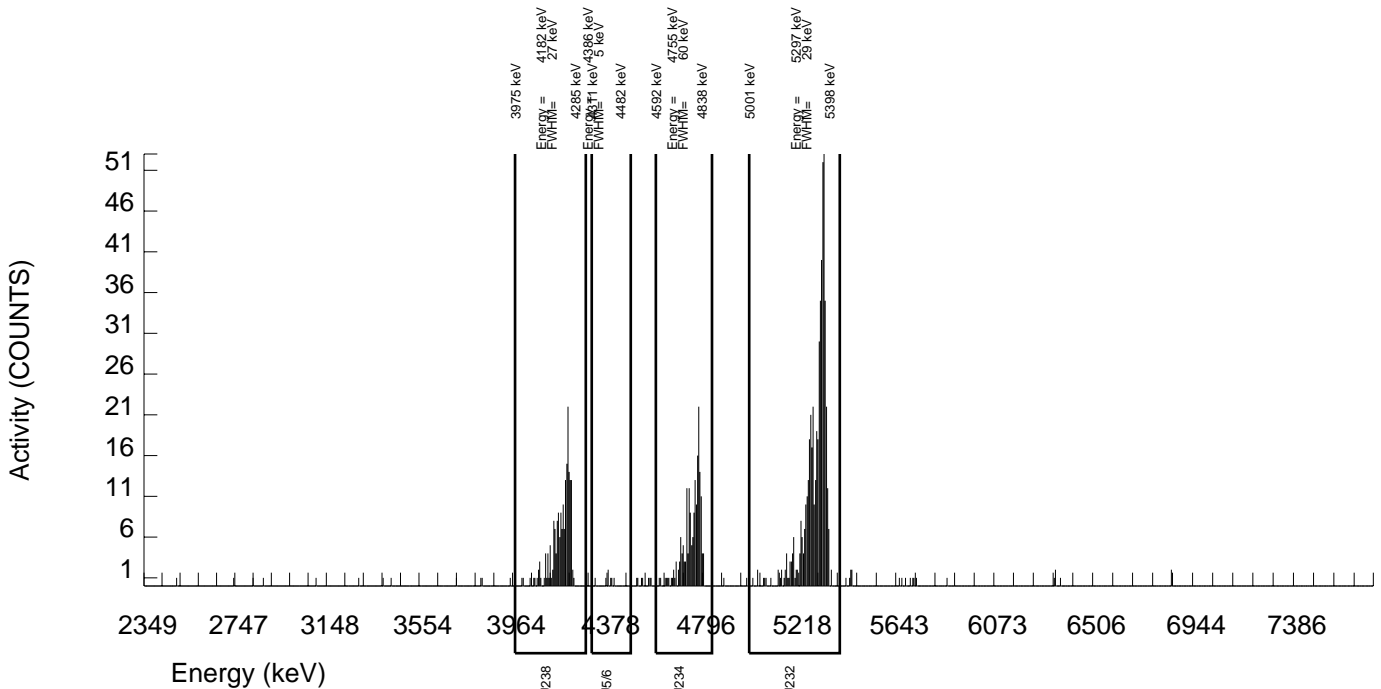
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 21-AUG-2009 00:00:00		SAMPLE ID : S1201914493_UU SAMPLE QTY: 0.504 G	
DETECTOR NUMBER :78771 AVERAGE %EFFICIENCY :25.4523 % YIELD : 39.372		COUNT DATE: 5-SEP-2009 12:42:56 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.998E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.998E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26108 dpm RESULTS : 2.07141 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B140.CNF;345 BKG DATE : 30-AUG-2009 EFF FILE : W140.CNF;97 CAL DATE : 17-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	191.000	181.408	8.000	2.8284	100.0000	1.62E+00	3.47E-01	1.44E-01	5.87E-02	2.46E-01
U232	5302.100	531.000	527.000	4.000	2.0000	100.0000	4.70E+00	8.20E-01	1.10E-01	4.15E-02	4.04E-01
U-235	4391.000	7.000	6.000	1.000	1.0000	80.90000	6.61E-02	6.19E-02	8.44E-02	2.56E-02	6.11E-02
U-238	4184.730	199.000	196.000	3.000	1.7321	100.0000	1.75E+00	3.63E-01	9.86E-02	3.59E-02	2.48E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



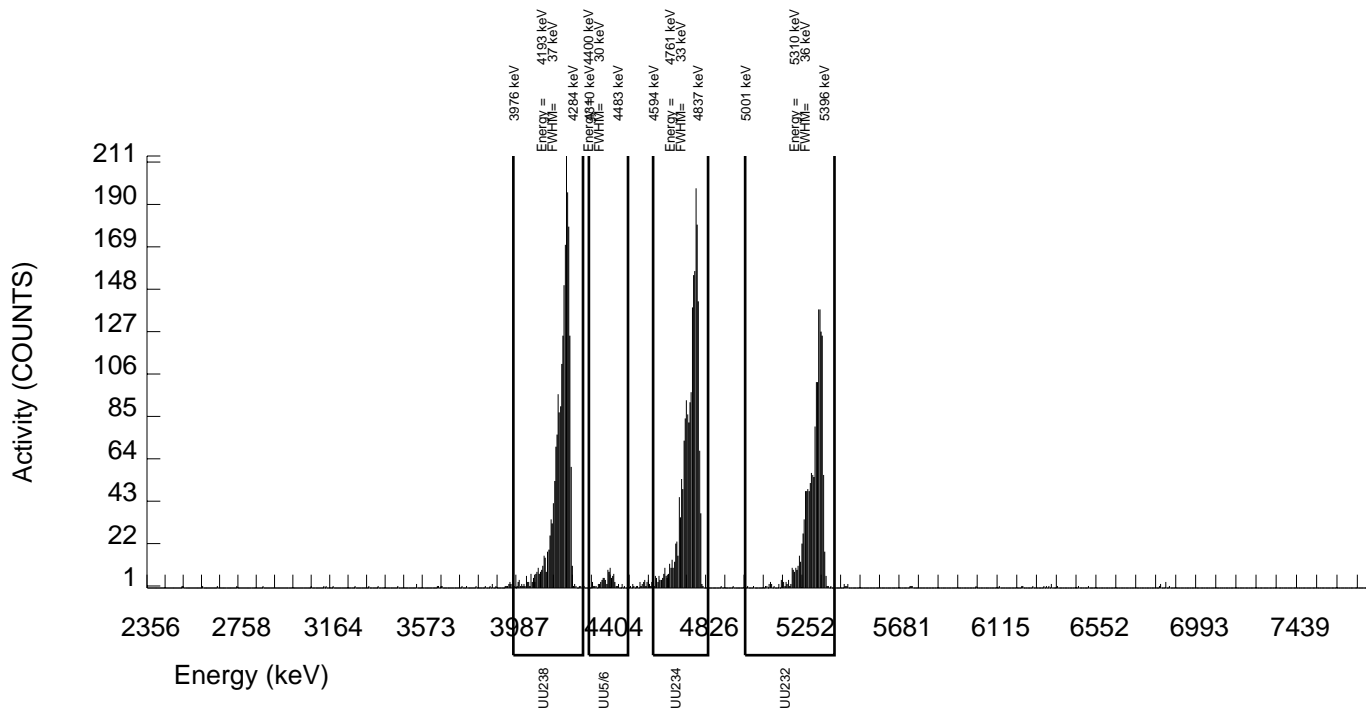
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784 SAMPLE DATE : 21-AUG-2009 00:00:00		SAMPLE ID : S1201914494_UU SAMPLE QTY: 0.506 G	
DETECTOR NUMBER :72531 AVERAGE %EFFICIENCY :29.7937 % YIELD : 95.670		COUNT DATE: 4-SEP-2009 14:41:52 ELAPSED LIVE TIME(SEC): 59999.99 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.978E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/G : 4.978E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26108 dpm RESULTS : 5.03325 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B011.CNF;1062 BKG DATE : 30-AUG-2009 EFF FILE : W011.CNF;301 CAL DATE : 4-SEP-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	2062.000	2048.471	9.000	3.0000	100.0000	6.40E+00	9.07E-01	5.30E-02	2.18E-02	2.78E-01
U232	5302.100	1512.000	1499.000	13.000	3.6056	100.0000	4.68E+00	6.76E-01	6.18E-02	2.62E-02	2.39E-01
U-235	4391.000	88.000	84.000	4.000	2.0000	80.90000	3.24E-01	8.47E-02	4.75E-02	1.80E-02	7.26E-02
U-238	4184.730	2137.000	2132.000	5.000	2.2361	100.0000	6.66E+00	9.42E-01	4.19E-02	1.62E-02	2.83E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 898784
SAMPLE DATE : 1-SEP-2009 00:00:00.

SAMPLE ID : S1201914495_UU
SAMPLE QTY: 0.509 G

DETECTOR NUMBER :67594
AVERAGE %EFFICIENCY :29.9482
% YIELD : 96.890

COUNT DATE: 4-SEP-2009 14:41:52
ELAPSED LIVE TIME(SEC): 59999.99
ANALYST :JXD2

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.949E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/G : 4.949E+00

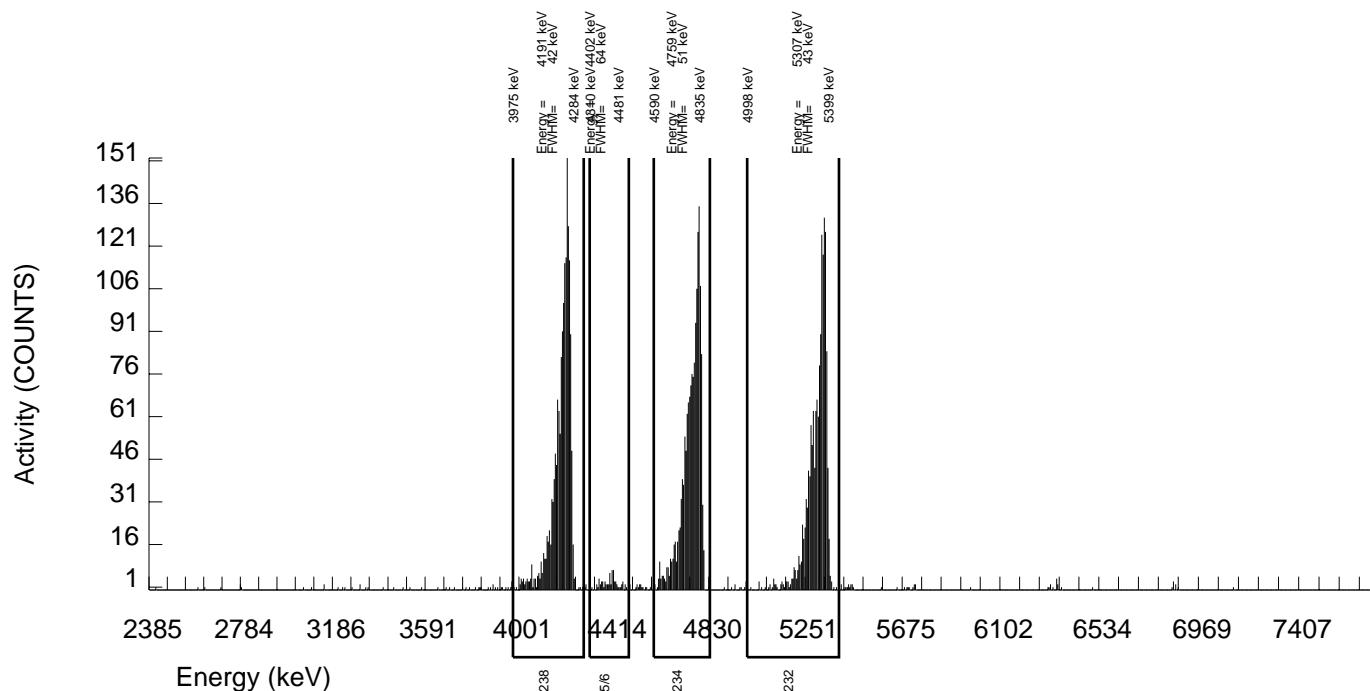
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.25956 dpm
RESULTS : 5.09600 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B012.CNF;1064
BKG DATE : 30-AUG-2009
EFF FILE : W012.CNF;302
CAL DATE : 4-SEP-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/G	TPU 1.96-SIGMA	MDA pCi/G	Lc pCi/G	UNC pCi/G
U-3/4	4763.020	1600.000	1591.389	4.000	2.0000	100.0000	4.85E+00	6.97E-01	3.75E-02	1.42E-02	2.39E-01
U232	5302.100	1543.000	1526.000	17.000	4.1231	100.0000	4.65E+00	6.70E-01	6.77E-02	2.93E-02	2.36E-01
U-235	4391.000	70.000	68.000	2.000	1.4142	80.90000	2.56E-01	7.16E-02	3.61E-02	1.24E-02	6.27E-02
U-238	4184.730	1639.000	1633.000	6.000	2.4495	100.0000	4.98E+00	7.14E-01	4.39E-02	1.74E-02	2.42E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



Radiochemistry Batch Checklist, Rev 9

Batch# 903039 Product: U Date: 9/17/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required)			N/A
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, 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/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
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 line outs initialed and dated.	✓		
No transcription errors are apparent.			
Aux data is correct.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.			N/A
Batch non-conformances second reviewed and disposition verified to be completed.			N/A
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: _____

J. M. I. - 9/17/09
G. M. D. 9/17/09

Secondary Review Performed By: _____

9/12 9/18
KERR

Uranium Que Sheet

15-SEP-09

Batch #: 903039 Analyst: JXD2 First Client Due Date: 18-SEP-09 Internal Due Date: 12-SEP-09
 Tracer Isotope: U-232 Tracer Code: 1283-E Expiration Date: 01/15/10 Vol: 0.1
 LCS Isotope: U-238 LCS Code: 1163-G Expiration Date: 04/16/10 Vol: 0.1
 Spike Isotope: U-238 Spike Code: _____ Expiration Date: _____ Vol: _____
 Prep Date: 09/15/09 Initials: gwd Pipet ID: 297058 Balance ID: 11250207

Witness: [Signature] 9/15/09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Aliquot (g)	U Det #
235782015-2	EB082009-SO2	SAMPLE		.03 pCi/L	WATER	KERR003	20-AUG-09	1	1	0.800	161
1201924684-1	MB for batch 903039	MB		.03 pCi/L	WATER	QC ACCOUNT		2	2	0.800	162
1201924687-1	LCS for batch 903039	LCS		.03 pCi/L	WATER	QC ACCOUNT		3	3	0.800	163
1201924688-1	LCS for batch 903039	LCS		.03 pCi/L	WATER	QC ACCOUNT	20-AUG-09 20-SEP-09	4	4	0.800	164

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

Solid Sample Dissolution by: LEACH or DIGESTION
 Circle One

Data Reviewed By: [Signature] 9/17/09

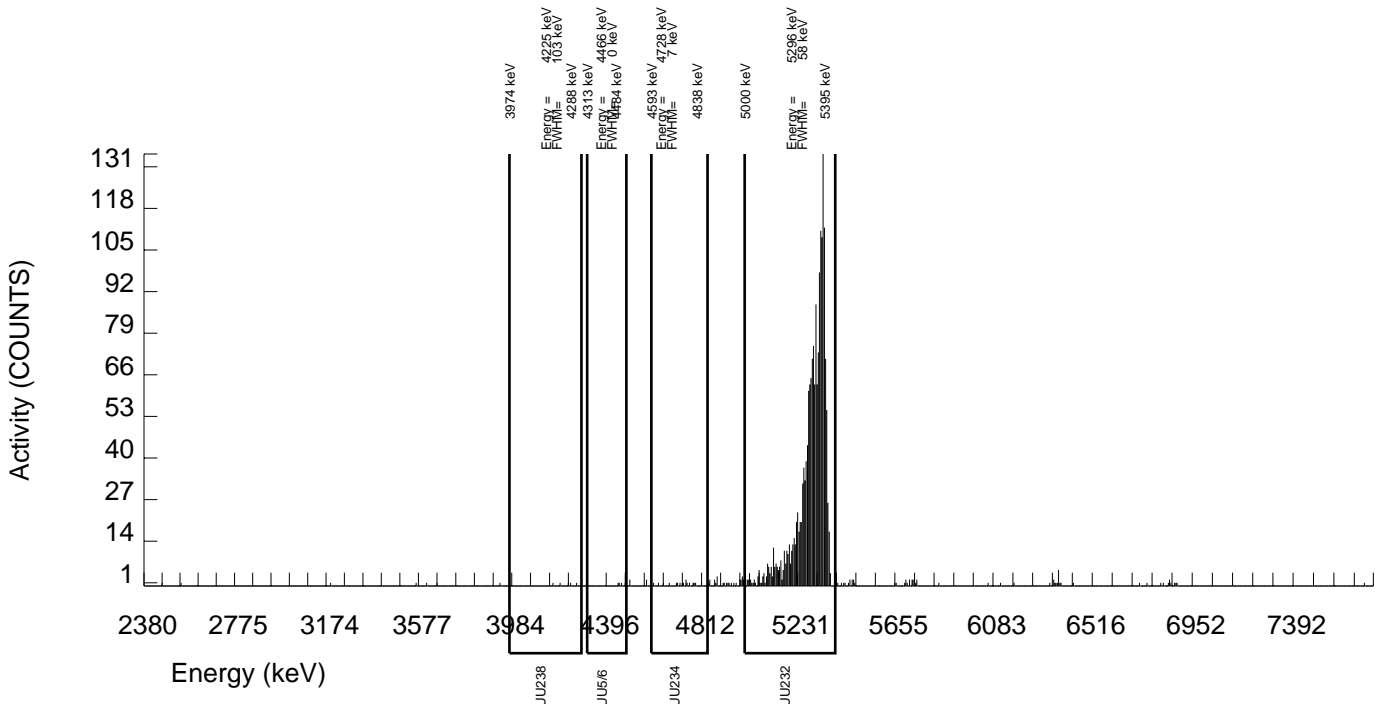
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 903039 SAMPLE DATE : 20-AUG-2009 00:00:00		SAMPLE ID : S0235782015_UU SAMPLE QTY: 0.800 L	
DETECTOR NUMBER :70321 AVERAGE %EFFICIENCY :37.3131 % YIELD : 94.765		COUNT DATE:16-SEP-2009 08:19:08 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.26122 dpm RESULTS : 4.98581 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B161.CNF;124 BKG DATE : 13-SEP-2009 EFF FILE : W161.CNF;43 CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
U-3/4	4763.020	17.000	8.381	3.000	1.7321	100.0000	1.33E-02	1.20E-02	1.76E-02	6.42E-03	1.18E-02
U232	5302.100	1881.000	1859.000	22.000	4.6904	100.0000	2.96E+00	4.15E-01	3.96E-02	1.74E-02	1.36E-01
U-235	4391.000	4.000	3.000	1.000	1.0000	80.90000	5.90E-03	8.66E-03	1.51E-02	4.58E-03	8.63E-03
U-238	4184.730	5.000	2.000	3.000	1.7321	100.0000	3.18E-03	8.84E-03	1.76E-02	6.42E-03	8.83E-03

NOTE: Corrections made to U-3/4 net area due to tracer impurity



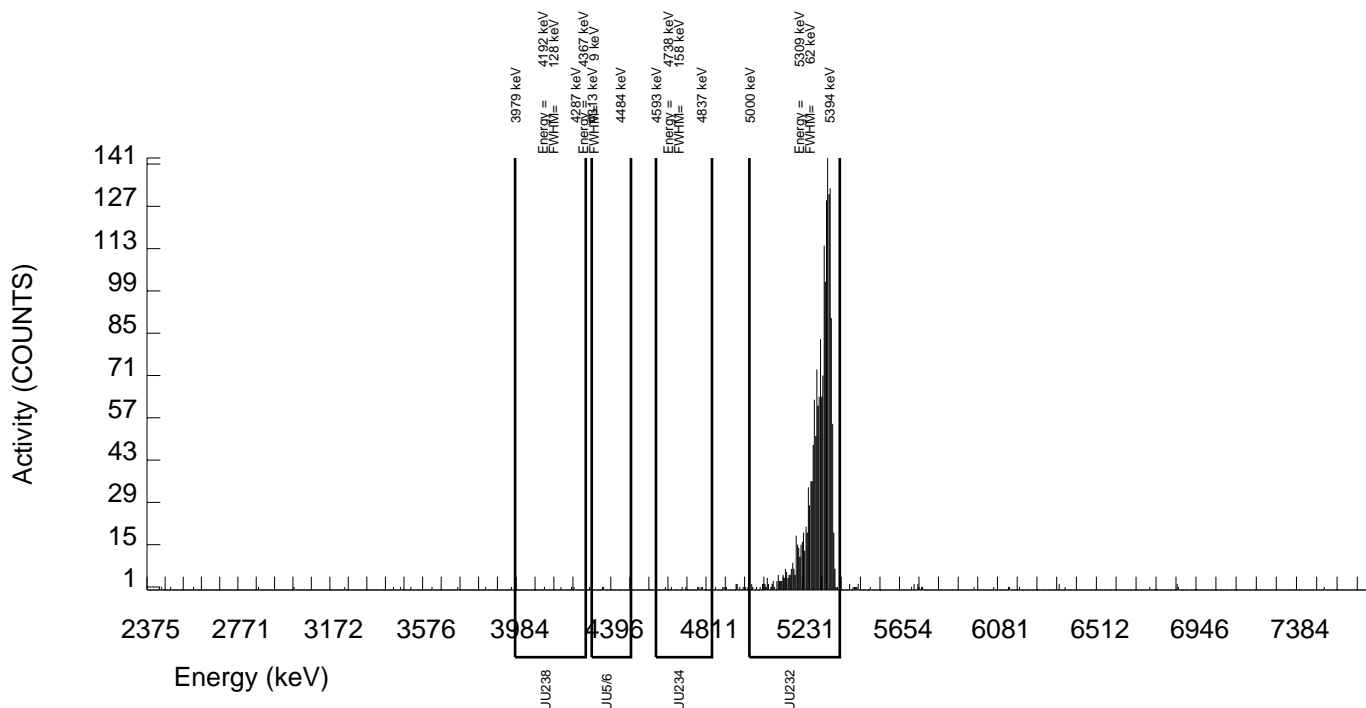
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 903039 SAMPLE DATE : 15-SEP-2009 00:00:00		SAMPLE ID : S1201924684_UU SAMPLE QTY: 0.800 L	
DETECTOR NUMBER :70323 AVERAGE %EFFICIENCY :37.2396 % YIELD : 97.097		COUNT DATE:16-SEP-2009 08:19:09 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25762 dpm RESULTS : 5.10501 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B162.CNF;126 BKG DATE : 13-SEP-2009 EFF FILE : W162.CNF;52 CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
U-3/4	4763.020	8.000	-0.745	3.000	1.7321	100.0000	-1.16E-03	7.00E-03	1.72E-02	6.27E-03	7.00E-03
U232	5302.100	1906.000	1901.000	5.000	2.2361	100.0000	2.96E+00	4.13E-01	2.09E-02	8.10E-03	1.33E-01
U-235	4391.000	2.000	2.000	0.000	0.0000	80.90000	3.85E-03	5.36E-03	5.77E-03	0.00E+00	5.34E-03
U-238	4184.730	4.000	1.000	3.000	1.7321	100.0000	1.56E-03	8.08E-03	1.72E-02	6.27E-03	8.08E-03

NOTE: Corrections made to U-3/4 net area due to tracer impurity



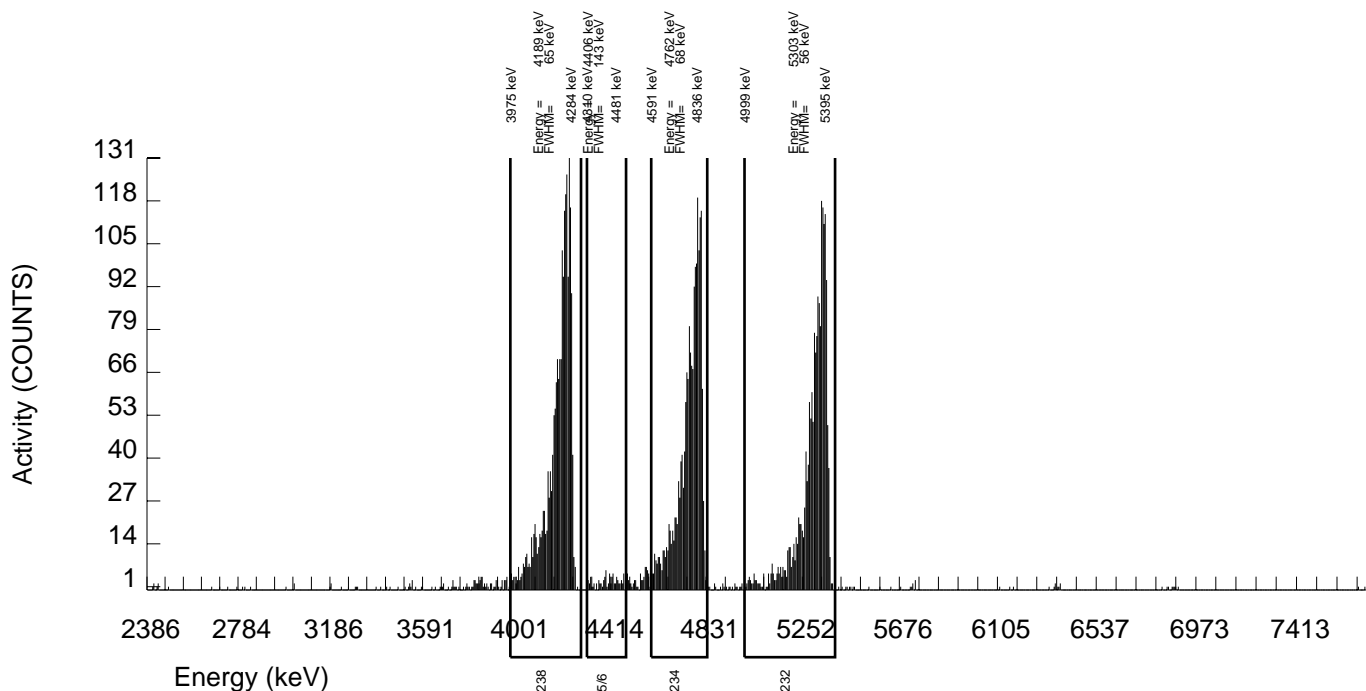
GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 903039 SAMPLE DATE : 15-SEP-2009 00:00:00		SAMPLE ID : S1201924687_UU SAMPLE QTY: 0.800 L	
DETECTOR NUMBER :70324 AVERAGE %EFFICIENCY :37.8496 % YIELD : 90.406		COUNT DATE:16-SEP-2009 08:19:11 ELAPSED LIVE TIME(SEC): 60000.00 ANALYST :JXD2	
MS/MSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	LCS/LCSD ID : 1163-G ISOTOPE : U-238 PCI/L : 3.149E+00	TRACER ID : 1283-E ISOTOPE : U232 NOMINAL : 5.25762 dpm RESULTS : 4.75322 dpm	LIB FILE : ENV_ALPHA_UU.N BKG FILE : B163.CNF;127 BKG DATE : 13-SEP-2009 EFF FILE : W163.CNF;40 CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
U-3/4	4763.020	1817.000	1791.563	20.000	4.4721	100.0000	2.95E+00	4.15E-01	3.92E-02	1.71E-02	1.38E-01
U232	5302.100	1824.000	1799.000	25.000	5.0000	100.0000	2.96E+00	4.16E-01	4.32E-02	1.91E-02	1.39E-01
U-235	4391.000	81.000	77.000	4.000	2.0000	80.90000	1.57E-01	4.22E-02	2.50E-02	9.46E-03	3.68E-02
U-238	4184.730	2010.000	2001.000	9.000	3.0000	100.0000	3.29E+00	4.60E-01	2.79E-02	1.15E-02	1.45E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

BATCH NUMBER: 903039
SAMPLE DATE : 15-SEP-2009 00:00:00

SAMPLE ID : S1201924688_UU
SAMPLE QTY: 0.800 L

DETECTOR NUMBER :70325
AVERAGE %EFFICIENCY :37.9524
% YIELD : 94.422

COUNT DATE:16-SEP-2009 08:19:15
ELAPSED LIVE TIME(SEC): 60000.00
ANALYST :JXD2

MS/MSD
ID : 1163-G
ISOTOPE : U-238
PCI/L : 3.149E+00

LCS/LCSD
ID : 1163-G
ISOTOPE : U-238
PCI/L : 3.149E+00

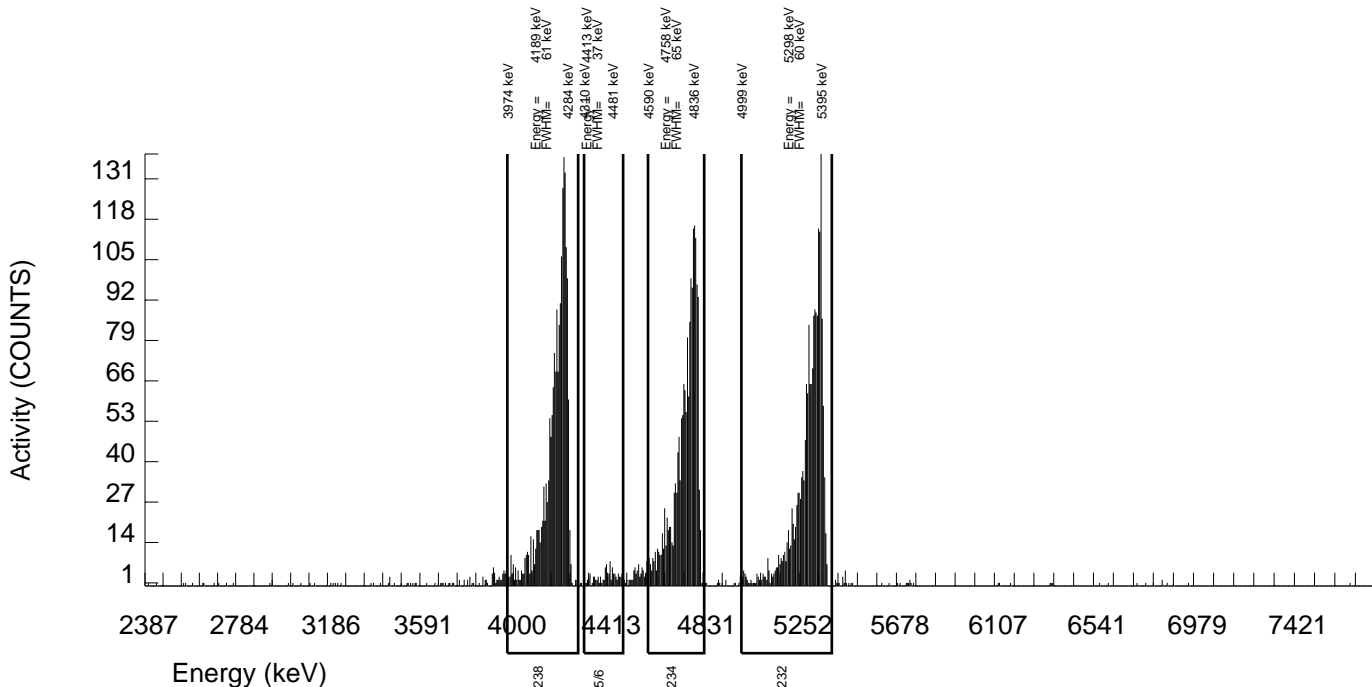
TRACER
ID : 1283-E
ISOTOPE : U232
NOMINAL : 5.25762 dpm
RESULTS : 4.96433 dpm

LIB FILE : ENV_ALPHA_UU.N
BKG FILE : B164.CNF;124
BKG DATE : 13-SEP-2009
EFF FILE : W164.CNF;40
CAL DATE : 24-AUG-2009

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	GROSS AREA	NET AREA	BKG AREA	BKG Sg	%ABUN	ACTIVITY pCi/L	TPU 1.96-SIGMA	MDA pCi/L	Lc pCi/L	UNC pCi/L
U-3/4	4763.020	1797.000	1787.306	4.000	2.0000	100.0000	2.81E+00	3.93E-01	1.93E-02	7.31E-03	1.30E-01
U232	5302.100	1895.000	1884.000	11.000	3.3166	100.0000	2.96E+00	4.13E-01	2.90E-02	1.21E-02	1.34E-01
U-235	4391.000	97.000	95.000	2.000	1.4142	80.90000	1.85E-01	4.50E-02	1.86E-02	6.39E-03	3.79E-02
U-238	4184.730	1920.000	1913.000	7.000	2.6458	100.0000	3.01E+00	4.19E-01	2.41E-02	9.67E-03	1.35E-01

NOTE: Corrections made to U-3/4 net area due to tracer impurity



RADIUM 228

Radiochemistry Batch Checklist, Rev 9

Batch# 898628 Product: 129228 Date: 9/3/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required)			NA
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%. Or meets the client's required RER acceptance criteria.	✓		See case narrative
Tracer yield is 15-125% . Carrier yield 25-125%. Or meets the client's contract acceptance criteria.	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.	✓		
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.			NA
Batch non-conformances second reviewed and disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By:

[Signature] 9/18
KERK

Secondary Review Performed By:

[Signature] 9/3/09

Radium-228 Que Sheet

Batch #: 898628
 Spike Isotope: Radium-228
 LCS Isotope: Radium-228
 Tracer Isotope: Barium-133
 Prep Date: 8-31-09
 Analyst: JXC5
 Spike Code: ~~0503-0~~
 LCS Code: 0503-10
 Tracer Code: 0112-5
 Initials: MS
 First Client Due Date: 09/18/2009
 Expiration Date: 9-13-09
 Expiration Date: 2-17-10
 Pipet ID: 2760953
 Internal Due Date: 09/07/2009
 Ac-228 Ingrow: 9-1-09 / 0940
 Separation Date/Time: 9-3-09 / 0915
 Witness: gn 8/31/09
 Balance ID: 1955160

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collect Date & Time	Pos. #	Vol (mL)	Det #	Ba Yield (%)	Gamma Det. #
235208014-1	EB081909-SO1	SAMPLE		3 pCi/L	WATER	KERR003	19-AUG-09 02:00 PM	1	2.00	8A	77.87	
235782015-1	EB082009-SO2	SAMPLE		3 pCi/L	WATER	KERR003	20-AUG-09 09:00 AM	2	2.00	8C	73.47	
235860015-1	EB082109-SO1	SAMPLE		3 pCi/L	WATER	KERR003	21-AUG-09 01:26 PM	3	2.00	9A	80.59	
1201914015-1	MB for batch 898628	MB		3 pCi/L	WATER	QC ACCOUNT	19-AUG-09 02:00 PM	4	2.00	9B	85.11	
1201914016-1	LCS for batch 898628	LCS		3 pCi/L	WATER	QC ACCOUNT	19-AUG-09 02:00 PM	5	2.00	10B	79.64	
1201914017-1	LCSD for batch 898628	LCSD		3 pCi/L	WATER	QC ACCOUNT	19-AUG-09 02:00 PM	6	2.00	10D	80.52	

MS 9/5/09
 identify ✓

MS 9/5/09

Comments: _____
 Data Reviewed By: Matthew Z...

Radium-228 Liquid

Filename : RA228.XLS
 File type : Excel
 Version # : 1.2.4

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml) : N/A
 Spike Volume Added : N/A

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

Batch : 898628
 Analyst : JXC5
 Prep Date : 8/31/2009

LCS S/N : 0503-B
 LCS Exp Date : 9/13/2009
 LCS Activity (dpm/ml) : 178.78
 LCS Volume Added : 0.10

Procedure Code : GFC28RAL
 Parmname : Radium-228
 Required MDA : 3 pCi/L

Ra-228 Abundance : 1
 Ra-228 Method Uncertainty : 0.1268

Tracer S/N : 0112-J
 Tracer Exp Date : 2/17/2010
 Tracer Volume Added : 0.10

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

Calibration Date : 7/2/2009
 Calibration Due Date : 7/31/2010
 Geometry: CeF on 25mm Filter

Sample Characteristics			Tracer Calculations				Tracer Samp.			
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot L	Sample StDev. L	Tracer Concentration (Ba-133 Ref.) (cpm)	Tracer Count Uncertainty (cpm)	Tracer Concentration (Ba-133 Samp.) (cpm)	Tracer Count Uncertainty (cpm)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)
1	235208014.1	0.2000	1.6007E-05	1.6007E-05	316.3	3.44%	246.3	3.96%	0.1	0.000701
2	235782015.1	0.2000	1.6007E-05	1.6007E-05	316.3	3.44%	232.4	4.10%	0.1	0.000701
3	235860015.1	0.2000	1.6007E-05	1.6007E-05	316.3	3.44%	254.9	3.89%	0.1	0.000701
4	1201914015.1	0.2000	1.6007E-05	1.6007E-05	316.3	3.44%	269.2	3.77%	0.1	0.000701
5	1201914016.1	0.2000	1.6007E-05	1.6007E-05	316.3	3.44%	251.9	3.91%	0.1	0.000701
6	1201914017.1	0.2000	1.6007E-05	1.6007E-05	316.3	3.44%	254.7	3.89%	0.1	0.000701

Count raw Data		Counting		Gross Counts		Beta		Detector Efficiency (cpm/dpm)		Detector Efficiency Error (cpm/dpm)		Weekly Bkg		Separation		Count Start		Ra-228 Decay		Ac-228 Decay		Ac-228 Count Correction		Calculated Sample Recovery %		Sample Recovery Error %	
Pos.	Detector ID	Time (min.)	Alpha	Beta	Alpha	Beta	cpm	(cpm/dpm)	(cpm/dpm)	cpm	Time (min.)	Count	Date/Time	Date/Time	Date/Time	Date/Time	Date/Time	Decay	Decay	Decay	Count	Correction	%	%	Error %	Error %	
1	8A	90	9	94	9	94	1.044	0.6247	0.00816	0.748	500	9/3/2009 9:15	9/3/2009 12:40	0.995	0.679	1.087	0.679	0.995	0.679	1.087	1.087	77.87%	2.80%				
2	8C	90	6	71	6	71	0.789	0.6339	0.00816	0.528	500	9/3/2009 9:15	9/3/2009 12:40	0.995	0.679	1.087	0.679	0.995	0.679	1.087	1.087	73.47%	2.85%				
3	9A	90	6	44	6	44	0.489	0.6496	0.00816	0.378	500	9/3/2009 9:15	9/3/2009 12:40	0.996	0.679	1.087	0.679	0.996	0.679	1.087	1.087	80.59%	2.78%				
4	7A	60	7	31	7	31	0.517	0.6180	0.00816	0.384	500	9/3/2009 9:15	9/3/2009 14:51	0.999	0.530	1.058	0.530	0.999	0.530	1.058	1.058	85.11%	2.74%				
5	7B	60	14	343	14	343	5.717	0.6280	0.00816	0.424	500	9/3/2009 9:15	9/3/2009 14:51	0.999	0.530	1.058	0.530	0.999	0.530	1.058	1.058	79.64%	2.79%				
6	10D	60	27	390	27	390	6.500	0.6320	0.00816	0.962	500	9/3/2009 9:15	9/3/2009 12:40	0.999	0.679	1.058	0.679	0.999	0.679	1.058	1.058	80.52%	2.78%				

- Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Pos.	Decision Level		Critical Level	Required MDA	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 pCi/L	Recovery
	pCi/L	pCi/L								pCi/L	pCi/L	pCi/L	pCi/L						
1	1.7177	1.2127	3	2.6736	2.2069	0.3872	0.2964	0.1145	1.6701	1.7624	SAMPLE								
2	1.5074	1.0642	3	2.3876	2.0286	0.3810	0.2609	0.0991	1.5103	1.5966	SAMPLE								
3	1.1348	0.8012	3	1.8330	0.7672	0.7100	0.1109	0.0787	1.0667	1.0845	SAMPLE								
4	1.6870	1.1910	3	2.8097	1.1345	0.7306	0.1327	0.0968	1.6233	1.6488	MB								
5	1.8644	1.3163	3	3.0823	47.6046	0.0654	5.2927	0.3100	5.4658	13.3112	LCS							40.2663	118.2%
6	2.1563	1.5224	3	3.3901	38.2468	0.0666	5.5380	0.3321	4.4947	10.7364	LCS			21.8%				40.2663	95.0%

898628r1

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine
235208014	8A	90	9	94	9/3/2009 12:40	9/3/2009 14:10	Protean
235782015	8C	90	6	71	9/3/2009 12:40	9/3/2009 14:10	Protean
235860015	9A	90	6	44	9/3/2009 12:40	9/3/2009 14:10	Protean
1201914015	7A	60	7	31	9/3/2009 14:51	9/3/2009 15:51	Protean
1201914016	7B	60	14	343	9/3/2009 14:51	9/3/2009 15:51	Protean
1201914017	10D	60	27	390	9/3/2009 12:40	9/3/2009 13:40	Protean

ASSAY 1-Sep-09 10:31:04

Protocol id 8 228_REC
Time limit 180
Count limit 50000
Isotope Ba-133
Protocol date 9-Apr-07 10:03:07
Run id. 57

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	97	1	180	1040	316.3	3.44		10:31:06
2	97	2	180	830	246.3	3.96	77.87	10:34:18
3	97	3	180	788	232.4	4.1	73.47	10:37:29
4	97	4	180	856	254.9	3.89	80.59	10:40:40
5	97	5	180	899	269.2	3.77	85.11	10:43:52
6	66	6	180	847	251.9	3.91	79.64	10:47:16
7	66	7	180	855	254.7	3.89	80.52	10:50:28

END OF ASSAY

Radiochemistry Batch Checklist, Rev 9

Batch# 899411 Product: Ra-228 Date: 9/11/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required)			N/A
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, 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.	✓		70-120%
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		See Narrative
Sample was run within hold time.	✓		
Sample was correctly preserved if required.			N/A
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 line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.			N/A
Batch non-conformances second reviewed and disposition verified to be completed.			N/A
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By: 

Secondary Review Performed By: 

KERR
9/18

Radium-228 Que Sheet

General Engineering Laboratories, Radiochemistry Division
09/02/2009

Batch #: 899411 Analyst: MXS2 First Client Due Date: 09/18/2009 Internal Due Date: 09/07/2009
 Spike Isotope: Radium-228 Spike Code: OS03-B Expiration Date: 09-13-09 Ac-228 Ingrow: 9-8-09 / 0955
 LCS Isotope: Radium-228 LCS Code: OS03-B Expiration Date: 9-13-09
 Tracer Isotope: Barium-133 Tracer Code: 012-J Expiration Date: 09-13-09
 Prep Date: 9-20-09 Initials: JLC Pipet ID: 2766953 Balance ID: 50410272
 Ac-228 Separation Date/Time: 9-10-09 / 0450
 Witness: JLR-2-09

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collect Date & Time	Pos. #	Vol (mL)	Ba Yield (%)	Gamma Det. #
235782001-2	SA198-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 09:35 AM	1	1.060	100.48	1A
235782002-2	SA198-27B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 09:57 AM	2	1.016	99.86	1B
235782003-2	SA175-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 06:48 AM	3	1.011	91.49	1C
235782004-2	SA175-28B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 07:17 AM	4	1.013	108.72	1D
235782005-2	SA139-0.5B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 06:55 AM	5	1.007	99.72	1E
235782006-2	SA139-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 07:15 AM	6	1.012	101.84	1F
235782007-2	SA139-25B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 07:30 AM	7	1.008	85.19	1G
235782008-2	SA139009-25B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 07:30 AM	8	1.010	103.95	1H
235782009-2	SA139-35B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 07:55 AM	9	1.003	95.91	1I
235782010-2	RSAT5-0.5B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 07:55 AM	10	1.009	103.88	1J
235782011-2	RSAT5-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 11:07 AM	11	1.016	104.43	1K
235782012-2	RSAT5-25B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 11:54 AM	12	1.012	97.96	1L
235782013-2	RSAT5-40B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 12:33 PM	13	1.003	85.80	1M
235782014-2	RSAT5-51B	SAMPLE		.5 pCi/g	SOIL	KERR003	20-AUG-09 01:14 PM	14	1.018	93.46	1N
235782016-2	RSOA6-10B	SAMPLE		.5 pCi/g	SOIL	KERR003	21-AUG-09 06:26 AM	15	1.002	97.04	1O
235782017-2	RSOA6-20B	SAMPLE		.5 pCi/g	SOIL	KERR003	21-AUG-09 06:51 AM	16	1.001	98.03	1P
235782018-2	RSOA6-34B	SAMPLE		.5 pCi/g	SOIL	KERR003	21-AUG-09 09:43 AM	17	1.001	99.93	1Q
1201915944-1	MB for batch 899411	MB		UCF pCi/g to pCi/g SOIL		QC ACCOUNT		18	1.018	83.83	1R
1201915945-2	RSOA6-34B(235782018DUP)	DUP		.5 pCi/g	SOIL	QC ACCOUNT	21-AUG-09 09:43 AM	19	1.009	89.27	1S
1201915946-2	RSOA6-34B(235782018MS)	MS		.5 pCi/g	SOIL	QC ACCOUNT	21-AUG-09 09:43 AM	20	1.012	108.95	1T
1201915947-1	LCS for batch 899411	LCS		UCF pCi/g to pCi/g SOIL		QC ACCOUNT		21	1.018	91.90	1U

Comments: JLC
 Data Reviewed By: [Signature]
 Instrument Used: (Circle One) PIC S/N: 10751-4
 Page 1 of 1

Radium-228 Solid

Filename : RA228.XLS
 File type : Excel
 Version # : 1.2.4

Batch : 899411
 Analyst : MXS2
 Prep Date : 9/2/2009

Ra-228 Abundance : 1
 Ra-228 Method Uncertainty : 0

Calibration Date : 7/2/2009
 Calibration Due Date : 7/31/2010

Geometry: CeF on 25mm Filter

Spike S/N : 0503-B
 Spike Exp Date : 9/13/2009
 Spike Activity (dpm/ml) : 178.66
 Spike Volume Added: 0.10

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 : 9/13/2009
 LCS Activity (dpm/ml) : 178.66
 LCS Volume Added: 0.10

Procedure Code : GFC28RAS
 Parname : Radium-228

Required MDA : 0.5 pCi/G
 Halfife of Ra-228 : 5.75 years
 Halfife of Ac-228 : 6.13 hours
 Batch counted on : PIC
 BKG Count time : 1000 min

Tracer S/N : 0112-J
 Tracer Exp Date : 2/17/2010
 Tracer Volume Added: 0.10

Sample Characteristics			Tracer Calculations				Tracer Samp.		
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Tracer Concentration (cpm) (Ba-133 Ref.)	Tracer Ref. Count Uncertainty (cpm)	Tracer Concentration (cpm) (Ba-133 Samp.)	Tracer Count Uncertainty (cpm)	Tracer Aliquot (mL)	Tracer Aliquot StDev. (mL)
1	235782001.3	1.0000	3.3233E-03	293.7	3.59%	295.1	3.58%	0.1	0.000701
2	235782002.2	1.0160	3.3250E-03	293.7	3.59%	293.3	3.59%	0.1	0.000701
3	235782003.3	1.0110	3.3245E-03	293.7	3.59%	268.7	3.77%	0.1	0.000701
4	235782004.2	1.0130	3.3247E-03	293.7	3.59%	259.1	3.85%	0.1	0.000701
5	235782005.3	1.0070	3.3241E-03	293.7	3.59%	291.4	3.60%	0.1	0.000701
6	235782006.3	1.0120	3.3246E-03	293.7	3.59%	299.1	3.55%	0.1	0.000701
7	235782007.2	1.0080	3.3242E-03	293.7	3.59%	250.2	3.93%	0.1	0.000701
8	235782008.3	1.0100	3.3244E-03	293.7	3.59%	305.3	3.51%	0.1	0.000701
9	235782009.2	1.0030	3.3237E-03	293.7	3.59%	281.7	3.67%	0.1	0.000701
10	235782010.2	1.0090	3.3243E-03	293.7	3.59%	305.1	3.51%	0.1	0.000701
11	235782011.2	1.0160	3.3250E-03	293.7	3.59%	306.7	3.50%	0.1	0.000701
12	235782012.2	1.0120	3.3246E-03	293.7	3.59%	287.7	3.63%	0.1	0.000701
13	235782013.3	1.0030	3.3237E-03	293.7	3.59%	252.0	3.91%	0.1	0.000701
14	235782014.2	1.0180	3.3252E-03	293.7	3.59%	274.5	3.73%	0.1	0.000701
15	235782016.2	1.0020	3.3235E-03	293.7	3.59%	285.0	3.65%	0.1	0.000701
16	235782017.3	1.0010	3.3234E-03	293.7	3.59%	287.9	3.63%	0.1	0.000701
17	235782018.2	1.0010	3.3234E-03	293.7	3.59%	293.5	3.59%	0.1	0.000701
18	1201915944.1	1.0180	3.3252E-03	293.7	3.59%	246.2	3.96%	0.1	0.000701
19	1201915945.3	1.0090	3.3243E-03	293.7	3.59%	262.2	3.82%	0.1	0.000701
20	1201915946.2	0.1120	3.2307E-03	293.7	3.59%	320.0	3.42%	0.1	0.000701
21	1201915947.1	1.0180	3.3252E-03	293.7	3.59%	269.9	3.76%	0.1	0.000701

Counting		Gross Counts		Beta	Detector	Detector	Weekly Bkg	Separation	Count	Ra-228	Ac-228	Calculated	Sample
Pos.	Detector ID	Time (min.)	Alpha	Beta	Efficiency (cpm/dpm)	Efficiency Error (cpm/dpm)	cpm	Date/Time	Start Date/Time	Decay	Count Correction	Sample Recovery %	Recovery Error %
1	1A	380	18	319	0.839	0.6303	0.319	9/10/2009 4:50	9/10/2009 10:06	0.993	1.400	100.48%	2.72%
2	1B	60	6	79	1.317	0.6282	0.301	9/10/2009 4:50	9/10/2009 7:23	0.993	1.058	99.86%	2.73%
3	1B	380	31	317	0.834	0.6282	0.301	9/10/2009 4:50	9/10/2009 10:06	0.993	1.400	91.49%	2.79%
4	1D	60	10	74	1.233	0.6043	0.538	9/10/2009 4:50	9/10/2009 7:24	0.993	1.058	88.22%	2.81%
5	1C	380	32	546	1.437	0.6176	0.777	9/10/2009 4:50	9/10/2009 10:06	0.993	1.400	99.22%	2.73%
6	1D	380	38	427	1.124	0.6043	0.538	9/10/2009 4:50	9/10/2009 10:06	0.993	1.400	101.84%	2.71%
7	3C	60	10	127	2.117	0.6164	1.160	9/10/2009 4:50	9/10/2009 7:24	0.993	1.058	85.19%	2.84%
8	2B	380	25	736	1.937	0.6167	1.285	9/10/2009 4:50	9/10/2009 10:06	0.993	1.400	103.95%	2.70%
9	4D	60	23	110	1.833	0.5873	1.156	9/10/2009 4:50	9/10/2009 7:25	0.993	1.058	95.91%	2.75%
10	5A	60	10	93	1.550	0.6258	0.469	9/10/2009 4:50	9/10/2009 7:25	0.993	1.058	103.88%	2.70%
11	5D	60	18	161	2.683	0.6237	1.247	9/10/2009 4:50	9/10/2009 7:25	0.993	1.058	104.43%	2.70%
12	6B	60	28	126	2.100	0.6163	0.766	9/10/2009 4:50	9/10/2009 7:25	0.993	1.058	97.96%	2.74%
13	2C	380	37	323	0.850	0.5969	0.315	9/10/2009 4:50	9/10/2009 10:07	0.993	1.400	85.80%	2.83%
14	7B	60	8	108	1.800	0.6280	0.431	9/10/2009 4:50	9/10/2009 7:25	0.993	1.058	93.46%	2.77%
15	7C	60	5	90	1.500	0.6178	0.280	9/10/2009 4:50	9/10/2009 7:26	0.993	1.058	97.04%	2.75%
16	2D	380	33	336	0.884	0.6119	0.325	9/10/2009 4:50	9/10/2009 10:07	0.993	1.400	98.03%	2.74%
17	8A	60	5	115	1.917	0.6247	0.690	9/10/2009 4:50	9/10/2009 7:26	0.993	1.058	99.93%	2.73%
18	8C	60	9	52	0.867	0.6339	0.492	9/10/2009 4:50	9/10/2009 7:26	0.997	1.058	83.83%	2.85%
19	3C	380	55	686	1.805	0.6164	1.160	9/10/2009 4:50	9/10/2009 10:07	0.993	1.400	89.27%	2.80%
20	9C	60	12	550	9.167	0.6273	0.343	9/10/2009 4:50	9/10/2009 7:26	0.993	1.058	108.95%	2.67%
21	10A	60	6	490	8.167	0.6389	0.298	9/10/2009 4:50	9/10/2009 7:26	0.997	1.058	91.90%	2.78%

- Notes:
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 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Pos.	Decision Level		Critical Level	Required MDA	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 pCi/G	Recovery
	pCi/G	pCi/G															
1	0.1444	0.1019	0.5	0.2182	0.9474	0.1006	0.5205	0.0503	0.1794	0.1868		SAMPLE					
2	0.1709	0.1207	0.5	0.2916	1.0217	0.1494	1.0157	0.1491	0.2941	0.2993		SAMPLE					
3	0.1529	0.1079	0.5	0.2316	1.0563	0.0979	0.5332	0.0500	0.1944	0.2031		SAMPLE					
4	0.2698	0.1905	0.5	0.4404	0.8260	0.2108	0.6953	0.1452	0.3382	0.3414		SAMPLE					
5	0.2314	0.1633	0.5	0.3415	1.2335	0.1060	0.6598	0.0675	0.2474	0.2563		SAMPLE					
6	0.1908	0.1347	0.5	0.2840	1.0849	0.1047	0.5857	0.0591	0.2146	0.2226		SAMPLE					
7	0.4046	0.2857	0.5	0.6320	1.1606	0.2016	0.9567	0.1909	0.4539	0.4587		SAMPLE					
8	0.2838	0.2003	0.5	0.4148	1.1622	0.1256	0.6518	0.0799	0.2792	0.2861		SAMPLE					
9	0.3786	0.2673	0.5	0.5915	0.7702	0.2645	0.6773	0.1781	0.3969	0.3993		SAMPLE					
10	0.2078	0.1467	0.5	0.3424	1.0592	0.1527	1.0810	0.1622	0.3115	0.3170		SAMPLE					
11	0.3359	0.2372	0.5	0.5229	1.3953	0.1519	1.4363	0.2144	0.4082	0.4155		SAMPLE					
12	0.2853	0.2014	0.5	0.4554	1.4040	0.1447	1.3340	0.1891	0.3901	0.3981		SAMPLE					
13	0.1771	0.1251	0.5	0.2679	1.2026	0.0988	0.5350	0.0505	0.2226	0.2329		SAMPLE					
14	0.2190	0.1546	0.5	0.3631	1.4747	0.1307	1.3690	0.1744	0.3683	0.3778		SAMPLE					
15	0.1756	0.1240	0.5	0.3015	1.3072	0.1335	1.2200	0.1590	0.3339	0.3420		SAMPLE					
16	0.1539	0.1087	0.5	0.2326	1.0755	0.0962	0.5592	0.0515	0.1941	0.2029		SAMPLE					
17	0.2651	0.1872	0.5	0.4258	1.2641	0.1500	1.2267	0.1807	0.3649	0.3717		SAMPLE					
18	0.2577	0.1819	0.5	0.4232	0.4445	0.3276	0.3747	0.1222	0.2842	0.2853		MB					
19	0.3146	0.2221	0.5	0.4606	1.3423	0.1226	0.6453	0.0769	0.3135	0.3224	235782018.2	DUP	6.0%			72.1322	
20	1.5269	1.0780	0.5	2.5769	74.2796	0.0598	8.8237	0.3913	6.4564	8.7088	235782018.2	MUS				101.2%	
21	0.1816	0.1282	0.5	0.3102	8.4535	0.0553	7.8687	0.3693	0.7777	0.9157		LCS				106.9%	

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine
235782001	1A	380	18	319	9/10/2009 10:06	9/10/2009 16:26	Protean
235782002	1B	60	6	79	9/10/2009 7:23	9/10/2009 8:23	Protean
235782003	1B	380	31	317	9/10/2009 10:06	9/10/2009 16:26	Protean
235782004	1D	60	10	74	9/10/2009 7:24	9/10/2009 8:24	Protean
235782005	1C	380	32	546	9/10/2009 10:06	9/10/2009 16:26	Protean
235782006	1D	380	38	427	9/10/2009 10:06	9/10/2009 16:26	Protean
235782007	3C	60	10	127	9/10/2009 7:24	9/10/2009 8:24	Protean
235782008	2B	380	25	736	9/10/2009 10:06	9/10/2009 16:26	Protean
235782009	4D	60	23	110	9/10/2009 7:25	9/10/2009 8:25	Protean
235782010	5A	60	10	93	9/10/2009 7:25	9/10/2009 8:25	Protean
235782011	5D	60	18	161	9/10/2009 7:25	9/10/2009 8:25	Protean
235782012	6B	60	28	126	9/10/2009 7:25	9/10/2009 8:25	Protean
235782013	2C	380	37	323	9/10/2009 10:07	9/10/2009 16:27	Protean
235782014	7B	60	8	108	9/10/2009 7:25	9/10/2009 8:25	Protean
235782016	7C	60	5	90	9/10/2009 7:26	9/10/2009 8:26	Protean
235782017	2D	380	33	336	9/10/2009 10:07	9/10/2009 16:27	Protean
235782018	8A	60	5	115	9/10/2009 7:26	9/10/2009 8:26	Protean
1201915944	8C	60	9	52	9/10/2009 7:26	9/10/2009 8:26	Protean
1201915945	3C	380	55	686	9/10/2009 10:07	9/10/2009 16:27	Protean
1201915946	9C	60	12	550	9/10/2009 7:26	9/10/2009 8:26	Protean
1201915947	10A	60	6	490	9/10/2009 7:26	9/10/2009 8:26	Protean

ASSAY 8-Sep-09 10:03:06

Protocol id 8 228_REC
Time limit 180
Count limit 50000
Isotope Ba-133
Protocol date 9-Apr-07 10:03:07
Run id. 69

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT TIME
1	98	1	180	972	293.7	3.59		10:03:08
2	98	2	180	977	295.1	3.58	100.48	10:06:20
3	98	3	180	971	293.3	3.59	99.86	10:09:31
4	98	4	180	897	268.7	3.77	91.49	10:12:43
5	98	5	180	868	259.1	3.85	88.22	10:15:54
6	88	6	180	965	291.4	3.6	99.22	10:19:18
7	88	7	180	988	299.1	3.55	101.84	10:22:30
8	88	8	180	842	250.2	3.93	85.19	10:25:41
9	88	9	180	1007	305.3	3.51	103.95	10:28:53
10	88	10	180	936	281.7	3.67	95.91	10:32:04
11	99	11	180	1007	305.1	3.51	103.88	10:35:29
12	99	12	180	1011	306.7	3.5	104.43	10:38:40
13	99	13	180	954	287.7	3.63	97.96	10:41:51
14	99	14	180	847	252	3.91	85.80	10:45:03
15	99	15	180	915	274.5	3.73	93.46	10:48:14
16	72	16	180	946	285	3.65	97.04	10:51:39
17	72	17	180	955	287.9	3.63	98.03	10:54:50
18	72	18	180	972	293.5	3.59	99.93	10:58:02
19	72	19	180	830	246.2	3.96	83.83	11:01:13
20	72	20	180	878	262.2	3.82	89.27	11:04:24
21	91	21	180	1051	320	3.42	108.95	11:07:49
22	91	22	180	901	269.9	3.76	91.90	11:11:00

END OF ASSAY

RADIUM 226

Radiochemistry Batch Checklist, Rev 9

Batch# 898657 Product: Tla-226 Date: 9/8/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required)			NA
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	✓		
Or meets the client's required RER acceptance criteria.			
Tracer yield is 15-125% . Carrier yield 25-125%.			NA
Or meets the client's contract acceptance criteria.			
Method blank is less than the RDL/ LLD.	✓		
(If rad samples. < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
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 line outs initialed and dated.	✓		
No transcription errors are apparent.			
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.			NA
Batch non-conformances second reviewed and disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP. results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By:

Symphony Pace

KERR 9/9/09

Secondary Review Performed By:

Zluch 9/8/09

Radium-226 Que Sheet

08/31/2009

General Engineering Laboratories, Radiochemistry Division

Batch #: 898657

Analyst: KSD1

First Client Due Date: 09/09/2009

Internal Due Date: 08/29/2009

Spike Isotope: Radium-226

Spike Code: 01284A

Expiration Date: 1/17/10

Vol: 0.1

Norm Conc: 24.1050

LCS Isotope: Radium-226

LCS Code: 01284A

Expiration Date: 1/17/10

Vol: 0.1

Norm Conc: 24.1050

Prep Date: 9/1/09

Pipet ID: 42930's

Initials: HD

Witness: 759 9/2/09

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 Date/Time	End LN De-em Date/Time	Start Count Date/Time	Cell #	Det #	Bkg counts	Total Counts
235177021-1	EB081109-SO	SAMPLE	WATER	1 pCi/L	KERR003 1	500	9/1/09 1710	9/8/09 0640	9/8/09 1030	108	1	8	19
235208014-1	EB081909-SO1	SAMPLE	WATER	1 pCi/L	KERR003 2	500	9/2/09 1710	9/8/09 0640	9/8/09 1030	207	2	8	12
235782015-1	EB082009-SO2	SAMPLE	WATER	1 pCi/L	KERR003 3	500	9/2/09 1710	9/8/09 0640	9/8/09 1030	307	3	8	25
235860015-1	EB082109-SO1	SAMPLE	WATER	1 pCi/L	KERR003 4	500	9/2/09 1710	9/8/09 0640	9/8/09 1030	506	5	8	24
1201914119-1	MB for batch 898657	MB	WATER	1 pCi/L	QC ACCOUNT 5	500	9/2/09 1710	9/8/09 0700	9/8/09 1100	209	2	8	14
1201914120-1	LCS for batch 898657	LCS	WATER	1 pCi/L	QC ACCOUNT 6	500	9/2/09 1710	9/8/09 0700	9/8/09 1100	308	3	7	935
1201914121-1	LCS for batch 898657	LCS	WATER	1 pCi/L	QC ACCOUNT 7	500	9/2/09 1710	9/8/09 0700	9/8/09 1135	507	5	4	977

Comments:

Instrument ID's:

LUCAS1:90988, LUCAS2:136917, LUCAS3:90989, LUCAS4:102753, LUC5:132286, LUC6:170055

Data Reviewed By:

Stacy Pace 9/8/09

Radium-226 Liquid

Filename : RA226.XLS
 File type : Excel
 Version # : 1.2.4

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

Batch : 898657

Analyst : KSD1
 Prep Date : 9/2/2009

Ra-226 Abundance : 1
 Ra-226 Method Uncertainty : 0.0918

LCS S/N : 0638-H
 LCS Exp Date : 7/17/2010
 LCS Activity (dpm/ml): 268.23
 LCS Volume Added: 0.10

Procedure Code : LUC26RAL
 Parmname : Radium-226
 Required MDA : 1 pCi/L
 Halflife of Ra-226 : 1600 years
 Halflife of Rn-222: 3.823 days
 Batch counted on : LUCAS CELL DETECTOR
 BKG Count time : 30 min

Pos.	Sample Characteristics		Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Count Raw Data			Weekly Background			Detector Efficiency (cpm/dpm)
	Sample ID	Sample Aliquot L				Cell Number	Counting Time (min.)	Gross Counts	Gross CPM	Counts	CPM	
1	235177021.1	0.5000	2.0256E-05	8/11/2009 9:10	108	30	19	0.633	8	0.267	30	1.9460
2	235208014.1	0.5000	2.0256E-05	8/19/2009 14:00	207	30	12	0.400	8	0.267	30	2.1460
3	235782015.1	0.5000	2.0256E-05	8/20/2009 9:00	307	30	25	0.833	8	0.267	30	1.9310
4	235860015.1	0.5000	2.0256E-05	8/21/2009 13:26	506	30	24	0.800	8	0.267	30	2.0040
5	1201914119.1	0.5000	2.0256E-05	9/2/2009 0:00	209	30	14	0.467	8	0.267	30	2.2910
6	1201914120.1	0.5000	2.0256E-05	9/2/2009 0:00	308	30	935	31.167	7	0.233	30	1.9500
7	1201914121.1	0.5000	2.0256E-05	9/2/2009 0:00	507	30	977	32.567	4	0.133	30	1.7010

Detector Efficiency Error (cpm/dpm)	Cell Calibration Date	Cell Calibration Due Date	De-Gas Date/Time	Rn-222 Ingrow End Date/Time	Count Start Date/Time	De-Gas to Ingrowth	Rn-222 Corrections to Count	During Count	Ra-226 Decay
0.05303	8/31/2009	8/31/2010	9/2/2009 17:10	9/8/2009 6:40	9/8/2009 10:30	0.635	0.971	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/2/2009 17:10	9/8/2009 6:40	9/8/2009 10:30	0.635	0.971	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/2/2009 17:10	9/8/2009 6:40	9/8/2009 10:30	0.635	0.971	1.002	1.000
0.14377	3/25/2009	3/25/2010	9/2/2009 17:10	9/8/2009 6:40	9/8/2009 10:30	0.635	0.971	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/2/2009 17:10	9/8/2009 7:00	9/8/2009 11:00	0.636	0.970	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/2/2009 17:10	9/8/2009 7:00	9/8/2009 11:00	0.636	0.970	1.002	1.000
0.14377	3/25/2009	3/25/2010	9/2/2009 17:10	9/8/2009 7:00	9/8/2009 11:35	0.636	0.966	1.002	1.000

- Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Pos.	Decision Level pCi/L	Critical Level pCi/L	Required MDA pCi/L	MDA pCi/L	Sample Act. Conc. pCi/L	Sample Act. Error pCi/L	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA		Sample QC	Sample Type	RPD	FIER	Nominal pCi/L	Recovery
									Counting Uncertainty pCi/L	Total Prop. Uncertainty pCi/L						
1	0.2326	0.1642	1	0.4033	0.2746	0.4753	0.3667	0.1732	0.2542	0.2605		SAMPLE				
2	0.2109	0.1489	1	0.3658	0.0905	1.1207	0.1333	0.1491	0.1984	0.1995		SAMPLE				
3	0.2344	0.1655	1	0.4065	0.4276	0.3433	0.5667	0.1915	0.2832	0.2979		SAMPLE				
4	0.2259	0.1595	1	0.3917	0.3878	0.3817	0.5333	0.1886	0.2687	0.2984		SAMPLE				
5	0.1976	0.1395	1	0.3425	0.1272	0.7855	0.2000	0.1563	0.1949	0.1971		MB				
6	0.2171	0.1533	1	0.3813	23.1102	0.0692	30.9333	1.0231	1.4981	5.2080		LCS			24.1650	95.6%
7	0.1890	0.1334	1	0.3529	27.9005	0.1473	32.4333	1.0440	1.7603	9.4927		LCSD	18.8%		24.1650	115.5%

Radiochemistry Batch Checklist, Rev 9

Batch# 901480 Product: Ra 226 Date: 9/16/09

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required)			N/A
If activity less 10* MDA/ MDC, error is 150% or less of sample activity. If greater 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are less 5* MDA/ MDC, then RPD is 100% or less. If greater 5* MDA/ MDC, then RPD 20% or less. If below the MDA/ MDC, the RPD is 0%.	✓		
Or meets the client's required RER acceptance criteria.			
Tracer yield is 15-125% . Carrier yield 25-125%.			N/A
Or meets the client's contract acceptance criteria.			
Method blank is less than the RDL/ LLD.	✓		
(If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.	✓		
Method Spike and LCS are within 75-125% or meets the client's contract acceptance criteria.	✓		
No blank spaces on data forms.			
All line outs initialed and dated.	✓		
No transcription errors are apparent.	✓		
Aux data is correct.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
QC data entered into QC database and batch is in REVW	✓		
Hit notification complete (if necessary)	✓		
Batch entered into Case Narrative.	✓		
Batch non-conformances completed, if applicable.			N/A
Batch non-conformances second reviewed and disposition verified to be completed.	✓		N/A GEL: 734496
Aliquot Correction completed if required.	✓		9/16/09 N/A NCR 734496
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

GEL Laboratories, LLC

revised 8/1/08

Primary Review Performed By:

Lanzetta Y 9/16/09

Secondary Review Performed By:

Almond 9/17/09

KERR

917 - 918

Radium-226 Que Sheet

General Engineering Laboratories, Radiochemistry Division

09/10/2009

Batch #: 901480

Analyst: KSD1

First Client Due Date: 09/18/2009

Internal Due Date: 09/07/2009

Spike Isotope: Radium-226 Spike Code: 003644

Expiration Date: 7/17/10

Nom Conc: 11.4964

LCS Isotope: Radium-226 LCS Code: 003844

Expiration Date: 7/17/10

Nom Conc: 11.404634 7/16/09

Prep Date: 9/16/09 Pipet ID: 147303

Initials: 140

Sample Count Time: 30 (Min)

Witness: [Signature]

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 counts	Total Counts
235782001-1	SA198-10B	SAMPLE		SOIL	.5 pCi/g	KERR003 /	1.054	9/16/09 1620	9/16/09 1620	9/16/09 1725	007	0	0	143
235782002-1	SA198-27B	SAMPLE		SOIL	.5 pCi/g	KERR003 2	1.007	9/16/09 1620	9/16/09 1500	9/16/09 1835	101	1	8	140
235782003-1	SA175-10B	SAMPLE		SOIL	.5 pCi/g	KERR003 3	1.008	9/16/09 1620	9/16/09 1500	9/16/09 1835	210	2	8	47
235782004-1	SA175-28B	SAMPLE		SOIL	.5 pCi/g	KERR003 4	1.000	9/16/09 1620	9/16/09 1500	9/16/09 1835	211	3	8	163
235782005-1	SA139-0.5B	SAMPLE		SOIL	.5 pCi/g	KERR003 5	1.008	9/16/09 1620	9/16/09 1500	9/16/09 1835	409	4	0	55
235782006-1	SA139-10B	SAMPLE		SOIL	.5 pCi/g	KERR003 6	1.024	9/16/09 1620	9/16/09 1500	9/16/09 1835	508	5	8	68
235782007-1	SA139-25B	SAMPLE		SOIL	.5 pCi/g	KERR003 7	1.028	9/16/09 1620	9/16/09 1500	9/16/09 1835	001	0	8	114
235782008-1	SA139009-25B	SAMPLE		SOIL	.5 pCi/g	KERR003 8	1.024	9/16/09 1620	9/16/09 1500	9/16/09 1835	100	1	8	90
235782009-1	SA139-35B	SAMPLE		SOIL	.5 pCi/g	KERR003 9	1.015	9/16/09 1620	9/16/09 1500	9/16/09 1910	204	2	8	140
235782010-1	RSAT5-0.5B	SAMPLE		SOIL	.5 pCi/g	KERR003 10	1.007	9/16/09 1620	9/16/09 1500	9/16/09 1910	205	3	8	55
235782011-1	RSAT5-10B	SAMPLE		SOIL	.5 pCi/g	KERR003 11	1.012	9/16/09 1620	9/16/09 1500	9/16/09 1910	404	4	8	66
235782012-1	RSAT5-25B	SAMPLE		SOIL	.5 pCi/g	KERR003 12	1.006	9/16/09 1620	9/16/09 1500	9/16/09 1910	503	5	8	111
235782013-1	RSAT5-40B	SAMPLE		SOIL	.5 pCi/g	KERR003 13	1.004	9/16/09 1620	9/16/09 1500	9/16/09 1910	011	0	8	110
235782014-1	RSAT5-51B	SAMPLE		SOIL	.5 pCi/g	KERR003 14	1.016	9/16/09 1620	9/16/09 1500	9/16/09 1945	111	1	8	141
235782016-1	RSOA6-10B	SAMPLE		SOIL	.5 pCi/g	KERR003 15	1.012	9/16/09 1620	9/16/09 1500	9/16/09 1945	203	2	8	77
235782017-1	RSOA6-20B	SAMPLE		SOIL	.5 pCi/g	KERR003 16	1.006	9/16/09 1620	9/16/09 1500	9/16/09 1945	301	3	8	109
235782018-1	RSOA6-34B	SAMPLE		SOIL	.5 pCi/g	KERR003 17	1.023	9/16/09 1620	9/16/09 1500	9/16/09 1945	410	4	8	71
1201920868-1	MB for batch 901480	MB		SOIL	.5 pCi/g	QC ACCOUNT 18	1.054	9/16/09 1620	9/16/09 1500	9/16/09 1945	504	5	4	10
1201920869-1	RSOA6-34B(235782018DUP)	DUP		SOIL	.5 pCi/g	QC ACCOUNT 19	1.014	9/16/09 1620	9/16/09 1500	9/16/09 2045	101	1	0	87
1201920870-1	RSOA6-34B(235782018MS)	MS		SOIL	.5 pCi/g	QC ACCOUNT 20	1.051	9/16/09 1620	9/16/09 1500	9/16/09 2045	211	2	0	1058
1201920871-1	LCS for batch 901480	LCS		SOIL	.5 pCi/g	QC ACCOUNT 21	1.054	9/16/09 1620	9/16/09 1500	9/16/09 2045	317	3	0	830

Comments: _____

Data Reviewed By: [Signature]

Instrument ID's: LUCASI:90988, LUCAS2:136917, LUCAS3:90989, LUCAS4:102753, LUC5:132286, LUC6:170055

Radium-226 Solid

Filename : RA226.XLS
 File type : Excel
 Version # : 1.2.4
 Batch : 901480
 Analyst : KSD1
 Prep Date : 9/10/2009
 Ra-226 Abundance : 1
 Ra-226 Method Uncertainty : 0.1153

Spike S/N : 0638-H
 Spike Exp Date : 7/17/2010
 Spike Activity (dpm/ml): 268.23
 Spike Volume Added: 0.10

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

Procedure Code : LUC26RAS
 Parmname : Radium-226
 Required MDA : 0.5 pCi/G
 Half-life of Ra-226 : 1600 years
 Half-life of Rn-222 : 3.823 days
 Batch counted on : LUCAS CELL DETECTOR
 BKG Count time : 30 min

Sample Characteristics			Count Raw Data			Weekly Background			Detector Efficiency			
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Cell Number	Counting Time (min.)	Gross Counts	Gross CPM	Counts	CPM	Count Time (min.)	Detector Efficiency (cpm/dpm)
1	235782001.1	1.0540	3.3290E-03	8/20/2009 9:35	607	30	143	4.767	6	0.200	30	2.4500
2	235782002.1	1.0010	3.3234E-03	8/20/2009 9:57	101	30	140	4.667	8	0.267	30	1.9560
3	235782003.1	1.0020	3.3235E-03	8/20/2009 6:48	210	30	47	1.567	8	0.267	30	2.2530
4	235782004.1	1.0000	3.3233E-03	8/20/2009 7:17	311	30	163	5.433	8	0.267	30	2.1140
5	235782005.1	1.0080	3.3242E-03	8/20/2009 6:55	409	30	55	1.833	6	0.200	30	2.0360
6	235782006.1	1.0240	3.3258E-03	8/20/2009 7:15	508	30	68	2.267	8	0.267	30	1.5340
7	235782007.1	1.0280	3.3269E-03	8/20/2009 7:30	601	30	114	3.800	8	0.267	30	2.1810
8	235782008.1	1.0240	3.3258E-03	8/20/2009 7:30	106	30	90	3.000	8	0.267	30	1.8360
9	235782009.1	1.0150	3.3249E-03	8/20/2009 7:55	204	30	140	4.667	8	0.267	30	2.1930
10	235782010.1	1.0070	3.3241E-03	8/20/2009 11:07	305	30	55	1.833	8	0.267	30	2.0570
11	235782011.1	1.0120	3.3248E-03	8/20/2009 11:25	404	30	66	2.200	8	0.267	30	1.9310
12	235782012.1	1.0060	3.3240E-03	8/20/2009 11:54	503	30	111	3.700	8	0.267	30	1.6010
13	235782013.1	1.0040	3.3238E-03	8/20/2009 12:33	611	30	110	3.667	8	0.267	30	2.3070
14	235782014.1	1.0160	3.3250E-03	8/20/2009 13:14	112	30	141	4.700	8	0.267	30	1.9310
15	235782016.1	1.0120	3.3246E-03	8/21/2009 6:26	203	30	77	2.567	8	0.267	30	2.2540
16	235782017.1	1.0060	3.3240E-03	8/21/2009 6:51	307	30	109	3.633	8	0.267	30	1.9310
17	235782018.1	1.0230	3.3257E-03	8/21/2009 9:43	410	30	71	2.367	8	0.267	30	1.8860
18	1201920868.1	1.0540	3.3290E-03	9/10/2009 0:00	504	30	10	0.333	4	0.133	30	1.6150
19	1201920869.1	1.0140	3.3248E-03	8/21/2009 9:43	102	30	87	2.900	6	0.200	30	1.8550
20	1201920870.1	1.0510	3.3286E-03	8/21/2009 9:43	211	30	1058	35.267	6	0.200	30	2.1710
21	1201920871.1	1.0540	3.3290E-03	9/10/2009 0:00	312	30	830	27.667	6	0.200	30	1.9440

Detector Efficiency Error (cpm/dpm)	Cell Calibration Date	Cell Calibration Due Date	De-Gas Date/Time	Rn-222 Ingrowth		Count Start Date/Time	Rn-222 Corrections		Ra-226 Decay
				End Date/Time	De-Gas to Ingrowth		Ingrowth to Count	During Count	
0.06605	8/4/2009	8/4/2010	9/11/2009 16:20	9/16/2009 13:50	0.588	9/16/2009 17:25	0.973	1.002	1.000
0.05303	8/31/2009	8/31/2010	9/11/2009 16:20	9/16/2009 15:00	0.592	9/16/2009 18:35	0.973	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/11/2009 16:20	9/16/2009 15:00	0.592	9/16/2009 18:35	0.973	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/11/2009 16:20	9/16/2009 15:00	0.592	9/16/2009 18:35	0.973	1.002	1.000
0.12371	3/2/2009	3/2/2010	9/11/2009 16:20	9/16/2009 15:00	0.592	9/16/2009 18:35	0.973	1.002	1.000
0.14377	3/25/2009	3/25/2010	9/11/2009 16:20	9/16/2009 15:00	0.592	9/16/2009 18:35	0.973	1.002	1.000
0.06605	8/4/2009	8/4/2010	9/11/2009 16:20	9/16/2009 15:00	0.592	9/16/2009 18:35	0.973	1.002	1.000
0.05303	8/31/2009	8/31/2010	9/11/2009 16:20	9/16/2009 15:25	0.593	9/16/2009 19:10	0.972	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/11/2009 16:20	9/16/2009 15:25	0.593	9/16/2009 19:10	0.972	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/11/2009 16:20	9/16/2009 15:25	0.593	9/16/2009 19:10	0.972	1.002	1.000
0.12371	3/2/2009	3/2/2010	9/11/2009 16:20	9/16/2009 15:25	0.593	9/16/2009 19:10	0.972	1.002	1.000
0.14377	3/25/2009	3/25/2010	9/11/2009 16:20	9/16/2009 15:25	0.593	9/16/2009 19:10	0.972	1.002	1.000
0.06605	8/4/2009	8/4/2010	9/11/2009 16:20	9/16/2009 15:25	0.593	9/16/2009 19:10	0.972	1.002	1.000
0.05303	8/31/2009	8/31/2010	9/11/2009 16:20	9/16/2009 15:50	0.595	9/16/2009 19:45	0.971	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/11/2009 16:20	9/16/2009 15:50	0.595	9/16/2009 19:45	0.971	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/11/2009 16:20	9/16/2009 15:50	0.595	9/16/2009 19:45	0.971	1.002	1.000
0.12371	3/2/2009	3/2/2010	9/11/2009 16:20	9/16/2009 15:50	0.595	9/16/2009 19:45	0.971	1.002	1.000
0.14377	3/25/2009	3/25/2010	9/11/2009 16:20	9/16/2009 15:50	0.595	9/16/2009 19:45	0.971	1.002	1.000
0.05303	8/31/2009	8/31/2010	9/11/2009 16:20	9/16/2009 16:10	0.596	9/16/2009 20:45	0.966	1.002	1.000
0.07722	12/19/2008	12/19/2009	9/11/2009 16:20	9/16/2009 16:10	0.596	9/16/2009 20:45	0.966	1.002	1.000
0.06082	2/4/2009	2/4/2010	9/11/2009 16:20	9/16/2009 16:10	0.596	9/16/2009 20:45	0.966	1.002	1.000

- Notes:
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Pos.	Decision Level pCi/G	Critical Level pCi/G	Required MDA pCi/G	MDA pCi/G	Sample Act. Conc. pCi/G	Sample Act. Error pCi/G	Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA		Sample QC	Sample Type	RPD	FER	Nominal pCi/G	Recovery
									Counting Uncertainty pCi/G	Total Prop. Uncertainty pCi/G						
1	0.0818	0.0578	0.5	0.1459	1.3884	0.1110	4.5667	0.4069	0.2425	0.4355		SAMPLE				
2	0.1238	0.0874	0.5	0.2147	1.7536	0.1064	4.4000	0.4055	0.3168	0.5392		SAMPLE				
3	0.1074	0.0758	0.5	0.1862	0.4494	0.2053	1.3000	0.2472	0.1675	0.2074		SAMPLE				
4	0.1147	0.0810	0.5	0.1988	1.9071	0.1041	5.1667	0.4359	0.3154	0.5806		SAMPLE				
5	0.1023	0.0722	0.5	0.1825	0.6210	0.2018	1.6333	0.2603	0.1940	0.2829		SAMPLE				
6	0.1543	0.1090	0.5	0.2676	0.9835	0.2044	2.0000	0.2906	0.2829	0.4570		SAMPLE				
7	0.1081	0.0763	0.5	0.1875	1.2297	0.1234	3.5333	0.3682	0.2512	0.4071		SAMPLE				
8	0.1288	0.0910	0.5	0.2234	1.1335	0.1319	2.7333	0.3300	0.2682	0.3892		SAMPLE				
9	0.1088	0.0768	0.5	0.1887	1.5411	0.1203	4.4000	0.4055	0.2784	0.5033		SAMPLE				
10	0.1169	0.0826	0.5	0.2027	0.5897	0.1795	1.5667	0.2646	0.1952	0.2466		SAMPLE				
11	0.1239	0.0875	0.5	0.2149	0.7713	0.1932	1.9333	0.2867	0.2242	0.3401		SAMPLE				
12	0.1504	0.1062	0.5	0.2607	1.6619	0.1786	3.4333	0.3636	0.3450	0.6925		SAMPLE				
13	0.1046	0.0738	0.5	0.1813	1.1444	0.1254	3.4000	0.3621	0.2389	0.3820		SAMPLE				
14	0.1233	0.0871	0.5	0.2139	1.7602	0.1060	4.4333	0.4069	0.3166	0.5404		SAMPLE				
15	0.1061	0.0749	0.5	0.1839	0.7854	0.1544	2.3000	0.3073	0.2057	0.2966		SAMPLE				
16	0.1246	0.0879	0.5	0.2160	1.3499	0.1232	3.3667	0.3606	0.2834	0.4465		SAMPLE				
17	0.1254	0.0885	0.5	0.2175	0.8478	0.1877	2.1000	0.2963	0.2344	0.3660		SAMPLE				
18	0.1005	0.0710	0.5	0.1877	0.0915	0.6400	0.2000	0.1247	0.1119	0.1166		MB				
19	0.1118	0.0789	0.5	0.1994	1.1218	0.1304	2.7000	0.3215	0.2618	0.3827	235782018.1	DUP	27.8%	1.0142	11.4964	97.1%
20	0.0922	0.0651	0.5	0.1644	12.0108	0.0833	35.0667	1.0873	0.7299	3.3482	235782018.1	MS			11.4634	91.4%
21	0.1026	0.0724	0.5	0.1830	10.4761	0.0703	27.4667	0.9638	0.7205	2.7727		LCS				

METHOD CALIBRATION DATA

ALPHA SPECTROSCOPY

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 (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 ⁻¹ at 22.8 °C [b]*		
Solution mass	Approximately 5.15 g		
Chemical Properties:			
Solution composition	Chemical Formula	Concentration (mol·L ⁻¹)	Mass Fraction (g·g ⁻¹)
	H ₂ O	54	0.94
	HNO ₃	1.0	0.06
	HCl	<0.001	<4 × 10 ⁻⁵
	²⁴⁴ Cm +3	5 × 10 ⁻¹¹	1 × 10 ⁻¹¹
Radiological Properties:			
Radionuclide	Curium-244		
Reference time	1230 EST, 1 February 1996 [c]		
Massic activity of the solution [d]	37.06 Bq·g ⁻¹ 24.12 Bq·g ⁻¹		
Relative expanded uncertainty (k=2)	0.68% [e] [f]		
Alpha-particle-emitting daughters	Plutonium-240: (0.22 ± 0.11) Bq·g ⁻¹ [b] [c]		
Alpha-particle-emitting impurities	Curium-243: (0.005 ± 0.004) Bq·g ⁻¹ [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		

37.06 x 2 2004
6

- [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 λ (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:

W.M. [Signature] 9-6-02

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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 ^{(1)*}
Solution mass	Approximately 5 grams
Solution composition	Neptunium-237 in 2 mol·L ⁻¹ nitric acid
Reference time	March 1992
Radioactivity concentration	97.0 Bq·g ⁻¹
Overall uncertainty	1.28 percent ⁽²⁾
Photon-emitting impurities	None detected ⁽³⁾
Alpha-particle-emitting impurities	None detected ⁽⁴⁾
Half life	(2.14 ± 0.11) × 10 ⁶ years ⁽⁵⁾
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

NOTES

- (1) Approximately five milliliters of solution. Ampoule specifications:
- | | |
|----------------------|------------------------|
| body diameter | 16.5 ± 0.5 mm |
| wall thickness | 0.60 ± 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
- $0.19 \text{ } \gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 30 and 307 keV and
 $0.01 \text{ } \gamma \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ 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
- $0.10 \text{ } \alpha \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ for energies between 1.0 and 4.3 MeV and
 $0.05 \text{ } \alpha \cdot \text{s}^{-1} \cdot \text{g}^{-1}$ 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 : 78788
Calibration Date/Time : 4-SEP-2009 12:35:32
Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.226
NP-237	4341	2/28/10	4768.800	4768.853
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
Energy Calibration Zero : 2535.497
Energy Calibration Slope : 5.123575
Energy Calibration Quadratic : 3.5177087E-04
Energy Calibration Range : 8151.000

Instrument : CHAMBER 002
Detector : 78266
Calibration Date/Time : 4-SEP-2009 12:35:41
Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3181.913
NP-237	4341	2/28/10	4768.800	4768.018
CM-244	4320A	2/28/10	5795.020	5794.179

Energy/Channel Equation : see above
Energy Calibration Zero : 2471.037
Energy Calibration Slope : 5.125078
Energy Calibration Quadratic : 3.3477767E-04
Energy Calibration Range : 8070.000

Instrument : CHAMBER 003
Detector : 67617
Calibration Date/Time : 4-SEP-2009 12:35:49
Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.431
NP-237	4341	2/28/10	4768.800	4767.487
CM-244	4320A	2/28/10	5795.020	5793.671

Energy/Channel Equation : see above
Energy Calibration Zero : 2603.599
Energy Calibration Slope : 5.520661
Energy Calibration Quadratic : 3.8628373E-04
Energy Calibration Range : 8662.000

Instrument : CHAMBER 004
 Detector : 64279
 Calibration Date/Time : 4-SEP-2009 12:35:56
 Calibration Source Id : AESS-004
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.248
 NP-237 4341 2/28/10 4768.800 4768.163
 CM-244 4320A 2/28/10 5795.020 5794.666
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2539.883
 Energy Calibration Slope : 5.106114
 Energy Calibration Quadratic : 3.6220285E-04
 Energy Calibration Range : 8148.000

Instrument : CHAMBER 005
 Detector : 67612
 Calibration Date/Time : 4-SEP-2009 12:36:04
 Calibration Source Id : AESS-005
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.596
 NP-237 4341 2/28/10 4768.800 4768.626
 CM-244 4320A 2/28/10 5795.020 5794.885
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.695
 Energy Calibration Slope : 5.003819
 Energy Calibration Quadratic : 3.1809139E-04
 Energy Calibration Range : 7847.000

Instrument : CHAMBER 006
 Detector : 67613
 Calibration Date/Time : 4-SEP-2009 12:36:12
 Calibration Source Id : AESS-006
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.970
 CM-244 4320A 2/28/10 5795.020 5795.230
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2372.089
 Energy Calibration Slope : 4.968963
 Energy Calibration Quadratic : 2.9746475E-04
 Energy Calibration Range : 7772.000

Instrument : CHAMBER 007
 Detector : 67607
 Calibration Date/Time : 4-SEP-2009 12:36:20
 Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3194.223
NP-237	4341	2/28/10	4768.800	4774.131
CM-244	4320A	2/28/10	5795.020	5795.286

Energy/Channel Equation : see above
 Energy Calibration Zero : 2411.533
 Energy Calibration Slope : 5.136289
 Energy Calibration Quadratic : 3.6015504E-04
 Energy Calibration Range : 8049.000

Instrument : CHAMBER 008
 Detector : 78788
 Calibration Date/Time : 4-SEP-2009 12:36:40
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.947
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2374.892
 Energy Calibration Slope : 4.958869
 Energy Calibration Quadratic : 3.2790817E-04
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 009
 Detector : 72528
 Calibration Date/Time : 4-SEP-2009 12:36:51
 Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.331
NP-237	4341	2/28/10	4768.800	4768.908
CM-244	4320A	2/28/10	5795.020	5795.229

Energy/Channel Equation : see above
 Energy Calibration Zero : 2369.859
 Energy Calibration Slope : 4.969983
 Energy Calibration Quadratic : 3.0930861E-04
 Energy Calibration Range : 7783.000

Instrument : CHAMBER 010
 Detector : 72529
 Calibration Date/Time : 4-SEP-2009 12:37:00
 Calibration Source Id : AESS-010

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.738
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2375.295
 Energy Calibration Slope : 4.946028
 Energy Calibration Quadratic : 2.9286626E-04
 Energy Calibration Range : 7747.000

Instrument : CHAMBER 011
 Detector : 72531
 Calibration Date/Time : 4-SEP-2009 12:37:27
 Calibration Source Id : AESS-011

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.151

Energy/Channel Equation : see above
 Energy Calibration Zero : 2351.281
 Energy Calibration Slope : 4.995483
 Energy Calibration Quadratic : 3.1063837E-04
 Energy Calibration Range : 7792.000

Instrument : CHAMBER 012
 Detector : 67594
 Calibration Date/Time : 4-SEP-2009 12:37:37
 Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.665
CM-244	4320A	2/28/10	5795.020	5794.701

Energy/Channel Equation : see above
 Energy Calibration Zero : 2380.536
 Energy Calibration Slope : 4.954679
 Energy Calibration Quadratic : 2.8732172E-04
 Energy Calibration Range : 7755.000

Instrument : CHAMBER 013
 Detector : 78790
 Calibration Date/Time : 4-SEP-2009 12:37:47
 Calibration Source Id : AESS-013
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.702
 NP-237 4341 2/28/10 4768.800 4769.527
 CM-244 4320A 2/28/10 5795.020 5795.398

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.963
 Energy Calibration Slope : 4.909760
 Energy Calibration Quadratic : 2.9884593E-04
 Energy Calibration Range : 7700.000

Instrument : CHAMBER 014
 Detector : 67616
 Calibration Date/Time : 4-SEP-2009 12:37:57
 Calibration Source Id : AESS-014
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.690
 NP-237 4341 2/28/10 4768.800 4768.619
 CM-244 4320A 2/28/10 5795.020 5794.719

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2351.225
 Energy Calibration Slope : 4.953602
 Energy Calibration Quadratic : 3.2283107E-04
 Energy Calibration Range : 7762.000

Instrument : CHAMBER 015
 Detector : 61581
 Calibration Date/Time : 4-SEP-2009 12:38:32
 Calibration Source Id : AESS-015
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.566
 NP-237 4341 2/28/10 4768.800 4769.887
 CM-244 4320A 2/28/10 5795.020 5795.771

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2340.391
 Energy Calibration Slope : 4.902360
 Energy Calibration Quadratic : 2.9459049E-04
 Energy Calibration Range : 7669.000

Instrument : CHAMBER 016
 Detector : 78774
 Calibration Date/Time : 4-SEP-2009 12:39:14
 Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.862
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.881
 Energy Calibration Slope : 4.887459
 Energy Calibration Quadratic : 3.1538753E-04
 Energy Calibration Range : 7688.000

Instrument : CHAMBER 017
 Detector : 78791
 Calibration Date/Time : 4-SEP-2009 12:39:56
 Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.864
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2360.881
 Energy Calibration Slope : 4.992493
 Energy Calibration Quadratic : 2.7980251E-04
 Energy Calibration Range : 7767.000

Instrument : CHAMBER 018
 Detector : 78782
 Calibration Date/Time : 4-SEP-2009 12:40:11
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5794.892

Energy/Channel Equation : see above
 Energy Calibration Zero : 2354.269
 Energy Calibration Slope : 4.957198
 Energy Calibration Quadratic : 3.2317592E-04
 Energy Calibration Range : 7769.000

Instrument : CHAMBER 019
 Detector : 78786
 Calibration Date/Time : 4-SEP-2009 12:40:24
 Calibration Source Id : AESS-019

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.321
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2346.765
 Energy Calibration Slope : 5.052913
 Energy Calibration Quadratic : 2.4091676E-04
 Energy Calibration Range : 7774.000

Instrument : CHAMBER 020
 Detector : 78787
 Calibration Date/Time : 4-SEP-2009 12:40:33
 Calibration Source Id : AESS-020

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.527
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2338.013
 Energy Calibration Slope : 4.982131
 Energy Calibration Quadratic : 2.9908412E-04
 Energy Calibration Range : 7753.000

Instrument : CHAMBER 021
 Detector : 67047
 Calibration Date/Time : 4-SEP-2009 12:40:41
 Calibration Source Id : AESS-021

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2273.506
 Energy Calibration Slope : 4.978734
 Energy Calibration Quadratic : 2.7200553E-04
 Energy Calibration Range : 7657.000

Instrument : CHAMBER 022
 Detector : 72530
 Calibration Date/Time : 4-SEP-2009 12:40:50
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.361
NP-237	4341	2/28/10	4768.800	4769.133
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2375.240
 Energy Calibration Slope : 4.980961
 Energy Calibration Quadratic : 2.7447013E-04
 Energy Calibration Range : 7764.000

Instrument : CHAMBER 023
 Detector : 78264
 Calibration Date/Time : 4-SEP-2009 12:40:59
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.015
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5794.708

Energy/Channel Equation : see above
 Energy Calibration Zero : 2381.774
 Energy Calibration Slope : 5.002218
 Energy Calibration Quadratic : 2.9209474E-04
 Energy Calibration Range : 7810.000

Instrument : CHAMBER 024
 Detector : 76542
 Calibration Date/Time : 4-SEP-2009 12:41:10
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2348.764
 Energy Calibration Slope : 4.960187
 Energy Calibration Quadratic : 2.8149344E-04
 Energy Calibration Range : 7723.000

Instrument : CHAMBER 025
 Detector : 45-149AA5
 Calibration Date/Time : 5-SEP-2009 13:36:12
 Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.301
NP-237	4341	2/28/10	4768.800	4769.169
CM-244	4320A	2/28/10	5795.020	5795.134

Energy/Channel Equation : see above
 Energy Calibration Zero : 2313.345
 Energy Calibration Slope : 4.853284
 Energy Calibration Quadratic : 3.0770546E-04
 Energy Calibration Range : 7606.000

Instrument : CHAMBER 026
 Detector : 78204
 Calibration Date/Time : 5-SEP-2009 13:36:22
 Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.929
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.057
 Energy Calibration Slope : 4.920322
 Energy Calibration Quadratic : 3.5937896E-04
 Energy Calibration Range : 7773.000

Instrument : CHAMBER 027
 Detector : 42484
 Calibration Date/Time : 5-SEP-2009 13:36:31
 Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.819
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2363.651
 Energy Calibration Slope : 4.963936
 Energy Calibration Quadratic : 3.2873321E-04
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 028
 Detector : 78792
 Calibration Date/Time : 5-SEP-2009 13:36:41
 Calibration Source Id : AESS-028
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.019
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2311.599
 Energy Calibration Slope : 4.936965
 Energy Calibration Quadratic : 3.4681335E-04
 Energy Calibration Range : 7731.000

Instrument : CHAMBER 029
 Detector : 33454
 Calibration Date/Time : 5-SEP-2009 13:36:49
 Calibration Source Id : AESS-029
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.046
 NP-237 4341 2/28/10 4768.800 4768.273
 CM-244 4320A 2/28/10 5795.020 5794.838
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2346.906
 Energy Calibration Slope : 4.889407
 Energy Calibration Quadratic : 2.9813289E-04
 Energy Calibration Range : 7666.000

Instrument : CHAMBER 030
 Detector : 33447
 Calibration Date/Time : 5-SEP-2009 13:36:58
 Calibration Source Id : AESS-030
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.621
 Energy Calibration Slope : 4.959564
 Energy Calibration Quadratic : 3.0966211E-04
 Energy Calibration Range : 7780.000

Instrument : CHAMBER 031
 Detector : 67042
 Calibration Date/Time : 5-SEP-2009 13:37:09
 Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.344
NP-237	4341	2/28/10	4768.800	4769.750
CM-244	4320A	2/28/10	5795.020	5795.848

Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.347
 Energy Calibration Slope : 4.922678
 Energy Calibration Quadratic : 3.3807335E-04
 Energy Calibration Range : 7754.000

Instrument : CHAMBER 032
 Detector : 67041
 Calibration Date/Time : 5-SEP-2009 13:37:21
 Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3082.708
NP-237	4341	2/28/10	4768.800	4596.952
CM-244	4320A	2/28/10	5795.020	5590.557

Energy/Channel Equation : see above
 Energy Calibration Zero : 2480.957
 Energy Calibration Slope : 5.431309
 Energy Calibration Quadratic :
 Energy Calibration Range : 8043.000

Instrument : CHAMBER 033
 Detector : 78785
 Calibration Date/Time : 5-SEP-2009 13:37:30
 Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.293
NP-237	4341	2/28/10	4768.800	4768.798
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2371.628
 Energy Calibration Slope : 4.957000
 Energy Calibration Quadratic : 3.2105893E-04
 Energy Calibration Range : 7784.000

Instrument : CHAMBER 034
 Detector : 61586
 Calibration Date/Time : 5-SEP-2009 13:37:40
 Calibration Source Id : AESS-034

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3048.128
NP-237	4341	2/28/10	4768.800	4505.317
CM-244	4320A	2/28/10	5795.020	5654.358

Energy/Channel Equation : see above
 Energy Calibration Zero : 2505.085
 Energy Calibration Slope : 5.306273
 Energy Calibration Quadratic :
 Energy Calibration Range : 7939.000

Instrument : CHAMBER 035
 Detector : 78202
 Calibration Date/Time : 5-SEP-2009 13:37:51
 Calibration Source Id : AESS-035

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.195
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2331.502
 Energy Calibration Slope : 4.956956
 Energy Calibration Quadratic : 3.3284936E-04
 Energy Calibration Range : 7756.000

Instrument : CHAMBER 036
 Detector : 78203
 Calibration Date/Time : 5-SEP-2009 13:38:00
 Calibration Source Id : AESS-036

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.261
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.112

Energy/Channel Equation : see above
 Energy Calibration Zero : 2349.949
 Energy Calibration Slope : 4.931112
 Energy Calibration Quadratic : 3.3396695E-04
 Energy Calibration Range : 7750.000

Instrument : CHAMBER 037
 Detector : 45-149BB5
 Calibration Date/Time : 5-SEP-2009 13:38:11
 Calibration Source Id : AESS-037

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4769.328
CM-244	4320A	2/28/10	5795.020	5795.274

Energy/Channel Equation : see above
 Energy Calibration Zero : 2377.698
 Energy Calibration Slope : 4.936130
 Energy Calibration Quadratic : 2.6397177E-04
 Energy Calibration Range : 7709.000

Instrument : CHAMBER 038
 Detector : 72532
 Calibration Date/Time : 5-SEP-2009 13:38:20
 Calibration Source Id : AESS-038

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.173

Energy/Channel Equation : see above
 Energy Calibration Zero : 2373.418
 Energy Calibration Slope : 4.945736
 Energy Calibration Quadratic : 3.1779311E-04
 Energy Calibration Range : 7771.000

Instrument : CHAMBER 039
 Detector : 45-149BB2
 Calibration Date/Time : 5-SEP-2009 13:38:28
 Calibration Source Id : AESS-039

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.413
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2383.597
 Energy Calibration Slope : 4.901721
 Energy Calibration Quadratic : 3.2673960E-04
 Energy Calibration Range : 7746.000

Instrument : CHAMBER 040
 Detector : 78773
 Calibration Date/Time : 5-SEP-2009 13:38:36
 Calibration Source Id : AESS-040
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.203
 NP-237 4341 2/28/10 4768.800 4768.877
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2349.601
 Energy Calibration Slope : 4.890684
 Energy Calibration Quadratic : 3.3607692E-04
 Energy Calibration Range : 7710.000

Instrument : CHAMBER 041
 Detector : 78205
 Calibration Date/Time : 5-SEP-2009 13:38:44
 Calibration Source Id : AESS-041
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.316
 NP-237 4341 2/28/10 4768.800 4768.914
 CM-244 4320A 2/28/10 5795.020 5795.124
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2359.603
 Energy Calibration Slope : 4.927306
 Energy Calibration Quadratic : 3.6796945E-04
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 042
 Detector : 78793
 Calibration Date/Time : 5-SEP-2009 13:38:52
 Calibration Source Id : AESS-042
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.945
 CM-244 4320A 2/28/10 5795.020 5795.068
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2375.562
 Energy Calibration Slope : 4.905127
 Energy Calibration Quadratic : 3.3096116E-04
 Energy Calibration Range : 7745.000

Instrument : CHAMBER 043
 Detector : 76543
 Calibration Date/Time : 5-SEP-2009 13:38:59
 Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.008
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.285

Energy/Channel Equation : see above
 Energy Calibration Zero : 2370.828
 Energy Calibration Slope : 4.912446
 Energy Calibration Quadratic : 3.4794814E-04
 Energy Calibration Range : 7766.000

Instrument : CHAMBER 044
 Detector : 79459
 Calibration Date/Time : 5-SEP-2009 13:39:07
 Calibration Source Id : AESS-044

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.899
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.678
 Energy Calibration Slope : 4.935909
 Energy Calibration Quadratic : 3.3428424E-04
 Energy Calibration Range : 7763.000

Instrument : CHAMBER 045
 Detector : 78783
 Calibration Date/Time : 5-SEP-2009 13:39:15
 Calibration Source Id : AESS-045

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.021
 Energy Calibration Slope : 4.936533
 Energy Calibration Quadratic : 3.2874785E-04
 Energy Calibration Range : 7762.000

Instrument : CHAMBER 046
 Detector : 76544
 Calibration Date/Time : 5-SEP-2009 13:39:23
 Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.265
NP-237	4341	2/28/10	4768.800	4768.973
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.969
 Energy Calibration Slope : 4.880176
 Energy Calibration Quadratic : 3.5064379E-04
 Energy Calibration Range : 7727.000

Instrument : CHAMBER 047
 Detector : 46-089B1
 Calibration Date/Time : 5-SEP-2009 13:39:31
 Calibration Source Id : AESS-047

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.348
NP-237	4341	2/28/10	4768.800	4768.802
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.118
 Energy Calibration Slope : 4.961685
 Energy Calibration Quadratic : 3.1629670E-04
 Energy Calibration Range : 7765.000

Instrument : CHAMBER 048
 Detector : 42483
 Calibration Date/Time : 5-SEP-2009 13:39:40
 Calibration Source Id : AESS-048

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.138
NP-237	4341	2/28/10	4768.800	4768.944
CM-244	4320A	2/28/10	5795.020	5795.069

Energy/Channel Equation : see above
 Energy Calibration Zero : 2374.542
 Energy Calibration Slope : 4.945658
 Energy Calibration Quadratic : 2.9861915E-04
 Energy Calibration Range : 7752.000

Instrument : CHAMBER 065
 Detector : 68551
 Calibration Date/Time : 10-SEP-2009 15:04:30
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.073
NP-237	4341	2/28/10	4768.800	4768.577
CM-244	4320A	2/28/10	5795.020	5794.580

Energy/Channel Equation : see above
 Energy Calibration Zero : 2383.800
 Energy Calibration Slope : 4.899660
 Energy Calibration Quadratic : 3.5114386E-04
 Energy Calibration Range : 7769.000

Instrument : CHAMBER 066
 Detector : 46-089C1
 Calibration Date/Time : 10-SEP-2009 15:10:17
 Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.283
NP-237	4341	2/28/10	4768.800	4768.430
CM-244	4320A	2/28/10	5795.020	5794.649

Energy/Channel Equation : see above
 Energy Calibration Zero : 2375.698
 Energy Calibration Slope : 4.989659
 Energy Calibration Quadratic : 2.8016025E-04
 Energy Calibration Range : 7779.000

Instrument : CHAMBER 067
 Detector : 46-089B4
 Calibration Date/Time : 10-SEP-2009 15:10:36
 Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.598
NP-237	4341	2/28/10	4768.800	4768.347
CM-244	4320A	2/28/10	5795.020	5794.829

Energy/Channel Equation : see above
 Energy Calibration Zero : 2400.727
 Energy Calibration Slope : 4.962031
 Energy Calibration Quadratic : 2.9563357E-04
 Energy Calibration Range : 7792.000

Instrument : CHAMBER 068
 Detector : 78794
 Calibration Date/Time : 10-SEP-2009 15:10:50
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.527
CM-244	4320A	2/28/10	5795.020	5794.924

Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.846
 Energy Calibration Slope : 4.977042
 Energy Calibration Quadratic : 3.0877045E-04
 Energy Calibration Range : 7785.000

Instrument : CHAMBER 069
 Detector : 78795
 Calibration Date/Time : 10-SEP-2009 15:11:01
 Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.644
NP-237	4341	2/28/10	4768.800	4768.741
CM-244	4320A	2/28/10	5795.020	5794.891

Energy/Channel Equation : see above
 Energy Calibration Zero : 2374.492
 Energy Calibration Slope : 4.948631
 Energy Calibration Quadratic : 3.2262344E-04
 Energy Calibration Range : 7780.000

Instrument : CHAMBER 070
 Detector : 46-089B2
 Calibration Date/Time : 10-SEP-2009 15:11:09
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.486
NP-237	4341	2/28/10	4768.800	4768.275
CM-244	4320A	2/28/10	5795.020	5794.764

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.844
 Energy Calibration Slope : 4.930166
 Energy Calibration Quadratic : 3.1462612E-04
 Energy Calibration Range : 7769.000

Instrument : CHAMBER 071
 Detector : 64259
 Calibration Date/Time : 10-SEP-2009 11:52:27
 Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.047
 Energy Calibration Slope : 4.992121
 Energy Calibration Quadratic : 2.8609094E-04
 Energy Calibration Range : 7788.000

Instrument : CHAMBER 072
 Detector : 45-149AA3
 Calibration Date/Time : 10-SEP-2009 11:52:37
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2365.249
 Energy Calibration Slope : 4.946693
 Energy Calibration Quadratic : 3.0473375E-04
 Energy Calibration Range : 7750.000

Instrument : CHAMBER 073
 Detector : 78775
 Calibration Date/Time : 10-SEP-2009 11:52:45
 Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.994
CM-244	4320A	2/28/10	5795.020	5795.212

Energy/Channel Equation : see above
 Energy Calibration Zero : 2337.191
 Energy Calibration Slope : 4.930847
 Energy Calibration Quadratic : 3.1032809E-04
 Energy Calibration Range : 7712.000

Instrument : CHAMBER 074
 Detector : 78266
 Calibration Date/Time : 10-SEP-2009 11:52:53
 Calibration Source Id : AESS-010
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.297
 NP-237 4341 2/28/10 4768.800 4768.798
 CM-244 4320A 2/28/10 5795.020 5795.021

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2347.677
 Energy Calibration Slope : 4.994187
 Energy Calibration Quadratic : 2.9070242E-04
 Energy Calibration Range : 7767.000

Instrument : CHAMBER 075
 Detector : 68550
 Calibration Date/Time : 10-SEP-2009 11:53:01
 Calibration Source Id : AESS-011
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.614
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.927
 Energy Calibration Slope : 4.947097
 Energy Calibration Quadratic : 3.2553895E-04
 Energy Calibration Range : 7769.000

Instrument : CHAMBER 076
 Detector : 78779
 Calibration Date/Time : 10-SEP-2009 11:54:17
 Calibration Source Id : AESS-012
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.273
 NP-237 4341 2/28/10 4768.800 4769.246
 CM-244 4320A 2/28/10 5795.020 5795.156

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2348.219
 Energy Calibration Slope : 4.941242
 Energy Calibration Quadratic : 3.2608485E-04
 Energy Calibration Range : 7750.000

Instrument : CHAMBER 077
 Detector : 67576
 Calibration Date/Time : 9-SEP-2009 14:24:36
 Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.586
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2365.540
 Energy Calibration Slope : 4.940758
 Energy Calibration Quadratic : 2.9910897E-04
 Energy Calibration Range : 7739.000

Instrument : CHAMBER 078
 Detector : 67577
 Calibration Date/Time : 9-SEP-2009 14:24:46
 Calibration Source Id : AESS-014

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.776
NP-237	4341	2/28/10	4768.800	4770.902
CM-244	4320A	2/28/10	5795.020	5796.737

Energy/Channel Equation : see above
 Energy Calibration Zero : 2400.171
 Energy Calibration Slope : 4.950543
 Energy Calibration Quadratic : 3.2390543E-04
 Energy Calibration Range : 7809.000

Instrument : CHAMBER 079
 Detector : 67598
 Calibration Date/Time : 9-SEP-2009 14:25:09
 Calibration Source Id : AESS-015

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3180.320
NP-237	4341	2/28/10	4768.800	4761.978
CM-244	4320A	2/28/10	5795.020	5776.398

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.911
 Energy Calibration Slope : 5.011374
 Energy Calibration Quadratic : 2.7555224E-04
 Energy Calibration Range : 7811.000

Instrument : CHAMBER 080
 Detector : 78197
 Calibration Date/Time : 9-SEP-2009 14:25:19
 Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.420
NP-237	4341	2/28/10	4768.800	4768.374
CM-244	4320A	2/28/10	5795.020	5794.640

Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.814
 Energy Calibration Slope : 5.017712
 Energy Calibration Quadratic : 2.8129964E-04
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 081
 Detector : 72533
 Calibration Date/Time : 9-SEP-2009 14:25:34
 Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3181.871
NP-237	4341	2/28/10	4768.800	4695.089
CM-244	4320A	2/28/10	5795.020	5736.250

Energy/Channel Equation : see above
 Energy Calibration Zero : 2241.359
 Energy Calibration Slope : 9.062563
 Energy Calibration Quadratic : -3.5732647E-03
 Energy Calibration Range : 7775.000

Instrument : CHAMBER 082
 Detector : 64263
 Calibration Date/Time : 9-SEP-2009 14:25:44
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.636
NP-237	4341	2/28/10	4768.800	4767.951
CM-244	4320A	2/28/10	5795.020	5793.988

Energy/Channel Equation : see above
 Energy Calibration Zero : 2395.243
 Energy Calibration Slope : 4.989262
 Energy Calibration Quadratic : 3.2476569E-04
 Energy Calibration Range : 7845.000

Instrument : CHAMBER 083
 Detector : 64278
 Calibration Date/Time : 9-SEP-2009 14:25:54
 Calibration Source Id : AESS-019

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.177
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2373.941
 Energy Calibration Slope : 5.037010
 Energy Calibration Quadratic : 2.4928377E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 084
 Detector : 78265
 Calibration Date/Time : 9-SEP-2009 14:26:03
 Calibration Source Id : AESS-020

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.060
 Energy Calibration Slope : 5.027309
 Energy Calibration Quadratic : 2.6733367E-04
 Energy Calibration Range : 7790.000

Instrument : CHAMBER 085
 Detector : 78776
 Calibration Date/Time : 9-SEP-2009 14:26:12
 Calibration Source Id : AESS-021

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.723
 Energy Calibration Slope : 5.005558
 Energy Calibration Quadratic : 2.7239005E-04
 Energy Calibration Range : 7776.000

Instrument : CHAMBER 086
 Detector : 78198
 Calibration Date/Time : 9-SEP-2009 14:26:20
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.488
NP-237	4341	2/28/10	4768.800	4769.725
CM-244	4320A	2/28/10	5795.020	5795.349

Energy/Channel Equation : see above
 Energy Calibration Zero : 2355.530
 Energy Calibration Slope : 5.002363
 Energy Calibration Quadratic : 2.4857160E-04
 Energy Calibration Range : 7739.000

Instrument : CHAMBER 087
 Detector : 78199
 Calibration Date/Time : 9-SEP-2009 14:26:29
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.441
NP-237	4341	2/28/10	4768.800	4769.107
CM-244	4320A	2/28/10	5795.020	5795.313

Energy/Channel Equation : see above
 Energy Calibration Zero : 2342.304
 Energy Calibration Slope : 4.966381
 Energy Calibration Quadratic : 2.5458023E-04
 Energy Calibration Range : 7695.000

Instrument : CHAMBER 088
 Detector : 33452
 Calibration Date/Time : 9-SEP-2009 14:26:37
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2351.972
 Energy Calibration Slope : 4.962395
 Energy Calibration Quadratic : 2.3138702E-04
 Energy Calibration Range : 7676.000

Instrument : CHAMBER 089
 Detector : 78262
 Calibration Date/Time : 9-SEP-2009 14:26:46
 Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.780
 Energy Calibration Slope : 4.988051
 Energy Calibration Quadratic : 3.2016891E-04
 Energy Calibration Range : 7805.000

Instrument : CHAMBER 090
 Detector : 78263
 Calibration Date/Time : 9-SEP-2009 14:26:55
 Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.786
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2369.189
 Energy Calibration Slope : 4.910583
 Energy Calibration Quadratic : 3.3626173E-04
 Energy Calibration Range : 7750.000

Instrument : CHAMBER 091
 Detector : 78259
 Calibration Date/Time : 9-SEP-2009 14:27:04
 Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2372.086
 Energy Calibration Slope : 4.976717
 Energy Calibration Quadratic : 3.2079496E-04
 Energy Calibration Range : 7805.000

Instrument : CHAMBER 092
 Detector : 79457
 Calibration Date/Time : 9-SEP-2009 14:27:12
 Calibration Source Id : AESS-028

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.777
CM-244	4320A	2/28/10	5795.020	5794.923

Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.868
 Energy Calibration Slope : 4.924122
 Energy Calibration Quadratic : 3.2251322E-04
 Energy Calibration Range : 7734.000

Instrument : CHAMBER 093
 Detector : 33206
 Calibration Date/Time : 9-SEP-2009 14:27:22
 Calibration Source Id : AESS-029

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.249
NP-237	4341	2/28/10	4768.800	4768.968
CM-244	4320A	2/28/10	5795.020	5795.159

Energy/Channel Equation : see above
 Energy Calibration Zero : 2372.322
 Energy Calibration Slope : 4.913898
 Energy Calibration Quadratic : 3.2920585E-04
 Energy Calibration Range : 7749.000

Instrument : CHAMBER 094
 Detector : 78267
 Calibration Date/Time : 9-SEP-2009 14:27:30
 Calibration Source Id : AESS-030

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.321
NP-237	4341	2/28/10	4768.800	4768.963
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.784
 Energy Calibration Slope : 4.940577
 Energy Calibration Quadratic : 3.1028298E-04
 Energy Calibration Range : 7749.000

Instrument : CHAMBER 095
 Detector : 64279
 Calibration Date/Time : 9-SEP-2009 14:27:38
 Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.571
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.875
 Energy Calibration Slope : 4.949866
 Energy Calibration Quadratic : 3.0133256E-04
 Energy Calibration Range : 7743.000

Instrument : CHAMBER 096
 Detector : 67605
 Calibration Date/Time : 9-SEP-2009 14:27:47
 Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.717
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2354.901
 Energy Calibration Slope : 4.924323
 Energy Calibration Quadratic : 3.5411670E-04
 Energy Calibration Range : 7769.000

Instrument : CHAMBER 097
 Detector : 67599
 Calibration Date/Time : 9-SEP-2009 14:27:55
 Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.643
NP-237	4341	2/28/10	4768.800	4768.475
CM-244	4320A	2/28/10	5795.020	5795.003

Energy/Channel Equation : see above
 Energy Calibration Zero : 2369.802
 Energy Calibration Slope : 4.943386
 Energy Calibration Quadratic : 3.3847254E-04
 Energy Calibration Range : 7787.000

Instrument : CHAMBER 098
 Detector : 68644
 Calibration Date/Time : 9-SEP-2009 14:28:04
 Calibration Source Id : AESS-034

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.815
NP-237	4341	2/28/10	4768.800	4768.749
CM-244	4320A	2/28/10	5795.020	5794.866

Energy/Channel Equation : see above
 Energy Calibration Zero : 2387.741
 Energy Calibration Slope : 4.973858
 Energy Calibration Quadratic : 3.2656032E-04
 Energy Calibration Range : 7823.000

Instrument : CHAMBER 099
 Detector : 70317
 Calibration Date/Time : 9-SEP-2009 14:28:14
 Calibration Source Id : AESS-035

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.694
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2371.501
 Energy Calibration Slope : 4.902037
 Energy Calibration Quadratic : 3.4626262E-04
 Energy Calibration Range : 7754.000

Instrument : CHAMBER 100
 Detector : 79456
 Calibration Date/Time : 9-SEP-2009 14:28:23
 Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.712
NP-237	4341	2/28/10	4768.800	4768.612
CM-244	4320A	2/28/10	5795.020	5794.822

Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.407
 Energy Calibration Slope : 4.911796
 Energy Calibration Quadratic : 3.3084911E-04
 Energy Calibration Range : 7730.000

Instrument : CHAMBER 101
 Detector : 64253
 Calibration Date/Time : 9-SEP-2009 14:28:33
 Calibration Source Id : AESS-037

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.576
NP-237	4341	2/28/10	4768.800	4768.407
CM-244	4320A	2/28/10	5795.020	5794.465

Energy/Channel Equation : see above
 Energy Calibration Zero : 2416.719
 Energy Calibration Slope : 4.931056
 Energy Calibration Quadratic : 3.4281739E-04
 Energy Calibration Range : 7826.000

Instrument : CHAMBER 102
 Detector : 72525
 Calibration Date/Time : 9-SEP-2009 14:28:41
 Calibration Source Id : AESS-038

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.861
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.512
 Energy Calibration Slope : 4.874489
 Energy Calibration Quadratic : 3.3478835E-04
 Energy Calibration Range : 7707.000

Instrument : CHAMBER 103
 Detector : 79461
 Calibration Date/Time : 9-SEP-2009 14:28:50
 Calibration Source Id : AESS-039

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.015
 Energy Calibration Slope : 4.922173
 Energy Calibration Quadratic : 3.3696479E-04
 Energy Calibration Range : 7783.000

Instrument : CHAMBER 104
 Detector : 72524
 Calibration Date/Time : 9-SEP-2009 14:28:59
 Calibration Source Id : AESS-040
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.839
 NP-237 4341 2/28/10 4768.800 4768.720
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.914
 Energy Calibration Slope : 4.883392
 Energy Calibration Quadratic : 3.4849218E-04
 Energy Calibration Range : 7728.000

Instrument : CHAMBER 105
 Detector : 78777
 Calibration Date/Time : 10-SEP-2009 13:05:54
 Calibration Source Id : AESS-041
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.290
 NP-237 4341 2/28/10 4768.800 4769.099
 CM-244 4320A 2/28/10 5795.020 5795.203
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2371.469
 Energy Calibration Slope : 4.894183
 Energy Calibration Quadratic : 3.2872061E-04
 Energy Calibration Range : 7728.000

Instrument : CHAMBER 106
 Detector : 64274
 Calibration Date/Time : 9-SEP-2009 14:29:53
 Calibration Source Id : AESS-042
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.543
 NP-237 4341 2/28/10 4768.800 4769.107
 CM-244 4320A 2/28/10 5795.020 5795.161
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.643
 Energy Calibration Slope : 4.909638
 Energy Calibration Quadratic : 3.7089069E-04
 Energy Calibration Range : 7803.000

Instrument : CHAMBER 107
 Detector : 67578
 Calibration Date/Time : 9-SEP-2009 14:30:02
 Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.094

Energy/Channel Equation : see above
 Energy Calibration Zero : 2367.437
 Energy Calibration Slope : 4.969880
 Energy Calibration Quadratic : 3.2337336E-04
 Energy Calibration Range : 7796.000

Instrument : CHAMBER 108
 Detector : 78778
 Calibration Date/Time : 9-SEP-2009 14:30:11
 Calibration Source Id : AESS-044

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.197
NP-237	4341	2/28/10	4768.800	4768.829
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.148
 Energy Calibration Slope : 4.886508
 Energy Calibration Quadratic : 3.4449942E-04
 Energy Calibration Range : 7726.000

Instrument : CHAMBER 109
 Detector : 79463
 Calibration Date/Time : 9-SEP-2009 14:30:20
 Calibration Source Id : AESS-045

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.819
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2363.478
 Energy Calibration Slope : 4.886961
 Energy Calibration Quadratic : 3.7578429E-04
 Energy Calibration Range : 7762.000

Instrument : CHAMBER 110
 Detector : 67602
 Calibration Date/Time : 9-SEP-2009 14:30:29
 Calibration Source Id : AESS-046
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2455.144
 Energy Calibration Slope : 5.068584
 Energy Calibration Quadratic : 3.6489649E-04
 Energy Calibration Range : 8028.000

Instrument : CHAMBER 111
 Detector : 79462
 Calibration Date/Time : 9-SEP-2009 14:30:39
 Calibration Source Id : AESS-047
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.019
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.093
 Energy Calibration Slope : 4.964253
 Energy Calibration Quadratic : 3.3889871E-04
 Energy Calibration Range : 7803.000

Instrument : CHAMBER 112
 Detector : 78261
 Calibration Date/Time : 9-SEP-2009 14:30:47
 Calibration Source Id : AESS-048
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2374.713
 Energy Calibration Slope : 4.915321
 Energy Calibration Quadratic : 3.3604659E-04
 Energy Calibration Range : 7760.000

Instrument : CHAMBER 113
 Detector : 45-111B4
 Calibration Date/Time : 17-AUG-2009 14:57:05
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.693
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2388.351
 Energy Calibration Slope : 4.986037
 Energy Calibration Quadratic : 2.9112995E-04
 Energy Calibration Range : 7799.000

Instrument : CHAMBER 114
 Detector : 78258
 Calibration Date/Time : 17-AUG-2009 14:57:42
 Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.738
NP-237	4341	2/28/10	4768.800	4768.375
CM-244	4320A	2/28/10	5795.020	5794.878

Energy/Channel Equation : see above
 Energy Calibration Zero : 2341.717
 Energy Calibration Slope : 4.967946
 Energy Calibration Quadratic : 2.6719994E-04
 Energy Calibration Range : 7709.000

Instrument : CHAMBER 115
 Detector : 45-132FF4
 Calibration Date/Time : 17-AUG-2009 14:57:55
 Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.996
CM-244	4320A	2/28/10	5795.020	5795.124

Energy/Channel Equation : see above
 Energy Calibration Zero : 2360.484
 Energy Calibration Slope : 5.001271
 Energy Calibration Quadratic : 2.5857674E-04
 Energy Calibration Range : 7753.000

Instrument : CHAMBER 116
 Detector : 45-132FF2
 Calibration Date/Time : 17-AUG-2009 14:58:06
 Calibration Source Id : AESS-008
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.296
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.140
 Energy Calibration Slope : 4.998592
 Energy Calibration Quadratic : 2.4986797E-04
 Energy Calibration Range : 7739.000

Instrument : CHAMBER 117
 Detector : 33450
 Calibration Date/Time : 17-AUG-2009 14:58:17
 Calibration Source Id : AESS-003
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.212
 NP-237 4341 2/28/10 4768.800 4768.136
 CM-244 4320A 2/28/10 5795.020 5794.829

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2377.331
 Energy Calibration Slope : 4.984442
 Energy Calibration Quadratic : 2.6023277E-04
 Energy Calibration Range : 7754.000

Instrument : CHAMBER 118
 Detector : 75544
 Calibration Date/Time : 17-AUG-2009 14:58:27
 Calibration Source Id : AESS-009
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.453
 NP-237 4341 2/28/10 4768.800 4768.624
 CM-244 4320A 2/28/10 5795.020 5794.893

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2343.030
 Energy Calibration Slope : 4.970738
 Energy Calibration Quadratic : 2.7650801E-04
 Energy Calibration Range : 7723.000

Instrument : CHAMBER 119
 Detector : 74429
 Calibration Date/Time : 2-FEB-2009 15:15:38
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3001.688
NP-237	4341	2/28/10	4768.800	4669.281
CM-244	4320A	2/28/10	5795.020	5706.875

Energy/Channel Equation : see above
 Energy Calibration Zero : 2437.949
 Energy Calibration Slope : 5.036866
 Energy Calibration Quadratic :
 Energy Calibration Range : 7596.000

Instrument : CHAMBER 120
 Detector : 74430
 Calibration Date/Time : 18-AUG-2009 13:38:55
 Calibration Source Id : AESS-010

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.734
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5794.984

Energy/Channel Equation : see above
 Energy Calibration Zero : 2316.127
 Energy Calibration Slope : 4.939470
 Energy Calibration Quadratic : 2.8824760E-04
 Energy Calibration Range : 7676.000

Instrument : CHAMBER 121
 Detector : 75545
 Calibration Date/Time : 17-AUG-2009 14:58:37
 Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.992
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5794.910

Energy/Channel Equation : see above
 Energy Calibration Zero : 2338.077
 Energy Calibration Slope : 4.950966
 Energy Calibration Quadratic : 2.8139201E-04
 Energy Calibration Range : 7703.000

Instrument : CHAMBER 122
 Detector : 75546
 Calibration Date/Time : 17-AUG-2009 14:58:49
 Calibration Source Id : AESS-011

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.767
NP-237	4341	2/28/10	4768.800	4768.557
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2334.596
 Energy Calibration Slope : 4.961221
 Energy Calibration Quadratic : 2.6947071E-04
 Energy Calibration Range : 7697.000

Instrument : CHAMBER 123
 Detector : 45-142V3
 Calibration Date/Time : 17-AUG-2009 14:58:58
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.626
NP-237	4341	2/28/10	4768.800	4768.419
CM-244	4320A	2/28/10	5795.020	5794.913

Energy/Channel Equation : see above
 Energy Calibration Zero : 2377.630
 Energy Calibration Slope : 4.988592
 Energy Calibration Quadratic : 2.4062325E-04
 Energy Calibration Range : 7738.000

Instrument : CHAMBER 124
 Detector : 45-142V2
 Calibration Date/Time : 17-AUG-2009 14:59:08
 Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.737
NP-237	4341	2/28/10	4768.800	4768.348
CM-244	4320A	2/28/10	5795.020	5794.822

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.445
 Energy Calibration Slope : 5.014465
 Energy Calibration Quadratic : 2.5700411E-04
 Energy Calibration Range : 7794.000

Instrument : CHAMBER 125
 Detector : 75547
 Calibration Date/Time : 17-AUG-2009 14:59:18
 Calibration Source Id : AESS-013

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.519
NP-237	4341	2/28/10	4768.800	4768.590
CM-244	4320A	2/28/10	5795.020	5794.968

Energy/Channel Equation : see above
 Energy Calibration Zero : 2346.234
 Energy Calibration Slope : 4.935012
 Energy Calibration Quadratic : 2.8653492E-04
 Energy Calibration Range : 7700.000

Instrument : CHAMBER 126
 Detector : 75548
 Calibration Date/Time : 17-AUG-2009 14:59:32
 Calibration Source Id : AESS-019

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.586
NP-237	4341	2/28/10	4768.800	4768.494
CM-244	4320A	2/28/10	5795.020	5794.836

Energy/Channel Equation : see above
 Energy Calibration Zero : 2351.831
 Energy Calibration Slope : 5.025319
 Energy Calibration Quadratic : 2.1107355E-04
 Energy Calibration Range : 7719.000

Instrument : CHAMBER 127
 Detector : 78770
 Calibration Date/Time : 17-AUG-2009 14:59:46
 Calibration Source Id : AESS-014

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.831
NP-237	4341	2/28/10	4768.800	4768.741
CM-244	4320A	2/28/10	5795.020	5794.894

Energy/Channel Equation : see above
 Energy Calibration Zero : 2339.154
 Energy Calibration Slope : 4.970251
 Energy Calibration Quadratic : 2.5652250E-04
 Energy Calibration Range : 7698.000

Instrument : CHAMBER 128
 Detector : 75549
 Calibration Date/Time : 17-AUG-2009 15:00:39
 Calibration Source Id : AESS-020
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.531
 NP-237 4341 2/28/10 4768.800 4768.610
 CM-244 4320A 2/28/10 5795.020 5794.838

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2330.388
 Energy Calibration Slope : 5.000057
 Energy Calibration Quadratic : 2.3812153E-04
 Energy Calibration Range : 7700.000

Instrument : CHAMBER 129
 Detector : 76227
 Calibration Date/Time : 17-AUG-2009 15:00:50
 Calibration Source Id : AESS-015
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.843
 NP-237 4341 2/28/10 4768.800 4768.717
 CM-244 4320A 2/28/10 5795.020 5794.874

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2351.215
 Energy Calibration Slope : 4.930460
 Energy Calibration Quadratic : 2.9455224E-04
 Energy Calibration Range : 7709.000

Instrument : CHAMBER 130
 Detector : 76228
 Calibration Date/Time : 17-AUG-2009 15:01:00
 Calibration Source Id : AESS-021
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.985
 NP-237 4341 2/28/10 4768.800 4768.658
 CM-244 4320A 2/28/10 5795.020 5794.729

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2337.606
 Energy Calibration Slope : 4.982665
 Energy Calibration Quadratic : 2.2944069E-04
 Energy Calibration Range : 7680.000

Instrument : CHAMBER 131
 Detector : 33448
 Calibration Date/Time : 17-AUG-2009 15:01:10
 Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3178.948
NP-237	4341	2/28/10	4768.800	4766.564
CM-244	4320A	2/28/10	5795.020	5793.610

Energy/Channel Equation : see above
 Energy Calibration Zero : 2408.823
 Energy Calibration Slope : 4.963500
 Energy Calibration Quadratic : 2.8727154E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 132
 Detector : 67579
 Calibration Date/Time : 17-AUG-2009 15:01:19
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.495
CM-244	4320A	2/28/10	5795.020	5794.895

Energy/Channel Equation : see above
 Energy Calibration Zero : 2326.639
 Energy Calibration Slope : 5.034670
 Energy Calibration Quadratic : 2.1709618E-04
 Energy Calibration Range : 7710.000

Instrument : CHAMBER 133
 Detector : 76229
 Calibration Date/Time : 17-AUG-2009 15:01:29
 Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.802
NP-237	4341	2/28/10	4768.800	4768.798
CM-244	4320A	2/28/10	5795.020	5794.855

Energy/Channel Equation : see above
 Energy Calibration Zero : 2310.723
 Energy Calibration Slope : 4.901457
 Energy Calibration Quadratic : 2.6648620E-04
 Energy Calibration Range : 7609.000

Instrument : CHAMBER 134
 Detector : 76230
 Calibration Date/Time : 17-AUG-2009 15:01:38
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.670
NP-237	4341	2/28/10	4768.800	4768.734
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2328.671
 Energy Calibration Slope : 4.971330
 Energy Calibration Quadratic : 2.3919715E-04
 Energy Calibration Range : 7670.000

Instrument : CHAMBER 135
 Detector : 64270
 Calibration Date/Time : 17-AUG-2009 15:01:50
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.220
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2334.713
 Energy Calibration Slope : 4.950563
 Energy Calibration Quadratic : 2.6665861E-04
 Energy Calibration Range : 7684.000

Instrument : CHAMBER 136
 Detector : 68549
 Calibration Date/Time : 17-AUG-2009 15:02:00
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.547
NP-237	4341	2/28/10	4768.800	4769.648
CM-244	4320A	2/28/10	5795.020	5795.176

Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.961
 Energy Calibration Slope : 4.996480
 Energy Calibration Quadratic : 2.6544984E-04
 Energy Calibration Range : 7748.000

Instrument : CHAMBER 137
 Detector : 64288
 Calibration Date/Time : 18-AUG-2009 09:58:00
 Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.426
CM-244	4320A	2/28/10	5795.020	5794.897

Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.854
 Energy Calibration Slope : 5.032813
 Energy Calibration Quadratic : 2.8756596E-04
 Energy Calibration Range : 7832.000

Instrument : CHAMBER 138
 Detector : 65877
 Calibration Date/Time : 17-AUG-2009 15:10:23
 Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.778
CM-244	4320A	2/28/10	5795.020	5794.902

Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.472
 Energy Calibration Slope : 4.997972
 Energy Calibration Quadratic : 2.8433124E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 139
 Detector : 76231
 Calibration Date/Time : 17-AUG-2009 15:10:36
 Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.807
NP-237	4341	2/28/10	4768.800	4768.778
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.050
 Energy Calibration Slope : 4.923675
 Energy Calibration Quadratic : 3.2614564E-04
 Energy Calibration Range : 7737.000

Instrument : CHAMBER 140
 Detector : 78771
 Calibration Date/Time : 17-AUG-2009 15:10:53
 Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5794.950

Energy/Channel Equation : see above
 Energy Calibration Zero : 2343.606
 Energy Calibration Slope : 4.949296
 Energy Calibration Quadratic : 3.0935110E-04
 Energy Calibration Range : 7736.000

Instrument : CHAMBER 141
 Detector : 76232
 Calibration Date/Time : 17-AUG-2009 15:11:05
 Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.704
NP-237	4341	2/28/10	4768.800	4768.701
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2354.080
 Energy Calibration Slope : 4.967496
 Energy Calibration Quadratic : 2.7667297E-04
 Energy Calibration Range : 7731.000

Instrument : CHAMBER 142
 Detector : 64261
 Calibration Date/Time : 17-AUG-2009 15:11:22
 Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5794.996

Energy/Channel Equation : see above
 Energy Calibration Zero : 2377.858
 Energy Calibration Slope : 4.966272
 Energy Calibration Quadratic : 3.0408424E-04
 Energy Calibration Range : 7782.000

Instrument : CHAMBER 143
 Detector : 65882
 Calibration Date/Time : 17-AUG-2009 15:11:35
 Calibration Source Id : AESS-028
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.838
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.476
 Energy Calibration Slope : 4.958334
 Energy Calibration Quadratic : 2.9036327E-04
 Energy Calibration Range : 7735.000

Instrument : CHAMBER 144
 Detector : 75551
 Calibration Date/Time : 17-AUG-2009 15:11:48
 Calibration Source Id : AESS-034
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.149
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2348.280
 Energy Calibration Slope : 4.953019
 Energy Calibration Quadratic : 2.9027942E-04
 Energy Calibration Range : 7725.000

Instrument : CHAMBER 145
 Detector : 72526
 Calibration Date/Time : 17-AUG-2009 15:12:06
 Calibration Source Id : AESS-029
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5794.950

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.188
 Energy Calibration Slope : 4.950538
 Energy Calibration Quadratic : 3.1101296E-04
 Energy Calibration Range : 7754.000

Instrument : CHAMBER 146
 Detector : 72527
 Calibration Date/Time : 17-AUG-2009 15:12:19
 Calibration Source Id : AESS-035
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.841
 NP-237 4341 2/28/10 4768.800 4768.589
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2352.896
 Energy Calibration Slope : 4.936564
 Energy Calibration Quadratic : 2.8588294E-04
 Energy Calibration Range : 7708.000

Instrument : CHAMBER 147
 Detector : 75550
 Calibration Date/Time : 17-AUG-2009 15:12:37
 Calibration Source Id : AESS-030
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.991
 NP-237 4341 2/28/10 4768.800 4768.681
 CM-244 4320A 2/28/10 5795.020 5794.852
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2344.357
 Energy Calibration Slope : 4.979820
 Energy Calibration Quadratic : 2.4974984E-04
 Energy Calibration Range : 7706.000

Instrument : CHAMBER 148
 Detector : 74429
 Calibration Date/Time : 17-AUG-2009 15:12:57
 Calibration Source Id : AESS-036
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.790
 NP-237 4341 2/28/10 4768.800 4768.746
 CM-244 4320A 2/28/10 5795.020 5794.901
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2347.048
 Energy Calibration Slope : 4.952481
 Energy Calibration Quadratic : 2.8881739E-04
 Energy Calibration Range : 7721.000

Instrument : CHAMBER 149
 Detector : 33449
 Calibration Date/Time : 17-AUG-2009 15:02:09
 Calibration Source Id : AESS-037

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.635
NP-237	4341	2/28/10	4768.800	4768.444
CM-244	4320A	2/28/10	5795.020	5794.948

Energy/Channel Equation : see above
 Energy Calibration Zero : 2393.262
 Energy Calibration Slope : 4.951241
 Energy Calibration Quadratic : 3.0021602E-04
 Energy Calibration Range : 7778.000

Instrument : CHAMBER 150
 Detector : 75552
 Calibration Date/Time : 17-AUG-2009 15:02:19
 Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2357.177
 Energy Calibration Slope : 4.964990
 Energy Calibration Quadratic : 2.8429780E-04
 Energy Calibration Range : 7739.000

Instrument : CHAMBER 151
 Detector : 75556
 Calibration Date/Time : 17-AUG-2009 15:02:29
 Calibration Source Id : AESS-038

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.755
CM-244	4320A	2/28/10	5795.020	5794.925

Energy/Channel Equation : see above
 Energy Calibration Zero : 2344.746
 Energy Calibration Slope : 4.932197
 Energy Calibration Quadratic : 2.7974858E-04
 Energy Calibration Range : 7689.000

Instrument : CHAMBER 152
 Detector : 76222
 Calibration Date/Time : 17-AUG-2009 15:02:41
 Calibration Source Id : AESS-044
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.811
 NP-237 4341 2/28/10 4768.800 4768.798
 CM-244 4320A 2/28/10 5795.020 5794.877
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2344.480
 Energy Calibration Slope : 4.936235
 Energy Calibration Quadratic : 2.8715734E-04
 Energy Calibration Range : 7700.000

Instrument : CHAMBER 153
 Detector : 76223
 Calibration Date/Time : 17-AUG-2009 15:02:59
 Calibration Source Id : AESS-039
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.810
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5794.996
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2337.684
 Energy Calibration Slope : 4.933674
 Energy Calibration Quadratic : 3.0187287E-04
 Energy Calibration Range : 7706.000

Instrument : CHAMBER 154
 Detector : 76224
 Calibration Date/Time : 17-AUG-2009 15:03:12
 Calibration Source Id : AESS-045
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.019
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2342.948
 Energy Calibration Slope : 4.948957
 Energy Calibration Quadratic : 2.8683257E-04
 Energy Calibration Range : 7711.000

Instrument : CHAMBER 155
 Detector : 75553
 Calibration Date/Time : 17-AUG-2009 15:03:49
 Calibration Source Id : AESS-040
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.770
 NP-237 4341 2/28/10 4768.800 4768.662
 CM-244 4320A 2/28/10 5795.020 5794.902

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2367.728
 Energy Calibration Slope : 4.983710
 Energy Calibration Quadratic : 2.8808211E-04
 Energy Calibration Range : 7773.000

Instrument : CHAMBER 156
 Detector : 75554
 Calibration Date/Time : 17-AUG-2009 15:03:58
 Calibration Source Id : AESS-046
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.851
 NP-237 4341 2/28/10 4768.800 4768.705
 CM-244 4320A 2/28/10 5795.020 5794.899

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.355
 Energy Calibration Slope : 4.999010
 Energy Calibration Quadratic : 2.6741659E-04
 Energy Calibration Range : 7762.000

Instrument : CHAMBER 157
 Detector : 75555
 Calibration Date/Time : 17-AUG-2009 15:04:07
 Calibration Source Id : AESS-041
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.868
 NP-237 4341 2/28/10 4768.800 4768.768
 CM-244 4320A 2/28/10 5795.020 5794.925

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.092
 Energy Calibration Slope : 4.979420
 Energy Calibration Quadratic : 2.8018607E-04
 Energy Calibration Range : 7751.000

Instrument : CHAMBER 158
 Detector : 33451
 Calibration Date/Time : 17-AUG-2009 15:04:18
 Calibration Source Id : AESS-047
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.449
 NP-237 4341 2/28/10 4768.800 4768.432
 CM-244 4320A 2/28/10 5795.020 5794.938
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.976
 Energy Calibration Slope : 5.006801
 Energy Calibration Quadratic : 3.0287215E-04
 Energy Calibration Range : 7835.000

Instrument : CHAMBER 159
 Detector : 76225
 Calibration Date/Time : 17-AUG-2009 15:04:28
 Calibration Source Id : AESS-042
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2354.720
 Energy Calibration Slope : 4.980748
 Energy Calibration Quadratic : 2.9428111E-04
 Energy Calibration Range : 7764.000

Instrument : CHAMBER 160
 Detector : 76226
 Calibration Date/Time : 17-AUG-2009 15:04:40
 Calibration Source Id : AESS-048
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2355.649
 Energy Calibration Slope : 4.990073
 Energy Calibration Quadratic : 2.8874222E-04
 Energy Calibration Range : 7768.000

Instrument : CHAMBER 161
 Detector : 70321
 Calibration Date/Time : 24-AUG-2009 14:06:47
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2374.961
 Energy Calibration Slope : 4.910189
 Energy Calibration Quadratic : 3.2356248E-04
 Energy Calibration Range : 7742.000

Instrument : CHAMBER 162
 Detector : 70323
 Calibration Date/Time : 24-AUG-2009 14:06:56
 Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2369.767
 Energy Calibration Slope : 4.933752
 Energy Calibration Quadratic : 2.9582490E-04
 Energy Calibration Range : 7732.000

Instrument : CHAMBER 163
 Detector : 70324
 Calibration Date/Time : 24-AUG-2009 14:07:06
 Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2380.833
 Energy Calibration Slope : 4.951450
 Energy Calibration Quadratic : 2.9602056E-04
 Energy Calibration Range : 7762.000

Instrument : CHAMBER 164
 Detector : 70325
 Calibration Date/Time : 24-AUG-2009 14:07:20
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2382.319
 Energy Calibration Slope : 4.937610
 Energy Calibration Quadratic : 3.1754762E-04
 Energy Calibration Range : 7771.000

Instrument : CHAMBER 165
 Detector : 72544
 Calibration Date/Time : 24-AUG-2009 14:07:34
 Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2383.801
 Energy Calibration Slope : 4.978922
 Energy Calibration Quadratic : 2.7212233E-04
 Energy Calibration Range : 7768.000

Instrument : CHAMBER 166
 Detector : 74545
 Calibration Date/Time : 24-AUG-2009 14:07:42
 Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.102
 Energy Calibration Slope : 4.917744
 Energy Calibration Quadratic : 3.4292034E-04
 Energy Calibration Range : 7771.000

Instrument : CHAMBER 167
 Detector : 72546
 Calibration Date/Time : 24-AUG-2009 14:07:51
 Calibration Source Id : AESS-004
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2378.657
 Energy Calibration Slope : 4.932514
 Energy Calibration Quadratic : 3.1670861E-04
 Energy Calibration Range : 7762.000

Instrument : CHAMBER 168
 Detector : 72547
 Calibration Date/Time : 24-AUG-2009 14:07:59
 Calibration Source Id : AESS-010
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2383.249
 Energy Calibration Slope : 4.927288
 Energy Calibration Quadratic : 3.2642024E-04
 Energy Calibration Range : 7771.000

Instrument : CHAMBER 169
 Detector : 72548
 Calibration Date/Time : 24-AUG-2009 14:08:11
 Calibration Source Id : AESS-005
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2381.642
 Energy Calibration Slope : 4.923596
 Energy Calibration Quadratic : 3.2521432E-04
 Energy Calibration Range : 7764.000

Instrument : CHAMBER 170
 Detector : 72549
 Calibration Date/Time : 24-AUG-2009 14:08:20
 Calibration Source Id : AESS-011

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.492
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2382.004
 Energy Calibration Slope : 4.926051
 Energy Calibration Quadratic : 3.3877406E-04
 Energy Calibration Range : 7782.000

Instrument : CHAMBER 171
 Detector : 78260
 Calibration Date/Time : 24-AUG-2009 14:08:29
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4769.426
CM-244	4320A	2/28/10	5795.020	5795.289

Energy/Channel Equation : see above
 Energy Calibration Zero : 2366.691
 Energy Calibration Slope : 4.935659
 Energy Calibration Quadratic : 3.0618926E-04
 Energy Calibration Range : 7742.000

Instrument : CHAMBER 172
 Detector : 78772
 Calibration Date/Time : 24-AUG-2009 14:08:40
 Calibration Source Id : AESS-012

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.798
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2367.995
 Energy Calibration Slope : 4.907234
 Energy Calibration Quadratic : 3.5045875E-04
 Energy Calibration Range : 7760.000

Instrument : CHAMBER 173
 Detector : 74431
 Calibration Date/Time : 24-AUG-2009 14:08:49
 Calibration Source Id : AESS-013
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.808
 Energy Calibration Slope : 4.998088
 Energy Calibration Quadratic : 2.5220143E-04
 Energy Calibration Range : 7747.000

Instrument : CHAMBER 174
 Detector : 74432
 Calibration Date/Time : 24-AUG-2009 14:08:58
 Calibration Source Id : AESS-019
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2359.695
 Energy Calibration Slope : 5.048626
 Energy Calibration Quadratic : 1.8959134E-04
 Energy Calibration Range : 7728.000

Instrument : CHAMBER 175
 Detector : 74433
 Calibration Date/Time : 24-AUG-2009 14:09:06
 Calibration Source Id : AESS-014
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2365.396
 Energy Calibration Slope : 4.978646
 Energy Calibration Quadratic : 2.7462494E-04
 Energy Calibration Range : 7751.000

Instrument : CHAMBER 176
 Detector : 74434
 Calibration Date/Time : 24-AUG-2009 14:09:15
 Calibration Source Id : AESS-020

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.332
 Energy Calibration Slope : 5.014320
 Energy Calibration Quadratic : 2.4356594E-04
 Energy Calibration Range : 7752.000

Instrument : CHAMBER 177
 Detector : 74435
 Calibration Date/Time : 24-AUG-2009 14:09:24
 Calibration Source Id : AESS-015

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.740
 Energy Calibration Slope : 4.964604
 Energy Calibration Quadratic : 2.9061688E-04
 Energy Calibration Range : 7753.000

Instrument : CHAMBER 178
 Detector : 74436
 Calibration Date/Time : 24-AUG-2009 14:09:35
 Calibration Source Id : AESS-021

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.420
 Energy Calibration Slope : 4.990875
 Energy Calibration Quadratic : 2.6006214E-04
 Energy Calibration Range : 7742.000

Instrument : CHAMBER 179
 Detector : 74437
 Calibration Date/Time : 24-AUG-2009 14:09:44
 Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2360.365
 Energy Calibration Slope : 4.967896
 Energy Calibration Quadratic : 2.8685154E-04
 Energy Calibration Range : 7748.000

Instrument : CHAMBER 180
 Detector : 74438
 Calibration Date/Time : 24-AUG-2009 14:09:54
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.338
 Energy Calibration Slope : 5.025792
 Energy Calibration Quadratic : 2.1654682E-04
 Energy Calibration Range : 7732.000

Instrument : CHAMBER 181
 Detector : 74439
 Calibration Date/Time : 24-AUG-2009 14:10:03
 Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.697
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.787
 Energy Calibration Slope : 4.972206
 Energy Calibration Quadratic : 2.7814286E-04
 Energy Calibration Range : 7746.000

Instrument : CHAMBER 182
 Detector : 74440
 Calibration Date/Time : 24-AUG-2009 14:10:14
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2353.051
 Energy Calibration Slope : 4.986979
 Energy Calibration Quadratic : 2.5764259E-04
 Energy Calibration Range : 7730.000

Instrument : CHAMBER 183
 Detector : 74441
 Calibration Date/Time : 24-AUG-2009 14:10:29
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.208
 Energy Calibration Slope : 4.980685
 Energy Calibration Quadratic : 2.7016739E-04
 Energy Calibration Range : 7746.000

Instrument : CHAMBER 184
 Detector : 74442
 Calibration Date/Time : 24-AUG-2009 14:10:41
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2359.055
 Energy Calibration Slope : 5.010284
 Energy Calibration Quadratic : 2.3703104E-04
 Energy Calibration Range : 7738.000

Instrument : CHAMBER 185
 Detector : 68615
 Calibration Date/Time : 24-AUG-2009 14:10:54
 Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.699
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.733
 Energy Calibration Slope : 4.933492
 Energy Calibration Quadratic : 2.8617174E-04
 Energy Calibration Range : 7714.000

Instrument : CHAMBER 186
 Detector : 68616
 Calibration Date/Time : 24-AUG-2009 14:11:06
 Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2365.753
 Energy Calibration Slope : 4.935731
 Energy Calibration Quadratic : 2.9755512E-04
 Energy Calibration Range : 7732.000

Instrument : CHAMBER 187
 Detector : 68620
 Calibration Date/Time : 24-AUG-2009 14:11:16
 Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2376.047
 Energy Calibration Slope : 4.966012
 Energy Calibration Quadratic : 3.0612116E-04
 Energy Calibration Range : 7782.000

Instrument : CHAMBER 188
 Detector : 68621
 Calibration Date/Time : 24-AUG-2009 14:11:25
 Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2368.519
 Energy Calibration Slope : 4.967674
 Energy Calibration Quadratic : 2.9094989E-04
 Energy Calibration Range : 7761.000

Instrument : CHAMBER 189
 Detector : 68622
 Calibration Date/Time : 24-AUG-2009 14:11:34
 Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2363.805
 Energy Calibration Slope : 4.932057
 Energy Calibration Quadratic : 3.0281782E-04
 Energy Calibration Range : 7732.000

Instrument : CHAMBER 190
 Detector : 68623
 Calibration Date/Time : 24-AUG-2009 14:11:43
 Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2358.846
 Energy Calibration Slope : 4.945598
 Energy Calibration Quadratic : 2.9230170E-04
 Energy Calibration Range : 7730.000

Instrument : CHAMBER 191
 Detector : 68624
 Calibration Date/Time : 24-AUG-2009 14:11:54
 Calibration Source Id : AESS-028

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2370.757
 Energy Calibration Slope : 4.964250
 Energy Calibration Quadratic : 3.1056980E-04
 Energy Calibration Range : 7780.000

Instrument : CHAMBER 192
 Detector : 74430
 Calibration Date/Time : 24-AUG-2009 14:12:04
 Calibration Source Id : AESS-034

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2365.552
 Energy Calibration Slope : 4.984001
 Energy Calibration Quadratic : 2.9122332E-04
 Energy Calibration Range : 7775.000

Instrument : CHAMBER 193
 Detector : 68627
 Calibration Date/Time : 24-AUG-2009 14:12:15
 Calibration Source Id : AESS-029

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.432
 Energy Calibration Slope : 4.926356
 Energy Calibration Quadratic : 3.1079396E-04
 Energy Calibration Range : 7735.000

Instrument : CHAMBER 194
 Detector : 68635
 Calibration Date/Time : 24-AUG-2009 14:12:24
 Calibration Source Id : AESS-035

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.972
 Energy Calibration Slope : 4.949121
 Energy Calibration Quadratic : 2.8917161E-04
 Energy Calibration Range : 7733.000

Instrument : CHAMBER 195
 Detector : 68636
 Calibration Date/Time : 24-AUG-2009 14:12:38
 Calibration Source Id : AESS-030

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.802
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.575
 Energy Calibration Slope : 4.972611
 Energy Calibration Quadratic : 2.6226370E-04
 Energy Calibration Range : 7729.000

Instrument : CHAMBER 196
 Detector : 68637
 Calibration Date/Time : 24-AUG-2009 14:12:49
 Calibration Source Id : AESS-036

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.691
 Energy Calibration Slope : 4.926461
 Energy Calibration Quadratic : 3.1398068E-04
 Energy Calibration Range : 7739.000

Instrument : CHAMBER 197
 Detector : 78894
 Calibration Date/Time : 24-AUG-2009 14:12:58
 Calibration Source Id : AESS-037

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2371.940
 Energy Calibration Slope : 4.962372
 Energy Calibration Quadratic : 3.0214558E-04
 Energy Calibration Range : 7770.000

Instrument : CHAMBER 198
 Detector : 78895
 Calibration Date/Time : 24-AUG-2009 14:13:11
 Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2366.058
 Energy Calibration Slope : 4.966545
 Energy Calibration Quadratic : 2.8346200E-04
 Energy Calibration Range : 7749.000

Instrument : CHAMBER 199
 Detector : 78896
 Calibration Date/Time : 24-AUG-2009 14:13:20
 Calibration Source Id : AESS-038

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2368.399
 Energy Calibration Slope : 4.967513
 Energy Calibration Quadratic : 2.9532972E-04
 Energy Calibration Range : 7765.000

Instrument : CHAMBER 200
 Detector : 78900
 Calibration Date/Time : 24-AUG-2009 14:13:29
 Calibration Source Id : AESS-044
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2366.221
 Energy Calibration Slope : 4.968300
 Energy Calibration Quadratic : 2.9352392E-04
 Energy Calibration Range : 7762.000

Instrument : CHAMBER 201
 Detector : 78902
 Calibration Date/Time : 24-AUG-2009 14:13:38
 Calibration Source Id : AESS-039
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.156
 Energy Calibration Slope : 4.974658
 Energy Calibration Quadratic : 2.9066936E-04
 Energy Calibration Range : 7761.000

Instrument : CHAMBER 202
 Detector : 78903
 Calibration Date/Time : 24-AUG-2009 14:13:47
 Calibration Source Id : AESS-045
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2356.033
 Energy Calibration Slope : 4.956886
 Energy Calibration Quadratic : 2.9409473E-04
 Energy Calibration Range : 7740.000

Instrument : CHAMBER 203
 Detector : 78905
 Calibration Date/Time : 24-AUG-2009 14:16:33
 Calibration Source Id : AESS-040
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.159
 Energy Calibration Slope : 4.957525
 Energy Calibration Quadratic : 3.0185276E-04
 Energy Calibration Range : 7757.000

Instrument : CHAMBER 204
 Detector : 78907
 Calibration Date/Time : 24-AUG-2009 14:14:37
 Calibration Source Id : AESS-046
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.799
 CM-244 4320A 2/28/10 5795.020 5795.021
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2361.336
 Energy Calibration Slope : 4.953297
 Energy Calibration Quadratic : 3.0559121E-04
 Energy Calibration Range : 7754.000

Instrument : CHAMBER 205
 Detector : 78908
 Calibration Date/Time : 24-AUG-2009 14:14:46
 Calibration Source Id : AESS-041
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2366.916
 Energy Calibration Slope : 4.956555
 Energy Calibration Quadratic : 3.0603251E-04
 Energy Calibration Range : 7763.000

Instrument : CHAMBER 206
 Detector : 78909
 Calibration Date/Time : 24-AUG-2009 14:14:55
 Calibration Source Id : AESS-047
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2362.312
 Energy Calibration Slope : 4.958225
 Energy Calibration Quadratic : 2.9557038E-04
 Energy Calibration Range : 7749.000

Instrument : CHAMBER 207
 Detector : 78910
 Calibration Date/Time : 24-AUG-2009 14:15:04
 Calibration Source Id : AESS-042
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.801
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2365.581
 Energy Calibration Slope : 4.980759
 Energy Calibration Quadratic : 2.8388310E-04
 Energy Calibration Range : 7764.000

Instrument : CHAMBER 208
 Detector : 78911
 Calibration Date/Time : 24-AUG-2009 14:15:14
 Calibration Source Id : AESS-048
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.800
 CM-244 4320A 2/28/10 5795.020 5795.020
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2364.472
 Energy Calibration Slope : 4.972521
 Energy Calibration Quadratic : 2.9282621E-04
 Energy Calibration Range : 7763.000

Instrument : CHAMBER 209
 Detector : 79188
 Calibration Date/Time : 28-AUG-2009 13:24:07
 Calibration Source Id : AESS-001

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.335
CM-244	4320A	2/28/10	5795.020	5794.881

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.838
 Energy Calibration Slope : 4.927811
 Energy Calibration Quadratic : 3.3034658E-04
 Energy Calibration Range : 7783.000

Instrument : CHAMBER 210
 Detector : 79189
 Calibration Date/Time : 28-AUG-2009 13:25:35
 Calibration Source Id : AESS-002

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.411
NP-237	4341	2/28/10	4768.800	4768.113
CM-244	4320A	2/28/10	5795.020	5794.645

Energy/Channel Equation : see above
 Energy Calibration Zero : 2383.667
 Energy Calibration Slope : 4.959684
 Energy Calibration Quadratic : 2.9263049E-04
 Energy Calibration Range : 7769.000

Instrument : CHAMBER 211
 Detector : 79190
 Calibration Date/Time : 28-AUG-2009 13:25:47
 Calibration Source Id : AESS-003

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.995
NP-237	4341	2/28/10	4768.800	4768.326
CM-244	4320A	2/28/10	5795.020	5794.748

Energy/Channel Equation : see above
 Energy Calibration Zero : 2392.783
 Energy Calibration Slope : 4.948876
 Energy Calibration Quadratic : 3.2176418E-04
 Energy Calibration Range : 7798.000

Instrument : CHAMBER 212
 Detector : 79191
 Calibration Date/Time : 28-AUG-2009 13:26:50
 Calibration Source Id : AESS-004

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.995
NP-237	4341	2/28/10	4768.800	4768.536
CM-244	4320A	2/28/10	5795.020	5794.696

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.425
 Energy Calibration Slope : 4.930474
 Energy Calibration Quadratic : 3.3508314E-04
 Energy Calibration Range : 7791.000

Instrument : CHAMBER 213
 Detector : 79192
 Calibration Date/Time : 28-AUG-2009 13:27:02
 Calibration Source Id : AESS-005

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.585
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2391.388
 Energy Calibration Slope : 4.965888
 Energy Calibration Quadratic : 2.9186261E-04
 Energy Calibration Range : 7782.000

Instrument : CHAMBER 214
 Detector : 79193
 Calibration Date/Time : 28-AUG-2009 13:27:13
 Calibration Source Id : AESS-006

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.617
NP-237	4341	2/28/10	4768.800	4768.269
CM-244	4320A	2/28/10	5795.020	5794.897

Energy/Channel Equation : see above
 Energy Calibration Zero : 2388.729
 Energy Calibration Slope : 4.939622
 Energy Calibration Quadratic : 3.2170661E-04
 Energy Calibration Range : 7784.000

Instrument : CHAMBER 215
 Detector : 79194
 Calibration Date/Time : 28-AUG-2009 13:27:24
 Calibration Source Id : AESS-007

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.687
CM-244	4320A	2/28/10	5795.020	5794.826

Energy/Channel Equation : see above
 Energy Calibration Zero : 2394.311
 Energy Calibration Slope : 4.937372
 Energy Calibration Quadratic : 3.3629968E-04
 Energy Calibration Range : 7803.000

Instrument : CHAMBER 216
 Detector : 79195
 Calibration Date/Time : 28-AUG-2009 13:27:35
 Calibration Source Id : AESS-008

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.995
NP-237	4341	2/28/10	4768.800	4768.219
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.139
 Energy Calibration Slope : 4.935822
 Energy Calibration Quadratic : 3.2837162E-04
 Energy Calibration Range : 7789.000

Instrument : CHAMBER 217
 Detector : 79410
 Calibration Date/Time : 28-AUG-2009 13:27:45
 Calibration Source Id : AESS-009

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.999
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5794.882

Energy/Channel Equation : see above
 Energy Calibration Zero : 2392.370
 Energy Calibration Slope : 4.932100
 Energy Calibration Quadratic : 3.3393077E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 218
 Detector : 79411
 Calibration Date/Time : 28-AUG-2009 13:27:55
 Calibration Source Id : AESS-010
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.358
 NP-237 4341 2/28/10 4768.800 4768.423
 CM-244 4320A 2/28/10 5795.020 5794.546

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.502
 Energy Calibration Slope : 4.945263
 Energy Calibration Quadratic : 3.2289582E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 219
 Detector : 79412
 Calibration Date/Time : 28-AUG-2009 13:28:06
 Calibration Source Id : AESS-011
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.507
 CM-244 4320A 2/28/10 5795.020 5794.730

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2388.417
 Energy Calibration Slope : 4.951864
 Energy Calibration Quadratic : 3.1518008E-04
 Energy Calibration Range : 7790.000

Instrument : CHAMBER 220
 Detector : 79413
 Calibration Date/Time : 28-AUG-2009 13:28:15
 Calibration Source Id : AESS-012
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.604
 CM-244 4320A 2/28/10 5795.020 5795.020

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2384.931
 Energy Calibration Slope : 4.925590
 Energy Calibration Quadratic : 3.4113281E-04
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 221
 Detector : 79414
 Calibration Date/Time : 28-AUG-2009 13:28:26
 Calibration Source Id : AESS-013
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.994
 NP-237 4341 2/28/10 4768.800 4768.508
 CM-244 4320A 2/28/10 5795.020 5795.021

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.873
 Energy Calibration Slope : 4.963081
 Energy Calibration Quadratic : 3.1328213E-04
 Energy Calibration Range : 7801.000

Instrument : CHAMBER 222
 Detector : 79415
 Calibration Date/Time : 28-AUG-2009 13:28:40
 Calibration Source Id : AESS-014
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.242
 CM-244 4320A 2/28/10 5795.020 5795.020

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2383.161
 Energy Calibration Slope : 5.032124
 Energy Calibration Quadratic : 2.3446424E-04
 Energy Calibration Range : 7782.000

Instrument : CHAMBER 223
 Detector : 79416
 Calibration Date/Time : 28-AUG-2009 13:28:50
 Calibration Source Id : AESS-015
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.000
 NP-237 4341 2/28/10 4768.800 4768.591
 CM-244 4320A 2/28/10 5795.020 5794.816

 Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.471
 Energy Calibration Slope : 4.966544
 Energy Calibration Quadratic : 3.1951332E-04
 Energy Calibration Range : 7810.000

Instrument : CHAMBER 224
 Detector : 79417
 Calibration Date/Time : 28-AUG-2009 13:29:01
 Calibration Source Id : AESS-016

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.496
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2391.014
 Energy Calibration Slope : 4.986970
 Energy Calibration Quadratic : 2.9468181E-04
 Energy Calibration Range : 7807.000

Instrument : CHAMBER 225
 Detector : 79418
 Calibration Date/Time : 28-AUG-2009 13:29:13
 Calibration Source Id : AESS-017

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.995
NP-237	4341	2/28/10	4768.800	4768.482
CM-244	4320A	2/28/10	5795.020	5794.771

Energy/Channel Equation : see above
 Energy Calibration Zero : 2392.520
 Energy Calibration Slope : 4.953336
 Energy Calibration Quadratic : 3.1543931E-04
 Energy Calibration Range : 7795.000

Instrument : CHAMBER 226
 Detector : 79419
 Calibration Date/Time : 28-AUG-2009 13:29:24
 Calibration Source Id : AESS-018

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.533
CM-244	4320A	2/28/10	5795.020	5794.638

Energy/Channel Equation : see above
 Energy Calibration Zero : 2385.990
 Energy Calibration Slope : 4.969761
 Energy Calibration Quadratic : 3.0473244E-04
 Energy Calibration Range : 7795.000

Instrument : CHAMBER 227
 Detector : 79420
 Calibration Date/Time : 28-AUG-2009 13:29:35
 Calibration Source Id : AESS-019
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.989
 NP-237 4341 2/28/10 4768.800 4768.396
 CM-244 4320A 2/28/10 5795.020 5795.019
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.018
 Energy Calibration Slope : 4.958102
 Energy Calibration Quadratic : 3.1095589E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 228
 Detector : 79421
 Calibration Date/Time : 28-AUG-2009 13:30:03
 Calibration Source Id : AESS-020
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3183.001
 NP-237 4341 2/28/10 4768.800 4768.080
 CM-244 4320A 2/28/10 5795.020 5794.730
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2384.553
 Energy Calibration Slope : 4.991631
 Energy Calibration Quadratic : 2.7237524E-04
 Energy Calibration Range : 7782.000

Instrument : CHAMBER 229
 Detector : 79422
 Calibration Date/Time : 28-AUG-2009 13:30:14
 Calibration Source Id : AESS-021
 Cal. Isotopes Source Id Expiration Date Standard Energy Actual Energy
 GD-148 6445-278 2/28/10 3183.000 3182.535
 NP-237 4341 2/28/10 4768.800 4768.314
 CM-244 4320A 2/28/10 5795.020 5794.771
 Energy/Channel Equation : see above
 Energy Calibration Zero : 2391.623
 Energy Calibration Slope : 4.946116
 Energy Calibration Quadratic : 3.3402635E-04
 Energy Calibration Range : 7807.000

Instrument : CHAMBER 230
 Detector : 79423
 Calibration Date/Time : 28-AUG-2009 13:31:10
 Calibration Source Id : AESS-022

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.295
CM-244	4320A	2/28/10	5795.020	5794.755

Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.924
 Energy Calibration Slope : 4.965939
 Energy Calibration Quadratic : 3.0765639E-04
 Energy Calibration Range : 7795.000

Instrument : CHAMBER 231
 Detector : 79424
 Calibration Date/Time : 28-AUG-2009 13:31:59
 Calibration Source Id : AESS-023

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.555
NP-237	4341	2/28/10	4768.800	4768.511
CM-244	4320A	2/28/10	5795.020	5794.833

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.970
 Energy Calibration Slope : 4.957988
 Energy Calibration Quadratic : 3.0450191E-04
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 232
 Detector : 79425
 Calibration Date/Time : 28-AUG-2009 13:32:18
 Calibration Source Id : AESS-024

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.305
CM-244	4320A	2/28/10	5795.020	5794.704

Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.107
 Energy Calibration Slope : 5.009925
 Energy Calibration Quadratic : 2.5456178E-04
 Energy Calibration Range : 7783.000

Instrument : CHAMBER 233
 Detector : 79426
 Calibration Date/Time : 28-AUG-2009 13:32:35
 Calibration Source Id : AESS-025

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.576
CM-244	4320A	2/28/10	5795.020	5794.737

Energy/Channel Equation : see above
 Energy Calibration Zero : 2384.864
 Energy Calibration Slope : 4.921108
 Energy Calibration Quadratic : 3.4491287E-04
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 234
 Detector : 79427
 Calibration Date/Time : 28-AUG-2009 13:32:51
 Calibration Source Id : AESS-026

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.551
NP-237	4341	2/28/10	4768.800	4768.513
CM-244	4320A	2/28/10	5795.020	5794.778

Energy/Channel Equation : see above
 Energy Calibration Zero : 2381.948
 Energy Calibration Slope : 4.930495
 Energy Calibration Quadratic : 3.2252993E-04
 Energy Calibration Range : 7769.000

Instrument : CHAMBER 235
 Detector : 79428
 Calibration Date/Time : 28-AUG-2009 13:33:07
 Calibration Source Id : AESS-027

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.799
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.848
 Energy Calibration Slope : 4.916008
 Energy Calibration Quadratic : 3.6057594E-04
 Energy Calibration Range : 7802.000

Instrument : CHAMBER 236
 Detector : 79429
 Calibration Date/Time : 28-AUG-2009 13:33:24
 Calibration Source Id : AESS-028

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.403
CM-244	4320A	2/28/10	5795.020	5795.021

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.679
 Energy Calibration Slope : 4.915041
 Energy Calibration Quadratic : 3.5203501E-04
 Energy Calibration Range : 7792.000

Instrument : CHAMBER 237
 Detector : 79430
 Calibration Date/Time : 28-AUG-2009 13:33:41
 Calibration Source Id : AESS-029

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.371
 Energy Calibration Slope : 4.953910
 Energy Calibration Quadratic : 3.1539882E-04
 Energy Calibration Range : 7790.000

Instrument : CHAMBER 238
 Detector : 79431
 Calibration Date/Time : 28-AUG-2009 13:33:59
 Calibration Source Id : AESS-030

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.662
CM-244	4320A	2/28/10	5795.020	5795.015

Energy/Channel Equation : see above
 Energy Calibration Zero : 2382.061
 Energy Calibration Slope : 4.932787
 Energy Calibration Quadratic : 3.2764973E-04
 Energy Calibration Range : 7777.000

Instrument : CHAMBER 239
 Detector : 79432
 Calibration Date/Time : 28-AUG-2009 13:34:23
 Calibration Source Id : AESS-031

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.464
 Energy Calibration Slope : 4.922751
 Energy Calibration Quadratic : 3.5207078E-04
 Energy Calibration Range : 7801.000

Instrument : CHAMBER 240
 Detector : 79433
 Calibration Date/Time : 28-AUG-2009 13:34:40
 Calibration Source Id : AESS-032

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.994
NP-237	4341	2/28/10	4768.800	4768.676
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2384.323
 Energy Calibration Slope : 4.929180
 Energy Calibration Quadratic : 3.3816224E-04
 Energy Calibration Range : 7786.000

Instrument : CHAMBER 241
 Detector : 79434
 Calibration Date/Time : 28-AUG-2009 13:34:57
 Calibration Source Id : AESS-033

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2388.207
 Energy Calibration Slope : 4.903821
 Energy Calibration Quadratic : 3.6748822E-04
 Energy Calibration Range : 7795.000

Instrument : CHAMBER 242
 Detector : 79435
 Calibration Date/Time : 28-AUG-2009 13:35:16
 Calibration Source Id : AESS-034

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.542
CM-244	4320A	2/28/10	5795.020	5794.775

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.032
 Energy Calibration Slope : 4.921538
 Energy Calibration Quadratic : 3.5085063E-04
 Energy Calibration Range : 7798.000

Instrument : CHAMBER 243
 Detector : 79436
 Calibration Date/Time : 28-AUG-2009 13:35:39
 Calibration Source Id : AESS-035

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.988
NP-237	4341	2/28/10	4768.800	4768.486
CM-244	4320A	2/28/10	5795.020	5794.752

Energy/Channel Equation : see above
 Energy Calibration Zero : 2386.548
 Energy Calibration Slope : 4.951634
 Energy Calibration Quadratic : 3.2005890E-04
 Energy Calibration Range : 7793.000

Instrument : CHAMBER 244
 Detector : 79437
 Calibration Date/Time : 28-AUG-2009 13:36:07
 Calibration Source Id : AESS-036

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.497
NP-237	4341	2/28/10	4768.800	4768.339
CM-244	4320A	2/28/10	5795.020	5794.813

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.547
 Energy Calibration Slope : 4.935142
 Energy Calibration Quadratic : 3.3349055E-04
 Energy Calibration Range : 7794.000

Instrument : CHAMBER 245
 Detector : 79438
 Calibration Date/Time : 28-AUG-2009 13:36:53
 Calibration Source Id : AESS-037

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.392
NP-237	4341	2/28/10	4768.800	4768.244
CM-244	4320A	2/28/10	5795.020	5794.789

Energy/Channel Equation : see above
 Energy Calibration Zero : 2393.397
 Energy Calibration Slope : 4.967153
 Energy Calibration Quadratic : 3.0749093E-04
 Energy Calibration Range : 7802.000

Instrument : CHAMBER 246
 Detector : 78912
 Calibration Date/Time : 28-AUG-2009 13:37:05
 Calibration Source Id : AESS-038

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.994
NP-237	4341	2/28/10	4768.800	4768.559
CM-244	4320A	2/28/10	5795.020	5794.661

Energy/Channel Equation : see above
 Energy Calibration Zero : 2393.972
 Energy Calibration Slope : 4.938848
 Energy Calibration Quadratic : 3.3234741E-04
 Energy Calibration Range : 7800.000

Instrument : CHAMBER 247
 Detector : 79440
 Calibration Date/Time : 28-AUG-2009 13:37:16
 Calibration Source Id : AESS-039

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.001
NP-237	4341	2/28/10	4768.800	4768.340
CM-244	4320A	2/28/10	5795.020	5794.822

Energy/Channel Equation : see above
 Energy Calibration Zero : 2392.511
 Energy Calibration Slope : 4.947969
 Energy Calibration Quadratic : 3.3144341E-04
 Energy Calibration Range : 7807.000

Instrument : CHAMBER 248
 Detector : 79441
 Calibration Date/Time : 28-AUG-2009 13:37:28
 Calibration Source Id : AESS-040

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5794.763

Energy/Channel Equation : see above
 Energy Calibration Zero : 2387.425
 Energy Calibration Slope : 4.938920
 Energy Calibration Quadratic : 3.3573247E-04
 Energy Calibration Range : 7797.000

Instrument : CHAMBER 249
 Detector : 79442
 Calibration Date/Time : 28-AUG-2009 13:37:39
 Calibration Source Id : AESS-041

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.655
CM-244	4320A	2/28/10	5795.020	5794.817

Energy/Channel Equation : see above
 Energy Calibration Zero : 2387.492
 Energy Calibration Slope : 4.950956
 Energy Calibration Quadratic : 3.3470633E-04
 Energy Calibration Range : 7808.000

Instrument : CHAMBER 250
 Detector : 79443
 Calibration Date/Time : 28-AUG-2009 13:37:51
 Calibration Source Id : AESS-042

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.800
CM-244	4320A	2/28/10	5795.020	5795.020

Energy/Channel Equation : see above
 Energy Calibration Zero : 2382.437
 Energy Calibration Slope : 4.924478
 Energy Calibration Quadratic : 3.4610991E-04
 Energy Calibration Range : 7788.000

Instrument : CHAMBER 251
 Detector : 79444
 Calibration Date/Time : 28-AUG-2009 13:38:01
 Calibration Source Id : AESS-043

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.630
CM-244	4320A	2/28/10	5795.020	5794.883

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.000
 Energy Calibration Slope : 4.933837
 Energy Calibration Quadratic : 3.5430092E-04
 Energy Calibration Range : 7814.000

Instrument : CHAMBER 252
 Detector : 79445
 Calibration Date/Time : 28-AUG-2009 13:38:11
 Calibration Source Id : AESS-044

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.618
CM-244	4320A	2/28/10	5795.020	5794.764

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.483
 Energy Calibration Slope : 4.925191
 Energy Calibration Quadratic : 3.5263240E-04
 Energy Calibration Range : 7803.000

Instrument : CHAMBER 253
 Detector : 79446
 Calibration Date/Time : 28-AUG-2009 13:38:20
 Calibration Source Id : AESS-045

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3183.000
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5794.899

Energy/Channel Equation : see above
 Energy Calibration Zero : 2397.089
 Energy Calibration Slope : 4.939593
 Energy Calibration Quadratic : 3.6825475E-04
 Energy Calibration Range : 7841.000

Instrument : CHAMBER 254
 Detector : 79447
 Calibration Date/Time : 28-AUG-2009 13:38:31
 Calibration Source Id : AESS-046

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.420
NP-237	4341	2/28/10	4768.800	4768.432
CM-244	4320A	2/28/10	5795.020	5794.736

Energy/Channel Equation : see above
 Energy Calibration Zero : 2392.513
 Energy Calibration Slope : 4.939602
 Energy Calibration Quadratic : 3.3955529E-04
 Energy Calibration Range : 7807.000

Instrument : CHAMBER 255
 Detector : 79448
 Calibration Date/Time : 28-AUG-2009 13:38:42
 Calibration Source Id : AESS-047

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.573
NP-237	4341	2/28/10	4768.800	4768.801
CM-244	4320A	2/28/10	5795.020	5795.019

Energy/Channel Equation : see above
 Energy Calibration Zero : 2389.962
 Energy Calibration Slope : 4.937794
 Energy Calibration Quadratic : 3.5419688E-04
 Energy Calibration Range : 7818.000

Instrument : CHAMBER 256
 Detector : 79449
 Calibration Date/Time : 28-AUG-2009 13:38:54
 Calibration Source Id : AESS-048

Cal. Isotopes	Source Id	Expiration Date	Standard Energy	Actual Energy
GD-148	6445-278	2/28/10	3183.000	3182.994
NP-237	4341	2/28/10	4768.800	4768.603
CM-244	4320A	2/28/10	5795.020	5794.763

Energy/Channel Equation : see above
 Energy Calibration Zero : 2390.038
 Energy Calibration Slope : 4.925209
 Energy Calibration Quadratic : 3.5748276E-04
 Energy Calibration Range : 7808.000

Subsection 2: Background Calibration

Instrument : CHAMBER 001
 Detector : 78788
 Background Analysis Date/Time : 30-AUG-2009 16:15:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.095	3301.491	2.000000	0.4800001	70.71068	95.00000
NP-237	4436.328	4901.460	12.00000	2.880001	28.86751	95.00000
CM-244	5531.570	5886.270	6.000000	1.440000	40.82483	95.00000

Instrument : CHAMBER 002
 Detector : 78266
 Background Analysis Date/Time : 30-AUG-2009 16:15:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.085	3299.620	1.000000	0.2400001	100.0000	95.00000
NP-237	4434.644	4904.846	7.000000	1.680000	37.79645	95.00000
CM-244	5534.154	5882.659	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 003
 Detector : 67617
 Background Analysis Date/Time : 30-AUG-2009 16:15:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.938	3299.717	3.000000	0.7200001	57.73503	95.00000
NP-237	4432.844	4902.827	10.00000	2.400001	31.62278	95.00000
CM-244	5531.440	5887.803	4.000000	0.9600002	50.00000	95.00000

Instrument : CHAMBER 004
 Detector : 64279
 Background Analysis Date/Time : 30-AUG-2009 16:15:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.026	3298.308	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4435.760	4905.548	7.000000	1.680000	37.79645	95.00000
CM-244	5534.947	5883.809	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 005
 Detector : 67612
 Background Analysis Date/Time : 30-AUG-2009 16:15:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.654	3300.689	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.859	4901.997	5.000000	1.200000	44.72136	95.00000
CM-244	5533.435	5885.045	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 006
 Detector : 67613
 Background Analysis Date/Time : 30-AUG-2009 16:15:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.771	3301.528	3.000000	0.7200001	57.73503	95.00000
NP-237	4433.310	4904.612	10.00000	2.400001	31.62278	95.00000
CM-244	5535.175	5883.158	9.000000	2.160001	33.33334	95.00000

Instrument : CHAMBER 007
 Detector : 67607
 Background Analysis Date/Time : 30-AUG-2009 16:15:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.315	3300.370	2.000000	0.4799997	70.71068	95.00000
NP-237	4436.975	4905.147	7.000000	1.679999	37.79645	95.00000
CM-244	5533.959	5885.477	23.00000	5.519996	20.85144	95.00000

Instrument : CHAMBER 008
 Detector : 78788
 Background Analysis Date/Time : 30-AUG-2009 16:15:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.794	3298.426	2.000000	0.4799997	70.71068	95.00000
NP-237	4437.020	4904.595	6.000000	1.439999	40.82483	95.00000
CM-244	5532.536	5882.336	4.000000	0.9599993	50.00000	95.00000

Instrument : CHAMBER 009
 Detector : 72528
 Background Analysis Date/Time : 30-AUG-2009 16:15:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.892	3299.892	4.000000	0.9599993	50.00000	95.00000
NP-237	4433.436	4905.789	11.00000	2.639998	30.15113	95.00000
CM-244	5532.687	5887.081	9.000000	2.159998	33.33334	95.00000

Instrument : CHAMBER 010
 Detector : 72529
 Background Analysis Date/Time : 30-AUG-2009 16:15:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.087	3300.334	3.000000	0.7199995	57.73503	95.00000
NP-237	4436.842	4905.812	6.000000	1.439999	40.82483	95.00000
CM-244	5533.178	5884.706	6.000000	1.439999	40.82483	95.00000

Instrument : CHAMBER 011
 Detector : 72531
 Background Analysis Date/Time : 30-AUG-2009 16:15:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.718	3301.411	3.000000	0.7199995	57.73503	95.00000
NP-237	4435.900	4905.463	15.00000	3.599998	25.81989	95.00000
CM-244	5535.617	5886.431	10.00000	2.399998	31.62278	95.00000

Instrument : CHAMBER 012
 Detector : 67594
 Background Analysis Date/Time : 30-AUG-2009 16:15:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.283	3301.924	2.000000	0.4799997	70.71068	95.00000
NP-237	4434.309	4903.502	10.00000	2.399998	31.62278	95.00000
CM-244	5531.028	5882.575	10.00000	2.399998	31.62278	95.00000

Instrument : CHAMBER 013
 Detector : 78790
 Background Analysis Date/Time : 30-AUG-2009 16:15:12
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.309	3297.583	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4432.512	4904.184	11.00000	2.640001	30.15113	95.00000
CM-244	5533.734	5883.657	4.000000	0.9600002	50.00000	95.00000

Instrument : CHAMBER 014
 Detector : 67616
 Background Analysis Date/Time : 30-AUG-2009 16:15:12
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.575	3298.988	3.000000	0.7200001	57.73503	95.00000
NP-237	4436.470	4903.458	8.000000	1.920000	35.35534	95.00000
CM-244	5530.496	5885.133	26.00000	6.240001	19.61161	95.00000

Instrument : CHAMBER 015
 Detector : 61581
 Background Analysis Date/Time : 30-AUG-2009 16:15:12
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.656	3297.520	3.000000	0.7200001	57.73503	95.00000
NP-237	4435.901	4901.612	9.000000	2.160001	33.33334	95.00000
CM-244	5535.255	5884.514	26.00000	6.240001	19.61161	95.00000

Instrument : CHAMBER 016
 Detector : 78774
 Background Analysis Date/Time : 30-AUG-2009 16:15:12
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.611	3297.891	1.000000	0.2400001	100.0000	95.00000
NP-237	4435.494	4901.479	2.000000	0.4800001	70.71068	95.00000
CM-244	5530.741	5886.030	3.000000	0.7200001	57.73503	95.00000

Instrument : CHAMBER 017
 Detector : 78791
 Background Analysis Date/Time : 30-AUG-2009 16:15:12
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.315	3299.165	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4433.955	4905.994	7.000000	1.680000	37.79645	95.00000
CM-244	5531.756	5885.157	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 018
 Detector : 78782
 Background Analysis Date/Time : 30-AUG-2009 16:15:12
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.045	3297.645	5.000000	1.200000	44.72136	95.00000
NP-237	4435.824	4903.103	6.000000	1.440000	40.82483	95.00000
CM-244	5530.534	5885.395	5.000000	1.200000	44.72136	95.00000

Instrument : CHAMBER 019
 Detector : 78786
 Background Analysis Date/Time : 30-AUG-2009 16:15:13
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.371	3300.084	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.711	4901.697	6.000000	1.440000	40.82483	95.00000
CM-244	5534.730	5883.386	3.000000	0.7200001	57.73503	95.00000

Instrument : CHAMBER 020
 Detector : 78787
 Background Analysis Date/Time : 30-AUG-2009 16:15:13
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.745	3300.511	3.000000	0.7200001	57.73503	95.00000
NP-237	4436.191	4903.850	11.00000	2.640001	30.15113	95.00000
CM-244	5531.198	5885.719	4.000000	0.9600002	50.00000	95.00000

Instrument : CHAMBER 021
 Detector : 67047
 Background Analysis Date/Time : 30-AUG-2009 16:15:13
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.027	3300.488	2.000000	0.4800001	70.71068	95.00000
NP-237	4433.390	4904.438	6.000000	1.440000	40.82483	95.00000
CM-244	5534.035	5886.544	16.00000	3.840001	25.00000	95.00000

Instrument : CHAMBER 022
 Detector : 72530
 Background Analysis Date/Time : 30-AUG-2009 16:15:13
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.050	3301.029	39.00000	9.360003	16.01282	95.00000
NP-237	4437.549	4902.815	18.00000	4.320001	23.57022	95.00000
CM-244	5531.706	5883.854	12.00000	2.880001	28.86751	95.00000

Instrument : CHAMBER 023
 Detector : 78264
 Background Analysis Date/Time : 30-AUG-2009 16:15:13
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.319	3301.853	1.000000	0.2400001	100.0000	95.00000
NP-237	4434.632	4902.993	6.000000	1.440000	40.82483	95.00000
CM-244	5531.100	5885.960	8.000000	1.920000	35.35534	95.00000

Instrument : CHAMBER 024
 Detector : 76542
 Background Analysis Date/Time : 30-AUG-2009 16:15:13
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.280	3301.361	1.000000	0.2400001	100.0000	95.00000
NP-237	4434.951	4904.473	14.00000	3.360001	26.72612	95.00000
CM-244	5532.286	5883.922	5.000000	1.200000	44.72136	95.00000

Instrument : CHAMBER 025
 Detector : 45-149AA5
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.958	3301.287	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4436.686	4904.740	7.000000	1.680000	37.79645	95.00000
CM-244	5534.991	5882.562	76.00000	18.24000	11.47079	95.00000

Instrument : CHAMBER 026
 Detector : 78204
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.735	3300.836	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.801	4902.784	4.000000	0.9600002	50.00000	95.00000
CM-244	5530.708	5886.284	60.00000	14.40000	12.90994	95.00000

Instrument : CHAMBER 027
 Detector : 42484
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.280	3298.316	9.000000	2.160000	33.33334	95.00000
NP-237	4433.196	4906.637	9.000000	2.160000	33.33334	95.00000
CM-244	5535.439	5885.723	61.00000	14.64000	12.80369	95.00000

Instrument : CHAMBER 028
 Detector : 78792
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.441	3297.640	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.847	4903.788	13.00000	3.120001	27.73501	95.00000
CM-244	5532.676	5883.223	65.00000	15.60000	12.40347	95.00000

Instrument : CHAMBER 029
 Detector : 33454
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.567	3301.667	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.493	4902.470	13.000000	3.120001	27.73501	95.00000
CM-244	5535.032	5883.746	87.000000	20.88000	10.72113	95.00000

Instrument : CHAMBER 030
 Detector : 33447
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.332	3299.665	1.000000	0.2400000	100.0000	95.00000
NP-237	4436.037	4902.215	13.000000	3.120001	27.73501	95.00000
CM-244	5533.195	5886.933	97.000000	23.28000	10.15346	95.00000

Instrument : CHAMBER 031
 Detector : 67042
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.980	3300.809	8.000000	1.919999	35.35534	95.00000
NP-237	4433.475	4904.204	10.000000	2.399998	31.62278	95.00000
CM-244	5535.021	5883.627	87.000000	20.87999	10.72113	95.00000

Instrument : CHAMBER 032
 Detector : 67041
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.500	3301.085	2.000000	0.4799997	70.71068	95.00000
NP-237	4436.228	4903.321	14.000000	3.359998	26.72612	95.00000
CM-244	5533.353	5886.388	25.000000	5.999996	20.00000	95.00000

Instrument : CHAMBER 033
 Detector : 78785
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.232	3299.661	3.000000	0.7199996	57.73503	95.00000
NP-237	4437.092	4904.010	7.000000	1.679999	37.79645	95.00000
CM-244	5530.913	5885.453	49.00000	11.75999	14.28572	95.00000

Instrument : CHAMBER 034
 Detector : 61586
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.956	3301.026	2.000000	0.4799997	70.71068	95.00000
NP-237	4436.568	4903.521	30.00000	7.199996	18.25742	95.00000
CM-244	5534.967	5885.181	31.00000	7.439995	17.96053	95.00000

Instrument : CHAMBER 035
 Detector : 78202
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.620	3300.593	2.000000	0.4799997	70.71068	95.00000
NP-237	4435.499	4903.774	16.00000	3.839998	25.00000	95.00000
CM-244	5532.763	5883.199	70.00000	16.79999	11.95229	95.00000

Instrument : CHAMBER 036
 Detector : 78203
 Background Analysis Date/Time : 30-AUG-2009 16:15:14
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.620	3298.917	2.000000	0.4799997	70.71068	95.00000
NP-237	4433.050	4904.263	7.000000	1.679999	37.79645	95.00000
CM-244	5535.616	5884.466	51.00000	12.23999	14.00280	95.00000

Instrument : CHAMBER 037
 Detector : 45-149BB5
 Background Analysis Date/Time : 30-AUG-2009 16:15:15
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.836	3299.917	5.000000	1.199999	44.72136	95.00000
NP-237	4435.582	4906.557	19.00000	4.559997	22.94157	95.00000
CM-244	5534.307	5882.810	72.00000	17.27999	11.78511	95.00000

Instrument : CHAMBER 038
 Detector : 72532
 Background Analysis Date/Time : 30-AUG-2009 16:15:15
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.576	3299.256	2.000000	0.4799997	70.71068	95.00000
NP-237	4433.771	4904.686	10.00000	2.399998	31.62278	95.00000
CM-244	5535.244	5883.467	79.00000	18.95999	11.25088	95.00000

Instrument : CHAMBER 039
 Detector : 45-149BB2
 Background Analysis Date/Time : 30-AUG-2009 16:15:15
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.453	3301.599	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.722	4905.688	12.00000	2.879998	28.86751	95.00000
CM-244	5532.346	5883.894	84.00000	20.15999	10.91089	95.00000

Instrument : CHAMBER 040
 Detector : 78773
 Background Analysis Date/Time : 30-AUG-2009 16:15:15
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.070	3301.002	6.000000	1.439999	40.82483	95.00000
NP-237	4437.116	4905.104	4.000000	0.9599993	50.00000	95.00000
CM-244	5532.249	5884.180	66.00000	15.83999	12.30915	95.00000

Instrument : CHAMBER 041
 Detector : 78205
 Background Analysis Date/Time : 30-AUG-2009 16:15:15
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.305	3298.942	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4436.425	4904.659	10.00000	2.399998	31.62278	95.00000
CM-244	5534.452	5885.748	82.00000	19.67999	11.04315	95.00000

Instrument : CHAMBER 042
 Detector : 78793
 Background Analysis Date/Time : 30-AUG-2009 16:15:15
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.887	3299.366	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4437.123	4905.630	11.00000	2.639998	30.15113	95.00000
CM-244	5533.333	5885.512	81.00000	19.43999	11.11111	95.00000

Instrument : CHAMBER 043
 Detector : 76543
 Background Analysis Date/Time : 30-AUG-2009 16:15:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.321	3301.623	1.000000	0.2400000	100.0000	95.00000
NP-237	4433.027	4903.519	5.000000	1.200000	44.72136	95.00000
CM-244	5534.268	5882.956	61.00000	14.64000	12.80369	95.00000

Instrument : CHAMBER 044
 Detector : 79459
 Background Analysis Date/Time : 30-AUG-2009 16:15:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.930	3302.506	5.000000	1.200000	44.72136	95.00000
NP-237	4437.594	4903.934	14.00000	3.360001	26.72612	95.00000
CM-244	5530.392	5884.844	80.00000	19.20000	11.18034	95.00000

Instrument : CHAMBER 045
 Detector : 78783
 Background Analysis Date/Time : 30-AUG-2009 16:15:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.243	3301.709	2.000000	0.4800001	70.71068	95.00000
NP-237	4436.057	4901.945	5.000000	1.200000	44.72136	95.00000
CM-244	5533.013	5887.031	74.00000	17.76000	11.62476	95.00000

Instrument : CHAMBER 046
 Detector : 76544
 Background Analysis Date/Time : 30-AUG-2009 16:15:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.377	3301.861	2.000000	0.4800001	70.71068	95.00000
NP-237	4437.291	4905.414	7.000000	1.680000	37.79645	95.00000
CM-244	5533.098	5885.505	74.00000	17.76000	11.62476	95.00000

Instrument : CHAMBER 047
 Detector : 46-089B1
 Background Analysis Date/Time : 30-AUG-2009 16:15:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.396	3301.175	5.000000	1.200000	44.72136	95.00000
NP-237	4434.358	4901.480	17.00000	4.080001	24.25356	95.00000
CM-244	5533.889	5883.104	83.00000	19.92000	10.97643	95.00000

Instrument : CHAMBER 048
 Detector : 42483
 Background Analysis Date/Time : 30-AUG-2009 16:15:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.395	3299.708	1.000000	0.2400000	100.0000	95.00000
NP-237	4436.890	4906.295	16.00000	3.840001	25.00000	95.00000
CM-244	5534.380	5886.375	85.00000	20.40000	10.84652	95.00000

Instrument : CHAMBER 065
 Detector : 68551
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.771	3302.255	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.128	4905.667	13.00000	3.120001	27.73501	95.00000
CM-244	5535.235	5883.315	19.00000	4.560001	22.94157	95.00000

Instrument : CHAMBER 066
 Detector : 46-089C1
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.607	3298.188	3.000000	0.7200001	57.73503	95.00000
NP-237	4437.248	4903.693	10.00000	2.400001	31.62278	95.00000
CM-244	5534.302	5887.473	10.00000	2.400001	31.62278	95.00000

Instrument : CHAMBER 067
 Detector : 46-089B4
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.364	3298.403	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.841	4903.104	10.00000	2.400001	31.62278	95.00000
CM-244	5532.249	5884.796	13.00000	3.120001	27.73501	95.00000

Instrument : CHAMBER 068
 Detector : 78794
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.800	3301.258	3.000000	0.7200001	57.73503	95.00000
NP-237	4436.421	4904.138	1.000000	0.2400001	100.0000	95.00000
CM-244	5531.799	5886.613	11.00000	2.640001	30.15113	95.00000

Instrument : CHAMBER 069
 Detector : 78795
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.054	3301.031	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.816	4903.115	3.000000	0.7200001	57.73503	95.00000
CM-244	5534.580	5883.355	10.00000	2.400001	31.62278	95.00000

Instrument : CHAMBER 070
 Detector : 46-089B2
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.000	3298.556	1.000000	0.2400001	100.0000	95.00000
NP-237	4433.983	4903.126	6.000000	1.440000	40.82483	95.00000
CM-244	5531.262	5883.482	8.000000	1.920000	35.35534	95.00000

Instrument : CHAMBER 071
 Detector : 64259
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.344	3299.186	3.000000	0.7199995	57.73503	95.00000
NP-237	4434.336	4901.423	9.000000	2.159998	33.33334	95.00000
CM-244	5533.037	5886.837	10.00000	2.399998	31.62278	95.00000

Instrument : CHAMBER 072
 Detector : 45-149AA3
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.347	3300.937	4.000000	0.9599993	50.00000	95.00000
NP-237	4434.227	4904.277	7.000000	1.679999	37.79645	95.00000
CM-244	5533.368	5885.995	19.00000	4.559997	22.94157	95.00000

Instrument : CHAMBER 073
 Detector : 78775
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.457	3300.404	1.000000	0.2399998	100.0000	95.00000
NP-237	4436.939	4906.411	7.000000	1.679999	37.79645	95.00000
CM-244	5534.874	5887.223	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 074
 Detector : 78266
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.696	3301.963	2.000000	0.4799997	70.71068	95.00000
NP-237	4433.697	4901.594	11.00000	2.639998	30.15113	95.00000
CM-244	5534.405	5883.535	6.000000	1.439999	40.82483	95.00000

Instrument : CHAMBER 075
 Detector : 68550
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.430	3298.418	5.000000	1.199999	44.72136	95.00000
NP-237	4434.533	4906.317	16.00000	3.839997	25.00000	95.00000
CM-244	5532.867	5887.264	9.000000	2.159998	33.33334	95.00000

Instrument : CHAMBER 076
 Detector : 78779
 Background Analysis Date/Time : 6-SEP-2009 14:27:07
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.065	3298.826	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.152	4905.629	7.000000	1.679999	37.79645	95.00000
CM-244	5531.791	5885.977	3.000000	0.7199995	57.73503	95.00000

Instrument : CHAMBER 077
 Detector : 67576
 Background Analysis Date/Time : 6-SEP-2009 14:27:08
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.808	3299.921	1.000000	0.2399998	100.0000	95.00000
NP-237	4436.345	4905.457	2.000000	0.4799997	70.71068	95.00000
CM-244	5533.165	5884.958	10.00000	2.399998	31.62278	95.00000

Instrument : CHAMBER 078
 Detector : 67577
 Background Analysis Date/Time : 6-SEP-2009 14:27:08
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.845	3301.764	3.000000	0.7199996	57.73503	95.00000
NP-237	4437.423	4903.707	6.000000	1.439999	40.82483	95.00000
CM-244	5535.183	5883.980	9.000000	2.159999	33.33334	95.00000

Instrument : CHAMBER 079
 Detector : 67598
 Background Analysis Date/Time : 6-SEP-2009 14:27:08
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.167	3301.886	2.000000	0.4799997	70.71068	95.00000
NP-237	4434.317	4902.083	5.000000	1.199999	44.72136	95.00000
CM-244	5534.342	5882.989	7.000000	1.679999	37.79645	95.00000

Instrument : CHAMBER 080
 Detector : 78197
 Background Analysis Date/Time : 6-SEP-2009 14:27:08
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.423	3300.841	4.000000	0.9599994	50.00000	95.00000
NP-237	4436.127	4905.211	7.000000	1.679999	37.79645	95.00000
CM-244	5534.013	5883.733	4.000000	0.9599994	50.00000	95.00000

Instrument : CHAMBER 081
 Detector : 72533
 Background Analysis Date/Time : 6-SEP-2009 14:27:08
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2985.860	3301.995	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.890	4902.925	1.000000	0.2399998	100.0000	95.00000
CM-244	5531.182	5884.811	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 082
 Detector : 64263
 Background Analysis Date/Time : 6-SEP-2009 14:27:08
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.498	3298.727	4.000000	0.9599994	50.00000	95.00000
NP-237	4432.414	4902.039	7.000000	1.679999	37.79645	95.00000
CM-244	5532.619	5883.836	11.00000	2.639998	30.15113	95.00000

Instrument : CHAMBER 083
 Detector : 64278
 Background Analysis Date/Time : 6-SEP-2009 14:27:09
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.167	3298.934	1.000000	0.2400000	100.0000	95.00000
NP-237	4433.867	4901.929	7.000000	1.680000	37.79645	95.00000
CM-244	5533.935	5887.502	5.000000	1.200000	44.72136	95.00000

Instrument : CHAMBER 084
 Detector : 78265
 Background Analysis Date/Time : 6-SEP-2009 14:27:09
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.557	3301.261	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4436.726	4905.499	6.000000	1.440000	40.82483	95.00000
CM-244	5533.547	5882.686	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 085
 Detector : 78776
 Background Analysis Date/Time : 6-SEP-2009 14:27:09
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.601	3300.074	1.000000	0.2400000	100.0000	95.00000
NP-237	4436.653	4903.942	6.000000	1.440000	40.82483	95.00000
CM-244	5535.486	5883.705	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 086
 Detector : 78198
 Background Analysis Date/Time : 6-SEP-2009 14:27:09
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.774	3299.664	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.667	4903.104	10.00000	2.400000	31.62278	95.00000
CM-244	5531.307	5882.758	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 087
 Detector : 78199
 Background Analysis Date/Time : 6-SEP-2009 14:27:09
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.236	3300.170	4.000000	0.9600002	50.00000	95.00000
NP-237	4436.843	4904.805	7.000000	1.680000	37.79645	95.00000
CM-244	5535.169	5884.995	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 088
 Detector : 33452
 Background Analysis Date/Time : 6-SEP-2009 14:27:09
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.949	3298.130	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.755	4901.405	6.000000	1.440000	40.82483	95.00000
CM-244	5533.353	5886.188	11.00000	2.640000	30.15113	95.00000

Instrument : CHAMBER 089
 Detector : 78262
 Background Analysis Date/Time : 6-SEP-2009 14:27:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.289	3300.634	2.000000	0.4800001	70.71068	95.00000
NP-237	4434.456	4904.010	10.000000	2.400001	31.62278	95.00000
CM-244	5534.385	5885.433	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 090
 Detector : 78263
 Background Analysis Date/Time : 6-SEP-2009 14:27:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.266	3299.227	2.000000	0.4800001	70.71068	95.00000
NP-237	4433.868	4903.300	9.000000	2.160001	33.33334	95.00000
CM-244	5532.356	5885.351	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 091
 Detector : 78259
 Background Analysis Date/Time : 6-SEP-2009 14:27:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.076	3298.663	1.000000	0.2400001	100.0000	95.00000
NP-237	4435.039	4903.577	5.000000	1.200000	44.72136	95.00000
CM-244	5532.620	5882.943	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 092
 Detector : 79457
 Background Analysis Date/Time : 6-SEP-2009 14:27:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.440	3301.094	98.000000	23.52001	10.10153	95.00000
NP-237	4437.352	4901.805	9.000000	2.160001	33.33334	95.00000
CM-244	5530.798	5883.590	9.000000	2.160001	33.33334	95.00000

Instrument : CHAMBER 093
 Detector : 33206
 Background Analysis Date/Time : 6-SEP-2009 14:27:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.703	3297.696	5.000000	1.200000	44.72136	95.00000
NP-237	4437.176	4906.330	9.000000	2.160001	33.33334	95.00000
CM-244	5534.842	5887.449	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 094
 Detector : 78267
 Background Analysis Date/Time : 6-SEP-2009 14:27:10
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.223	3299.522	2.000000	0.4800001	70.71068	95.00000
NP-237	4437.384	4902.143	9.000000	2.160001	33.33334	95.00000
CM-244	5531.241	5883.942	1.000000	0.2400001	100.0000	95.00000

Instrument : CHAMBER 095
 Detector : 64279
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.368	3299.100	4.000000	0.9599994	50.00000	95.00000
NP-237	4432.777	4902.890	11.00000	2.639998	30.15113	95.00000
CM-244	5531.978	5884.563	25.00000	5.999996	20.00000	95.00000

Instrument : CHAMBER 096
 Detector : 67605
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.016	3298.247	3.000000	0.7199996	57.73503	95.00000
NP-237	4433.400	4905.592	17.00000	4.079998	24.25356	95.00000
CM-244	5533.378	5883.405	6.000000	1.439999	40.82483	95.00000

Instrument : CHAMBER 097
 Detector : 67599
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.986	3300.981	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.608	4904.990	4.000000	0.9599994	50.00000	95.00000
CM-244	5532.644	5882.410	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 098
 Detector : 68644
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.306	3298.708	7.000000	1.679999	37.79645	95.00000
NP-237	4434.769	4903.339	9.000000	2.159999	33.33334	95.00000
CM-244	5532.564	5883.056	3.000000	0.7199996	57.73503	95.00000

Instrument : CHAMBER 099
 Detector : 70317
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.666	3300.290	2.000000	0.4799997	70.71068	95.00000
NP-237	4434.357	4903.837	11.00000	2.639998	30.15113	95.00000
CM-244	5533.206	5886.495	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 100
 Detector : 79456
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.537	3298.592	4.000000	0.9599994	50.00000	95.00000
NP-237	4433.227	4902.504	17.00000	4.079998	24.25356	95.00000
CM-244	5531.221	5883.961	12.00000	2.879998	28.86751	95.00000

Instrument : CHAMBER 101
 Detector : 64253
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.324	3300.256	3.000000	0.7199996	57.73503	95.00000
NP-237	4433.583	4904.714	11.000000	2.639998	30.15113	95.00000
CM-244	5530.834	5885.200	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 102
 Detector : 72525
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.972	3297.750	2.000000	0.4799997	70.71068	95.00000
NP-237	4434.781	4906.296	6.000000	1.439999	40.82483	95.00000
CM-244	5531.260	5887.302	2.000000	0.4799997	70.71068	95.00000

Instrument : CHAMBER 103
 Detector : 79461
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.531	3301.057	1.000000	0.2399998	100.0000	95.00000
NP-237	4432.571	4902.800	2.000000	0.4799997	70.71068	95.00000
CM-244	5532.928	5886.525	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 104
 Detector : 72524
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.726	3302.339	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.026	4906.432	9.000000	2.159999	33.33334	95.00000
CM-244	5534.210	5886.645	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 105
 Detector : 78777
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.378	3298.176	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4433.342	4905.964	4.000000	0.9599994	50.00000	95.00000
CM-244	5532.223	5883.573	1.000000	0.2399998	100.0000	95.00000

Instrument : CHAMBER 106
 Detector : 64274
 Background Analysis Date/Time : 6-SEP-2009 14:27:11
 Background Count Time : 59999.99

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.139	3297.527	1.000000	0.2399998	100.0000	95.00000
NP-237	4435.882	4902.515	11.00000	2.639998	30.15113	95.00000
CM-244	5535.620	5885.870	5.000000	1.199999	44.72136	95.00000

Instrument : CHAMBER 107
 Detector : 67578
 Background Analysis Date/Time : 6-SEP-2009 14:27:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.674	3297.932	4.000000	0.9600002	50.00000	95.00000
NP-237	4433.280	4901.472	7.000000	1.680000	37.79645	95.00000
CM-244	5535.487	5885.665	1.000000	0.2400000	100.0000	95.00000

