SURVEY UNIT DATA SUMMARY & SIGN TEST WORKSHEET

Year	2007
Survey Unit #	9
MARSSIM Classification	1

Th-232 $DCGL_W$	4.0

	Th-232					
Sample ID	**Gross Result (pCi/g)**			**MDA (pCi/g)**	**DCGLw-Result**	**Sign Test Parameter[1]**
SU9-176-1	0.86	+/-	0.14	0.21	3.14	1
SU9-177-1	0.91	+/-	0.15	0.22	3.09	1
SU9-178-1	0.84	+/-	0.15	0.25	3.16	1
SU9-179-1	0.85	+/-	0.14	0.24	3.15	1
SU9-180-1	1.10	+/-	0.19	0.37	2.90	1
SU9-181-1	1.82	+/-	0.29	0.44	2.18	1
SU9-182-1	1.41	+/-	0.22	0.37	2.59	1
SU9-183-1	1.77	+/-	0.32	0.57	2.23	1
SU9-184-1	1.24	+/-	0.25	0.48	2.76	1
SU9-185-1	0.82	+/-	0.13	0.24	3.18	1
SU9-186-1	1.17	+/-	0.21	0.37	2.83	1
SU9-187-1	0.96	+/-	0.17	0.32	3.04	1
SU9-188-1	0.81	+/-	0.18	0.31	3.19	1
SU9-189-1	0.91	+/-	0.15	0.29	3.09	1
SU9-190-1	0.77	+/-	0.13	0.19	3.23	1
SU9-191-1	0.72	+/-	0.16	0.27	3.28	1
SU9-192-1	0.65	+/-	0.16	0.28	3.35	1
SU9-193-1	0.64	+/-	0.10	0.15	3.36	1
SU9-194-1	0.46	+/-	0.13	0.30	3.54	1
SU9-195-1	0.38	+/-	0.11	0.21	3.62	1

Mean	**0.95**	***Sign Test Statistics***	
Median	**0.86**		
Min	**0.38**	***Sum of Positive Signs***	**20**
Max	**1.82**	***Sign Test Critical Value for N=20***	**14**
Std Dev (1 σ)	**0.38**	***Survey Unit Evaluation***	PASS

Notes: [1] If Th-232 result > DCGLw, then Sign = -1, otherwise Sign = 1

SURVEY UNIT DATA SUMMARY & SIGN TEST WORKSHEET

Year	2007
Survey Unit #	10
MARSSIM Classification	1

Th-232 $DCGL_W$	4.0

	Th-232					
Sample ID	**Gross Result (pCi/g)**			**MDA (pCi/g)**	**DCGLw-Result**	**Sign Test Parameter[1]**
SU10-197-1	2.36	+/-	0.20	0.32	1.64	1
SU10-198-1	1.57	+/-	0.23	0.34	2.43	1
SU10-199-1	1.02	+/-	0.14	0.28	2.98	1
SU10-200-1	1.00	+/-	0.23	0.31	3.00	1
SU10-202-PR	0.74	+/-	0.13	0.23	3.26	1
SU10-204-1*	0.71	+/-	N/A	0.60	3.29	1
SU10-205-1	1.19	+/-	0.24	0.29	2.81	1
SU10-207-1	0.97	+/-	0.24	0.40	3.03	1
SU10-208-1	0.72	+/-	0.14	0.22	3.28	1
SU10-209-1*	0.08	+/-	N/A	0.53	3.92	1
SU10-210-1*	0.76	+/-	N/A	0.73	3.24	1
SU10-212-1	1.53	+/-	0.20	0.35	2.47	1
SU10-214-PR	1.53	+/-	0.13	0.23	2.47	1
SU10-215-1	1.11	+/-	0.20	0.31	2.89	1
Mean	**1.09**	***Sign Test Statistics***				
Median	**1.01**					
Min	**0.08**	***Sum of Positive Signs***				**14**
Max	**2.36**	***Sign Test Critical Value for N=14***				**10**
Std Dev (1 σ)	**0.54**	***Survey Unit Evaluation***				PASS

Notes: [1] If Th-232 result > DCGLw, then Sign = -1, otherwise Sign = 1

* This value is estimated for the Ac-228 911 keV peak, due to the actual value being less than the MDA

SURVEY UNIT DATA SUMMARY & SIGN TEST WORKSHEET

Year	2007
Survey Unit #	11
MARSSIM Classification	1

Th-232 $DCGL_W$	4.0

	Th-232					
Sample ID	**Gross Result (pCi/g)**			**MDA (pCi/g)**	**DCGLw-Result**	**Sign Test Parameter[1]**
SU11-216-PR	0.88	+/-	0.16	0.25	3.12	1
SU11-217-PR	1.34	+/-	0.13	0.22	2.66	1
SU11-218-PR	0.74	+/-	0.12	0.25	3.26	1
SU11-219-1*	0.80	+/-	N/A	0.52	3.20	1
SU11-220-PR	0.74	+/-	0.13	0.22	3.26	1
SU11-221-PR	0.75	+/-	0.12	0.16	3.25	1
SU11-222-1	0.77	+/-	0.13	0.22	3.23	1
SU11-223*	0.76	+/-	N/A	0.48	3.24	1
SU11-224-PR	0.88	+/-	0.15	0.24	3.12	1
SU11-225-PR	0.87	+/-	0.13	0.21	3.13	1
SU11-226-PR	0.84	+/-	0.12	0.19	3.16	1
SU11-227-1	1.16	+/-	0.20	0.32	2.84	1
SU11-228-PR	0.76	+/-	0.13	0.25	3.24	1
SU11-229-PR	0.79	+/-	0.12	0.20	3.21	1
SU11-230-1	0.71	+/-	0.13	0.19	3.29	1
SU11-231-1	0.73	+/-	0.13	0.25	3.27	1
SU11-232-PR	0.76	+/-	0.14	0.22	3.24	1
SU11-233-PR	0.82	+/-	0.13	0.24	3.18	1
SU11-234-PR	1.01	+/-	0.16	0.24	2.99	1
SU11-235-1	0.78	+/-	0.14	0.21	3.22	1

Mean	**0.84**	***Sign Test Statistics***	
Median	**0.79**		
Min	**0.71**	***Sum of Positive Signs***	**20**
Max	**1.34**	***Sign Test Critical Value for N=20***	**14**
Std Dev (1 σ)	**0.16**	***Survey Unit Evaluation***	PASS

Notes: [1] If Th-232 result > DCGLw, then Sign = -1, otherwise Sign = 1

* This value is estimated for the Ac-228 911 keV peak, due to the actual value being less than the MDA

SURVEY UNIT DATA SUMMARY & SIGN TEST WORKSHEET

Year	2007
Survey Unit #	12
MARSSIM Classification	2

Th-232 $DCGL_W$	4.0

	Th-232					
Sample ID	**Gross Result (pCi/g)**			**MDA (pCi/g)**	**DCGLw-Result**	**Sign Test Parameter[1]**
SU12-301-1	0.94	+/-	0.17	0.28	3.06	1
SU12-302-1	1.04	+/-	0.18	0.30	2.96	1
SU12-303-1	1.43	+/-	0.20	0.37	2.57	1
SU12-304-1	0.78	+/-	0.13	0.25	3.22	1
SU12-305-1	0.93	+/-	0.13	0.26	3.07	1
SU12-306-1	1.01	+/-	0.16	0.31	2.99	1
SU12-309-1	0.93	+/-	0.16	0.31	3.07	1
SU12-311-1	0.97	+/-	0.17	0.32	3.03	1
SU12-312-1	0.59	+/-	0.14	0.26	3.41	1
SU12-313-1	0.97	+/-	0.19	0.36	3.03	1
SU12-314-1	0.79	+/-	0.13	0.21	3.21	1
SU12-315-1	0.81	+/-	0.13	0.21	3.19	1
SU12-316-1	0.97	+/-	0.17	0.30	3.03	1
SU12-317-1	0.71	+/-	0.14	0.25	3.29	1
SU12-318-1	1.03	+/-	0.18	0.30	2.97	1
SU12-319-1	0.87	+/-	0.18	0.27	3.13	1
SU12-320-1	1.03	+/-	0.25	0.38	2.97	1
Mean	**0.93**	***Sign Test Statistics***				
Median	**0.94**					
Min	**0.59**	***Sum of Positive Signs***				**17**
Max	**1.43**	***Sign Test Critical Value for N=17***				**12**
Std Dev (1 σ)	**0.18**	***Survey Unit Evaluation***				PASS