Instrument : CHAMBER 108
 Detector : 78778
 Background Analysis Date/Time : 6-SEP-2009 14:27:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.265	3302.021	2.000000	0.4800001	70.71068	95.00000
NP-237	4432.866	4906.223	4.000000	0.9600002	50.00000	95.00000
CM-244	5533.837	5886.132	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 109
 Detector : 79463
 Background Analysis Date/Time : 6-SEP-2009 14:27:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.183	3300.537	2.000000	0.4800001	70.71068	95.00000
NP-237	4435.497	4906.168	6.000000	1.440000	40.82483	95.00000
CM-244	5532.493	5887.375	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 110
 Detector : 67602
 Background Analysis Date/Time : 6-SEP-2009 14:27:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.369	3301.395	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.897	4901.753	5.000000	1.200000	44.72136	95.00000
CM-244	5534.153	5887.267	15.00000	3.600001	25.81989	95.00000

Instrument : CHAMBER 111
 Detector : 79462
 Background Analysis Date/Time : 6-SEP-2009 14:27:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.920	3299.168	3.000000	0.7200001	57.73503	95.00000
NP-237	4435.442	4904.437	8.000000	1.920000	35.35534	95.00000
CM-244	5534.527	5885.642	2.000000	0.4800001	70.71068	95.00000

Instrument : CHAMBER 112
 Detector : 78261
 Background Analysis Date/Time : 6-SEP-2009 14:27:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.379	3300.588	1.000000	0.2400000	100.0000	95.00000
NP-237	4436.103	4905.883	5.000000	1.200000	44.72136	95.00000
CM-244	5535.395	5883.265	3.000000	0.7200001	57.73503	95.00000

Instrument : CHAMBER 113
 Detector : 45-111B4
 Background Analysis Date/Time : 16-AUG-2009 16:34:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.867	3300.361	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.565	4901.409	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5532.822	5886.571	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 114
 Detector : 78258
 Background Analysis Date/Time : 16-AUG-2009 16:34:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.066	3300.343	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.866	4902.961	2.000000	0.6000000	70.71068	95.00000
CM-244	5535.155	5886.142	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 115
 Detector : 45-132FF4
 Background Analysis Date/Time : 16-AUG-2009 16:34:55
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.683	3299.666	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.623	4904.729	6.000000	1.800000	40.82483	95.00000
CM-244	5534.066	5886.268	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 116
 Detector : 45-132FF2
 Background Analysis Date/Time : 16-AUG-2009 16:34:59
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.930	3301.615	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.958	4904.160	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.087	5883.400	11.00000	3.300000	30.15113	95.00000

Instrument : CHAMBER 117
 Detector : 33450
 Background Analysis Date/Time : 16-AUG-2009 16:35:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.306	3298.199	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.520	4903.152	3.000000	0.9000000	57.73503	95.00000
CM-244	5530.582	5887.083	11.00000	3.300000	30.15113	95.00000

Instrument : CHAMBER 118
 Detector : 75544
 Background Analysis Date/Time : 16-AUG-2009 16:35:08
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.856	3302.528	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.711	4902.773	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.177	5883.080	18.00000	5.400000	23.57022	95.00000

Instrument : CHAMBER 119
 Detector : 74429
 Background Analysis Date/Time : 16-AUG-2009 16:35:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.004	3299.253	3.000000	0.9000000	57.73503	95.00000
NP-237	4432.548	4906.013	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5530.584	5883.165	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 120
 Detector : 74430
 Background Analysis Date/Time : 16-AUG-2009 16:35:17
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.209	3300.389	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.370	4904.997	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5531.794	5882.950	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 121
 Detector : 75545
 Background Analysis Date/Time : 16-AUG-2009 16:35:22
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.483	3299.036	4.000000	1.200000	50.00000	95.00000
NP-237	4436.007	4904.843	6.000000	1.800000	40.82483	95.00000
CM-244	5531.746	5882.876	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 122
 Detector : 75546
 Background Analysis Date/Time : 16-AUG-2009 16:35:26
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.140	3302.149	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.728	4903.501	14.00000	4.200000	26.72612	95.00000
CM-244	5535.323	5886.133	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 123
 Detector : 45-142V3
 Background Analysis Date/Time : 16-AUG-2009 16:35:30
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.820	3298.601	3.000000	0.9000000	57.73503	95.00000
NP-237	4437.478	4905.941	6.000000	1.800000	40.82483	95.00000
CM-244	5531.339	5886.453	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 124
 Detector : 45-142V2
 Background Analysis Date/Time : 16-AUG-2009 16:35:35
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.806	3300.376	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.352	4902.974	9.000000	2.700000	33.33334	95.00000
CM-244	5533.246	5885.946	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 125
 Detector : 75547
 Background Analysis Date/Time : 16-AUG-2009 16:35:39
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.619	3299.275	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.269	4906.266	6.000000	1.800000	40.82483	95.00000
CM-244	5531.959	5882.482	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 126
 Detector : 75548
 Background Analysis Date/Time : 16-AUG-2009 16:35:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.372	3298.946	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.297	4901.551	15.00000	4.500000	25.81989	95.00000
CM-244	5532.806	5882.587	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 127
 Detector : 78770
 Background Analysis Date/Time : 16-AUG-2009 16:35:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.622	3297.830	3.000000	0.9000000	57.73503	95.00000
NP-237	4435.622	4904.092	1.000000	0.3000000	100.0000	95.00000
CM-244	5535.184	5885.434	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 128
 Detector : 75549
 Background Analysis Date/Time : 16-AUG-2009 16:35:52
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.482	3299.177	135.0000	40.50000	8.606629	95.00000
NP-237	4436.028	4905.664	84.00000	25.20000	10.91089	95.00000
CM-244	5532.549	5883.141	32.00000	9.600000	17.67767	95.00000

Instrument : CHAMBER 129
 Detector : 76227
 Background Analysis Date/Time : 16-AUG-2009 16:35:57
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.146	3298.635	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.563	4905.761	8.000000	2.400000	35.35534	95.00000
CM-244	5531.918	5882.796	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 130
 Detector : 76228
 Background Analysis Date/Time : 16-AUG-2009 16:36:01
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.230	3297.665	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.582	4901.937	8.000000	2.400000	35.35534	95.00000
CM-244	5530.859	5884.881	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 131
 Detector : 33448
 Background Analysis Date/Time : 16-AUG-2009 16:36:05
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.455	3301.428	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.994	4904.668	4.000000	1.200000	50.00000	95.00000
CM-244	5532.826	5884.723	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 132
 Detector : 67579
 Background Analysis Date/Time : 16-AUG-2009 16:36:09
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.906	3301.298	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.560	4903.500	5.000000	1.500000	44.72136	95.00000
CM-244	5531.586	5882.587	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 133
 Detector : 76229
 Background Analysis Date/Time : 16-AUG-2009 16:36:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.199	3301.674	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.849	4905.652	3.000000	0.9000000	57.73503	95.00000
CM-244	5530.602	5882.872	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 134
 Detector : 76230
 Background Analysis Date/Time : 16-AUG-2009 16:36:19
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.055	3302.112	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.969	4905.408	21.00000	6.300000	21.82179	95.00000
CM-244	5534.460	5883.375	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 135
 Detector : 64270
 Background Analysis Date/Time : 16-AUG-2009 16:36:23
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.813	3300.105	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.123	4902.752	2.000000	0.6000000	70.71068	95.00000
CM-244	5532.979	5882.877	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 136
 Detector : 68549
 Background Analysis Date/Time : 16-AUG-2009 16:36:27
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.796	3301.682	3.000000	0.9000000	57.73503	95.00000
NP-237	4435.713	4901.780	14.00000	4.200000	26.72612	95.00000
CM-244	5531.520	5884.028	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 137
 Detector : 64288
 Background Analysis Date/Time : 16-AUG-2009 16:36:31
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.035	3302.352	4.000000	1.200000	50.00000	95.00000
NP-237	4435.990	4901.349	6.000000	1.800000	40.82483	95.00000
CM-244	5532.344	5883.346	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 138
 Detector : 65877
 Background Analysis Date/Time : 16-AUG-2009 16:36:35
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.457	3300.623	3.000000	0.9000000	57.73503	95.00000
NP-237	4436.833	4904.301	13.00000	3.900000	27.73501	95.00000
CM-244	5531.035	5885.034	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 139
 Detector : 76231
 Background Analysis Date/Time : 16-AUG-2009 16:36:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.624	3300.322	4.000000	1.200000	50.00000	95.00000
NP-237	4436.965	4901.673	8.000000	2.400000	35.35534	95.00000
CM-244	5531.099	5884.173	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 140
 Detector : 78771
 Background Analysis Date/Time : 16-AUG-2009 16:36:43
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.243	3300.208	3.000000	0.9000000	57.73503	95.00000
NP-237	4435.227	4906.111	12.00000	3.600000	28.86751	95.00000
CM-244	5531.085	5884.403	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 141
 Detector : 76232
 Background Analysis Date/Time : 16-AUG-2009 16:36:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.414	3297.748	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.262	4901.753	5.000000	1.500000	44.72136	95.00000
CM-244	5534.971	5886.637	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 142
 Detector : 64261
 Background Analysis Date/Time : 16-AUG-2009 16:36:52
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.269	3301.948	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.864	4905.404	11.00000	3.300000	30.15113	95.00000
CM-244	5531.110	5884.773	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 143
 Detector : 65882
 Background Analysis Date/Time : 16-AUG-2009 16:36:56
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.868	3300.973	10.00000	3.000000	31.62278	95.00000
NP-237	4435.203	4905.234	16.00000	4.800000	25.00000	95.00000
CM-244	5533.941	5886.181	11.00000	3.300000	30.15113	95.00000

Instrument : CHAMBER 144
 Detector : 75551
 Background Analysis Date/Time : 16-AUG-2009 16:37:00
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.050	3299.833	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.005	4902.603	12.00000	3.600000	28.86751	95.00000
CM-244	5530.735	5882.656	9.000000	2.700000	33.33334	95.00000

Instrument : CHAMBER 145
 Detector : 72526
 Background Analysis Date/Time : 16-AUG-2009 16:37:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.923	3299.882	3.000000	0.9000000	57.73503	95.00000
NP-237	4434.984	4905.949	4.000000	1.200000	50.00000	95.00000
CM-244	5531.069	5884.490	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 146
 Detector : 72527
 Background Analysis Date/Time : 16-AUG-2009 16:37:08
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.460	3301.164	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.288	4903.095	2.000000	0.6000000	70.71068	95.00000
CM-244	5534.042	5884.573	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 147
 Detector : 75550
 Background Analysis Date/Time : 16-AUG-2009 16:37:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.910	3299.539	10.00000	3.000000	31.62278	95.00000
NP-237	4433.251	4901.935	8.000000	2.400000	35.35534	95.00000
CM-244	5533.139	5883.368	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 148
 Detector : 74429
 Background Analysis Date/Time : 16-AUG-2009 16:37:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.725	3298.446	6.000000	1.800000	40.82483	95.00000
NP-237	4436.496	4905.977	7.000000	2.100000	37.79645	95.00000
CM-244	5533.919	5885.716	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 149
 Detector : 33449
 Background Analysis Date/Time : 16-AUG-2009 16:37:20
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.734	3299.272	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4437.371	4901.944	4.000000	1.200000	50.00000	95.00000
CM-244	5530.548	5882.851	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 150
 Detector : 75552
 Background Analysis Date/Time : 16-AUG-2009 16:37:24
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.316	3300.643	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.415	4905.497	7.000000	2.100000	37.79645	95.00000
CM-244	5534.121	5886.240	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 151
 Detector : 75556
 Background Analysis Date/Time : 16-AUG-2009 16:37:28
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.659	3302.040	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.623	4901.634	4.000000	1.200000	50.00000	95.00000
CM-244	5531.364	5886.469	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 152
 Detector : 76222
 Background Analysis Date/Time : 16-AUG-2009 16:37:32
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.044	3297.777	4.000000	1.200000	50.00000	95.00000
NP-237	4437.300	4905.285	5.000000	1.500000	44.72136	95.00000
CM-244	5531.209	5887.199	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 153
 Detector : 76223
 Background Analysis Date/Time : 16-AUG-2009 16:37:35
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.175	3301.127	4.000000	1.200000	50.00000	95.00000
NP-237	4437.148	4906.174	10.00000	3.000000	31.62278	95.00000
CM-244	5533.838	5885.640	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 154
 Detector : 76224
 Background Analysis Date/Time : 16-AUG-2009 16:37:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.160	3298.663	3.000000	0.9000000	57.73503	95.00000
NP-237	4435.792	4904.845	6.000000	1.800000	40.82483	95.00000
CM-244	5532.170	5883.602	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 155
 Detector : 75553
 Background Analysis Date/Time : 16-AUG-2009 16:37:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.137	3299.574	8.000000	2.400000	35.35534	95.00000
NP-237	4433.383	4905.252	9.000000	2.700000	33.33334	95.00000
CM-244	5530.995	5884.485	8.000000	2.400000	35.35534	95.00000

Instrument : CHAMBER 156
 Detector : 75554
 Background Analysis Date/Time : 16-AUG-2009 16:37:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.410	3301.423	6.000000	1.800000	40.82483	95.00000
NP-237	4436.034	4902.390	17.00000	5.100000	24.25356	95.00000
CM-244	5532.563	5885.336	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 157
 Detector : 75555
 Background Analysis Date/Time : 16-AUG-2009 16:37:52
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.948	3299.042	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.337	4902.073	9.000000	2.700000	33.33334	95.00000
CM-244	5531.733	5884.378	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 158
 Detector : 33451
 Background Analysis Date/Time : 16-AUG-2009 16:37:56
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.074	3301.013	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.907	4905.421	10.00000	3.000000	31.62278	95.00000
CM-244	5535.323	5885.904	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 159
 Detector : 76225
 Background Analysis Date/Time : 16-AUG-2009 16:38:00
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.022	3301.502	4.000000	1.200000	50.00000	95.00000
NP-237	4435.853	4902.842	7.000000	2.100000	37.79645	95.00000
CM-244	5534.528	5883.086	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 160
 Detector : 76226
 Background Analysis Date/Time : 16-AUG-2009 16:38:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.982	3298.890	6.000000	1.800000	40.82483	95.00000
NP-237	4434.439	4901.761	20.00000	6.000000	22.36068	95.00000
CM-244	5533.753	5882.414	11.00000	3.300000	30.15113	95.00000

Instrument : CHAMBER 161
 Detector : 70321
 Background Analysis Date/Time : 23-AUG-2009 11:54:11
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.799	3299.450	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4437.354	4905.712	6.000000	1.800000	40.82483	95.00000
CM-244	5533.034	5884.911	14.00000	4.200000	26.72612	95.00000

Instrument : CHAMBER 162
 Detector : 70323
 Background Analysis Date/Time : 23-AUG-2009 11:54:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.108	3297.679	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4437.157	4905.370	5.000000	1.500000	44.72136	95.00000
CM-244	5531.808	5882.856	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 163
 Detector : 70324
 Background Analysis Date/Time : 23-AUG-2009 11:54:21
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.316	3301.922	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.725	4904.333	12.00000	3.600000	28.86751	95.00000
CM-244	5532.622	5884.699	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 164
 Detector : 70325
 Background Analysis Date/Time : 23-AUG-2009 11:54:26
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.433	3301.590	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.137	4904.243	9.000000	2.700000	33.33334	95.00000
CM-244	5533.726	5886.727	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 165
 Detector : 72544
 Background Analysis Date/Time : 23-AUG-2009 11:54:31
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.235	3298.979	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.502	4904.549	7.000000	2.100000	37.79645	95.00000
CM-244	5532.823	5884.601	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 166
 Detector : 74545
 Background Analysis Date/Time : 23-AUG-2009 11:54:35
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.175	3297.621	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.428	4904.926	5.000000	1.500000	44.72136	95.00000
CM-244	5535.556	5884.119	12.000000	3.600000	28.86751	95.00000

Instrument : CHAMBER 167
 Detector : 72546
 Background Analysis Date/Time : 23-AUG-2009 11:54:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.148	3302.011	2.000000	0.6000000	70.71068	95.00000
NP-237	4433.463	4903.100	12.000000	3.6000000	28.86751	95.00000
CM-244	5531.940	5884.576	10.000000	3.0000000	31.62278	95.00000

Instrument : CHAMBER 168
 Detector : 72547
 Background Analysis Date/Time : 23-AUG-2009 11:54:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.237	3300.921	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.534	4902.237	16.000000	4.8000000	25.00000	95.00000
CM-244	5531.663	5884.741	9.000000	2.7000000	33.33334	95.00000

Instrument : CHAMBER 169
 Detector : 72548
 Background Analysis Date/Time : 23-AUG-2009 11:54:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.165	3298.594	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.229	4903.754	13.00000	3.900000	27.73501	95.00000
CM-244	5532.658	5885.433	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 170
 Detector : 72549
 Background Analysis Date/Time : 23-AUG-2009 11:54:54
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.025	3299.867	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.622	4903.408	16.00000	4.800000	25.00000	95.00000
CM-244	5534.316	5882.981	5.000000	1.500000	44.72136	95.00000

Instrument : CHAMBER 171
 Detector : 78260
 Background Analysis Date/Time : 23-AUG-2009 11:54:58
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.433	3300.366	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.595	4905.826	9.000000	2.700000	33.33334	95.00000
CM-244	5533.870	5885.935	10.00000	3.000000	31.62278	95.00000

Instrument : CHAMBER 172
 Detector : 78772
 Background Analysis Date/Time : 23-AUG-2009 11:55:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.870	3297.903	3.000000	0.9000000	57.73503	95.00000
NP-237	4433.678	4903.969	9.000000	2.700000	33.33334	95.00000
CM-244	5534.514	5883.121	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 173
 Detector : 74431
 Background Analysis Date/Time : 23-AUG-2009 11:55:07
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.449	3298.086	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4435.604	4905.905	2.000000	0.6000000	70.71068	95.00000
CM-244	5534.021	5885.467	33.00000	9.900001	17.40777	95.00000

Instrument : CHAMBER 174
 Detector : 74432
 Background Analysis Date/Time : 23-AUG-2009 11:55:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.639	3300.179	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.486	4905.219	9.000000	2.700000	33.33334	95.00000
CM-244	5531.026	5885.734	20.00000	6.000000	22.36068	95.00000

Instrument : CHAMBER 175
 Detector : 74433
 Background Analysis Date/Time : 23-AUG-2009 11:55:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.018	3300.926	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.197	4902.367	8.000000	2.400000	35.35534	95.00000
CM-244	5531.134	5883.215	22.00000	6.600000	21.32007	95.00000

Instrument : CHAMBER 176
 Detector : 74434
 Background Analysis Date/Time : 23-AUG-2009 11:55:21
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.853	3298.318	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.083	4904.101	7.000000	2.100000	37.79645	95.00000
CM-244	5532.948	5884.695	23.00000	6.900000	20.85144	95.00000

Instrument : CHAMBER 177
 Detector : 74435
 Background Analysis Date/Time : 23-AUG-2009 11:55:26
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.857	3298.211	3.000000	0.9000000	57.73503	95.00000
NP-237	4433.475	4903.934	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.213	5885.773	29.00000	8.700001	18.56953	95.00000

Instrument : CHAMBER 178
 Detector : 74436
 Background Analysis Date/Time : 23-AUG-2009 11:55:31
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.399	3300.807	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.785	4903.123	10.00000	3.000000	31.62278	95.00000
CM-244	5531.481	5883.158	22.00000	6.600000	21.32007	95.00000

Instrument : CHAMBER 179
 Detector : 74437
 Background Analysis Date/Time : 23-AUG-2009 11:55:36
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.874	3299.393	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.018	4905.518	5.000000	1.500000	44.72136	95.00000
CM-244	5534.758	5887.251	32.00000	9.600000	17.67767	95.00000

Instrument : CHAMBER 180
 Detector : 74438
 Background Analysis Date/Time : 23-AUG-2009 11:55:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.946	3300.627	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.505	4904.405	9.000000	2.700000	33.33334	95.00000
CM-244	5531.104	5886.649	24.00000	7.200000	20.41241	95.00000

Instrument : CHAMBER 181
 Detector : 74439
 Background Analysis Date/Time : 23-AUG-2009 11:55:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.658	3302.315	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4432.549	4902.677	7.000000	2.100000	37.79645	95.00000
CM-244	5531.208	5883.203	33.00000	9.900001	17.40777	95.00000

Instrument : CHAMBER 182
 Detector : 74440
 Background Analysis Date/Time : 23-AUG-2009 11:55:49
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.553	3299.709	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4435.824	4905.707	3.000000	0.9000000	57.73503	95.00000
CM-244	5533.404	5884.684	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 183
 Detector : 74441
 Background Analysis Date/Time : 23-AUG-2009 11:55:54
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.015	3297.962	3.000000	0.9000000	57.73503	95.00000
NP-237	4434.099	4904.342	5.000000	1.500000	44.72136	95.00000
CM-244	5532.826	5884.696	34.00000	10.20000	17.14986	95.00000

Instrument : CHAMBER 184
 Detector : 74442
 Background Analysis Date/Time : 23-AUG-2009 11:55:58
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.045	3299.169	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.505	4902.470	5.000000	1.500000	44.72136	95.00000
CM-244	5535.333	5886.318	24.00000	7.200000	20.41241	95.00000

Instrument : CHAMBER 185
 Detector : 68615
 Background Analysis Date/Time : 23-AUG-2009 11:56:04
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.897	3299.344	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.571	4905.243	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.503	5886.106	27.00000	8.100000	19.24501	95.00000

Instrument : CHAMBER 186
 Detector : 68616
 Background Analysis Date/Time : 23-AUG-2009 11:56:08
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.379	3299.140	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.242	4902.774	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.982	5886.349	24.00000	7.200000	20.41241	95.00000

Instrument : CHAMBER 187
 Detector : 68620
 Background Analysis Date/Time : 23-AUG-2009 11:56:12
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.498	3300.157	4.000000	1.200000	50.00000	95.00000
NP-237	4437.493	4903.961	8.000000	2.400000	35.35534	95.00000
CM-244	5535.243	5883.722	19.00000	5.700000	22.94157	95.00000

Instrument : CHAMBER 188
 Detector : 68621
 Background Analysis Date/Time : 23-AUG-2009 11:56:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.985	3297.497	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.354	4904.064	5.000000	1.500000	44.72136	95.00000
CM-244	5533.683	5886.437	31.00000	9.300000	17.96053	95.00000

Instrument : CHAMBER 189
 Detector : 68622
 Background Analysis Date/Time : 23-AUG-2009 11:56:21
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.052	3301.735	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.853	4905.539	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.776	5884.354	29.00000	8.700001	18.56953	95.00000

Instrument : CHAMBER 190
 Detector : 68623
 Background Analysis Date/Time : 23-AUG-2009 11:56:25
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.652	3298.950	4.000000	1.200000	50.00000	95.00000
NP-237	4435.677	4904.720	24.00000	7.200000	20.41241	95.00000
CM-244	5532.170	5883.736	36.00000	10.80000	16.66667	95.00000

Instrument : CHAMBER 191
 Detector : 68624
 Background Analysis Date/Time : 23-AUG-2009 11:56:29
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.100	3299.772	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.436	4904.158	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.545	5884.668	27.00000	8.100000	19.24501	95.00000

Instrument : CHAMBER 192
 Detector : 74430
 Background Analysis Date/Time : 23-AUG-2009 11:56:33
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.046	3297.560	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.061	4903.990	4.000000	1.200000	50.00000	95.00000
CM-244	5535.519	5883.955	25.00000	7.500000	20.00000	95.00000

Instrument : CHAMBER 193
 Detector : 68627
 Background Analysis Date/Time : 23-AUG-2009 11:56:37
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.087	3301.572	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.483	4905.309	7.000000	2.100000	37.79645	95.00000
CM-244	5532.931	5884.819	32.00000	9.600000	17.67767	95.00000

Instrument : CHAMBER 194
 Detector : 68635
 Background Analysis Date/Time : 23-AUG-2009 11:56:41
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.152	3297.570	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.536	4903.587	4.000000	1.200000	50.00000	95.00000
CM-244	5530.970	5882.461	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 195
 Detector : 68636
 Background Analysis Date/Time : 23-AUG-2009 11:56:45
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.288	3300.624	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.057	4902.978	3.000000	0.9000000	57.73503	95.00000
CM-244	5534.813	5885.542	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 196
 Detector : 68637
 Background Analysis Date/Time : 23-AUG-2009 11:56:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.410	3301.963	3.000000	0.9000000	57.73503	95.00000
NP-237	4437.321	4906.417	5.000000	1.500000	44.72136	95.00000
CM-244	5534.476	5886.645	21.00000	6.300000	21.82179	95.00000

Instrument : CHAMBER 197
 Detector : 78894
 Background Analysis Date/Time : 23-AUG-2009 11:56:54
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.920	3300.320	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4436.468	4902.348	1.000000	0.3000000	100.0000	95.00000
CM-244	5532.745	5886.065	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 198
 Detector : 78895
 Background Analysis Date/Time : 23-AUG-2009 11:56:58
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.305	3299.642	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.397	4904.448	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.011	5885.087	30.00000	9.000000	18.25742	95.00000

Instrument : CHAMBER 199
 Detector : 78896
 Background Analysis Date/Time : 23-AUG-2009 11:57:02
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.912	3297.497	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4433.891	4904.941	5.000000	1.500000	44.72136	95.00000
CM-244	5535.121	5882.869	7.000000	2.100000	37.79645	95.00000

Instrument : CHAMBER 200
 Detector : 78900
 Background Analysis Date/Time : 23-AUG-2009 11:57:06
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.845	3300.480	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.941	4902.709	10.00000	3.000000	31.62278	95.00000
CM-244	5532.744	5885.759	30.00000	9.000000	18.25742	95.00000

Instrument : CHAMBER 201
 Detector : 78902
 Background Analysis Date/Time : 23-AUG-2009 11:57:10
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.531	3297.499	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.991	4906.359	5.000000	1.500000	44.72136	95.00000
CM-244	5531.510	5884.700	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 202
 Detector : 78903
 Background Analysis Date/Time : 23-AUG-2009 11:57:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.301	3298.322	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.596	4902.750	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5531.710	5884.137	14.00000	4.200000	26.72612	95.00000

Instrument : CHAMBER 203
 Detector : 78905
 Background Analysis Date/Time : 23-AUG-2009 11:57:19
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.566	3301.771	4.000000	1.200000	50.00000	95.00000
NP-237	4437.077	4902.609	6.000000	1.800000	40.82483	95.00000
CM-244	5532.534	5885.590	12.00000	3.600000	28.86751	95.00000

Instrument : CHAMBER 204
 Detector : 78907
 Background Analysis Date/Time : 23-AUG-2009 11:57:23
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.303	3298.289	13.00000	3.900000	27.73501	95.00000
NP-237	4433.152	4903.866	12.00000	3.600000	28.86751	95.00000
CM-244	5533.856	5886.993	34.00000	10.20000	17.14986	95.00000

Instrument : CHAMBER 205
 Detector : 78908
 Background Analysis Date/Time : 23-AUG-2009 11:57:27
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.267	3299.423	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.928	4905.917	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.946	5884.256	15.00000	4.500000	25.81989	95.00000

Instrument : CHAMBER 206
 Detector : 78909
 Background Analysis Date/Time : 23-AUG-2009 11:57:31
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.740	3299.836	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.469	4904.811	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5534.058	5886.660	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 207
 Detector : 78910
 Background Analysis Date/Time : 23-AUG-2009 11:57:35
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.560	3301.824	2.000000	0.6000000	70.71068	95.00000
NP-237	4434.563	4905.877	4.000000	1.200000	50.00000	95.00000
CM-244	5530.790	5883.765	14.00000	4.200000	26.72612	95.00000

Instrument : CHAMBER 208
 Detector : 78911
 Background Analysis Date/Time : 23-AUG-2009 11:57:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.613	3299.492	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.795	4902.883	6.000000	1.800000	40.82483	95.00000
CM-244	5533.327	5886.561	13.00000	3.900000	27.73501	95.00000

Instrument : CHAMBER 209
 Detector : 79188
 Background Analysis Date/Time : 23-AUG-2009 11:57:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.940	3298.642	2.000000	0.6000000	70.71068	95.00000
NP-237	4435.592	4905.793	3.000000	0.9000000	57.73503	95.00000
CM-244	5530.388	5883.749	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 210
 Detector : 79189
 Background Analysis Date/Time : 23-AUG-2009 11:57:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.073	3301.089	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.142	4905.164	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.916	5886.208	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 211
 Detector : 79190
 Background Analysis Date/Time : 23-AUG-2009 11:57:52
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.282	3299.071	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4434.230	4900.253	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.327	5885.262	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 212
 Detector : 79191
 Background Analysis Date/Time : 23-AUG-2009 11:57:56
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.918	3298.870	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.027	4902.590	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.378	5887.318	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 213
 Detector : 79192
 Background Analysis Date/Time : 23-AUG-2009 11:58:01
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.497	3299.775	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.841	4905.254	1.000000	0.3000000	100.0000	95.00000
CM-244	5534.504	5887.063	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 214
 Detector : 79193
 Background Analysis Date/Time : 23-AUG-2009 11:58:05
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.133	3298.396	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4436.844	4902.153	4.000000	1.200000	50.00000	95.00000
CM-244	5532.271	5885.676	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 215
 Detector : 79194
 Background Analysis Date/Time : 23-AUG-2009 11:58:09
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.638	3298.993	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4433.482	4904.904	1.000000	0.3000000	100.0000	95.00000
CM-244	5531.246	5885.655	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 216
 Detector : 79195
 Background Analysis Date/Time : 23-AUG-2009 11:58:13
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.181	3299.336	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4432.606	4903.311	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.853	5887.574	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 217
 Detector : 79410
 Background Analysis Date/Time : 23-AUG-2009 11:58:18
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.031	3301.074	1.000000	0.3000000	100.0000	95.00000
NP-237	4434.240	4905.058	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5530.547	5884.453	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 218
 Detector : 79411
 Background Analysis Date/Time : 23-AUG-2009 11:58:23
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.583	3301.235	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.884	4901.733	9.000000	2.700000	33.33334	95.00000
CM-244	5532.602	5886.438	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 219
 Detector : 79412
 Background Analysis Date/Time : 23-AUG-2009 11:58:27
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.207	3300.096	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.206	4906.290	4.000000	1.200000	50.00000	95.00000
CM-244	5531.669	5885.285	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 220
 Detector : 79413
 Background Analysis Date/Time : 23-AUG-2009 11:58:31
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.930	3297.738	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.749	4901.420	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
CM-244	5532.504	5886.683	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 221
 Detector : 79414
 Background Analysis Date/Time : 23-AUG-2009 11:58:35
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.954	3298.454	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4435.659	4902.272	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5533.925	5882.692	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 222
 Detector : 79415
 Background Analysis Date/Time : 23-AUG-2009 11:58:40
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.392	3301.657	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4433.525	4905.197	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5534.683	5886.672	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 223
 Detector : 79416
 Background Analysis Date/Time : 23-AUG-2009 11:58:47
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.058	3298.884	2.000000	0.6000000	70.71068	95.00000
NP-237	4432.434	4905.074	2.000000	0.6000000	70.71068	95.00000
CM-244	5532.599	5887.467	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 224
 Detector : 79417
 Background Analysis Date/Time : 23-AUG-2009 11:58:53
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.636	3298.216	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4432.951	4905.382	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.025	5886.099	4.000000	1.200000	50.00000	95.00000

Instrument : CHAMBER 225
 Detector : 79418
 Background Analysis Date/Time : 23-AUG-2009 11:58:59
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.462	3299.408	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.737	4905.917	1.000000	0.3000000	100.0000	95.00000
CM-244	5531.430	5885.124	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 226
 Detector : 79419
 Background Analysis Date/Time : 23-AUG-2009 11:59:05
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.793	3300.581	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.080	4904.877	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.936	5884.804	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 227
 Detector : 79420
 Background Analysis Date/Time : 23-AUG-2009 11:59:10
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.468	3297.622	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.427	4904.675	1.000000	0.3000000	100.0000	95.00000
CM-244	5535.505	5883.794	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 228
 Detector : 79421
 Background Analysis Date/Time : 23-AUG-2009 11:59:16
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.529	3302.052	1.000000	0.3000000	100.0000	95.00000
NP-237	4435.206	4906.368	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.800	5883.365	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 229
 Detector : 79422
 Background Analysis Date/Time : 23-AUG-2009 11:59:21
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.967	3297.813	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.942	4905.968	2.000000	0.6000000	70.71068	95.00000
CM-244	5533.045	5882.442	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 230
 Detector : 79423
 Background Analysis Date/Time : 23-AUG-2009 11:59:28
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.307	3300.916	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4432.950	4904.639	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.626	5884.491	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 231
 Detector : 79424
 Background Analysis Date/Time : 23-AUG-2009 11:59:34
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.314	3302.411	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4437.493	4903.010	4.000000	1.200000	50.00000	95.00000
CM-244	5532.978	5886.091	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 232
 Detector : 79425
 Background Analysis Date/Time : 23-AUG-2009 11:59:39
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.963	3301.243	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.020	4902.090	4.000000	1.200000	50.00000	95.00000
CM-244	5531.563	5883.791	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 233
 Detector : 79426
 Background Analysis Date/Time : 23-AUG-2009 11:59:46
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.373	3302.025	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.487	4905.324	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.110	5885.315	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 234
 Detector : 79427
 Background Analysis Date/Time : 23-AUG-2009 11:59:51
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.269	3300.079	1.000000	0.3000000	100.0000	95.00000
NP-237	4436.893	4901.571	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.864	5883.822	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 235
 Detector : 79428
 Background Analysis Date/Time : 23-AUG-2009 11:59:57
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.964	3301.553	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.767	4906.350	1.000000	0.3000000	100.0000	95.00000
CM-244	5533.497	5883.248	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 236
 Detector : 79429
 Background Analysis Date/Time : 23-AUG-2009 12:00:03
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.553	3300.921	3.000000	0.9000000	57.73503	95.00000
NP-237	4432.813	4903.618	11.00000	3.300000	30.15113	95.00000
CM-244	5534.883	5883.901	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 237
 Detector : 79430
 Background Analysis Date/Time : 23-AUG-2009 12:00:08
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.412	3298.430	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.021	4905.306	1.000000	0.3000000	100.0000	95.00000
CM-244	5530.956	5884.725	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 238
 Detector : 79431
 Background Analysis Date/Time : 23-AUG-2009 12:00:14
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.738	3300.787	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4433.583	4904.073	4.000000	1.200000	50.00000	95.00000
CM-244	5534.315	5882.484	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 239
 Detector : 79432
 Background Analysis Date/Time : 23-AUG-2009 12:00:20
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.271	3298.066	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.718	4902.950	8.000000	2.400000	35.35534	95.00000
CM-244	5535.054	5884.530	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 240
 Detector : 79433
 Background Analysis Date/Time : 23-AUG-2009 12:00:26
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.716	3297.687	2.000000	0.6000000	70.71068	95.00000
NP-237	4436.108	4901.861	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.981	5887.143	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 241
 Detector : 79434
 Background Analysis Date/Time : 23-AUG-2009 12:00:31
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.942	3297.913	4.000000	1.200000	50.00000	95.00000
NP-237	4434.531	4905.642	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
CM-244	5532.339	5887.328	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 242
 Detector : 79435
 Background Analysis Date/Time : 23-AUG-2009 12:00:38
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.675	3302.424	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4435.599	4901.625	2.000000	0.6000000	70.71068	95.00000
CM-244	5533.423	5882.719	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 243
 Detector : 79436
 Background Analysis Date/Time : 23-AUG-2009 12:00:44
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.382	3298.347	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.037	4905.494	2.000000	0.6000000	70.71068	95.00000
CM-244	5531.482	5885.497	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 244
 Detector : 79437
 Background Analysis Date/Time : 23-AUG-2009 12:00:50
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.566	3299.789	5.000000	1.500000	44.72136	95.00000
NP-237	4433.571	4904.626	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.417	5884.486	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 245
 Detector : 79438
 Background Analysis Date/Time : 23-AUG-2009 12:00:56
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.843	3302.525	0.000000E+00	0.000000E+00	0.000000E+00	95.00000
NP-237	4434.670	4906.399	2.000000	0.6000000	70.71068	95.00000
CM-244	5532.436	5886.326	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 246
 Detector : 78912
 Background Analysis Date/Time : 23-AUG-2009 12:01:02
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.420	3298.792	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.098	4904.335	4.000000	1.200000	50.00000	95.00000
CM-244	5530.336	5884.508	0.000000E+00	0.000000E+00	0.000000E+00	95.00000

Instrument : CHAMBER 247
 Detector : 79440
 Background Analysis Date/Time : 23-AUG-2009 12:01:07
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.040	3298.952	5.000000	1.500000	44.72136	95.00000
NP-237	4435.157	4901.869	5.000000	1.500000	44.72136	95.00000
CM-244	5534.103	5883.404	6.000000	1.800000	40.82483	95.00000

Instrument : CHAMBER 248
 Detector : 79441
 Background Analysis Date/Time : 23-AUG-2009 12:01:13
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2989.950	3302.491	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.546	4903.912	6.000000	1.800000	40.82483	95.00000
CM-244	5530.441	5884.950	3.000000	0.9000000	57.73503	95.00000

Instrument : CHAMBER 249
 Detector : 79442
 Background Analysis Date/Time : 23-AUG-2009 12:01:19
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.458	3299.653	2.000000	0.6000000	70.71068	95.00000
NP-237	4437.087	4904.383	6.000000	1.800000	40.82483	95.00000
CM-244	5532.120	5887.291	2.000000	0.6000000	70.71068	95.00000

Instrument : CHAMBER 250
 Detector : 79443
 Background Analysis Date/Time : 23-AUG-2009 12:01:25
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2988.375	3300.259	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4433.621	4904.859	3.000000	0.9000000	57.73503	95.00000
CM-244	5531.200	5885.729	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 251
 Detector : 79444
 Background Analysis Date/Time : 23-AUG-2009 12:01:31
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2992.181	3299.694	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4435.877	4903.211	9.000000	2.700000	33.33334	95.00000
CM-244	5531.476	5887.181	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 252
 Detector : 79445
 Background Analysis Date/Time : 23-AUG-2009 12:01:36
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.594	3297.549	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000
NP-237	4436.816	4903.310	2.000000	0.6000000	70.71068	95.00000
CM-244	5530.420	5885.459	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 253
 Detector : 79446
 Background Analysis Date/Time : 23-AUG-2009 12:01:42
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.116	3298.147	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.082	4905.908	11.00000	3.300000	30.15113	95.00000
CM-244	5531.106	5882.794	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 254
 Detector : 79447
 Background Analysis Date/Time : 23-AUG-2009 12:01:48
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2990.155	3297.706	1.000000	0.3000000	100.0000	95.00000
NP-237	4433.107	4904.992	6.000000	1.800000	40.82483	95.00000
CM-244	5532.020	5886.853	0.0000000E+00	0.0000000E+00	0.0000000E+00	95.00000

Instrument : CHAMBER 255
 Detector : 79448
 Background Analysis Date/Time : 23-AUG-2009 12:02:23
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2987.598	3300.373	1.000000	0.3000000	100.0000	95.00000
NP-237	4437.418	4905.095	9.000000	2.700000	33.33334	95.00000
CM-244	5533.813	5884.354	1.000000	0.3000000	100.0000	95.00000

Instrument : CHAMBER 256
 Detector : 79449
 Background Analysis Date/Time : 23-AUG-2009 12:02:28
 Background Count Time : 60000.00

Cal. Isotopes	Start Energy	End Energy	Counts in 1000 min	Counts during Cal	% Error	Confidence
GD-148	2991.222	3298.267	1.000000	0.3000000	100.0000	95.00000
NP-237	4432.956	4905.052	3.000000	0.9000000	57.73503	95.00000
CM-244	5532.797	5882.840	2.000000	0.6000000	70.71068	95.00000

Subsection 3: Efficiency Calibration

Instrument : CHAMBER 001
 Detector : 78788
 Standard ID : AESS-001
 Standard Reference Date : 20-FEB-2008 09:54:53
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:35:32
 Average Efficiency : 0.3122659
 Average Efficiency Error : 8.6114258E-03
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.6698	28-FEB-2010	2989.095	3301.491	15006.00	0.3039177	1.3064248E-02	58.79536
NP-237	171.0024	28-FEB-2010	4436.328	4901.460	12916.00	0.3146430	1.5974019E-02	71.14886
CM-244	158.1060	28-FEB-2010	5531.570	5886.270	11555.00	0.3229480	1.6424600E-02	57.32594

Instrument : CHAMBER 002
 Detector : 78266
 Standard ID : AESS-002
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:35:41
 Average Efficiency : 0.3090980
 Average Efficiency Error : 8.5114390E-03
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1144	28-FEB-2010	2992.085	3299.620	14650.00	0.3094049	1.3305944E-02	45.54427
NP-237	200.4990	28-FEB-2010	4434.644	4904.846	15015.00	0.3119993	1.5806440E-02	68.48380
CM-244	196.5558	28-FEB-2010	5534.154	5882.659	13603.00	0.3058844	1.5517467E-02	51.44160

Instrument : CHAMBER 003
 Detector : 67617
 Standard ID : AESS-003
 Standard Reference Date : 15-FEB-2008 13:12:27
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:35:49
 Average Efficiency : 0.3361934
 Average Efficiency Error : 9.2456024E-03
 Confidence : 95.00000

Cal. Isteps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.9740	28-FEB-2010	2991.938	3299.717	15919.00	0.3314925	1.4234867E-02	68.71011
NP-237	203.2080	28-FEB-2010	4432.844	4902.827	16799.00	0.3444051	1.7424129E-02	74.30300
CM-244	197.2236	28-FEB-2010	5531.440	5887.803	14947.00	0.3350840	1.6976947E-02	62.51212

Instrument : CHAMBER 004
 Detector : 64279
 Standard ID : AESS-004
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:35:56
 Average Efficiency : 0.3331009
 Average Efficiency Error : 9.1593768E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.1222	28-FEB-2010	2992.026	3298.308	16101.00	0.3301861	1.4176016E-02	53.22534
NP-237	204.2586	28-FEB-2010	4435.760	4905.548	16353.00	0.3335505	1.6880305E-02	62.94835
CM-244	198.8100	28-FEB-2010	5534.947	5883.809	15145.00	0.3368652	1.7064264E-02	54.23564

Instrument : CHAMBER 005
 Detector : 67612
 Standard ID : AESS-005
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:36:04
 Average Efficiency : 0.2950116
 Average Efficiency Error : 8.1236903E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.7452	28-FEB-2010	2989.654	3300.689	14685.00	0.2945226	1.2665418E-02	52.17361
NP-237	209.5938	28-FEB-2010	4436.859	4901.997	14804.00	0.2942757	1.4911278E-02	59.02256
CM-244	202.7478	28-FEB-2010	5533.435	5885.045	13592.00	0.2964495	1.5039029E-02	52.51872

Instrument : CHAMBER 006
 Detector : 67613
 Standard ID : AESS-006
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:39
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:36:12
 Average Efficiency : 0.3072436
 Average Efficiency Error : 8.4615378E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6952	28-FEB-2010	2987.771	3301.528	14462.00	0.3000935	1.2908642E-02	53.74769
NP-237	204.7038	28-FEB-2010	4433.310	4904.612	15292.00	0.3112141	1.5762975E-02	64.28081
CM-244	195.0060	28-FEB-2010	5535.175	5883.158	13852.00	0.3140766	1.5929047E-02	53.04362

Instrument : CHAMBER 007
 Detector : 67607
 Standard ID : AESS-007
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:40
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 4-SEP-2009 12:36:20
 Average Efficiency : 0.2367712
 Average Efficiency Error : 6.6109751E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.7342	28-FEB-2010	2991.315	3300.370	13798.00	0.2821096	1.2145956E-02	48.72938
NP-237	205.0260	28-FEB-2010	4436.975	4905.147	11957.00	0.2429639	1.2349783E-02	65.83331
CM-244	199.6806	28-FEB-2010	5533.959	5885.477	9051.000	0.2003213	1.0235304E-02	52.23785

Instrument : CHAMBER 008
 Detector : 78788
 Standard ID : AESS-008
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:40
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 4-SEP-2009 12:36:40
 Average Efficiency : 0.3205987
 Average Efficiency Error : 8.8198772E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.0418	28-FEB-2010	2989.794	3298.426	15461.00	0.3171742	1.3626882E-02	47.98743
NP-237	209.2716	28-FEB-2010	4437.020	4904.595	16084.00	0.3202048	1.6208146E-02	61.69046
CM-244	199.6488	28-FEB-2010	5532.536	5882.336	14721.00	0.3260421	1.6522150E-02	43.41613

Instrument : CHAMBER 009
 Detector : 72528
 Standard ID : AESS-009
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:40
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 4-SEP-2009 12:36:51
 Average Efficiency : 0.3402912
 Average Efficiency Error : 9.3554687E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.3736	28-FEB-2010	2990.892	3299.892	16250.00	0.3376825	1.4495632E-02	49.34795
NP-237	204.0192	28-FEB-2010	4433.436	4905.789	16617.00	0.3393191	1.7169004E-02	62.72510
CM-244	197.2128	28-FEB-2010	5532.687	5887.081	15400.00	0.3450909	1.7477276E-02	53.13368

Instrument : CHAMBER 010
 Detector : 72529
 Standard ID : AESS-010
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:40
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 4-SEP-2009 12:37:00
 Average Efficiency : 0.3139585
 Average Efficiency Error : 8.6422609E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.0008	28-FEB-2010	2988.087	3300.334	14912.00	0.3120262	1.3414358E-02	49.22013
NP-237	202.9926	28-FEB-2010	4436.842	4905.812	15310.00	0.3142270	1.5915314E-02	60.15851
CM-244	196.2330	28-FEB-2010	5533.178	5884.706	14044.00	0.3164504	1.6046330E-02	53.33372

Instrument : CHAMBER 011
 Detector : 72531
 Standard ID : AESS-011
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:40
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 4-SEP-2009 12:37:27
 Average Efficiency : 0.2979373
 Average Efficiency Error : 8.2009137E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	212.8284	28-FEB-2010	2990.718	3301.411	14912.00	0.2961519	1.2731905E-02	50.71152
NP-237	214.4868	28-FEB-2010	4435.900	4905.463	15442.00	0.2999101	1.5188582E-02	60.36610
CM-244	208.4184	28-FEB-2010	5535.617	5886.431	14071.00	0.2985013	1.5135813E-02	50.96436

Instrument : CHAMBER 012
 Detector : 67594
 Standard ID : AESS-012
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:40
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 4-SEP-2009 12:37:37
 Average Efficiency : 0.2994823
 Average Efficiency Error : 8.2469489E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.2200	28-FEB-2010	2989.283	3301.924	14660.00	0.3004818	1.2922071E-02	52.00318
NP-237	205.8930	28-FEB-2010	4434.309	4903.502	14933.00	0.3021517	1.5308659E-02	64.10130
CM-244	203.1954	28-FEB-2010	5531.028	5882.575	13584.00	0.2955756	1.4994888E-02	57.14846

Instrument : CHAMBER 013
 Detector : 78790
 Standard ID : AESS-013
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:37:47
 Average Efficiency : 0.3441789
 Average Efficiency Error : 9.4585977E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6544	28-FEB-2010	2992.309	3297.583	16707.00	0.3467621	1.4878578E-02	47.93691
NP-237	210.2526	28-FEB-2010	4432.512	4904.184	17205.00	0.3409068	1.7242415E-02	63.48001
CM-244	201.9108	28-FEB-2010	5533.734	5883.657	15707.00	0.3439779	1.7416557E-02	53.05471

Instrument : CHAMBER 014
 Detector : 67616
 Standard ID : AESS-014
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:37:57
 Average Efficiency : 0.3126531
 Average Efficiency Error : 8.6011579E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	214.7088	28-FEB-2010	2990.575	3298.988	15569.00	0.3064544	1.3164708E-02	48.59332
NP-237	211.7160	28-FEB-2010	4436.470	4903.458	16179.00	0.3183725	1.6114254E-02	68.41453
CM-244	207.3882	28-FEB-2010	5530.496	5885.133	14842.00	0.3161798	1.6020818E-02	54.78078

Instrument : CHAMBER 015
 Detector : 61581
 Standard ID : AESS-015
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:38:32
 Average Efficiency : 0.3250474
 Average Efficiency Error : 8.9431657E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0270	28-FEB-2010	2987.656	3297.520	15498.00	0.3210663	1.3793531E-02	58.50532
NP-237	200.6460	28-FEB-2010	4435.901	4901.612	15878.00	0.3296820	1.6690506E-02	70.32646
CM-244	195.9270	28-FEB-2010	5535.255	5884.514	14460.00	0.3262195	1.6535265E-02	60.28641

Instrument : CHAMBER 016
 Detector : 78774
 Standard ID : AESS-016
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:39:14
 Average Efficiency : 0.3337179
 Average Efficiency Error : 9.1785332E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0534	28-FEB-2010	2988.611	3297.891	15952.00	0.3304393	1.4189126E-02	48.70612
NP-237	199.3962	28-FEB-2010	4435.494	4901.479	16393.00	0.3425452	1.7334972E-02	61.52191
CM-244	198.6402	28-FEB-2010	5530.741	5886.030	14827.00	0.3300566	1.6723992E-02	56.19504

Instrument : CHAMBER 017
 Detector : 78791
 Standard ID : AESS-017
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:39:56
 Average Efficiency : 0.2932511
 Average Efficiency Error : 8.0763726E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.0798	28-FEB-2010	2989.315	3299.165	14535.00	0.2924541	1.2578820E-02	44.96824
NP-237	208.5846	28-FEB-2010	4433.955	4905.994	14930.00	0.2982117	1.5109048E-02	56.65096
CM-244	205.5828	28-FEB-2010	5531.756	5885.157	13466.00	0.2896459	1.4695838E-02	49.42458

Instrument : CHAMBER 018
 Detector : 78782
 Standard ID : AESS-018
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:41
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:40:11
 Average Efficiency : 0.3229291
 Average Efficiency Error : 8.8838805E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.1856	28-FEB-2010	2989.045	3297.645	15448.00	0.3229351	1.3874616E-02	44.39913
NP-237	208.8990	28-FEB-2010	4435.824	4903.103	16130.00	0.3216979	1.6283154E-02	64.50001
CM-244	198.1458	28-FEB-2010	5530.534	5885.395	14527.00	0.3241743	1.6430404E-02	51.39432

Instrument : CHAMBER 019
 Detector : 78786
 Standard ID : AESS-019
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:40:24
 Average Efficiency : 0.2905655
 Average Efficiency Error : 8.0145085E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.6468	28-FEB-2010	2992.371	3300.084	13452.00	0.2778059	1.1966659E-02	44.41962
NP-237	202.9140	28-FEB-2010	4432.711	4901.697	14988.00	0.3077365	1.5590836E-02	62.76942
CM-244	199.3140	28-FEB-2010	5534.730	5883.386	13290.00	0.2946945	1.4954864E-02	50.33946

Instrument : CHAMBER 020
 Detector : 78787
 Standard ID : AESS-020
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:40:33
 Average Efficiency : 0.3434685
 Average Efficiency Error : 9.4453506E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	205.5870	28-FEB-2010	2990.745	3300.511	16134.00	0.3317050	1.4240759E-02	49.47922
NP-237	203.4984	28-FEB-2010	4436.191	4903.850	17194.00	0.3519965	1.7803436E-02	60.99994
CM-244	197.1096	28-FEB-2010	5531.198	5885.719	15755.00	0.3534269	1.7894309E-02	50.27258

Instrument : CHAMBER 021
 Detector : 67047
 Standard ID : AESS-021
 Standard Reference Date : 19-FEB-2008 15:31:52
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:40:41
 Average Efficiency : 0.3053718
 Average Efficiency Error : 8.4061036E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.3608	28-FEB-2010	2991.027	3300.488	14910.00	0.3024271	1.3001683E-02	54.25101
NP-237	210.1548	28-FEB-2010	4433.390	4904.438	15336.00	0.3040332	1.5398674E-02	66.84158
CM-244	200.7390	28-FEB-2010	5534.035	5886.544	14134.00	0.3111110	1.5774274E-02	53.45971

Instrument : CHAMBER 022
 Detector : 72530
 Standard ID : AESS-022
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:40:50
 Average Efficiency : 0.3167550
 Average Efficiency Error : 8.7174345E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	209.6724	28-FEB-2010	2992.050	3301.029	15236.00	0.3069546	1.3191545E-02	48.80446
NP-237	206.8830	28-FEB-2010	4437.549	4902.815	16171.00	0.3256005	1.6480263E-02	64.55595
CM-244	203.0208	28-FEB-2010	5531.706	5883.854	14838.00	0.3231215	1.6372502E-02	53.46963

Instrument : CHAMBER 023
 Detector : 78264
 Standard ID : AESS-023
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:40:59
 Average Efficiency : 0.3319828
 Average Efficiency Error : 9.1288136E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	207.4764	28-FEB-2010	2991.319	3301.853	16017.00	0.3263104	1.4010864E-02	47.06707
NP-237	207.4998	28-FEB-2010	4434.632	4902.993	16663.00	0.3345701	1.6928136E-02	62.52299
CM-244	199.8804	28-FEB-2010	5531.100	5885.960	15271.00	0.3377988	1.7109787E-02	47.13729

Instrument : CHAMBER 024
 Detector : 76542
 Standard ID : AESS-024
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 4-SEP-2009 07:36:42
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 4-SEP-2009 12:41:10
 Average Efficiency : 0.3282878
 Average Efficiency Error : 9.0300748E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.5218	28-FEB-2010	2988.280	3301.361	15578.00	0.3235334	1.3898253E-02	49.01440
NP-237	205.6662	28-FEB-2010	4434.951	4904.473	16364.00	0.3314564	1.6774241E-02	73.72572
CM-244	198.3060	28-FEB-2010	5532.286	5883.922	14893.00	0.3320678	1.6824935E-02	56.15541

Instrument : CHAMBER 025
 Detector : 45-149AA5
 Standard ID : AESS-025
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:36:12
 Average Efficiency : 0.3276502
 Average Efficiency Error : 9.0310313E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.5670	28-FEB-2010	2988.958	3301.287	15226.00	0.3290954	1.4142862E-02	57.79382
NP-237	167.9916	28-FEB-2010	4436.686	4904.740	13253.00	0.3286704	1.6679743E-02	71.75627
CM-244	157.2432	28-FEB-2010	5534.991	5882.562	11563.00	0.3246800	1.6513394E-02	67.10056

Instrument : CHAMBER 026
 Detector : 78204
 Standard ID : AESS-026
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:36:22
 Average Efficiency : 0.3213052
 Average Efficiency Error : 9.4170934E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.5072	28-FEB-2010	2988.735	3300.836	15089.00	0.3196830	1.6195688E-02	50.04417
NP-237	168.0294	28-FEB-2010	4435.801	4902.784	13239.00	0.3282672	1.6659509E-02	56.07543
CM-244	160.5822	28-FEB-2010	5530.708	5886.284	11504.00	0.3164098	1.6093958E-02	50.89248

Instrument : CHAMBER 027
 Detector : 42484
 Standard ID : AESS-027
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:36:31
 Average Efficiency : 0.3385510
 Average Efficiency Error : 9.9218553E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.4238	28-FEB-2010	2989.280	3298.316	15261.00	0.3334595	1.6891224E-02	44.29322
NP-237	161.6154	28-FEB-2010	4433.196	4906.637	13292.00	0.3426305	1.7387481E-02	57.33553
CM-244	148.1754	28-FEB-2010	5535.439	5885.723	11402.00	0.3398517	1.7288936E-02	52.16496

Instrument : CHAMBER 028
 Detector : 78792
 Standard ID : AESS-028
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:36:41
 Average Efficiency : 0.3044925
 Average Efficiency Error : 8.9324238E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.6542	28-FEB-2010	2989.441	3297.640	14137.00	0.2992923	1.5175839E-02	43.30858
NP-237	168.1992	28-FEB-2010	4435.847	4903.788	12490.00	0.3093279	1.5712239E-02	58.21876
CM-244	156.7614	28-FEB-2010	5532.676	5883.223	10835.00	0.3052154	1.5540821E-02	45.24567

Instrument : CHAMBER 029
 Detector : 33454
 Standard ID : AESS-029
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:36:49
 Average Efficiency : 0.3151154
 Average Efficiency Error : 9.2400359E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.5742	28-FEB-2010	2987.567	3301.667	14598.00	0.3061087	1.5514722E-02	59.98596
NP-237	169.7700	28-FEB-2010	4432.493	4902.470	13008.00	0.3191791	1.6202597E-02	64.76778
CM-244	154.8234	28-FEB-2010	5535.032	5883.746	11258.00	0.3209674	1.6332163E-02	52.83419

Instrument : CHAMBER 030
 Detector : 33447
 Standard ID : AESS-030
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:08
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:36:58
 Average Efficiency : 0.3203139
 Average Efficiency Error : 9.3901874E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.9792	28-FEB-2010	2991.332	3299.665	14751.00	0.3133562	1.5879847E-02	54.85928
NP-237	166.3758	28-FEB-2010	4436.037	4902.215	13026.00	0.3261414	1.6555686E-02	71.82014
CM-244	157.1856	28-FEB-2010	5533.195	5886.933	11469.00	0.3220125	1.6380262E-02	58.73045

Instrument : CHAMBER 031
 Detector : 67042
 Standard ID : AESS-031
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:37:09
 Average Efficiency : 0.3353133
 Average Efficiency Error : 9.2432722E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.6650	28-FEB-2010	2988.980	3300.809	15051.00	0.3284457	1.4117910E-02	62.13078
NP-237	162.9186	28-FEB-2010	4433.475	4904.204	13378.00	0.3420834	1.7358093E-02	78.83074
CM-244	153.1968	28-FEB-2010	5535.021	5883.627	11764.00	0.3388719	1.7230390E-02	60.52183

Instrument : CHAMBER 032
 Detector : 67041
 Standard ID : AESS-032
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:37:21
 Average Efficiency : 0.2159665
 Average Efficiency Error : 6.2416224E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.2364	28-FEB-2010	2991.500	3301.085	12930.00	0.2799107	1.2067080E-02	108.5704
NP-237	165.9822	28-FEB-2010	4436.228	4903.321	11857.00	0.2975635	1.5127208E-02	150.4912
CM-244	153.7938	28-FEB-2010	5533.353	5886.388	5601.000	0.1608285	8.3242906E-03	0.0000000E+00

Instrument : CHAMBER 033
 Detector : 78785
 Standard ID : AESS-033
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:37:30
 Average Efficiency : 0.3134830
 Average Efficiency Error : 8.6526405E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.4158	28-FEB-2010	2991.232	3299.661	14169.00	0.3112248	1.3392622E-02	46.76679
NP-237	161.7816	28-FEB-2010	4437.092	4904.010	12161.00	0.3131624	1.5913626E-02	60.14054
CM-244	147.2670	28-FEB-2010	5530.913	5885.453	10575.00	0.3170980	1.6152723E-02	52.75375

Instrument : CHAMBER 034
 Detector : 61586
 Standard ID : AESS-034
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:37:40
 Average Efficiency : 5.4748973E-05
 Average Efficiency Error : 8.9538866E-05
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2987.956	3301.026	9319.000	0.1963924	8.5345702E-03	80.18852
NP-237	167.2962	28-FEB-2010	4436.568	4903.521	7134.000	0.1774998	9.1209533E-03	0.0000000E+00
CM-244	154.4388	28-FEB-2010	5534.967	5885.181	8.000000	1.6030130E-05	6.59548113E-05	5.306273

Instrument : CHAMBER 035
 Detector : 78202
 Standard ID : AESS-035
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:37:51
 Average Efficiency : 0.3050995
 Average Efficiency Error : 8.4187118E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.6666	28-FEB-2010	2991.620	3300.593	14168.00	0.3014163	1.2970550E-02	45.14441
NP-237	168.2934	28-FEB-2010	4435.499	4903.774	12515.00	0.3097561	1.5733534E-02	52.82528
CM-244	158.8128	28-FEB-2010	5532.763	5883.199	11004.00	0.3058464	1.5568729E-02	51.98632

Instrument : CHAMBER 036
 Detector : 78203
 Standard ID : AESS-036
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:09
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:38:00
 Average Efficiency : 0.3236991
 Average Efficiency Error : 8.9239618E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.3204	28-FEB-2010	2991.620	3298.917	15082.00	0.3166323	1.3609574E-02	51.84582
NP-237	167.4312	28-FEB-2010	4433.050	4904.263	13282.00	0.3304925	1.6771674E-02	66.46858
CM-244	156.4188	28-FEB-2010	5535.616	5884.466	11603.00	0.3275855	1.6659884E-02	53.86180

Instrument : CHAMBER 037
 Detector : 45-149BB5
 Standard ID : AESS-037
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:38:11
 Average Efficiency : 0.3527313
 Average Efficiency Error : 9.7141266E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7372	28-FEB-2010	2988.836	3299.917	16029.00	0.3425954	1.4709930E-02	69.97938
NP-237	167.1294	28-FEB-2010	4435.582	4906.557	14502.00	0.3614331	1.8319361E-02	87.55756
CM-244	154.7664	28-FEB-2010	5534.307	5882.810	12611.00	0.3597120	1.8269511E-02	71.60854

Instrument : CHAMBER 038
 Detector : 72532
 Standard ID : AESS-038
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:38:20
 Average Efficiency : 0.3374661
 Average Efficiency Error : 9.2953844E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1408	28-FEB-2010	2991.576	3299.256	15782.00	0.3332799	1.4313720E-02	52.53116
NP-237	170.0886	28-FEB-2010	4433.771	4904.686	13898.00	0.3404015	1.7263360E-02	67.00319
CM-244	157.7460	28-FEB-2010	5535.244	5883.467	12174.00	0.3406372	1.7310385E-02	53.71938

Instrument : CHAMBER 039
 Detector : 45-149BB2
 Standard ID : AESS-039
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:38:28
 Average Efficiency : 0.3630306
 Average Efficiency Error : 9.9983541E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.2418	28-FEB-2010	2991.453	3301.599	16042.00	0.3526957	1.5143363E-02	60.09052
NP-237	159.1506	28-FEB-2010	4432.722	4905.688	14315.00	0.3747012	1.8995127E-02	78.06614
CM-244	151.7142	28-FEB-2010	5532.346	5883.894	12631.00	0.3674615	1.8662771E-02	63.39179

Instrument : CHAMBER 040
 Detector : 78773
 Standard ID : AESS-040
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:38:36
 Average Efficiency : 0.3207370
 Average Efficiency Error : 8.8450955E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4828	28-FEB-2010	2991.070	3301.002	14629.00	0.3178972	1.3671570E-02	46.05933
NP-237	166.8174	28-FEB-2010	4437.116	4905.104	12857.00	0.3211111	1.6303439E-02	59.80341
CM-244	155.0100	28-FEB-2010	5532.249	5884.180	11394.00	0.3244938	1.6507916E-02	47.50864

Instrument : CHAMBER 041
 Detector : 78205
 Standard ID : AESS-041
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:38:44
 Average Efficiency : 0.3298833
 Average Efficiency Error : 9.0887686E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.9034	28-FEB-2010	2991.305	3298.942	15596.00	0.3232844	1.3887258E-02	46.32725
NP-237	171.2268	28-FEB-2010	4436.425	4904.659	13704.00	0.3334179	1.6912539E-02	62.94285
CM-244	159.5796	28-FEB-2010	5534.452	5885.748	12158.00	0.3362667	1.7088668E-02	51.06727

Instrument : CHAMBER 042
 Detector : 78793
 Standard ID : AESS-042
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 5-SEP-2009 13:38:52
 Average Efficiency : 0.3262490
 Average Efficiency Error : 8.9996839E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	188.7090	28-FEB-2010	2988.887	3299.366	14425.00	0.3230868	1.3898331E-02	45.61874
NP-237	159.6558	28-FEB-2010	4437.123	4905.630	12564.00	0.3278245	1.6650224E-02	58.62441
CM-244	150.5208	28-FEB-2010	5533.333	5885.512	11230.00	0.3292493	1.6754221E-02	49.02582

Instrument : CHAMBER 043
 Detector : 76543
 Standard ID : AESS-043
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:38:59
 Average Efficiency : 0.3388386
 Average Efficiency Error : 9.3338015E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7708	28-FEB-2010	2990.321	3301.623	15716.00	0.3358650	1.4425773E-02	53.08127
NP-237	168.7422	28-FEB-2010	4433.027	4903.519	13744.00	0.3393443	1.7212395E-02	71.29913
CM-244	156.3252	28-FEB-2010	5534.268	5882.956	12132.00	0.3426539	1.7413609E-02	49.48456

Instrument : CHAMBER 044
 Detector : 79459
 Standard ID : AESS-044
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:39:07
 Average Efficiency : 0.3461110
 Average Efficiency Error : 9.5328372E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4510	28-FEB-2010	2989.930	3302.506	16084.00	0.3495771	1.5008831E-02	49.84488
NP-237	166.6248	28-FEB-2010	4437.594	4903.934	13869.00	0.3467283	1.7584775E-02	67.30765
CM-244	155.8290	28-FEB-2010	5530.392	5884.844	12036.00	0.3408923	1.7326539E-02	50.42044

Instrument : CHAMBER 045
 Detector : 78783
 Standard ID : AESS-045
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:39:15
 Average Efficiency : 0.3386171
 Average Efficiency Error : 9.3369978E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	186.9936	28-FEB-2010	2989.243	3301.709	15126.00	0.3418811	1.4694056E-02	41.09813
NP-237	160.8066	28-FEB-2010	4436.057	4901.945	12808.00	0.3318377	1.6849035E-02	59.62828
CM-244	145.8384	28-FEB-2010	5533.013	5887.031	11276.00	0.3412594	1.7364025E-02	48.59882

Instrument : CHAMBER 046
 Detector : 76544
 Standard ID : AESS-046
 Standard Reference Date : 19-FEB-2008 19:35:48
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:39:23
 Average Efficiency : 0.3428833
 Average Efficiency Error : 9.4477413E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.7474	28-FEB-2010	2992.377	3301.861	15517.00	0.3367483	1.4466916E-02	50.54656
NP-237	164.6658	28-FEB-2010	4437.291	4905.414	13709.00	0.3468411	1.7593319E-02	60.02387
CM-244	151.3824	28-FEB-2010	5533.098	5885.505	11938.00	0.3480568	1.7692965E-02	49.85977

Instrument : CHAMBER 047
 Detector : 46-089B1
 Standard ID : AESS-047
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:39:31
 Average Efficiency : 0.3414553
 Average Efficiency Error : 9.4057210E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2992.396	3301.175	15755.00	0.3371730	1.4481370E-02	53.45372
NP-237	168.3948	28-FEB-2010	4434.358	4901.480	13876.00	0.3432392	1.7407728E-02	75.59270
CM-244	154.6032	28-FEB-2010	5533.889	5883.104	12119.00	0.3459478	1.7581582E-02	61.01867

Instrument : CHAMBER 048
 Detector : 42483
 Standard ID : AESS-048
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 5-SEP-2009 09:03:12
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 5-SEP-2009 13:39:40
 Average Efficiency : 0.3165880
 Average Efficiency Error : 8.7361159E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	191.8350	28-FEB-2010	2992.395	3299.708	14224.00	0.3133849	1.3484558E-02	54.26610
NP-237	161.5530	28-FEB-2010	4436.890	4906.295	12281.00	0.3166445	1.6088169E-02	68.16459
CM-244	151.1856	28-FEB-2010	5534.380	5886.375	11007.00	0.3212399	1.6352450E-02	58.44775

Instrument : CHAMBER 065
 Detector : 68551
 Standard ID : AESS-001
 Standard Reference Date : 20-FEB-2008 09:54:53
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 10-SEP-2009 15:04:30
 Average Efficiency : 0.3100883
 Average Efficiency Error : 8.5527664E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.6698	28-FEB-2010	2991.771	3302.255	14851.00	0.3008073	1.2933016E-02	62.88732
NP-237	171.0024	28-FEB-2010	4436.128	4905.667	13073.00	0.3184626	1.6165027E-02	69.15641
CM-244	158.1060	28-FEB-2010	5535.235	5883.315	11309.00	0.3161527	1.6085027E-02	63.10107

Instrument : CHAMBER 066
 Detector : 46-089C1
 Standard ID : AESS-002
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 10-SEP-2009 15:10:17
 Average Efficiency : 0.3110259
 Average Efficiency Error : 8.5637672E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1144	28-FEB-2010	2988.607	3298.188	14654.00	0.3095190	1.3310824E-02	54.84346
NP-237	200.4990	28-FEB-2010	4437.248	4903.693	15121.00	0.3141871	1.5915856E-02	66.53844
CM-244	196.5558	28-FEB-2010	5534.302	5887.473	13783.00	0.3100429	1.5725579E-02	63.56669

Instrument : CHAMBER 067
 Detector : 46-089B4
 Standard ID : AESS-003
 Standard Reference Date : 15-FEB-2008 13:12:27
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 10-SEP-2009 15:10:36
 Average Efficiency : 0.3240344
 Average Efficiency Error : 8.9155603E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.9740	28-FEB-2010	2990.364	3298.403	15350.00	0.3196994	1.3737111E-02	79.47321
NP-237	203.2080	28-FEB-2010	4432.841	4903.104	15841.00	0.3247619	1.6441898E-02	80.45038
CM-244	197.2236	28-FEB-2010	5532.249	5884.796	14701.00	0.3296957	1.6707668E-02	73.81536

Instrument : CHAMBER 068
 Detector : 78794
 Standard ID : AESS-004
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 10-SEP-2009 15:10:50
 Average Efficiency : 0.3020239
 Average Efficiency Error : 8.3167572E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.1222	28-FEB-2010	2991.800	3301.258	14672.00	0.3009101	1.2940318E-02	47.94542
NP-237	204.2586	28-FEB-2010	4436.421	4904.138	14895.00	0.3038381	1.5394546E-02	58.67663
CM-244	198.8100	28-FEB-2010	5531.799	5886.613	13563.00	0.3017887	1.5310434E-02	51.79538

Instrument : CHAMBER 069
 Detector : 78795
 Standard ID : AESS-005
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 10-SEP-2009 15:11:01
 Average Efficiency : 0.3129162
 Average Efficiency Error : 8.6101322E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.7452	28-FEB-2010	2988.054	3301.031	15378.00	0.3084619	1.3253862E-02	54.03180
NP-237	209.5938	28-FEB-2010	4436.816	4903.115	16074.00	0.3195325	1.6174214E-02	58.24020
CM-244	202.7478	28-FEB-2010	5534.580	5883.355	14342.00	0.3129326	1.5863417E-02	53.89188

Instrument : CHAMBER 070
 Detector : 46-089B2
 Standard ID : AESS-006
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:46
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 10-SEP-2009 15:11:09
 Average Efficiency : 0.3482738
 Average Efficiency Error : 9.5760990E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6952	28-FEB-2010	2992.000	3298.556	16246.00	0.3371675	1.4473605E-02	67.12303
NP-237	204.7038	28-FEB-2010	4433.983	4903.126	17357.00	0.3532659	1.7865704E-02	81.09286
CM-244	195.0060	28-FEB-2010	5531.262	5883.482	15901.00	0.3607397	1.8262517E-02	66.82144

Instrument : CHAMBER 071
 Detector : 64259
 Standard ID : AESS-007
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 10-SEP-2009 11:52:27
 Average Efficiency : 0.3214687
 Average Efficiency Error : 8.8457242E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.7342	28-FEB-2010	2989.344	3299.186	15325.00	0.3133740	1.3465736E-02	56.09136
NP-237	205.0260	28-FEB-2010	4434.336	4901.423	16144.00	0.3280451	1.6604269E-02	69.48186
CM-244	199.6806	28-FEB-2010	5533.037	5886.837	14767.00	0.3271829	1.6579321E-02	59.20222

Instrument : CHAMBER 072
 Detector : 45-149AA3
 Standard ID : AESS-008
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 10-SEP-2009 11:52:37
 Average Efficiency : 0.3227442
 Average Efficiency Error : 8.8778548E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.0418	28-FEB-2010	2988.347	3300.937	15575.00	0.3195517	1.3727306E-02	55.34483
NP-237	209.2716	28-FEB-2010	4434.227	4904.277	16283.00	0.3241670	1.6406268E-02	64.89168
CM-244	199.6488	28-FEB-2010	5533.368	5885.995	14710.00	0.3259238	1.6516438E-02	59.94393

Instrument : CHAMBER 073
 Detector : 78775
 Standard ID : AESS-009
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 10-SEP-2009 11:52:45
 Average Efficiency : 0.3359991
 Average Efficiency Error : 9.2396224E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.3736	28-FEB-2010	2988.457	3300.404	15946.00	0.3314302	1.4231771E-02	46.86103
NP-237	204.0192	28-FEB-2010	4436.939	4906.411	16500.00	0.3369443	1.7050246E-02	59.05204
CM-244	197.2128	28-FEB-2010	5534.874	5887.223	15241.00	0.3417855	1.7312098E-02	52.30267

Instrument : CHAMBER 074
 Detector : 78266
 Standard ID : AESS-010
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 10-SEP-2009 11:52:53
 Average Efficiency : 0.3169551
 Average Efficiency Error : 8.7234061E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.0008	28-FEB-2010	2991.696	3301.963	15290.00	0.3199897	1.3750562E-02	44.39154
NP-237	202.9926	28-FEB-2010	4433.697	4901.594	15300.00	0.3139971	1.5903838E-02	61.02532
CM-244	196.2330	28-FEB-2010	5534.405	5883.535	14008.00	0.3158379	1.6015843E-02	51.54432

Instrument : CHAMBER 075
 Detector : 68550
 Standard ID : AESS-011
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 10-SEP-2009 11:53:01
 Average Efficiency : 0.2971224
 Average Efficiency Error : 8.1791338E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	212.8284	28-FEB-2010	2990.430	3298.418	14809.00	0.2941414	1.2647107E-02	52.11724
NP-237	214.4868	28-FEB-2010	4434.533	4906.317	15462.00	0.3002940	1.5207780E-02	67.55200
CM-244	208.4184	28-FEB-2010	5532.867	5887.264	14050.00	0.2982485	1.5123297E-02	57.31767

Instrument : CHAMBER 076
 Detector : 78779
 Standard ID : AESS-012
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 10-SEP-2009 07:45:11
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 10-SEP-2009 11:54:17
 Average Efficiency : 0.3059885
 Average Efficiency Error : 8.4235072E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.2200	28-FEB-2010	2991.065	3298.826	14877.00	0.3049859	1.3112247E-02	45.11341
NP-237	205.8930	28-FEB-2010	4434.152	4905.629	15344.00	0.3104837	1.5725281E-02	58.70590
CM-244	203.1954	28-FEB-2010	5531.791	5885.977	13918.00	0.3030716	1.5369832E-02	46.80729

Instrument : CHAMBER 077
 Detector : 67576
 Standard ID : AESS-013
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:24:36
 Average Efficiency : 0.3291396
 Average Efficiency Error : 9.0509364E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6544	28-FEB-2010	2987.808	3299.921	15927.00	0.3306105	1.4196881E-02	53.64344
NP-237	210.2526	28-FEB-2010	4436.345	4905.457	16476.00	0.3265030	1.6522143E-02	62.05485
CM-244	201.9108	28-FEB-2010	5533.165	5884.958	15053.00	0.3297988	1.6707685E-02	51.22417

Instrument : CHAMBER 078
 Detector : 67577
 Standard ID : AESS-014
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:24:46
 Average Efficiency : 0.3299014
 Average Efficiency Error : 9.0704178E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	214.7088	28-FEB-2010	2988.845	3301.764	16285.00	0.3205900	1.3761424E-02	56.74648
NP-237	211.7160	28-FEB-2010	4437.423	4903.707	17250.00	0.3394600	1.7168697E-02	79.97527
CM-244	207.3882	28-FEB-2010	5535.183	5883.980	15699.00	0.3347095	1.6947417E-02	74.62044

Instrument : CHAMBER 079
 Detector : 67598
 Standard ID : AESS-015
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:25:09
 Average Efficiency : 0.3093783
 Average Efficiency Error : 8.5256686E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0270	28-FEB-2010	2991.167	3301.886	15186.00	0.3146481	1.3522660E-02	117.2651
NP-237	200.6460	28-FEB-2010	4434.317	4902.083	15627.00	0.3244899	1.6430864E-02	180.5293
CM-244	195.9270	28-FEB-2010	5534.342	5882.989	12883.00	0.2908847	1.4768375E-02	168.4019

Instrument : CHAMBER 080
 Detector : 78197
 Standard ID : AESS-016
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:25:19
 Average Efficiency : 0.3317912
 Average Efficiency Error : 9.1261221E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0534	28-FEB-2010	2989.423	3300.841	15869.00	0.3287475	1.4117784E-02	46.69153
NP-237	199.3962	28-FEB-2010	4436.127	4905.211	16261.00	0.3397571	1.7195579E-02	62.40028
CM-244	198.6402	28-FEB-2010	5534.013	5883.733	14752.00	0.3285567	1.6649110E-02	54.90419

Instrument : CHAMBER 081
 Detector : 72533
 Standard ID : AESS-017
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:25:34
 Average Efficiency : 3.2520483E-03
 Average Efficiency Error : 2.2165517E-04
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.0798	28-FEB-2010	2985.860	3301.995	519.0000	1.0443983E-02	3.3596549E-04	0.0000000E+00
NP-237	208.5846	28-FEB-2010	4434.890	4902.925	110.0000	2.1925590E-03	3.3650678E-04	324.5057
CM-244	205.5828	28-FEB-2010	5531.182	5884.811	15476.00	0.3330374	1.6865745E-02	123.0501

Instrument : CHAMBER 082
 Detector : 64263
 Standard ID : AESS-018
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:47
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:25:44
 Average Efficiency : 0.3270527
 Average Efficiency Error : 8.9960992E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.1856	28-FEB-2010	2988.498	3298.727	15879.00	0.3319936	1.4257031E-02	68.06654
NP-237	208.8990	28-FEB-2010	4432.414	4902.039	16167.00	0.3224314	1.6319836E-02	99.17132
CM-244	198.1458	28-FEB-2010	5532.619	5883.836	14565.00	0.3251634	1.6480012E-02	89.06033

Instrument : CHAMBER 083
 Detector : 64278
 Standard ID : AESS-019
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:25:54
 Average Efficiency : 0.3391902
 Average Efficiency Error : 9.3321698E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.6468	28-FEB-2010	2992.167	3298.934	15733.00	0.3249606	1.3957175E-02	58.00032
NP-237	202.9140	28-FEB-2010	4433.867	4901.929	17290.00	0.3550012	1.7954253E-02	70.26266
CM-244	199.3140	28-FEB-2010	5533.935	5887.502	15622.00	0.3465812	1.7549563E-02	56.38813

Instrument : CHAMBER 084
 Detector : 78265
 Standard ID : AESS-020
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:26:03
 Average Efficiency : 0.3350314
 Average Efficiency Error : 9.2154304E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	205.5870	28-FEB-2010	2989.557	3301.261	15819.00	0.3252851	1.3969814E-02	48.98574
NP-237	203.4984	28-FEB-2010	4436.726	4905.499	16848.00	0.3449366	1.7450403E-02	70.44247
CM-244	197.1096	28-FEB-2010	5533.547	5882.686	15157.00	0.3402030	1.7233172E-02	54.07273

Instrument : CHAMBER 085
 Detector : 78776
 Standard ID : AESS-021
 Standard Reference Date : 19-FEB-2008 15:31:52
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:26:12
 Average Efficiency : 0.3292786
 Average Efficiency Error : 9.0559786E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.3608	28-FEB-2010	2989.601	3300.074	15821.00	0.3209520	1.3783680E-02	42.12930
NP-237	210.1548	28-FEB-2010	4436.653	4903.942	16896.00	0.3349628	1.6945269E-02	61.19312
CM-244	200.7390	28-FEB-2010	5535.486	5883.705	15264.00	0.3362489	1.7031331E-02	49.49862

Instrument : CHAMBER 086
 Detector : 78198
 Standard ID : AESS-022
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:26:20
 Average Efficiency : 0.3029490
 Average Efficiency Error : 8.3418479E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	209.6724	28-FEB-2010	2989.774	3299.664	14654.00	0.2954483	1.2705724E-02	44.56695
NP-237	206.8830	28-FEB-2010	4432.667	4903.104	15406.00	0.3102368	1.5711984E-02	60.31703
CM-244	203.0208	28-FEB-2010	5531.307	5882.758	14090.00	0.3070555	1.5569190E-02	52.15140

Instrument : CHAMBER 087
 Detector : 78199
 Standard ID : AESS-023
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:26:29
 Average Efficiency : 0.3163625
 Average Efficiency Error : 8.7070642E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	207.4764	28-FEB-2010	2992.236	3300.170	15108.00	0.3078162	1.3230279E-02	45.44902
NP-237	207.4998	28-FEB-2010	4436.843	4904.805	16167.00	0.3246053	1.6429869E-02	59.32936
CM-244	199.8804	28-FEB-2010	5535.169	5884.995	14512.00	0.3212101	1.6280370E-02	49.57772

Instrument : CHAMBER 088
 Detector : 33452
 Standard ID : AESS-024
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:48
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:26:37
 Average Efficiency : 0.2999967
 Average Efficiency Error : 8.2643600E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.5218	28-FEB-2010	2990.949	3298.130	14110.00	0.2930872	1.2613131E-02	56.18594
NP-237	205.6662	28-FEB-2010	4435.755	4901.405	15108.00	0.3060495	1.5503770E-02	71.69653
CM-244	198.3060	28-FEB-2010	5533.353	5886.188	13644.00	0.3043465	1.5438884E-02	59.83284

Instrument : CHAMBER 089
 Detector : 78262
 Standard ID : AESS-025
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:26:46
 Average Efficiency : 0.2972493
 Average Efficiency Error : 8.2093449E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.5670	28-FEB-2010	2990.289	3300.634	14083.00	0.3044111	1.3100956E-02	47.72214
NP-237	167.9916	28-FEB-2010	4434.456	4904.010	12075.00	0.2994348	1.5217808E-02	61.09237
CM-244	157.2432	28-FEB-2010	5534.385	5885.433	10178.00	0.2863488	1.4596111E-02	52.33496

Instrument : CHAMBER 090
 Detector : 78263
 Standard ID : AESS-026
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:26:55
 Average Efficiency : 0.3275550
 Average Efficiency Error : 9.5983204E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.5072	28-FEB-2010	2988.266	3299.227	15467.00	0.3277251	1.6597889E-02	53.31313
NP-237	168.0294	28-FEB-2010	4433.868	4903.300	13545.00	0.3358254	1.7037485E-02	69.24764
CM-244	160.5822	28-FEB-2010	5532.356	5885.351	11610.00	0.3198535	1.6265867E-02	52.99377

Instrument : CHAMBER 091
 Detector : 78259
 Standard ID : AESS-027
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:27:04
 Average Efficiency : 0.3392405
 Average Efficiency Error : 9.9426452E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.4238	28-FEB-2010	2989.076	3298.663	15172.00	0.3315902	1.6797749E-02	49.95338
NP-237	161.6154	28-FEB-2010	4435.039	4903.577	13164.00	0.3393553	1.7223677E-02	65.17027
CM-244	148.1754	28-FEB-2010	5532.620	5882.943	11642.00	0.3475904	1.7675593E-02	49.76140

Instrument : CHAMBER 092
 Detector : 79457
 Standard ID : AESS-028
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:27:12
 Average Efficiency : 0.3136944
 Average Efficiency Error : 9.1980351E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.6542	28-FEB-2010	2989.440	3301.094	14617.00	0.3089983	1.5661661E-02	48.63953
NP-237	168.1992	28-FEB-2010	4437.352	4901.805	12860.00	0.3185114	1.6171454E-02	63.42407
CM-244	156.7614	28-FEB-2010	5530.798	5883.590	11124.00	0.3138794	1.5973775E-02	49.57573

Instrument : CHAMBER 093
 Detector : 33206
 Standard ID : AESS-029
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:27:22
 Average Efficiency : 0.3231539
 Average Efficiency Error : 9.4716763E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.5742	28-FEB-2010	2991.703	3297.696	15042.00	0.3154363	1.5981223E-02	52.74934
NP-237	169.7700	28-FEB-2010	4437.176	4906.330	13219.00	0.3243812	1.6462712E-02	61.46286
CM-244	154.8234	28-FEB-2010	5534.842	5887.449	11563.00	0.3304077	1.6803728E-02	55.29604

Instrument : CHAMBER 094
 Detector : 78267
 Standard ID : AESS-030
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:49
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:27:30
 Average Efficiency : 0.3055932
 Average Efficiency Error : 8.9650415E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.9792	28-FEB-2010	2992.223	3299.522	14071.00	0.2989359	1.5158761E-02	44.30522
NP-237	166.3758	28-FEB-2010	4437.384	4902.143	12435.00	0.3113646	1.5816737E-02	61.41903
CM-244	157.1856	28-FEB-2010	5531.241	5883.942	10909.00	0.3070350	1.5630694E-02	52.35673

Instrument : CHAMBER 095
 Detector : 64279
 Standard ID : AESS-031
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:27:38
 Average Efficiency : 0.3137313
 Average Efficiency Error : 8.6583951E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.6650	28-FEB-2010	2991.368	3299.100	14061.00	0.3068862	1.3207882E-02	52.62669
NP-237	162.9186	28-FEB-2010	4432.777	4902.890	12558.00	0.3211056	1.6309092E-02	65.45838
CM-244	153.1968	28-FEB-2010	5531.978	5884.563	10977.00	0.3167241	1.6122520E-02	52.41710

Instrument : CHAMBER 096
 Detector : 67605
 Standard ID : AESS-032
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:27:47
 Average Efficiency : 0.3106423
 Average Efficiency Error : 8.5713780E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.2364	28-FEB-2010	2991.016	3298.247	14392.00	0.3115879	1.3404301E-02	50.48295
NP-237	165.9822	28-FEB-2010	4433.400	4905.592	12339.00	0.3096451	1.5731385E-02	66.39977
CM-244	153.7938	28-FEB-2010	5533.378	5883.405	10793.00	0.3103344	1.5801737E-02	51.91969

Instrument : CHAMBER 097
 Detector : 67599
 Standard ID : AESS-033
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:27:55
 Average Efficiency : 0.3432320
 Average Efficiency Error : 9.4599053E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.4158	28-FEB-2010	2987.986	3300.981	15354.00	0.3372997	1.4493308E-02	58.69976
NP-237	161.7816	28-FEB-2010	4432.608	4904.990	13427.00	0.3457866	1.7545013E-02	70.32799
CM-244	147.2670	28-FEB-2010	5532.644	5882.410	11640.00	0.3495324	1.7774450E-02	61.10017

Instrument : CHAMBER 098
 Detector : 68644
 Standard ID : AESS-034
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:28:04
 Average Efficiency : 0.3363666
 Average Efficiency Error : 9.2672715E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2989.306	3298.708	15807.00	0.3331439	1.4307539E-02	48.93986
NP-237	167.2962	28-FEB-2010	4434.769	4903.339	13402.00	0.3337240	1.6933486E-02	63.20418
CM-244	154.4388	28-FEB-2010	5532.564	5883.056	12013.00	0.3439962	1.7483871E-02	53.44681

Instrument : CHAMBER 099
 Detector : 70317
 Standard ID : AESS-035
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:28:14
 Average Efficiency : 0.3415650
 Average Efficiency Error : 9.4073527E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.6666	28-FEB-2010	2989.666	3300.290	15818.00	0.3365546	1.4453813E-02	52.12797
NP-237	168.2934	28-FEB-2010	4434.357	4903.837	14011.00	0.3468184	1.7586825E-02	67.03065
CM-244	158.8128	28-FEB-2010	5533.206	5886.495	12343.00	0.3436985	1.7461235E-02	57.20668

Instrument : CHAMBER 100
 Detector : 79456
 Standard ID : AESS-046
 Standard Reference Date : 19-FEB-2008 19:35:48
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:50
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:28:23
 Average Efficiency : 0.3417855
 Average Efficiency Error : 9.4188042E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.7474	28-FEB-2010	2987.537	3298.592	15379.00	0.3337772	1.4341556E-02	48.29451
NP-237	164.6658	28-FEB-2010	4433.227	4902.504	13725.00	0.3471916	1.7610893E-02	69.52662
CM-244	151.3824	28-FEB-2010	5531.221	5883.961	11934.00	0.3485355	1.7716564E-02	58.65465

Instrument : CHAMBER 101
 Detector : 64253
 Standard ID : AESS-037
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:51
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:28:33
 Average Efficiency : 0.3331621
 Average Efficiency Error : 9.1828480E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7372	28-FEB-2010	2988.324	3300.256	15185.00	0.3245981	1.3950290E-02	62.51688
NP-237	167.1294	28-FEB-2010	4433.583	4904.714	13661.00	0.3405141	1.7273273E-02	74.91586
CM-244	154.7664	28-FEB-2010	5530.834	5885.200	11860.00	0.3389104	1.7228924E-02	62.58625

Instrument : CHAMBER 102
 Detector : 72525
 Standard ID : AESS-038
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:51
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:28:41
 Average Efficiency : 0.3306259
 Average Efficiency Error : 9.1093592E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1408	28-FEB-2010	2988.972	3297.750	15673.00	0.3310117	1.4218019E-02	58.00007
NP-237	170.0886	28-FEB-2010	4434.781	4906.296	13528.00	0.3313670	1.6811563E-02	65.49485
CM-244	157.7460	28-FEB-2010	5531.260	5887.302	11748.00	0.3293554	1.6745811E-02	54.09600

Instrument : CHAMBER 103
 Detector : 79461
 Standard ID : AESS-039
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:51
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:28:50
 Average Efficiency : 0.3374034
 Average Efficiency Error : 9.3009584E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.2418	28-FEB-2010	2989.531	3301.057	15204.00	0.3343053	1.4367142E-02	48.16033
NP-237	159.1506	28-FEB-2010	4432.571	4902.800	13150.00	0.3442635	1.7473033E-02	61.80596
CM-244	151.7142	28-FEB-2010	5532.928	5886.525	11500.00	0.3352344	1.7050749E-02	51.58518

Instrument : CHAMBER 104
 Detector : 72524
 Standard ID : AESS-040
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:51
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:28:59
 Average Efficiency : 0.3164843
 Average Efficiency Error : 8.7294979E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4828	28-FEB-2010	2987.726	3302.339	14550.00	0.3162437	1.3601788E-02	50.21744
NP-237	166.8174	28-FEB-2010	4433.026	4906.432	12735.00	0.3180338	1.6149586E-02	61.05716
CM-244	155.0100	28-FEB-2010	5534.210	5886.645	11051.00	0.3152894	1.6047265E-02	49.53526

Instrument : CHAMBER 105
 Detector : 78777
 Standard ID : AESS-041
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 10-SEP-2009 08:05:49
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 10-SEP-2009 13:05:54
 Average Efficiency : 0.3204335
 Average Efficiency Error : 8.8321911E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.9034	28-FEB-2010	2988.378	3298.176	15185.00	0.3147994	1.3529159E-02	44.06408
NP-237	171.2268	28-FEB-2010	4433.342	4905.964	13331.00	0.3243763	1.6460380E-02	67.44377
CM-244	159.5796	28-FEB-2010	5532.223	5883.573	11721.00	0.3248615	1.6517937E-02	52.09479

Instrument : CHAMBER 106
 Detector : 64274
 Standard ID : AESS-042
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:51
 Calibration Count Time : 239.9998
 Efficiency Calibration Date/Time : 9-SEP-2009 14:29:53
 Average Efficiency : 0.3297303
 Average Efficiency Error : 9.0942848E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	188.7090	28-FEB-2010	2991.139	3297.527	14535.00	0.3255782	1.4003548E-02	57.74923
NP-237	159.6558	28-FEB-2010	4435.882	4902.515	12678.00	0.3307996	1.6798999E-02	64.42507
CM-244	150.5208	28-FEB-2010	5535.620	5885.870	11395.00	0.3347719	1.7029930E-02	57.47010

Instrument : CHAMBER 107
 Detector : 67578
 Standard ID : AESS-043
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:30:02
 Average Efficiency : 0.3095734
 Average Efficiency Error : 8.5404720E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7708	28-FEB-2010	2988.674	3297.932	14378.00	0.3072861	1.3219491E-02	51.71804
NP-237	168.7422	28-FEB-2010	4433.280	4901.472	12674.00	0.3129115	1.5890619E-02	56.28183
CM-244	156.3252	28-FEB-2010	5535.487	5885.665	10942.00	0.3095406	1.5757412E-02	53.71681

Instrument : CHAMBER 108
 Detector : 78778
 Standard ID : AESS-044
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:30:11
 Average Efficiency : 0.3469062
 Average Efficiency Error : 9.5538897E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4510	28-FEB-2010	2992.265	3302.021	15929.00	0.3462588	1.4868798E-02	47.67246
NP-237	166.6248	28-FEB-2010	4432.866	4906.223	13845.00	0.3461942	1.7558007E-02	66.16933
CM-244	155.8290	28-FEB-2010	5533.837	5886.132	12282.00	0.3485486	1.7708981E-02	53.14913

Instrument : CHAMBER 109
 Detector : 79463
 Standard ID : AESS-045
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:30:20
 Average Efficiency : 0.3601399
 Average Efficiency Error : 9.9204248E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	186.9936	28-FEB-2010	2990.183	3300.537	15991.00	0.3614694	1.5520932E-02	45.39969
NP-237	160.8066	28-FEB-2010	4435.497	4906.168	13637.00	0.3533118	1.7922862E-02	63.49113
CM-244	145.8384	28-FEB-2010	5532.493	5887.375	12056.00	0.3655725	1.8579422E-02	47.36362

Instrument : CHAMBER 110
 Detector : 67602
 Standard ID : AESS-046
 Standard Reference Date : 8-JAN-2007 09:29:00
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:30:29
 Average Efficiency : 0.3276164
 Average Efficiency Error : 9.0335608E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.6531	28-FEB-2010	2991.369	3301.395	14962.00	0.3232884	1.3900084E-02	49.50702
NP-237	164.3834	28-FEB-2010	4433.897	4901.753	13166.00	0.3336918	1.6936194E-02	65.58610
CM-244	159.4253	28-FEB-2010	5534.153	5887.267	11333.00	0.3279556	1.6684897E-02	50.52806

Instrument : CHAMBER 111
 Detector : 79462
 Standard ID : AESS-047
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:30:39
 Average Efficiency : 0.3412021
 Average Efficiency Error : 9.3983272E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2989.920	3299.168	15887.00	0.3400430	1.4602548E-02	48.42237
NP-237	168.3948	28-FEB-2010	4435.442	4904.437	13721.00	0.3394575	1.7218571E-02	66.98242
CM-244	154.6032	28-FEB-2010	5534.527	5885.642	12050.00	0.3446757	1.7517529E-02	50.93661

Instrument : CHAMBER 112
 Detector : 78261
 Standard ID : AESS-048
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 9-SEP-2009 09:27:52
 Calibration Count Time : 240.0000
 Efficiency Calibration Date/Time : 9-SEP-2009 14:30:47
 Average Efficiency : 0.3196034
 Average Efficiency Error : 8.8177547E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	191.8350	28-FEB-2010	2989.379	3300.588	14393.00	0.3171406	1.3643136E-02	45.61455
NP-237	161.5530	28-FEB-2010	4436.103	4905.883	12568.00	0.3241147	1.6461657E-02	58.16378
CM-244	151.1856	28-FEB-2010	5535.395	5883.265	10896.00	0.3187040	1.6225114E-02	46.20684

Instrument : CHAMBER 113
 Detector : 45-111B4
 Standard ID : AESS-001
 Standard Reference Date : 20-FEB-2008 09:54:53
 Calibration Analysis Date/Time : 17-AUG-2009 09:40:49
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:57:05
 Average Efficiency : 0.2505672
 Average Efficiency Error : 6.9084223E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.6698	28-FEB-2010	2990.867	3300.361	15169.00	0.2456670	1.0558164E-02	69.86203
NP-237	171.0024	28-FEB-2010	4434.565	4901.409	13130.00	0.2559362	1.2990281E-02	75.93420
CM-244	158.1060	28-FEB-2010	5532.822	5886.571	11319.00	0.2525721	1.2849954E-02	69.15296

Instrument : CHAMBER 114
 Detector : 78258
 Standard ID : AESS-007
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 17-AUG-2009 09:40:56
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:57:42
 Average Efficiency : 0.2566939
 Average Efficiency Error : 7.0618941E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.7342	28-FEB-2010	2992.066	3300.343	15529.00	0.2538896	1.0907058E-02	46.46336
NP-237	205.0260	28-FEB-2010	4433.866	4902.961	15975.00	0.2597136	1.3147265E-02	59.75802
CM-244	199.6806	28-FEB-2010	5535.155	5886.142	14576.00	0.2577351	1.3062422E-02	48.49145

Instrument : CHAMBER 115
 Detector : 45-132FF4
 Standard ID : AESS-002
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:02
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:57:55
 Average Efficiency : 0.2653268
 Average Efficiency Error : 7.2980789E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1144	28-FEB-2010	2989.683	3299.666	15797.00	0.2667769	1.1457291E-02	62.01321
NP-237	200.4990	28-FEB-2010	4433.623	4904.729	15897.00	0.2642607	1.3378277E-02	65.74837
CM-244	196.5558	28-FEB-2010	5534.066	5886.268	14729.00	0.2644131	1.3399067E-02	62.30648

Instrument : CHAMBER 116
 Detector : 45-132FF2
 Standard ID : AESS-008
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:08
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:06
 Average Efficiency : 0.2617015
 Average Efficiency Error : 7.1968301E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.0418	28-FEB-2010	2991.930	3301.615	15931.00	0.2613424	1.1222276E-02	57.22266
NP-237	209.2716	28-FEB-2010	4433.958	4904.160	16458.00	0.2621330	1.3264989E-02	65.63932
CM-244	199.6488	28-FEB-2010	5532.087	5883.400	14804.00	0.2617715	1.3264321E-02	58.02108

Instrument : CHAMBER 117
 Detector : 33450
 Standard ID : AESS-003
 Standard Reference Date : 15-FEB-2008 13:12:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:13
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:17
 Average Efficiency : 0.2525579
 Average Efficiency Error : 6.9512939E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.9740	28-FEB-2010	2989.306	3298.199	15015.00	0.2500224	1.0747343E-02	65.18716
NP-237	203.2080	28-FEB-2010	4433.520	4903.152	15609.00	0.2560285	1.2964435E-02	69.72454
CM-244	197.2236	28-FEB-2010	5530.582	5887.083	14123.00	0.2527719	1.2816428E-02	63.59301

Instrument : CHAMBER 118
 Detector : 75544
 Standard ID : AESS-009
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:17
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:27
 Average Efficiency : 0.2576301
 Average Efficiency Error : 7.0881532E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.3736	28-FEB-2010	2988.856	3302.528	15454.00	0.2568017	1.1033086E-02	48.57111
NP-237	204.0192	28-FEB-2010	4432.711	4902.773	15795.00	0.2580543	1.3065088E-02	53.80557
CM-244	197.2128	28-FEB-2010	5531.177	5883.080	14443.00	0.2583711	1.3096387E-02	48.23898

Instrument : CHAMBER 119
 Detector : 74429
 Standard ID : AESS-004
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 18-AUG-2009 08:34:33
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 2-FEB-2009 15:15:38
 Average Efficiency : 0.2936279
 Average Efficiency Error : 1.2630888E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.1222	28-FEB-2010	2992.004	3299.253	1406.000	0.2936279	1.2630888E-02	0.0000000E+00
NP-237	204.2586	28-FEB-2010	4432.548	4906.013	0.0000000E+00	0.0000000E+00	0.0000000E+00	0.0000000E+00
CM-244	198.8100	28-FEB-2010	5530.584	5883.165	0.0000000E+00	0.0000000E+00	0.0000000E+00	0.0000000E+00

Instrument : CHAMBER 120
 Detector : 74430
 Standard ID : AESS-010
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 18-AUG-2009 08:35:01
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 18-AUG-2009 13:38:55
 Average Efficiency : 0.2589359
 Average Efficiency Error : 7.1242545E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.0008	28-FEB-2010	2988.209	3300.389	15391.00	0.2575360	1.1065440E-02	43.23295
NP-237	202.9926	28-FEB-2010	4436.370	4904.997	15823.00	0.2598289	1.3154631E-02	56.74783
CM-244	196.2330	28-FEB-2010	5531.794	5882.950	14449.00	0.2600255	1.3180019E-02	54.60671

Instrument : CHAMBER 121
 Detector : 75545
 Standard ID : AESS-005
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:25
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:37
 Average Efficiency : 0.2477992
 Average Efficiency Error : 6.8184505E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.7452	28-FEB-2010	2991.483	3299.036	15409.00	0.2471195	1.0617682E-02	50.47642
NP-237	209.5938	28-FEB-2010	4436.007	4904.843	15591.00	0.2479274	1.2554423E-02	56.89366
CM-244	202.7478	28-FEB-2010	5531.746	5882.876	14277.00	0.2486278	1.2604386E-02	50.04906

Instrument : CHAMBER 122
 Detector : 75546
 Standard ID : AESS-011
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:30
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:49
 Average Efficiency : 0.2511526
 Average Efficiency Error : 6.9076614E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	212.8284	28-FEB-2010	2989.140	3302.149	15817.00	0.2511983	1.0788003E-02	55.71524
NP-237	214.4868	28-FEB-2010	4434.728	4903.501	16008.00	0.2487148	1.2590243E-02	57.96050
CM-244	208.4184	28-FEB-2010	5535.323	5886.133	14974.00	0.2536270	1.2849721E-02	53.77795

Instrument : CHAMBER 123
 Detector : 45-142V3
 Standard ID : AESS-006
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:34
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:58:58
 Average Efficiency : 0.2594329
 Average Efficiency Error : 7.1380134E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6952	28-FEB-2010	2989.820	3298.601	15515.00	0.2574363	1.1059616E-02	71.81727
NP-237	204.7038	28-FEB-2010	4437.478	4905.941	15738.00	0.2562436	1.2974020E-02	72.62444
CM-244	195.0060	28-FEB-2010	5531.339	5886.453	14683.00	0.2658339	1.3471606E-02	67.85081

Instrument : CHAMBER 124
 Detector : 45-142V2
 Standard ID : AESS-012
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:39
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:59:08
 Average Efficiency : 0.2622745
 Average Efficiency Error : 7.2123613E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.2200	28-FEB-2010	2989.806	3300.376	16169.00	0.2650077	1.1376831E-02	65.10977
NP-237	205.8930	28-FEB-2010	4436.352	4902.974	16128.00	0.2610630	1.3214089E-02	71.08579
CM-244	203.1954	28-FEB-2010	5533.246	5885.946	14953.00	0.2598179	1.3163561E-02	70.97868

Instrument : CHAMBER 125
 Detector : 75547
 Standard ID : AESS-013
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:44
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:59:18
 Average Efficiency : 0.2577128
 Average Efficiency Error : 7.0888288E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6544	28-FEB-2010	2987.619	3299.275	15570.00	0.2584035	1.1100472E-02	45.32409
NP-237	210.2526	28-FEB-2010	4433.269	4906.266	16194.00	0.2567104	1.2993116E-02	55.37461
CM-244	201.9108	28-FEB-2010	5531.959	5882.482	14741.00	0.2577693	1.3062201E-02	51.62124

Instrument : CHAMBER 126
 Detector : 75548
 Standard ID : AESS-019
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:49
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:59:32
 Average Efficiency : 0.2528252
 Average Efficiency Error : 6.9586127E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.6468	28-FEB-2010	2988.372	3298.946	15025.00	0.2481292	1.0665805E-02	51.29427
NP-237	202.9140	28-FEB-2010	4437.297	4901.551	15728.00	0.2582902	1.3077814E-02	59.55880
CM-244	199.3140	28-FEB-2010	5532.806	5882.587	14367.00	0.2543760	1.2894685E-02	53.51087

Instrument : CHAMBER 127
 Detector : 78770
 Standard ID : AESS-014
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:53
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 14:59:46
 Average Efficiency : 0.2467646
 Average Efficiency Error : 6.7887292E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	214.7088	28-FEB-2010	2989.622	3297.830	15608.00	0.2456636	1.0552737E-02	45.17228
NP-237	211.7160	28-FEB-2010	4435.622	4904.092	15815.00	0.2489925	1.2606090E-02	55.68476
CM-244	207.3882	28-FEB-2010	5535.184	5885.434	14463.00	0.2461215	1.2475103E-02	51.99955

Instrument : CHAMBER 128
 Detector : 75549
 Standard ID : AESS-020
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 17-AUG-2009 09:41:59
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:00:39
 Average Efficiency : 0.2557978
 Average Efficiency Error : 7.0393290E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	205.5870	28-FEB-2010	2989.482	3299.177	15312.00	0.2510756	1.0789989E-02	50.23243
NP-237	203.4984	28-FEB-2010	4436.028	4905.664	15805.00	0.2584755	1.3086889E-02	59.26414
CM-244	197.1096	28-FEB-2010	5532.549	5883.141	14531.00	0.2601309	1.3184624E-02	52.60558

Instrument : CHAMBER 129
 Detector : 76227
 Standard ID : AESS-015
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:03
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:00:50
 Average Efficiency : 0.2636167
 Average Efficiency Error : 7.2512124E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0270	28-FEB-2010	2992.146	3298.635	15855.00	0.2626581	1.1279699E-02	51.01081
NP-237	200.6460	28-FEB-2010	4432.563	4905.761	16101.00	0.2674463	1.3537456E-02	55.64974
CM-244	195.9270	28-FEB-2010	5531.918	5882.796	14498.00	0.2612732	1.3242676E-02	51.23387

Instrument : CHAMBER 130
 Detector : 76228
 Standard ID : AESS-021
 Standard Reference Date : 19-FEB-2008 15:31:52
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:09
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:00
 Average Efficiency : 0.2500172
 Average Efficiency Error : 6.8798582E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.3608	28-FEB-2010	2989.230	3297.665	15254.00	0.2474099	1.0632024E-02	49.47410
NP-237	210.1548	28-FEB-2010	4434.582	4901.937	15716.00	0.2492386	1.2619579E-02	59.00264
CM-244	200.7390	28-FEB-2010	5530.859	5884.881	14487.00	0.2546751	1.2908396E-02	49.18253

Instrument : CHAMBER 131
 Detector : 33448
 Standard ID : AESS-016
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:13
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:10
 Average Efficiency : 0.2486686
 Average Efficiency Error : 6.8503493E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0534	28-FEB-2010	2988.455	3301.428	14427.00	0.2389750	1.0279993E-02	88.46142
NP-237	199.3962	28-FEB-2010	4434.994	4904.668	15550.00	0.2599315	1.3162703E-02	91.50983
CM-244	198.6402	28-FEB-2010	5532.826	5884.723	14238.00	0.2530668	1.2829903E-02	81.92683

Instrument : CHAMBER 132
 Detector : 67579
 Standard ID : AESS-022
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:18
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:19
 Average Efficiency : 0.2503150
 Average Efficiency Error : 6.8899435E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	209.6724	28-FEB-2010	2989.906	3301.298	15059.00	0.2427482	1.0434108E-02	48.23922
NP-237	206.8830	28-FEB-2010	4432.560	4903.500	15980.00	0.2574485	1.3032571E-02	59.84295
CM-244	203.0208	28-FEB-2010	5531.586	5882.587	14657.00	0.2549047	1.2918007E-02	51.83584

Instrument : CHAMBER 133
 Detector : 76229
 Standard ID : AESS-017
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:22
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:29
 Average Efficiency : 0.2444916
 Average Efficiency Error : 6.7288522E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.0798	28-FEB-2010	2992.199	3301.674	15088.00	0.2427499	1.0433814E-02	51.73604
NP-237	208.5846	28-FEB-2010	4436.849	4905.652	15341.00	0.2451461	1.2416095E-02	59.86903
CM-244	205.5828	28-FEB-2010	5530.602	5882.872	14343.00	0.2463241	1.2486813E-02	55.80942

Instrument : CHAMBER 134
 Detector : 76230
 Standard ID : AESS-023
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:27
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:38
 Average Efficiency : 0.2444722
 Average Efficiency Error : 6.7306994E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	207.4764	28-FEB-2010	2989.055	3302.112	14731.00	0.2399838	1.0319396E-02	45.58716
NP-237	207.4998	28-FEB-2010	4432.969	4905.408	15414.00	0.2475136	1.2535379E-02	52.40787
CM-244	199.8804	28-FEB-2010	5534.460	5883.375	14046.00	0.2480791	1.2579419E-02	47.39998

Instrument : CHAMBER 135
 Detector : 64270
 Standard ID : AESS-018
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:32
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:01:50
 Average Efficiency : 0.2546879
 Average Efficiency Error : 7.0084208E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.1856	28-FEB-2010	2987.813	3300.105	15110.00	0.2525907	1.0856513E-02	49.36219
NP-237	208.8990	28-FEB-2010	4435.123	4902.752	15878.00	0.2533506	1.2826114E-02	62.03614
CM-244	198.1458	28-FEB-2010	5532.979	5882.877	14546.00	0.2591602	1.3135060E-02	51.79539

Instrument : CHAMBER 136
 Detector : 68549
 Standard ID : AESS-024
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 17-AUG-2009 09:42:37
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:00
 Average Efficiency : 0.2475998
 Average Efficiency Error : 6.8165381E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.5218	28-FEB-2010	2991.796	3301.682	14741.00	0.2447980	1.0526305E-02	60.65231
NP-237	205.6662	28-FEB-2010	4435.713	4901.780	15573.00	0.2523313	1.2777670E-02	84.66249
CM-244	198.3060	28-FEB-2010	5531.520	5884.028	13875.00	0.2470199	1.2527825E-02	70.83999

Instrument : CHAMBER 137
 Detector : 64288
 Standard ID : AESS-025
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 15:19:29
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 18-AUG-2009 09:58:00
 Average Efficiency : 0.2555233
 Average Efficiency Error : 7.0462842E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.5670	28-FEB-2010	2990.035	3302.352	15040.00	0.2599163	1.1172320E-02	62.16771
NP-237	167.9916	28-FEB-2010	4435.990	4901.349	12745.00	0.2528539	1.2839622E-02	74.72440
CM-244	157.2432	28-FEB-2010	5532.344	5883.346	11242.00	0.2523895	1.2842122E-02	61.62554

Instrument : CHAMBER 138
 Detector : 65877
 Standard ID : AESS-031
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:05:25
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:10:23
 Average Efficiency : 0.2550827
 Average Efficiency Error : 7.0365570E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.6650	28-FEB-2010	2990.457	3300.623	14458.00	0.2522955	1.0852579E-02	60.07153
NP-237	162.9186	28-FEB-2010	4436.833	4904.301	12578.00	0.2572678	1.3066470E-02	64.63396
CM-244	153.1968	28-FEB-2010	5531.035	5885.034	11155.00	0.2569406	1.3075489E-02	58.61239

Instrument : CHAMBER 139
 Detector : 76231
 Standard ID : AESS-026
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 10:05:40
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:10:36
 Average Efficiency : 0.2493770
 Average Efficiency Error : 7.3113223E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.5072	28-FEB-2010	2988.624	3300.322	14789.00	0.2505293	1.2695529E-02	52.23651
NP-237	168.0294	28-FEB-2010	4436.965	4901.673	12535.00	0.2486135	1.2627549E-02	58.33430
CM-244	160.5822	28-FEB-2010	5531.099	5884.173	11327.00	0.2489982	1.2667944E-02	53.91700

Instrument : CHAMBER 140
 Detector : 78771
 Standard ID : AESS-032
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:05:55
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:10:53
 Average Efficiency : 0.2545226
 Average Efficiency Error : 7.0204390E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.2364	28-FEB-2010	2992.243	3300.208	14492.00	0.2508534	1.0790074E-02	46.38138
NP-237	165.9822	28-FEB-2010	4435.227	4906.111	12782.00	0.2566222	1.3030458E-02	51.74347
CM-244	153.7938	28-FEB-2010	5531.085	5884.403	11234.00	0.2578183	1.3118429E-02	44.44519

Instrument : CHAMBER 141
 Detector : 76232
 Standard ID : AESS-027
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:09
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:11:05
 Average Efficiency : 0.2584702
 Average Efficiency Error : 7.5807418E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.4238	28-FEB-2010	2989.414	3297.748	14427.00	0.2520987	1.2779256E-02	53.56795
NP-237	161.6154	28-FEB-2010	4437.262	4901.753	12660.00	0.2610831	1.3258832E-02	57.80217
CM-244	148.1754	28-FEB-2010	5534.971	5886.637	11030.00	0.2627913	1.3375781E-02	54.14219

Instrument : CHAMBER 142
 Detector : 64261
 Standard ID : AESS-033
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:21
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:11:22
 Average Efficiency : 0.2600435
 Average Efficiency Error : 7.1729934E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.4158	28-FEB-2010	2988.269	3301.948	14656.00	0.2574165	1.1070056E-02	54.03382
NP-237	161.7816	28-FEB-2010	4433.864	4905.404	12714.00	0.2618904	1.3299029E-02	57.43495
CM-244	147.2670	28-FEB-2010	5531.110	5884.773	10935.00	0.2619993	1.3337597E-02	54.46835

Instrument : CHAMBER 143
 Detector : 65882
 Standard ID : AESS-028
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:30
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:11:35
 Average Efficiency : 0.2441945
 Average Efficiency Error : 7.1629179E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.6542	28-FEB-2010	2987.868	3300.973	14504.00	0.2454895	1.2443409E-02	48.86588
NP-237	168.1992	28-FEB-2010	4435.203	4905.234	12409.00	0.2458239	1.2487897E-02	54.42411
CM-244	156.7614	28-FEB-2010	5533.941	5886.181	10719.00	0.2413527	1.2290902E-02	48.55591

Instrument : CHAMBER 144
 Detector : 75551
 Standard ID : AESS-034
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:42
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:11:48
 Average Efficiency : 0.2468767
 Average Efficiency Error : 6.8111387E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2992.050	3299.833	14487.00	0.2441242	1.0500696E-02	46.56598
NP-237	167.2962	28-FEB-2010	4433.005	4902.603	12463.00	0.2482506	1.2610275E-02	54.14901
CM-244	154.4388	28-FEB-2010	5530.735	5882.656	10920.00	0.2495103	1.2702089E-02	51.83741

Instrument : CHAMBER 145
 Detector : 72526
 Standard ID : AESS-029
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:50
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:12:06
 Average Efficiency : 0.2516074
 Average Efficiency Error : 7.3767379E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.5742	28-FEB-2010	2991.923	3299.882	14896.00	0.2497595	1.2655314E-02	52.44717
NP-237	169.7700	28-FEB-2010	4434.984	4905.949	12721.00	0.2497460	1.2682147E-02	64.14503
CM-244	154.8234	28-FEB-2010	5531.069	5884.490	11206.00	0.2555142	1.3001818E-02	51.97158

Instrument : CHAMBER 146
 Detector : 72527
 Standard ID : AESS-035
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:06:56
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:12:19
 Average Efficiency : 0.2487766
 Average Efficiency Error : 6.8616522E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.6666	28-FEB-2010	2989.460	3301.164	14683.00	0.2497765	1.0741138E-02	52.75697
NP-237	168.2934	28-FEB-2010	4435.288	4903.095	12451.00	0.2466013	1.2526580E-02	54.23803
CM-244	158.8128	28-FEB-2010	5534.042	5884.573	11233.00	0.2496148	1.2701104E-02	51.22379

Instrument : CHAMBER 147
 Detector : 75550
 Standard ID : AESS-030
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 17-AUG-2009 10:07:03
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:12:37
 Average Efficiency : 0.2470976
 Average Efficiency Error : 7.2475495E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.9792	28-FEB-2010	2990.910	3299.539	14303.00	0.2429080	1.2314880E-02	46.94440
NP-237	166.3758	28-FEB-2010	4433.251	4901.935	12590.00	0.2521924	1.2808450E-02	53.36894
CM-244	157.1856	28-FEB-2010	5533.139	5883.368	10980.00	0.2465573	1.2550585E-02	53.24918

Instrument : CHAMBER 148
 Detector : 74429
 Standard ID : AESS-036
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 17-AUG-2009 10:07:10
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:12:57
 Average Efficiency : 0.2480969
 Average Efficiency Error : 6.8435837E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.3204	28-FEB-2010	2990.725	3298.446	14645.00	0.2458259	1.0571792E-02	53.02917
NP-237	167.4312	28-FEB-2010	4436.496	4905.977	12647.00	0.2517435	1.2784752E-02	56.62496
CM-244	156.4188	28-FEB-2010	5533.919	5885.716	10983.00	0.2477803	1.2612724E-02	51.14078

Instrument : CHAMBER 149
 Detector : 33449
 Standard ID : AESS-037
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:46:49
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:09
 Average Efficiency : 0.2465136
 Average Efficiency Error : 6.8024271E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7372	28-FEB-2010	2991.734	3299.272	14178.00	0.2423231	1.0427443E-02	68.70028
NP-237	167.1294	28-FEB-2010	4437.371	4901.944	12533.00	0.2499420	1.2695006E-02	68.91545
CM-244	154.7664	28-FEB-2010	5530.548	5882.851	10933.00	0.2492944	1.2690787E-02	65.41205

Instrument : CHAMBER 150
 Detector : 75552
 Standard ID : AESS-043
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:06
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:19
 Average Efficiency : 0.2486527
 Average Efficiency Error : 6.8590841E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7708	28-FEB-2010	2992.316	3300.643	14670.00	0.2506822	1.0780259E-02	53.31720
NP-237	168.7422	28-FEB-2010	4435.415	4905.497	12565.00	0.2481675	1.2604410E-02	58.05605
CM-244	156.3252	28-FEB-2010	5534.121	5886.240	10915.00	0.2463857	1.2543092E-02	53.10606

Instrument : CHAMBER 151
 Detector : 75556
 Standard ID : AESS-038
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:22
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:29
 Average Efficiency : 0.2450182
 Average Efficiency Error : 6.7593171E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1408	28-FEB-2010	2990.659	3302.040	14473.00	0.2443945	1.0512492E-02	52.21863
NP-237	170.0886	28-FEB-2010	4434.623	4901.634	12448.00	0.2439277	1.2390838E-02	56.98894
CM-244	157.7460	28-FEB-2010	5531.364	5886.469	11043.00	0.2470334	1.2573502E-02	57.42078

Instrument : CHAMBER 152
 Detector : 76222
 Standard ID : AESS-044
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:27
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:41
 Average Efficiency : 0.2490164
 Average Efficiency Error : 6.8703890E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4510	28-FEB-2010	2991.044	3297.777	14243.00	0.2475301	1.0650607E-02	47.08284
NP-237	166.6248	28-FEB-2010	4437.300	4905.285	12419.00	0.2484124	1.2619114E-02	60.94747
CM-244	155.8290	28-FEB-2010	5531.209	5887.199	11119.00	0.2517907	1.2814093E-02	54.11842

Instrument : CHAMBER 153
 Detector : 76223
 Standard ID : AESS-039
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:33
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:02:59
 Average Efficiency : 0.2519075
 Average Efficiency Error : 6.9520962E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.2418	28-FEB-2010	2989.175	3301.127	14308.00	0.2515197	1.0821341E-02	47.18059
NP-237	159.1506	28-FEB-2010	4437.148	4906.174	12220.00	0.2558792	1.3001786E-02	54.79121
CM-244	151.7142	28-FEB-2010	5533.838	5885.640	10690.00	0.2486704	1.2664073E-02	49.37799

Instrument : CHAMBER 154
 Detector : 76224
 Standard ID : AESS-045
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:38
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:03:12
 Average Efficiency : 0.2559401
 Average Efficiency Error : 7.0637148E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	186.9936	28-FEB-2010	2991.160	3298.663	14169.00	0.2560697	1.1019127E-02	49.27927
NP-237	160.8066	28-FEB-2010	4435.792	4904.845	12224.00	0.2533519	1.2873255E-02	55.70718
CM-244	145.8384	28-FEB-2010	5532.170	5883.602	10681.00	0.2584613	1.3162896E-02	52.40295

Instrument : CHAMBER 155
 Detector : 75553
 Standard ID : AESS-040
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:43
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:03:49
 Average Efficiency : 0.2604031
 Average Efficiency Error : 7.1793078E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4828	28-FEB-2010	2990.137	3299.574	15144.00	0.2631285	1.1309024E-02	51.70325
NP-237	166.8174	28-FEB-2010	4433.383	4905.252	13025.00	0.2602106	1.3208893E-02	58.26657
CM-244	155.0100	28-FEB-2010	5530.995	5884.485	11287.00	0.2569496	1.3073267E-02	54.09868

Instrument : CHAMBER 156
 Detector : 75554
 Standard ID : AESS-046
 Standard Reference Date : 19-FEB-2008 19:35:48
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:48
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:03:58
 Average Efficiency : 0.2478251
 Average Efficiency Error : 6.8396293E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.7474	28-FEB-2010	2991.410	3301.423	14146.00	0.2454547	1.0562697E-02	50.29560
NP-237	164.6658	28-FEB-2010	4436.034	4902.390	12227.00	0.2474083	1.2571326E-02	54.83716
CM-244	151.3824	28-FEB-2010	5532.563	5885.336	10800.00	0.2517493	1.2818515E-02	50.76693

Instrument : CHAMBER 157
 Detector : 75555
 Standard ID : AESS-041
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:53
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:04:07
 Average Efficiency : 0.2459567
 Average Efficiency Error : 6.7838337E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.9034	28-FEB-2010	2989.948	3299.042	14635.00	0.2425698	1.0431849E-02	49.95551
NP-237	171.2268	28-FEB-2010	4436.337	4902.073	12880.00	0.2506870	1.2727586E-02	53.18868
CM-244	159.5796	28-FEB-2010	5531.733	5884.378	11136.00	0.2462586	1.2532219E-02	53.03581

Instrument : CHAMBER 158
 Detector : 33451
 Standard ID : AESS-047
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:47:59
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:04:18
 Average Efficiency : 0.2470825
 Average Efficiency Error : 6.8179565E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2990.074	3301.013	14195.00	0.2429217	1.0452971E-02	65.65772
NP-237	168.3948	28-FEB-2010	4435.907	4905.421	12486.00	0.2470921	1.2551059E-02	76.64585
CM-244	154.6032	28-FEB-2010	5535.323	5885.904	11102.00	0.2534059	1.2896620E-02	68.27572

Instrument : CHAMBER 159
 Detector : 76225
 Standard ID : AESS-042
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 17-AUG-2009 09:48:04
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:04:28
 Average Efficiency : 0.2536185
 Average Efficiency Error : 6.9992472E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	188.7090	28-FEB-2010	2992.022	3301.502	14176.00	0.2538644	1.0924136E-02	47.45573
NP-237	159.6558	28-FEB-2010	4435.853	4902.842	12186.00	0.2543722	1.2925758E-02	52.94994
CM-244	150.5208	28-FEB-2010	5534.528	5883.086	10773.00	0.2525320	1.2859062E-02	52.36504

Instrument : CHAMBER 160
 Detector : 76226
 Standard ID : AESS-048
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 17-AUG-2009 09:48:09
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 17-AUG-2009 15:04:40
 Average Efficiency : 0.2450936
 Average Efficiency Error : 6.7667966E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	191.8350	28-FEB-2010	2988.982	3298.890	13916.00	0.2451341	1.0552234E-02	50.78497
NP-237	161.5530	28-FEB-2010	4434.439	4901.761	11957.00	0.2465858	1.2534058E-02	58.31113
CM-244	151.1856	28-FEB-2010	5533.753	5882.414	10437.00	0.2435748	1.2410097E-02	52.51821

Instrument : CHAMBER 161
 Detector : 70321
 Standard ID : AESS-001
 Standard Reference Date : 20-FEB-2008 09:54:53
 Calibration Analysis Date/Time : 24-AUG-2009 08:39:50
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:06:47
 Average Efficiency : 0.3731306
 Average Efficiency Error : 1.0235887E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.6698	28-FEB-2010	2988.799	3299.450	22121.00	0.3583271	1.5313427E-02	65.76945
NP-237	171.0024	28-FEB-2010	4437.354	4905.712	19775.00	0.3854371	1.9465830E-02	75.53835
CM-244	158.1060	28-FEB-2010	5533.034	5884.911	17229.00	0.3847365	1.9458989E-02	65.65879

Instrument : CHAMBER 162
 Detector : 70323
 Standard ID : AESS-007
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 24-AUG-2009 08:39:56
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:06:56
 Average Efficiency : 0.3723955
 Average Efficiency Error : 1.0201765E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.7342	28-FEB-2010	2991.108	3297.679	22068.00	0.3608688	1.5422536E-02	59.05890
NP-237	205.0260	28-FEB-2010	4437.157	4905.370	23621.00	0.3840082	1.9362321E-02	75.93850
CM-244	199.6806	28-FEB-2010	5531.808	5882.856	21406.00	0.3787849	1.9115422E-02	59.17039

Instrument : CHAMBER 163
 Detector : 70324
 Standard ID : AESS-002
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 24-AUG-2009 08:40:01
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:07:06
 Average Efficiency : 0.3784964
 Average Efficiency Error : 1.0368022E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1144	28-FEB-2010	2989.316	3301.922	21875.00	0.3695002	1.5793122E-02	75.87975
NP-237	200.4990	28-FEB-2010	4434.725	4904.333	23130.00	0.3844810	1.9389626E-02	89.93044
CM-244	196.5558	28-FEB-2010	5532.622	5884.699	21494.00	0.3861476	1.9486297E-02	68.44479

Instrument : CHAMBER 164
 Detector : 70325
 Standard ID : AESS-008
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 24-AUG-2009 08:40:07
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:07:20
 Average Efficiency : 0.3795241
 Average Efficiency Error : 1.0392675E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.0418	28-FEB-2010	2989.433	3301.590	22711.00	0.3726217	1.5919240E-02	60.22451
NP-237	209.2716	28-FEB-2010	4434.137	4904.243	23751.00	0.3782692	1.9072101E-02	72.85822
CM-244	199.6488	28-FEB-2010	5533.726	5886.727	22121.00	0.3914949	1.9750981E-02	58.50513

Instrument : CHAMBER 165
 Detector : 72544
 Standard ID : AESS-003
 Standard Reference Date : 15-FEB-2008 13:12:27
 Calibration Analysis Date/Time : 24-AUG-2009 08:40:14
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:07:34
 Average Efficiency : 0.3818519
 Average Efficiency Error : 1.0458693E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.9740	28-FEB-2010	2990.235	3298.979	22293.00	0.3712923	1.5866017E-02	64.67880
NP-237	203.2080	28-FEB-2010	4434.502	4904.549	23821.00	0.3907148	1.9699110E-02	89.80749
CM-244	197.2236	28-FEB-2010	5532.823	5884.601	21728.00	0.3892223	1.9639486E-02	65.21038

Instrument : CHAMBER 166
 Detector : 74545
 Standard ID : AESS-009
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 24-AUG-2009 08:40:20
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:07:42
 Average Efficiency : 0.3930937
 Average Efficiency Error : 1.0762543E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.3736	28-FEB-2010	2991.175	3297.621	23070.00	0.3834404	1.6378330E-02	51.93287
NP-237	204.0192	28-FEB-2010	4434.428	4904.926	24581.00	0.4015882	2.0242147E-02	75.61842
CM-244	197.2128	28-FEB-2010	5535.556	5884.119	22299.00	0.3992831	2.0142501E-02	56.82180

Instrument : CHAMBER 167
 Detector : 72546
 Standard ID : AESS-004
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 24-AUG-2009 08:40:25
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:07:51
 Average Efficiency : 0.3896100
 Average Efficiency Error : 1.0666691E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.1222	28-FEB-2010	2990.148	3302.011	23242.00	0.3811870	1.6280681E-02	60.73105
NP-237	204.2586	28-FEB-2010	4433.463	4903.100	24426.00	0.3985536	2.0090239E-02	78.42995
CM-244	198.8100	28-FEB-2010	5531.940	5884.576	22136.00	0.3933990	1.9846944E-02	60.41788

Instrument : CHAMBER 168
 Detector : 72547
 Standard ID : AESS-010
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 24-AUG-2009 08:40:32
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:07:59
 Average Efficiency : 0.3891803
 Average Efficiency Error : 1.0657012E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.0008	28-FEB-2010	2989.237	3300.921	22691.00	0.3797462	1.6223785E-02	60.45912
NP-237	202.9926	28-FEB-2010	4437.534	4902.237	24096.00	0.3956006	1.9943606E-02	81.13048
CM-244	196.2330	28-FEB-2010	5531.663	5884.741	22054.00	0.3970870	2.0033659E-02	60.17071

Instrument : CHAMBER 169
 Detector : 72548
 Standard ID : AESS-005
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 24-AUG-2009 08:40:37
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:08:11
 Average Efficiency : 0.3755721
 Average Efficiency Error : 1.0284009E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.7452	28-FEB-2010	2992.165	3298.594	22868.00	0.3668304	1.5670519E-02	63.17508
NP-237	209.5938	28-FEB-2010	4434.229	4903.754	23971.00	0.3811674	1.9216783E-02	80.00423
CM-244	202.7478	28-FEB-2010	5532.658	5885.433	21988.00	0.3832155	1.9334303E-02	60.82853

Instrument : CHAMBER 170
 Detector : 72549
 Standard ID : AESS-011
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 24-AUG-2009 08:40:43
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:08:20
 Average Efficiency : 0.3679080
 Average Efficiency Error : 1.0074493E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	212.8284	28-FEB-2010	2988.025	3299.867	22620.00	0.3593037	1.5351000E-02	55.68573
NP-237	214.4868	28-FEB-2010	4432.622	4903.408	24183.00	0.3757574	1.8942678E-02	83.32780
CM-244	208.4184	28-FEB-2010	5534.316	5882.981	22007.00	0.3730944	1.8823531E-02	57.78218

Instrument : CHAMBER 171
 Detector : 78260
 Standard ID : AESS-006
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 24-AUG-2009 08:40:49
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:08:29
 Average Efficiency : 0.3855957
 Average Efficiency Error : 1.0559761E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6952	28-FEB-2010	2988.433	3300.366	22641.00	0.3757591	1.6053872E-02	54.75708
NP-237	204.7038	28-FEB-2010	4436.595	4905.826	23976.00	0.3903738	1.9680876E-02	77.89750
CM-244	195.0060	28-FEB-2010	5533.870	5885.935	21851.00	0.3959031	1.9975597E-02	57.65449

Instrument : CHAMBER 172
 Detector : 78772
 Standard ID : AESS-012
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 24-AUG-2009 08:40:55
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:08:40
 Average Efficiency : 0.3797724
 Average Efficiency Error : 1.0397769E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.2200	28-FEB-2010	2991.870	3297.903	22889.00	0.3752128	1.6028440E-02	52.39552
NP-237	205.8930	28-FEB-2010	4433.678	4903.969	23812.00	0.3854640	1.9434443E-02	82.21458
CM-244	203.1954	28-FEB-2010	5534.514	5883.121	21897.00	0.3807611	1.9211210E-02	56.07287

Instrument : CHAMBER 173
 Detector : 74431
 Standard ID : AESS-013
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:01
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:08:49
 Average Efficiency : 0.2601730
 Average Efficiency Error : 7.1557011E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6544	28-FEB-2010	2988.449	3298.086	15819.00	0.2625923	1.1277330E-02	48.84491
NP-237	210.2526	28-FEB-2010	4435.604	4905.905	16223.00	0.2571892	1.3017043E-02	57.42966
CM-244	201.9108	28-FEB-2010	5534.021	5885.467	14862.00	0.2599279	1.3170394E-02	53.55892

Instrument : CHAMBER 174
 Detector : 74432
 Standard ID : AESS-019
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:06
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:08:58
 Average Efficiency : 0.2560052
 Average Efficiency Error : 7.0460425E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.6468	28-FEB-2010	2988.639	3300.179	15066.00	0.2488402	1.0695883E-02	51.37117
NP-237	202.9140	28-FEB-2010	4435.486	4905.219	15899.00	0.2611338	1.3219978E-02	60.89258
CM-244	199.3140	28-FEB-2010	5531.026	5885.734	14784.00	0.2618657	1.3269406E-02	47.62206

Instrument : CHAMBER 175
 Detector : 74433
 Standard ID : AESS-014
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:12
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:09:06
 Average Efficiency : 0.2541471
 Average Efficiency Error : 6.9896011E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	214.7088	28-FEB-2010	2992.018	3300.926	15876.00	0.2499355	1.0733101E-02	50.54956
NP-237	211.7160	28-FEB-2010	4437.197	4902.367	16318.00	0.2568789	1.3000464E-02	57.64658
CM-244	207.3882	28-FEB-2010	5531.134	5883.215	15134.00	0.2576209	1.3050339E-02	53.56906

Instrument : CHAMBER 176
 Detector : 74434
 Standard ID : AESS-020
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:18
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:09:15
 Average Efficiency : 0.2565841
 Average Efficiency Error : 7.0622312E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	205.5870	28-FEB-2010	2987.853	3298.318	15148.00	0.2490841	1.0705328E-02	47.98410
NP-237	203.4984	28-FEB-2010	4433.083	4904.101	15833.00	0.2593126	1.3128439E-02	58.20272
CM-244	197.1096	28-FEB-2010	5532.948	5884.695	14821.00	0.2655677	1.3456577E-02	49.33431

Instrument : CHAMBER 177
 Detector : 74435
 Standard ID : AESS-015
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:25
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:09:24
 Average Efficiency : 0.2668152
 Average Efficiency Error : 7.3382389E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0270	28-FEB-2010	2989.857	3298.211	15920.00	0.2637714	1.1326759E-02	49.45098
NP-237	200.6460	28-FEB-2010	4433.475	4903.934	16338.00	0.2714185	1.3736055E-02	53.30935
CM-244	195.9270	28-FEB-2010	5533.213	5885.773	14796.00	0.2666922	1.3513907E-02	53.74039

Instrument : CHAMBER 178
 Detector : 74436
 Standard ID : AESS-021
 Standard Reference Date : 19-FEB-2008 15:31:52
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:30
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:09:35
 Average Efficiency : 0.2595187
 Average Efficiency Error : 7.1381964E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.3608	28-FEB-2010	2991.399	3300.807	15690.00	0.2545363	1.0932880E-02	44.11681
NP-237	210.1548	28-FEB-2010	4432.785	4903.123	16730.00	0.2653126	1.3423340E-02	55.16845
CM-244	200.7390	28-FEB-2010	5531.481	5883.158	14852.00	0.2611876	1.3234260E-02	50.76077

Instrument : CHAMBER 179
 Detector : 74437
 Standard ID : AESS-016
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:36
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:09:44
 Average Efficiency : 0.2718232
 Average Efficiency Error : 7.4735158E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0534	28-FEB-2010	2990.874	3299.393	16266.00	0.2694745	1.1567459E-02	45.58660
NP-237	199.3962	28-FEB-2010	4435.018	4905.518	16480.00	0.2754735	1.3939864E-02	58.76590
CM-244	198.6402	28-FEB-2010	5534.758	5887.251	15277.00	0.2715900	1.3756392E-02	54.51526

Instrument : CHAMBER 180
 Detector : 74438
 Standard ID : AESS-022
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:41
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:09:54
 Average Efficiency : 0.2528372
 Average Efficiency Error : 6.9568004E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	209.6724	28-FEB-2010	2989.946	3300.627	15376.00	0.2479020	1.0651710E-02	47.69878
NP-237	206.8830	28-FEB-2010	4434.505	4904.405	15995.00	0.2576708	1.3043700E-02	52.34612
CM-244	203.0208	28-FEB-2010	5531.104	5886.649	14679.00	0.2553639	1.2941188E-02	49.43889

Instrument : CHAMBER 181
 Detector : 74439
 Standard ID : AESS-017
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:46
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:10:03
 Average Efficiency : 0.2567677
 Average Efficiency Error : 7.0618824E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.0798	28-FEB-2010	2988.658	3302.315	15809.00	0.2543999	1.0925616E-02	48.94121
NP-237	208.5846	28-FEB-2010	4432.549	4902.677	16291.00	0.2603085	1.3174290E-02	56.85185
CM-244	205.5828	28-FEB-2010	5531.208	5883.203	14943.00	0.2566723	1.3004515E-02	53.00024

Instrument : CHAMBER 182
 Detector : 74440
 Standard ID : AESS-023
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:51
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:10:14
 Average Efficiency : 0.2534730
 Average Efficiency Error : 6.9745579E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	207.4764	28-FEB-2010	2990.553	3299.709	15297.00	0.2492435	1.0710318E-02	46.65529
NP-237	207.4998	28-FEB-2010	4435.824	4905.707	15977.00	0.2566445	1.2991886E-02	50.94455
CM-244	199.8804	28-FEB-2010	5533.404	5884.684	14515.00	0.2565299	1.3002145E-02	46.18616

Instrument : CHAMBER 183
 Detector : 74441
 Standard ID : AESS-018
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 24-AUG-2009 08:41:56
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:10:29
 Average Efficiency : 0.2637588
 Average Efficiency Error : 7.2541810E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.1856	28-FEB-2010	2989.015	3297.962	16012.00	0.2677119	1.1494849E-02	47.11412
NP-237	208.8990	28-FEB-2010	4434.099	4904.342	16303.00	0.2601227	1.3164749E-02	52.97176
CM-244	198.1458	28-FEB-2010	5532.826	5884.696	14712.00	0.2621811	1.3286361E-02	53.53780

Instrument : CHAMBER 184
 Detector : 74442
 Standard ID : AESS-024
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:02
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:10:41
 Average Efficiency : 0.2604004
 Average Efficiency Error : 7.1640476E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.5218	28-FEB-2010	2989.045	3299.169	15378.00	0.2554370	1.0975426E-02	49.39055
NP-237	205.6662	28-FEB-2010	4437.505	4902.470	16322.00	0.2645144	1.3386835E-02	57.05146
CM-244	198.3060	28-FEB-2010	5535.333	5886.318	14804.00	0.2636573	1.3359983E-02	50.92117

Instrument : CHAMBER 185
 Detector : 68615
 Standard ID : AESS-025
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:07
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:10:54
 Average Efficiency : 0.2583998
 Average Efficiency Error : 7.1241027E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.5670	28-FEB-2010	2987.897	3299.344	14977.00	0.2588871	1.1128917E-02	59.70583
NP-237	167.9916	28-FEB-2010	4432.571	4905.243	13169.00	0.2612911	1.3261506E-02	62.76381
CM-244	157.2432	28-FEB-2010	5530.503	5886.106	11355.00	0.2549717	1.2971560E-02	55.40694

Instrument : CHAMBER 186
 Detector : 68616
 Standard ID : AESS-031
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:13
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:11:06
 Average Efficiency : 0.2578412
 Average Efficiency Error : 7.1111098E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.6650	28-FEB-2010	2992.379	3299.140	14692.00	0.2564398	1.1027561E-02	55.81911
NP-237	162.9186	28-FEB-2010	4434.242	4902.774	12639.00	0.2585895	1.3132489E-02	57.78773
CM-244	153.1968	28-FEB-2010	5534.982	5886.349	11244.00	0.2590897	1.3183227E-02	55.94541

Instrument : CHAMBER 187
 Detector : 68620
 Standard ID : AESS-026
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:19
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:11:16
 Average Efficiency : 0.2520546
 Average Efficiency Error : 7.3888451E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.5072	28-FEB-2010	2991.498	3300.157	14978.00	0.2537758	1.2857930E-02	50.69514
NP-237	168.0294	28-FEB-2010	4437.493	4903.961	12739.00	0.2526664	1.2830210E-02	58.36928
CM-244	160.5822	28-FEB-2010	5535.243	5883.722	11357.00	0.2497735	1.2706947E-02	53.40160

Instrument : CHAMBER 188
 Detector : 68621
 Standard ID : AESS-032
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:24
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:11:25
 Average Efficiency : 0.2590206
 Average Efficiency Error : 7.1418569E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.2364	28-FEB-2010	2988.985	3297.497	14940.00	0.2586645	1.1119837E-02	50.77880
NP-237	165.9822	28-FEB-2010	4433.354	4904.064	12857.00	0.2581703	1.3107833E-02	59.69577
CM-244	153.7938	28-FEB-2010	5533.683	5886.437	11347.00	0.2603945	1.3247656E-02	50.83346

Instrument : CHAMBER 189
 Detector : 68622
 Standard ID : AESS-027
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:30
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:11:34
 Average Efficiency : 0.2605012
 Average Efficiency Error : 7.6393606E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.4238	28-FEB-2010	2990.052	3301.735	14579.00	0.2547995	1.2914370E-02	54.11663
NP-237	161.6154	28-FEB-2010	4436.853	4905.539	12669.00	0.2612749	1.3268417E-02	57.74998
CM-244	148.1754	28-FEB-2010	5532.776	5884.354	11162.00	0.2659585	1.3534531E-02	55.68552

Instrument : CHAMBER 190
 Detector : 68623
 Standard ID : AESS-033
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:35
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:11:43
 Average Efficiency : 0.2627709
 Average Efficiency Error : 7.2474247E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.4158	28-FEB-2010	2991.652	3298.950	14837.00	0.2606309	1.1205810E-02	49.34105
NP-237	161.7816	28-FEB-2010	4435.677	4904.720	12625.00	0.2599701	1.3203092E-02	52.76612
CM-244	147.2670	28-FEB-2010	5532.170	5883.736	11225.00	0.2689729	1.3686700E-02	52.48962

Instrument : CHAMBER 191
 Detector : 68624
 Standard ID : AESS-028
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:40
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:11:54
 Average Efficiency : 0.2621362
 Average Efficiency Error : 7.6808794E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.6542	28-FEB-2010	2991.100	3299.772	15569.00	0.2636111	1.3349629E-02	49.40056
NP-237	168.1992	28-FEB-2010	4437.436	4904.158	13280.00	0.2631744	1.3355431E-02	53.16087
CM-244	156.7614	28-FEB-2010	5530.545	5884.668	11529.00	0.2596773	1.3207550E-02	53.47022

Instrument : CHAMBER 192
 Detector : 74430
 Standard ID : AESS-034
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:45
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:12:04
 Average Efficiency : 0.2555450
 Average Efficiency Error : 7.0466422E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2988.046	3297.560	14899.00	0.2511216	1.0796109E-02	50.91946
NP-237	167.2962	28-FEB-2010	4437.061	4903.990	12977.00	0.2585397	1.3124744E-02	59.22014
CM-244	154.4388	28-FEB-2010	5535.519	5883.955	11337.00	0.2591194	1.3182904E-02	51.43979

Instrument : CHAMBER 193
 Detector : 68627
 Standard ID : AESS-029
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:50
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:12:15
 Average Efficiency : 0.2629034
 Average Efficiency Error : 7.7030240E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.5742	28-FEB-2010	2990.087	3301.572	15539.00	0.2605920	1.3197066E-02	51.03585
NP-237	169.7700	28-FEB-2010	4436.483	4905.309	13298.00	0.2610572	1.3247789E-02	60.49369
CM-244	154.8234	28-FEB-2010	5532.931	5884.819	11722.00	0.2672982	1.3591460E-02	49.40217

Instrument : CHAMBER 194
 Detector : 68635
 Standard ID : AESS-035
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 24-AUG-2009 08:42:56
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:12:24
 Average Efficiency : 0.2559154
 Average Efficiency Error : 7.0551960E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.6666	28-FEB-2010	2990.152	3297.570	15094.00	0.2568187	1.1038445E-02	52.22760
NP-237	168.2934	28-FEB-2010	4434.536	4903.587	12941.00	0.2562945	1.3011310E-02	57.01247
CM-244	158.8128	28-FEB-2010	5530.970	5882.461	11437.00	0.2543004	1.2935611E-02	52.26905

Instrument : CHAMBER 195
 Detector : 68636
 Standard ID : AESS-030
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:02
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:12:38
 Average Efficiency : 0.2667065
 Average Efficiency Error : 7.8130718E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.9792	28-FEB-2010	2992.288	3300.624	15672.00	0.2662604	1.3482675E-02	51.81870
NP-237	166.3758	28-FEB-2010	4434.057	4902.978	13400.00	0.2684508	1.3621432E-02	55.01876
CM-244	157.1856	28-FEB-2010	5534.813	5885.542	11813.00	0.2654414	1.3495106E-02	48.18431

Instrument : CHAMBER 196
 Detector : 68637
 Standard ID : AESS-036
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:07
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:12:49
 Average Efficiency : 0.2563491
 Average Efficiency Error : 7.0671304E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.3204	28-FEB-2010	2990.410	3301.963	15144.00	0.2542627	1.0927959E-02	54.37652
NP-237	167.4312	28-FEB-2010	4437.321	4906.417	12971.00	0.2582058	1.3107896E-02	61.84642
CM-244	156.4188	28-FEB-2010	5534.476	5886.645	11409.00	0.2574924	1.3098660E-02	57.13540

Instrument : CHAMBER 197
 Detector : 78894
 Standard ID : AESS-037
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:12
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:12:58
 Average Efficiency : 0.2565553
 Average Efficiency Error : 7.0746746E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7372	28-FEB-2010	2991.920	3300.320	14773.00	0.2525423	1.0858861E-02	53.38351
NP-237	167.1294	28-FEB-2010	4436.468	4902.348	13097.00	0.2612088	1.3258392E-02	59.72187
CM-244	154.7664	28-FEB-2010	5532.745	5886.065	11302.00	0.2578566	1.3119171E-02	59.33312

Instrument : CHAMBER 198
 Detector : 78895
 Standard ID : AESS-043
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:18
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:13:11
 Average Efficiency : 0.2541020
 Average Efficiency Error : 7.0067579E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7708	28-FEB-2010	2991.305	3299.642	14821.00	0.2533123	1.0891330E-02	54.52969
NP-237	168.7422	28-FEB-2010	4434.397	4904.448	12902.00	0.2548661	1.2939337E-02	62.13729
CM-244	156.3252	28-FEB-2010	5533.011	5885.087	11271.00	0.2544529	1.2946853E-02	57.18044

Instrument : CHAMBER 199
 Detector : 78896
 Standard ID : AESS-038
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:24
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:13:20
 Average Efficiency : 0.2501573
 Average Efficiency Error : 6.8986462E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1408	28-FEB-2010	2988.912	3297.497	14841.00	0.2506579	1.0776930E-02	55.76347
NP-237	170.0886	28-FEB-2010	4433.891	4904.941	12813.00	0.2510752	1.2748260E-02	59.43263
CM-244	157.7460	28-FEB-2010	5535.121	5882.869	11103.00	0.2485638	1.2650183E-02	55.23568

Instrument : CHAMBER 200
 Detector : 78900
 Standard ID : AESS-044
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:29
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:13:29
 Average Efficiency : 0.2684568
 Average Efficiency Error : 7.3974063E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4510	28-FEB-2010	2991.845	3300.480	15537.00	0.2700785	1.1602442E-02	51.63891
NP-237	166.6248	28-FEB-2010	4436.941	4902.709	13461.00	0.2692276	1.3660024E-02	60.85046
CM-244	155.8290	28-FEB-2010	5532.744	5885.759	11723.00	0.2655081	1.3500395E-02	52.11015

Instrument : CHAMBER 201
 Detector : 78902
 Standard ID : AESS-039
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:34
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:13:38
 Average Efficiency : 0.2592217
 Average Efficiency Error : 7.1504964E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.2418	28-FEB-2010	2988.531	3297.499	14697.00	0.2584198	1.1112645E-02	48.26062
NP-237	159.1506	28-FEB-2010	4434.991	4906.359	12598.00	0.2638277	1.3399226E-02	56.82220
CM-244	151.7142	28-FEB-2010	5531.510	5884.700	10999.00	0.2559689	1.3029314E-02	45.31117

Instrument : CHAMBER 202
 Detector : 78903
 Standard ID : AESS-045
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:39
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:13:47
 Average Efficiency : 0.2636107
 Average Efficiency Error : 7.2720256E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	186.9936	28-FEB-2010	2990.301	3298.322	14668.00	0.2651460	1.1402297E-02	43.51926
NP-237	160.8066	28-FEB-2010	4432.596	4902.750	12471.00	0.2585094	1.3131124E-02	55.44957
CM-244	145.8384	28-FEB-2010	5531.710	5884.137	11024.00	0.2668914	1.3584715E-02	46.64507

Instrument : CHAMBER 203
 Detector : 78905
 Standard ID : AESS-040
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:44
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:16:33
 Average Efficiency : 0.2640079
 Average Efficiency Error : 7.2768405E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4828	28-FEB-2010	2988.566	3301.771	15299.00	0.2658898	1.1425615E-02	49.79924
NP-237	166.8174	28-FEB-2010	4437.077	4902.609	13111.00	0.2619471	1.3295709E-02	56.73104
CM-244	155.0100	28-FEB-2010	5532.534	5885.590	11568.00	0.2635126	1.3401660E-02	53.98056

Instrument : CHAMBER 204
 Detector : 78907
 Standard ID : AESS-046
 Standard Reference Date : 19-FEB-2008 19:35:48
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:49
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:14:37
 Average Efficiency : 0.2523464
 Average Efficiency Error : 6.9619059E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.7474	28-FEB-2010	2990.303	3298.289	14571.00	0.2528380	1.0874456E-02	50.39679
NP-237	164.6658	28-FEB-2010	4433.152	4903.866	12403.00	0.2510013	1.2750966E-02	53.81767
CM-244	151.3824	28-FEB-2010	5533.856	5886.993	10856.00	0.2530294	1.2882944E-02	47.99111

Instrument : CHAMBER 205
 Detector : 78908
 Standard ID : AESS-041
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 24-AUG-2009 08:43:54
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:14:46
 Average Efficiency : 0.2560018
 Average Efficiency Error : 7.0556081E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.9034	28-FEB-2010	2991.267	3299.423	15358.00	0.2545983	1.0939639E-02	47.30880
NP-237	171.2268	28-FEB-2010	4434.928	4905.917	13265.00	0.2582288	1.3104673E-02	60.39516
CM-244	159.5796	28-FEB-2010	5530.946	5884.256	11561.00	0.2557920	1.3009178E-02	54.31215

Instrument : CHAMBER 206
 Detector : 78909
 Standard ID : AESS-047
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 24-AUG-2009 08:44:00
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:14:55
 Average Efficiency : 0.2539860
 Average Efficiency Error : 7.0044687E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2991.740	3299.836	14668.00	0.2510710	1.0797012E-02	49.54147
NP-237	168.3948	28-FEB-2010	4434.469	4904.811	12921.00	0.2557680	1.2984839E-02	58.90450
CM-244	154.6032	28-FEB-2010	5534.058	5886.660	11229.00	0.2564440	1.3048770E-02	52.29348

Instrument : CHAMBER 207
 Detector : 78910
 Standard ID : AESS-042
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 24-AUG-2009 08:44:06
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:15:04
 Average Efficiency : 0.2567169
 Average Efficiency Error : 7.0834220E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	188.7090	28-FEB-2010	2987.560	3301.824	14325.00	0.2565888	1.1039187E-02	52.32441
NP-237	159.6558	28-FEB-2010	4434.563	4905.877	12409.00	0.2590533	1.3159815E-02	57.42267
CM-244	150.5208	28-FEB-2010	5530.790	5883.765	10855.00	0.2546263	1.2963978E-02	55.85357

Instrument : CHAMBER 208
 Detector : 78911
 Standard ID : AESS-048
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 24-AUG-2009 08:44:11
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 24-AUG-2009 14:15:14
 Average Efficiency : 0.2558721
 Average Efficiency Error : 7.0590605E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	191.8350	28-FEB-2010	2990.613	3299.492	14536.00	0.2561232	1.1016136E-02	49.47414
NP-237	161.5530	28-FEB-2010	4436.795	4902.883	12269.00	0.2531039	1.2859914E-02	57.37383
CM-244	151.1856	28-FEB-2010	5533.327	5886.561	11065.00	0.2584097	1.3152145E-02	53.34291

Instrument : CHAMBER 209
 Detector : 79188
 Standard ID : AESS-001
 Standard Reference Date : 20-FEB-2008 09:54:53
 Calibration Analysis Date/Time : 28-AUG-2009 07:06:29
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:24:07
 Average Efficiency : 0.3688648
 Average Efficiency Error : 1.0119580E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.6698	28-FEB-2010	2991.940	3298.642	21909.00	0.3549186	1.5169610E-02	67.58371
NP-237	171.0024	28-FEB-2010	4435.592	4905.793	19508.00	0.3802500	1.9206451E-02	83.29742
CM-244	158.1060	28-FEB-2010	5530.388	5883.749	17000.00	0.3798451	1.9214446E-02	66.10979

Instrument : CHAMBER 210
 Detector : 79189
 Standard ID : AESS-002
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 28-AUG-2009 07:06:35
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:25:35
 Average Efficiency : 0.3925964
 Average Efficiency Error : 1.0751541E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1144	28-FEB-2010	2988.073	3301.089	22564.00	0.3811763	1.6285976E-02	59.50077
NP-237	200.4990	28-FEB-2010	4435.142	4905.164	24168.00	0.4017925	2.0255197E-02	72.98598
CM-244	196.5558	28-FEB-2010	5533.916	5886.208	22310.00	0.4010454	2.0231251E-02	59.60097

Instrument : CHAMBER 211
 Detector : 79190
 Standard ID : AESS-003
 Standard Reference Date : 15-FEB-2008 13:12:27
 Calibration Analysis Date/Time : 28-AUG-2009 07:06:39
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:25:47
 Average Efficiency : 0.3783190
 Average Efficiency Error : 1.0361547E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.9740	28-FEB-2010	2991.282	3299.071	22252.00	0.3706464	1.5838793E-02	59.43069
NP-237	203.2080	28-FEB-2010	4434.230	4900.253	23526.00	0.3867531	1.9501008E-02	83.71527
CM-244	197.2236	28-FEB-2010	5531.327	5885.262	21283.00	0.3814342	1.9250123E-02	60.34041

Instrument : CHAMBER 212
 Detector : 79191
 Standard ID : AESS-004
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 28-AUG-2009 07:06:45
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:26:50
 Average Efficiency : 0.3842054
 Average Efficiency Error : 1.0521159E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.1222	28-FEB-2010	2991.918	3298.870	22817.00	0.3742636	1.5988497E-02	61.37182
NP-237	204.2586	28-FEB-2010	4437.027	4902.590	24211.00	0.3950988	1.9917466E-02	76.39180
CM-244	198.8100	28-FEB-2010	5533.378	5887.318	21854.00	0.3886002	1.9607035E-02	60.73505

Instrument : CHAMBER 213
 Detector : 79192
 Standard ID : AESS-005
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 28-AUG-2009 07:06:50
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:27:02
 Average Efficiency : 0.3626718
 Average Efficiency Error : 9.9363821E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.7452	28-FEB-2010	2991.497	3299.775	21877.00	0.3509731	1.5001265E-02	65.21502
NP-237	209.5938	28-FEB-2010	4434.841	4905.254	23395.00	0.3720641	1.8761570E-02	80.31606
CM-244	202.7478	28-FEB-2010	5534.504	5887.063	21311.00	0.3715691	1.8752033E-02	64.10100

Instrument : CHAMBER 214
 Detector : 79193
 Standard ID : AESS-006
 Standard Reference Date : 14-FEB-2008 09:35:18
 Calibration Analysis Date/Time : 28-AUG-2009 07:06:55
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:27:13
 Average Efficiency : 0.3838671
 Average Efficiency Error : 1.0511074E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6952	28-FEB-2010	2991.133	3298.396	22762.00	0.3778099	1.6140467E-02	58.86099
NP-237	204.7038	28-FEB-2010	4436.844	4902.153	23748.00	0.3866856	1.9496445E-02	74.56451
CM-244	195.0060	28-FEB-2010	5532.271	5885.676	21514.00	0.3900006	1.9680507E-02	59.70840

Instrument : CHAMBER 215
 Detector : 79194
 Standard ID : AESS-007
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 28-AUG-2009 07:06:59
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:27:24
 Average Efficiency : 0.3806459
 Average Efficiency Error : 1.0423170E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.7342	28-FEB-2010	2991.638	3298.993	22783.00	0.3725980	1.5917629E-02	61.31356
NP-237	205.0260	28-FEB-2010	4433.482	4904.904	23893.00	0.3884499	1.9584404E-02	80.36595
CM-244	199.6806	28-FEB-2010	5531.246	5885.655	21745.00	0.3849533	1.9423924E-02	60.77392

Instrument : CHAMBER 216
 Detector : 79195
 Standard ID : AESS-008
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:04
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:27:35
 Average Efficiency : 0.3745080
 Average Efficiency Error : 1.0257245E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.0418	28-FEB-2010	2992.181	3299.336	22346.00	0.3666793	1.5668461E-02	61.23994
NP-237	209.2716	28-FEB-2010	4432.606	4903.311	23466.00	0.3737679	1.8847005E-02	82.70575
CM-244	199.6488	28-FEB-2010	5533.853	5887.574	21885.00	0.3874936	1.9550970E-02	61.73182

Instrument : CHAMBER 217
 Detector : 79410
 Standard ID : AESS-009
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:09
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:27:45
 Average Efficiency : 0.3777330
 Average Efficiency Error : 1.0345438E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.3736	28-FEB-2010	2989.031	3301.074	22245.00	0.3697601	1.5800970E-02	58.22815
NP-237	204.0192	28-FEB-2010	4434.240	4905.058	23534.00	0.3845063	1.9388009E-02	79.31593
CM-244	197.2128	28-FEB-2010	5530.547	5884.453	21374.00	0.3829291	1.9324809E-02	62.42009

Instrument : CHAMBER 218
 Detector : 79411
 Standard ID : AESS-010
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:14
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:27:55
 Average Efficiency : 0.3930598
 Average Efficiency Error : 1.0761084E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.0008	28-FEB-2010	2988.583	3301.235	23052.00	0.3858313	1.6480651E-02	58.44905
NP-237	202.9926	28-FEB-2010	4435.884	4901.733	24227.00	0.3977866	2.0052891E-02	78.90448
CM-244	196.2330	28-FEB-2010	5532.602	5886.438	22153.00	0.3990829	2.0133503E-02	64.39376

Instrument : CHAMBER 219
 Detector : 79412
 Standard ID : AESS-011
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:18
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:28:06
 Average Efficiency : 0.3681216
 Average Efficiency Error : 1.0080670E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	212.8284	28-FEB-2010	2992.207	3300.096	22591.00	0.3588740	1.5332905E-02	58.48974
NP-237	214.4868	28-FEB-2010	4435.206	4906.290	24021.00	0.3732913	1.8819345E-02	78.80820
CM-244	208.4184	28-FEB-2010	5531.669	5885.285	22231.00	0.3770731	1.9022530E-02	63.56152

Instrument : CHAMBER 220
 Detector : 79413
 Standard ID : AESS-012
 Standard Reference Date : 14-FEB-2008 13:39:25
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:23
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:28:15
 Average Efficiency : 0.3790617
 Average Efficiency Error : 1.0378873E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	206.2200	28-FEB-2010	2990.930	3297.738	22806.00	0.3739041	1.5973235E-02	57.23833
NP-237	205.8930	28-FEB-2010	4435.749	4901.420	23881.00	0.3866248	1.9492462E-02	76.47005
CM-244	203.1954	28-FEB-2010	5532.504	5886.683	21795.00	0.3791749	1.9131947E-02	59.12632

Instrument : CHAMBER 221
 Detector : 79414
 Standard ID : AESS-013
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:27
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:28:26
 Average Efficiency : 0.3760977
 Average Efficiency Error : 1.0297902E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.6544	28-FEB-2010	2989.954	3298.454	22543.00	0.3742467	1.5990108E-02	51.83245
NP-237	210.2526	28-FEB-2010	4435.659	4902.272	23655.00	0.3750251	1.8909130E-02	73.29375
CM-244	201.9108	28-FEB-2010	5533.925	5882.692	21697.00	0.3798594	1.9167274E-02	59.34735

Instrument : CHAMBER 222
 Detector : 79415
 Standard ID : AESS-014
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:32
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:28:40
 Average Efficiency : 0.3479734
 Average Efficiency Error : 9.5388982E-03
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	214.7088	28-FEB-2010	2990.392	3301.657	21181.00	0.3334915	1.4259904E-02	57.45364
NP-237	211.7160	28-FEB-2010	4433.525	4905.197	22862.00	0.3599479	1.8154154E-02	71.83906
CM-244	207.3882	28-FEB-2010	5534.683	5886.672	21099.00	0.3594557	1.8142378E-02	61.07040

Instrument : CHAMBER 223
 Detector : 79416
 Standard ID : AESS-015
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:38
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:28:50
 Average Efficiency : 0.3915000
 Average Efficiency Error : 1.0720647E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0270	28-FEB-2010	2990.058	3298.884	22991.00	0.3809772	1.6273832E-02	50.91898
NP-237	200.6460	28-FEB-2010	4432.434	4905.074	24293.00	0.4035698	2.0343946E-02	76.26361
CM-244	195.9270	28-FEB-2010	5532.599	5887.467	21933.00	0.3957134	1.9965306E-02	59.83861

Instrument : CHAMBER 224
 Detector : 79417
 Standard ID : AESS-016
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:44
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:29:01
 Average Efficiency : 0.3813685
 Average Efficiency Error : 1.0448295E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.0534	28-FEB-2010	2988.636	3298.216	22249.00	0.3686436	1.5753238E-02	55.61435
NP-237	199.3962	28-FEB-2010	4432.951	4905.382	23877.00	0.3991403	2.0123499E-02	76.52156
CM-244	198.6402	28-FEB-2010	5532.025	5886.099	21587.00	0.3841456	1.9384453E-02	60.82283

Instrument : CHAMBER 225
 Detector : 79418
 Standard ID : AESS-017
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:50
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:29:13
 Average Efficiency : 0.3798896
 Average Efficiency Error : 1.0400972E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	210.0798	28-FEB-2010	2991.462	3299.408	23067.00	0.3712333	1.5856978E-02	56.54003
NP-237	208.5846	28-FEB-2010	4434.737	4905.917	24322.00	0.3886784	1.9593079E-02	73.79168
CM-244	205.5828	28-FEB-2010	5531.430	5885.124	22345.00	0.3842223	1.9382324E-02	56.97727

Instrument : CHAMBER 226
 Detector : 79419
 Standard ID : AESS-018
 Standard Reference Date : 14-FEB-2008 17:45:04
 Calibration Analysis Date/Time : 28-AUG-2009 07:07:57
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:29:24
 Average Efficiency : 0.3827937
 Average Efficiency Error : 1.0482643E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	202.1856	28-FEB-2010	2991.793	3300.581	22481.00	0.3759236	1.6062303E-02	52.26083
NP-237	208.8990	28-FEB-2010	4433.080	4904.877	23880.00	0.3810358	1.9210700E-02	71.56741
CM-244	198.1458	28-FEB-2010	5530.936	5884.804	22156.00	0.3952768	1.9941466E-02	57.91118

Instrument : CHAMBER 227
 Detector : 79420
 Standard ID : AESS-019
 Standard Reference Date : 19-FEB-2008 11:05:22
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:03
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:29:35
 Average Efficiency : 0.3801799
 Average Efficiency Error : 1.0412521E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	204.6468	28-FEB-2010	2989.468	3297.622	22414.00	0.3702514	1.5820496E-02	54.09752
NP-237	202.9140	28-FEB-2010	4433.427	4904.675	23804.00	0.3910310	1.9715140E-02	71.53796
CM-244	199.3140	28-FEB-2010	5535.505	5883.794	21696.00	0.3846057	1.9406769E-02	56.80846

Instrument : CHAMBER 228
 Detector : 79421
 Standard ID : AESS-020
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:10
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:30:03
 Average Efficiency : 0.3820991
 Average Efficiency Error : 1.0465804E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	205.5870	28-FEB-2010	2992.529	3302.052	22496.00	0.3699491	1.5806897E-02	57.79967
NP-237	203.4984	28-FEB-2010	4435.206	4906.368	23880.00	0.3911529	1.9720770E-02	74.62083
CM-244	197.1096	28-FEB-2010	5530.800	5883.365	21859.00	0.3920157	1.9779330E-02	58.42591

Instrument : CHAMBER 229
 Detector : 79422
 Standard ID : AESS-021
 Standard Reference Date : 19-FEB-2008 15:31:52
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:15
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:30:14
 Average Efficiency : 0.3792264
 Average Efficiency Error : 1.0383990E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	208.3608	28-FEB-2010	2989.967	3297.813	22847.00	0.3706752	1.5834933E-02	56.62864
NP-237	210.1548	28-FEB-2010	4433.942	4905.968	24067.00	0.3817250	1.9244215E-02	74.03220
CM-244	200.7390	28-FEB-2010	5533.045	5882.442	22147.00	0.3898062	1.9665552E-02	61.11129

Instrument : CHAMBER 230
 Detector : 79423
 Standard ID : AESS-022
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:19
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:31:10
 Average Efficiency : 0.3733873
 Average Efficiency Error : 1.0229134E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	209.6724	28-FEB-2010	2992.307	3300.916	22287.00	0.3593755	1.5356863E-02	52.42038
NP-237	206.8830	28-FEB-2010	4432.950	4904.639	23944.00	0.3857800	1.9449461E-02	68.40366
CM-244	203.0208	28-FEB-2010	5530.626	5884.491	22017.00	0.3833580	1.9341249E-02	56.79975

Instrument : CHAMBER 231
 Detector : 79424
 Standard ID : AESS-023
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:24
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:31:59
 Average Efficiency : 0.3850142
 Average Efficiency Error : 1.0541392E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	207.4764	28-FEB-2010	2989.314	3302.411	23101.00	0.3764438	1.6079262E-02	62.44617
NP-237	207.4998	28-FEB-2010	4437.493	4903.010	24175.00	0.3883348	1.9576734E-02	78.49866
CM-244	199.8804	28-FEB-2010	5532.978	5886.091	22319.00	0.3947221	1.9912189E-02	60.41550

Instrument : CHAMBER 232
 Detector : 79425
 Standard ID : AESS-024
 Standard Reference Date : 14-FEB-2008 21:55:55
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:30
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:32:18
 Average Efficiency : 0.3742643
 Average Efficiency Error : 1.0255569E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.5218	28-FEB-2010	2990.963	3301.243	21662.00	0.3598436	1.5382325E-02	53.98000
NP-237	205.6662	28-FEB-2010	4436.020	4902.090	23797.00	0.3856703	1.9444924E-02	72.96513
CM-244	198.3060	28-FEB-2010	5531.563	5883.791	21651.00	0.3859375	1.9474341E-02	56.32160

Instrument : CHAMBER 233
 Detector : 79426
 Standard ID : AESS-025
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:35
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:32:35
 Average Efficiency : 0.3806617
 Average Efficiency Error : 1.0437921E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.5670	28-FEB-2010	2990.373	3302.025	21917.00	0.3788947	1.6194314E-02	59.57938
NP-237	167.9916	28-FEB-2010	4434.487	4905.324	19388.00	0.3846898	1.9431910E-02	80.68842
CM-244	157.2432	28-FEB-2010	5531.110	5885.315	16870.00	0.3792152	1.9184273E-02	59.70237

Instrument : CHAMBER 234
 Detector : 79427
 Standard ID : AESS-026
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:41
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:32:51
 Average Efficiency : 0.3701842
 Average Efficiency Error : 1.0801505E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.5072	28-FEB-2010	2988.269	3300.079	21287.00	0.3607304	1.8206345E-02	60.36027
NP-237	168.0294	28-FEB-2010	4436.893	4901.571	19195.00	0.3807805	1.9236386E-02	87.24484
CM-244	160.5822	28-FEB-2010	5530.864	5883.822	16817.00	0.3701437	1.8726060E-02	61.15481

Instrument : CHAMBER 235
 Detector : 79428
 Standard ID : AESS-027
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:45
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:33:07
 Average Efficiency : 0.3924418
 Average Efficiency Error : 1.1451972E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.4238	28-FEB-2010	2989.964	3301.553	21591.00	0.3773947	1.9044928E-02	59.06186
NP-237	161.6154	28-FEB-2010	4434.767	4906.350	19376.00	0.3996259	2.0186499E-02	69.60875
CM-244	148.1754	28-FEB-2010	5533.497	5883.248	16865.00	0.4023240	2.0353375E-02	59.46798

Instrument : CHAMBER 236
 Detector : 79429
 Standard ID : AESS-028
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:51
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:33:24
 Average Efficiency : 0.3822154
 Average Efficiency Error : 1.1149851E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	199.6542	28-FEB-2010	2989.553	3300.921	21911.00	0.3710214	1.8720830E-02	59.63935
NP-237	168.1992	28-FEB-2010	4432.813	4903.618	19461.00	0.3856082	1.9477623E-02	76.00614
CM-244	156.7614	28-FEB-2010	5534.883	5883.901	17350.00	0.3912177	1.9785114E-02	63.22596

Instrument : CHAMBER 237
 Detector : 79430
 Standard ID : AESS-029
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 28-AUG-2009 07:08:55
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:33:41
 Average Efficiency : 0.3836243
 Average Efficiency Error : 1.1190724E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.5742	28-FEB-2010	2990.412	3298.430	22171.00	0.3718633	1.8761324E-02	57.93632
NP-237	169.7700	28-FEB-2010	4434.021	4905.306	19694.00	0.3866741	1.9529065E-02	74.67754
CM-244	154.8234	28-FEB-2010	5530.956	5884.725	17244.00	0.3937016	1.9912098E-02	63.18201

Instrument : CHAMBER 238
 Detector : 79431
 Standard ID : AESS-030
 Standard Reference Date : 15-FEB-2008 09:06:52
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:00
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:33:59
 Average Efficiency : 0.3827302
 Average Efficiency Error : 1.1164652E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.9792	28-FEB-2010	2988.738	3300.787	21962.00	0.3731618	1.8828424E-02	57.84193
NP-237	166.3758	28-FEB-2010	4433.583	4904.073	19552.00	0.3916996	1.9784329E-02	69.05827
CM-244	157.1856	28-FEB-2010	5534.315	5882.484	17088.00	0.3842701	1.9437104E-02	55.46104

Instrument : CHAMBER 239
 Detector : 79432
 Standard ID : AESS-031
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:05
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:34:23
 Average Efficiency : 0.3877645
 Average Efficiency Error : 1.0634423E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	193.6650	28-FEB-2010	2991.271	3298.066	21814.00	0.3807774	1.6275739E-02	53.01001
NP-237	162.9186	28-FEB-2010	4436.718	4902.950	19446.00	0.3978185	2.0094519E-02	75.58379
CM-244	153.1968	28-FEB-2010	5535.054	5884.530	16836.00	0.3883347	1.9646063E-02	61.05005

Instrument : CHAMBER 240
 Detector : 79433
 Standard ID : AESS-032
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:09
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:34:40
 Average Efficiency : 0.3763680
 Average Efficiency Error : 1.0324174E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	195.2364	28-FEB-2010	2990.716	3297.687	21305.00	0.3688990	1.5772741E-02	54.18781
NP-237	165.9822	28-FEB-2010	4436.108	4901.861	19099.00	0.3835373	1.9376662E-02	70.26006
CM-244	153.7938	28-FEB-2010	5532.981	5887.143	16557.00	0.3804168	1.9249255E-02	59.34691

Instrument : CHAMBER 241
 Detector : 79434
 Standard ID : AESS-033
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:15
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:34:57
 Average Efficiency : 0.3975072
 Average Efficiency Error : 1.0901848E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.4158	28-FEB-2010	2991.942	3297.913	22027.00	0.3869813	1.6538920E-02	56.90702
NP-237	161.7816	28-FEB-2010	4434.531	4905.642	19524.00	0.4022706	2.0318527E-02	70.70508
CM-244	147.2670	28-FEB-2010	5532.339	5887.328	17047.00	0.4090414	2.0690644E-02	61.22742

Instrument : CHAMBER 242
 Detector : 79435
 Standard ID : AESS-034
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:21
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:35:16
 Average Efficiency : 0.3864579
 Average Efficiency Error : 1.0596083E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.5488	28-FEB-2010	2990.675	3302.424	22431.00	0.3781182	1.6156483E-02	57.80299
NP-237	167.2962	28-FEB-2010	4435.599	4901.625	19682.00	0.3921467	1.9805590E-02	79.14774
CM-244	154.4388	28-FEB-2010	5533.423	5882.719	17192.00	0.3933641	1.9895712E-02	58.04135

Instrument : CHAMBER 243
 Detector : 79436
 Standard ID : AESS-035
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:26
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:35:39
 Average Efficiency : 0.3714339
 Average Efficiency Error : 1.0188053E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	198.6666	28-FEB-2010	2990.382	3298.347	21390.00	0.3639862	1.5561880E-02	52.11441
NP-237	168.2934	28-FEB-2010	4434.037	4905.494	19170.00	0.3796824	1.9181171E-02	79.79841
CM-244	158.8128	28-FEB-2010	5531.482	5885.497	16828.00	0.3744243	1.8942432E-02	60.93315

Instrument : CHAMBER 244
 Detector : 79437
 Standard ID : AESS-036
 Standard Reference Date : 18-FEB-2008 11:28:15
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:32
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:36:07
 Average Efficiency : 0.3715149
 Average Efficiency Error : 1.0192083E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	201.3204	28-FEB-2010	2987.566	3299.789	21504.00	0.3610823	1.5436707E-02	66.23463
NP-237	167.4312	28-FEB-2010	4433.571	4904.626	19293.00	0.3840864	1.9402392E-02	76.43731
CM-244	156.4188	28-FEB-2010	5530.417	5884.486	16611.00	0.3752594	1.8987549E-02	63.78664

Instrument : CHAMBER 245
 Detector : 79438
 Standard ID : AESS-037
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:37
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:36:53
 Average Efficiency : 0.3848314
 Average Efficiency Error : 1.0552316E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7372	28-FEB-2010	2988.843	3302.525	22076.00	0.3774236	1.6129972E-02	66.05534
NP-237	167.1294	28-FEB-2010	4434.670	4906.399	19600.00	0.3909029	1.9743593E-02	75.47243
CM-244	154.7664	28-FEB-2010	5532.436	5886.326	17075.00	0.3898463	1.9719332E-02	65.09534

Instrument : CHAMBER 246
 Detector : 78912
 Standard ID : AESS-038
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:44
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:37:05
 Average Efficiency : 0.3738058
 Average Efficiency Error : 1.0253170E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	200.1408	28-FEB-2010	2991.420	3298.792	21522.00	0.3635281	1.5541083E-02	66.60865
NP-237	170.0886	28-FEB-2010	4433.098	4904.335	19515.00	0.3824243	1.9316213E-02	81.32760
CM-244	157.7460	28-FEB-2010	5530.336	5884.508	17010.00	0.3810334	1.9274388E-02	64.73948

Instrument : CHAMBER 247
 Detector : 79440
 Standard ID : AESS-039
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:50
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:37:16
 Average Efficiency : 0.3955781
 Average Efficiency Error : 1.0848942E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	192.2418	28-FEB-2010	2991.040	3298.952	21948.00	0.3859353	1.6494961E-02	55.97421
NP-237	159.1506	28-FEB-2010	4435.157	4901.869	19486.00	0.4080938	2.0613093E-02	75.98156
CM-244	151.7142	28-FEB-2010	5534.103	5883.404	17090.00	0.3980037	2.0131798E-02	63.42304

Instrument : CHAMBER 248
 Detector : 79441
 Standard ID : AESS-040
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 28-AUG-2009 07:09:55
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:37:28
 Average Efficiency : 0.3941916
 Average Efficiency Error : 1.0806664E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4828	28-FEB-2010	2989.950	3302.491	22290.00	0.3874540	1.6556673E-02	56.03559
NP-237	166.8174	28-FEB-2010	4437.546	4903.912	19884.00	0.3972850	2.0063095E-02	79.90582
CM-244	155.0100	28-FEB-2010	5530.441	5884.950	17598.00	0.4011423	2.0283826E-02	58.96740

Instrument : CHAMBER 249
 Detector : 79442
 Standard ID : AESS-041
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 28-AUG-2009 07:10:01
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:37:39
 Average Efficiency : 0.3691496
 Average Efficiency Error : 1.0125251E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	203.9034	28-FEB-2010	2991.458	3299.653	21709.00	0.3599154	1.5384958E-02	54.07297
NP-237	171.2268	28-FEB-2010	4437.087	4904.383	19560.00	0.3807467	1.9231046E-02	72.35228
CM-244	159.5796	28-FEB-2010	5532.120	5887.291	16794.00	0.3718590	1.8813105E-02	57.81293

Instrument : CHAMBER 250
 Detector : 79443
 Standard ID : AESS-042
 Standard Reference Date : 18-FEB-2008 15:31:47
 Calibration Analysis Date/Time : 28-AUG-2009 07:10:06
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:37:51
 Average Efficiency : 0.3921595
 Average Efficiency Error : 1.0755106E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	188.7090	28-FEB-2010	2988.375	3300.259	21703.00	0.3887982	1.6619630E-02	48.88448
NP-237	159.6558	28-FEB-2010	4433.621	4904.859	19099.00	0.3987351	2.0144468E-02	67.77724
CM-244	150.5208	28-FEB-2010	5531.200	5885.729	16638.00	0.3905834	1.9762557E-02	55.02527

Instrument : CHAMBER 251
 Detector : 79444
 Standard ID : AESS-043
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 28-AUG-2009 07:10:12
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:38:01
 Average Efficiency : 0.3860320
 Average Efficiency Error : 1.0584467E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.7708	28-FEB-2010	2992.181	3299.694	22112.00	0.3779713	1.6153051E-02	53.81643
NP-237	168.7422	28-FEB-2010	4435.877	4903.211	19812.00	0.3913130	1.9762235E-02	75.40137
CM-244	156.3252	28-FEB-2010	5531.476	5887.181	17382.00	0.3928898	1.9869251E-02	59.21478

Instrument : CHAMBER 252
 Detector : 79445
 Standard ID : AESS-044
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 28-AUG-2009 07:10:17
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:38:11
 Average Efficiency : 0.3746736
 Average Efficiency Error : 1.0277720E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.4510	28-FEB-2010	2990.594	3297.549	21166.00	0.3679778	1.5734663E-02	58.89096
NP-237	166.6248	28-FEB-2010	4436.816	4903.310	19132.00	0.3827184	1.9334946E-02	82.92307
CM-244	155.8290	28-FEB-2010	5530.420	5885.459	16612.00	0.3766809	1.9059464E-02	58.52933

Instrument : CHAMBER 253
 Detector : 79446
 Standard ID : AESS-045
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 28-AUG-2009 07:10:22
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:38:20
 Average Efficiency : 0.4166903
 Average Efficiency Error : 1.1423565E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	186.9936	28-FEB-2010	2990.116	3298.147	22479.00	0.4063848	1.7363828E-02	54.86803
NP-237	160.8066	28-FEB-2010	4437.082	4905.908	20384.00	0.4224682	2.1329734E-02	78.85169
CM-244	145.8384	28-FEB-2010	5531.106	5882.794	17611.00	0.4266897	2.1575425E-02	60.09909

Instrument : CHAMBER 254
 Detector : 79447
 Standard ID : AESS-046
 Standard Reference Date : 19-FEB-2008 19:35:48
 Calibration Analysis Date/Time : 28-AUG-2009 07:10:27
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:38:31
 Average Efficiency : 0.3994595
 Average Efficiency Error : 1.0953108E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	194.7474	28-FEB-2010	2990.155	3297.706	22342.00	0.3878187	1.6571781E-02	57.29897
NP-237	164.6658	28-FEB-2010	4433.107	4904.992	20059.00	0.4060186	2.0502383E-02	81.53826
CM-244	151.3824	28-FEB-2010	5532.020	5886.853	17611.00	0.4110290	2.0783551E-02	57.98274

Instrument : CHAMBER 255
 Detector : 79448
 Standard ID : AESS-047
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 28-AUG-2009 07:10:32
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:38:42
 Average Efficiency : 0.3673038
 Average Efficiency Error : 1.0076646E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	197.4804	28-FEB-2010	2987.598	3300.373	21106.00	0.3613006	1.5449724E-02	54.03281
NP-237	168.3948	28-FEB-2010	4437.418	4905.095	18737.00	0.3708411	1.8738993E-02	71.81757
CM-244	154.6032	28-FEB-2010	5533.813	5884.354	16306.00	0.3726670	1.8860538E-02	60.74806

Instrument : CHAMBER 256
 Detector : 79449
 Standard ID : AESS-048
 Standard Reference Date : 19-FEB-2008 00:32:27
 Calibration Analysis Date/Time : 28-AUG-2009 07:10:37
 Calibration Count Time : 300.0000
 Efficiency Calibration Date/Time : 28-AUG-2009 13:38:54
 Average Efficiency : 0.3796731
 Average Efficiency Error : 1.0416142E-02
 Confidence : 95.00000

Cal. Istps	DPM	Exp. Date	Start Engy	End Engy	Counts	EFF.	EFF Err	Resolution
GD-148	191.8350	28-FEB-2010	2991.222	3298.267	21126.00	0.3722856	1.5919263E-02	56.71911
NP-237	161.5530	28-FEB-2010	4432.956	4905.052	18745.00	0.3867485	1.9542677E-02	77.89369
CM-244	151.1856	28-FEB-2010	5532.797	5882.840	16417.00	0.3836786	1.9416265E-02	61.63605

LUCAS CELL COUNTERS

General Engineering Laboratories

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

Lucas Cell Calibration Package

	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?	✓		
	✓		
	✓		
	✓		
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: Kelli S. Dume

Date: 8/31/09

Reviewed By: Angela G. H.

Date: 8/31/09

Effective Date: 8/31/09

Ra-226 Cell Constants

standard ID: 0299-H
 Volume added (mL): 0.1
 Standard Reference Activity (DPM/mL): 2483.21

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/Time flushed to cell	Date/Time end of degas	Bkg Counts 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
101	1.846	cal 7	8/27/2009 16:35	8/27/2009 13:30	8/21/2009 11:30	4479	15	298.60	248.32	6.08333	0.12847	3544	0.9958
101	1.960	cal 9	8/24/2009 14:20	8/24/2009 9:30	8/18/2009 13:40	4581	15	305.40	248.32	5.82639	0.20139	3541	0.9958
101	2.060	cal 1	8/21/2009 15:00	8/21/2009 9:30	8/18/2009 13:40	2945	15	196.33	248.32	2.82639	0.22917	3538	0.9958
102	1.862	cal 5	8/27/2009 15:50	8/27/2009 12:40	8/21/2009 10:50	4510	15	300.67	248.32	6.07639	0.13194	3544	0.9958
102	1.850	cal 10	8/24/2009 14:45	8/24/2009 9:55	8/18/2009 13:40	4330	15	288.67	248.32	5.84375	0.20139	3541	0.9958
102	1.853	cal 2	8/21/2009 15:20	8/21/2009 9:50	8/18/2009 13:40	2659	15	177.27	248.32	2.84028	0.22917	3538	0.9958

104	2.073	Average	1.972	cal 1	8/27/2009 14:25	8/27/2009 9:35	8/24/2009 11:00	3070	15	204.67	248.32	2.94097	0.20139	3544	0.9958
104	1.855	Stdev	0.110	cal 11	8/24/2009 15:15	8/24/2009 10:15	8/18/2009 13:40	4343	15	289.53	248.32	5.85764	0.20833	3541	0.9958
104	1.987	cal 3	8/21/2009 15:50	8/21/2009 10:10	8/18/2009 13:40	2858	15	190.53	248.32	2.85417	0.23611	3538	0.9958		

106	1.985	Average	1.836	cal 2	8/27/2009 14:55	8/27/2009 10:00	8/24/2009 11:20	2940	15	196.00	248.32	2.94444	0.20466	3544	0.9958
106	1.738	Stdev	0.131	cal 12	8/24/2009 15:35	8/24/2009 10:40	8/18/2009 13:40	4078	15	271.87	248.32	5.87500	0.20466	3541	0.9958
106	1.786	cal 4	8/21/2009 16:30	8/21/2009 10:30	8/18/2009 13:40	2572	15	171.47	248.32	2.86806	0.25000	3538	0.9958		
107	2.025	Average	1.981	cal 8	8/27/2009 16:55	8/27/2009 13:50	8/21/2009 11:55	4910	15	327.33	248.32	6.07986	0.12847	3544	0.9958
107	2.054	Stdev	0.102	cal 1	8/24/2009 15:55	8/24/2009 11:00	8/21/2009 10:50	3090	15	206.00	248.32	3.00694	0.20466	3541	0.9958
107	1.864	cal 5	8/21/2009 16:45	8/21/2009 10:50	8/18/2009 13:40	2696	15	179.73	248.32	2.88194	0.24653	3538	0.9958		
108	1.906	Average	1.946	cal 6	8/27/2009 16:05	8/27/2009 13:05	8/21/2009 11:15	4623	15	308.20	248.32	6.07639	0.12500	3544	0.9958
108	1.975	Stdev	0.036	cal 2	8/24/2009 16:25	8/24/2009 11:20	8/21/2009 10:50	2978	15	198.53	248.32	3.02083	0.21181	3541	0.9958
108	1.957	cal 6	8/21/2009 17:00	8/21/2009 11:15	8/18/2009 13:40	2846	15	189.73	248.32	2.89931	0.23958	3538	0.9958		

111	2.162	Average	2.024	cal 3	8/27/2009 15:12	8/27/2009 10:20	8/24/2009 12:25	3177	15	211.80	248.32	2.91319	0.20278	3544	0.9958
111	2.051	Stdev	0.153	cal 3	8/24/2009 17:00	8/24/2009 12:25	8/21/2009 10:50	3139	15	209.27	248.32	3.06597	0.19097	3541	0.9958
111	1.859	cal 7	8/21/2009 17:15	8/21/2009 11:30	8/18/2009 13:40	2712	15	180.80	248.32	2.90972	0.23958	3538	0.9958		
112	1.962	Average	1.931	cal 4	8/27/2009 15:30	8/27/2009 10:50	8/24/2009 12:40	2895	15	193.00	248.32	2.92361	0.19444	3544	0.9958
112	1.967	Stdev	0.059	cal 4	8/24/2009 17:15	8/24/2009 12:40	8/21/2009 10:50	3019	15	201.27	248.32	3.07639	0.19097	3541	0.9958
112	1.863	cal 8	8/21/2009 17:35	8/21/2009 11:55	8/18/2009 13:40	2731	15	182.07	248.32	2.92708	0.23611	3538	0.9958		

EffErr 0.053028 <- Put in Machines.xls (Lucas Cell Tab)

8/13/09

VW 8/13/109

Ra-226 Calibration Sheet

Standard ID: 0119-H

Volume Added (mL): 0.1

Expiration Date: 8/1/10

$\frac{219}{8/13/09} = 900$
 $\frac{219}{8/13/09} = 900$
 * count time 15 min

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts
Cal 1	500	8/18/09 1340	8/21/09 0930	8/21/09 1500 8/21/09 1430	101	1	3142 4055
Cal 2	500	8/18/09 1340	8/21/09 0950	8/21/09 1500 8/21/09 1425	102	1	2778
Cal 3	500	8/18/09 1340	8/21/09 1010	8/21/09 1550 8/21/09 1445	104	1	2182 219
Cal 4	500	8/18/09 1340	8/21/09 1030	8/21/09 1630	106	1	2572
Cal 5	500	8/18/09 1340	8/21/09 1050	8/21/09 1645	107	1	2696
Cal 6	500	8/18/09 1340	8/21/09 1115	8/21/09 1700	108	1	2846
Cal 7	500	8/18/09 1340	8/21/09 1130	8/21/09 1715	111	1	2712
Cal 8	500	8/18/09 1340	8/21/09 1155	8/21/09 1735	112	1	2731
Cal 9							
Cal 10							
Cal 11							
Cal 12							

$\frac{2945}{8/21/09}$
 $\frac{2659}{8/21/09}$
 $\frac{2858}{8/21/09}$

WSP/BSM

8/13/09

8/21/09

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL-RAD-A-008 Isotope RA-226
 Date Standards Prepared 4/5/05 Cocktail Type Used NA
 Standard ID 0799-H Matrix of Vial/Planchett NA
 Amount Used (g or ml) 0.1 NA
 Standard Activity (DPM/g or ml) 2483.233 Type of Scintillation Vial NA
 Reference Date 12/15/99 Pipette ID Used 1429303
 Expiration Date 8/1/10 Balance ID Used 38080204
 Residue/Carrier Agent D-IMHCl Quenching Agent NA

	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				
	100502105				

Prepared By: Kelli Dorego Date 8/31/09
 Reviewed By: Angela J Gh Date 8/31/09

Rev 1 RLM 9/10/97

eev

8-21-00

Nycomed Amersham plc
Amersham Laboratories

0299



CALIBRATION
No. 0140



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: Radium-226

Product code: RAY44
Solution number: R4/131/89

Measurement Reference time: 1200 GMT on 15 December 1999

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 $\nu_{eff} = \infty$ 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


Approved
Signature

Date of issue

17th December 1999

VO 8131105

Nycomed



Standard Traceability Log Rad

Source Material Info	
Parent Code:	0299
Prepared By:	Angela Johnson
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 Johnson
Prep Date:	09/15/2000
Verification Date:	01/23/2008
Expiration Date:	01/23/2009
Primary Code:	0299-A
Dilution (mL):	100 mL
Mass of Parent(g):	4.6634 g
Density(g/mL):	1.0012
Balance ID:	

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

$(\text{Mass of parent(g)}) * (\text{Parent Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
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	01/26/2009	01/26/2010
08/07/2009	Mary Aders	5.0767	250	0299-H	2483.2133 dpm/mL	08/07/2009	08/07/2010

GEL Laboratories LLC
Version 1.0 9/18/2000

W. Spina

Voltage Curve Ludlum #1

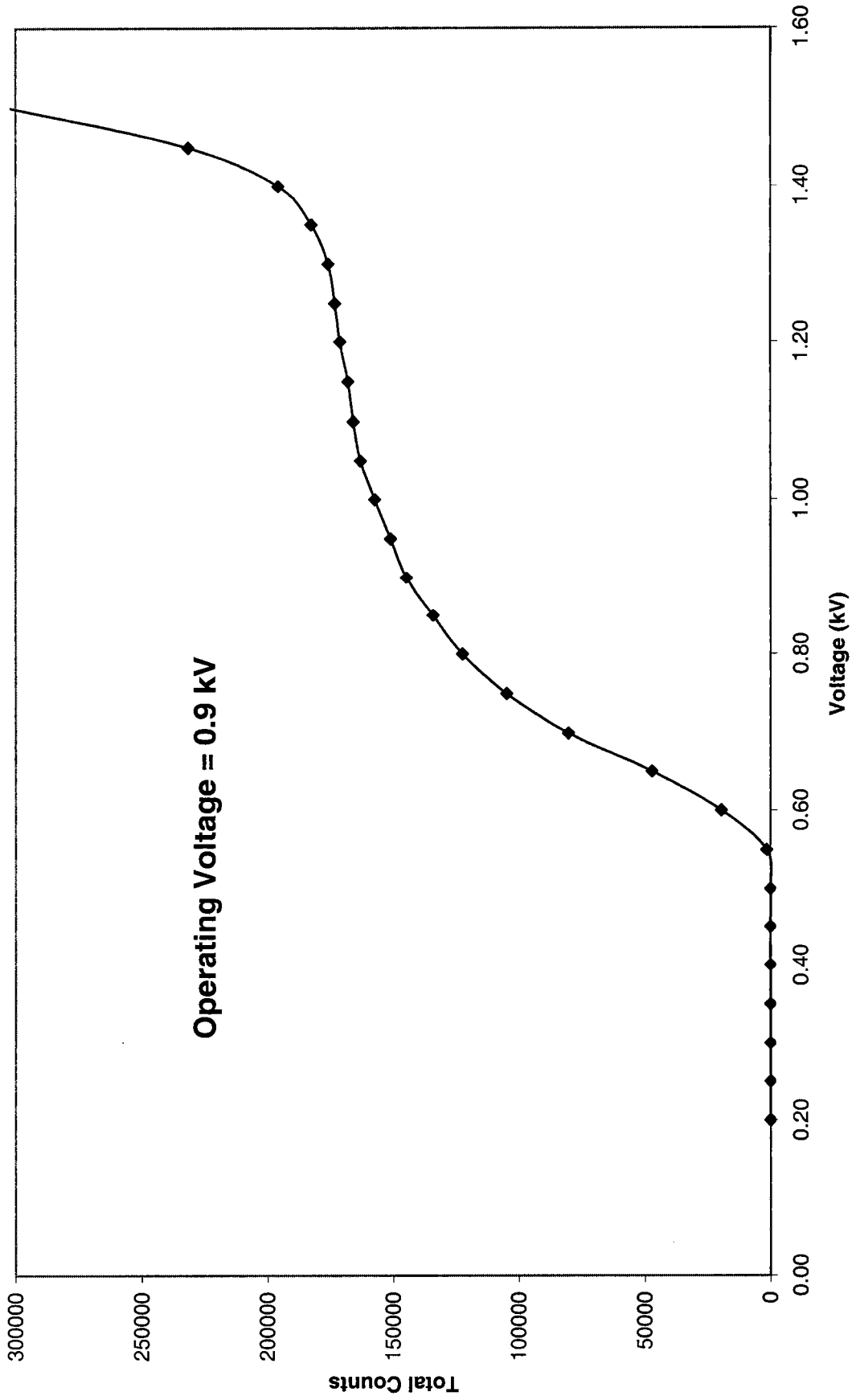
Voltage (kV)	Count Time (min)	Counts	Date/Time
0.20	1.00	0	8/21/09 13:20
0.25	1.00	0	8/21/09 13:21
0.30	1.00	0	8/21/09 13:22
0.35	1.00	0	8/21/09 13:23
0.40	1.00	0	8/21/09 13:24
0.45	1.00	0	8/21/09 13:25
0.50	1.00	0	8/21/09 13:26
0.55	1.00	1534	8/21/09 13:27
0.60	1.00	19637	8/21/09 13:28
0.65	1.00	47206	8/21/09 13:29
0.70	1.00	80410	8/21/09 13:30
0.75	1.00	104945	8/21/09 13:31
0.80	1.00	122514	8/21/09 13:32
0.85	1.00	134160	8/21/09 13:33
0.90	1.00	144753	8/21/09 13:34
0.95	1.00	151057	8/21/09 13:35
1.00	1.00	157429	8/21/09 13:36
1.05	1.00	163110	8/21/09 13:37
1.10	1.00	166034	8/21/09 13:38
1.15	1.00	168121	8/21/09 13:39
1.20	1.00	171347	8/21/09 13:40
1.25	1.00	173388	8/21/09 13:41
1.30	1.00	175958	8/21/09 13:42
1.35	1.00	182719	8/21/09 13:43
1.40	1.00	195871	8/21/09 13:44
1.45	1.00	231584	8/21/09 13:45
1.50	1.00	303021	8/21/09 13:46
1.55	1.00	387838	8/21/09 13:47

Detector set to operate at 0.90 kV

Handwritten: 8/31/09

Ludlum Detector Voltage Curve

—◆— Voltage Curve Ludlum #1



8/13/09

Control Limits for Lucas Cell Counter #1

Analyst: KSD1
Date: 8/31/2009

Count #	Detector #1
1	138383
2	138269
3	141307
4	140521
5	132825
6	135924
7	139231
8	138298
9	135342
10	138056
11	138123
12	139159
13	138410
14	138251
15	138438
16	138080
17	137814
18	137961
19	137248
20	137477

Average = 137955.9
Std. Dev. = 1775.5

+3 S. D. = 143282.4266
+2 S. D. = 141506.901
Mean = 137955.9
-2 S. D. = 134404.799
-3 S. D. = 132629.2734

Control Limits **8/31/2009** * Operating Voltage changed to 0.9 kV
Detector #1
Upper Limit **143282**
Lower Limit **132629**

Handwritten signature
8/31/09

	Eff	Cal Date
101	1.956	8/31/2009
102	1.855	8/31/2009
104	1.972	8/31/2009
106	1.836	8/31/2009
107	1.981	8/31/2009
108	1.946	8/31/2009
111	2.024	8/31/2009
112	1.931	8/31/2009

Lucas	Ra-226	
Oldest Cal	01/23/2008	
Detector	Eff Error	Cal Date
1	0.0530	8/31/2009
2	0.0772	12/19/2008
3	0.0608	1/23/2008
4	0.1237	3/2/2009
5	0.1438	3/25/2009
6	0.0661	8/4/2009
7	0.0855	11/21/2008

Ra-226 WATER

Batch : LCSVER
 Date : 8/20/2008
 Analyst : KSD1

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	689	101	1.956	0.267	0.5907	25.3156	1.9236	8/31/2009 14:35
Ver 6	0.500	30	697	102	1.855	0.133	0.4721	27.1986	2.0367	8/31/2009 15:05
Ver 2	0.500	30	656	104	1.972	0.267	0.6303	25.7021	2.0032	8/28/2009 14:00
Ver 4	0.500	30	638	106	1.836	0.267	0.6304	24.9919	1.9762	8/31/2009 15:40
Ver 7	0.500	30	629	107	1.981	0.267	0.6257	24.4533	1.9479	8/28/2009 17:50
Ver 5	0.500	30	693	108	1.946	0.267	0.5959	25.6861	1.9459	8/31/2009 16:15
Ver 3	0.500	30	672	111	2.024	0.267	0.6129	25.6096	1.9713	8/28/2009 14:35
Ver 4	0.500	30	631	112	1.931	0.267	0.6411	25.1365	1.9990	8/28/2009 15:10

JLQ
8/31/09

Sample ID	Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
Ver 2		1	8/31/2009 14:35	LCS	0638-H	24.17	pCi/L	105%
Ver 3		1	8/31/2009 15:05	LCS	0638-H	24.17	pCi/L	113%
Ver 2		1	8/28/2009 14:00	LCS	0638-H	24.17	pCi/L	106%
Ver 4		1	8/31/2009 15:40	LCS	0638-H	24.17	pCi/L	103%
Ver 7		1	8/28/2009 17:50	LCS	0638-H	24.17	pCi/L	101%
Ver 8		1	8/31/2009 16:15	LCS	0638-H	24.17	pCi/L	106%
Ver 3		1	8/28/2009 14:35	LCS	0638-H	24.17	pCi/L	106%
Ver 4		1	8/28/2009 15:10	LCS	0638-H	24.17	pCi/L	104%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM	Ingrowth constant
8/28/2009 10:20	8/31/2009 11:10	72.83	3.42	0.4230	0.9745	1.0019	22.7000	0.4130
8/28/2009 10:40	8/31/2009 11:30	72.83	3.58	0.4230	0.9733	1.0019	23.1000	0.4125
8/25/2009 16:00	8/28/2009 10:20	66.33	3.67	0.3940	0.9727	1.0019	21.6000	0.3839
8/28/2009 11:00	8/31/2009 11:55	72.92	3.75	0.4234	0.9721	1.0019	21.0000	0.4123
8/25/2009 16:00	8/28/2009 12:00	68.00	5.83	0.4015	0.9569	1.0019	20.7000	0.3850
8/28/2009 11:20	8/31/2009 12:15	72.92	4.00	0.4234	0.9703	1.0019	22.8333	0.4115
8/25/2009 16:00	8/28/2009 10:40	66.67	3.92	0.3955	0.9709	1.0019	22.1333	0.3847
8/25/2009 16:00	8/28/2009 11:00	67.00	4.17	0.3970	0.9690	1.0019	20.7667	0.3854

Handwritten signature and date: 8/31/09

062584 CAP: 11/11/10

Ra-226 Verification Sheet

* 1 .9 voltage

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
VEN 1	500	8/28/09 1600	8/28/09 0555	8/28/09 1310	101	1	8	525
VEN 2	500	8/28/09 1600	8/28/09 1020	8/28/09 1400	104	1	8	654
VEN 3	500	8/28/09 1600	8/28/09 1040	8/28/09 1435	111	1	8	672
VEN 4	500	8/28/09 1600	8/28/09 1100	8/28/09 1510	112	1	8	631
VEN 5	500	8/28/09 1600	8/28/09 1120	8/28/09 1510	106	1	8	678
VEN 6	500	8/28/09 1600	8/28/09 1140	8/28/09 1610	107	1	4	654
VEN 7	500	8/28/09 1600	8/28/09 1200	8/28/09 1750	107	1	8	629
VEN 8	500	8/28/09 1600	8/28/09 1305	8/28/09 1820	108	1	8	736
VEN 2	500	8/28/09 1020	8/28/09 1110	8/28/09 1435	101	1	8	689
VEN 3	500	8/28/09 1040	8/28/09 1130	8/28/09 1505	102	1	4	697
VEN 4	500	8/28/09 1050	8/28/09 1155	8/28/09 1540	106	1	8	638
VEN 5	500	8/28/09 1120	8/28/09 1215	8/28/09 1615	108	1	8	693

W 8/30/09
W 8/31/09

W 9/1/09

W 8/28/09

W 8/28/09
410

W 8/28/09

ANALYTICS

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

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: γ -impurities (other than decay products) <0.1%

5.01065 grams 0.1M HCl solution with 50 μ g/g Ba carrier.

P O NUMBER 3231RD, Item 5

SOURCE PREPARED BY:

M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED:

ACUM 1/26/04

W 8731105

Standard Traceability Log Rad

WARNING! Training must be completed!!