Notes: [1] If Th-232 result > DCGLw, then Sign = -1, otherwise Sign = 1

SURVEY UNIT DATA SUMMARY & SIGN TEST WORKSHEET

Year	2007
Survey Unit #	13
MARSSIM Classification	2

Th-232 $DCGL_W$ (pCi/g)	4.0

	Th-232					
Sample ID	**Gross Result (pCi/g)**			**MDA (pCi/g)**	**DCGLw-Result**	**Sign Test Parameter[1]**
SU13-326-1	0.66	+/-	0.14	0.25	3.34	1
SU13-327-1	0.78	+/-	0.15	0.26	3.22	1
SU13-328-1	0.97	+/-	0.22	0.42	3.03	1
SU13-329-1	1.48	+/-	0.27	0.39	2.52	1
SU13-331-1	0.84	+/-	0.15	0.24	3.16	1
SU13-332-1*	0.32	+/-	N/A	0.69	3.68	1
SU13-333-1	0.76	+/-	0.12	0.22	3.24	1
SU13-334-1	0.55	+/-	0.12	0.22	3.45	1
SU13-335-1	0.79	+/-	0.19	0.31	3.21	1
SU13-336-1	0.89	+/-	0.17	0.29	3.11	1
SU13-337-1	0.89	+/-	0.15	0.31	3.11	1

Mean	**0.81**	***Sign Test Statistics***	
Median	**0.79**		
Min	**0.32**	***Sum of Positive Signs***	**11**
Max	**1.48**	***Sign Test Critical Value for N = 11***	**8**
Std Dev (1 σ)	**0.29**	***Survey Unit Evaluation***	PASS

Notes: [1] If Th-232 result > DCGLw, then Sign = -1, otherwise Sign = 1

* This value is estimated for the Ac-228 911 keV peak, due to the actual value being less than the MDA

SURVEY UNIT DATA SUMMARY & SIGN TEST WORKSHEET

Year	2007
Survey Unit #	14
MARSSIM Classification	2

Th-232 $DCGL_W$ (pCi/g)	4.0

	Th-232					
Sample ID	**Gross Result (pCi/g)**			**MDA (pCi/g)**	**DCGLw-Result**	**Sign Test Parameter[1]**
SU14-338-1	0.81	+/-	0.15	0.25	3.19	1
SU14-339-1	0.63	+/-	0.10	0.14	3.37	1
SU14-340-1	0.72	+/-	0.14	0.29	3.28	1
SU14-341-1	0.61	+/-	0.13	0.26	3.39	1
SU14-342-1	0.74	+/-	0.14	0.26	3.26	1
SU14-343-1	0.39	+/-	0.12	0.19	3.61	1
SU14-344-1	1.05	+/-	0.18	0.33	2.95	1
SU14-345-1	0.61	+/-	0.13	0.24	3.39	1
SU14-346-1	0.71	+/-	0.13	0.25	3.29	1
SU14-347-1	0.76	+/-	0.15	0.29	3.24	1
SU14-348-1	2.04	+/-	0.24	0.38	1.96	1
SU14-349-1	0.60	+/-	0.12	0.25	3.40	1
SU14-350-1	1.03	+/-	0.17	0.28	2.97	1
SU14-352-1	0.57	+/-	0.14	0.29	3.43	1
SU14-353-1	0.93	+/-	0.16	0.28	3.07	1
SU14-354-1	0.87	+/-	0.15	0.27	3.13	1
SU14-355-1	0.81	+/-	0.19	0.31	3.19	1
Mean	**0.82**	***Sign Test Statistics***				
Median	**0.74**					
Min	**0.39**	***Sum of Positive Signs***				**17**
Max	**2.04**	***Sign Test Critical Value for N = 17***				**12**
Std Dev (1 σ)	**0.36**	***Survey Unit Evaluation***				PASS