Alphalims will be locked out if training is not completed within 1 week of assignment Contact Quality if additional time is needed to complete training

Source Material Info	
Parent Code:	0638
Prepared By:	Amanda Fehr
Carrier Conc:	0.1M HCl
Reference Date:	01/23/2004
Ampoule Mass (g):	5.01065 g
Uncertainty:	+/- 3.3 %
LogBook No:	RC-S-037-037

A Solution Material Info	
Isotope:	Radium-226
Prepared By:	Amanda Fehr
Prep Date:	01/16/2006
Verification Date:	04/09/2009
Expiration Date:	04/09/2010
Primary Code:	0638-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8398 g
Density(g/mL):	1.0266
Balance ID:	38080204

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

$$(\text{Mass of parent(g)} * (\text{Parent Activity (dps)} * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)})$$

$$(\text{Mass of parent(g)} * (\text{Parent Activity (dps)} * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)})$$

$$(4.8398 \text{ g}) * (23530 \text{ dps}) * (\text{conversion dpm to dps}) * (60 \text{ dpm/dps}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13636.6133 \text{ dpm/mL}$$

$$(4.8398 \text{ g}) * (23530 \text{ dps}) * (60 \text{ dpm/dps}) / (1.0266 \text{ g/mL}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13282.9676 \text{ dpm/g}$$

W 8/28/09

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	01/17/2007	01/17/2008
07/17/2006	Mary Aders	2.1313	100	0638-C	282.6281 dpm/mL	07/26/2006	07/26/2007
03/28/2007	Daniel Roy	2.1025	100	0638-D	279.2744 dpm/ml	04/08/2007	04/08/2008
03/28/2007	Daniel Roy	45.468	250	0638-E	2415.7999 dpm/ml	04/09/2009	04/09/2010
12/18/2007	Daniel Roy	2.014	100	0638-F	267.519 dpm/ml	02/02/2009	02/02/2010
02/12/2008	Daniel Roy	.5004	100	0638-G	66.468 dpm/ml	03/02/2009	03/02/2010
07/23/2008	Daniel Roy	5.0607	250	0638-H	268.8845 dpm/ml	07/17/2009	07/17/2010

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Ra-226 Standard 0638-H

D. Roy 7/23/2008	Isotope	Value	Uncertainty
	0638-H	11.852	1.1079
	0638-H	12.092	1.1141
	0638-H	12.372	1.1216
Mean Value (Counting) =	12.106	100.13	Pass
Stdev =	0.260353631		Rule 3 (Pass/Fail)
Target =	12.09		
Lower Limit =	11.5848594		
Upper Limit =	12.62627393		
Rule 1 Pass/Fail	Pass		
Two sigma =	0.520707263		
10 % of Mean =	1.210556667		
Rule 2 (Pass/Fail)	Pass		

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-H by transferring portions of the degassed standard into tared glass liquid scintillation vials. 10 mL of DI Water and 10 mL of mineral oil were added to each vial and the vials were shaken. A Blank vial was prepared in a similar fashion using 10 mL of DI Water and 10 mL of mineral oil. The standard verification vials and Background source were dark adapted for two hours and counted on LSC RED using source standard verification. 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

David D. Roy 8/14/08
Ver. L. Jones 8/14/08

General Engineering Laboratories

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

Lucas Cell Calibration Package

	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: Kelli Donnell

Date: 12/19/08

Reviewed By: Mark G. Adams

Date: 12/19/08

Effective Date: 12/19/08

NU 12/19/08

Ra-226 Cell Constants

Standard Reference date: 12/15/1999
 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 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	2.021	Average	9/15/2008 15:45	9/15/2008 9:05	9/12/2008 13:20	0.267	5596	30	186.53	243.02	2.82292	0.27778	3198	0.9962
201	2.043	Stdv	9/18/2008 13:00	9/18/2008 8:10	9/15/2008 9:05	0.267	5949	30	198.30	243.02	2.96181	0.20139	3201	0.9962
201	1.915		9/25/2008 19:35	9/25/2008 9:15	9/22/2008 10:00	0.267	5361	30	178.70	243.02	2.96875	0.49056	3208	0.9962
202	2.436	Average	9/15/2008 16:20	9/15/2008 9:35	9/12/2008 13:20	0.267	6779	30	225.97	243.02	2.84375	0.28125	3198	0.9962
202	2.209	Stdv	9/18/2008 13:50	9/18/2008 8:45	9/15/2008 9:35	0.267	6425	30	214.17	243.02	2.96528	0.21181	3201	0.9962
202	2.137		10/21/2008 13:50	10/20/2008 13:45	10/13/2008 16:00	0.267	9248	30	308.27	243.02	6.90625	1.00347	3234	0.9962
203	2.255	Average	9/15/2008 16:50	9/15/2008 10:00	9/12/2008 13:20	0.267	6300	30	210.00	243.02	2.86111	0.28472	3198	0.9962
203	2.273	Stdv	9/18/2008 14:25	9/18/2008 9:15	9/15/2008 10:00	0.267	6613	30	220.43	243.02	2.96875	0.21528	3201	0.9962
203	2.234		9/25/2008 21:00	9/25/2008 10:15	9/22/2008 10:00	0.267	6298	30	209.93	243.02	3.01042	0.44782	3208	0.9962
204	2.184	Average	9/15/2008 17:25	9/15/2008 10:30	9/12/2008 13:20	0.267	6132	30	204.40	243.02	2.88194	0.28819	3198	0.9962
204	2.300	Stdv	9/18/2008 14:55	9/18/2008 9:35	9/15/2008 10:30	0.267	6671	30	222.37	243.02	2.96181	0.22222	3201	0.9962
204	2.096		9/30/2008 14:05	9/30/2008 9:10	9/28/2008 9:45	0.133	7535	30	251.17	243.02	3.97569	0.20486	3213	0.9962
205	1.677	Average	10/21/2008 8:30	10/20/2008 14:05	10/13/2008 16:00	0.267	7584	30	252.80	243.02	6.32014	0.76736	3233	0.9962
205	1.730	Stdv	9/18/2008 16:00	9/18/2008 10:05	9/15/2008 10:55	0.167	4989	30	166.63	243.02	2.96528	0.24653	3201	0.9962
205	1.990		9/30/2008 14:45	9/30/2008 9:40	9/28/2008 9:45	0.187	7170	30	239.00	243.02	3.89653	0.21181	3213	0.9962
206	2.240	Average	9/15/2008 21:10	9/15/2008 11:25	9/12/2008 13:20	0.233	6216	30	207.20	243.02	2.32014	0.40825	3198	0.9962
206	2.293	Stdv	9/18/2008 16:35	9/18/2008 10:25	9/15/2008 11:25	0.267	6604	30	220.13	243.02	2.95833	0.25694	3201	0.9962
206	2.245		9/30/2008 15:20	9/30/2008 10:15	9/28/2008 9:45	0.267	8125	30	270.83	243.02	4.02083	0.21181	3213	0.9962
207	2.187	Average	9/15/2008 21:40	9/15/2008 11:50	9/12/2008 13:20	0.267	6084	30	203.13	243.02	2.33750	0.40972	3198	0.9962
207	2.141	Stdv	9/18/2008 17:55	9/18/2008 10:40	9/15/2008 11:50	0.267	6105	30	203.50	243.02	2.95139	0.30208	3201	0.9962
207	2.110		9/30/2008 16:00	9/30/2008 10:45	9/28/2008 9:45	0.233	7856	30	255.20	243.02	4.04167	0.21875	3213	0.9962
208	2.239	Average	9/15/2008 22:15	9/15/2008 12:15	9/12/2008 13:20	0.267	6288	30	208.60	243.02	2.85486	0.41667	3198	0.9962
208	2.243	Stdv	9/18/2008 19:30	9/18/2008 11:00	9/15/2008 12:15	0.133	6374	30	212.47	243.02	2.94786	0.41290	3201	0.9962
208	2.148		9/30/2008 16:55	9/30/2008 11:10	9/28/2008 9:45	0.695	7691	30	236.03	243.02	4.96989	0.89569	3213	0.9962
209	2.471	Average	9/15/2008 22:45	9/15/2008 13:50	9/12/2008 13:20	0.033	7073	30	235.77	243.02	3.02083	0.37153	3198	0.9962
209	2.212	Stdv	9/18/2008 19:15	9/18/2008 11:15	9/15/2008 13:50	0.067	6170	30	205.67	243.02	2.89236	0.33333	3201	0.9962
209	2.420		9/30/2008 17:25	9/30/2008 11:40	9/28/2008 9:45	0.100	8795	30	293.17	243.02	4.07986	0.23958	3213	0.9962
210	2.320	Average	9/15/2008 23:15	9/15/2008 14:15	9/12/2008 13:20	0.033	6665	30	222.17	243.02	3.03819	0.37500	3198	0.9962
210	2.210	Stdv	9/18/2008 19:45	9/18/2008 11:30	9/15/2008 14:15	0.100	6142	30	204.73	243.02	2.88542	0.34375	3201	0.9962
210	2.230		9/30/2008 18:00	9/30/2008 12:05	9/28/2008 9:45	0.033	8116	30	270.53	243.02	4.09722	0.24653	3213	0.9962
211	2.140	Average	9/15/2008 23:50	9/15/2008 14:30	9/12/2008 13:20	0.033	6150	30	205.00	243.02	3.04661	0.36889	3198	0.9962
211	2.238	Stdv	9/18/2008 22:20	9/18/2008 12:35	9/15/2008 14:30	0.133	6207	30	206.90	243.02	2.92014	0.40625	3201	0.9962
211	2.136		9/30/2008 18:30	9/30/2008 13:35	9/28/2008 9:45	0.100	7917	30	263.90	243.02	4.15972	0.20486	3213	0.9962
212	2.405	Average	9/16/2008 0:20	9/15/2008 14:50	9/12/2008 13:20	0.033	6926	30	230.87	243.02	3.06250	0.39583	3198	0.9962
212	2.315	Stdv	9/18/2008 22:55	9/18/2008 12:50	9/15/2008 14:50	0.267	6405	30	213.50	243.02	2.91667	0.42014	3201	0.9962
212	2.244		9/30/2008 19:50	9/30/2008 14:00	9/28/2008 9:45	0.267	8287	30	276.23	243.02	4.17708	0.24306	3213	0.9962

NU 12/19/08

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Verification for Ra-226 Standard 0299-G

4/2/2008	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Mass. Used (G)	Source DPM/G
D. Roy	0299-G N1	2536.9600	52.4000	2484.5600	1.917186	0.5057	2562.667649
	0299-G N2	2520.2500	52.4000	2467.8500	1.917186	0.5056	2545.935781
	0299-G N3	2532.5000	52.4000	2480.1000	1.917186	0.5042	2565.677715
						Average =	2558.093715

Mean Value (Counting) = 2558.093715
 Stdev = 10.63610098

Certificate Value = 2437.6 dpm/mL
 Lower Limit = 2536.821513 dpm/mL
 Upper Limit = 2579.365917 dpm/mL
 Rule 1 Pass/Fail = Fail *exception taken due to full recovery of standard
 Two sigma = 21.27220197 dpm/mL
 10 % of Mean = 255.8093715 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 Gold for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 4/02/08 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0024. 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.

BAD.SOP.M-001

Mut 12/19/08
W 17/19/08
Mary E. Johnson 4/9/08
Daniel Dwyer 4/10/08



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:	01/23/2008
Ampoule Mass (g):	5.0368 g	Expiration Date:	01/23/2009
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
		Balance ID:	

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
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	04/02/2008	04/02/2009

GEL Laboratories LLC
Version 1.0 9/18/2000

all ok re 12/19/08
len 12/19/08

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number <u>GLRAD A-008</u>	Isotope <u>Ra-226</u>
Date Standards Prepared <u>4/5/08</u>	Cocktail Type Used <u>NA</u>
Standard ID <u>0299-G</u>	Matrix of Vial/Planchett <u>NA</u> <u>NA</u> <u>NA</u>
Amount Used (g or ml) <u>0.1</u>	Type of Scintillation Vial <u>NA</u>
Standard Activity (DPM/g or ml) <u>2446.347</u>	Pipette ID Used <u>1429303</u>
Reference Date <u>12/15/99</u>	Balance ID Used <u>36040216</u>
Expiration Date <u>4/2/09</u>	Quenching Agent <u>NA</u>
Residue/Carrier Agent <u>0.5 M HCl</u>	

	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
14	Cal 14				
13	Cal 13				
43	Cal 43				
15	Cal 15				
44	Cal 44				
46	Cal 46				
36	Cal 36				
19	Cal 19				
47	Cal 47				
37	Cal 37				
42	Cal 42				

See table

Prepared By: Kelli S. Deroso Date: 12/19/08
 Reviewed By: M. G. Johnson Date: 12/19/08

Rev 1 RLM 9/10/97

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.

Handwritten notes:
12/19/99
12/19/98

Ra-226 WATER

Batch : LCSVER
Date : 10/31/2008
Analyst : KSD1

Procedure Code : LUC26RAL

Parname : 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 1	0.500	30	1014	201	1.993	0.267	0.3504	22.1841	1.3817	11/17/2008 15:10
VER 2	0.500	30	1056	202	2.261	0.267	0.3089	20.3702	1.2427	11/17/2008 15:45
VER 3	0.500	30	726	203	2.254	0.267	0.5419	24.4866	1.8110	10/30/2008 16:05
VER 4	0.500	30	737	204	2.193	0.267	0.5519	25.3188	1.8580	10/30/2008 18:20
VER 5	0.500	30	937	205	1.799	0.267	0.3882	22.6936	1.4718	11/17/2008 16:20
VER 6	0.500	30	780	206	2.259	0.267	0.5373	26.1045	1.8604	10/30/2008 20:20
VER 7	0.500	30	711	207	2.146	0.267	0.5705	25.2245	1.8858	10/30/2008 22:00
VER 3	0.500	30	593	208	2.283	0.267	0.5132	16.9552	1.4723	11/20/2008 16:40
VER 9	0.500	30	630	209	2.291	0.133	0.4042	21.0513	1.6596	10/30/2008 23:40
VER 10	0.500	30	691	210	2.253	0.033	0.2527	23.7356	1.7736	10/31/2008 1:15
VER 11	0.500	30	1067	211	2.171	0.267	0.3314	22.0840	1.3401	11/17/2008 21:55
VER 12	0.500	30	648	212	2.322	0.133	0.4223	22.6294	1.7586	10/31/2008 9:15

12/19/08
KSD

Sample ID	Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
201		2	11/17/2008 10:20	LCS	0638-F	24.10	pCi/L	92%
202		2	11/17/2008 10:45	LCS	0638-F	24.10	pCi/L	85%
203		2	10/30/2008 11:05	LCS	0638-F	24.10	pCi/L	102%
204		2	10/30/2008 12:30	LCS	0638-F	24.10	pCi/L	105%
205		2	11/17/2008 11:10	LCS	0638-F	24.10	pCi/L	94%
206		2	10/30/2008 13:10	LCS	0638-F	24.10	pCi/L	108%
207		2	10/30/2008 13:25	LCS	0638-F	24.10	pCi/L	105%
208		2	11/20/2008 11:45	LCS	0638-F	24.10	pCi/L	70%
209		2	10/30/2008 14:05	LCS	0638-F	24.10	pCi/L	87%
210		2	10/30/2008 14:25	LCS	0638-F	24.10	pCi/L	98%
211		2	11/17/2008 12:20	LCS	0638-F	24.10	pCi/L	92%
212		2	10/30/2008 14:55	LCS	0638-F	24.10	pCi/L	94%

WV
12/18/08

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM	Ingrowth constant
11/10/2008 15:35	11/17/2008 10:20	162.75	4.83	0.7073	0.9642	1.0019	33.5333	0.6833
11/10/2008 15:35	11/17/2008 10:45	163.17	5.00	0.7083	0.9630	1.0019	34.9333	0.6833
10/27/2008 14:20	10/30/2008 11:05	68.75	5.00	0.4049	0.9630	1.0019	23.9333	0.3907
10/27/2008 14:20	10/30/2008 12:30	70.17	5.83	0.4113	0.9569	1.0019	24.3000	0.3943
11/10/2008 15:35	11/17/2008 11:10	163.58	5.17	0.7092	0.9617	1.0019	30.9667	0.6833
10/27/2008 14:20	10/30/2008 13:10	70.83	7.17	0.4142	0.9473	1.0019	25.7333	0.3931
10/27/2008 14:20	10/30/2008 13:25	71.08	8.58	0.4153	0.9373	1.0019	23.4330	0.3900
11/17/2008 11:10	11/20/2008 11:45	72.58	4.92	0.4219	0.9696	1.0019	17.5900	0.4073
10/27/2008 14:20	10/30/2008 14:05	71.75	9.58	0.4182	0.9302	1.0019	20.8670	0.3898
10/27/2008 14:20	10/30/2008 14:25	72.08	10.83	0.4197	0.9215	1.0019	23.0003	0.3875
11/10/2008 15:35	11/17/2008 12:20	164.75	9.58	0.7117	0.9302	1.0019	35.3000	0.6633
10/27/2008 14:20	10/30/2008 14:55	72.58	18.33	0.4219	0.8707	1.0019	21.4670	0.3681

WV
12/18/08

WV 12/19/08
WV 12/18/08

Verification for Ra-226 Standard 0638-F

D Roy
12/27/2007

Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Source DPM/mL
0638-F N1	1239.9000	31.5000	1208.4000	4.624018	261.3311626
0638-F N2	1222.8000	31.5000	1191.3000	4.624018	257.6330801
0638-F N3	1219.4000	31.5000	1187.9000	4.624018	256.8977889
					Average =

Mean Value (Counting) = 258.6206772
Stdev = 2.375965421

96.8384646
0.00918707 Rule 3 (Pass/Fail) Pass

Certificate Value = 267.1
Lower Limit = 253.8687464
Upper Limit = 263.3726081
Rule 1 Pass/Fail Fail
Two sigma = 4.751930843
10 % of Mean = 25.86206772
Rule 2 (Pass/Fail) Pass

*exception taken due to full recovery of standard

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-F 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 YELLOW using source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 12/27/07 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 (0024-A). Each verification source calculation was performed as follows:

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

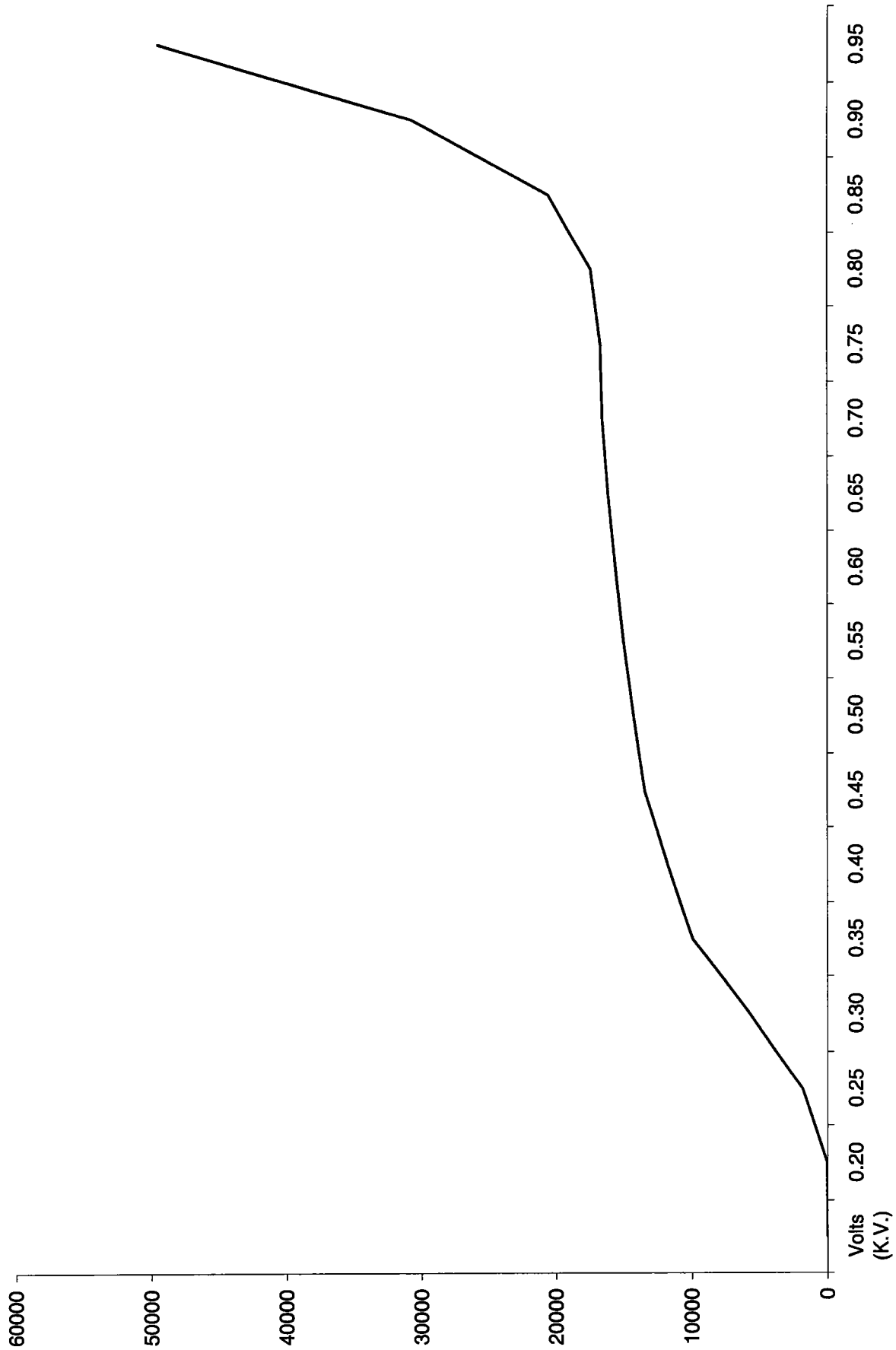
where:

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

Reference RAD SOP M-001

12/19/08

1/4/07
Amanda L. Fehe 1/4/07



mut 12/19/08
VW 12/19/08

201	1.993	12/19/2008
202	2.261	12/19/2008
203	2.254	12/19/2008
204	2.193	12/19/2008
205	1.799	12/19/2008
206	2.259	12/19/2008
207	2.146	12/19/2008
209	2.291	12/19/2008
210	2.253	12/19/2008
211	2.171	12/19/2008
212	2.322	12/19/2008

*Next
12/19/08*

General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414

(843)556-8171

Lucas Cell Calibration Package

	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: Kellipanel

Date: 2/3/09

Reviewed By: W. G. Hens

Date: 2/4/09

Effective Date: 2/4/09

Ra-226 Cell Constants

Standard Reference date: 12/15/1999
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 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	1.867	Average	1/20/2009 11:05	1/19/2009 10:10	1/19/2009 15:45	0.267	9355	30	311.83	9.76736	1.03819	3324	0.9961
301	2.184	Stdev	1/29/2009 11:50	1/29/2009 8:50	1/28/2009 13:00	0.267	6239	30	207.97	2.82639	0.12500	3333	0.9961
301	2.011		1/26/2009 14:35	1/26/2009 9:25	1/22/2009 9:10	0.267	7282	30	242.73	4.01042	0.21528	3331	0.9961
302	2.082	Average	1/30/2009 11:30	1/30/2009 8:30	1/28/2009 13:00	0.267	7401	30	246.70	3.81250	0.12500	3334	0.9961
302	2.225	Stdev	1/29/2009 13:30	1/29/2009 9:20	1/28/2009 13:00	0.233	6335	30	211.17	2.84722	0.17361	3334	0.9961
302	2.086		1/26/2009 15:30	1/26/2009 9:55	1/22/2009 9:10	0.267	7555	30	251.83	4.03125	0.23264	3331	0.9961
303	1.958	Average	1/20/2009 13:40	1/19/2009 11:00	1/19/2009 15:45	0.267	9695	30	323.17	9.80208	1.11111	3325	0.9961
303	2.218	Stdev	1/22/2009 20:35	1/22/2009 10:05	1/19/2009 15:00	0.267	5938	30	197.93	2.79514	0.43750	3327	0.9961
303	2.231		1/26/2009 17:20	1/26/2009 10:25	1/22/2009 9:10	0.267	8028	30	267.60	4.05208	0.28819	3331	0.9961

305	1.897	Average	1/20/2009 14:50	1/19/2009 11:35	1/19/2009 15:45	0.200	9357	30	311.90	9.82639	1.13542	3325	0.9961
305	2.191	Stdev	1/22/2009 21:50	1/22/2009 11:05	1/19/2009 15:00	0.267	5921	30	197.37	2.83681	0.44792	3327	0.9961
305	2.083		1/26/2009 23:00	1/26/2009 11:20	1/22/2009 9:10	0.267	7280	30	242.67	4.09028	0.48611	3331	0.9961
306	1.730	Average	1/20/2009 15:20	1/19/2009 11:50	1/19/2009 15:45	0.167	8521	30	284.03	9.83681	1.14593	3325	0.9961
306	1.891	Stdev	1/29/2009 14:30	1/29/2009 10:20	1/28/2009 13:00	0.233	4869	30	162.30	2.88889	0.17361	3334	0.9961
306	1.821		1/26/2009 23:30	1/26/2009 11:50	1/22/2009 9:10	0.267	6387	30	212.90	4.11111	0.48611	3331	0.9961
307	1.818	Average	1/20/2009 15:50	1/19/2009 12:05	1/19/2009 15:45	0.267	8944	30	298.13	9.84722	1.15625	3325	0.9961
307	2.095	Stdev	1/30/2009 12:55	1/30/2009 9:10	1/28/2009 13:00	0.267	7442	30	248.07	3.84028	0.15625	3335	0.9961
307	1.881		1/27/2009 0:05	1/26/2009 12:10	1/22/2009 9:10	0.267	6598	30	219.93	4.12500	0.49653	3331	0.9961
308	2.129	Average	1/29/2009 15:50	1/29/2009 11:05	1/28/2009 13:00	0.133	6149	30	204.97	2.92014	0.19792	3334	0.9961
308	1.858	Stdev	1/23/2009 9:35	1/22/2009 13:45	1/19/2009 15:00	0.267	4829	30	160.97	2.94792	0.82639	3327	0.9961
308	1.862		1/27/2009 8:30	1/26/2009 13:15	1/22/2009 9:10	0.267	6226	30	207.53	4.17014	0.80208	3331	0.9961
309	1.857	Average	1/20/2009 17:20	1/19/2009 13:35	1/19/2009 15:45	0.033	9149	30	304.97	9.90972	1.15625	3325	0.9961
309	1.964	Stdev	1/23/2009 10:30	1/22/2009 14:05	1/19/2009 15:00	0.267	5100	30	170.00	2.96181	0.85069	3327	0.9961
309	1.810		1/27/2009 9:05	1/26/2009 13:30	1/22/2009 9:10	0.267	6046	30	201.53	4.18056	0.81597	3331	0.9961

311	2.140	Average	1/29/2009 16:40	1/29/2009 11:20	1/28/2009 13:00	0.267	6176	30	205.87	2.93056	0.22222	3334	0.9961
311	2.212	Stdev	1/23/2009 12:20	1/22/2009 14:25	1/19/2009 15:00	0.267	5698	30	189.93	2.97569	0.91319	3328	0.9961
311	1.988		1/27/2009 10:15	1/26/2009 13:45	1/22/2009 9:10	0.267	6607	30	220.23	4.19097	0.85417	3331	0.9961
312	1.871	Average	1/20/2009 19:16	1/19/2009 14:10	1/19/2009 15:45	0.100	9135	30	304.50	9.93403	1.21250	3325	0.9961
312	2.014	Stdev	1/29/2009 17:10	1/29/2009 11:35	1/28/2009 13:00	0.167	5814	30	193.80	2.94097	0.23264	3334	0.9961
312	1.946		1/27/2009 11:10	1/26/2009 14:00	1/22/2009 9:10	0.267	6446	30	214.87	4.20139	0.88194	3331	0.9961

K0 2/3/09

Verification for Ra-226 Standard 0299-G

4/2/2008	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Mass. Used (G)	Source DPM/G
D. Roy	0299-G N1	2536.9600	52.4000	2484.5600	1.917186	0.5057	2562.667649
	0299-G N2	2520.2500	52.4000	2467.8500	1.917186	0.5056	2545.935781
	0299-G N3	2532.5000	52.4000	2480.1000	1.917186	0.5042	2565.677715
						Average =	2558.093715

Mean Value (Counting) = 2558.093715
 Stdev = 10.63610098

104.944421 Pass
 0.00415782 Rule 3 (Pass/Fail)

Certificate Value = 2437.6 dpm/mL
 Lower Limit = 2536.821513 dpm/mL
 Upper Limit = 2579.365917 dpm/mL
 Rule 1 Pass/Fail Fail *exception taken due to full recovery of standard
 Two sigma = 21.27220197 dpm/mL
 10 % of Mean = 255.8093715 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 Gold for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 4/02/08 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0024. 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

Handwritten notes:
 5/10/08
 M. N. 2310
 1.5 ml water for 30 sec



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:	01/23/2008
Ampoule Mass (g):	5.0368 g	Expiration Date:	01/23/2009
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
		Balance ID:	

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

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$$

$$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$$

$$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$$

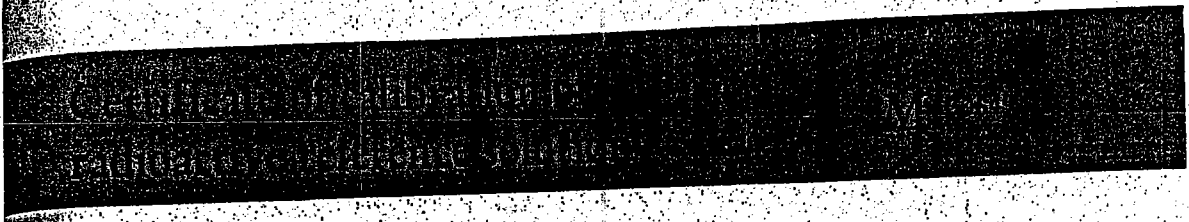
Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
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	04/02/2008	04/02/2009

GEL Laboratories LLC
Version 1.0 9/18/2000

LD 2/3/09
ALLA 2/4/09

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

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.

KB 21/3/09
WMA 21/11/09

Ra-226 WATER

Batch : LCSVER
 Date : 1/2/2009
 Analyst : KSD1

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
1	0.500	30	656	301	2.021	0.267	0.4919	20.0589	1.5634	1/30/2009 15:05
1	0.500	30	655	302	2.131	0.267	0.5554	22.6149	1.7640	2/2/2009 13:40
2	0.500	30	914	303	2.136	0.267	0.4647	26.4838	1.7397	1/30/2009 15:40
3	0.500	30	791	305	2.057	0.267	0.4845	23.8718	1.6891	1/30/2009 17:05
4	0.500	30	768	306	1.747	0.267	0.5709	27.2885	1.9605	1/30/2009 17:37
2	0.500	30	720	307	1.931	0.267	0.6113	27.3779	2.0335	2/2/2009 14:15
5	0.500	30	730	308	1.950	0.267	0.5149	23.3957	1.7254	1/30/2009 19:05
6	0.500	30	764	309	1.877	0.267	0.5908	28.0944	2.0238	1/31/2009 10:20
7	0.500	30	594	311	2.114	0.267	0.5510	20.3087	1.6667	1/31/2009 17:20
8	0.500	30	542	312	1.944	0.267	0.8009	26.8983	2.3154	2/2/2009 8:25

601112
 CW

Handwritten signature

Sample ID	Cell #	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
1	301	3	1/30/2009 10:40	LCS	0638-F	24.10	pCi/L	83%
2	302	3	2/2/2009 9:15	LCS	0638-F	24.10	pCi/L	94%
2	303	3	1/30/2009 11:05	LCS	0638-F	24.10	pCi/L	110%
3	305	3	1/30/2009 11:30	LCS	0638-F	24.10	pCi/L	99%
4	306	3	1/30/2009 11:45	LCS	0638-F	24.10	pCi/L	113%
2	307	3	2/2/2009 9:40	LCS	0638-F	24.10	pCi/L	114%
5	308	3	1/30/2009 12:00	LCS	0638-F	24.10	pCi/L	97%
3	309	3	1/30/2009 13:05	LCS	0638-F	24.10	pCi/L	117%
7	311	3	1/30/2009 13:20	LCS	0638-F	24.10	pCi/L	84%
8	312	3	1/30/2009 13:40	LCS	0638-F	24.10	pCi/L	112%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	Net CPM	Ingrowth constant
1/26/2009 16:05	1/30/2009 10:40	90.58	4.42	0.9672	1.0019	21.6000	0.4800
1/30/2009 10:00	2/2/2009 9:15	71.25	4.42	0.9672	1.0019	21.5667	0.4032
1/26/2009 16:05	1/30/2009 11:05	91.00	4.58	0.9660	1.0019	30.1997	0.4809
1/26/2009 16:05	1/30/2009 11:30	91.42	5.58	0.9587	1.0019	26.1000	0.4788
1/26/2009 16:05	1/30/2009 11:45	91.67	5.87	0.9567	1.0019	25.3330	0.4787
1/30/2009 10:00	2/2/2009 9:40	71.67	4.58	0.9660	1.0019	23.7330	0.4044
1/26/2009 16:05	1/30/2009 12:00	91.92	7.08	0.9479	1.0019	24.0667	0.4753
1/26/2009 16:05	1/30/2009 13:05	93.00	21.25	0.8518	1.0019	25.1997	0.4305
1/26/2009 16:05	1/30/2009 13:20	93.25	28.00	0.8095	1.0019	19.5330	0.4099
1/26/2009 16:05	1/30/2009 13:40	93.58	66.75	0.6041	1.0019	17.7997	0.3067

5/11/12
 071
 LEWA 2141.04

Verification for Ra-226 Standard 0638-F

	Isotope	Value	Uncertainty
D. Roy 2/2/2009	0638-F #1	24.629	1.7426
	0638-F #2	24.438	1.7557
	0638-F #3	22.791	1.6808
Mean Value (Counting) =	23.953	99.60	Pass
Stdev =	1.010781096		Rule 3 (Pass/Fail)
Target =	24.05		
Lower Limit =	21.93100448		
Upper Limit =	25.97412886		
Rule 1 Pass/Fail	Pass		
Two sigma =	2.021562191		
10 % of Mean =	2.395256667		
Rule 2 (Pass/Fail)	Pass		

- 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 standard 0638-F using 0.1 mL for each source. Each source was counted using routine Lucas cell procedures. Calibration for 0299-G was used in this verification.

140 2/4/09
[Signature]
 Amanda L. Lehn
 2/4/09

General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GL-RAD-008 Isotope Pb-226
 Date Standards Prepared ^{2/11/09} 12/13/2007 Cocktail Type Used N/A
 Standard ID 0630-F Matrix of Vial/Planchett N/A
 Amount Used (g or ml) 0.1 ml Type of Scintillation Vial N/A
 Standard Activity (DPM/g or mL) 267.519 dpm/ml Pipette ID Used 1429303
 Reference Date 1/23/2004 Balance ID Used N/A
 Expiration Date 2/14/09 Quenching Agent N/A
 Residue/Carrier Agent 0.1 ml H₂O

	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				

LO 2/13/09

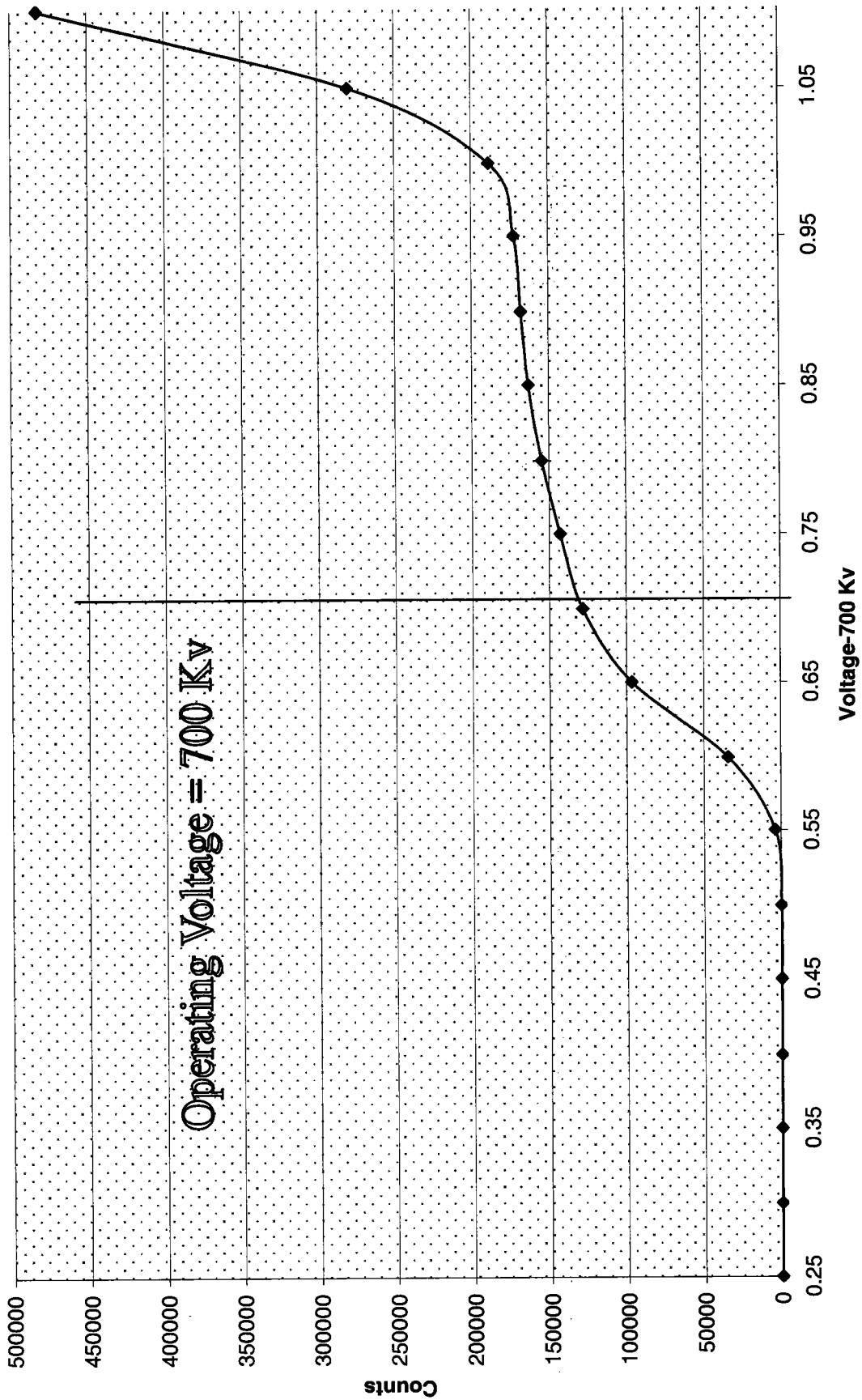
Prepared By: Kelli Brunell Date 2/13/09
 Reviewed By: [Signature] Date 2/14/09

Voltage Curve 1-09

Voltage Curve Ludlum # 3				
Volts	Counts	Date	Time	Detector
0.00	0	1/20/2009	13:45	3
0.05	0	1/20/2009	13:46	3
0.10	0	1/20/2009	13:47	3
0.15	0	1/20/2009	13:48	3
0.20	0	1/20/2009	13:49	3
0.25	0	1/20/2009	14:00	3
0.30	0	1/20/2009	14:01	3
0.35	0	1/20/2009	14:02	3
0.40	0	1/20/2009	14:03	3
0.45	0	1/20/2009	14:04	3
0.50	0	1/20/2009	14:05	3
0.55	3914	1/20/2009	14:06	3
0.60	34392	1/20/2009	14:07	3
0.65	96643	1/20/2009	14:08	3
0.70	128361	1/20/2009	14:09	3
0.75	142888	1/20/2009	14:10	3
0.80	154583	1/20/2009	14:11	3
0.85	163087	1/20/2009	14:12	3
0.90	167801	1/20/2009	14:13	3
0.95	172317	1/20/2009	14:14	3
1.00	188508	1/20/2009	14:15	3

LLA 2/4/09
LW
2/3/09

Ludlum 3 Voltage Curve



LCM
2/11/09

KO 213109

301	2.021	2/4/2009
302	2.131	2/4/2009
303	2.136	2/4/2009
305	2.057	2/4/2009
306	1.747	2/4/2009
307	1.931	2/4/2009
308	1.950	2/4/2009
309	1.877	2/4/2009
311	2.114	2/4/2009
312	1.944	2/4/2009

RE UT
2/4/09

~~RE UT~~
2/4/09
RE UT
2/4/09

General Engineering Laboratories

2040 Savage Road, Charleston, SC 29414

(843)556-8171

Lucas Cell Calibration Package

	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: Kelli Dorrel

Date: 2/28/09

Reviewed By: Angela Johnson

Date: 3/2/09

Effective Date: 3/2/09

Ra-226 Cell Constants

Standard Reference date : 12/15/1999
 standard ID : 0.299-G
 Volume added (mL) : 0.1
 Standard Reference Activity (DPM/mL) : 2446.35

Lucas cell #	Call 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
401	1.689	Average	2/23/2009 16:15	2/23/2009 10:30	2/20/2009 17:25	0.267	4580	30	152.67	243.66	2.71181	0.23958	3359	0.9960
401	1.585	Stdev	2/27/2009 13:15	2/27/2009 9:00	2/23/2009 16:05	0.267	5474	30	182.47	243.66	3.70486	0.17708	3363	0.9960
401	1.448		2/25/2009 14:40	2/25/2009 7:55	2/20/2009 17:25	0.267	5677	30	189.23	243.66	4.60417	0.28125	3361	0.9960
402	2.133	Average	2/23/2009 16:55	2/23/2009 11:05	2/20/2009 17:25	0.267	5817	30	193.90	243.66	2.73611	0.24306	3359	0.9960
402	2.173	Stdev	2/27/2009 14:10	2/27/2009 9:30	2/23/2009 16:05	0.267	7507	30	250.23	243.66	3.72569	0.19444	3363	0.9960
402	2.048		2/25/2009 15:25	2/25/2009 8:15	2/20/2009 17:25	0.267	8017	30	267.23	243.66	4.61806	0.29861	3361	0.9960
403	1.475	Average	2/23/2009 18:30	2/23/2009 11:30	2/20/2009 17:25	0.267	4011	30	133.70	243.66	2.75347	0.29167	3359	0.9960
403	1.495	Stdev	2/27/2009 14:50	2/27/2009 10:00	2/23/2009 16:05	0.267	5182	30	172.73	243.66	3.74853	0.20139	3363	0.9960
403	1.419		2/25/2009 15:55	2/25/2009 8:35	2/20/2009 17:25	0.267	5582	30	185.40	243.66	4.63194	0.30556	3361	0.9960
404	1.792	Average	2/23/2009 19:05	2/23/2009 13:10	2/20/2009 17:25	0.267	5005	30	166.83	243.66	2.82292	0.24653	3359	0.9960
404	2.142	Stdev	2/27/2009 15:25	2/27/2009 10:30	2/23/2009 16:05	0.267	7443	30	248.10	243.66	3.76736	0.20486	3363	0.9960
404	1.859		2/25/2009 20:20	2/25/2009 8:55	2/20/2009 17:25	0.267	7075	30	235.83	243.66	4.64583	0.47569	3361	0.9960
405	2.066	Average	3/2/2009 13:40	3/2/2009 10:30	2/25/2009 14:00	0.267	8602	30	286.73	243.66	4.85417	0.13194	3366	0.9960
405	1.899	Stdev	2/27/2009 16:00	2/27/2009 10:55	2/23/2009 16:05	0.267	6612	30	220.40	243.66	3.78472	0.21181	3363	0.9960
405	1.745		2/25/2009 20:55	2/25/2009 10:10	2/20/2009 17:25	0.267	6721	30	224.03	243.66	4.69792	0.44792	3361	0.9960
409	1.805	Average	2/24/2009 0:30	2/23/2009 15:20	2/20/2009 17:25	0.267	5039	30	167.97	243.66	2.91319	0.38194	3359	0.9960
409	2.153	Stdev	2/3/2009 21:10	2/3/2009 15:00	1/30/2009 10:50	0.267	7949	30	264.97	243.67	4.17361	0.25694	3339	0.9960
409	2.149		2/27/2009 16:35	2/27/2009 11:30	2/23/2009 16:05	0.267	7516	30	250.53	243.66	3.80903	0.21181	3363	0.9960
410	1.869	Average	2/26/2009 8:50	2/25/2009 13:05	2/20/2009 17:25	0.267	6838	30	227.93	243.66	4.31944	0.82292	3361	0.9960
410	1.965	Stdev	2/4/2009 8:30	2/3/2009 15:30	1/30/2009 10:50	0.267	6708	30	223.60	243.67	4.19444	0.70853	3339	0.9960
410	1.824		2/24/2009 8:00	2/23/2009 15:40	2/20/2009 17:25	0.267	4840	30	161.33	243.66	2.92708	0.68056	3359	0.9960
411	1.824	Average	2/24/2009 8:40	2/23/2009 15:55	2/20/2009 17:25	0.267	4839	30	161.30	243.66	2.93750	0.69792	3359	0.9960
411	1.911	Stdev	2/27/2009 17:45	2/27/2009 12:20	2/23/2009 16:05	0.267	6357	30	211.90	243.66	3.84375	0.22569	3363	0.9960
411	1.836		2/26/2009 9:30	2/25/2009 13:40	2/20/2009 17:25	0.267	6734	30	224.47	243.66	4.84375	0.82639	3361	0.9960
412	1.947	Average	2/26/2009 10:15	2/25/2009 14:05	2/20/2009 17:25	0.267	7137	30	237.90	243.66	4.86111	0.84028	3361	0.9960
412	2.131	Stdev	2/27/2009 18:20	2/27/2009 12:45	2/23/2009 16:05	0.267	7495	30	249.83	243.66	3.86111	0.23264	3363	0.9960
412	1.822		2/24/2009 9:40	2/23/2009 16:10	2/20/2009 17:25	0.267	4818	30	160.60	243.66	2.94792	0.72917	3359	0.9960

EffErr 0.123705 <- Put in Machines.xls (Lucas Cell Tab)

Angela J. ... 3/2/09
Miki Davel 3/2/09

401	1.574	3/2/2009
402	2.118	3/2/2009
403	1.463	3/2/2009
404	1.931	3/2/2009
405	1.903	3/2/2009
409	2.036	3/2/2009
410	1.886	3/2/2009
411	1.824	3/2/2009
412	1.967	3/2/2009


General Engineering Laboratories Verification Source Preparation Sheet

Applicable SOP Number GLRAD-A-008 Isotope Pu-239
 Date Standards Prepared 4/15/09 Cocktail Type Used NA
 Standard ID 02996 Matrix of Vial/Planchett NA
 Amount Used (g or ml) 0.1 Type of Scintillation Vial NA
 Standard Activity (DPM/g or mL) 2446.347 Pipette ID Used 1429303
 Reference Date 4/15/09 Balance ID Used 3604026
 Expiration Date 4/15/09 Quenching Agent NA
 Residue/Carrier Agent 0.5M HCl

	Standard Number	Quenching Vol (uL) Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
3	CA13				
43	CA143				
7	CA17				
42	CA142				
13	CA143				
44	CA144				
30	CA130				
48	CA148				
36	CA136				
35	CA135				
38	CA138				
15	CA115				
14	CA114				
46	CA146				
47	CA147				

Prepared By: Kell Deneke Date: 3/2/09
 Reviewed By: Angie J. Ghera Date: 3/2/09

Rev 1 RLM 9/10/97



Standard Traceability Log Rad

A Solution Material Info	
Isotope:	Radium-226
Prepared By:	Angela Johnson
Prep Date:	09/15/2000
Verification Date:	01/23/2008
Expiration Date:	01/23/2009
Primary Code:	0299-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.6634 g
Density(g/mL):	1.0012
Balance ID:	

Source Material Info	
Parent Code:	0299
Prepared By:	Angela Johnson
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

461

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

$(\text{Mass of parent(g)}) * (\text{Parent Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parent Activity (kBq/g)}) * (\text{conversion dpm to kBq}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (100 \text{ mL}) = 122414.2500 \text{ dpm/mL}$
$(4.6634 \text{ g}) * (43.75 \text{ kBq/g}) * (60000 \text{ dpm/kBq}) / (1.0012 \text{ g/mL}) / (100 \text{ mL}) = 122273.3377 \text{ dpm/g}$

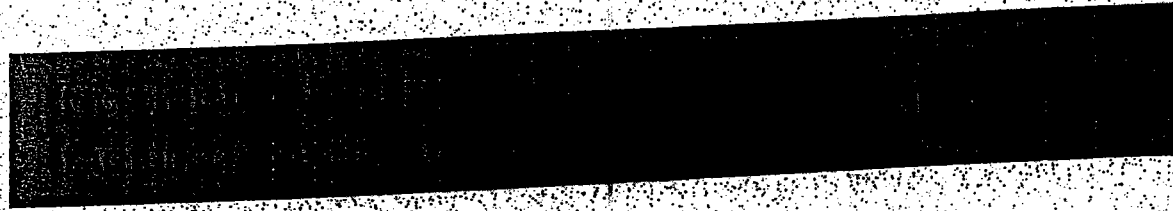
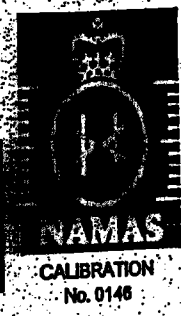
Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
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	04/02/2008	04/02/2009

CEL Laboratories LLC
Version 1.0 9/18/2000

8-21-00
Nycomed Amersham plc
Amersham Laboratories

0299



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

Date of
issue 17th December 1999

Nycomed
Amersham

Verification for Ra-226 Standard 0299-G

4/2/2008
D. Roy

Isotope
0299-G N1
0299-G N2
0299-G N3

Detector CPM
2536.9600
2520.2500
2532.5000

BKG CPM
52.4000
52.4000
52.4000

NET CPM
2484.5600
2467.8500
2480.1000

Detector Eff
1.917186
1.917186
1.917186

Mass. Used (G)
0.5057
0.5056
0.5042

Source DPM/G
2562.667649
2545.935781
2565.677715

Average =

Mean Value (Counting) = 2558.093715
Stdev = 10.63610098

104.944421
0.00415782

Pass
Rule 3 (Pass/Fail)

Certificate Value = 2437.6 dpm/mL
Lower Limit = 2536.821513 dpm/mL
Upper Limit = 2579.365917 dpm/mL
Rule 1 Pass/Fail = Fail *exception taken due to full recovery of standard
Two sigma = 21.27220197 dpm/mL
10 % of Mean = 255.8093715 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 Gold for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 4/02/08 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0024. Each verification source calculation was performed as follows:

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

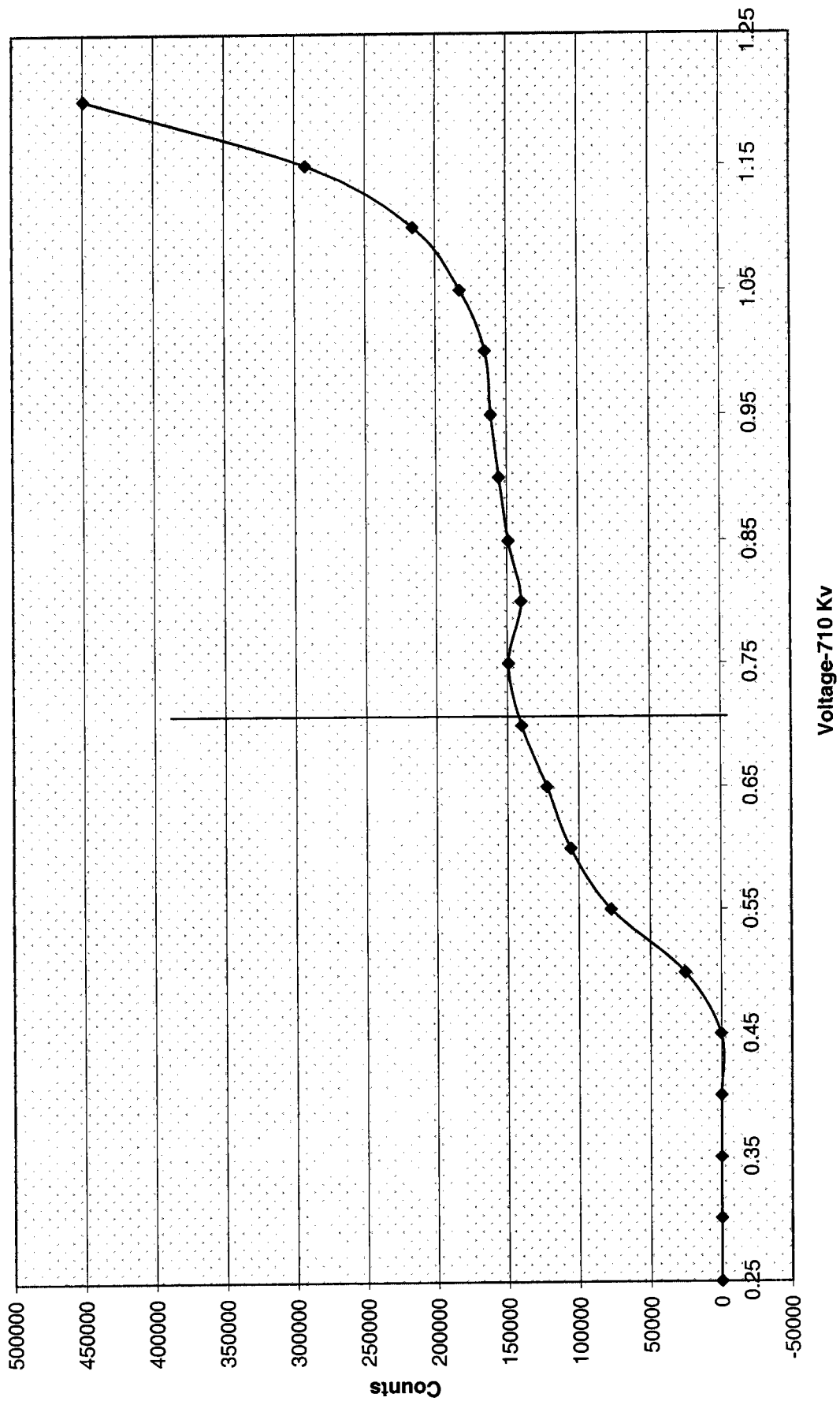
where:

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

RAD.SOP.M-001

Henry St. Johnson 4/19/08
David Roy 4/10/08
WMS

Ludlum 4 Voltage Curve



10/3/04

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 checked="" type="checkbox"/>		
	<input checked="" type="checkbox"/>		
	<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"/>		
	<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"/>		
	<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: Kelli Brancee

Date: 3/24/09

Reviewed By: Angela Johnson

Date: 3/25/09

Effective Date: 3/25/09

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	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	
501	1.927	15	3/6/2009 7:50	3/3/2009 8:15	2/25/2009 14:00	5281	30	176.03	243.03	5.76042	2.98264	3369	0.9960
501	2.086	9	3/11/2009 10:40	3/10/2009 12:50	3/5/2009 14:00	7611	30	253.70	243.03	4.95139	0.90972	3374	0.9960
501	2.247	42	3/12/2009 13:30	3/12/2009 9:10	3/6/2009 15:25	10210	30	340.33	243.03	5.73958	0.18056	3376	0.9960
502	1.772	16	3/18/2009 8:25	3/17/2009 12:50	3/10/2009 14:00	7951	30	265.03	243.03	6.95739	0.81597	3381	0.9960
502	2.045	14	3/11/2009 11:15	3/10/2009 13:20	3/5/2009 14:00	7474	30	249.13	243.03	4.97222	0.91319	3374	0.9960
502	1.816	19	3/12/2009 14:20	3/12/2009 9:35	3/6/2009 15:25	8243	30	274.77	243.03	5.75694	0.19792	3376	0.9960
503	1.581	46	3/6/2009 9:20	3/5/2009 9:20	2/25/2009 14:00	7250	30	241.67	243.03	7.80556	1.00000	3369	0.9960
503	1.633	42	3/19/2009 20:15	3/19/2009 15:15	3/12/2009 12:10	8282	30	276.07	243.03	7.12847	0.20833	3383	0.9960
503	1.588	44	3/12/2009 14:50	3/12/2009 10:00	3/6/2009 15:25	7214	30	240.47	243.03	5.77431	0.20139	3378	0.9960
504	1.592	47	3/6/2009 10:30	3/5/2009 9:40	2/25/2009 14:00	7262	30	242.07	243.03	7.81944	1.03472	3369	0.9960
504	1.611	34	3/11/2009 12:30	3/10/2009 14:05	3/5/2009 14:00	5889	30	196.30	243.03	5.00347	0.93403	3375	0.9960
504	1.641	19	3/19/2009 20:50	3/19/2009 15:30	3/12/2009 12:10	8310	30	277.00	243.03	7.13889	0.22222	3383	0.9960
505	2.364	16	3/6/2009 12:40	3/5/2009 10:05	2/25/2009 14:00	10654	30	355.13	243.03	7.83681	1.10764	3370	0.9960
505	2.438	23	3/11/2009 13:00	3/10/2009 14:30	3/5/2009 14:00	8924	30	297.47	243.03	5.02083	0.93750	3375	0.9960
505	2.190	7	3/12/2009 17:01	3/12/2009 10:50	3/6/2009 15:25	9884	30	329.47	243.03	5.80903	0.25764	3376	0.9960
506	1.902	25	3/6/2009 13:10	3/5/2009 10:30	2/25/2009 14:00	8576	30	285.87	243.03	7.85417	1.11111	3370	0.9960
506	2.124	47	3/11/2009 13:30	3/10/2009 15:05	3/5/2009 14:00	7804	30	260.13	243.03	5.04514	0.93403	3375	0.9960
506	1.965	13	3/12/2009 17:40	3/12/2009 11:15	3/6/2009 15:25	8954	30	298.47	243.03	5.82639	0.26736	3376	0.9960
507	1.708	23	3/6/2009 13:45	3/5/2009 10:55	2/25/2009 14:00	7695	30	256.50	243.03	7.87153	1.11806	3370	0.9960
507	1.722	25	3/11/2009 14:20	3/10/2009 15:27	3/5/2009 14:00	6315	30	210.50	243.03	5.06042	0.95347	3375	0.9960
507	1.674	43	3/12/2009 18:30	3/12/2009 11:35	3/6/2009 15:25	7535	30	251.17	243.03	5.84028	0.28819	3376	0.9960
508	1.605	39	3/6/2009 14:20	3/5/2009 11:25	2/25/2009 14:00	7236	30	241.20	243.03	7.89236	1.12153	3370	0.9960
508	1.497	44	3/19/2009 21:30	3/19/2009 15:45	3/12/2009 12:10	7581	30	252.03	243.03	7.14931	0.23958	3383	0.9960
508	1.499	3	3/12/2009 20:45	3/12/2009 12:10	3/6/2009 15:25	6680	30	222.67	243.03	5.86458	0.35764	3376	0.9960
509	1.730	28	3/6/2009 14:50	3/5/2009 11:45	2/25/2009 14:00	7795	30	259.83	243.03	7.90625	1.12847	3370	0.9960
509	1.857	39	3/11/2009 15:25	3/10/2009 16:05	3/5/2009 14:00	6810	30	227.00	243.03	5.08681	0.97222	3375	0.9960
509	1.806	36	3/12/2009 21:20	3/12/2009 12:35	3/6/2009 15:25	8049	30	268.30	243.03	5.88194	0.36458	3376	0.9960
510	1.460	9	3/6/2009 15:25	3/5/2009 12:10	2/25/2009 14:00	6578	30	219.27	243.03	7.92361	1.13542	3370	0.9960
510	1.433	28	3/11/2009 16:05	3/10/2009 16:20	3/5/2009 14:00	5246	30	174.87	243.03	5.09722	0.98958	3375	0.9960
510	1.481	35	3/12/2009 21:55	3/12/2009 12:50	3/6/2009 15:25	6589	30	219.63	243.03	5.89236	0.37847	3376	0.9960
511	1.839	34	3/6/2009 16:30	3/5/2009 13:20	2/25/2009 14:00	8316	30	277.20	243.03	7.97222	1.13194	3370	0.9960
511	1.995	46	3/12/2009 16:50	3/10/2009 16:35	3/5/2009 14:00	7283	30	242.77	243.03	5.10764	1.01042	3375	0.9960
511	2.041	37	3/12/2009 22:40	3/12/2009 13:10	3/6/2009 15:25	9088	30	302.27	243.03	5.90625	0.39583	3376	0.9960
512	1.796	48	3/11/2009 17:35	3/10/2009 16:50	3/5/2009 14:00	6542	30	218.07	243.03	5.11806	1.03125	3375	0.9960
512	2.100	38	3/12/2009 23:15	3/12/2009 13:30	3/6/2009 15:25	9322	30	310.73	243.03	5.92014	0.40625	3376	0.9960
512	1.972	48	3/18/2009 13:00	3/17/2009 14:00	3/6/2009 14:00	8653	30	288.43	243.03	7.00000	0.95833	3382	0.9960

*Backgrounds are not significant enough to be considered in calculations. ANSI N42.25-1997 (B.2).

ERR 0.143768 <- Put in Machines.xls (Lucas Cell Tab)

Calibration
Ra-226 Verification-Sheet
3/14/09

Cal # 5

3/24/09
3/19/09

3/19/09

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 15	500	2/25/09 1400	3/2/09 0815	3/6/09 0750	501	5	8	5281
Cal 14	500	2/25/09 1400	2/26/09 0845	3/6/09 0840	502	5	1	4208
		2/25/09 1400	3/3/09		503	5	100 3/3/09	6800
Cal 46	500	2/25/09 1400	3/5/09 0920	3/6/09 0900	503	5	3	7250
Cal 47	500	2/25/09 1400	3/5/09 0940	3/6/09 1030	504	5	1	7262
Cal 48	500	2/25/09 1400	3/5/09 1005	3/6/09 1040	505	5	3	10654
Cal 45	500	2/25/09 1400	3/5/09 1030	3/6/09 1016	506	5	8	8576
Cal 23	500	2/25/09 1400	3/5/09 1055	3/6/09 1345	507	5	4	7695
Cal 39	500	2/25/09 1400	3/5/09 1125	3/6/09 1420	508	5	1	7236
Cal 28	500	2/25/09 1400	3/5/09 1145	3/6/09 1450	509	5	8	7795
Cal 9	500	2/25/09 1400	3/5/09 1210	3/6/09 1525	510	5	2	6578
Cal 34	500	2/25/09 1400	3/5/09 1220	3/6/09 1630	511	5	6	8316

Calibration

Ra-226 Verification Sheet

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Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background CPM	Total Counts
Cal 9	500	3/5/09 1400	3/10/09 1250	3/11/09 1040	501	5	8	7611
Cal 14	500	3/5/09 1400	3/10/09 1370	3/11/09 1115	502	5	5	7474
Cal 15	500	3/5/09 1400	3/10/09 1345	3/11/09 1155	503	5	8	7352
Cal 16	500	3/5/09 1400	3/10/09 1405	3/11/09 1230	504	5	4	5889
Cal 17	500	3/5/09 1400	3/10/09 1430	3/11/09 1280	505	5	2	8924
Cal 17	500	3/5/09 1400	3/10/09 1505	3/11/09 1530	506	5	8	7804
Cal 18	500	3/5/09 1400	3/10/09 1527	3/11/09 1410	507	5	4	6315
Cal 19	500	3/5/09 1400	3/10/09 1550	3/11/09 1455	508	5	4	6443
Cal 29	500	3/5/09 1400	3/10/09 1605	3/11/09 1525	509	5	8	6810
Cal 28	500	3/5/09 1400	3/10/09 1620	3/11/09 1610	510	5	3	5246
Cal 44	500	3/5/09 1400	3/10/09 1635	3/11/09 1650	511	5	8	7283
Cal 48	500	3/5/09 1400	3/10/09 1650	3/11/09 1735	512	5	8	6542

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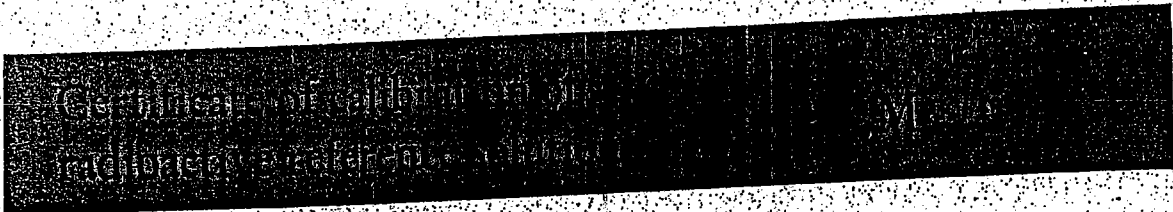
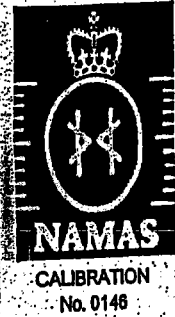
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8-21-00

Nycomed Amersham plc
Amersham Laboratories

0299



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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

Date of 478 17th December 1999



Standard Traceability Log Rad

Source Material Info	
Parent Code:	0299
Prepared By:	Angela Johnson
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 Johnson
Prep Date:	09/15/2000
Verification Date:	01/23/2008
Expiration Date:	01/23/2009
Primary Code:	0299-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.6634 g
Density(g/mL):	1.0012
Balance ID:	

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
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	04/02/2008	04/02/2009

GEL Laboratories LLC
Version 1.0 9/18/2000

Kelli Dorell

Verification for Ra-226 Standard 0299-G

4/2/2008	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff	Standard Mass. Used (G)	Source DPM/G
D. Roy	0299-G N1	2536.9600	52.4000	2484.5600	1.917186	0.5057	2562.667649
	0299-G N2	2520.2500	52.4000	2467.8500	1.917186	0.5056	2545.935781
	0299-G N3	2532.5000	52.4000	2480.1000	1.917186	0.5042	2565.677715
						Average =	2558.093715

Mean Value (Counting) = 2558.093715
 Stdev = 10.63610098

Certificate Value = 2437.6 dpm/mL
 Lower Limit = 2536.821513 dpm/mL
 Upper Limit = 2579.365917 dpm/mL

Rule 1 Pass/Fail **Fail** *exception taken due to full recovery of standard
 Two sigma = 21.27220197 dpm/mL
 10 % of Mean = 255.8093715 dpm/mL
 Rule 2 (Pass/Fail) **Pass**

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 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 Gold for Radium source standard verification. The Ra-226 efficiency calibration which was used for verification calculations was performed on 4/02/08 using source 0024-A (Ra-226). Calibration data is recorded in this logbook under Ra-226 0024. 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.

BAD.SOP.M-001

Handwritten notes:
 New Source 3/24/09
 4/19/08
 David Dwyer 4/10/08

General Engineering Laboratories
Verification Source Preparation Sheet
Calibration

Applicable SOP Number GL RAD-A-008 Isotope RA-226
 Date Standards Prepared 4/15/09 Cocktail Type Used NA
 Standard ID 0249-G Matrix of Vial/Planchett NA
 Amount Used (g or ml) 0.1 Type of Scintillation Vial NA
 Standard Activity (DPM/g or ml) 2446.347 Pipette ID Used 1429303
 Reference Date 12/15/99 Balance ID Used 36240216
 Expiration Date 4/2/09 Quenching Agent NA
 Residue/Carrier Agent D.5M HCl

	Standard Number	Quenching Vol (uL) Residue Volume (mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
15	Ca115				
46	Ca146				
47	Ca147				
16	Ca116				
25	Ca125				
23	Ca123				
39	Ca139				
28	Ca128				
9	Ca19				
34	Ca134				
42	Ca142				
19	Ca119				
44	Ca144				
7	Ca17				
13	Ca113				

Prepared By: Kelli D'Amico Date 3/24/09
 Reviewed By: _____ Date _____

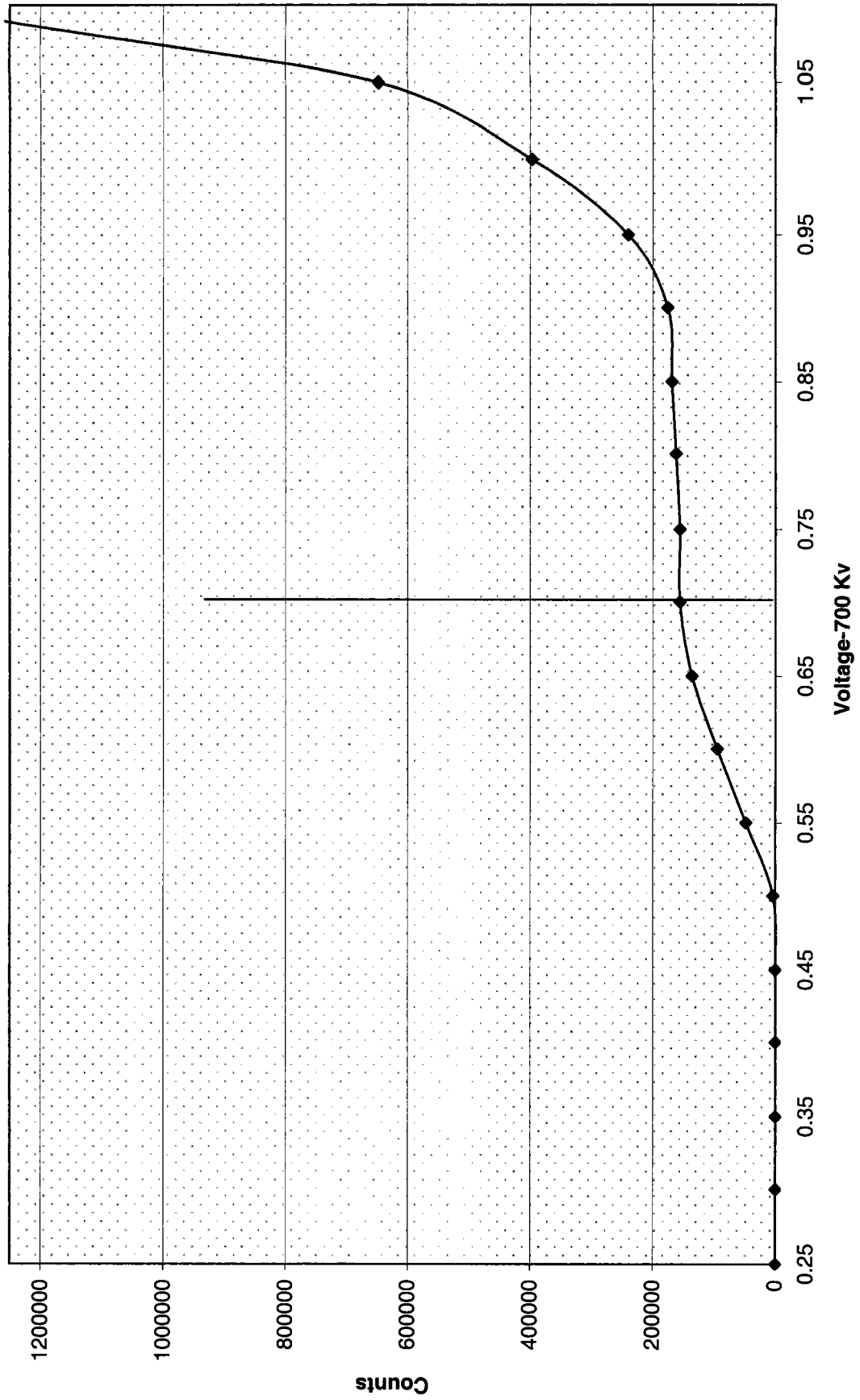
Rev 1 RLM 9/10/97

Voltage

Voltage Curve Ludlum # 5				
Volts	Counts	Date	Time	Detector
0.00	0	2/25/2009	9:20	5
0.05	0	2/25/2009	9:20	5
0.10	0	2/25/2009	9:20	5
0.15	0	2/25/2009	9:20	5
0.20	0	2/25/2009	9:20	5
0.25	0	2/25/2009	9:20	5
0.30	0	2/25/2009	9:20	5
0.35	0	2/25/2009	9:20	5
0.40	0	2/25/2009	9:20	5
0.45	0	2/25/2009	9:20	5
0.50	3611	2/25/2009	9:20	5
0.55	47984	2/25/2009	9:20	5
0.60	94752	2/25/2009	9:20	5
0.65	135854	2/25/2009	9:20	5
0.70	155952	2/25/2009	9:20	5
0.75	155696	2/25/2009	9:20	5
0.80	161972	2/25/2009	9:20	5
0.85	168840	2/25/2009	9:20	5
0.90	175598	2/25/2009	9:20	5
0.95	239969	2/25/2009	9:20	5
1.00	397249	2/25/2009	9:20	5

UD 3/25/09

Ludlum 5 Voltage Curve



KAP 3/24/09

Ra-226 WATER

Batch : LCSVER
 Date : 2/20/2008
 Analyst : DXM2

Procedure Code : LUC26RAL
 Parmname : Radium-226
 MDA : 1 pCi/L

Bkg Count Time: 30 min Instrument Used : LUCAS CELL DETECTOR

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 1	0.500	30	766	501	2.087	0.267	0.6041	28.8142	2.0728	3/16/2009 15:10
Ver 2	0.500	30	537	502	1.878	0.167	0.5682	23.0223	1.9747	3/16/2009 19:25
Ver 3	0.500	30	518	503	1.601	0.267	0.8071	25.9035	2.2832	3/16/2009 20:20
Ver 4	0.500	30	701	504	1.615	0.267	0.6021	26.2570	1.9774	3/20/2009 19:00
Ver 5	0.500	30	680	505	2.331	0.033	0.2559	23.5744	1.7758	3/16/2009 22:00
Ver 6	0.500	30	893	506	2.004	0.267	0.4859	27.0593	1.7988	3/20/2009 19:40
Ver 7	0.500	30	488	507	1.701	0.267	0.7287	22.0004	2.0008	3/16/2009 23:00
Ver 8	0.500	30	544	508	1.534	0.033	0.3760	27.7023	2.3344	3/16/2009 23:30
Ver 9	0.500	30	768	509	1.798	0.267	0.5430	25.9694	1.8657	3/20/2009 20:50
Ver 10	0.500	30	432	510	1.458	0.033	0.3700	21.6379	2.0476	3/17/2009 5:00
Ver 11	0.500	30	577	511	1.959	0.267	0.5934	21.2369	1.7694	3/17/2009 5:35
Ver 12	0.500	30	723	512	1.956	0.267	0.5945	26.7349	1.9815	3/17/2009 6:10

Sample ID	Sample Dup	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
501		5	3/16/2009 15:10	LCS	0638-F	24.05	pCi/L	120%
502		5	3/16/2009 19:25	LCS	0638-F	24.05	pCi/L	96%
503		5	3/16/2009 20:20	LCS	0638-F	24.05	pCi/L	108%
504		5	3/20/2009 19:00	LCS	0638-F	24.05	pCi/L	109%
505		5	3/16/2009 22:00	LCS	0638-F	24.05	pCi/L	98%
506		5	3/20/2009 19:40	LCS	0638-F	24.05	pCi/L	113%
507		5	3/16/2009 23:00	LCS	0638-F	24.05	pCi/L	91%
508		5	3/16/2009 23:30	LCS	0638-F	24.05	pCi/L	115%
509		5	3/20/2009 20:50	LCS	0638-F	24.05	pCi/L	108%
510		5	3/17/2009 5:00	LCS	0638-F	24.05	pCi/L	90%
511		5	3/17/2009 5:35	LCS	0638-F	24.05	pCi/L	88%
512		5	3/17/2009 6:10	LCS	0638-F	24.05	pCi/L	111%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM	Ingrowth constant
3/13/2009 15:30	3/16/2009 9:45	66.25	5.42	0.3936	0.9599	1.0019	25.2667	0.3785
3/13/2009 15:30	3/16/2009 10:10	66.67	9.25	0.3955	0.9325	1.0019	17.7333	0.3695
3/13/2009 15:30	3/16/2009 10:30	67.00	9.83	0.3970	0.9284	1.0019	17.0000	0.3693
3/16/2009 14:00	3/20/2009 13:05	95.08	5.92	0.5122	0.9563	1.0019	23.1000	0.4908
3/13/2009 15:30	3/16/2009 11:25	67.92	10.58	0.4012	0.9232	1.0019	22.6333	0.3711
3/16/2009 14:00	3/20/2009 13:20	95.33	6.33	0.5131	0.9533	1.0019	29.5000	0.4901
3/13/2009 15:30	3/16/2009 13:50	70.33	9.17	0.4120	0.9331	1.0019	15.9997	0.3852
3/13/2009 15:30	3/16/2009 13:50	70.33	9.67	0.4120	0.9296	1.0019	18.1000	0.3837
3/16/2009 14:00	3/20/2009 13:45	95.75	7.08	0.5147	0.9479	1.0019	25.3333	0.4888
3/13/2009 5:30	3/16/2009 14:25	80.92	14.58	0.4571	0.8957	1.0019	14.3667	0.4103
3/13/2009 5:30	3/16/2009 14:45	81.25	14.83	0.4585	0.8941	1.0019	18.9663	0.4107
3/13/2009 5:30	3/16/2009 15:00	81.50	15.17	0.4595	0.8918	1.0019	23.8330	0.4106

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
NUN 1	500	3/16/09 1530	3/16/09 0945	3/16/09 1510 3/16/09 1510 SEE 3/16/09	501	5	8	766
NUN 2	500	3/13/09 1530	3/16/09 1010	3/16/09 1925	502	5	85 140 3/12/09	537
NUN 3	500	3/13/09 1530	3/16/09 1030	3/16/09 2020	503	5	8	518
NUN 4	500	3/13/09 1530	3/16/09 1100	3/16/09 2115	504	5	8	577
NUN 5	500	3/13/09 1530	3/16/09 1125	3/16/09 2200	505	5	8 140 3/12/09	680
NUN 6	500	3/13/09 1530	3/16/09 1155	3/16/09 2230	506	5	8	707
NUN 7	500	3/13/09 1530	3/16/09 1320	3/16/09 2300	507	5	8	488
NUN 8	500	3/13/09 1530	3/16/09 1350	3/16/09 2330	508	5	8 140 3/12/09	544
NUN 9	500	3/13/09 1530	3/16/09 1410	3/17/09 0445 0345 0345 0345	509	5	8	640
NUN 10	500	3/13/09 1530	3/16/09 1415	3/17/09 0500 0500	510	5	8 140 3/12/09	432
NUN 11	500	3/13/09 1530	3/16/09 1445	3/17/09 0535	511	5	8	577
NUN 12	500	3/13/09 1530	3/16/09 1500	3/17/09 0610	512	5	8	723

140
3/24/09

140
3/24/09

140
3/24/09

3/25/09
3/25/09

Ra-226 Verification Sheet

Standard ID: 0638F

Volume Added (mL): 0.1

Expiration Date: 12/10

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Background Counts	Total Counts
VEN 1	500	3/16/09 1400	3/20/09 1245	3/20/09 1820	501	5	8	70
VEN 2	500	3/16/09 1400	3/20/09 1305	3/20/09 1900	504	5	8	701
VEN 3	500	3/16/09 1400	3/20/09 1320	3/30/09 1940 <small>10/10/09 1940</small>	506	5	8	893
VEN 4	500	3/16/09 1400	3/20/09 1345	3/30/09 2050 <small>10/10/09 2050</small>	509	5	8	768

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GEL 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:	03/04/2007
Ampoule Mass (g):	5.01065 g	Expiration Date:	03/04/2008
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
		Balance ID:	38080204

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

$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.8398 \text{ g}) * (23530 \text{ dps}) * (60 \text{ dpm/dps}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13636.6133 \text{ dpm/mL}$
$(4.8398 \text{ g}) * (23530 \text{ dps}) * (60 \text{ dpm/dps}) / (1.0266 \text{ g/mL}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13282.9676 \text{ dpm/g}$

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	01/17/2007	01/17/2008
07/17/2006	Mary Aders	2.1313	100	0638-C	282.6281 dpm/mL	07/26/2006	07/26/2007
03/28/2007	Daniel Roy	2.1025	100	0638-D	279.2744 dpm/ml	04/08/2007	04/08/2008
03/28/2007	Daniel Roy	45.468	250	0638-E	2415.7999 dpm/ml	04/09/2008	04/08/2009
12/18/2007	Daniel Roy	2.014	100	0638-F	267.519 dpm/ml	02/02/2009	02/02/2010
02/12/2008	Daniel Roy	.5004	100	0638-G	66.468 dpm/ml	03/04/2008	03/04/2009
07/23/2008	Daniel Roy	5.0607	250	0638-H	268.8845 dpm/ml	07/23/2008	07/23/2009

Verification for Ra-226 Standard 0638-F

D. Roy	Isotope	Value	Uncertainty
2/2/2009	0638-F #1	24.629	1.7426
	0638-F #2	24.438	1.7557
	0638-F #3	22.791	1.6808
Mean Value (Counting) =	23.953	99.60	Pass
Stdev =	1.010781096		Rule 3 (Pass/Fail)
Target =	24.05		
Lower Limit =	21.93100448		
Upper Limit =	25.97412886		
Rule 1 Pass/Fail	Pass		
Two sigma =	2.021562191		
10 % of Mean =	2.395256667		
Rule 2 (Pass/Fail)	Pass		

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 standard 0638-F using 0.1 mL for each source. Each source was counted using routine Lucas cell procedures. Calibration for 0299-G was used in this verification.

140 3124109

General Engineering Laboratories

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

Lucas Cell Calibration Package

	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?	✓		
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: KDD 8/14/09

Date: 8/14/09

Reviewed By: Angela D. Jones

Date: 8/16/09

Effective Date: 8/14/09

KD 8/16/09

Ra-226 Cell Constants

Standard Reference date: 12/15/1999
 Standard ID: 0299-G
 Volume added (mL): 0.1
 Standard Reference Activity (DPM/mL): 2446.3471

Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/time flushed to cell	Date/time end of degas	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
601	2.164	Average	5/26/2009 13:30	5/26/2009 9:30	5/19/2009 14:00	10883	30	362.77	6.81250	0.16667	3451	0.9959
601	2.253	Stdev	5/22/2009 12:55	5/22/2009 9:15	5/19/2009 14:00	6378	30	212.60	2.80208	0.15278	3447	0.9959
601	2.126		5/29/2009 14:45	5/29/2009 9:50	5/22/2009 10:45	10735	30	357.83	6.96181	0.20486	3454	0.9959
602	2.007	Average	5/29/2009 15:20	5/29/2009 10:15	5/22/2009 10:45	10133	30	337.77	6.97917	0.21181	3454	0.9959
602	2.194	Stdev	5/26/2009 14:05	5/26/2009 9:55	5/19/2009 14:00	11033	30	367.77	6.82986	0.17361	3451	0.9959
602	2.304		6/2/2009 14:45	6/2/2009 11:30	5/29/2009 9:50	8575	30	285.83	4.06944	0.13542	3458	0.9959
604	2.244	Average	6/2/2009 15:50	6/2/2009 11:50	5/29/2009 9:50	8321	30	277.37	4.08333	0.16667	3458	0.9959
604	2.076	Stdev	5/29/2009 15:55	5/29/2009 10:45	5/22/2009 12:00	10451	30	348.37	6.94792	0.21528	3454	0.9959
604	2.079		5/26/2009 15:45	5/26/2009 10:20	5/19/2009 14:00	10372	30	345.73	6.84722	0.22569	3451	0.9959
605	2.096	Average	5/26/2009 16:15	5/26/2009 10:50	5/19/2009 14:00	10474	30	349.13	6.86806	0.22569	3451	0.9959
605	2.228	Stdev	5/22/2009 16:25	5/22/2009 10:45	5/19/2009 14:00	6318	30	210.60	2.86458	0.23611	3447	0.9959
605	2.122		5/29/2009 17:15	5/29/2009 11:05	5/22/2009 12:50	10587	30	352.90	6.92708	0.25694	3454	0.9959
606	2.543	Average	5/29/2009 17:45	5/29/2009 13:10	5/26/2009 9:30	7816	30	260.53	3.15278	0.19097	3454	0.9959
606	2.202	Stdev	5/26/2009 16:45	5/26/2009 12:25	5/22/2009 12:00	8057	30	268.57	4.01736	0.18056	3451	0.9959
606	2.298		6/2/2009 18:20	6/2/2009 12:55	5/29/2009 9:50	8495	30	283.17	4.12847	0.22569	3458	0.9959
607	2.454	Average	6/2/2009 19:00	6/2/2009 13:10	5/29/2009 9:50	9057	30	301.90	4.13889	0.24306	3458	0.9959
607	2.572	Stdev	5/29/2009 19:00	5/29/2009 13:25	5/26/2009 9:55	7832	30	261.07	3.14583	0.23264	3454	0.9959
607	2.325		5/26/2009 17:15	5/26/2009 12:50	5/22/2009 12:00	8527	30	284.23	4.03472	0.18403	3451	0.9959
609	2.277	Average	5/26/2009 19:20	5/26/2009 13:10	5/22/2009 12:00	8261	30	275.37	4.04861	0.25694	3451	0.9959
609	2.280	Stdev	5/22/2009 19:20	5/22/2009 12:00	5/19/2009 14:00	6473	30	215.77	2.91667	0.30556	3447	0.9959
609	2.392		5/29/2009 19:40	5/29/2009 13:45	5/26/2009 10:20	7261	30	242.03	3.14236	0.24653	3454	0.9959
611	2.488	Average	5/29/2009 20:20	5/29/2009 14:00	5/26/2009 10:50	7510	30	250.33	3.13194	0.26389	3454	0.9959
611	2.245	Stdev	5/26/2009 22:00	5/26/2009 13:25	5/22/2009 12:00	8010	30	267.00	4.05903	0.35764	3451	0.9959
611	2.187		6/2/2009 19:50	6/2/2009 13:25	5/29/2009 9:50	8052	30	268.40	4.14931	0.26736	3458	0.9959

EffErr 0.066051 ← Put in Machines.xls (Lucas Cell Tab)

Backgrounds are not significant enough to be included in calculations ANSI N42.25-1997 (B.2).

Original of 9/16/09
WJ 8/16/09

601	2.181	8/4/2009
602	2.168	8/4/2009
604	2.133	8/4/2009
605	2.149	8/4/2009
606	2.348	8/4/2009
607	2.45	8/4/2009
609	2.316	8/4/2009
611	2.307	8/4/2009

Lucas	Ra-226	
Oldest Cal	01/23/2008	
Detector	Eff Error	Cal Date
1	0.0958	8/29/2008
2	0.0772	12/19/2008
3	0.0608	1/23/2008
4	0.1237	3/2/2009
5	0.1438	3/25/2009
6	0.0661	8/4/2009
7	0.0855	11/21/2008

**General Engineering Laboratories
Calibration Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-008

Isotope Ra226

Date Standards Prepared 4/5/05

Cocktail Type Used NA

Standard ID 0299-G

Matrix of Vial/Planchett NA

Amount Used (g or ml) 0.1

NA
NA

Standard Activity (DPM/g or mL) 2446.3471

Type of Scintillation Vial NA

Reference Date 12/15/99

Pipette ID Used 1429303

Expiration Date 1/26/10

Balance ID Used 38080204

Residue/Carrier Agent 0.1M HCl

Quenching Agent NA

	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				

JBG
8/4/09

JBG
8/4/09

Prepared By: Kelli Rowell Date 8/4/09

Reviewed By: Angela Gh... Date 8/4/09

Rev 1 RLM 9/10/97

10/8/05

Ra-226 Calibration Sheet

Standard ID: ~~0299-G~~ 0299-G
 Volume Added (mL): 0.1 *19814109

Expiration Date: ~~4/11/10~~ *19814109

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts
Cal 5	500	5/22/09 1045	5/24/09 0950	5/29/09 14:45	601	6	10735
Cal 6	500	5/22/09 1045	5/24/09 1015	5/29/09 15:20	602	6	10133
Cal 7	500	5/22/09 1200	5/24/09 1045	5/29/09 15:55	604	6	10451
Cal 8	500	5/22/09 1250	5/24/09 1105	5/29/09 17:15 17:20	605	6	10587
Cal 9	500	5/24/09 0930	5/24/09 1310	5/29/09 17:45	606	6	7816
Cal 10	500	5/24/09 0955	5/24/09 1325	5/29/09 19:00	607	6	7832
Cal 11	500	5/24/09 1000	5/24/09 1345	5/29/09 19:40	609	6	7261
Cal 12	500	5/24/09 1050	5/24/09 1400	5/29/09 20:20	611	6	7510
					608	6	
					610	6	
					612	6	

*19814109
 *19814109

Ra-226 Calibration Sheet

Standard ID: ~~0299-6~~ 0299-6
 Volume Added (mL): 0.1 ~~1126110~~ 1126110
 Expiration Date: ~~1126110~~ 1126110

Sample ID	Volume (mL)	End Degas Date/Time	End De-em Date/Time	Start Count Date/Time	Cell #	Det #	Total Counts
Cal 1	500	5/19/09 1400	5/22/09 0915	5/20/09 1255	601	6	6318
Cal 2	500	5/19/09 1400	5/22/09 0945	5/22/09 1325	602	6	6358
Cal 3	500	5/19/09 1400	5/22/09 1010	5/22/09 1420	604	6	4600
Cal 4	500	5/19/09 1400	5/22/09 1045	5/22/09 1625	605	6	6318
Cal 5	500	5/19/09 1400	5/22/09 1115	5/22/09 1700	606	6	6494
Cal 6	500	5/19/09 1400	5/22/09 1140	5/22/09 1735	607	6	6428
Cal 7	500	5/19/09 1400	5/22/09 1200	5/22/09 1920	609	6	6473
Cal 8	500	5/19/09 1400	5/22/09 1250	5/22/09 2035	611	6	6455
Cal 9							
Cal 10							
Cal 11							
Cal 12							

100 814109
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 100 814109
 6162-100 814109

1126110

219
 814109
 100 816109

EEC

8-21-00

Nycomed Amersham plc
Amersham Laboratories

0299

CALIBRATION
No. 0146

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: Radium-226

Product code: RAY44
Solution number: R4/131/89

Measurement Reference time: 1200 GMT on 15 December 1999

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 $\nu_{eff} = \infty$ 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

Approved
Signature

Date of
issue

17th December 1999

Verification for Ra-226 Standard 0299-G

M. Aders 1/26/2009	Isotope	Value DPM	Uncertainty
	0299-A #1	220.970	0.2670
	0299-A #2	241.730	0.2670
	0299-A #3	257.470	0.2670
Mean Value (Counting) =	240.057	98.52	Pass
Stdev =	18.30744475		Rule 3 (Pass/Fail)
Target =	243.67		
Lower Limit =	203.4417772		
Upper Limit =	276.6715562		
Rule 1 Pass/Fail	Pass		
Two sigma =	36.6148895		
10 % of Mean =	24.00566667		
Rule 2 (Pass/Fail)	Fail	*exception taken due to full recovery of standard	

- 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 standard 0299-A using 0.1 mL for each source. Each standard was degassed and transferred according to SOP GL-RAD-A-008. Each source was counted using Ra-226 procedures.

M. Aders 241.730
August 9th 8/4/09

Ra-226 Cell Constants

Standard Reference date: 12/15/1999
standard ID: 0299-G
Volume added (mL): 0.1
Standard Reference Activity (DPM/mL): 2446.35

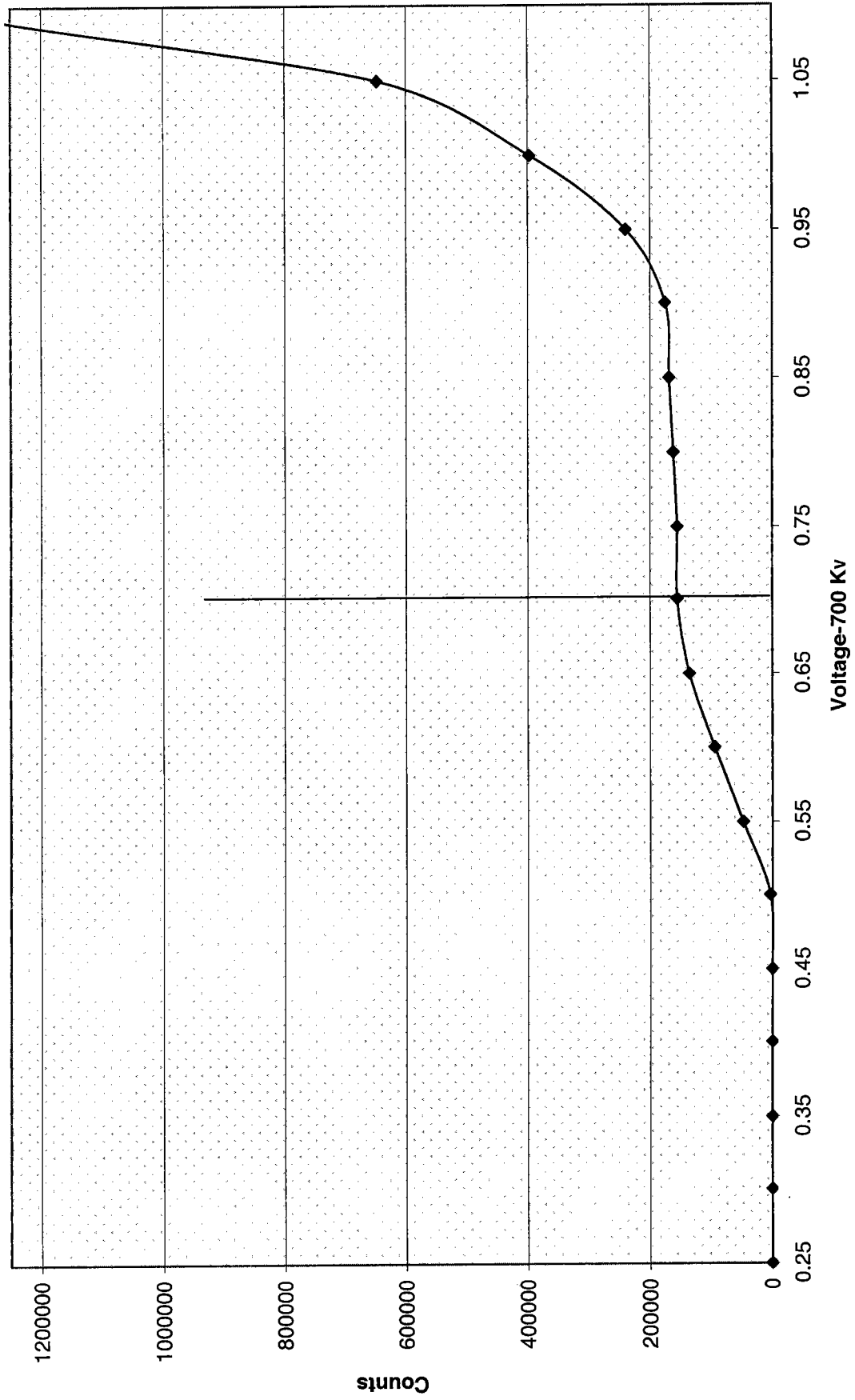
Lucas cell #	Cell constant	Standard Source	Date/Time of count	Date/Time flushed to cell	Date/Time end of degas	bkg cpm	total counts	count time min	cpm	Known activity dpm	t1 (days) end-degas to flush	t2 (days) end-flush to count	t3 (days) Std Ref Date to count	Decay from Std Ref Date to count
301	2.021	43	39839.60764	39839.39236	39835.38194	0.267	7282	30	242.73	243.6698	4.01041667	0.2152778	3330.607639	0.996055555
302	2.131	47	39839.64583	39839.41319	39835.38194	0.267	7555	30	251.83	243.6698	4.03125	0.2326389	3330.645833	0.996055551
303	2.136	19	39839.72222	39839.43403	39835.38194	0.267	8028	30	267.60	243.6697	4.05208333	0.2881944	3330.722222	0.996055419

VOLTAGE CURVE 3_08

Voltage Curve Ludlum # 6				
Volts	Counts	Date	Time	Detector
0.00	0	5/20/2009	9:00	6
0.05	0	5/20/2009	9:01	6
0.10	0	5/20/2009	9:02	6
0.15	0	5/20/2009	9:03	6
0.20	0	5/20/2009	9:04	6
0.25	0	5/20/2009	9:05	6
0.30	0	5/20/2009	9:06	6
0.35	0	5/20/2009	9:07	6
0.40	0	5/20/2009	9:08	6
0.45	512	5/20/2009	9:09	6
0.50	3625	5/20/2009	9:10	6
0.55	47990	5/20/2009	9:11	6
0.60	94752	5/20/2009	9:12	6
0.65	135854	5/20/2009	9:13	6
0.70	155952	5/20/2009	9:14	6
0.75	155700	5/20/2009	9:15	6
0.80	161972	5/20/2009	9:16	6
0.85	168860	5/20/2009	9:17	6
0.90	175598	5/20/2009	9:18	6
0.95	239969	5/20/2009	9:19	6
1.00	397270	5/20/2009	9:20	6

M 8/4/09

Ludlum 6 Voltage Curve



WGS

Ra-226 WATER

Batch : LCSVER
Date : 6/2/2009
Analyst : KSD1

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 1	0.800	30	1018	601	2.181	0.267	0.2115	13.4431	0.8356	6/8/2009 15:35
ver 2	0.800	30	994	602	2.168	0.100	0.1442	13.2563	0.8279	6/8/2009 16:05
ver 3	0.800	30	955	604	2.133	0.167	0.1786	12.9119	0.8254	6/8/2009 16:40
ver 4	0.800	30	1144	605	2.149	0.267	0.2143	15.3201	0.8971	6/8/2009 17:15
ver 5	0.800	30	1046	606	2.348	0.233	0.1867	12.8971	0.7895	6/8/2009 18:30
ver 6	0.800	30	1001	607	2.450	0.267	0.1893	11.8239	0.7413	6/8/2009 19:15
ver 7	0.800	30	1060	609	2.316	0.267	0.2007	13.2848	0.8089	6/8/2009 20:05
ver 8	0.800	30	943	611	2.307	0.267	0.2053	12.0754	0.7806	6/8/2009 23:10

Handwritten signature and date: 6/8/09

Sample ID	Cell #	Det #	Run Date	Sample Type	Standard ID	NC	NC units	Recovery/RPD
ver 1	601	6	6/8/2009 15:35	LCS	0638-F	15.03	pCi/L	89%
ver 2	602	6	6/8/2009 16:05	LCS	0638-F	15.03	pCi/L	88%
ver 3	604	6	6/8/2009 16:40	LCS	0638-F	15.03	pCi/L	86%
ver 4	605	6	6/8/2009 17:15	LCS	0638-F	15.03	pCi/L	102%
ver 5	606	6	6/8/2009 18:30	LCS	0638-F	15.03	pCi/L	86%
ver 6	607	6	6/8/2009 19:15	LCS	0638-F	15.03	pCi/L	79%
ver 7	609	6	6/8/2009 20:05	LCS	0638-F	15.03	pCi/L	88%
ver 8	611	6	6/8/2009 23:10	LCS	0638-F	15.03	pCi/L	80%

DEGASSING DATE/TIME	DE-EMAN. DATE/TIME	DEGASS-DE-EM	dE-EM-COUNT	constant	constant	constant	Net CPM	Ingrowth constant
6/2/2009 12:40	6/8/2009 12:15	143.58	3.33	0.6618	0.9751	1.0019	33.6667	0.6466
6/2/2009 12:40	6/8/2009 12:40	144.00	3.42	0.6628	0.9745	1.0019	33.0333	0.6472
6/2/2009 12:40	6/8/2009 13:05	144.42	3.58	0.6639	0.9733	1.0019	31.6663	0.6474
6/2/2009 12:40	6/8/2009 13:30	144.83	3.75	0.6650	0.9721	1.0019	37.8667	0.6476
6/2/2009 12:40	6/8/2009 13:50	145.17	4.67	0.6658	0.9654	1.0019	34.6333	0.6440
6/2/2009 12:40	6/8/2009 14:15	145.58	5.00	0.6668	0.9630	1.0019	33.0997	0.6434
6/2/2009 12:40	6/8/2009 14:35	145.92	5.50	0.6677	0.9593	1.0019	35.0667	0.6417
6/2/2009 12:40	6/8/2009 15:00	146.33	8.17	0.6687	0.9402	1.0019	31.1663	0.6299

Handwritten notes:
 8/16/09
 11/18/10/09

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: γ -impurities (other than decay products) <0.1%

5.01065 grams 0.1M HCl solution with 50 μ g/g Ba carrier.

P O NUMBER 3231RD, Item 5

SOURCE PREPARED BY:

M. D. Currie
M. D. Currie, Radiochemist

Q A APPROVED:

RCUW 1/26/04

Standard Traceability Log Rad

Source Material Info	
Parent Code:	0638
Prepared By:	Amanda Fehr
Carrier Conc:	0.1M HCl
Reference Date:	01/23/2004
Ampoule Mass (g):	5.01065 g
Uncertainty:	+/- 3.3 %
LogBook No:	RC-S-037-037

A Solution Material Info	
Isotope:	Radium-226
Prepared By:	Amanda Fehr
Prep Date:	01/16/2006
Verification Date:	04/09/2009
Expiration Date:	04/09/2010
Primary Code:	0638-A
Dilution(mL):	100 mL
Mass of Parent(g):	4.8398 g
Density(g/mL):	1.0266
Balance ID:	38080204

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

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$$

$$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$$

$$(4.8398 \text{ g}) * (23530 \text{ dps}) * (60 \text{ dpm/dps}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13636.6133 \text{ dpm/mL}$$

$$(4.8398 \text{ g}) * (23530 \text{ dps}) * (60 \text{ dpm/dps}) / (1.0266 \text{ g/mL}) / (5.01065 \text{ g} * 100 \text{ mL}) = 13282.9676 \text{ dpm/g}$$

WMO 8/14/09

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	01/17/2007	01/17/2008
07/17/2006	Mary Aders	2.1313	100	0638-C	282.6281 dpm/mL	07/26/2006	07/26/2007
03/28/2007	Daniel Roy	2.1025	100	0638-D	279.2744 dpm/ml	04/08/2007	04/08/2008
03/28/2007	Daniel Roy	45.468	250	0638-E	2415.7999 dpm/ml	04/09/2009	04/09/2010
12/18/2007	Daniel Roy	2.014	100	0638-F	267.519 dpm/ml	02/02/2009	02/02/2010
02/12/2008	Daniel Roy	.5004	100	0638-G	66.468 dpm/ml	03/02/2009	03/02/2010
07/23/2008	Daniel Roy	5.0607	250	0638-H	268.8845 dpm/ml	07/17/2009	07/17/2010

GEL Laboratories LLC
Version 1.0 9/18/2000

W084116

Verification for Ra-226 Standard 0638-F

D. Roy 2/2/2009	Isotope	Value	Uncertainty
	0638-F #1	24.629	1.7426
	0638-F #2	24.438	1.7557
	0638-F #3	22.791	1.6808
Mean Value (Counting) =	23.953	99.60	Pass
Stdev =	1.010781096		Rule 3 (Pass/Fail)
Target =	24.05		
Lower Limit =	21.93100448		
Upper Limit =	25.97412886		
Rule 1 Pass/Fail	Pass		
Two sigma =	2.021562191		
10 % of Mean =	2.395256667		
Rule 2 (Pass/Fail)	Pass		

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 standard 0638-F using 0.1 mL for each source. Each source was counted using routine Lucas cell procedures. Calibration for 0299-G was used in this verification.

Handwritten notes:
 0638-F #1
 2/2/2009
 Amanda [Signature]

Radium-226 Que Sheet

General Engineering Laboratories, Radiochemistry Division

Batch #: 838839

02/03/2009

Analyst: KSDI

First Client Due Date:

Internal Due Date: 02/07/2009

Spike Isotope: Radium-226 Spike Code: 0003-P

Expiration Date: 12/27/08

Nom Conc:

LCS Isotope: Radium-226 LCS Code: 003000

Expiration Date: 12/27/08

Nom Conc:

Prep Date: 12/27/08

Pipet ID:

Initials: VSD

Witness:

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 Date/Time	De-em Date/Time	Start Count Date/Time	Cell #	Det #	Bkg counts	Total Counts
1201770521-1	LCS for batch 838839	LCS	GROUND	WAJ 1	1 pCi/L	QC ACCOUNT	500	1/26/09 10:05	1/26/09 11:30	1/26/09 13:10	1/26/09 17:05	305	3	9	741
1201770522-1	LCS for batch 838839	LCS	GROUND	WAJ 1	1 pCi/L	QC ACCOUNT	500	1/26/09 10:05	1/26/09 11:45	1/26/09 13:10	1/26/09 17:57	304	3	9	748
1201770523-1	LCS for batch 838839	LCS	GROUND	WAJ 1	1 pCi/L	QC ACCOUNT	500	1/26/09 10:05	1/26/09 12:00	1/26/09 13:10	1/26/09 19:05	305	3	9	743

Comments:

Instrument ID's:

LUCAS-5028, LUCAS-13617, LUCAS-90899, LUCAS-162753, LUCAS-132286, LUC-6-17055

Data Reviewed By:

WJ Slivers

Radium-226 Liquid

Filename : RA226.XLS
 File type : Excel
 Version # : 1.2.3

Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A
 Pipet, 0.1 ml Stdev : +/- 0.000701 ml
 Pipet, 0.5 ml Stdev : +/- 0.002564 ml
 Pipet, 1 ml Stdev : +/- 0.005480 ml

Batch : 838839
 Analyst : KSD1
 Prep Date : 1/26/2009
 Ra-226 Abundance : 1
 Ra-226 Method Uncertainty : 0.0918

Procedure Code : LUC26RAL
 Parmname : Radium-226
 Required MDA : 1 pCi/L
 Half-life of Ra-226 : 1600 years
 Half-life of Rn-222: 3.823 days
 Batch counted on : LUCAS CELL DETECTOR
 BKG Count time : 30 min

LCS S/N : 0638-F
 LCS Exp Date : 12/20/2008
 LCS Activity (dpm/ml): 266.94
 LCS Volume Added: 0.10

Sample Characteristics		Count Raw Data				Weekly Background			Detector Efficiency		
Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Cell Number	Counting Time (min.)	Gross Counts	Gross CPM	Counts	CPM	Count Time (min.)	Efficiency (cpm/dpm)
1201770521.1	0.5000	2.0256E-05	1/26/2009 0:00	305	30	791	26.367	8	0.267	30	1.9930
1201770522.1	0.5000	2.0256E-05	1/26/2009 0:00	306	30	768	25.600	8	0.267	30	1.9500
1201770523.1	0.5000	2.0256E-05	1/26/2009 0:00	308	30	730	24.333	8	0.267	30	2.0010

Handwritten notes:
 UNSM105
 1/26/09

Detector Efficiency Error (cpm/dpm)	Cell Calibration Date	Cell Calibration Due Date	De-Gas Date/Time	Rn-222 Ingrowth		Count Start Date/Time	Rn-222 Corrections		Ra-226 Decay
				End Date/Time	De-Gas to Ingrowth		Ingrowth to Count	During Count	
0.06082	1/23/2008	1/22/2009	1/26/2009 16:05	1/30/2009 11:30	1/30/2009 17:05	0.499	0.959	1.002	1.000
0.06082	1/23/2008	1/22/2009	1/26/2009 16:05	1/30/2009 11:45	1/30/2009 17:37	0.500	0.957	1.002	1.000
0.06082	1/23/2008	1/22/2009	1/26/2009 16:05	1/30/2009 12:00	1/30/2009 19:05	0.501	0.948	1.002	1.000

K0816104
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- Notes.
 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Results Decision Level pCi/L	Critical Level pCi/L	MDA pCi/L	Sample Act.		Net Count Rate CPM	Net Count Rate Error CPM	2 SIGMA Counting Uncertainty pCi/L		2 SIGMA Total Prop. Uncertainty pCi/L		Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
			Conc. pCi/L	Error pCi/L			2 SIGMA Counting Uncertainty pCi/L	2 SIGMA Total Prop. Uncertainty pCi/L								
0.2932	0.2070	0.5083	24.6287	0.0707	26.1000	0.9422	1.7426	5.5940	LCS					24.0486	102.4%	
0.2997	0.2116	0.5196	24.4384	0.0710	25.3333	0.9286	1.7557	5.5591	LCS					24.0486	101.6%	
0.2942	0.2077	0.5101	22.7906	0.0715	24.0667	0.9055	1.6808	5.1982	LCS					24.0486	94.8%	

11/28/10
(15)

GAS FLOW PROPORTIONAL COUNTERS


General Engineering Laboratories

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

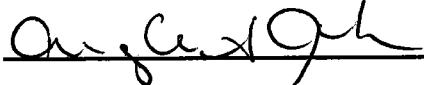
Gas Flow Proportional Counter Calibration Package

Method: Ra-228 (AC)

	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? beta absorption curves? beta plateau?			Average Efficiency
	<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"/>		
5) Is the method Carrier Standardization included?			N/A

Prepared By: 

Date: 7/2/09

Reviewed By: 

Date: 7/2/09

Effective Date: 7/2/09

Ra-228 Calibration PROTEAN Detectors

Detector #	Source #	Seperation date	Count date	Ac-228 decay (dec)	Spike Vol. Ra-228 (mL)	Std. Act. Ra-228 dpm/mL	Standard Nominal dpm	raw beta counts	ct. time (min)	Beta cpm	corrected* cpm	Ra-228 eff (cpm/dpm)	Seperation time	
													Decay Corrected	Volume corrected
1A	1	7/1/09 10:45	7/1/2009 13:36	0.7249	1.5	6363.2	9544.8	13564	3	4521.3	6237.434348	0.6535		
1A	2	7/1/09 10:45	7/1/2009 13:52	0.7032	1.5	6363.2	9544.8	12775	3	4258.3	6055.521583	0.6344		
1A	3	7/1/09 10:45	7/1/2009 13:48	0.7083	1.5	6363.2	9544.8	12750	3	4250.0	6000.085083	0.6286	Average EFF	
1A	4	7/1/09 10:45	7/1/2009 13:41	0.7170	1.5	6363.2	9544.8	12410	3	4136.7	5769.683602	0.6045	0.6303	
1B	1	7/1/09 10:45	7/1/2009 13:41	0.7174	1.5	6363.2	9544.8	13292	3	4430.7	6176.07771	0.6471		
1B	2	7/1/09 10:45	7/1/2009 13:36	0.7246	1.5	6363.2	9544.8	13274	3	4424.7	6106.181463	0.6397		
1B	3	7/1/09 10:45	7/1/2009 13:52	0.7031	1.5	6363.2	9544.8	12699	3	4233.0	6020.43969	0.6308	Average EFF	
1B	4	7/1/09 10:45	7/1/2009 13:48	0.7082	1.5	6363.2	9544.8	12072	3	4024.0	5682.267909	0.5953	0.6282	
1C	1	7/1/09 10:45	7/1/2009 13:48	0.7085	1.5	6363.2	9544.8	12813	3	4271.0	6028.410186	0.6316		
1C	2	7/1/09 10:45	7/1/2009 13:41	0.7172	1.5	6363.2	9544.8	12979	3	4326.3	6032.15531	0.6320		
1C	3	7/1/09 10:45	7/1/2009 13:36	0.7245	1.5	6363.2	9544.8	12755	3	4251.7	5868.722998	0.6149	Average EFF	
1C	4	7/1/09 10:45	7/1/2009 13:52	0.7030	1.5	6363.2	9544.8	11917	3	3972.3	5650.765354	0.5920	0.6176	
1D	1	7/1/09 10:45	7/1/2009 13:52	0.7033	1.5	6363.2	9544.8	12473	3	4157.7	5911.258105	0.6193		
1D	2	7/1/09 10:45	7/1/2009 13:48	0.7084	1.5	6363.2	9544.8	12484	3	4161.3	5874.170562	0.6154		
1D	3	7/1/09 10:45	7/1/2009 13:41	0.7171	1.5	6363.2	9544.8	12289	3	4096.3	5712.363902	0.5985	Average EFF	
1D	4	7/1/09 10:45	7/1/2009 13:36	0.7243	1.5	6363.2	9544.8	12115	3	4038.3	5575.47435	0.5841	0.6043	
2A	1	7/1/09 10:45	7/1/2009 13:57	0.6960	1.5	6363.2	9544.8	12499	3	4166.3	5986.085459	0.6272		
2A	2	7/1/09 10:45	7/1/2009 14:15	0.6728	1.5	6363.2	9544.8	12103	3	4034.3	5996.6905	0.6283		
2A	3	7/1/09 10:45	7/1/2009 14:09	0.6815	1.5	6363.2	9544.8	11968	3	3989.3	5854.110901	0.6133	Average EFF	
2A	4	7/1/09 10:45	7/1/2009 14:02	0.6899	1.5	6363.2	9544.8	11855	3	3951.7	5728.227222	0.6001	0.6172	
2B	1	7/1/09 10:45	7/1/2009 14:02	0.6903	1.5	6363.2	9544.8	12471	3	4157.0	6022.266434	0.6309		
2B	2	7/1/09 10:45	7/1/2009 13:57	0.6958	1.5	6363.2	9544.8	12492	3	4164.0	5984.232843	0.6270		
2B	3	7/1/09 10:45	7/1/2009 14:15	0.6727	1.5	6363.2	9544.8	11892	3	3964.0	5892.884561	0.6174	Average EFF	
2B	4	7/1/09 10:45	7/1/2009 14:09	0.6814	1.5	6363.2	9544.8	11539	3	3846.3	5644.974311	0.5914	0.6167	
2C	1	7/1/09 10:45	7/1/2009 14:08	0.6817	1.5	6363.2	9544.8	12050	3	4016.7	5892.005142	0.6173		
2C	2	7/1/09 10:45	7/1/2009 14:02	0.6901	1.5	6363.2	9544.8	11914	3	3971.3	5754.571355	0.6029		
2C	3	7/1/09 10:45	7/1/2009 13:58	0.6957	1.5	6363.2	9544.8	11994	3	3998.0	5746.92868	0.6021	Average EFF	
2C	4	7/1/09 10:45	7/1/2009 14:15	0.6726	1.5	6363.2	9544.8	10889	3	3629.7	5396.37168	0.5654	0.5969	
2D	1	7/1/09 10:45	7/1/2009 14:15	0.6729	1.5	6363.2	9544.8	12010	3	4003.3	5949.493049	0.6233		
2D	2	7/1/09 10:45	7/1/2009 14:08	0.6816	1.5	6363.2	9544.8	12124	3	4041.3	5929.303014	0.6212		
2D	3	7/1/09 10:45	7/1/2009 14:02	0.6900	1.5	6363.2	9544.8	12168	3	4056.0	5878.360714	0.6159	Average EFF	
2D	4	7/1/09 10:45	7/1/2009 13:58	0.6954	1.5	6363.2	9544.8	11692	3	3897.3	5604.158523	0.5871	0.6119	
3A	1	7/1/09 10:45	7/1/2009 14:19	0.6675	1.5	6363.2	9544.8	11194	3	3731.3	5589.748519	0.5856		
3A	2	7/1/09 10:45	7/1/2009 14:30	0.6482	1.5	6363.2	9544.8	14227	4	3556.8	5486.792678	0.5748		
3A	3	7/1/09 10:45	7/1/2009 14:35	0.6548	1.5	6363.2	9544.8	14180	4	3545.0	5414.108112	0.5672	Average EFF	
3A	4	7/1/09 10:45	7/1/2009 14:25	0.6608	1.5	6363.2	9544.8	13754	4	3438.5	5203.464549	0.5452	0.5682	
3B	1	7/1/09 10:45	7/1/2009 14:25	0.6612	1.5	6363.2	9544.8	15370	4	3842.5	5811.010789	0.6088		
3B	2	7/1/09 10:45	7/1/2009 14:20	0.6673	1.5	6363.2	9544.8	11695	3	3898.3	5842.303251	0.6121		
3B	3	7/1/09 10:45	7/1/2009 14:35	0.6481	1.5	6363.2	9544.8	14905	4	3726.3	5749.171166	0.6023	Average EFF	
3B	4	7/1/09 10:45	7/1/2009 14:30	0.6547	1.5	6363.2	9544.8	14220	4	3555.0	5430.231301	0.5689	0.5980	
3C	1	7/1/09 10:45	7/1/2009 14:29	0.6552	1.5	6363.2	9544.8	15644	4	3911.0	5969.527404	0.6254		
3C	2	7/1/09 10:45	7/1/2009 14:25	0.6611	1.5	6363.2	9544.8	15964	4	3991.0	6036.911214	0.6325		
3C	3	7/1/09 10:45	7/1/2009 14:20	0.6672	1.5	6363.2	9544.8	11701	3	3900.3	5846.033242	0.6125	Average EFF	
3C	4	7/1/09 10:45	7/1/2009 14:35	0.6480	1.5	6363.2	9544.8	14729	4	3682.3	5682.352456	0.5953	0.6164	
3D	1	7/1/09 10:45	7/1/2009 14:35	0.6484	1.5	6363.2	9544.8	15152	4	3788.0	5842.430209	0.6121		
3D	2	7/1/09 10:45	7/1/2009 14:30	0.6550	1.5	6363.2	9544.8	15168	4	3792.0	5789.343603	0.6065		
3D	3	7/1/09 10:45	7/1/2009 14:25	0.6610	1.5	6363.2	9544.8	15295	4	3823.8	5785.011122	0.6061	Average EFF	
3D	4	7/1/09 10:45	7/1/2009 14:20	0.6670	1.5	6363.2	9544.8	10942	3	3647.3	5468.022172	0.5729	0.5994	
4A	1	7/1/09 10:45	7/1/2009 14:40	0.6418	1.5	6363.2	9544.8	15298	4	3824.5	5959.288371	0.6243		
4A	2	7/1/09 10:45	7/1/2009 15:00	0.6187	1.5	6363.2	9544.8	14897	4	3724.3	6019.957238	0.6307		
4A	3	7/1/09 10:45	7/1/2009 14:53	0.6266	1.5	6363.2	9544.8	15050	4	3762.5	6005.095127	0.6291	Average EFF	
4A	4	7/1/09 10:45	7/1/2009 14:48	0.6325	1.5	6363.2	9544.8	14462	4	3615.5	5715.951787	0.5989	0.6208	
4B	1	7/1/09 10:45	7/1/2009 14:48	0.6329	1.5	6363.2	9544.8	15335	4	3833.8	6057.768128	0.6347		
4B	2	7/1/09 10:45	7/1/2009 14:41	0.6416	1.5	6363.2	9544.8	15513	4	3878.3	6044.745331	0.6333		
4B	3	7/1/09 10:45	7/1/2009 15:00	0.6186	1.5	6363.2	9544.8	14521	4	3630.3	5868.58525	0.6148	Average EFF	
4B	4	7/1/09 10:45	7/1/2009 14:53	0.6265	1.5	6363.2	9544.8	14328	4	3582.0	5717.547589	0.5990	0.6205	
4C	1	7/1/09 10:45	7/1/2009 14:53	0.6268	1.5	6363.2	9544.8	14733	4	3683.3	5876.583259	0.6157		
4C	2	7/1/09 10:45	7/1/2009 14:48	0.6327	1.5	6363.2	9544.8	14902	4	3725.5	5888.011911	0.6169		
4C	3	7/1/09 10:45	7/1/2009 14:41	0.6414	1.5	6363.2	9544.8	14856	4	3714.0	5790.010842	0.6066	Average EFF	
4C	4	7/1/09 10:45	7/1/2009 15:00	0.6185	1.5	6363.2	9544.8	13733	4	3433.3	5550.795964	0.5816	0.6052	
4D	1	7/1/09 10:45	7/1/2009 15:00	0.6188	1.5	6363.2	9544.8	14167	4	3541.8	5723.884149	0.5997		
4D	2	7/1/09 10:45	7/1/2009 14:53	0.6267	1.5	6363.2	9544.8	14204	4	3551.0	5666.467573	0.5937		
4D	3	7/1/09 10:45	7/1/2009 14:48	0.6326	1.5	6363.2	9544.8	14131	4	3532.8	5584.07765	0.5850	Average EFF	
4D	4	7/1/09 10:45	7/1/2009 14:41	0.6413	1.5	6363.2	9544.8	13978	4	3494.5	5449.182717	0.5709	0.5873	
5A	1	7/1/09 10:45	7/1/2009 15:06	0.6112	1.5	6363.2	9544.8	14870	4	3717.5	6082.165089	0.6372		
5A	2	7/1/09 10:45	7/1/2009 15:21	0.5943	1.5	6363.2	9544.8	14487	4	3621.8	6094.223373	0.6385		
5A	3	7/1/09 10:45	7/1/2009 15:17	0.5996	1.5	6363.2	9544.8	14259	4	3564.8	5945.170793	0.6229	Average EFF	
5A	4	7/1/09 10:45	7/1/2009 15:12	0.6047	1.5	6363.2	9544.8	13957	4	3489.3	5770.592799	0.6046	0.6258	
5B	1	7/1/09 10:45	7/1/2009 15:12	0.6050	1.5	6363.2	9544.8	14869	4	3717.3	6144.005028	0.6437		
5B	2	7/1/09 10:45	7/1/2009 15:06	0.6111	1.5	6363.2	9544.8	14821	4	3705.3	6063.072791	0.6352		
5B	3	7/1/09 10:45	7/1/2009 15:21	0.5942	1.5	6363.2	9544.8	14289	4	3572.3	6011.872812	0.6299	Average EFF	
5B	4	7/1/09 10:45	7/1/2009 15:17	0.5995	1.5	6363.2	9544.8	13809	4	3452.3	5758.629577	0.6033	0.6280	
5C	1	7/1/09 10:45	7/1/2009 15:17	0.5994	1.5	6363.2	9544.8	14676	4	3669.0	6120.953053	0.6413		
5C	2	7/1/09 10:45	7/1/2009 15:12	0.6049	1.5	6363.2	9544.8	15122	4	3780.5	6249.917577	0.6548		
5C	3	7/1/09 10:45	7/1/2009 15:07	0.6108	1.5	6363.2	9544.8	14958	4	3739.5	6121.8025	0.6414	Average EFF	

7/21/09

5C	4	7/1/09 10:45	7/1/2009 15:21	0.5941	1.5	6363.2	9544.8	13831	4	3457.8	5819.905873	0.6097	0.6368
5D	1	7/1/09 10:45	7/1/2009 15:21	0.5943	1.5	6363.2	9544.8	14321	4	3580.3	6024.014899	0.6311	
5D	2	7/1/09 10:45	7/1/2009 15:17	0.5993	1.5	6363.2	9544.8	14642	4	3680.5	6107.538025	0.6399	
5D	3	7/1/09 10:45	7/1/2009 15:12	0.6048	1.5	6363.2	9544.8	14443	4	3610.8	5970.409434	0.6255	Average EFF
5D	4	7/1/09 10:45	7/1/2009 15:07	0.6107	1.5	6363.2	9544.8	13954	4	3488.5	5711.973074	0.5984	0.6237
6A	1	7/1/09 10:45	7/1/2009 15:27	0.5885	1.5	6363.2	9544.8	14018	4	3504.5	5955.42076	0.6239	
6A	2	7/1/09 10:45	7/1/2009 15:40	0.5735	1.5	6363.2	9544.8	12283	3.5	3509.4	6118.819734	0.6411	
6A	3	7/1/09 10:45	7/1/2009 15:36	0.5779	1.5	6363.2	9544.8	12111	3.5	3460.3	5987.187856	0.6273	Average EFF
6A	4	7/1/09 10:45	7/1/2009 15:32	0.5826	1.5	6363.2	9544.8	11598	3.5	3313.7	5687.952648	0.5959	0.6221
6B	1	7/1/09 10:45	7/1/2009 15:32	0.5824	1.5	6363.2	9544.8	12151	3.5	3471.7	5961.398905	0.6246	
6B	2	7/1/09 10:45	7/1/2009 15:27	0.5885	1.5	6363.2	9544.8	14371	4	3592.8	6105.389624	0.6397	
6B	3	7/1/09 10:45	7/1/2009 15:40	0.5734	1.5	6363.2	9544.8	11705	3.5	3344.3	5831.983307	0.6110	Average EFF
6B	4	7/1/09 10:45	7/1/2009 15:36	0.5779	1.5	6363.2	9544.8	11388	3.5	3253.7	5630.295163	0.5899	0.6163
6C	1	7/1/09 10:45	7/1/2009 15:36	0.5778	1.5	6363.2	9544.8	12161	3.5	3474.6	6013.224586	0.6300	
6C	2	7/1/09 10:45	7/1/2009 15:32	0.5821	1.5	6363.2	9544.8	12083	3.5	3452.3	5930.638446	0.6213	
6C	3	7/1/09 10:45	7/1/2009 15:27	0.5883	1.5	6363.2	9544.8	13638	4	3409.5	5795.433731	0.6072	Average EFF
6C	4	7/1/09 10:45	7/1/2009 15:40	0.5733	1.5	6363.2	9544.8	11218	3.5	3205.1	5590.212659	0.5857	0.6111
6D	1	7/1/09 10:45	7/1/2009 15:40	0.5732	1.5	6363.2	9544.8	11987	3.5	3424.9	5974.547886	0.6259	
6D	2	7/1/09 10:45	7/1/2009 15:36	0.5777	1.5	6363.2	9544.8	12183	3.5	3480.9	6025.235519	0.6313	
6D	3	7/1/09 10:45	7/1/2009 15:32	0.5819	1.5	6363.2	9544.8	11882	3.5	3394.9	5833.810262	0.6112	Average EFF
6D	4	7/1/09 10:45	7/1/2009 15:27	0.5881	1.5	6363.2	9544.8	13018	4	3254.5	5533.899914	0.5798	0.6120
7A	1	7/1/09 10:45	7/1/2009 15:46	0.5673	1.5	6363.2	9544.8	12007	3.5	3430.6	6047.285806	0.6336	
7A	2	7/1/09 10:45	7/1/2009 16:00	0.5525	1.5	6363.2	9544.8	11655	3.5	3330.0	6027.30696	0.6315	
7A	3	7/1/09 10:45	7/1/2009 15:56	0.5569	1.5	6363.2	9544.8	11445	3.5	3270.0	5871.972756	0.6152	Average EFF
7A	4	7/1/09 10:45	7/1/2009 15:50	0.5627	1.5	6363.2	9544.8	11121	3.5	3177.4	5846.694018	0.5916	0.6180
7B	1	7/1/09 10:45	7/1/2009 15:51	0.5622	1.5	6363.2	9544.8	11988	3.5	3419.4	6082.664171	0.6373	
7B	2	7/1/09 10:45	7/1/2009 15:46	0.5673	1.5	6363.2	9544.8	12050	3.5	3442.9	6069.322745	0.6359	
7B	3	7/1/09 10:45	7/1/2009 16:00	0.5524	1.5	6363.2	9544.8	11675	3.5	3335.7	6038.785014	0.6327	Average EFF
7B	4	7/1/09 10:45	7/1/2009 15:56	0.5567	1.5	6363.2	9544.8	11271	3.5	3220.3	5784.331251	0.6060	0.6280
7C	1	7/1/09 10:45	7/1/2009 15:56	0.5566	1.5	6363.2	9544.8	11781	3.5	3366.0	6047.202464	0.6336	
7C	2	7/1/09 10:45	7/1/2009 15:51	0.5621	1.5	6363.2	9544.8	11760	3.5	3360.0	5978.073192	0.6263	
7C	3	7/1/09 10:45	7/1/2009 15:46	0.5670	1.5	6363.2	9544.8	11766	3.5	3361.7	5928.878357	0.6212	Average EFF
7C	4	7/1/09 10:45	7/1/2009 16:00	0.5523	1.5	6363.2	9544.8	10888	3.5	3110.9	5632.598965	0.5901	0.6178
7D	1	7/1/09 10:45	7/1/2009 16:00	0.5522	1.5	6363.2	9544.8	11805	3.5	3315.7	6004.271132	0.6291	
7D	2	7/1/09 10:45	7/1/2009 15:56	0.5565	1.5	6363.2	9544.8	11920	3.5	3405.7	6119.509991	0.6411	
7D	3	7/1/09 10:45	7/1/2009 15:51	0.5619	1.5	6363.2	9544.8	11933	3.5	3409.4	6067.346561	0.6357	Average EFF
7D	4	7/1/09 10:45	7/1/2009 15:46	0.5668	1.5	6363.2	9544.8	11305	3.5	3230.0	5698.36602	0.5970	0.6257
8A	1	7/1/09 10:45	7/1/2009 16:06	0.5466	1.5	6363.2	9544.8	11673	3.5	3335.1	6101.651756	0.6393	
8A	2	7/1/09 10:45	7/1/2009 16:19	0.5333	1.5	6363.2	9544.8	11172	3.5	3192.0	5985.379105	0.6271	
8A	3	7/1/09 10:45	7/1/2009 16:15	0.5377	1.5	6363.2	9544.8	11258	3.5	3216.6	5982.329368	0.6268	Average EFF
8A	4	7/1/09 10:45	7/1/2009 16:10	0.5424	1.5	6363.2	9544.8	10977	3.5	3136.3	5782.059146	0.6058	0.6247
8B	1	7/1/09 10:45	7/1/2009 16:10	0.5423	1.5	6363.2	9544.8	11583	3.5	3309.4	6102.412618	0.6393	
8B	2	7/1/09 10:45	7/1/2009 16:06	0.5466	1.5	6363.2	9544.8	11758	3.5	3359.4	6146.082528	0.6439	
8B	3	7/1/09 10:45	7/1/2009 16:19	0.5332	1.5	6363.2	9544.8	11499	3.5	3285.4	6161.727069	0.6456	Average EFF
8B	4	7/1/09 10:45	7/1/2009 16:15	0.5376	1.5	6363.2	9544.8	10844	3.5	3098.3	5763.600098	0.6038	0.6332
8C	1	7/1/09 10:45	7/1/2009 16:15	0.5375	1.5	6363.2	9544.8	11539	3.5	3296.9	6133.782218	0.6426	
8C	2	7/1/09 10:45	7/1/2009 16:10	0.5422	1.5	6363.2	9544.8	11774	3.5	3364.0	6204.011354	0.6500	
8C	3	7/1/09 10:45	7/1/2009 16:06	0.5465	1.5	6363.2	9544.8	11611	3.5	3317.4	6070.574762	0.6380	Average EFF
8C	4	7/1/09 10:45	7/1/2009 16:19	0.5331	1.5	6363.2	9544.8	10809	3.5	3088.3	5793.080291	0.6069	0.6339
8D	1	7/1/09 10:45	7/1/2009 16:19	0.5330	1.5	6363.2	9544.8	11301	3.5	3228.9	6057.336905	0.6346	
8D	2	7/1/09 10:45	7/1/2009 16:15	0.5374	1.5	6363.2	9544.8	11412	3.5	3260.6	6067.58377	0.6357	
8D	3	7/1/09 10:45	7/1/2009 16:10	0.5421	1.5	6363.2	9544.8	11660	3.5	3331.4	6145.874775	0.6439	Average EFF
8D	4	7/1/09 10:45	7/1/2009 16:06	0.5464	1.5	6363.2	9544.8	10918	3.5	3119.4	5709.327085	0.5982	0.6281
9A	1	7/1/09 10:45	7/1/2009 16:24	0.5280	1.5	6363.2	9544.8	11805	3.5	3315.7	6280.207813	0.6580	
9A	2	7/1/09 10:45	7/1/2009 16:42	0.5106	1.5	6363.2	9544.8	11281	3.5	3223.1	6313.016372	0.6614	
9A	3	7/1/09 10:45	7/1/2009 16:33	0.5196	1.5	6363.2	9544.8	11301	3.5	3228.9	6214.402502	0.6511	Average EFF
9A	4	7/1/09 10:45	7/1/2009 16:29	0.5236	1.5	6363.2	9544.8	10987	3.5	3139.1	5995.155865	0.6281	0.6496
9B	1	7/1/09 10:45	7/1/2009 16:29	0.5235	1.5	6363.2	9544.8	11151	3.5	3186.0	6085.406803	0.6376	
9B	2	7/1/09 10:45	7/1/2009 16:24	0.5280	1.5	6363.2	9544.8	11462	3.5	3274.9	6202.821366	0.6499	
9B	3	7/1/09 10:45	7/1/2009 16:42	0.5104	1.5	6363.2	9544.8	11004	3.5	3144.0	6180.125852	0.6454	Average EFF
9B	4	7/1/09 10:45	7/1/2009 16:33	0.5195	1.5	6363.2	9544.8	10581	3.5	3023.1	5819.569586	0.6097	0.6356
9C	1	7/1/09 10:45	7/1/2009 16:33	0.5194	1.5	6363.2	9544.8	11026	3.5	3150.3	6064.890483	0.6354	
9C	2	7/1/09 10:45	7/1/2009 16:29	0.5235	1.5	6363.2	9544.8	11281	3.5	3223.1	6157.122814	0.6451	
9C	3	7/1/09 10:45	7/1/2009 16:24	0.5279	1.5	6363.2	9544.8	11016	3.5	3147.4	5962.583098	0.6247	Average EFF
9C	4	7/1/09 10:45	7/1/2009 16:42	0.5103	1.5	6363.2	9544.8	10297	3.5	2942.0	5765.244836	0.6040	0.6273
9D	1	7/1/09 10:45	7/1/2009 16:38	0.5146	1.5	6363.2	9544.8	11135	3.5	3181.4	6182.4976	0.6477	
9D	2	7/1/09 10:45	7/1/2009 16:33	0.5193	1.5	6363.2	9544.8	11412	3.5	3260.6	6278.391381	0.6578	
9D	3	7/1/09 10:45	7/1/2009 16:29	0.5234	1.5	6363.2	9544.8	11340	3.5	3240.0	6190.682442	0.6486	Average EFF
9D	4	7/1/09 10:45	7/1/2009 16:24	0.5278	1.5	6363.2	9544.8	10912	3.5	3117.7	5907.401951	0.6189	0.6433
10A	1	7/1/09 10:45	7/1/2009 16:47	0.5057	1.5	6363.2	9544.8	10991	3.5	3140.3	6209.984837	0.6506	
10A	2	7/1/09 10:45	7/1/2009 17:12	0.4824	1.5	6363.2	9544.8	11959	4	2989.8	6198.168046	0.6494	
10A	3	7/1/09 10:45	7/1/2009 16:58	0.4958	1.5	6363.2	9544.8	10553	3.5	3015.1	6081.381423	0.6371	Average EFF
10A	4	7/1/09 10:45	7/1/2009 16:53	0.5003	1.5	6363.2	9544.8	10338	3.5	2953.7	5903.409852	0.6185	0.6389
10B	1	7/1/09 10:45	7/1/2009 17:03	0.4910	1.5	6363.2	9544.8	11110	4	2777.5	5856.748417	0.5927	
10B	2	7/1/09 10:45	7/1/2009 16:47	0.5057	1.5	6363.2	9544.8	10812	3.5	3089.1	6109.231533	0.6401	
10B	3	7/1/09 10:45	7/1/2009 17:12	0.4822	1.5	6363.2	9544.8	11422	4	2855.5	5921.333197	0.6204	Average EFF
10B	4	7/1/09 10:45	7/1/2009 16:58	0.4957	1.5	6363.2	9544.8	9967	3.5	2847.7	5744.946895	0.6019	0.6137
10C	1	7/1/09 10:45	7/1/2009 16:58	0.4956	1.5	6363.2	9544.8	10482	3.5	2994.9	6042.548531	0.6331	
10C	2	7/1/09 10:45	7/1										

10D	3	7/1/09 10:45	7/1/2009 16:53	0.5000	1.5	6363.2	9544.8	10643	3.5	3040.9	6081.577364	0.6372	Average EFF
10D	4	7/1/09 10:45	7/1/2009 16:48	0.5053	1.5	6363.2	9544.8	10064	3.5	2875.4	5690.501596	0.5962	0.6320
11A	1	7/1/09 10:45	7/1/2009 11:56	0.8745	1.5	6363.2	9544.8	14773	3	4924.3	5631.22443	0.5900	
11A	2	7/1/09 10:45	7/1/2009 12:08	0.8547	1.5	6363.2	9544.8	14429	3	4809.7	5627.17636	0.5896	
11A	3	7/1/09 10:45	7/1/2009 12:04	0.8607	1.5	6363.2	9544.8	14454	3	4818.0	5597.851728	0.5865	Average EFF
11A	4	7/1/09 10:45	7/1/2009 12:00	0.8677	1.5	6363.2	9544.8	14013	3	4671.0	5383.193838	0.5640	0.5825
11B	1	7/1/09 10:45	7/1/2009 12:00	0.8681	1.5	6363.2	9544.8	16203	3	5401.0	6221.768068	0.6518	
11B	2	7/1/09 10:45	7/1/2009 11:56	0.8742	1.5	6363.2	9544.8	16106	3	5368.7	6141.073627	0.6434	
11B	3	7/1/09 10:45	7/1/2009 12:08	0.8545	1.5	6363.2	9544.8	15643	3	5214.3	6102.154531	0.6393	Average EFF
11B	4	7/1/09 10:45	7/1/2009 12:04	0.8606	1.5	6363.2	9544.8	15133	3	5044.3	5861.738123	0.6141	0.6372
11C	1	7/1/09 10:45	7/1/2009 12:04	0.8609	1.5	6363.2	9544.8	15637	3	5212.3	6054.305139	0.6343	
11C	2	7/1/09 10:45	7/1/2009 12:00	0.8680	1.5	6363.2	9544.8	15919	3	5308.3	6113.481467	0.6405	
11C	3	7/1/09 10:45	7/1/2009 11:56	0.8740	1.5	6363.2	9544.8	16452	3	5484.0	6274.376359	0.6574	Average EFF
11C	4	7/1/09 10:45	7/1/2009 12:08	0.8544	1.5	6363.2	9544.8	14887	3	4962.3	5808.157492	0.6085	0.6352
11D	1	7/1/09 10:45	7/1/2009 12:08	0.8548	1.5	6363.2	9544.8	15607	3	5202.3	6085.822645	0.6376	
11D	2	7/1/09 10:45	7/1/2009 12:04	0.8608	1.5	6363.2	9544.8	15944	3	5314.7	6174.138045	0.6469	
11D	3	7/1/09 10:45	7/1/2009 12:00	0.8679	1.5	6363.2	9544.8	16098	3	5366.0	6182.989937	0.6478	Average EFF
11D	4	7/1/09 10:45	7/1/2009 11:56	0.8738	1.5	6363.2	9544.8	15191	3	5063.7	5794.733717	0.6071	0.6348
12A	1	7/1/09 10:45	7/1/2009 12:15	0.8437	1.5	6363.2	9544.8	15450	3	5150.0	6104.026984	0.6395	
12A	2	7/1/09 10:45	7/1/2009 12:28	0.8234	1.5	6363.2	9544.8	15016	3	5005.3	6078.958269	0.6369	
12A	3	7/1/09 10:45	7/1/2009 12:24	0.8296	1.5	6363.2	9544.8	14984	3	4994.7	6020.558384	0.6308	Average EFF
12A	4	7/1/09 10:45	7/1/2009 12:20	0.8358	1.5	6363.2	9544.8	14530	3	4843.3	5794.58497	0.6071	0.6286
12B	1	7/1/09 10:45	7/1/2009 12:20	0.8362	1.5	6363.2	9544.8	15404	3	5134.7	6140.635636	0.6433	
12B	2	7/1/09 10:45	7/1/2009 12:15	0.8437	1.5	6363.2	9544.8	15607	3	5202.3	6166.05496	0.6460	
12B	3	7/1/09 10:45	7/1/2009 12:28	0.8232	1.5	6363.2	9544.8	15060	3	5020.0	6097.91718	0.6389	Average EFF
12B	4	7/1/09 10:45	7/1/2009 12:24	0.8295	1.5	6363.2	9544.8	14553	3	4851.0	5848.11587	0.6127	0.6352
12C	1	7/1/09 10:45	7/1/2009 12:24	0.8300	1.5	6363.2	9544.8	15183	3	5061.0	6097.649845	0.6388	
12C	2	7/1/09 10:45	7/1/2009 12:20	0.8361	1.5	6363.2	9544.8	15651	3	5217.0	6239.881493	0.6537	
12C	3	7/1/09 10:45	7/1/2009 12:15	0.8436	1.5	6363.2	9544.8	15216	3	5072.0	6012.519531	0.6299	Average EFF
12C	4	7/1/09 10:45	7/1/2009 12:28	0.8231	1.5	6363.2	9544.8	14117	3	4705.7	5716.805229	0.5989	0.6304
12D	1	7/1/09 10:45	7/1/2009 12:28	0.8235	1.5	6363.2	9544.8	15174	3	5058.0	6141.959419	0.6435	
12D	2	7/1/09 10:45	7/1/2009 12:24	0.8298	1.5	6363.2	9544.8	15137	3	5045.7	6080.699807	0.6371	
12D	3	7/1/09 10:45	7/1/2009 12:20	0.8359	1.5	6363.2	9544.8	15418	3	5139.3	6148.142699	0.6441	Average EFF
12D	4	7/1/09 10:45	7/1/2009 12:15	0.8434	1.5	6363.2	9544.8	14566	3	4855.3	5758.75774	0.6031	0.6320
13A	1	7/1/09 10:45	7/1/2009 12:33	0.8153	1.5	6363.2	9544.8	15230	3	5076.7	6226.552932	0.6524	
13A	2	7/1/09 10:45	7/1/2009 12:50	0.7902	1.5	6363.2	9544.8	14784	3	4928.0	6236.596242	0.6534	
13A	3	7/1/09 10:45	7/1/2009 12:41	0.8031	1.5	6363.2	9544.8	14851	3	4950.3	6164.384216	0.6458	Average EFF
13A	4	7/1/09 10:45	7/1/2009 12:37	0.8090	1.5	6363.2	9544.8	14183	3	4727.7	5843.553624	0.6122	0.6410
13B	1	7/1/09 10:45	7/1/2009 12:37	0.8094	1.5	6363.2	9544.8	15625	3	5208.3	6434.850276	0.6742	
13B	2	7/1/09 10:45	7/1/2009 12:33	0.8153	1.5	6363.2	9544.8	15450	3	5150.0	6316.496573	0.6618	
13B	3	7/1/09 10:45	7/1/2009 12:50	0.7901	1.5	6363.2	9544.8	14689	3	4896.3	6197.297391	0.6493	Average EFF
13B	4	7/1/09 10:45	7/1/2009 12:41	0.8029	1.5	6363.2	9544.8	14377	3	4792.3	5968.757323	0.6253	0.6526
13C	1	7/1/09 10:45	7/1/2009 12:41	0.8033	1.5	6363.2	9544.8	15426	3	5142.0	6401.251014	0.6707	
13C	2	7/1/09 10:45	7/1/2009 12:37	0.8093	1.5	6363.2	9544.8	15315	3	5105.0	6307.973396	0.6609	
13C	3	7/1/09 10:45	7/1/2009 12:33	0.8152	1.5	6363.2	9544.8	15288	3	5096.0	6251.048762	0.6549	Average EFF
13C	4	7/1/09 10:45	7/1/2009 12:50	0.7900	1.5	6363.2	9544.8	14222	3	4740.7	6001.209943	0.6287	0.6538
13D	1	7/1/09 10:45	7/1/2009 12:50	0.7903	1.5	6363.2	9544.8	14492	3	4830.7	6112.65055	0.6404	
13D	2	7/1/09 10:45	7/1/2009 12:46	0.7958	1.5	6363.2	9544.8	14858	3	4952.7	6223.19528	0.6520	
13D	3	7/1/09 10:45	7/1/2009 12:37	0.8082	1.5	6363.2	9544.8	14873	3	4957.7	6126.881339	0.6419	Average EFF
13D	4	7/1/09 10:45	7/1/2009 12:33	0.8151	1.5	6363.2	9544.8	14389	3	4796.3	5884.197712	0.6165	0.6377
14A	1	7/1/09 10:45	7/1/2009 12:54	0.7834	1.5	6363.2	9544.8	14463	3	4821.0	6153.596507	0.6447	
14A	2	7/1/09 10:45	7/1/2009 13:17	0.7507	1.5	6363.2	9544.8	14137	3	4712.3	6277.53373	0.6577	
14A	3	7/1/09 10:45	7/1/2009 13:13	0.7571	1.5	6363.2	9544.8	14022	3	4674.0	6173.627369	0.6468	Average EFF
14A	4	7/1/09 10:45	7/1/2009 13:02	0.7727	1.5	6363.2	9544.8	13451	3	4483.7	5802.630587	0.6080	0.6393
14B	1	7/1/09 10:45	7/1/2009 13:01	0.7730	1.5	6363.2	9544.8	14039	3	4679.7	6054.030301	0.6343	
14B	2	7/1/09 10:45	7/1/2009 12:54	0.7834	1.5	6363.2	9544.8	14398	3	4799.3	6126.324754	0.6418	
14B	3	7/1/09 10:45	7/1/2009 13:17	0.7505	1.5	6363.2	9544.8	13475	3	4491.7	5984.510182	0.6270	Average EFF
14B	4	7/1/09 10:45	7/1/2009 13:13	0.7569	1.5	6363.2	9544.8	13077	3	4359.0	5758.643863	0.6033	0.6266
14C	1	7/1/09 10:45	7/1/2009 13:12	0.7573	1.5	6363.2	9544.8	14116	3	4705.3	6213.281445	0.6510	
14C	2	7/1/09 10:45	7/1/2009 13:02	0.7729	1.5	6363.2	9544.8	14187	3	4729.0	6118.427365	0.6410	
14C	3	7/1/09 10:45	7/1/2009 12:55	0.7832	1.5	6363.2	9544.8	14409	3	4803.0	6132.734423	0.6425	Average EFF
14C	4	7/1/09 10:45	7/1/2009 13:17	0.7505	1.5	6363.2	9544.8	13229	3	4409.7	5875.993199	0.6156	0.6375
14D	1	7/1/09 10:45	7/1/2009 13:17	0.7508	1.5	6363.2	9544.8	13927	3	4642.3	6183.314452	0.6478	
14D	2	7/1/09 10:45	7/1/2009 13:12	0.7572	1.5	6363.2	9544.8	14089	3	4696.3	6202.348821	0.6498	
14D	3	7/1/09 10:45	7/1/2009 13:02	0.7728	1.5	6363.2	9544.8	13912	3	4637.3	6000.768164	0.6287	Average EFF
14D	4	7/1/09 10:45	7/1/2009 12:55	0.7830	1.5	6363.2	9544.8	13545	3	4515.0	5766.084113	0.6041	0.6326

*Background is considered negligible

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time
1 1A		3	126	13564	7/1/2009 13:36	7/1/2009 13:39
2 1A		3	136	12775	7/1/2009 13:52	7/1/2009 13:55
3 1A		3	135	12750	7/1/2009 13:48	7/1/2009 13:51
4 1A		3	142	12410	7/1/2009 13:41	7/1/2009 13:44
1 1B		3	115	13292	7/1/2009 13:41	7/1/2009 13:44
2 1B		3	136	13274	7/1/2009 13:36	7/1/2009 13:39
3 1B		3	131	12699	7/1/2009 13:52	7/1/2009 13:55
4 1B		3	129	12072	7/1/2009 13:48	7/1/2009 13:51
1 1C		3	207	12813	7/1/2009 13:48	7/1/2009 13:51
2 1C		3	221	12979	7/1/2009 13:41	7/1/2009 13:44
3 1C		3	189	12755	7/1/2009 13:36	7/1/2009 13:39
4 1C		3	179	11917	7/1/2009 13:52	7/1/2009 13:55
1 1D		3	558	12473	7/1/2009 13:52	7/1/2009 13:55
2 1D		3	582	12484	7/1/2009 13:48	7/1/2009 13:51
3 1D		3	632	12289	7/1/2009 13:41	7/1/2009 13:44
4 1D		3	568	12115	7/1/2009 13:36	7/1/2009 13:39
1 2A		3	424	12499	7/1/2009 13:57	7/1/2009 14:00
2 2A		3	449	12103	7/1/2009 14:15	7/1/2009 14:18
3 2A		3	419	11968	7/1/2009 14:09	7/1/2009 14:12
4 2A		3	417	11855	7/1/2009 14:02	7/1/2009 14:05
1 2B		3	42	12471	7/1/2009 14:02	7/1/2009 14:05
2 2B		3	39	12492	7/1/2009 13:57	7/1/2009 14:00
3 2B		3	54	11892	7/1/2009 14:15	7/1/2009 14:18
4 2B		3	69	11539	7/1/2009 14:09	7/1/2009 14:12
1 2C		3	504	12050	7/1/2009 14:08	7/1/2009 14:11
2 2C		3	527	11914	7/1/2009 14:02	7/1/2009 14:05
3 2C		3	496	11994	7/1/2009 13:58	7/1/2009 14:01
4 2C		3	499	10889	7/1/2009 14:15	7/1/2009 14:18
1 2D		3	543	12010	7/1/2009 14:15	7/1/2009 14:18
2 2D		3	508	12124	7/1/2009 14:08	7/1/2009 14:11
3 2D		3	542	12168	7/1/2009 14:02	7/1/2009 14:05
4 2D		3	544	11692	7/1/2009 13:58	7/1/2009 14:01
1 3A		3	1397	11194	7/1/2009 14:19	7/1/2009 14:22
2 3A		4	1809	14227	7/1/2009 14:35	7/1/2009 14:39
3 3A		4	1757	14180	7/1/2009 14:30	7/1/2009 14:34
4 3A		4	1725	13754	7/1/2009 14:25	7/1/2009 14:29
1 3B		4	914	15370	7/1/2009 14:25	7/1/2009 14:29
2 3B		3	731	11695	7/1/2009 14:20	7/1/2009 14:23
3 3B		4	960	14905	7/1/2009 14:35	7/1/2009 14:39
4 3B		4	922	14220	7/1/2009 14:30	7/1/2009 14:34
1 3C		4	671	15644	7/1/2009 14:29	7/1/2009 14:33
2 3C		4	722	15964	7/1/2009 14:25	7/1/2009 14:29
3 3C		3	558	11701	7/1/2009 14:20	7/1/2009 14:23
4 3C		4	647	14729	7/1/2009 14:35	7/1/2009 14:39
1 3D		4	651	15152	7/1/2009 14:35	7/1/2009 14:39
2 3D		4	722	15168	7/1/2009 14:30	7/1/2009 14:34
3 3D		4	684	15295	7/1/2009 14:25	7/1/2009 14:29
4 3D		3	466	10942	7/1/2009 14:20	7/1/2009 14:23
1 4A		4	412	15298	7/1/2009 14:40	7/1/2009 14:44
2 4A		4	407	14897	7/1/2009 15:00	7/1/2009 15:04
3 4A		4	389	15050	7/1/2009 14:53	7/1/2009 14:57

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7/2/09

4 4A	4	417	14462	7/1/2009 14:48	7/1/2009 14:52
1 4B	4	58	15335	7/1/2009 14:48	7/1/2009 14:52
2 4B	4	61	15513	7/1/2009 14:41	7/1/2009 14:45
3 4B	4	53	14521	7/1/2009 15:00	7/1/2009 15:04
4 4B	4	72	14328	7/1/2009 14:53	7/1/2009 14:57
1 4C	4	532	14733	7/1/2009 14:53	7/1/2009 14:57
2 4C	4	545	14902	7/1/2009 14:48	7/1/2009 14:52
3 4C	4	486	14856	7/1/2009 14:41	7/1/2009 14:45
4 4C	4	540	13733	7/1/2009 15:00	7/1/2009 15:04
1 4D	4	1158	14167	7/1/2009 15:00	7/1/2009 15:04
2 4D	4	1192	14204	7/1/2009 14:53	7/1/2009 14:57
3 4D	4	1136	14131	7/1/2009 14:48	7/1/2009 14:52
4 4D	4	1149	13978	7/1/2009 14:41	7/1/2009 14:45
1 5A	4	424	14870	7/1/2009 15:06	7/1/2009 15:10
2 5A	4	395	14487	7/1/2009 15:21	7/1/2009 15:25
3 5A	4	403	14259	7/1/2009 15:17	7/1/2009 15:21
4 5A	4	389	13957	7/1/2009 15:12	7/1/2009 15:16
1 5B	4	428	14869	7/1/2009 15:12	7/1/2009 15:16
2 5B	4	440	14821	7/1/2009 15:06	7/1/2009 15:10
3 5B	4	420	14289	7/1/2009 15:21	7/1/2009 15:25
4 5B	4	414	13809	7/1/2009 15:17	7/1/2009 15:21
1 5C	4	436	14676	7/1/2009 15:17	7/1/2009 15:21
2 5C	4	443	15122	7/1/2009 15:12	7/1/2009 15:16
3 5C	4	433	14958	7/1/2009 15:07	7/1/2009 15:11
4 5C	4	416	13831	7/1/2009 15:21	7/1/2009 15:25
1 5D	4	451	14321	7/1/2009 15:21	7/1/2009 15:25
2 5D	4	452	14642	7/1/2009 15:17	7/1/2009 15:21
3 5D	4	444	14443	7/1/2009 15:12	7/1/2009 15:16
4 5D	4	414	13954	7/1/2009 15:07	7/1/2009 15:11
1 6A	4	272	14018	7/1/2009 15:27	7/1/2009 15:31
2 6A	3.5	246	12283	7/1/2009 15:40	7/1/2009 15:44
3 6A	3.5	231	12111	7/1/2009 15:36	7/1/2009 15:40
4 6A	3.5	229	11598	7/1/2009 15:32	7/1/2009 15:35
1 6B	3.5	540	12151	7/1/2009 15:32	7/1/2009 15:36
2 6B	4	592	14371	7/1/2009 15:27	7/1/2009 15:31
3 6B	3.5	498	11705	7/1/2009 15:40	7/1/2009 15:44
4 6B	3.5	498	11388	7/1/2009 15:36	7/1/2009 15:40
1 6C	3.5	462	12161	7/1/2009 15:36	7/1/2009 15:40
2 6C	3.5	468	12083	7/1/2009 15:32	7/1/2009 15:36
3 6C	4	534	13638	7/1/2009 15:27	7/1/2009 15:31
4 6C	3.5	455	11218	7/1/2009 15:40	7/1/2009 15:44
1 6D	3.5	456	11987	7/1/2009 15:40	7/1/2009 15:44
2 6D	3.5	468	12183	7/1/2009 15:36	7/1/2009 15:40
3 6D	3.5	496	11882	7/1/2009 15:32	7/1/2009 15:36
4 6D	4	525	13018	7/1/2009 15:27	7/1/2009 15:31
1 7A	3.5	466	12007	7/1/2009 15:46	7/1/2009 15:50
2 7A	3.5	491	11655	7/1/2009 16:00	7/1/2009 16:04
3 7A	3.5	444	11445	7/1/2009 15:56	7/1/2009 15:59
4 7A	3.5	477	11121	7/1/2009 15:50	7/1/2009 15:54
1 7B	3.5	418	11968	7/1/2009 15:51	7/1/2009 15:54
2 7B	3.5	448	12050	7/1/2009 15:46	7/1/2009 15:50
3 7B	3.5	460	11675	7/1/2009 16:00	7/1/2009 16:04

4 7B	3.5	413	11271	7/1/2009 15:56	7/1/2009 16:00
1 7C	3.5	471	11781	7/1/2009 15:56	7/1/2009 16:00
2 7C	3.5	457	11760	7/1/2009 15:51	7/1/2009 15:54
3 7C	3.5	454	11766	7/1/2009 15:46	7/1/2009 15:50
4 7C	3.5	406	10888	7/1/2009 16:00	7/1/2009 16:04
1 7D	3.5	359	11605	7/1/2009 16:00	7/1/2009 16:04
2 7D	3.5	391	11920	7/1/2009 15:56	7/1/2009 16:00
3 7D	3.5	386	11933	7/1/2009 15:51	7/1/2009 15:55
4 7D	3.5	400	11305	7/1/2009 15:46	7/1/2009 15:50
1 8A	3.5	348	11673	7/1/2009 16:06	7/1/2009 16:09
2 8A	3.5	340	11172	7/1/2009 16:19	7/1/2009 16:22
3 8A	3.5	298	11258	7/1/2009 16:15	7/1/2009 16:18
4 8A	3.5	327	10977	7/1/2009 16:10	7/1/2009 16:13
1 8B	3.5	124	11583	7/1/2009 16:10	7/1/2009 16:13
2 8B	3.5	112	11758	7/1/2009 16:06	7/1/2009 16:09
3 8B	3.5	110	11499	7/1/2009 16:19	7/1/2009 16:23
4 8B	3.5	102	10844	7/1/2009 16:15	7/1/2009 16:18
1 8C	3.5	202	11539	7/1/2009 16:15	7/1/2009 16:18
2 8C	3.5	196	11774	7/1/2009 16:10	7/1/2009 16:14
3 8C	3.5	203	11611	7/1/2009 16:06	7/1/2009 16:09
4 8C	3.5	207	10809	7/1/2009 16:19	7/1/2009 16:23
1 8D	3.5	240	11301	7/1/2009 16:19	7/1/2009 16:23
2 8D	3.5	248	11412	7/1/2009 16:15	7/1/2009 16:18
3 8D	3.5	233	11660	7/1/2009 16:10	7/1/2009 16:14
4 8D	3.5	235	10918	7/1/2009 16:06	7/1/2009 16:10
1 9A	3.5	39	11605	7/1/2009 16:24	7/1/2009 16:28
2 9A	3.5	49	11281	7/1/2009 16:42	7/1/2009 16:46
3 9A	3.5	47	11301	7/1/2009 16:33	7/1/2009 16:36
4 9A	3.5	64	10987	7/1/2009 16:29	7/1/2009 16:32
1 9B	3.5	53	11151	7/1/2009 16:29	7/1/2009 16:32
2 9B	3.5	39	11462	7/1/2009 16:24	7/1/2009 16:28
3 9B	3.5	45	11004	7/1/2009 16:42	7/1/2009 16:46
4 9B	3.5	51	10581	7/1/2009 16:33	7/1/2009 16:36
1 9C	3.5	49	11026	7/1/2009 16:33	7/1/2009 16:36
2 9C	3.5	49	11281	7/1/2009 16:29	7/1/2009 16:32
3 9C	3.5	40	11016	7/1/2009 16:24	7/1/2009 16:28
4 9C	3.5	60	10297	7/1/2009 16:42	7/1/2009 16:46
1 9D	3.5	65	11135	7/1/2009 16:38	7/1/2009 16:41
2 9D	3.5	53	11412	7/1/2009 16:33	7/1/2009 16:37
3 9D	3.5	54	11340	7/1/2009 16:29	7/1/2009 16:32
4 9D	3.5	77	10912	7/1/2009 16:24	7/1/2009 16:28
1 10A	3.5	71	10991	7/1/2009 16:47	7/1/2009 16:51
2 10A	4	106	11959	7/1/2009 17:12	7/1/2009 17:16
3 10A	3.5	70	10553	7/1/2009 16:58	7/1/2009 17:01
4 10A	3.5	95	10338	7/1/2009 16:53	7/1/2009 16:56
1 10B	4	139	11110	7/1/2009 17:03	7/1/2009 17:07
2 10B	3.5	102	10812	7/1/2009 16:47	7/1/2009 16:51
3 10B	4	103	11422	7/1/2009 17:12	7/1/2009 17:16
4 10B	3.5	110	9967	7/1/2009 16:58	7/1/2009 17:01
1 10C	3.5	74	10482	7/1/2009 16:58	7/1/2009 17:01
2 10C	3.5	79	10535	7/1/2009 16:53	7/1/2009 16:57
3 10C	3.5	87	10723	7/1/2009 16:47	7/1/2009 16:51

4 10C	4	95	11066	7/1/2009 17:13	7/1/2009 17:17
1 10D	4	102	12021	7/1/2009 17:13	7/1/2009 17:17
2 10D	3.5	75	10614	7/1/2009 16:58	7/1/2009 17:01
3 10D	3.5	78	10643	7/1/2009 16:53	7/1/2009 16:57
4 10D	3.5	81	10064	7/1/2009 16:48	7/1/2009 16:51
1 11A	3	31	14773	7/1/2009 11:56	7/1/2009 11:59
2 11A	3	23	14429	7/1/2009 12:08	7/1/2009 12:11
3 11A	3	33	14454	7/1/2009 12:04	7/1/2009 12:07
4 11A	3	49	14013	7/1/2009 12:00	7/1/2009 12:03
1 11B	3	43	16203	7/1/2009 12:00	7/1/2009 12:03
2 11B	3	53	16106	7/1/2009 11:56	7/1/2009 11:59
3 11B	3	46	15643	7/1/2009 12:08	7/1/2009 12:11
4 11B	3	42	15133	7/1/2009 12:04	7/1/2009 12:07
1 11C	3	27	15637	7/1/2009 12:04	7/1/2009 12:07
2 11C	3	38	15919	7/1/2009 12:00	7/1/2009 12:03
3 11C	3	33	16452	7/1/2009 11:56	7/1/2009 11:59
4 11C	3	46	14887	7/1/2009 12:08	7/1/2009 12:11
1 11D	3	43	15607	7/1/2009 12:08	7/1/2009 12:11
2 11D	3	42	15944	7/1/2009 12:04	7/1/2009 12:07
3 11D	3	32	16098	7/1/2009 12:00	7/1/2009 12:03
4 11D	3	39	15191	7/1/2009 11:56	7/1/2009 11:59
1 12A	3	29	15450	7/1/2009 12:15	7/1/2009 12:18
2 12A	3	28	15016	7/1/2009 12:28	7/1/2009 12:31
3 12A	3	31	14984	7/1/2009 12:24	7/1/2009 12:27
4 12A	3	46	14530	7/1/2009 12:20	7/1/2009 12:23
1 12B	3	26	15404	7/1/2009 12:20	7/1/2009 12:23
2 12B	3	31	15607	7/1/2009 12:15	7/1/2009 12:18
3 12B	3	34	15060	7/1/2009 12:28	7/1/2009 12:31
4 12B	3	49	14553	7/1/2009 12:24	7/1/2009 12:27
1 12C	3	24	15183	7/1/2009 12:24	7/1/2009 12:27
2 12C	3	44	15651	7/1/2009 12:20	7/1/2009 12:23
3 12C	3	46	15216	7/1/2009 12:15	7/1/2009 12:18
4 12C	3	60	14117	7/1/2009 12:28	7/1/2009 12:31
1 12D	3	48	15174	7/1/2009 12:28	7/1/2009 12:31
2 12D	3	37	15137	7/1/2009 12:24	7/1/2009 12:27
3 12D	3	25	15418	7/1/2009 12:20	7/1/2009 12:23
4 12D	3	59	14566	7/1/2009 12:15	7/1/2009 12:18
1 13A	3	50	15230	7/1/2009 12:33	7/1/2009 12:36
2 13A	3	36	14784	7/1/2009 12:50	7/1/2009 12:53
3 13A	3	41	14851	7/1/2009 12:41	7/1/2009 12:44
4 13A	3	49	14183	7/1/2009 12:37	7/1/2009 12:40
1 13B	3	39	15625	7/1/2009 12:37	7/1/2009 12:40
2 13B	3	41	15450	7/1/2009 12:33	7/1/2009 12:36
3 13B	3	37	14689	7/1/2009 12:50	7/1/2009 12:53
4 13B	3	47	14377	7/1/2009 12:41	7/1/2009 12:44
1 13C	3	54	15426	7/1/2009 12:41	7/1/2009 12:44
2 13C	3	41	15315	7/1/2009 12:37	7/1/2009 12:40
3 13C	3	36	15288	7/1/2009 12:33	7/1/2009 12:36
4 13C	3	34	14222	7/1/2009 12:50	7/1/2009 12:53
1 13D	3	47	14492	7/1/2009 12:50	7/1/2009 12:53
2 13D	3	50	14858	7/1/2009 12:46	7/1/2009 12:49
3 13D	3	43	14873	7/1/2009 12:37	7/1/2009 12:40

4 13D	3	47	14389	7/1/2009 12:33	7/1/2009 12:36
1 14A	3	44	14463	7/1/2009 12:54	7/1/2009 12:57
2 14A	3	41	14137	7/1/2009 13:17	7/1/2009 13:20
3 14A	3	45	14022	7/1/2009 13:13	7/1/2009 13:16
4 14A	3	51	13451	7/1/2009 13:02	7/1/2009 13:05
1 14B	3	42	14039	7/1/2009 13:01	7/1/2009 13:04
2 14B	3	36	14398	7/1/2009 12:54	7/1/2009 12:57
3 14B	3	47	13475	7/1/2009 13:17	7/1/2009 13:20
4 14B	3	47	13077	7/1/2009 13:13	7/1/2009 13:16
1 14C	3	26	14116	7/1/2009 13:12	7/1/2009 13:15
2 14C	3	35	14187	7/1/2009 13:02	7/1/2009 13:05
3 14C	3	37	14409	7/1/2009 12:55	7/1/2009 12:58
4 14C	3	38	13229	7/1/2009 13:17	7/1/2009 13:20
1 14D	3	16	13927	7/1/2009 13:17	7/1/2009 13:20
2 14D	3	32	14089	7/1/2009 13:12	7/1/2009 13:15
3 14D	3	16	13912	7/1/2009 13:02	7/1/2009 13:05
4 14D	3	47	13545	7/1/2009 12:55	7/1/2009 12:58

Radium-228 Liquid

Filename : RA228.XLS
 File Type : Excel
 Version # : 1.2.3

 Batch : 59514
 Analyst : AFI
 Prep Date : 7/12/2009

 LCS SN : 0503-B
 LCS Exp Date : 9/13/2009
 LCS Activity (dpm/ml) : 182.42
 LCS Volume Added : 2.00

 Tracer SN : 0112-J
 Tracer Exp Date : 2/17/2010
 Tracer Volume Added : 0.10

 Re-228 Abundance : 1
 Re-228 Method Uncertainty : 0.0784

 Calibration Date : 6/2/2008
 Calibration Due Date : 6/30/2009

Spike SN : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml) : N/A
 Spike Volume Added : N/A

 Procedure Code : GFC060SRL
 Pararmene : Radium-228
 Required MDA : 1 pCi/L
 Half-life of Re-228 : 5.75 years
 Half-life of Ac-228 : 6.13 hours
 Batch counted on : PIC
 BKG Count time : 500 min

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

Pos.	Sample Characteristics			Count raw Data			Counting Time (min.)	Gross Counts Alpha	Beta cpm	Detector Efficiency Error (cpm/dpm)	Weekly Bkg Count Time (min.)	Separation Date/Time	Count Start Date/Time	Ra-228 Decay	Ac-228 Count Correction	Calculated Sample Recovery %	Sample Recovery Error %	Results Pos.	
	Sample ID	Sample Aliquot L	Sample Aliquot L	Detector ID	Pos.	Sample Date/Time													
1	1201245712.1	1.0000	2.0399E-05	1A	1	15	36	1980	132.000	0.6303	500	7/2/2009 5:40	7/2/2009 8:39	1.000	0.713	1.014	100.83%	1.00%	1
2	1201245713.1	1.0000	2.0399E-05	1B	2	15	27	1959	130.600	0.6292	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.712	1.014	108.20%	1.00%	2
3	1201245714.1	1.0000	2.0399E-05	1C	3	15	44	2108	140.533	0.6176	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.712	1.014	114.22%	1.00%	3
4	1201245715.1	1.0000	2.0399E-05	1D	4	15	108	2265	151.000	0.6043	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.712	1.014	120.58%	1.00%	4
5	1201245716.1	1.0000	2.0399E-05	2A	5	15	69	1838	122.533	0.6172	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.712	1.014	105.84%	1.00%	5
6	1201245717.1	1.0000	2.0399E-05	2B	6	15	8	2053	136.867	0.6167	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.712	1.014	102.70%	1.00%	6
7	1201245718.1	1.0000	2.0399E-05	2C	7	15	96	1982	132.133	0.5969	500	7/2/2009 5:40	7/2/2009 8:40	1.000	0.711	1.014	112.82%	1.00%	7
8	1201245719.1	1.0000	2.0399E-05	3A	8	15	233	1645	109.667	0.5682	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	111.91%	1.00%	8
9	1201245720.1	1.0000	2.0399E-05	3B	9	15	99	1821	121.400	0.5980	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	114.22%	1.00%	9
10	1201245721.1	1.0000	2.0399E-05	3C	10	15	96	1942	129.467	0.60535	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	114.22%	1.00%	10
11	1201245722.1	1.0000	2.0399E-05	3D	11	15	90	2076	138.400	0.5994	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	105.84%	1.00%	11
12	1201245723.1	1.0000	2.0399E-05	4A	12	15	79	1877	125.133	0.6208	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.675	1.014	102.70%	1.00%	12
13	1201245724.1	1.0000	2.0399E-05	4B	13	15	13	1909	127.267	0.6205	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.674	1.014	112.82%	1.00%	13
14	1201245725.1	1.0000	2.0399E-05	4C	14	15	45	1974	131.600	0.6052	500	7/2/2009 5:40	7/2/2009 9:08	1.000	0.684	1.014	111.91%	1.00%	14
15	1201245726.1	1.0000	2.0399E-05	4D	15	15	181	1880	125.333	0.5673	500	7/2/2009 5:40	7/2/2009 9:26	1.000	0.654	1.014	100.83%	1.00%	15
16	1201245727.1	1.0000	2.0399E-05	5A	16	15	53	1818	121.200	0.6258	500	7/2/2009 5:40	7/2/2009 9:26	1.000	0.651	1.014	108.20%	1.00%	16
17	1201245728.1	1.0000	2.0399E-05	5B	17	15	59	1785	119.000	0.6280	500	7/2/2009 5:40	7/2/2009 9:26	1.000	0.653	1.014	114.22%	1.00%	17
18	1201245729.1	1.0000	2.0399E-05	5C	18	15	43	2009	133.933	0.6368	500	7/2/2009 5:40	7/2/2009 9:26	1.000	0.652	1.014	120.58%	1.00%	18
19	1201245730.1	1.0000	2.0399E-05	5D	19	15	59	2107	140.467	0.6237	500	7/2/2009 5:40	7/2/2009 9:26	1.000	0.652	1.014	105.84%	1.00%	19
20	1201245731.1	1.0000	2.0399E-05	6A	20	15	35	1800	120.000	0.6221	500	7/2/2009 5:40	7/2/2009 9:27	1.000	0.651	1.014	114.22%	1.00%	20
21	1201245732.1	1.0000	2.0399E-05	6B	21	15	71	1816	121.067	0.6163	500	7/2/2009 5:40	7/2/2009 9:27	1.000	0.651	1.014	102.70%	1.00%	21
22	1201245733.1	1.0000	2.0399E-05	6C	22	15	81	1833	128.667	0.6111	500	7/2/2009 5:40	7/2/2009 9:27	1.000	0.651	1.014	112.82%	1.00%	22
23	1201245734.1	1.0000	2.0399E-05	6D	23	15	81	1826	121.733	0.6120	500	7/2/2009 5:40	7/2/2009 9:47	1.000	0.627	1.014	111.91%	1.00%	23
24	1201245735.1	1.0000	2.0399E-05	7A	24	15	75	1711	114.067	0.60816	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.627	1.014	108.20%	1.00%	24
25	1201245736.1	1.0000	2.0399E-05	7B	25	15	59	1783	118.867	0.6280	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.627	1.014	114.22%	1.00%	25
26	1201245737.1	1.0000	2.0399E-05	7C	26	15	74	1934	128.933	0.6178	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.627	1.014	102.70%	1.00%	26
27	1201245738.1	1.0000	2.0399E-05	7D	27	15	83	1963	130.867	0.6257	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.626	1.014	105.84%	1.00%	27
28	1201245739.1	1.0000	2.0399E-05	8A	28	15	49	1653	110.200	0.6247	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.626	1.014	102.70%	1.00%	28
29	1201245740.1	1.0000	2.0399E-05	8B	29	15	20	1788	119.200	0.6332	500	7/2/2009 5:40	7/2/2009 9:48	1.000	0.626	1.014	108.20%	1.00%	29
30	1201245741.1	1.0000	2.0399E-05	8C	30	15	34	1820	128.000	0.6339	500	7/2/2009 5:40	7/2/2009 10:07	1.000	0.604	1.014	111.91%	1.00%	30
31	1201245742.1	1.0000	2.0399E-05	8D	31	15	45	1782	118.800	0.6281	500	7/2/2009 5:40	7/2/2009 10:07	1.000	0.604	1.014	112.82%	1.00%	31
32	1201245743.1	1.0000	2.0399E-05	9A	32	15	17	1689	112.600	0.6496	500	7/2/2009 5:40	7/2/2009 10:06	1.000	0.605	1.014	100.83%	1.00%	32
33	1201490021.1	1.0000	2.0399E-05	9B	33	15	13	1706	113.733	0.6356	500	7/2/2009 5:40	7/2/2009 10:06	1.000	0.605	1.014	108.20%	1.00%	33
34	1201490022.1	1.0000	2.0399E-05	9C	34	15	13	1802	120.133	0.6273	500	7/2/2009 5:40	7/2/2009 10:22	1.000	0.587	1.014	114.22%	1.00%	34
35	1201490023.1	1.0000	2.0399E-05	9D	35	15	15	1945	128.667	0.6433	500	7/2/2009 5:40	7/2/2009 10:06	1.000	0.604	1.014	105.84%	1.00%	35
36	1201490024.1	1.0000	2.0399E-05	10A	36	15	10	1708	113.867	0.6389	500	7/2/2009 5:40	7/2/2009 10:07	1.000	0.604	1.014	102.70%	1.00%	36
37	1201490025.1	1.0000	2.0399E-05	10B	37	15	19	1743	116.200	0.6137	500	7/2/2009 5:40	7/2/2009 10:07	1.000	0.604	1.014	108.20%	1.00%	37
38	1201490026.1	1.0000	2.0399E-05	10C	38	15	15	1826	121.733	0.6250	500	7/2/2009 5:40	7/2/2009 10:06	1.000	0.604	1.014	111.91%	1.00%	38
39	1201490027.1	1.0000	2.0399E-05	10D	39	15	14	1769	117.933	0.6320	500	7/2/2009 5:40	7/2/2009 10:22	1.000	0.587	1.014	108.20%	1.00%	39
40	1201490028.1	1.0000	2.0399E-05	11A	40	15	19	2125	141.667	0.5825	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.819	1.014	100.83%	1.00%	40
41	1201245737.1	1.0000	2.0399E-05	11B	41	15	22	2260	160.667	0.6372	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.819	1.014	108.20%	1.00%	41
42	1201245738.1	1.0000	2.0399E-05	11C	42	15	13	2544	169.600	0.6352	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.819	1.014	114.22%	1.00%	42
43	1201245739.1	1.0000	2.0399E-05	11D	43	15	14	2596	173.067	0.6348	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.818	1.014	120.58%	1.00%	43
44	1201245740.1	1.0000	2.0399E-05	12A	44	15	17	2235	149.000	0.6286	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.818	1.014	105.84%	1.00%	44
45	1201245741.1	1.0000	2.0399E-05	12B	45	15	10	2330	155.333	0.6352	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.818	1.014	102.70%	1.00%	45
46	1201245742.1	1.0000	2.0399E-05	12C	46	15	16	2530	168.667	0.6304	500	7/2/2009 5:40	7/2/2009 7:26	1.000	0.818	1.014	111.91%	1.00%	46
47	1201245743.1	1.0000	2.0399E-05	12D	47	15	15	2463	164.200	0.6300	500	7/2/2009 5:40	7/2/2009 7:49	1.000	0.783	1.014	105.84%	1.00%	47
48	1201245744.1	1.0000	2.0399E-05	13A	48	15	11	2231	148.733	0.6410	500	7/2/2009 5:40	7/2/2009 7:49	1.000	0.783	1.014	108.20%	1.00%	48
49	1201490021.1	1.0000	2.0399E-05	13B	49	15	13	2190	148.000	0.6326	500	7/2/2009 5:40	7/2/2009 7:49	1.000	0.783	1.014	114.22%	1.00%	49
50	1201490022.1	1.0000	2.0399E-05	13C	50	15	11	2458	163.867	0.6358	500	7/2/2009 5:40	7/2/2009 7:50	1.000	0.783	1.014	120.58%	1.00%	50
51	1201490023.1	1.0000	2.0399E-05	13D	51	15	12	2635	175.667	0.6377	500	7/2/2009 5:40	7/2/2009 7:50	1.000	0.783	1.014	105.84%	1.00%	51
52	1201490024.1	1.0000	2.0399E-05	14A	52	15	11	2173	144.867	0.6266	500	7/2/2009 5:40	7/2/2009 7:50	1.000	0.782	1.014	102.70%	1.00%	52
53	1201490025.1	1.0000	2.0399E-05	14B	53	15	11	2281	152.067	0.6266	500	7/2/2009 5:40	7/2/2009 7:50						

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Normalis are decay corrected to Sample Date/Time

* indicates results calculated at 100% recovery

Decision Level	Critical Level	Required MDA	MDA	Sample Act. Conc.		Net Count Rate	Net Count Rate	2 SIGMA Counting		Total Prop. Uncertainty	Sample Type	Nominal pCi/L	Recovery
				pCi/L	Conc.			CPM	CPM				
0.3471	0.2451	1	0.6937	134.0279	0.0254	131.6880	2.9666	5.9178	21.6466	164.3409	LCS	164.3409	81.6%
0.3647	0.2575	1	0.7192	133.0399	0.0251	130.2590	2.9508	5.9071	21.4655	164.3409	LCS	164.3409	81.0%
0.5889	0.3790	1	0.9659	145.2921	0.0243	139.8173	3.0611	6.2347	23.3752	164.3409	LCS	164.3409	88.4%
0.4695	0.3314	1	0.8755	159.8828	0.0239	150.4760	3.1730	6.6057	25.6756	164.3409	LCS	164.3409	97.3%
0.4261	0.3008	1	0.8097	127.0000	0.0257	122.0633	2.8583	5.8279	20.5368	164.3409	LCS	164.3409	77.3%
0.7599	0.5395	1	1.2813	141.0616	0.0247	135.4387	3.0211	6.1673	22.7300	164.3409	LCS	164.3409	85.8%
0.3798	0.2681	1	0.7515	141.8559	0.0253	131.7993	2.9681	6.4352	22.9053	164.3409	LCS	164.3409	86.3%
0.4150	0.2830	1	0.8072	145.8182	0.0251	131.8887	2.9696	6.4352	23.5274	164.3409	LCS	164.3409	88.7%
0.6347	0.4481	1	1.1343	129.9854	0.0284	108.9047	2.7042	6.3116	21.1935	164.3409	LCS	164.3409	78.9%
0.9035	0.6379	1	1.5022	135.4510	0.0266	119.6900	2.8455	6.3115	21.9803	164.3409	LCS	164.3409	82.4%
0.6078	0.4291	1	1.0779	141.2594	0.0255	128.6447	2.9382	6.3235	22.8259	164.3409	LCS	164.3409	86.0%
0.5473	0.3864	1	0.9987	155.5960	0.0247	137.7700	3.0378	6.7244	25.0636	164.3409	LCS	164.3409	94.7%
0.6283	0.4436	1	1.1054	135.5336	0.0264	124.2433	2.8986	6.1761	21.9739	164.3409	LCS	164.3409	83.3%
0.9036	0.6379	1	1.4942	136.9155	0.0254	125.4287	2.9134	6.2333	22.1127	164.3409	LCS	164.3409	88.8%
0.7676	0.5419	1	1.3079	145.9826	0.0252	130.3400	2.9624	6.5032	23.5621	164.3409	LCS	164.3409	90.0%
0.7520	0.5309	1	1.3000	147.9661	0.0266	124.2633	2.8910	6.7471	24.0105	164.3409	LCS	164.3409	82.1%
0.4809	0.3395	1	0.9027	134.9611	0.0269	120.7040	2.8427	6.2312	21.9265	164.3409	LCS	164.3409	80.0%
0.8974	0.4924	1	1.2076	131.4742	0.0271	117.9500	2.8170	6.1544	21.3797	164.3409	LCS	164.3409	89.0%
0.6530	0.4610	1	1.1419	148.2299	0.0259	132.9873	2.9894	6.4406	23.6659	164.3409	LCS	164.3409	95.2%
0.7661	0.5409	1	1.3064	156.3706	0.0255	139.2187	3.0605	6.7377	25.2668	164.3409	LCS	164.3409	81.7%
0.6899	0.4871	1	1.1997	134.1863	0.0270	118.9960	2.8288	6.2523	21.8127	164.3409	LCS	164.3409	83.4%
0.6079	0.4292	1	1.0862	137.0396	0.0269	120.3027	2.8412	6.3436	22.2643	164.3409	LCS	164.3409	88.8%
0.9509	0.6713	1	1.5725	146.0056	0.0264	127.0307	2.9317	6.6044	23.6775	164.3409	LCS	164.3409	88.0%
0.4376	0.3090	1	0.8562	144.5849	0.0275	113.7227	2.7577	6.3903	21.8573	164.3409	LCS	164.3409	89.8%
0.4227	0.2984	1	0.8330	134.2390	0.0276	118.4887	2.8152	6.4094	22.3723	164.3409	LCS	164.3409	92.4%
0.4360	0.3079	1	0.8480	137.6373	0.0270	118.4887	2.8152	6.7858	24.6068	164.3409	LCS	164.3409	92.6%
0.3962	0.2797	1	0.7956	151.8935	0.0262	128.6313	2.9319	6.7499	24.6318	164.3409	LCS	164.3409	77.8%
0.4480	0.3163	1	0.8657	152.1131	0.0261	130.4707	2.9539	6.2072	20.8618	164.3409	LCS	164.3409	82.2%
0.6932	0.4470	1	1.1278	127.8251	0.0279	109.4120	2.7108	6.3699	21.9896	164.3409	LCS	164.3409	89.2%
0.8917	0.6931	1	1.6167	135.1471	0.0273	117.2540	2.8124	6.5922	23.7610	164.3409	LCS	164.3409	86.1%
0.5779	0.4080	1	1.0463	146.5864	0.0263	127.3240	2.9214	6.4441	23.0149	164.3409	LCS	164.3409	79.4%
0.8422	0.5946	1	1.4301	141.4935	0.0272	117.4880	2.8147	6.6441	23.0149	164.3409	LCS	164.3409	86.1%
0.4379	0.3091	1	0.8509	130.5505	0.0276	112.2200	2.7400	6.2478	21.2682	164.3409	LCS	164.3409	79.4%
0.7972	0.5629	1	1.3635	133.7974	0.0277	112.5273	2.7540	6.4182	21.9026	164.3409	LCS	164.3409	81.4%
0.4475	0.3159	1	0.8728	144.2924	0.0269	119.7633	2.8301	6.6832	23.4437	164.3409	LCS	164.3409	87.8%
0.8154	0.5757	1	1.3863	150.8313	0.0263	128.3747	2.9406	6.7718	24.4459	164.3409	LCS	164.3409	91.8%
0.4063	0.2868	1	0.8104	134.4151	0.0285	119.5507	2.7553	6.3927	21.8871	164.3409	LCS	164.3409	81.8%
1.9322	1.3641	1	2.9747	135.0540	0.0265	109.6040	2.7857	6.7277	22.0820	164.3409	LCS	164.3409	82.2%
0.4205	0.2969	1	0.8358	146.9063	0.0268	121.4093	2.8489	6.7565	23.8548	164.3409	LCS	164.3409	89.4%
0.4437	0.3182	1	0.8728	144.8386	0.0271	117.5853	2.8041	6.7699	23.5500	164.3409	LCS	164.3409	86.1%
0.3432	0.2423	1	0.6763	135.4546	0.0253	141.3227	3.0730	5.7736	21.8705	164.3409	LCS	164.3409	82.4%
0.3289	0.2322	1	0.6397	131.6931	0.0247	150.2887	3.1684	5.4434	21.2189	164.3409	LCS	164.3409	80.1%
0.2949	0.2082	1	0.5922	148.9038	0.0237	169.2980	3.3626	5.7929	23.8966	164.3409	LCS	164.3409	90.5%
0.3379	0.2365	1	0.6530	151.8473	0.0235	172.6707	3.3968	5.8549	24.3615	164.3409	LCS	164.3409	92.4%
0.4616	0.3400	1	0.8577	131.6889	0.0249	148.2120	3.2186	5.4891	21.2301	164.3409	LCS	164.3409	80.1%
0.7498	0.5287	1	1.2332	134.8566	0.0246	153.3873	3.2186	5.5463	21.7215	164.3409	LCS	164.3409	82.1%
0.4447	0.3140	1	0.8052	148.8317	0.0238	162.8880	3.3090	5.6232	23.8982	164.3409	LCS	164.3409	90.6%
0.6180	0.4363	1	1.0494	143.9479	0.0241	162.8880	3.3090	5.7315	23.1384	164.3409	LCS	164.3409	87.8%
0.3427	0.2420	1	0.6680	135.0873	0.0248	148.3533	3.1490	5.6202	21.7752	164.3409	LCS	164.3409	82.2%
0.5997	0.4234	1	1.0256	129.5009	0.0251	144.7940	3.1202	5.4697	20.8960	164.3409	LCS	164.3409	78.9%
0.6469	0.4602	1	1.0649	146.0021	0.0240	163.4967	3.3053	5.7852	23.4616	164.3409	LCS	164.3409	88.8%
0.3316	0.2341	1	0.6469	146.0021	0.0235	174.3747	3.4225	6.1425	25.6134	164.3409	LCS	164.3409	97.2%
0.6355	0.4487	1	1.0805	159.6717	0.0251	144.5507	3.1078	5.5650	21.3060	164.3409	LCS	164.3409	80.4%
0.3136	0.2214	1	0.6255	132.0625	0.0254	145.4707	3.1861	5.8215	21.9790	164.3409	LCS	164.3409	82.5%
1.4618	1.0321	1	2.2506	135.6135	0.0254	154.5427	3.2193	5.7718	22.7000	164.3409	LCS	164.3409	86.2%
0.3185	0.2249	1	0.6330	141.6298	0.0245	158.8520	3.2579	5.8988	23.6017	164.3409	LCS	164.3409	89.3%
0.3327	0.2349	1	0.6546	146.7439	0.0242	158.8520	3.2579	5.8988	23.6017	164.3409	LCS	164.3409	89.3%

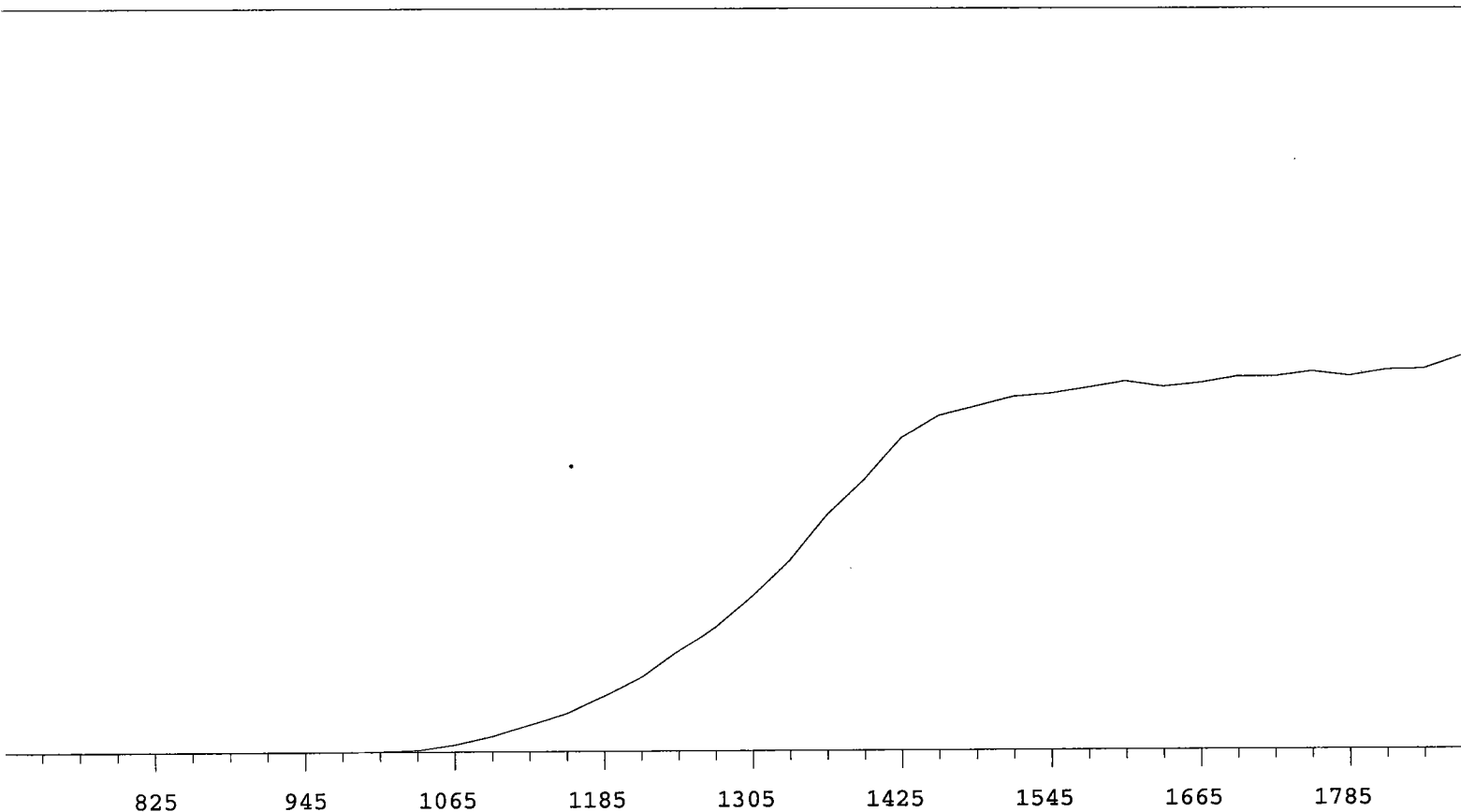
SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine
1	1A	15	36	1980	7/2/2009 8:39	7/2/2009 8:54	Protean
2	1B	15	27	1959	7/2/2009 8:40	7/2/2009 8:55	Protean
3	1C	15	44	2108	7/2/2009 8:40	7/2/2009 8:55	Protean
4	1D	15	108	2265	7/2/2009 8:40	7/2/2009 8:55	Protean
5	2A	15	69	1838	7/2/2009 8:40	7/2/2009 8:55	Protean
6	2B	15	8	2053	7/2/2009 8:40	7/2/2009 8:55	Protean
7	2C	15	96	1982	7/2/2009 8:40	7/2/2009 8:55	Protean
8	2D	15	93	1984	7/2/2009 9:08	7/2/2009 9:23	Protean
1	3A	15	233	1645	7/2/2009 9:08	7/2/2009 9:23	Protean
2	3B	15	99	1821	7/2/2009 9:08	7/2/2009 9:23	Protean
3	3C	15	96	1942	7/2/2009 9:08	7/2/2009 9:23	Protean
4	3D	15	90	2076	7/2/2009 9:08	7/2/2009 9:23	Protean
5	4A	15	79	1877	7/2/2009 9:08	7/2/2009 9:23	Protean
6	4B	15	13	1909	7/2/2009 9:08	7/2/2009 9:23	Protean
7	4C	15	97	1974	7/2/2009 9:09	7/2/2009 9:24	Protean
8	4D	15	181	1880	7/2/2009 9:25	7/2/2009 9:40	Protean
1	5A	15	53	1818	7/2/2009 9:26	7/2/2009 9:41	Protean
2	5B	15	59	1785	7/2/2009 9:26	7/2/2009 9:41	Protean
3	5C	15	43	2009	7/2/2009 9:26	7/2/2009 9:41	Protean
4	5D	15	59	2107	7/2/2009 9:26	7/2/2009 9:41	Protean
5	6A	15	35	1800	7/2/2009 9:27	7/2/2009 9:42	Protean
6	6B	15	71	1816	7/2/2009 9:27	7/2/2009 9:42	Protean
7	6C	15	81	1933	7/2/2009 9:27	7/2/2009 9:42	Protean
8	6D	15	81	1826	7/2/2009 9:47	7/2/2009 10:02	Protean
1	7A	15	75	1711	7/2/2009 9:48	7/2/2009 10:03	Protean
2	7B	15	59	1783	7/2/2009 9:48	7/2/2009 10:03	Protean
3	7C	15	74	1934	7/2/2009 9:48	7/2/2009 10:03	Protean
4	7D	15	83	1963	7/2/2009 9:48	7/2/2009 10:03	Protean
5	8A	15	49	1653	7/2/2009 9:48	7/2/2009 10:03	Protean
6	8B	15	20	1788	7/2/2009 9:48	7/2/2009 10:03	Protean
7	8C	15	34	1920	7/2/2009 9:48	7/2/2009 10:03	Protean
8	8D	15	45	1782	7/2/2009 10:07	7/2/2009 10:22	Protean
1	9A	15	17	1689	7/2/2009 10:06	7/2/2009 10:21	Protean
2	9B	15	13	1706	7/2/2009 10:06	7/2/2009 10:21	Protean
3	9C	15	13	1802	7/2/2009 10:06	7/2/2009 10:21	Protean
4	9D	15	15	1945	7/2/2009 10:06	7/2/2009 10:21	Protean
5	10A	15	10	1708	7/2/2009 10:07	7/2/2009 10:22	Protean
6	10B	15	19	1743	7/2/2009 10:07	7/2/2009 10:22	Protean
7	10C	15	15	1826	7/2/2009 10:07	7/2/2009 10:22	Protean
8	10D	15	14	1769	7/2/2009 10:22	7/2/2009 10:37	Protean
1	11A	15	19	2125	7/2/2009 7:26	7/2/2009 7:41	Protean
2	11B	15	22	2260	7/2/2009 7:26	7/2/2009 7:41	Protean
3	11C	15	13	2544	7/2/2009 7:26	7/2/2009 7:41	Protean
4	11D	15	14	2596	7/2/2009 7:26	7/2/2009 7:41	Protean
5	12A	15	17	2235	7/2/2009 7:26	7/2/2009 7:41	Protean
6	12B	15	10	2330	7/2/2009 7:26	7/2/2009 7:41	Protean
7	12C	15	16	2530	7/2/2009 7:26	7/2/2009 7:41	Protean
8	12D	15	10	2463	7/2/2009 7:26	7/2/2009 7:41	Protean
1	13A	15	11	2231	7/2/2009 7:49	7/2/2009 8:04	Protean
2	13B	15	13	2190	7/2/2009 7:49	7/2/2009 8:04	Protean
3	13C	15	11	2458	7/2/2009 7:49	7/2/2009 8:04	Protean

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7/2/09

4	13D	15	12	2635	7/2/2009 7:50	7/2/2009 8:05	Protean
5	14A	15	11	2173	7/2/2009 7:50	7/2/2009 8:05	Protean
6	14B	15	11	2281	7/2/2009 7:50	7/2/2009 8:05	Protean
7	14C	15	14	2323	7/2/2009 7:50	7/2/2009 8:05	Protean
8	14D	15	14	2388	7/2/2009 7:50	7/2/2009 8:05	Protean

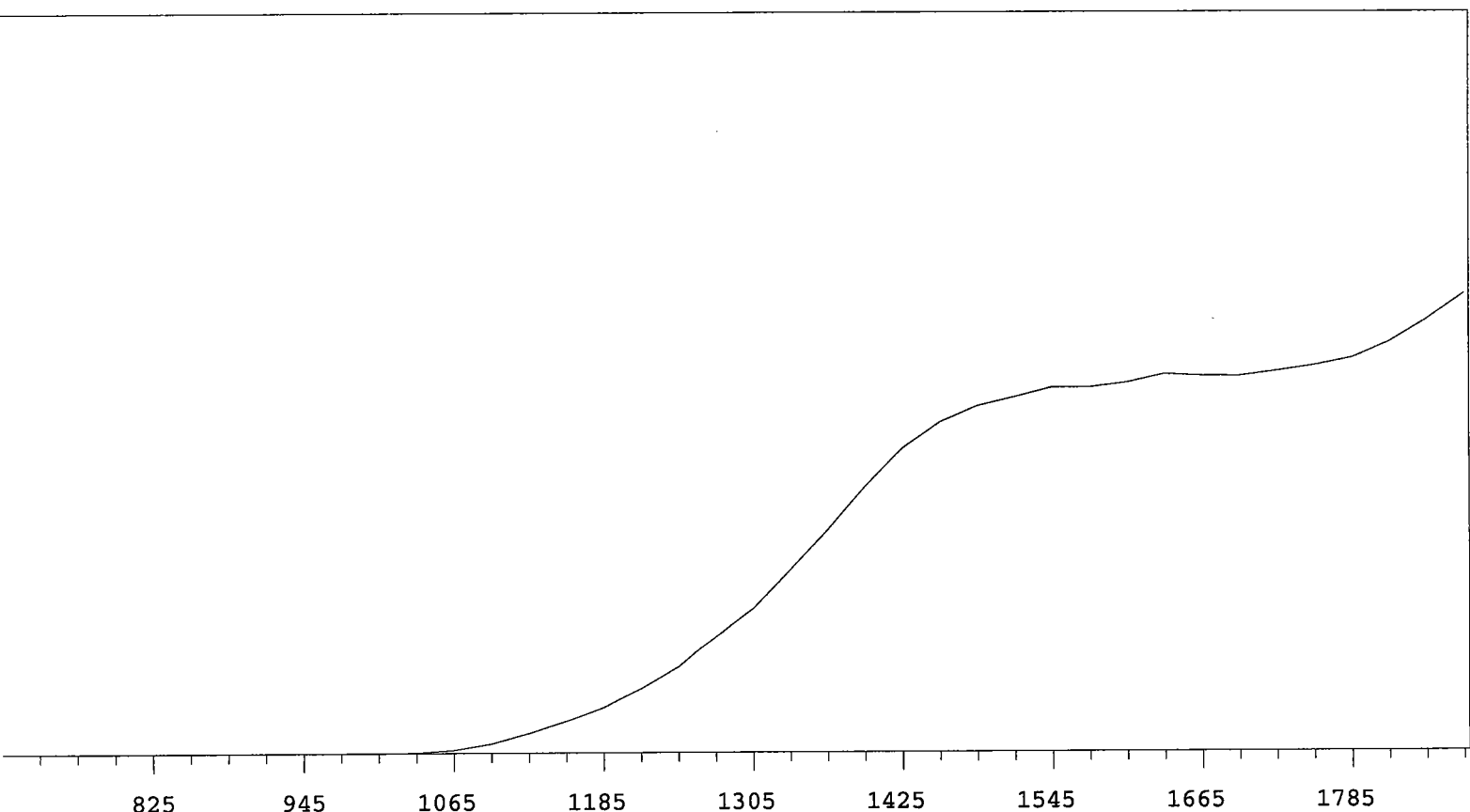
Ra-228 Protean	Cal Date A0	7/2/2009 A1	Exp Date A2	7/31/2009 A3	A4
1A	6.30258E-01				
1B	6.28221E-01				
1C	6.17615E-01				
1D	6.04341E-01				
2A	6.17224E-01				
2B	6.16681E-01				
2C	5.96919E-01				
2D	6.11886E-01				
3A	5.68218E-01				
3B	5.98041E-01				
3C	6.16431E-01				
3D	5.99405E-01				
4A	6.20765E-01				
4B	6.20459E-01				
4C	6.05183E-01				
4D	5.87325E-01				
5A	6.25790E-01				
5B	6.28027E-01				
5C	6.36802E-01				
5D	6.23741E-01				
6A	6.22050E-01				
6B	6.16280E-01				
6C	6.11053E-01				
6D	6.12043E-01				
7A	6.17961E-01				
7B	6.27962E-01				
7C	6.17791E-01				
7D	6.25720E-01				
8A	6.24723E-01				
8B	6.33167E-01				
8C	6.33890E-01				
8D	6.28089E-01				
9A	6.496412E-01				
9B	6.356321E-01				
9C	6.273008E-01				
9D	6.432553E-01				
10A	6.389066E-01				
10B	6.137441E-01				
10C	6.249999E-01				
10D	6.319781E-01				
11A	5.82502E-01				
11B	6.37172E-01				
11C	6.35171E-01				
11D	6.34840E-01				
12A	6.28566E-01				
12B	6.35234E-01				
12C	6.30366E-01				
12D	6.31956E-01				
13A	6.40953E-01				

13B	6.52643E-01
13C	6.53798E-01
13D	6.37701E-01
14A	6.39290E-01
14B	6.26611E-01
14C	6.37531E-01
14D	6.32609E-01



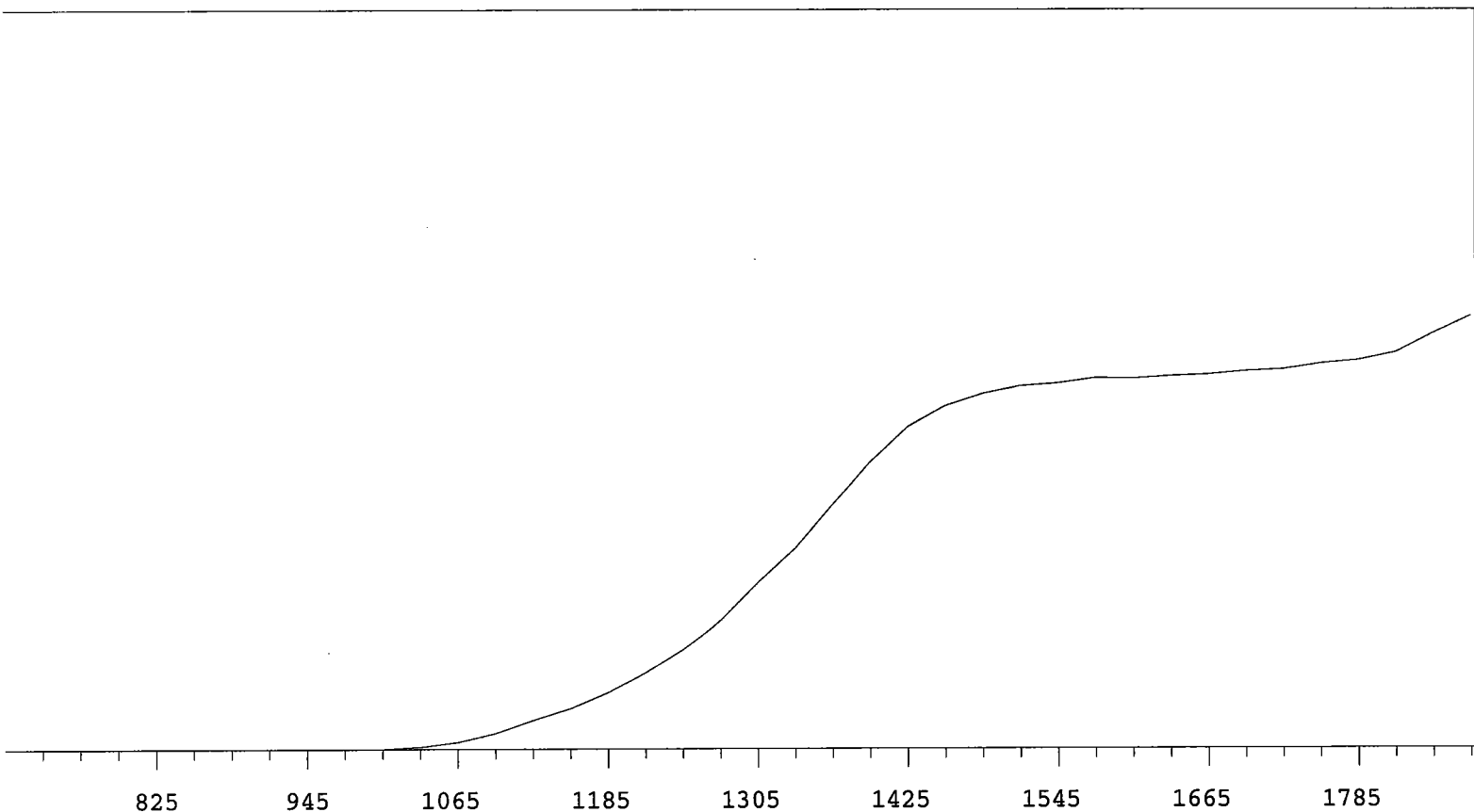
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	11640	+69.78
735	1		1335	14241	+62.88
765	0		1365	17534	+55.91
795	0	+0.00	1395	20127	+45.04
825	0	>100	1425	23254	+31.29
855	1	>100	1455	24902	+20.41
885	0	+55.56	1485	25605	+10.49
915	2	+66.67	1515	26310	+6.44
945	0	>100	1545	26535	+5.31
975	2	>100	1575	26953	+2.79
1005	42	>100	1605	27399	+1.83
1035	145	>100	1635	27000	+1.71
1065	544	>100	1665	27255	+1.62
1095	1136	>100	1695	27723	+3.14
1125	1967	>100	1725	27705	+1.56
1155	2845	>100	1755	28072	+1.15
1185	4078	>100	1785	27729	+1.43
1215	5483	+93.18	1815	28194	+3.24
1245	7400	+83.35	1845	28243	
1275	9328	+75.40	1875	29191	

Alpha Volts: 1575 Beta Volts: 1575

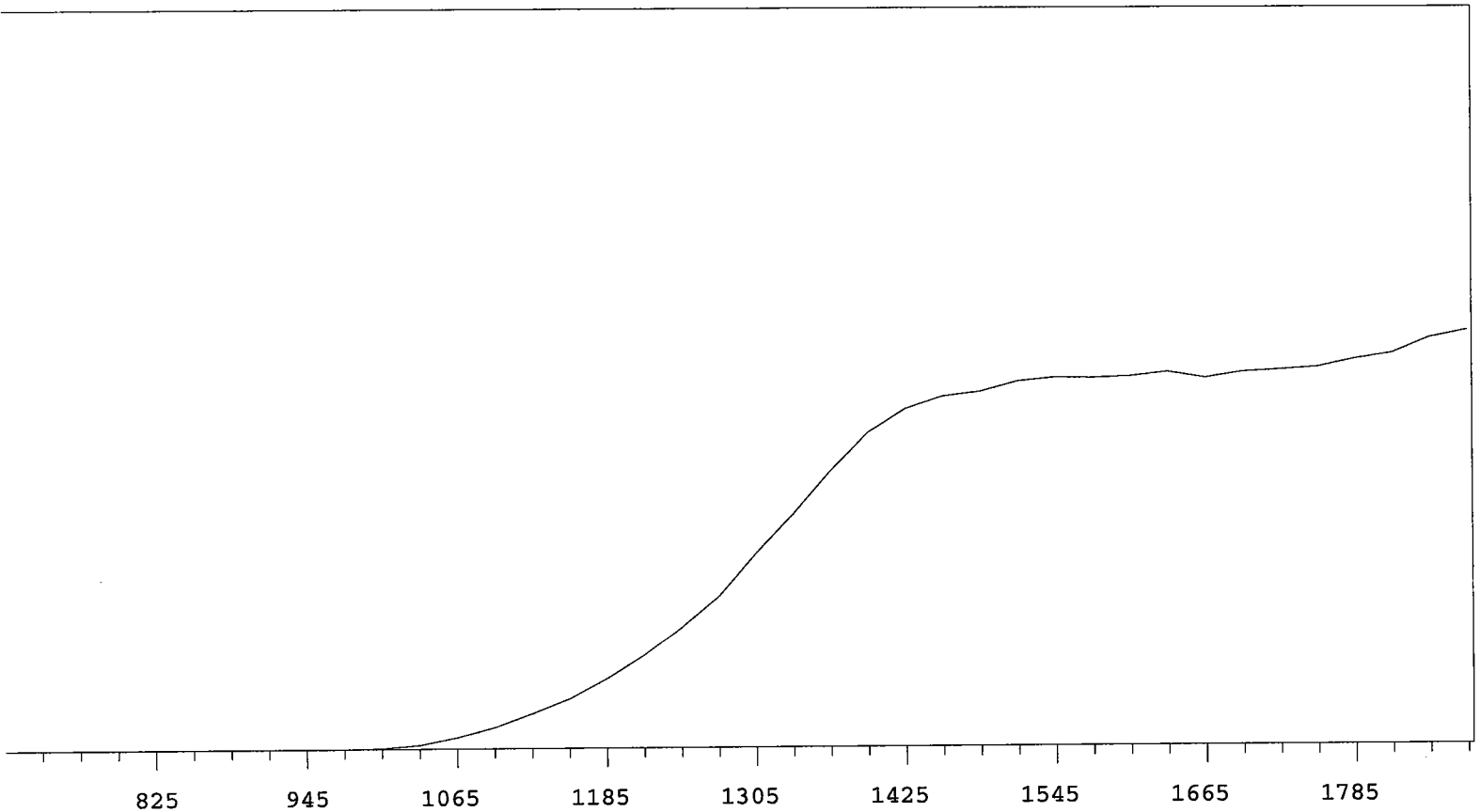


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	13188	+75.92
735	0		1335	16818	+67.60
765	0	+55.56	1365	20420	+59.86
795	1	+83.33	1395	24341	+47.85
825	1	+55.56	1425	27854	+35.51
855	0	>100	1455	30288	+23.26
885	1	+0.00	1485	31798	+14.54
915	0	+0.00	1515	32622	+8.32
945	1	>100	1545	33496	+5.11
975	0	>100	1575	33475	+4.43
1005	4	>100	1605	33903	+3.09
1035	56	>100	1635	34654	+2.46
1065	292	>100	1665	34485	+1.74
1095	890	>100	1695	34445	+1.84
1125	1841	>100	1725	34908	+3.91
1155	2936	>100	1755	35401	+6.80
1185	4179	>100	1785	36062	+10.27
1215	5837	>100	1815	37505	+14.30
1245	7821	+91.28	1845	39508	
1275	10638	+83.88	1875	41843	

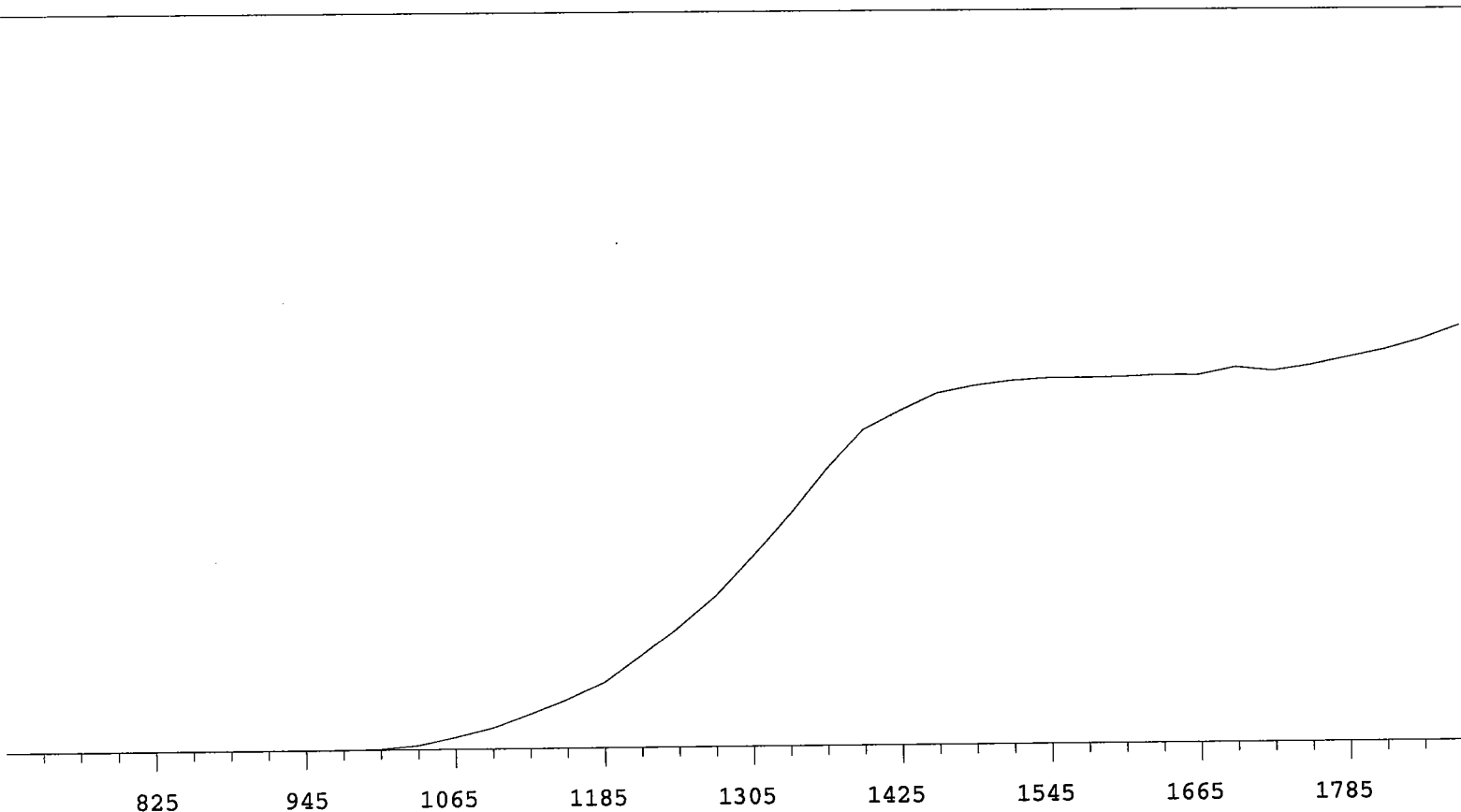
Alpha Volts: 1575 Beta Volts: 1575



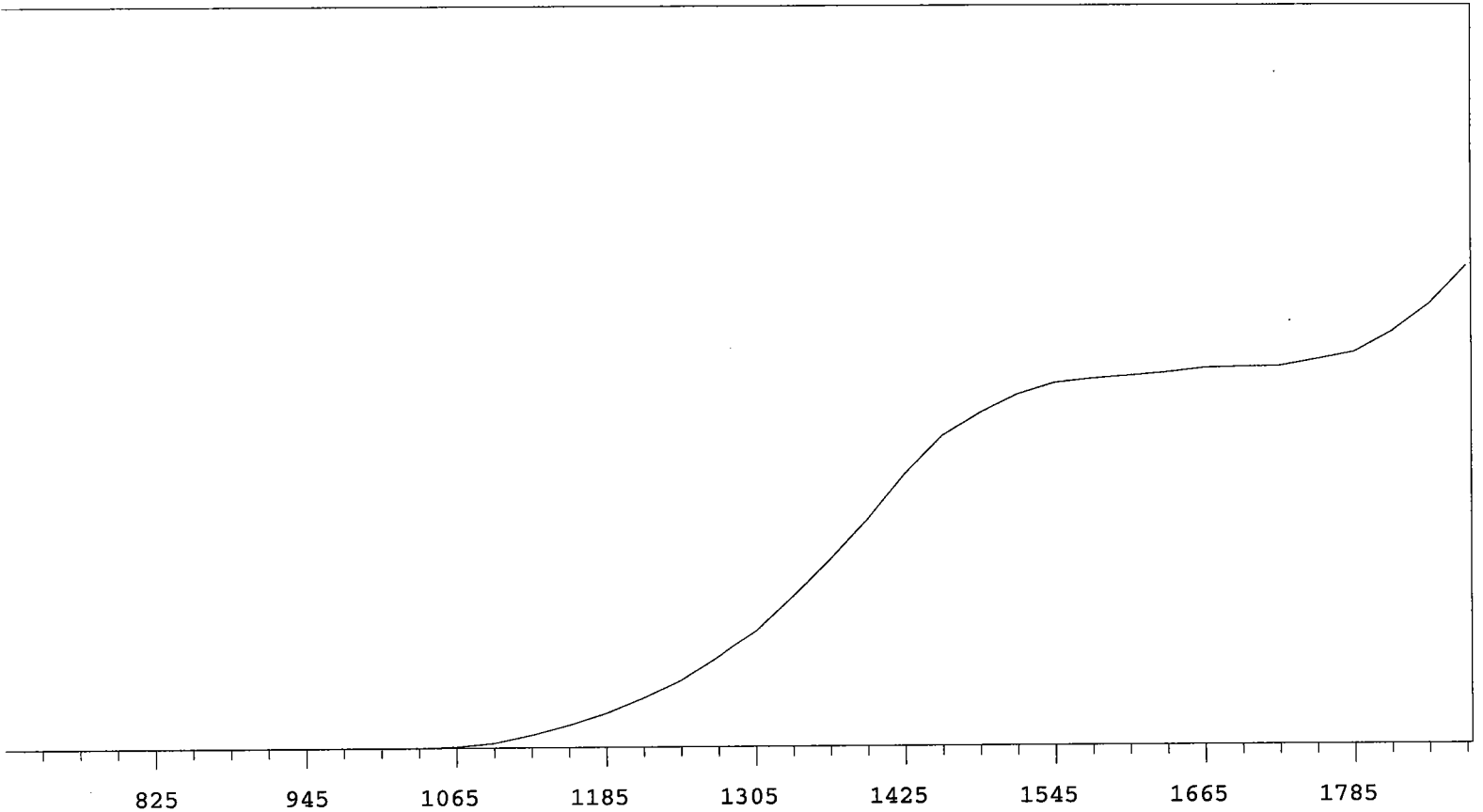
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	14817	+71.06
735	0		1335	17823	+63.34
765	1	+0.00	1365	21704	+53.63
795	0	>100	1395	25422	+42.55
825	1	-55.56	1425	28424	+29.21
855	1	+55.56	1455	30244	+18.11
885	0	>100	1485	31305	+10.10
915	1	>100	1515	31989	+6.07
945	0	>100	1545	32223	+3.43
975	4	>100	1575	32671	+2.15
1005	32	>100	1605	32621	+1.68
1035	206	>100	1635	32837	+1.52
1065	639	>100	1665	32961	+2.01
1095	1416	>100	1695	33249	+2.64
1125	2551	>100	1725	33409	+3.21
1155	3619	>100	1755	33931	+4.07
1185	5037	+98.68	1785	34234	+7.20
1215	6875	+91.19	1815	34909	+10.28
1245	8915	+85.53	1845	36660	
1275	11519	+77.28	1875	38205	



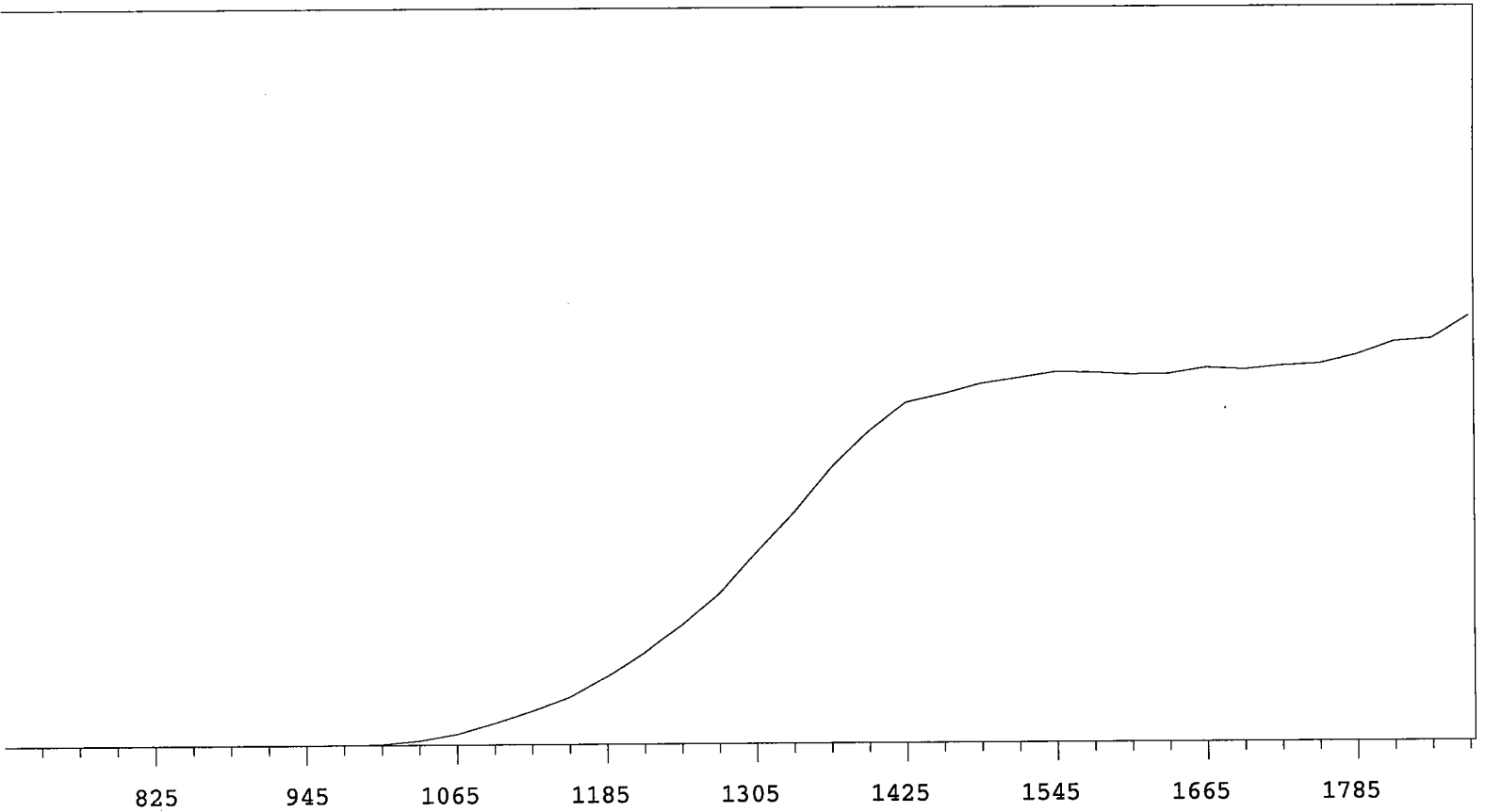
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15202	+66.36
735	1		1335	18216	+57.86
765	0	+0.00	1365	21597	+45.58
795	1	+0.00	1395	24648	+32.96
825	0	+0.00	1425	26505	+19.92
855	1	>100	1455	27475	+11.42
885	0	>100	1485	27836	+7.08
915	0	>100	1515	28609	+4.51
945	0	>100	1545	28896	+2.93
975	8	>100	1575	28862	+1.66
1005	75	>100	1605	28969	+0.36
1035	303	>100	1635	29292	+0.80
1065	872	>100	1665	28836	+1.06
1095	1656	>100	1695	29279	+1.48
1125	2729	>100	1725	29439	+3.59
1155	3862	>100	1755	29642	+4.07
1185	5425	+98.19	1785	30243	+6.51
1215	7256	+88.82	1815	30699	+7.79
1245	9510	+81.89	1845	31876	
1275	11944	+74.07	1875	32444	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19017	+67.45
735	1		1335	23157	+59.23
765	0	+83.33	1365	27625	+45.78
795	0	-83.33	1395	31465	+32.72
825	1	>100	1425	33352	+20.41
855	0	>100	1455	35084	+11.74
885	1	+100.00	1485	35819	+7.11
915	1	>100	1515	36292	+3.35
945	2	>100	1545	36527	+1.63
975	12	>100	1575	36540	+0.87
1005	91	>100	1605	36585	+0.48
1035	421	>100	1635	36742	+1.76
1065	1239	>100	1665	36691	+1.53
1095	2155	>100	1695	37461	+1.89
1125	3527	>100	1725	37073	+3.07
1155	4974	>100	1755	37603	+4.02
1185	6647	+97.44	1785	38346	+6.58
1215	9250	+89.00	1815	39111	+7.95
1245	12041	+82.15	1845	40115	
1275	15094	+73.81	1875	41409	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	12541	+83.18
735	1		1335	16192	+74.48
765	0		1365	20083	+67.17
795	0	>100	1395	24273	+58.43
825	0	>100	1425	29090	+46.86
855	0	>100	1455	33223	+34.56
885	0	>100	1485	35608	+22.67
915	0	>100	1515	37581	+13.63
945	1	>100	1545	38762	+8.18
975	2	>100	1575	39185	+4.42
1005	3	>100	1605	39484	+3.06
1035	14	>100	1635	39806	+2.61
1065	127	>100	1665	40264	+2.03
1095	500	>100	1695	40353	+2.32
1125	1332	>100	1725	40431	+3.28
1155	2373	>100	1755	41127	+7.09
1185	3614	>100	1785	41882	+12.40
1215	5227	>100	1815	44049	+18.52
1245	7060	+97.33	1845	46950	
1275	9574	+90.30	1875	51097	

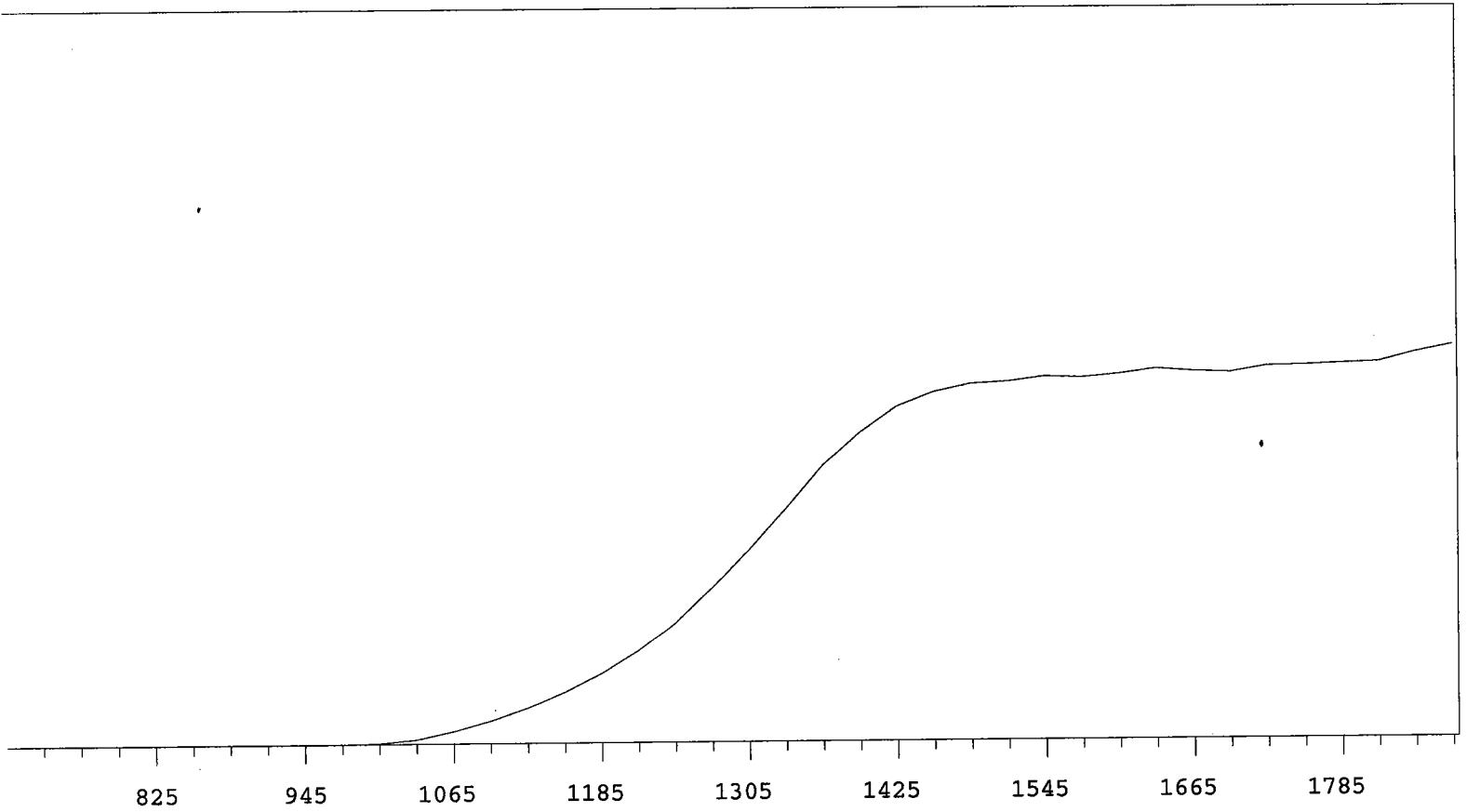


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18216	+67.74
735	0		1335	21995	+58.11
765	0		1365	26173	+46.11
795	0	>100	1395	29479	+32.75
825	0	>100	1425	32186	+20.62
855	0	>100	1455	33022	+12.13
885	0	>100	1485	33981	+7.22
915	1	>100	1515	34520	+4.95
945	0	>100	1545	35095	+2.07
975	17	>100	1575	35014	+0.38
1005	87	>100	1605	34812	+0.55
1035	438	>100	1635	34859	+1.11
1065	1055	>100	1665	35460	+1.94
1095	2114	>100	1695	35273	+1.95
1125	3282	>100	1725	35629	+2.73
1155	4625	>100	1755	35811	+5.77
1185	6554	+97.66	1785	36656	+6.44
1215	8743	+88.09	1815	37896	+9.21
1245	11345	+81.31	1845	38145	
1275	14261	+74.60	1875	40283	

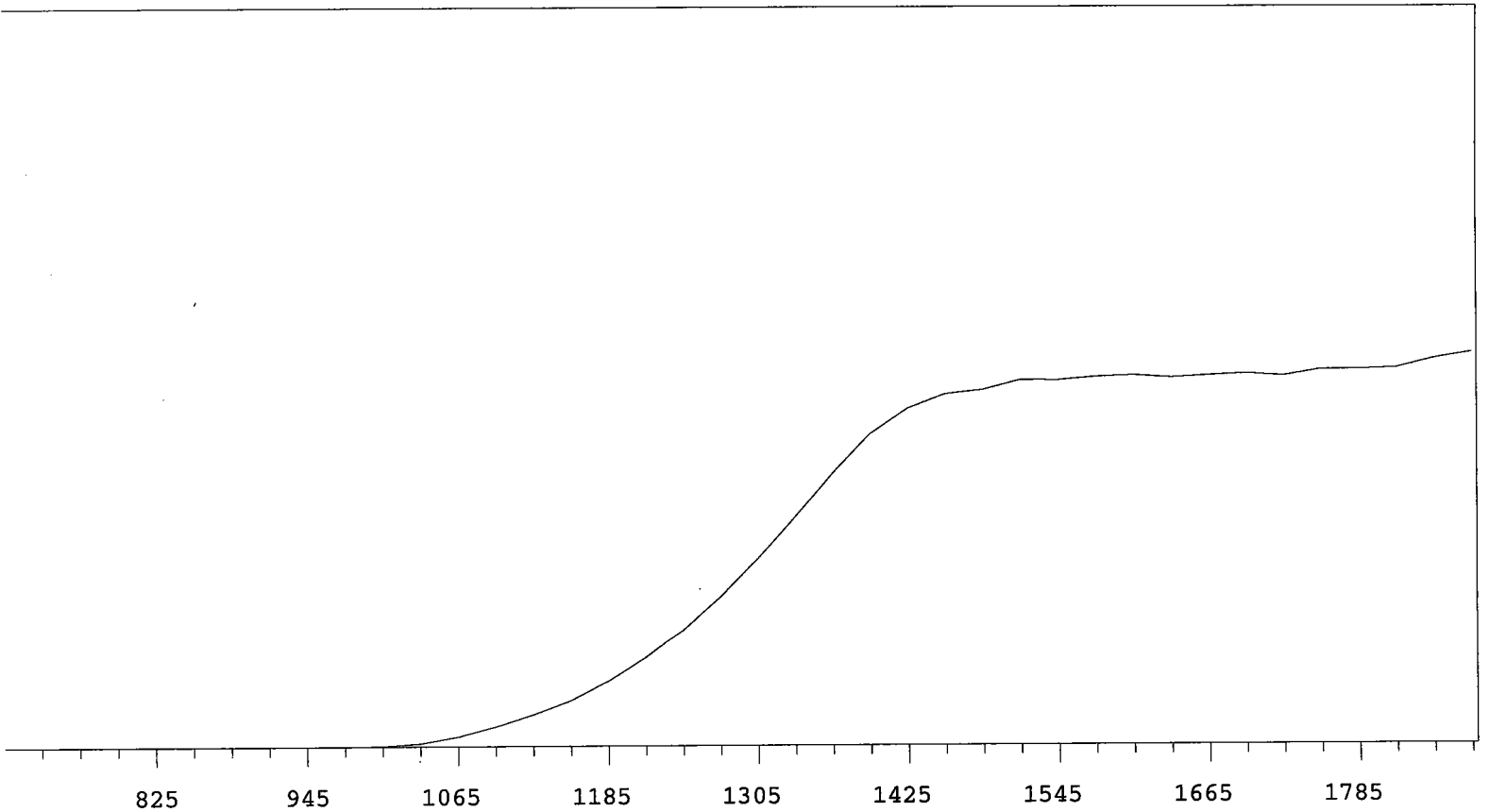
MPC 9600 Plateau
Alpha Volts: 705

Instrument 2 MPC 9604 Detector D
Beta Volts: 1575

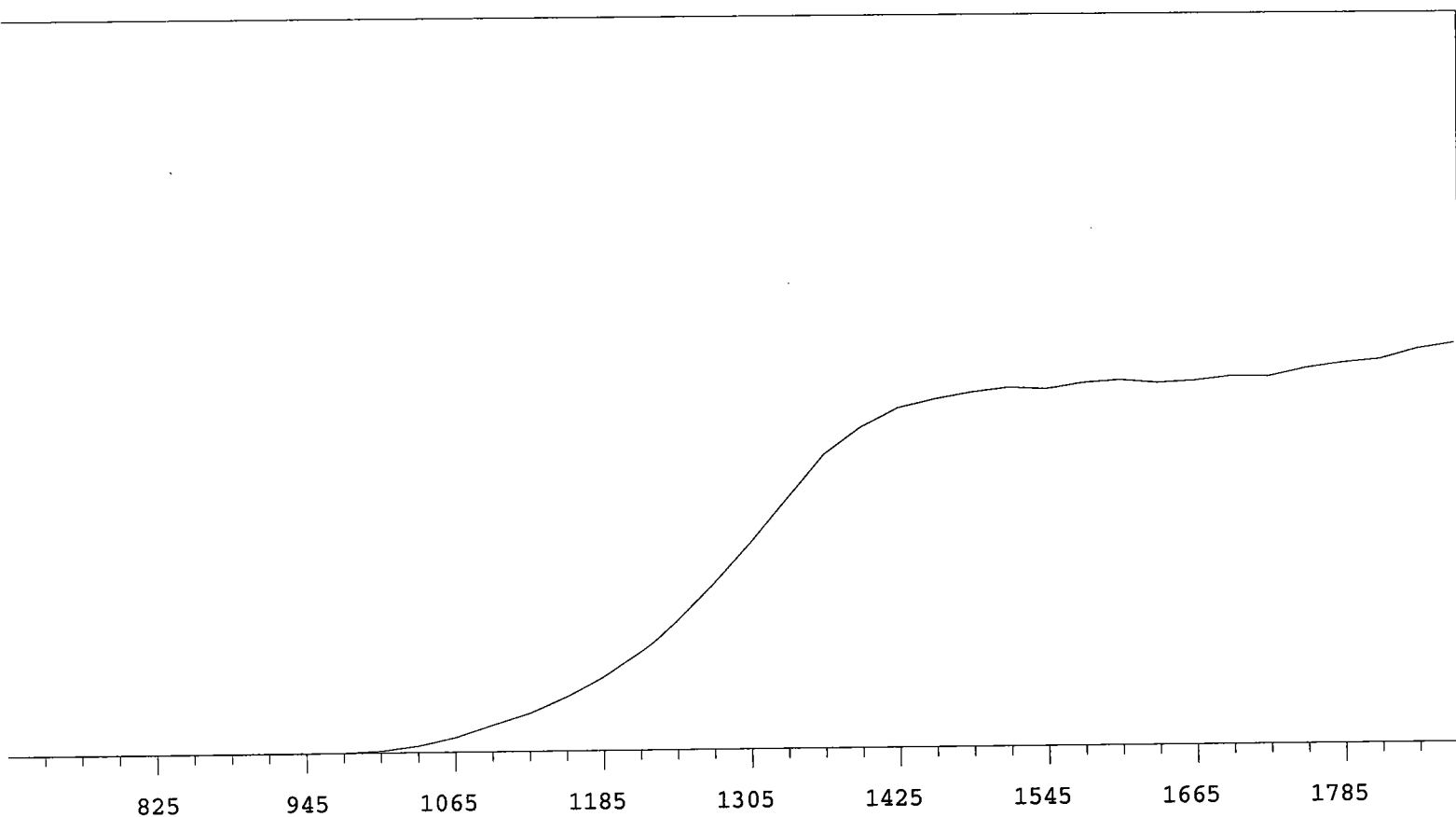
7/1/2009



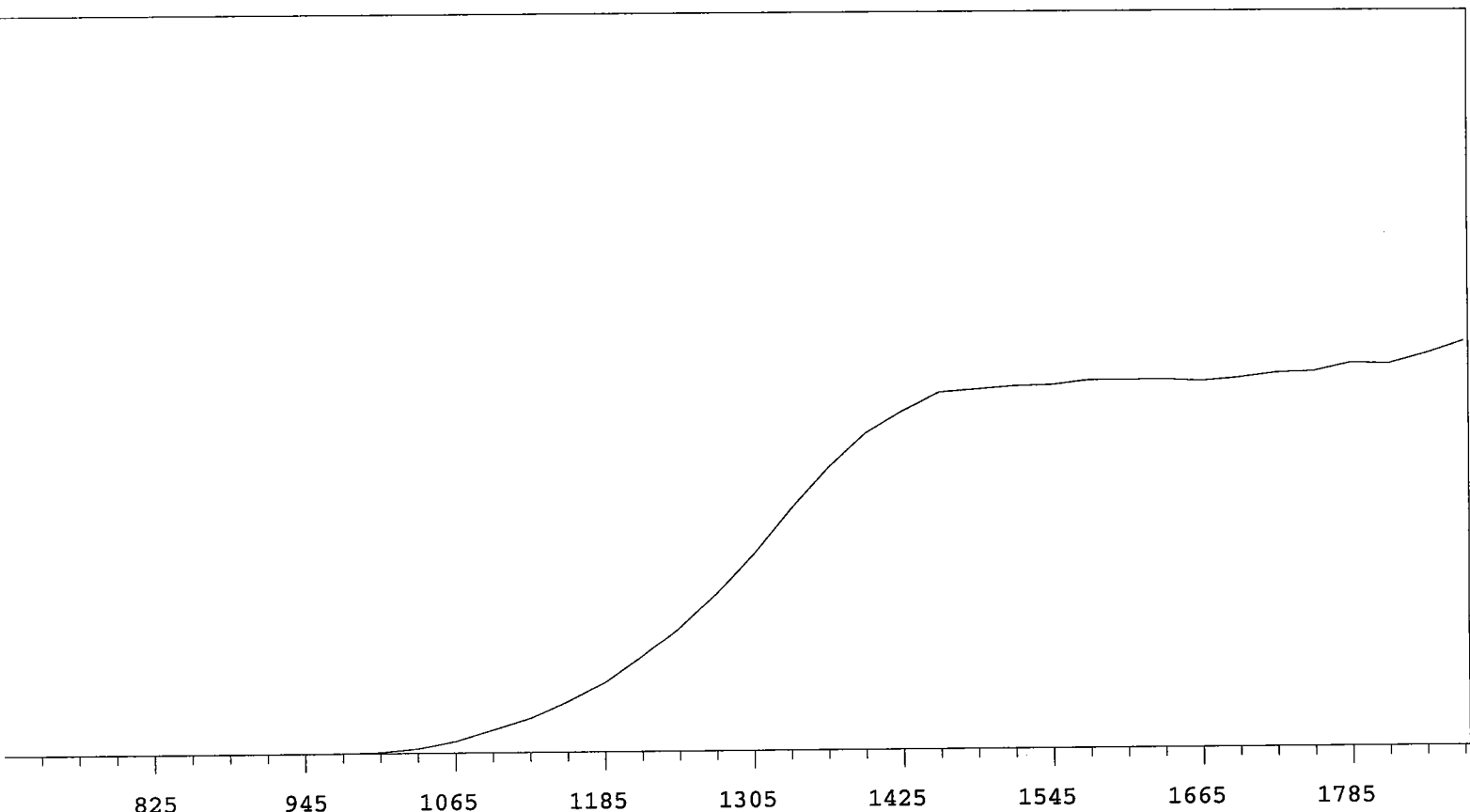
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18675	+65.94
735	0		1335	22620	+55.69
765	0	+83.33	1365	26869	+44.63
795	2	+55.56	1395	29957	+32.08
825	1	>100	1425	32494	+20.49
855	0	>100	1455	33836	+11.98
885	0	>100	1485	34627	+6.45
915	0	>100	1515	34849	+3.22
945	2	>100	1545	35298	+1.98
975	9	>100	1575	35180	+2.37
1005	89	>100	1605	35503	+1.57
1035	439	>100	1635	36006	+0.99
1065	1198	>100	1665	35722	+0.89
1095	2164	>100	1695	35597	+0.93
1125	3436	>100	1725	36188	+1.86
1155	4917	>100	1755	36272	+1.90
1185	6762	+96.59	1785	36389	+2.55
1215	9006	+89.14	1815	36529	+4.39
1245	11800	+81.34	1845	37459	
1275	15132	+73.59	1875	38170	



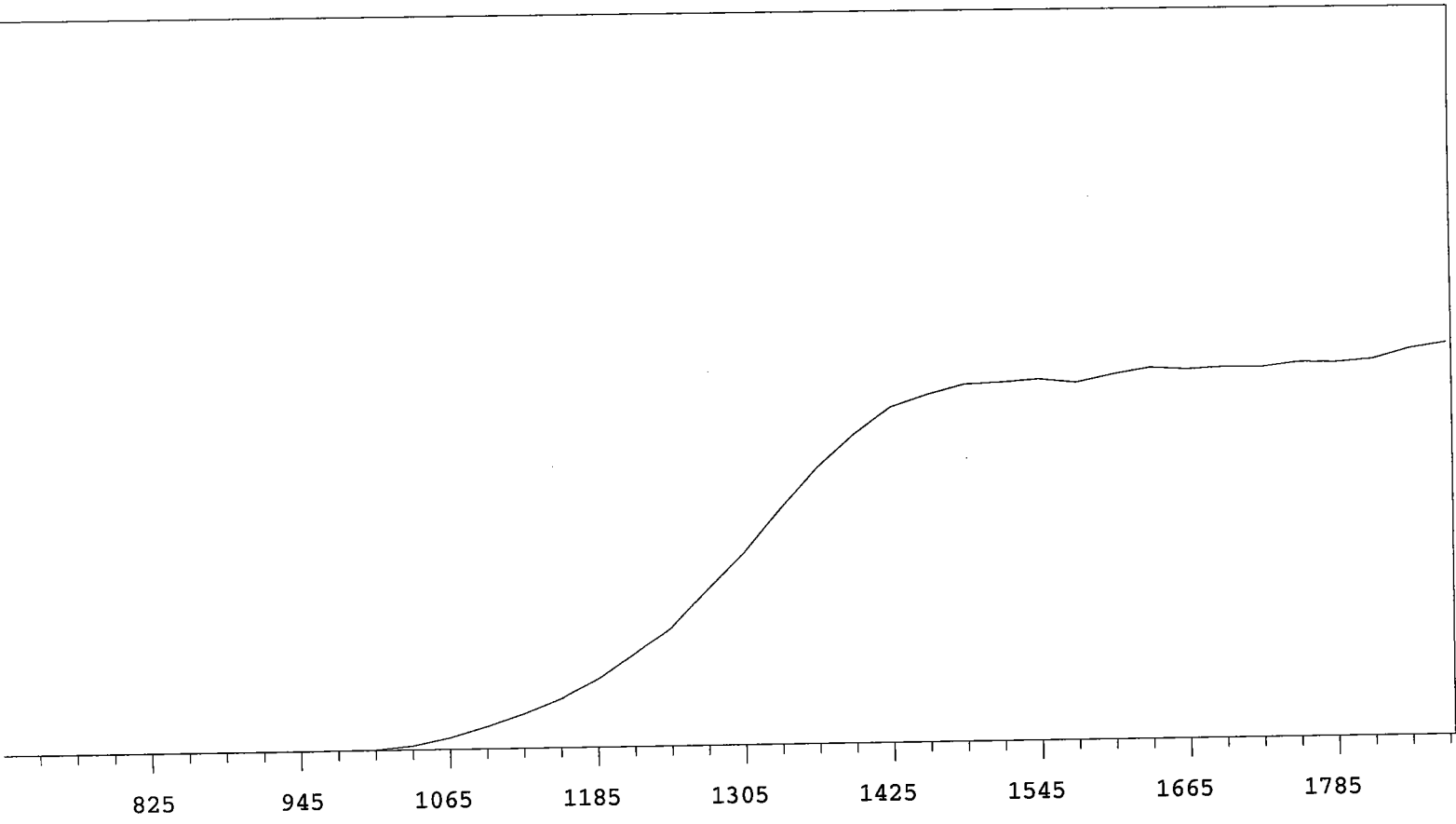
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	16654	+68.57
735	0		1335	20416	+59.26
765	0	+55.56	1365	24191	+47.28
795	1	>100	1395	27643	+34.04
825	1	+0.00	1425	29891	+21.08
855	1	>100	1455	31183	+12.30
885	0	>100	1485	31558	+6.67
915	0	>100	1515	32444	+4.05
945	0	>100	1545	32413	+2.90
975	9	>100	1575	32704	+0.81
1005	53	>100	1605	32837	+0.71
1035	302	>100	1635	32629	+0.49
1065	878	>100	1665	32797	+0.16
1095	1805	>100	1695	32964	+1.32
1125	2887	>100	1725	32746	+1.40
1155	4163	>100	1755	33308	+1.56
1185	5842	+99.81	1785	33318	+3.21
1215	7959	+90.90	1815	33456	+3.92
1245	10323	+83.03	1845	34283	
1275	13250	+75.91	1875	34815	



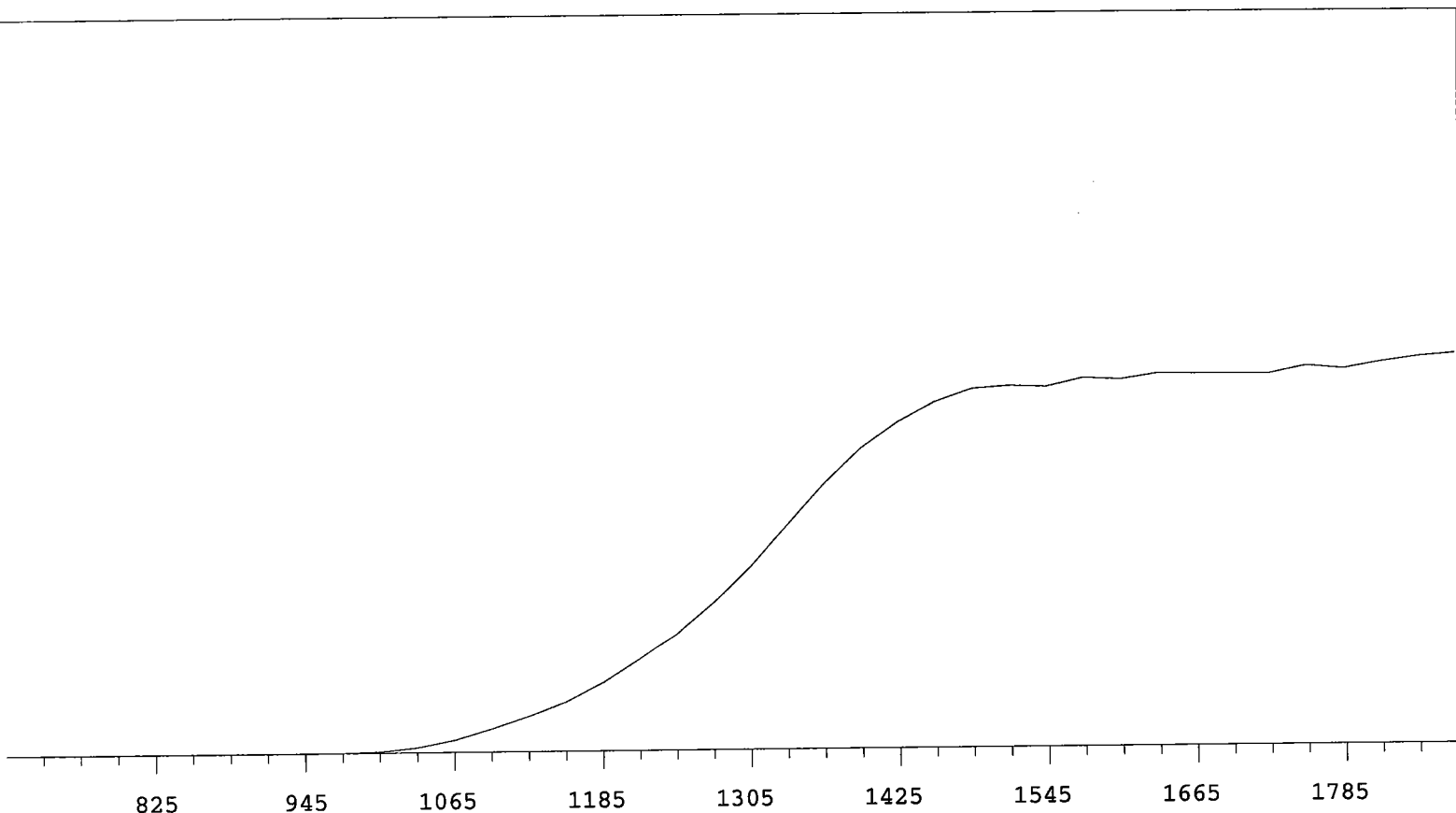
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	19810	+64.73
735	1		1335	23962	+52.62
765	0	-55.56	1365	28091	+39.27
795	0	>100	1395	30594	+25.61
825	1	>100	1425	32381	+14.86
855	3	+33.33	1455	33206	+8.91
885	0	+0.00	1485	33832	+4.41
915	1	>100	1515	34260	+3.01
945	2	>100	1545	34071	+2.33
975	29	>100	1575	34623	+1.34
1005	165	>100	1605	34848	+1.22
1035	613	>100	1635	34564	+0.89
1065	1394	>100	1665	34733	+1.01
1095	2558	>100	1695	35144	+2.76
1125	3702	>100	1725	35084	+3.66
1155	5222	>100	1755	35839	+3.97
1185	7161	+96.06	1785	36332	+5.39
1215	9507	+89.18	1815	36654	+5.35
1245	12552	+81.52	1845	37609	
1275	16030	+73.64	1875	38164	



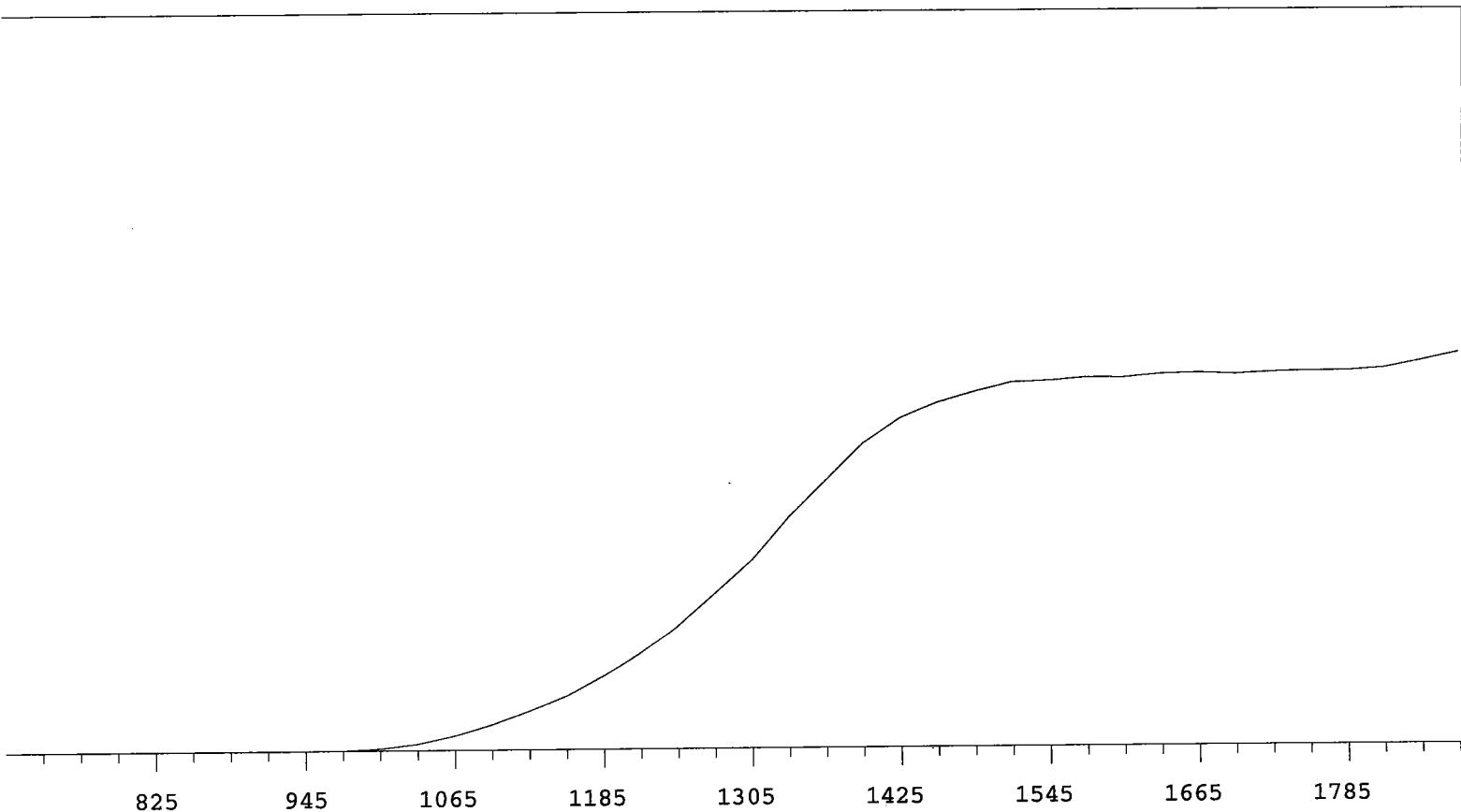
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	21412	+66.80
735	1		1335	26262	+56.32
765	1		1365	30679	+43.71
795	0	>100	1395	34466	+31.61
825	0	+0.00	1425	36949	+20.14
855	0	>100	1455	38998	+11.16
885	1	>100	1485	39313	+5.34
915	1	>100	1515	39625	+2.44
945	1	>100	1545	39751	+2.04
975	17	>100	1575	40227	+1.45
1005	122	>100	1605	40228	+0.56
1035	533	>100	1635	40255	+0.13
1065	1287	>100	1665	40075	+1.22
1095	2493	>100	1695	40384	+1.95
1125	3753	>100	1725	40900	+3.50
1155	5482	>100	1755	41028	+3.05
1185	7538	+99.39	1785	41899	+3.71
1215	10305	+90.31	1815	41767	+5.64
1245	13415	+82.57	1845	42852	
1275	17141	+75.13	1875	44132	



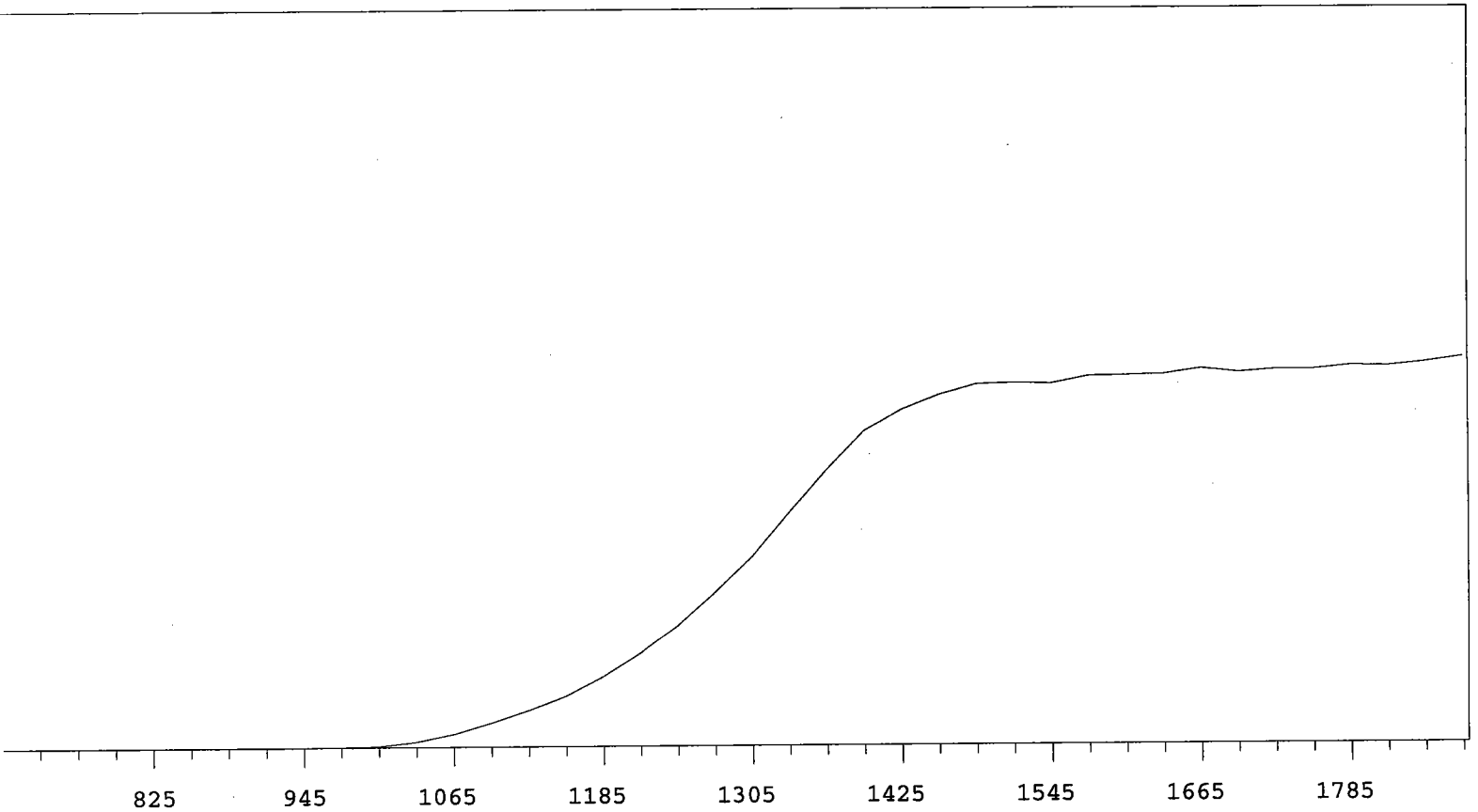
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14171	+66.45
735	1		1335	17362	+54.90
765	0	+0.00	1365	20310	+43.83
795	1	>100	1395	22647	+30.82
825	0	+83.33	1425	24551	+20.19
855	0	-83.33	1455	25440	+11.69
885	1	>100	1485	26124	+5.90
915	0	>100	1515	26245	+2.21
945	1	>100	1545	26428	+1.39
975	12	>100	1575	26151	+2.69
1005	51	>100	1605	26721	+2.72
1035	298	>100	1635	27168	+2.80
1065	848	>100	1665	27007	+0.87
1095	1649	>100	1695	27135	+0.70
1125	2535	>100	1725	27089	+1.24
1155	3602	>100	1755	27414	+1.43
1185	5036	+98.31	1785	27373	+3.21
1215	6880	+91.37	1815	27581	+4.34
1245	8822	+82.29	1845	28332	
1275	11546	+74.61	1875	28750	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16442	+66.24
735	0		1335	20146	+57.40
765	0		1365	23769	+46.40
795	0	>100	1395	26926	+34.68
825	2	+55.56	1425	29276	+24.40
855	1	>100	1455	31037	+15.28
885	0	-55.56	1485	32197	+7.91
915	3	>100	1515	32425	+4.33
945	0	>100	1545	32314	+2.14
975	16	>100	1575	33071	+2.66
1005	114	>100	1605	32918	+2.52
1035	451	>100	1635	33435	+1.02
1065	1100	>100	1665	33382	+0.73
1095	2068	>100	1695	33349	+1.07
1125	3189	>100	1725	33324	+1.28
1155	4386	>100	1755	34001	+2.26
1185	6094	+94.81	1785	33701	+3.08
1215	8184	+87.09	1815	34304	+2.97
1245	10489	+78.88	1845	34744	
1275	13273	+72.66	1875	35012	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15747	+62.38
735	1		1335	19230	+54.19
765	0	+0.00	1365	22255	+44.46
795	1	>100	1395	25299	+32.45
825	0	>100	1425	27370	+22.24
855	0	>100	1455	28625	+14.10
885	0	>100	1485	29467	+8.56
915	0	>100	1515	30213	+5.29
945	2	>100	1545	30326	+2.77
975	31	>100	1575	30564	+1.57
1005	176	>100	1605	30548	+1.52
1035	550	>100	1635	30820	+0.85
1065	1218	>100	1665	30898	+0.79
1095	2114	>100	1695	30779	+0.44
1125	3212	>100	1725	30934	+0.45
1155	4416	>100	1755	31008	+0.96
1185	6066	+92.28	1785	30991	+2.01
1215	7936	+85.60	1815	31196	+3.80
1245	10288	+76.79	1845	31781	
1275	13020	+70.59	1875	32406	

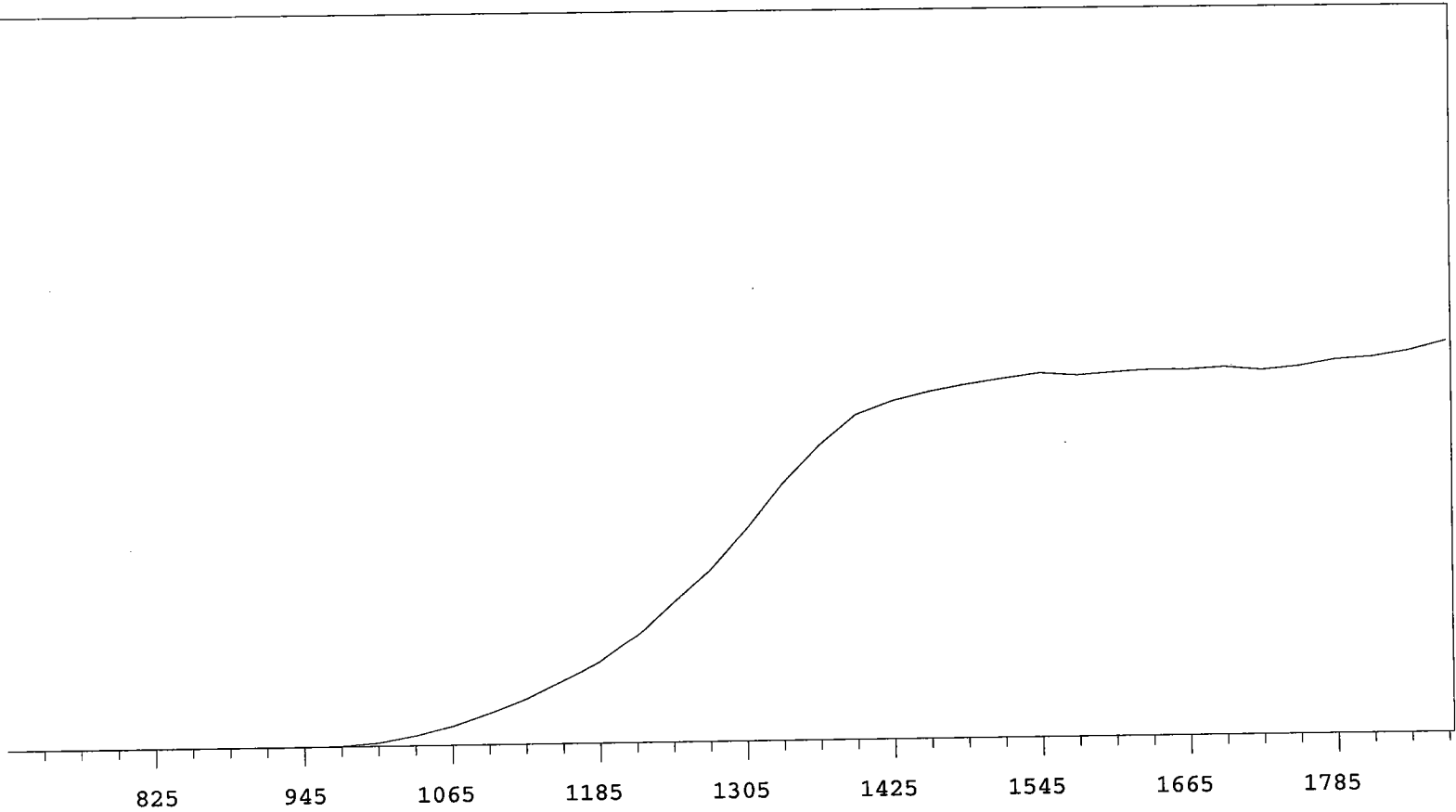


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19796	+65.77
735	1		1335	24338	+57.55
765	0	+55.56	1365	28686	+45.86
795	2	+0.00	1395	32750	+32.27
825	0	-55.56	1425	34919	+20.83
855	1	>100	1455	36434	+11.45
885	0	>100	1485	37487	+5.80
915	0	>100	1515	37623	+3.32
945	2	>100	1545	37528	+2.07
975	24	>100	1575	38277	+2.12
1005	134	>100	1605	38338	+2.70
1035	558	>100	1635	38426	+1.12
1065	1361	>100	1665	39007	+1.06
1095	2511	>100	1695	38592	+0.64
1125	3762	>100	1725	38870	+0.63
1155	5246	>100	1755	38868	+1.30
1185	7268	+96.29	1785	39238	+1.45
1215	9733	+88.98	1815	39169	+2.34
1245	12701	+79.94	1845	39570	
1275	16176	+73.13	1875	40086	

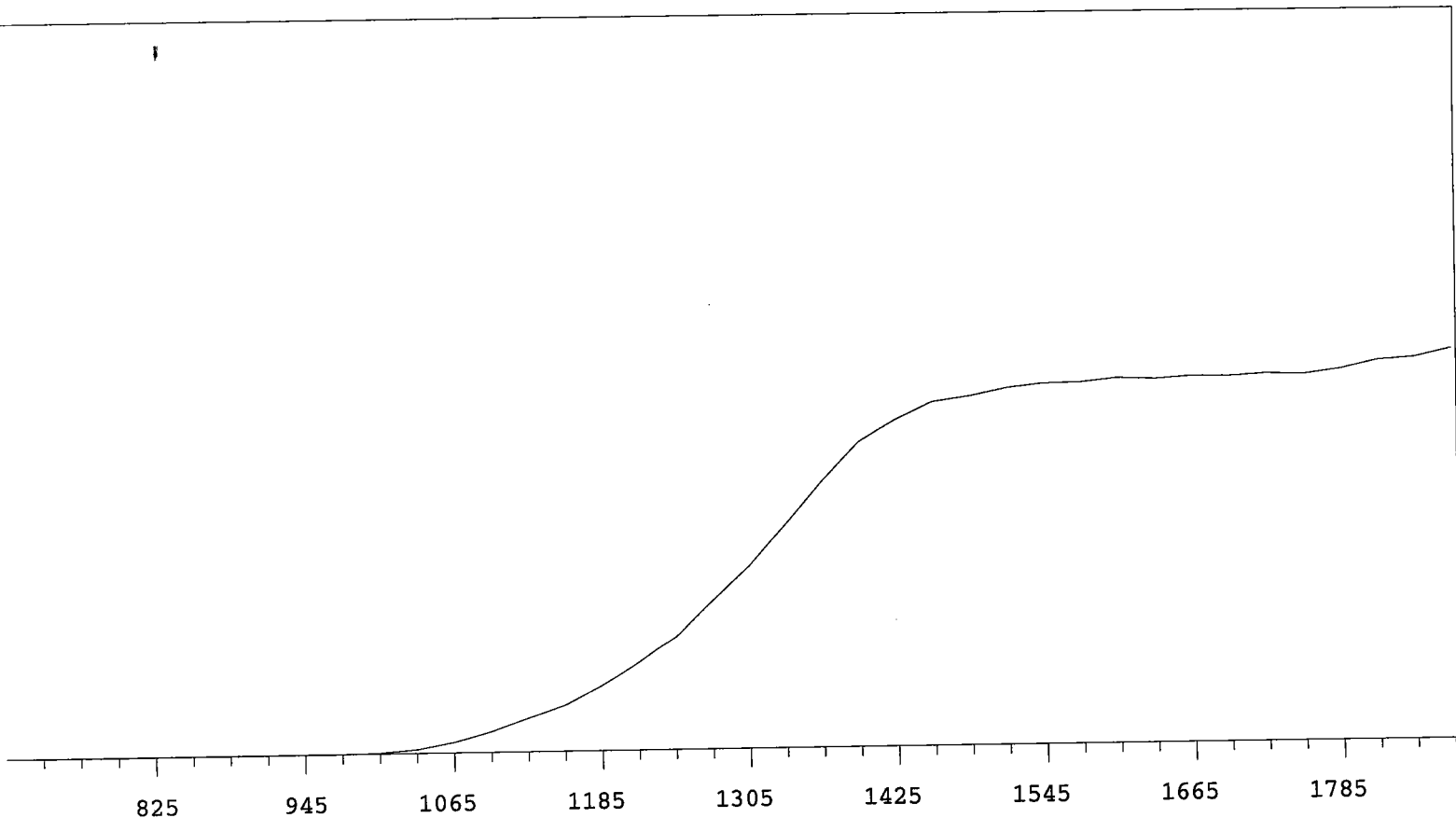
MPC 9600 Plateau
Alpha Volts: 705

Instrument 4 MPC 9604 Detector D
Beta Volts: 1575

7/1/2009



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18491	+61.09
735	0		1335	22444	+51.56
765	0	+0.00	1365	25756	+37.44
795	0	>100	1395	28379	+23.82
825	1	+83.33	1425	29517	+14.00
855	1	+55.56	1455	30309	+8.08
885	0	+0.00	1485	30874	+6.03
915	1	>100	1515	31345	+3.66
945	1	>100	1545	31782	+2.17
975	60	>100	1575	31567	+1.31
1005	297	>100	1605	31789	+0.78
1035	855	>100	1635	31963	+1.34
1065	1647	>100	1665	31956	+0.29
1095	2700	>100	1695	32123	+0.20
1125	3921	>100	1725	31850	+1.46
1155	5471	+96.54	1755	32114	+2.39
1185	7042	+90.21	1785	32665	+3.95
1215	9405	+82.23	1815	32876	+4.96
1245	12266	+76.33	1845	33399	
1275	14989	+69.38	1875	34206	

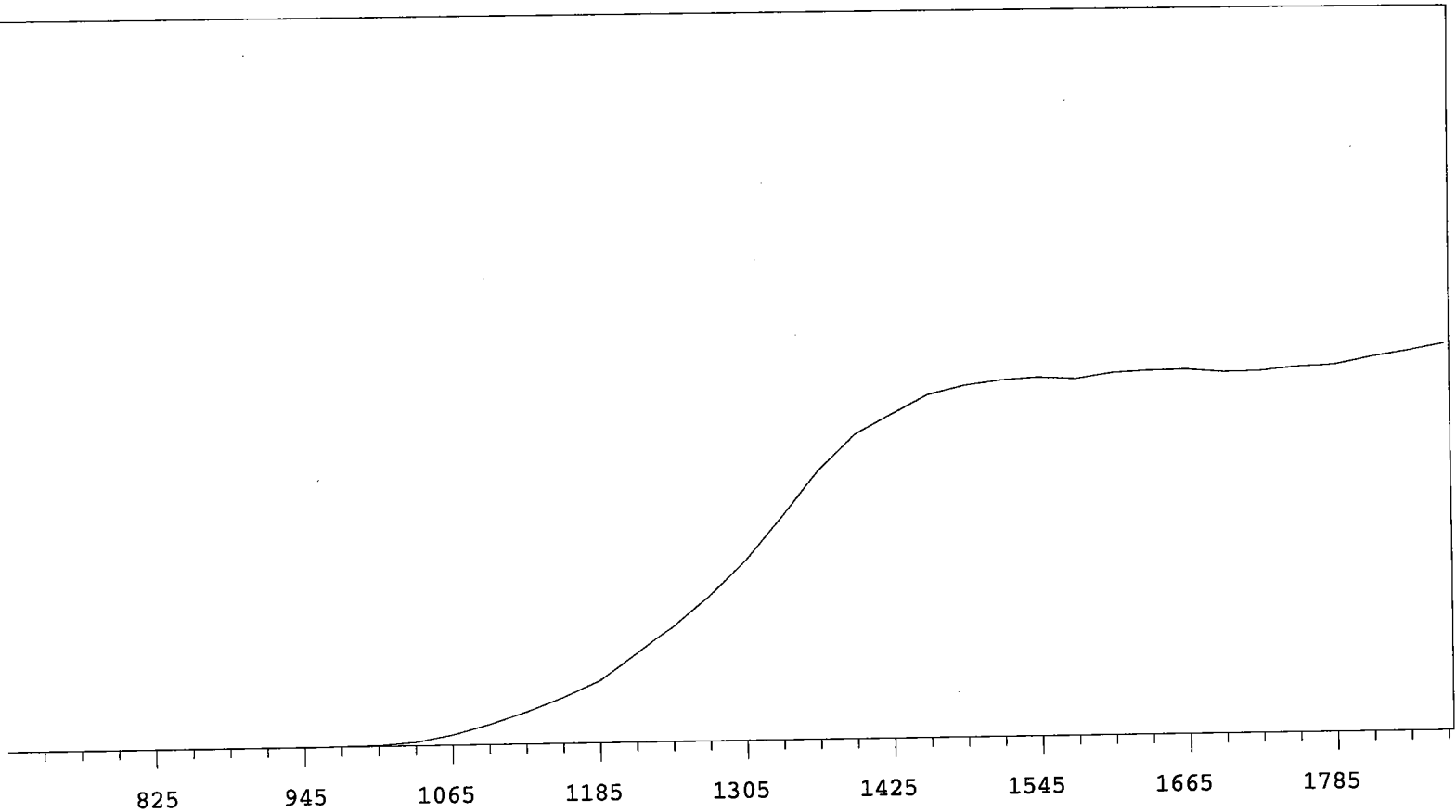


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	13974	+68.00
735	0		1335	17170	+58.62
765	1		1365	20456	+47.04
795	1	+83.33	1395	23332	+33.83
825	1	-83.33	1425	24996	+21.10
855	1	>100	1455	26290	+12.40
885	0	-55.56	1485	26683	+7.74
915	0	>100	1515	27270	+4.43
945	1	>100	1545	27590	+3.48
975	9	>100	1575	27635	+1.71
1005	76	>100	1605	27932	+1.20
1035	308	>100	1635	27807	+0.88
1065	814	>100	1665	28006	+0.62
1095	1600	>100	1695	27964	+0.63
1125	2598	>100	1725	28112	+0.98
1155	3596	>100	1755	28020	+2.84
1185	5065	+96.05	1785	28392	+3.76
1215	6773	+90.23	1815	29028	+5.17
1245	8717	+81.43	1845	29220	
1275	11391	+74.83	1875	29849	

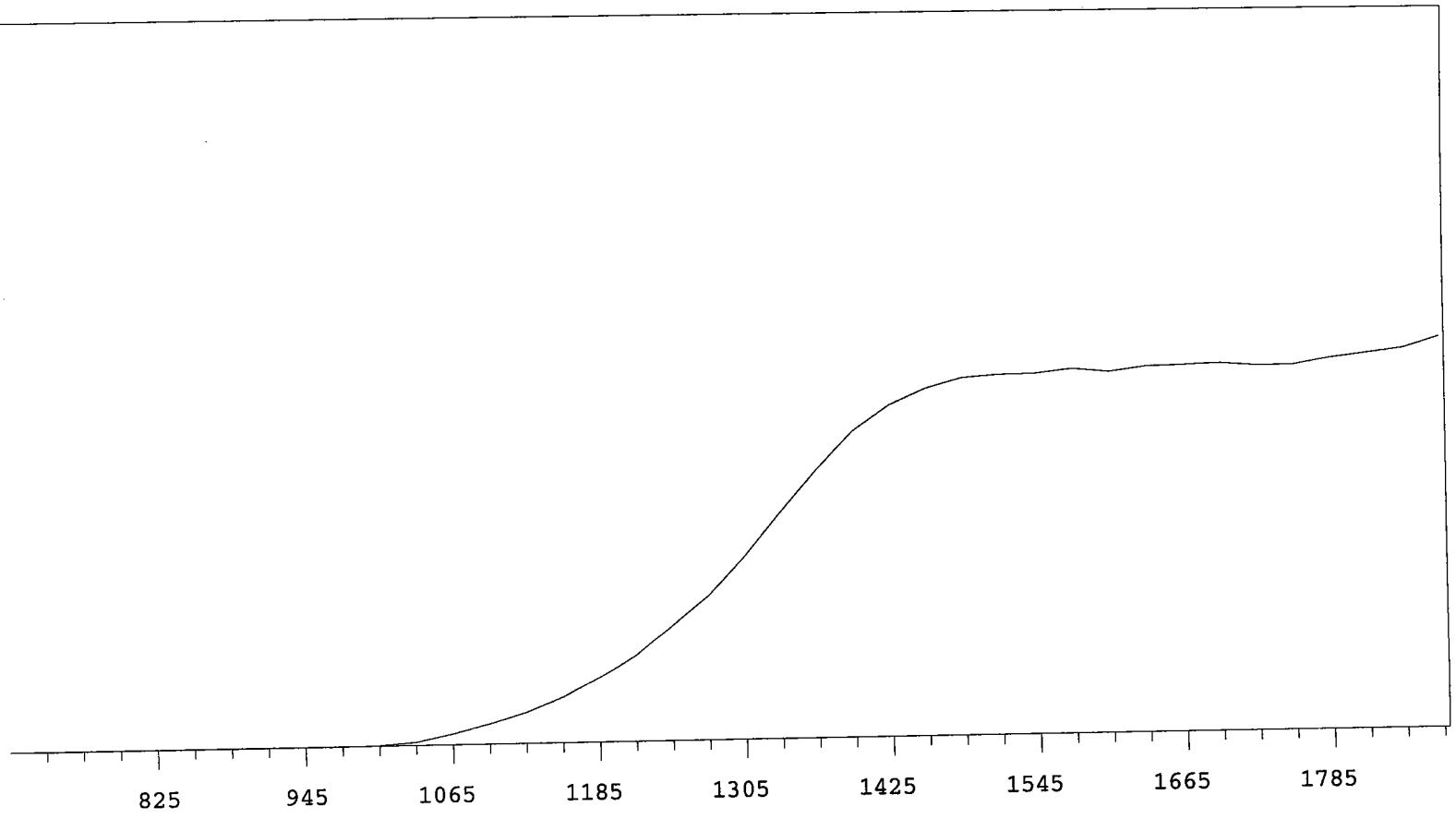
MPC 9600 Plateau
Alpha Volts: 705

Instrument 5 MPC 9604 Detector B
Beta Volts: 1575

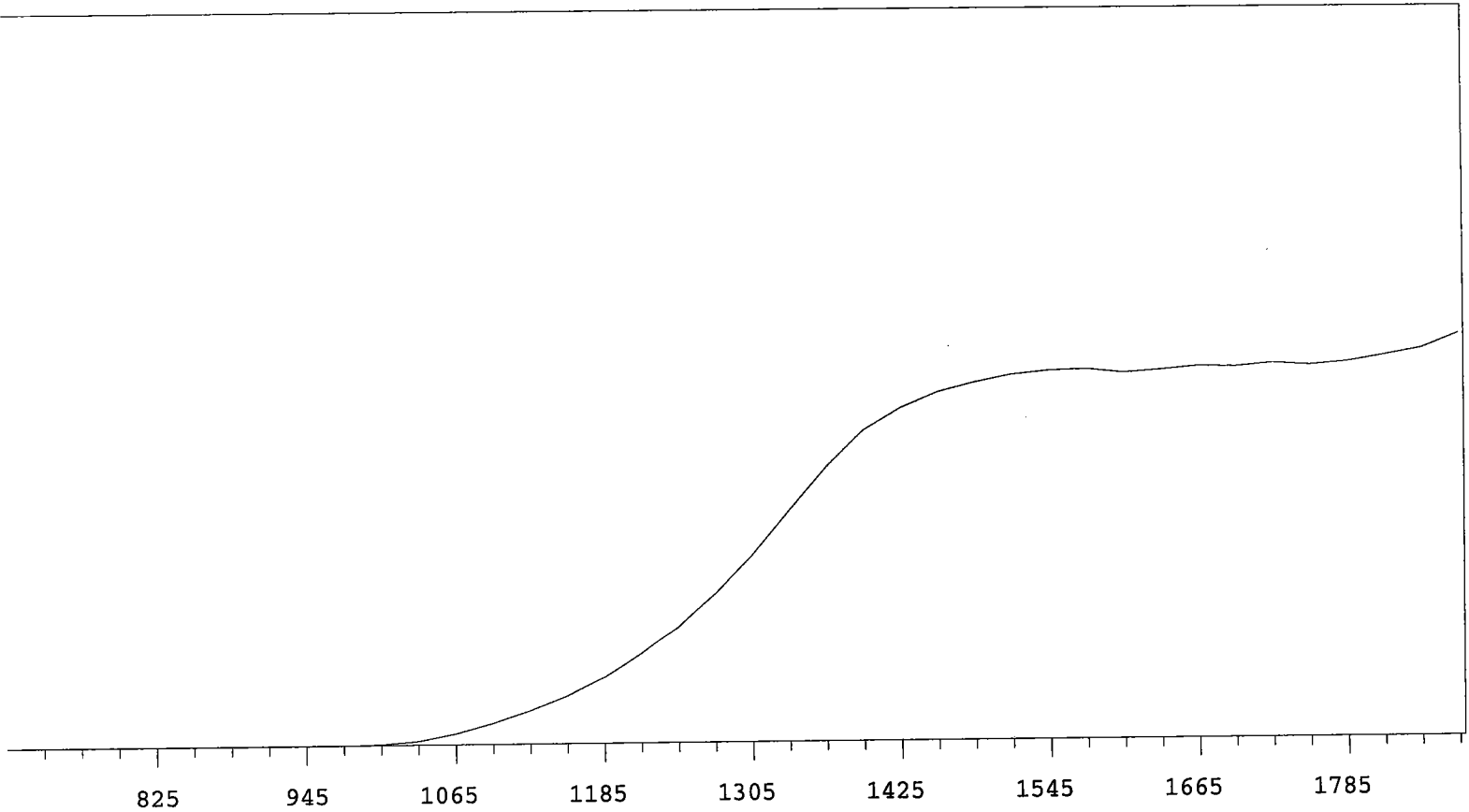
7/1/2009



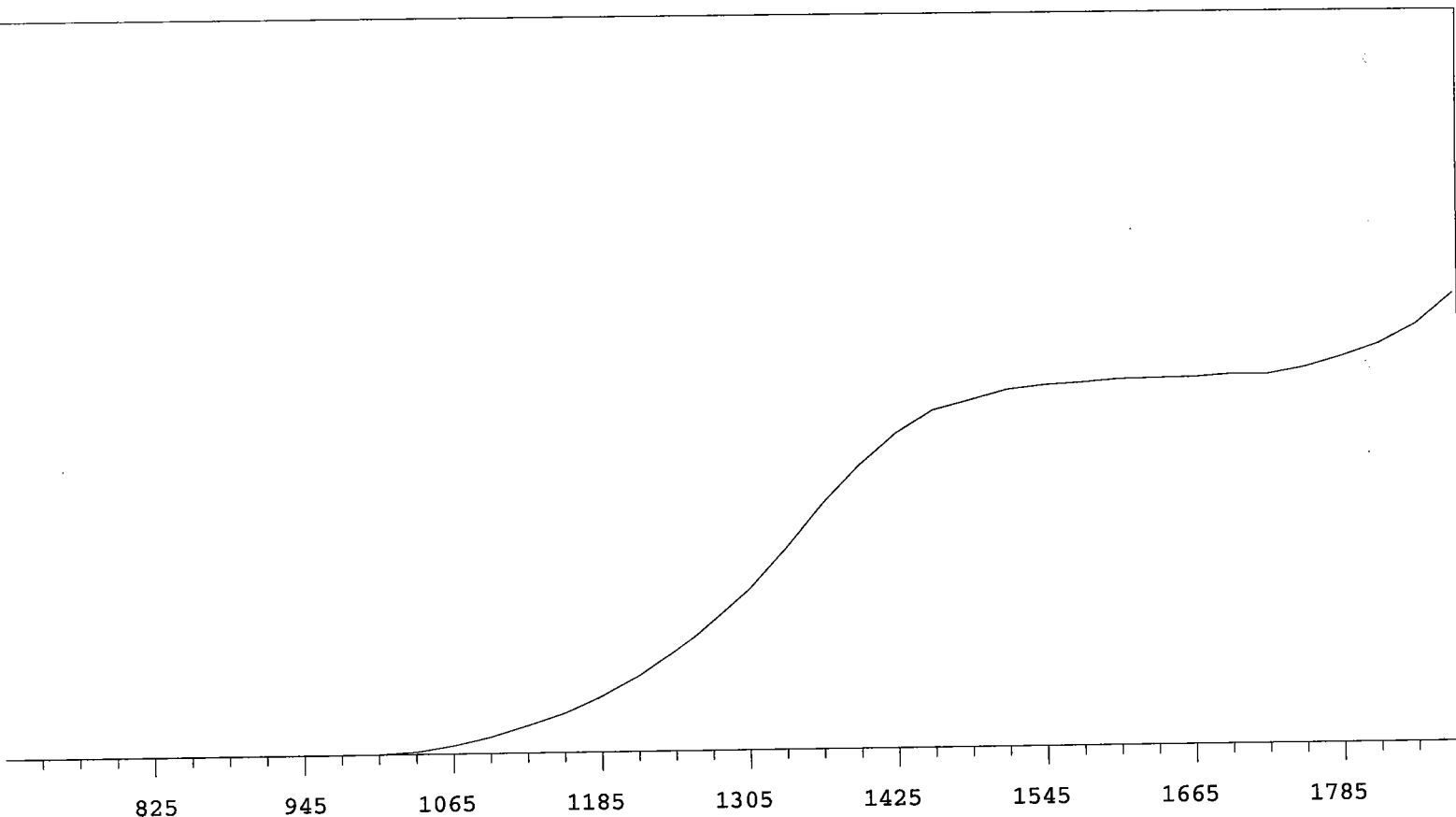
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17414	+68.46
735	0		1335	21540	+59.98
765	0		1365	25854	+46.75
795	0	>100	1395	29222	+33.38
825	1	>100	1425	31128	+21.52
855	1	+41.67	1455	32995	+13.26
885	2	-33.33	1485	33846	+8.09
915	0	>100	1515	34289	+3.25
945	1	>100	1545	34528	+2.00
975	17	>100	1575	34311	+1.78
1005	87	>100	1605	34866	+1.78
1035	336	>100	1635	35046	+1.14
1065	1010	>100	1665	35087	-0.26
1095	1955	>100	1695	34795	+0.11
1125	3124	>100	1725	34857	+0.93
1155	4486	>100	1755	35220	+2.81
1185	6017	>100	1785	35363	+3.98
1215	8507	+91.20	1815	36028	+4.79
1245	11148	+82.59	1845	36577	
1275	14003	+74.21	1875	37207	



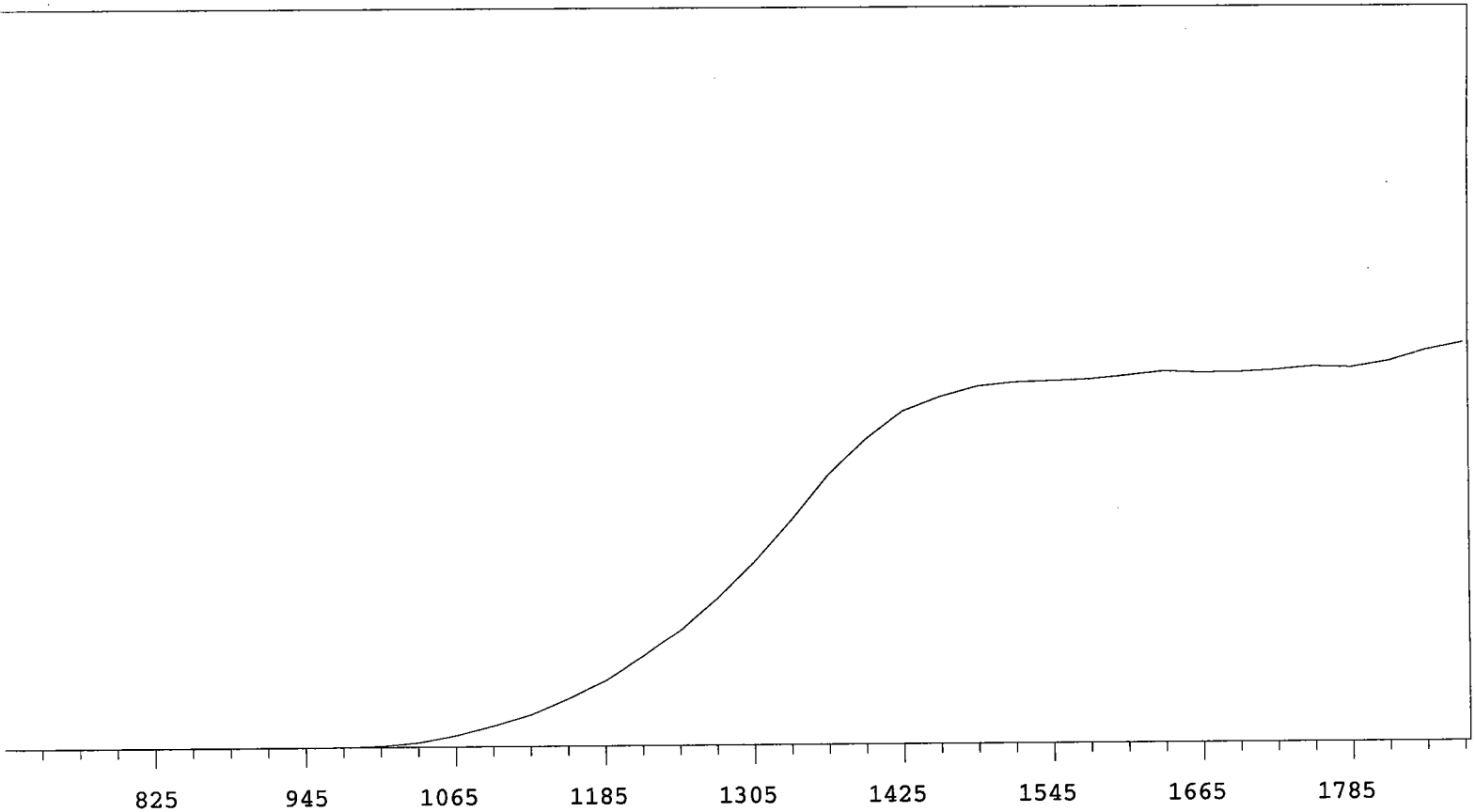
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17085	+68.24
735	0		1335	21135	+59.99
765	0		1365	25066	+47.39
795	0	>100	1395	28530	+33.93
825	0	>100	1425	30823	+22.30
855	1	>100	1455	32287	+12.93
885	0	>100	1485	33217	+6.71
915	1	>100	1515	33474	+3.57
945	2	>100	1545	33517	+1.17
975	7	>100	1575	33921	+1.13
1005	56	>100	1605	33584	+1.27
1035	305	>100	1635	34014	+1.12
1065	982	>100	1665	34116	+0.98
1095	1874	>100	1695	34225	-0.22
1125	2890	>100	1725	33980	+0.58
1155	4260	>100	1755	33971	+1.96
1185	6001	>100	1785	34541	+3.64
1215	8050	+91.54	1815	34954	+5.38
1245	10895	+82.98	1845	35375	
1275	13556	+76.26	1875	36384	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15025	+68.87
735	0		1335	18640	+58.97
765	0		1365	22048	+45.84
795	0	>100	1395	24877	+32.08
825	0	>100	1425	26653	+20.83
855	0	>100	1455	27899	+13.08
885	0	>100	1485	28670	+8.43
915	0	>100	1515	29257	+5.13
945	0	>100	1545	29568	+2.06
975	6	>100	1575	29683	+0.52
1005	81	>100	1605	29362	+0.57
1035	318	>100	1635	29589	+0.80
1065	897	>100	1665	29870	+1.82
1095	1710	>100	1695	29783	+0.90
1125	2714	>100	1725	30077	+0.75
1155	3925	>100	1755	29889	+2.02
1185	5395	+97.31	1785	30152	+3.33
1215	7282	+88.49	1815	30656	+6.54
1245	9426	+81.36	1845	31211	
1275	12007	+75.65	1875	32389	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16217	+71.57
735	0		1335	20184	+63.76
765	0		1365	24605	+53.98
795	0	>100	1395	28528	+41.40
825	0	>100	1425	31675	+28.02
855	0	>100	1455	33899	+17.93
885	0	>100	1485	34826	+10.65
915	0	>100	1515	35815	+6.13
945	0	>100	1545	36225	+4.15
975	7	>100	1575	36456	+2.28
1005	31	>100	1605	36747	+1.47
1035	238	>100	1635	36801	+1.26
1065	810	>100	1665	36859	+0.85
1095	1637	>100	1695	37095	+1.85
1125	2743	>100	1725	37072	+4.01
1155	3932	>100	1755	37724	+6.65
1185	5579	>100	1785	38802	+10.33
1215	7602	+94.41	1815	40036	+14.71
1245	10078	+84.86	1845	41975	
1275	13091	+77.67	1875	45123	

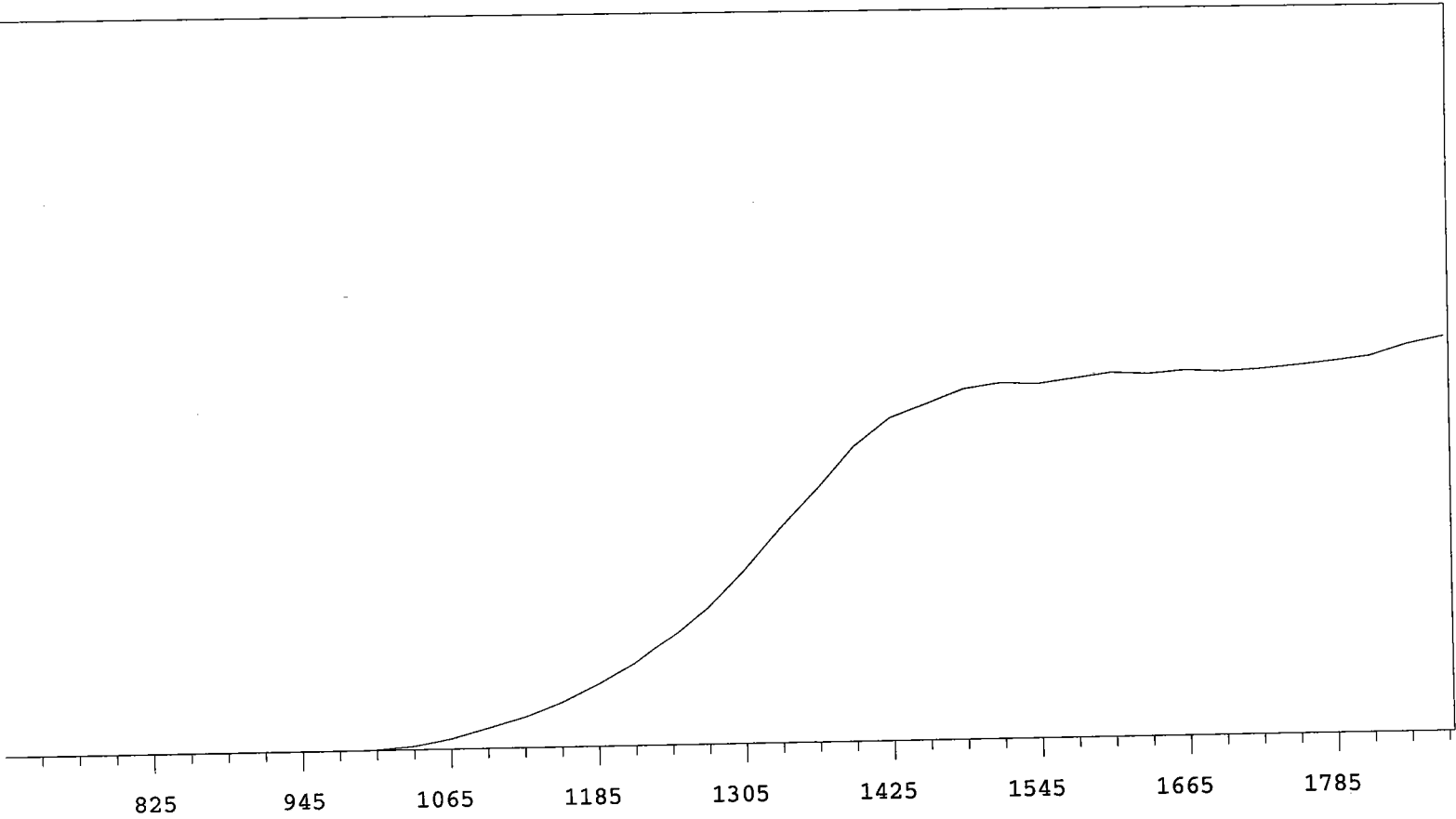


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	20094	+68.67
735	0		1335	24665	+59.40
765	0		1365	29591	+47.86
795	0	>100	1395	33376	+34.51
825	1	+83.33	1425	36440	+22.50
855	1	-83.33	1455	38024	+13.58
885	0	>100	1485	39187	+7.04
915	0	>100	1515	39608	+3.63
945	5	>100	1545	39722	+2.10
975	18	>100	1575	39894	+2.32
1005	125	>100	1605	40298	+2.09
1035	482	>100	1635	40711	+1.41
1065	1255	>100	1665	40574	+0.80
1095	2318	>100	1695	40608	+1.02
1125	3540	>100	1725	40839	+1.28
1155	5288	>100	1755	41201	+1.97
1185	7168	+98.51	1785	41065	+3.74
1215	9760	+88.48	1815	41711	+5.42
1245	12656	+81.52	1845	42917	
1275	16065	+74.58	1875	43699	

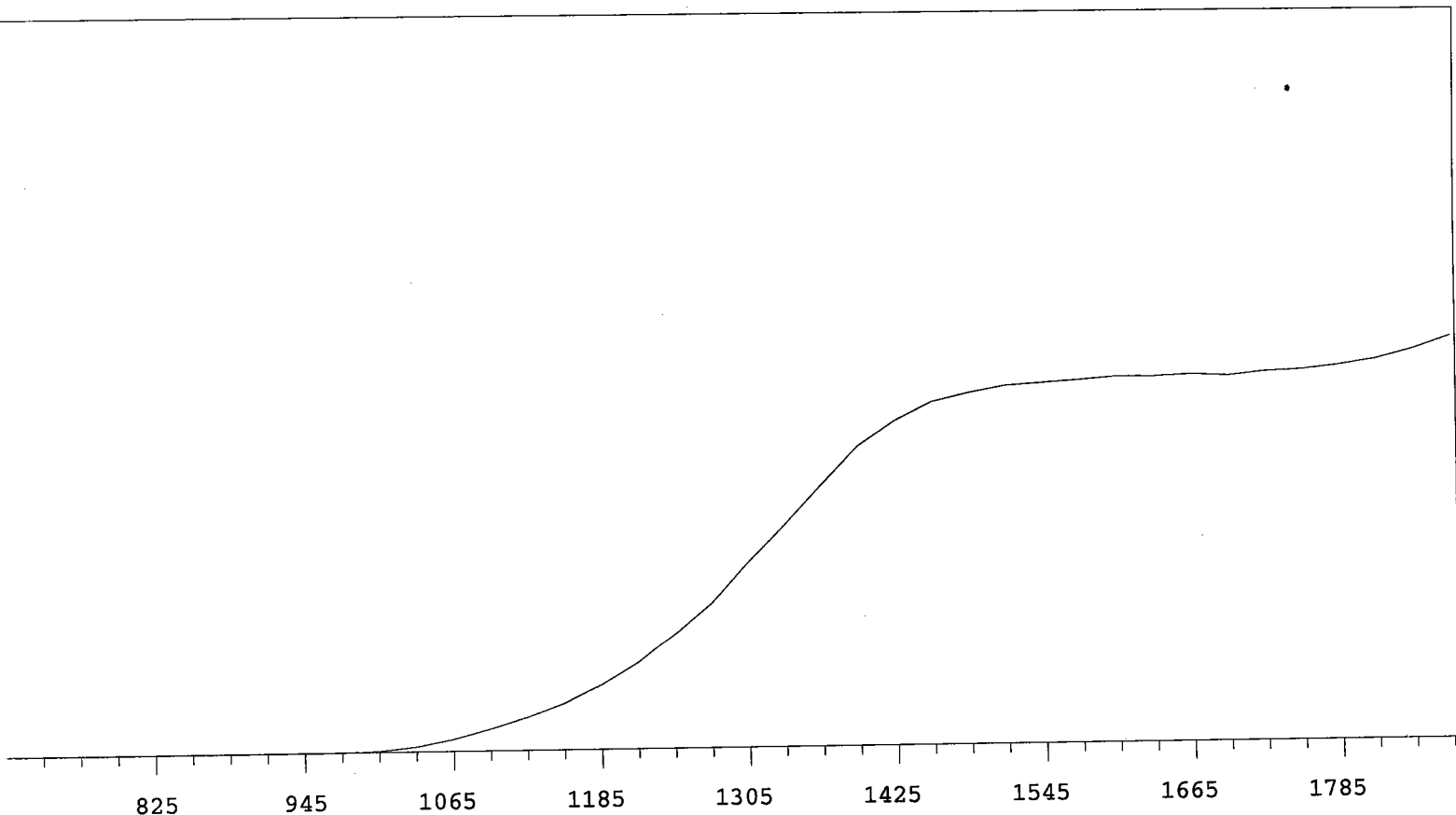
MPC 9600 Plateau
 Alpha Volts: 705

Instrument 6 MPC 9604 Detector C
 Beta Volts: 1575

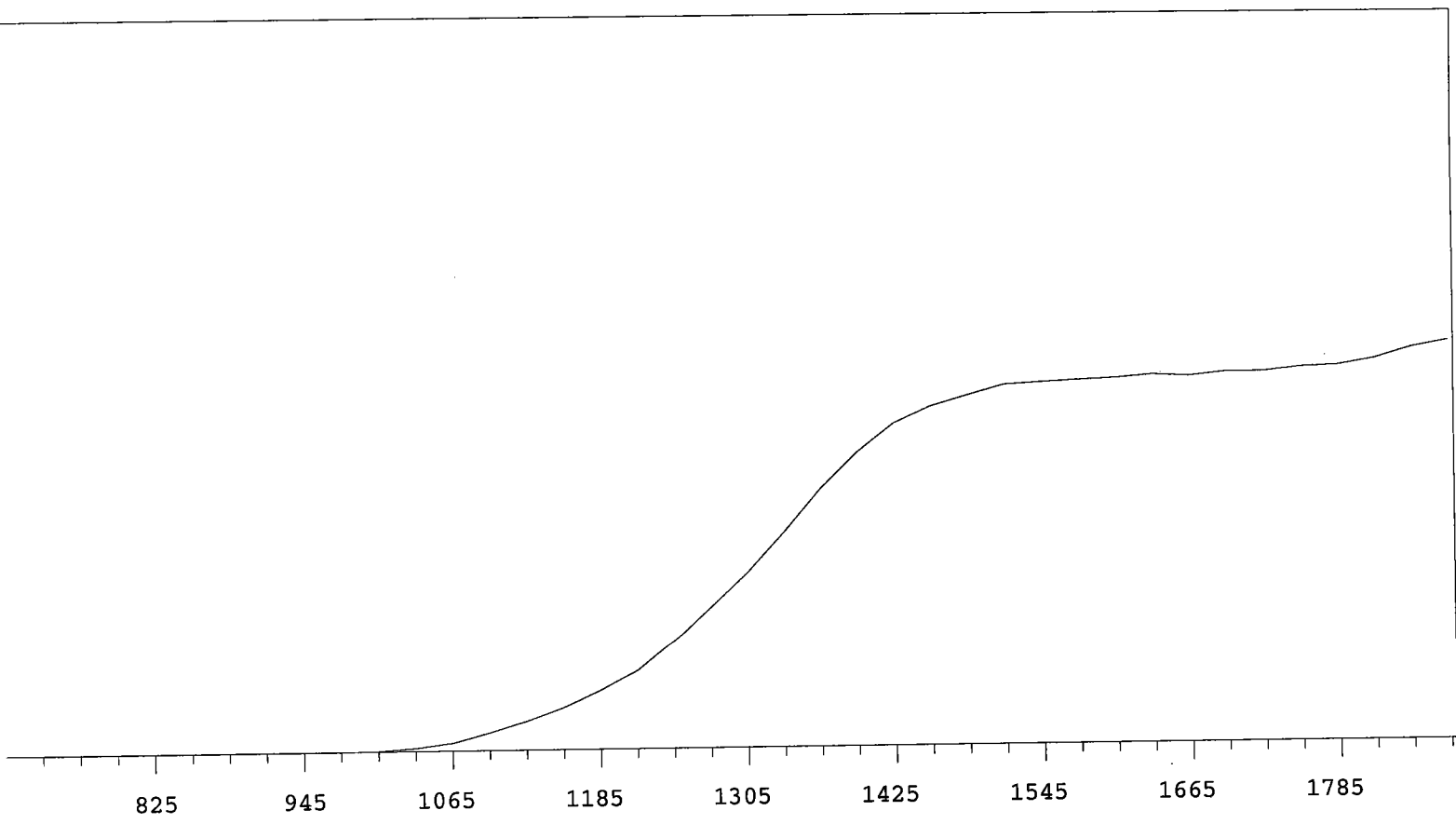
7/1/2009



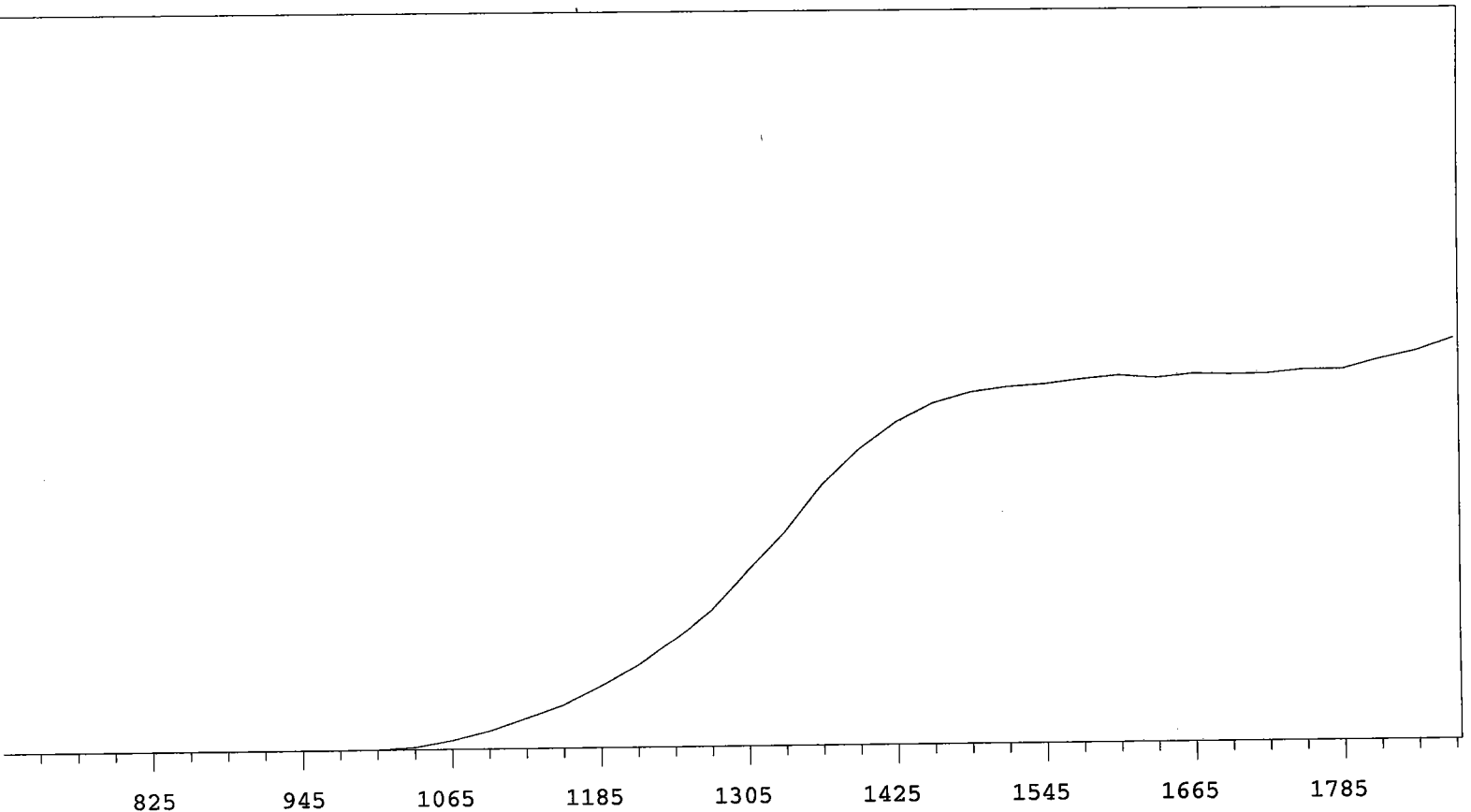
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17350	+67.80
735	0		1335	21371	+60.27
765	1	+0.00	1365	25084	+49.32
795	0	>100	1395	29177	+36.15
825	0	+0.00	1425	31927	+24.86
855	0	>100	1455	33217	+14.70
885	1	>100	1485	34545	+7.74
915	1	>100	1515	35097	+4.64
945	2	>100	1545	34927	+2.96
975	8	>100	1575	35439	+2.21
1005	70	>100	1605	35939	+2.41
1035	353	>100	1635	35763	+0.94
1065	990	>100	1665	36053	+0.35
1095	1956	>100	1695	35886	+1.15
1125	3024	>100	1725	36066	+1.77
1155	4400	>100	1755	36379	+3.03
1185	6173	+99.75	1785	36768	+4.80
1215	8230	+89.85	1815	37193	+6.14
1245	10904	+82.36	1845	38320	
1275	13747	+76.18	1875	39061	



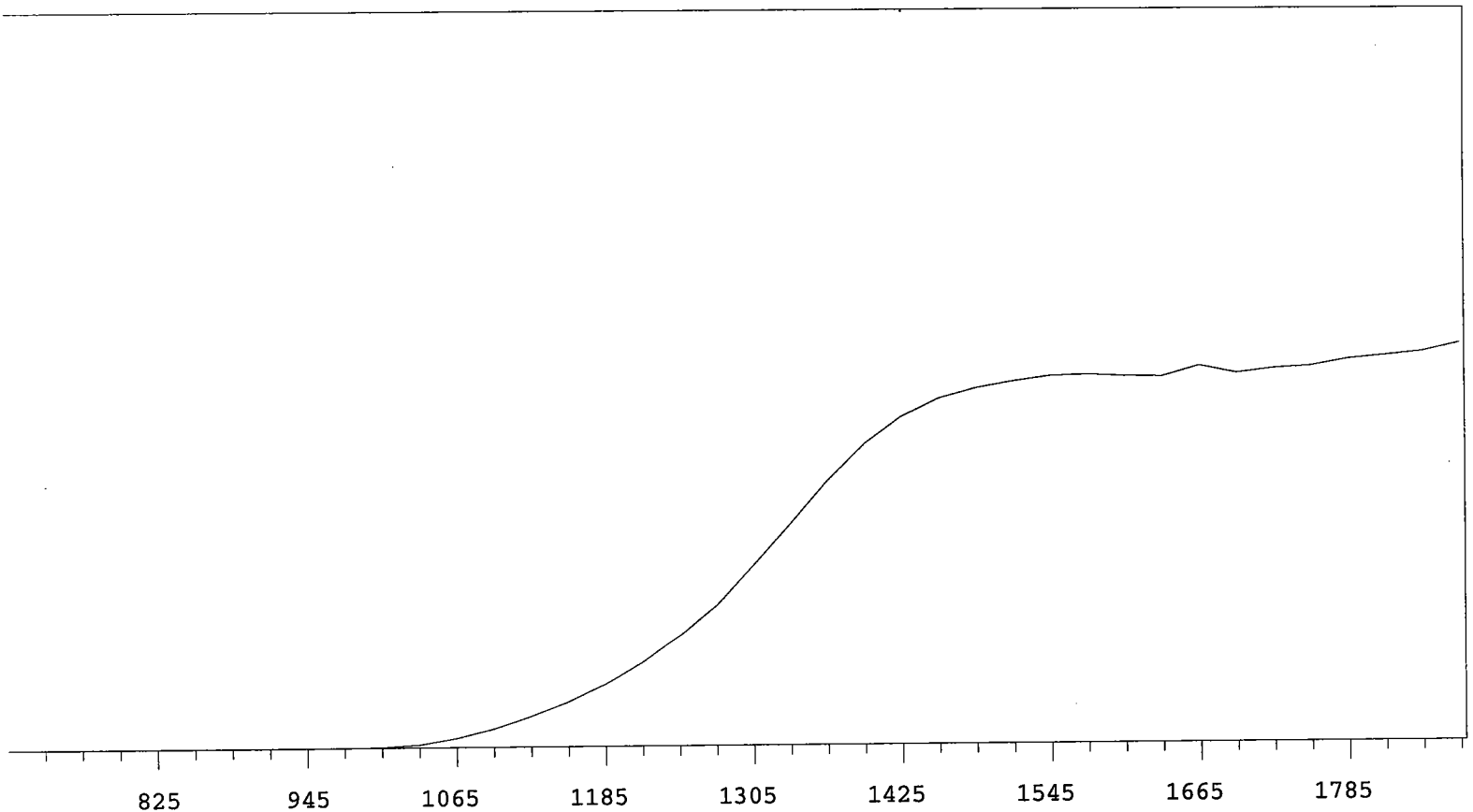
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17954	+65.82
735	0		1335	21482	+57.64
765	0		1365	25373	+45.78
795	1	+0.00	1395	29042	+34.80
825	0	>100	1425	31373	+23.29
855	0	+0.00	1455	33143	+14.25
885	0	>100	1485	34006	+8.49
915	1	>100	1515	34662	+4.71
945	0	>100	1545	34892	+3.14
975	14	>100	1575	35129	+1.86
1005	109	>100	1605	35411	+1.49
1035	481	>100	1635	35380	+0.62
1065	1177	>100	1665	35554	+0.65
1095	2133	>100	1695	35385	+1.18
1125	3243	>100	1725	35755	+1.89
1155	4554	>100	1755	35907	+3.26
1185	6285	+98.38	1785	36305	+4.62
1215	8468	+89.75	1815	36870	+6.98
1245	11266	+83.13	1845	37807	
1275	14088	+74.43	1875	39047	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	13228	+70.36
735	0		1335	16271	+60.12
765	0		1365	19506	+49.19
795	0	>100	1395	22188	+36.46
825	1	+83.33	1425	24373	+24.43
855	1	-83.33	1455	25649	+15.99
885	0	-55.56	1485	26433	+9.58
915	0	>100	1515	27195	+5.74
945	1	>100	1545	27367	+3.24
975	3	>100	1575	27490	+1.86
1005	42	>100	1605	27608	+1.22
1035	242	>100	1635	27841	+1.33
1065	613	>100	1665	27695	+1.11
1095	1353	>100	1695	27999	+1.42
1125	2213	>100	1725	27992	+2.04
1155	3256	>100	1755	28289	+2.52
1185	4474	>100	1785	28408	+4.56
1215	5932	+94.10	1815	28863	+5.70
1245	8072	+87.32	1845	29664	
1275	10579	+79.61	1875	30148	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16978	+70.97
735	0		1335	20569	+61.39
765	0		1365	24989	+48.97
795	0	>100	1395	28389	+36.69
825	0	>100	1425	30977	+24.05
855	0	>100	1455	32727	+14.93
885	0	>100	1485	33697	+8.42
915	1	>100	1515	34195	+4.89
945	1	>100	1545	34437	+3.49
975	3	>100	1575	34850	+2.11
1005	34	>100	1605	35174	+1.62
1035	221	>100	1635	34923	+0.68
1065	825	>100	1665	35250	+0.35
1095	1709	>100	1695	35171	+1.24
1125	2873	>100	1725	35237	+1.02
1155	4078	>100	1755	35584	+2.79
1185	5858	>100	1785	35587	+4.59
1215	7809	+91.82	1815	36485	+6.74
1245	10336	+85.02	1845	37270	
1275	13215	+77.79	1875	38453	

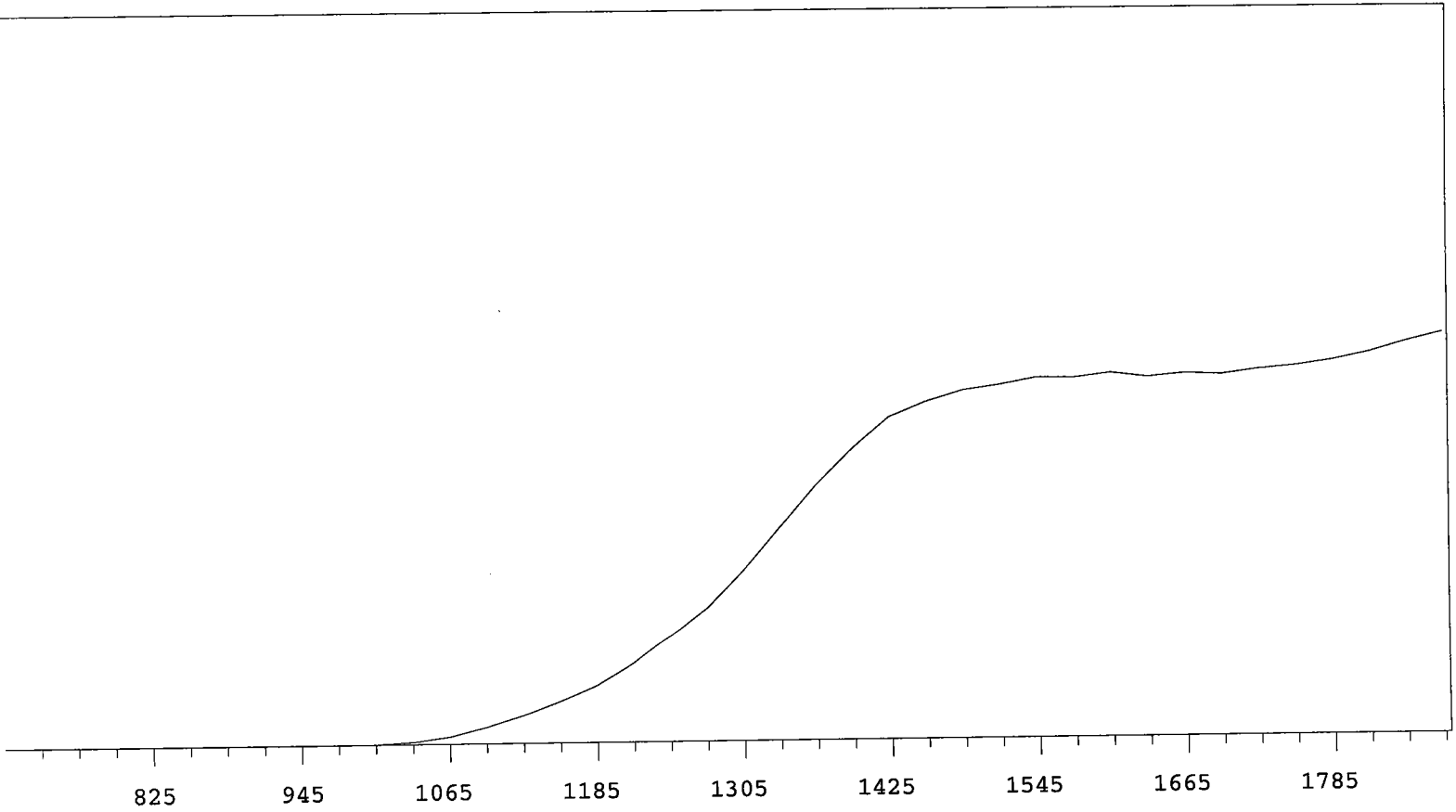


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16543	+70.03
735	0		1335	20257	+60.71
765	0		1365	24245	+48.17
795	0	>100	1395	27602	+35.50
825	0	>100	1425	30019	+23.48
855	0	>100	1455	31614	+14.53
885	0	>100	1485	32522	+8.91
915	0	>100	1515	33103	+5.28
945	0	>100	1545	33572	+2.60
975	4	>100	1575	33695	+0.70
1005	57	>100	1605	33525	+1.48
1035	277	>100	1635	33477	+0.99
1065	817	>100	1665	34432	+1.49
1095	1666	>100	1695	33745	+1.43
1125	2766	>100	1725	34149	+1.60
1155	4077	>100	1755	34350	+3.69
1185	5667	>100	1785	34955	+3.62
1215	7694	+91.50	1815	35251	+4.44
1245	10209	+84.83	1845	35592	
1275	12950	+77.50	1875	36382	

MPC 9600 Plateau
 Alpha Volts: 705

Instrument 7 MPC 9604 Detector D
 Beta Volts: 1575

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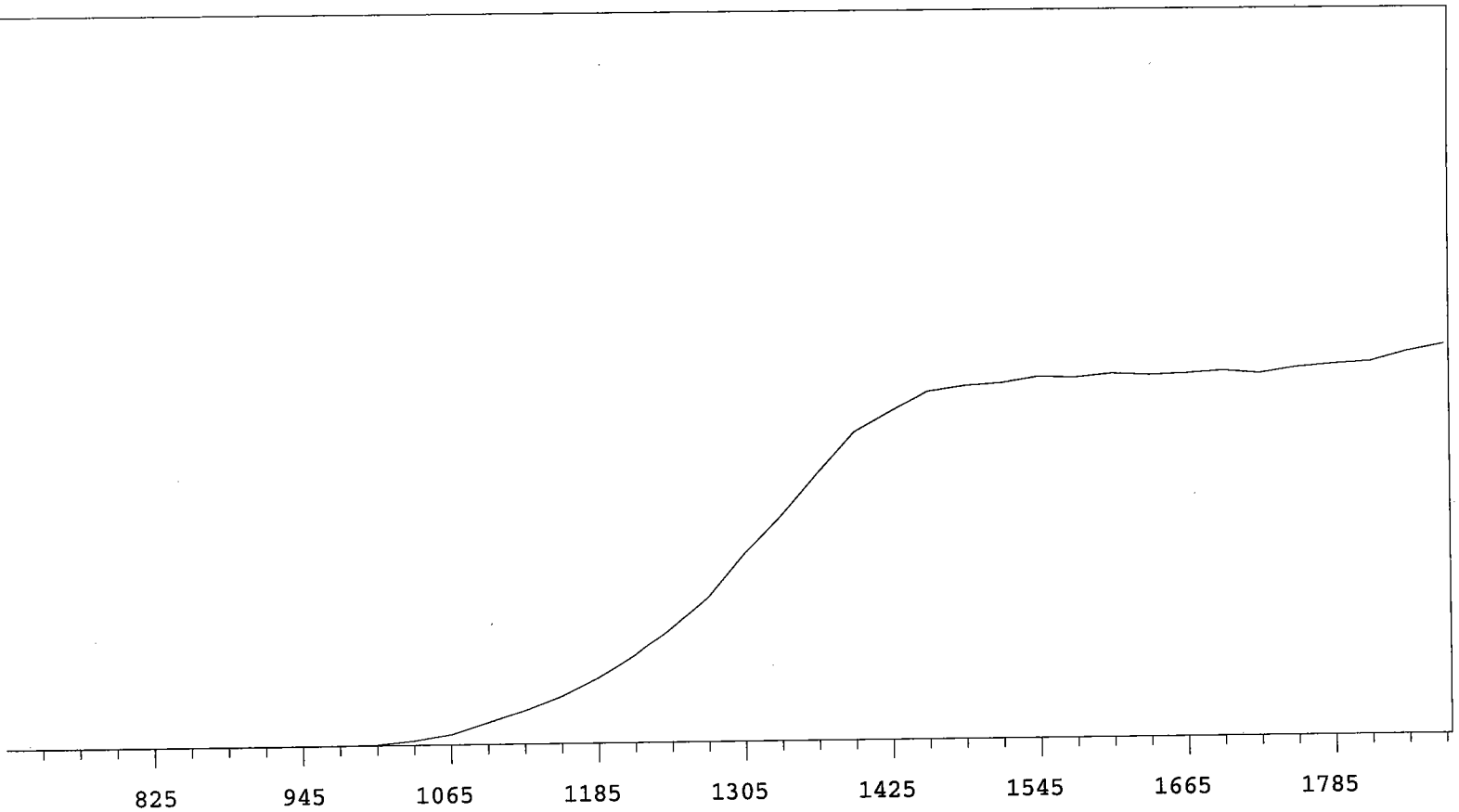


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14016	+71.42
735	0		1335	17436	+62.21
765	0		1365	20814	+50.32
795	0	>100	1395	23760	+36.91
825	0	>100	1425	26302	+24.91
855	0	>100	1455	27519	+15.17
885	0	>100	1485	28410	+8.91
915	0	>100	1515	28843	+5.41
945	0	>100	1545	29396	+3.58
975	5	>100	1575	29357	+1.54
1005	29	>100	1605	29719	+0.51
1035	204	>100	1635	29358	+0.23
1065	609	>100	1665	29623	+0.57
1095	1354	>100	1695	29509	+2.12
1125	2316	>100	1725	29896	+2.84
1155	3418	>100	1755	30165	+4.42
1185	4654	>100	1785	30570	+5.65
1215	6455	+92.99	1815	31180	+6.95
1245	8669	+86.45	1845	31995	
1275	10931	+79.15	1875	32717	

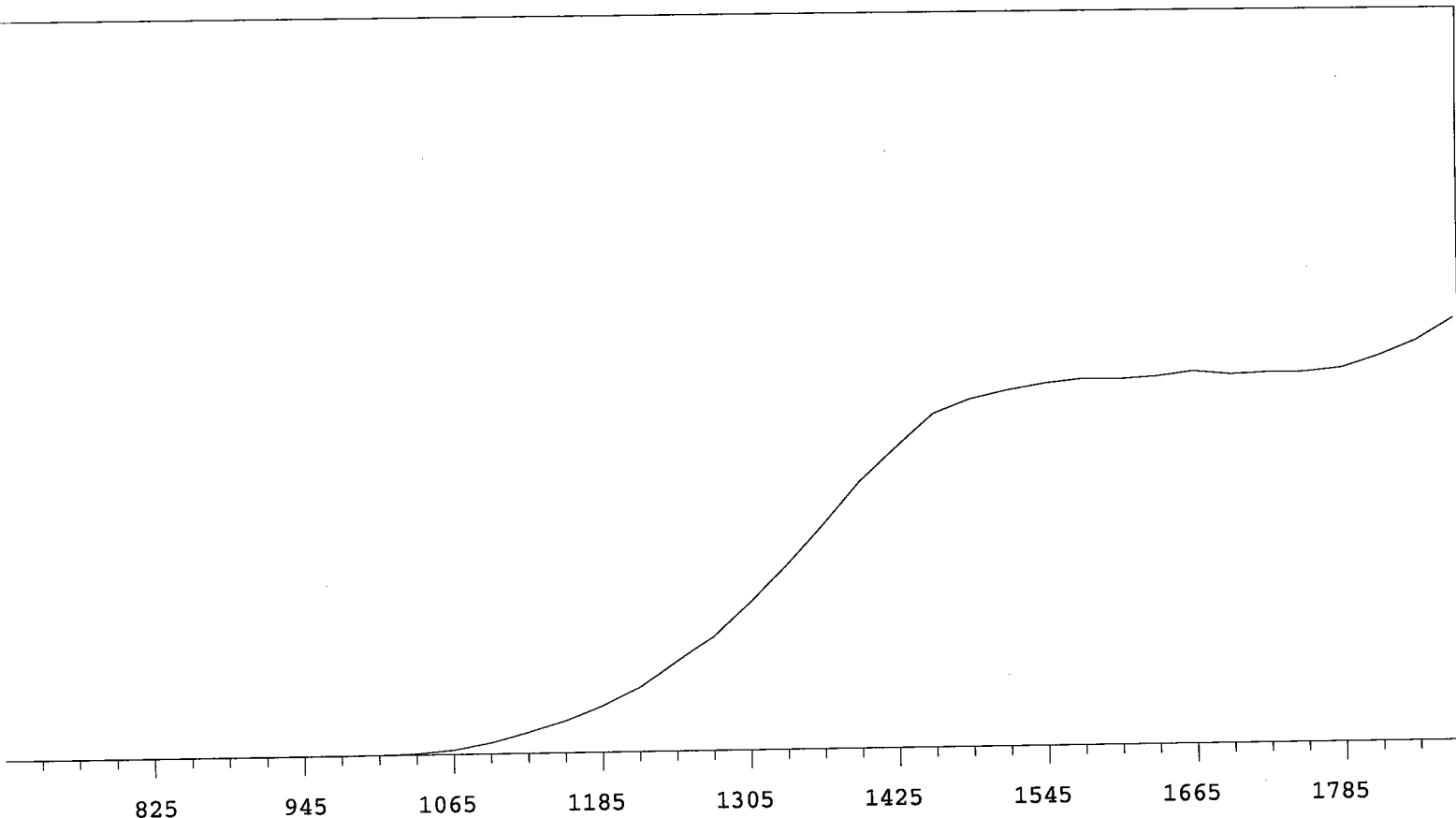
MPC 9600 Plateau
Alpha Volts: 705

Instrument 8 MPC 9604 Detector A
Beta Volts: 1575

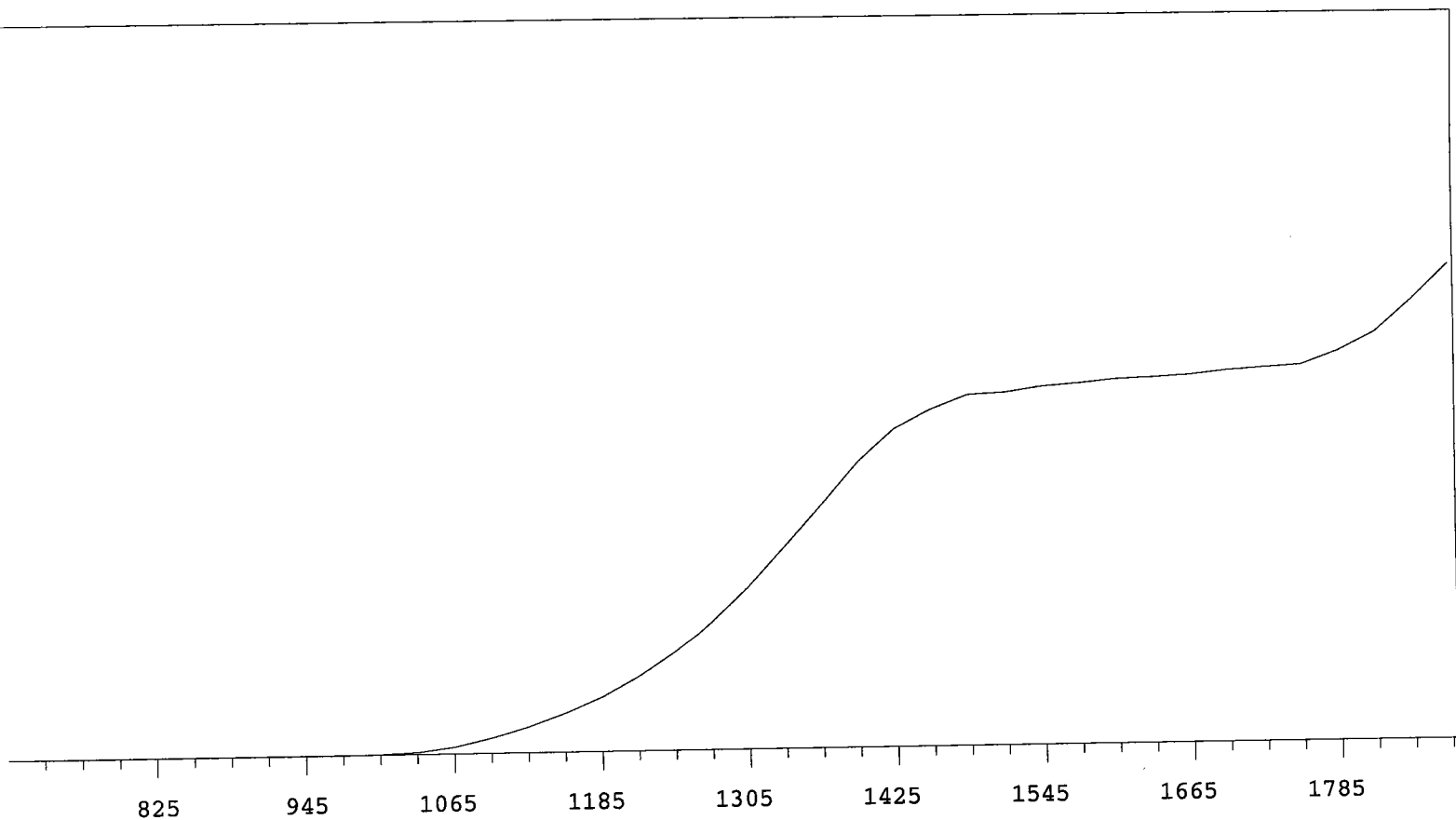
7/1/2009



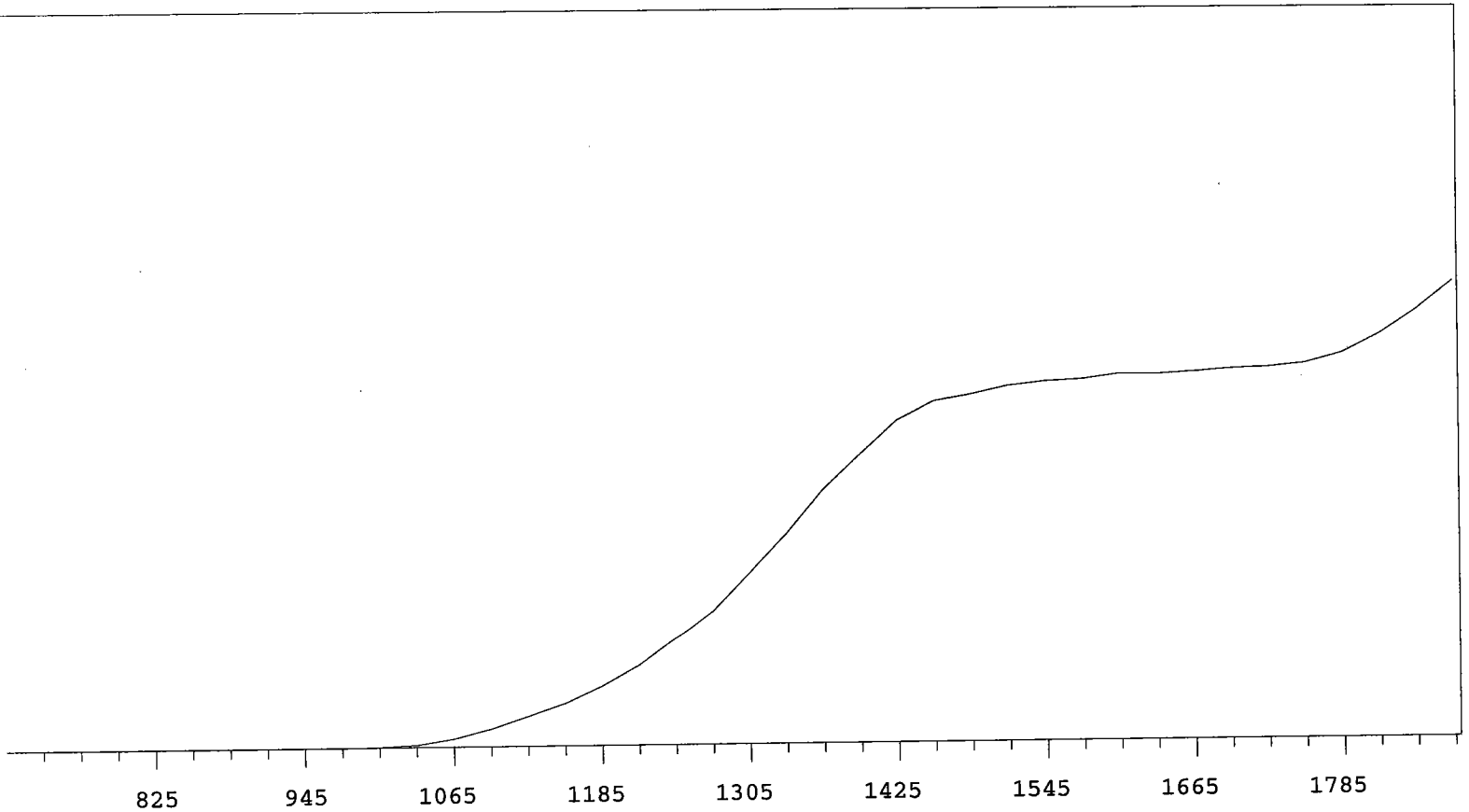
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19482	+67.45
735	0		1335	23344	+59.35
765	0		1365	27793	+45.86
795	0	>100	1395	31916	+34.29
825	0	>100	1425	33979	+21.61
855	0	>100	1455	35993	+11.71
885	0	>100	1485	36530	+7.04
915	0	>100	1515	36796	+3.11
945	1	>100	1545	37393	+2.44
975	9	>100	1575	37279	+1.41
1005	96	>100	1605	37650	+0.49
1035	468	>100	1635	37458	+0.91
1065	1084	>100	1665	37579	+0.12
1095	2286	>100	1695	37828	+1.10
1125	3479	>100	1725	37535	+1.72
1155	4912	>100	1755	38104	+2.18
1185	6819	+98.23	1785	38416	+4.12
1215	9153	+89.05	1815	38633	+4.92
1245	12105	+83.21	1845	39649	
1275	15122	+75.24	1875	40366	



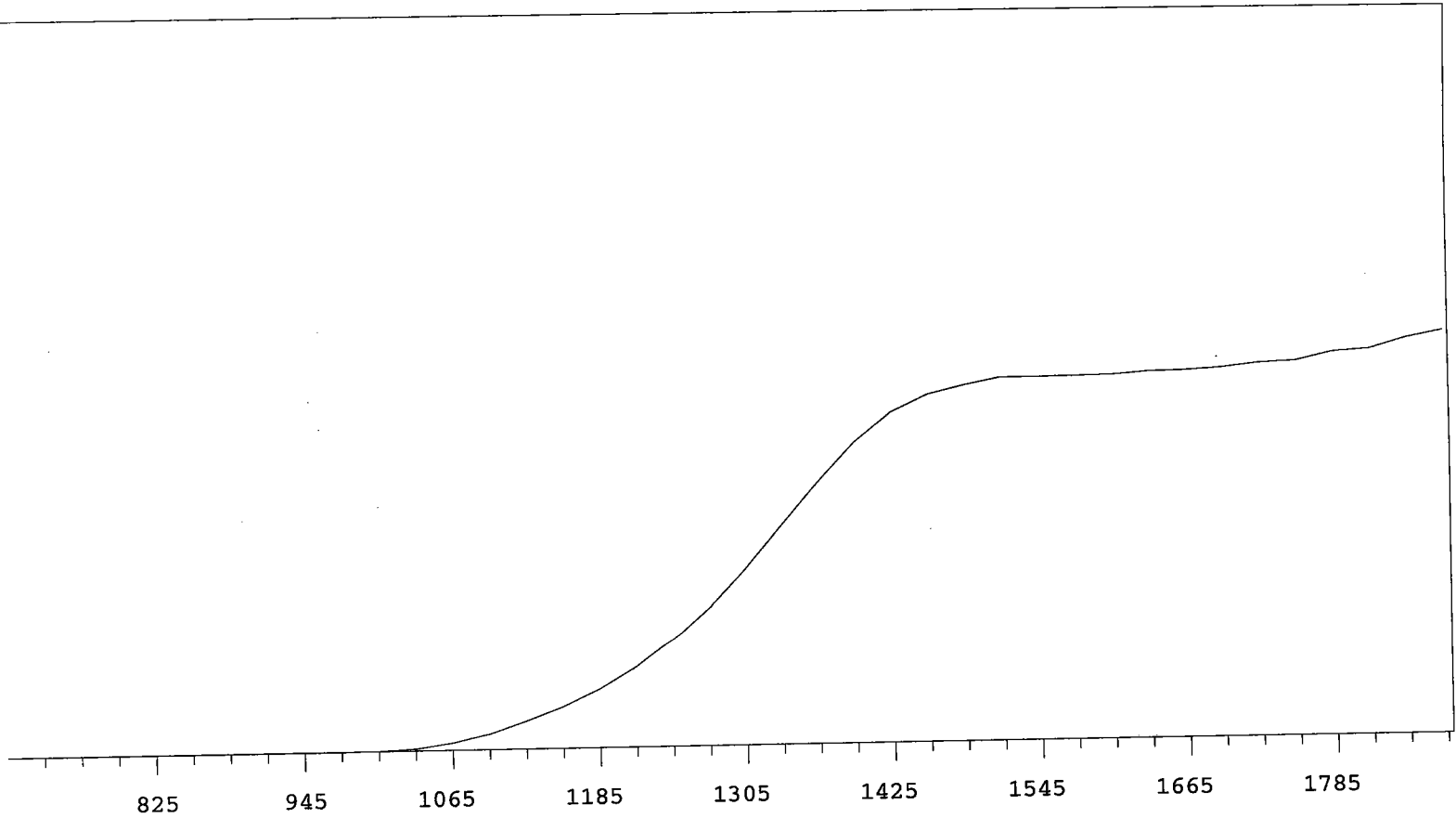
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16337	+74.91
735	0		1335	20471	+68.07
765	0		1365	25012	+57.86
795	0	>100	1395	29694	+47.48
825	0	>100	1425	33409	+35.17
855	0	>100	1455	37013	+23.27
885	0	>100	1485	38629	+14.35
915	0	>100	1515	39529	+7.69
945	0	>100	1545	40284	+4.34
975	0	>100	1575	40711	+2.52
1005	20	>100	1605	40642	+1.97
1035	122	>100	1635	40879	+1.11
1065	511	>100	1665	41405	+0.98
1095	1263	>100	1695	41011	+0.30
1125	2390	>100	1725	41182	+0.41
1155	3641	>100	1755	41178	+3.28
1185	5246	>100	1785	41573	+6.47
1215	7212	+98.32	1815	42858	+10.82
1245	9897	+89.80	1845	44440	
1275	12742	+82.40	1875	46780	



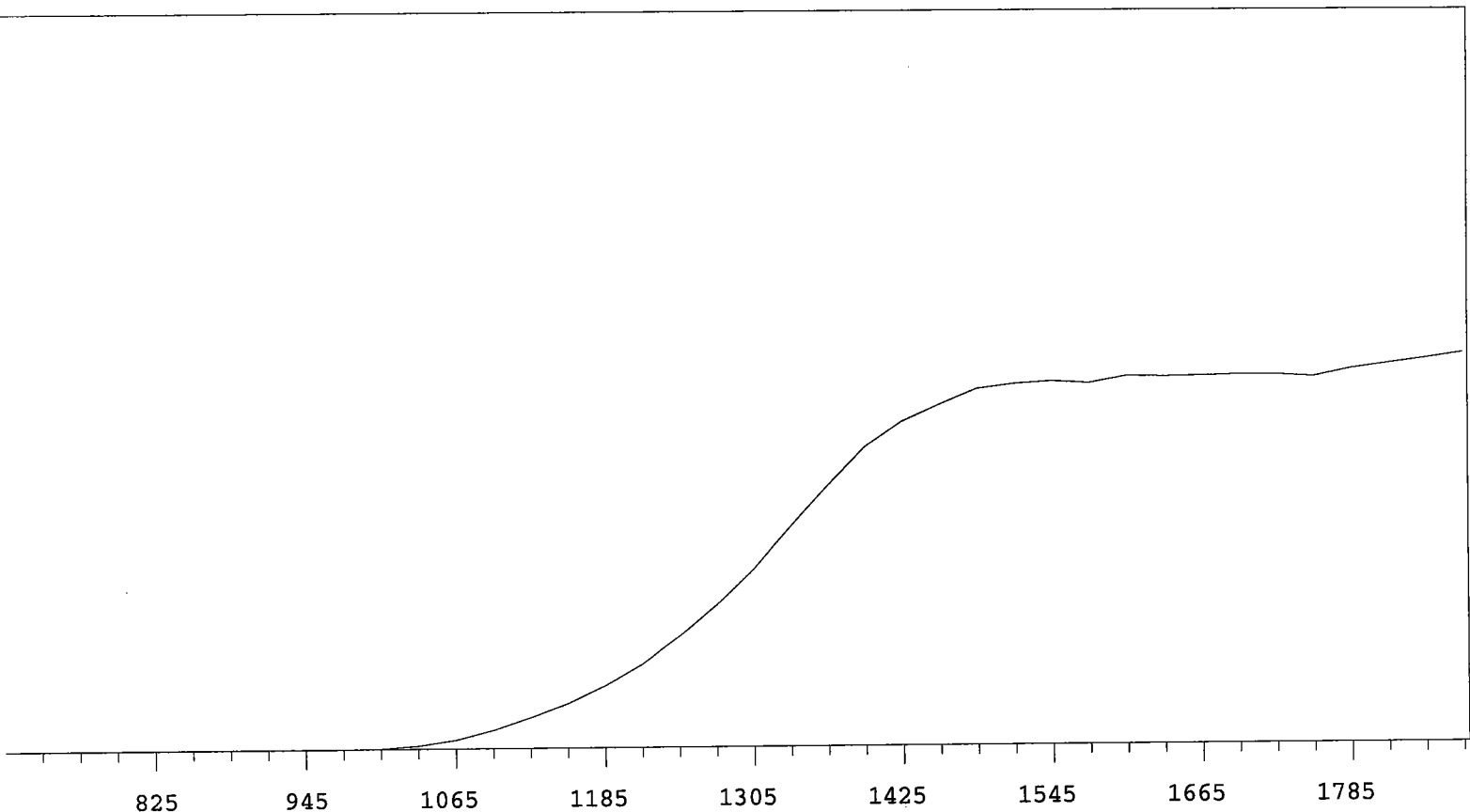
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16303	+72.82
735	0		1335	20309	+64.32
765	0		1365	24364	+53.82
795	0	>100	1395	28527	+40.95
825	0	>100	1425	31774	+28.74
855	0	>100	1455	33631	+16.87
885	0	>100	1485	35030	+9.25
915	0	>100	1515	35208	+5.21
945	0	>100	1545	35741	+3.27
975	4	>100	1575	36019	+2.95
1005	46	>100	1605	36373	+2.21
1035	202	>100	1635	36484	+2.27
1065	697	>100	1665	36713	+2.28
1095	1532	>100	1695	37093	+2.46
1125	2614	>100	1725	37325	+4.17
1155	3953	>100	1755	37543	+7.52
1185	5474	>100	1785	38833	+13.43
1215	7466	+93.09	1815	40656	+19.49
1245	9842	+86.73	1845	43753	
1275	12814	+80.29	1875	47246	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16889	+70.18
735	0		1335	20600	+61.29
765	1	+0.00	1365	24824	+50.40
795	0	>100	1395	28208	+38.85
825	0	>100	1425	31539	+25.79
855	0	>100	1455	33391	+16.06
885	0	>100	1485	33991	+8.60
915	0	>100	1515	34782	+5.01
945	0	>100	1545	35201	+4.10
975	5	>100	1575	35380	+2.50
1005	47	>100	1605	35849	+1.87
1035	243	>100	1635	35784	+1.79
1065	792	>100	1665	36000	+1.43
1095	1744	>100	1695	36269	+2.10
1125	2933	>100	1725	36381	+3.46
1155	4123	>100	1755	36733	+6.86
1185	5780	>100	1785	37669	+11.78
1215	7791	+91.58	1815	39465	+16.64
1245	10478	+84.93	1845	41803	
1275	13118	+77.50	1875	44665	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16226	+71.71
735	0		1335	20083	+61.95
765	1	+0.00	1365	23913	+49.99
795	0	>100	1395	27526	+36.97
825	0	>100	1425	30193	+24.54
855	0	>100	1455	31747	+14.71
885	0	>100	1485	32544	+7.71
915	0	>100	1515	33198	+3.66
945	0	>100	1545	33188	+1.51
975	2	>100	1575	33227	+0.73
1005	33	>100	1605	33278	+1.04
1035	203	>100	1635	33518	+1.38
1065	668	>100	1665	33565	+1.95
1095	1403	>100	1695	33774	+1.99
1125	2545	>100	1725	34135	+3.30
1155	3800	>100	1755	34244	+3.67
1185	5363	>100	1785	35022	+4.84
1215	7355	+95.00	1815	35229	+5.93
1245	9807	+87.69	1845	36179	
1275	12700	+80.28	1875	36821	



VOLTS COUNTS %/100 Volts

VOLTS COUNTS %/100 Volts

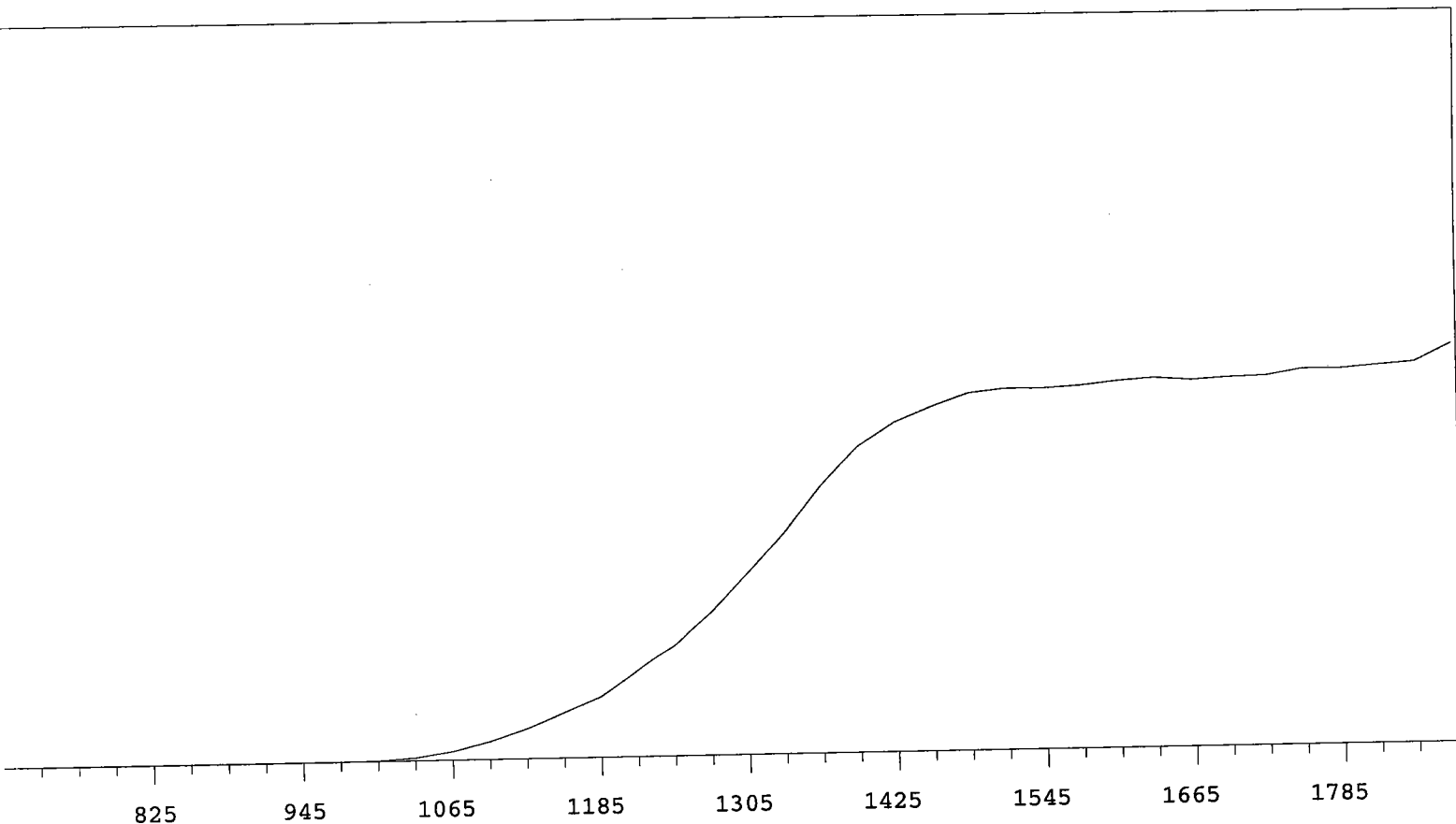
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 1005 45 >100
 1035 300 >100
 1065 836 >100
 1095 1742 >100
 1125 2896 >100
 1155 4198 >100
 1185 5849 >100
 1215 7887 +92.20
 1245 10561 +83.55
 1275 13442 +76.62

1305 16723 +68.78
 1335 20749 +60.55
 1365 24686 +48.78
 1395 28343 +35.24
 1425 30657 +24.31
 1455 32208 +15.22
 1485 33662 +9.32
 1515 34098 +4.47
 1545 34326 +2.17
 1575 34133 +1.60
 1605 34758 +1.41
 1635 34706 +1.35
 1665 34769 +0.30
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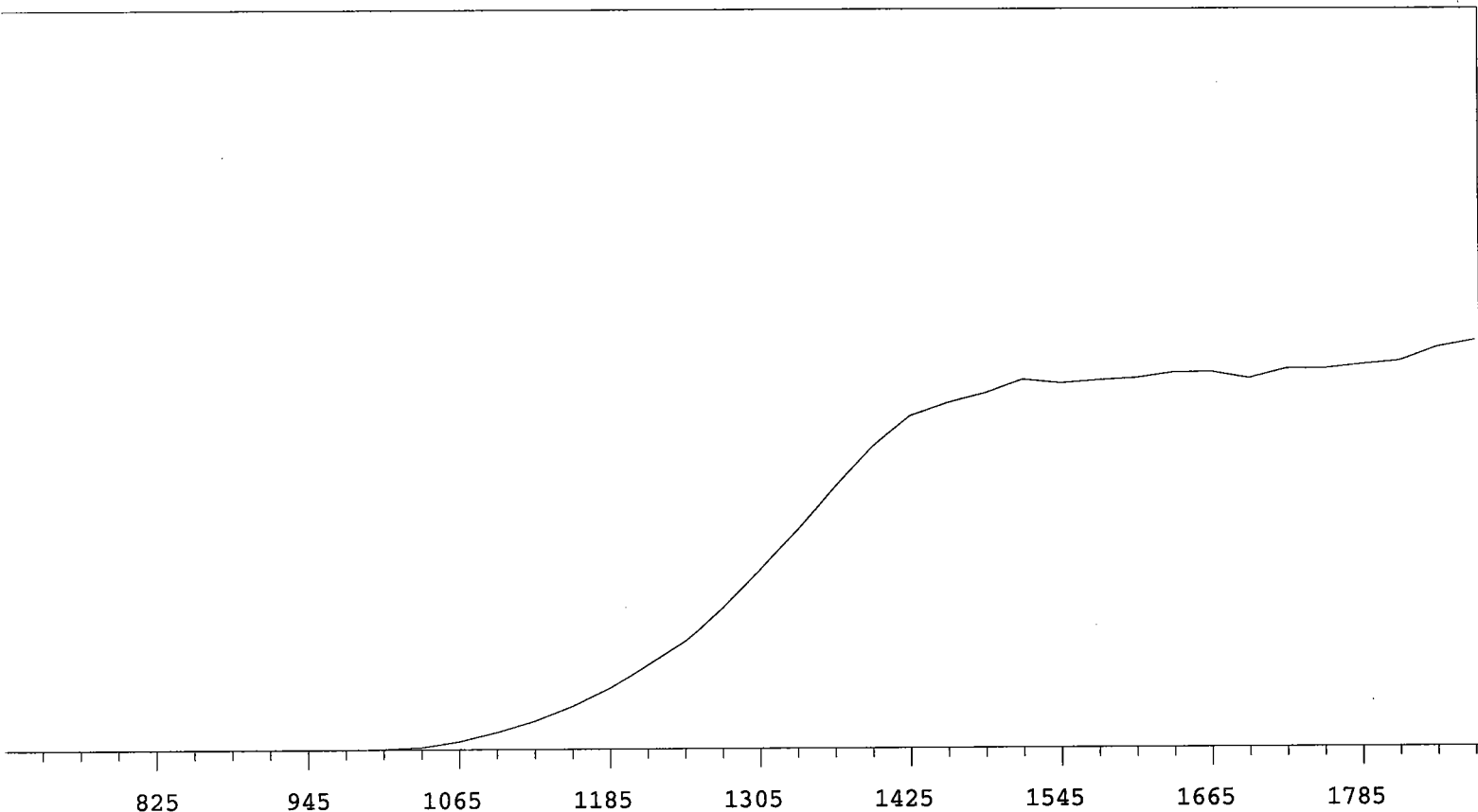
MPC 9600 Plateau
Alpha Volts: 870

Instrument 9 MPC 9604 Detector C
Beta Volts: 1530

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VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	20192	+70.39
735	0		1335	24524	+60.97
765	0		1365	29650	+48.44
795	0	>100	1395	33904	+35.09
825	0	>100	1425	36549	+22.73
855	0	>100	1455	38217	+13.58
885	1	>100	1485	39628	+7.51
915	1	>100	1515	40035	+3.73
945	2	>100	1545	40020	+1.92
975	3	>100	1575	40236	+2.06
1005	64	>100	1605	40680	+1.62
1035	349	>100	1635	40953	+1.03
1065	970	>100	1665	40643	+0.43
1095	1982	>100	1695	40882	+1.41
1125	3328	>100	1725	40979	+2.18
1155	5012	>100	1755	41654	+2.20
1185	6669	>100	1785	41602	+2.27
1215	9448	+92.67	1815	41935	+4.50
1245	12293	+86.58	1845	42259	
1275	15917	+76.99	1875	44183	

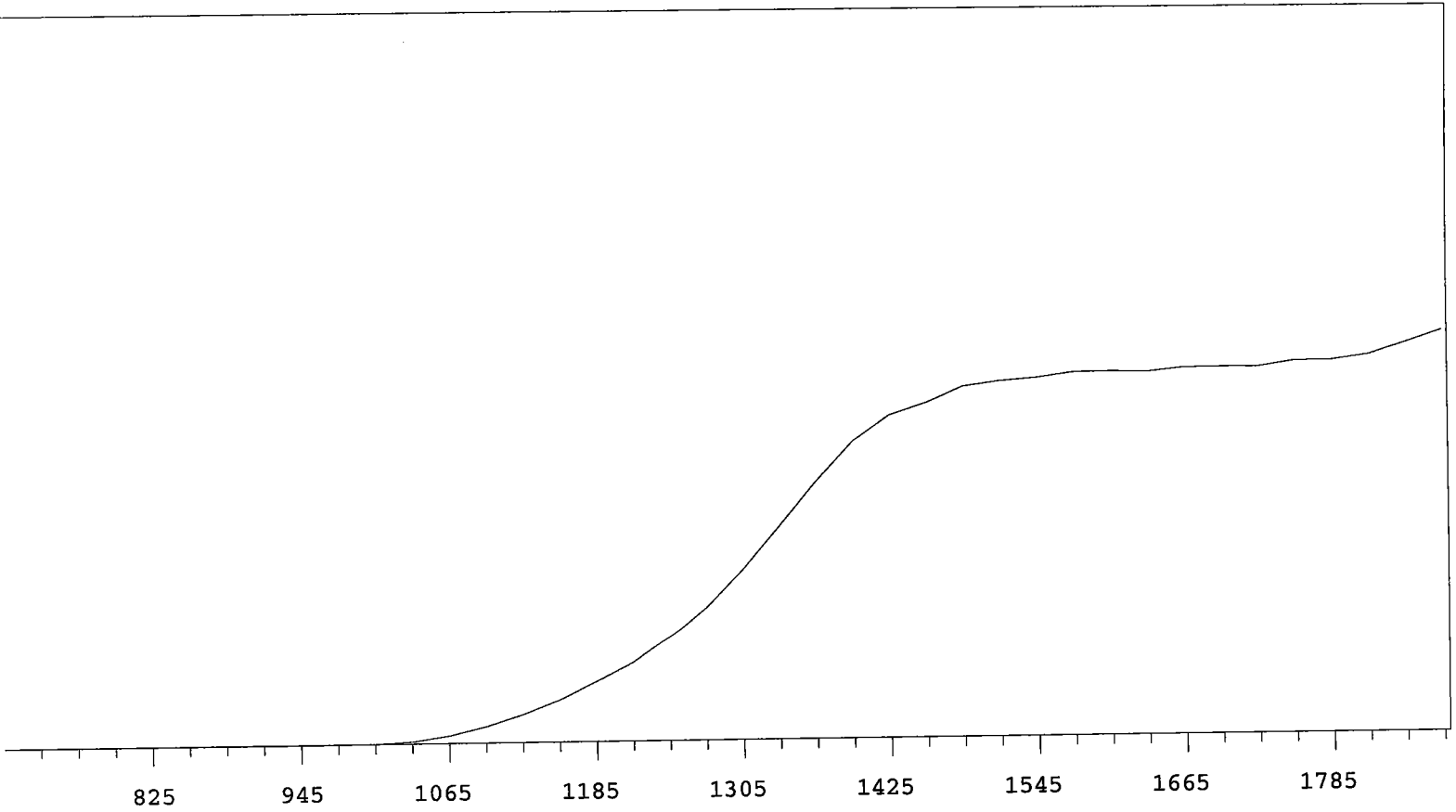


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	13319	+70.94
735	0		1335	16319	+61.35
765	0		1365	19577	+50.27
795	0	>100	1395	22498	+36.85
825	0	>100	1425	24782	+23.90
855	0	>100	1455	25761	+15.37
885	0	>100	1485	26486	+8.38
915	1	>100	1515	27503	+5.11
945	0	>100	1545	27223	+2.67
975	5	>100	1575	27453	+1.71
1005	35	>100	1605	27604	+2.70
1035	186	>100	1635	28021	+0.78
1065	618	>100	1665	28059	+1.05
1095	1280	>100	1695	27548	+0.90
1125	2141	>100	1725	28280	+2.16
1155	3268	>100	1755	28290	+3.51
1185	4659	>100	1785	28600	+4.46
1215	6343	+90.68	1815	28879	+6.35
1245	8064	+83.46	1845	29913	
1275	10497	+77.03	1875	30417	

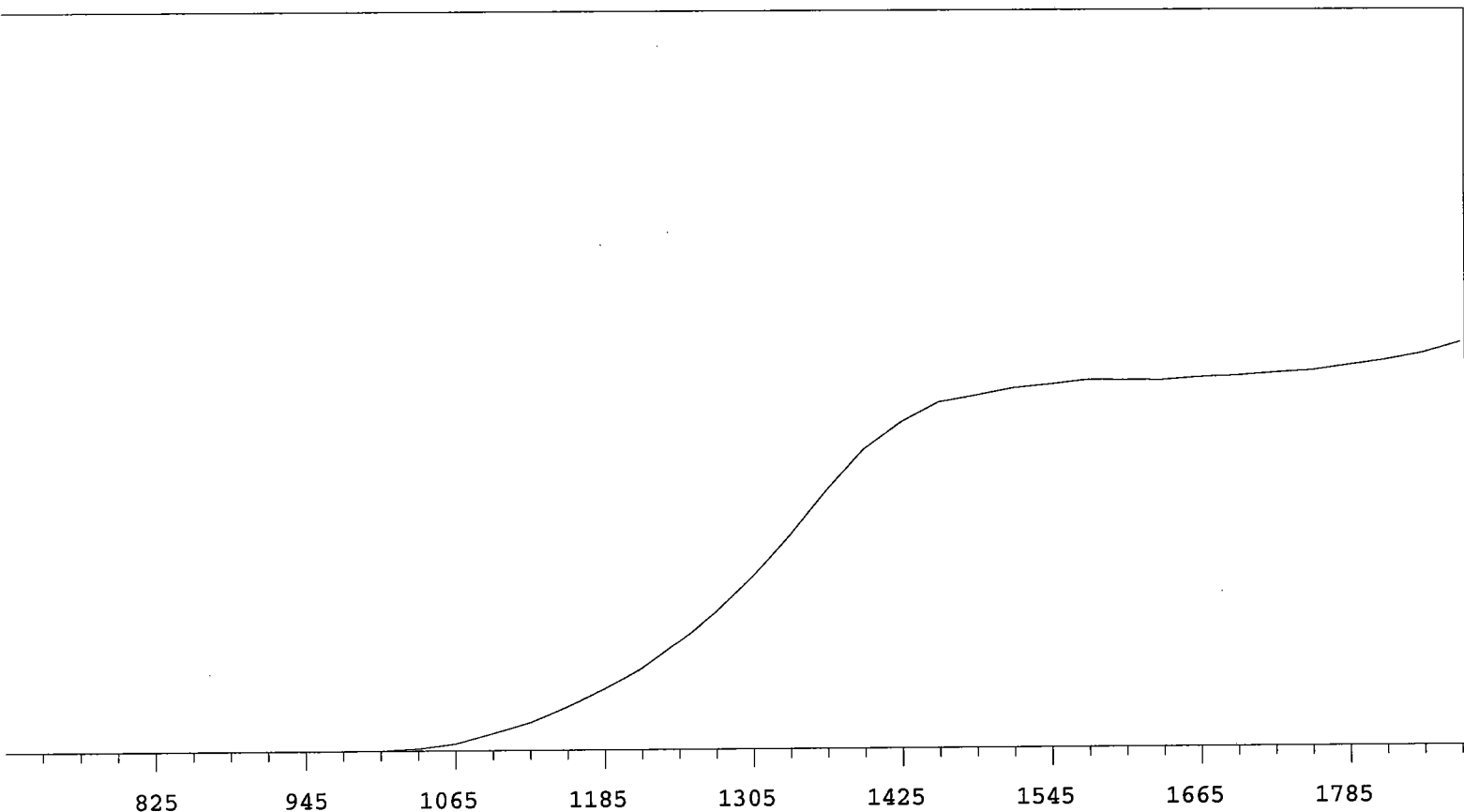
MPC 9600 Plateau
Alpha Volts: 870

Instrument 10 MPC 9604 Detector A
Beta Volts: 1552

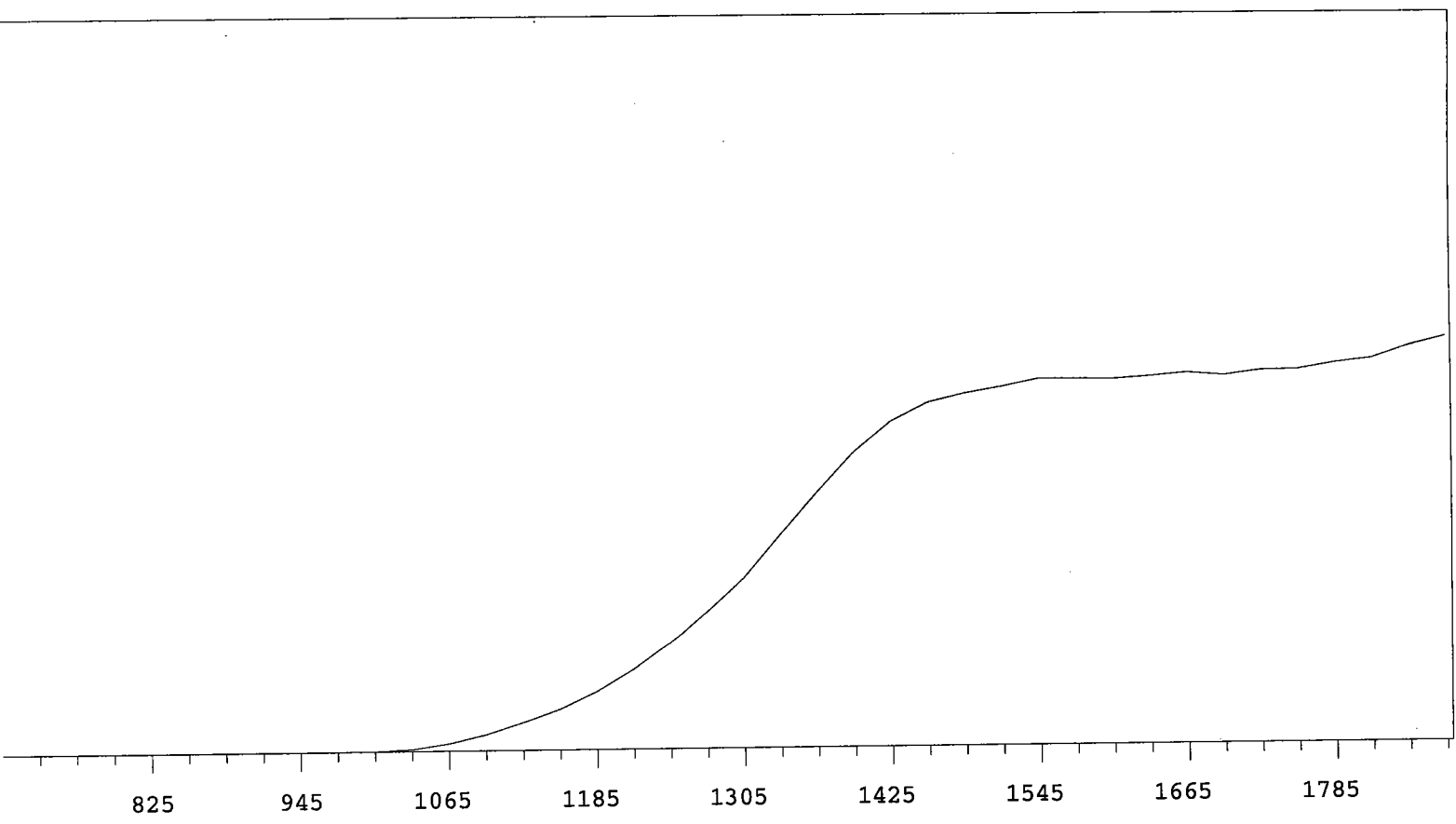
7/1/2009



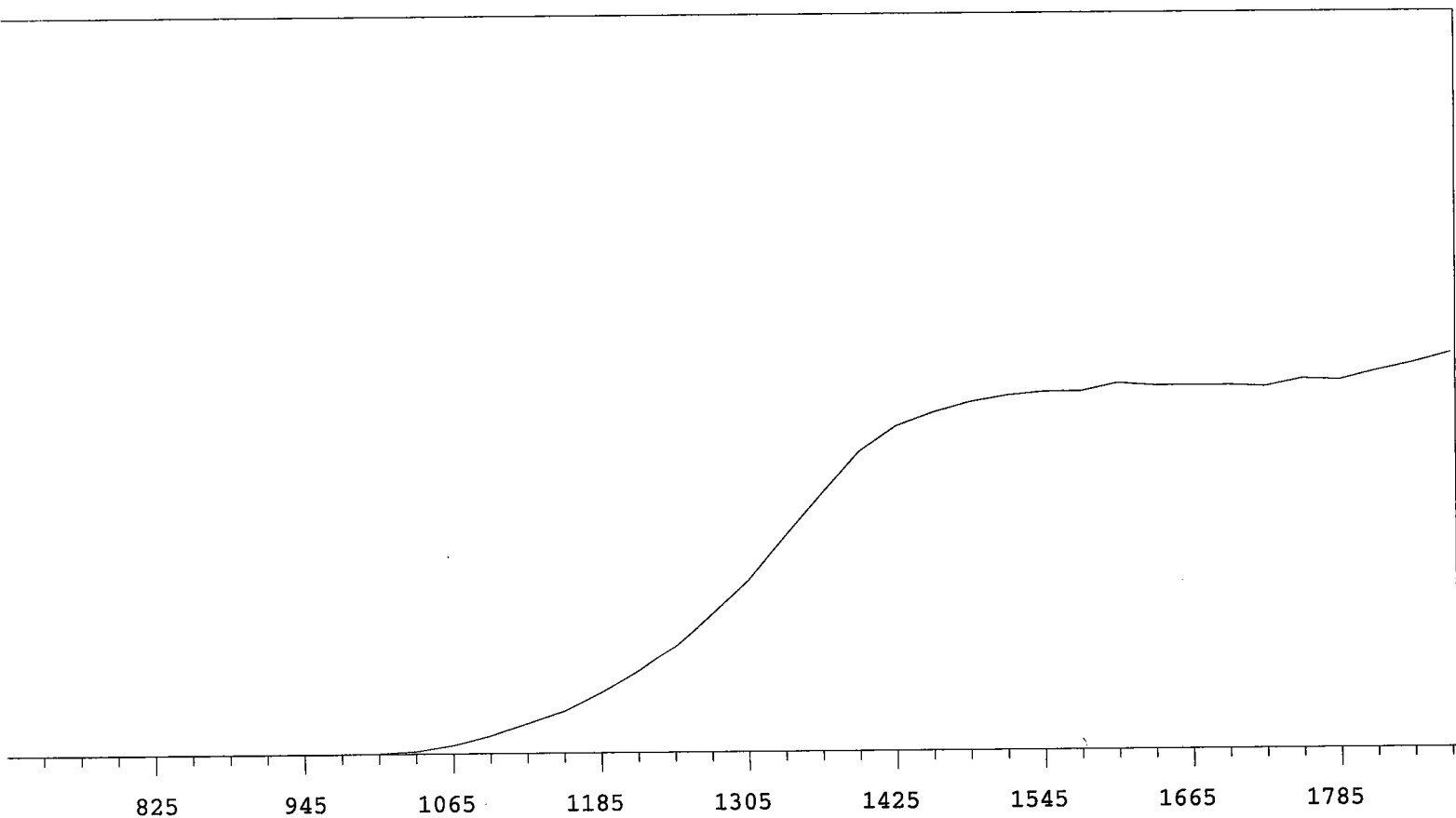
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16076	+72.76
735	1		1335	19985	+63.85
765	0		1365	24102	+50.95
795	0	>100	1395	27819	+36.01
825	0	>100	1425	30228	+23.86
855	0	>100	1455	31343	+14.40
885	0	>100	1485	32811	+8.77
915	0	>100	1515	33243	+6.10
945	0	>100	1545	33518	+3.25
975	1	>100	1575	34010	+1.98
1005	37	>100	1605	34061	+1.59
1035	198	>100	1635	33973	+0.97
1065	687	>100	1665	34346	+0.93
1095	1491	>100	1695	34366	+1.72
1125	2580	>100	1725	34341	+1.54
1155	3920	>100	1755	34860	+2.47
1185	5588	>100	1785	34897	+4.50
1215	7384	+91.32	1815	35377	+6.60
1245	9794	+84.81	1845	36458	
1275	12572	+79.73	1875	37630	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14469	+71.08
735	0		1335	17904	+63.07
765	0		1365	21677	+51.20
795	0	>100	1395	25027	+38.06
825	0	>100	1425	27237	+24.55
855	0	>100	1455	28914	+14.61
885	0	>100	1485	29480	+8.48
915	0	>100	1515	30075	+5.06
945	1	>100	1545	30374	+3.42
975	7	>100	1575	30738	+1.68
1005	28	>100	1605	30703	+1.08
1035	190	>100	1635	30679	+0.77
1065	597	>100	1665	30902	+1.46
1095	1474	>100	1695	30992	+1.89
1125	2383	>100	1725	31224	+2.40
1155	3680	>100	1755	31397	+3.27
1185	5131	>100	1785	31826	+4.13
1215	6808	+89.95	1815	32236	+5.59
1245	8990	+83.03	1845	32782	
1275	11493	+77.30	1875	33632	

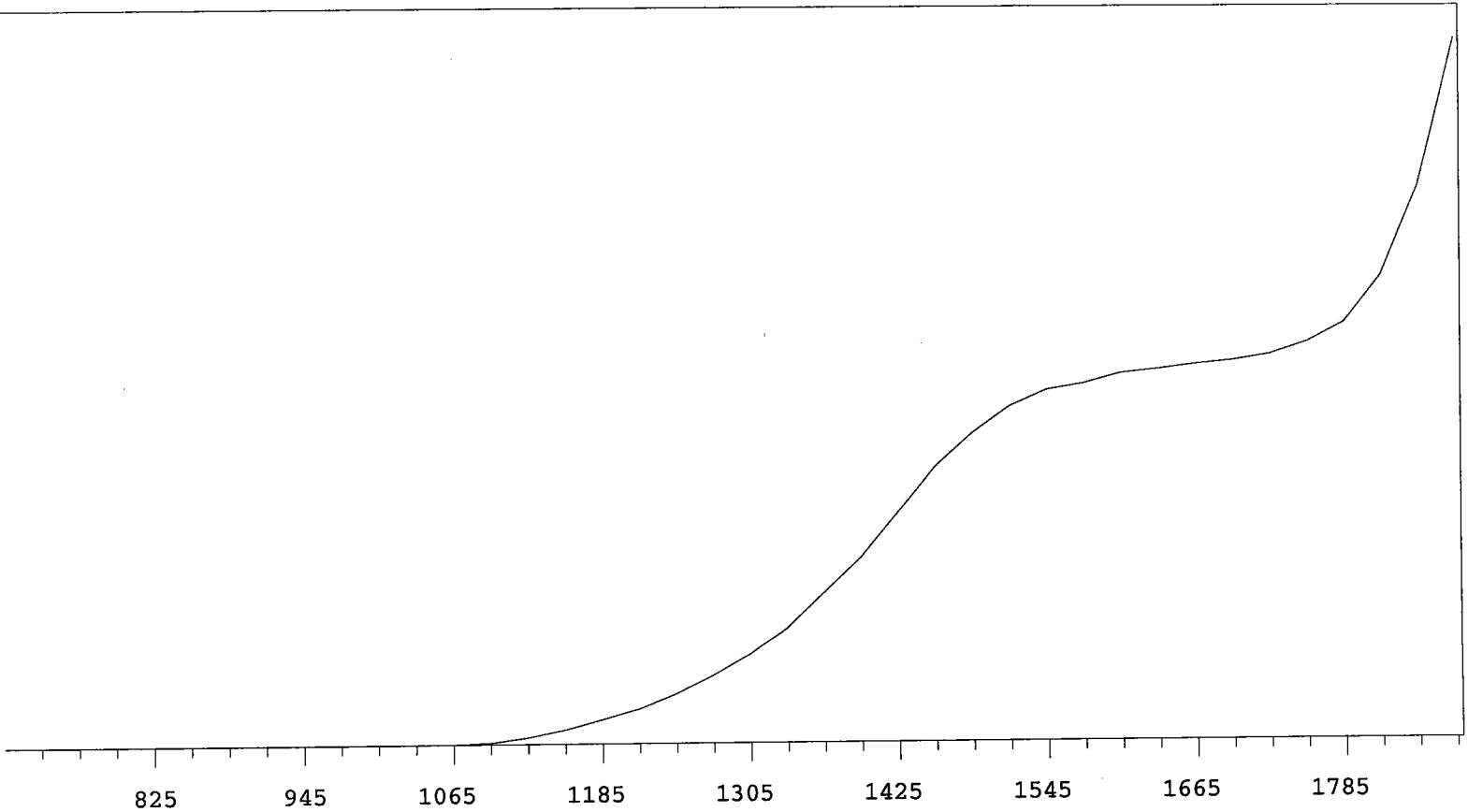


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18051	+71.16
735	0		1335	22586	+62.34
765	0		1365	26973	+51.47
795	0	>100	1395	31137	+38.24
825	0	>100	1425	34321	+25.70
855	0	>100	1455	36267	+15.37
885	1	>100	1485	37197	+9.21
915	0	>100	1515	37851	+5.38
945	2	>100	1545	38622	+3.00
975	2	>100	1575	38600	+1.55
1005	36	>100	1605	38538	+1.03
1035	220	>100	1635	38786	+0.91
1065	780	>100	1665	39129	+1.38
1095	1712	>100	1695	38832	+1.20
1125	2926	>100	1725	39323	+2.00
1155	4297	>100	1755	39390	+3.35
1185	6097	>100	1785	40031	+4.86
1215	8397	+95.11	1815	40466	+6.64
1245	11155	+85.84	1845	41713	
1275	14430	+78.79	1875	42620	

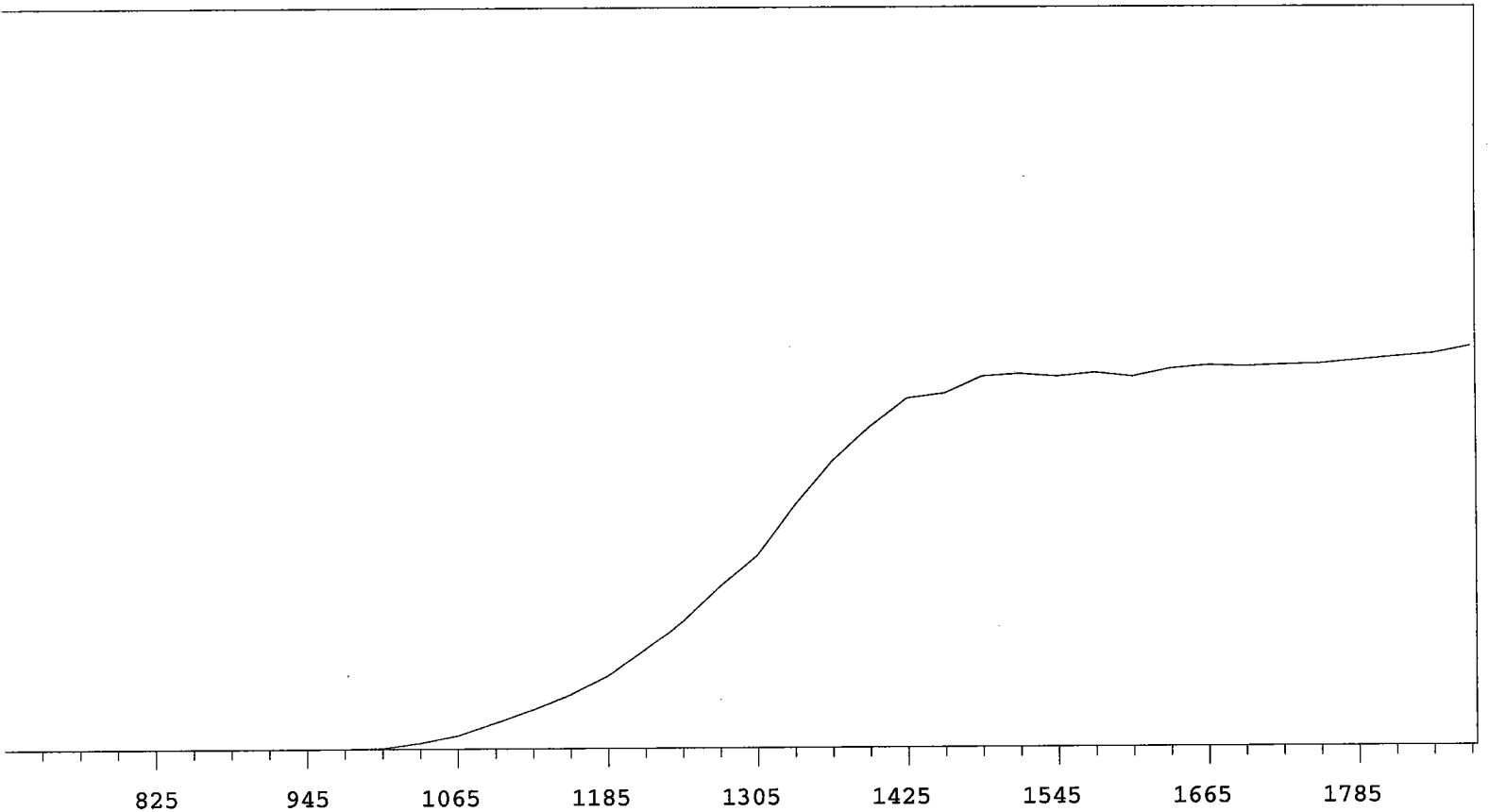


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15430	+69.87
735	0		1335	19258	+61.49
765	0		1365	23018	+50.06
795	0	>100	1395	26562	+35.34
825	0	>100	1425	28750	+22.67
855	0	>100	1455	29911	+13.20
885	0	>100	1485	30798	+8.01
915	0	>100	1515	31375	+4.83
945	0	>100	1545	31684	+3.74
975	3	>100	1575	31721	+2.38
1005	49	>100	1605	32398	+1.44
1035	244	>100	1635	32154	+0.64
1065	764	>100	1665	32157	-0.77
1095	1584	>100	1695	32152	+0.99
1125	2677	>100	1725	32029	+1.41
1155	3763	>100	1755	32699	+3.00
1185	5395	>100	1785	32566	+4.71
1215	7350	+93.71	1815	33351	+5.92
1245	9655	+83.52	1845	34031	
1275	12504	+76.82	1875	34941	

Alpha Volts: 1515 Beta Volts: 1515

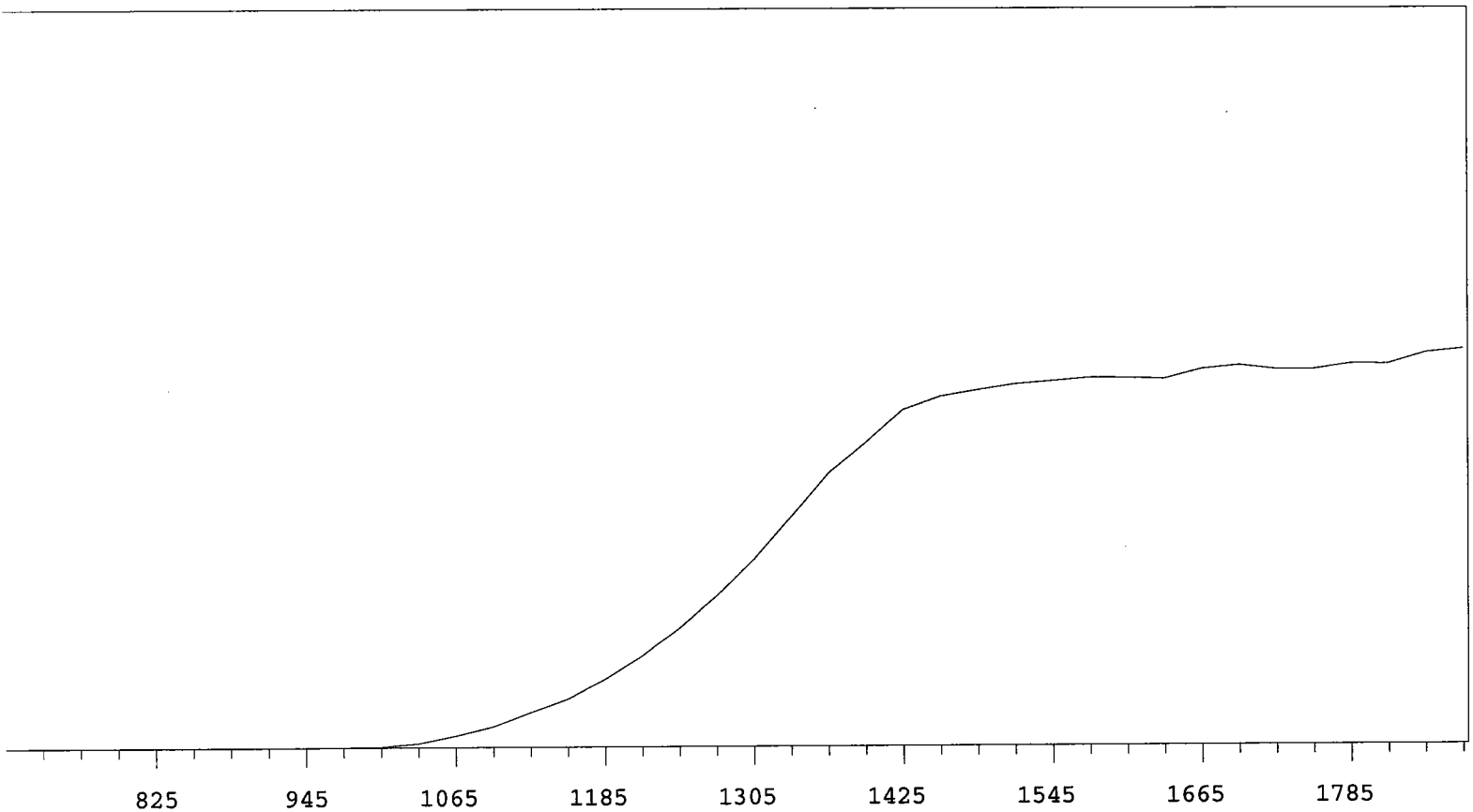


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	3225	+87.64
735	1		1335	4189	+80.15
765	0		1365	5428	+75.12
795	0	>100	1395	6662	+68.60
825	0	>100	1425	8241	+58.14
855	0	>100	1455	9857	+46.65
885	0	>100	1485	11018	+33.24
915	0	>100	1515	11953	+21.01
945	1	+0.00	1545	12538	+13.57
975	0	>100	1575	12760	+8.35
1005	0	>100	1605	13114	+5.84
1035	2	>100	1635	13258	+4.78
1065	9	>100	1665	13430	+3.99
1095	61	>100	1695	13551	+5.46
1125	248	>100	1725	13771	+8.65
1155	528	>100	1755	14204	+16.44
1185	882	>100	1785	14916	+30.03
1215	1270	>100	1815	16579	+48.74
1245	1786	>100	1845	19717	
1275	2478	+93.67	1875	25029	



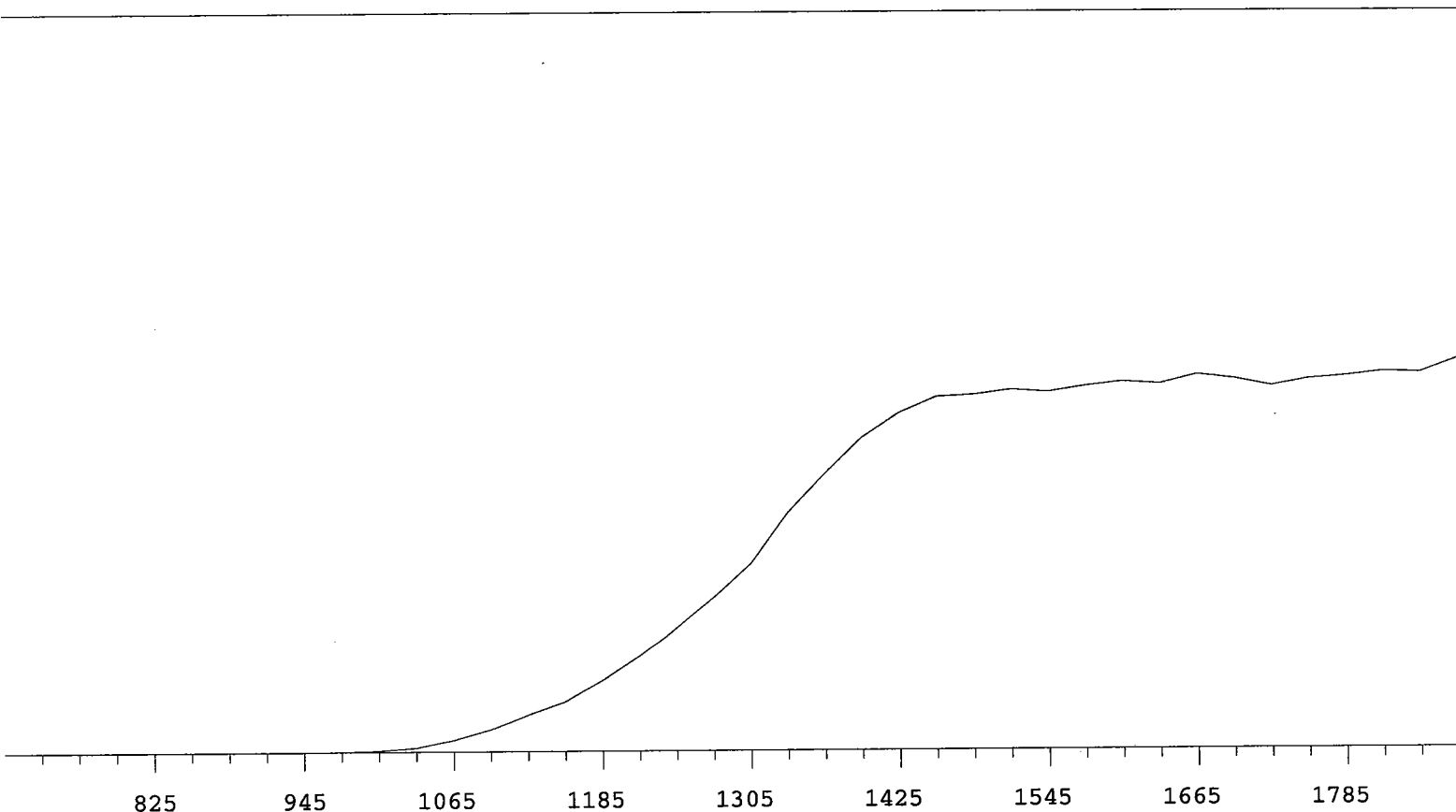
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8947	+65.63
735	0		1335	11238	+56.58
765	0		1365	13246	+46.66
795	0	>100	1395	14838	+30.69
825	0	>100	1425	16166	+20.11
855	0	>100	1455	16396	+11.95
885	0	>100	1485	17161	+5.61
915	1	>100	1515	17274	+3.59
945	0	>100	1545	17144	-0.00
975	11	>100	1575	17323	+0.80
1005	47	>100	1605	17136	+2.21
1035	280	>100	1635	17484	+1.94
1065	610	>100	1665	17638	+2.16
1095	1192	>100	1695	17580	+0.85
1125	1789	>100	1725	17655	+1.05
1155	2466	>100	1755	17700	+1.98
1185	3337	+94.91	1785	17857	+2.38
1215	4526	+88.85	1815	18006	+3.36
1245	5885	+78.40	1845	18140	
1275	7518	+72.09	1875	18468	

Alpha Volts: 1515 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	8636	+66.44
735	0		1335	10593	+56.56
765	0	+0.00	1365	12582	+46.23
795	0	>100	1395	13957	+33.45
825	1	+0.00	1425	15443	+21.49
855	0	>100	1455	16048	+13.14
885	0	+0.00	1485	16331	+6.45
915	0	>100	1515	16603	+4.19
945	1	>100	1545	16736	+2.73
975	7	>100	1575	16884	+1.11
1005	46	>100	1605	16875	+1.91
1035	191	>100	1635	16813	+2.86
1065	540	>100	1665	17257	+2.60
1095	957	>100	1695	17425	+1.58
1125	1597	>100	1725	17238	+0.49
1155	2217	>100	1755	17230	+0.63
1185	3154	+98.74	1785	17482	+3.27
1215	4239	+89.75	1815	17468	+4.46
1245	5550	+79.98	1845	17977	
1275	6980	+73.12	1875	18163	

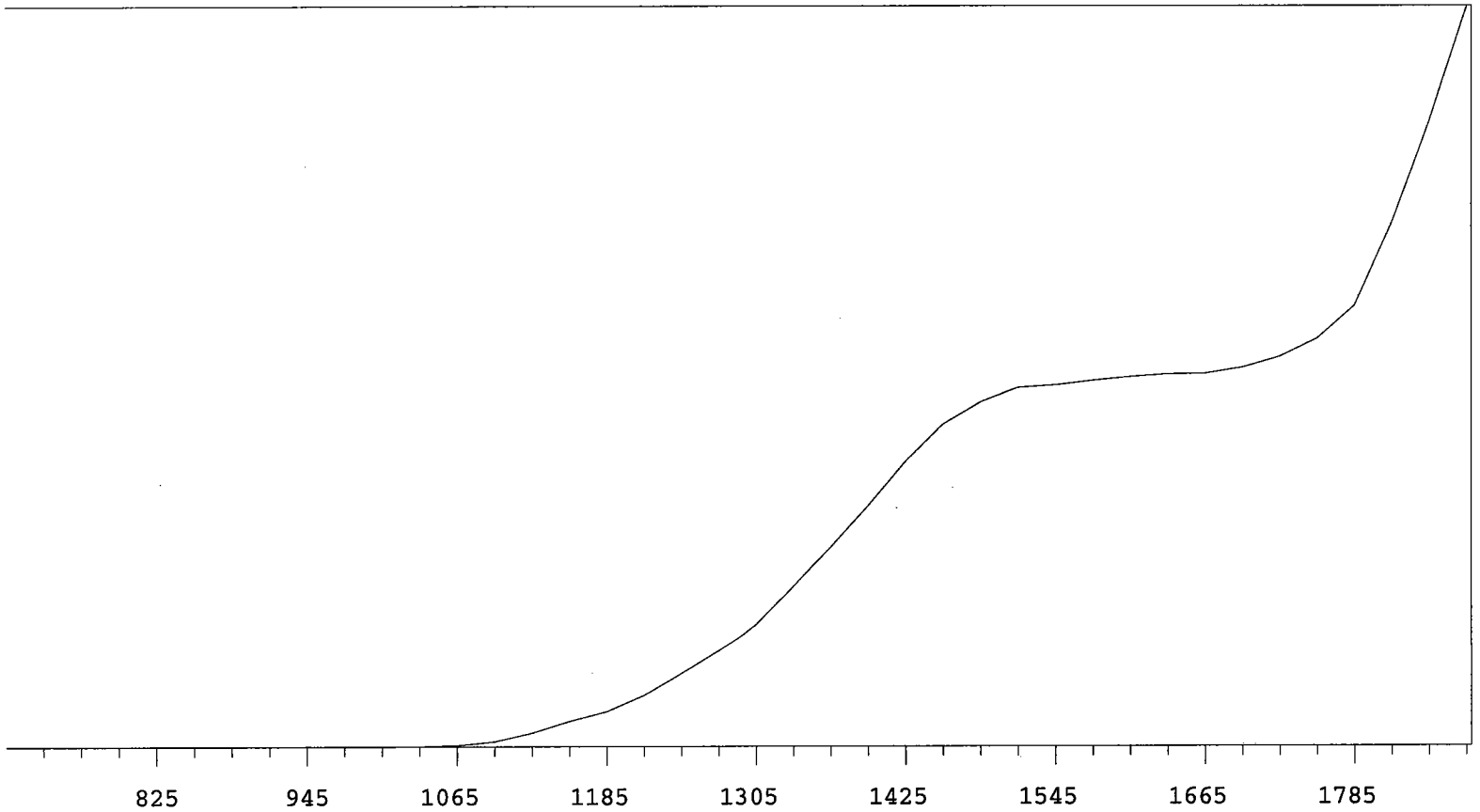
Alpha Volts: 1515 Beta Volts: 1515



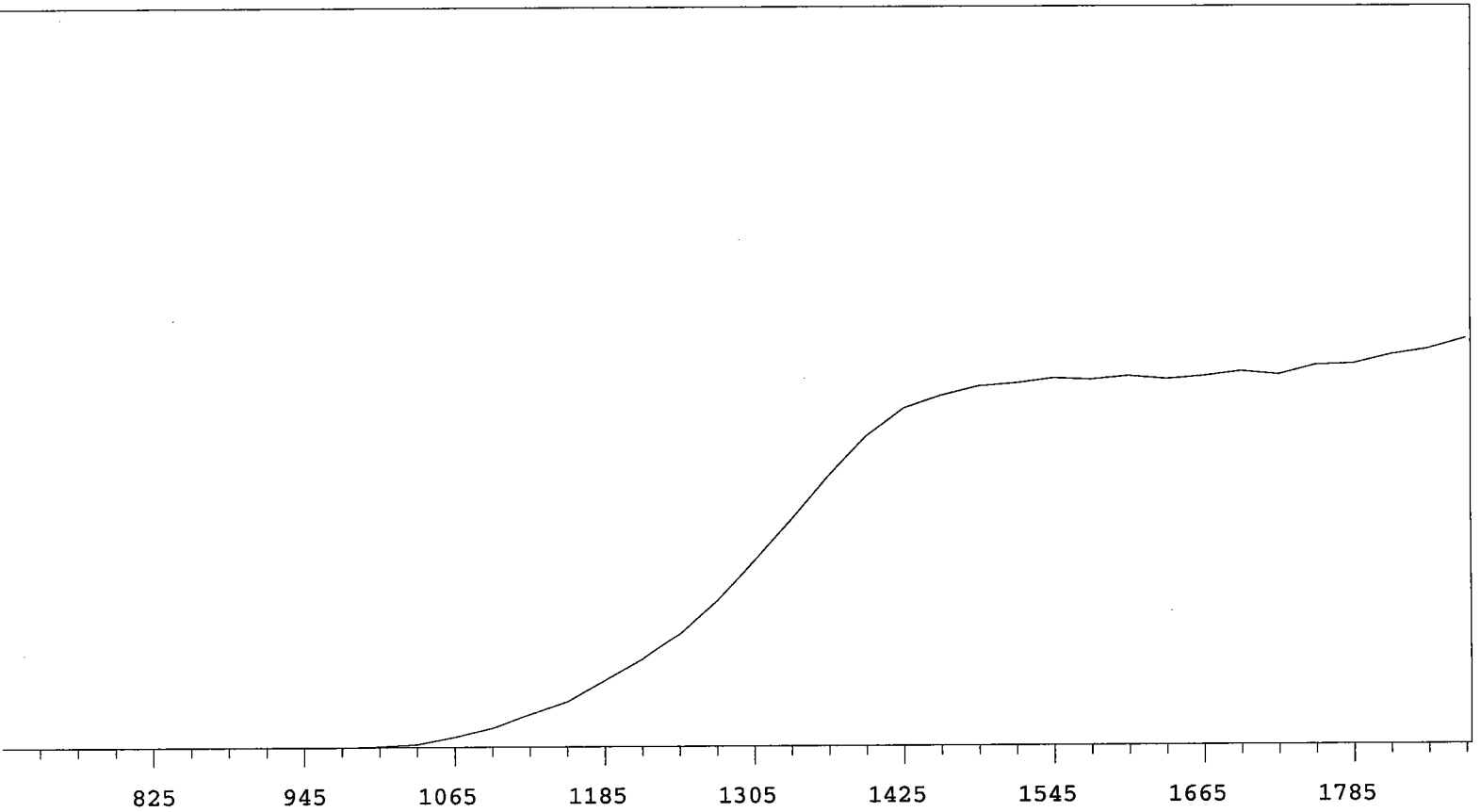
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	7679	+65.97
735	0		1335	9737	+57.57
765	0		1365	11301	+45.87
795	0	>100	1395	12767	+31.71
825	0	>100	1425	13767	+19.90
855	1	+83.33	1455	14399	+10.72
885	1	+55.56	1485	14467	+4.38
915	0	>100	1515	14671	+2.12
945	1	>100	1545	14576	+2.61
975	9	>100	1575	14808	+1.80
1005	60	>100	1605	14974	+3.15
1035	173	>100	1635	14872	+1.76
1065	480	>100	1665	15248	-0.41
1095	911	>100	1695	15067	-0.27
1125	1508	>100	1725	14784	-0.43
1155	2024	>100	1755	15044	+2.01
1185	2872	+97.38	1785	15163	+2.82
1215	3858	+89.30	1815	15333	+3.61
1245	5070	+78.02	1845	15278	
1275	6322	+73.30	1875	15817	

Alpha Volts: 705

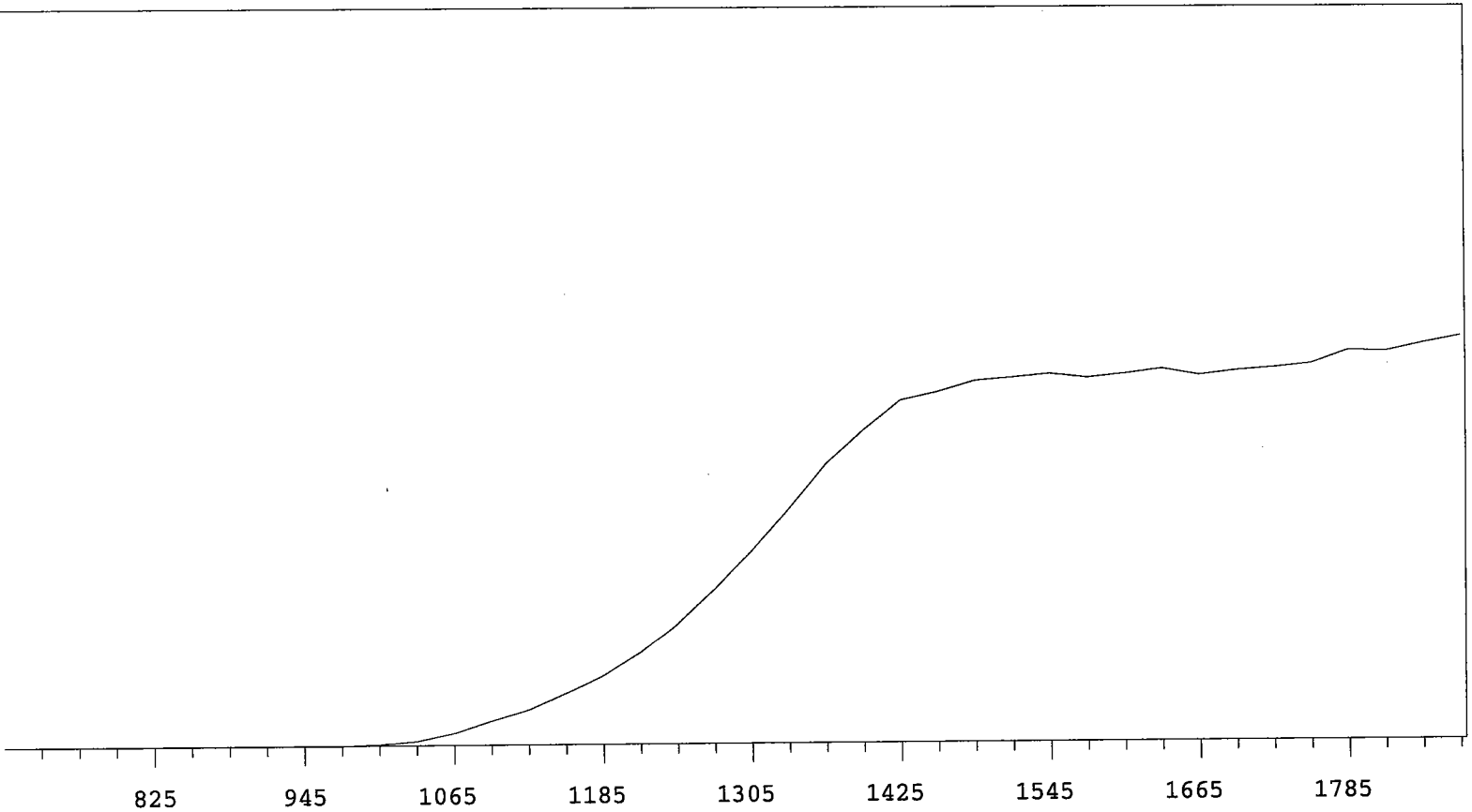
Beta Volts: 1515



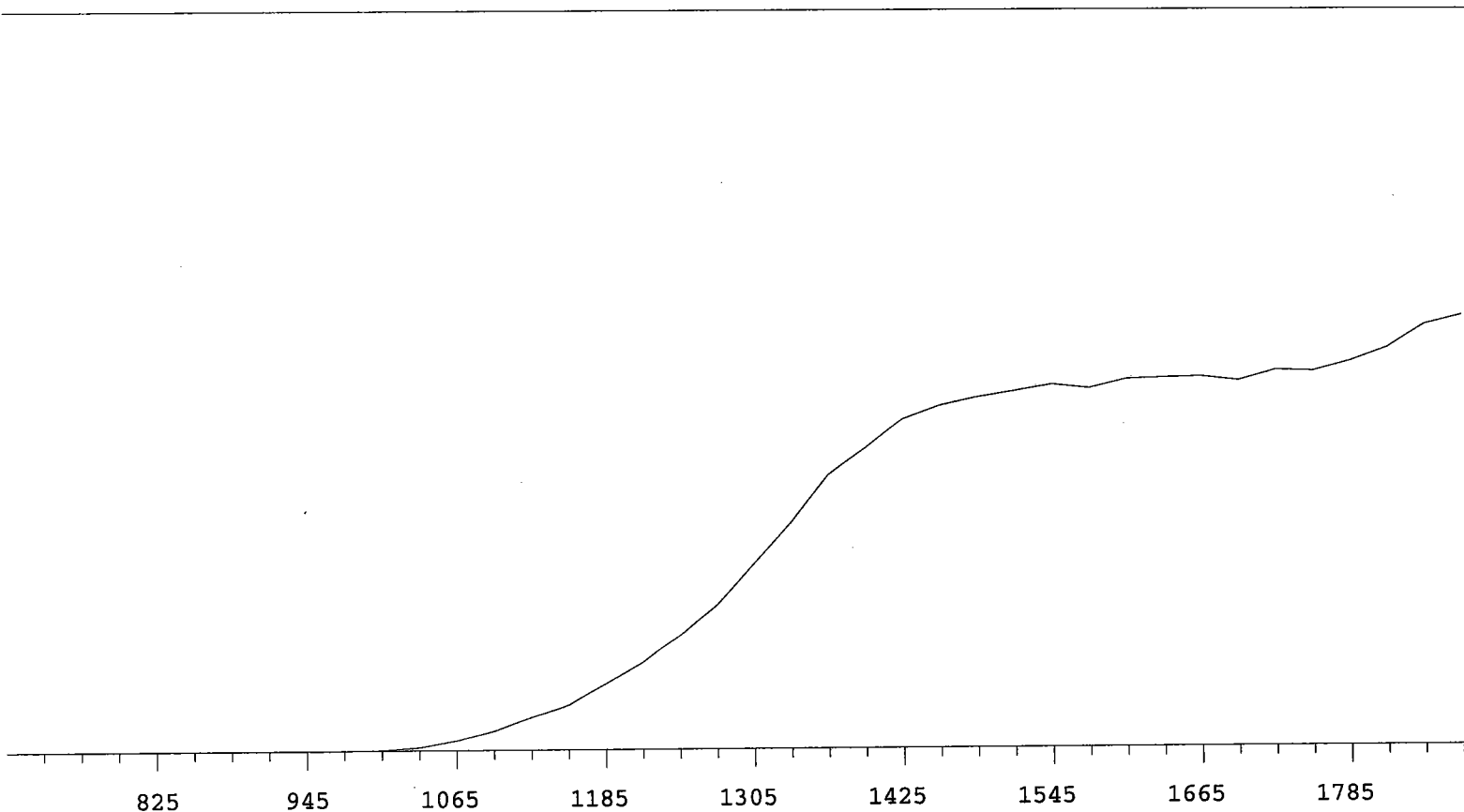
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	6302	+80.03
735	1		1335	8191	+73.78
765	0		1365	10140	+66.18
795	0	>100	1395	12247	+55.83
825	0	>100	1425	14468	+43.92
855	0	>100	1455	16303	+31.28
885	0	>100	1485	17411	+18.64
915	0	>100	1515	18150	+9.87
945	0	>100	1545	18275	+5.30
975	1	>100	1575	18496	+3.16
1005	3	>100	1605	18685	+2.66
1035	17	>100	1635	18820	+2.63
1065	84	>100	1665	18855	+4.16
1095	267	>100	1695	19152	+7.70
1125	709	>100	1725	19706	+13.90
1155	1299	>100	1755	20640	+26.51
1185	1813	>100	1785	22308	+40.92
1215	2638	>100	1815	26460	+51.46
1245	3777	+96.47	1845	31616	
1275	4915	+87.98	1875	37348	



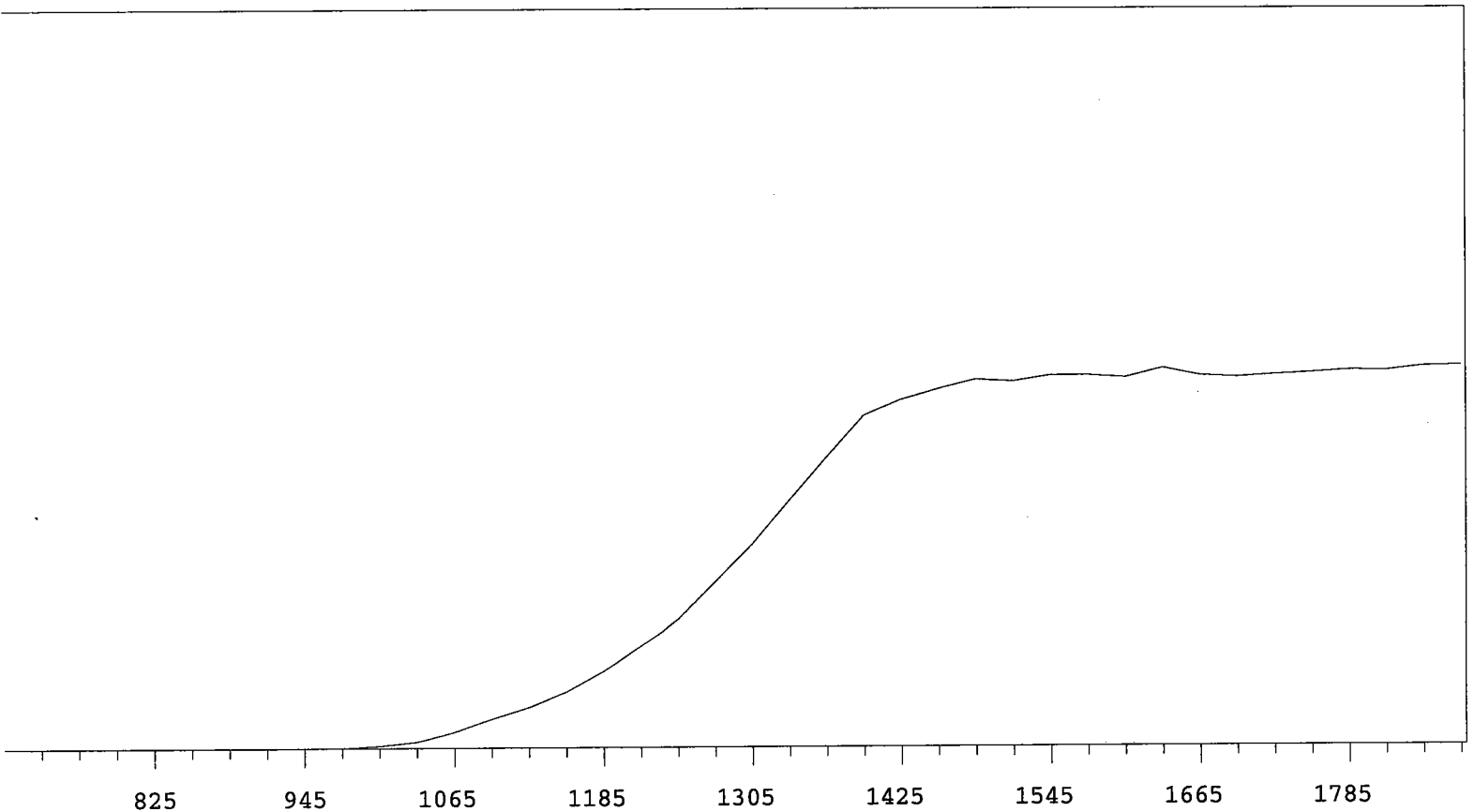
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	10207	+70.42
735	0		1335	12473	+60.75
765	0		1365	14900	+48.87
795	0	>100	1395	17101	+35.36
825	0	>100	1425	18643	+22.53
855	1	+83.33	1455	19350	+12.34
885	1	-83.33	1485	19848	+6.68
915	0	-55.56	1515	20014	+3.51
945	0	>100	1545	20278	+2.03
975	1	>100	1575	20186	+0.80
1005	43	>100	1605	20375	+0.32
1035	165	>100	1635	20209	+1.36
1065	557	>100	1665	20364	+0.83
1095	1055	>100	1695	20607	+2.43
1125	1775	>100	1725	20429	+2.51
1155	2470	>100	1755	20924	+3.64
1185	3617	+98.46	1785	20984	+5.11
1215	4757	+90.95	1815	21470	+5.63
1245	6186	+83.59	1845	21773	
1275	8021	+77.85	1875	22346	



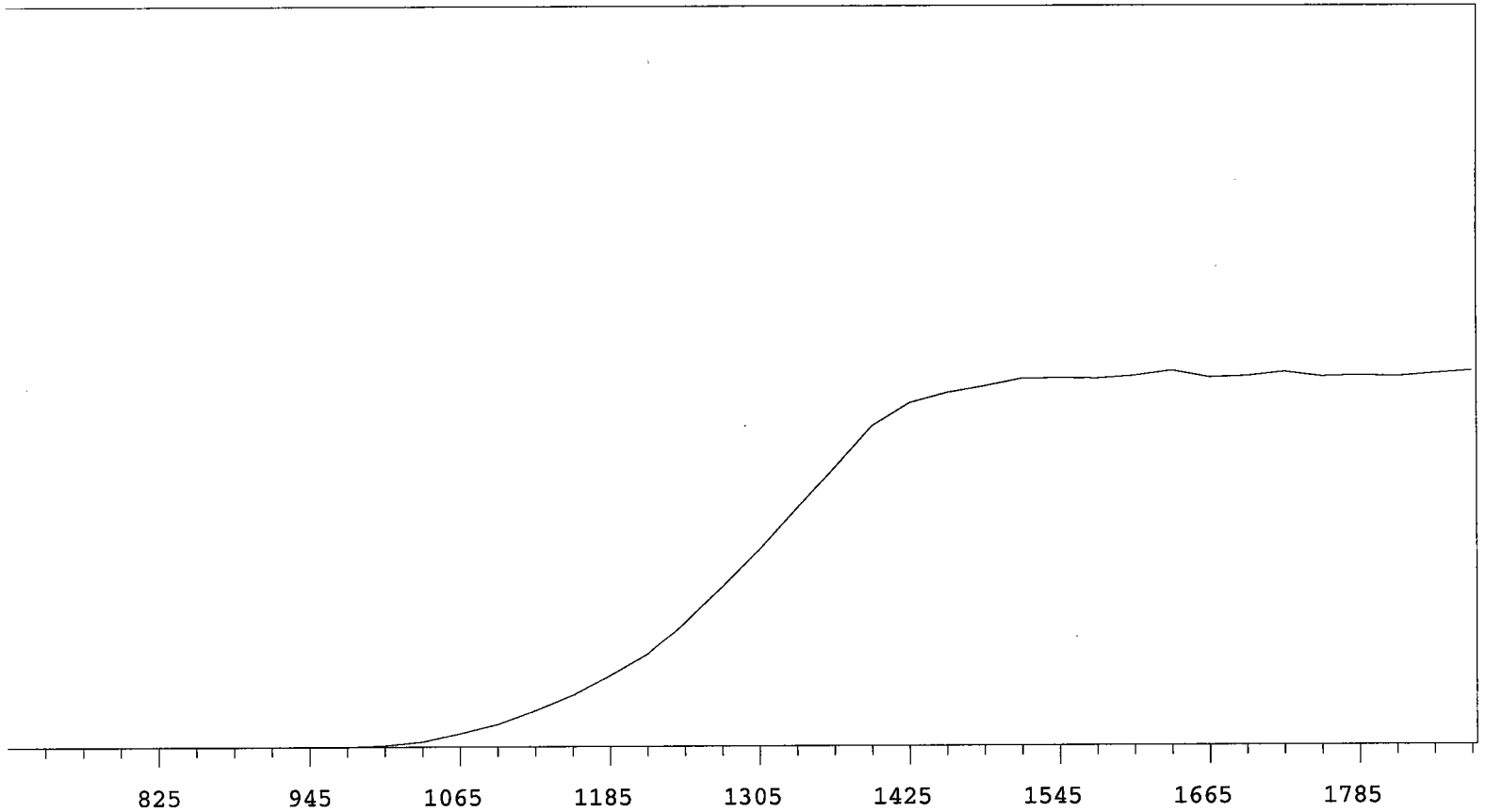
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	9543	+67.01
735	0		1335	11617	+56.47
765	0		1365	13791	+45.47
795	0	>100	1395	15387	+31.66
825	0	>100	1425	16819	+20.02
855	0	>100	1455	17210	+11.63
885	1	+0.00	1485	17742	+6.05
915	0	>100	1515	17892	+3.04
945	0	>100	1545	18070	+1.09
975	7	>100	1575	17856	+1.43
1005	52	>100	1605	18054	+0.42
1035	214	>100	1635	18287	+1.06
1065	590	>100	1665	17969	+0.78
1095	1201	>100	1695	18187	+1.48
1125	1759	>100	1725	18317	+4.89
1155	2569	>100	1755	18518	+4.76
1185	3440	+95.13	1785	19156	+5.18
1215	4583	+87.74	1815	19100	+5.18
1245	5985	+81.67	1845	19496	
1275	7682	+74.54	1875	19842	



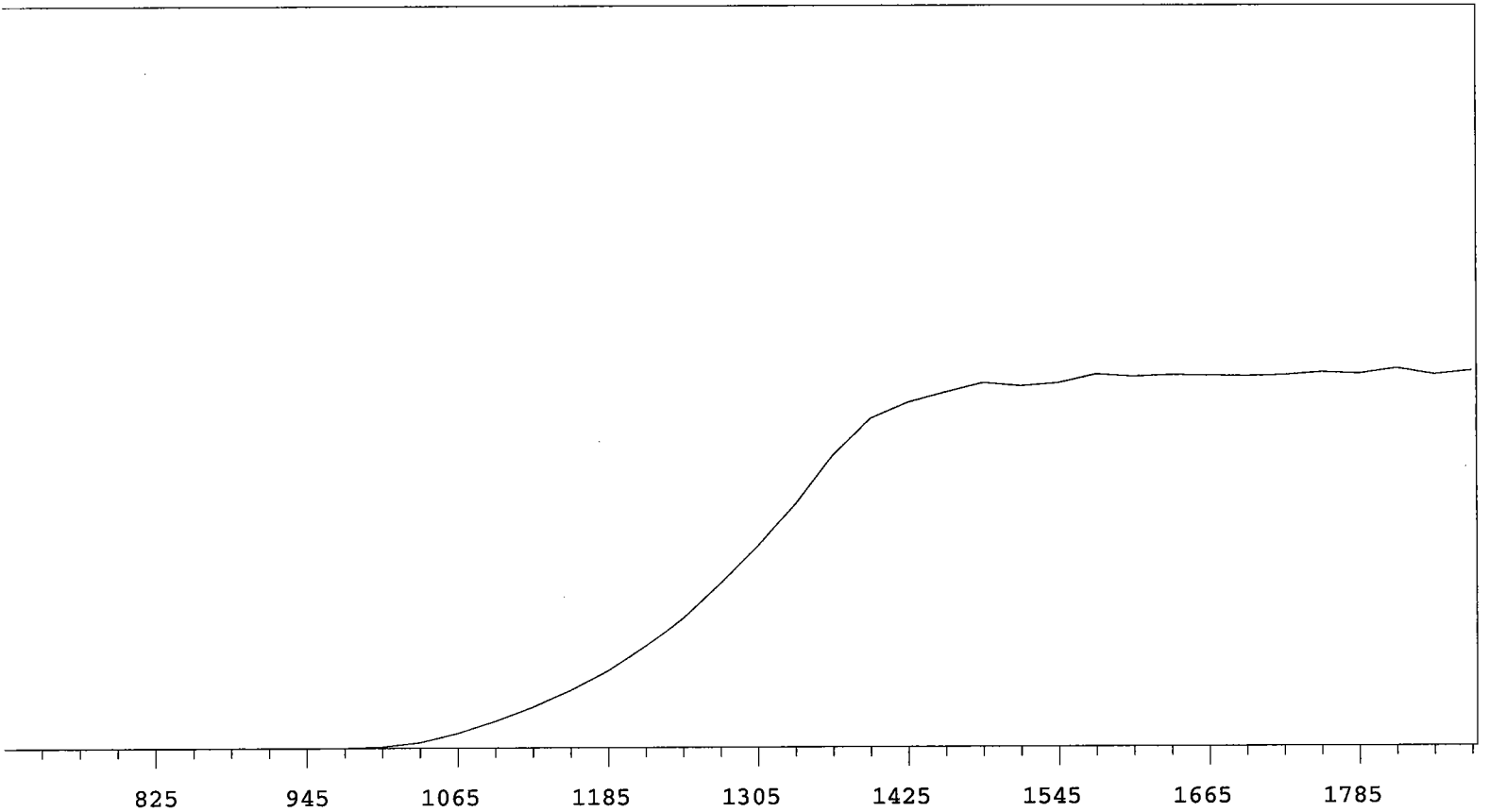
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	9144	+69.92
735	0		1335	11120	+58.43
765	0		1365	13399	+45.40
795	0	>100	1395	14711	+32.57
825	0	>100	1425	16134	+20.69
855	0	>100	1455	16805	+13.46
885	0	>100	1485	17209	+7.90
915	0	>100	1515	17500	+4.31
945	0	>100	1545	17812	+3.48
975	4	>100	1575	17629	+2.80
1005	26	>100	1605	18066	+2.23
1035	169	>100	1635	18122	+1.44
1065	483	>100	1665	18166	+1.20
1095	955	>100	1695	17967	+1.60
1125	1639	>100	1725	18469	+3.41
1155	2233	>100	1755	18409	+6.35
1185	3262	+98.61	1785	18884	+9.47
1215	4306	+89.77	1815	19535	+11.98
1245	5662	+82.36	1845	20630	
1275	7113	+76.36	1875	21076	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	9209	+64.55
735	1		1335	11200	+55.94
765	0	+55.56	1365	13123	+43.27
795	2	>100	1395	14957	+29.04
825	0	+0.00	1425	15658	+17.41
855	0	>100	1455	16123	+8.01
885	1	>100	1485	16530	+4.92
915	0	>100	1515	16437	+2.71
945	1	>100	1545	16704	+0.83
975	14	>100	1575	16707	+2.14
1005	104	>100	1605	16602	+0.55
1035	281	>100	1635	17024	-0.28
1065	720	>100	1665	16684	-0.42
1095	1302	>100	1695	16597	-0.85
1125	1834	>100	1725	16711	+1.27
1155	2544	>100	1755	16796	+1.51
1185	3485	+92.28	1785	16903	+1.57
1215	4624	+85.50	1815	16880	+1.46
1245	5878	+77.82	1845	17066	
1275	7515	+71.49	1875	17085	



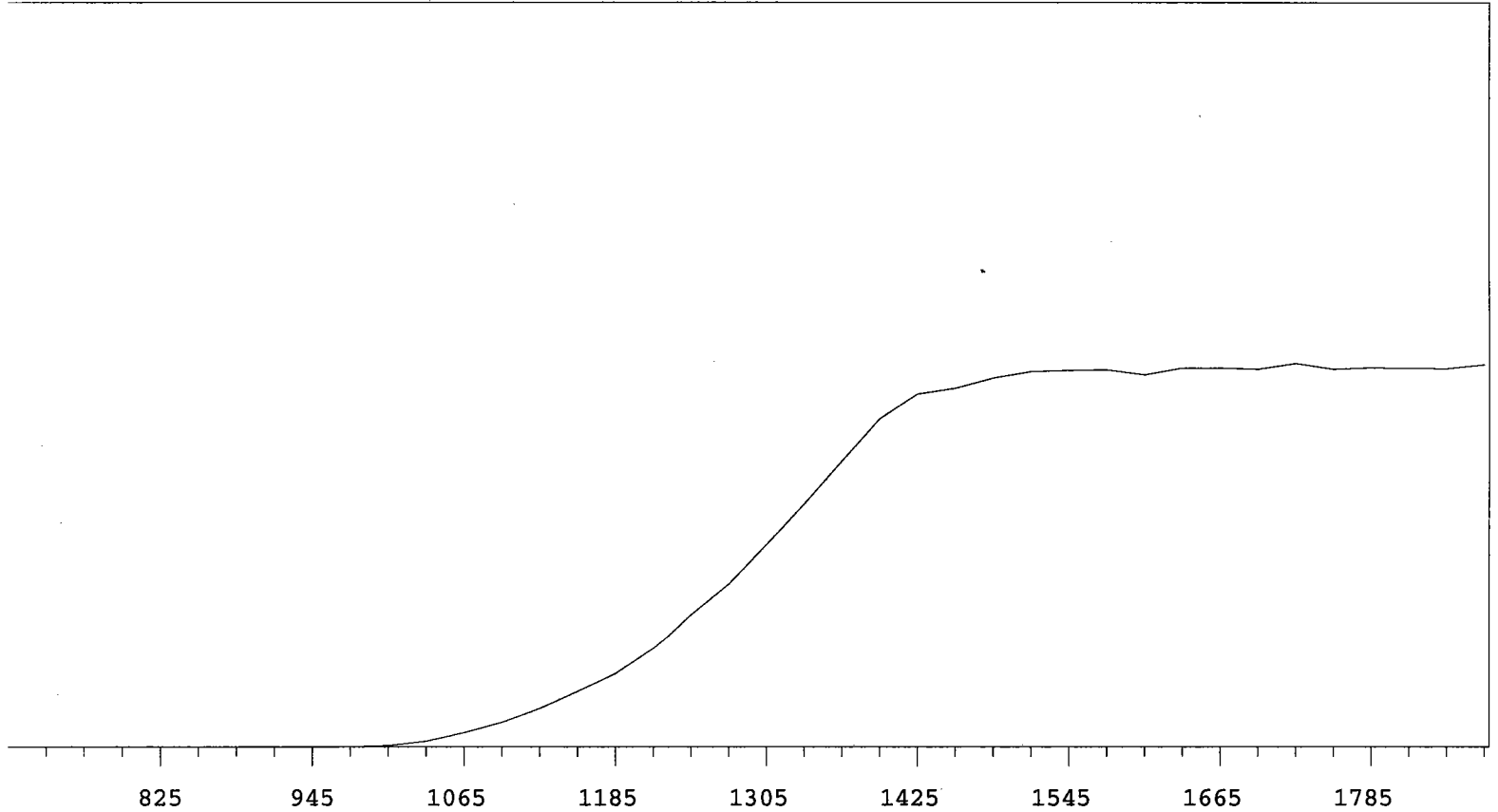
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	9666	+64.39
735	0		1335	11722	+55.91
765	0		1365	13680	+44.91
795	0	>100	1395	15677	+31.56
825	0	>100	1425	16786	+19.46
855	0	>100	1455	17283	+10.57
885	0	>100	1485	17608	+5.95
915	1	>100	1515	17972	+3.32
945	0	>100	1545	18006	+1.84
975	4	>100	1575	17970	+1.58
1005	70	>100	1605	18104	+0.74
1035	257	>100	1635	18351	+0.24
1065	648	>100	1665	18016	+0.16
1095	1116	>100	1695	18080	-0.63
1125	1784	>100	1725	18283	+0.29
1155	2560	>100	1755	18047	-0.47
1185	3531	+96.11	1785	18110	-0.32
1215	4568	+89.22	1815	18040	+1.17
1245	6137	+81.65	1845	18200	
1275	7855	+74.42	1875	18320	



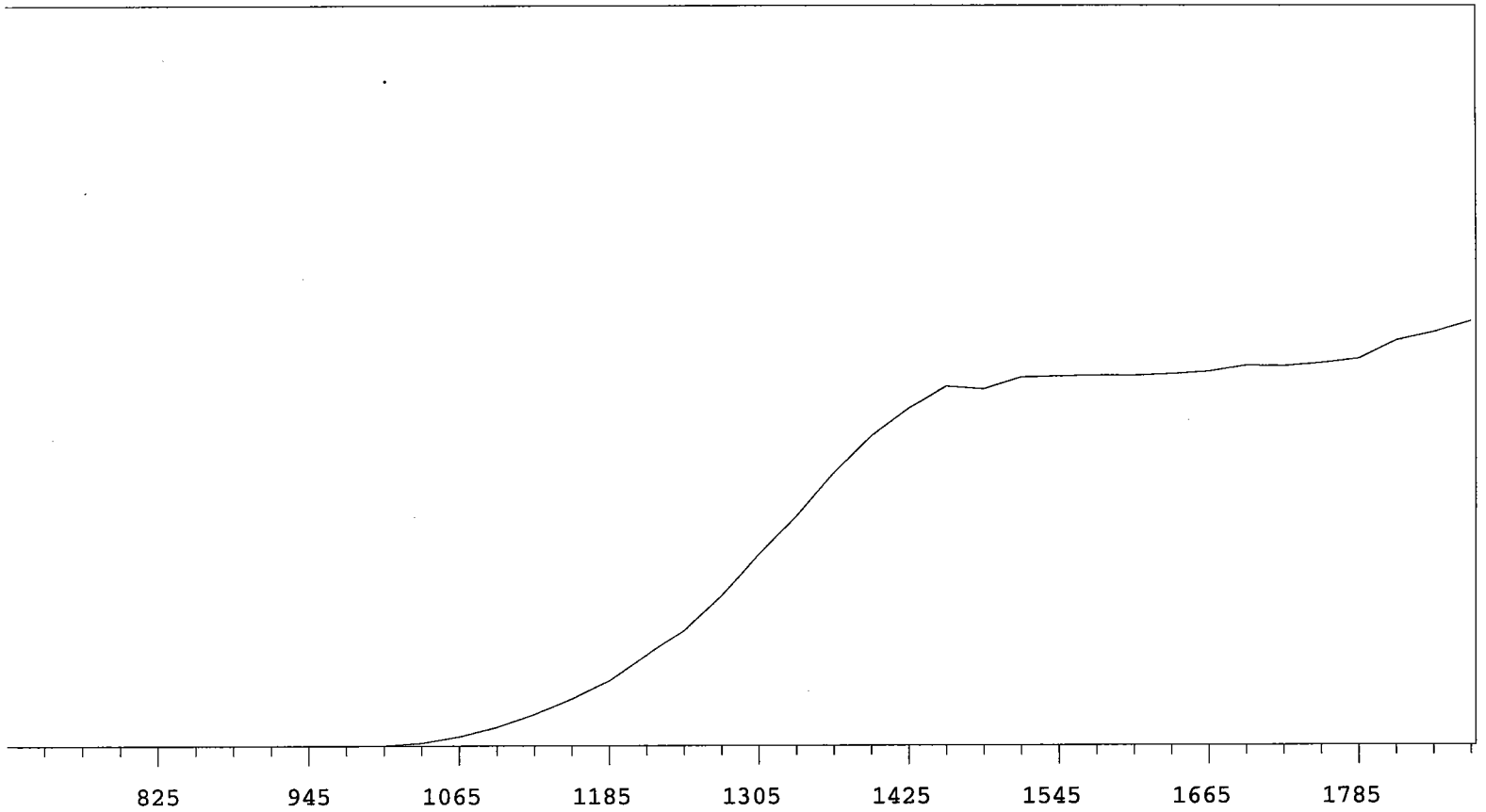
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	11573	+64.95
735	0		1335	13929	+56.47
765	0		1365	16726	+43.82
795	0	>100	1395	18834	+29.38
825	0	>100	1425	19743	+16.84
855	0	>100	1455	20314	+7.95
885	0	>100	1485	20860	+4.16
915	0	>100	1515	20670	+3.23
945	0	>100	1545	20844	+2.09
975	9	>100	1575	21330	+2.48
1005	93	>100	1605	21188	+1.16
1035	325	>100	1635	21280	-0.32
1065	834	>100	1665	21237	+0.08
1095	1525	>100	1695	21202	+0.42
1125	2318	>100	1725	21254	+0.60
1155	3233	>100	1755	21406	+1.41
1185	4357	+92.07	1785	21326	+0.42
1215	5755	+85.64	1815	21619	+0.16
1245	7438	+78.35	1845	21282	
1275	9463	+70.89	1875	21478	

Alpha Volts: 705

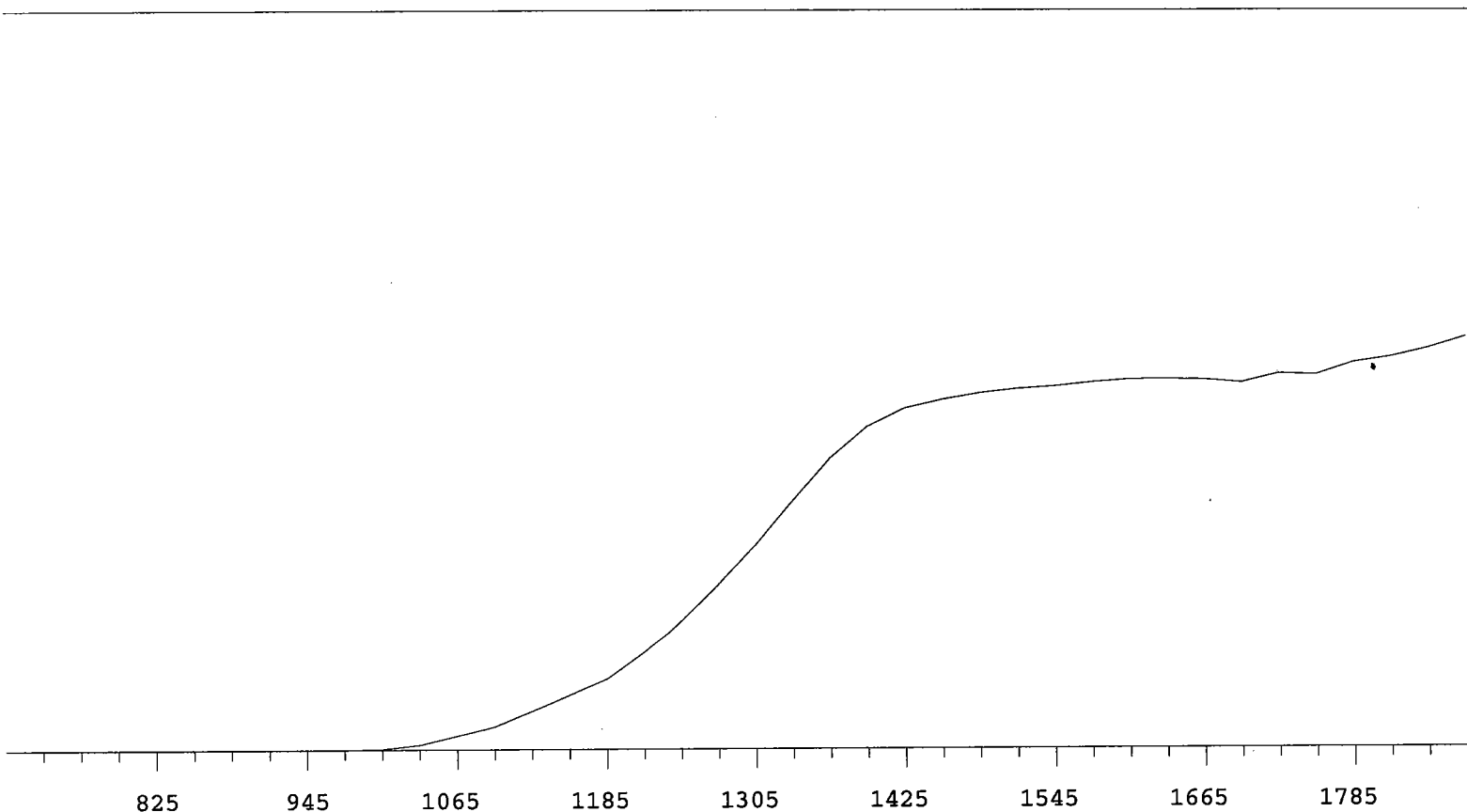
Beta Volts: 1515



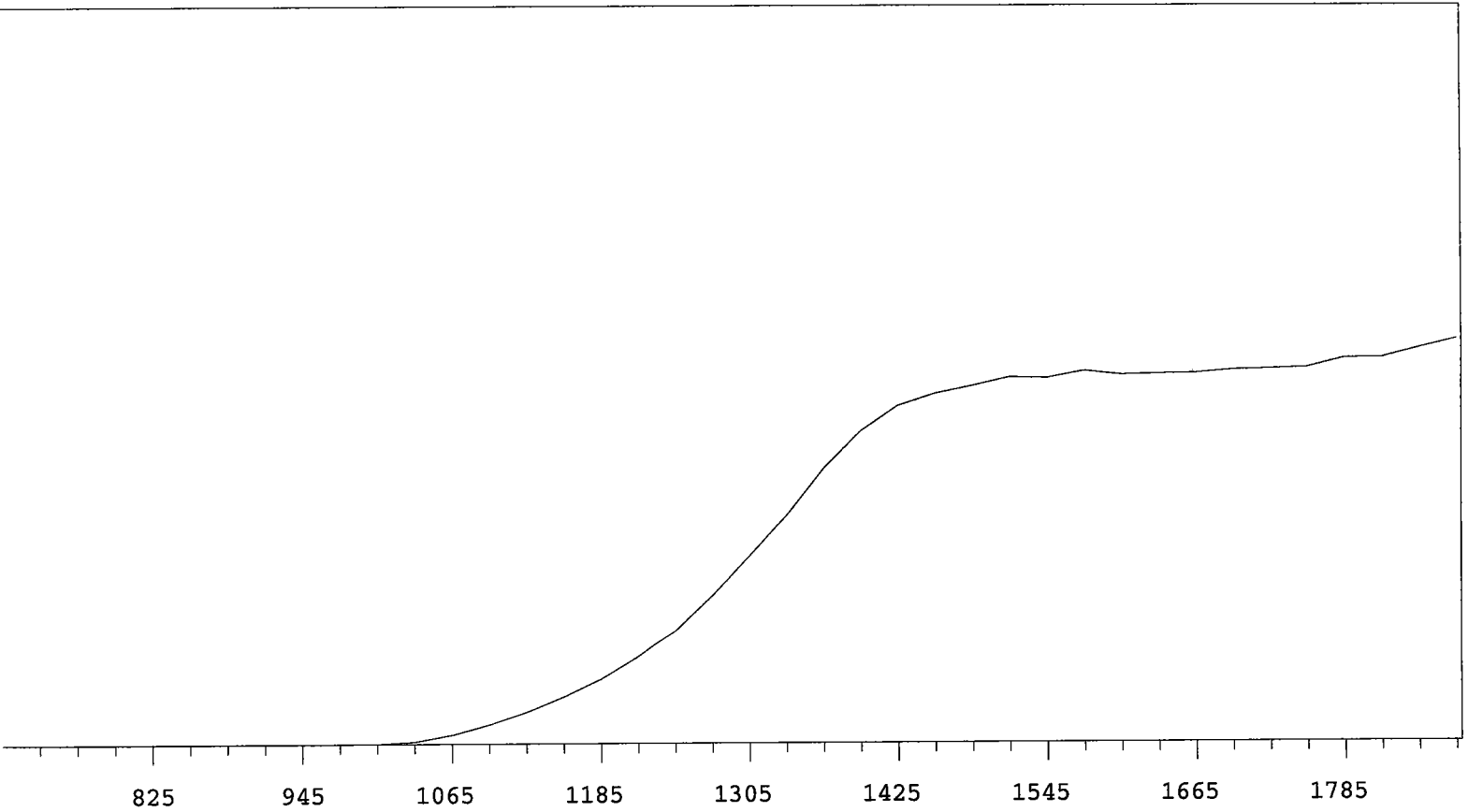
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	7524	+61.93
735	0		1335	9002	+55.36
765	0		1365	10542	+44.70
795	0	>100	1395	12064	+31.21
825	0	>100	1425	12981	+19.20
855	0	>100	1455	13192	+10.41
885	0	>100	1485	13570	+5.93
915	0	>100	1515	13820	+4.08
945	0	>100	1545	13866	+0.75
975	9	>100	1575	13880	+0.21
1005	58	>100	1605	13695	+0.59
1035	228	>100	1635	13950	+0.77
1065	544	>100	1665	13954	+1.92
1095	936	>100	1695	13911	+0.19
1125	1468	>100	1725	14116	+0.02
1155	2110	>100	1755	13908	-0.24
1185	2770	+94.71	1785	13960	-0.81
1215	3670	+85.91	1815	13939	+0.71
1245	4937	+79.46	1845	13931	
1275	6066	+70.79	1875	14071	



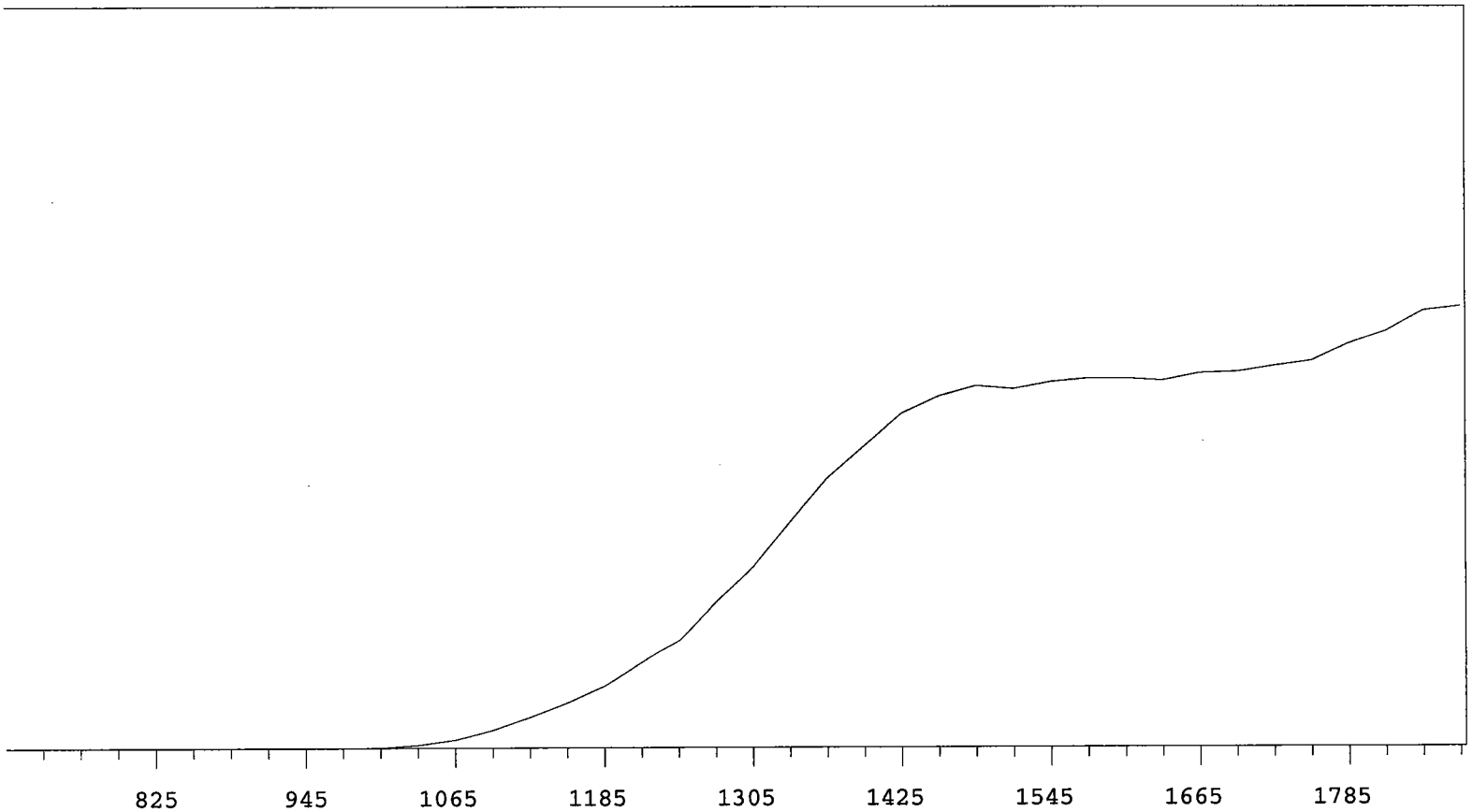
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8778	+67.49
735	0		1335	10502	+57.68
765	0		1365	12516	+46.36
795	0	>100	1395	14215	+35.88
825	0	>100	1425	15472	+22.01
855	0	>100	1455	16469	+12.99
885	1	+0.00	1485	16342	+6.70
915	0	>100	1515	16874	+3.07
945	0	>100	1545	16918	+2.53
975	0	>100	1575	16950	+0.58
1005	18	>100	1605	16943	+0.95
1035	137	>100	1635	17008	+2.13
1065	430	>100	1665	17130	+2.45
1095	865	>100	1695	17403	+2.43
1125	1444	>100	1725	17377	+2.43
1155	2151	>100	1755	17515	+4.88
1185	2981	>100	1785	17710	+7.54
1215	4168	+92.14	1815	18533	+9.04
1245	5377	+84.73	1845	18905	
1275	6924	+74.92	1875	19415	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8797	+65.44
735	0		1335	10726	+54.47
765	0		1365	12570	+41.11
795	0	>100	1395	13917	+26.79
825	0	>100	1425	14687	+15.44
855	1	+0.00	1455	15048	+8.47
885	0	>100	1485	15318	+5.00
915	0	>100	1515	15494	+3.76
945	0	>100	1545	15606	+3.04
975	3	>100	1575	15776	+2.35
1005	40	>100	1605	15889	+1.44
1035	210	>100	1635	15907	-0.16
1065	590	>100	1665	15881	+0.64
1095	983	>100	1695	15741	+1.21
1125	1645	>100	1725	16124	+3.63
1155	2342	>100	1755	16076	+5.41
1185	3045	+96.43	1785	16588	+5.79
1215	4201	+90.42	1815	16830	+7.53
1245	5579	+83.64	1845	17185	
1275	7121	+74.44	1875	17682	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	10118	+69.76
735	0		1335	12269	+59.65
765	0		1365	14810	+47.35
795	0	>100	1395	16773	+33.46
825	0	>100	1425	18104	+20.13
855	0	>100	1455	18720	+11.98
885	1	+0.00	1485	19122	+6.50
915	0	>100	1515	19580	+4.77
945	0	>100	1545	19527	+2.48
975	2	>100	1575	19902	+0.81
1005	21	>100	1605	19690	+0.53
1035	132	>100	1635	19739	+0.23
1065	491	>100	1665	19765	+1.29
1095	1036	>100	1695	19932	+1.40
1125	1698	>100	1725	19976	+2.72
1155	2517	>100	1755	20051	+2.92
1185	3468	>100	1785	20523	+4.26
1215	4721	+91.83	1815	20542	+5.57
1245	6175	+85.13	1845	21035	
1275	8025	+76.82	1875	21528	



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8095	+71.16
735	0		1335	10052	+58.38
765	0		1365	11990	+47.92
795	0	>100	1395	13400	+35.01
825	0	>100	1425	14808	+23.58
855	0	>100	1455	15554	+13.45
885	0	>100	1485	15987	+6.39
915	0	>100	1515	15861	+3.45
945	0	>100	1545	16156	+2.18
975	1	>100	1575	16297	+1.72
1005	14	>100	1605	16297	+1.33
1035	130	>100	1635	16208	+1.62
1065	363	>100	1665	16526	+2.92
1095	785	>100	1695	16581	+3.94
1125	1357	>100	1725	16832	+5.91
1155	1996	>100	1755	17039	+8.68
1185	2735	+99.45	1785	17800	+11.53
1215	3785	+94.20	1815	18351	+11.46
1245	4857	+86.43	1845	19265	
1275	6571	+78.80	1875	19468	

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

66002-278

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):	2.367 E4
HALF-LIFE:	5.75 years
CALIBRATION DATE:	April 23, 2003 12:00 EST
TOTAL UNCERTAINTY*:	2.4%

*95% Confidence Level

Impurities: γ -impurities (other than decay products) <0.1%,
Ra-226 <0.1%

5.31628 grams 4M HCl solution with 100 μ g/g Ba carrier.

P O NUMBER 3219 RD, Item 1

SOURCE PREPARED BY:

M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED:

J.M. Muth 4-23-03



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0553-A	Isotope:	Radium-228 SPIKE
Prepared By:	Lonnie Morris	Prepared By:	Lonnie Morris
Carrier Conc:	0.5M HCl	Prep Date:	04/25/2003
Reference Date:	04/23/2003	Verification Date:	04/27/2005
Ampoule Mass (g):	5.0235 g	Expiration Date:	04/27/2006
Uncertainty:	+/-	Primary Code:	0553-B
LogBook No:	RC-S-035-068	Dilution(mL):	1000 mL
		Mass of Parent(g):	30.535 g
		Density(g/mL):	
		Balance ID:	

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

$(\text{Mass of parent(g)}) * (\text{Parent Activity (dpm/mL)}) * (\text{conversion dpm to dpm}) / (\text{Dilution Vol}) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parent Activity (dpm/mL)}) * (\text{conversion dpm to dpm}) / \text{Density (g/mL)} / (\text{Dilution Vol}) = \text{Parent Activity (dpm/g)}$
$(30.535 \text{ g}) * (13419.8626 \text{ dpm/mL}) * (1 \text{ dpm/dpm}) / (1000 \text{ mL}) = 409.7755 \text{ dpm/mL}$
$(30.535 \text{ g}) * (13419.8626 \text{ dpm/mL}) * (1 \text{ dpm/dpm}) / (\text{g/mL}) / (1000 \text{ mL}) = \text{dpm/g}$

Secondary Standards

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

GEL Laboratories LLC
Version 1.0 9/18/2000

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: γ -impurities <0.1%

5.02617 grams 0.1M HCl solution with 110 $\mu\text{g/g}$ Ba carrier.

P O NUMBER 3208RD, Item 2

SOURCE PREPARED BY: M. Taskaeva
M. Taskaeva, Radiochemist

Q A APPROVED:

M. M. Ty 10202



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	0503	Isotope:	Radium-228
Prepared By:	Angela Johnson	Prepared By:	Angela Johnson
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
		Balance ID:	

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

$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (dps)}) * (\text{conversion dpm to dps}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.4737 \text{ g}) * (19390 \text{ dps}) * (60 \text{ dpm/dps}) / (5.02617 \text{ g} * 100 \text{ mL}) = 10355.2060 \text{ dpm/mL}$
$(4.4737 \text{ g}) * (19390 \text{ dps}) * (60 \text{ dpm/dps}) / (0.9992 \text{ g/mL}) / (5.02617 \text{ g} * 100 \text{ mL}) = 10363.0820 \text{ dpm/g}$

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	09/13/2008	09/13/2009

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Ra-228 Standard 0503-B

D. Roy 9/13/2008	Isotope	Detector CPM	BKG CPM	NET CPM	Detector Eff Mass. Used (mL)	Standard Source DPM/mL
	0503-B	1962.0000	45.6000	1916.4000	9.263763	206.8705773
	0503-B	1983.2000	45.6000	1937.6000	9.263763	209.1590642
	0503-B	1927.0000	45.6000	1881.4000	9.263763	203.092415

Mean Value (Counting) = 206.3740189 dpm/mL
 Stdev = 3.063655617 dpm/mL

102.890426 Pass

0.01484516 Rule 3 (Pass/Fail)

Certificate Value = 200.596 dpm/mL
 Lower Limit = 200.2467076 dpm/mL
 Upper Limit = 212.5013301 dpm/mL

Rule 1 Pass/Fail Pass
 Two sigma = 6.127311233
 10 % of Mean = 20.63740189
 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 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 Gold for Ra-228 source standard verification. The Ra-228 efficiency calibration which was used for verification calculations was performed on 9/13/08 using source 0683-A (Ra-228). Calibration data is recorded in this logbook under Ra-228 0683-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

David S. Juy 9/16/08

Angela Johnson 9/17/08

5/19/16

16 SEP 2008 16:24

ID: TOTAL ACTIVITY

USER:11 COMMENT:GOLD

PRESET TIME : 5.00

DATA CALC : CPM H# :YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 :EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX:YES LOW SAMPLE REJ: 0

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

CHAN: 0.0 - 990.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

CHAN: 0.0 - 1000.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
1	11-1	5.00	98.2	50.40	12.60	54.00	12.17	0.41	5.55
2	11-2	1.30	99.3	7802.31	1.99	7803.08	1.99	0.00	7.81
3	11-3	1.30	100.4	7782.31	1.99	7786.15	1.99	0.00	10.14
4	11-4	1.35	99.2	7581.48	1.98	7585.19	1.98	0.01	12.51
5	11-5	5.00	97.9	45.60	13.25	47.20	13.02	0.43	18.61
6	11-6	5.00	110.7	1962.00	2.02	1964.80	2.02	0.01	24.65
7	11-7	5.00	110.8	1983.20	2.01	1984.80	2.01	0.01	30.75
8	11-8	5.00	110.7	1927.00	2.04	1927.80	2.04	0.02	36.85

8/16/08
228

Sample Count Start Time:

16 Sep 2008 16:46:59

Data Capture Date:

9/16/2008 16:52:01

User Filename:

S11091611-5A.WK1

U11091611-1A.WK1

Spectrum Type

Log Counts

User Number:

11

User Id:

TOTAL ACTIVITY

User Comment:

GOLD

Isotope Name:

14C

Scintillator:

LIQUID

Sample, Rack-Pos, Time:

5 11-5 5.00

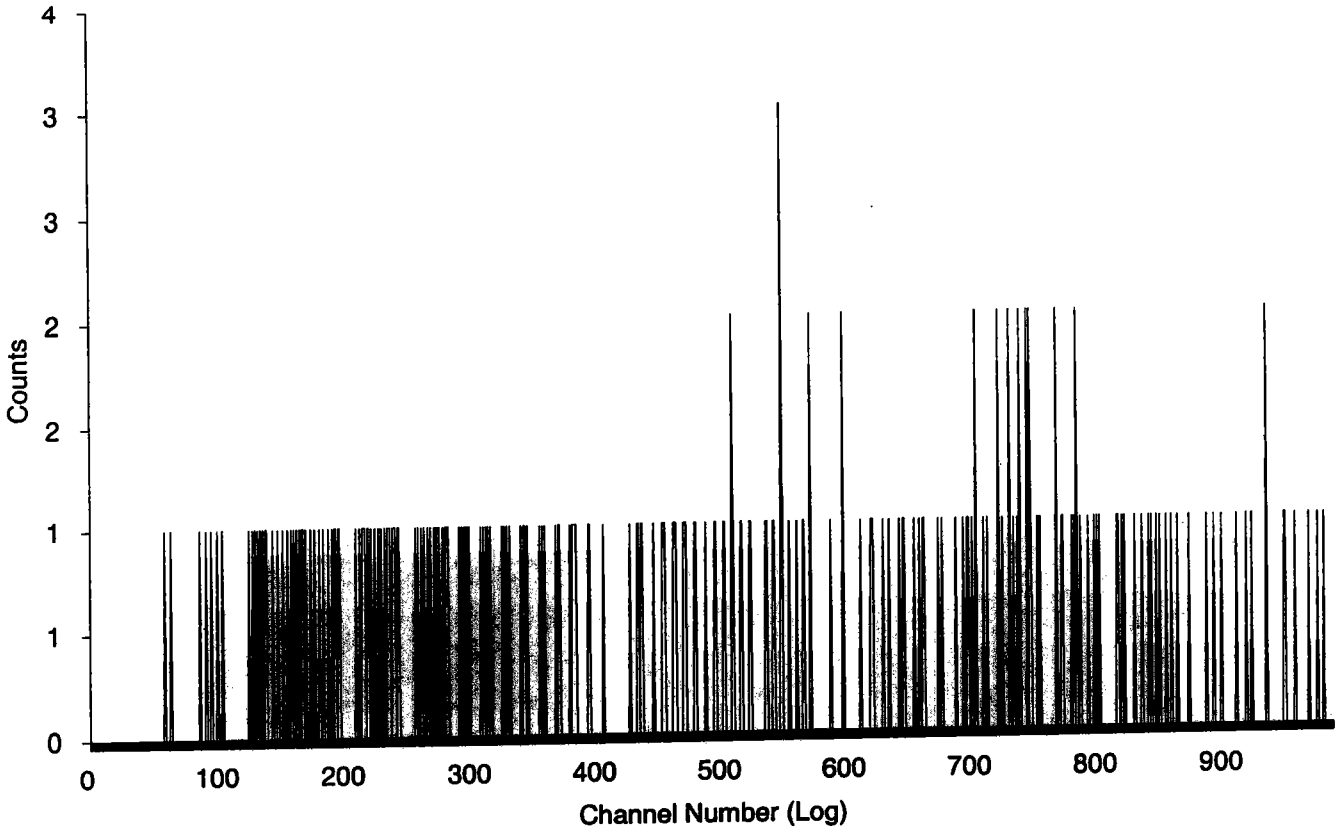
H#, Total Counts:

97.9 69

Start, End, X-Axis:

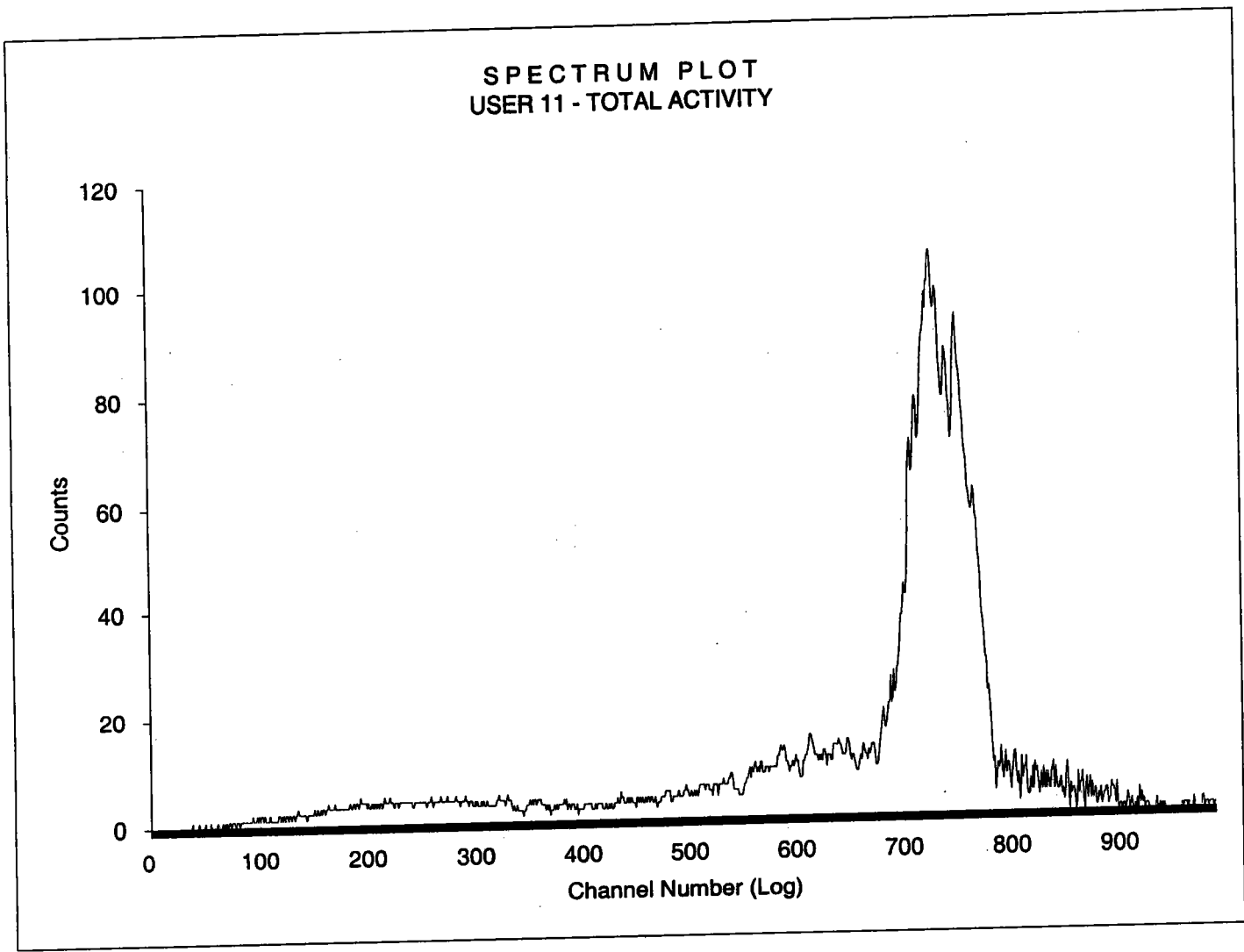
0 990 Channel Number

SPECTRUM PLOT
USER 11 - TOTAL ACTIVITY



50/9/16
25

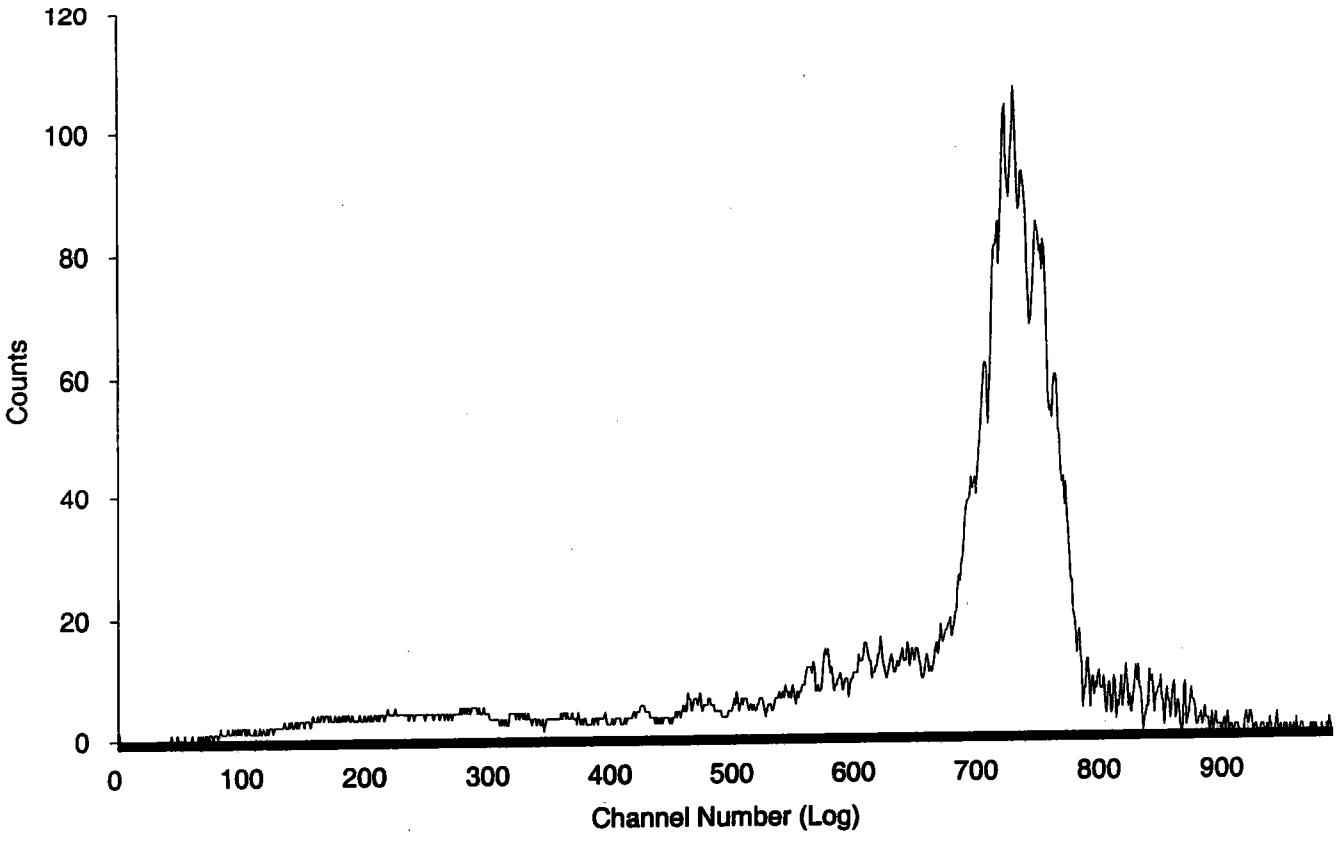
Sample Count Start Time: 16 Sep 2008 16:53:01
Data Capture Date: 9/16/2008 16:58:06
User Filename: S11091611-6A.WK1
U11091611-1A.WK1
Spectrum Type: Log Counts
User Number: 11
User Id: TOTAL ACTIVITY
User Comment: GOLD
Isotope Name: 14C
Scintillator: LIQUID
Sample, Rack-Pos, Time: 6 11-6 5.00
H#, Total Counts: 110.7 7666
Start, End, X-Axis: 0 990 Channel Number



8/16/08
SLS

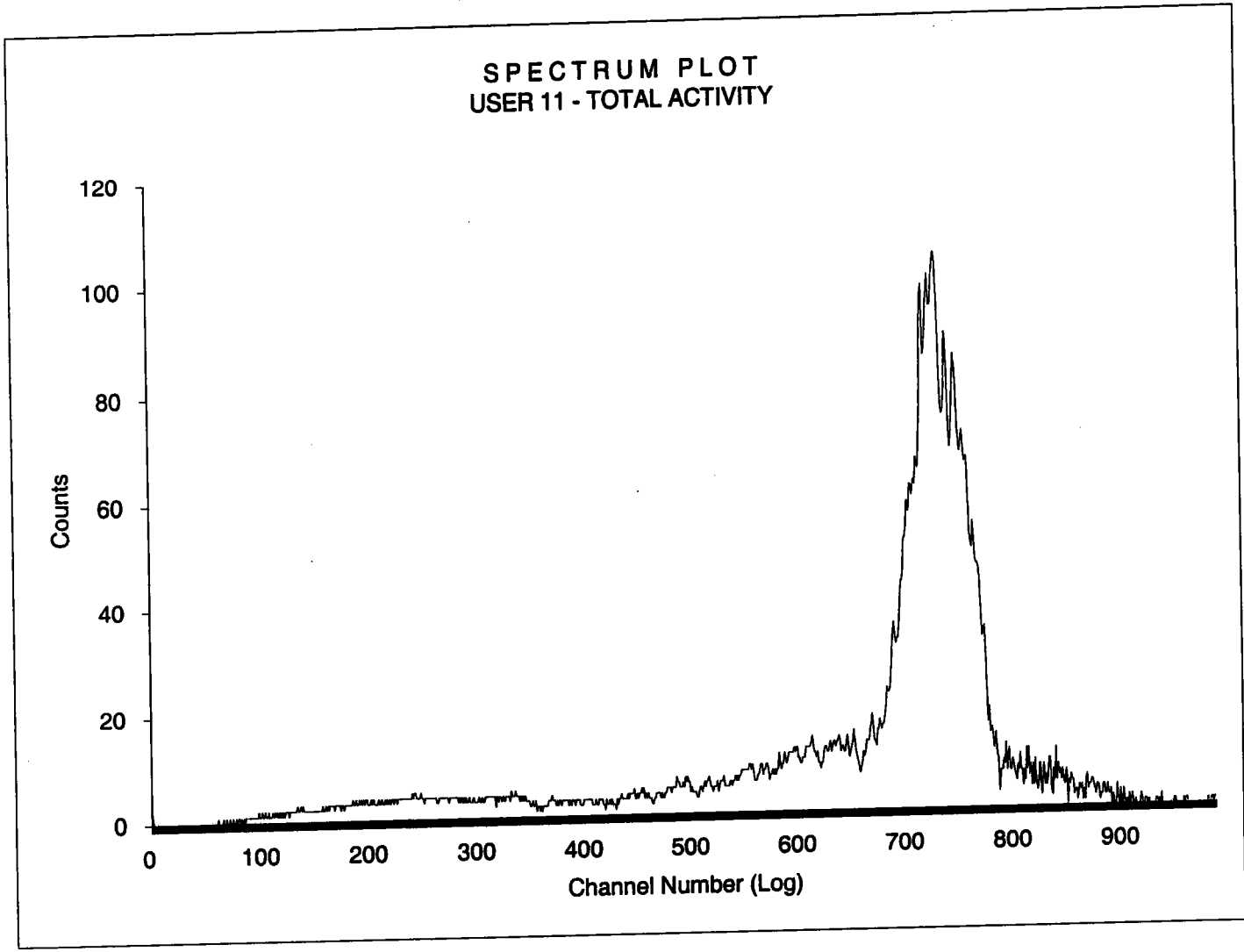
Sample Count Start Time: 16 Sep 2008 16:59:07
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U11091611-1A.WK1
Spectrum Type: Log Counts
User Number: 11
User Id: TOTAL ACTIVITY
User Comment: GOLD
Isotope Name: 14C
Scintillator: LIQUID
Sample, Rack-Pos, Time: 7 11-7 5.00
H#, Total Counts: 110.8 7726
Start, End, X-Axis: 0 990 Channel Number

SPECTRUM PLOT
USER 11 - TOTAL ACTIVITY



9/16/08
11-8

Sample Count Start Time: 16 Sep 2008 17:05:13
Data Capture Date: 9/16/2008 17:10:18
User Filename: S11091611-8A.WK1
U11091611-1A.WK1
Spectrum Type: Log Counts
User Number: 11
User Id: TOTAL ACTIVITY
User Comment: GOLD
Isotope Name: 14C
Scintillator: LIQUID
Sample, Rack-Pos, Time: 8 11-8 5.00
H#, Total Counts: 110.7 7557
Start, End, X-Axis: 0 990 Channel Number



ASSAY 30-Jun-09 19:32:06

Protocol id 8 228_REC
Time limit 180
Count limit 50000
Isotope Ba-133
Protocol date 9-Apr-07 10:03:07
Run id. 54

POS	RACK	BATCH	TIME	COUNTS	CPM	ERROR	% RECOVERY	COUNT	TIME
1	97	1	180	779	229.3	4.13			19:32:13
2	97	2	180	785	231.2	4.11	100.83		19:35:24
3	97	3	180	835	248.1	3.95	108.20		19:38:35
4	97	4	180	877	261.9	3.83	114.22		19:41:47
5	97	5	180	921	276.5	3.71	120.58		19:44:58
6	72	6	180	819	242.7	4	105.84		19:48:17
7	72	7	180	798	235.5	4.07	102.70		19:51:28
8	72	8	180	867	258.7	3.85	112.82		19:54:40
9	72	9	180	861	256.6	3.87	111.91		19:57:51

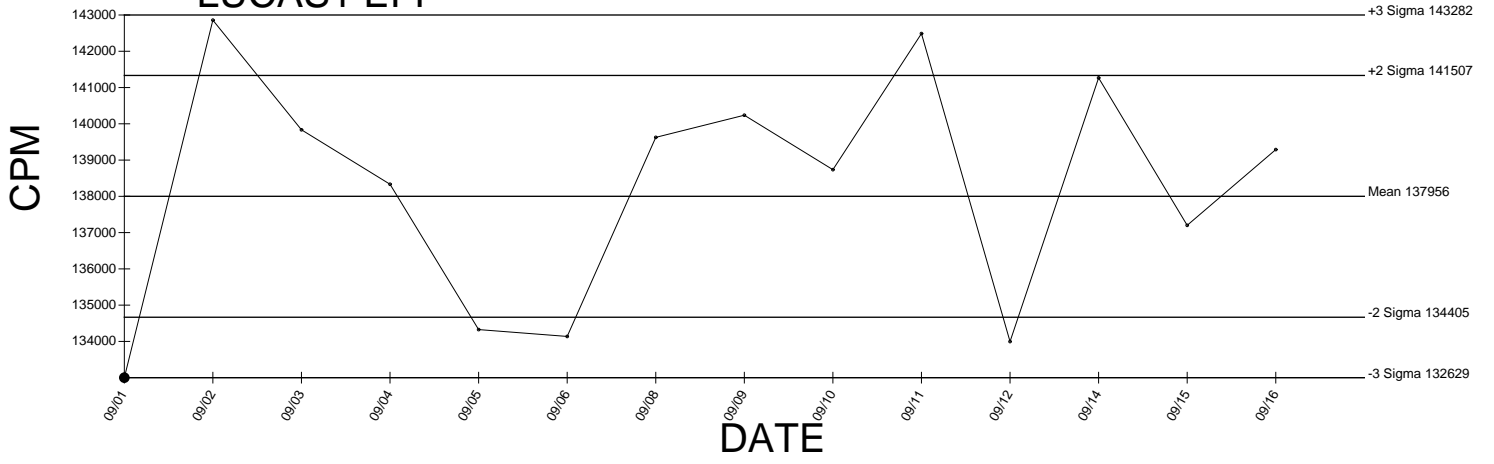
END OF ASSAY

[Handwritten signature]
7/2/09

BACKGROUND AND EFFICIENCY DATA

LUCAS1 EFF

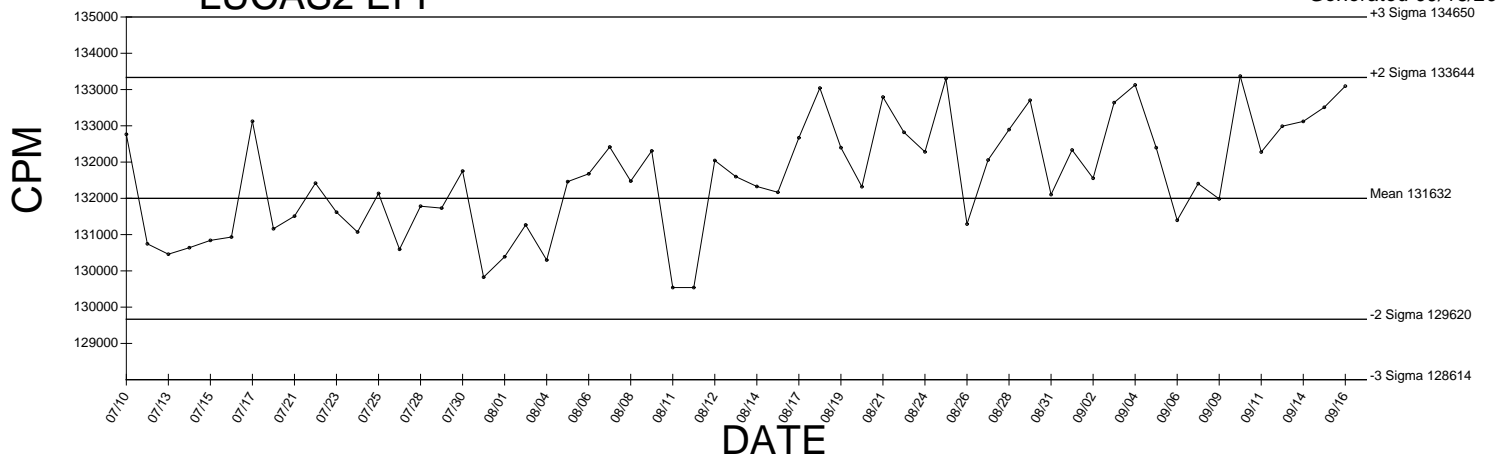
Generated 09/16/2009



● Denotes Outlier

LUCAS2 EFF

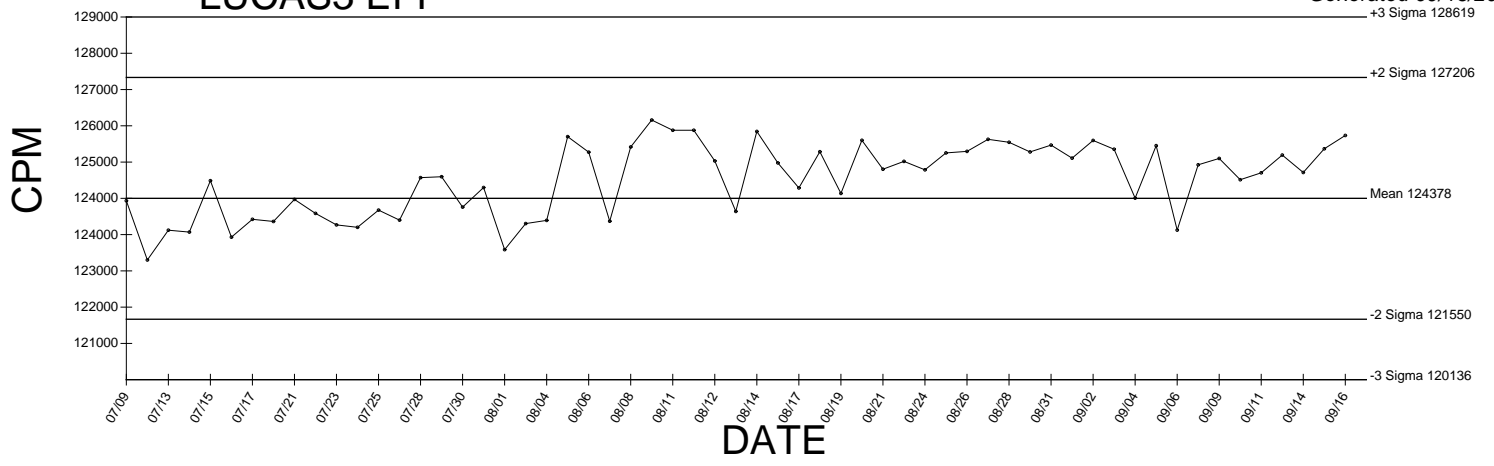
Generated 09/16/2009



● Denotes Outlier

LUCAS3 EFF

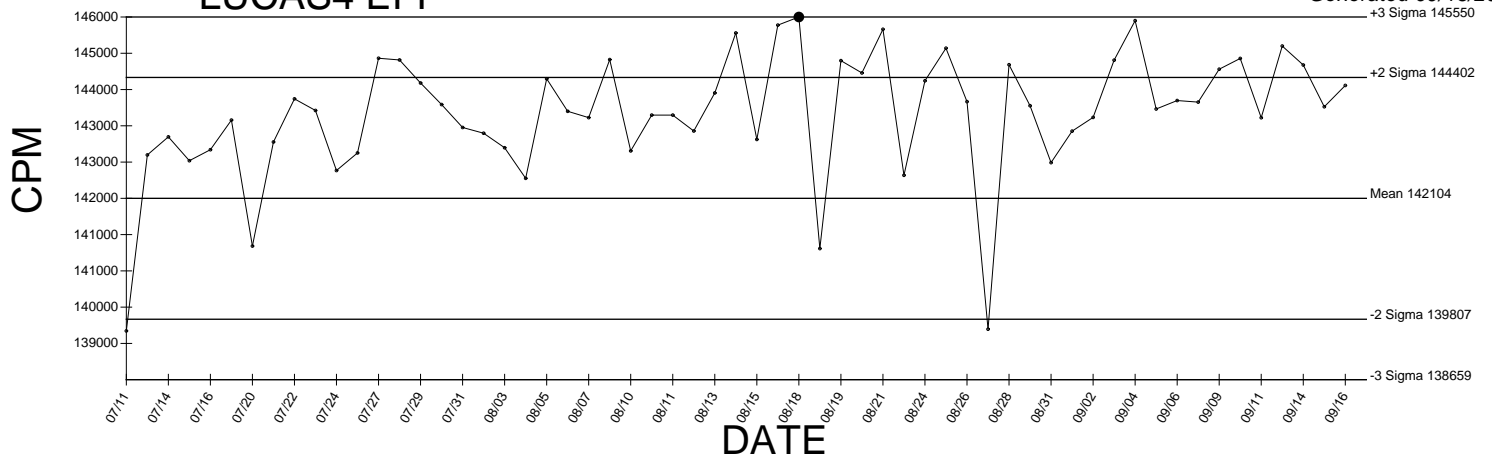
Generated 09/16/2009



● Denotes Outlier

LUCAS4 EFF

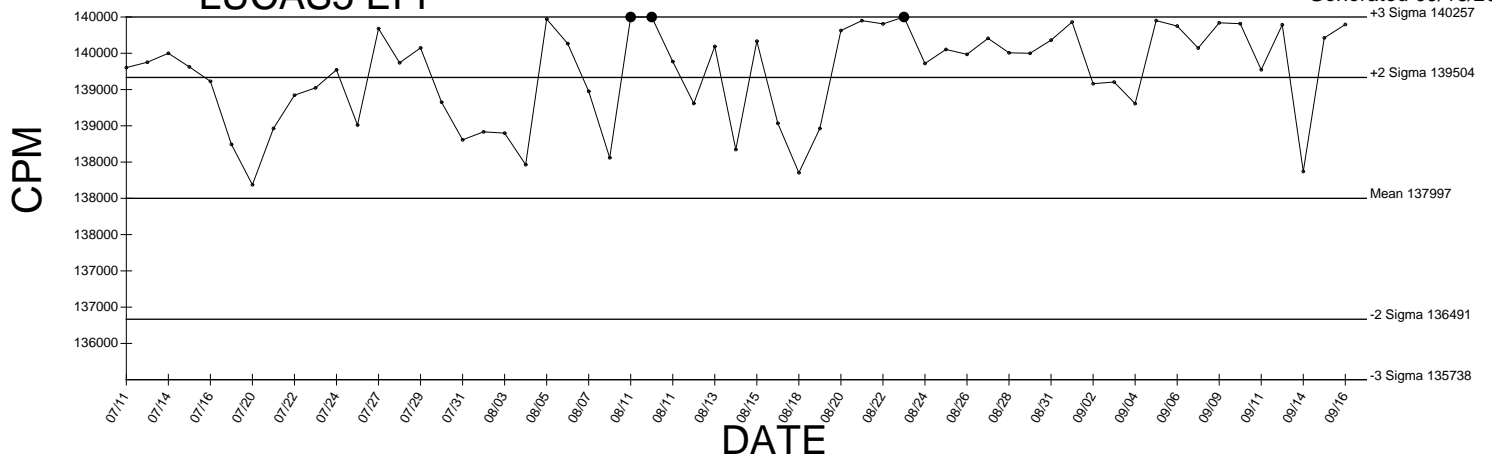
Generated 09/16/2009



● Denotes Outlier

LUCAS5 EFF

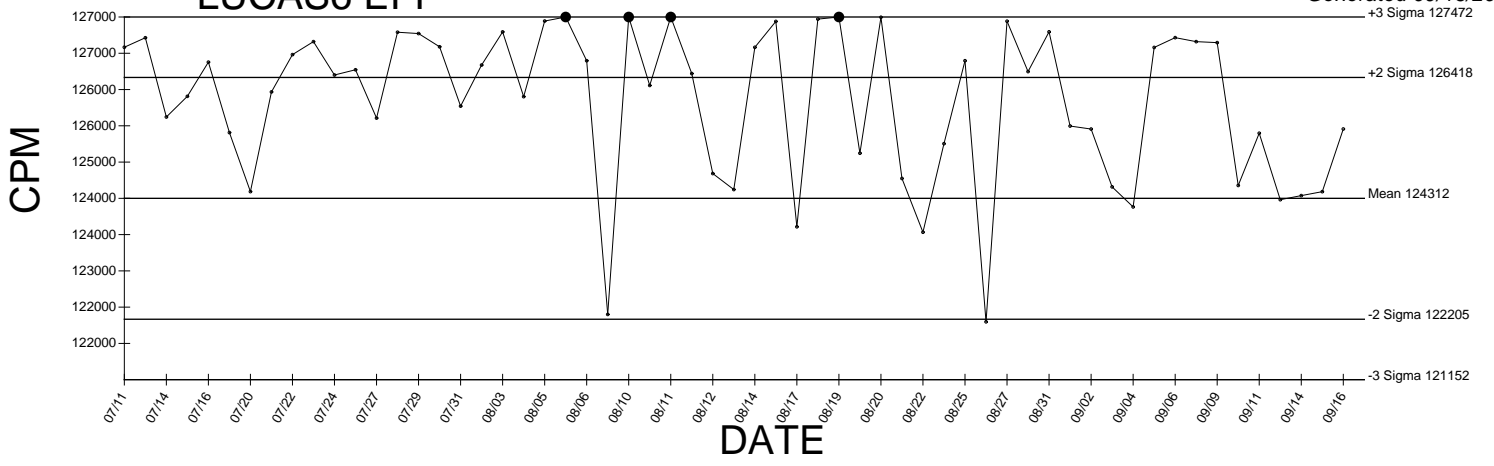
Generated 09/16/2009



● Denotes Outlier

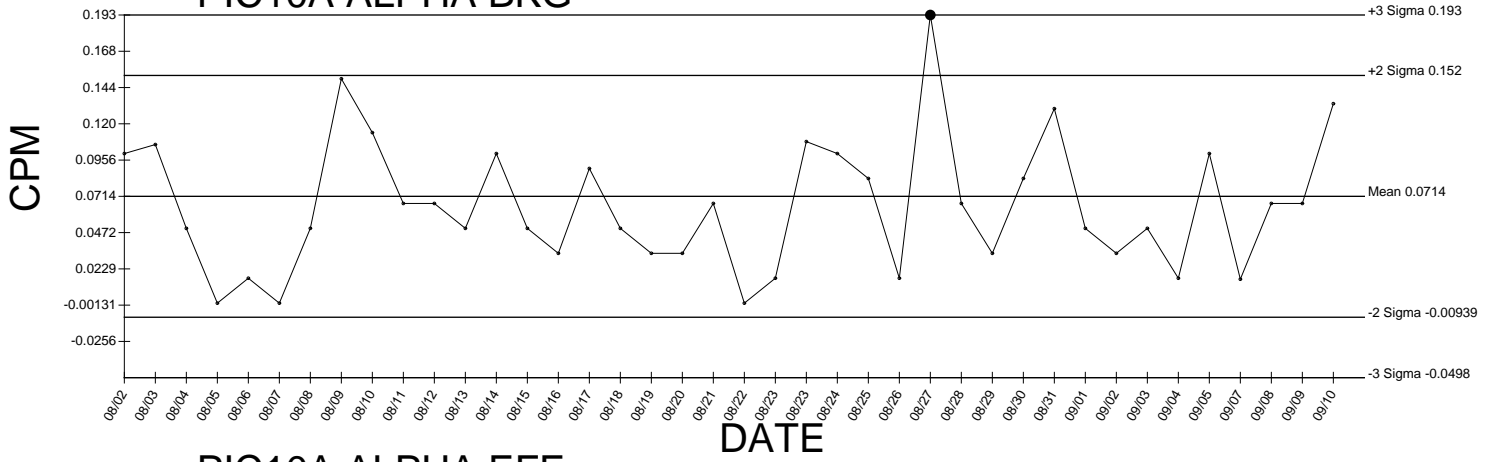
LUCAS6 EFF

Generated 09/16/2009

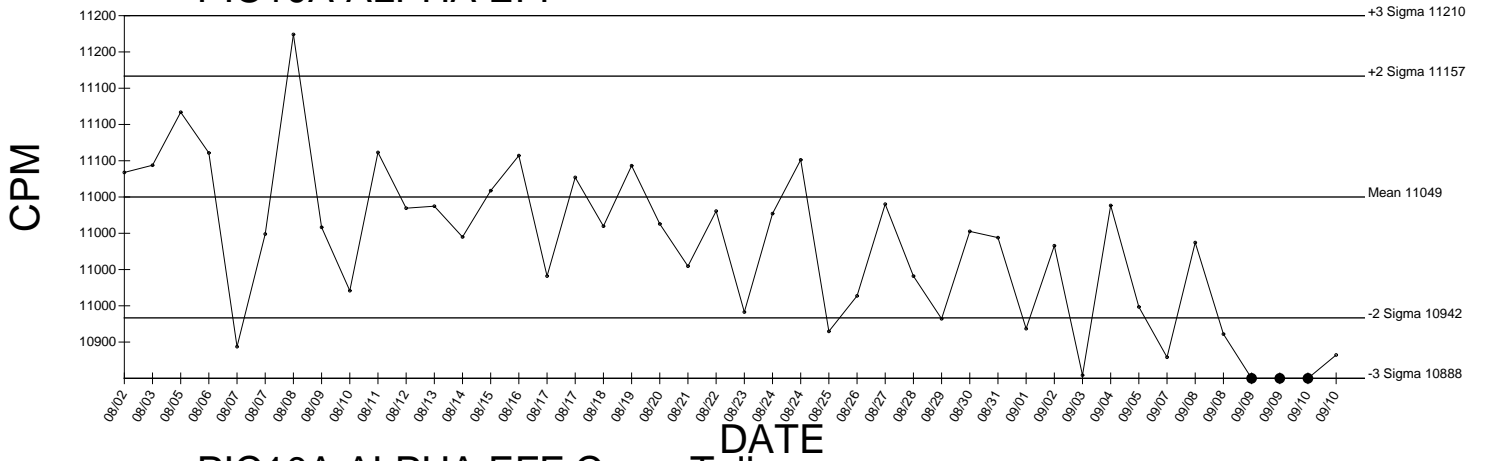


● Denotes Outlier

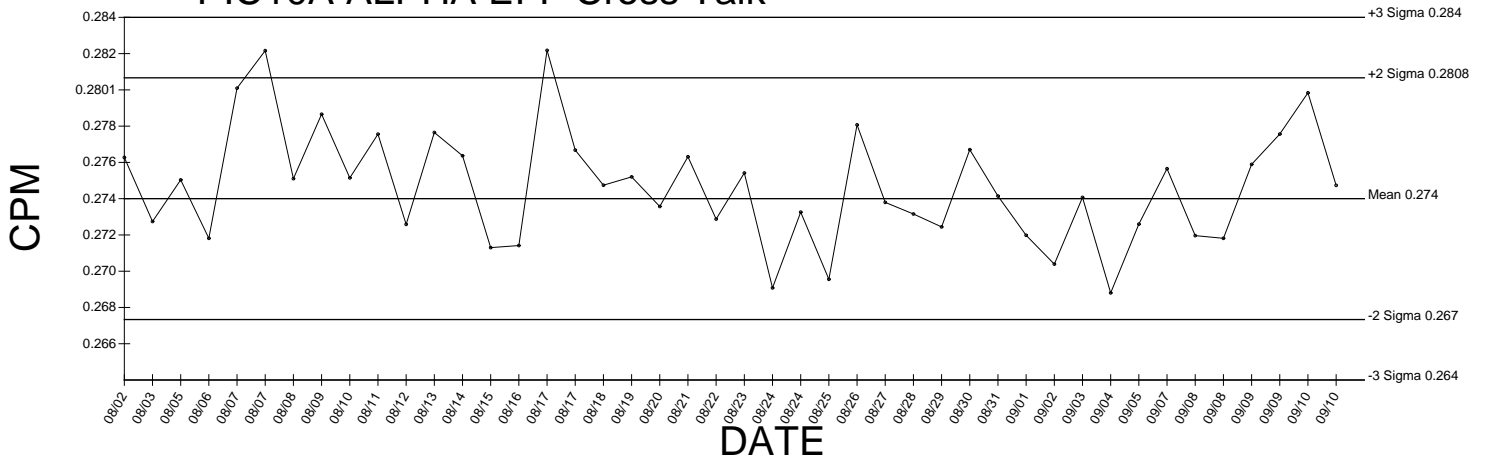
PIC10A ALPHA BKG



PIC10A ALPHA EFF



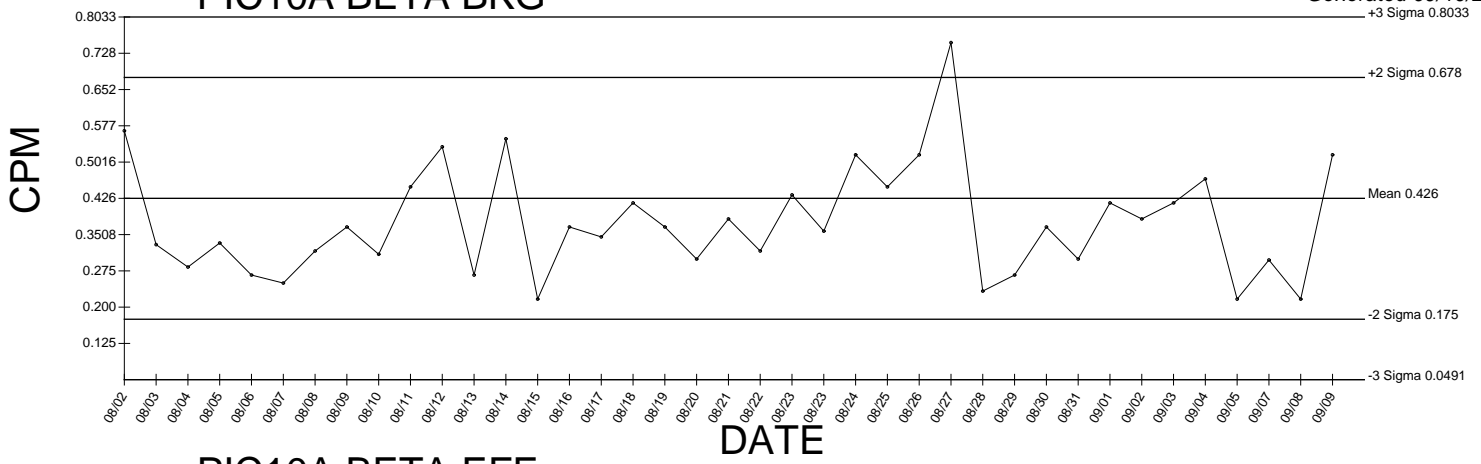
PIC10A ALPHA EFF Cross Talk



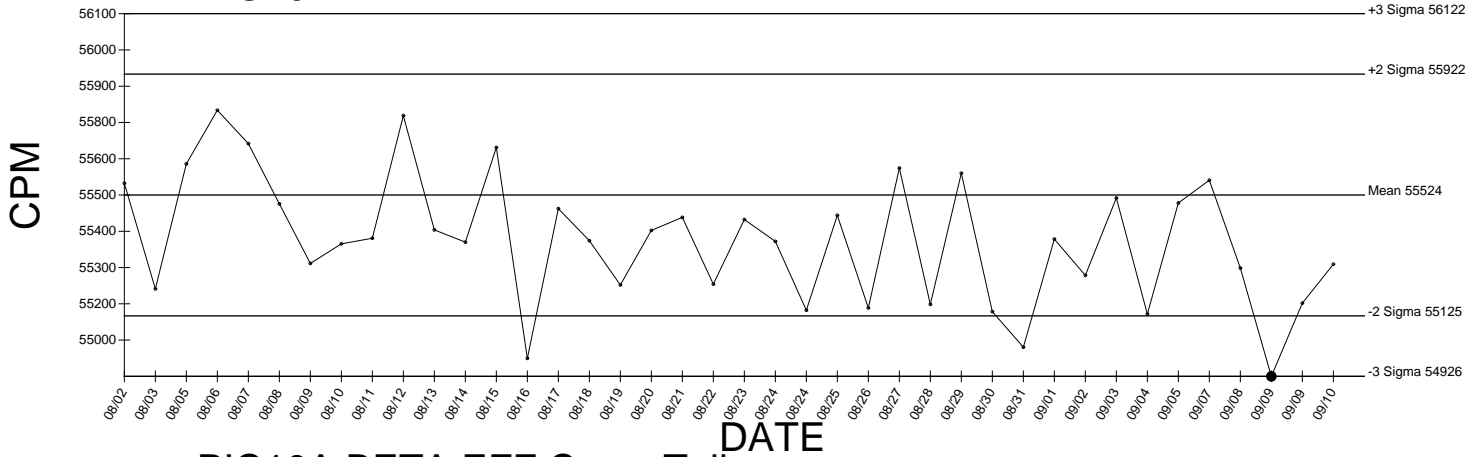
● Denotes Outlier

PIC10A BETA BKG

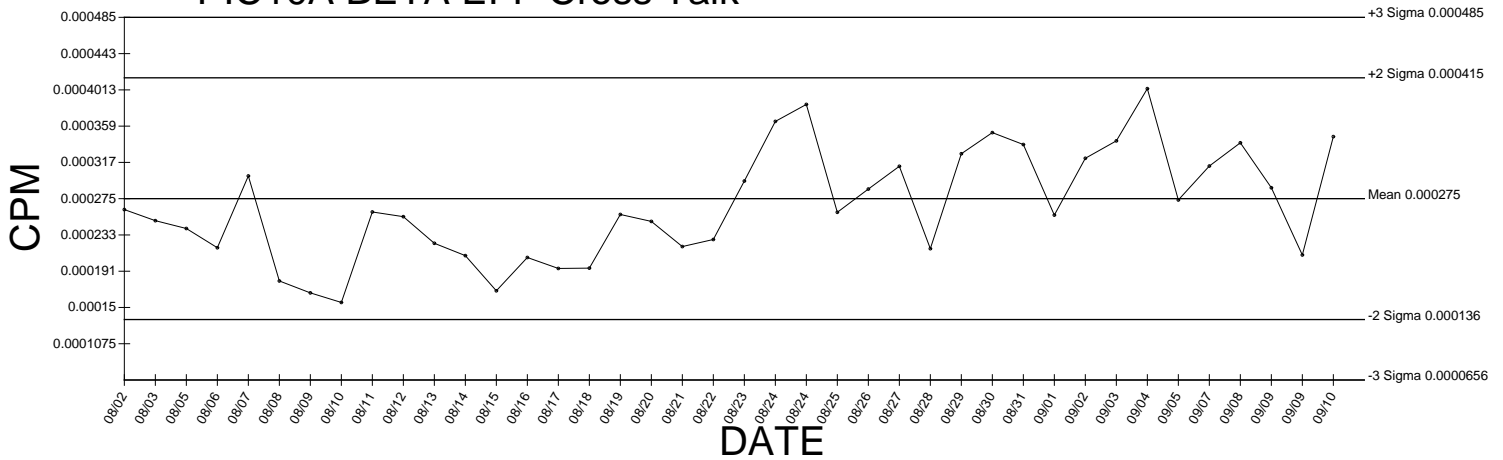
Generated 09/10/2009



PIC10A BETA EFF



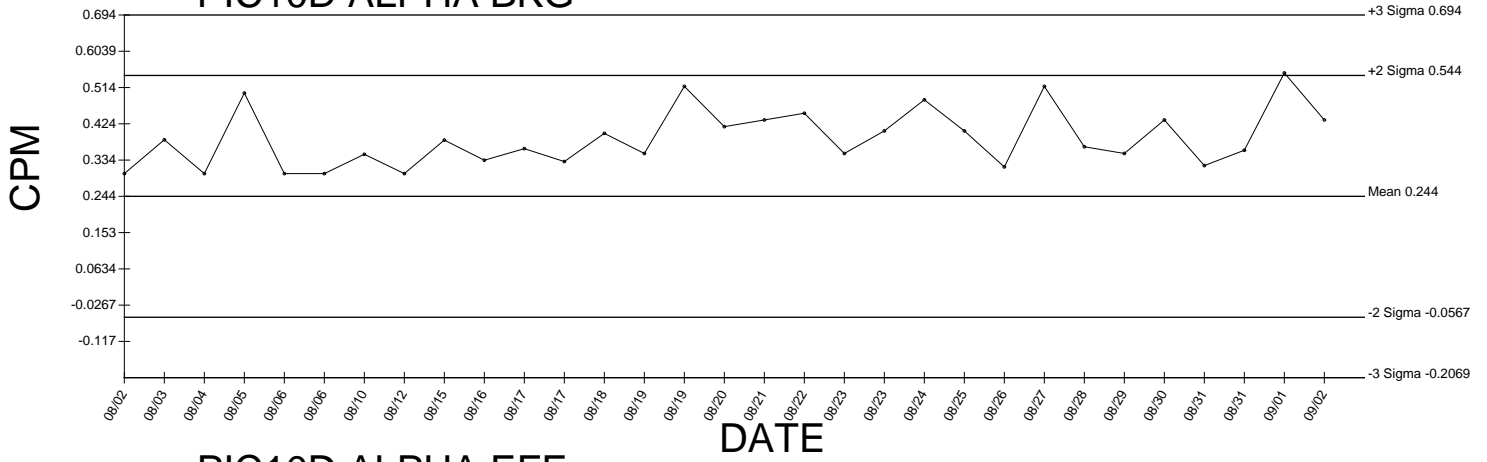
PIC10A BETA EFF Cross Talk



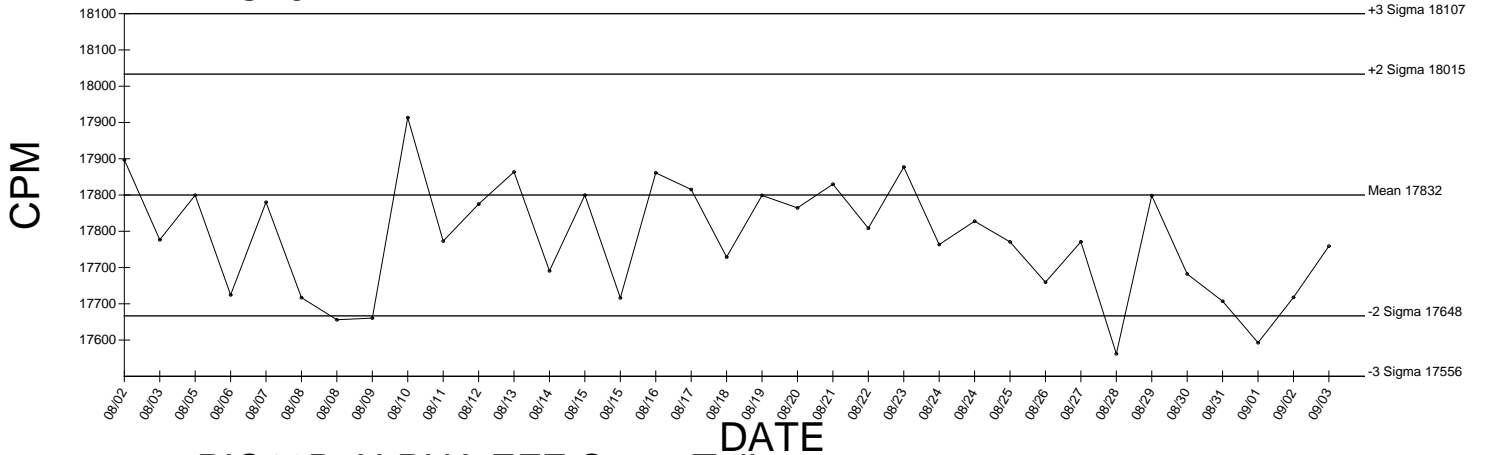
● Denotes Outlier

PIC10D ALPHA BKG

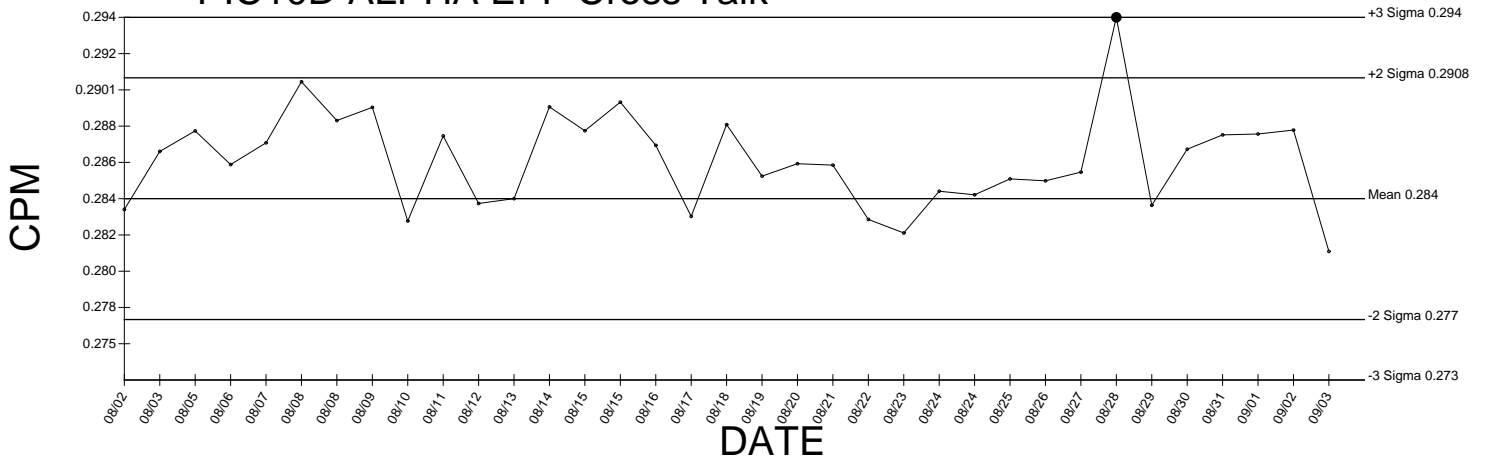
Generated 09/03/2009



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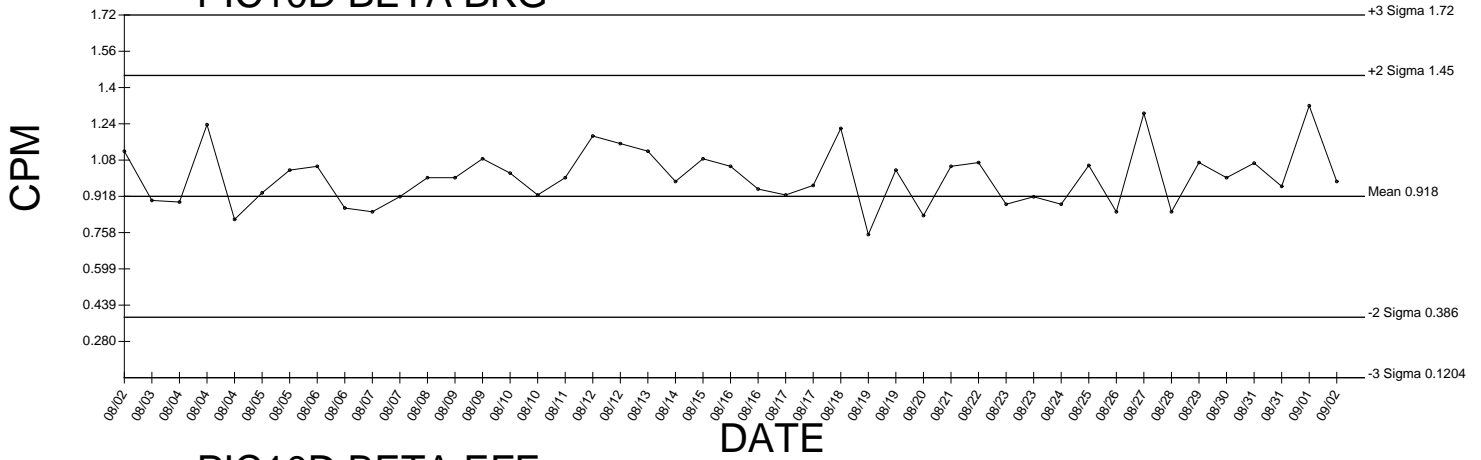


PIC10D ALPHA EFF Cross Talk

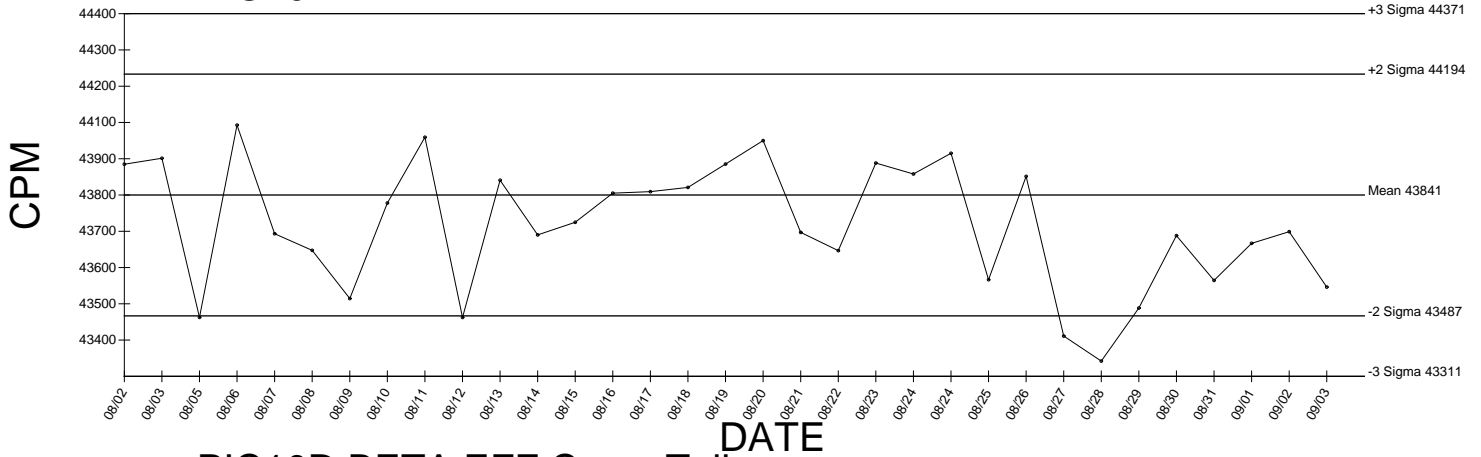


PIC10D BETA BKG

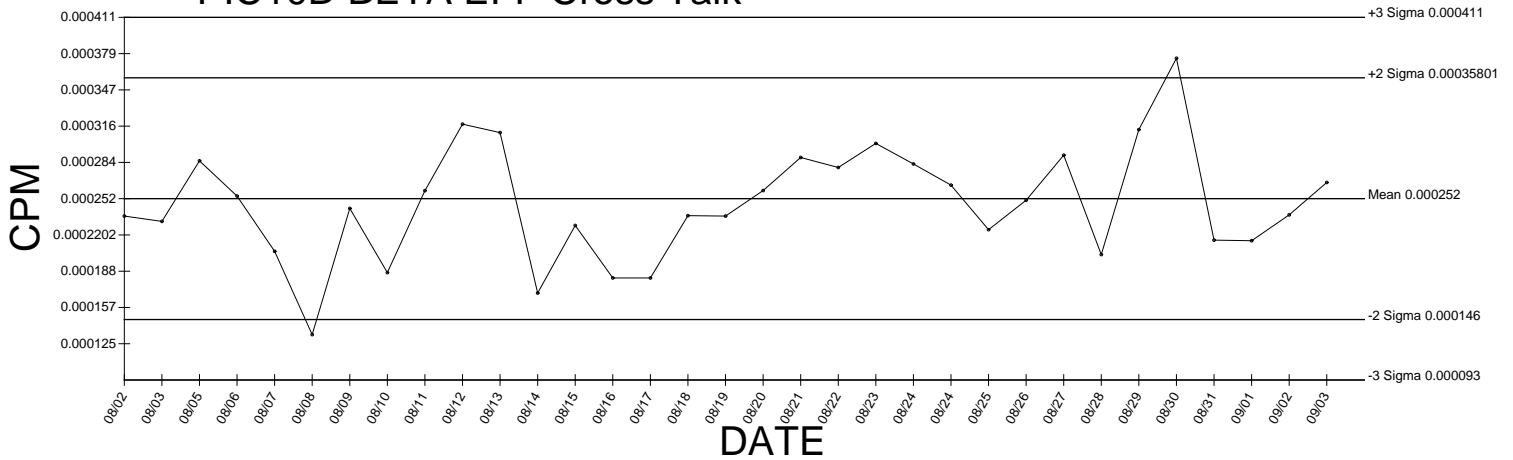
Generated 09/03/2009



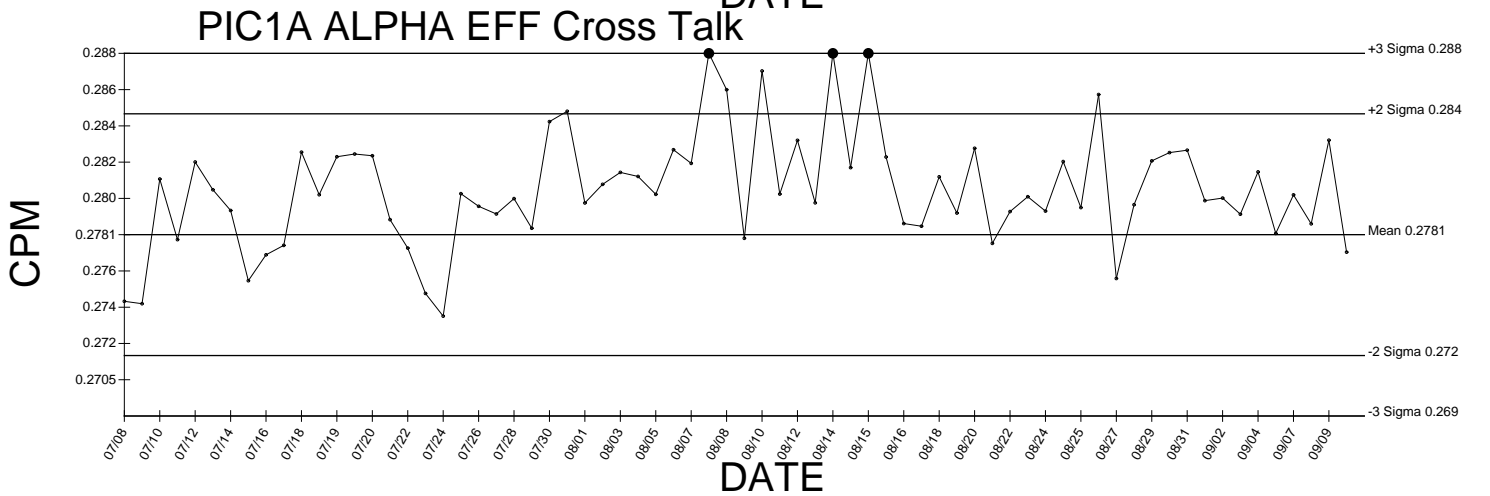
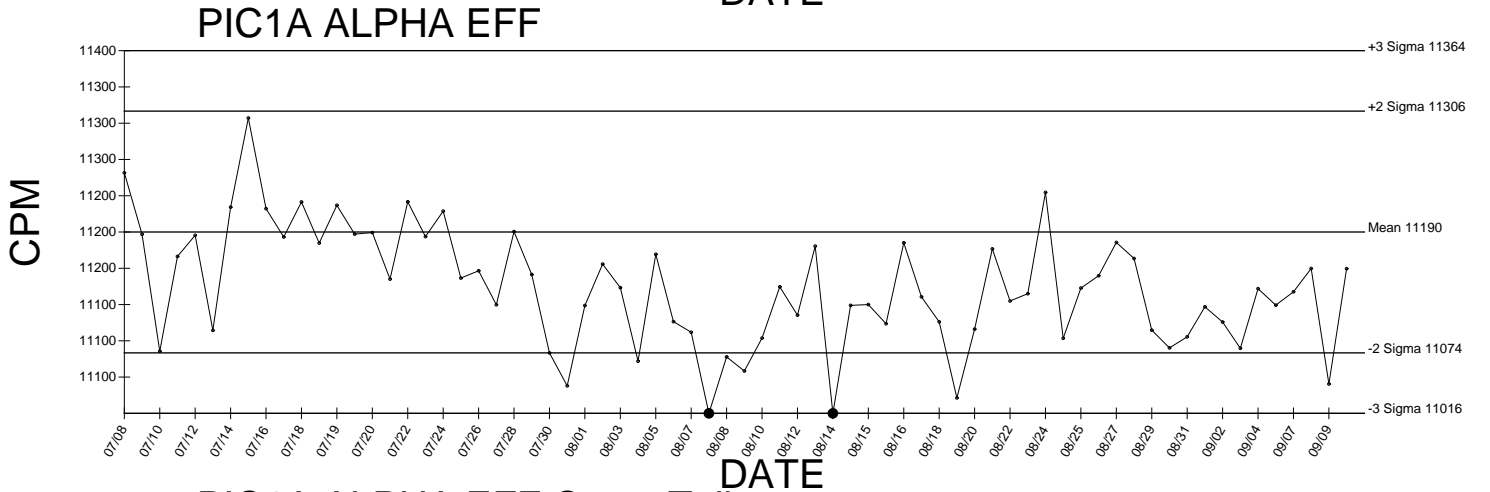
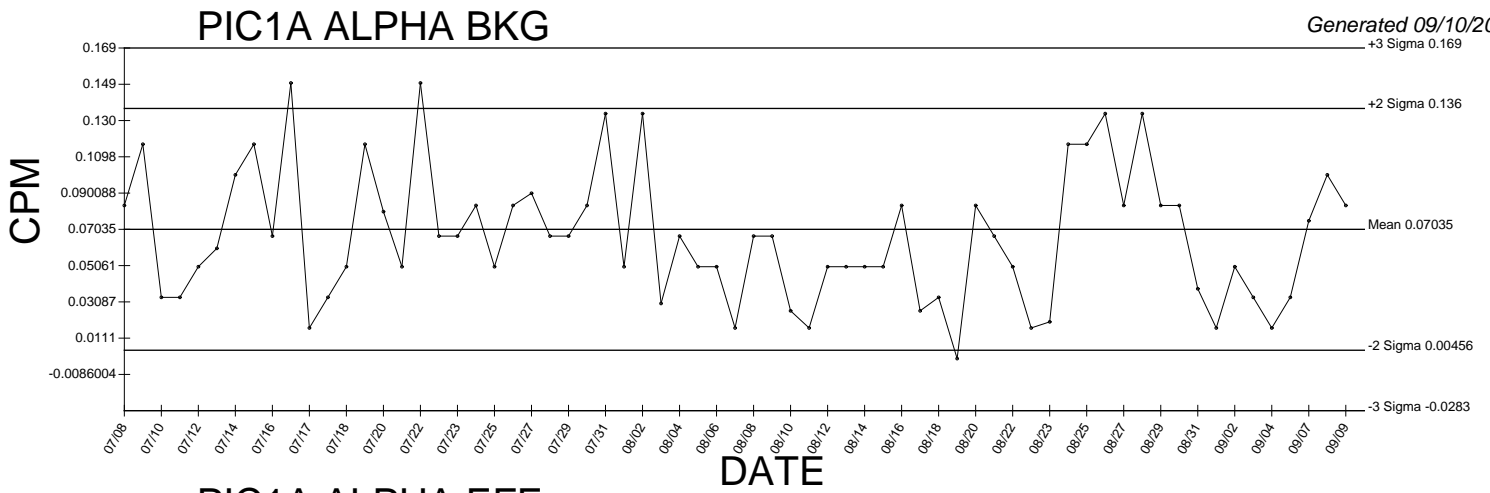
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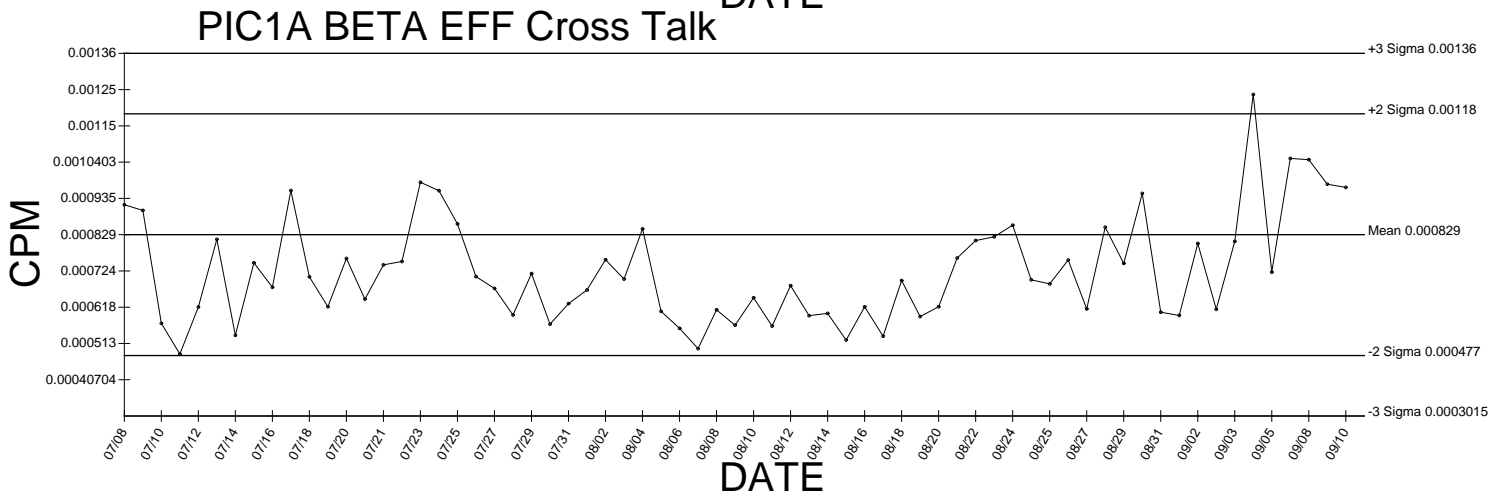
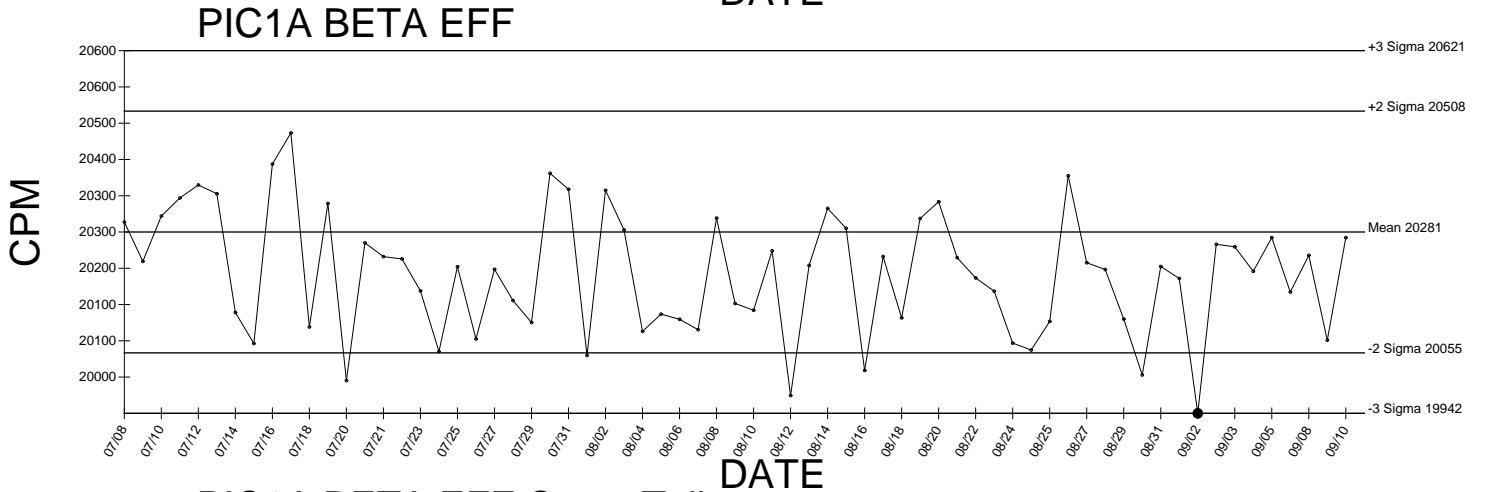
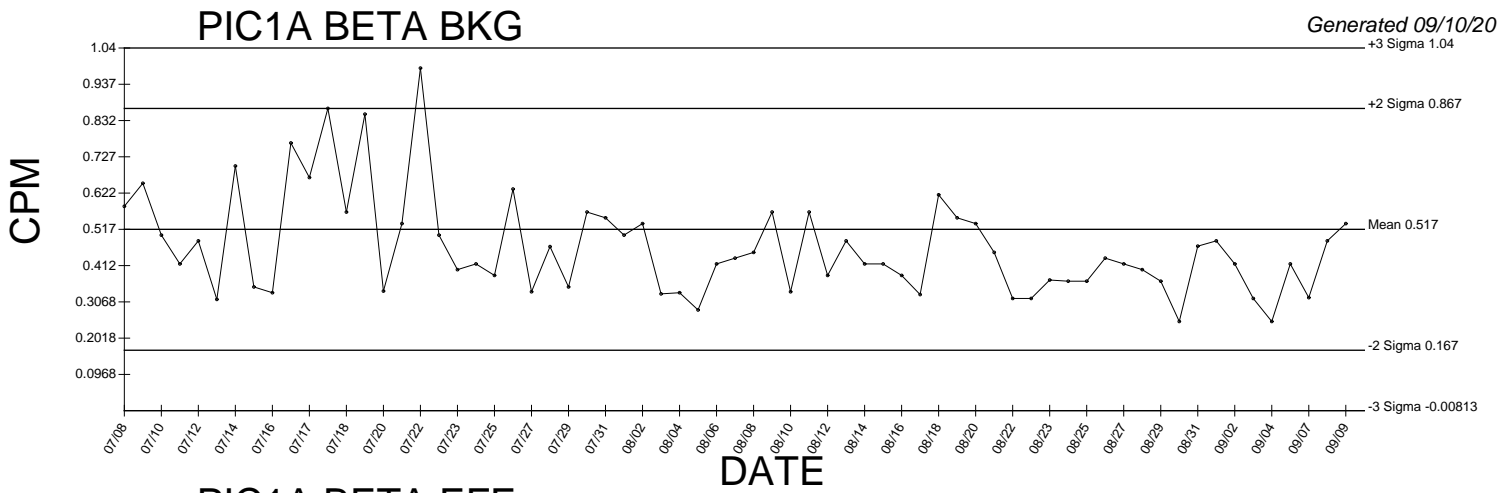
PIC10D BETA EFF Cross Talk



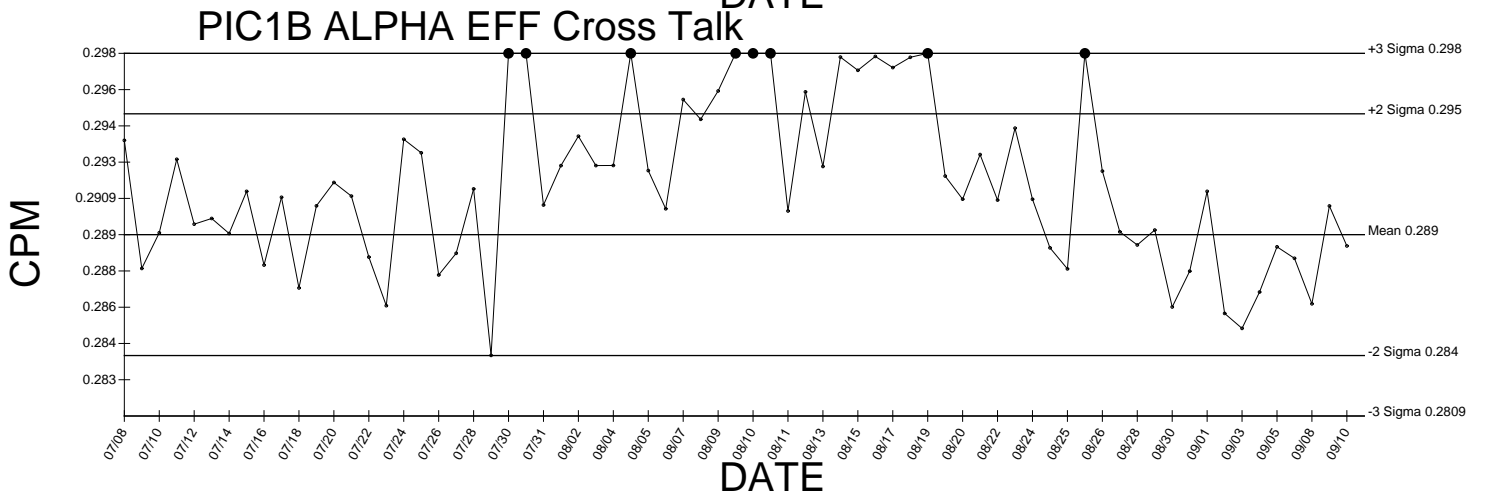
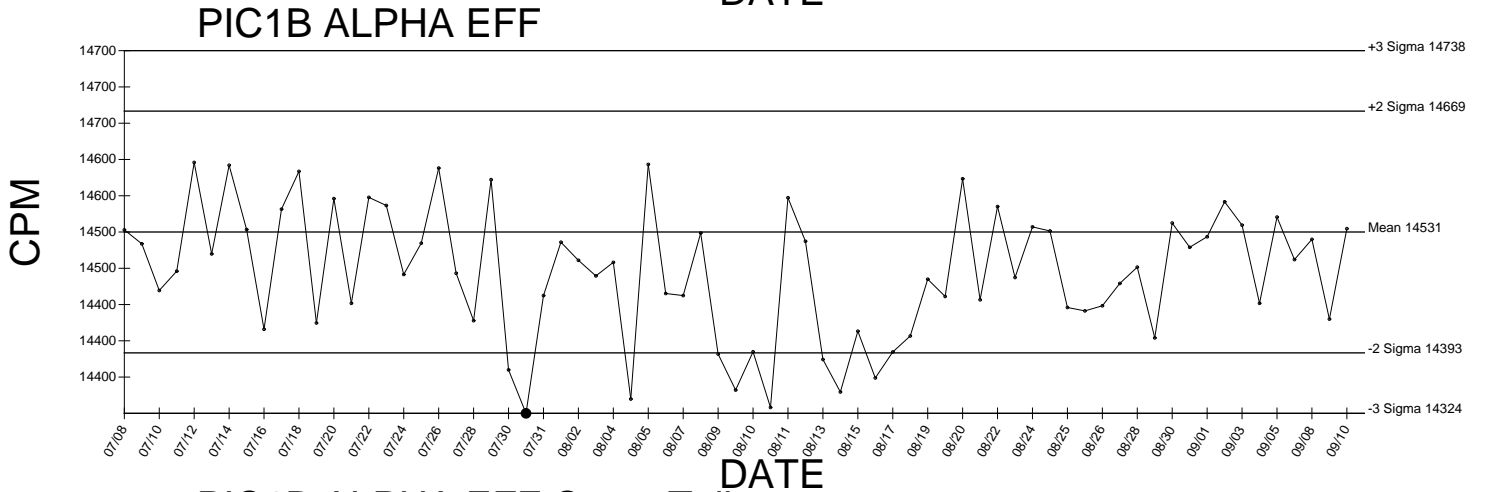
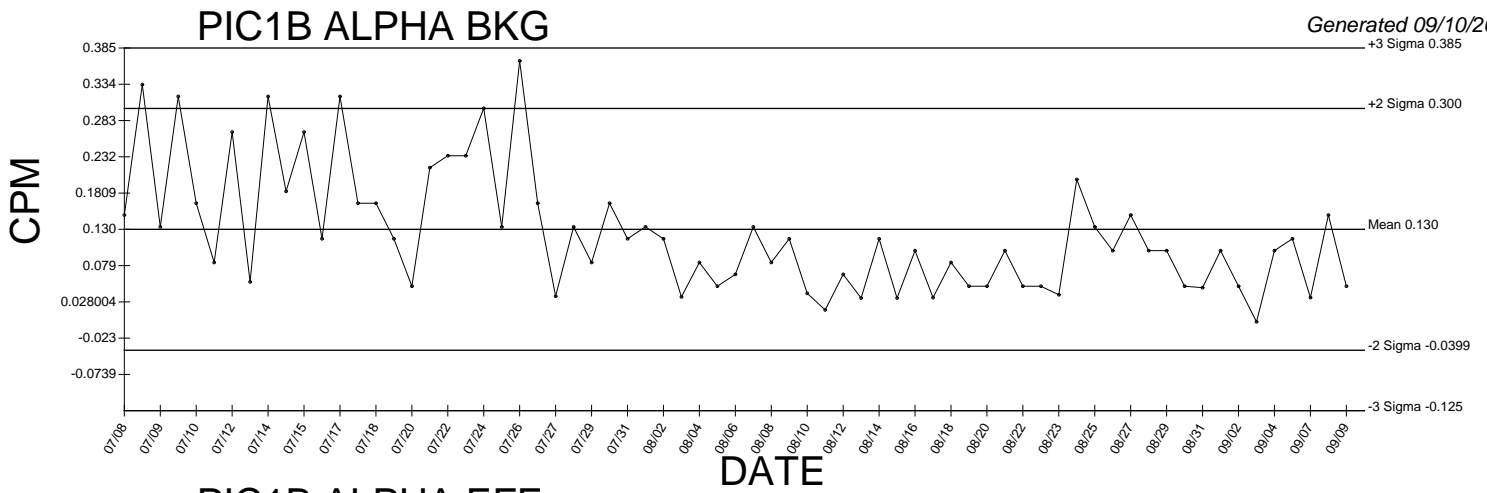
● Denotes Outlier



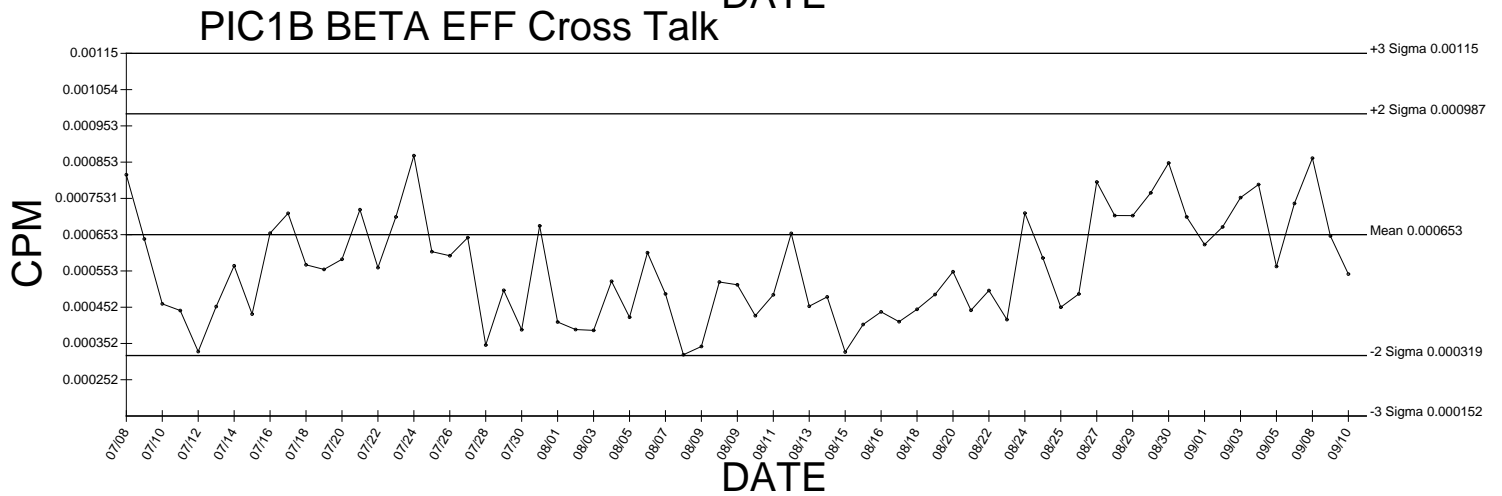
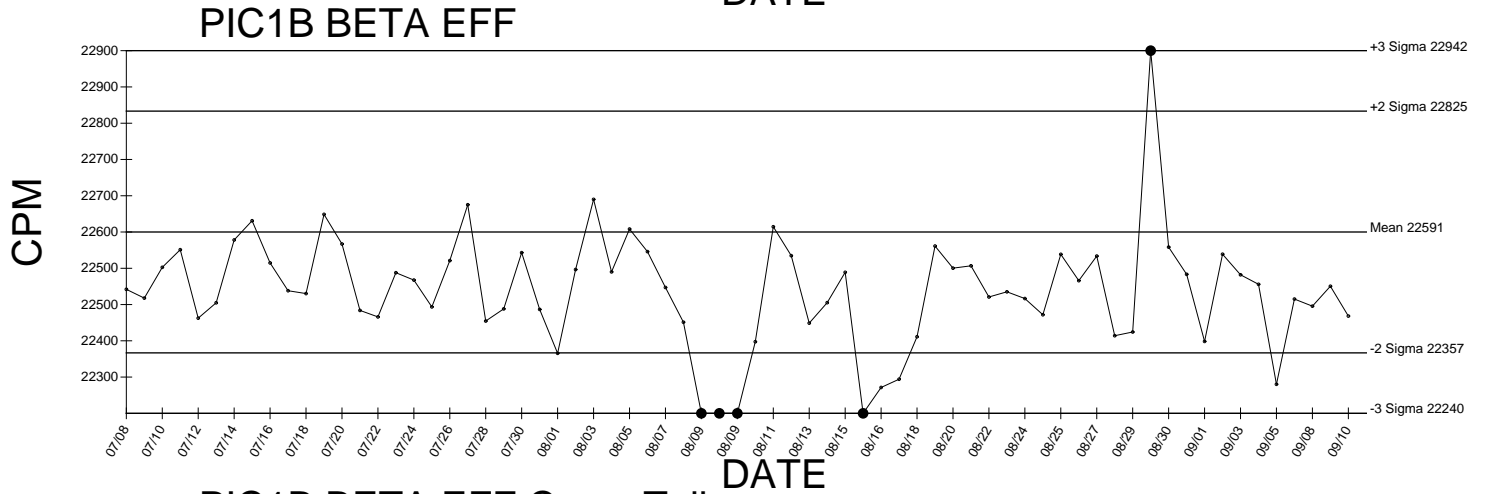
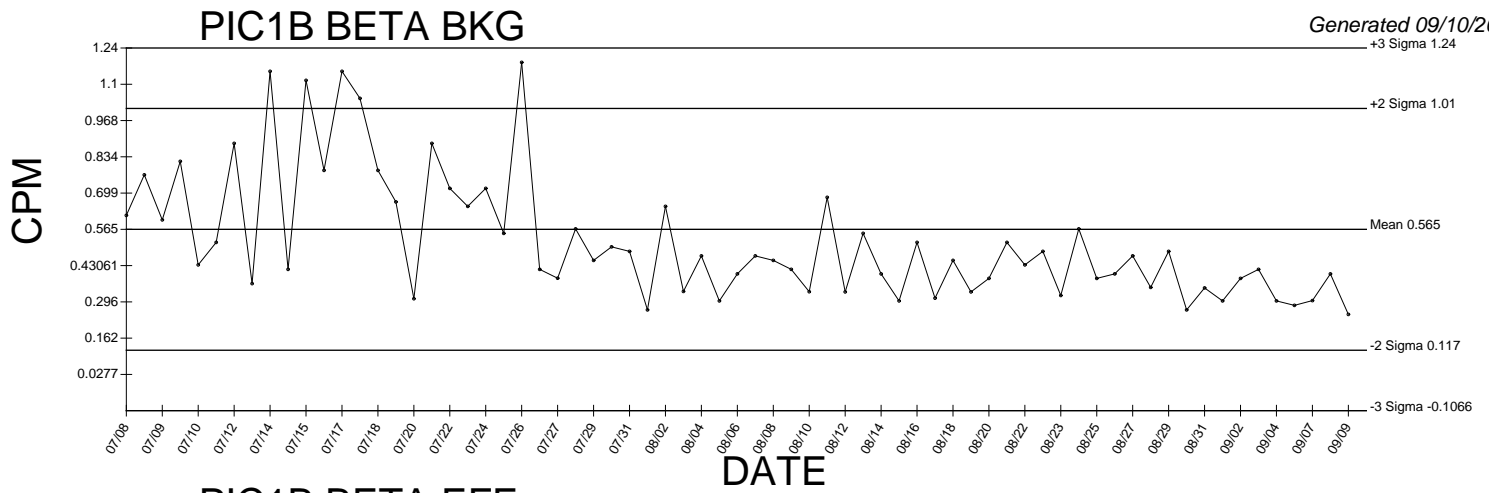
● Denotes Outlier



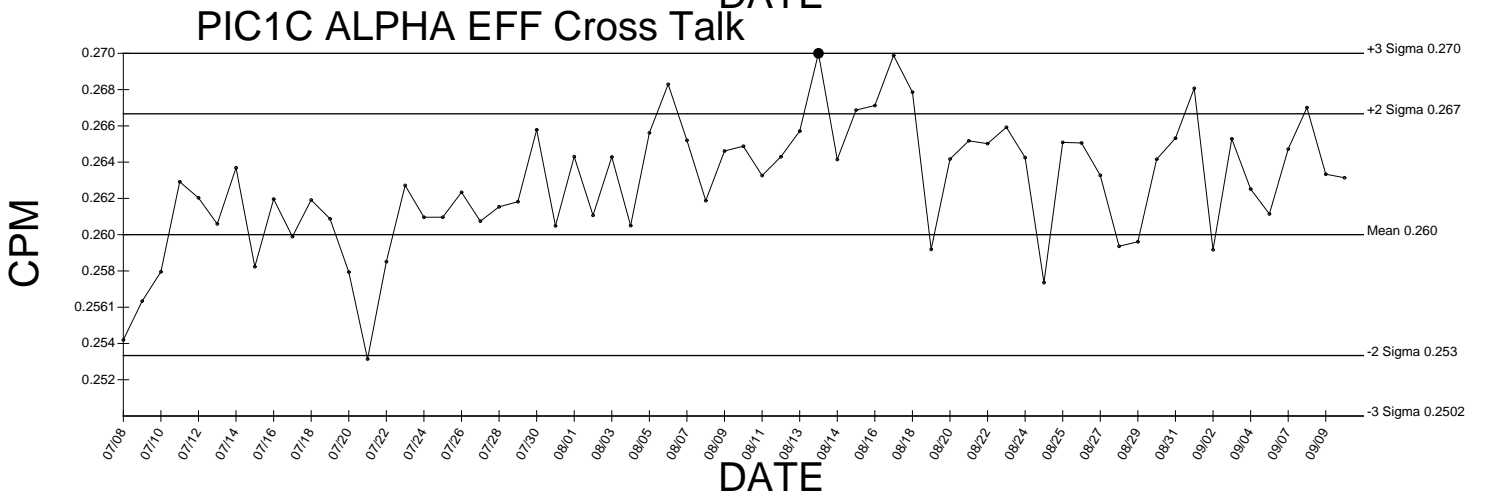
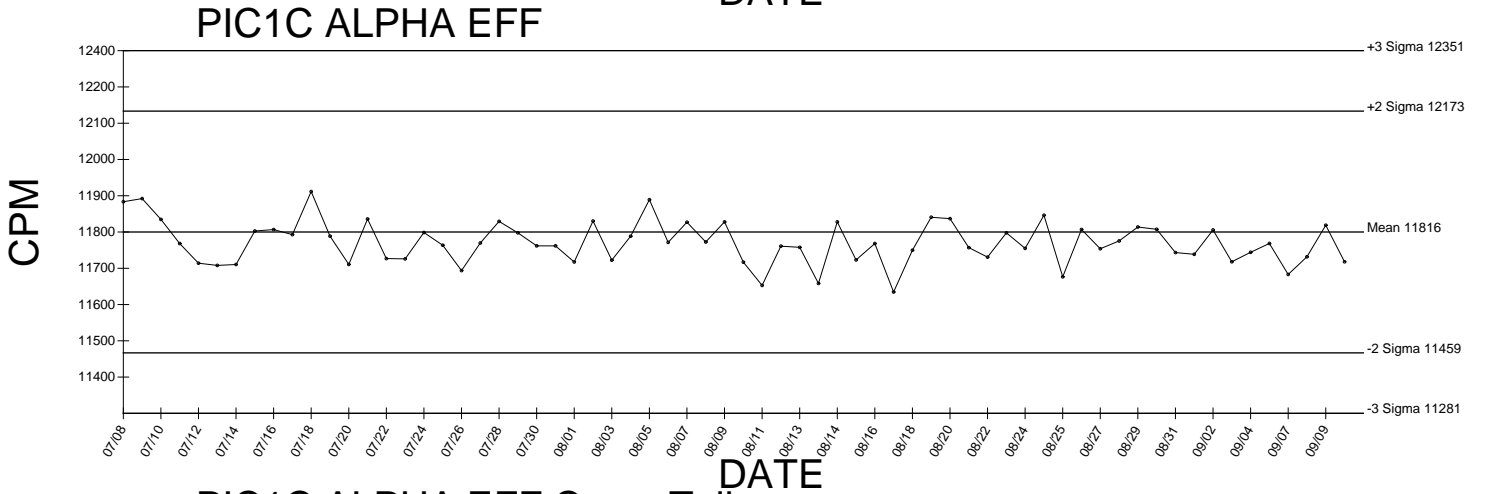
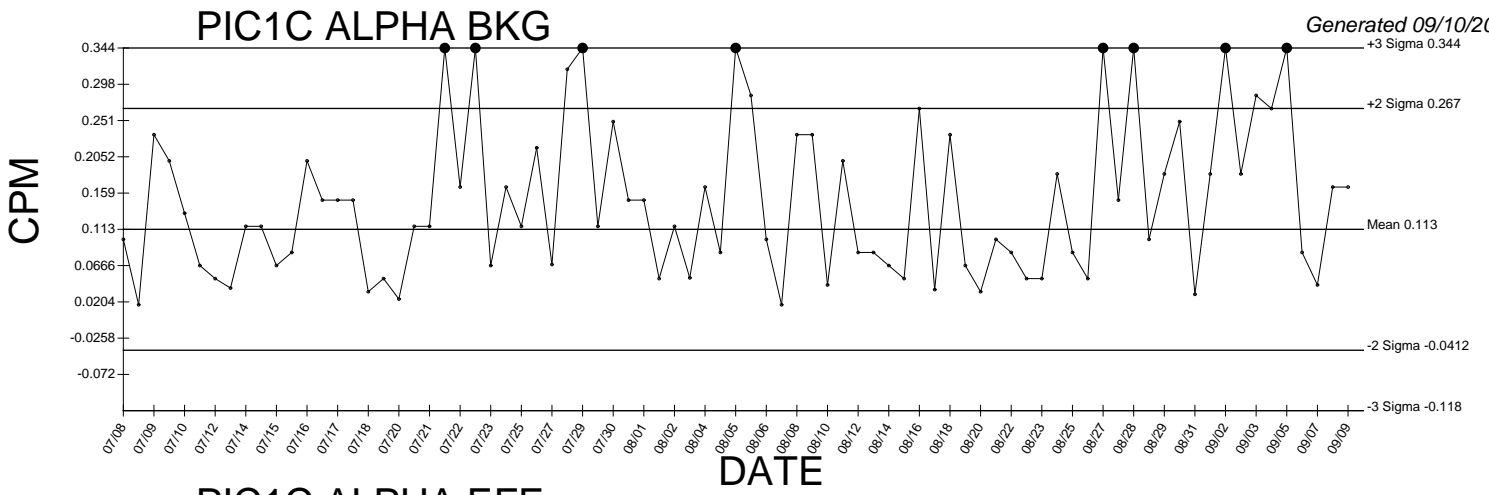
● Denotes Outlier



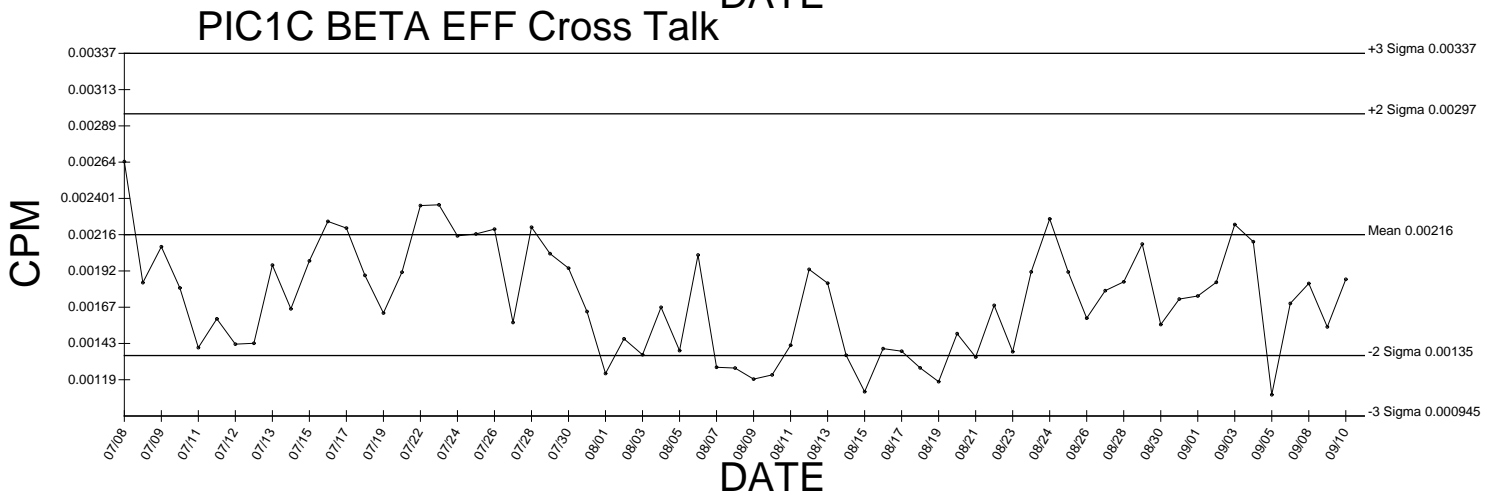
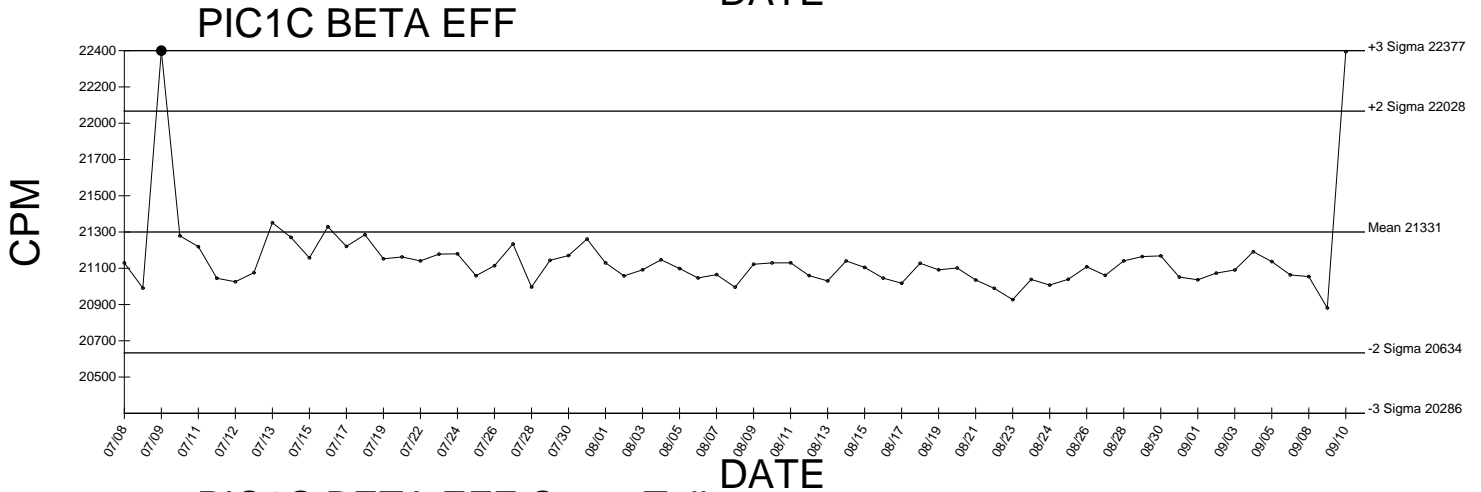
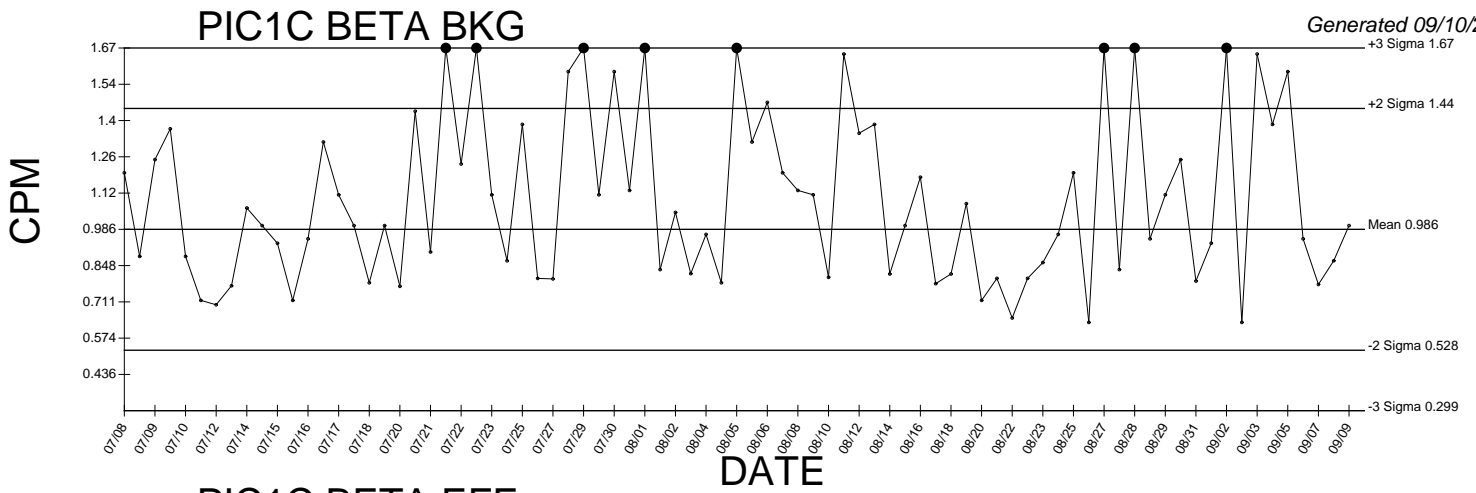
● Denotes Outlier



● Denotes Outlier

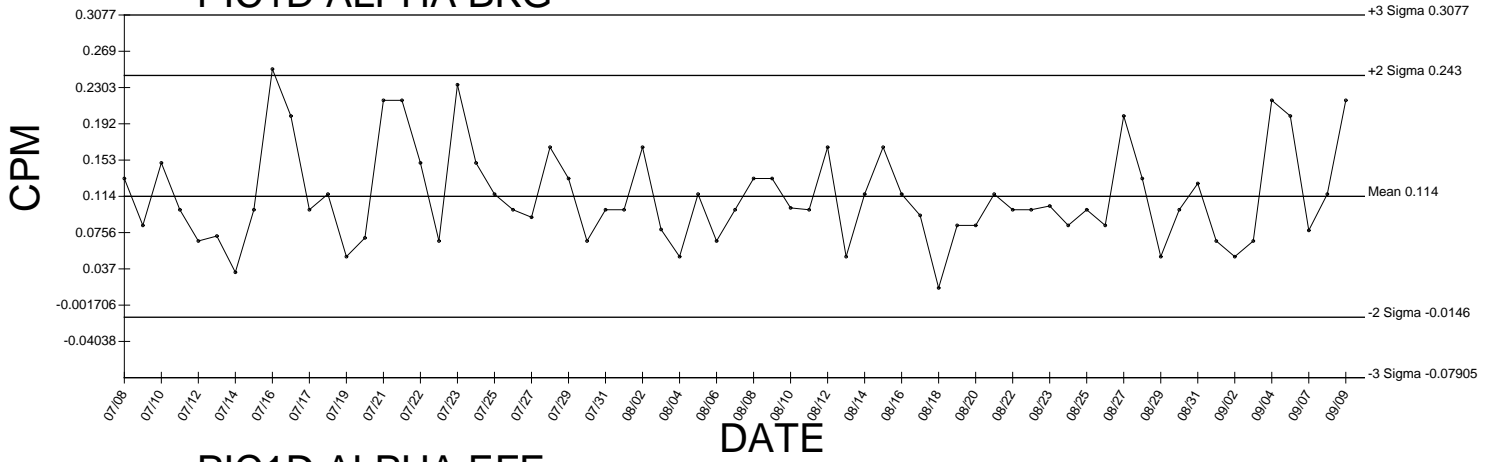


● Denotes Outlier

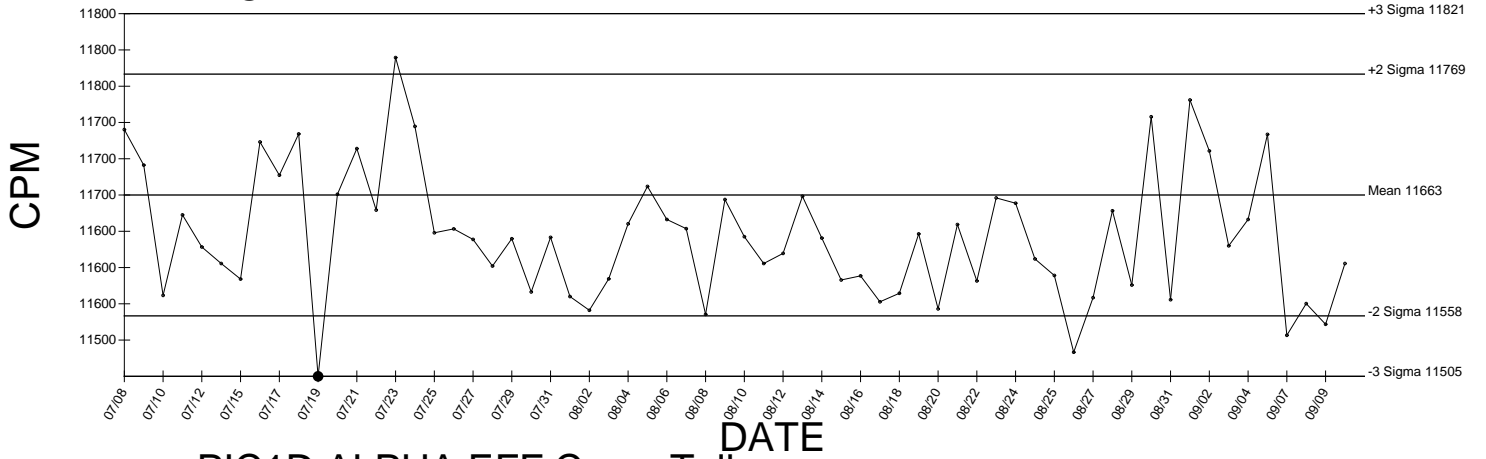


● Denotes Outlier

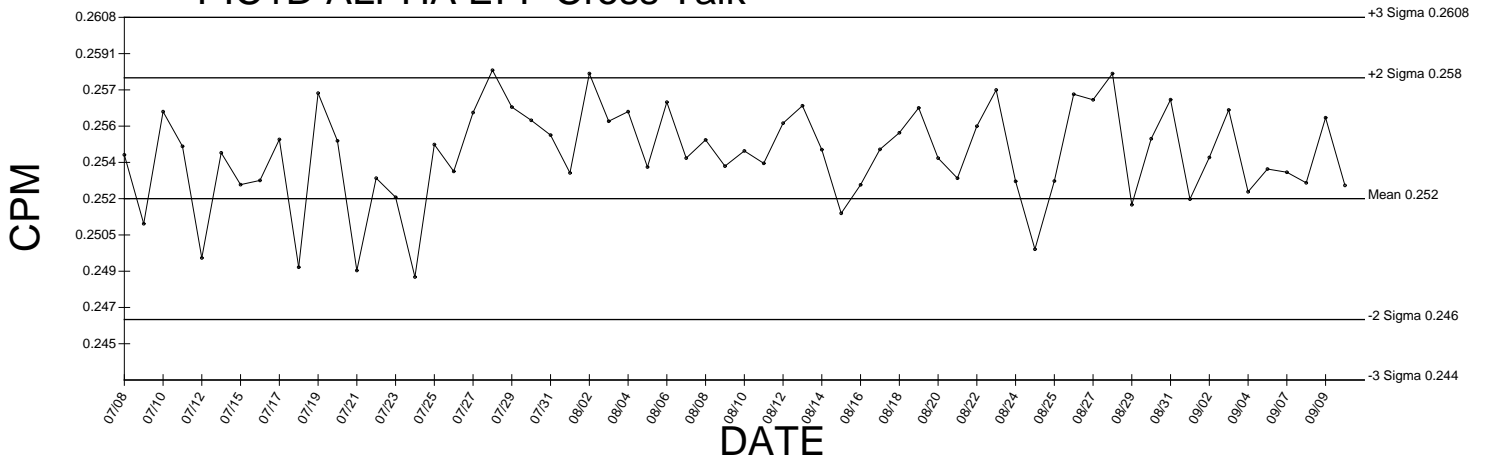
PIC1D ALPHA BKG



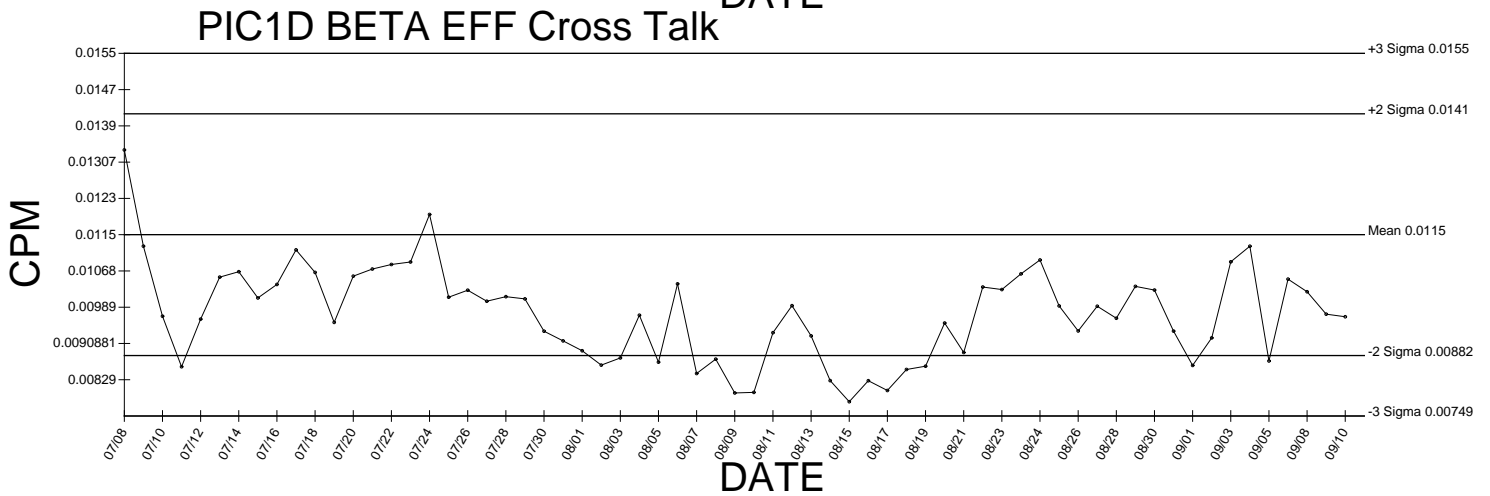
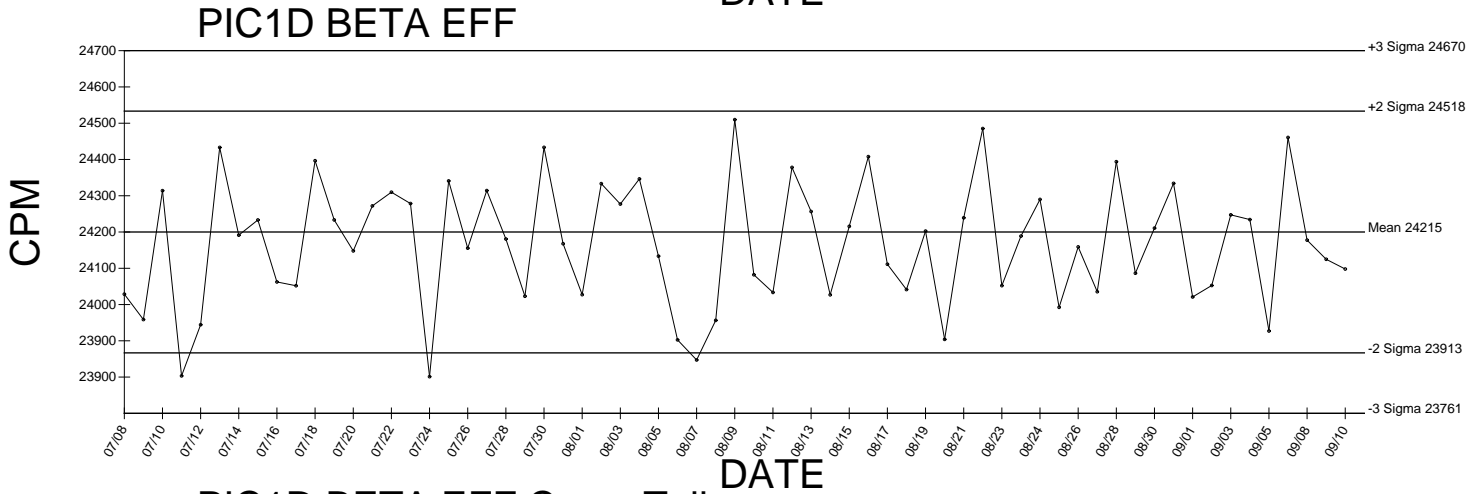
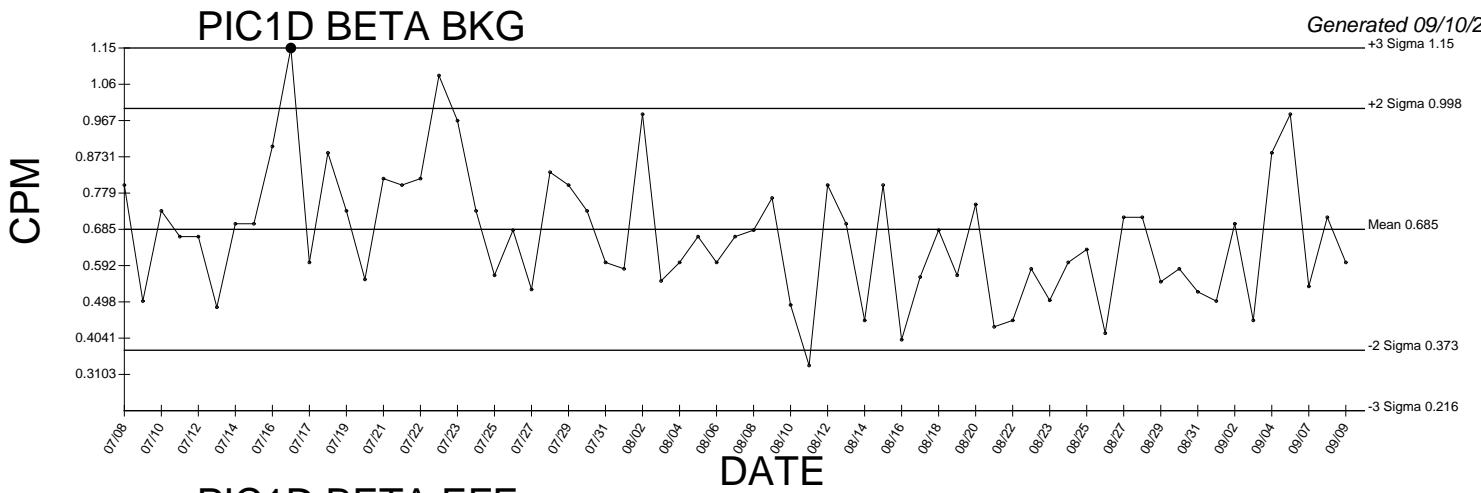
PIC1D ALPHA EFF



PIC1D ALPHA EFF Cross Talk

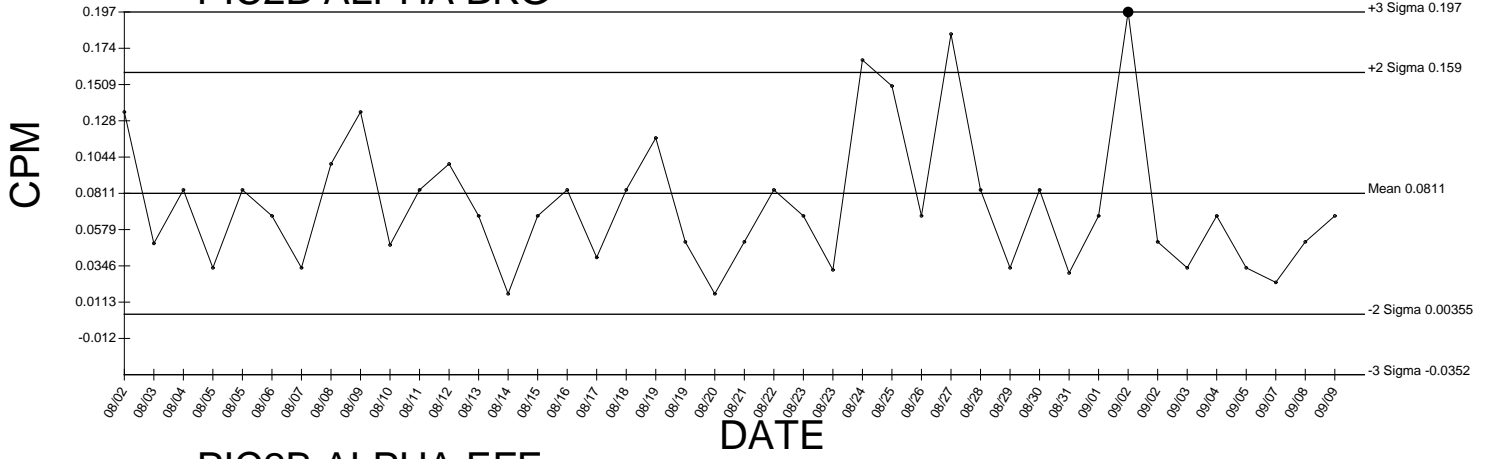


● Denotes Outlier

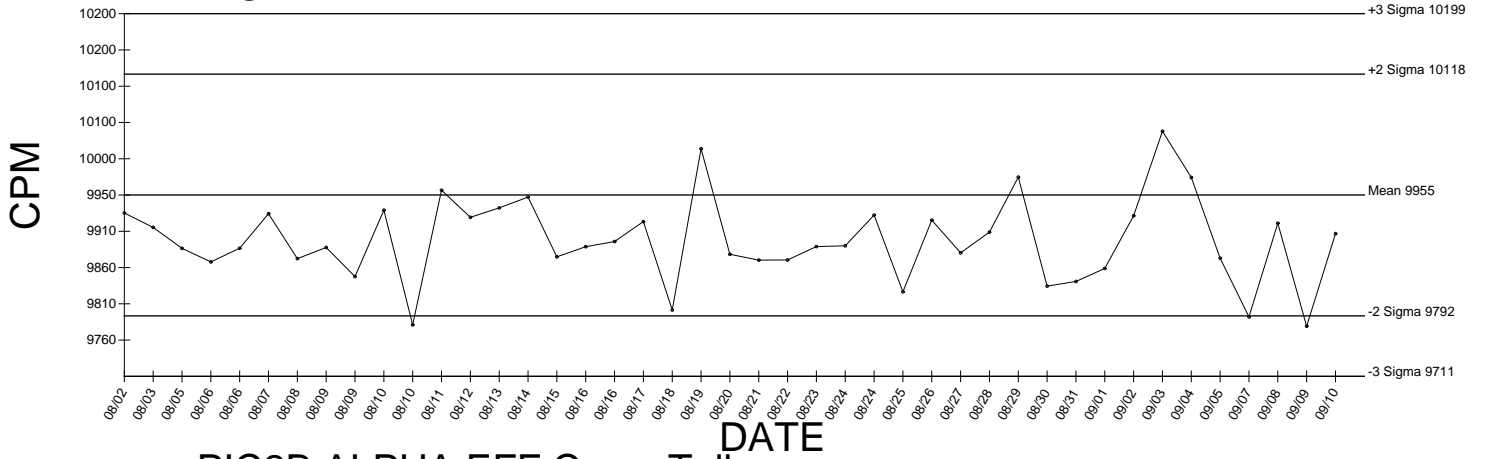


● Denotes Outlier

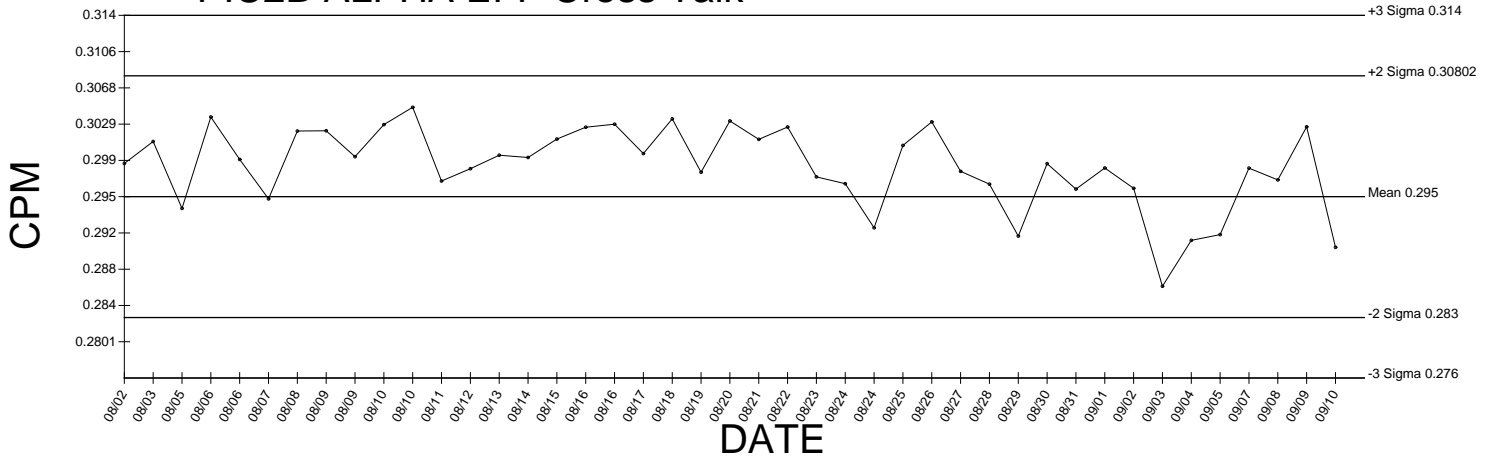
PIC2B ALPHA BKG



PIC2B ALPHA EFF

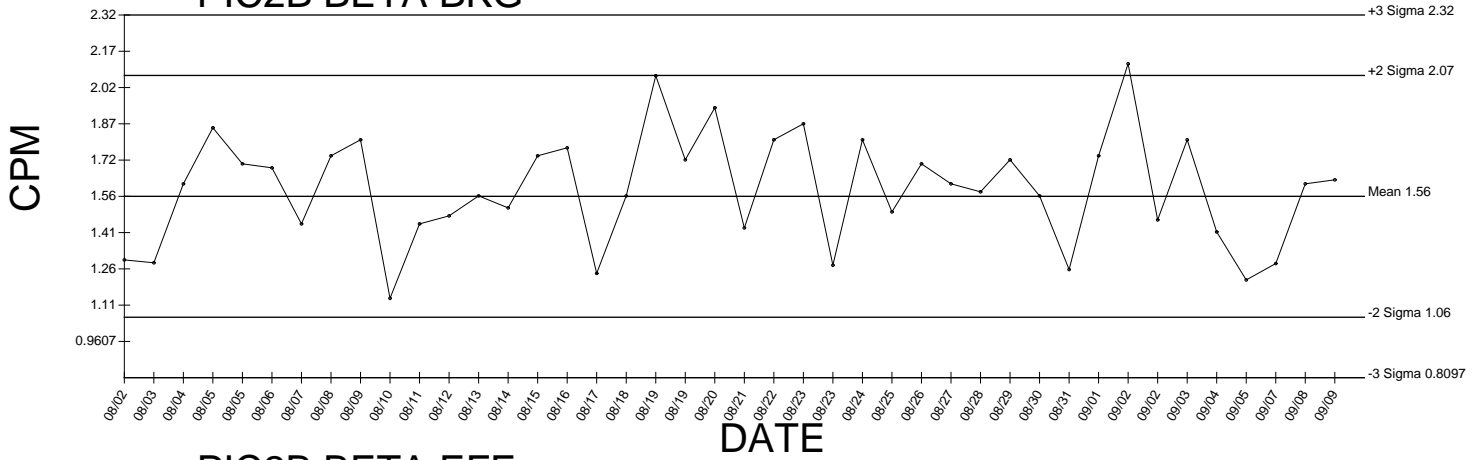


PIC2B ALPHA EFF Cross Talk

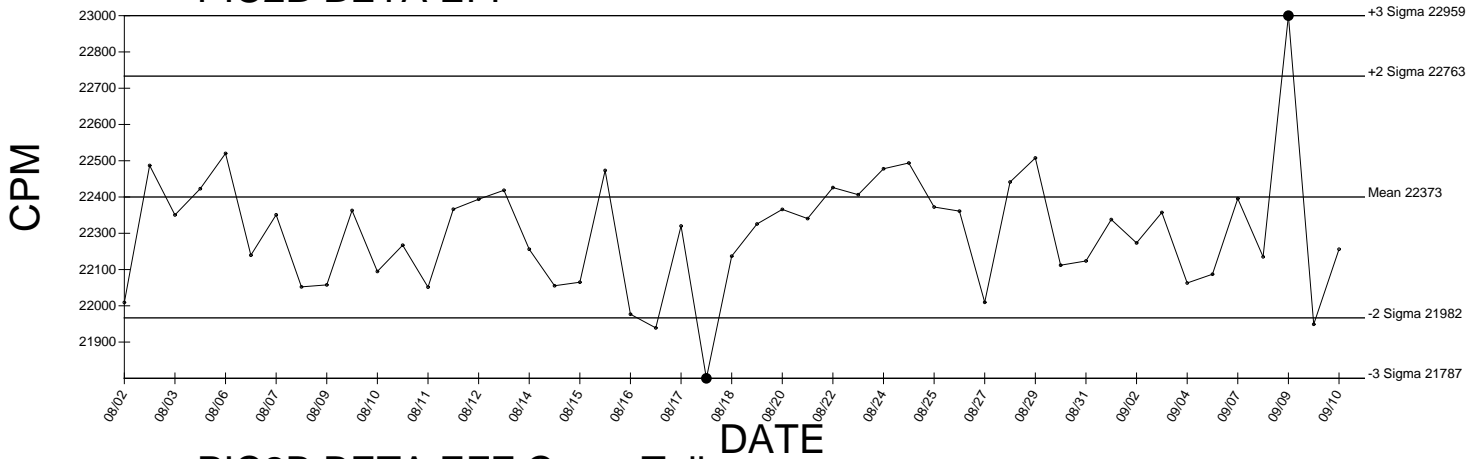


● Denotes Outlier

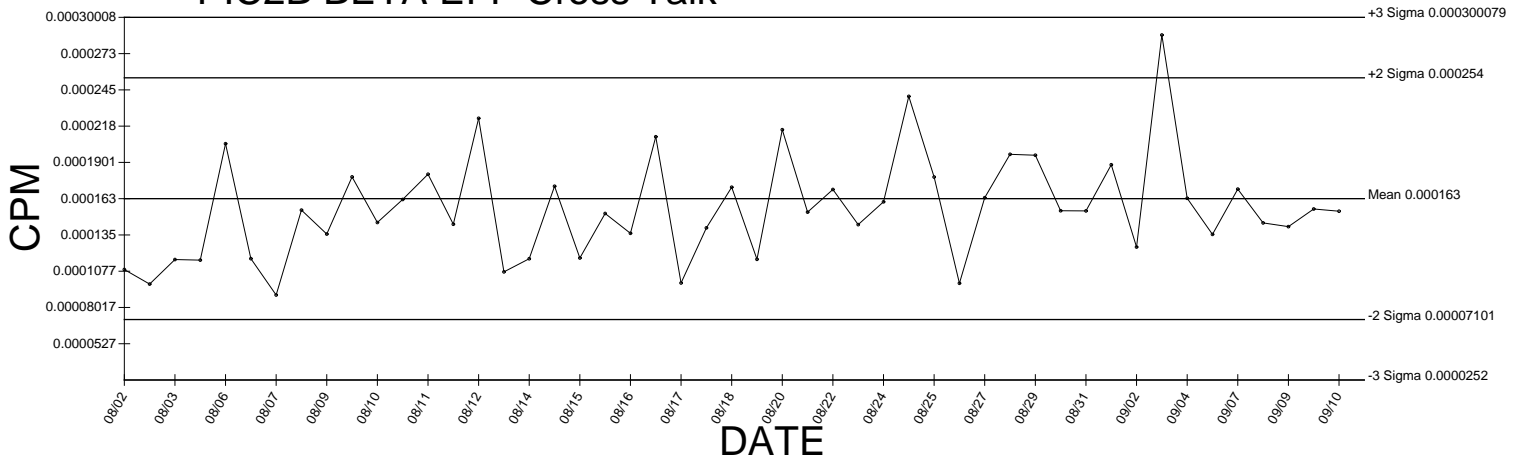
PIC2B BETA BKG



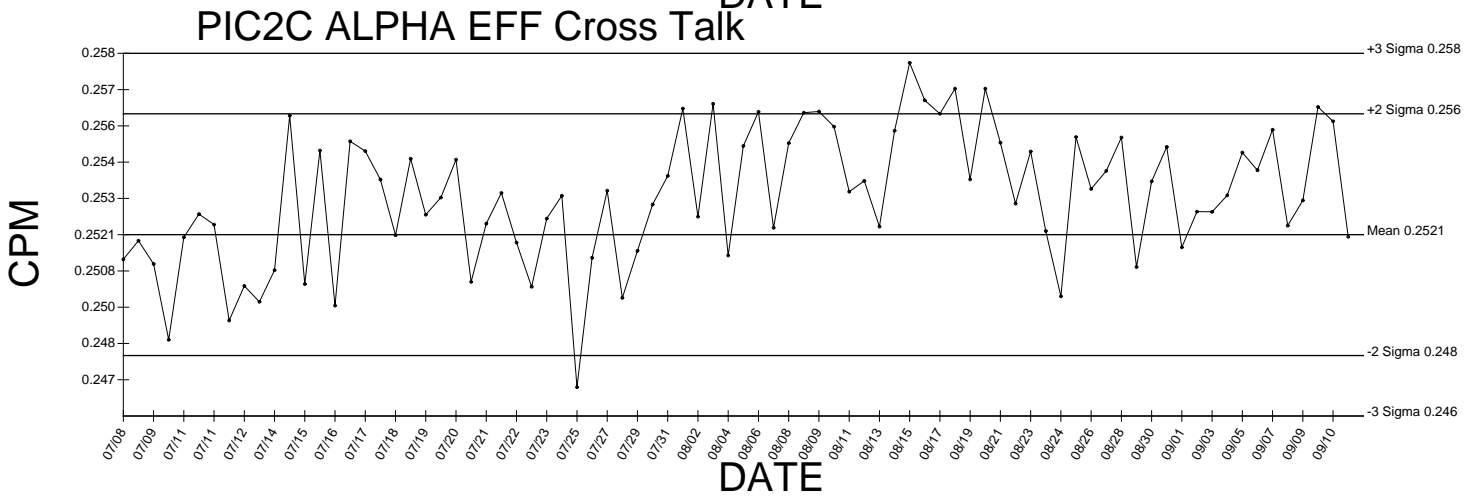
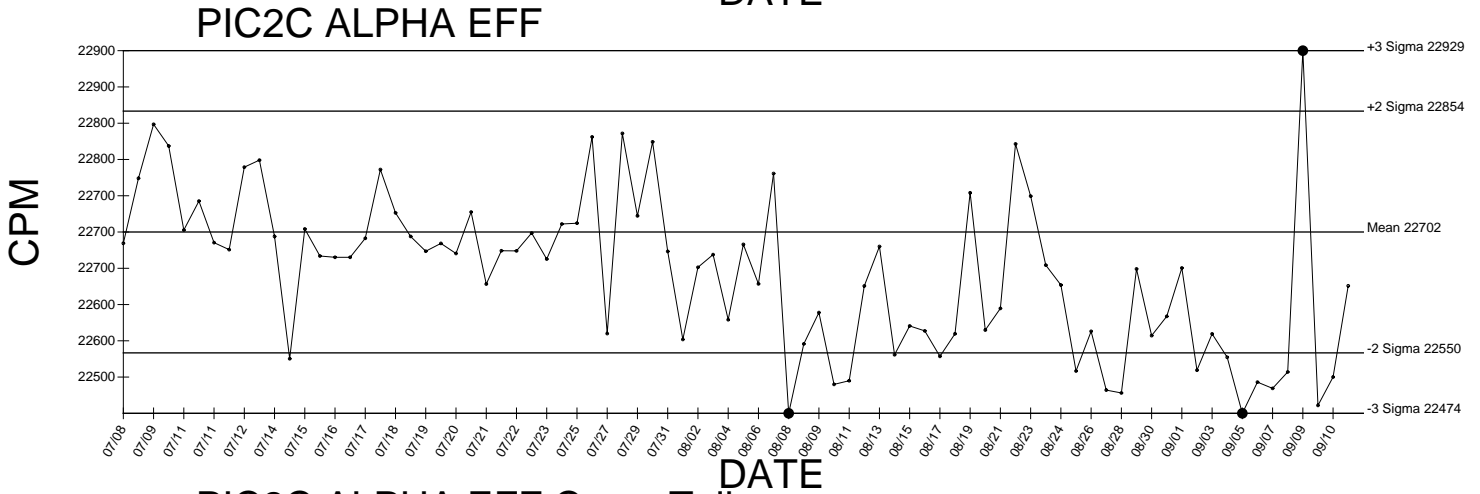
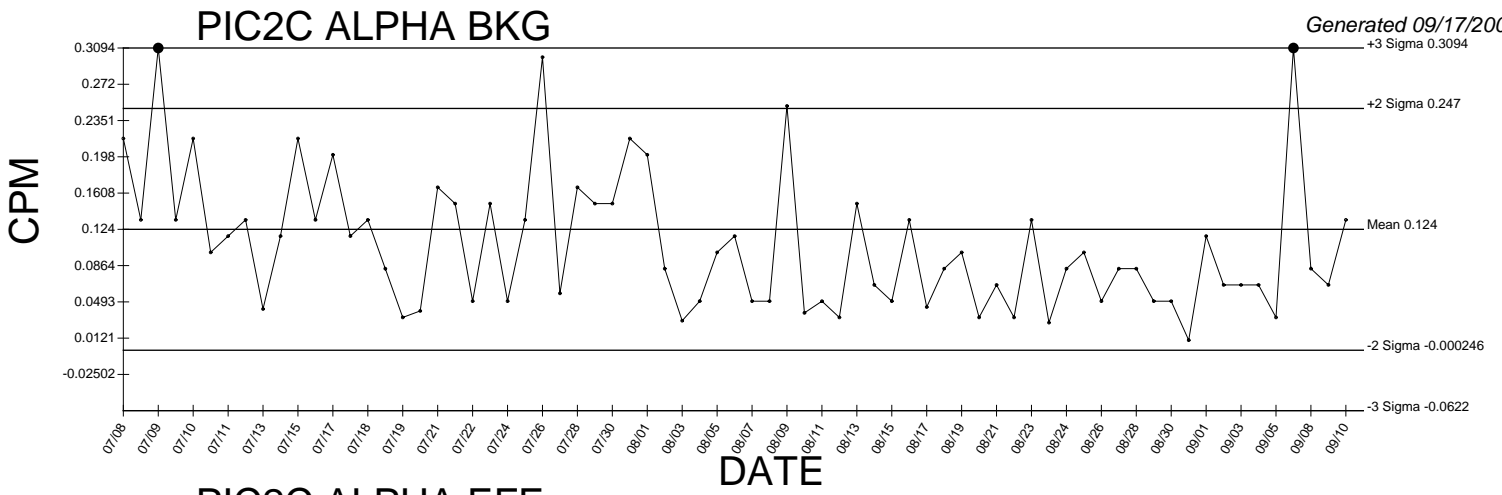
PIC2B BETA EFF



PIC2B BETA EFF Cross Talk

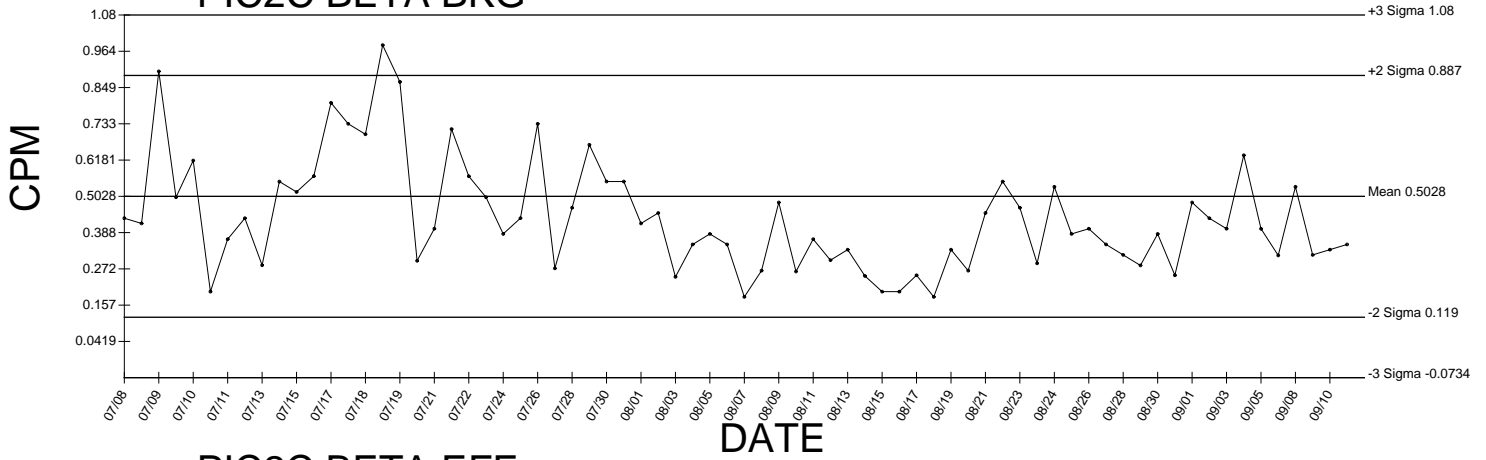


● Denotes Outlier

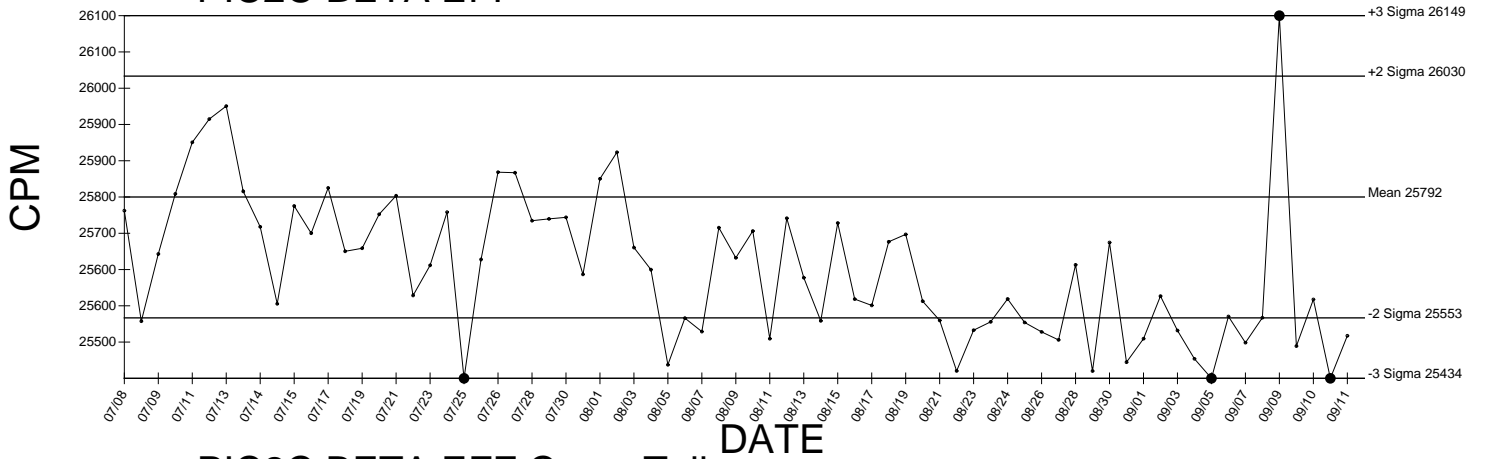


● Denotes Outlier

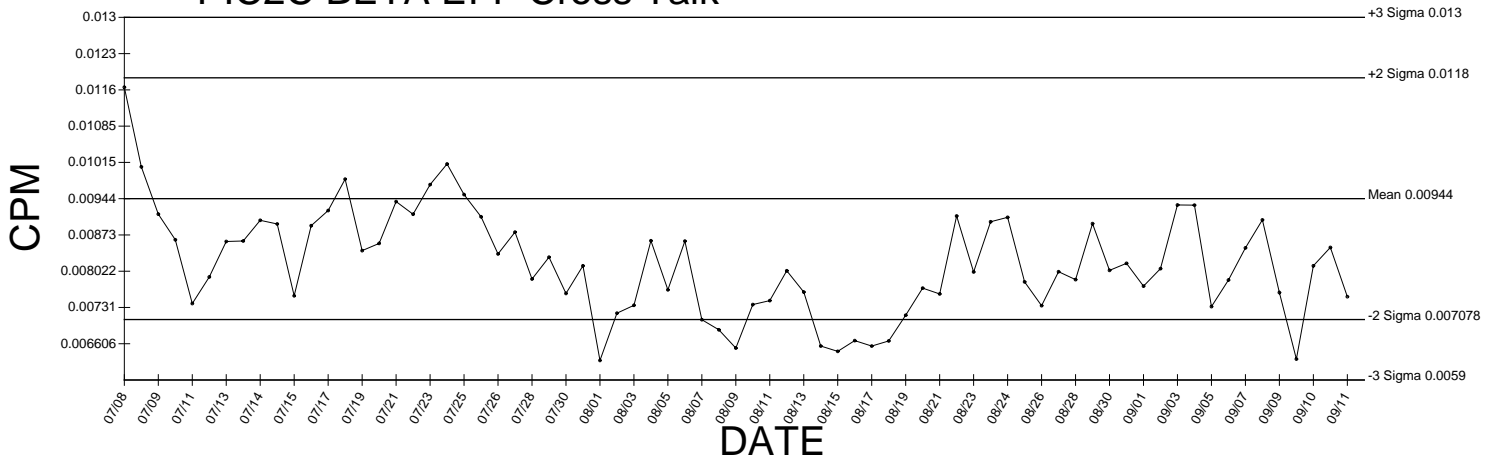
PIC2C BETA BKG



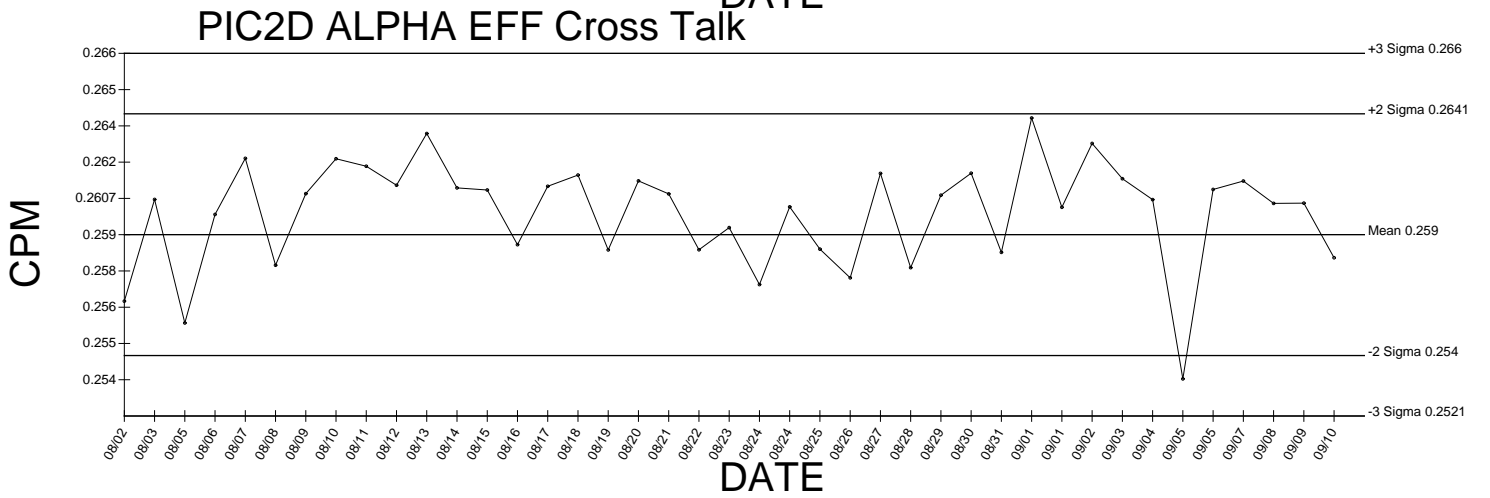
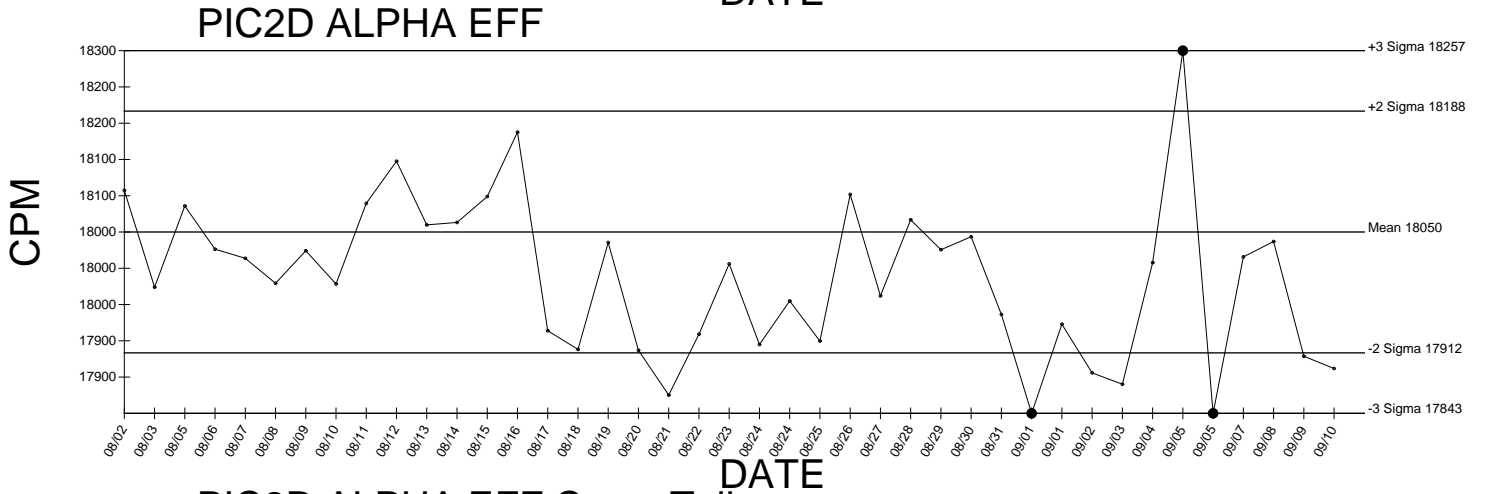
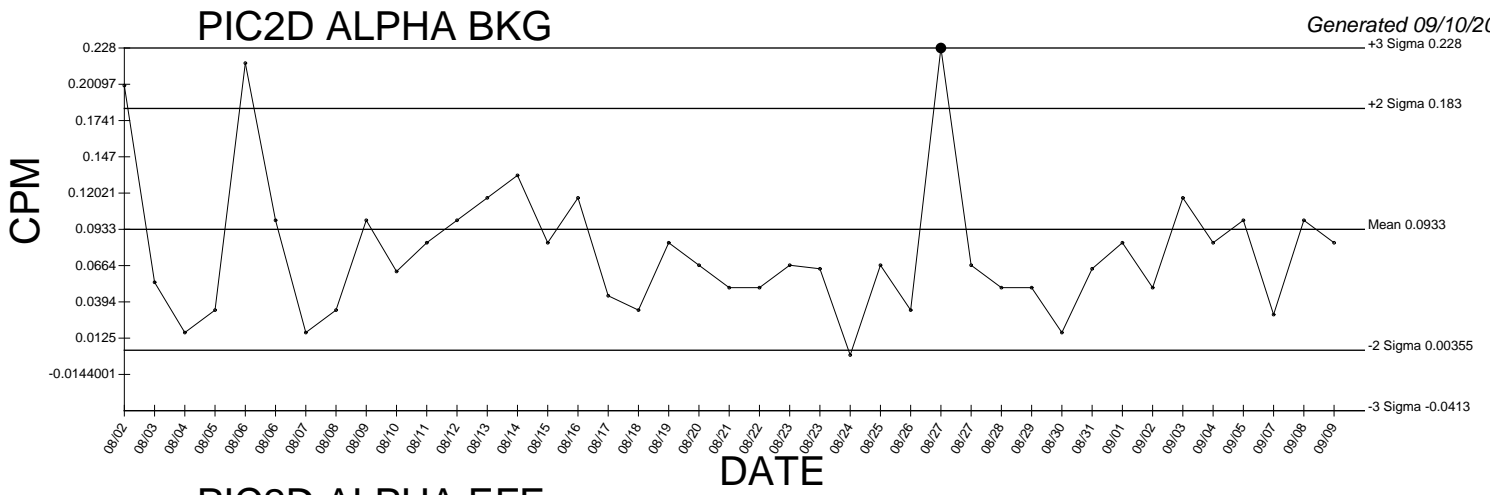
PIC2C BETA EFF



PIC2C BETA EFF Cross Talk



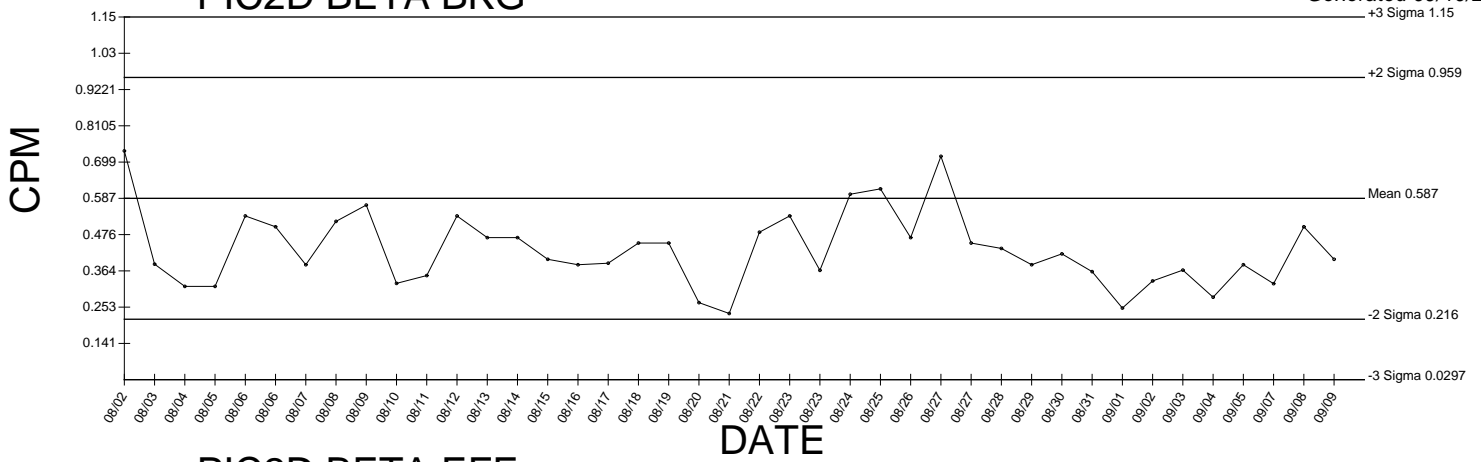
● Denotes Outlier



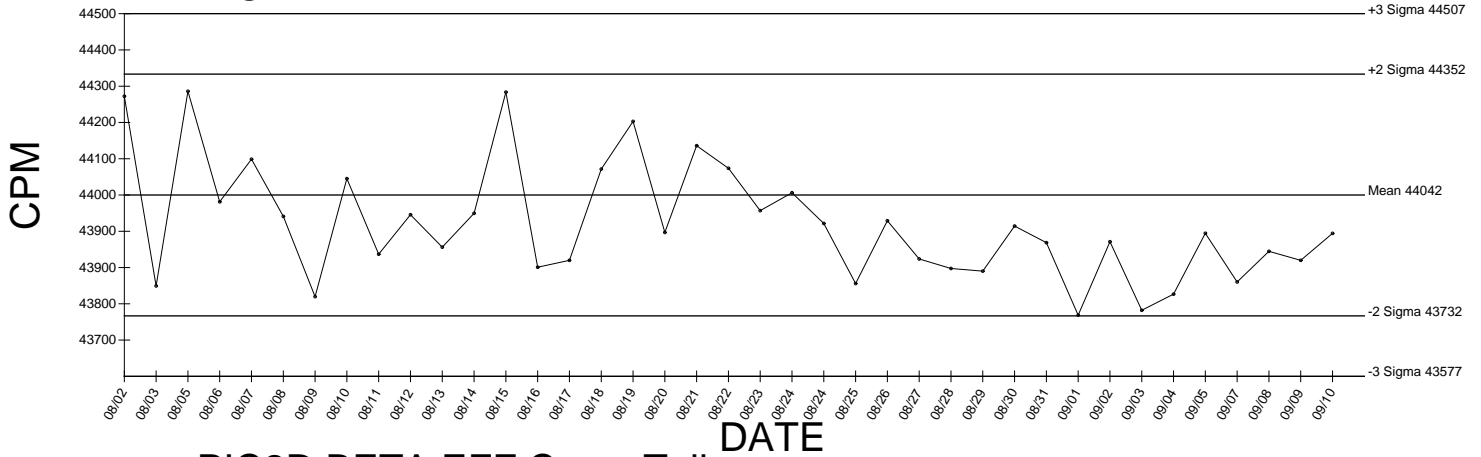
● Denotes Outlier

PIC2D BETA BKG

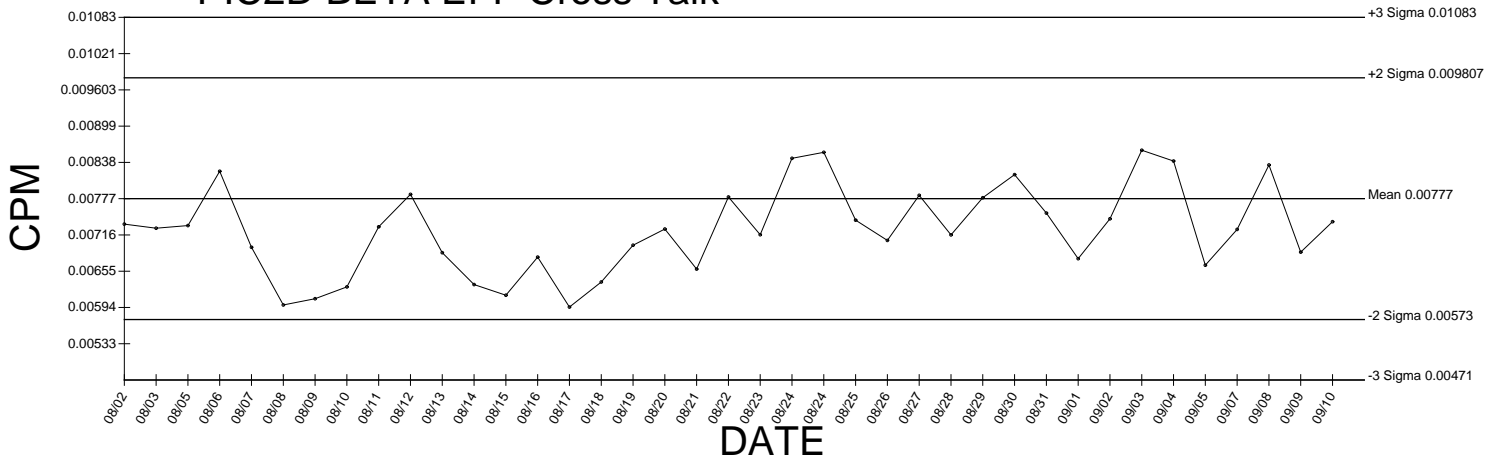
Generated 09/10/2009



PIC2D BETA EFF

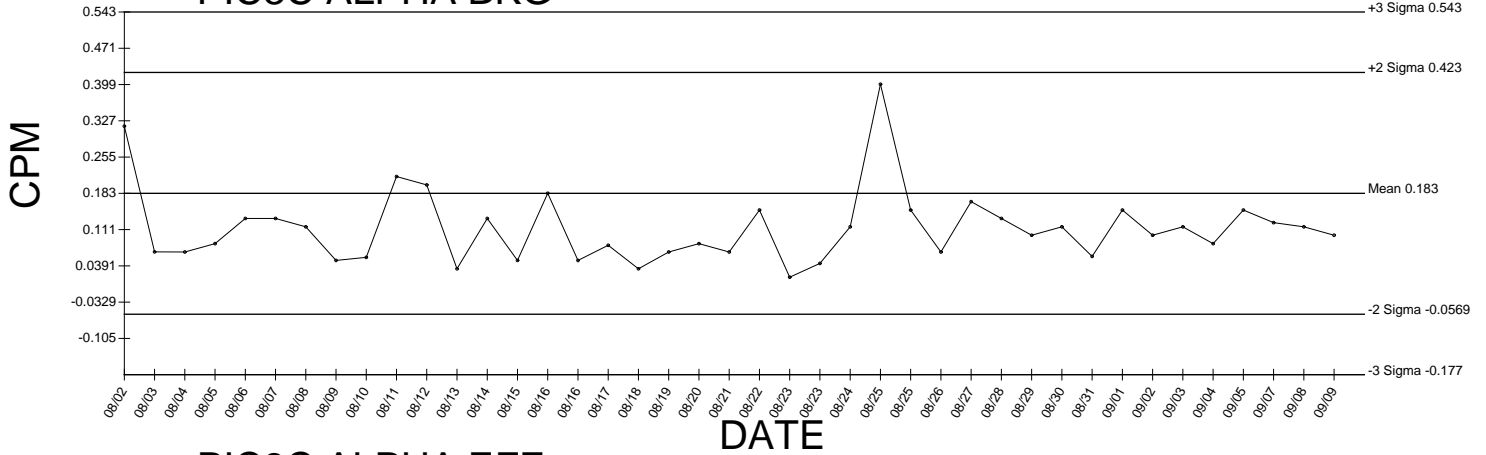


PIC2D BETA EFF Cross Talk

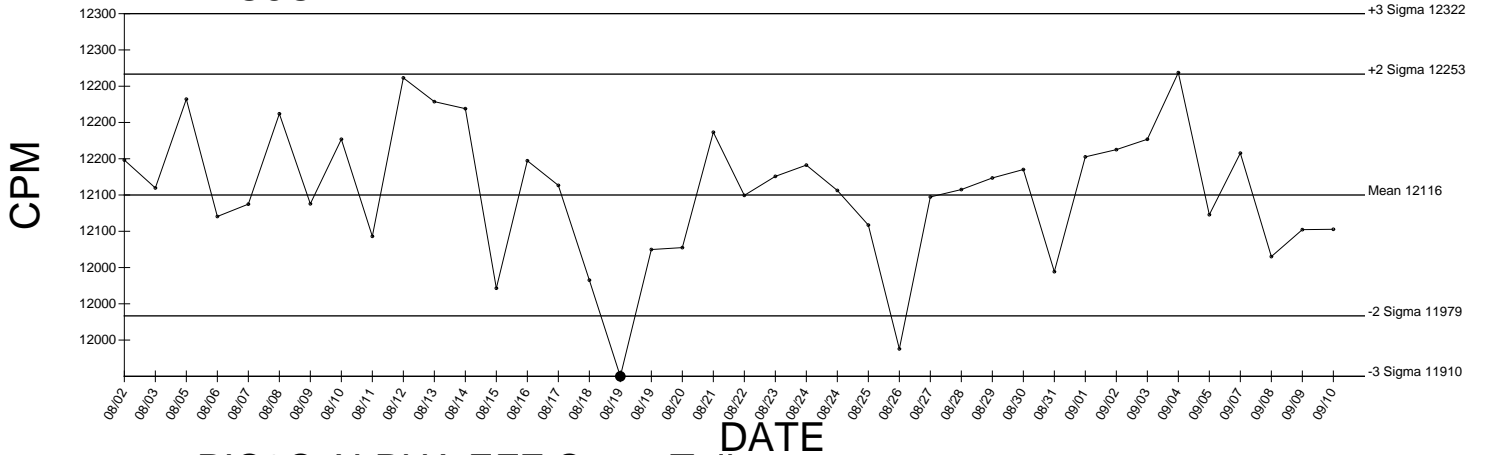


● Denotes Outlier

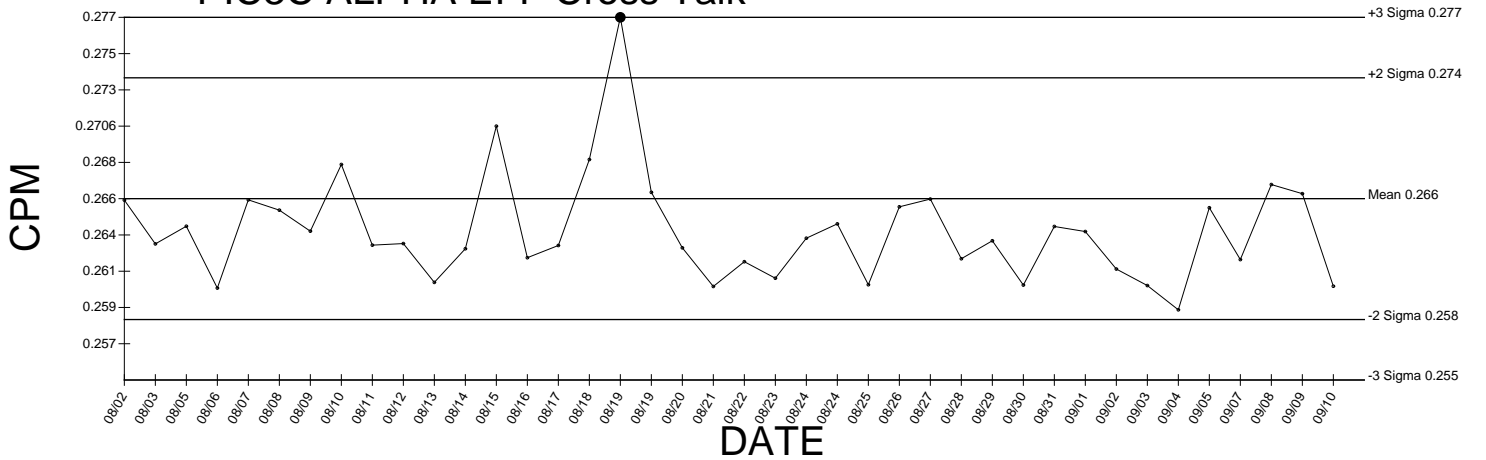
PIC3C ALPHA BKG



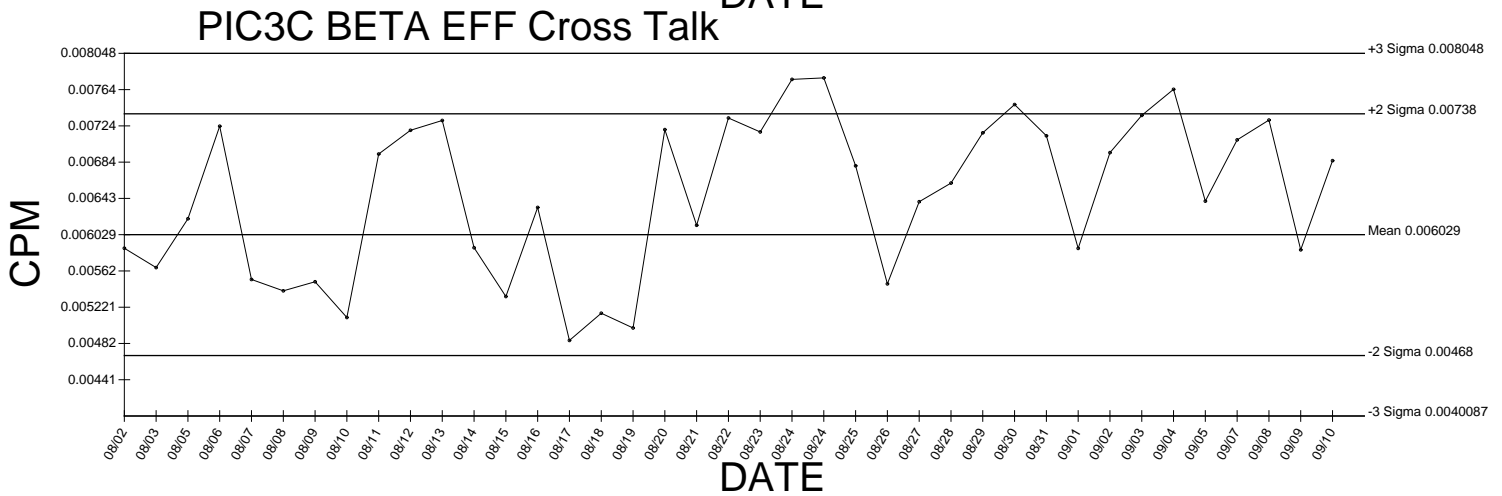
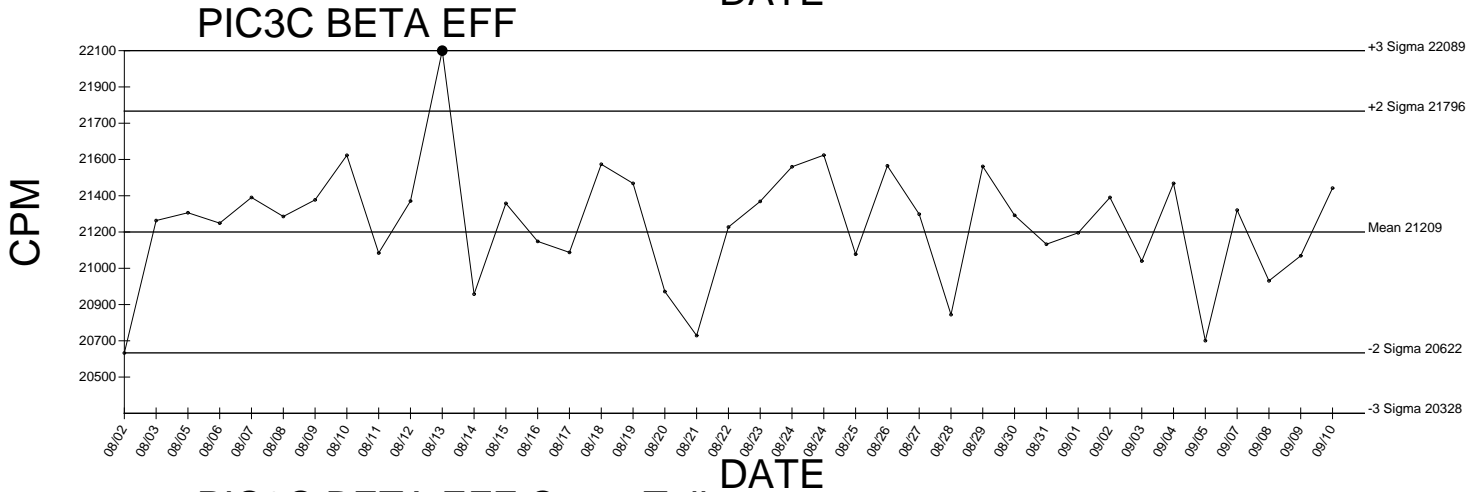
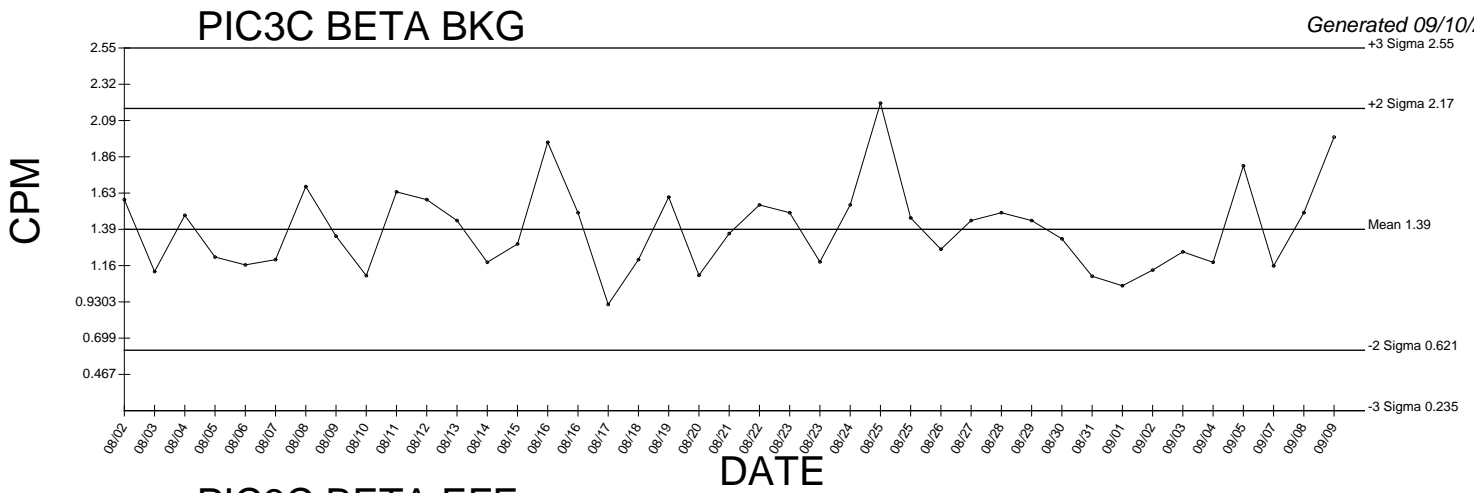
PIC3C ALPHA EFF



PIC3C ALPHA EFF Cross Talk



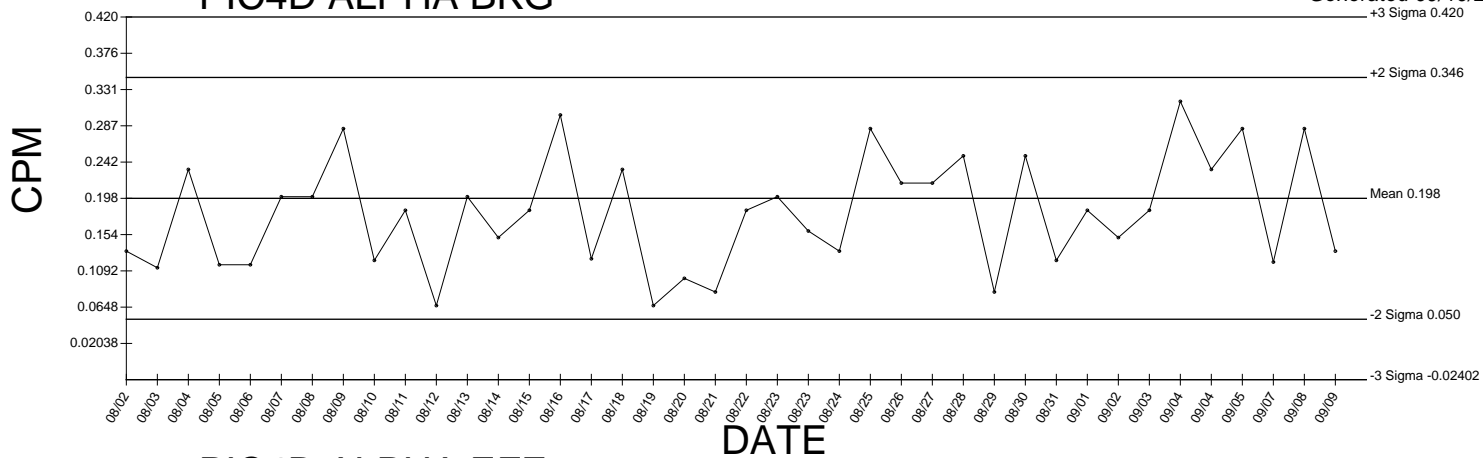
● Denotes Outlier



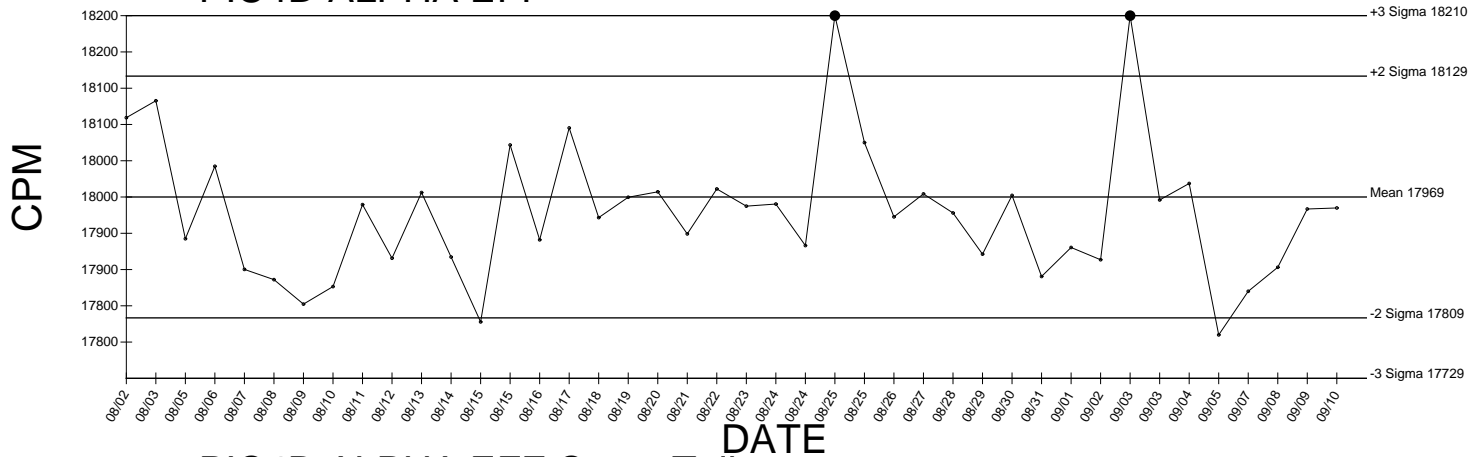
● Denotes Outlier

PIC4D ALPHA BKG

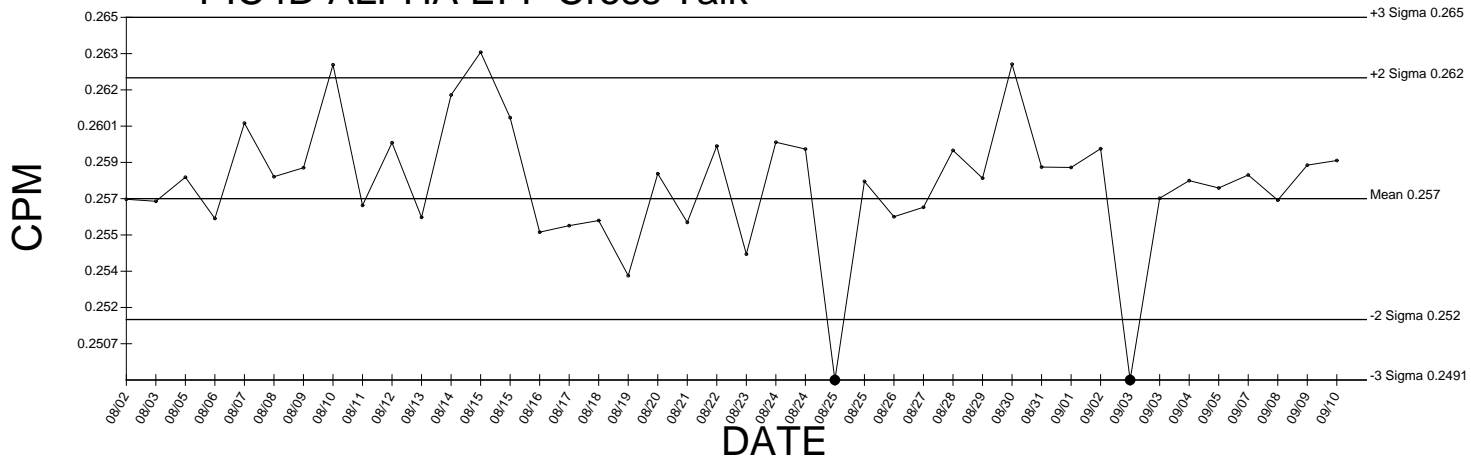
Generated 09/10/2009



PIC4D ALPHA EFF



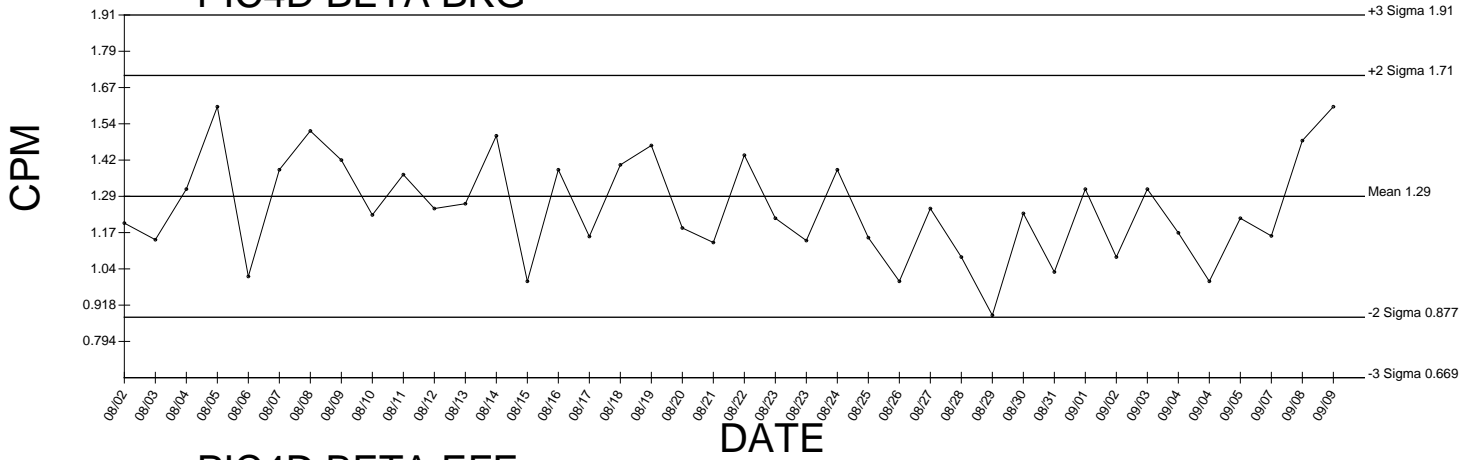
PIC4D ALPHA EFF Cross Talk



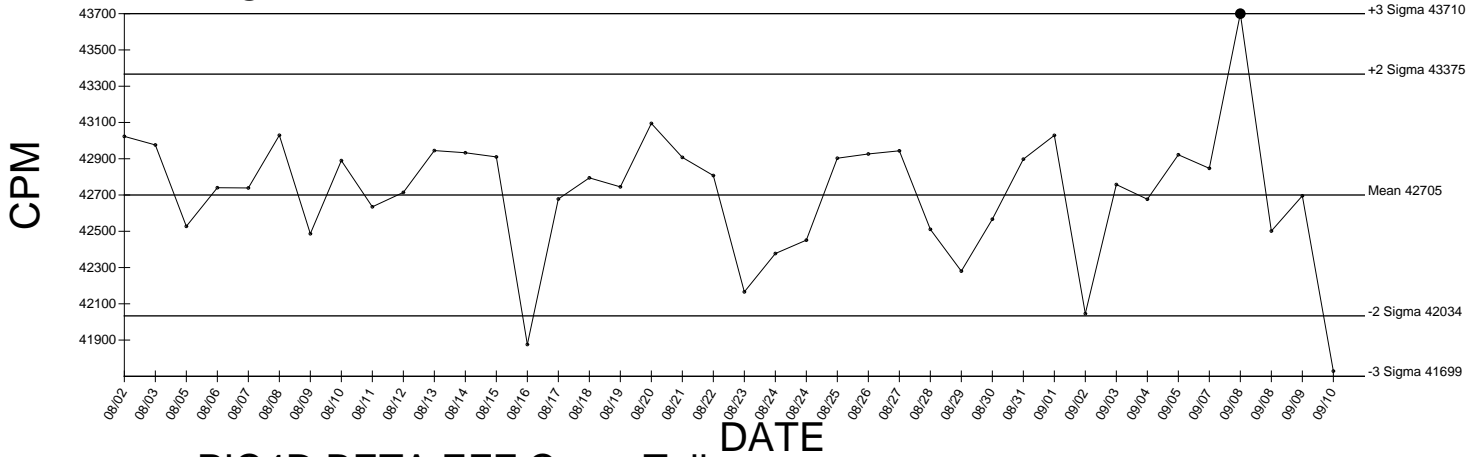
● Denotes Outlier

PIC4D BETA BKG

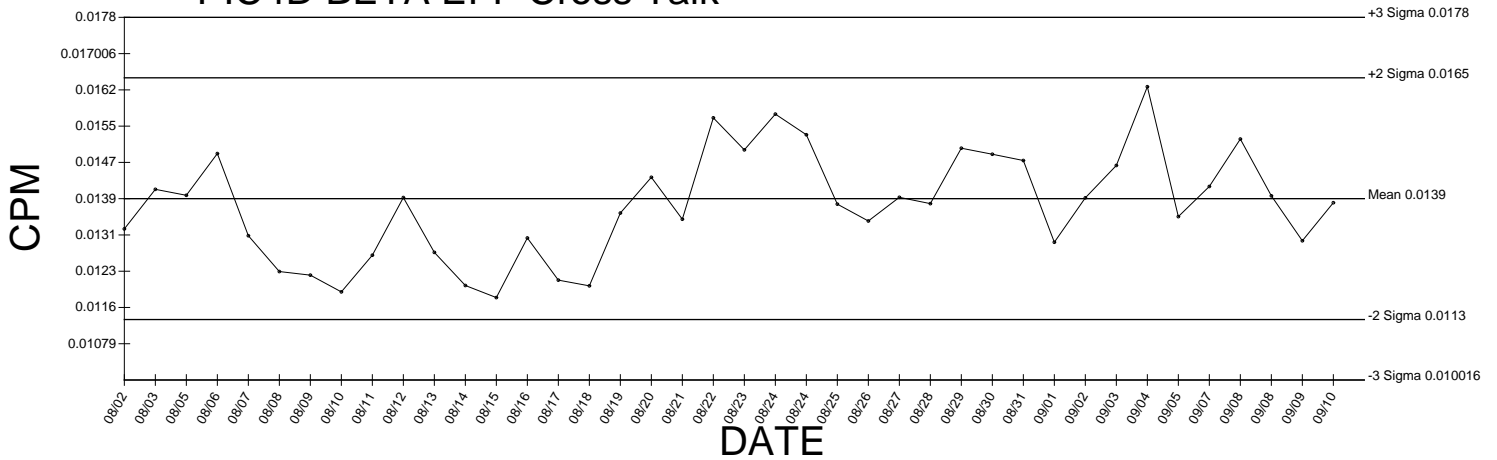
Generated 09/10/2009



PIC4D BETA EFF



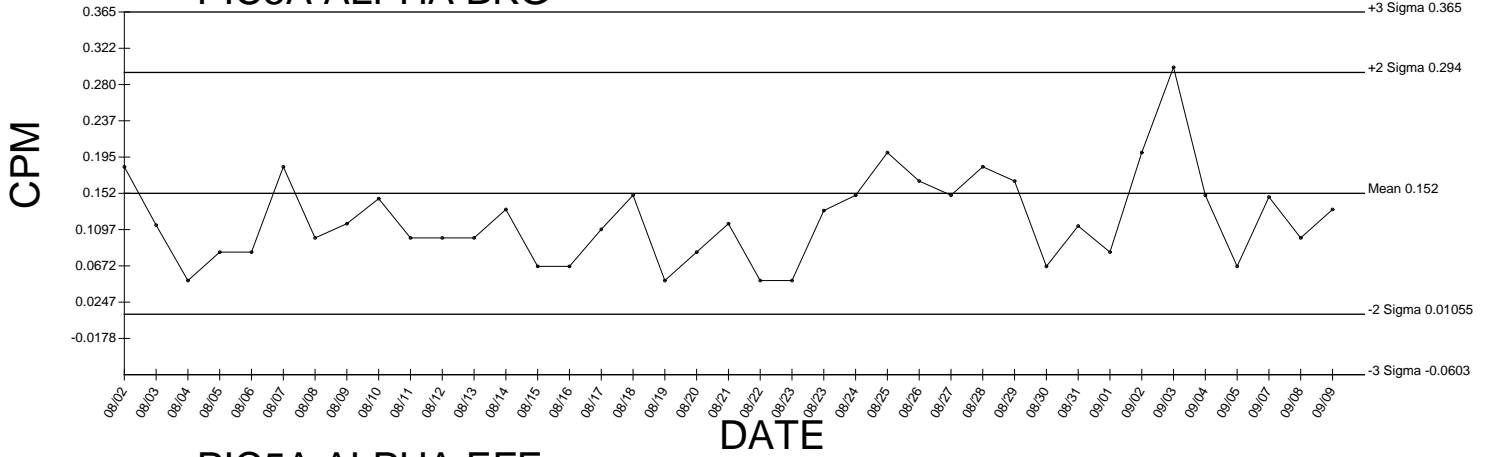
PIC4D BETA EFF Cross Talk



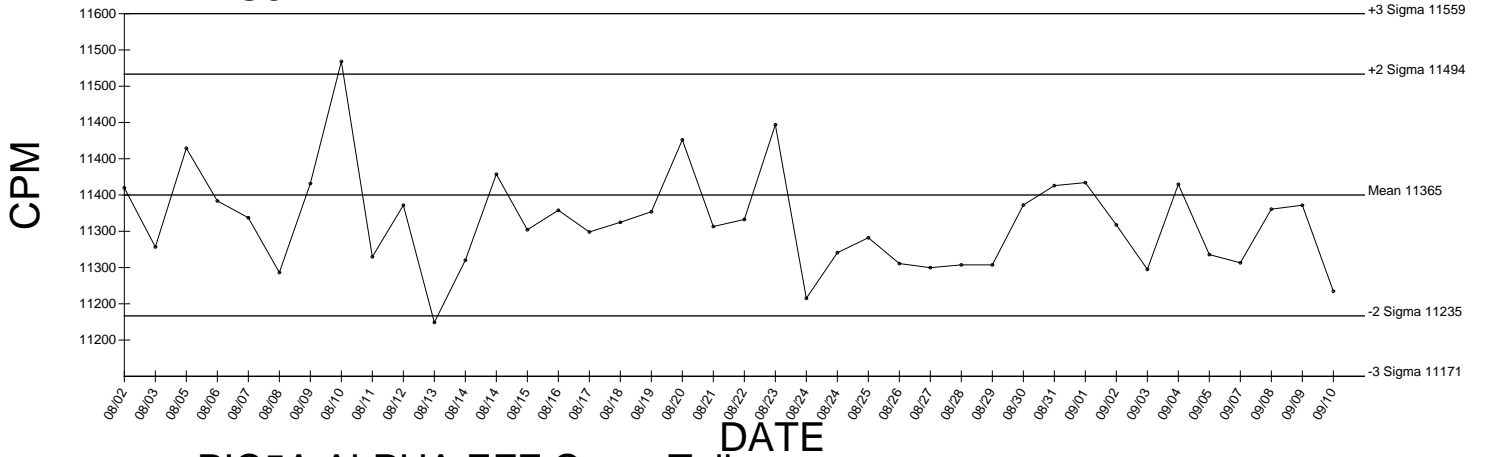
● Denotes Outlier

PIC5A ALPHA BKG

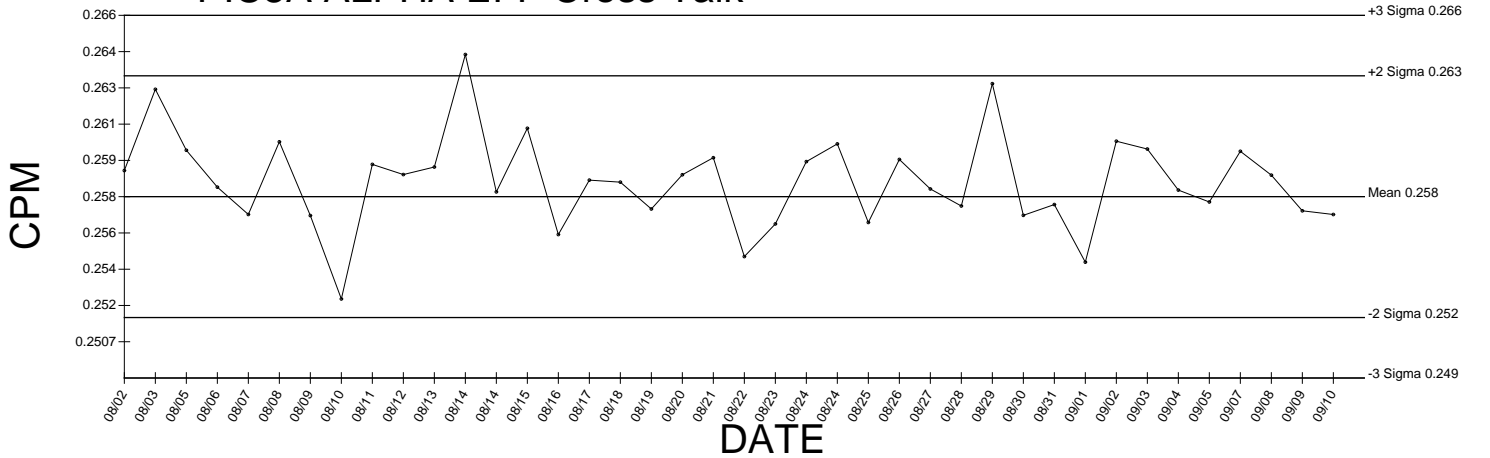
Generated 09/10/2009



PIC5A ALPHA EFF



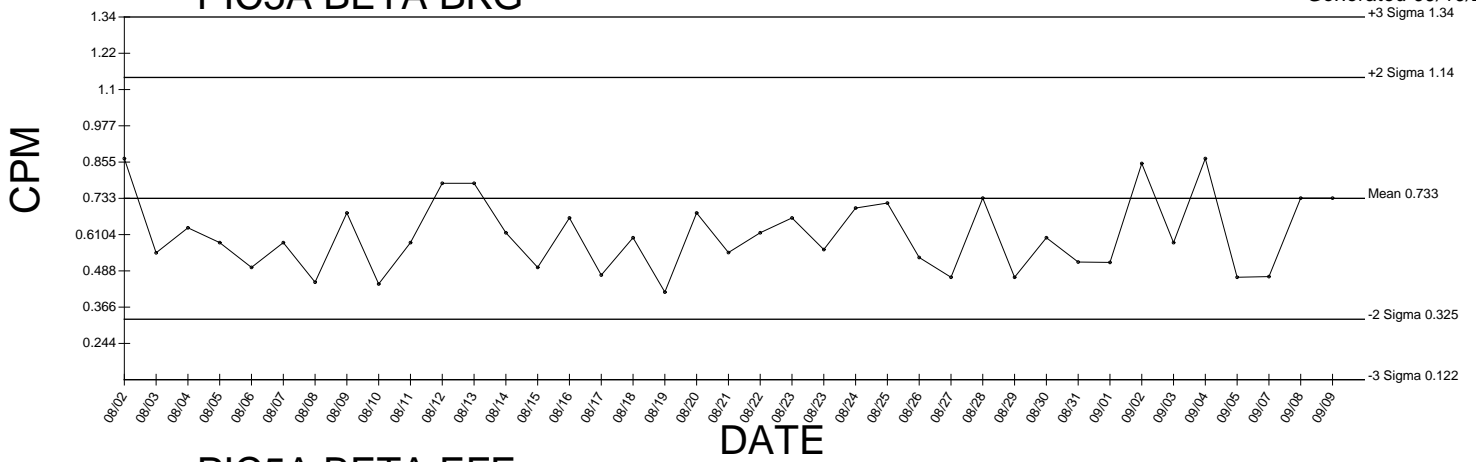
PIC5A ALPHA EFF Cross Talk



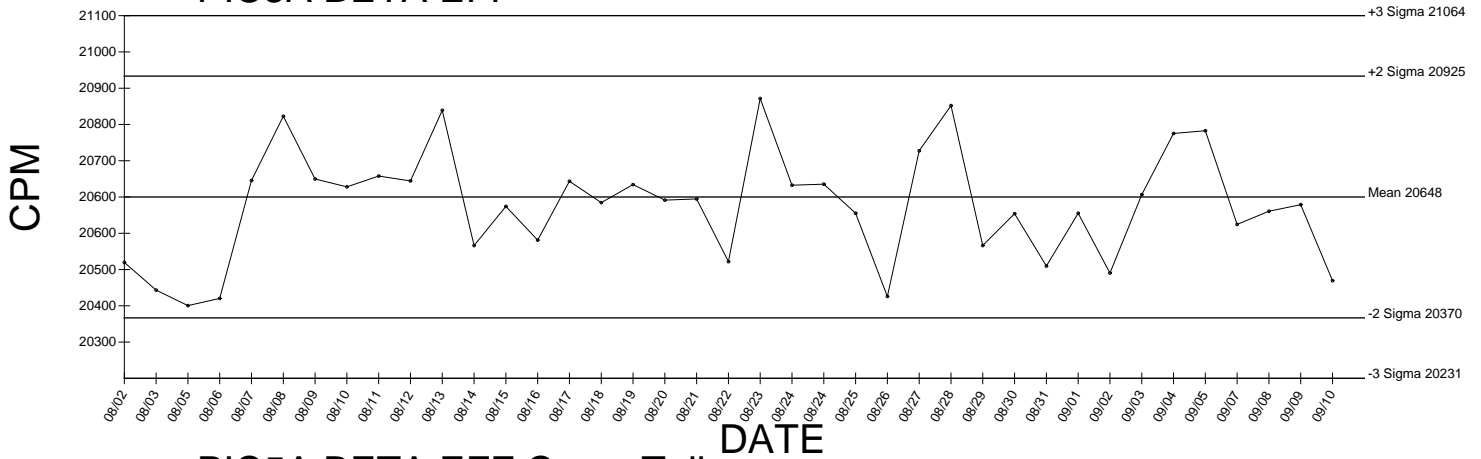
● Denotes Outlier

PIC5A BETA BKG

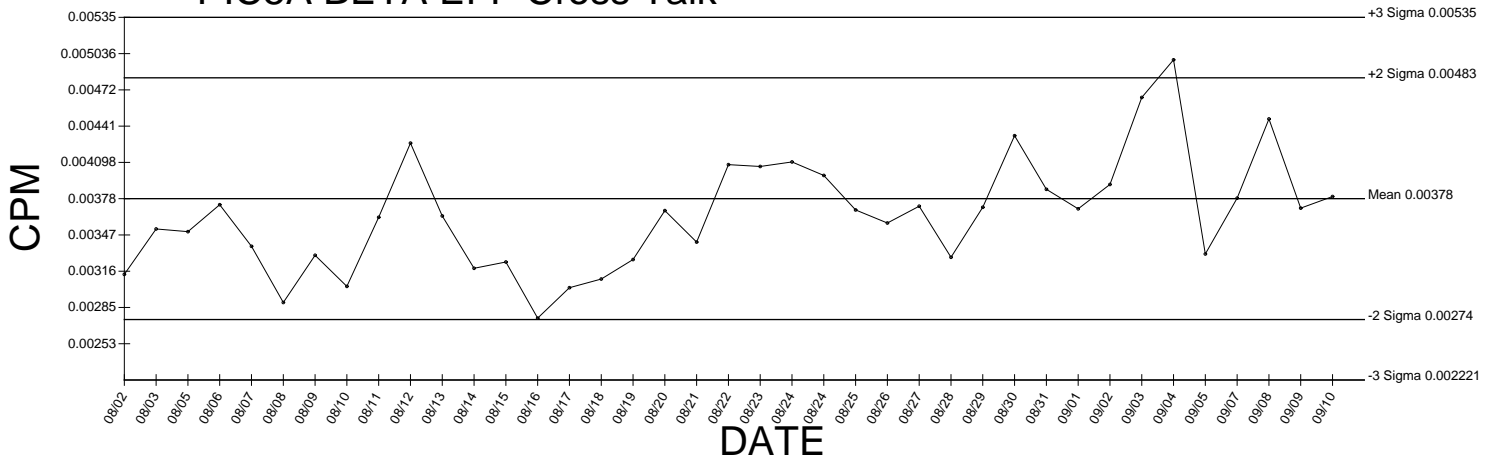
Generated 09/10/2009



PIC5A BETA EFF

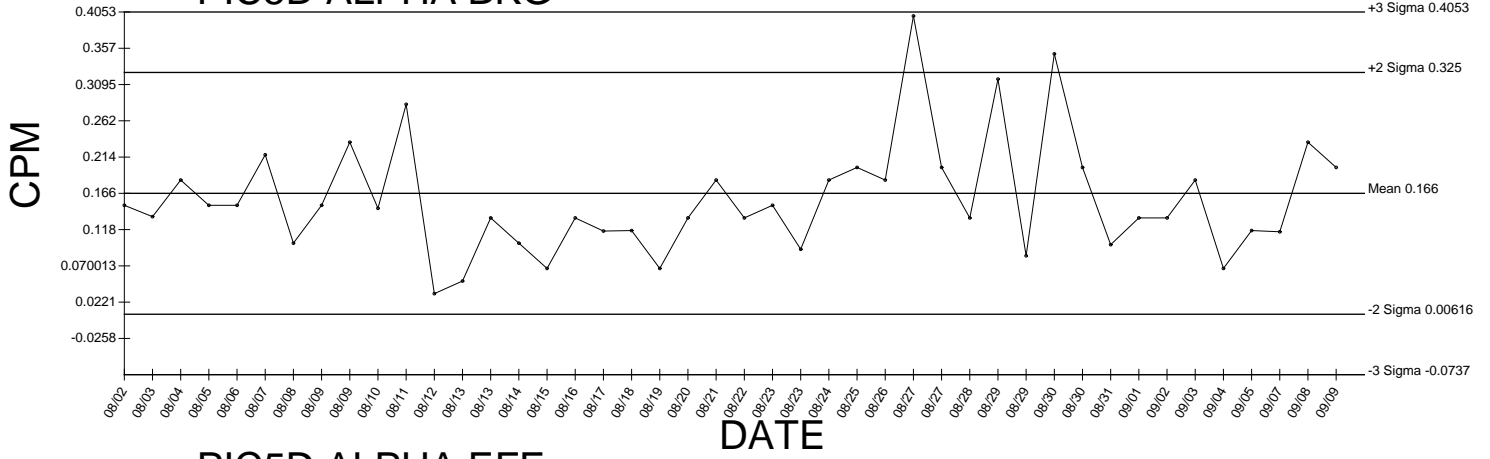


PIC5A BETA EFF Cross Talk

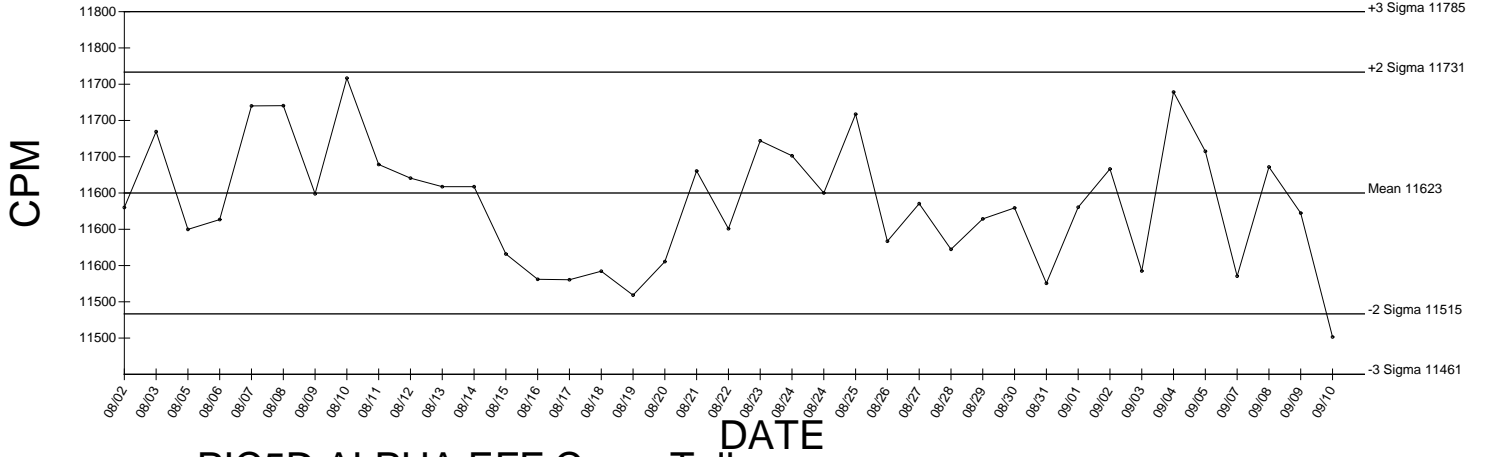


● Denotes Outlier

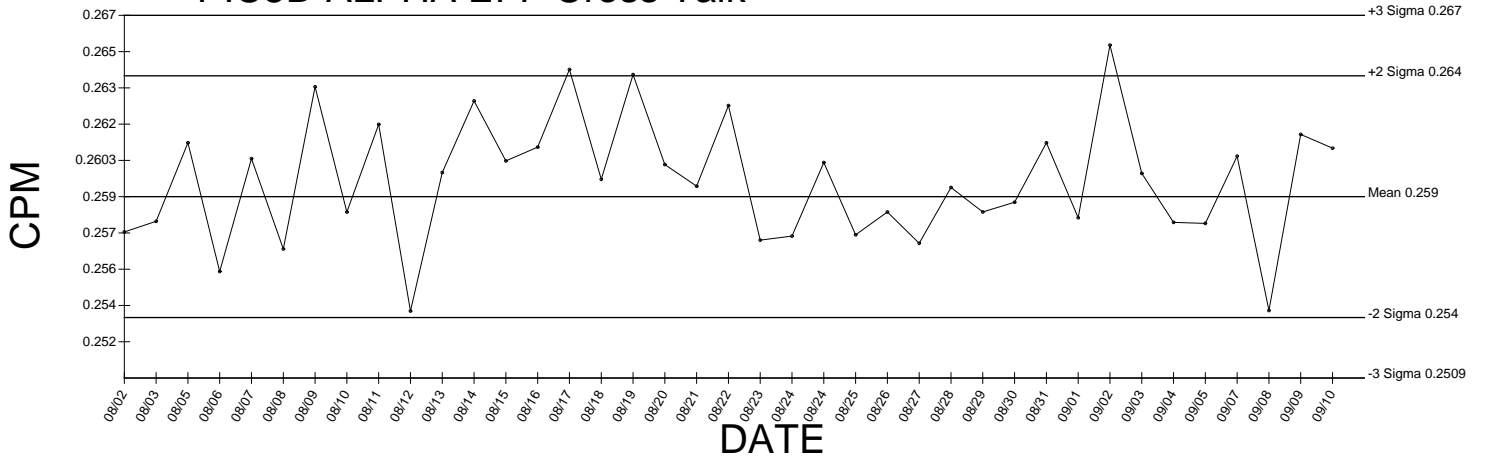
PIC5D ALPHA BKG



PIC5D ALPHA EFF



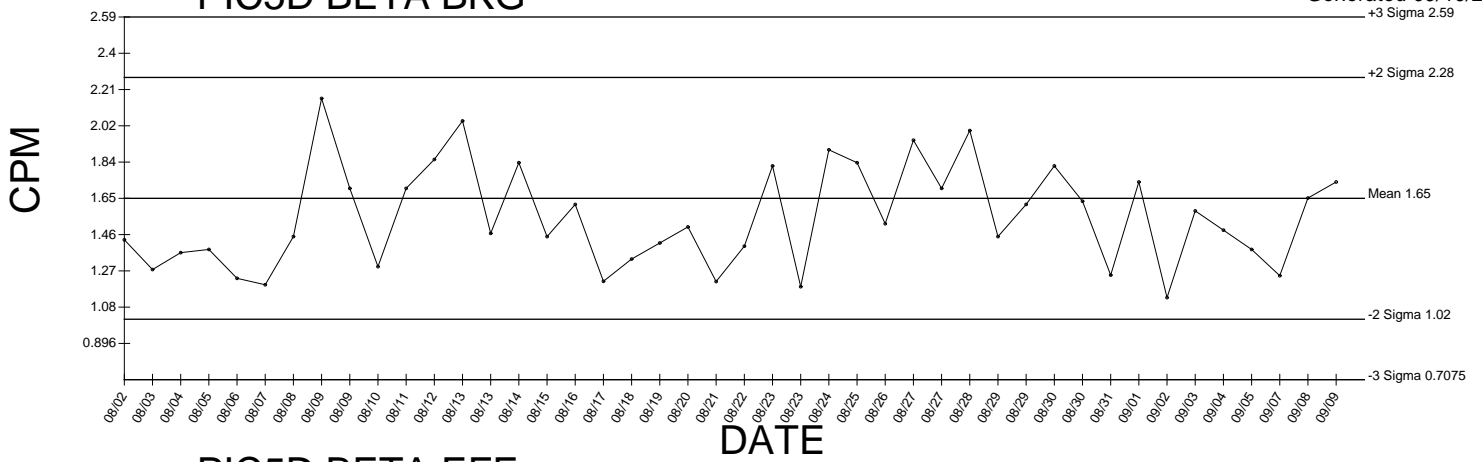
PIC5D ALPHA EFF Cross Talk



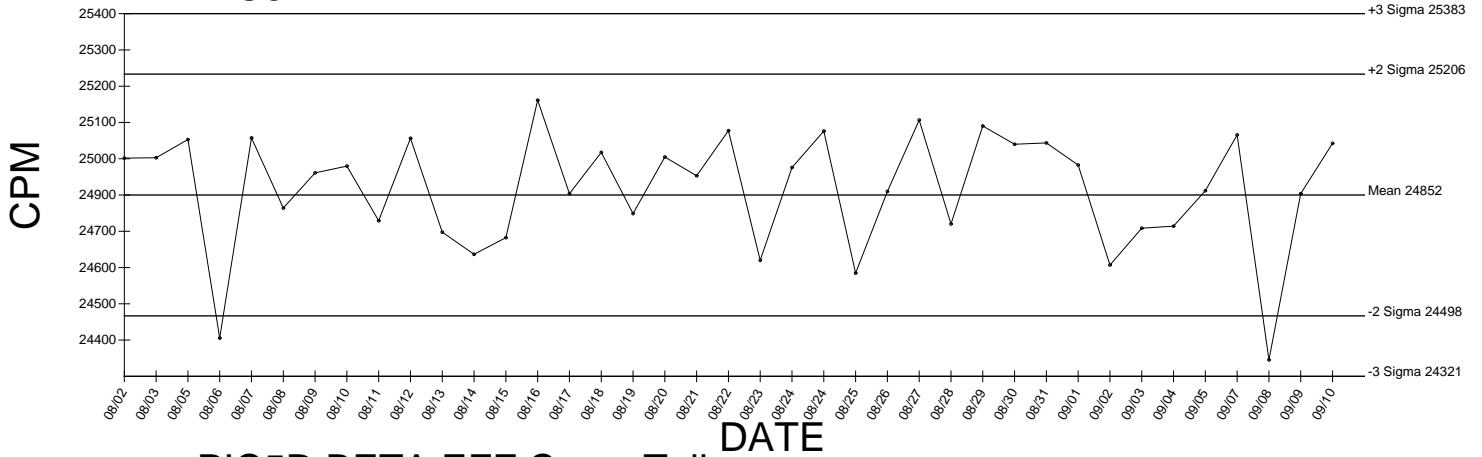
● Denotes Outlier

PIC5D BETA BKG

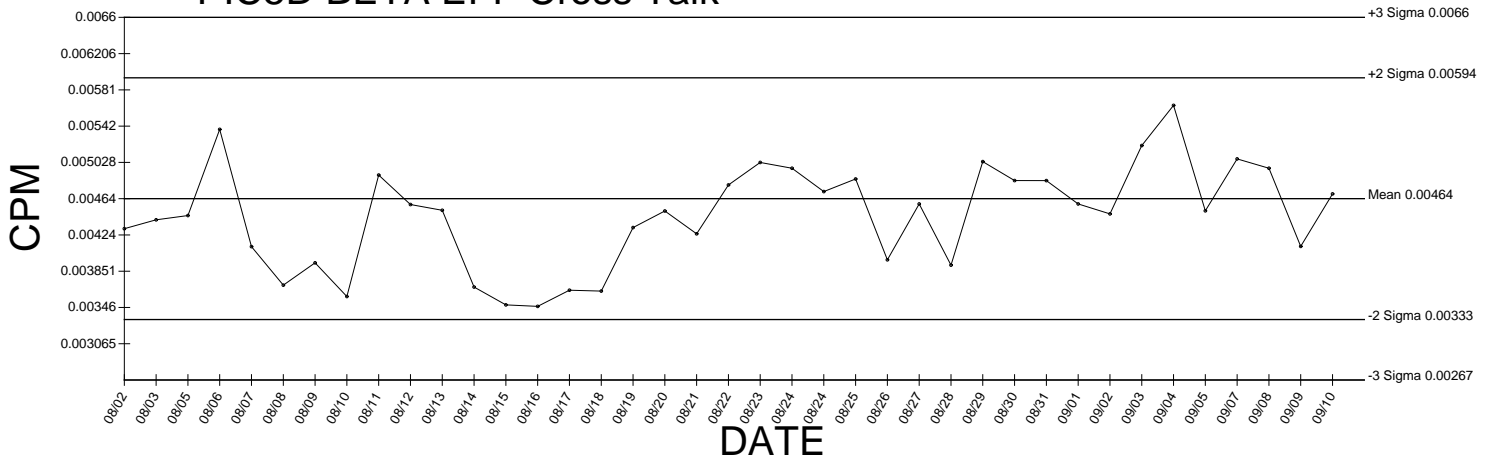
Generated 09/10/2009



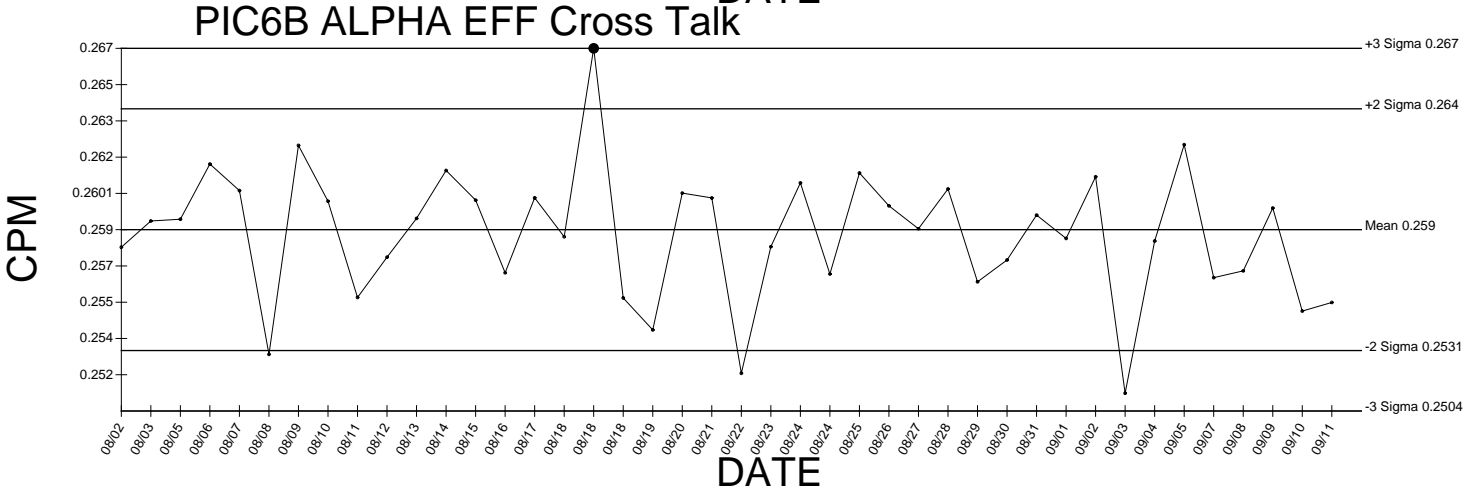
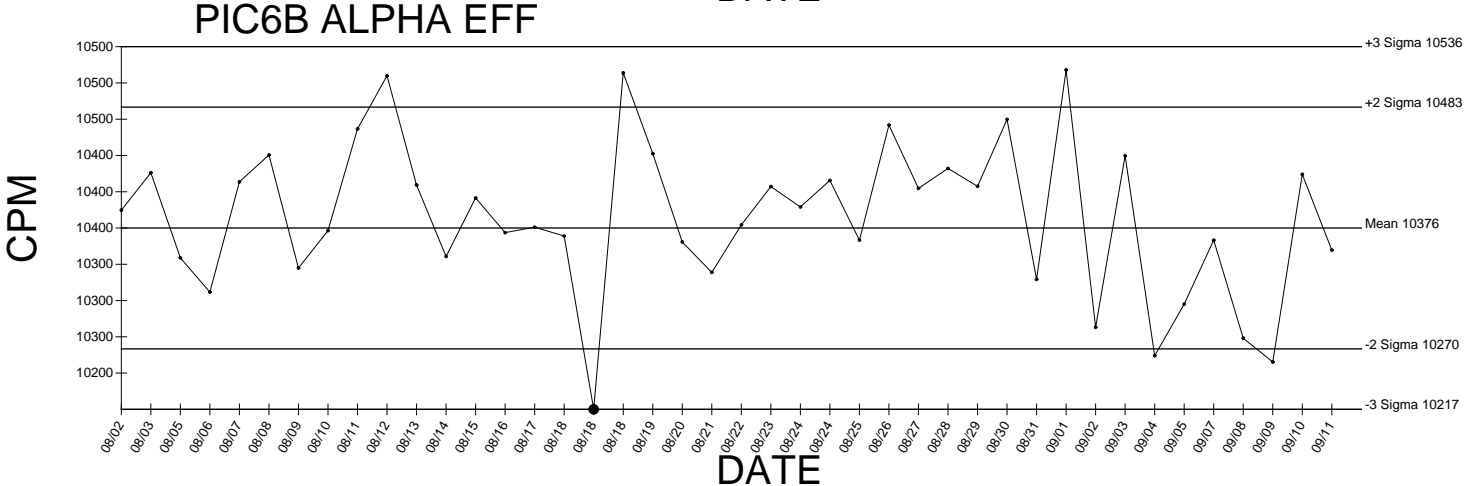
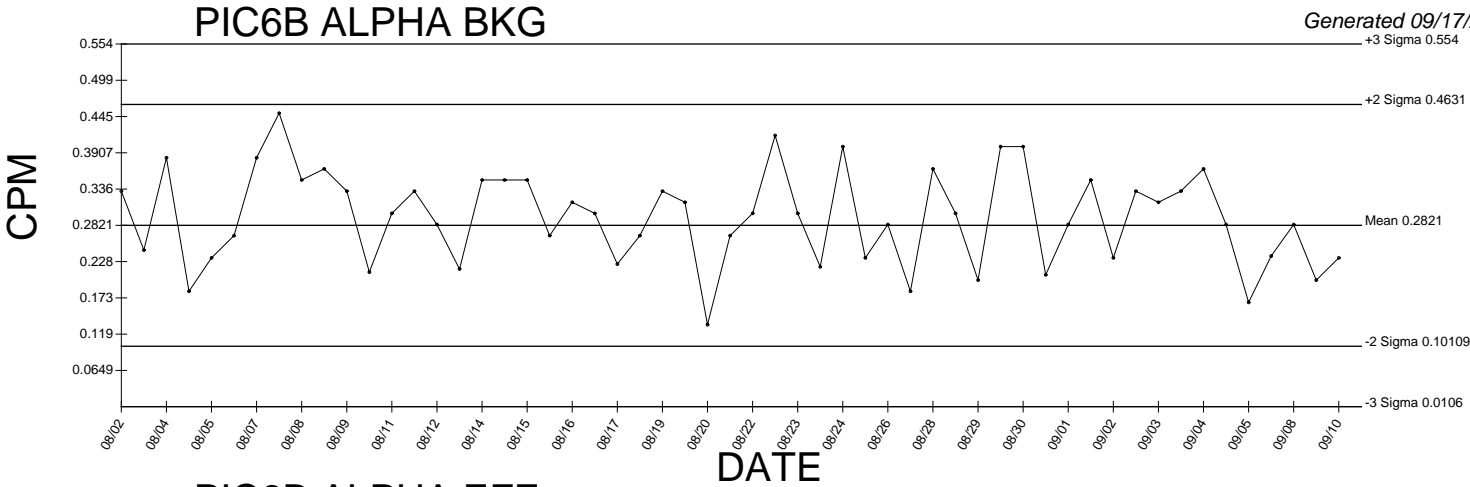
PIC5D BETA EFF



PIC5D BETA EFF Cross Talk



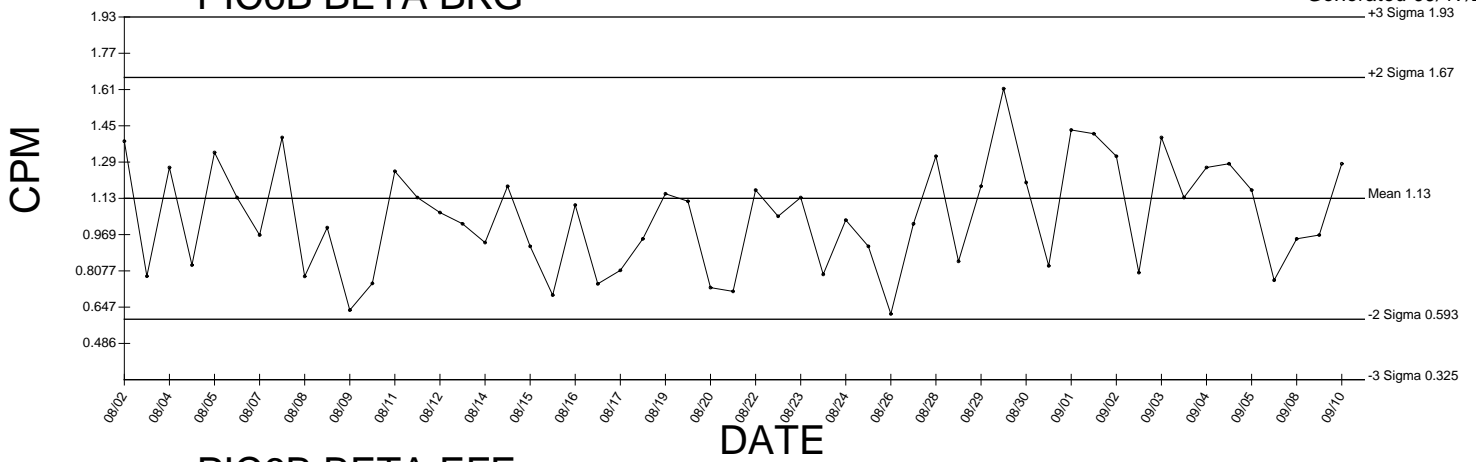
● Denotes Outlier



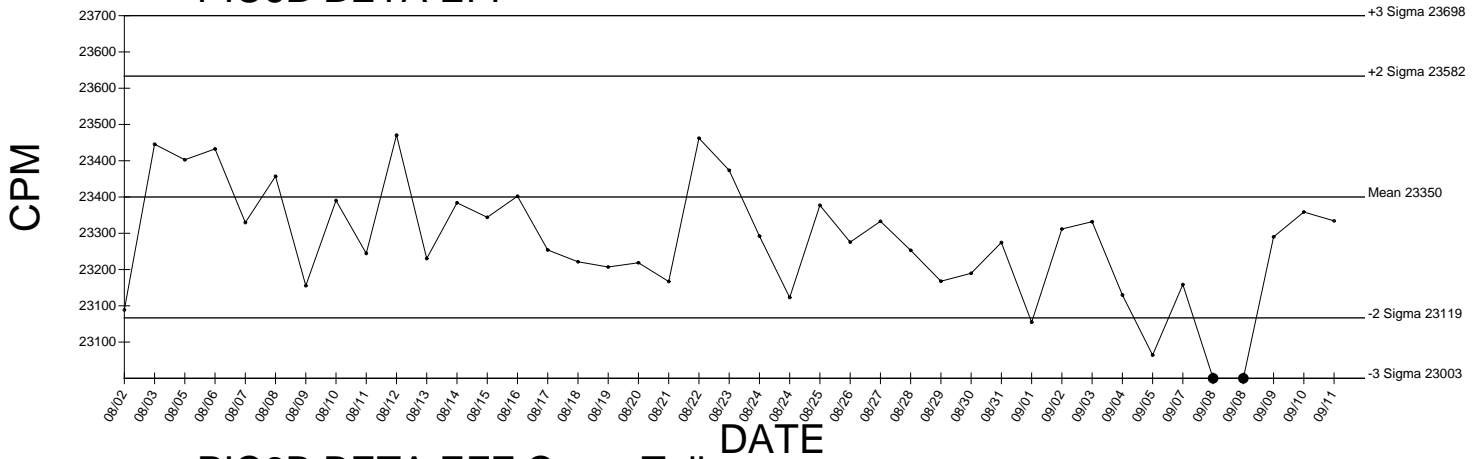
● Denotes Outlier

PIC6B BETA BKG

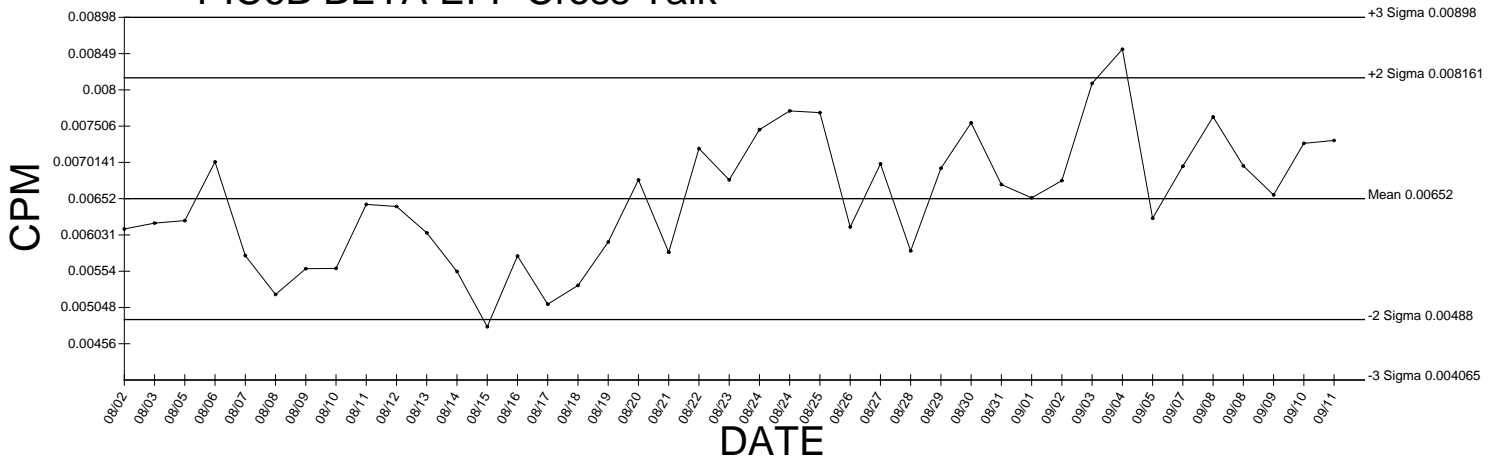
Generated 09/17/2009



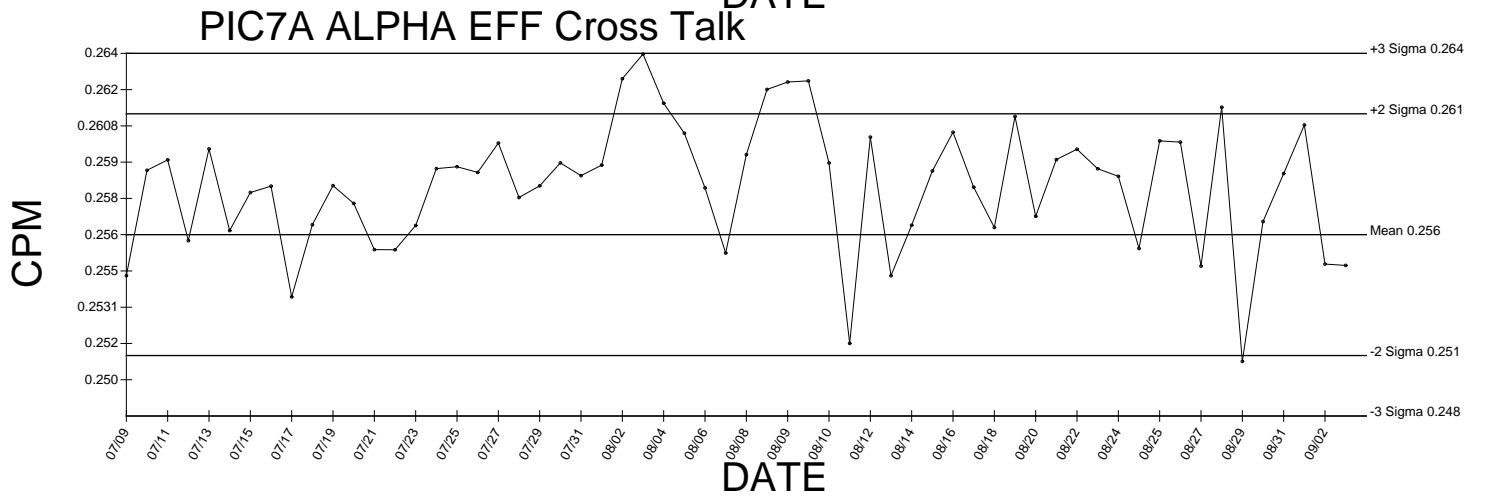
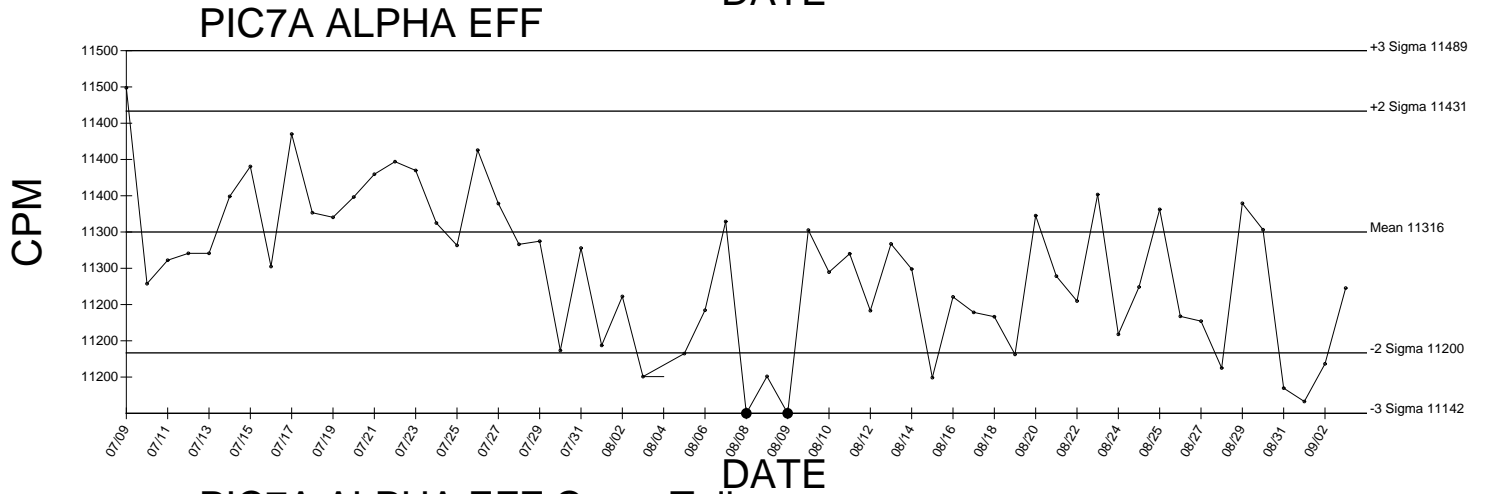
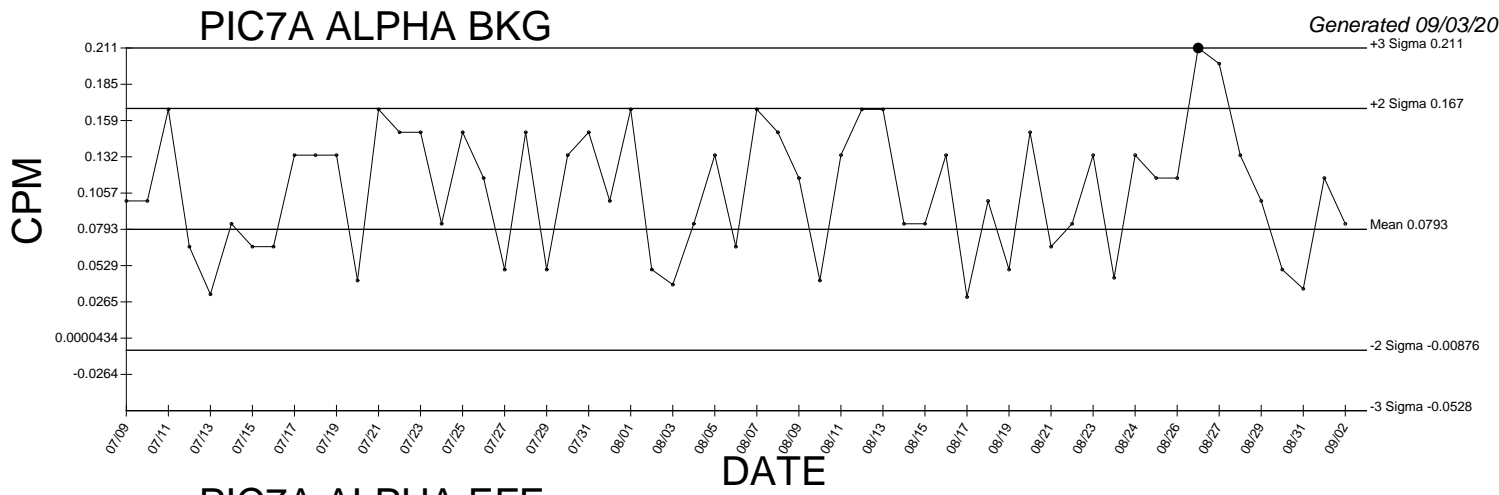
PIC6B BETA EFF



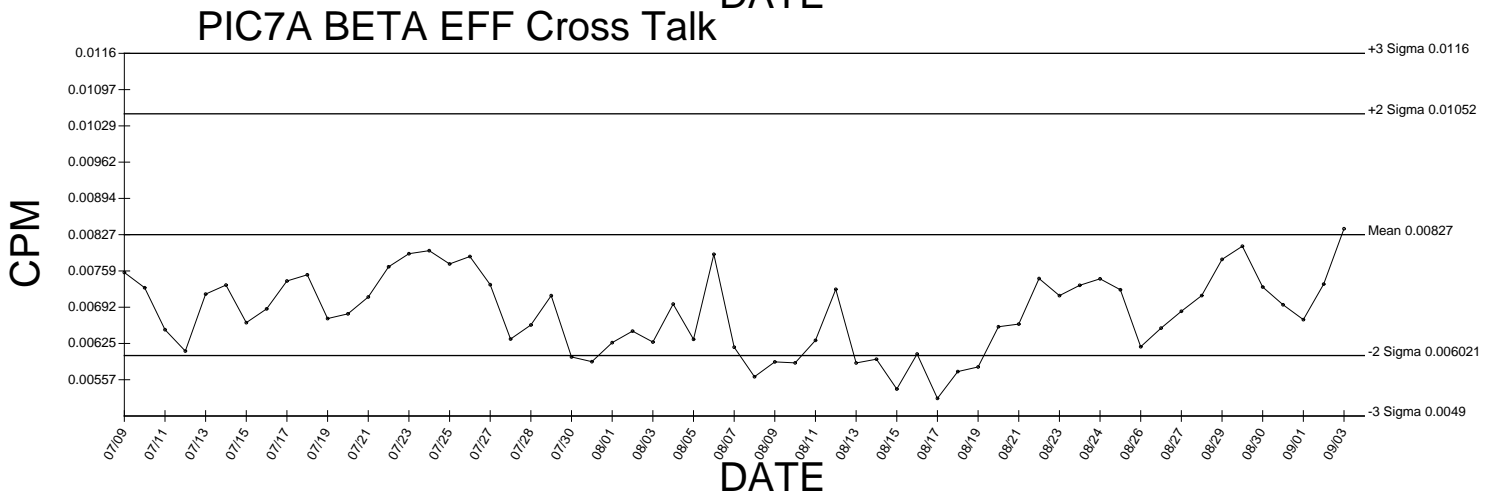
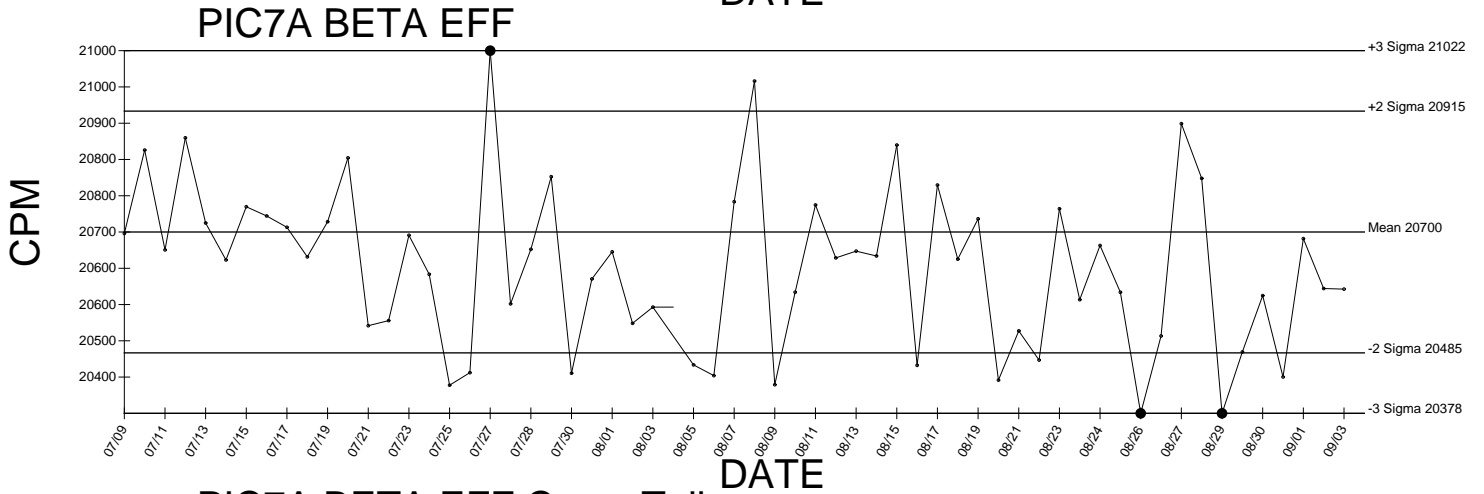
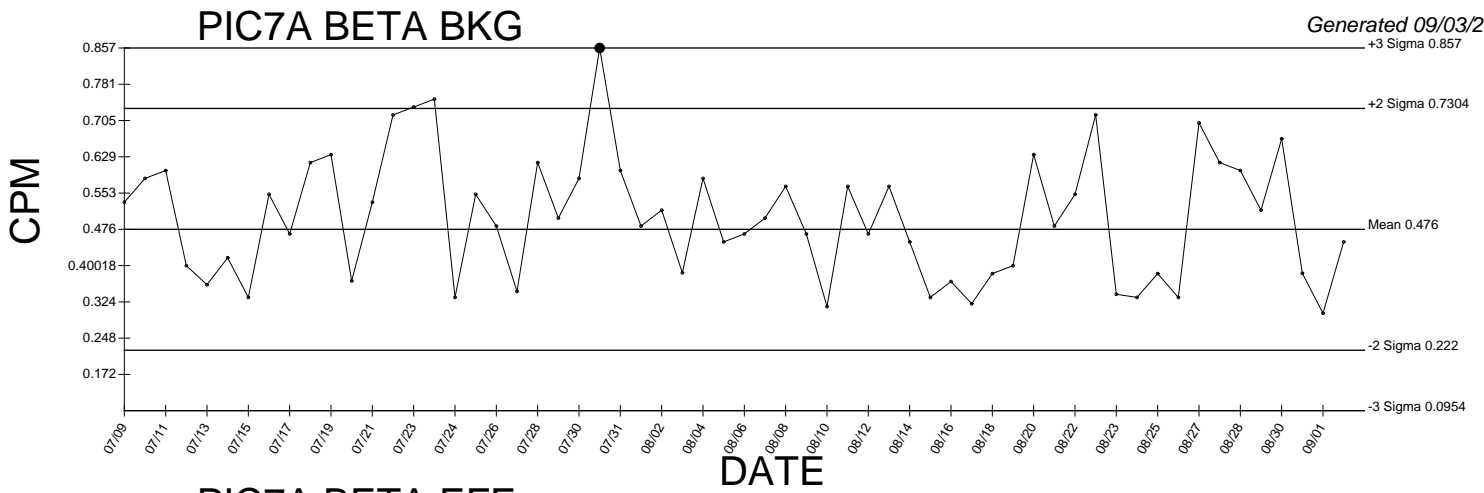
PIC6B BETA EFF Cross Talk



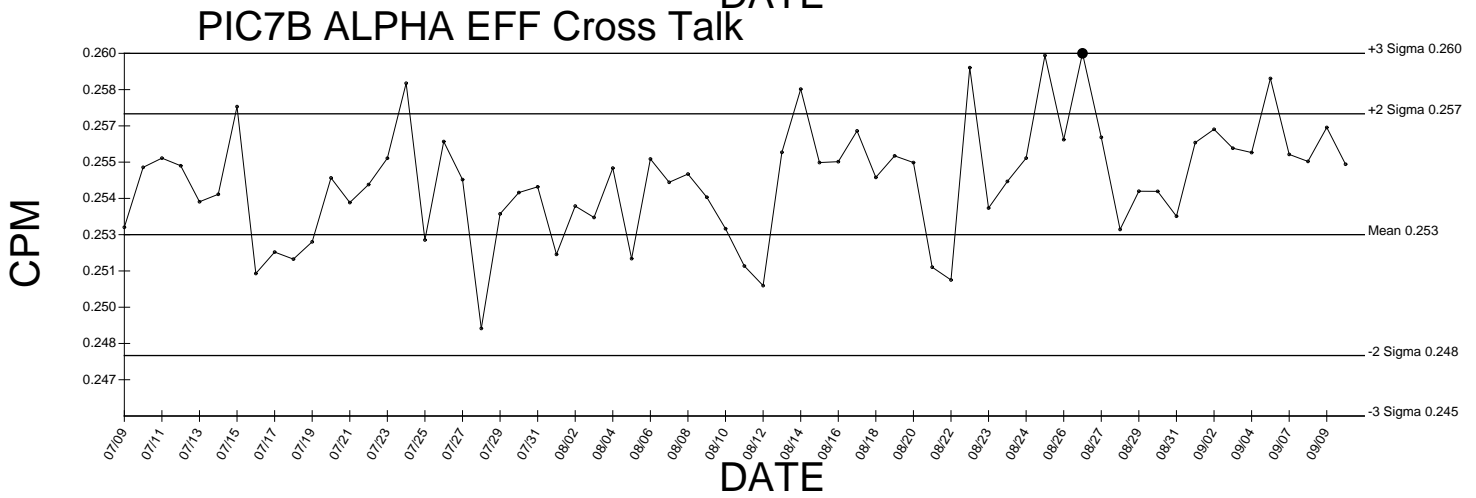
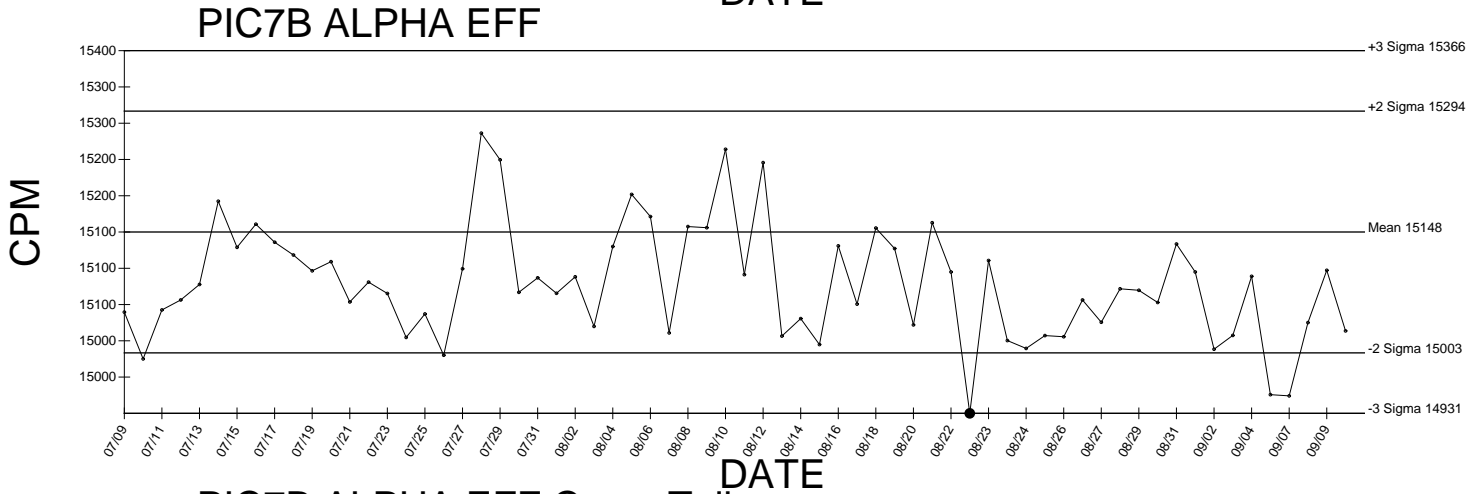
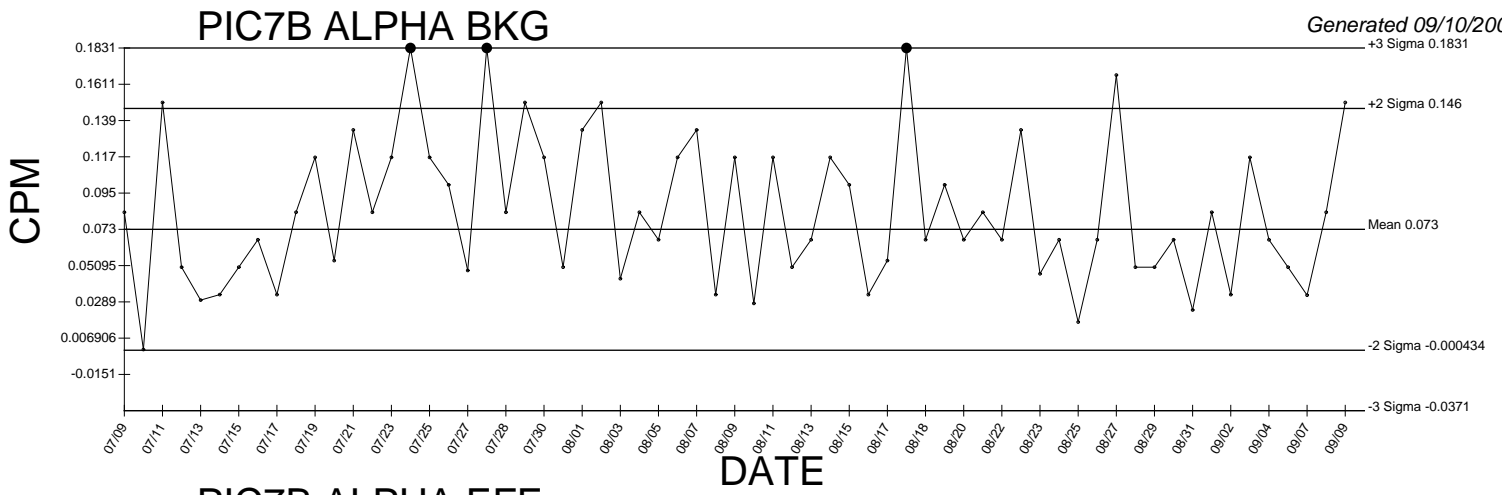
● Denotes Outlier



● Denotes Outlier



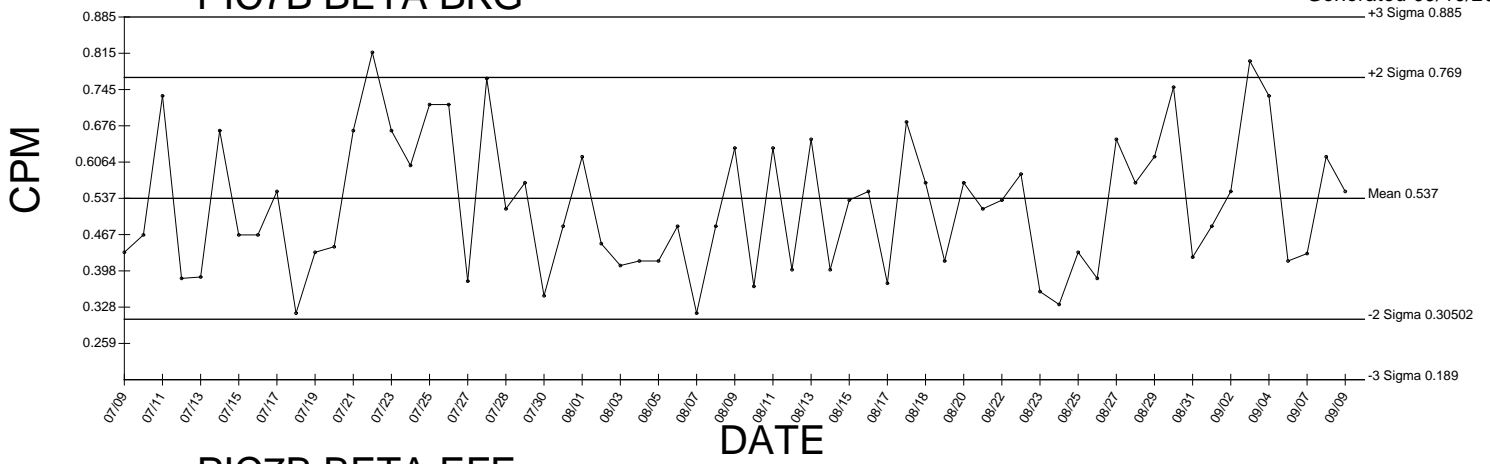
● Denotes Outlier



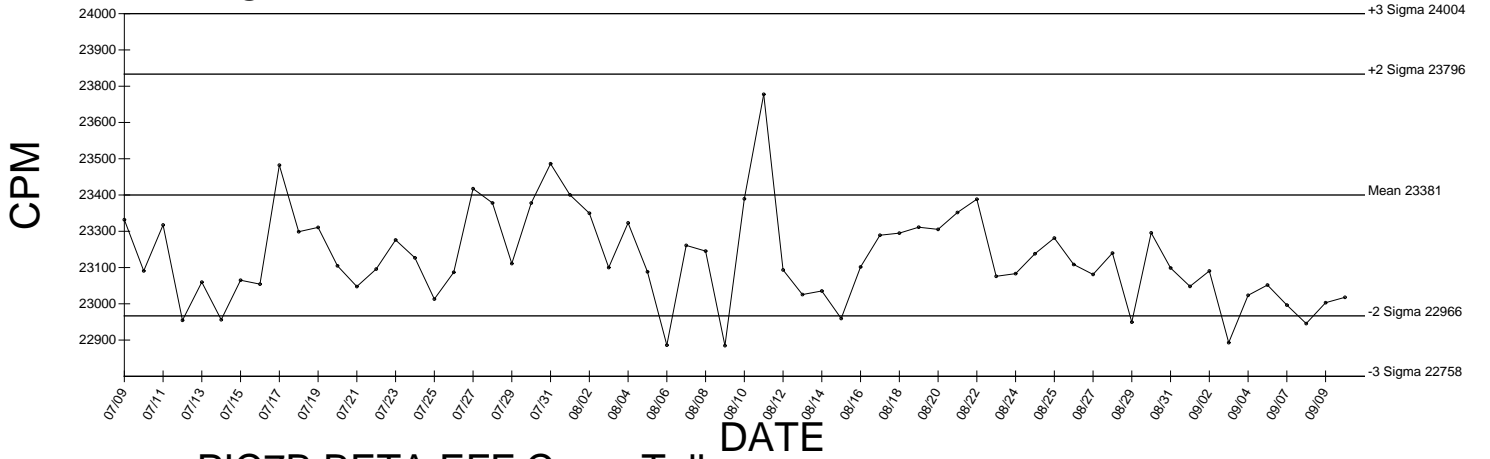
● Denotes Outlier

PIC7B BETA BKG

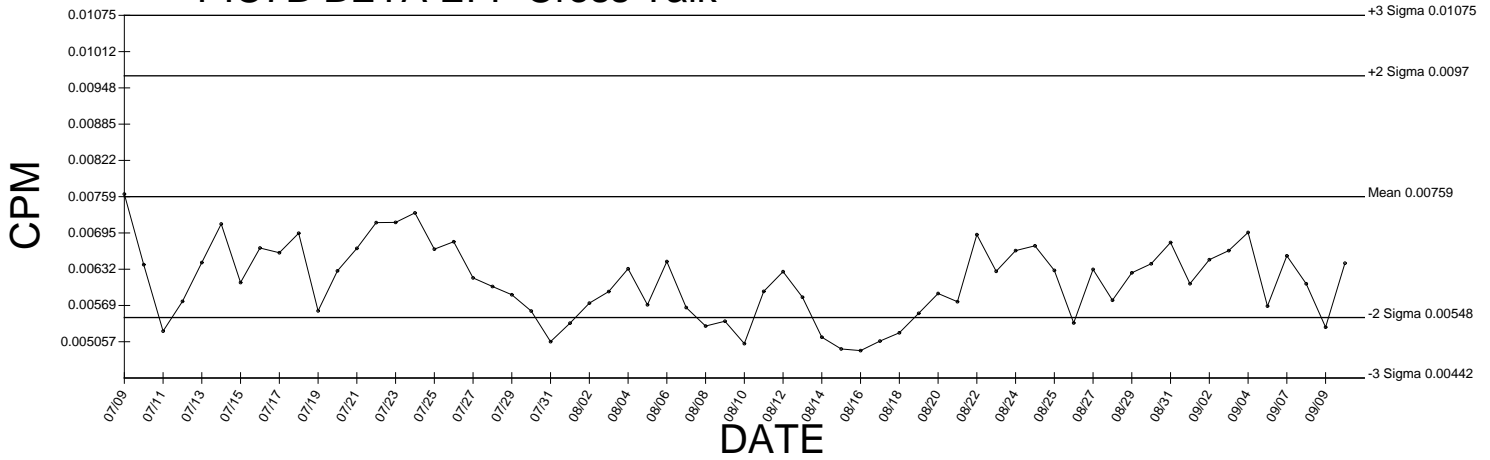
Generated 09/10/2009



PIC7B BETA EFF



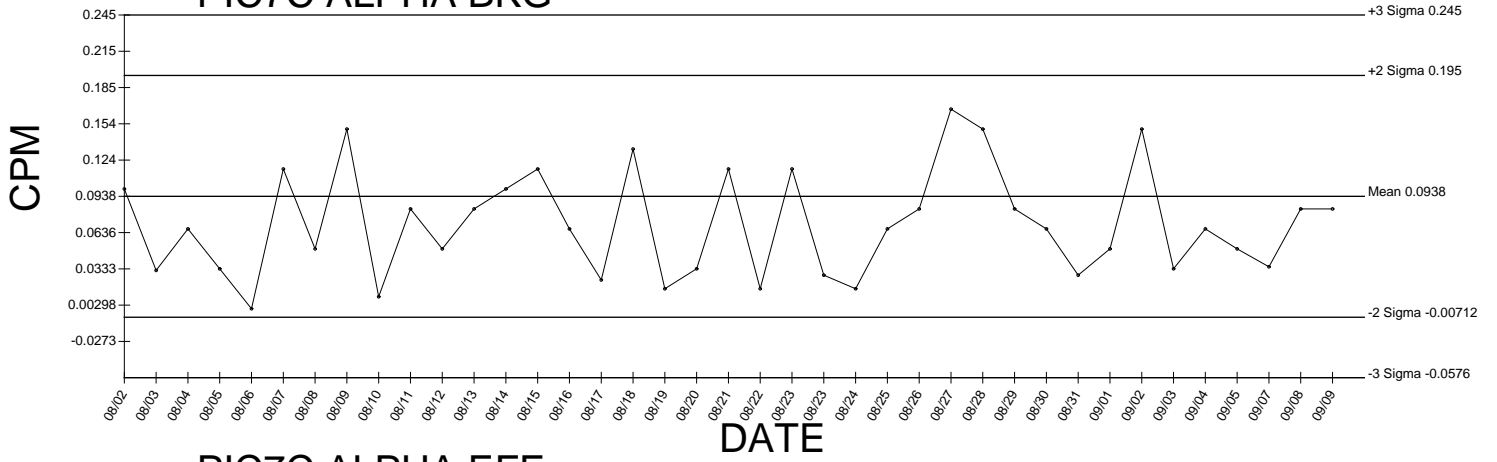
PIC7B BETA EFF Cross Talk



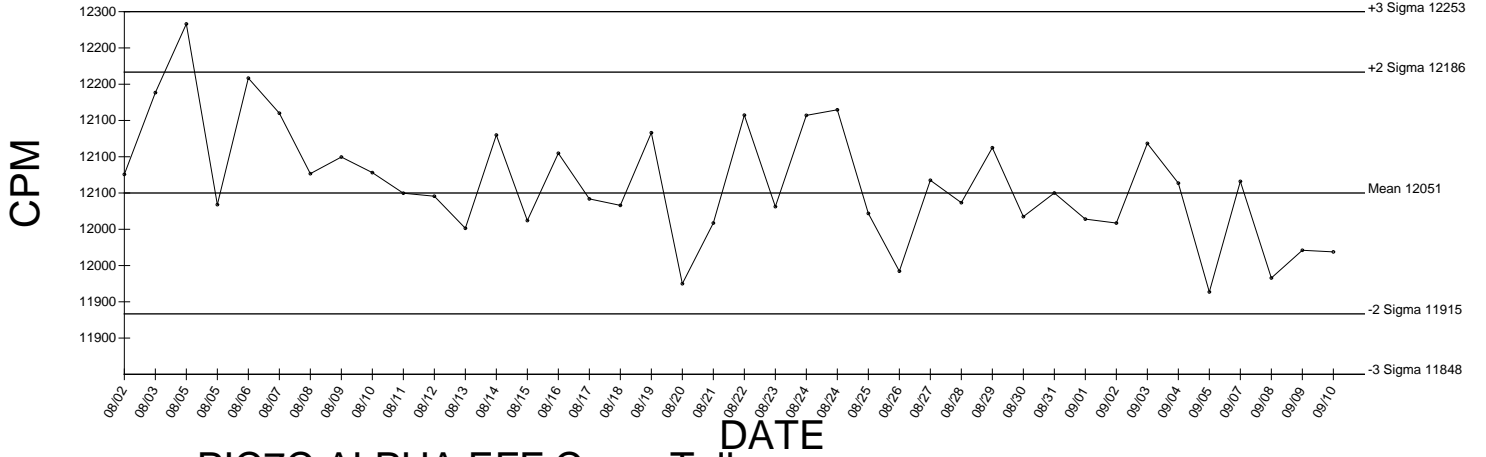
● Denotes Outlier

PIC7C ALPHA BKG

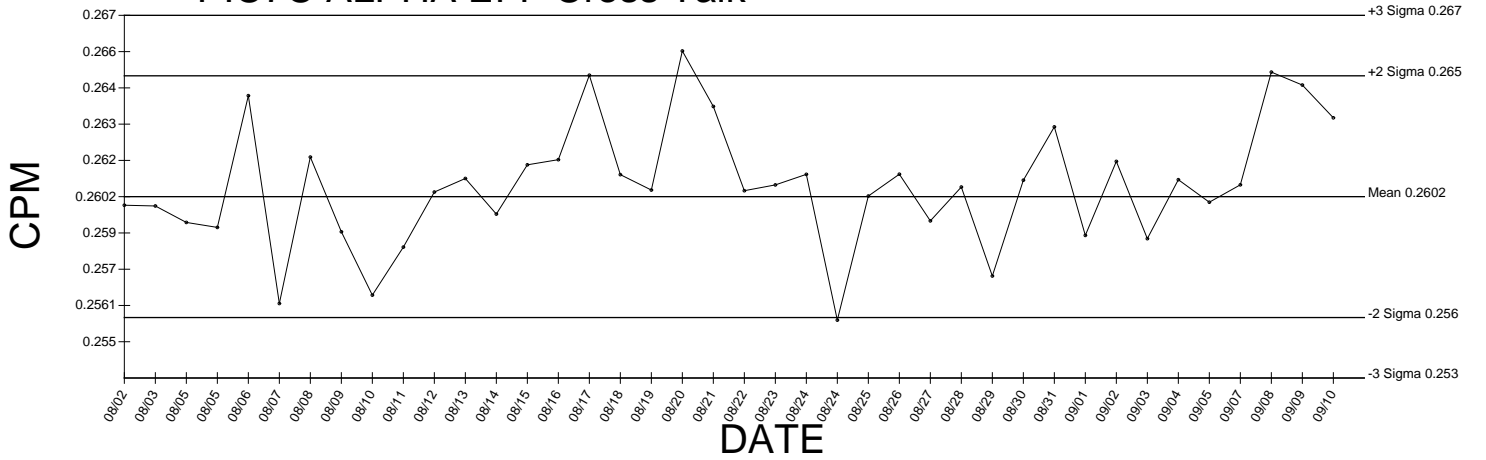
Generated 09/10/2009



PIC7C ALPHA EFF



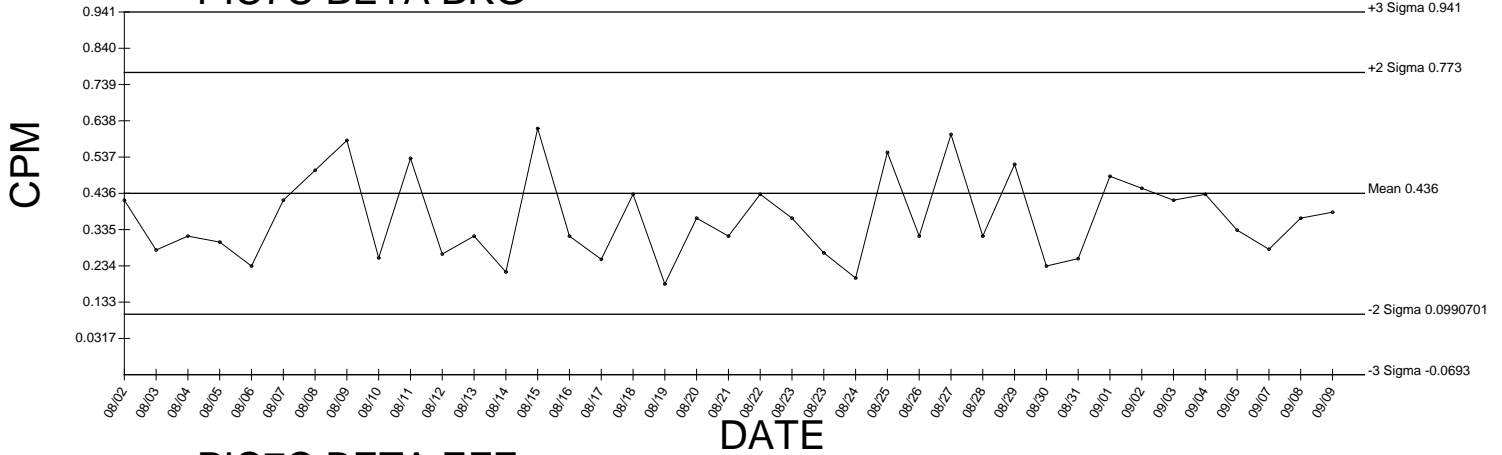
PIC7C ALPHA EFF Cross Talk



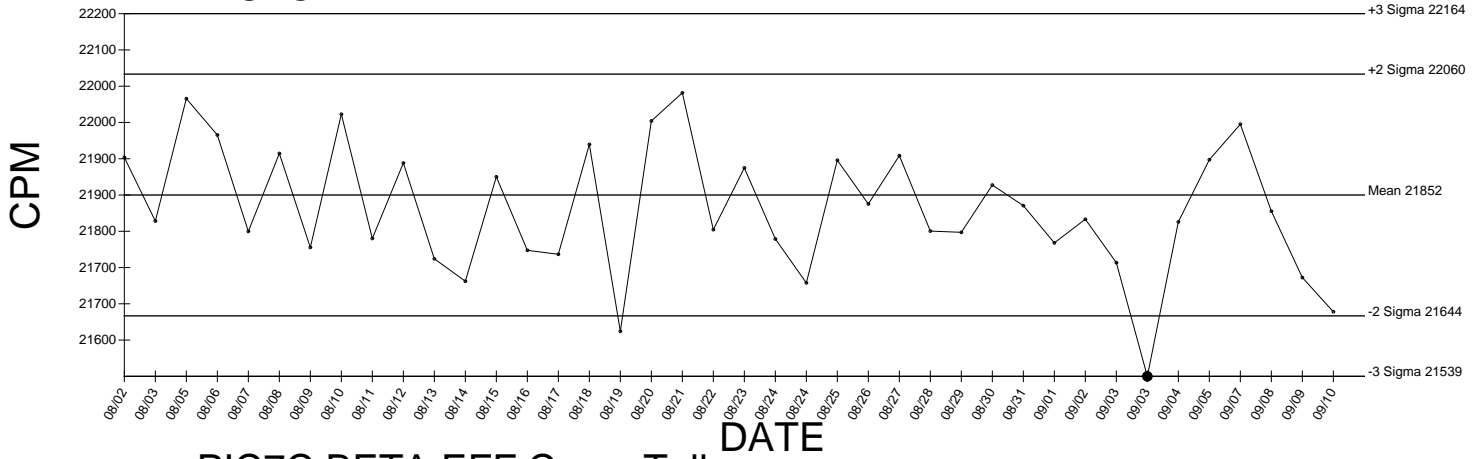
● Denotes Outlier

PIC7C BETA BKG

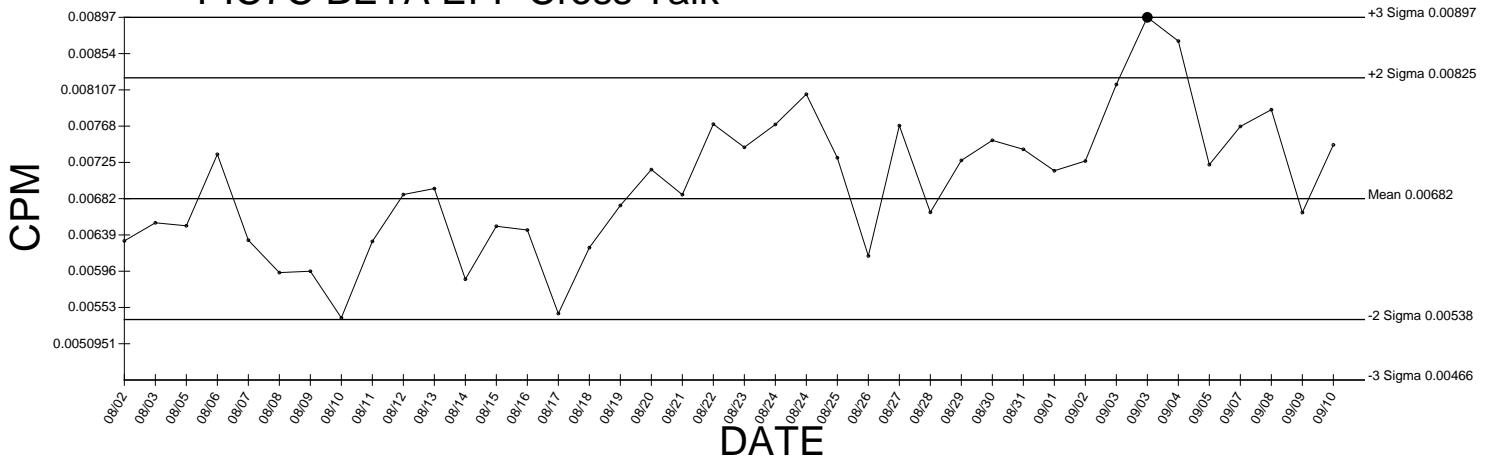
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PIC7C BETA EFF



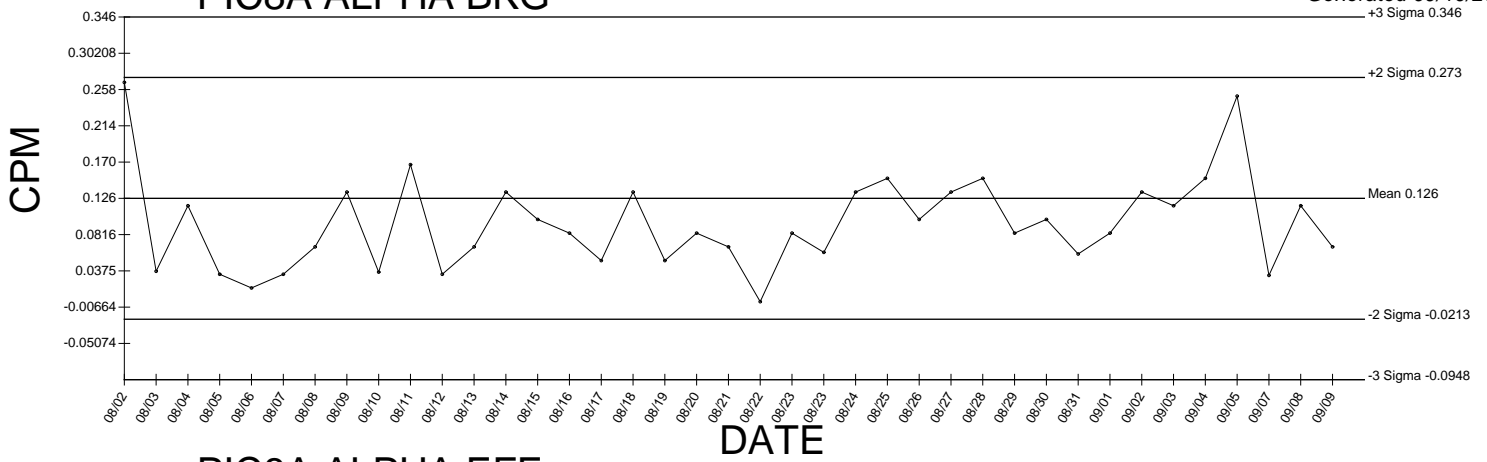
PIC7C BETA EFF Cross Talk



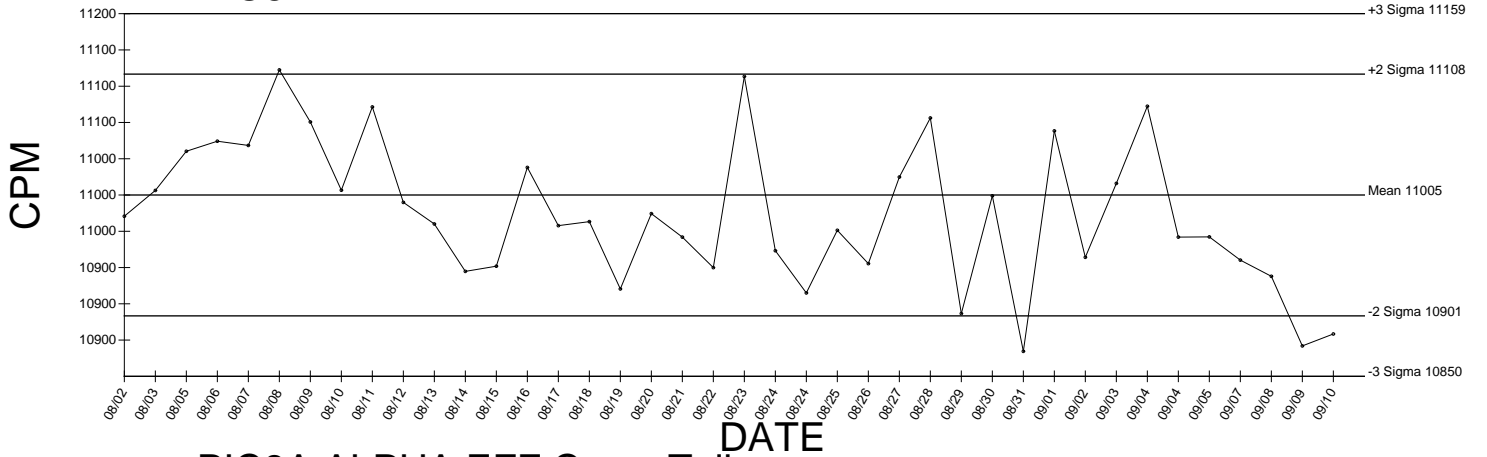
● Denotes Outlier

PIC8A ALPHA BKG

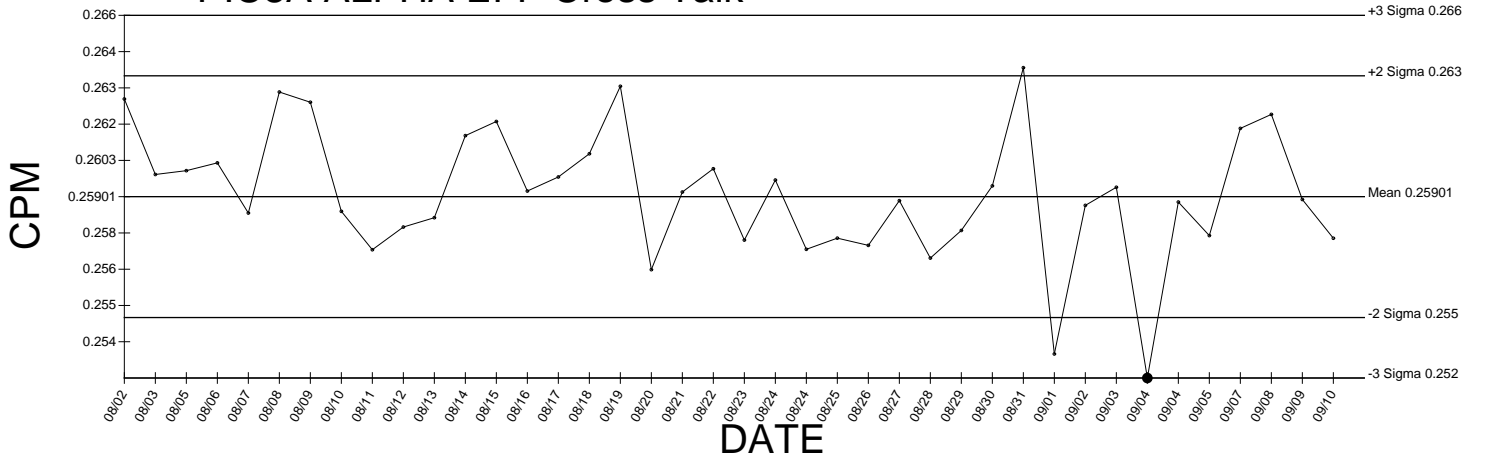
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PIC8A ALPHA EFF



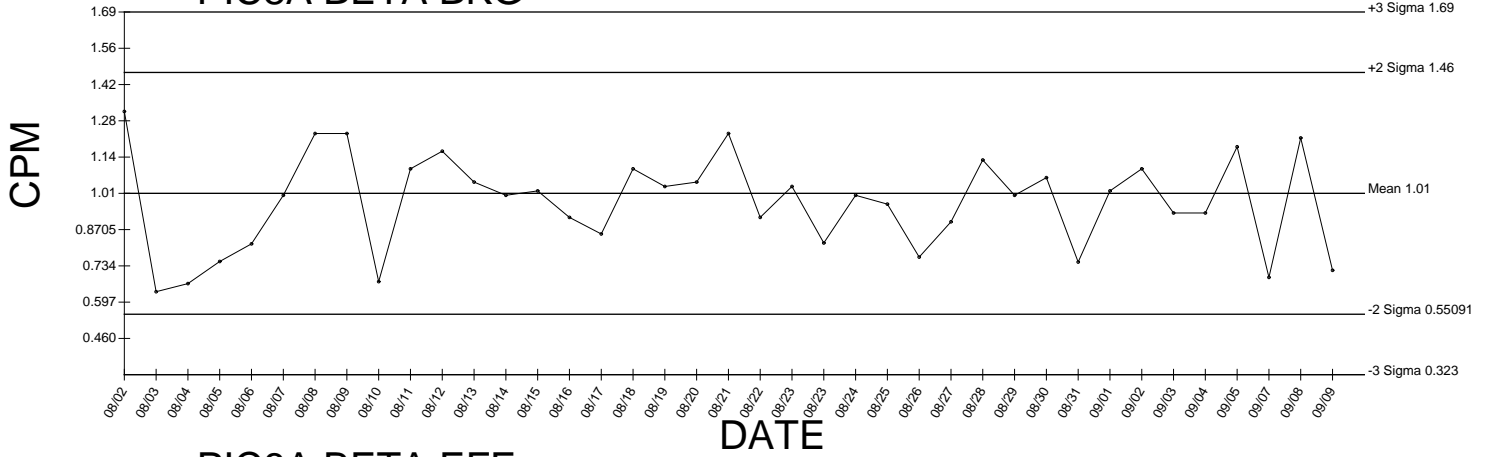
PIC8A ALPHA EFF Cross Talk



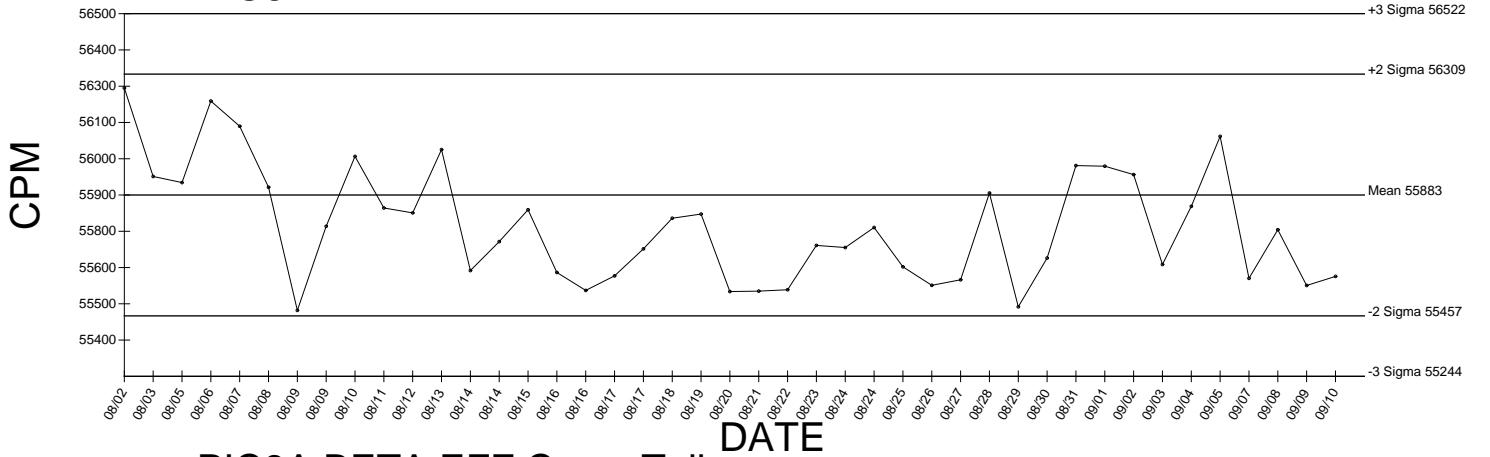
● Denotes Outlier

PIC8A BETA BKG

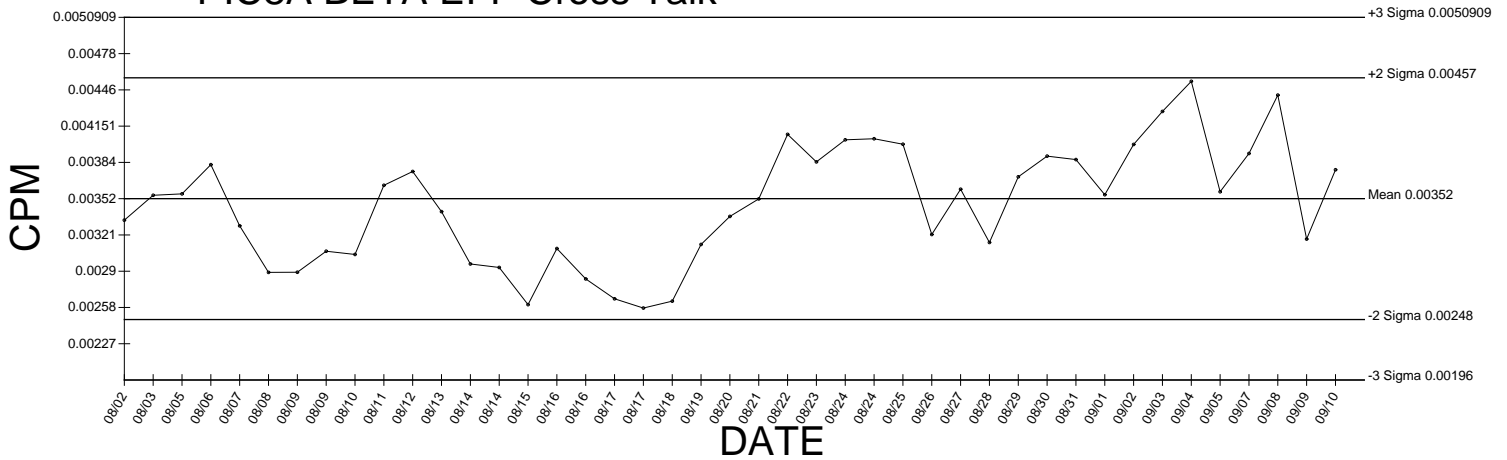
Generated 09/10/2009



PIC8A BETA EFF



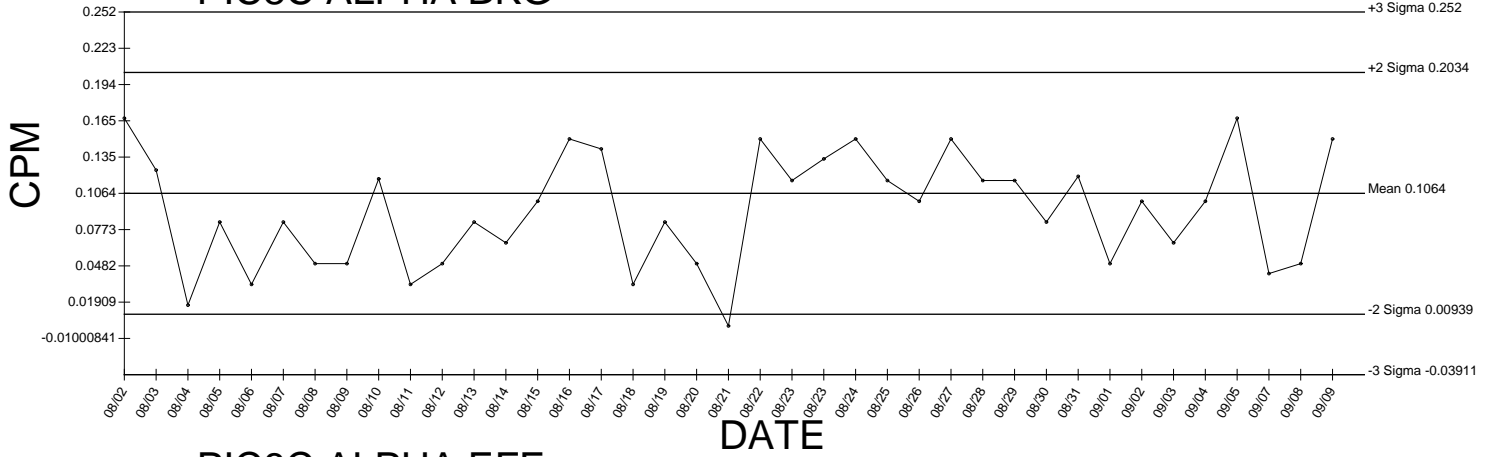
PIC8A BETA EFF Cross Talk



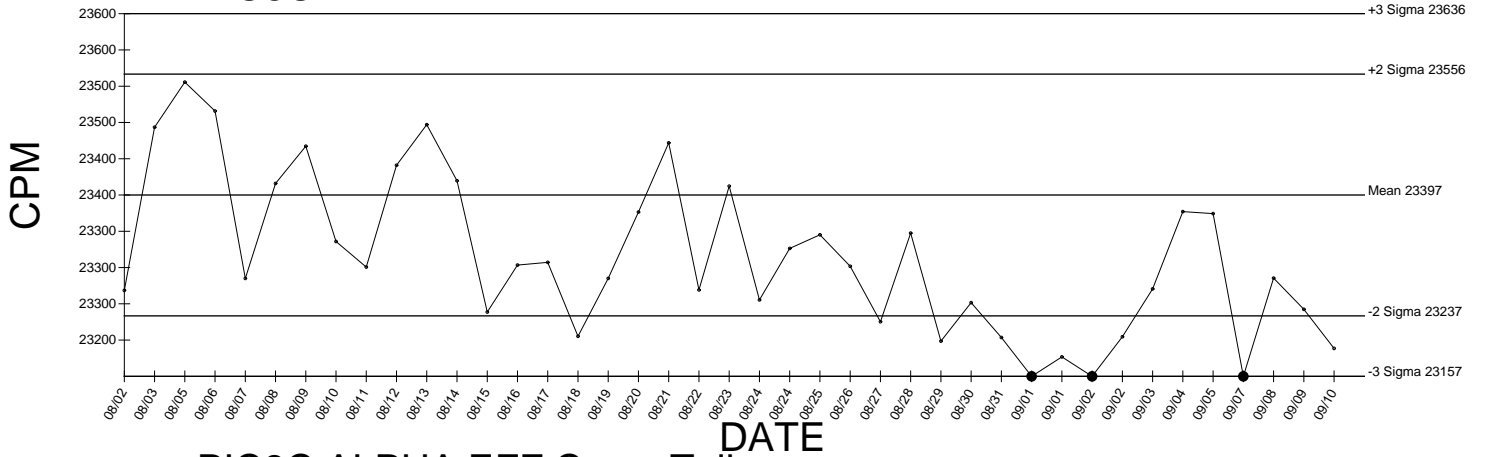
● Denotes Outlier

PIC8C ALPHA BKG

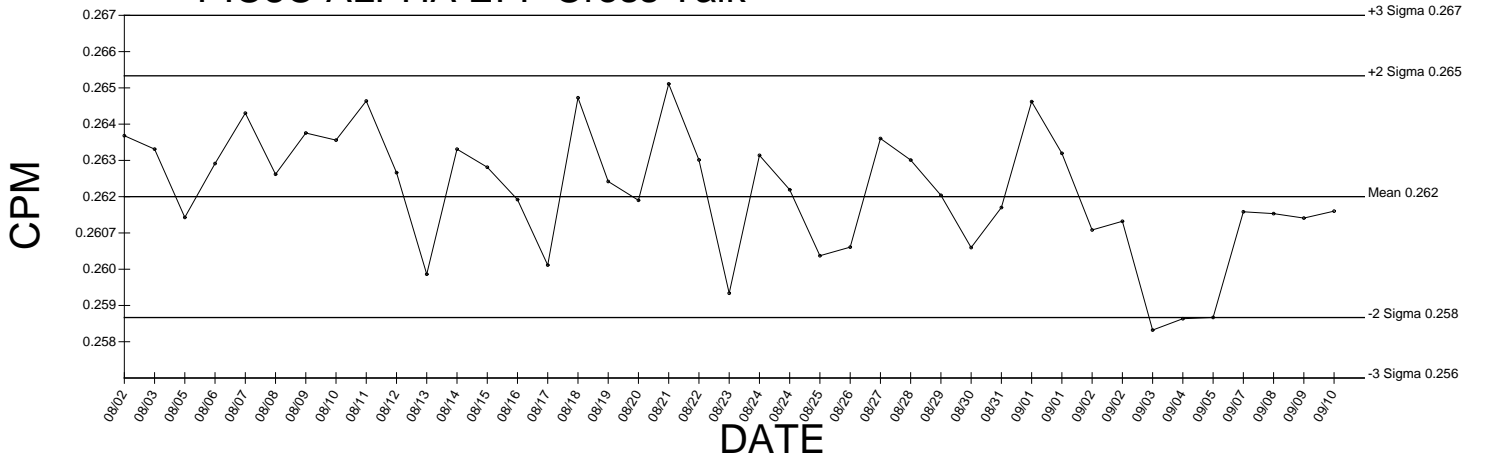
Generated 09/10/2009



PIC8C ALPHA EFF



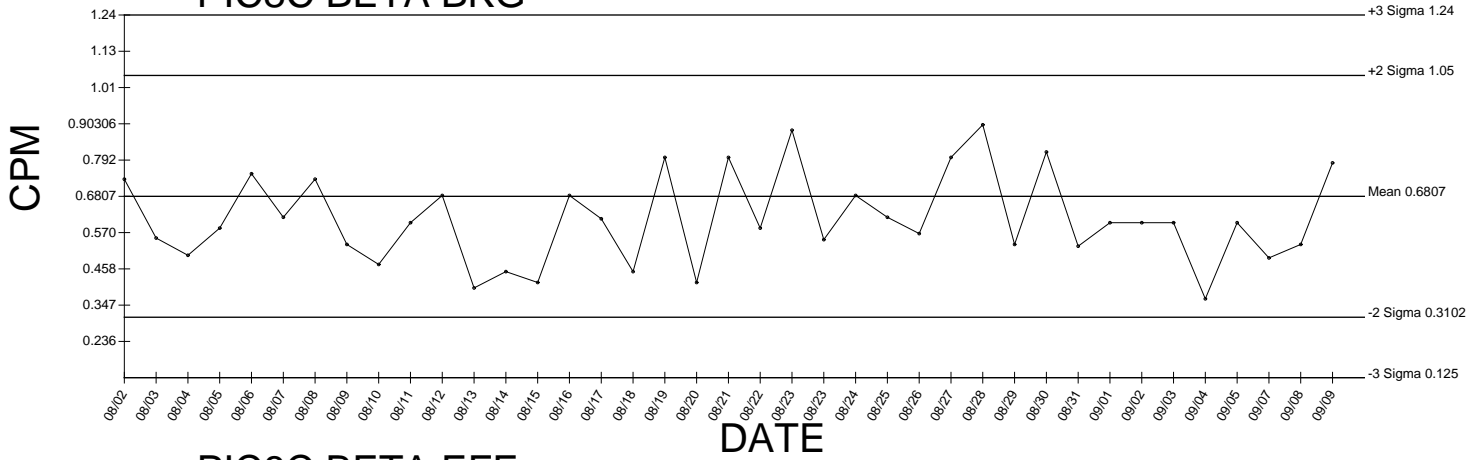
PIC8C ALPHA EFF Cross Talk



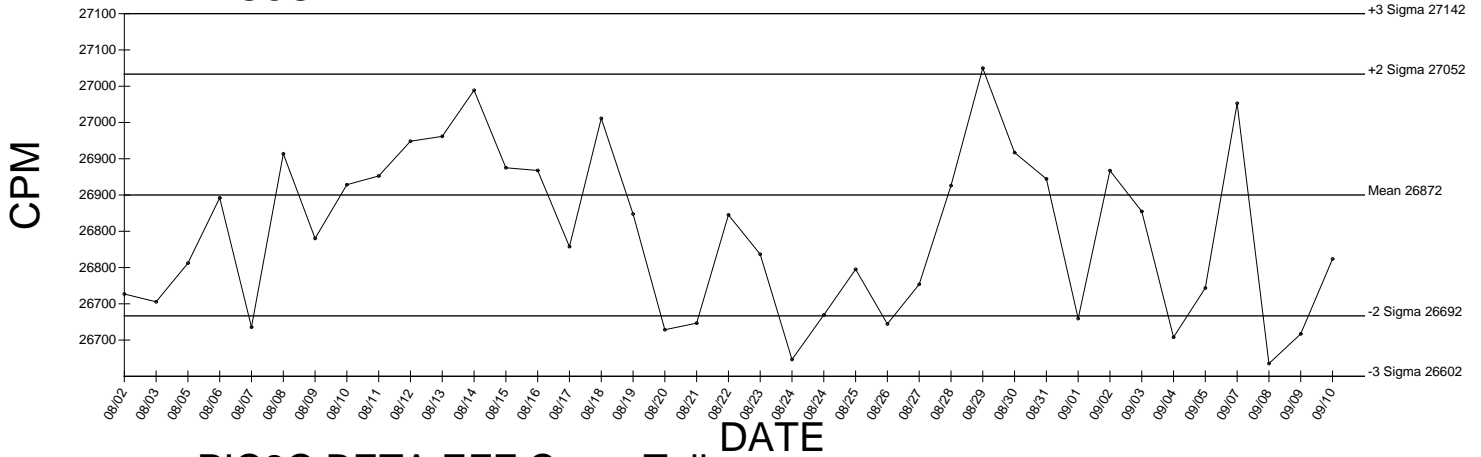
● Denotes Outlier

PIC8C BETA BKG

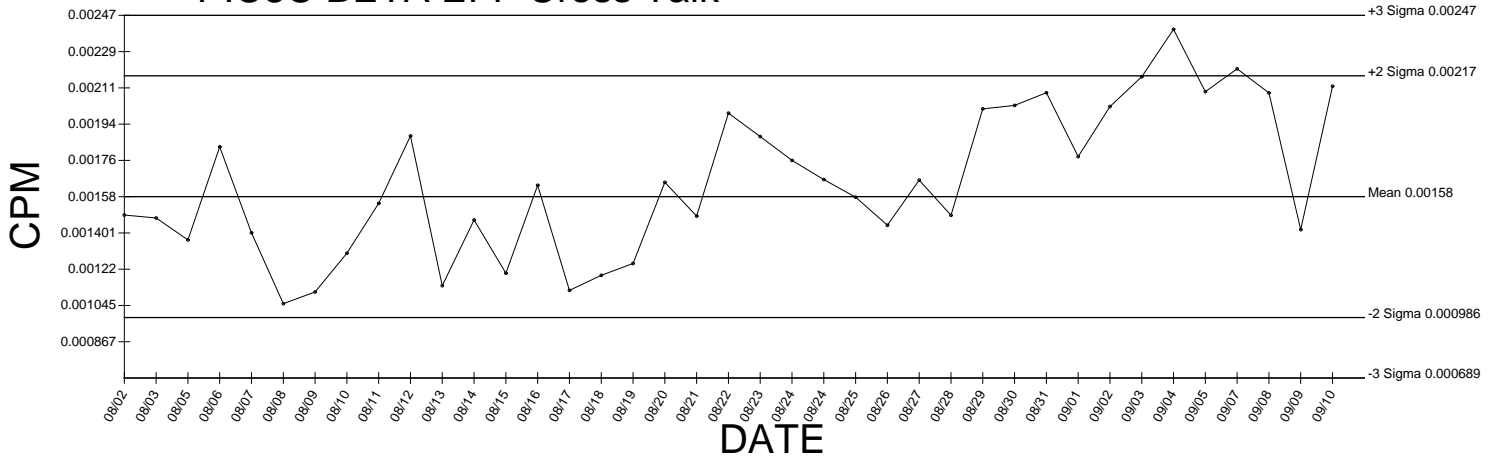
Generated 09/10/2009



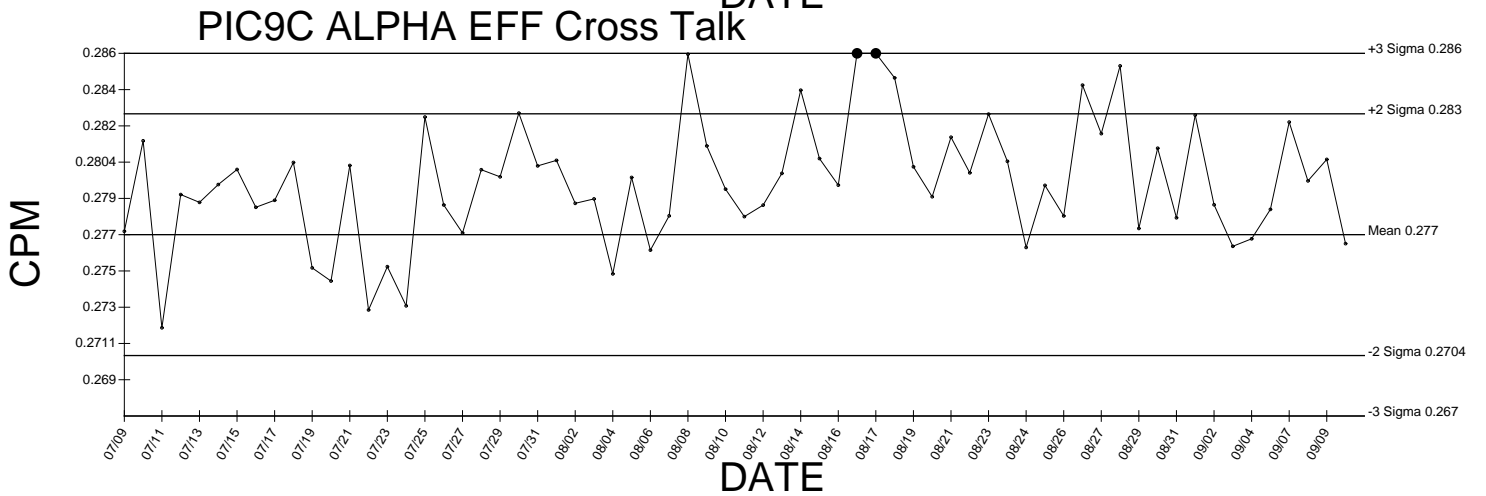
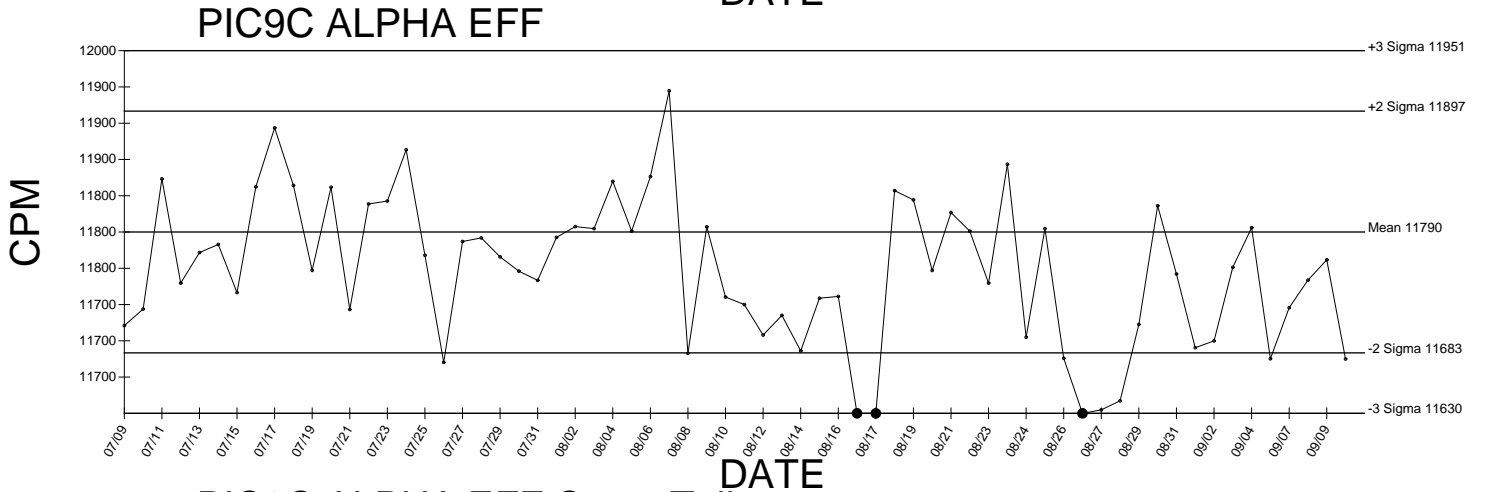
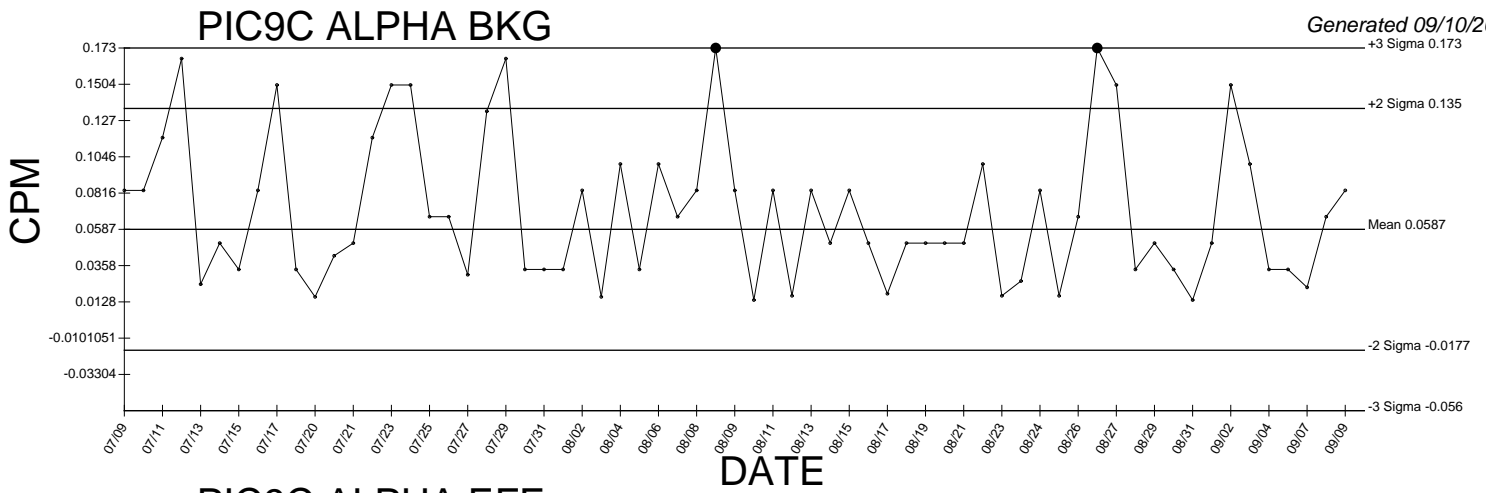
PIC8C BETA EFF



PIC8C BETA EFF Cross Talk



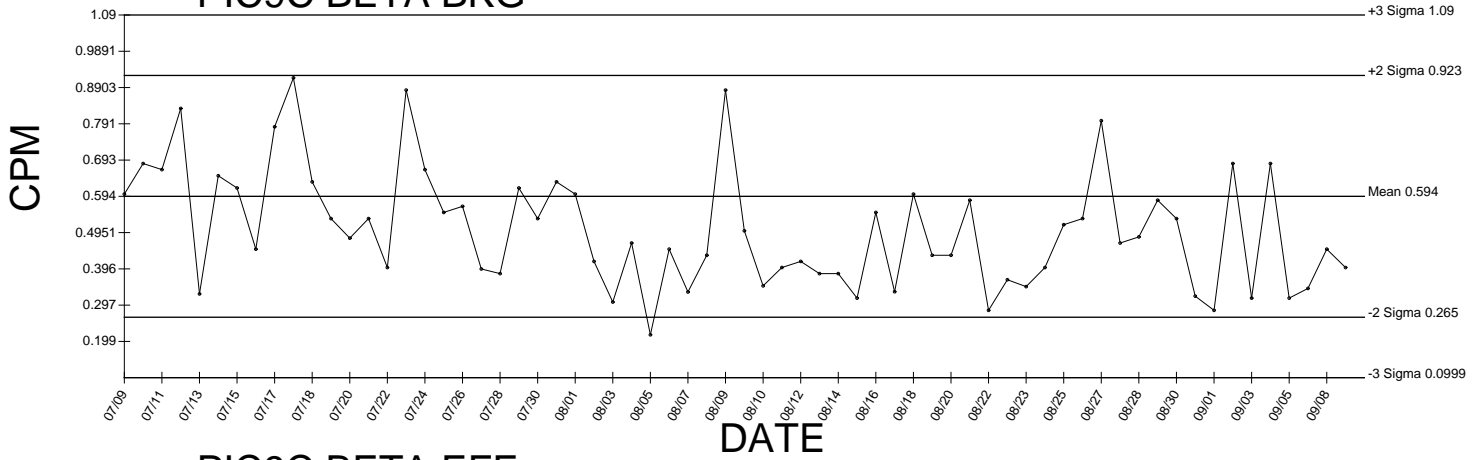
● Denotes Outlier



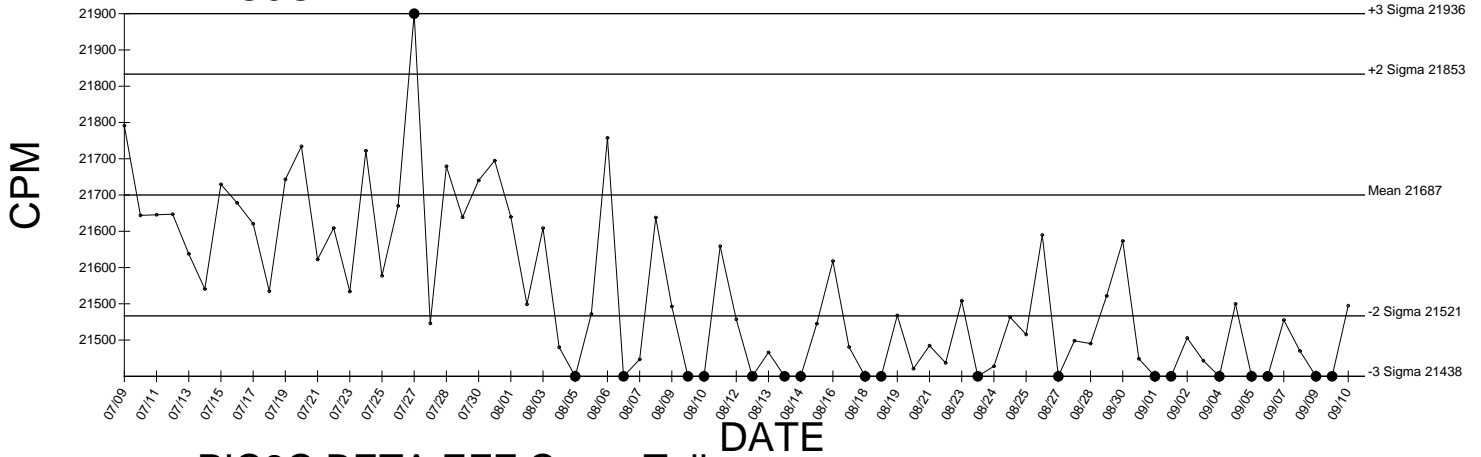
● Denotes Outlier

PIC9C BETA BKG

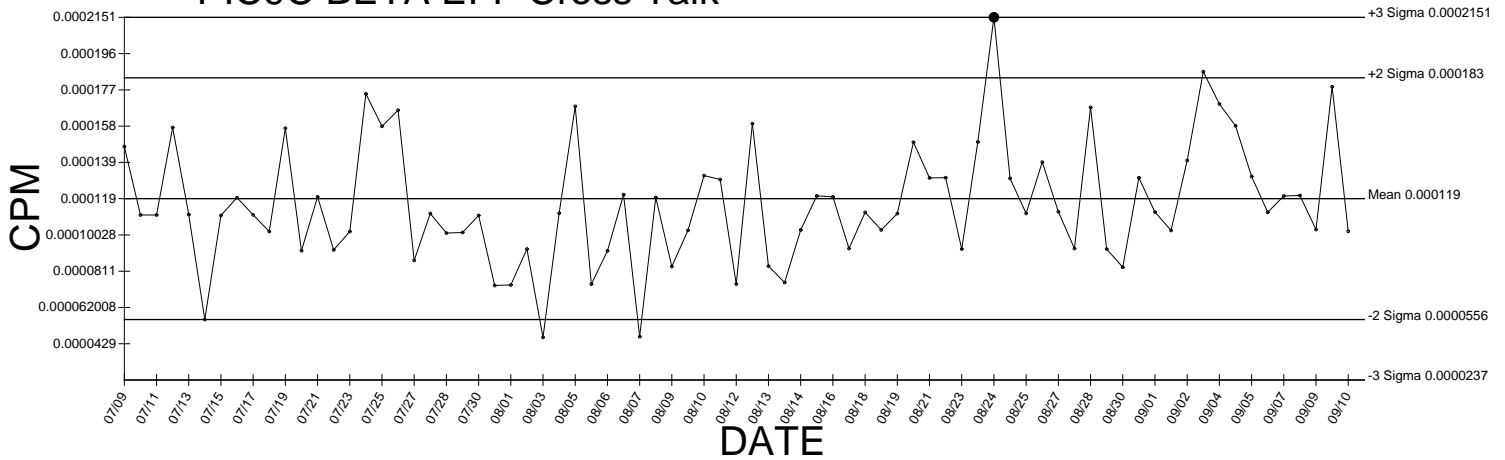
Generated 09/10/2009



PIC9C BETA EFF

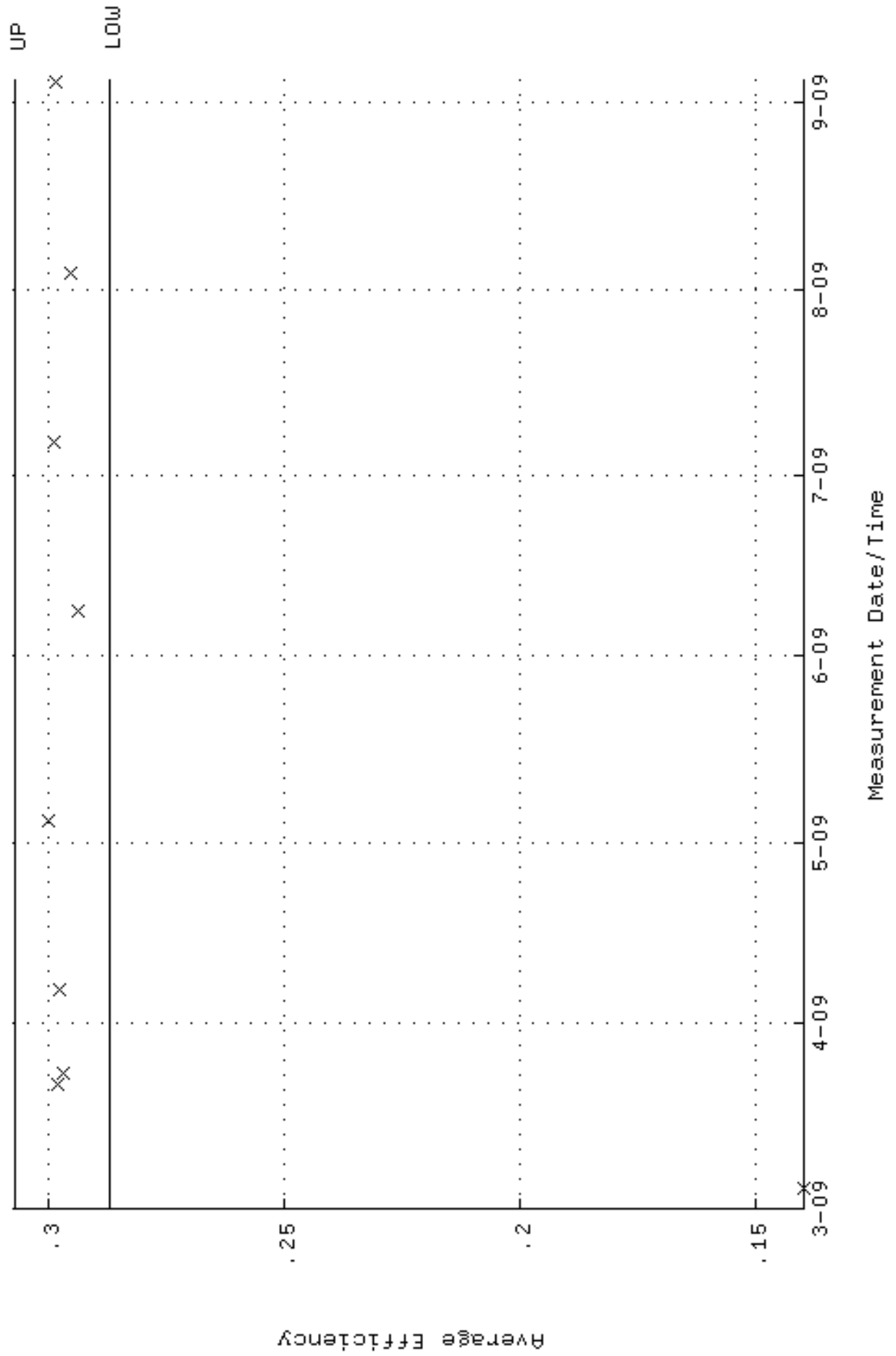


PIC9C BETA EFF Cross Talk

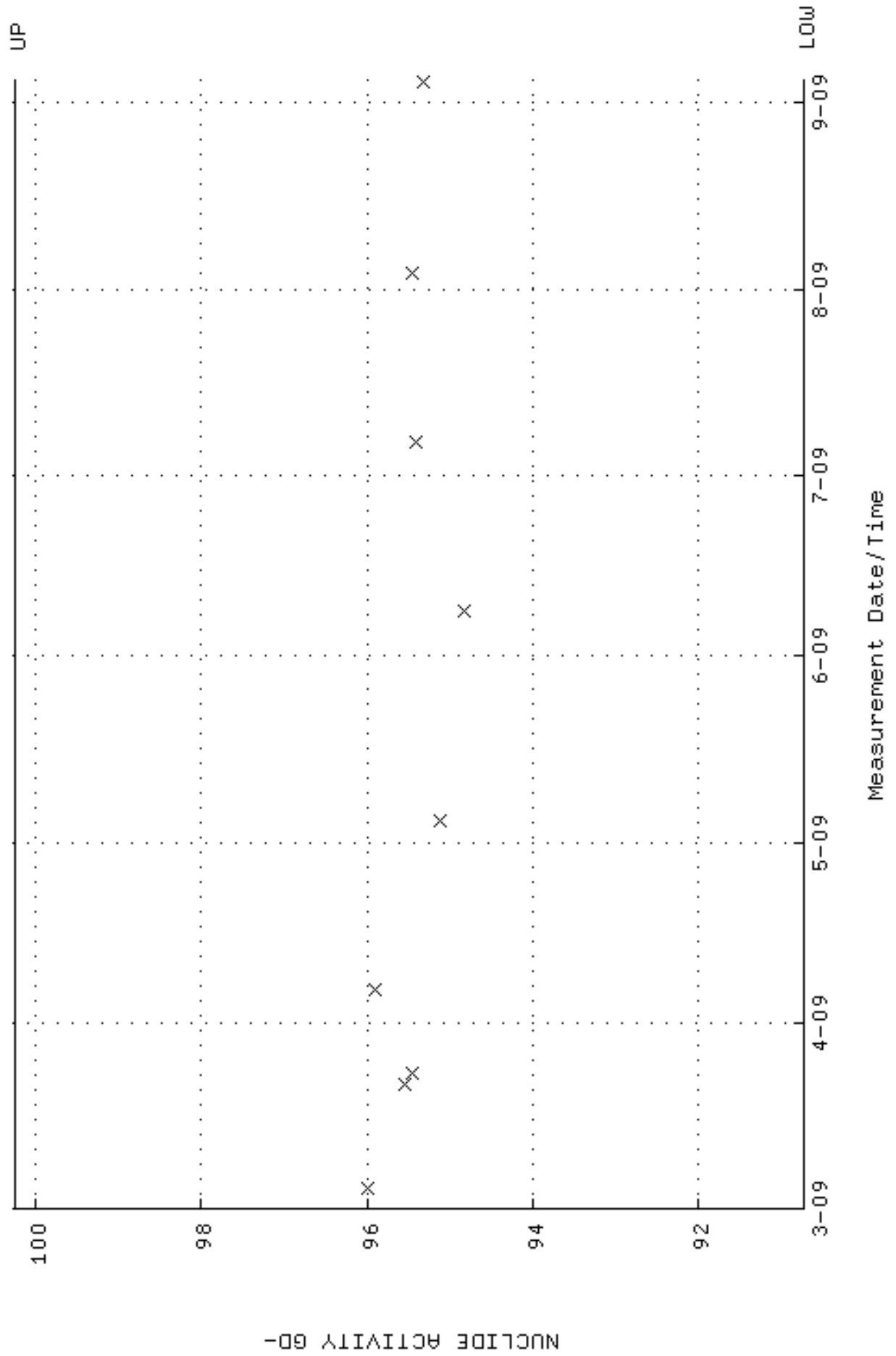


● Denotes Outlier

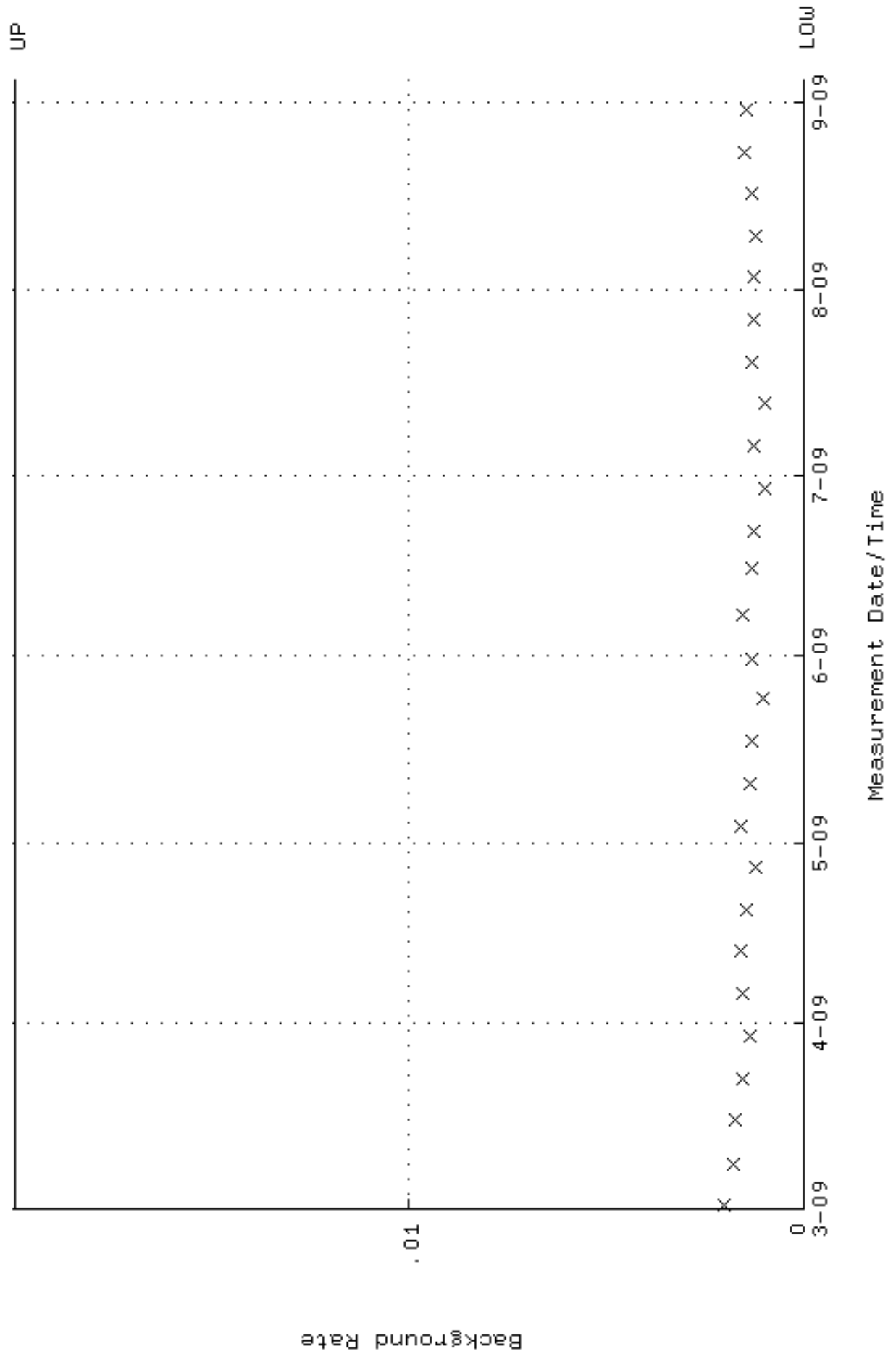
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 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2009 12:51:49 through 4-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.287129 through 0.307129



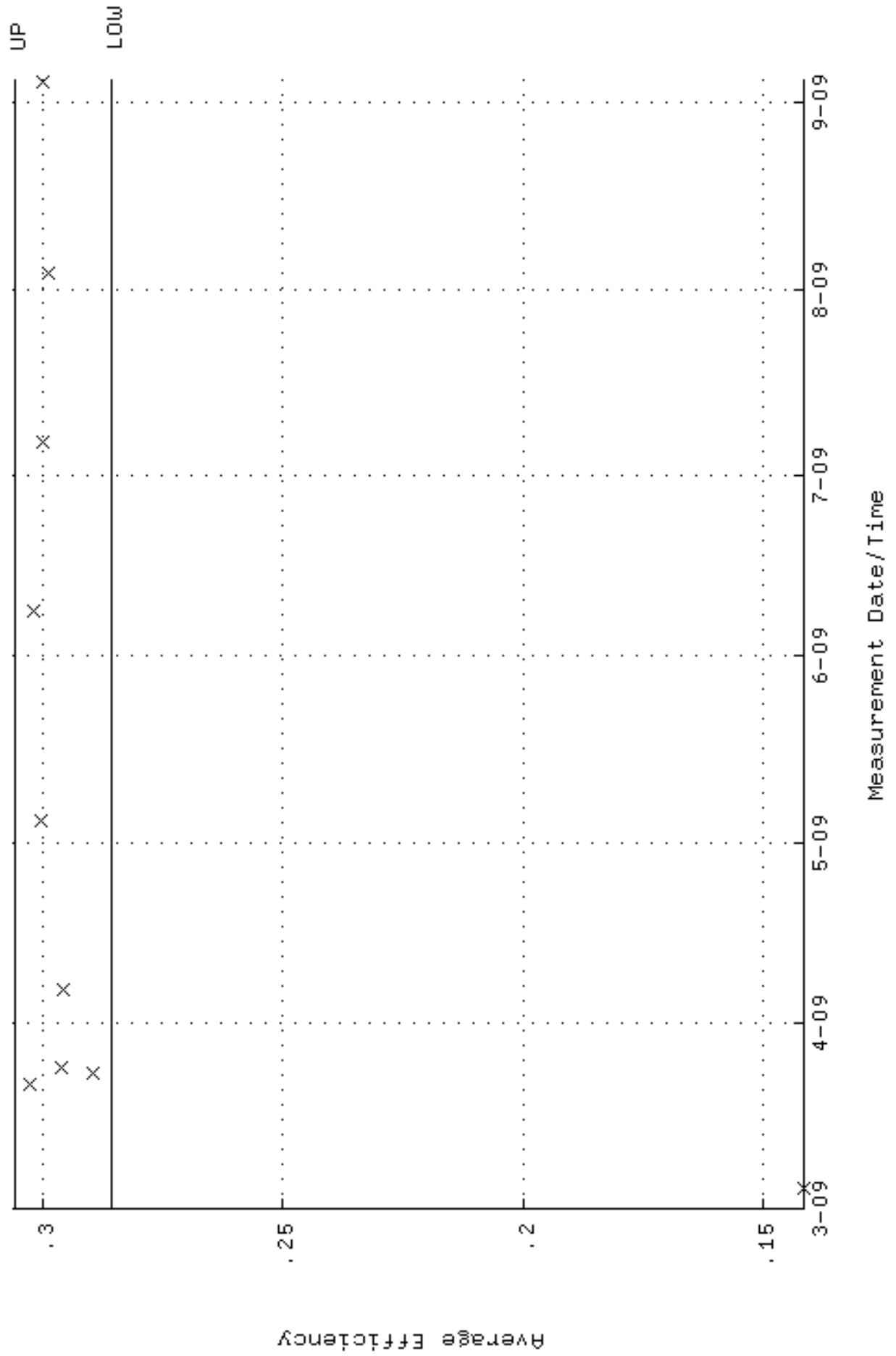
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 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2009 12:51:49 through 4-SEP-2009 12:00:00
 Lower/Upper Lmts: 90.7092 through 100.258



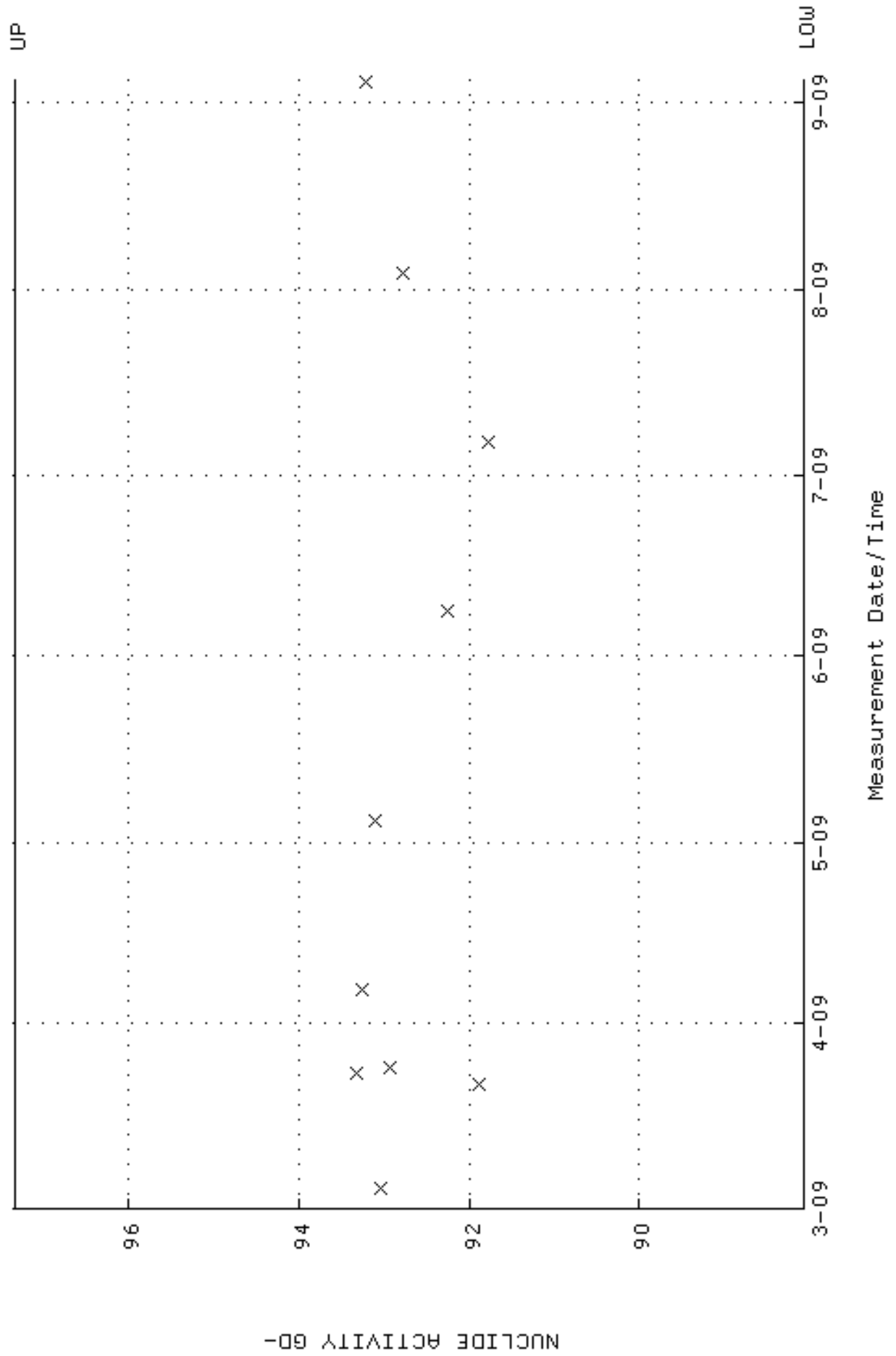
QA filename : DKA100:[ENV_ALPHA.QA.B]B011.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-MAR-2009 17:17:21 through 4-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



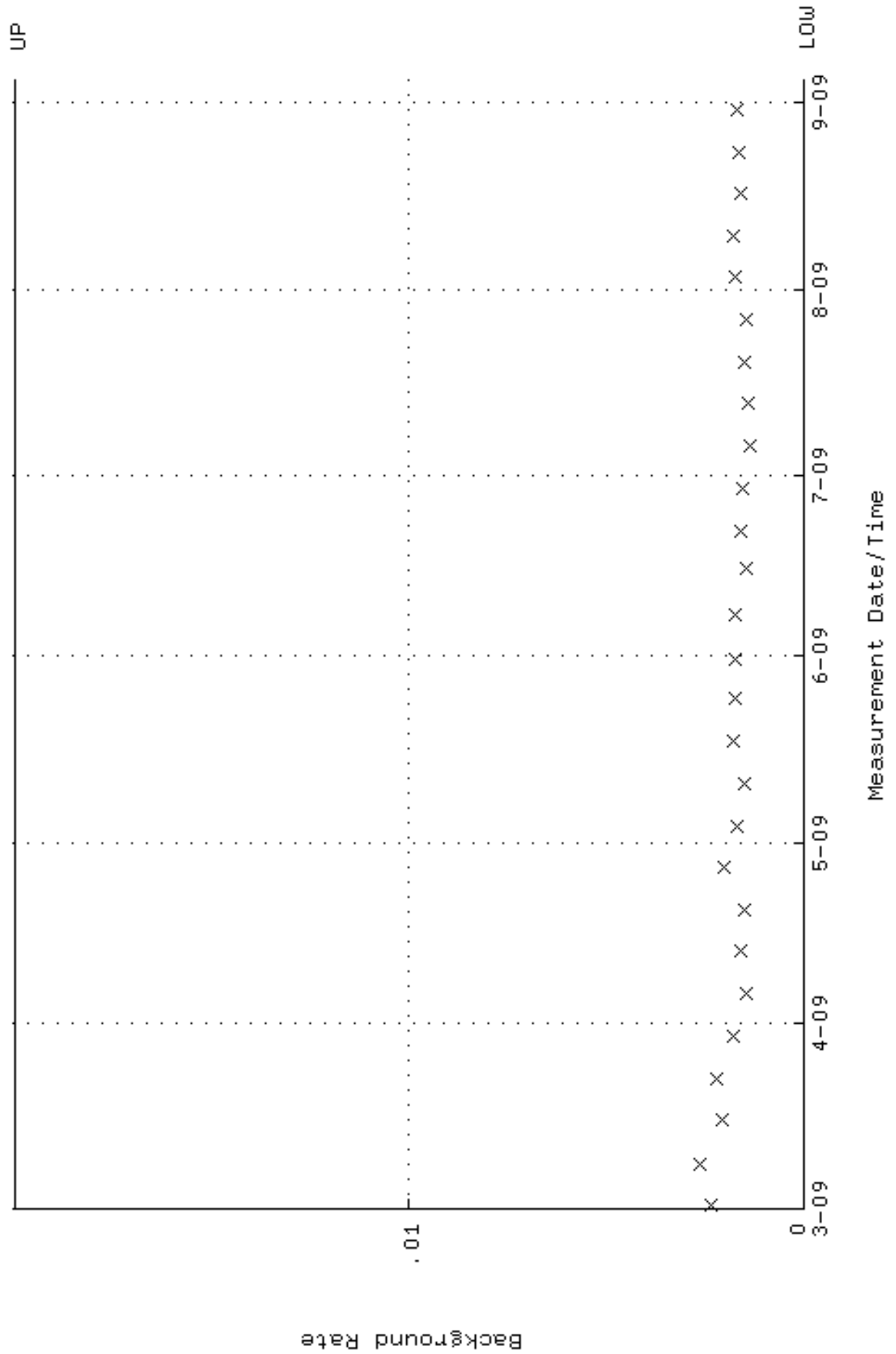
QA filename : DKA100:[ENV_ALPHA.QA.W]W012.QAF;4
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 4-MAR-2009 12:51:49 through 4-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.285730 through 0.305730



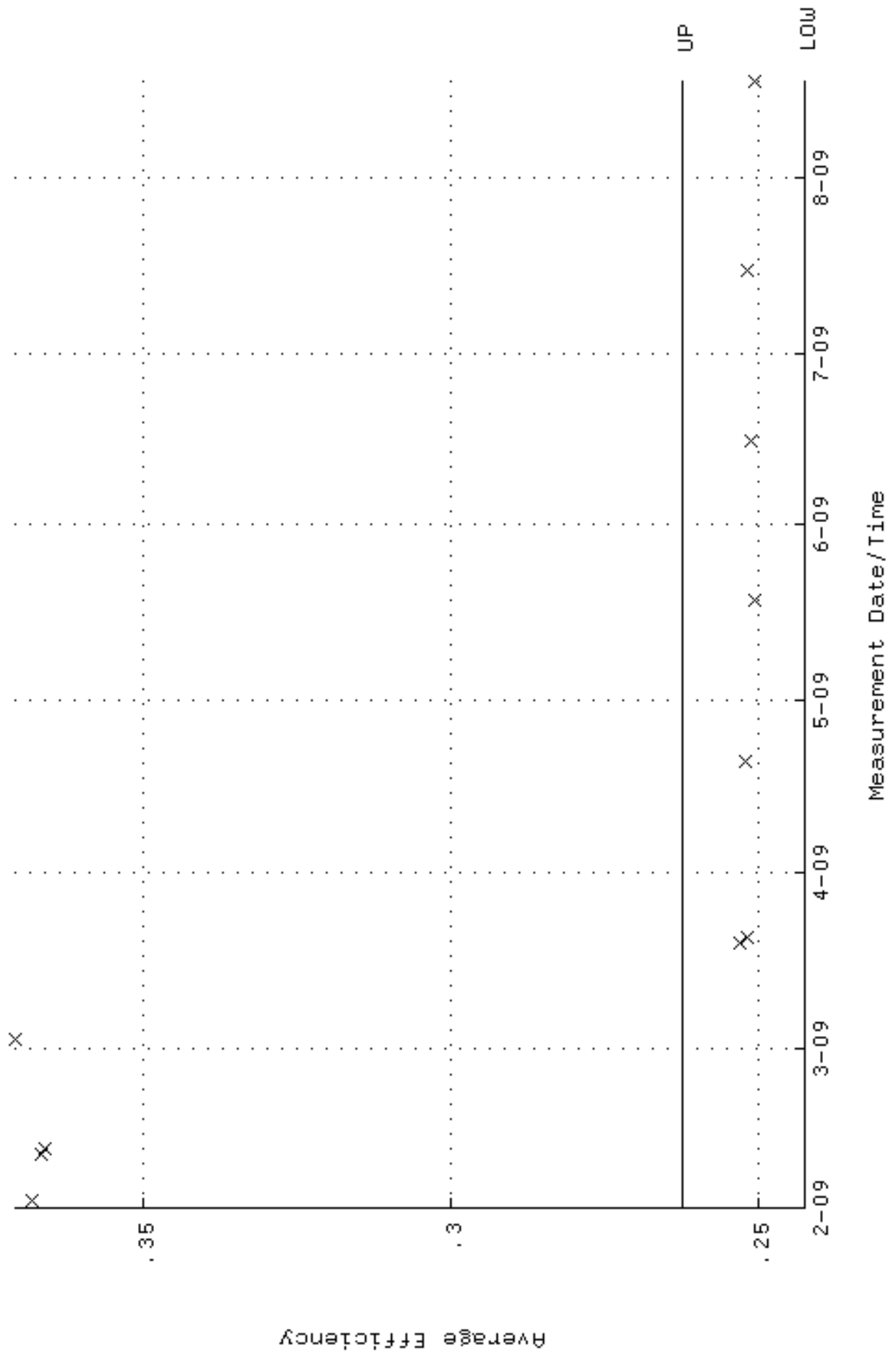
QA filename : DKA100:[ENV_ALPHA.QA.W]w012.QAF;4
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 4-MAR-2009 12:51:49 through 4-SEP-2009 12:00:00
 Lower/Upper Lmts: 88.0678 through 97.3382



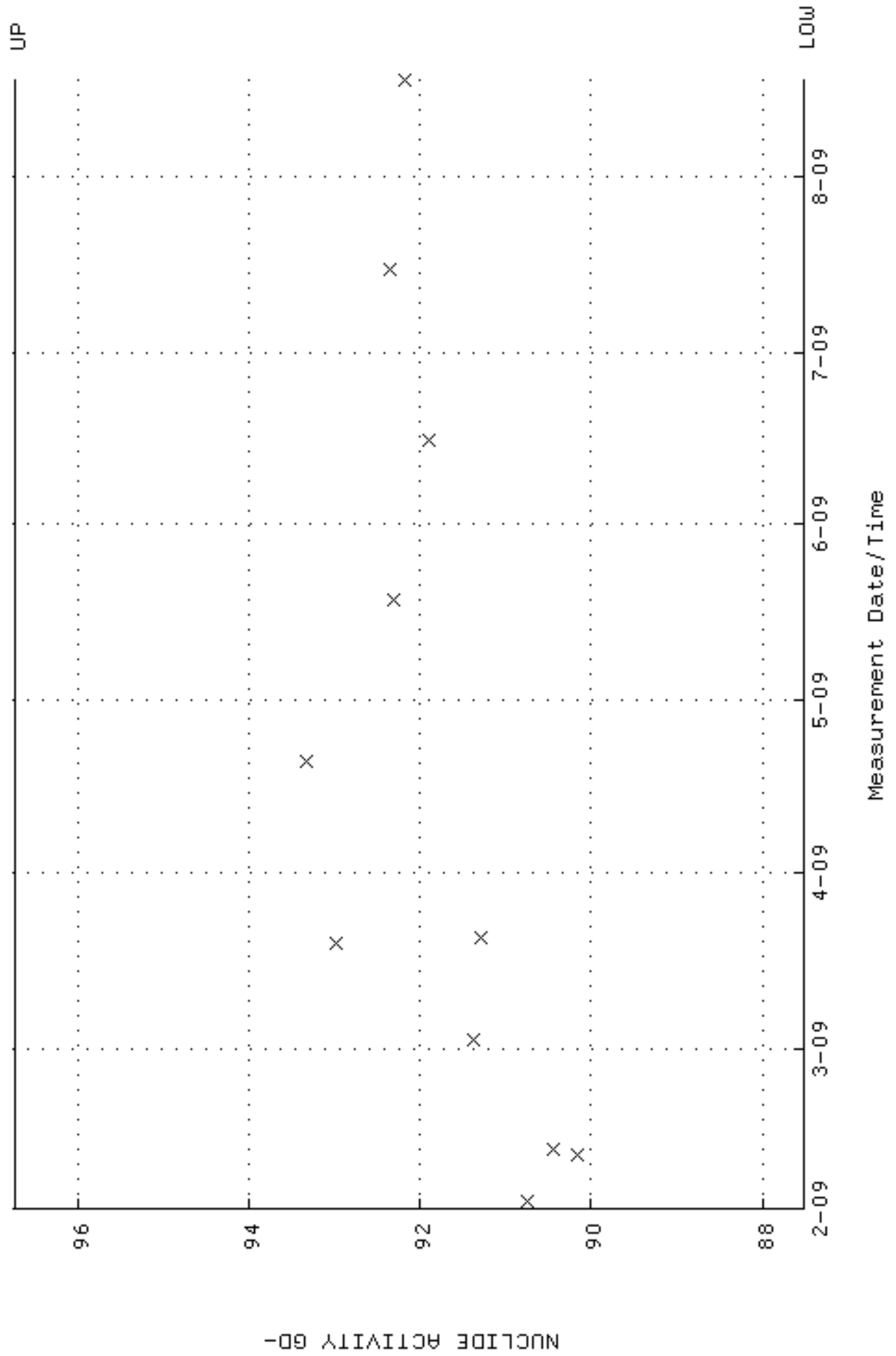
QA filename : DKA100:[ENV_ALPHA.QA.B]B012.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-MAR-2009 17:17:21 through 4-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 2.000000E-02



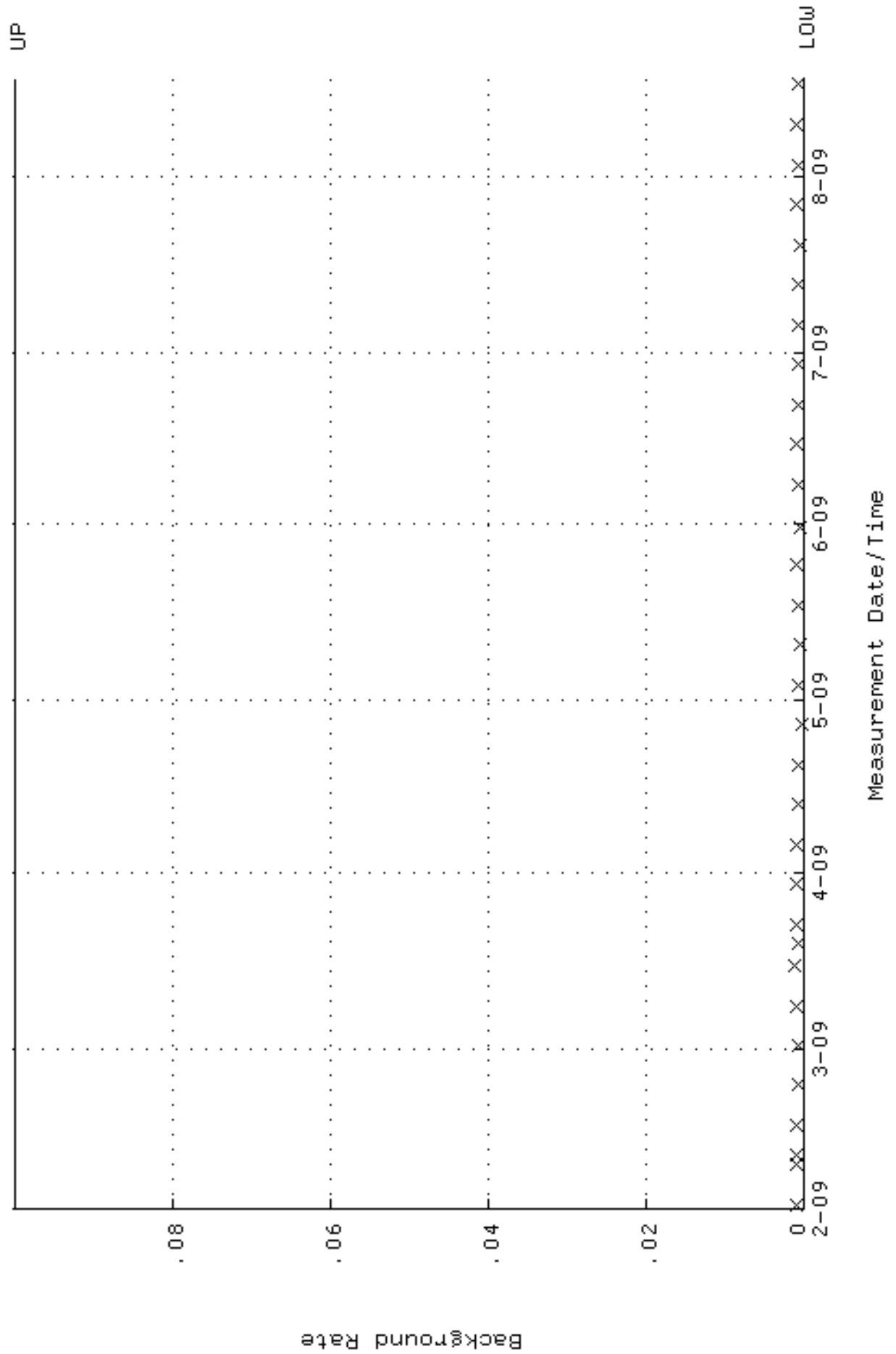
QA filename : DKA100:[ENV_ALPHA.QA.W]W113.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:31:03 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.242598 through 0.262598



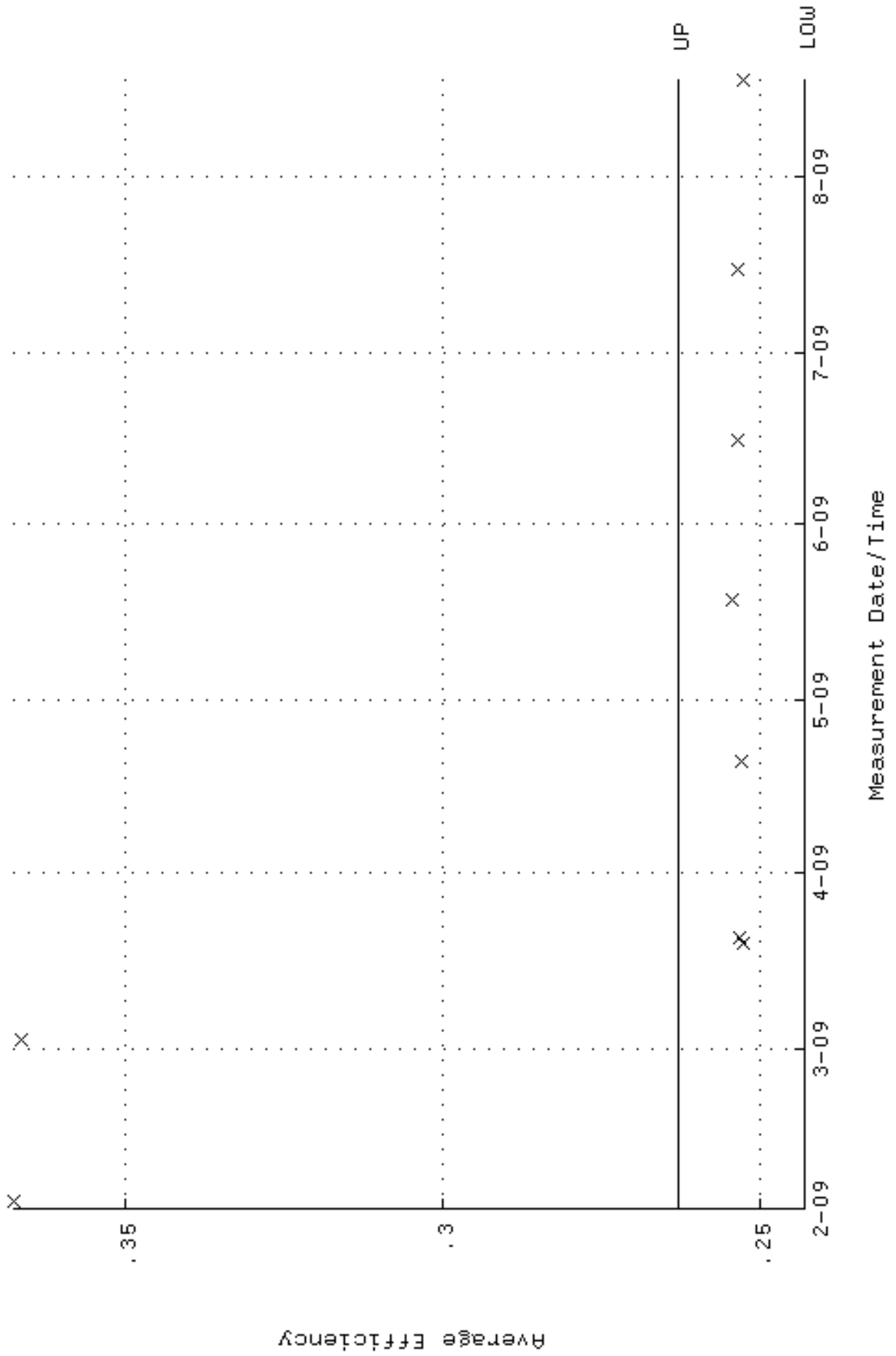
QA filename : DKA100:[ENV_ALPHA.QA.W]w113.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:31:03 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 87.5172 through 96.7296



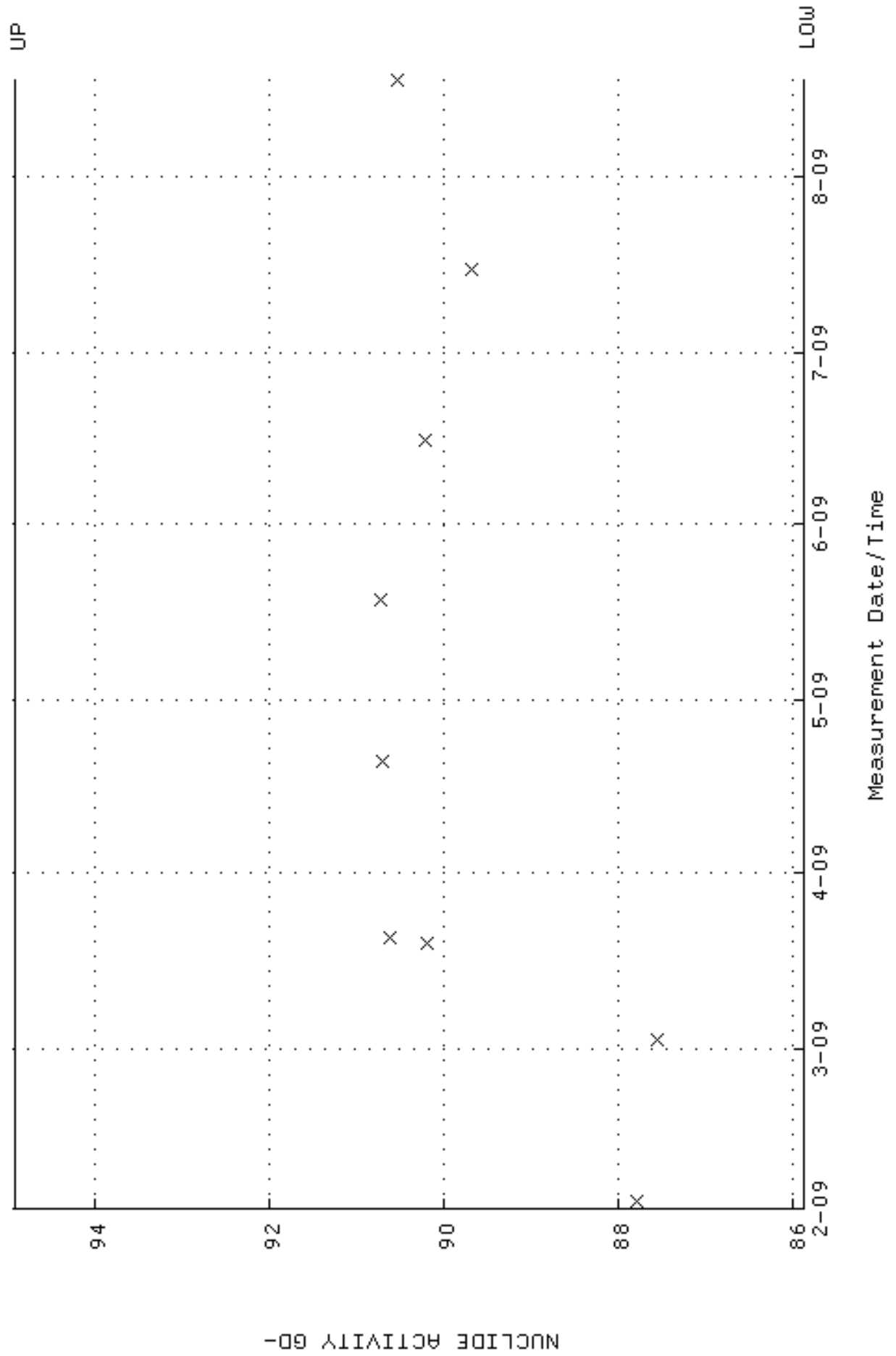
QA filename : DKA100:[ENV_ALPHA.QA.B]B113.QAF;2
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:00:15 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



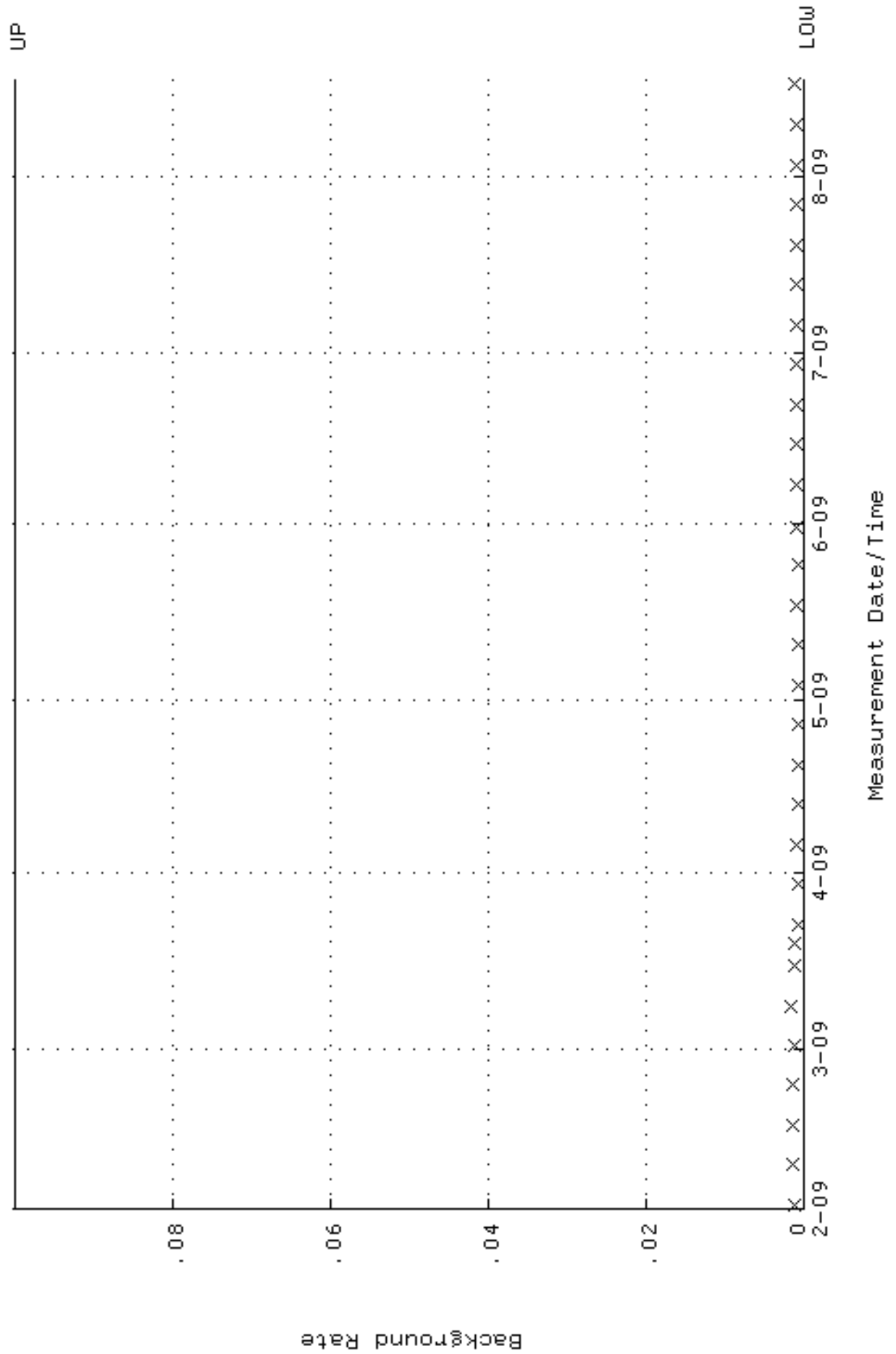
QA filename : DKA100:[ENV_ALPHA.QA.W]W117.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:31:33 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.242940 through 0.262940



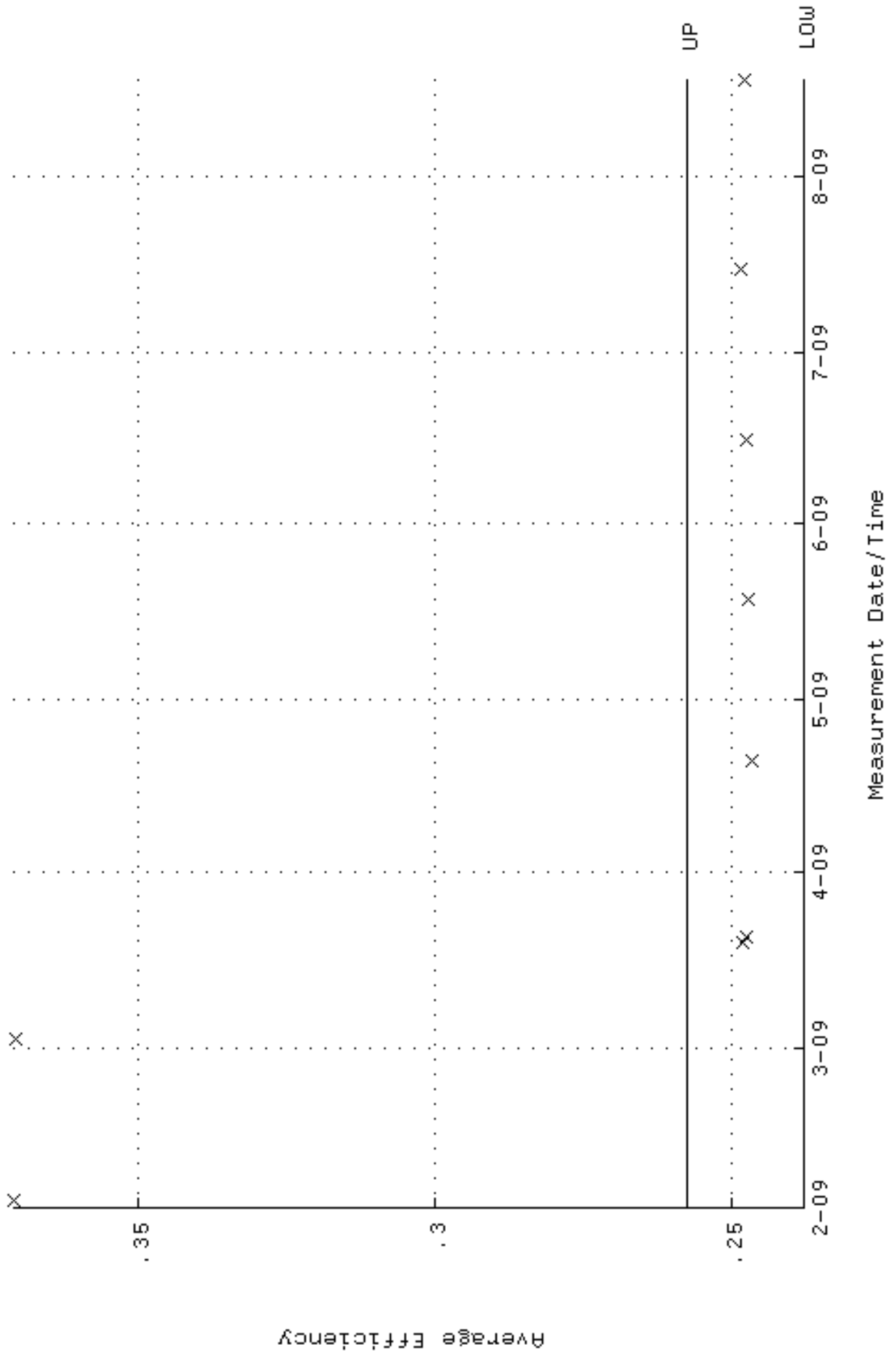
QA filename : DKA100:[ENV_ALPHA.QA.W]w117.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-FEB-2009 10:31:33 through 17-AUG-2009 12:00:00
Lower/Upper Lmts: 85.8693 through 94.9081



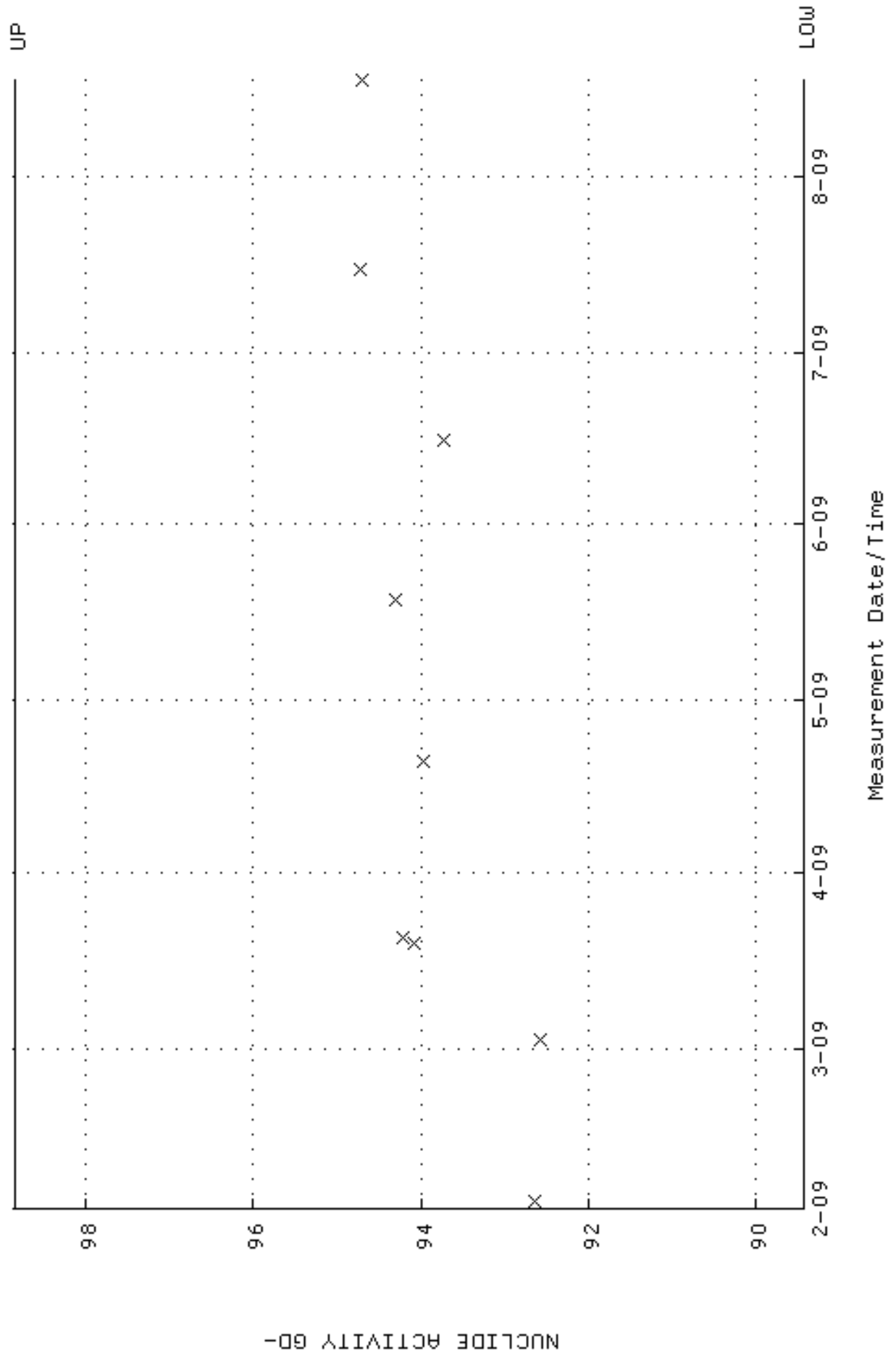
QA filename : DKA100:[ENV_ALPHA.QA.B]B117.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:01:17 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



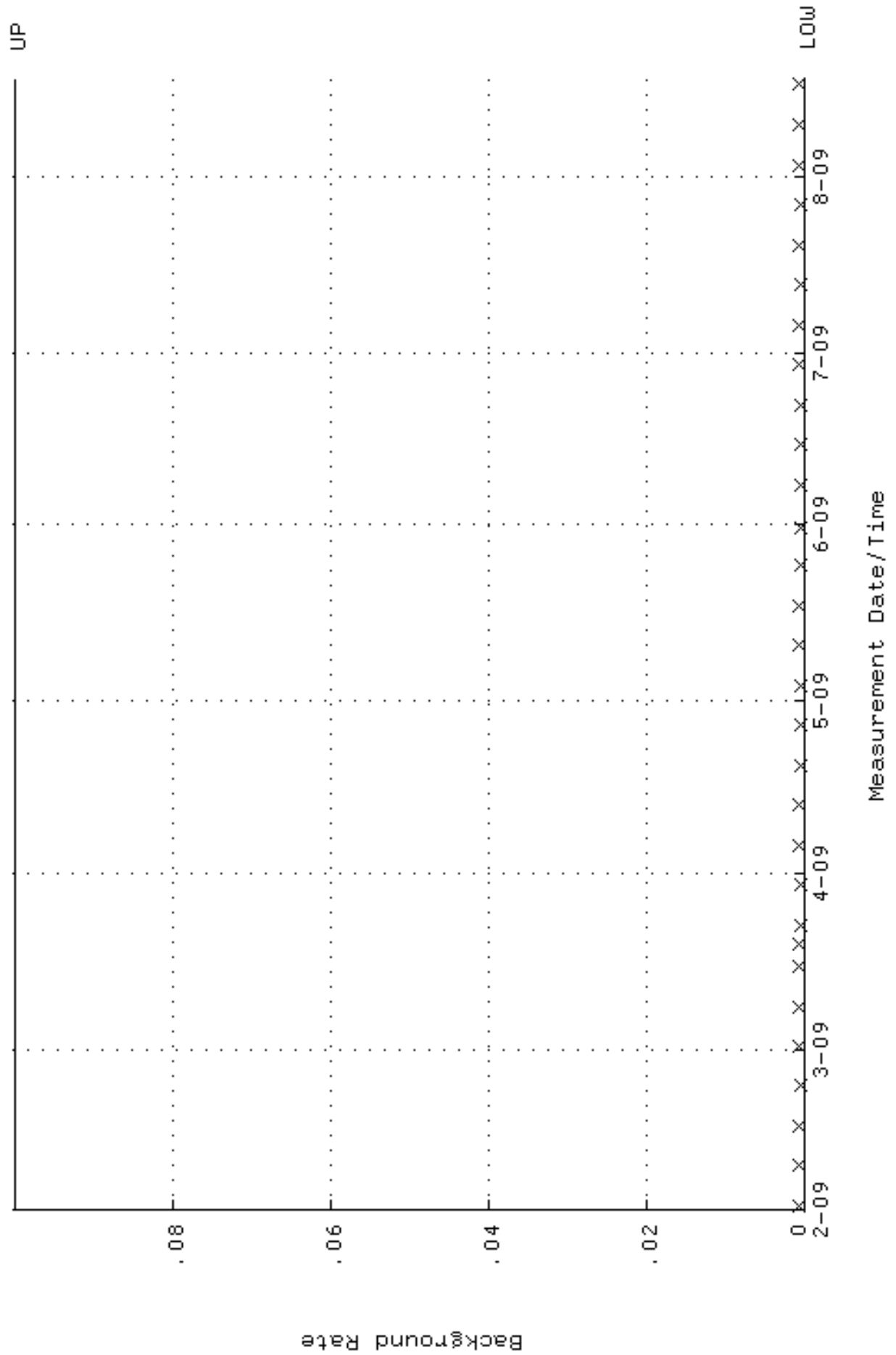
QA filename : DKA100:[ENV_ALPHA.QA.W]W121.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:32:01 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.237686 through 0.257686



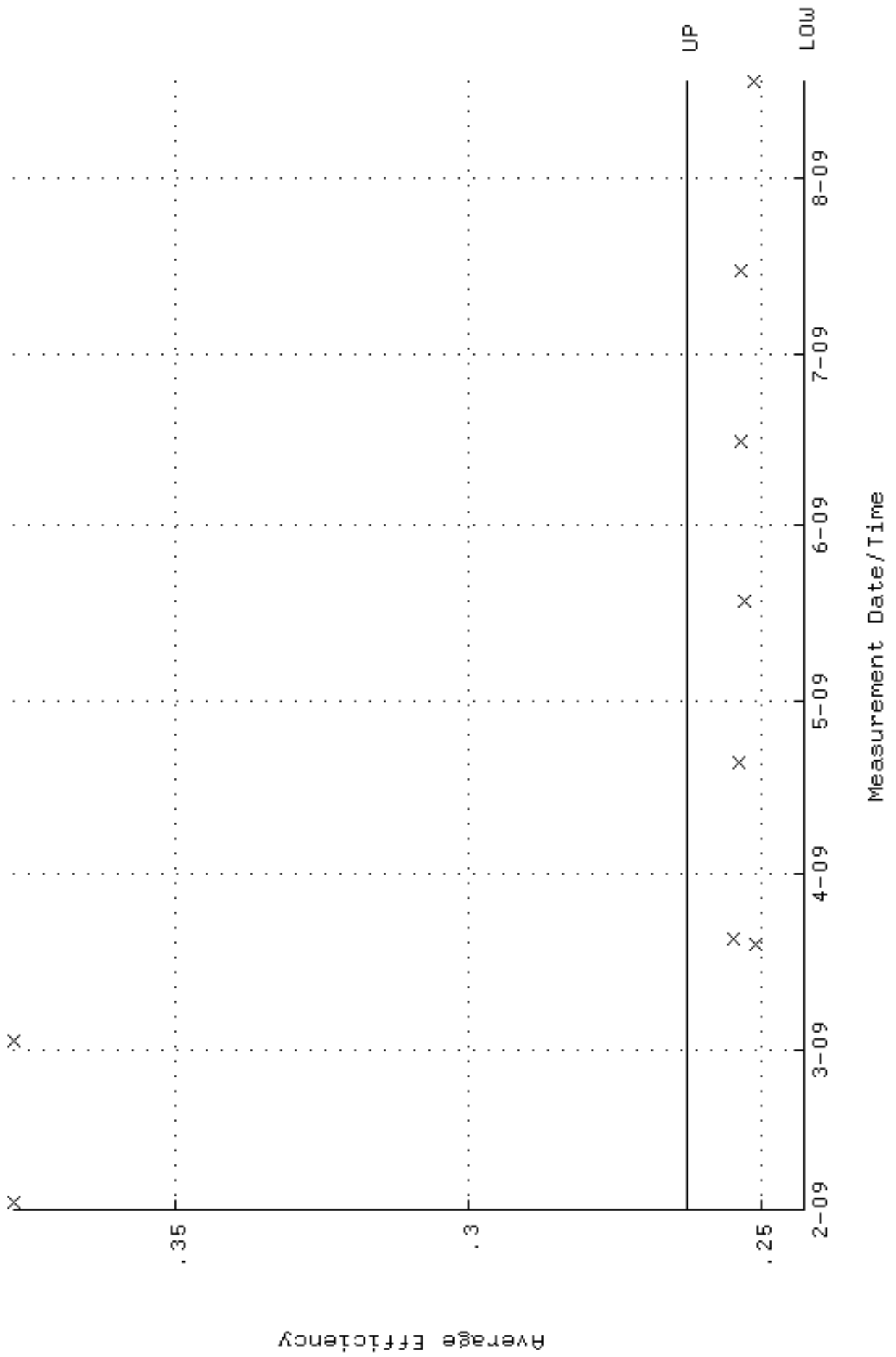
QA filename : DKA100:[ENV_ALPHA.QA.W]W121.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:32:01 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 89.4263 through 98.8395



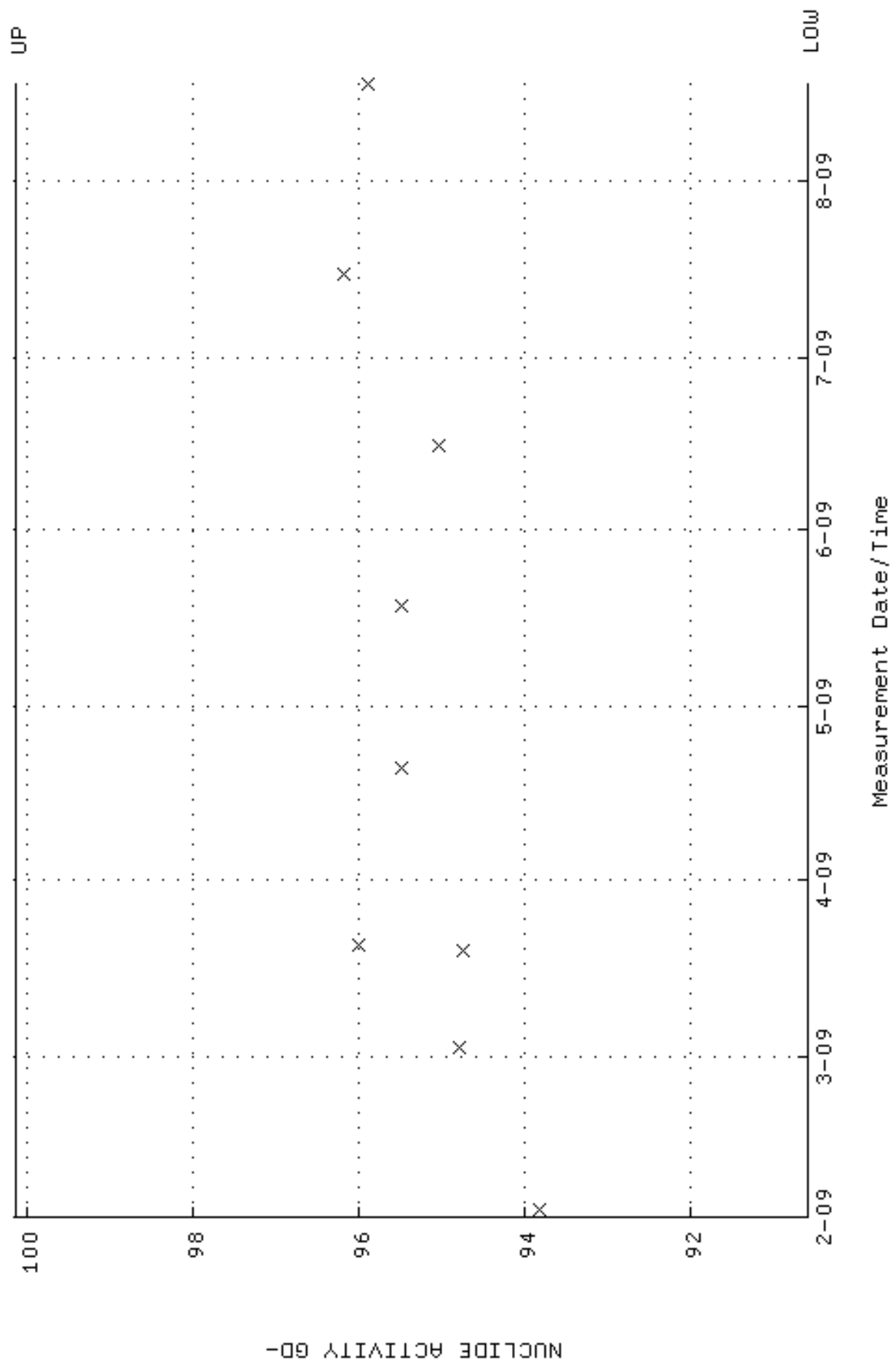
QA filename : DKA100:[ENV_ALPHA.QA.B]B121.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:02:23 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



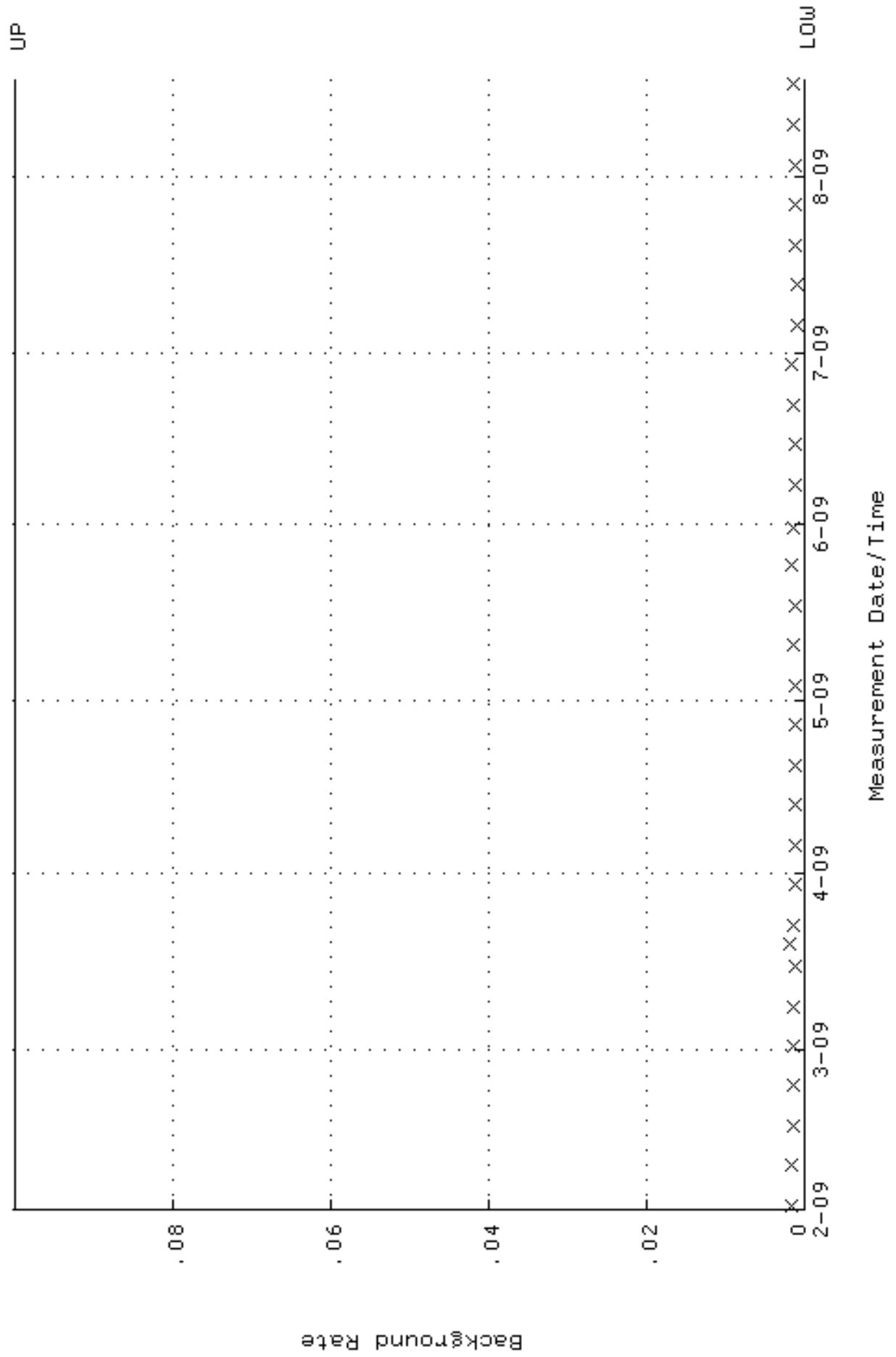
QA filename : DKA100:[ENV_ALPHA.QA.W]W122.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:32:09 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.242659 through 0.262659



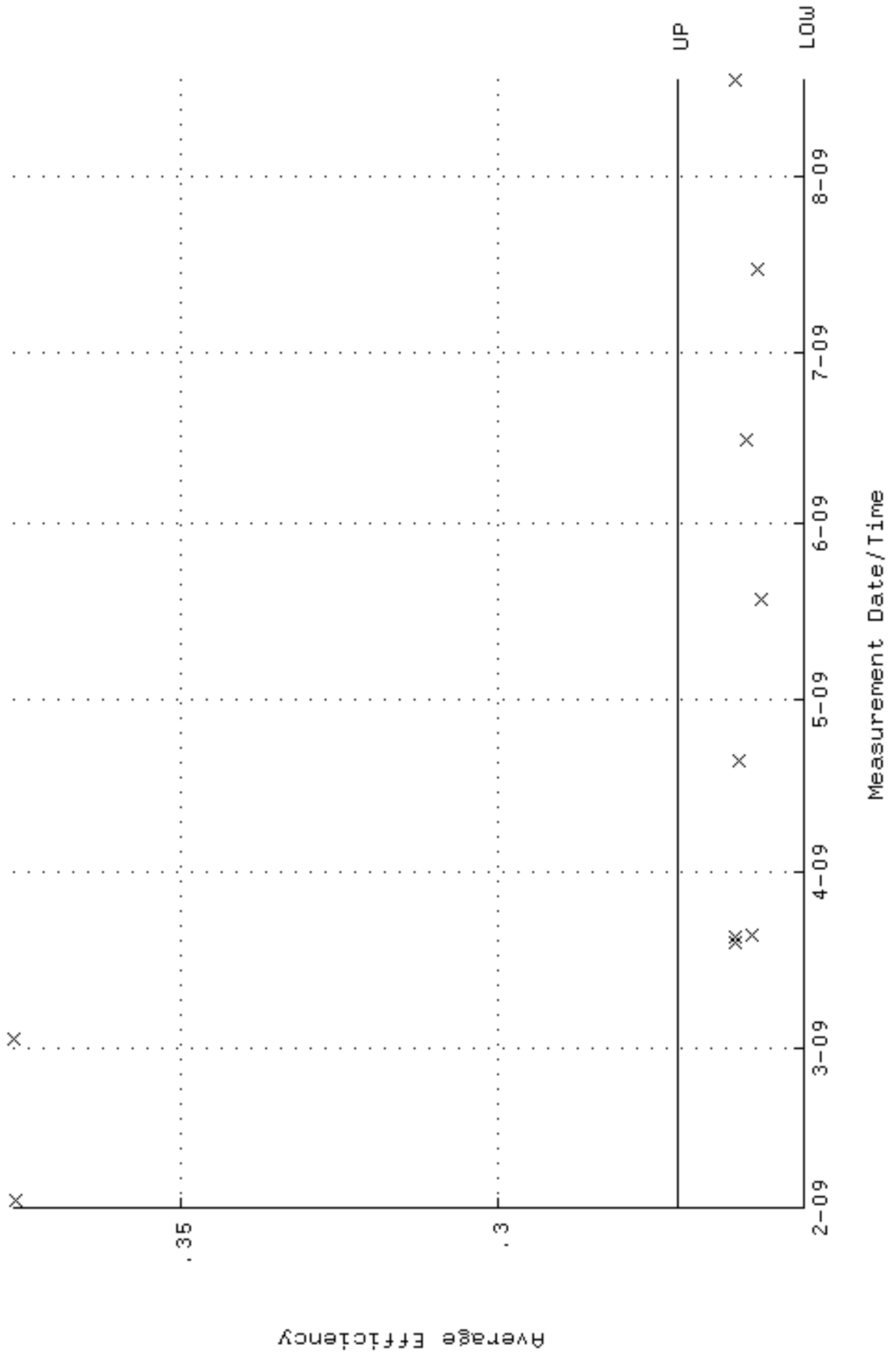
QA filename : DKA100:[ENV_ALPHA.QA.W]W122.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:32:09 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 90.5949 through 100.131



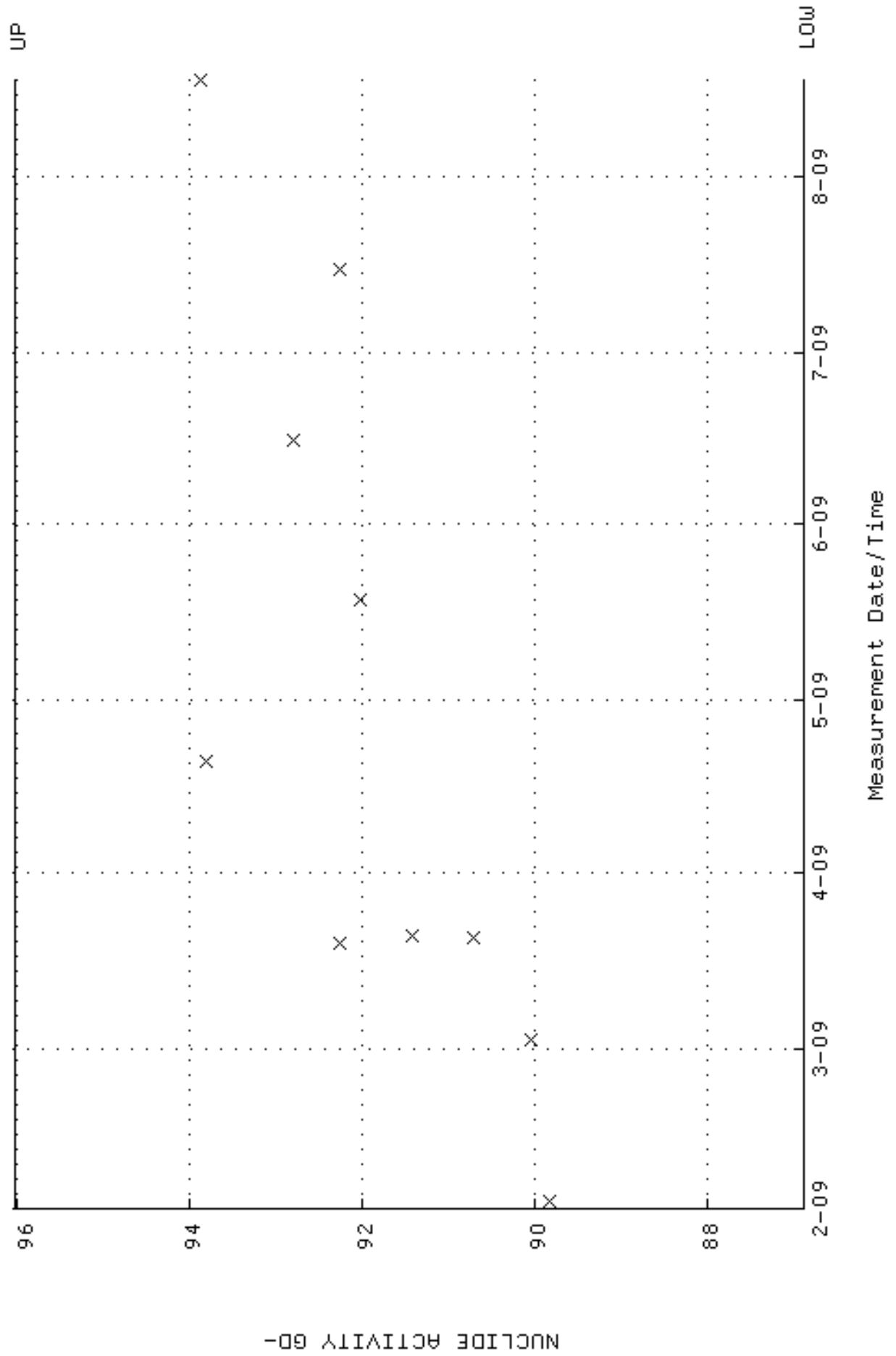
QA filename : DKA100:[ENV_ALPHA.QA.B]B122.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:02:39 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



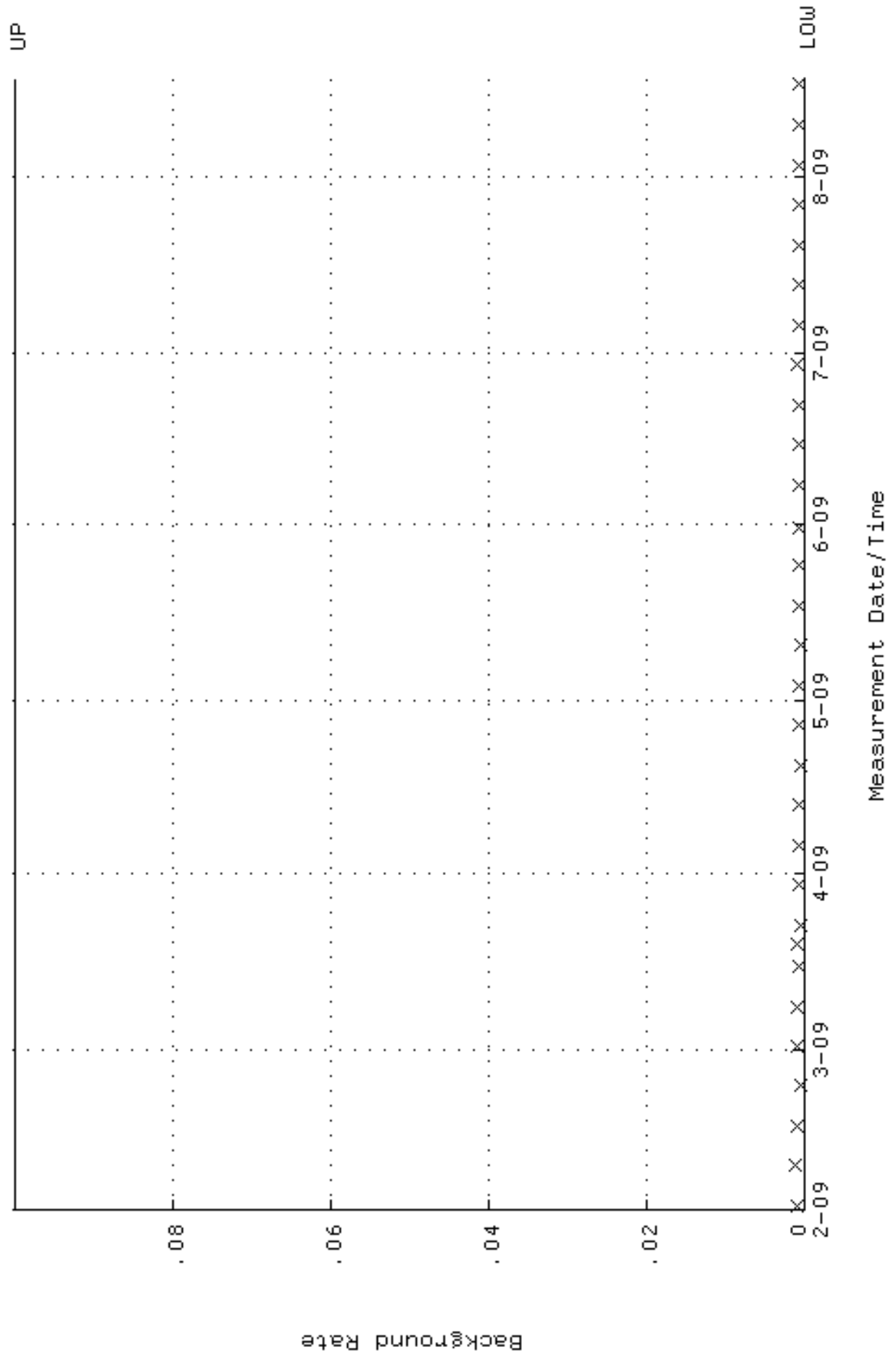
QA filename : DKA100:[ENV_ALPHA.QA.W]W124.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:32:23 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.251398 through 0.271398



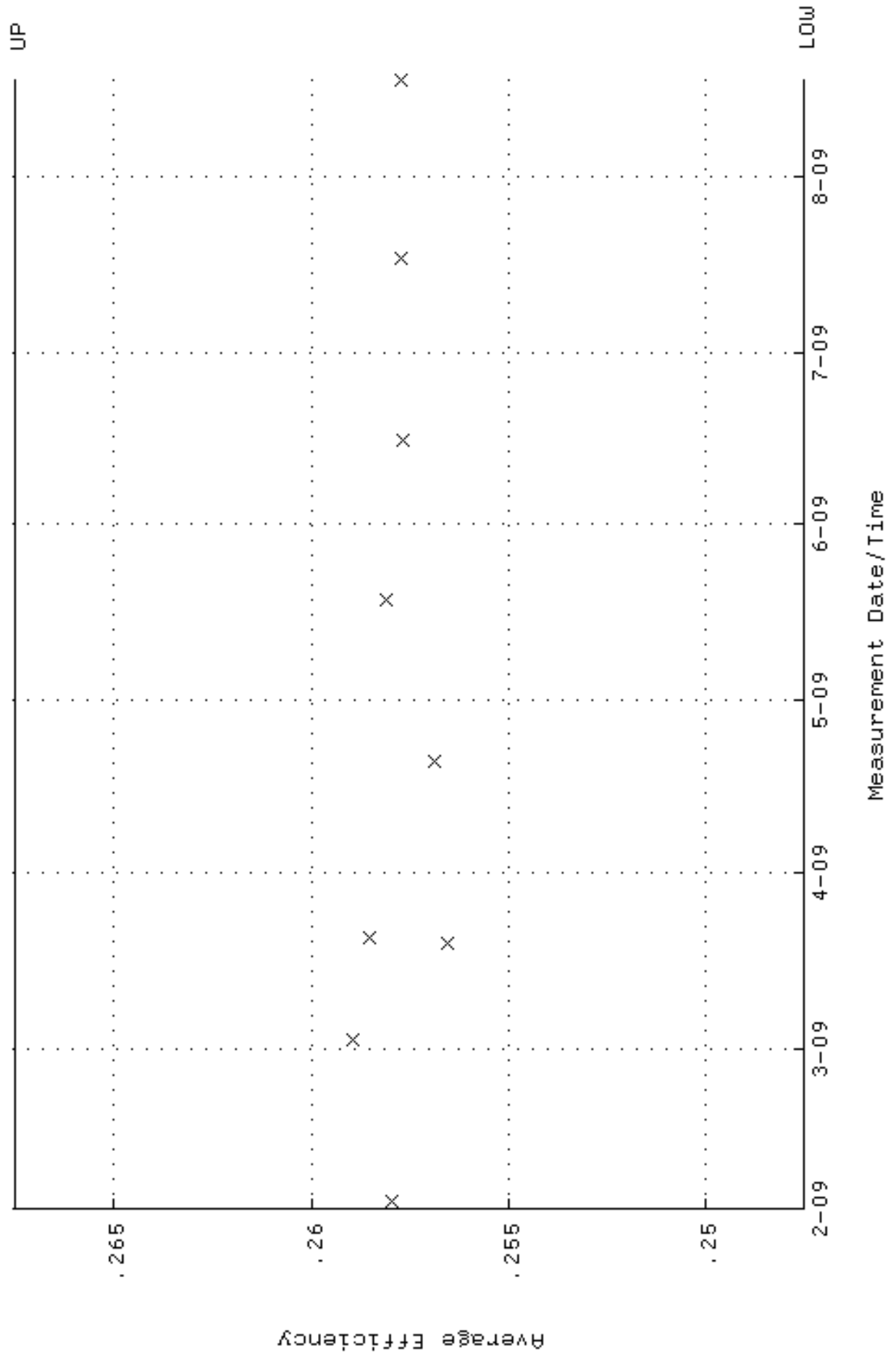
QA filename : DKA100:[ENV_ALPHA.QA.W]W124.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:32:23 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 86.8862 through 96.0322



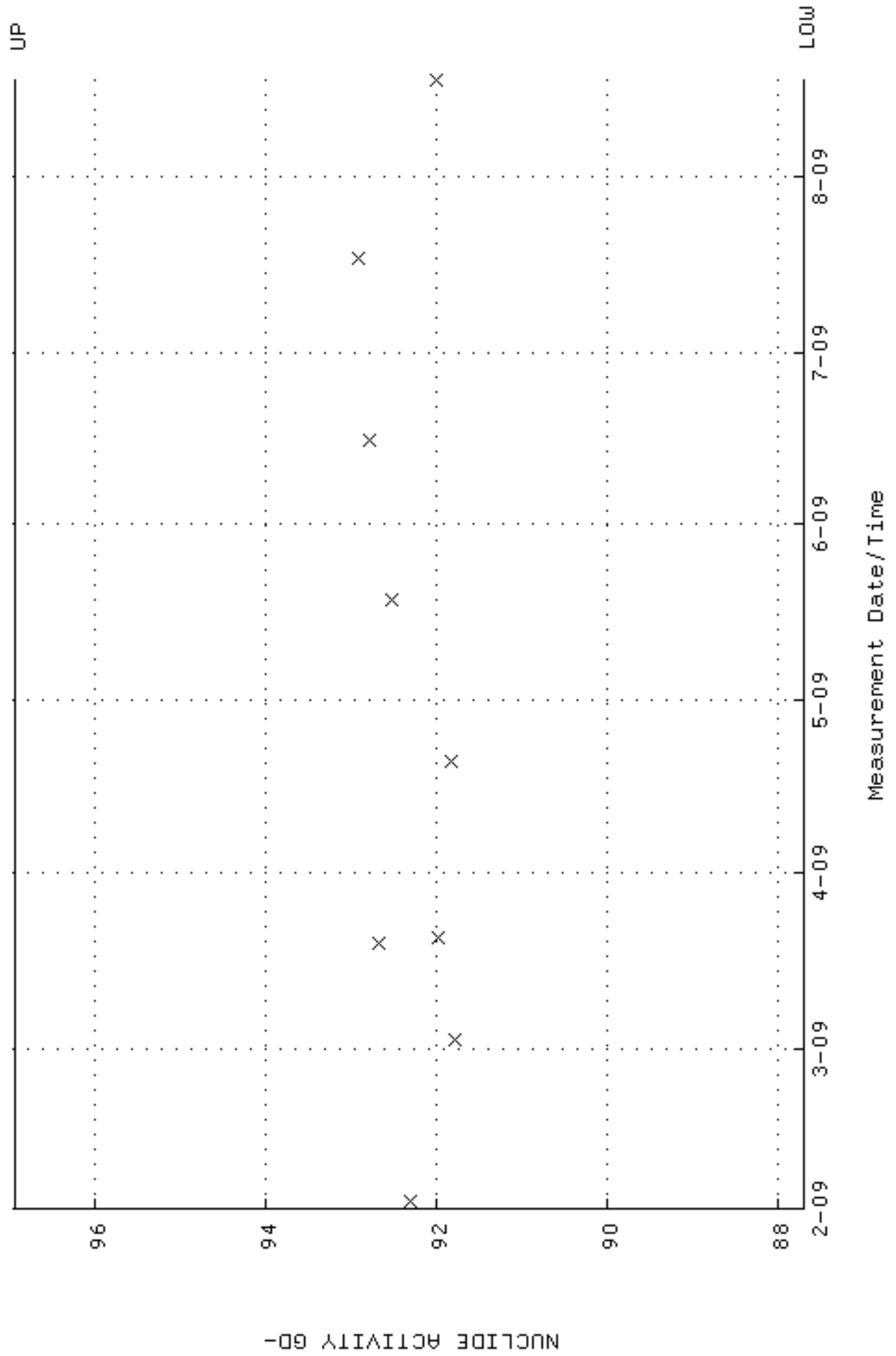
QA filename : DKA100:[ENV_ALPHA.QA.B]B124.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:03:04 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



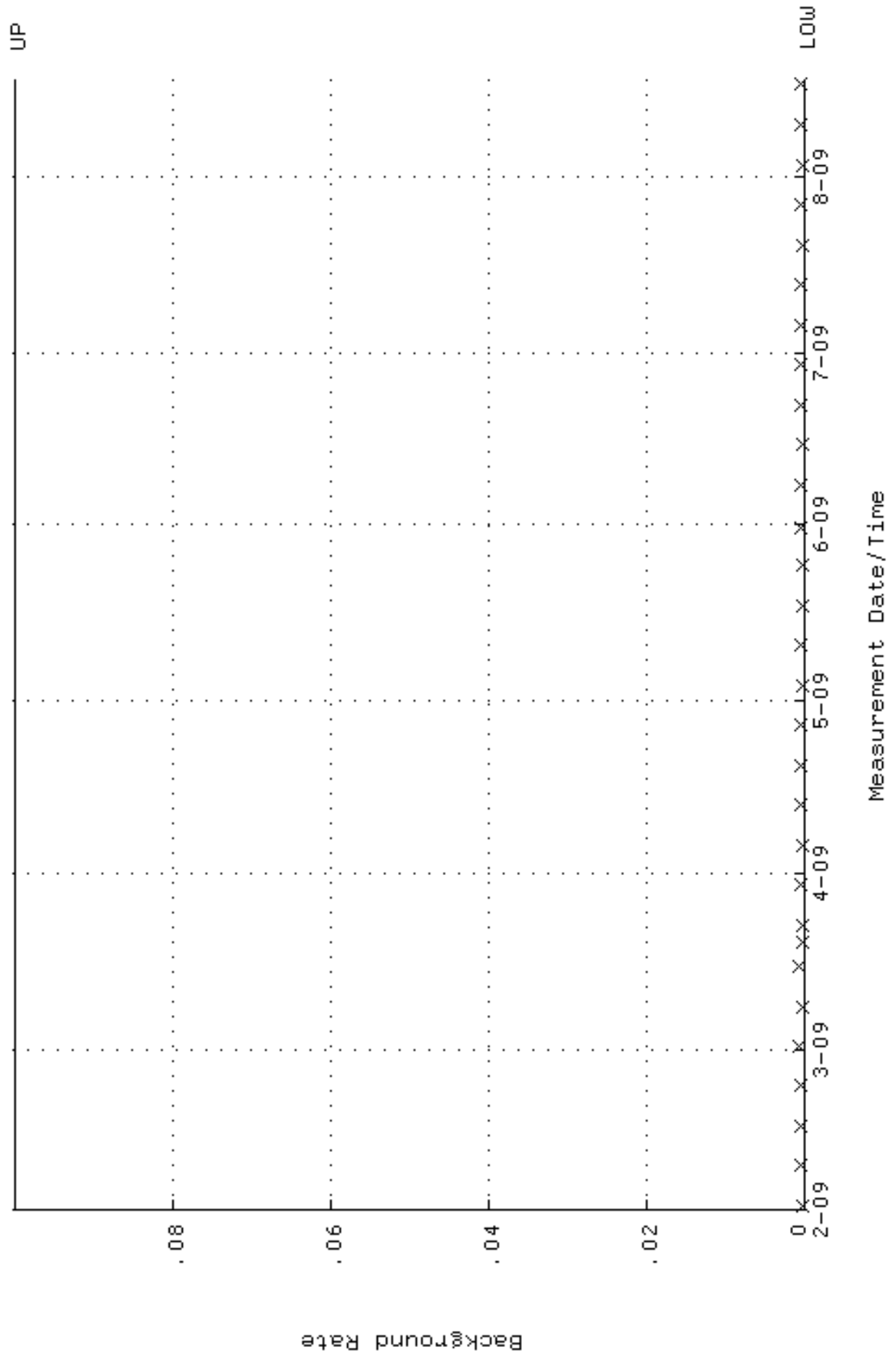
QA filename : DKA100:[ENV_ALPHA.QA.W]W125.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:32:31 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.247512 through 0.267512



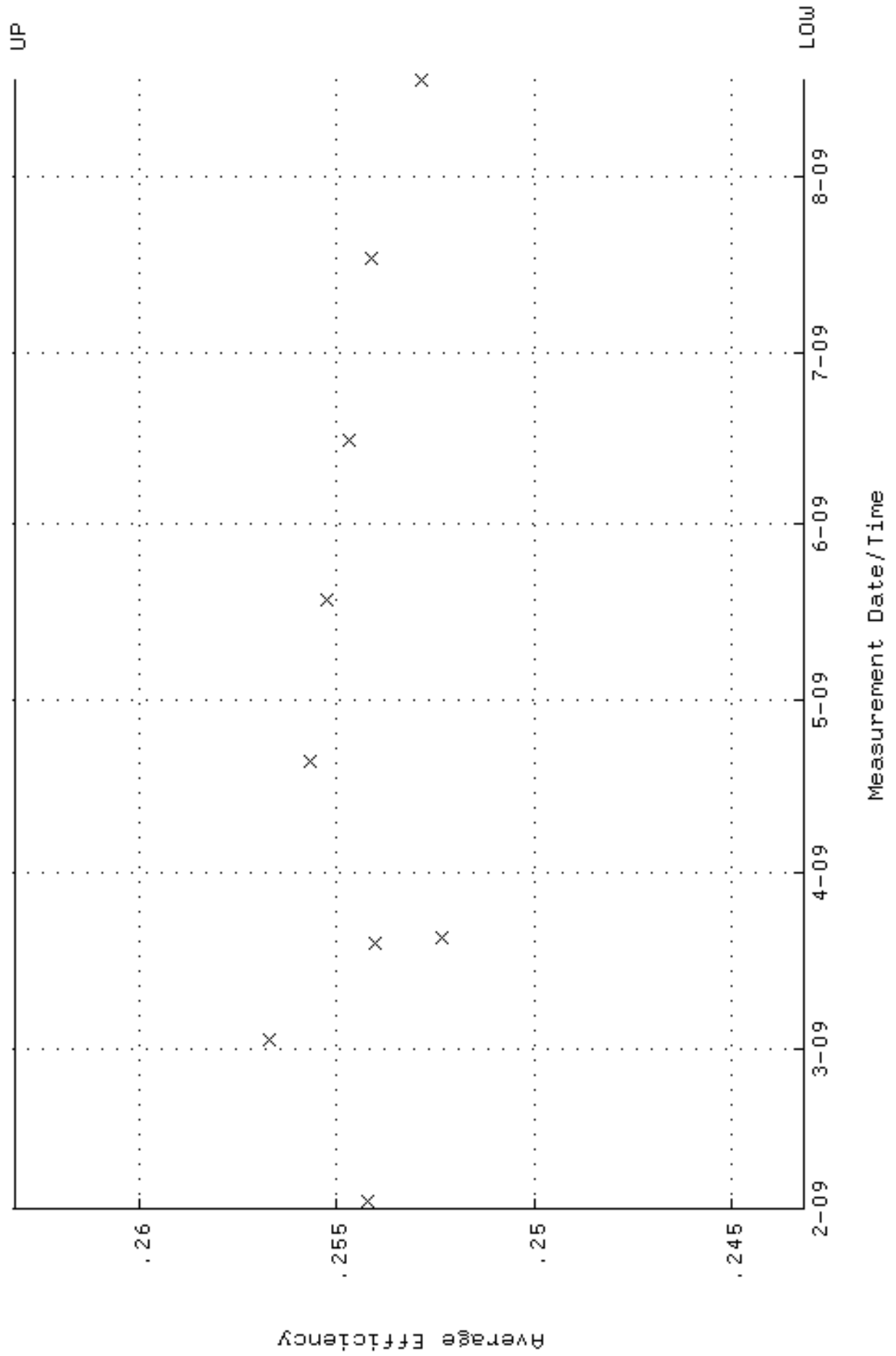
QA filename : DKA100:[ENV_ALPHA.QA.W]W125.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-FEB-2009 10:32:31 through 17-AUG-2009 12:00:00
Lower/Upper Lmts: 87.6956 through 96.9268



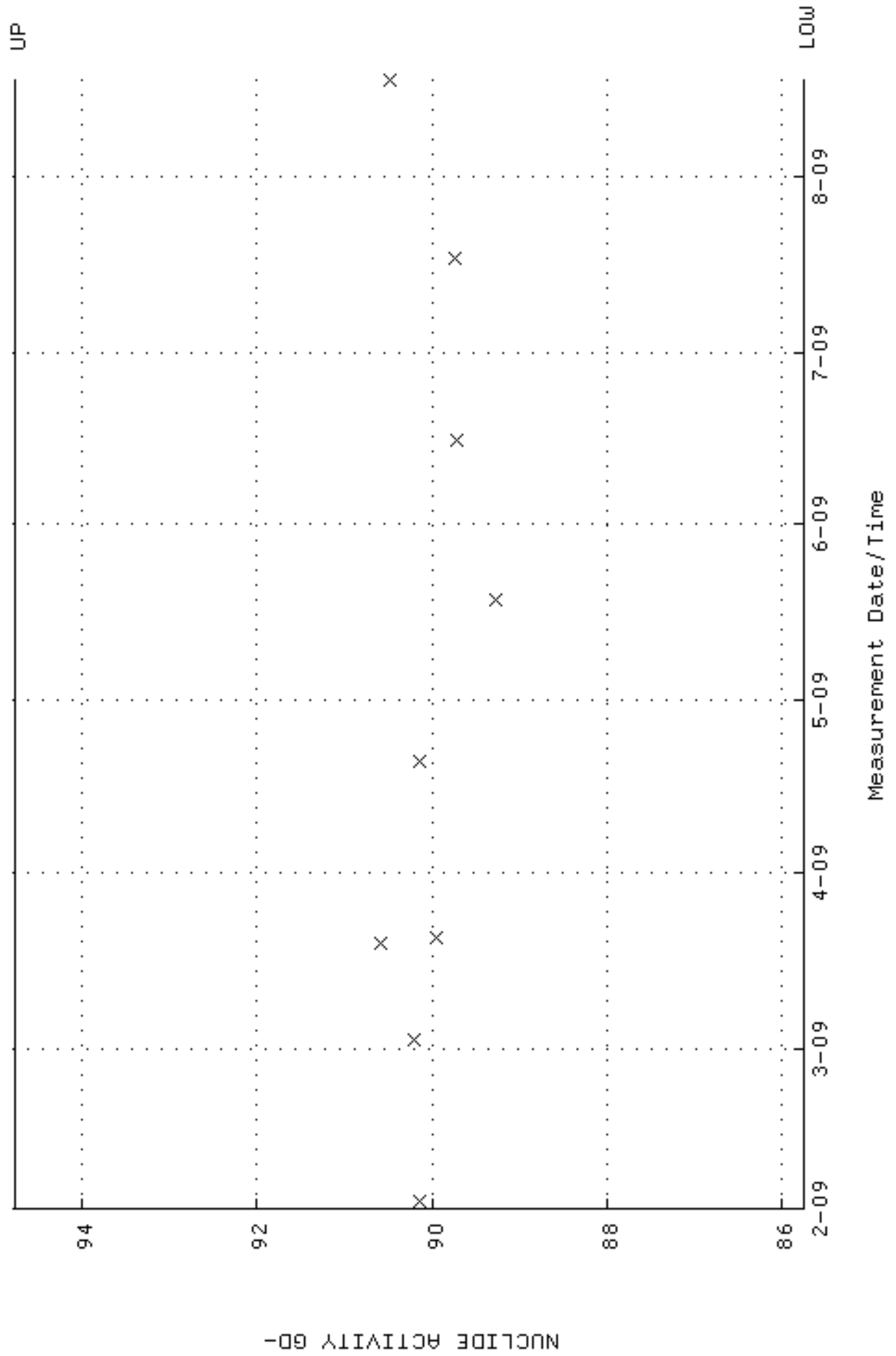
QA filename : DKA100:[ENV_ALPHA.QA.B]B125.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:03:17 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



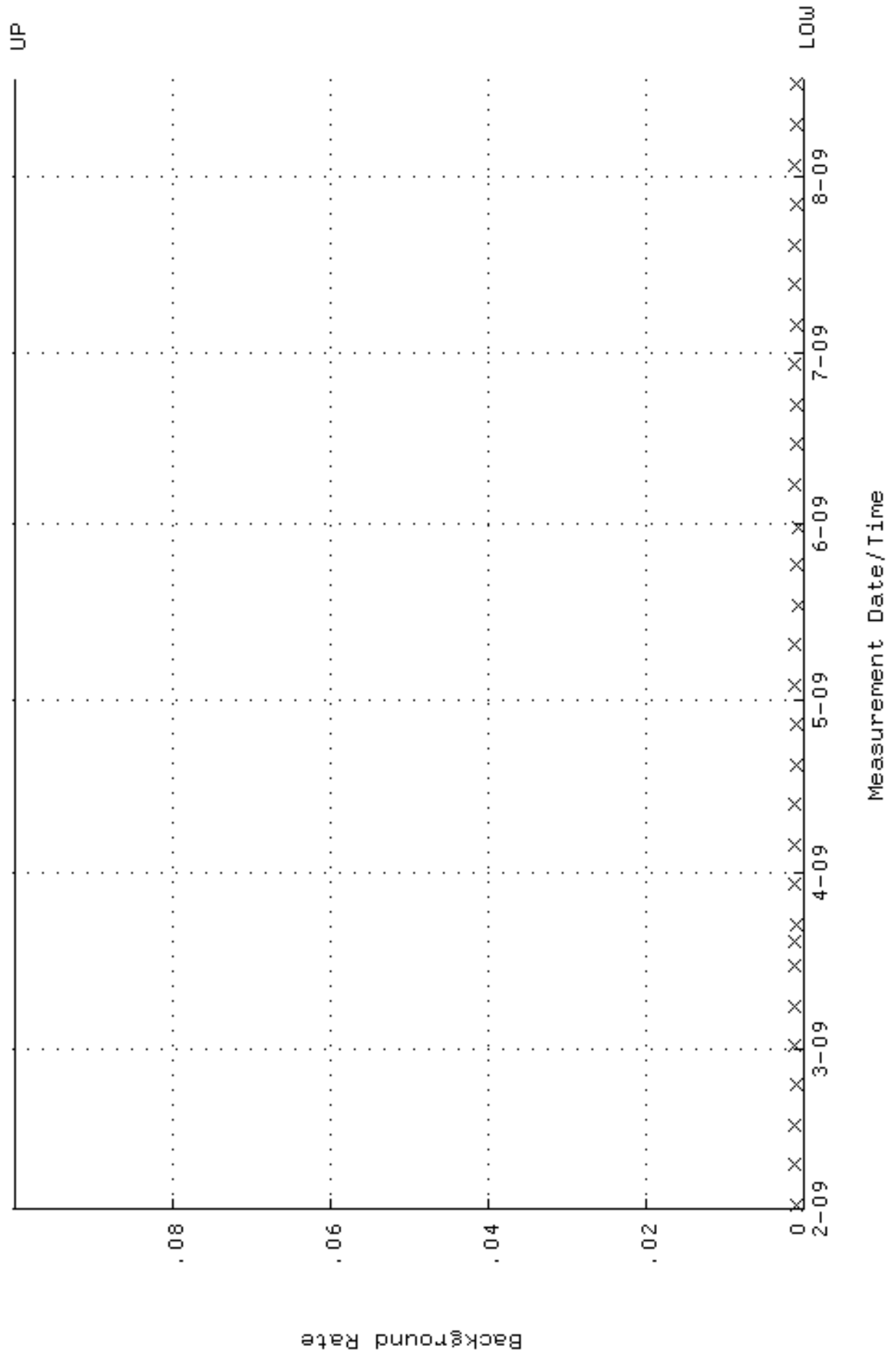
QA filename : DKA100:[ENV_ALPHA.QA.W]W126.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:32:38 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.243156 through 0.263156



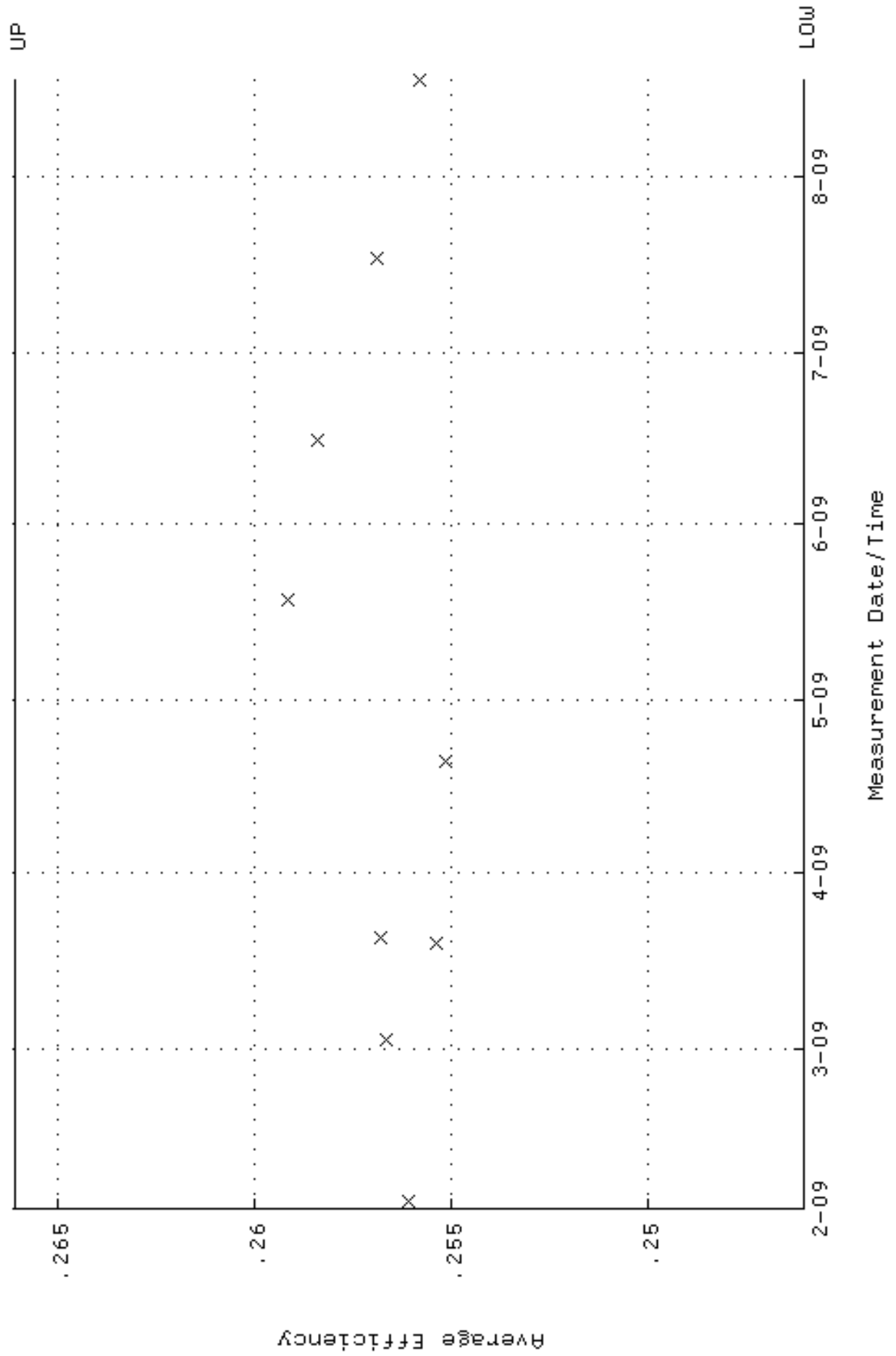
QA filename : DKA100:[ENV_ALPHA.QA.W]w126.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:32:38 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 85.7449 through 94.7707



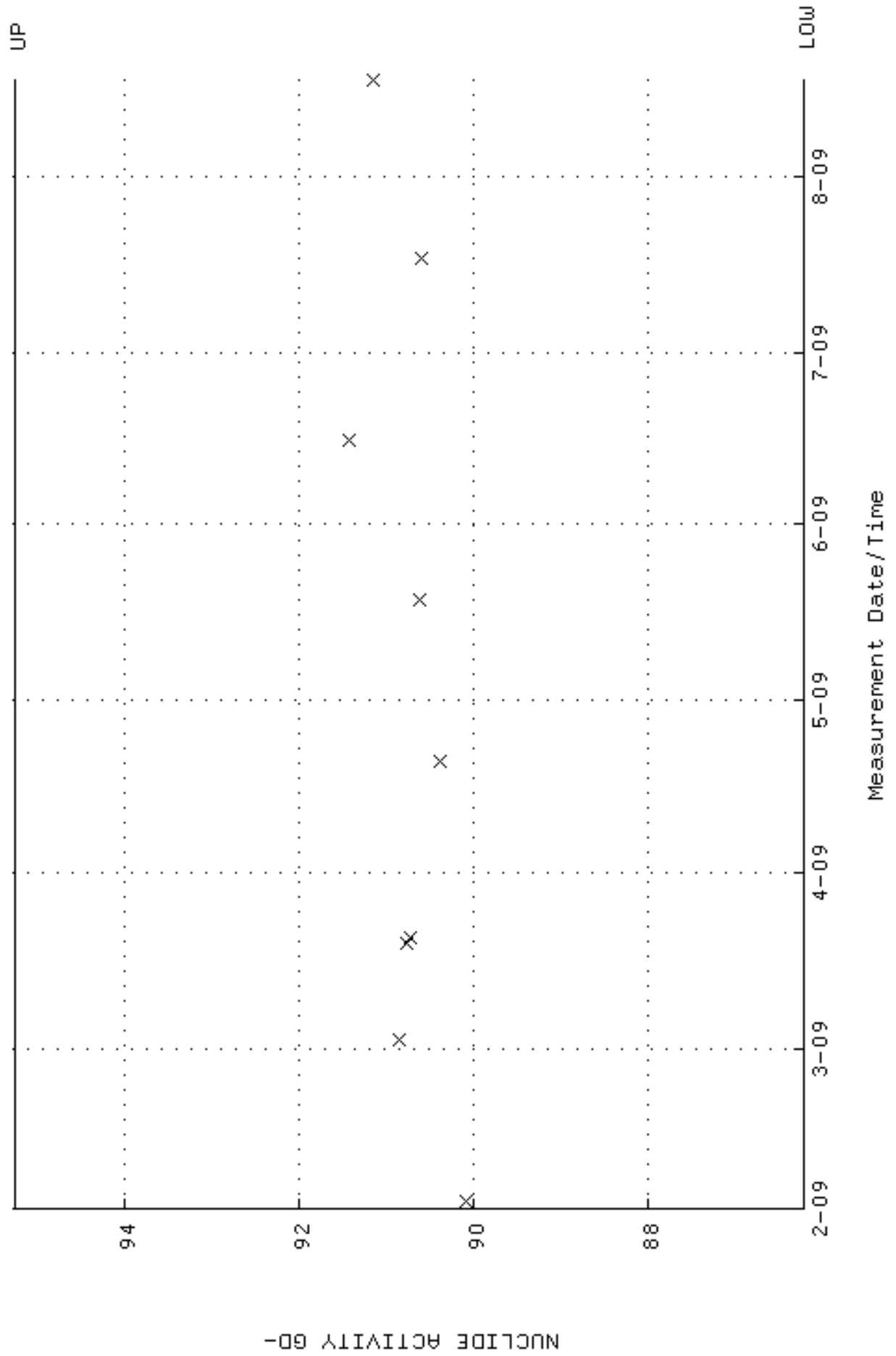
QA filename : DKA100:[ENV_ALPHA.QA.B]B126.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:03:31 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



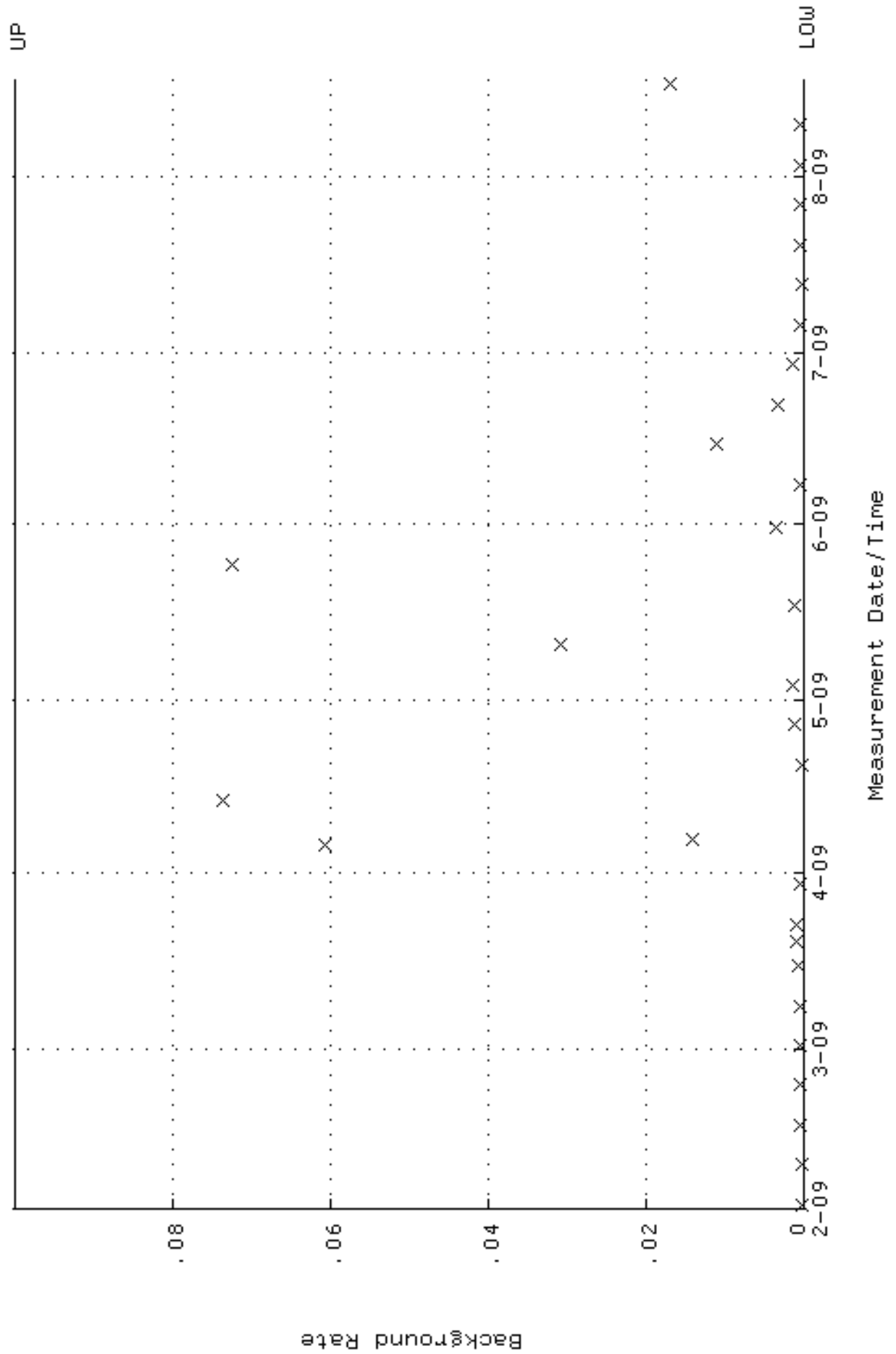
QA filename : DKA100:[ENV_ALPHA.QA.W]W128.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:32:52 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.246062 through 0.266062



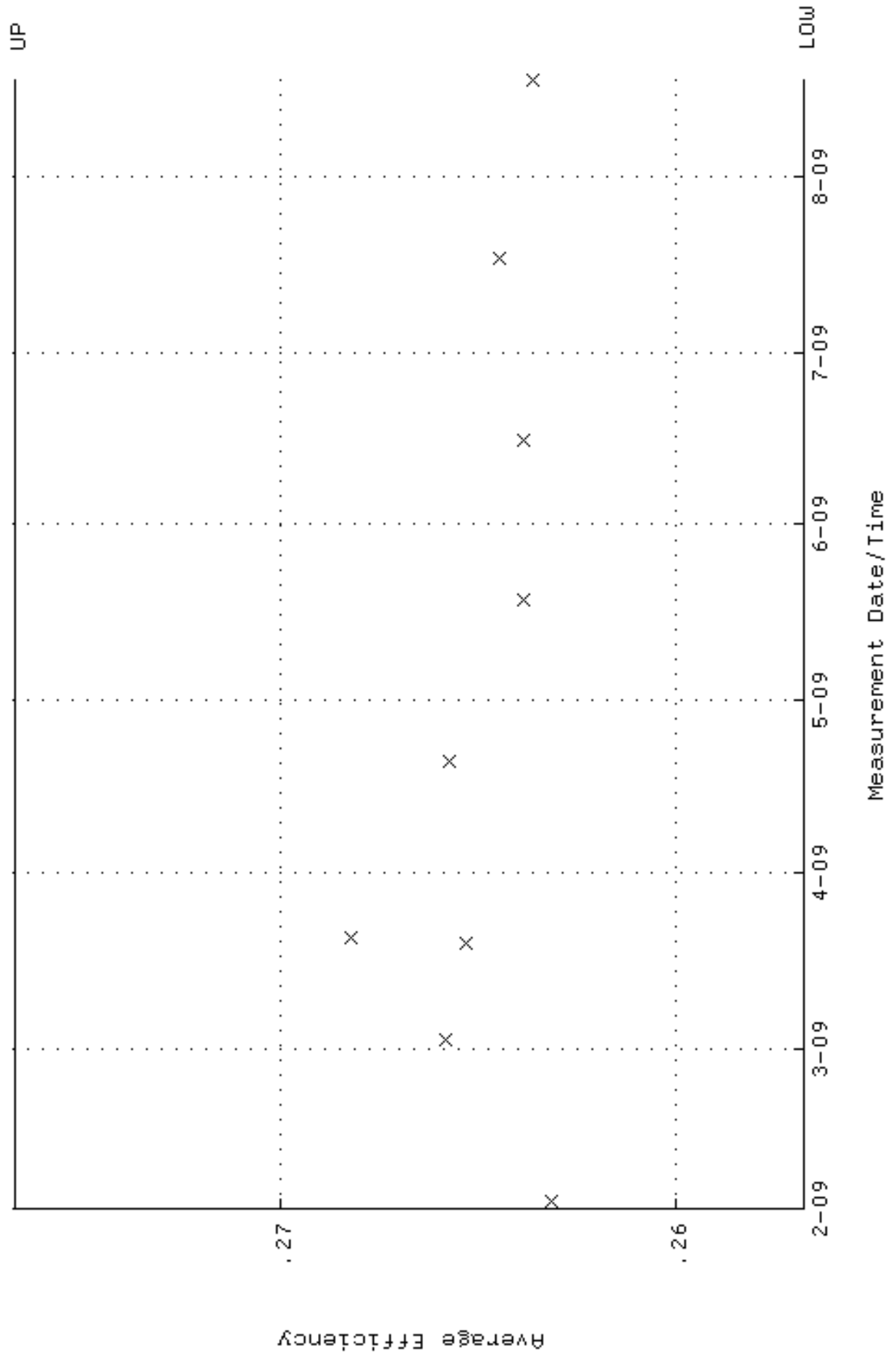
QA filename : DKA100:[ENV_ALPHA.QA.W]W128.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:32:52 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 86.1964 through 95.2697



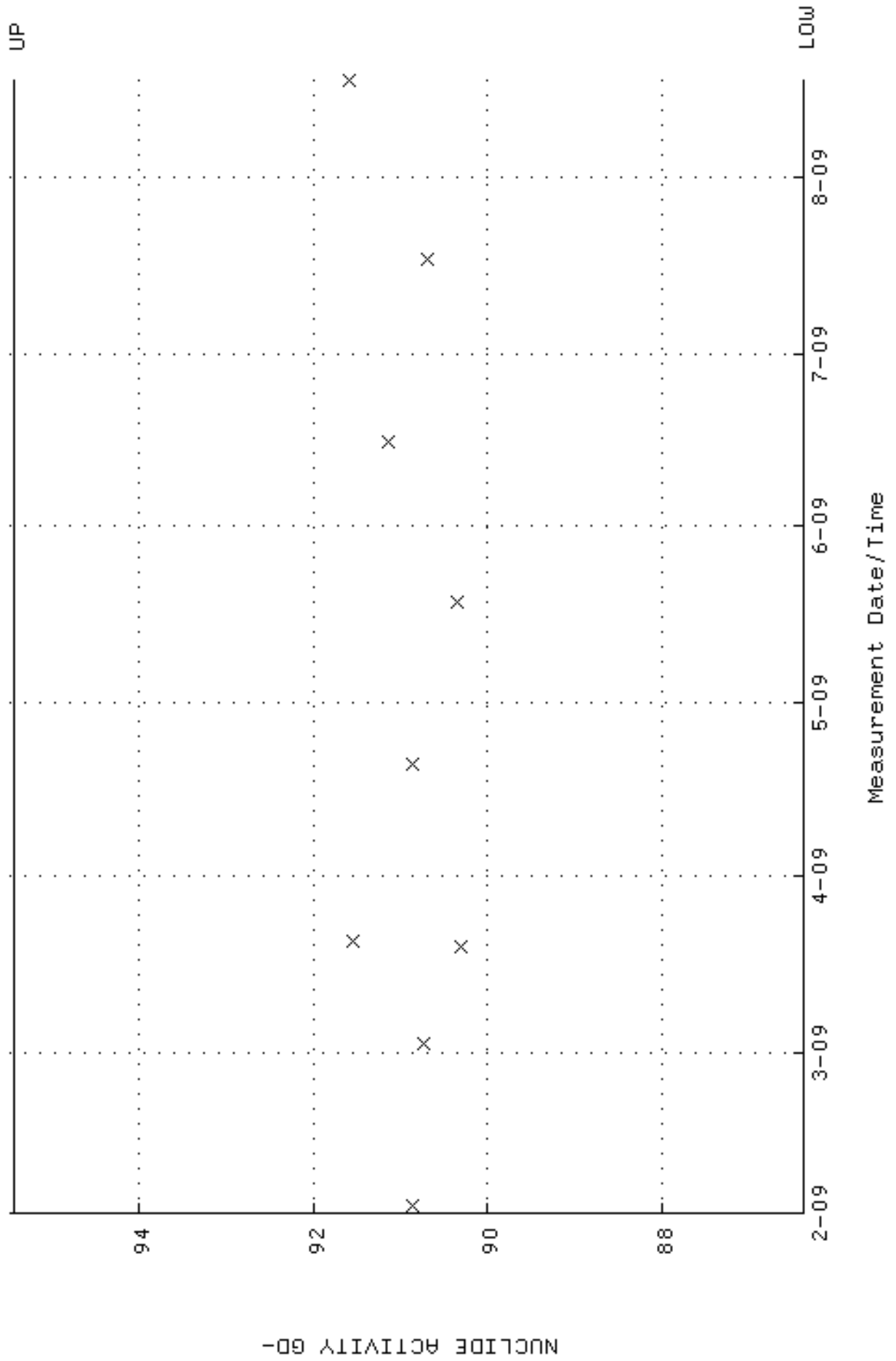
QA filename : DKA100:[ENV_ALPHA.QA.B]B128.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:04:00 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



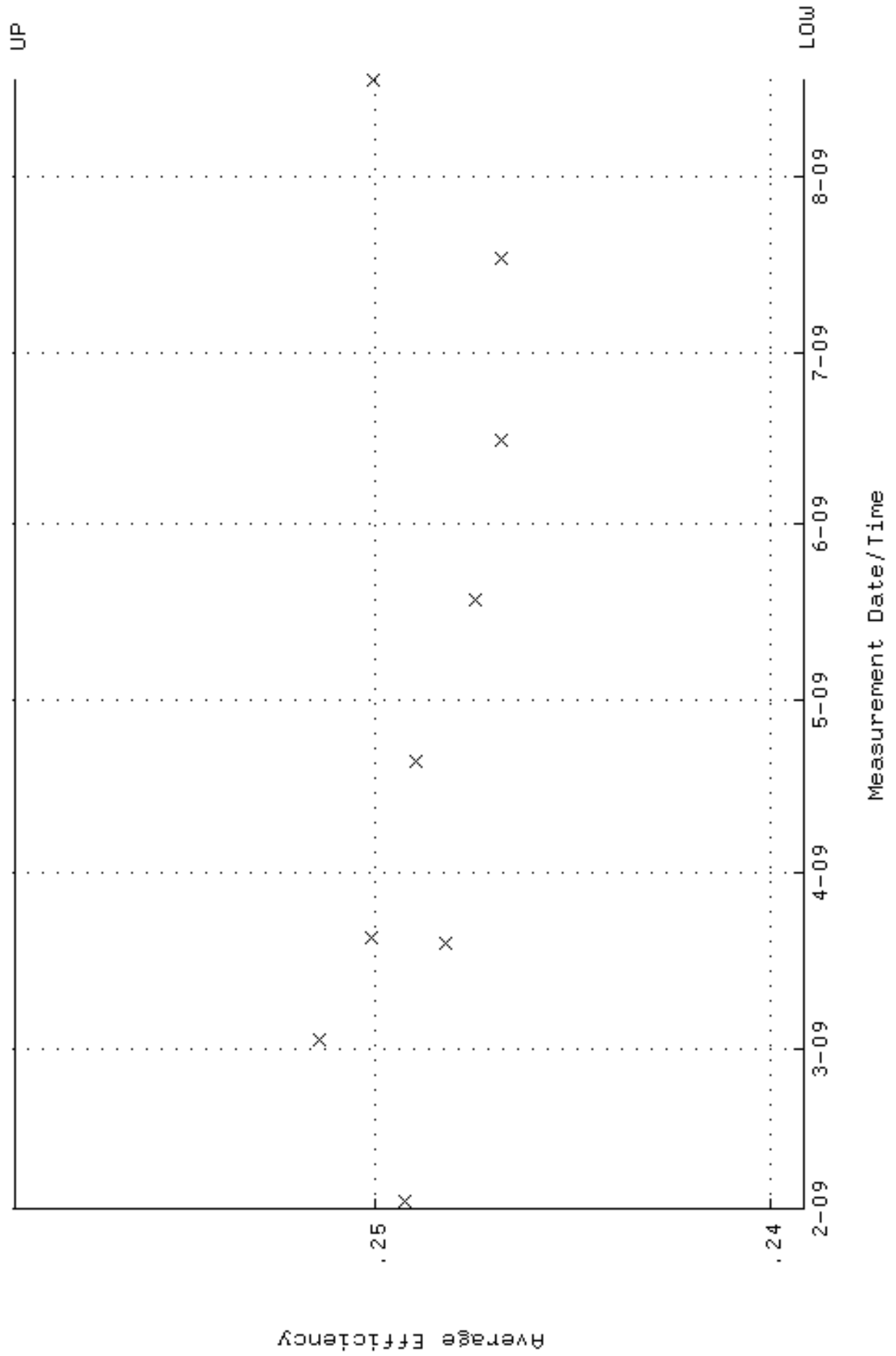
QA filename : DKA100:[ENV_ALPHA.QA.W]W129.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:33:00 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.256741 through 0.276741



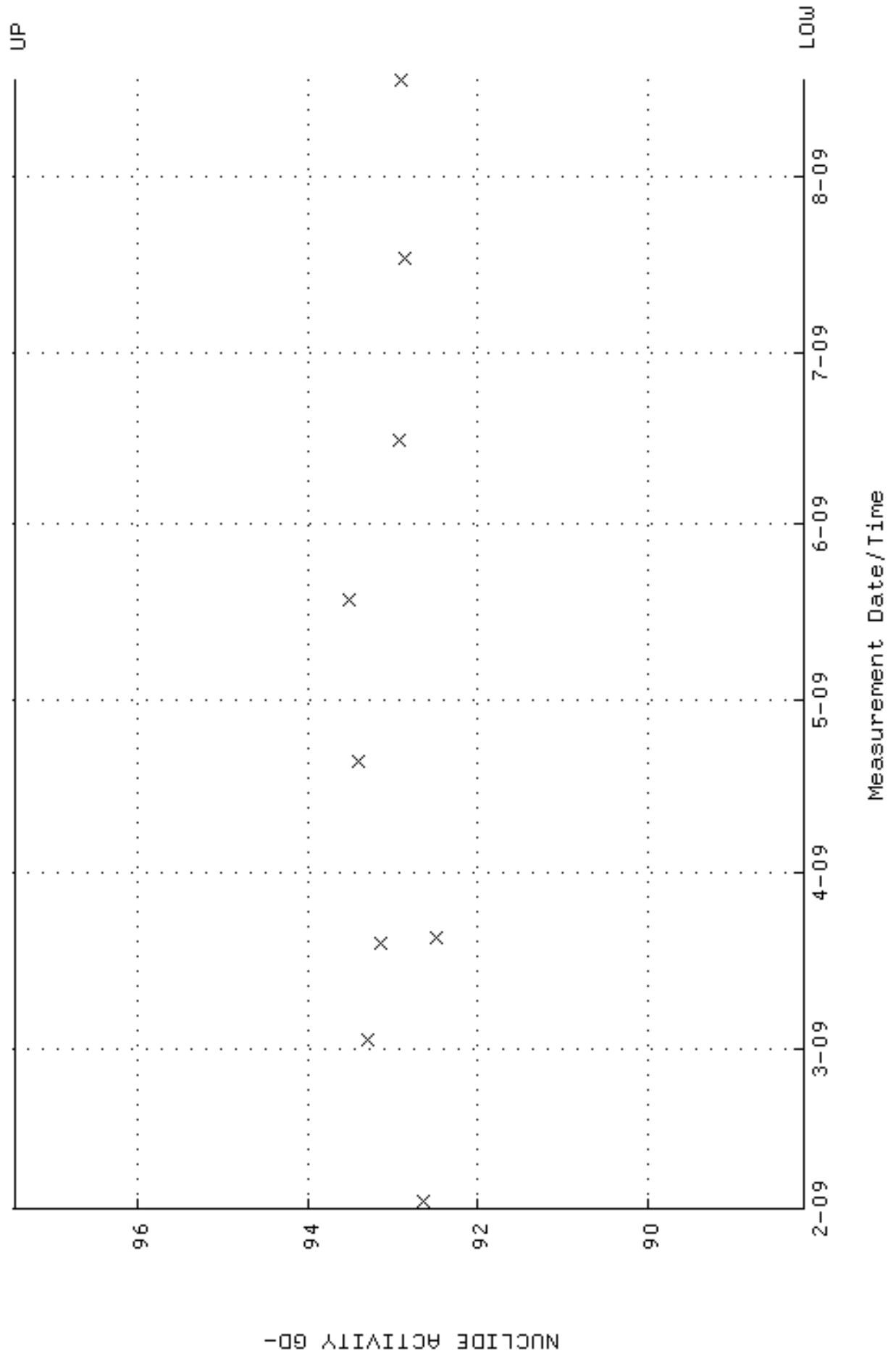
QA filename : DKA100:[ENV_ALPHA.QA.W]W129.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:33:00 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 86.3646 through 95.4556



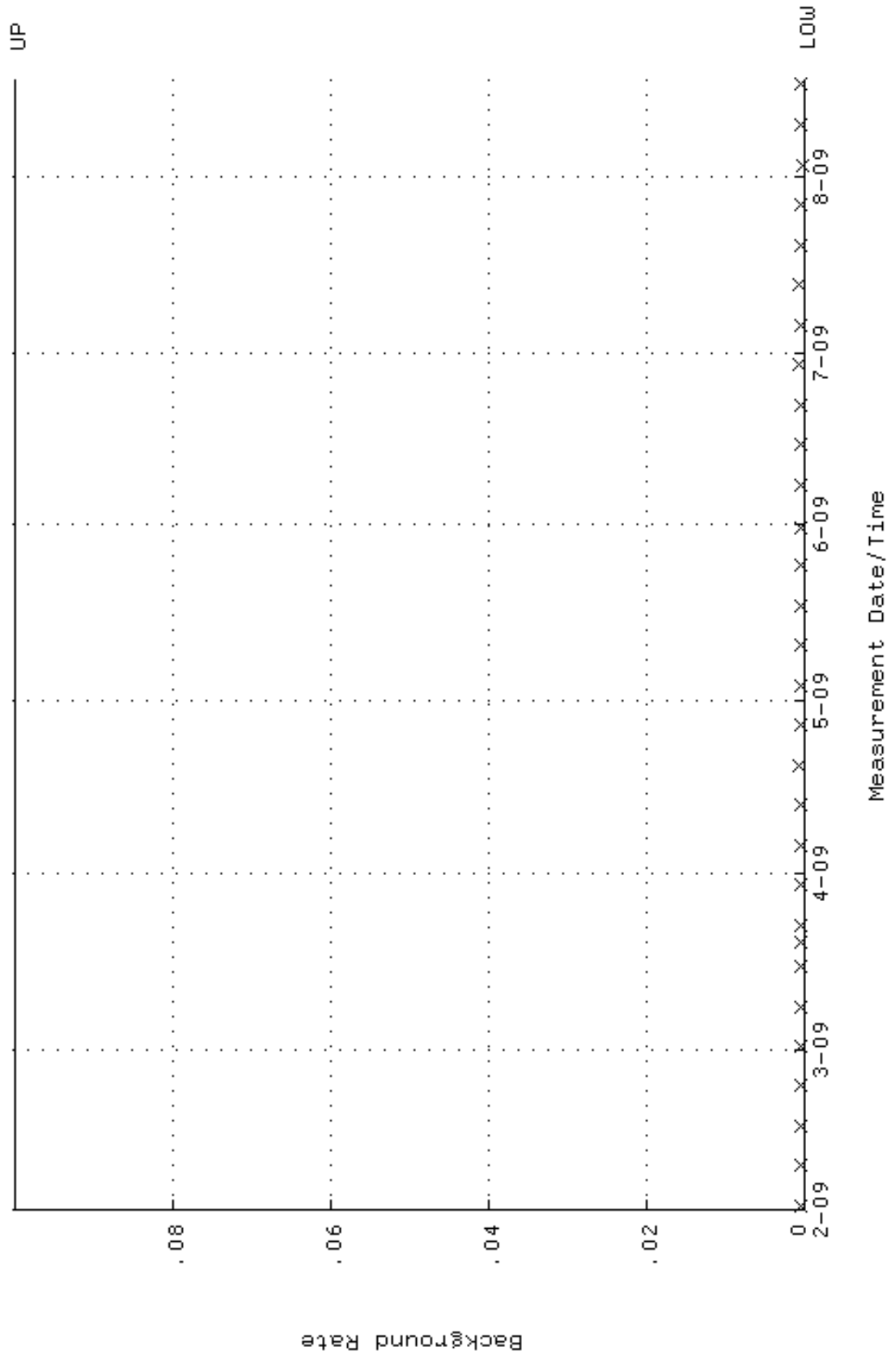
QA filename : DKA100:[ENV_ALPHA.QA.W]W130.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:33:06 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.239131 through 0.259131



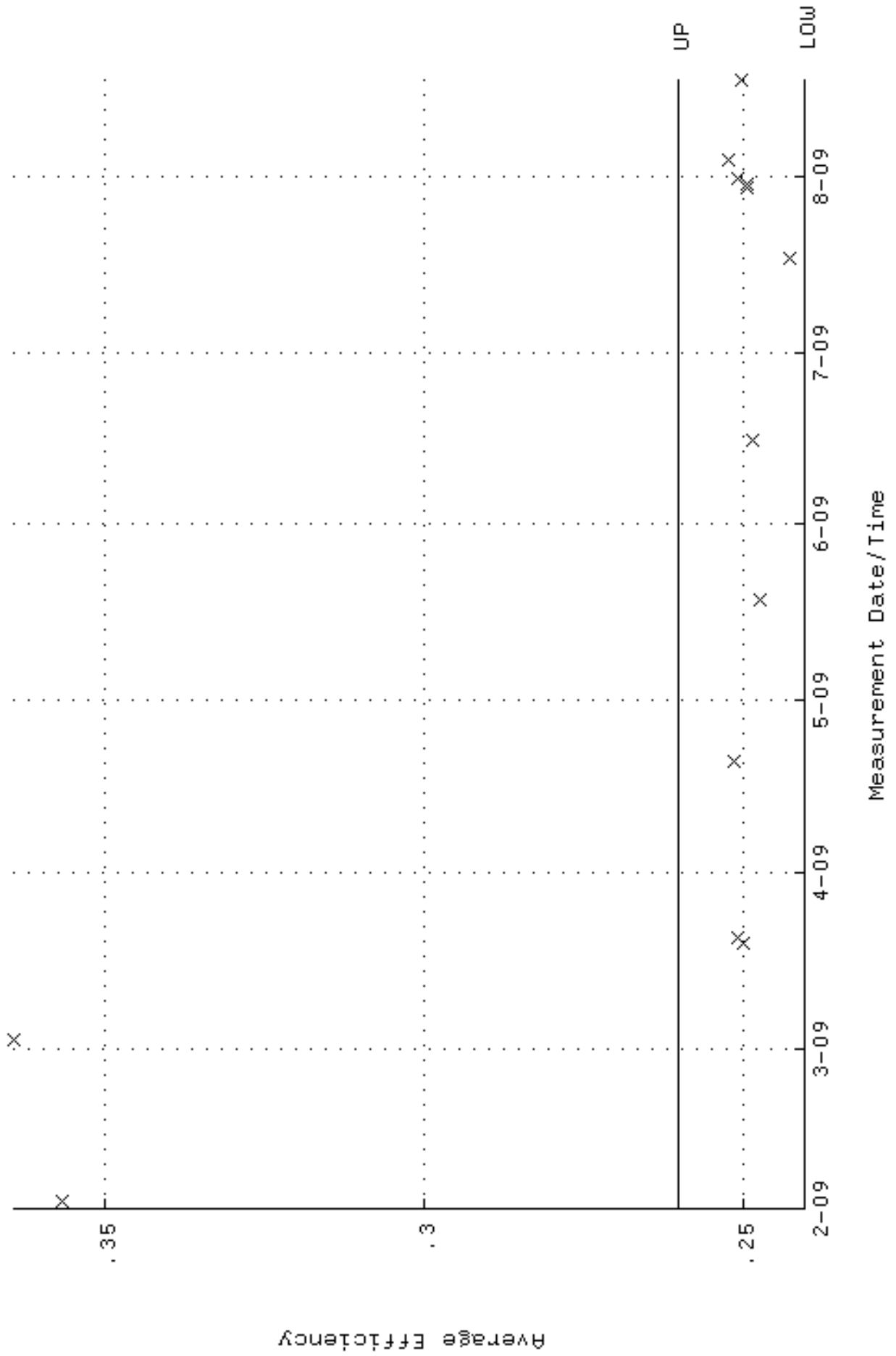
QA filename : DKA100:[ENV_ALPHA.QA.W]W130.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:33:06 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 88.1614 through 97.4416



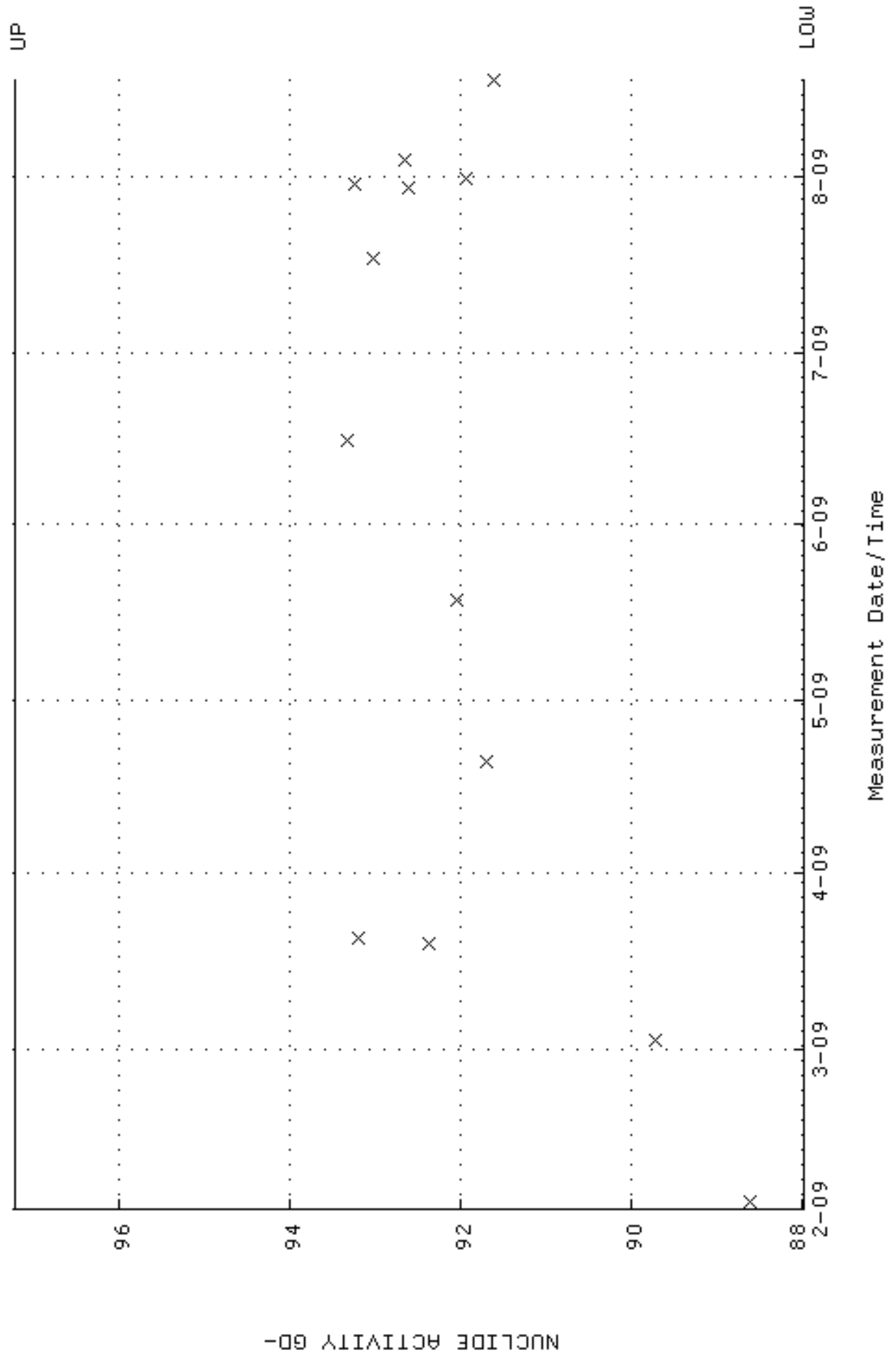
QA filename : DKA100:[ENV_ALPHA.QA.B]B130.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:04:29 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



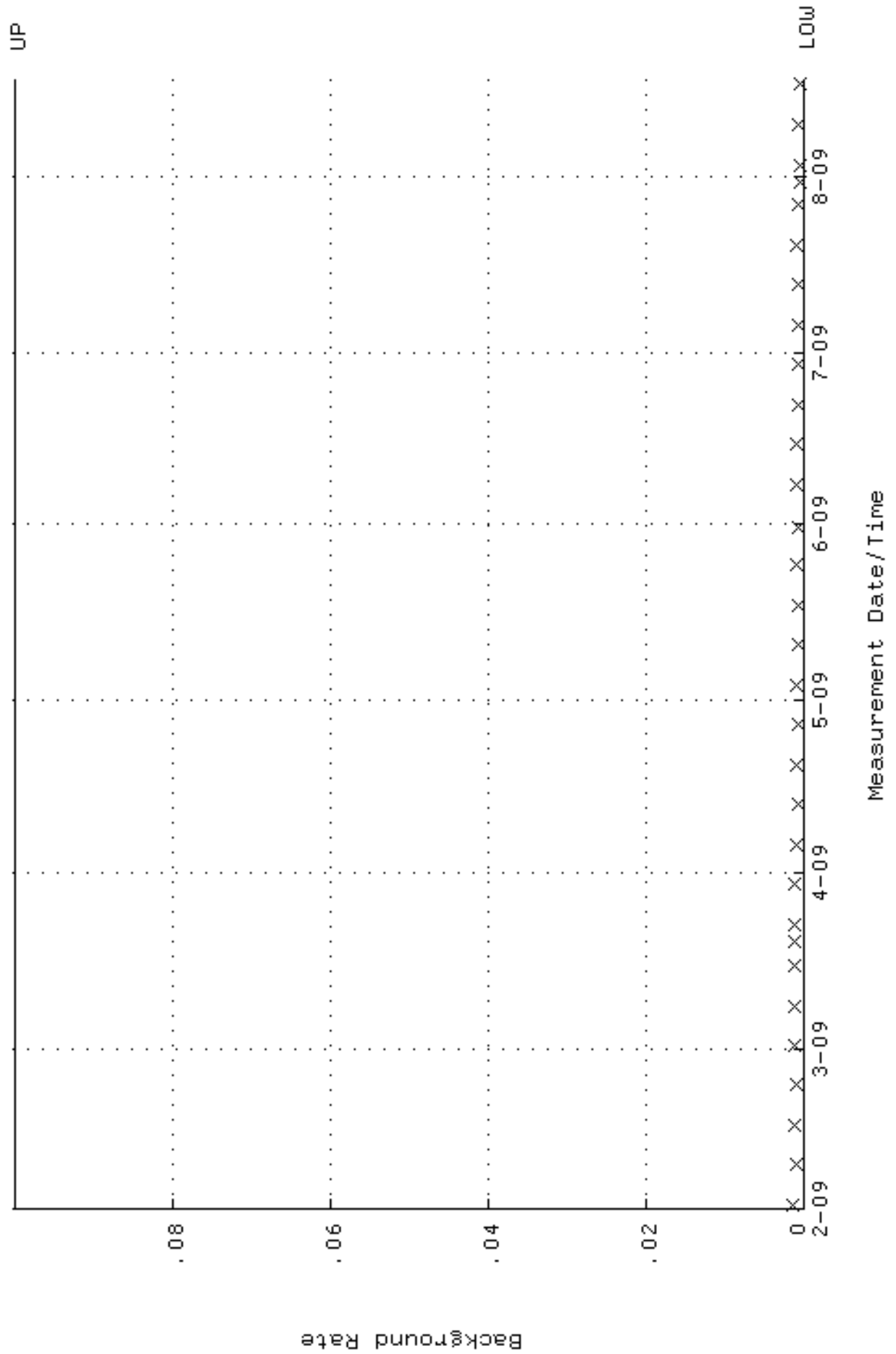
QA filename : DKA100:[ENV_ALPHA.QA.W]W132.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:33:19 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.240573 through 0.260573



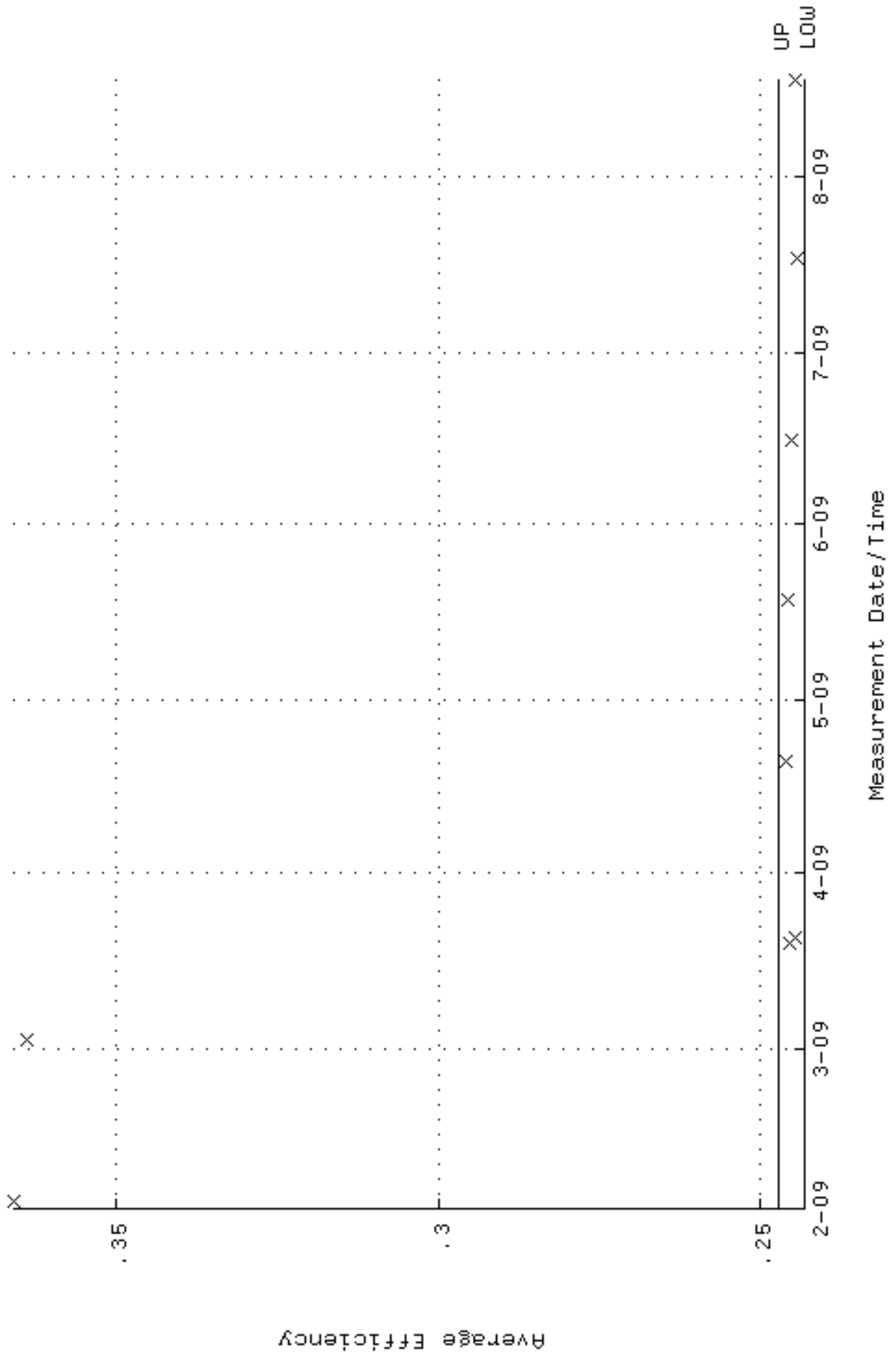
QA filename : DKA100:[ENV_ALPHA.QA.W]W132.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:33:19 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 87.9674 through 97.2272



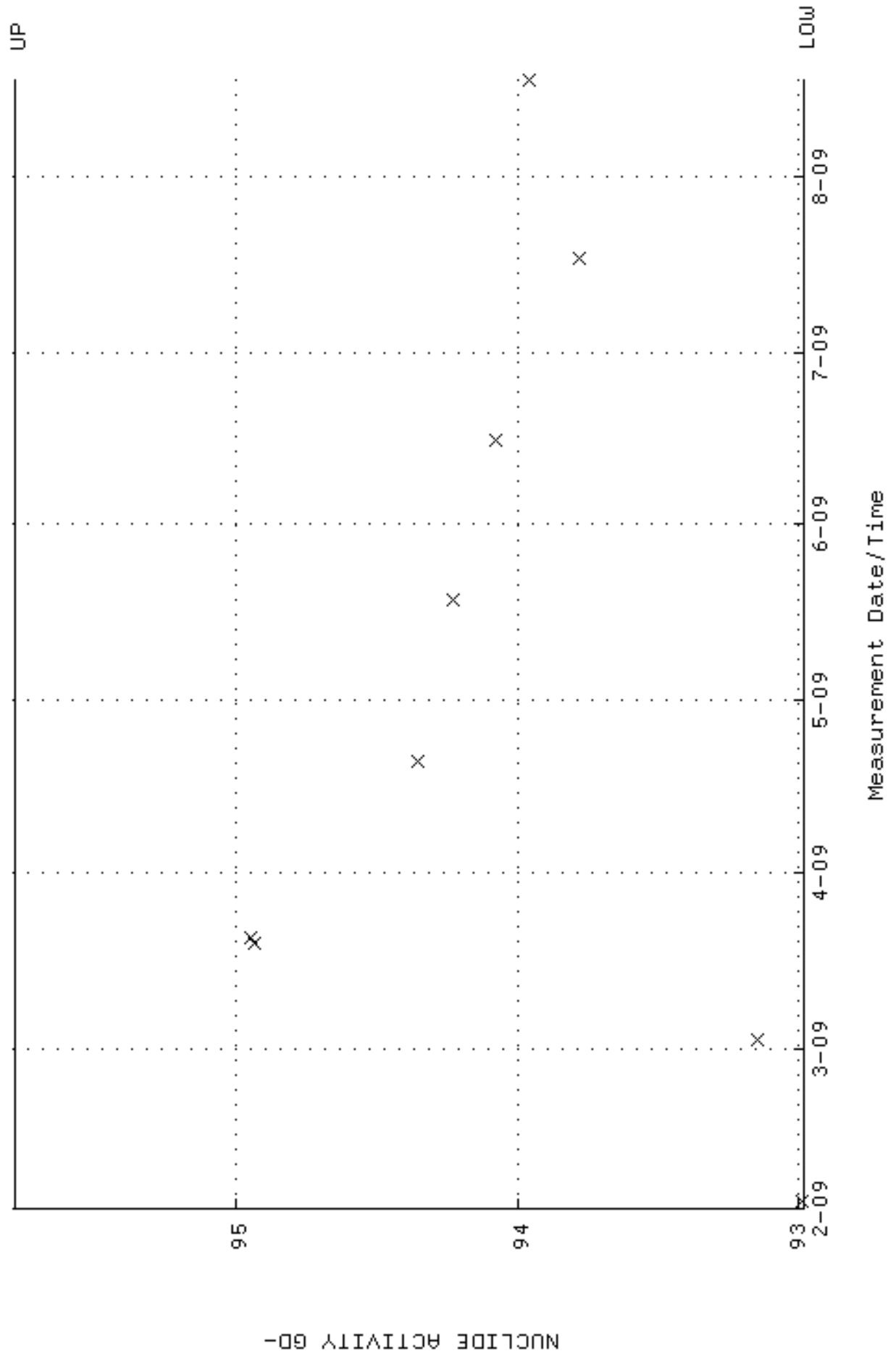
QA filename : DKA100:[ENV_ALPHA.QA.B]B132.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:04:55 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



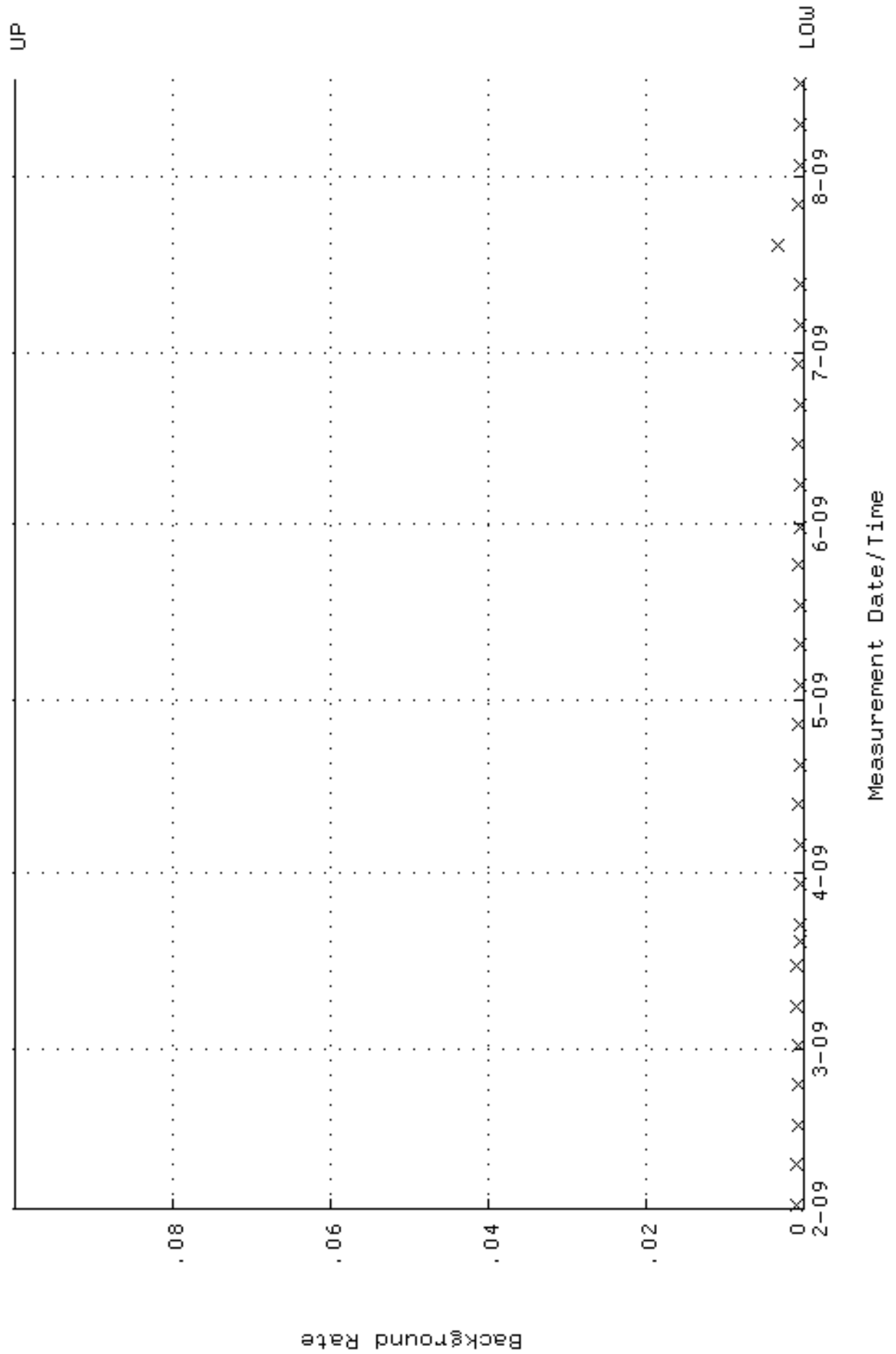
QA filename : DKA100:[ENV_ALPHA.QA.W]W133.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:33:26 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.243148 through 0.247324



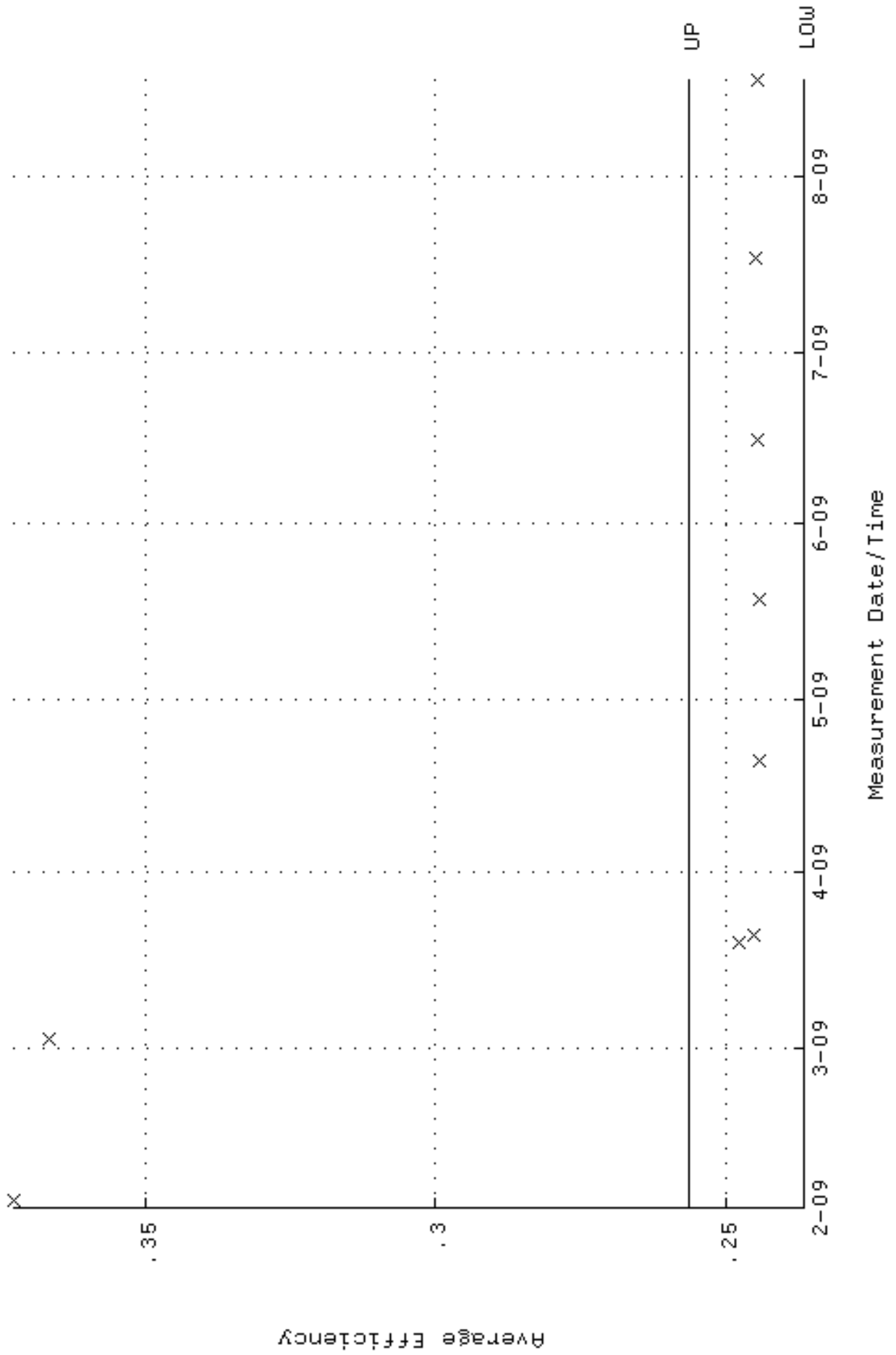
QA filename : DKA100:[ENV_ALPHA.QA.W]w133.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:33:26 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 92.9792 through 95.7898



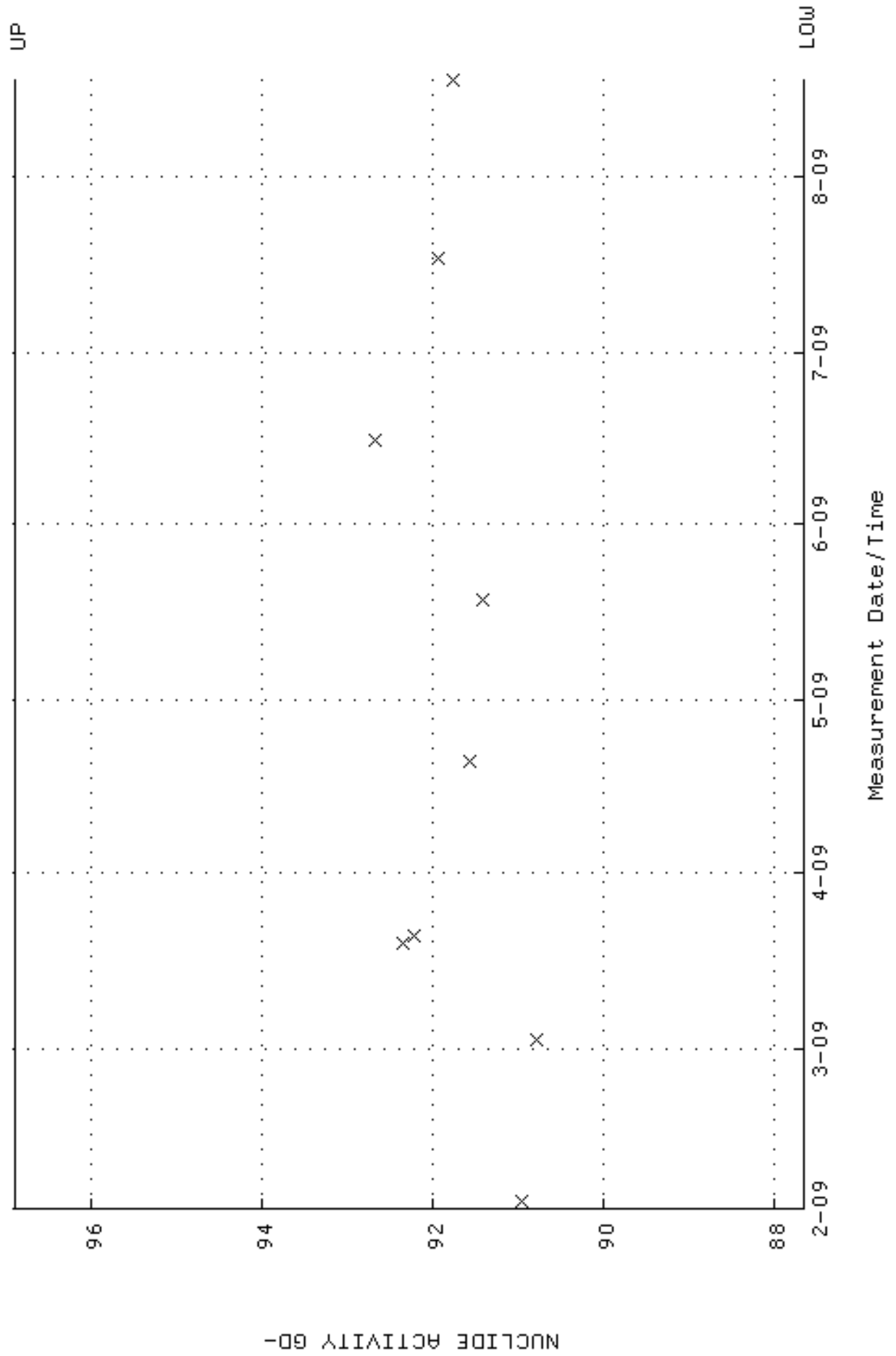
QA filename : DKA100:[ENV_ALPHA.QA.B]B133.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:05:10 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



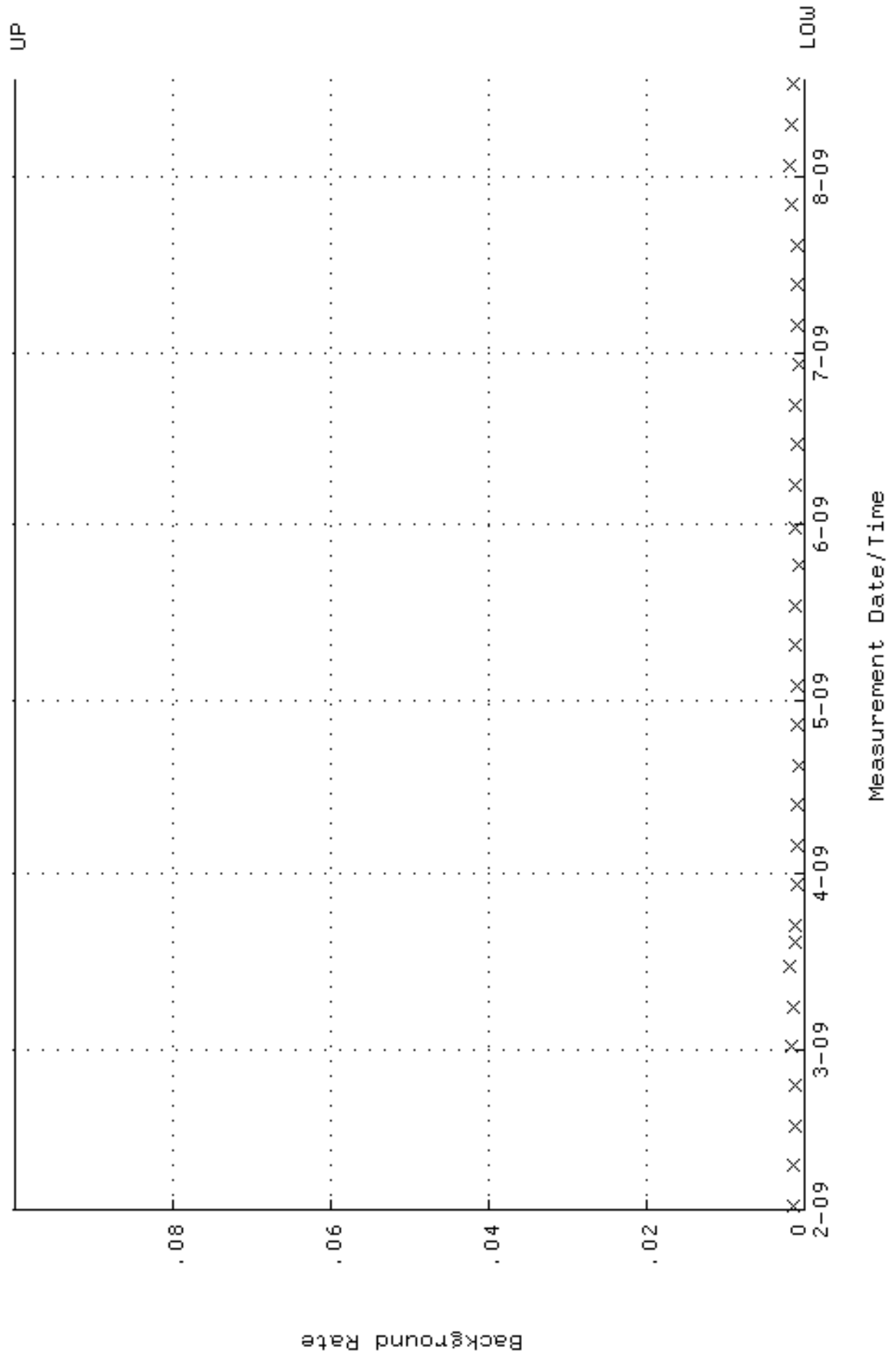
QA filename : DKA100:[ENV_ALPHA.QA.W]W134.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:33:33 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.236455 through 0.256455



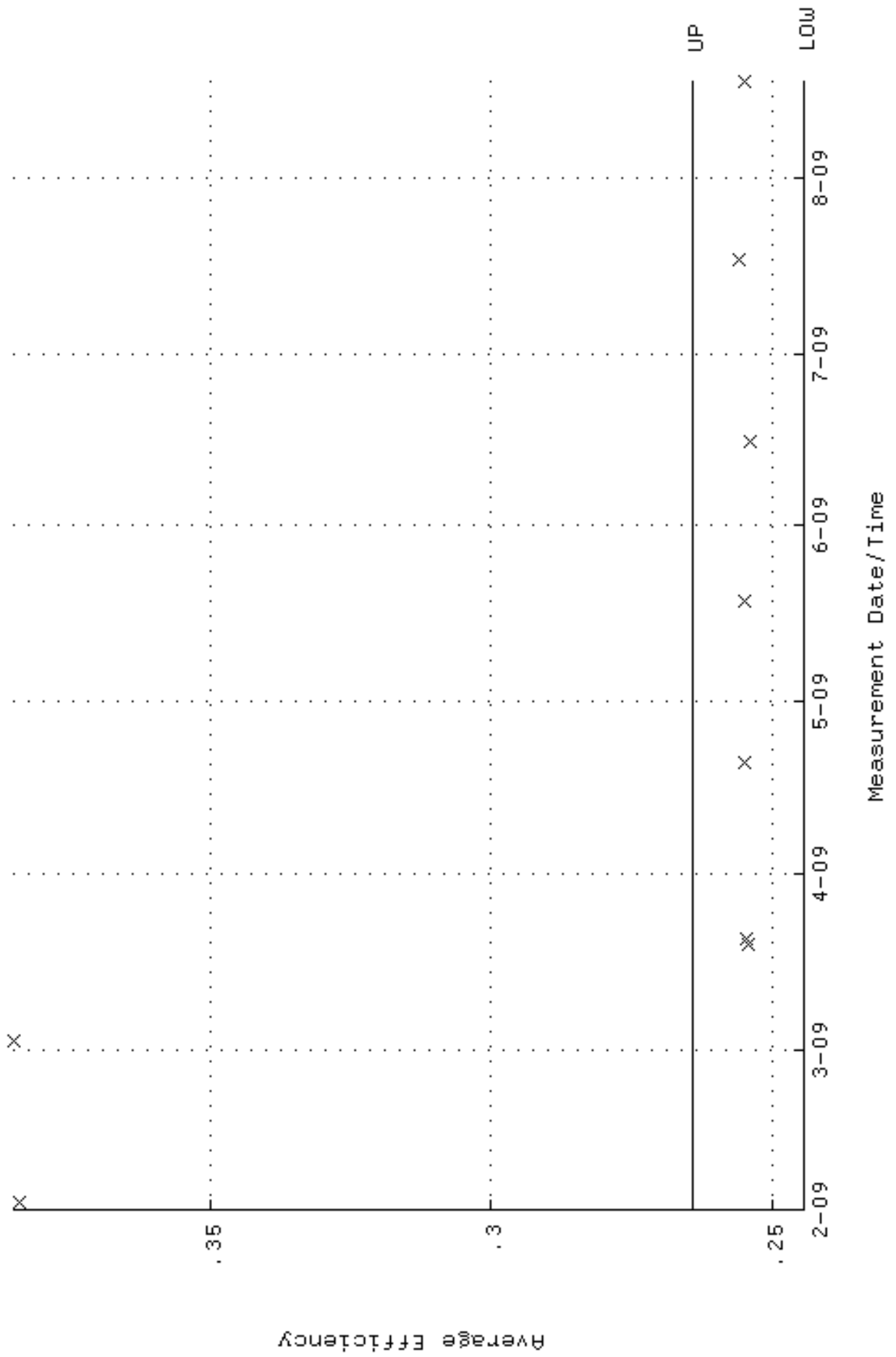
QA filename : DKA100:[ENV_ALPHA.QA.W]w134.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 2-FEB-2009 10:33:33 through 17-AUG-2009 12:00:00
Lower/Upper Lmts: 87.6576 through 96.8848



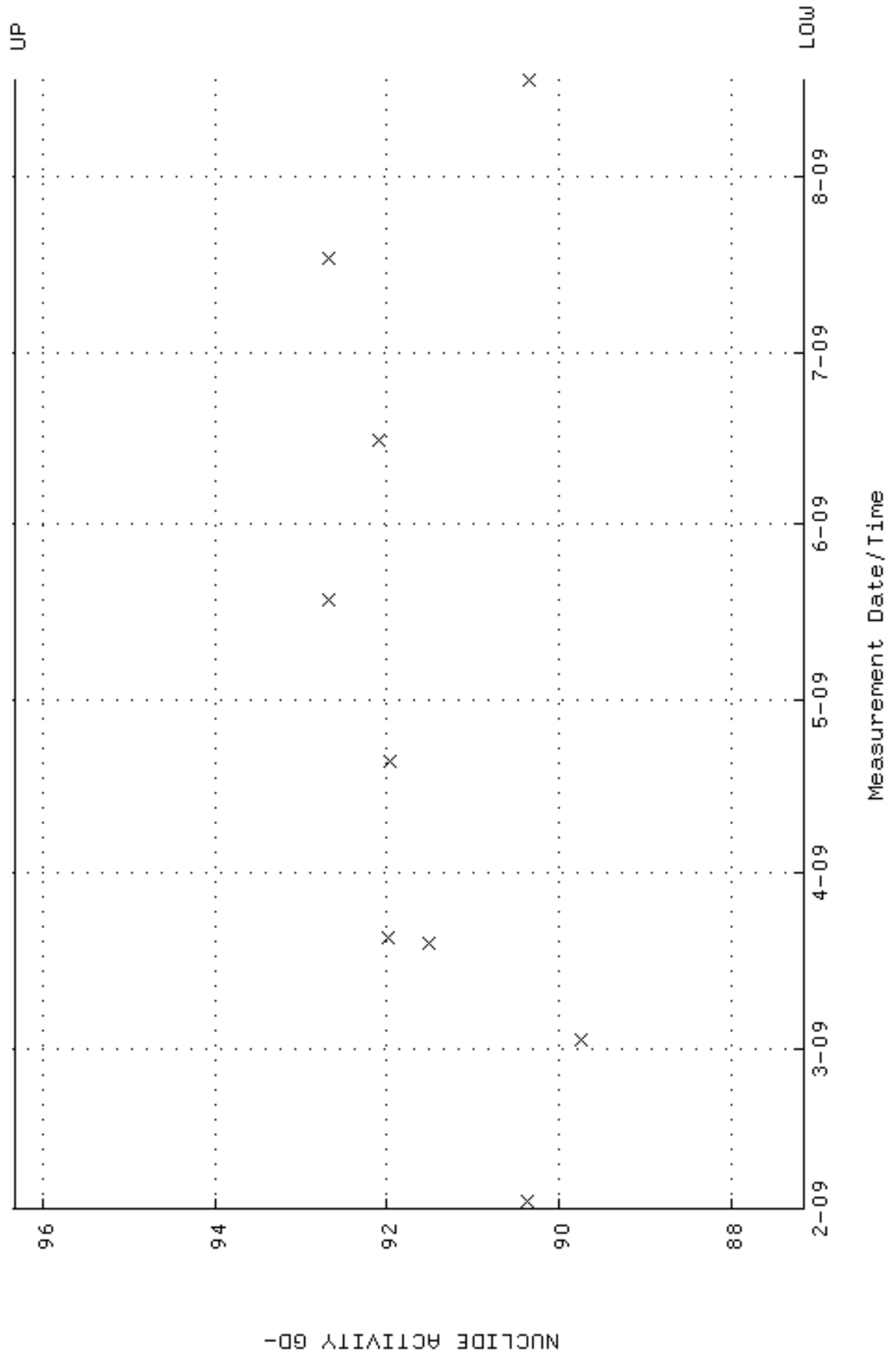
QA filename : DKA100:[ENV_ALPHA.QA.B]B134.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:05:24 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



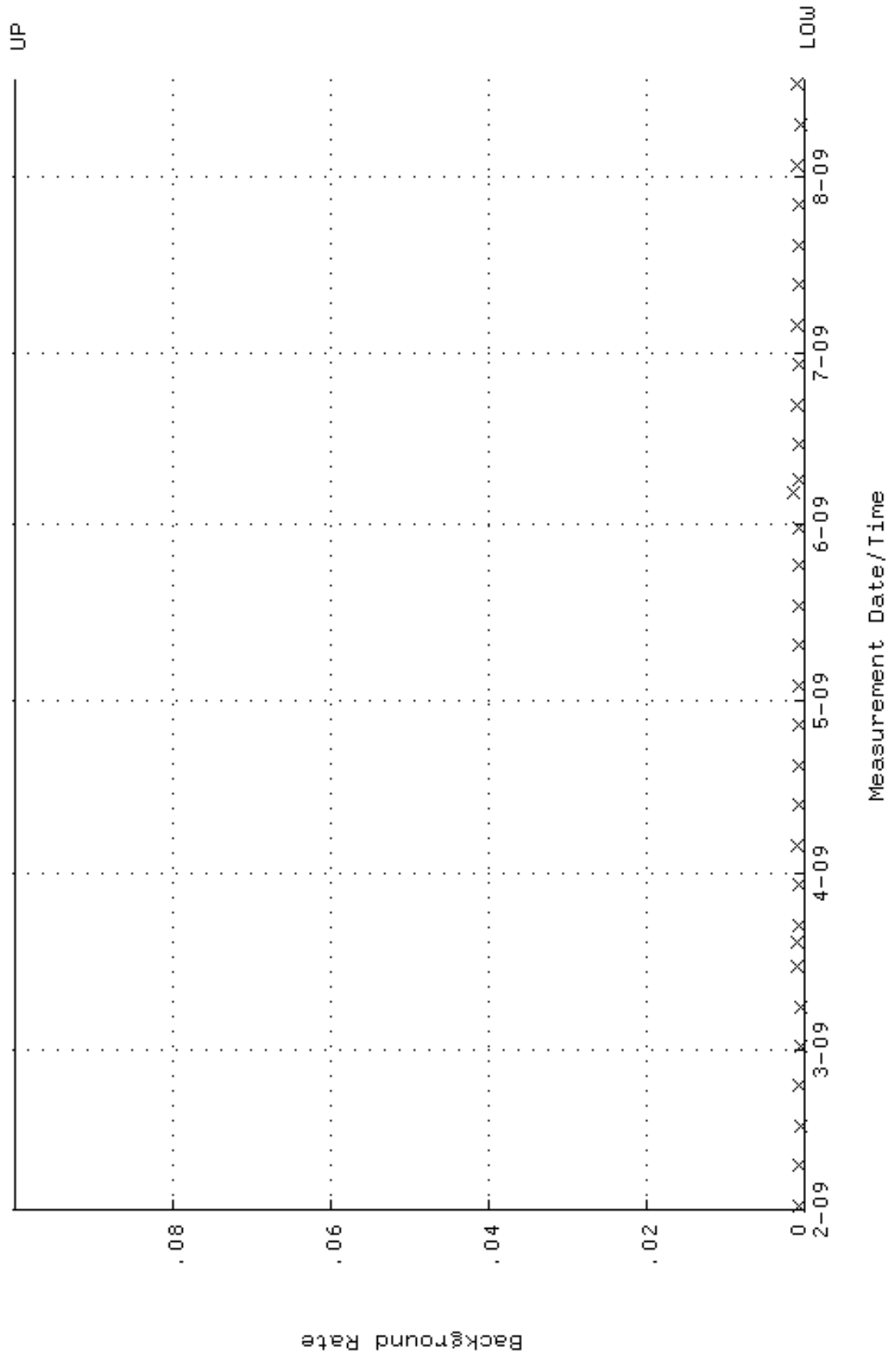
QA filename : DKA100:[ENV_ALPHA.QA.W]W135.QAF;2
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:33:40 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.244305 through 0.264305



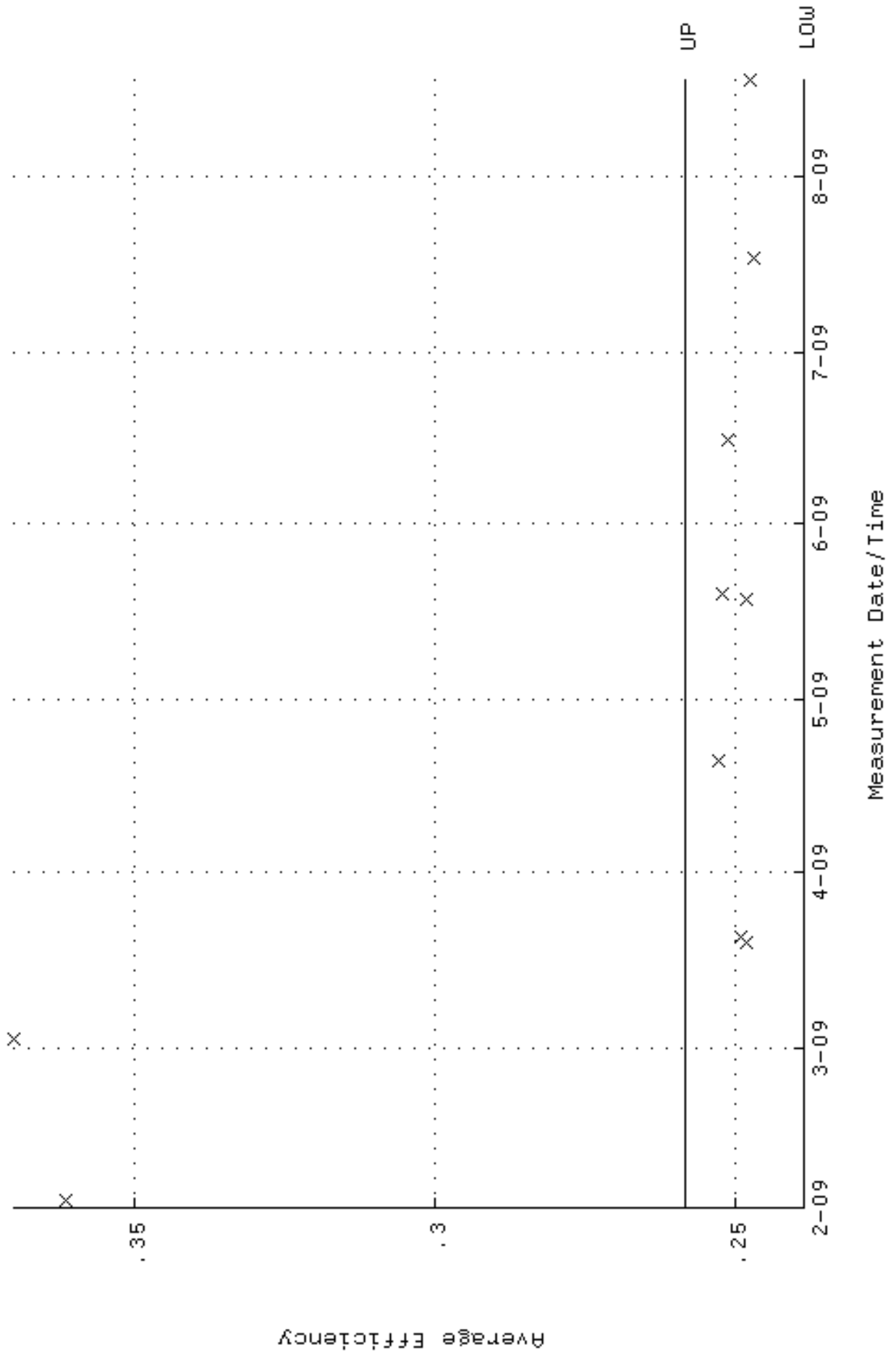
QA filename : DKA100:[ENV_ALPHA.QA.W]W135.QAF;2
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:33:40 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 87.1482 through 96.3217



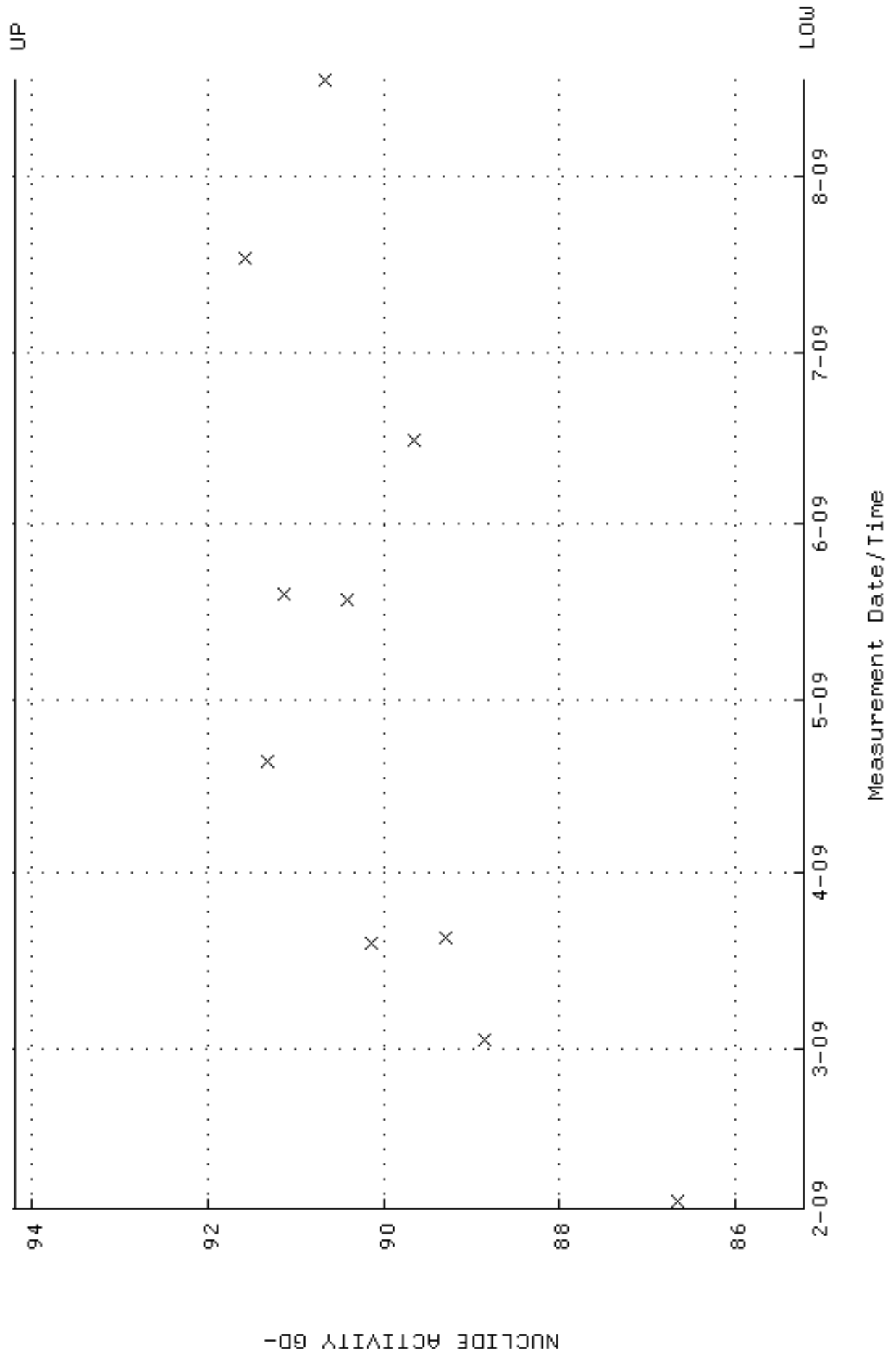
QA filename : DKA100:[ENV_ALPHA.QA.B]B135.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:05:37 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



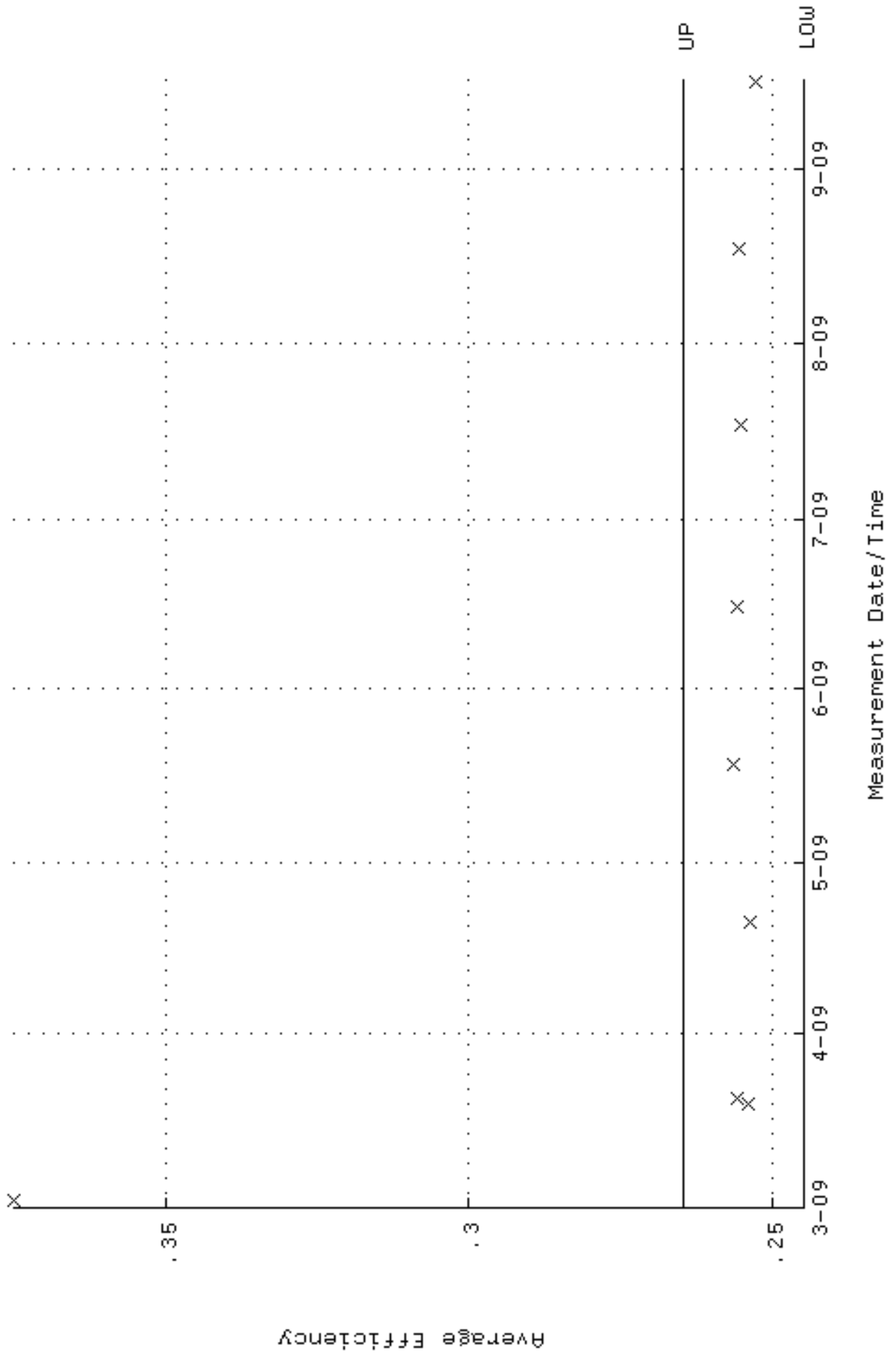
QA filename : DKA100:[ENV_ALPHA.QA.W]W136.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-FEB-2009 10:33:46 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.238568 through 0.258568



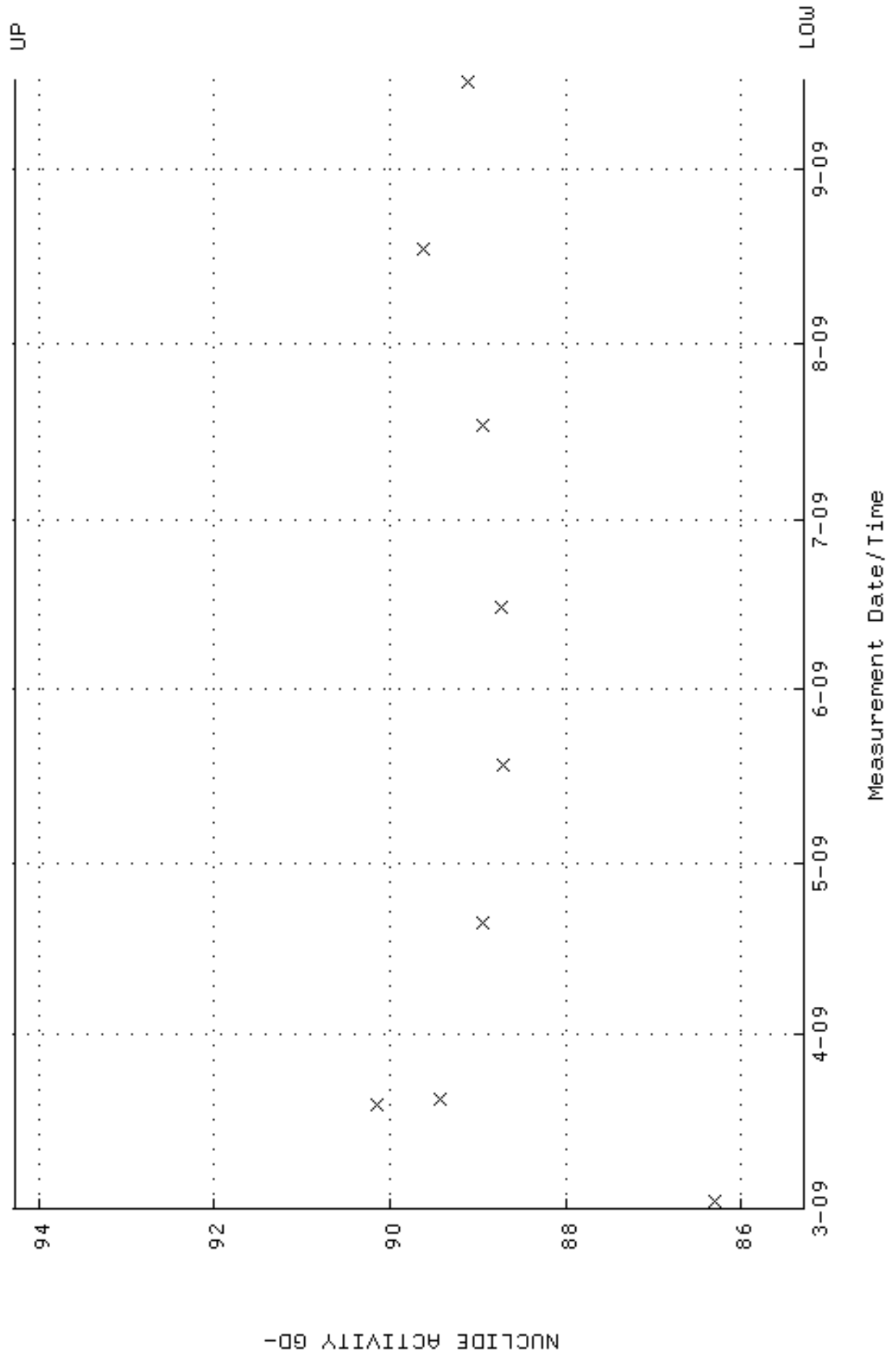
QA filename : DKA100:[ENV_ALPHA.QA.W]W136.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-FEB-2009 10:33:46 through 17-AUG-2009 12:00:00
 Lower/Upper Lmts: 85.2214 through 94.1920



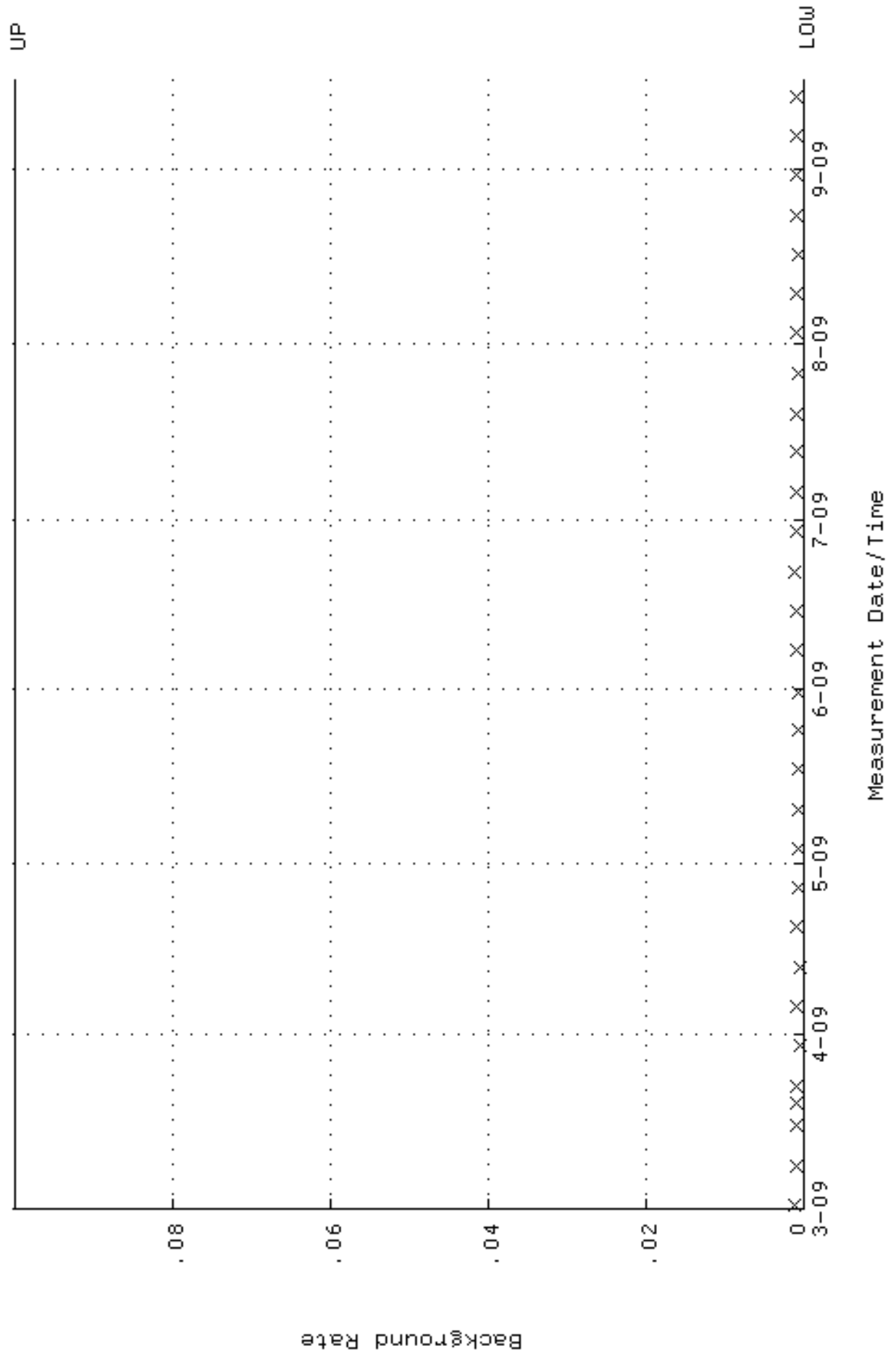
QA filename : DKA100:[ENV_ALPHA.QA.W]W137.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-MAR-2009 11:10:03 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.244801 through 0.264801



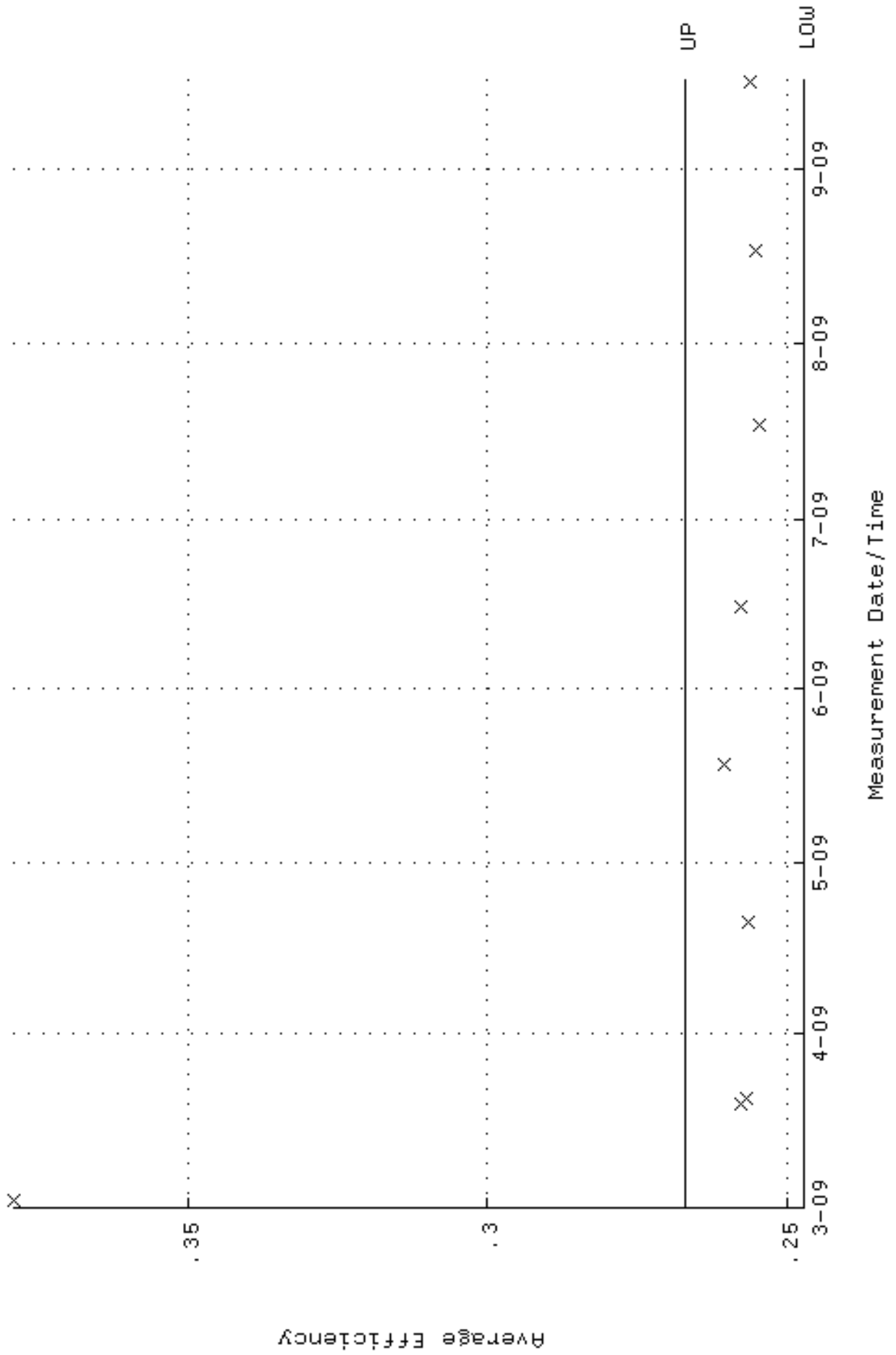
QA filename : DKA100:[ENV_ALPHA.QA.W]W137.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-MAR-2009 11:10:03 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 85.2880 through 94.2656



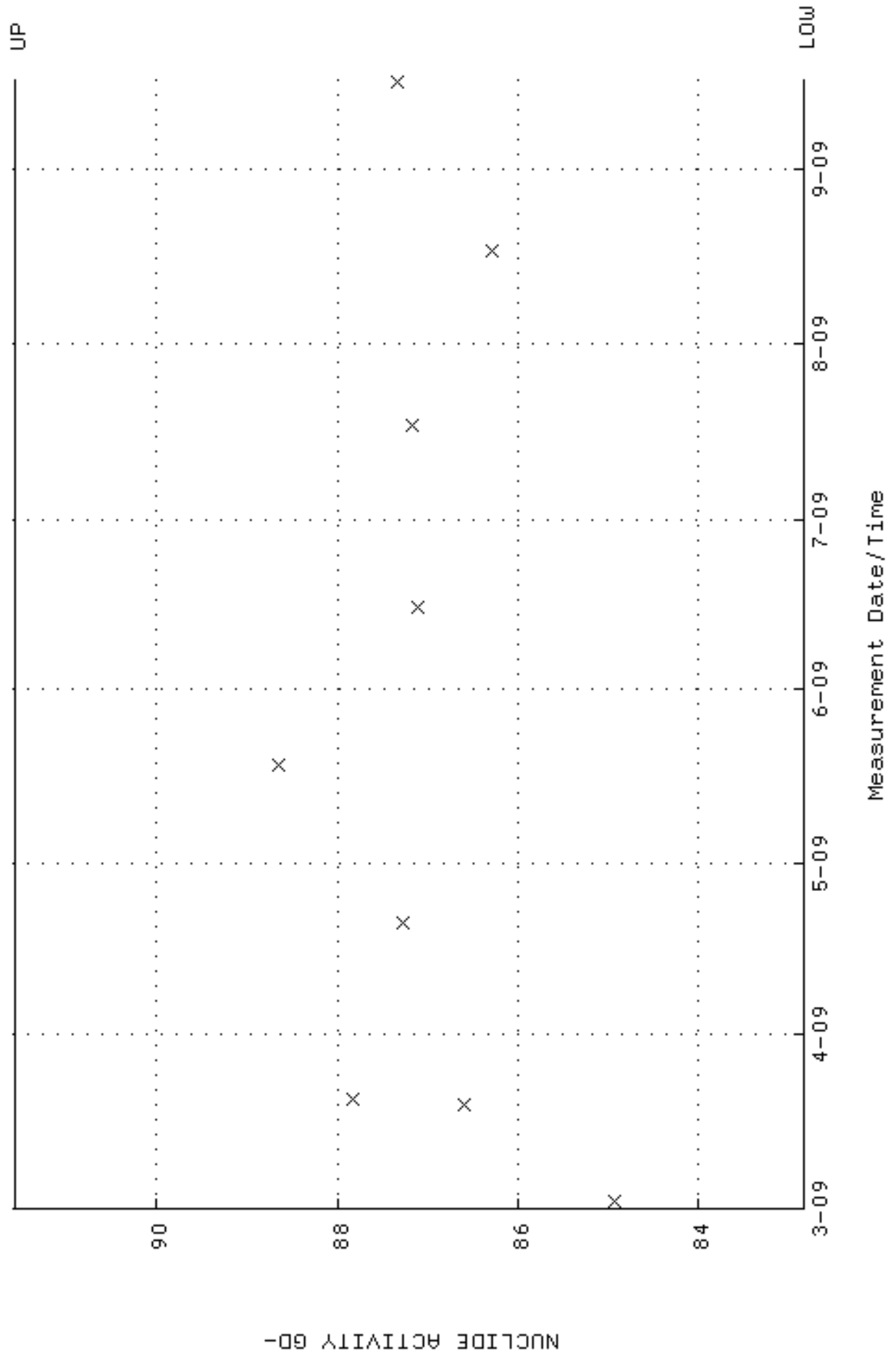
QA filename : DKA100:[ENV_ALPHA.QA.B]B137.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-MAR-2009 17:19:28 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



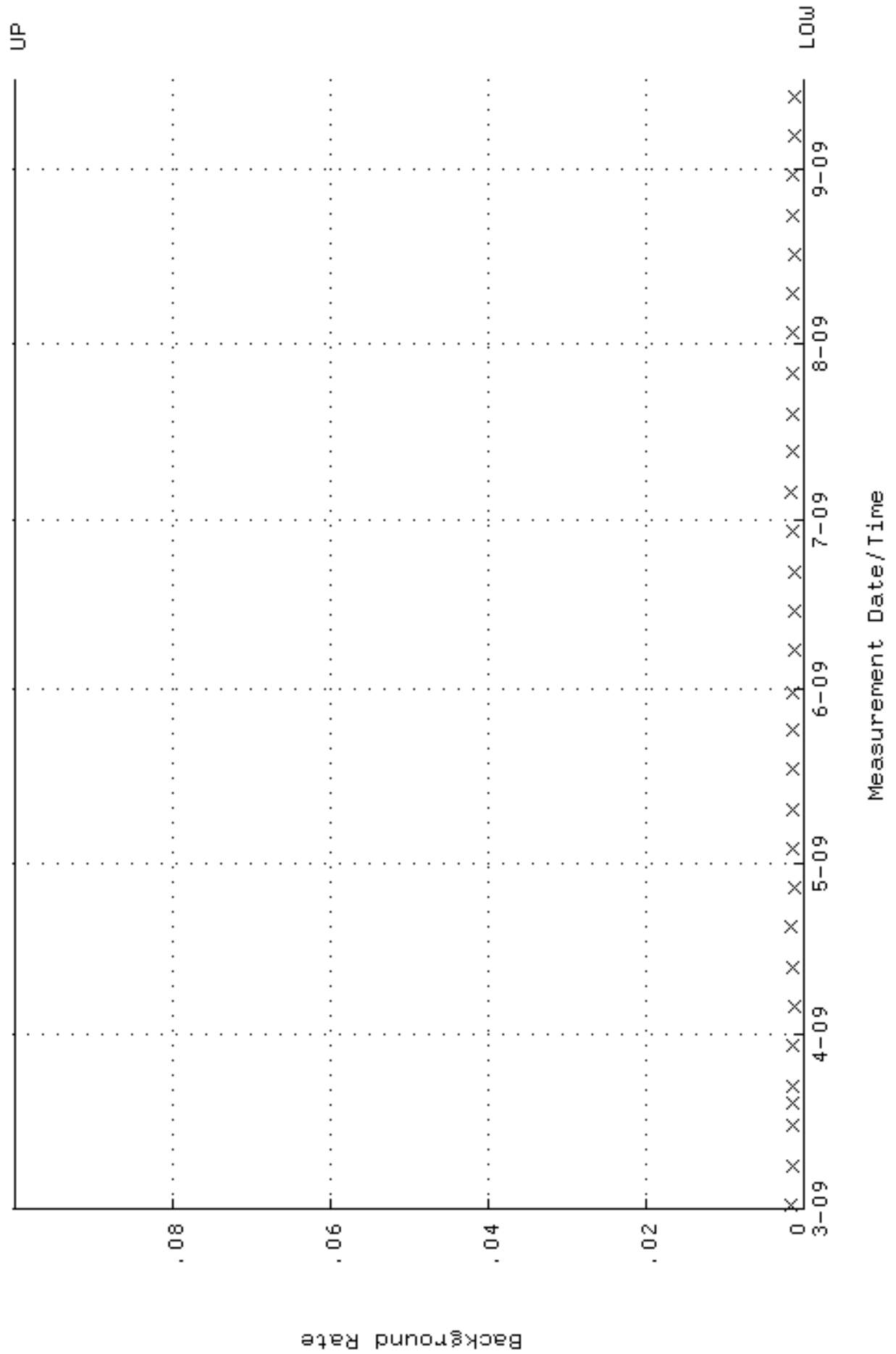
QA filename : DKA100:[ENV_ALPHA.QA.W]W138.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-MAR-2009 11:10:08 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.247085 through 0.267085



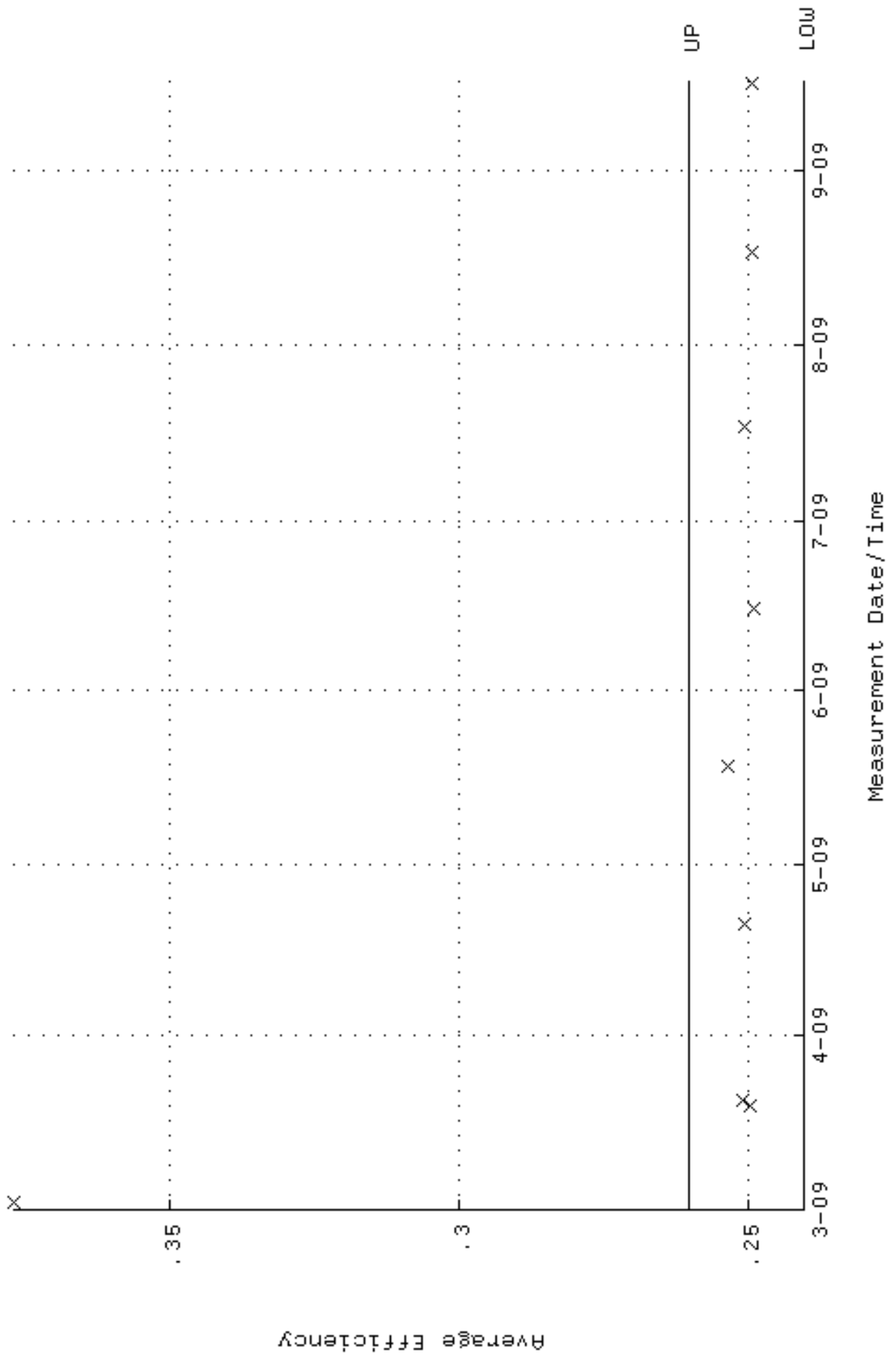
QA filename : DKA100:[ENV_ALPHA.QA.W]W138.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-MAR-2009 11:10:08 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 82.8399 through 91.5599



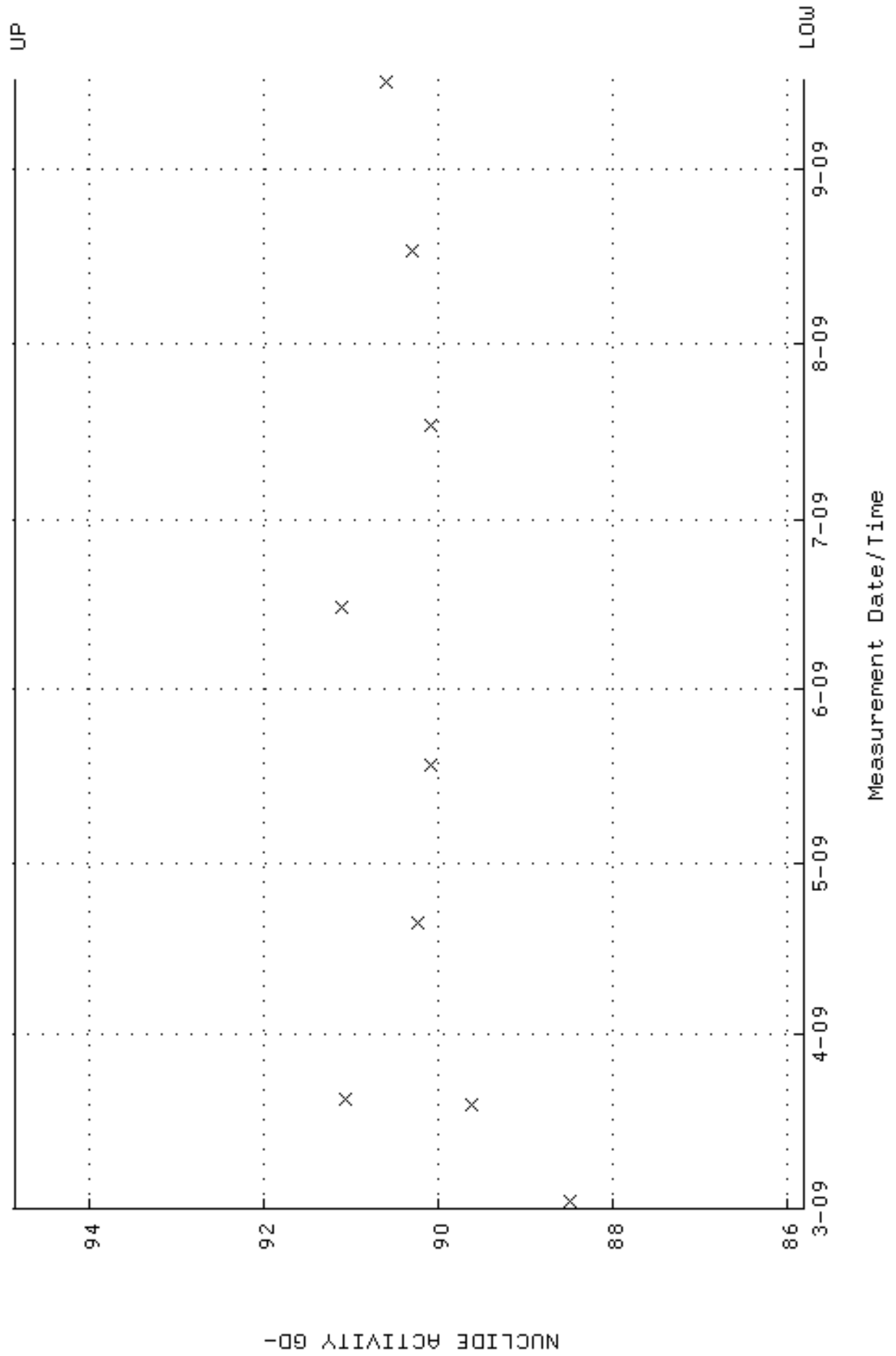
QA filename : DKA100:[ENV_ALPHA.QA.B]B138.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-MAR-2009 17:19:32 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



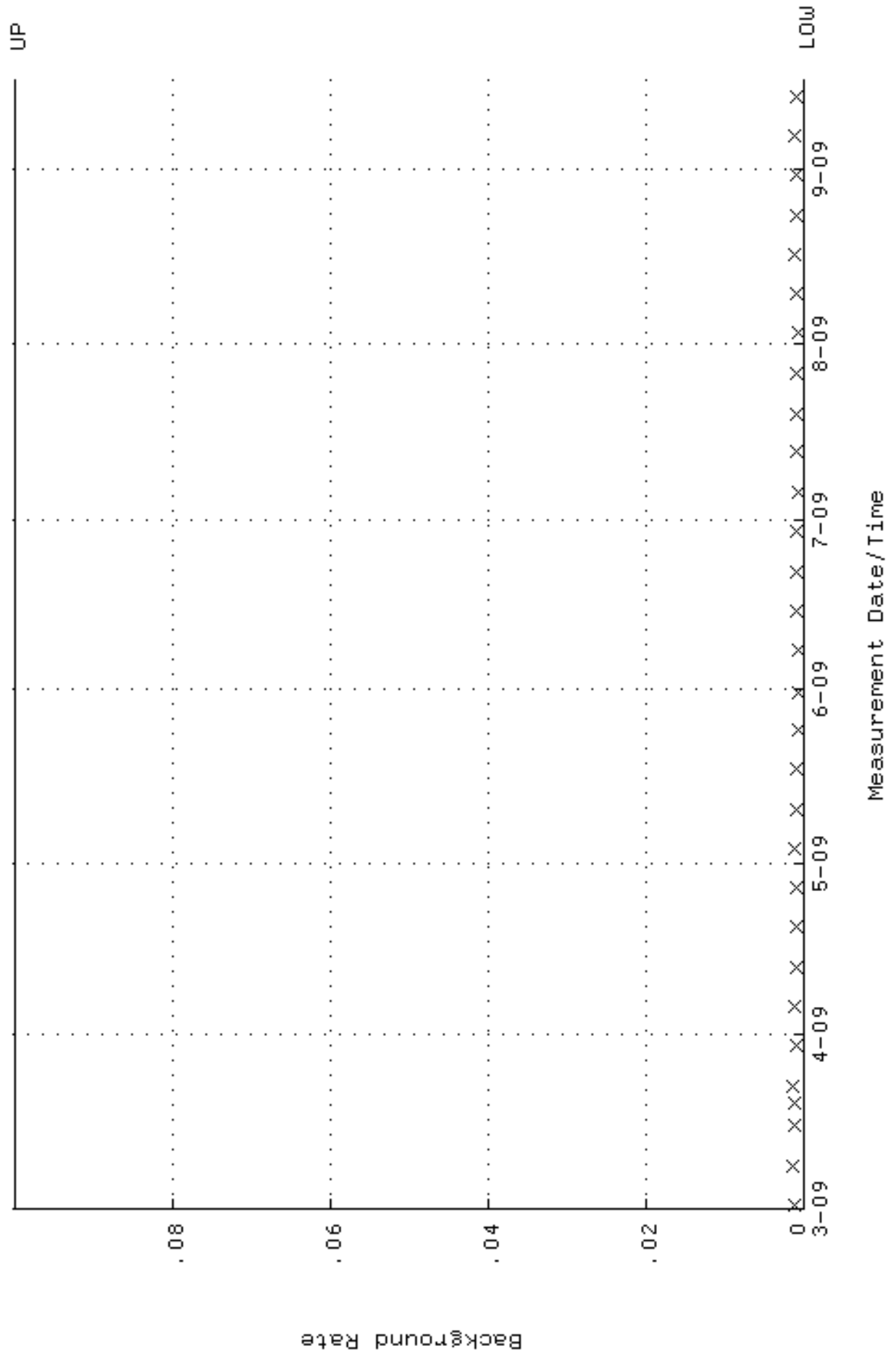
QA filename : DKA100:[ENV_ALPHA.QA.W]W139.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-MAR-2009 11:10:14 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.240299 through 0.260299



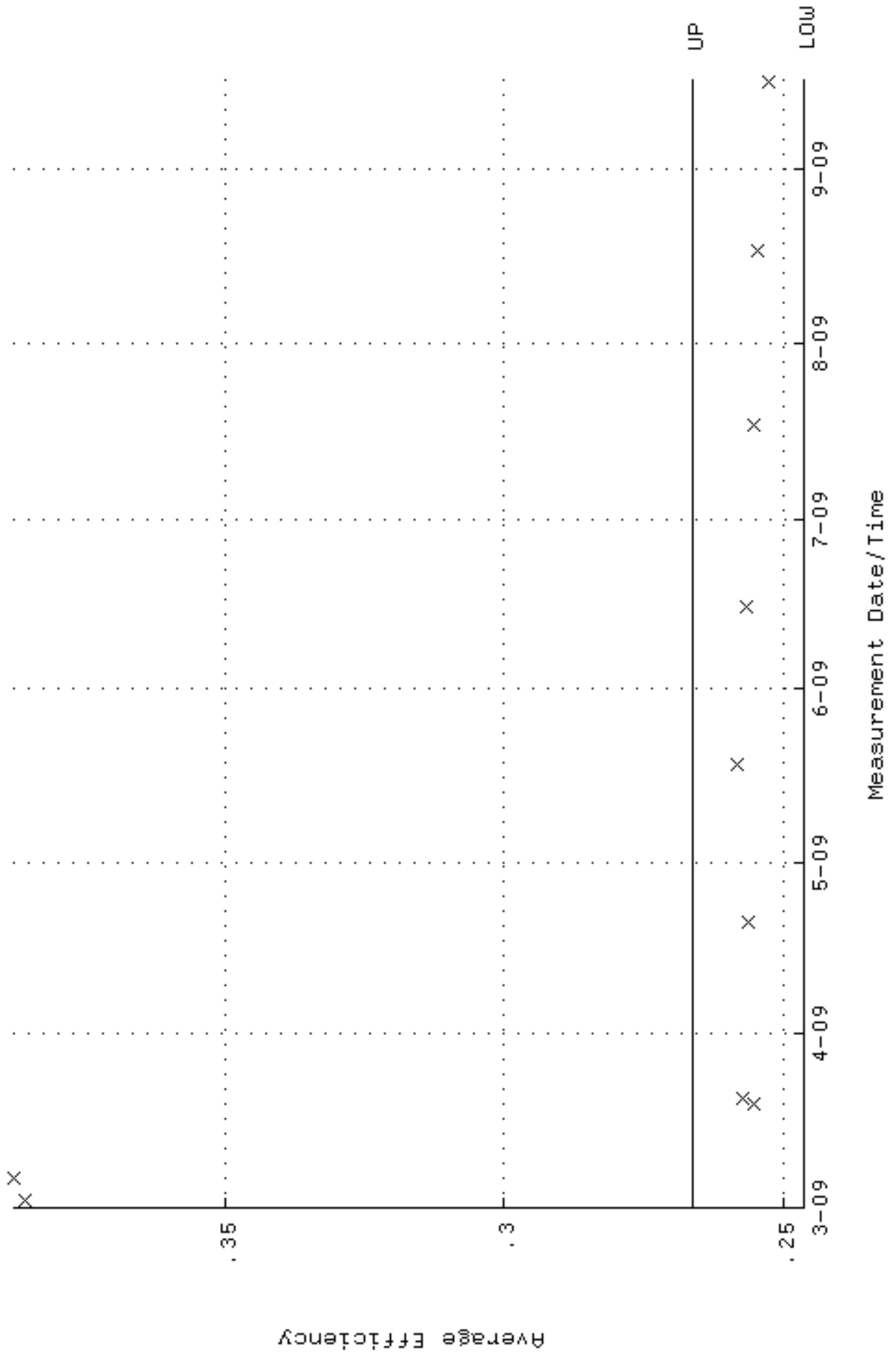
QA filename : DKA100:[ENV_ALPHA.QA.W]w139.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-MAR-2009 11:10:14 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 85.8145 through 94.8477



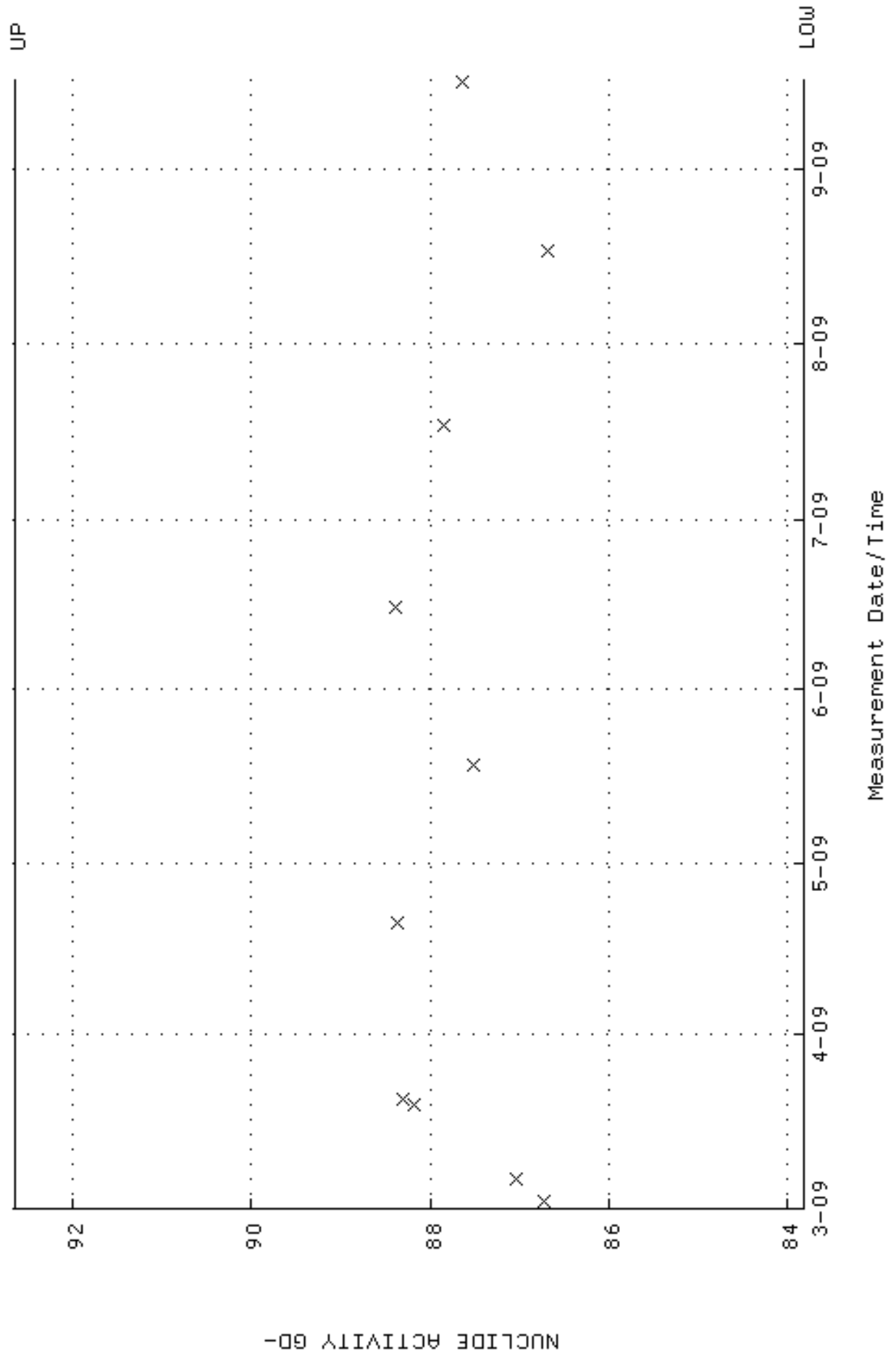
QA filename : DKA100:[ENV_ALPHA.QA.B]B139.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-MAR-2009 17:19:37 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



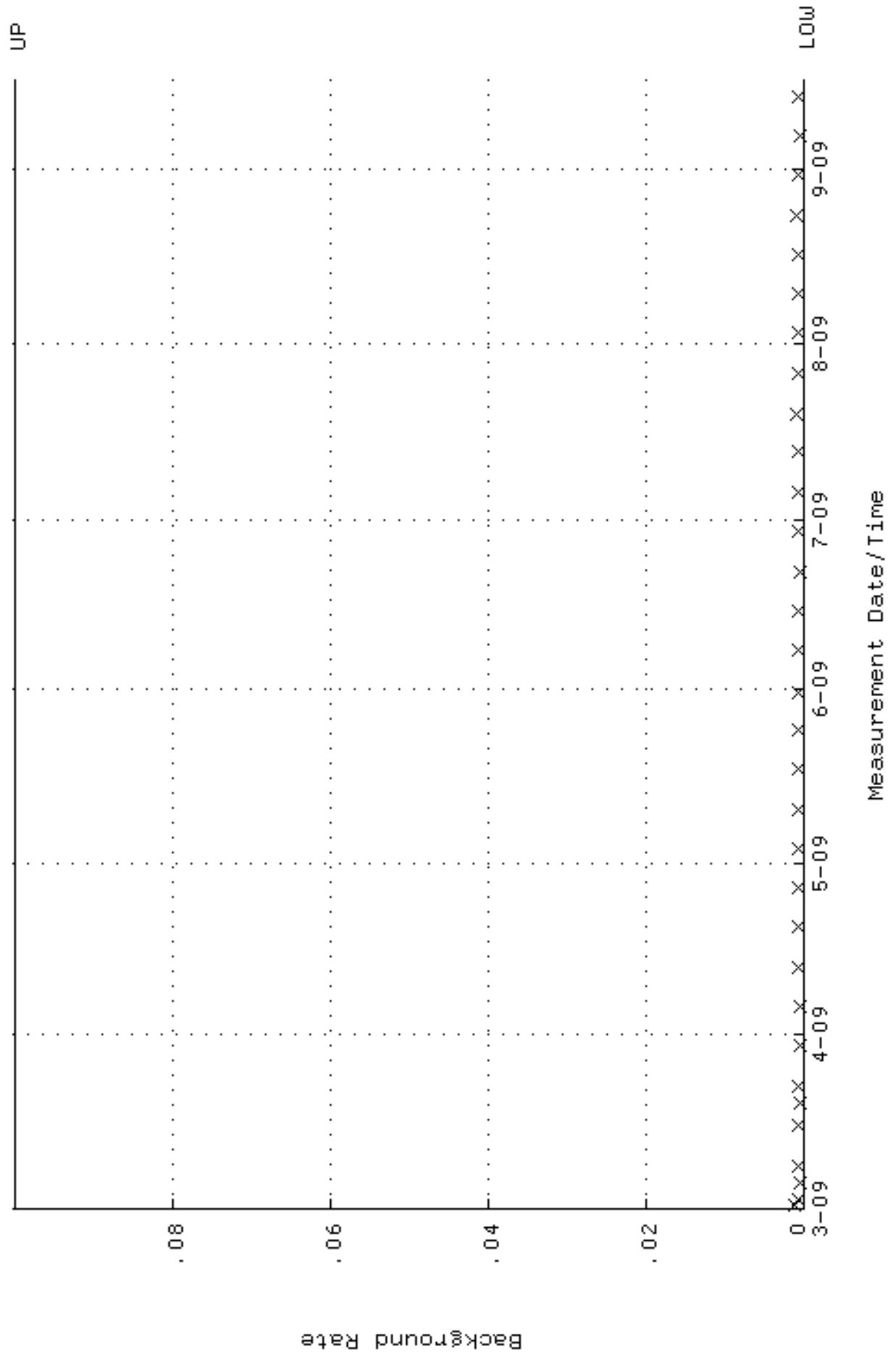
QA filename : DKA100:[ENV_ALPHA.QA.W]W140.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 2-MAR-2009 11:10:19 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.246178 through 0.266178



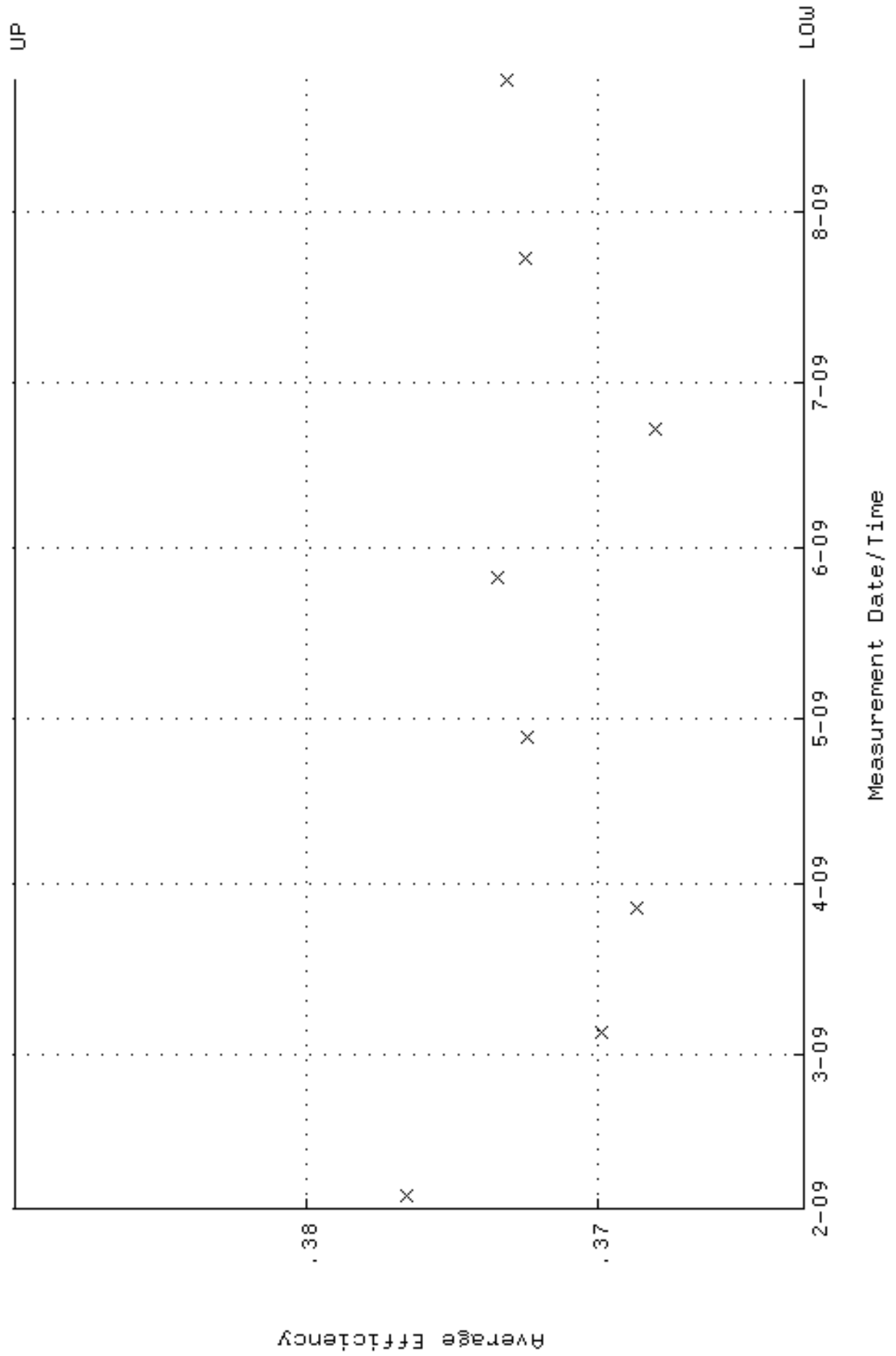
QA filename : DKA100:[ENV_ALPHA.QA.W]W140.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 2-MAR-2009 11:10:19 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 83.8171 through 92.6399



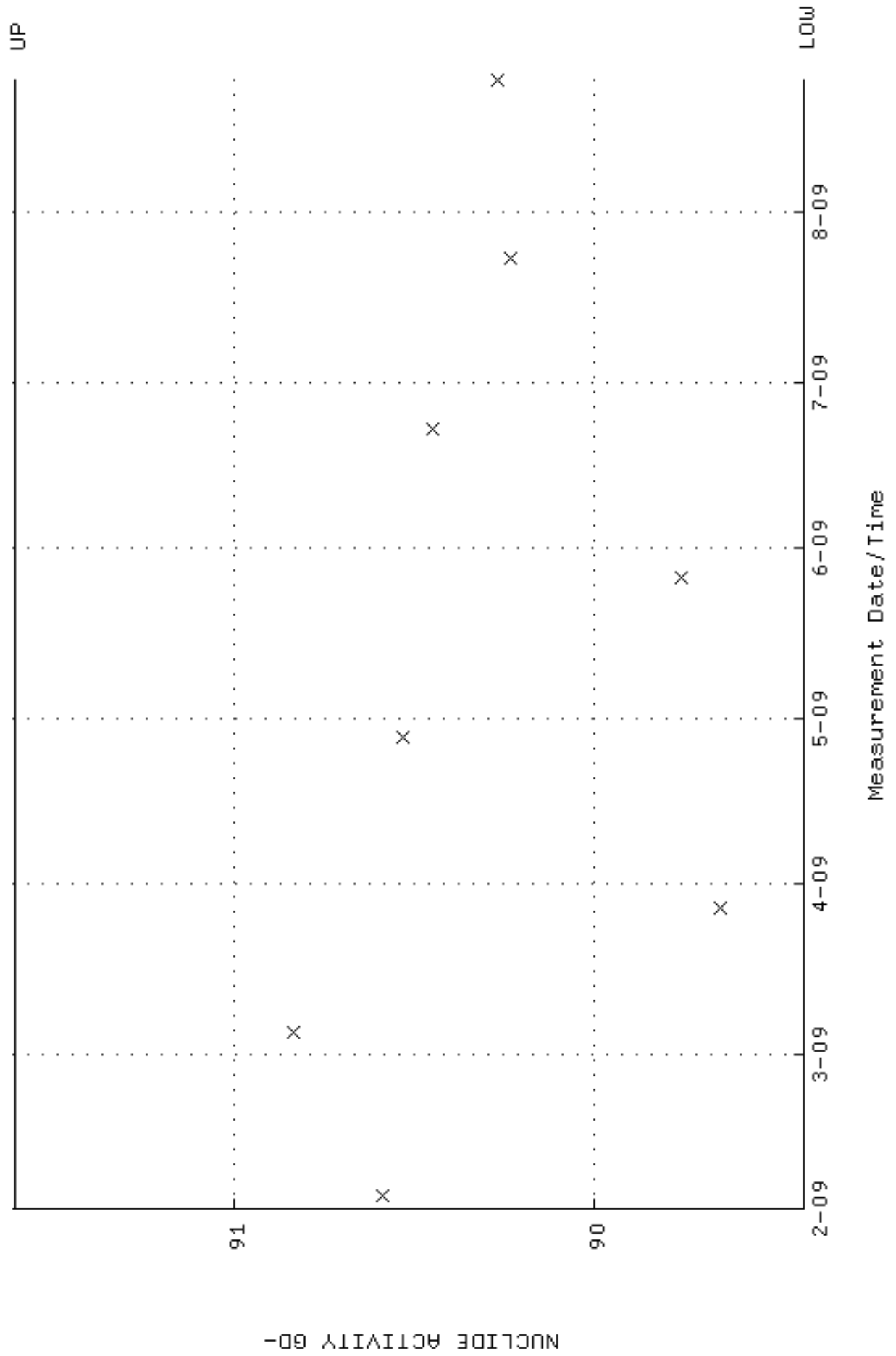
QA filename : DKA100:[ENV_ALPHA.QA.B]B140.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-MAR-2009 17:19:41 through 16-SEP-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



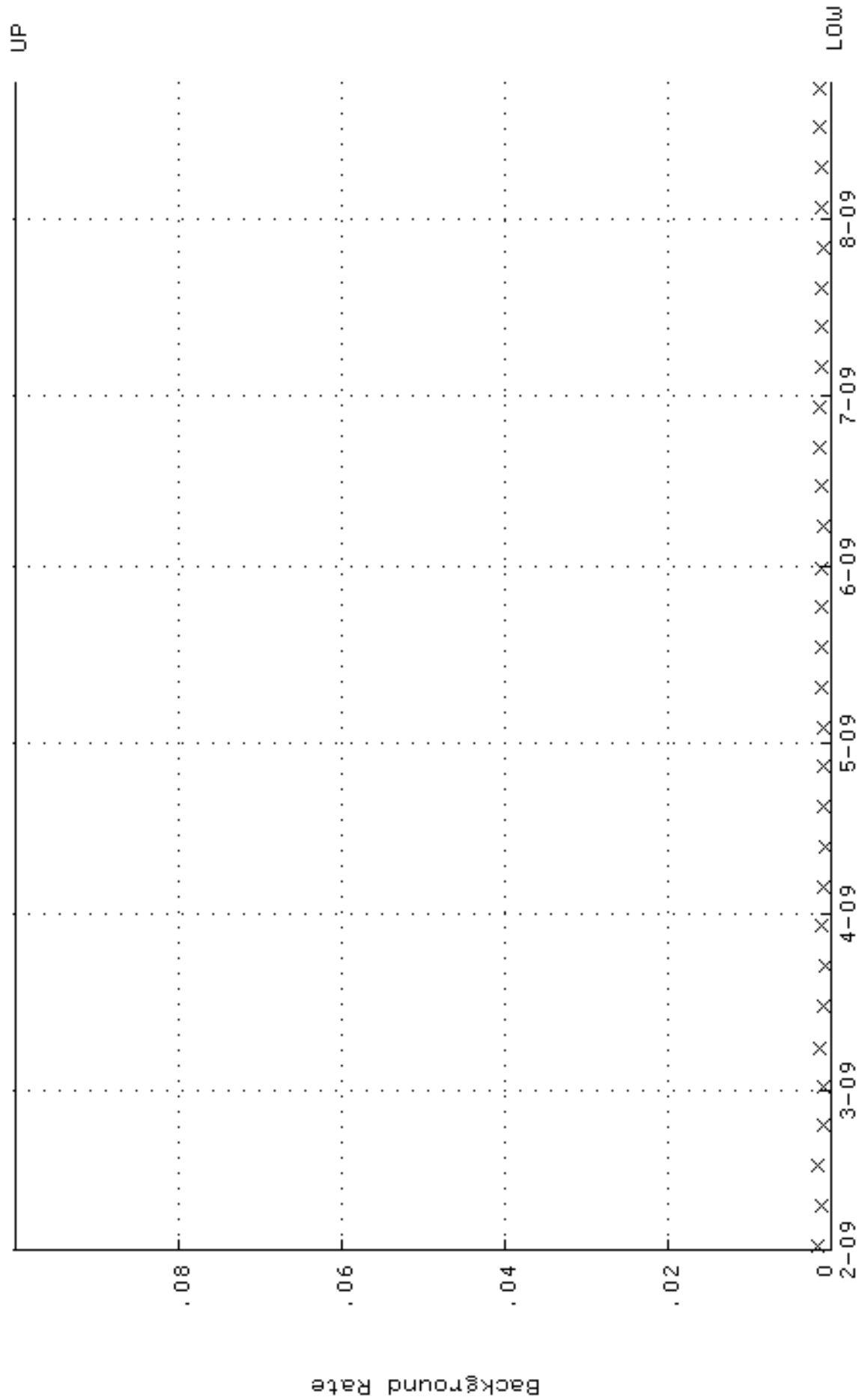
QA filename : DKA100:[ENV_ALPHA.QA.W]W161.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 07:29:38 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.362982 through 0.389932



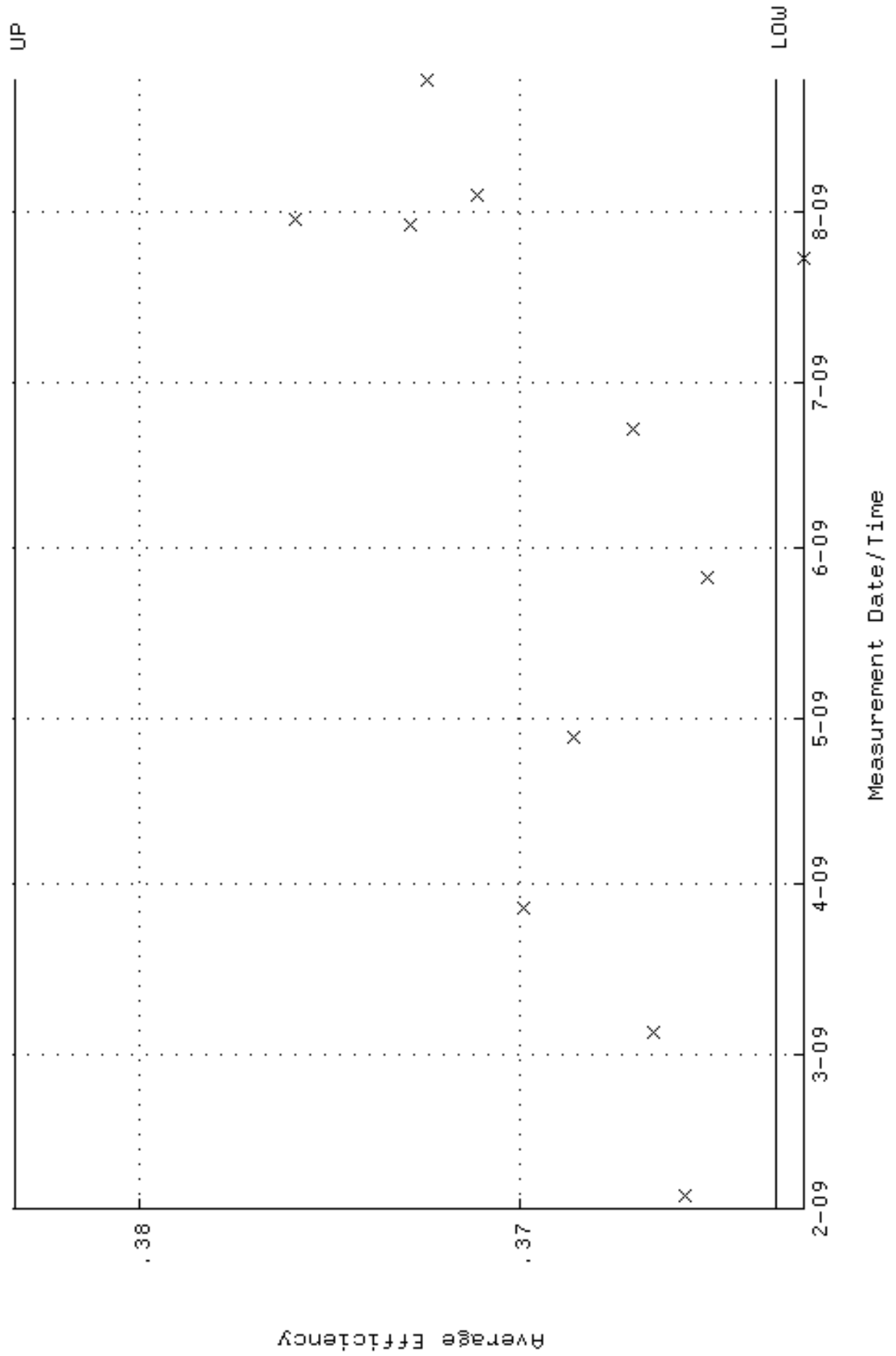
QA filename : DKA100:[ENV_ALPHA.QA.W]W161.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-FEB-2009 07:29:38 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 89.4216 through 91.6054



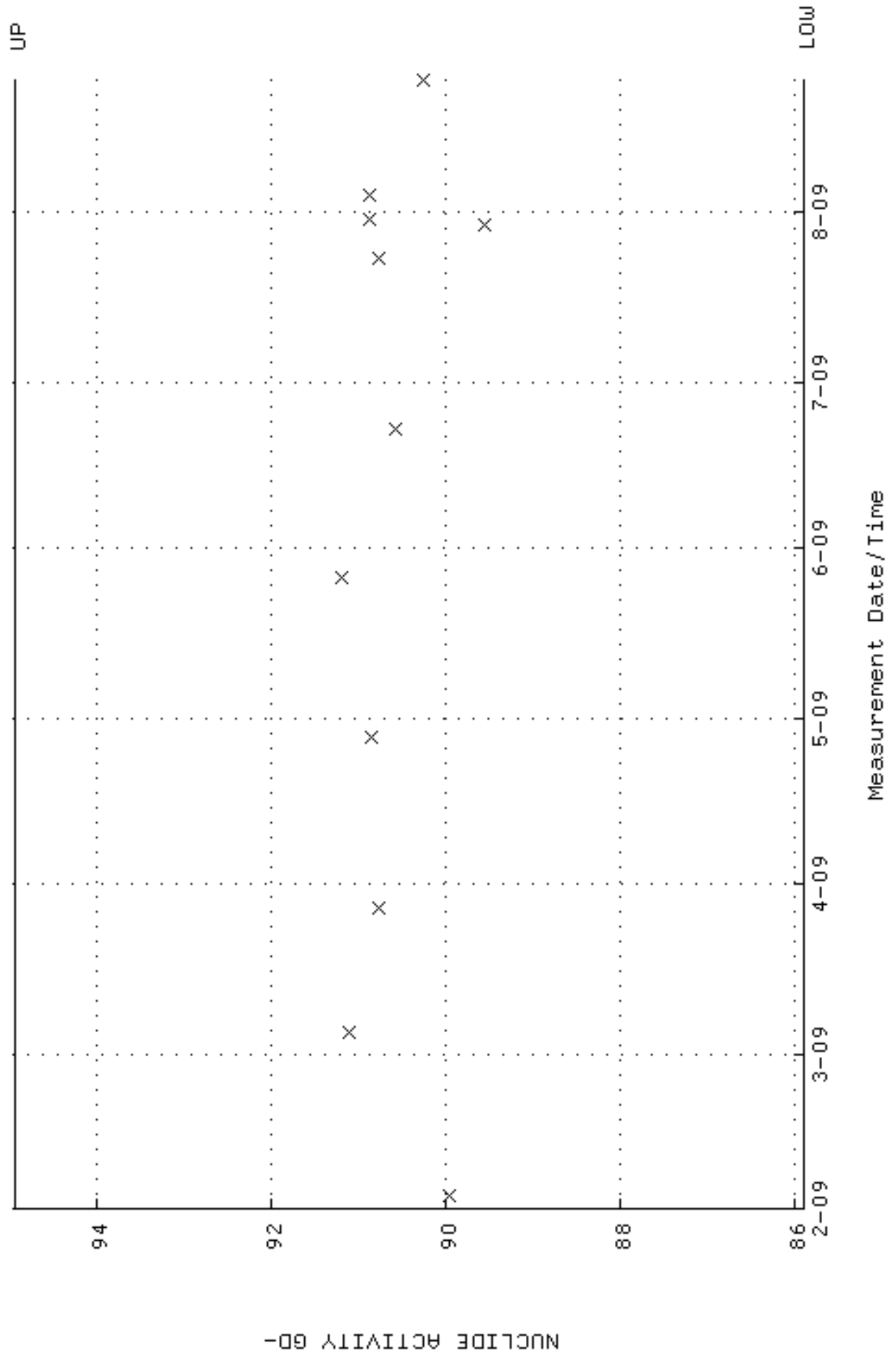
QA filename : DKA100:[ENV_ALPHA.QA.B]B161.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:12:04 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



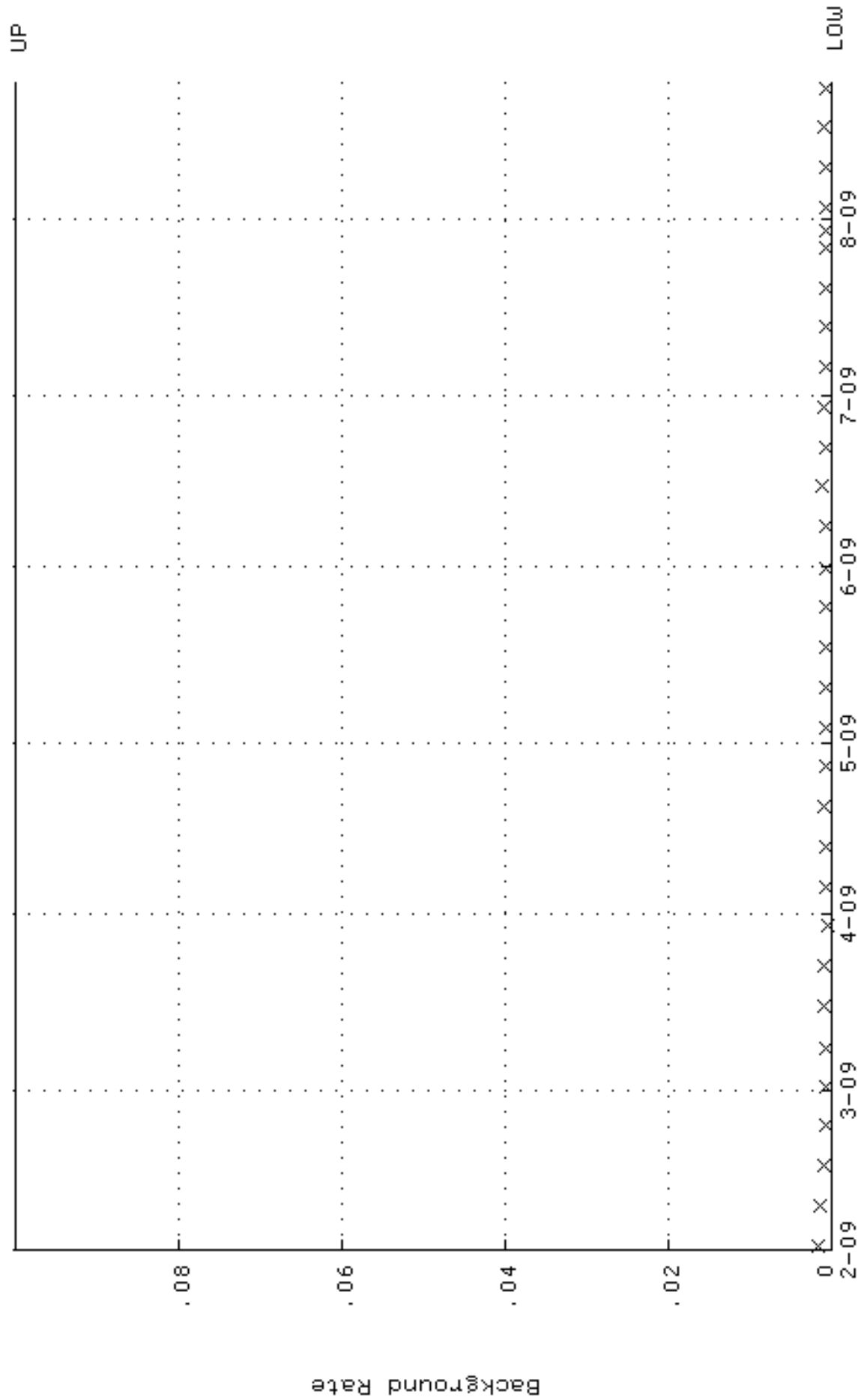
QA filename : DKA100:[ENV_ALPHA.QA.W]W162.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 07:29:45 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.363287 through 0.383287



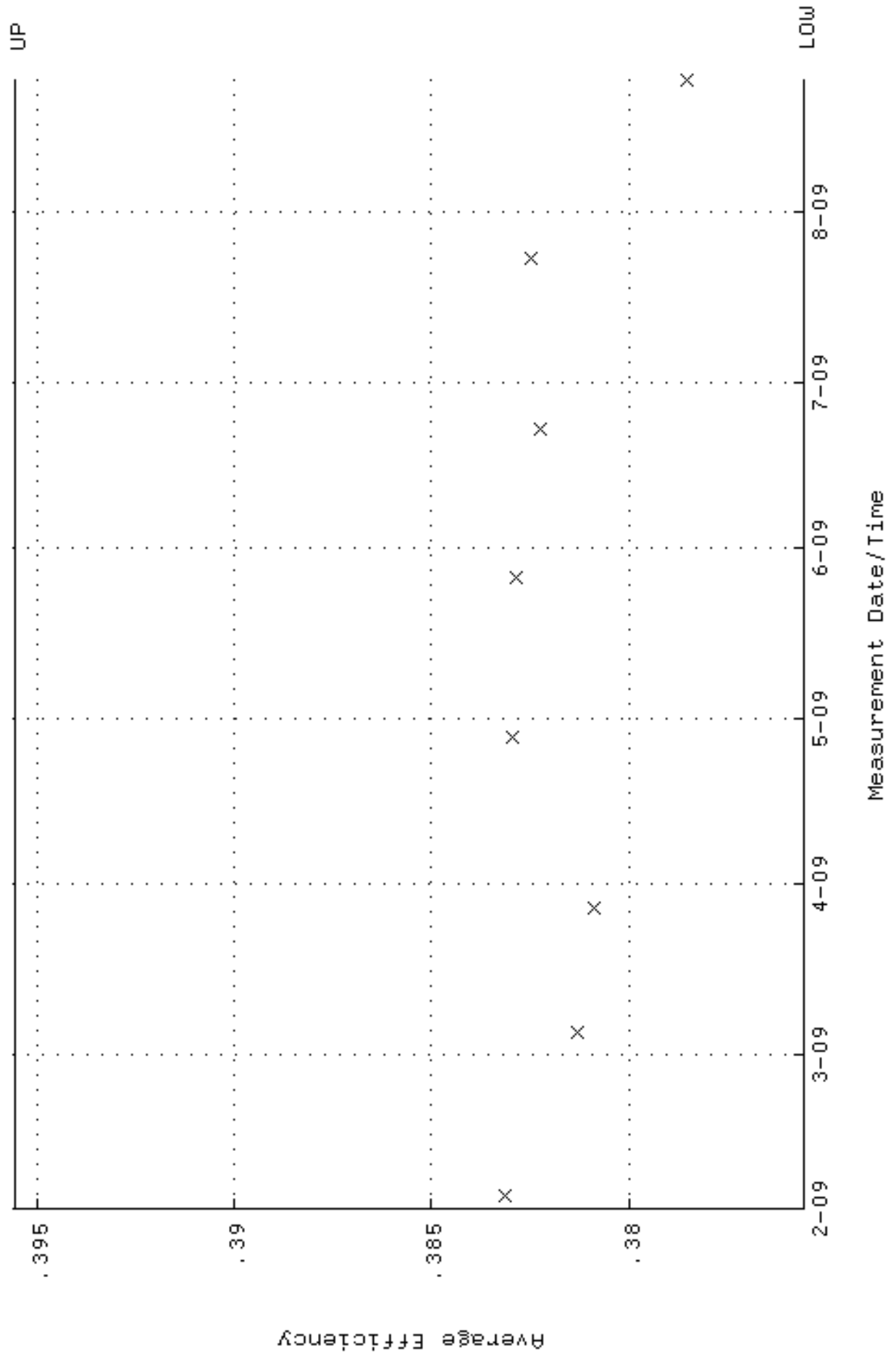
QA filename : DKA100:[ENV_ALPHA.QA.W]W162.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 3-FEB-2009 07:29:45 through 24-AUG-2009 12:00:00
Lower/Upper Lmts: 85.8969 through 94.9387



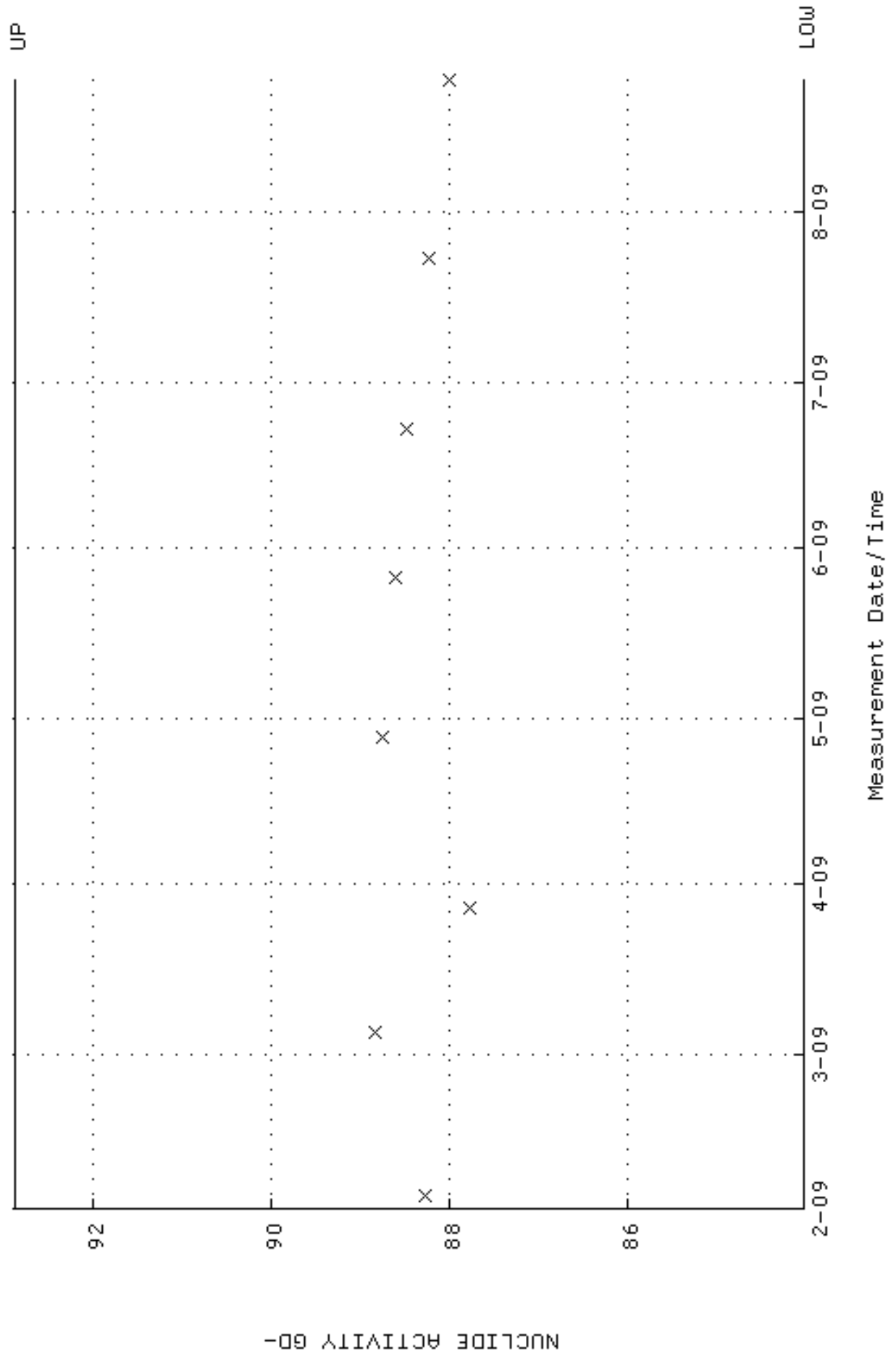
QA filename : DKA100:[ENV_ALPHA.QA.B]B162.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:12:19 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



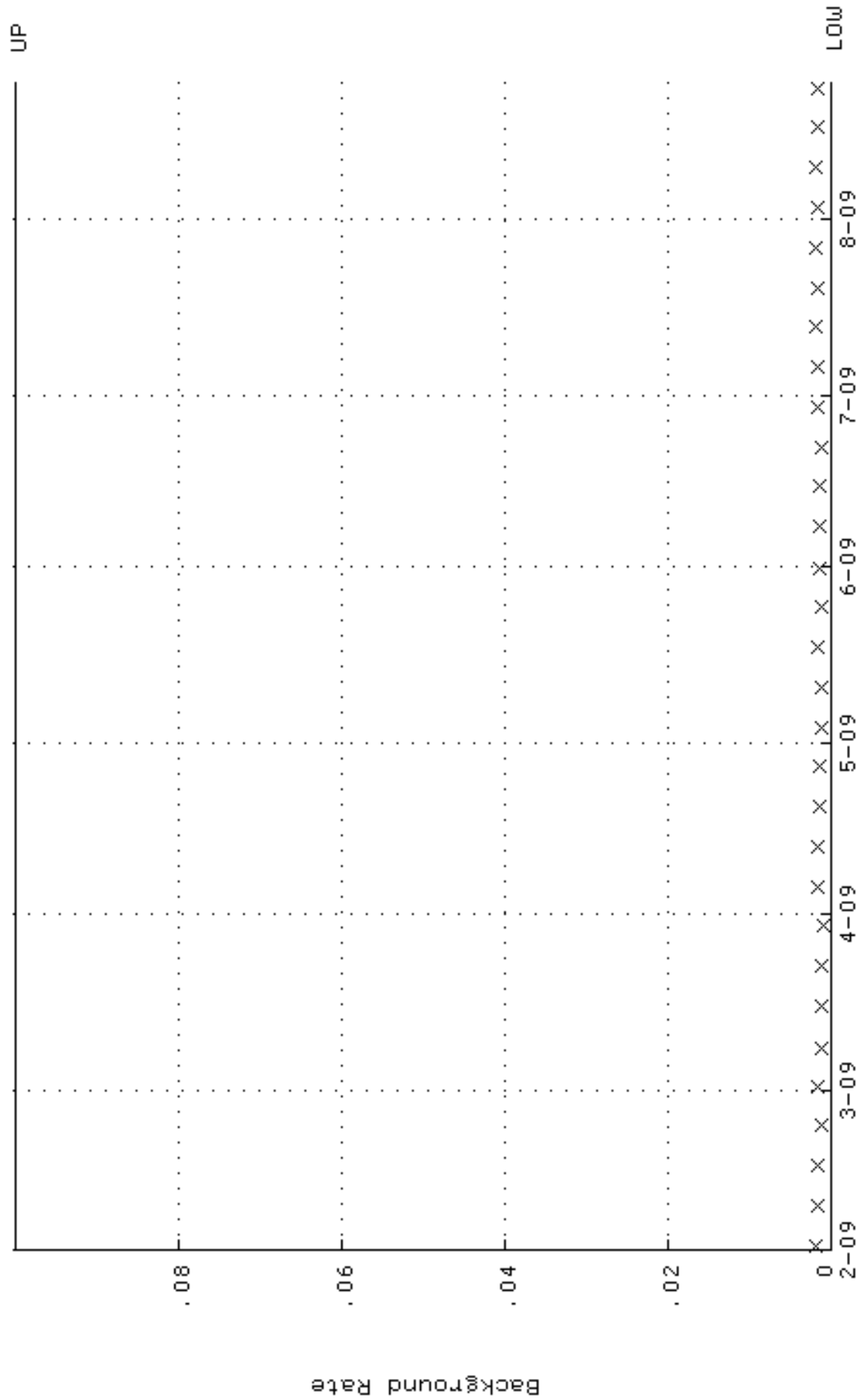
QA filename : DKA100:[ENV_ALPHA.QA.W]W163.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 07:29:52 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.375557 through 0.395557



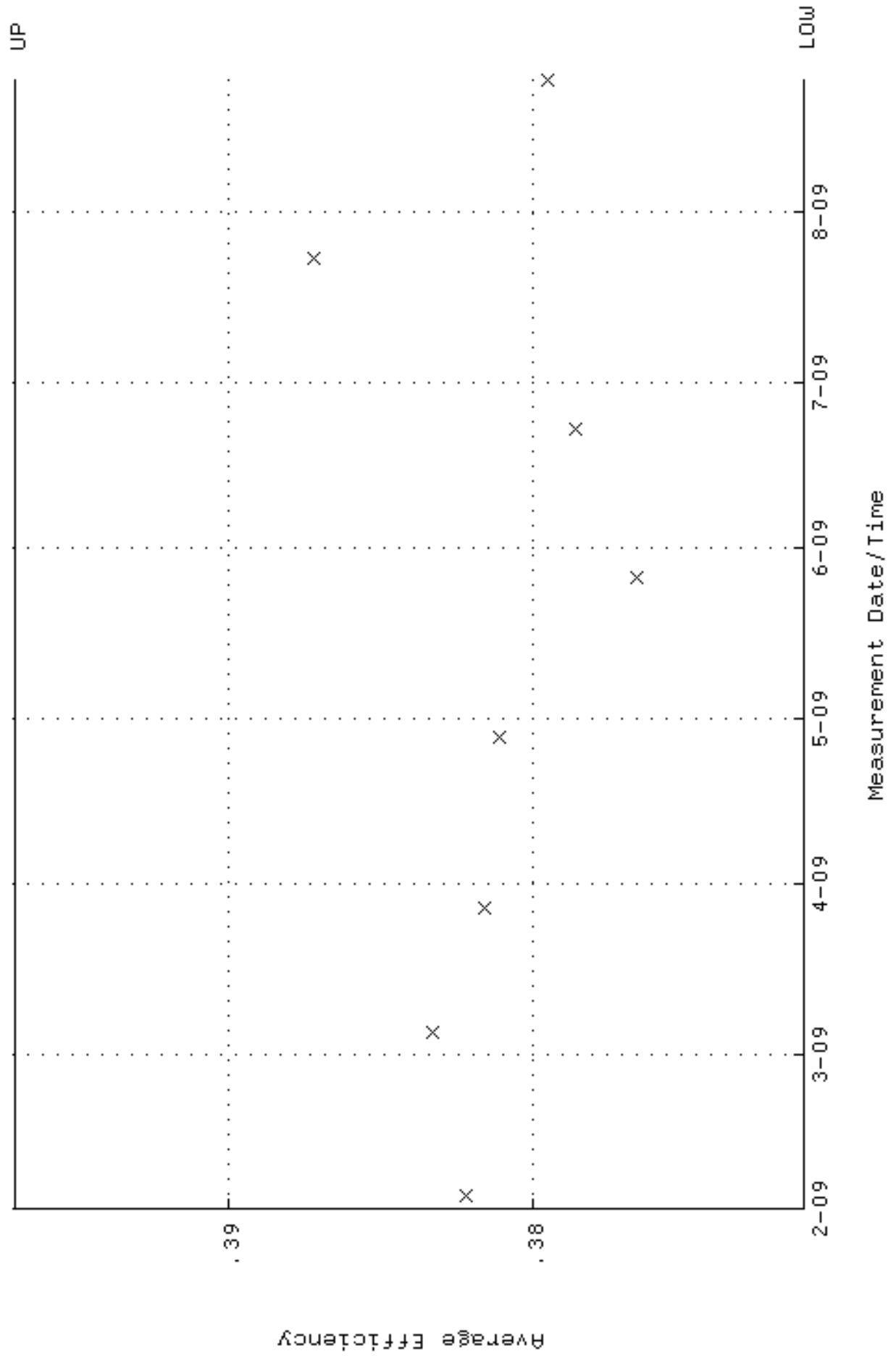
QA filename : DKA100:[ENV_ALPHA.QA.W]W163.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-FEB-2009 07:29:52 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 84.0322 through 92.8777



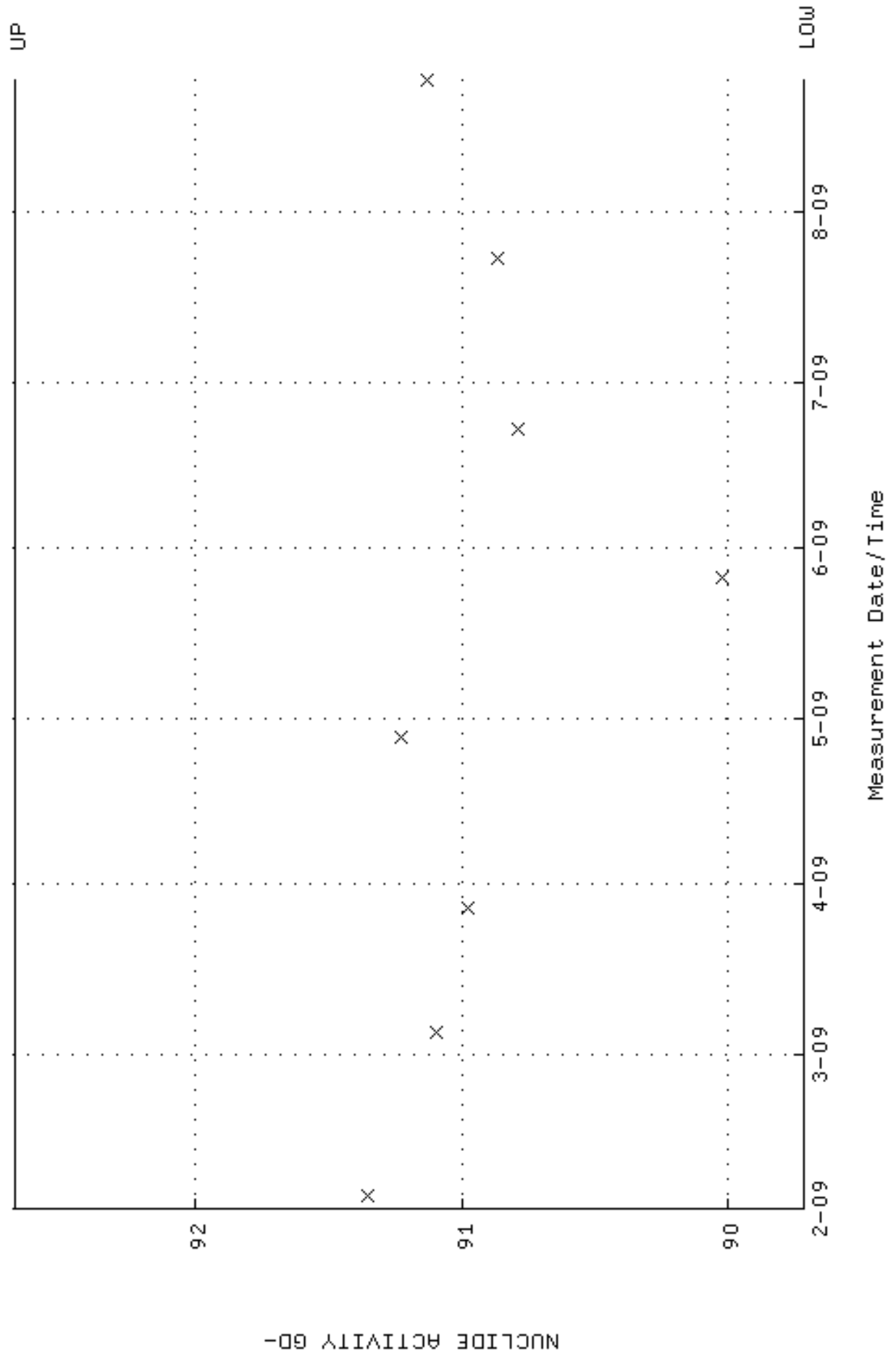
QA filename : DKA100:[ENV_ALPHA.QA.B]B163.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:12:33 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



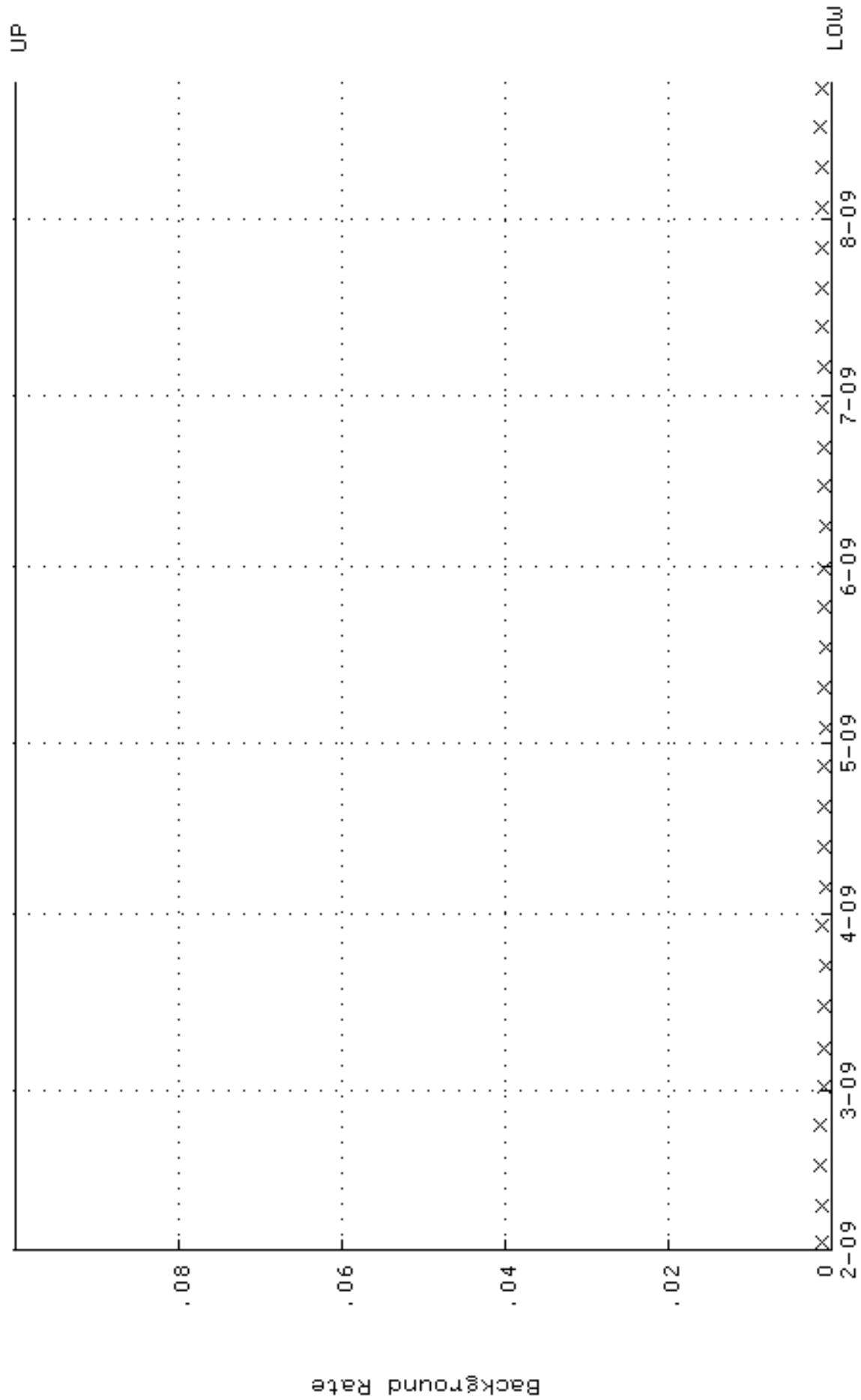
QA filename : DKA100:[ENV_ALPHA.QA.W]W164.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 07:29:59 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.371107 through 0.397001



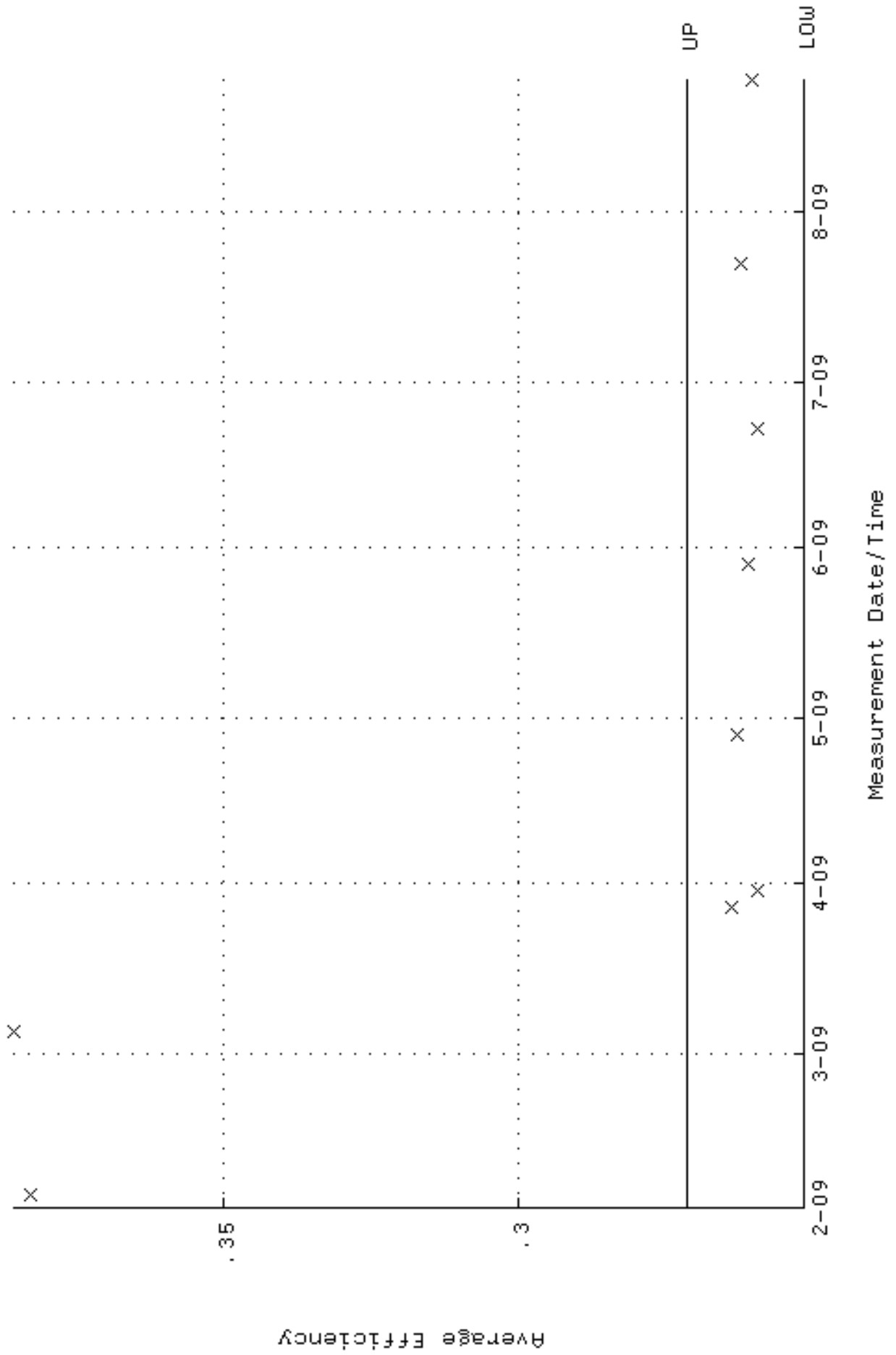
QA filename : DKA100:[ENV_ALPHA.QA.W]W164.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-FEB-2009 07:29:59 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 89.7107 through 92.6809



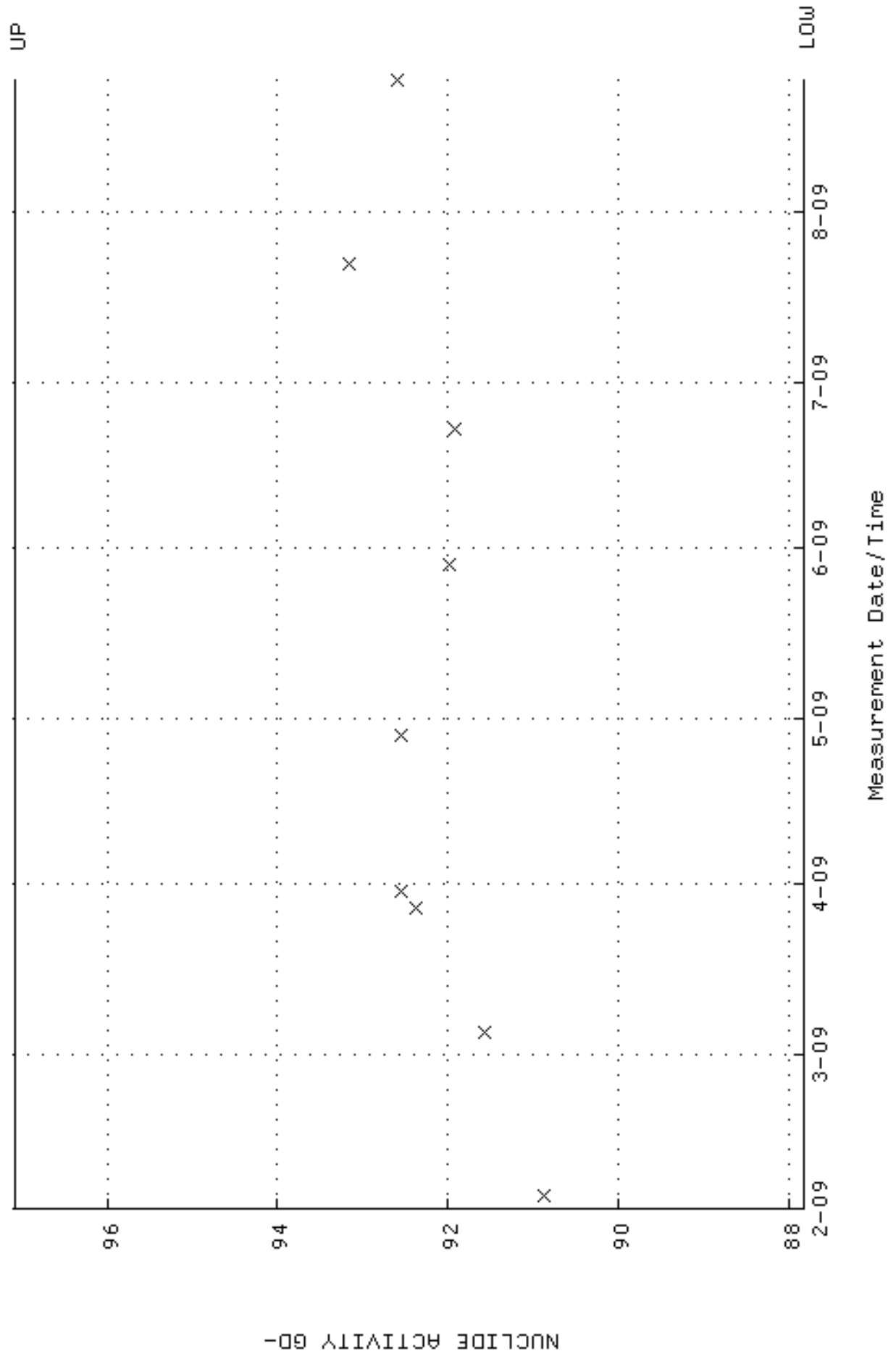
QA filename : DKA100:[ENV_ALPHA.QA.B]B164.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 2-FEB-2009 11:27:29 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



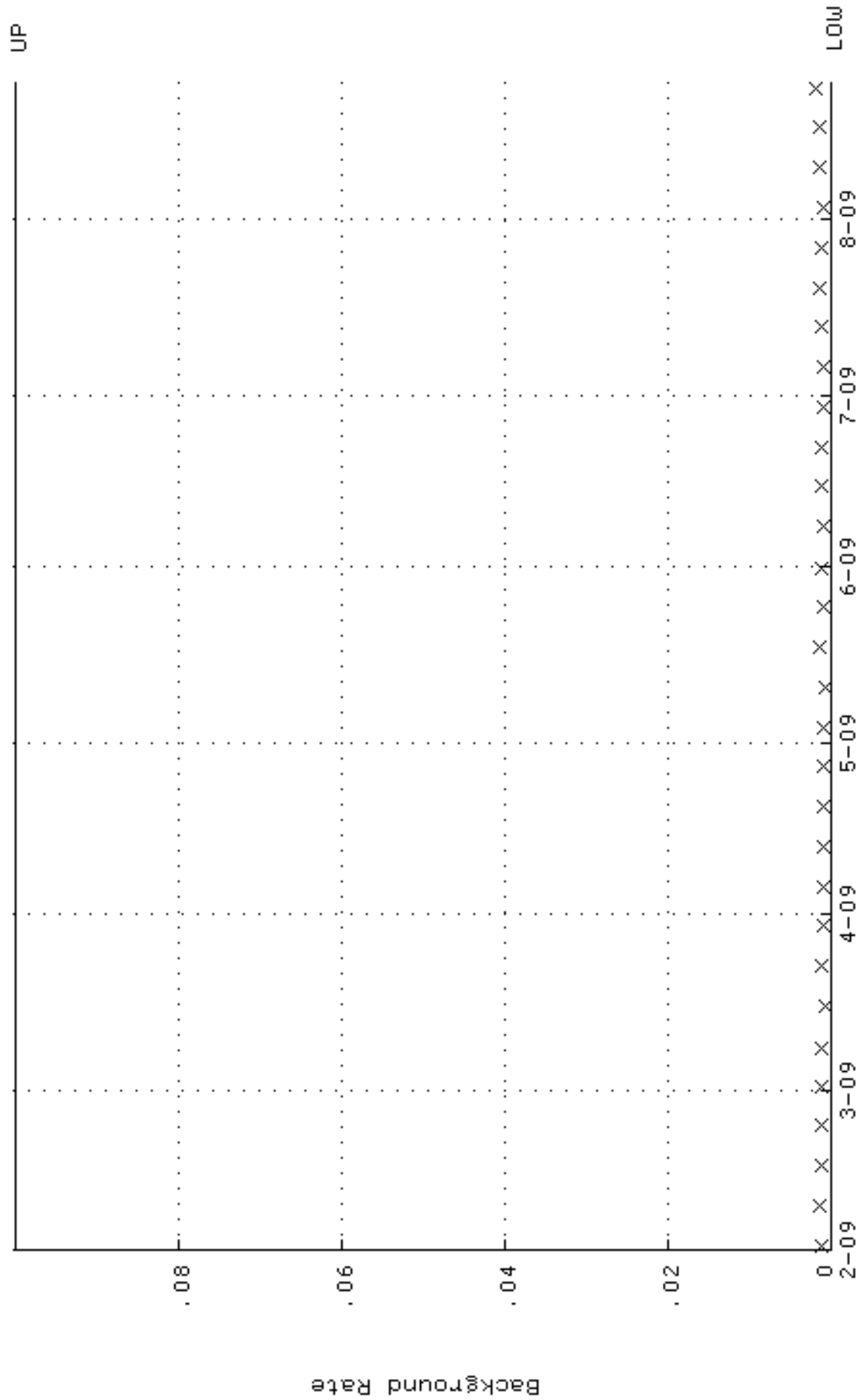
QA filename : DKA100:[ENV_ALPHA.QA.W]W173.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 12:05:35 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.251498 through 0.271498



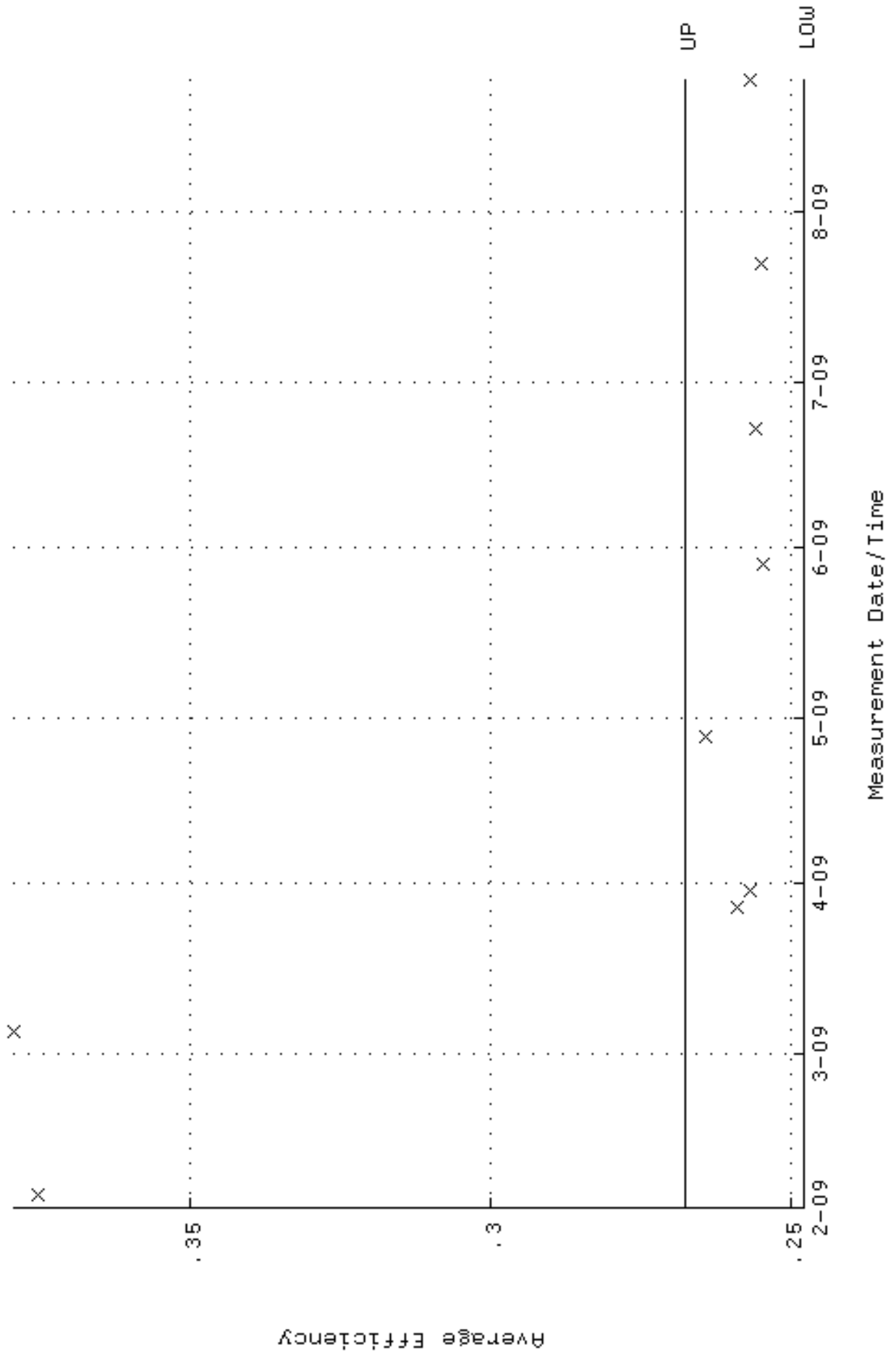
QA filename : DKA100:[ENV_ALPHA.QA.W]W173.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 3-FEB-2009 12:05:35 through 24-AUG-2009 12:00:00
Lower/Upper Lmts: 87.8322 through 97.0776



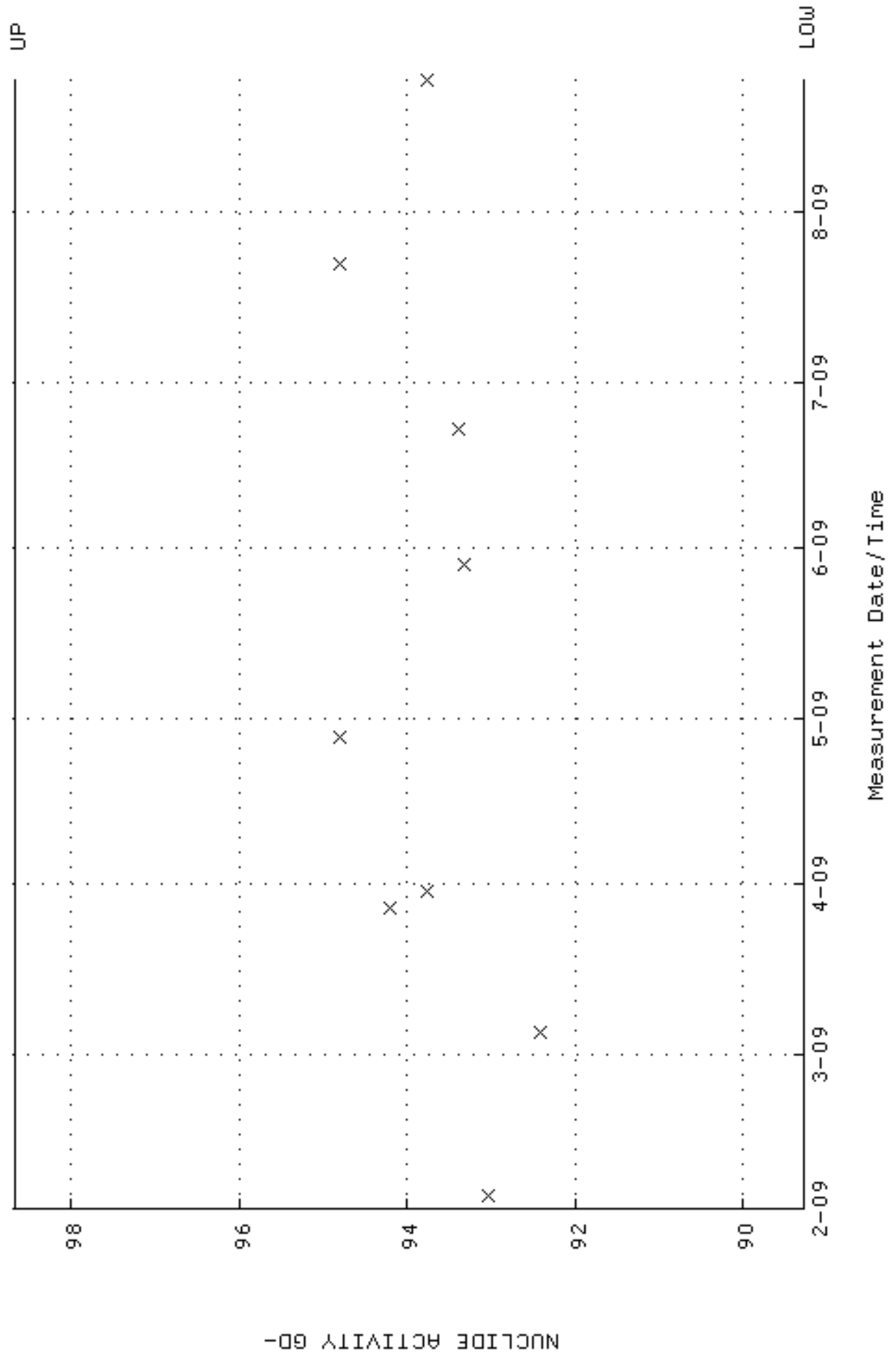
QA filename : DKA100:[ENV_ALPHA.QA.B]B173.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:14:48 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



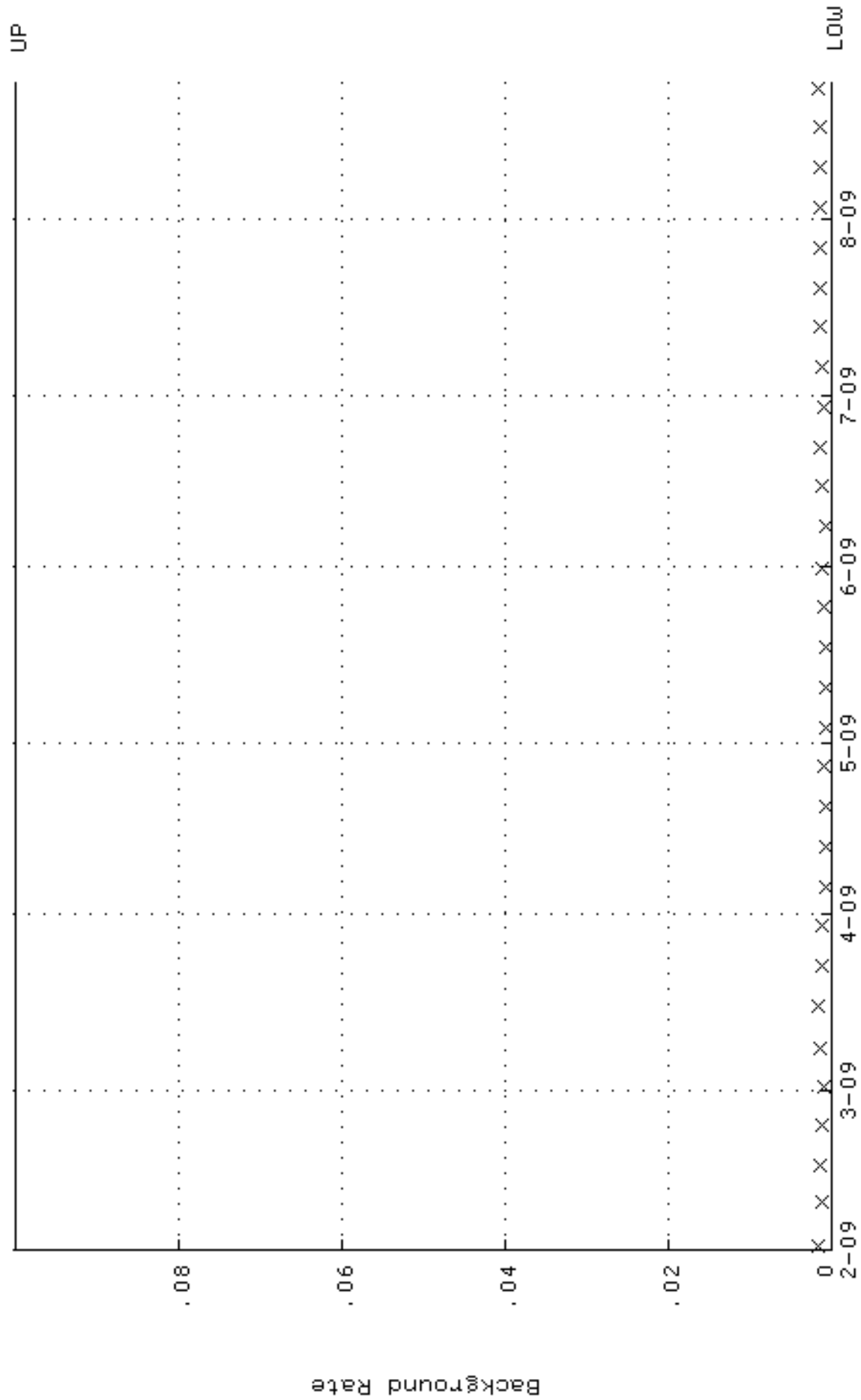
QA filename : DKA100:[ENV_ALPHA.QA.W]W181.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 12:08:56 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.247722 through 0.267722



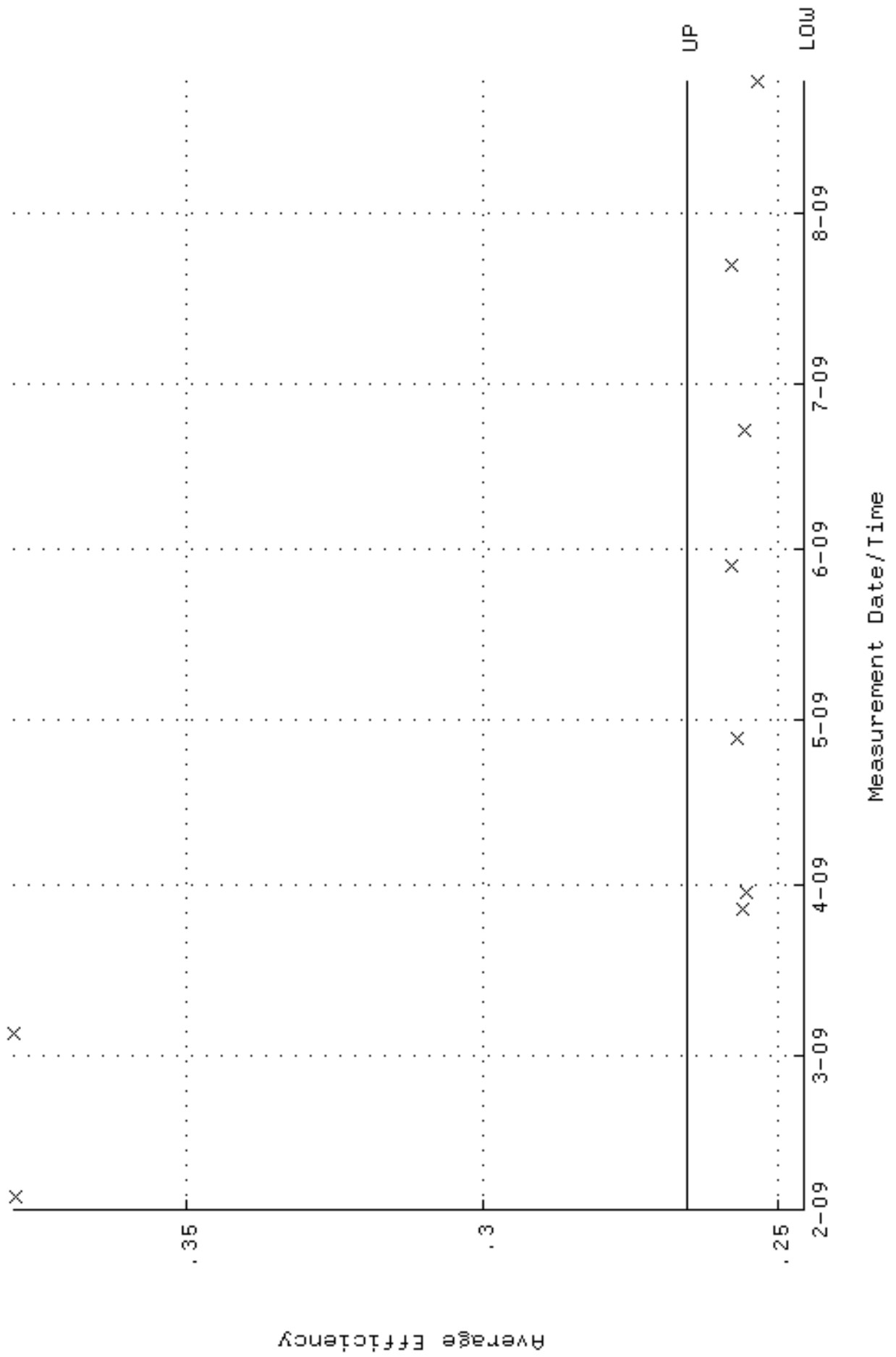
QA filename : DKA100:[ENV_ALPHA.QA.W]w181.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-FEB-2009 12:08:56 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 89.2737 through 98.6709



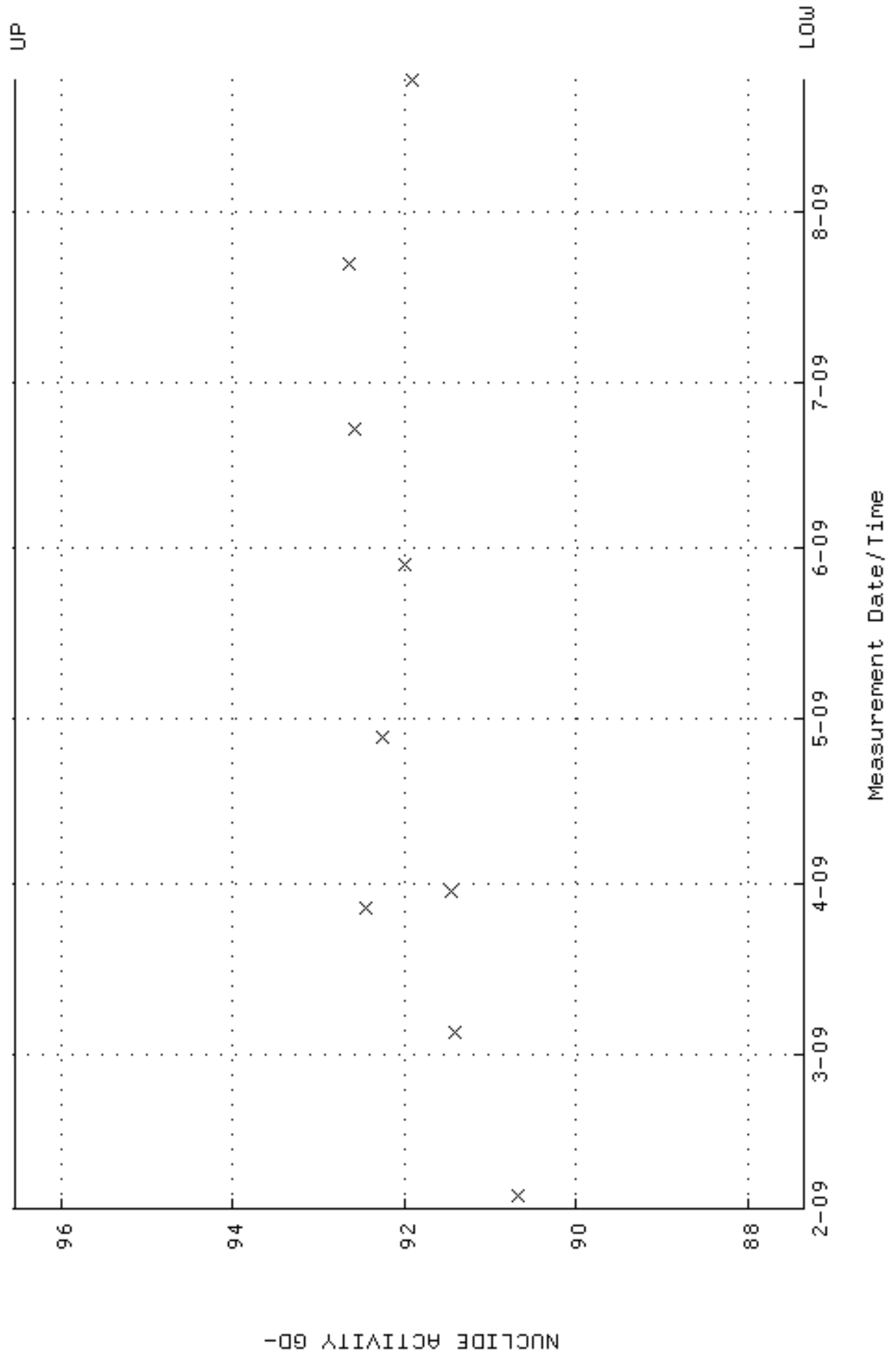
QA filename : DKA100:[ENV_ALPHA.QA.B]B181.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:16:47 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



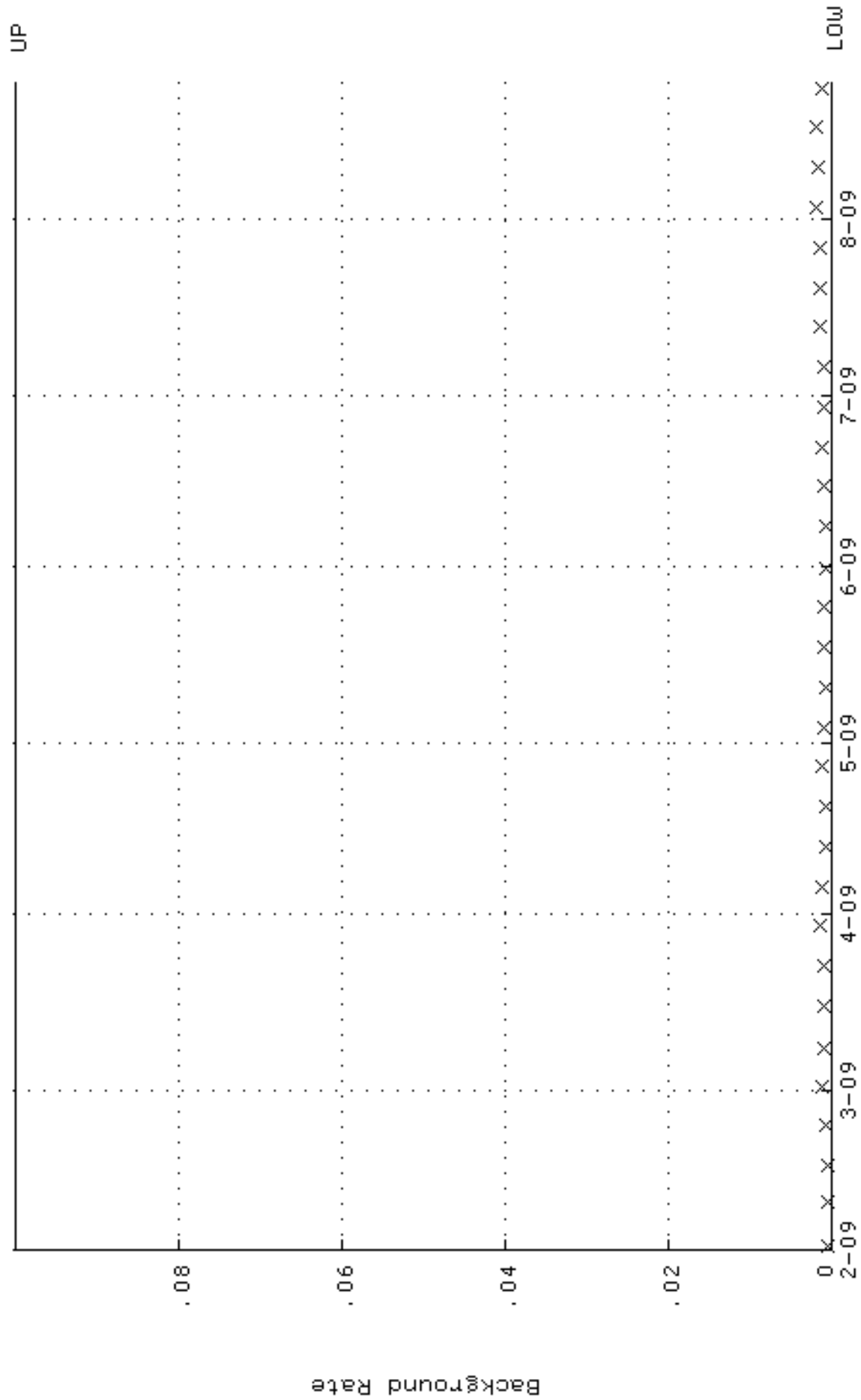
QA filename : DKA100:[ENV_ALPHA.QA.W]W182.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 12:09:03 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.245707 through 0.265707



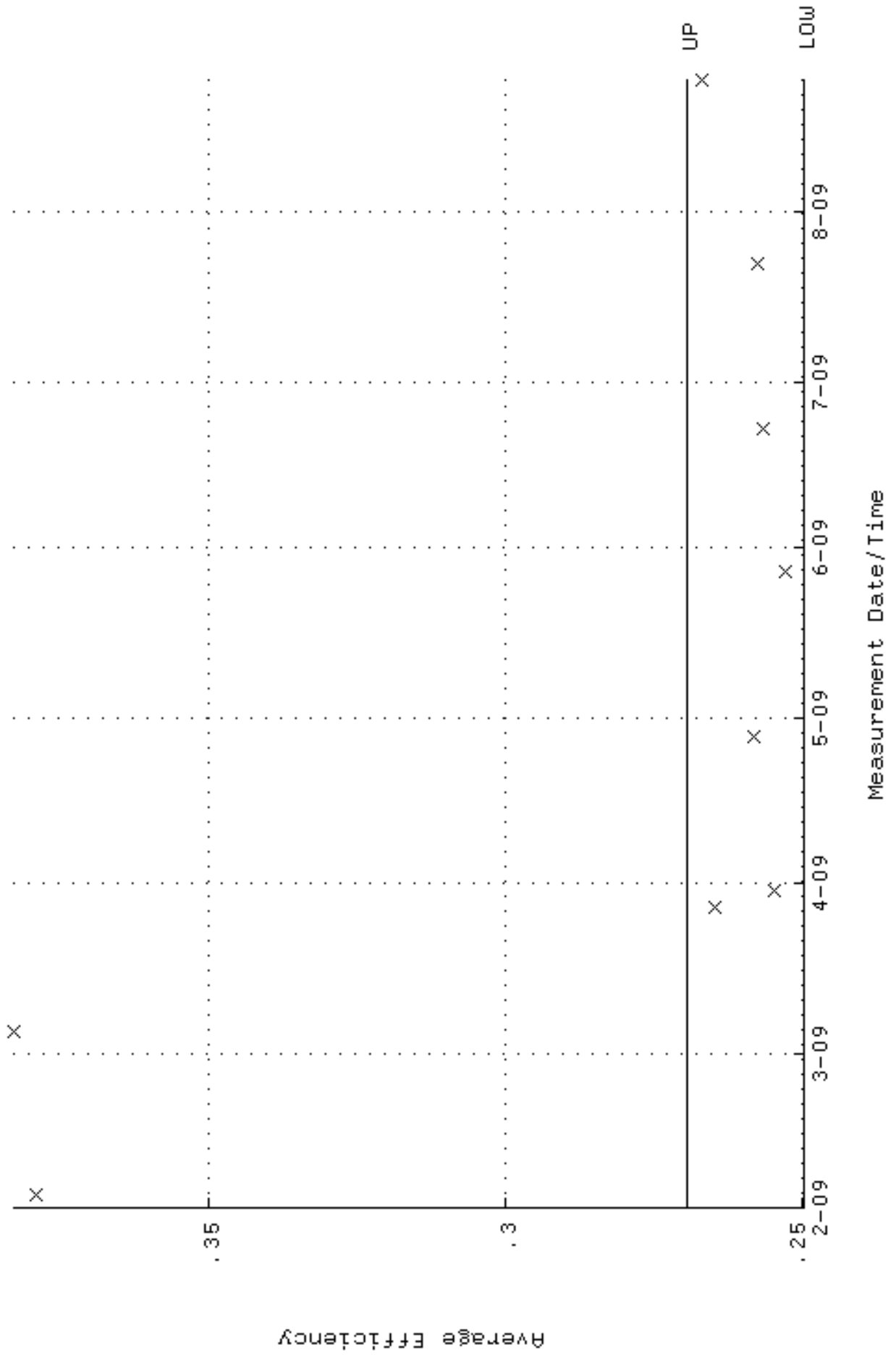
QA filename : DKA100:[ENV_ALPHA.QA.W]W182.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-FEB-2009 12:09:03 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 87.3454 through 96.5396



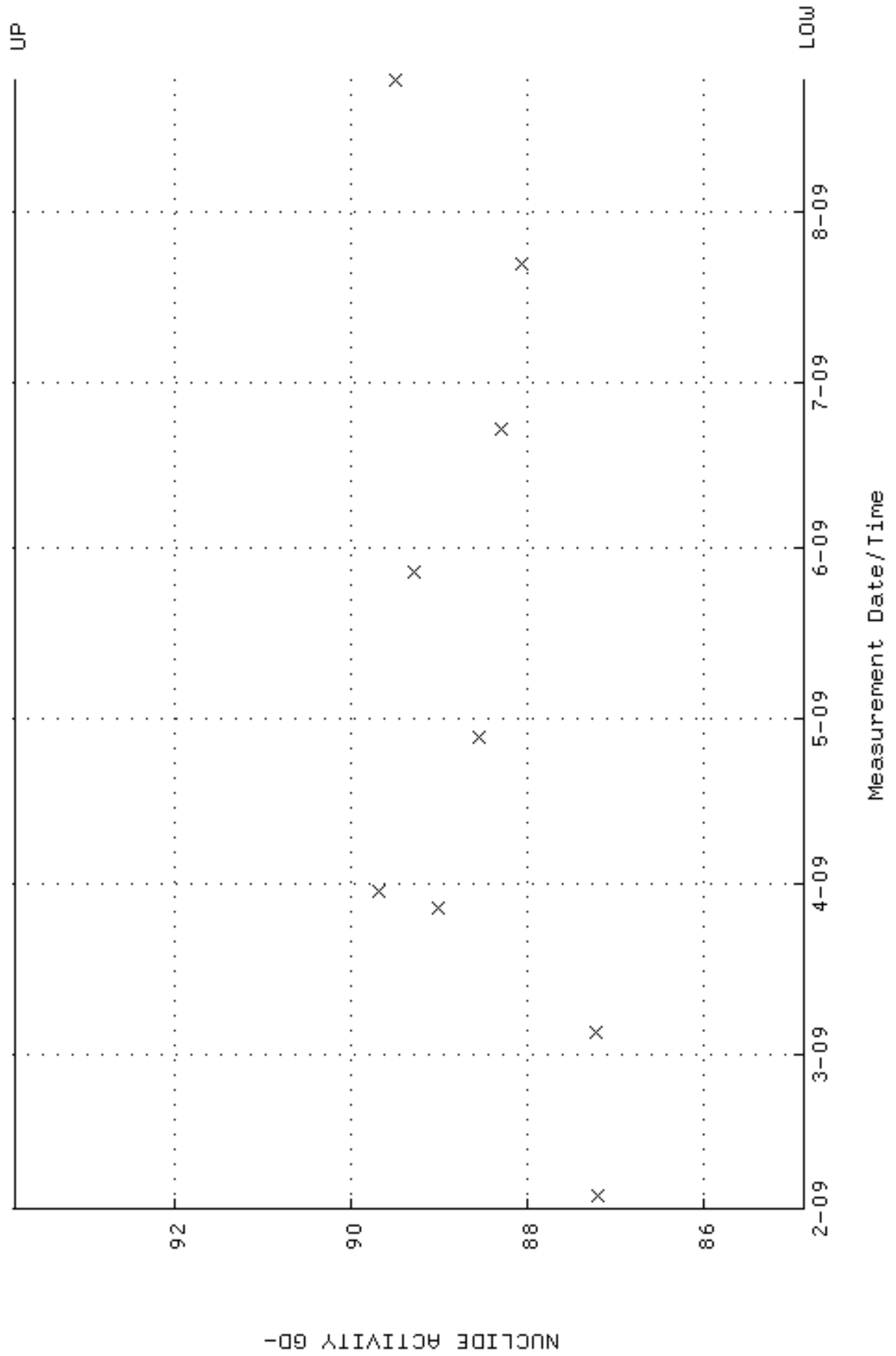
QA filename : DKA100:[ENV_ALPHA.QA.B]B182.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:17:02 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



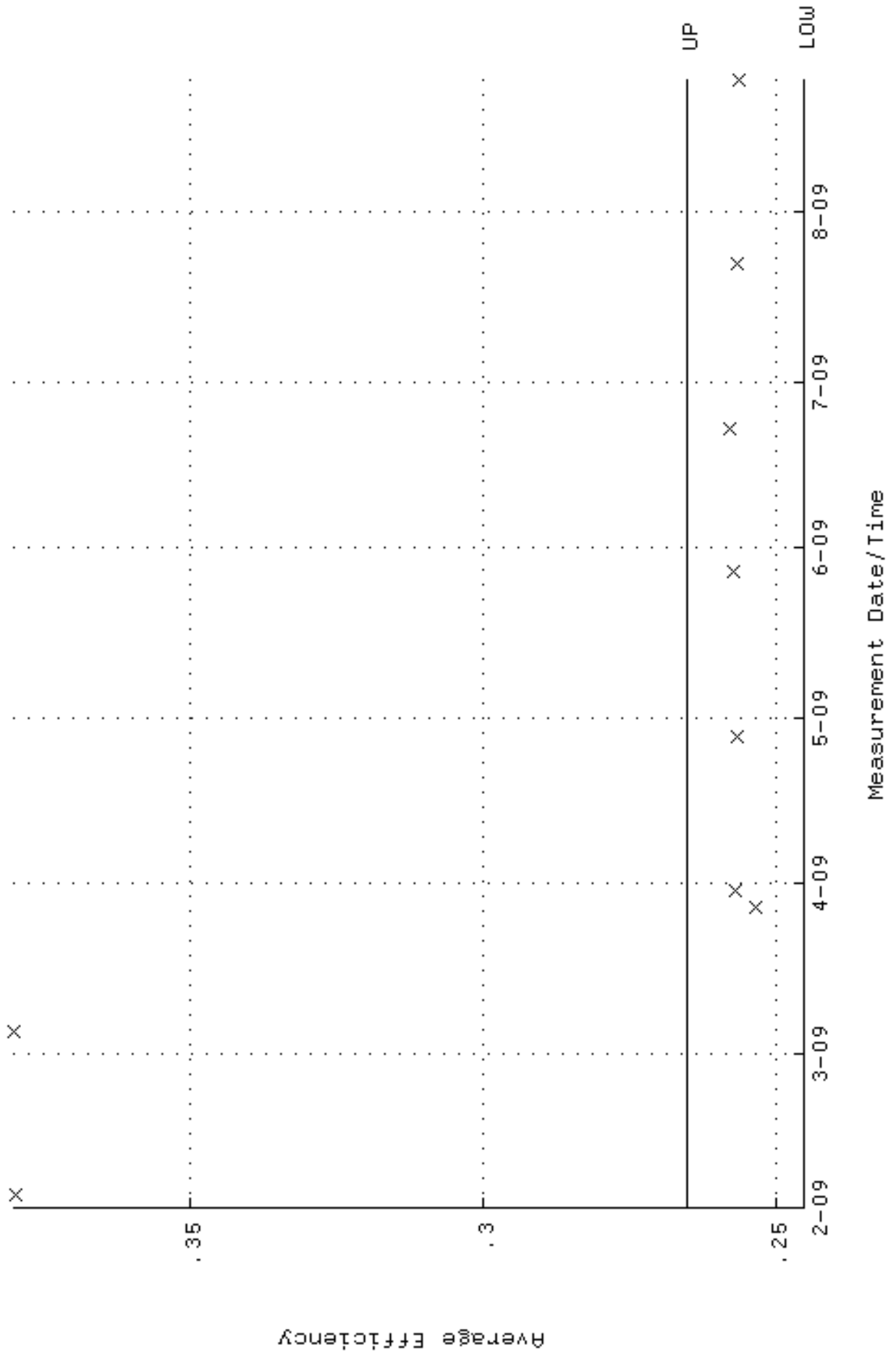
QA filename : DKA100:[ENV_ALPHA.QA.W]W195.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 12:10:17 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.249622 through 0.269622



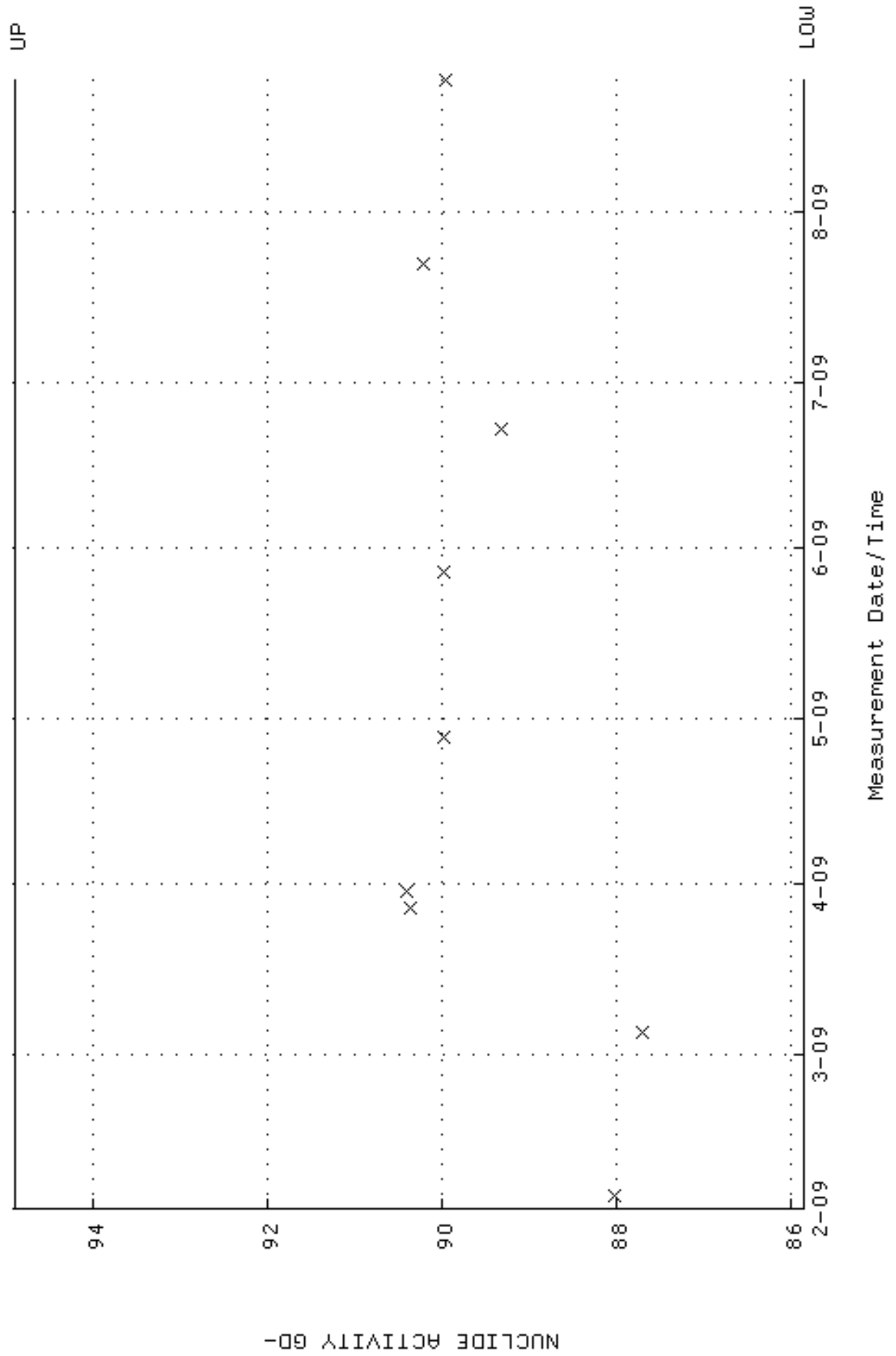
QA filename : DKA100:[ENV_ALPHA.QA.W]W195.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-FEB-2009 12:10:17 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 84.8653 through 93.7985



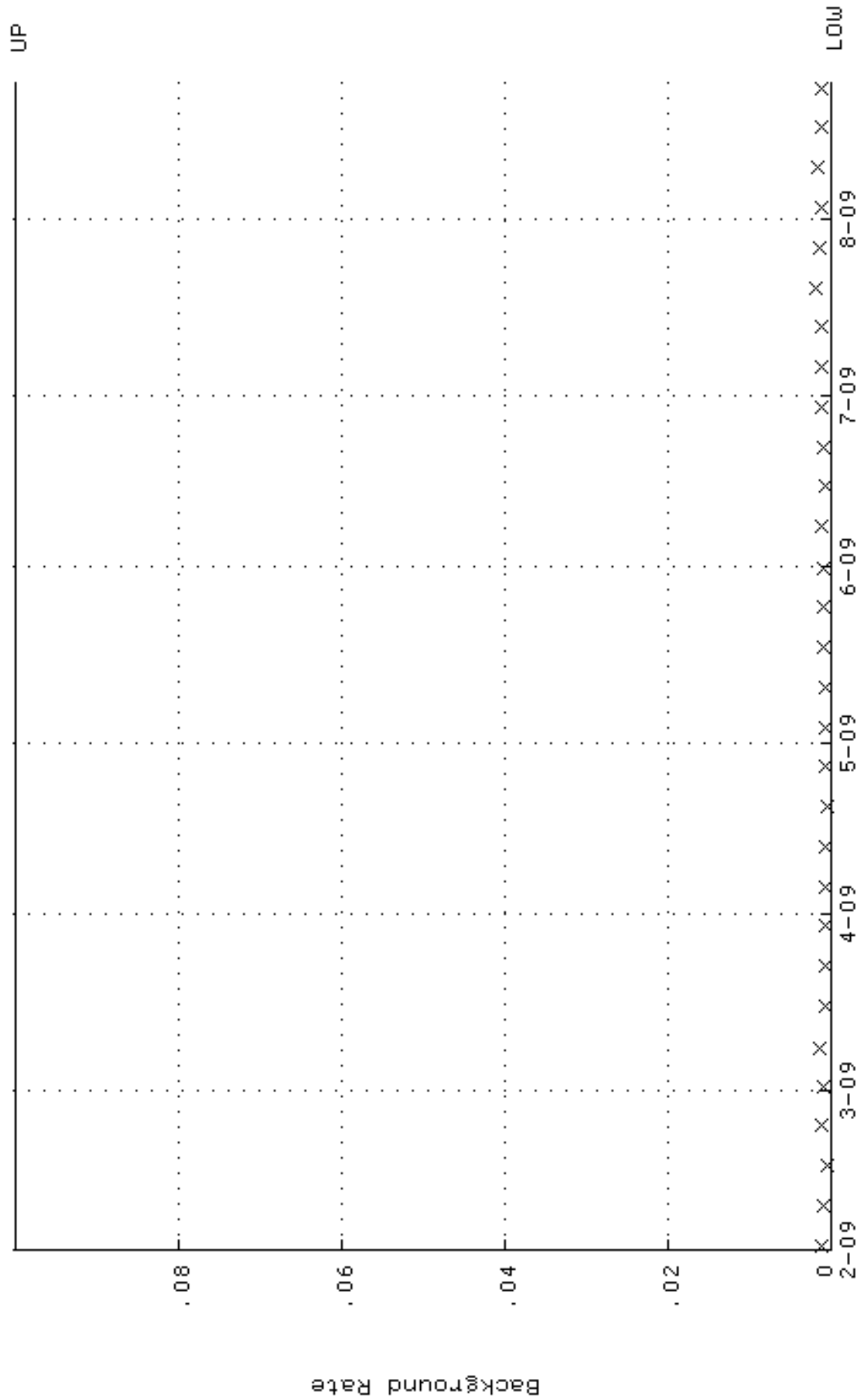
QA filename : DKA100:[ENV_ALPHA.QA.W]W196.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 3-FEB-2009 12:10:22 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.245168 through 0.265168



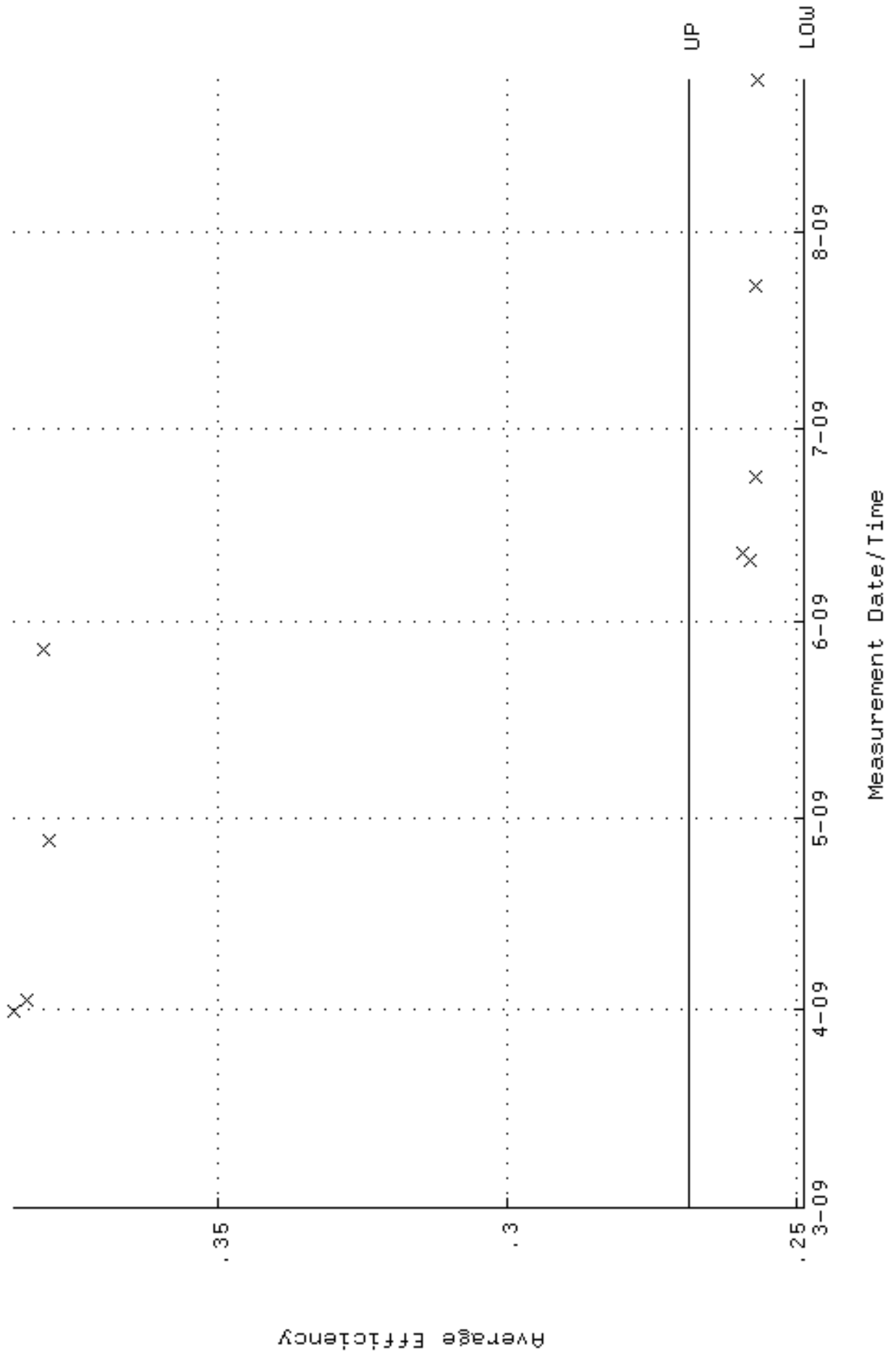
QA filename : DKA100:[ENV_ALPHA.QA.W]W196.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 3-FEB-2009 12:10:22 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 85.8592 through 94.8970



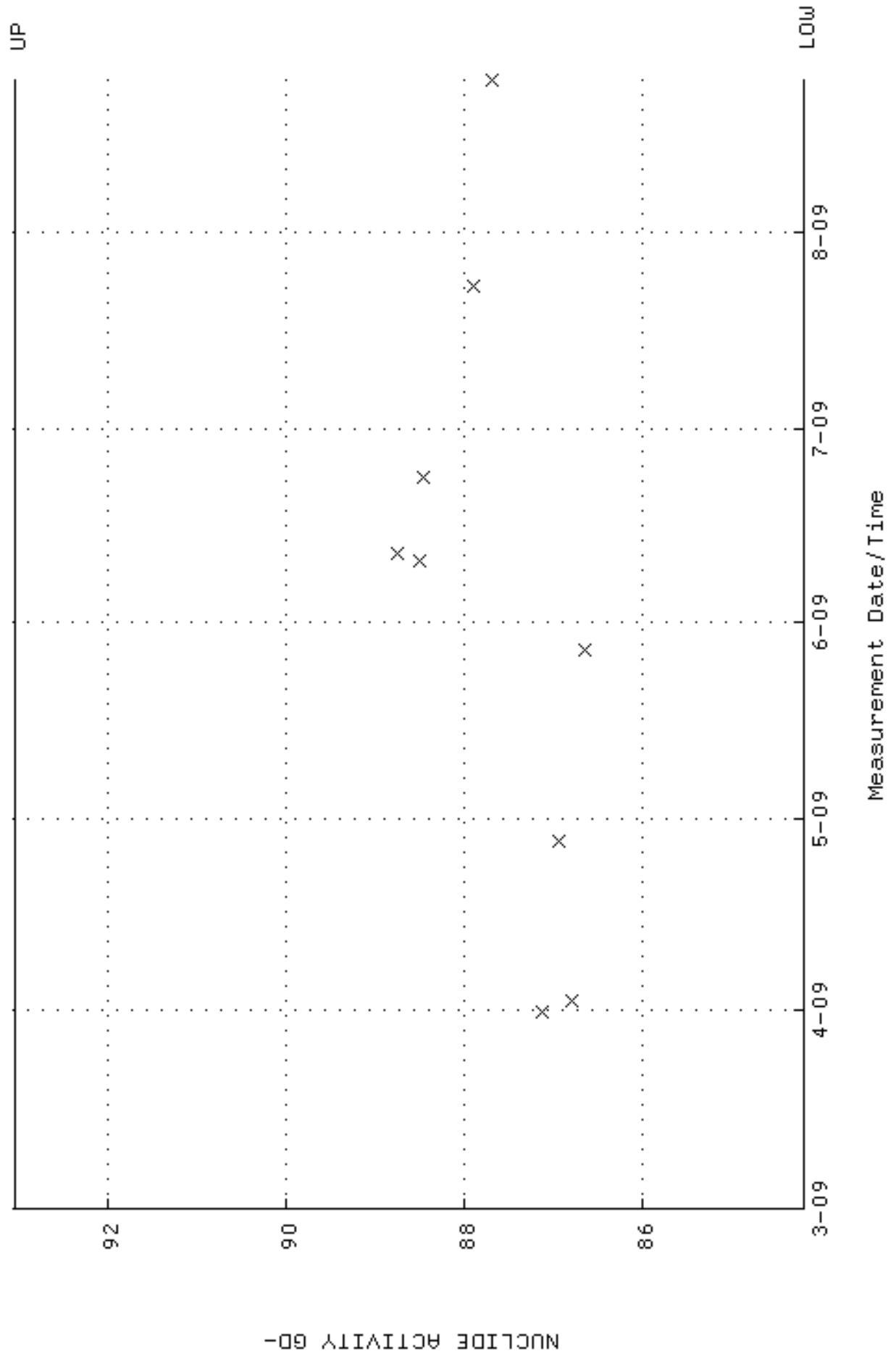
QA filename : DKA100:[ENV_ALPHA.QA.B]B196.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-FEB-2009 17:20:38 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



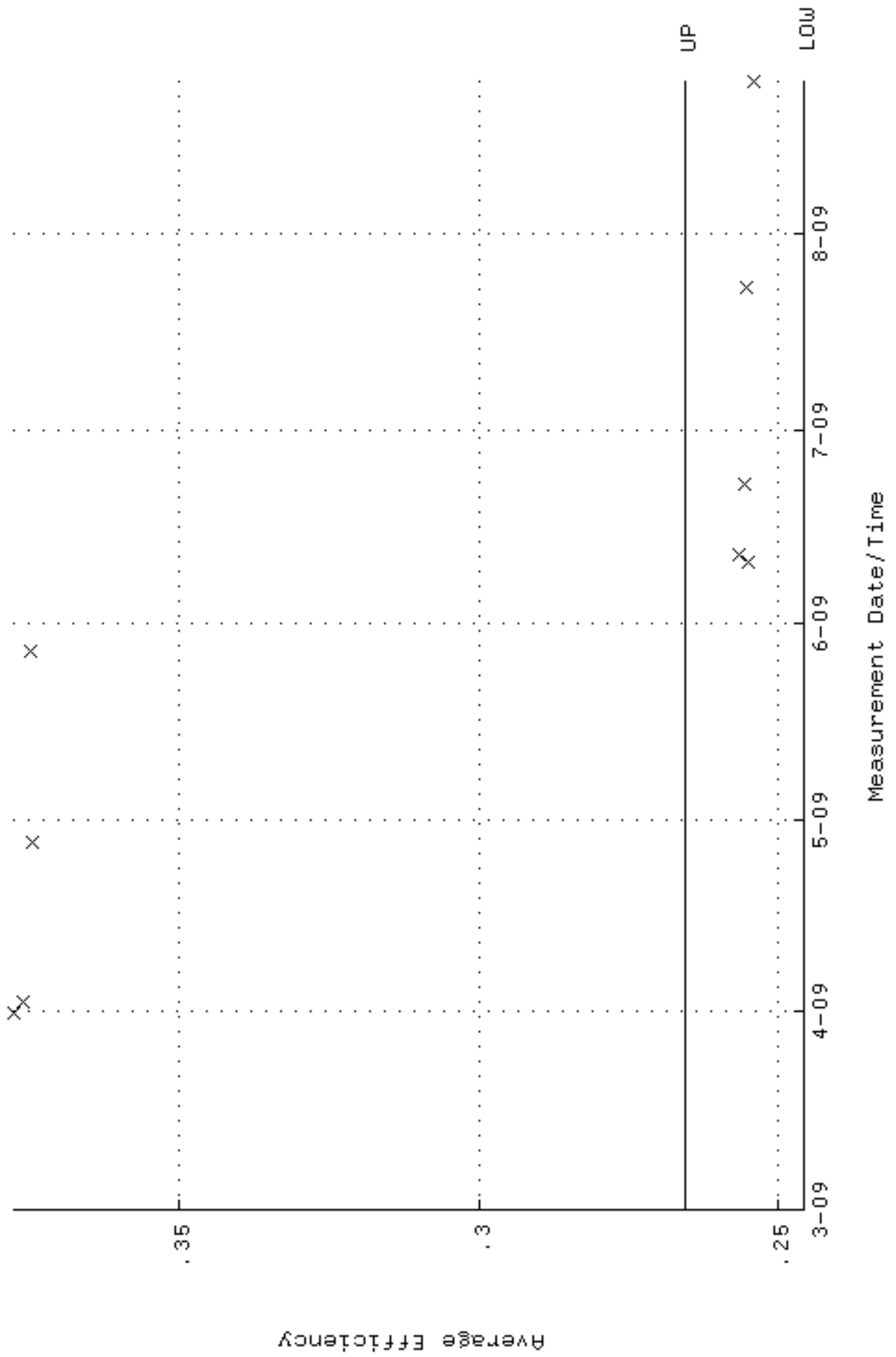
QA filename : DKA100:[ENV_ALPHA.QA.W]W197.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:03:56 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.248572 through 0.268572



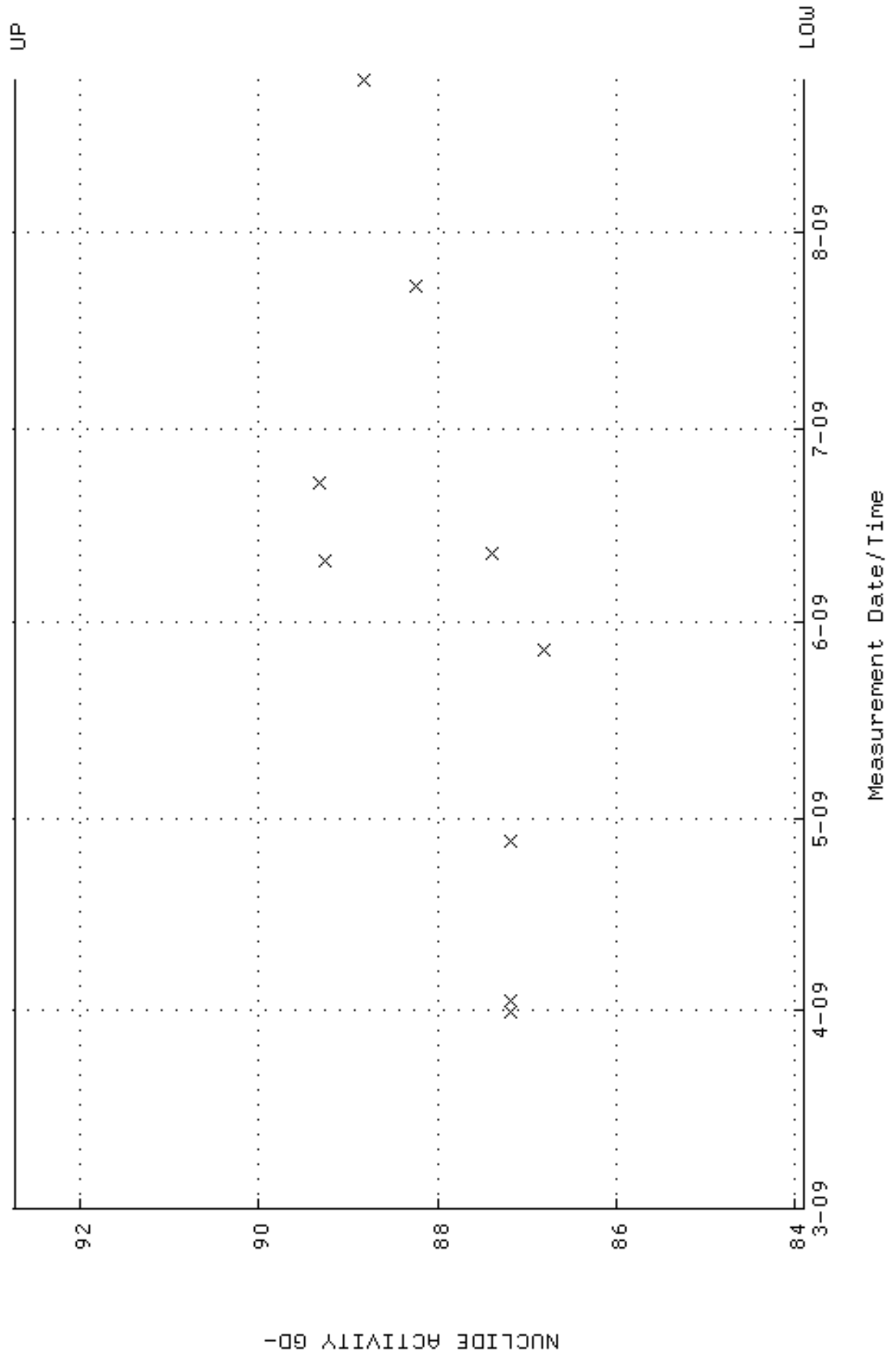
QA filename : DKA100:[ENV_ALPHA.QA.W]w197.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 31-MAR-2009 15:03:56 through 24-AUG-2009 12:00:00
Lower/Upper Lmts: 84.1772 through 93.0380



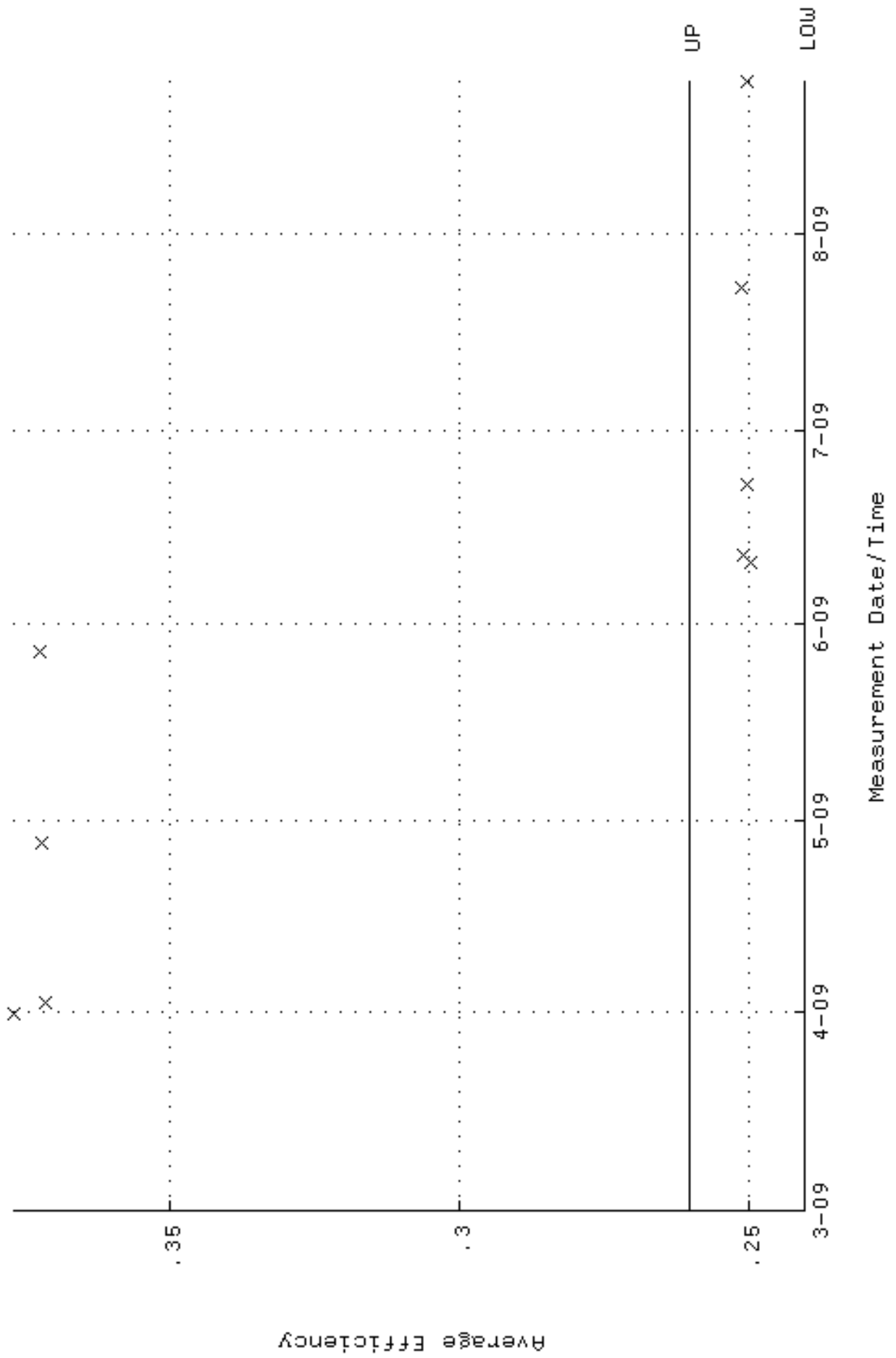
QA filename : DKA100:[ENV_ALPHA.QA.W]W198.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:06:01 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.245817 through 0.265817



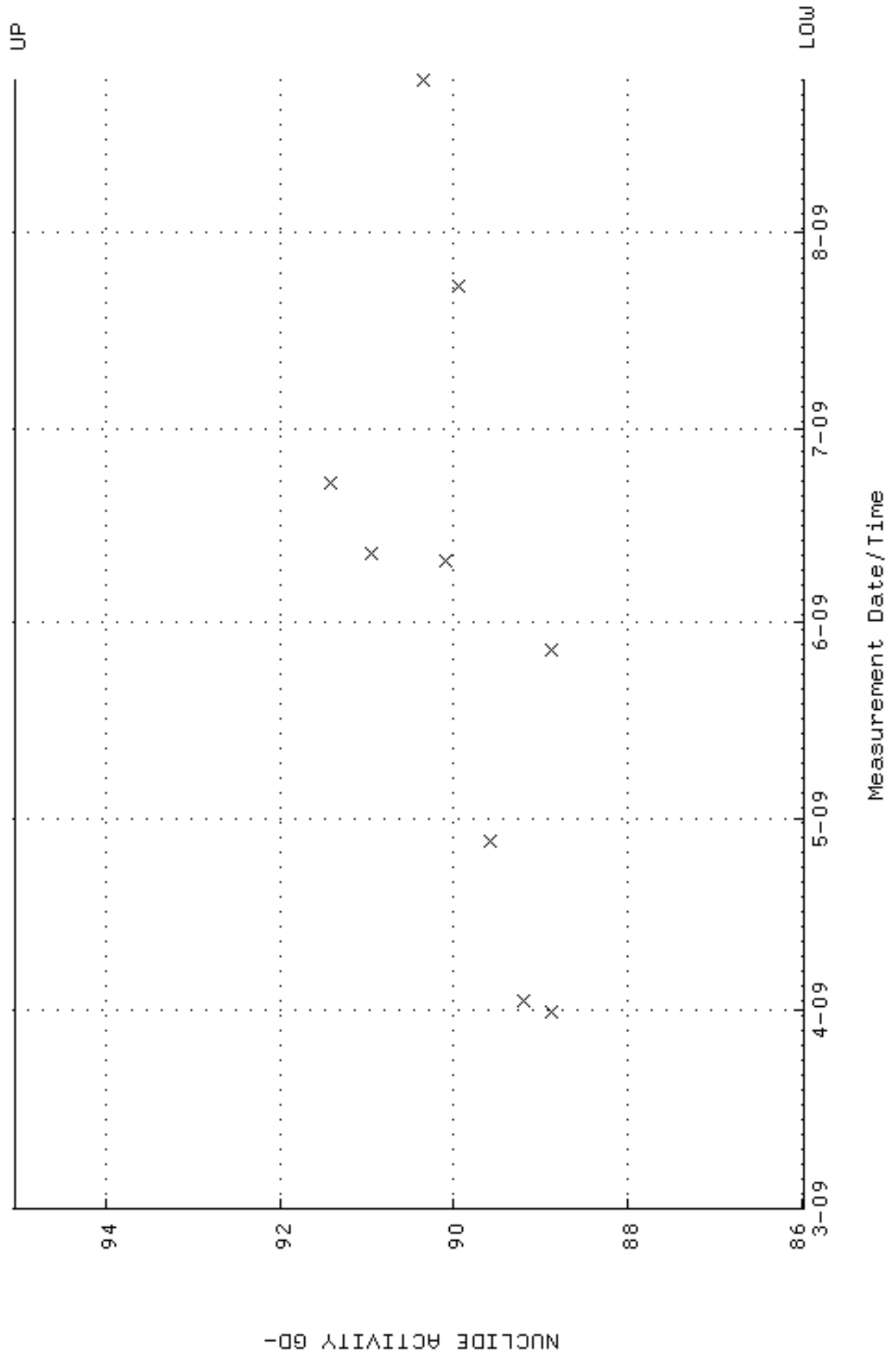
QA filename : DKA100:[ENV_ALPHA.QA.W]W198.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:06:01 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 83.8978 through 92.7292



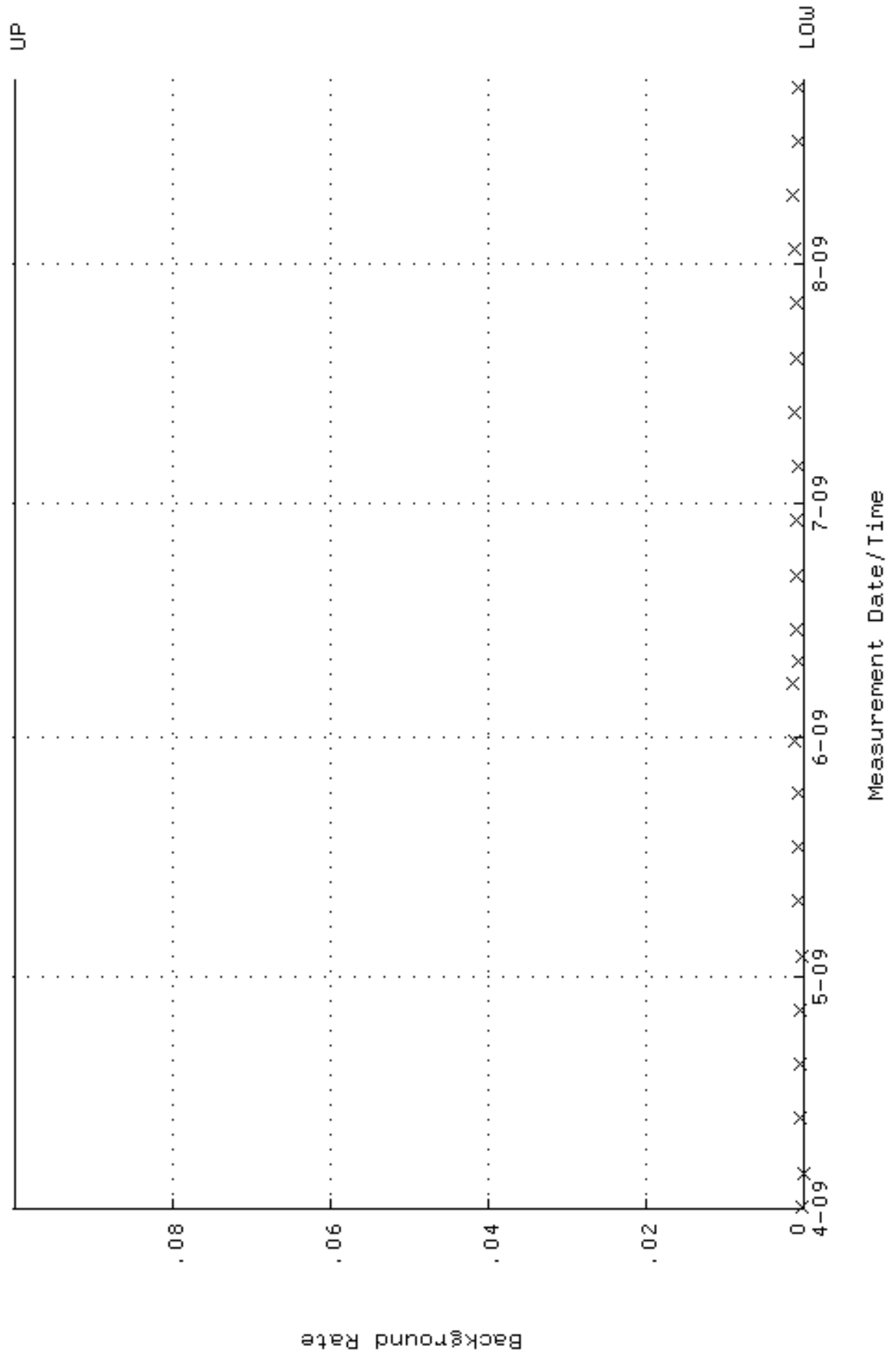
QA filename : DKA100:[ENV_ALPHA.QA.W]W199.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:10:22 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.240278 through 0.260278



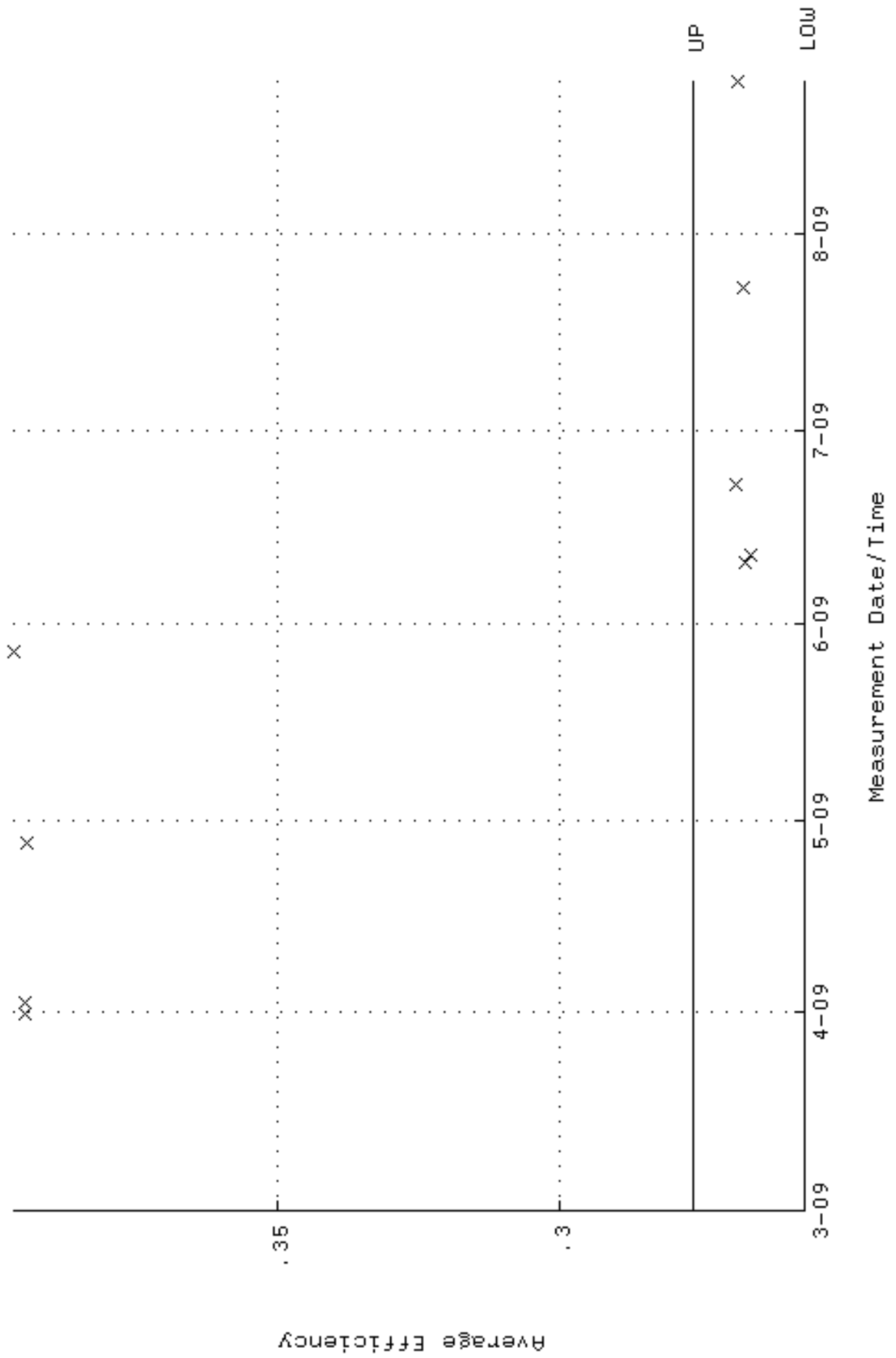
QA filename : DKA100:[ENV_ALPHA.QA.W]w199.QAF;1
Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
Start/End Dates : 31-MAR-2009 15:10:22 through 24-AUG-2009 12:00:00
Lower/Upper Lmts: 85.9853 through 95.0363



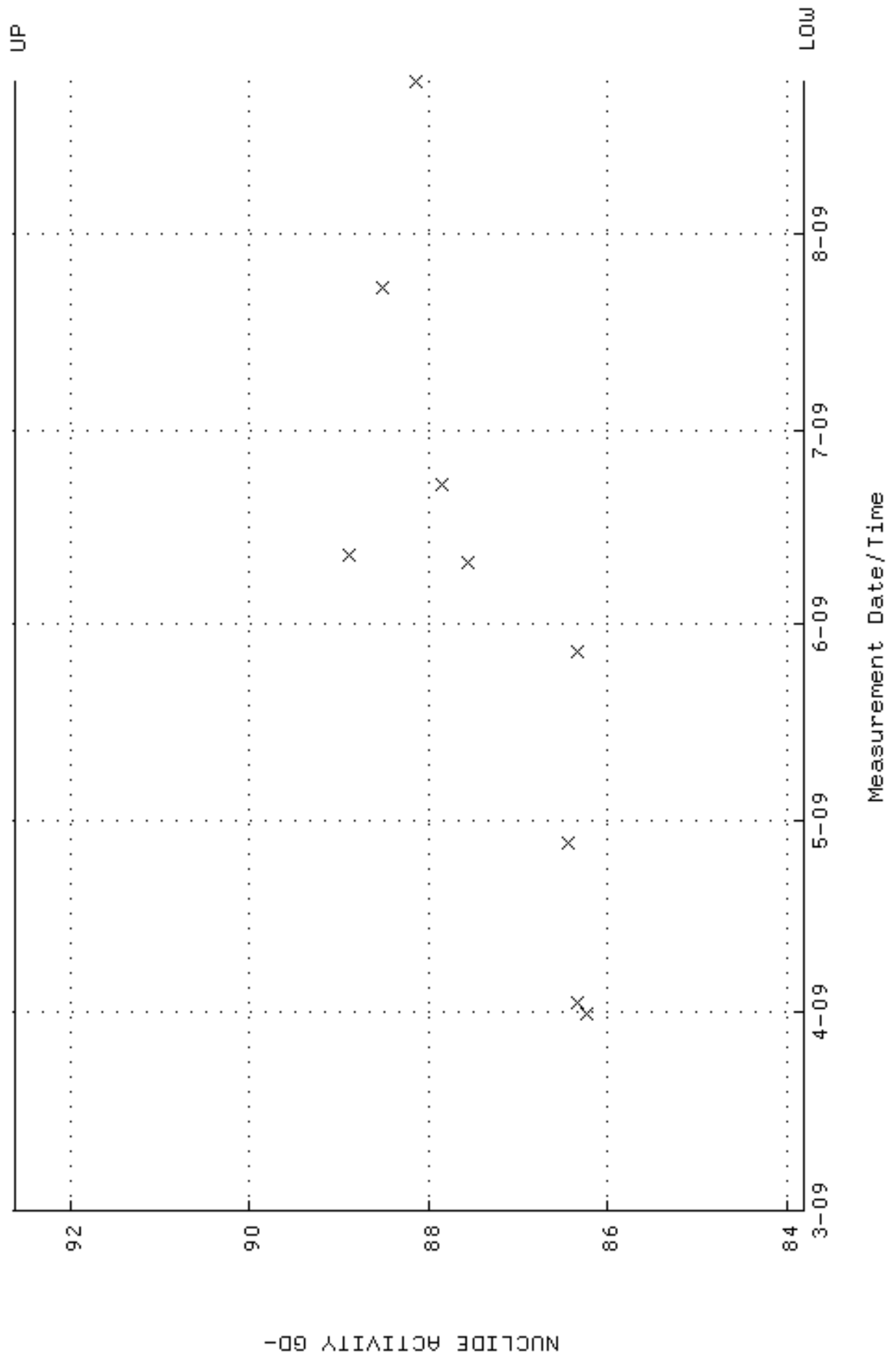
QA filename : DKA100:[ENV_ALPHA.QA.B]B199.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-APR-2009 08:02:28 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



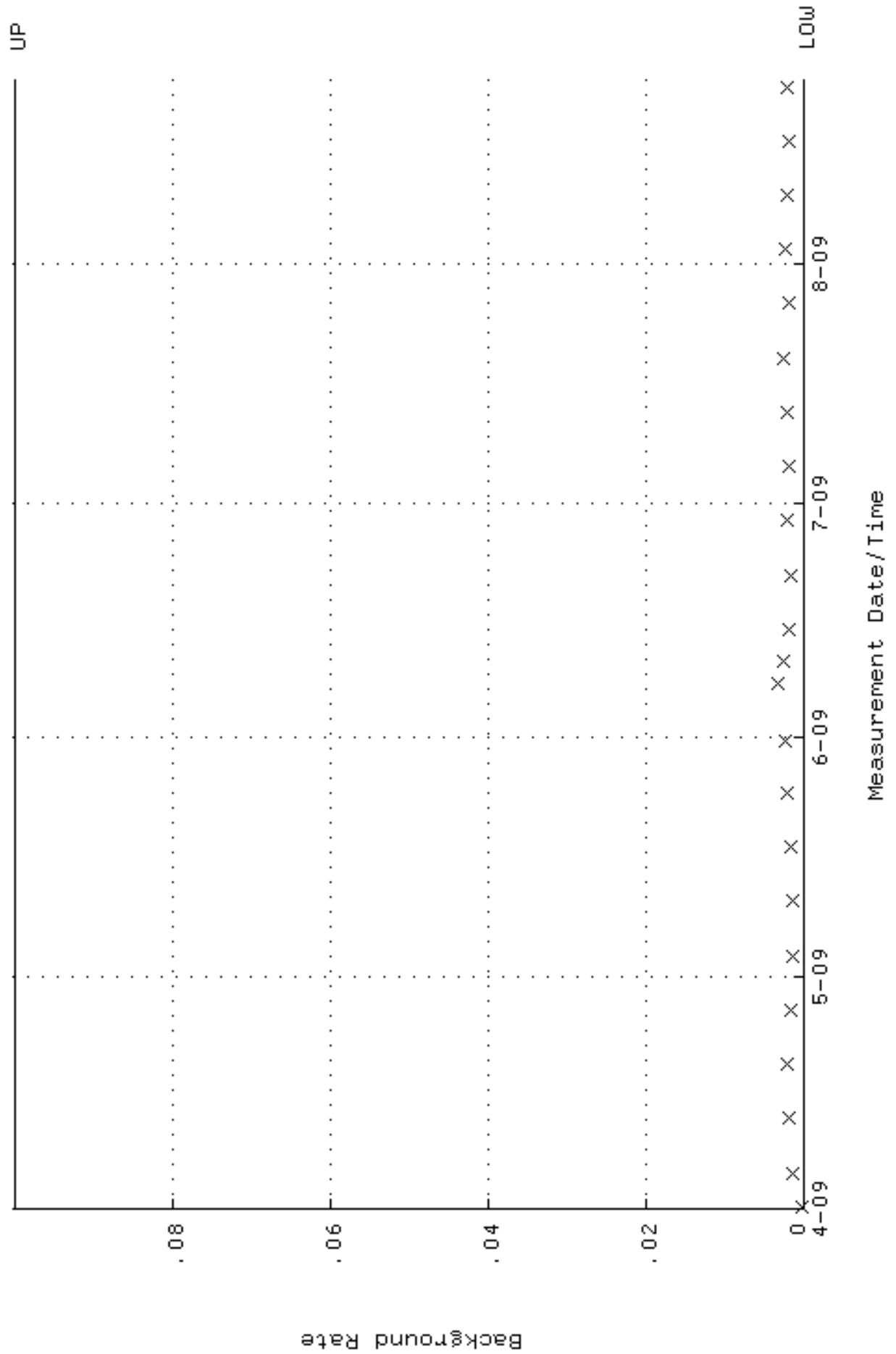
QA filename : DKA100:[ENV_ALPHA.QA.W]W200.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:10:24 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.256586 through 0.276586



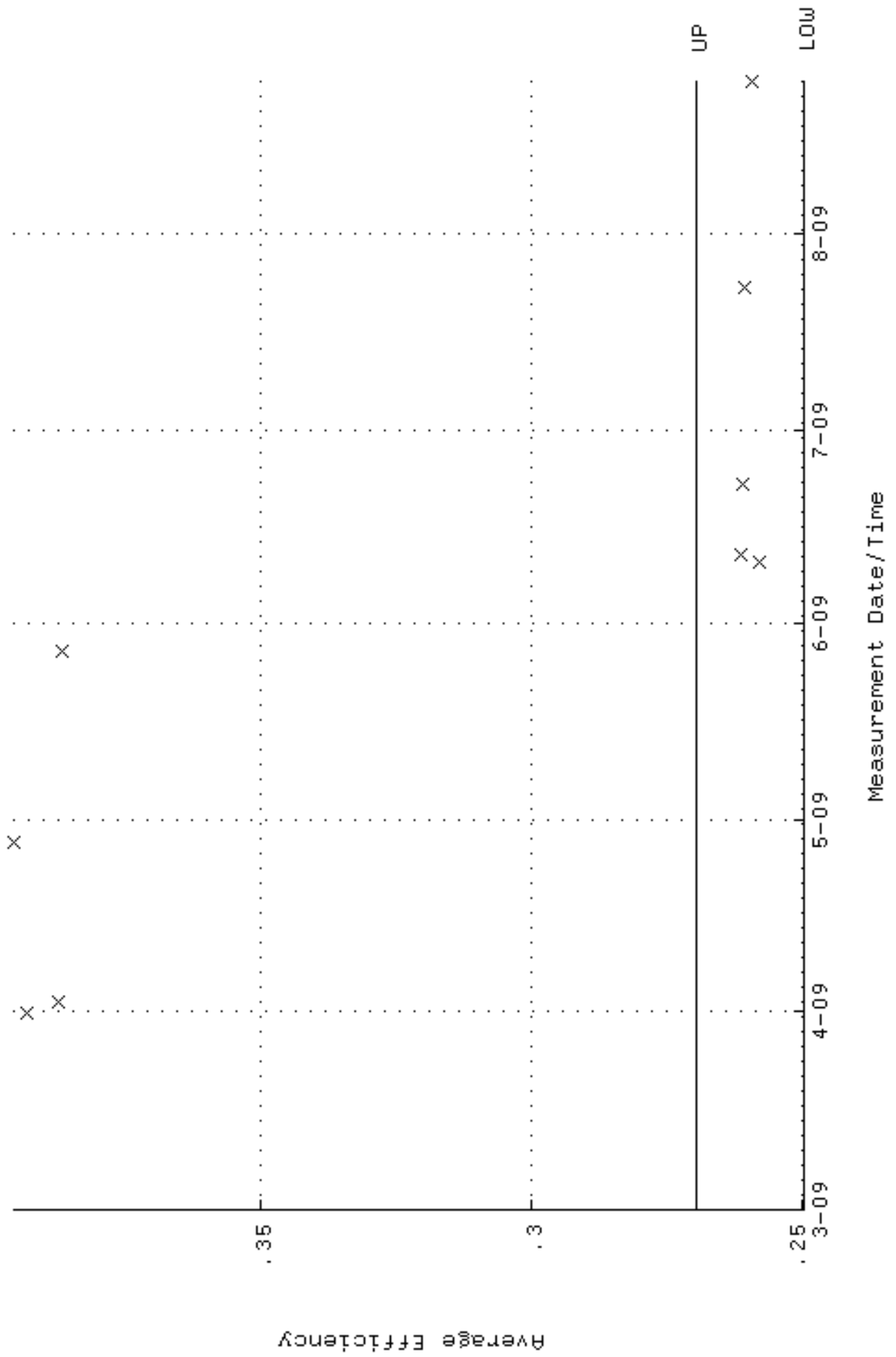
QA filename : DKA100:[ENV_ALPHA.QA.W]w200.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:10:24 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 83.8028 through 92.6242



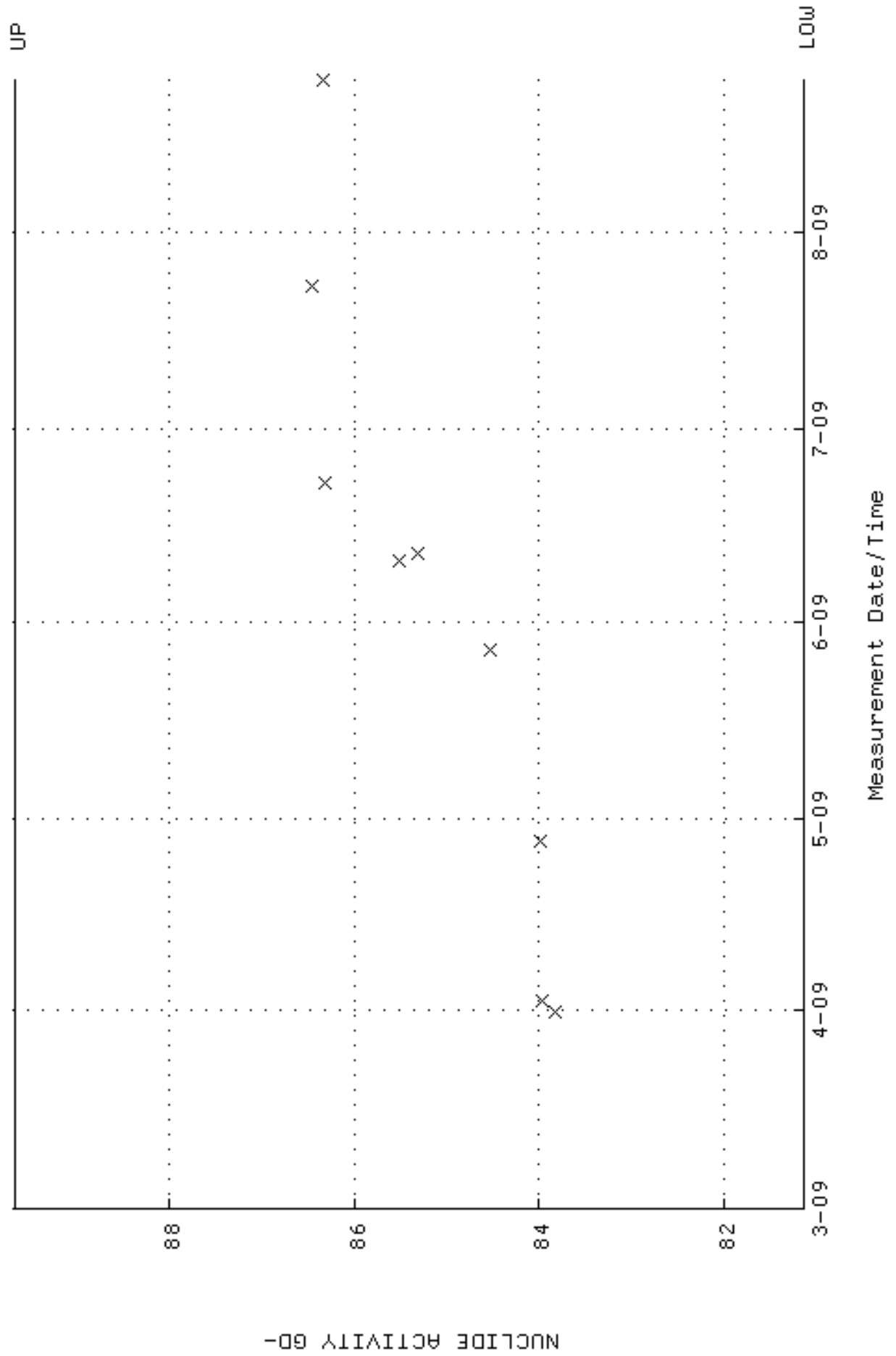
QA filename : DKA100:[ENV_ALPHA.QA.B]B200.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-APR-2009 08:02:33 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



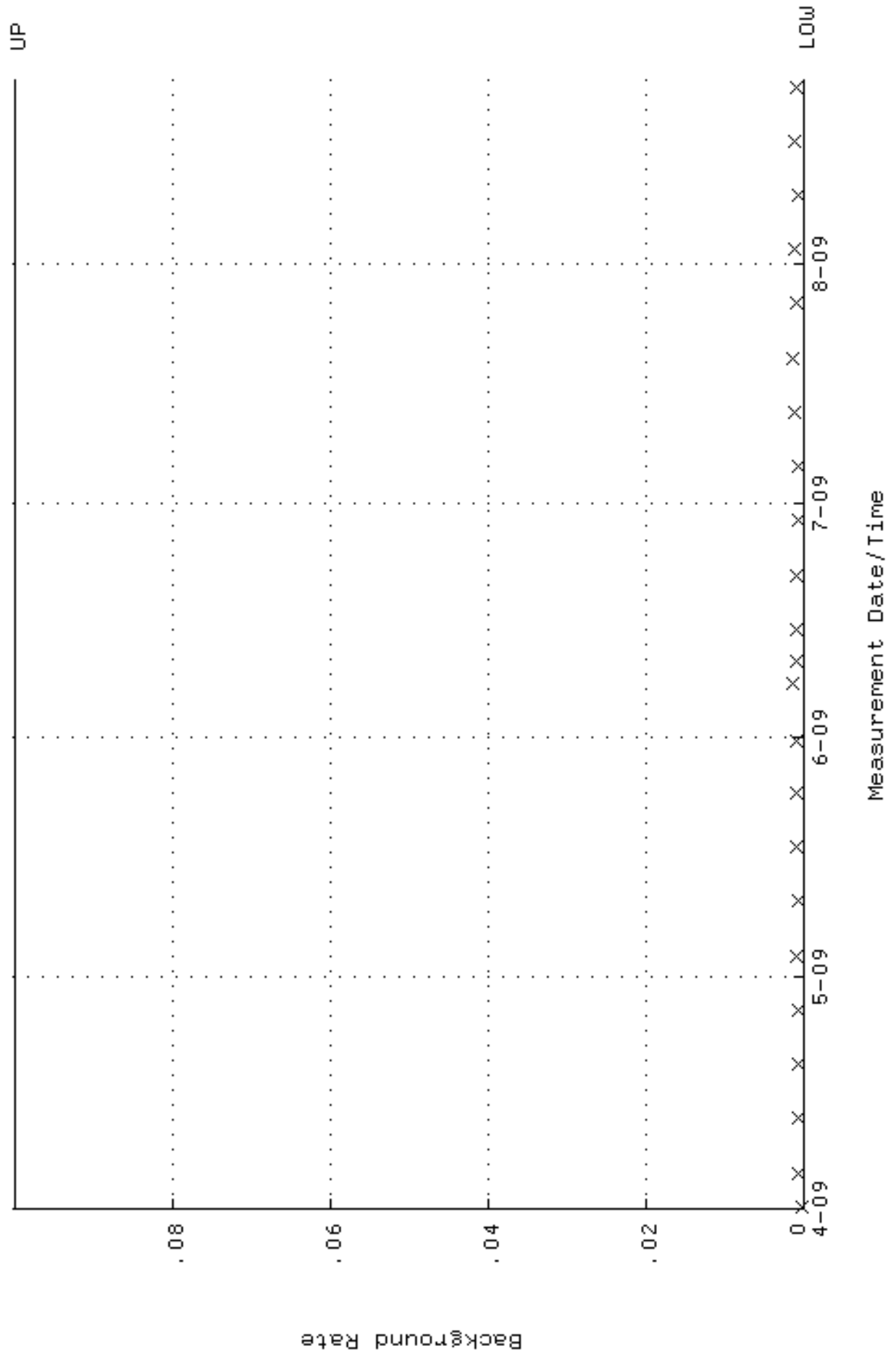
QA filename : DKA100:[ENV_ALPHA.QA.W]W201.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:10:26 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.249568 through 0.269568



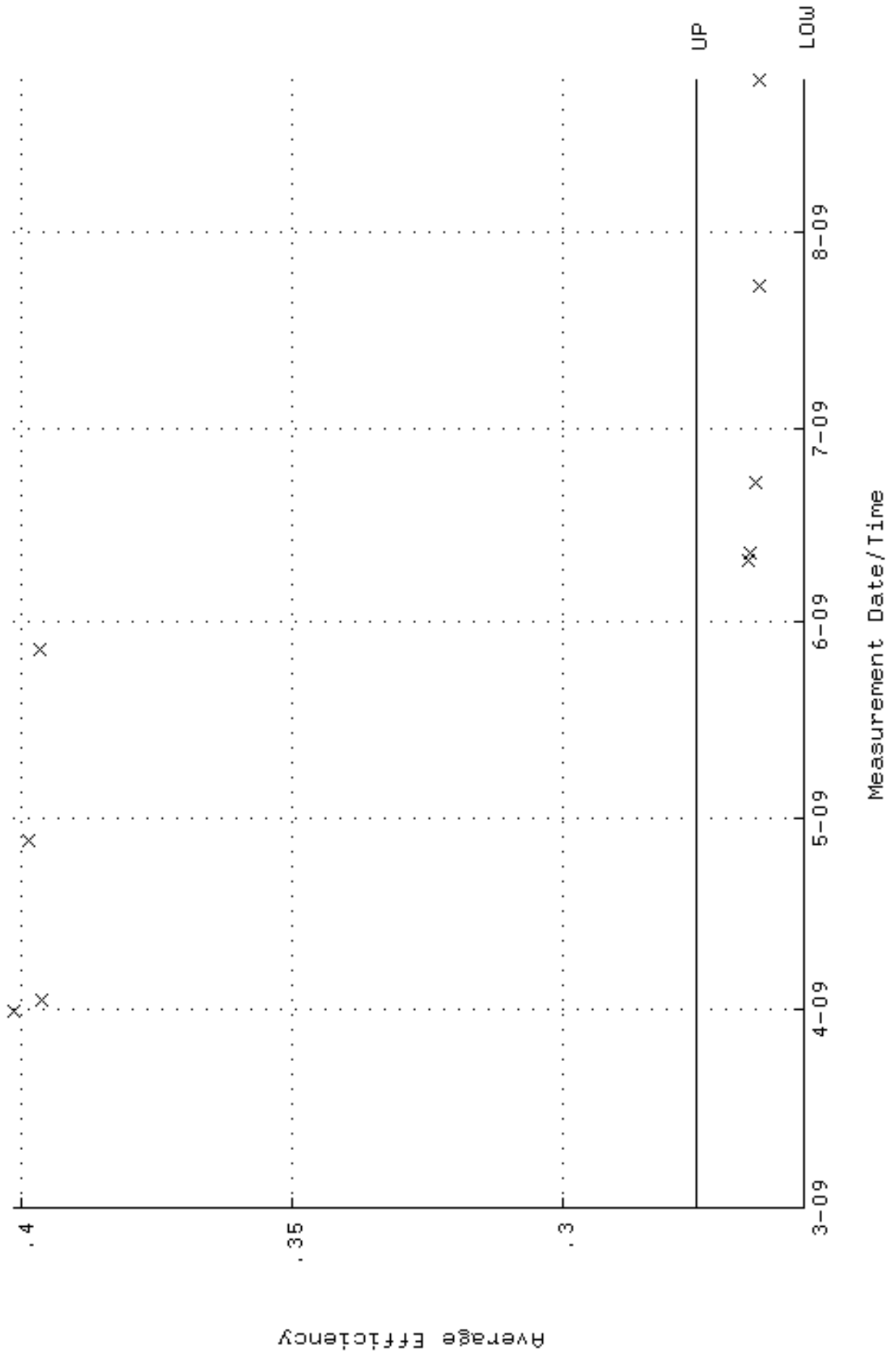
QA filename : DKA100:[ENV_ALPHA.QA.W]w201.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:10:26 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 81.1299 through 89.6699



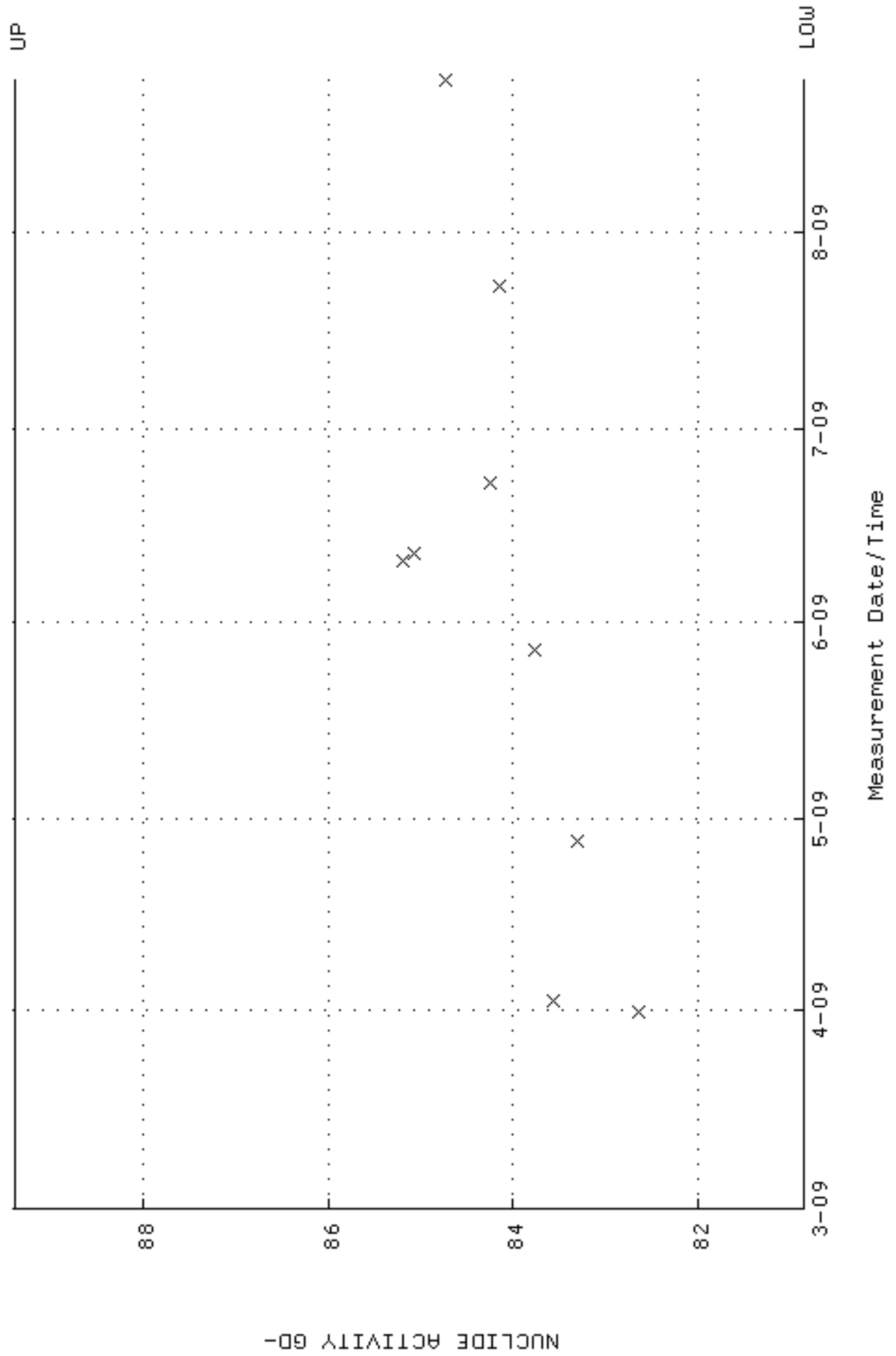
QA filename : DKA100:[ENV_ALPHA.QA.B]B201.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-APR-2009 08:02:39 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



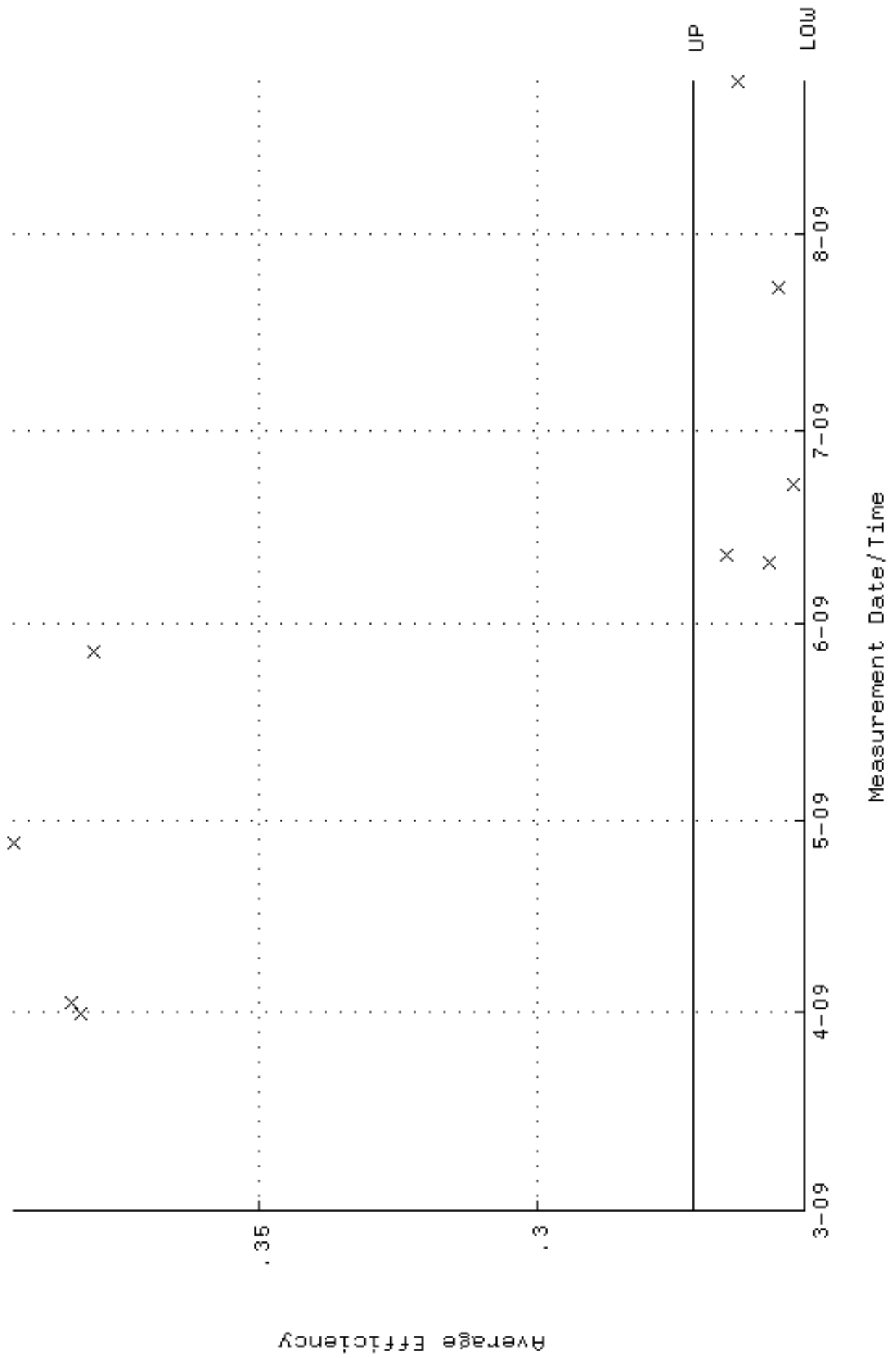
QA filename : DKA100:[ENV_ALPHA.QA.W]W202.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:10:28 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.255511 through 0.275511



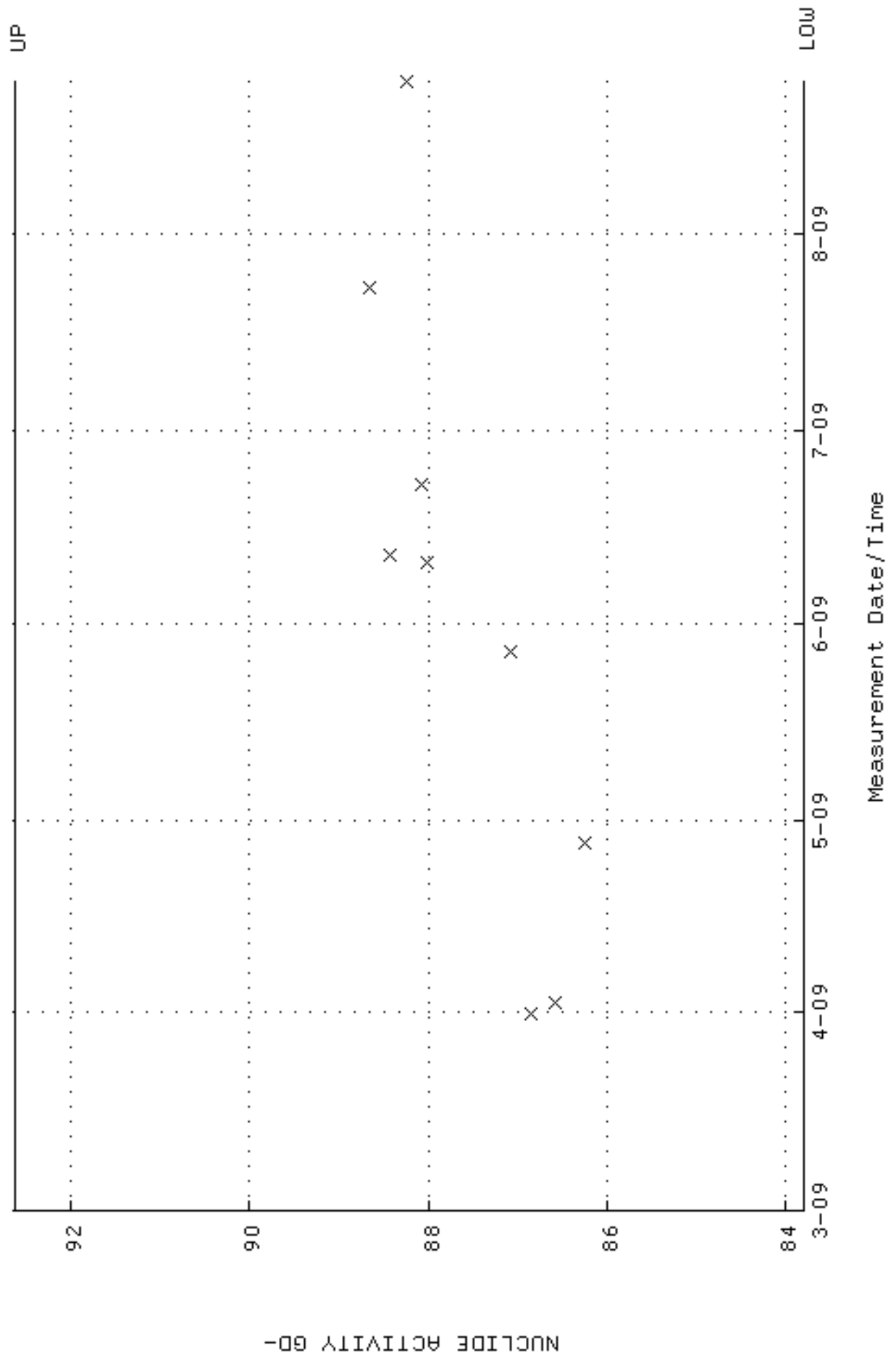
QA filename : DKA100:[ENV_ALPHA.QA.W]w202.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:10:28 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 80.8649 through 89.3769



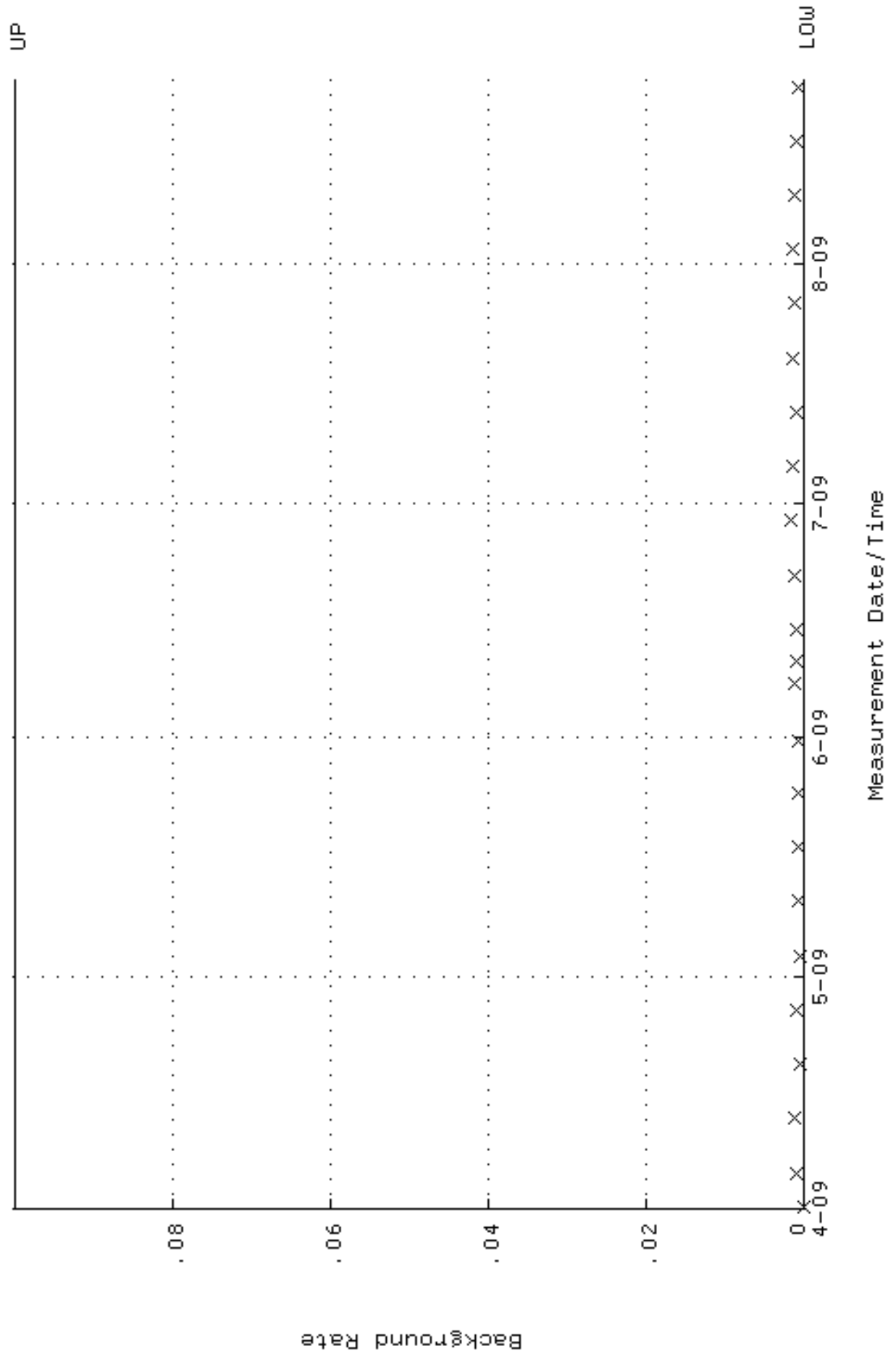
QA filename : DKA100:[ENV_ALPHA.QA.W]W203.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:10:29 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.252203 through 0.272203



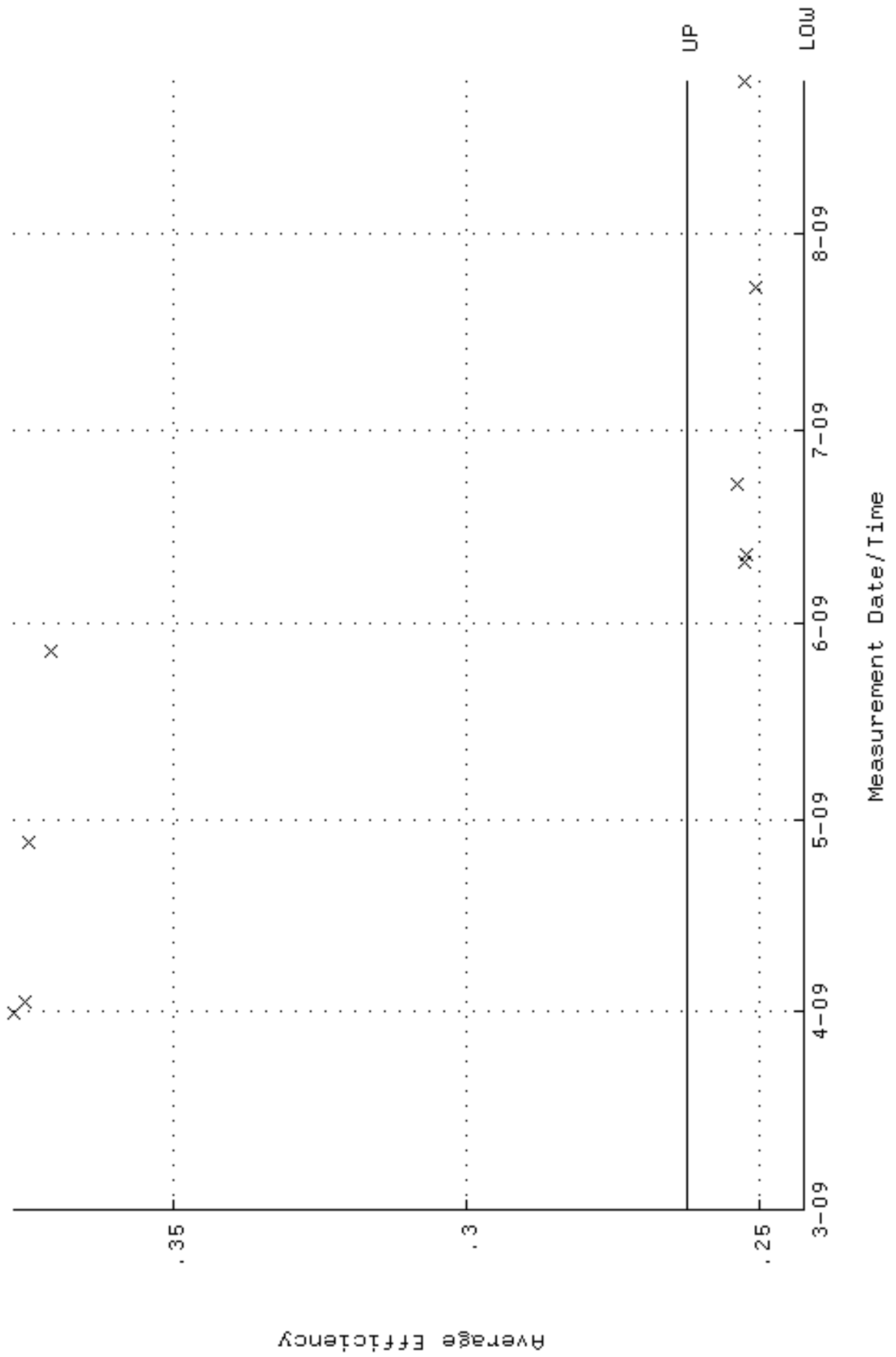
QA filename : DKA100:[ENV_ALPHA.QA.W]w203.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:10:29 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 83.7993 through 92.6203



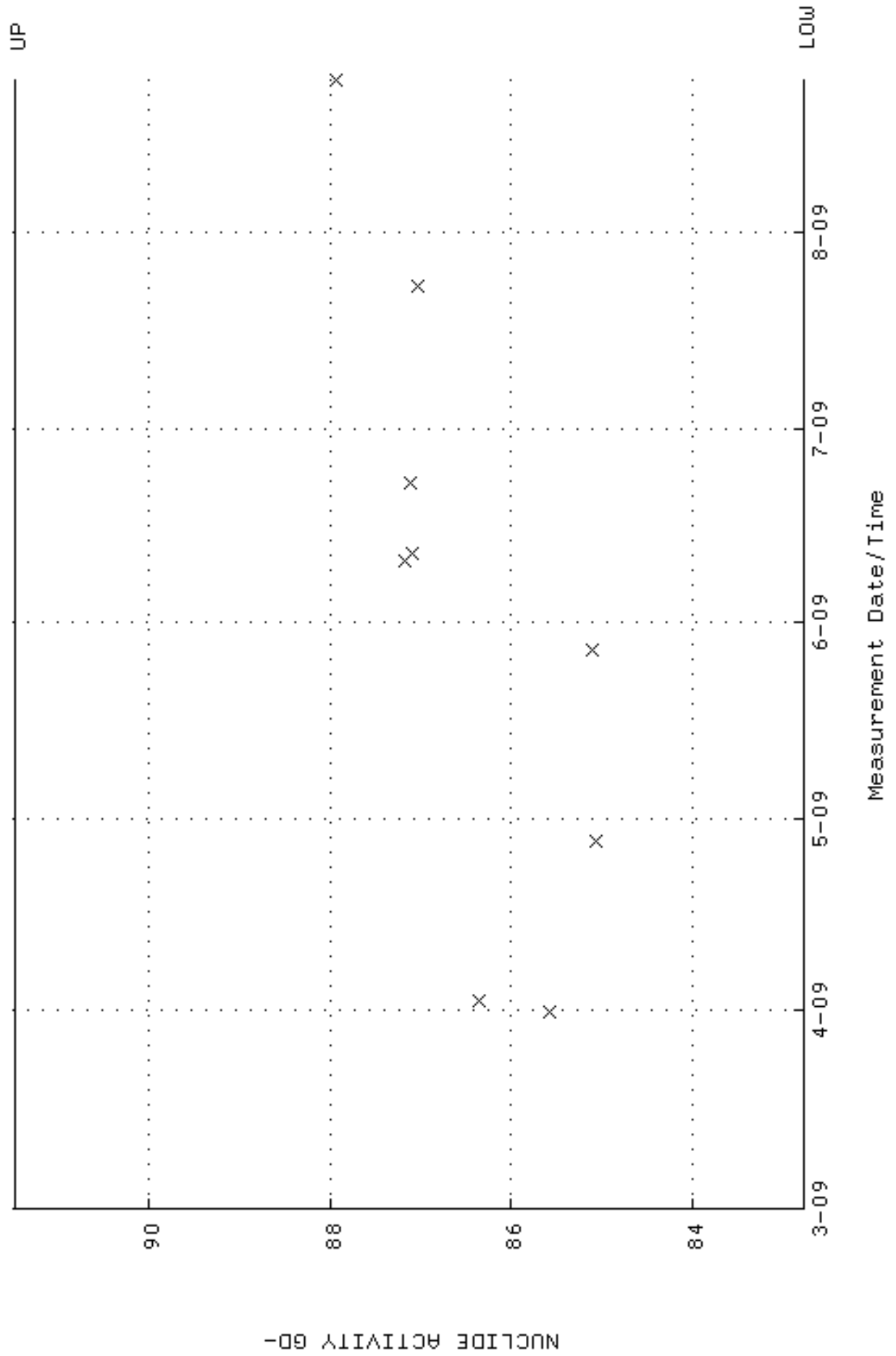
QA filename : DKA100:[ENV_ALPHA.QA.B]B203.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-APR-2009 08:02:49 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



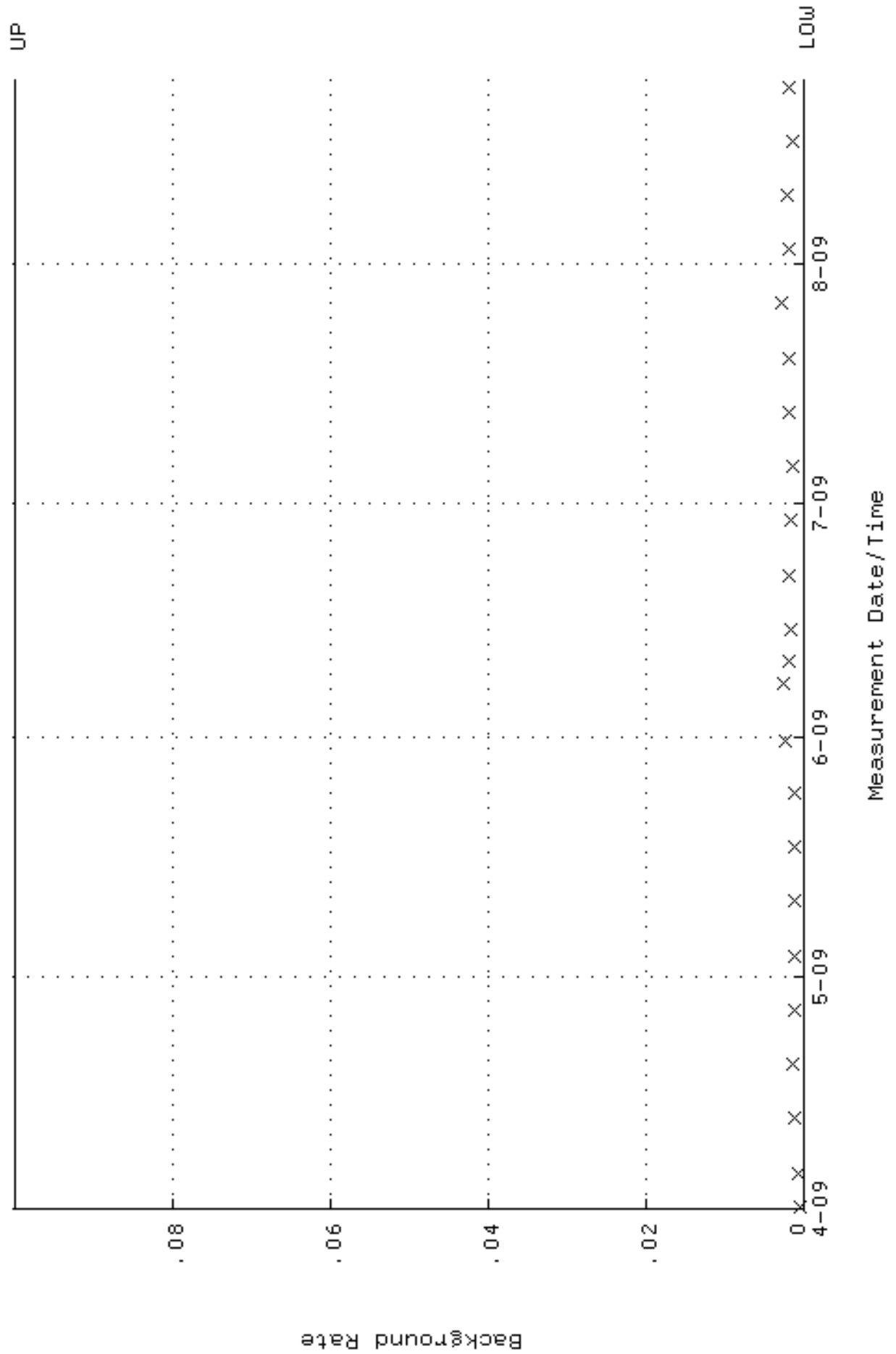
QA filename : DKA100:[ENV_ALPHA.QA.W]W204.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:10:31 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.242368 through 0.262368



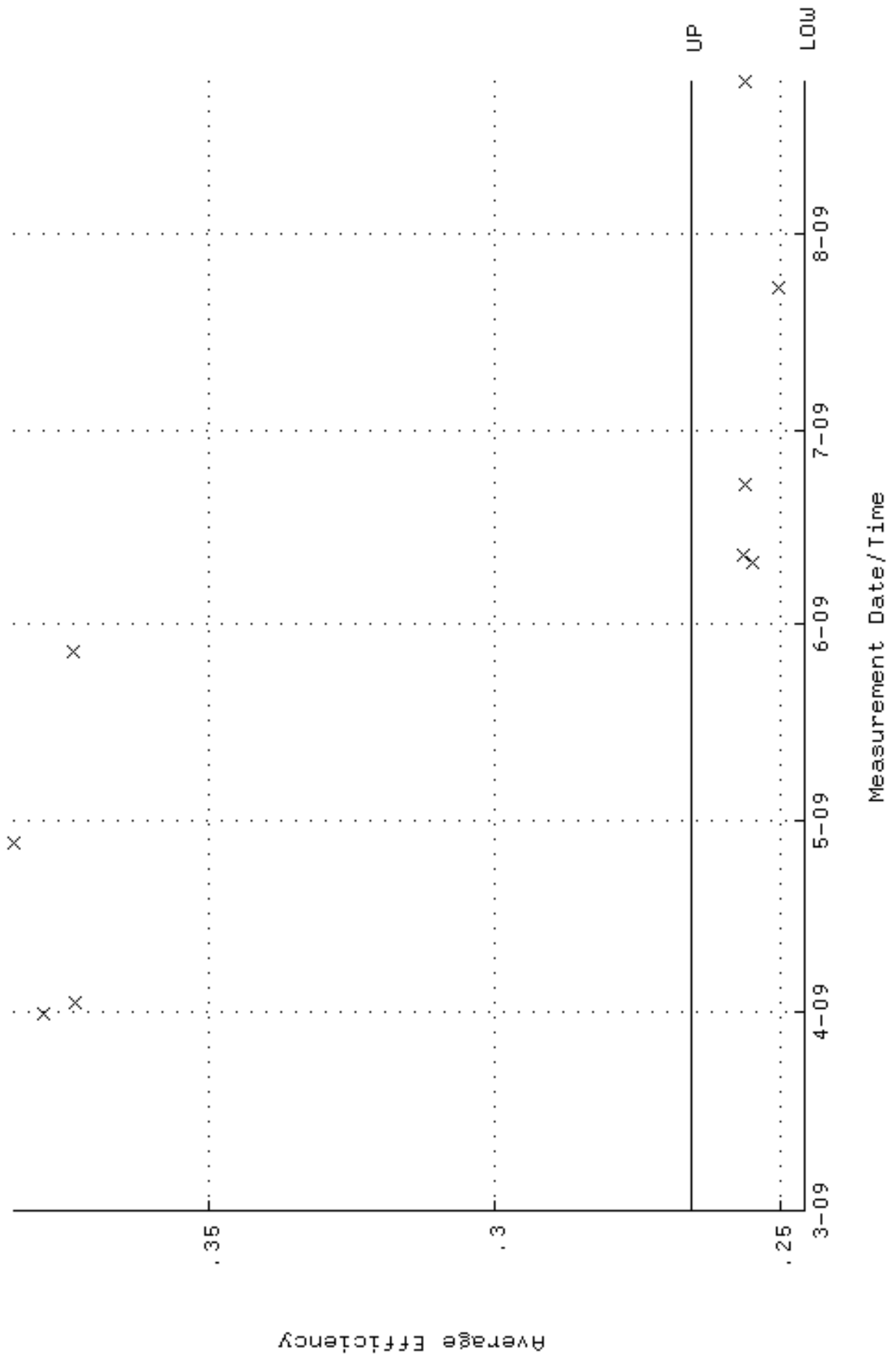
QA filename : DKA100:[ENV_ALPHA.QA.W]w204.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:10:31 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 82.7661 through 91.4783



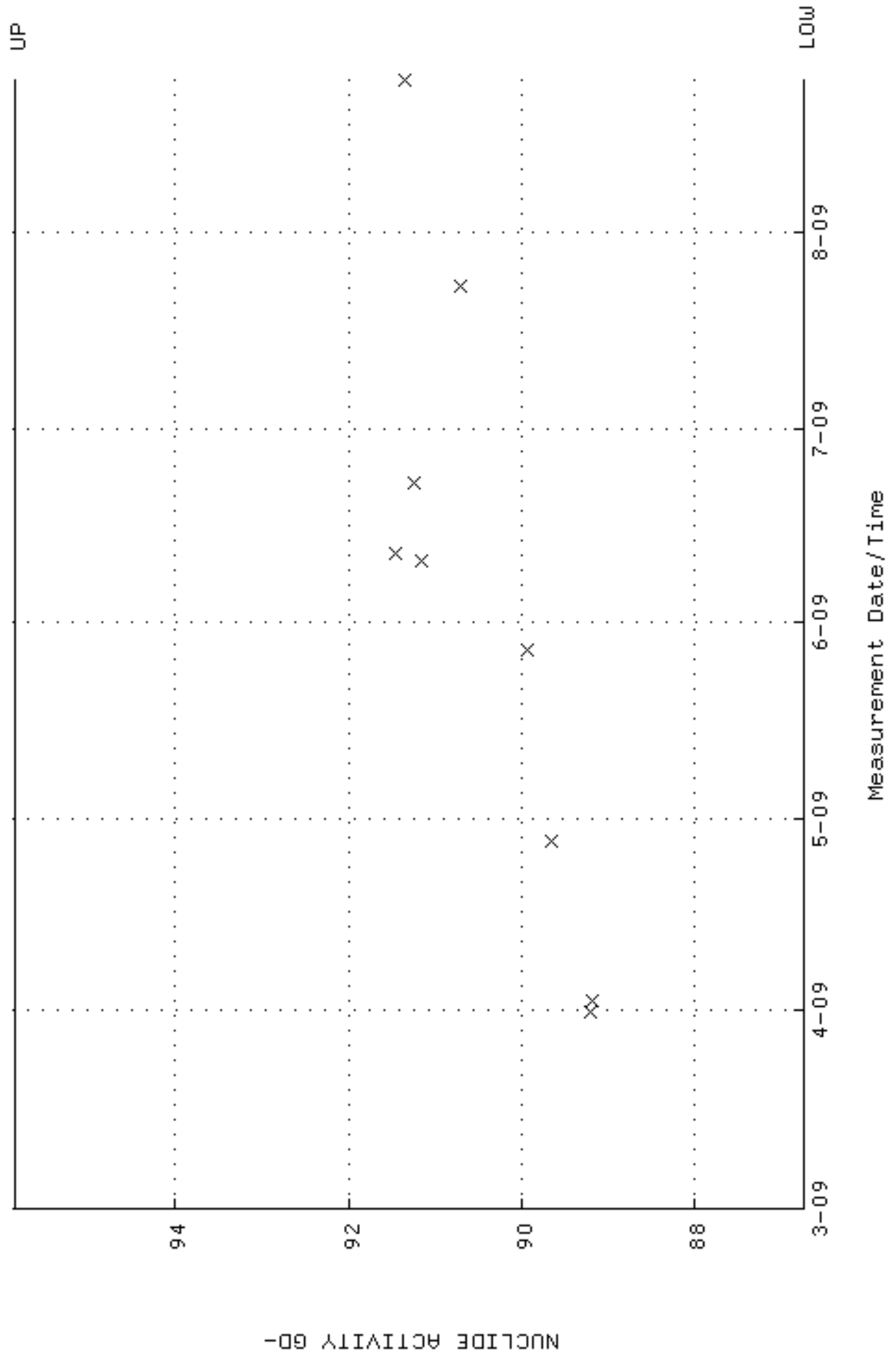
QA filename : DKA100:[ENV_ALPHA.QA.B]B204.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-APR-2009 08:02:55 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



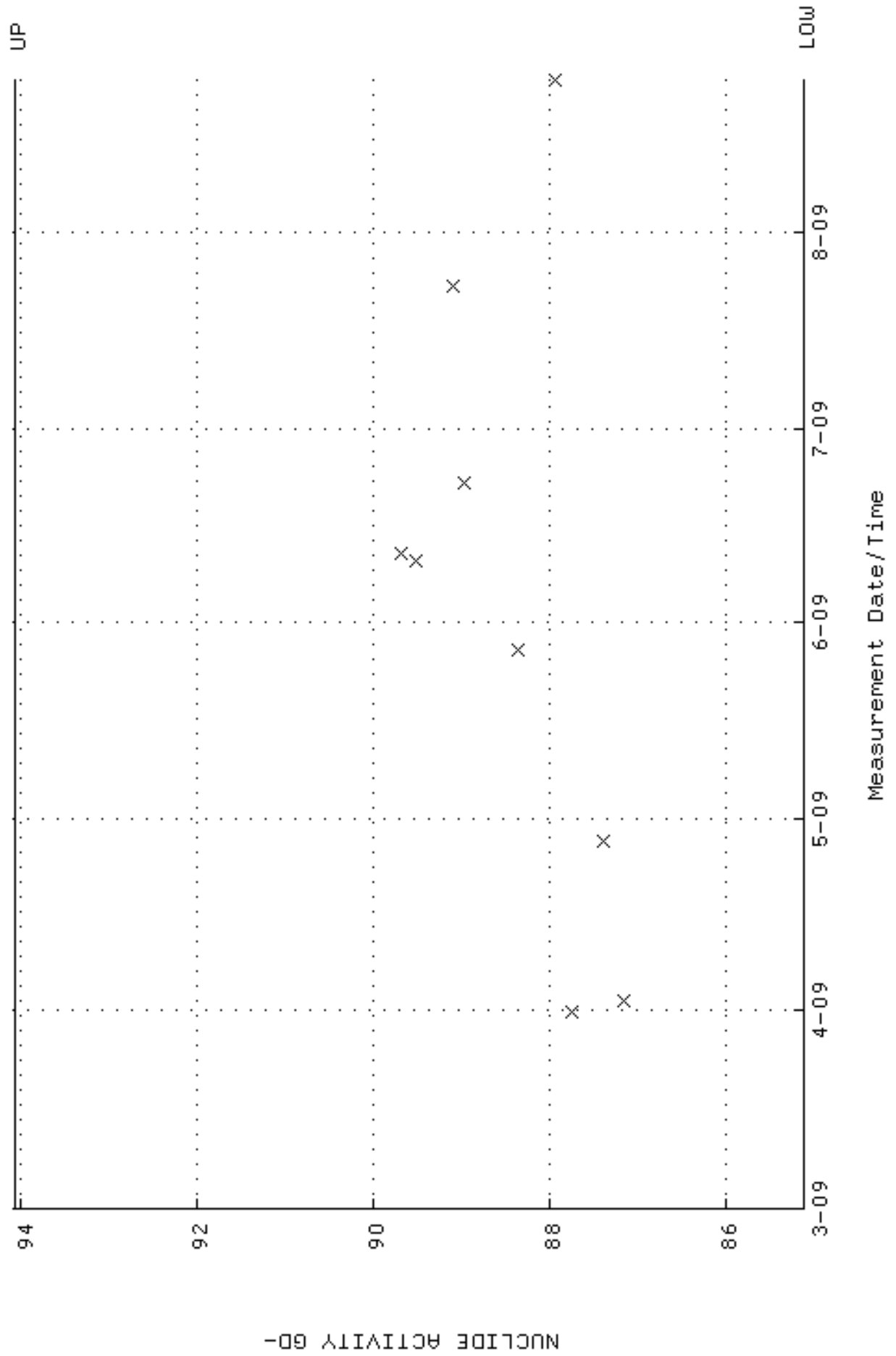
QA filename : DKA100:[ENV_ALPHA.QA.W]W205.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:10:33 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.245702 through 0.265702



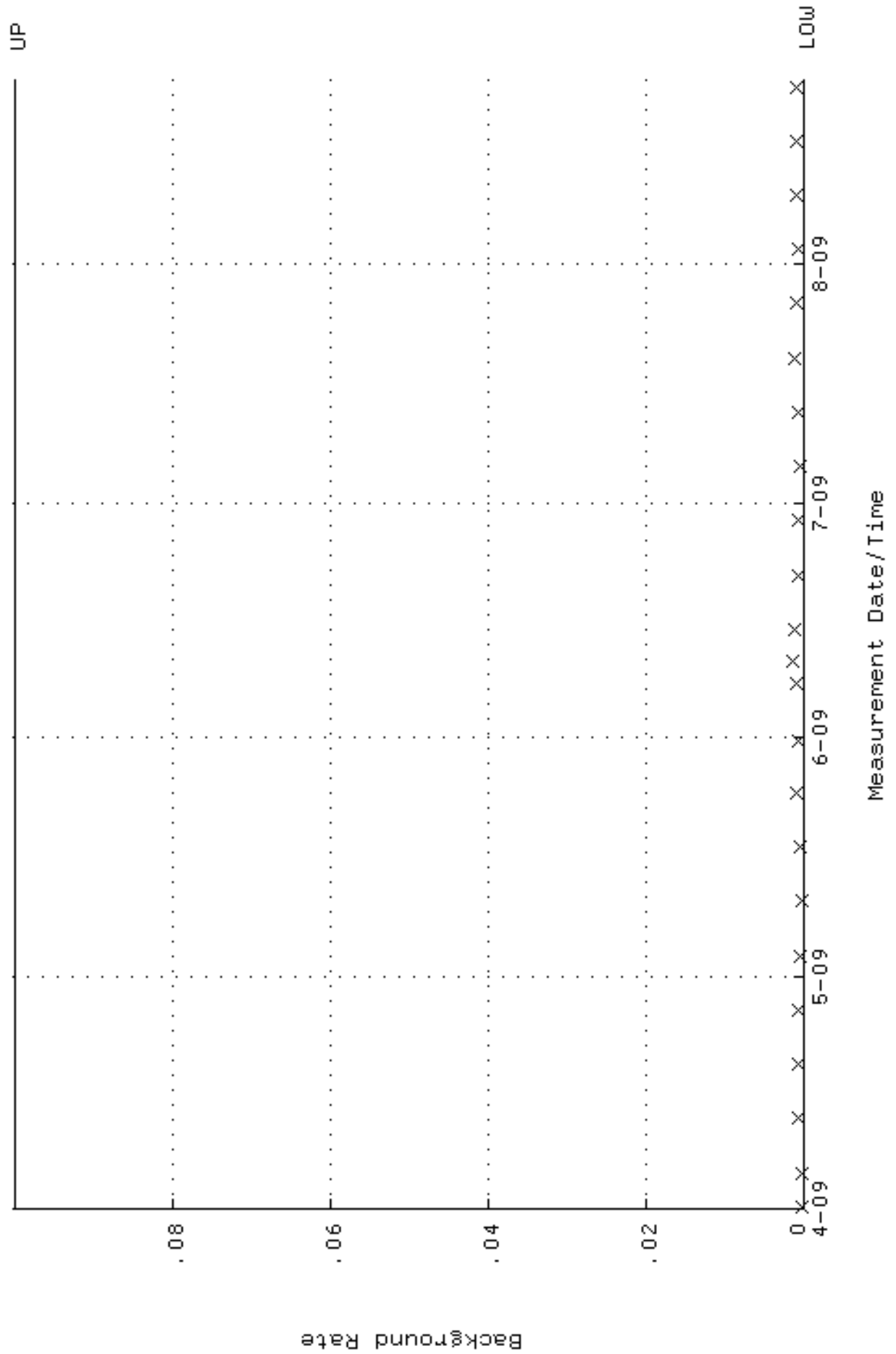
QA filename : DKA100:[ENV_ALPHA.QA.W]W205.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:10:33 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 86.7285 through 95.8579



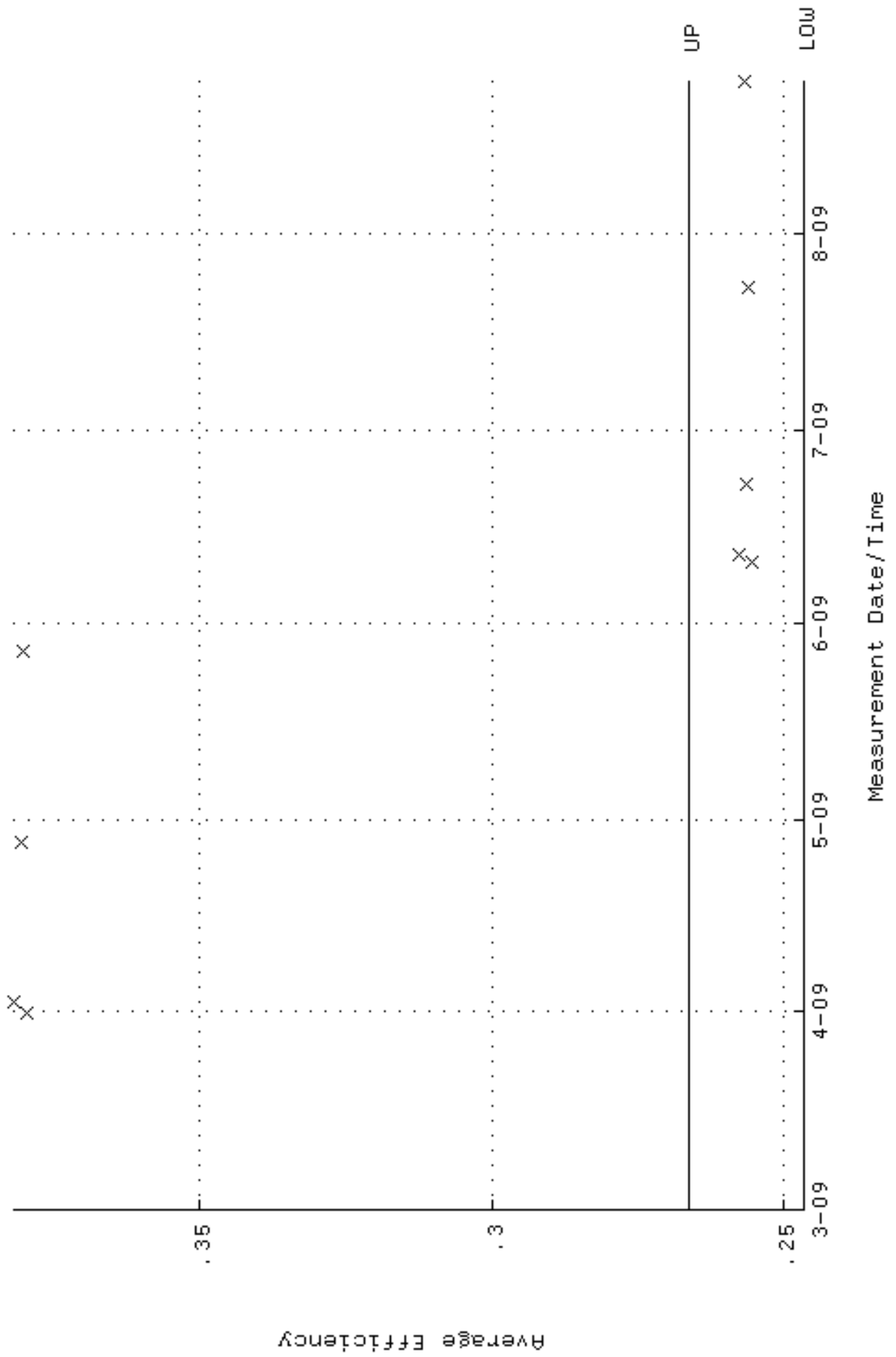
QA filename : DKA100:[ENV_ALPHA.QA.W]w206.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:10:35 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 85.1104 through 94.0694



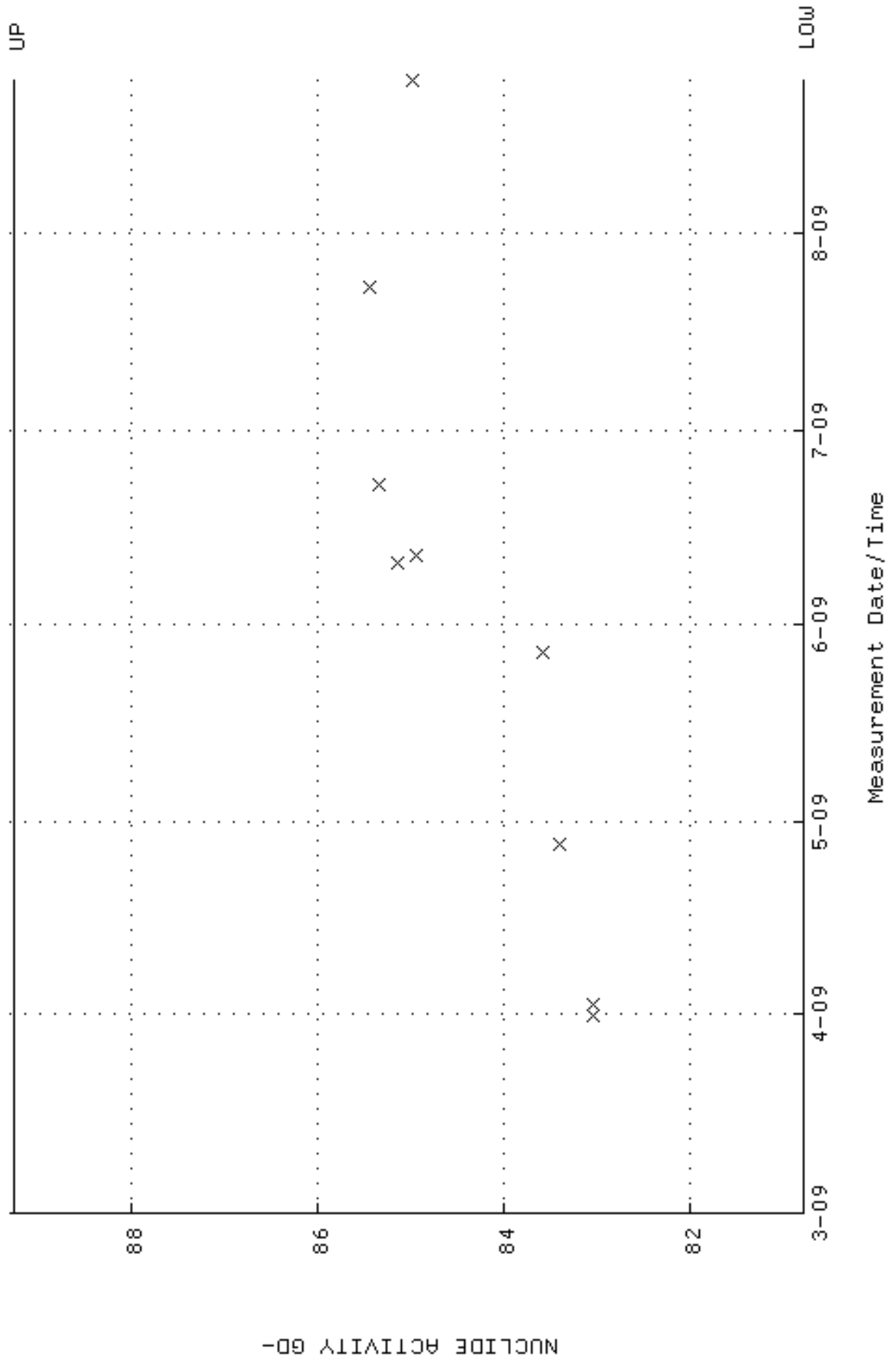
QA filename : DKA100:[ENV_ALPHA.QA.B]B206.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-APR-2009 08:03:06 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



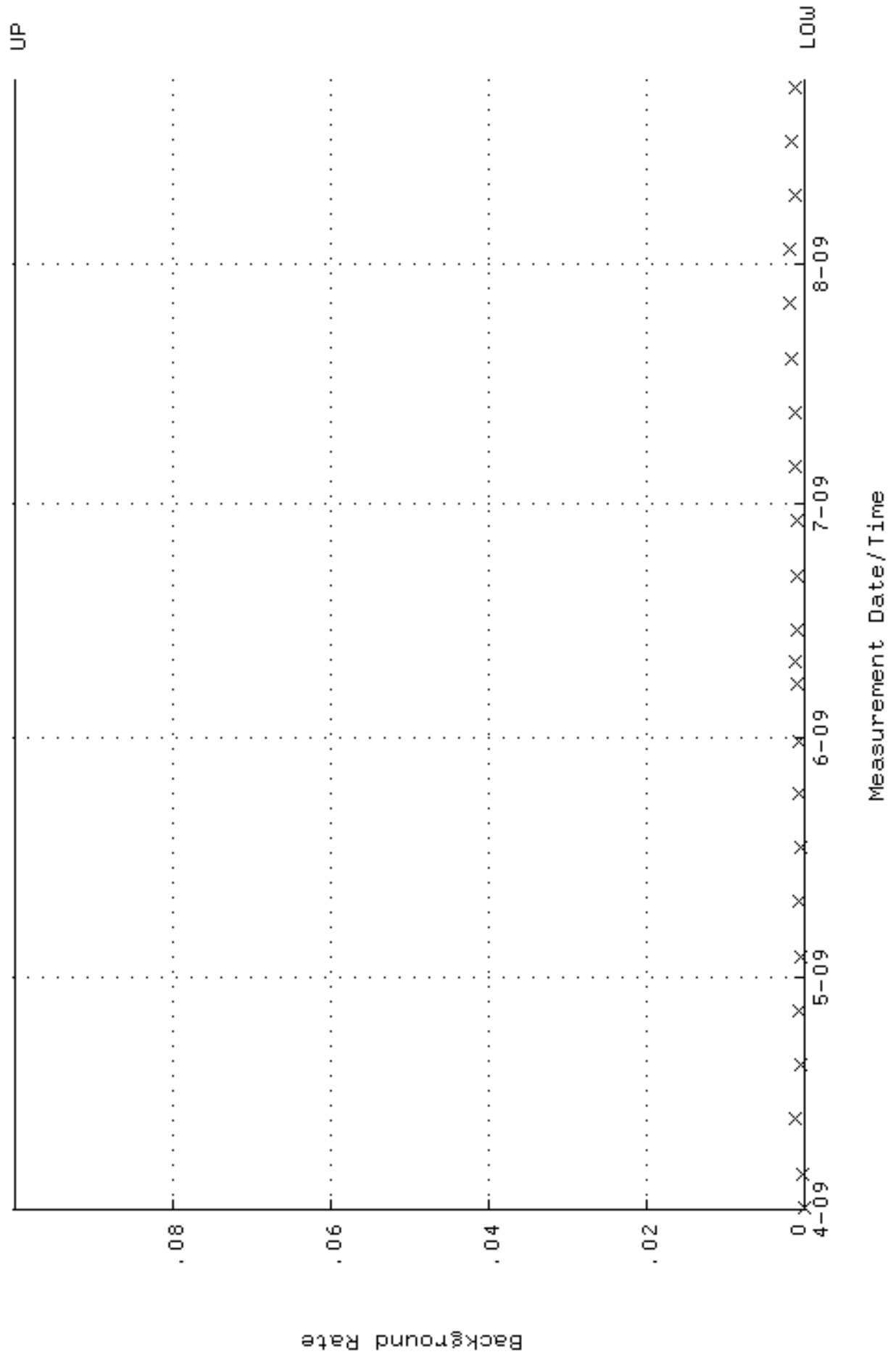
QA filename : DKA100:[ENV_ALPHA.QA.W]W207.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:10:38 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.246432 through 0.266432



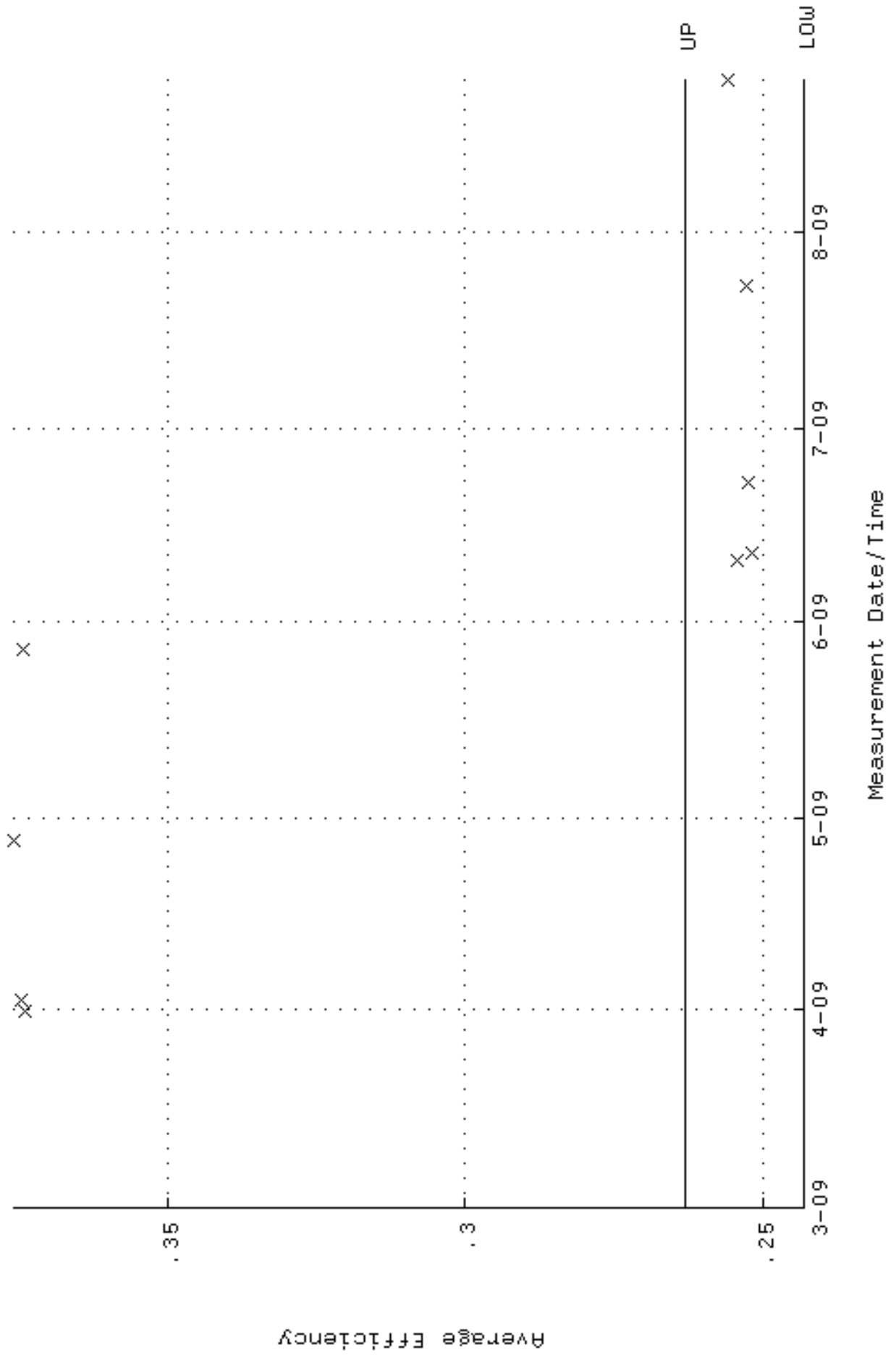
QA filename : DKA100:[ENV_ALPHA.QA.W]w207.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:10:38 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 80.7759 through 89.2787



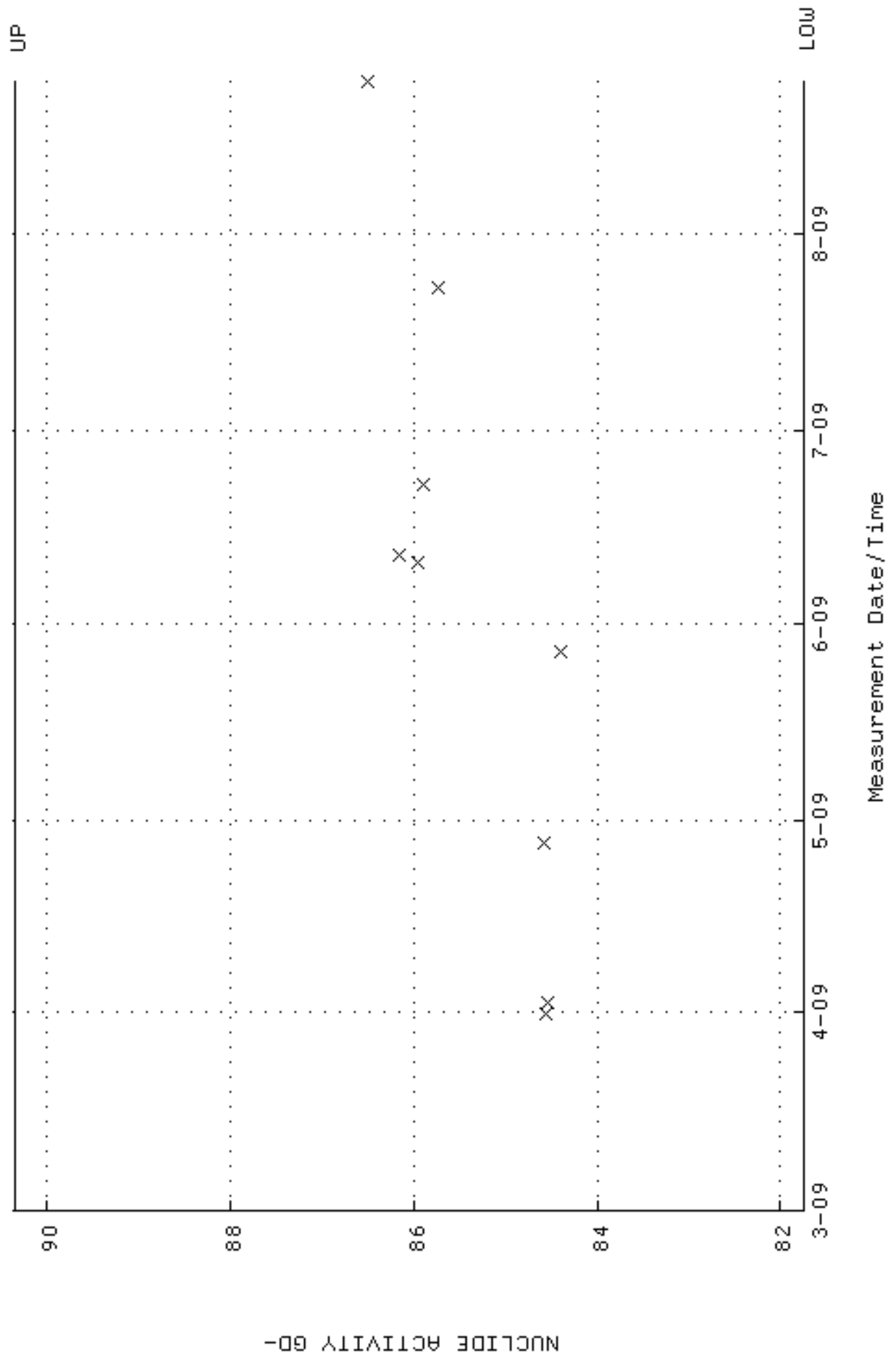
QA filename : DKA100:[ENV_ALPHA.QA.B]B207.QAF;1
 Parameter Name : BACKRATE (Background Rate)
 Start/End Dates : 1-APR-2009 08:03:11 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.000000E+00 through 0.100000



QA filename : DKA100:[ENV_ALPHA.QA.W]W208.QAF;1
 Parameter Name : AVRGEFF (Average Efficiency)
 Start/End Dates : 31-MAR-2009 15:10:40 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 0.243128 through 0.263128



QA filename : DKA100:[ENV_ALPHA.QA.W]w208.QAF;1
 Parameter Name : NLAIVITY-GD148 (NUCLIDE ACTIVITY GD-148)
 Start/End Dates : 31-MAR-2009 15:10:40 through 24-AUG-2009 12:00:00
 Lower/Upper Lmts: 81.7467 through 90.3517



RUNLOGS

Instrument Run Log

Instrument Type: GFPC

Batch ID: 898628

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
235208014	SAMPLE	JXC5	PIC8A	03-SEP-09 12:40	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782015	SAMPLE	JXC5	PIC8C	03-SEP-09 12:40	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235860015	SAMPLE	JXC5	PIC9A	03-SEP-09 12:40	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201914017	LCSD	JXC5	PIC10D	03-SEP-09 12:40	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201914015	MB	JXC5	PIC7A	03-SEP-09 14:51	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201914016	LCS	JXC5	PIC7B	03-SEP-09 14:51	DONE	CeF on 25mm Filter	02-JUL-09 00:00

Instrument Run Log

Instrument Type: LUCAS CELL DETECTOR

Batch ID: 898657

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
235177021	SAMPLE	KSD1	LUCAS1	08-SEP-09 10:30	DONE	Lucas Cell	31-AUG-09 00:00
235208014	SAMPLE	KSD1	LUCAS2	08-SEP-09 10:30	DONE	Lucas Cell	19-DEC-08 00:00
235782015	SAMPLE	KSD1	LUCAS3	08-SEP-09 10:30	DONE	Lucas Cell	04-FEB-09 00:00
235860015	SAMPLE	KSD1	LUCAS5	08-SEP-09 10:30	DONE	Lucas Cell	25-MAR-09 00:00
1201914119	MB	KSD1	LUCAS2	08-SEP-09 11:00	DONE	Lucas Cell	19-DEC-08 00:00
1201914120	LCS	KSD1	LUCAS3	08-SEP-09 11:00	DONE	Lucas Cell	04-FEB-09 00:00
1201914121	LCSD	KSD1	LUCAS5	08-SEP-09 11:35	DONE	Lucas Cell	25-MAR-09 00:00

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 898783

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1201914490	MS	JXD2	1181	04-SEP-09 14:07	DONE		
1201914491	LCS	JXD2	1182	04-SEP-09 14:07	DONE		
235782011	SAMPLE	JXD2	1195	12-SEP-09 14:51	DONE		
235782012	SAMPLE	JXD2	1196	12-SEP-09 14:51	DONE		
235782001	SAMPLE	JXD2	1199	12-SEP-09 14:51	DONE		
235782002	SAMPLE	JXD2	1200	12-SEP-09 14:51	DONE		
235782003	SAMPLE	JXD2	1201	12-SEP-09 14:51	DONE		
235782004	SAMPLE	JXD2	1202	12-SEP-09 14:51	DONE		
235782005	SAMPLE	JXD2	1203	12-SEP-09 14:51	DONE		
235782006	SAMPLE	JXD2	1204	12-SEP-09 14:51	DONE		
235782007	SAMPLE	JXD2	1205	12-SEP-09 14:51	DONE		
235782008	SAMPLE	JXD2	1206	12-SEP-09 14:51	DONE		
235782009	SAMPLE	JXD2	1207	12-SEP-09 14:51	DONE		
235782010	SAMPLE	JXD2	1208	12-SEP-09 14:51	DONE		
235782013	SAMPLE	JXD2	1197	14-SEP-09 20:10	DONE		
235782014	SAMPLE	JXD2	1199	14-SEP-09 20:10	DONE		
235782016	SAMPLE	JXD2	1200	14-SEP-09 20:10	DONE		
235782017	SAMPLE	JXD2	1201	14-SEP-09 20:10	DONE		
235782018	SAMPLE	JXD2	1202	14-SEP-09 20:10	DONE		
1201914488	MB	JXD2	1203	14-SEP-09 20:10	DUSE		
1201914489	DUP	JXD2	1204	14-SEP-09 20:10	DONE		
1201914488	MB	JXD2	1173	15-SEP-09 18:00	DONE		

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 898784

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1201914494	MS	JXD2	1011	04-SEP-09 14:41	DONE		
1201914495	LCS	JXD2	1012	04-SEP-09 14:41	DONE		
235782001	SAMPLE	JXD2	1113	05-SEP-09 11:59	DONE		
235782002	SAMPLE	JXD2	1117	05-SEP-09 11:59	DONE		
235782003	SAMPLE	JXD2	1121	05-SEP-09 11:59	DONE		
235782004	SAMPLE	JXD2	1122	05-SEP-09 11:59	DONE		
235782005	SAMPLE	JXD2	1124	05-SEP-09 12:00	DONE		
235782006	SAMPLE	JXD2	1125	05-SEP-09 12:00	DONE		
235782007	SAMPLE	JXD2	1126	05-SEP-09 12:00	DONE		
235782008	SAMPLE	JXD2	1128	05-SEP-09 12:00	DONE		
235782009	SAMPLE	JXD2	1129	05-SEP-09 12:00	DONE		
235782010	SAMPLE	JXD2	1130	05-SEP-09 12:00	DONE		
235782011	SAMPLE	JXD2	1132	05-SEP-09 12:00	DONE		
235782012	SAMPLE	JXD2	1133	05-SEP-09 12:00	DONE		
235782013	SAMPLE	JXD2	1134	05-SEP-09 12:00	DONE		
235782014	SAMPLE	JXD2	1135	05-SEP-09 12:00	DONE		
235782016	SAMPLE	JXD2	1136	05-SEP-09 12:00	DONE		
235782017	SAMPLE	JXD2	1137	05-SEP-09 12:42	DONE		
235782018	SAMPLE	JXD2	1138	05-SEP-09 12:42	DONE		
1201914492	MB	JXD2	1139	05-SEP-09 12:42	DONE		
1201914493	DUP	JXD2	1140	05-SEP-09 12:42	DONE		

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 898785

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1201914501	LCS	JXD2	1048	04-SEP-09 11:28	DUSE		
1201914502	LCSD	JXD2	1185	09-SEP-09 17:43	DUSE		
235782015	SAMPLE	JXD2	1197	12-SEP-09 14:51	DUSE		
1201914500	MB	JXD2	1198	12-SEP-09 14:51	DUSE		
1201914500	MB	JXD2	1197	15-SEP-09 21:48	DONE		
235782015	SAMPLE	JXD2	1198	15-SEP-09 21:48	DONE		
1201914501	LCS	JXD2	1205	15-SEP-09 21:48	DONE		
1201914502	LCSD	JXD2	1206	15-SEP-09 21:48	DONE		

Instrument Run Log

Instrument Type: GFPC

Batch ID: 899411

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
235782002	SAMPLE	MXS2	PIC1B	10-SEP-09 07:23	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782004	SAMPLE	MXS2	PIC1D	10-SEP-09 07:24	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782007	SAMPLE	MXS2	PIC3C	10-SEP-09 07:24	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782009	SAMPLE	MXS2	PIC4D	10-SEP-09 07:25	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782010	SAMPLE	MXS2	PIC5A	10-SEP-09 07:25	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782011	SAMPLE	MXS2	PIC5D	10-SEP-09 07:25	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782012	SAMPLE	MXS2	PIC6B	10-SEP-09 07:25	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782014	SAMPLE	MXS2	PIC7B	10-SEP-09 07:25	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782016	SAMPLE	MXS2	PIC7C	10-SEP-09 07:26	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782018	SAMPLE	MXS2	PIC8A	10-SEP-09 07:26	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201915944	MB	MXS2	PIC8C	10-SEP-09 07:26	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201915946	MS	MXS2	PIC9C	10-SEP-09 07:26	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201915947	LCS	MXS2	PIC10A	10-SEP-09 07:26	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782001	SAMPLE	MXS2	PIC1A	10-SEP-09 10:06	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782003	SAMPLE	MXS2	PIC1B	10-SEP-09 10:06	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782005	SAMPLE	MXS2	PIC1C	10-SEP-09 10:06	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782006	SAMPLE	MXS2	PIC1D	10-SEP-09 10:06	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782008	SAMPLE	MXS2	PIC2B	10-SEP-09 10:06	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782013	SAMPLE	MXS2	PIC2C	10-SEP-09 10:07	DONE	CeF on 25mm Filter	02-JUL-09 00:00
235782017	SAMPLE	MXS2	PIC2D	10-SEP-09 10:07	DONE	CeF on 25mm Filter	02-JUL-09 00:00
1201915945	DUP	MXS2	PIC3C	10-SEP-09 10:07	DONE	CeF on 25mm Filter	02-JUL-09 00:00

Instrument Run Log

Instrument Type: LUCAS CELL DETECTOR

Batch ID: 901480

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
235782001	SAMPLE	KSD1	LUCAS6	16-SEP-09 17:25	DONE	Lucas Cell	04-AUG-09 00:00
235782002	SAMPLE	KSD1	LUCAS1	16-SEP-09 18:35	DONE	Lucas Cell	31-AUG-09 00:00
235782003	SAMPLE	KSD1	LUCAS2	16-SEP-09 18:35	DONE	Lucas Cell	19-DEC-08 00:00
235782004	SAMPLE	KSD1	LUCAS3	16-SEP-09 18:35	DONE	Lucas Cell	04-FEB-09 00:00
235782005	SAMPLE	KSD1	LUCAS4	16-SEP-09 18:35	DONE	Lucas Cell	02-MAR-09 00:00
235782006	SAMPLE	KSD1	LUCAS5	16-SEP-09 18:35	DONE	Lucas Cell	25-MAR-09 00:00
235782007	SAMPLE	KSD1	LUCAS6	16-SEP-09 18:35	DONE	Lucas Cell	04-AUG-09 00:00
235782008	SAMPLE	KSD1	LUCAS1	16-SEP-09 19:10	DONE	Lucas Cell	31-AUG-09 00:00
235782009	SAMPLE	KSD1	LUCAS2	16-SEP-09 19:10	DONE	Lucas Cell	19-DEC-08 00:00
235782010	SAMPLE	KSD1	LUCAS3	16-SEP-09 19:10	DONE	Lucas Cell	04-FEB-09 00:00
235782011	SAMPLE	KSD1	LUCAS4	16-SEP-09 19:10	DONE	Lucas Cell	02-MAR-09 00:00
235782012	SAMPLE	KSD1	LUCAS5	16-SEP-09 19:10	DONE	Lucas Cell	25-MAR-09 00:00
235782013	SAMPLE	KSD1	LUCAS6	16-SEP-09 19:10	DONE	Lucas Cell	04-AUG-09 00:00
235782014	SAMPLE	KSD1	LUCAS1	16-SEP-09 19:45	DONE	Lucas Cell	31-AUG-09 00:00
235782016	SAMPLE	KSD1	LUCAS2	16-SEP-09 19:45	DONE	Lucas Cell	19-DEC-08 00:00
235782017	SAMPLE	KSD1	LUCAS3	16-SEP-09 19:45	DONE	Lucas Cell	04-FEB-09 00:00
235782018	SAMPLE	KSD1	LUCAS4	16-SEP-09 19:45	DONE	Lucas Cell	02-MAR-09 00:00
1201920868	MB	KSD1	LUCAS5	16-SEP-09 19:45	DONE	Lucas Cell	25-MAR-09 00:00
1201920869	DUP	KSD1	LUCAS1	16-SEP-09 20:45	DONE	Lucas Cell	31-AUG-09 00:00
1201920870	MS	KSD1	LUCAS2	16-SEP-09 20:45	DONE	Lucas Cell	19-DEC-08 00:00
1201920871	LCS	KSD1	LUCAS3	16-SEP-09 20:45	DONE	Lucas Cell	04-FEB-09 00:00

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 903039

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
235782015	SAMPLE	JXD2	1161	16-SEP-09 08:19	DONE		
1201924684	MB	JXD2	1162	16-SEP-09 08:19	DONE		
1201924687	LCS	JXD2	1163	16-SEP-09 08:19	DONE		
1201924688	LCSD	JXD2	1164	16-SEP-09 08:19	DONE		