Notes: [1] If Th-232 result > DCGLw, then Sign = -1, otherwise Sign = 1

SURVEY UNIT DATA SUMMARY & SIGN TEST WORKSHEET

Year	2007
Survey Unit #	15
MARSSIM Classification	2

Th-232 $DCGL_W$ (pCi/g)	4.0

	Th-232					
Sample ID	**Gross Result (pCi/g)**			**MDA (pCi/g)**	**DCGLw-Result**	**Sign Test Parameter[1]**
SU15-356-1	1.06	+/-	0.18	0.30	2.94	1
SU15-357-1	0.15	+/-	0.17	0.19	3.85	1
SU15-359-1	1.04	+/-	0.16	0.25	2.96	1
SU15-360-1	0.71	+/-	0.12	0.20	3.29	1
SU15-361-1	0.68	+/-	0.13	0.24	3.32	1
SU15-362-1	0.78	+/-	0.13	0.22	3.22	1
SU15-363-1	0.81	+/-	0.13	0.21	3.19	1
SU15-364-1	0.85	+/-	0.18	0.33	3.15	1
SU15-365-1	0.18	+/-	0.11	0.27	3.82	1
SU15-366-1	0.87	+/-	0.18	0.26	3.13	1
SU15-367-1	0.76	+/-	0.13	0.22	3.24	1
SU15-369-1	0.97	+/-	0.15	0.24	3.03	1
SU15-370-1	0.82	+/-	0.15	0.27	3.18	1
SU15-371-1	0.72	+/-	0.13	0.21	3.28	1
SU15-372-1	1.03	+/-	0.23	0.39	2.97	1
SU15-373-1	0.79	+/-	0.13	0.21	3.21	1
SU15-374-1	0.62	+/-	0.12	0.22	3.38	1
SU15-375-1	0.71	+/-	0.13	0.26	3.29	1
Mean	**0.75**	***Sign Test Statistics***				
Median	**0.79**					
Min	**0.15**	***Sum of Positive Signs***				**18**
Max	**1.06**	***Sign Test Critical Value for N = 18***				**12**
Std Dev (1 σ)	**0.25**	***Survey Unit Evaluation***				PASS

Notes: [1] If Th-232 result > DCGLw, then Sign = -1, otherwise Sign = 1

SURVEY UNIT DATA SUMMARY & SIGN TEST WORKSHEET

Year	2007
Survey Unit #	16
MARSSIM Classification	1

Th-232 $DCGL_W$ (pCi/g)	4.0

	Th-232					
Sample ID	**Gross Result (pCi/g)**			**MDA (pCi/g)**	**DCGLw-Result**	**Sign Test Parameter[1]**
SU16-376	7.80E-01	+/-	1.17E-01	2.04E-01	3.22	1
SU16-377	8.42E-01	+/-	1.06E-01	1.46E-01	3.16	1
SU16-378	6.72E-01	+/-	9.36E-02	1.54E-01	3.33	1
SU16-379	7.08E-01	+/-	1.14E-01	1.97E-01	3.29	1
SU16-380	4.05E-01	+/-	8.70E-02	1.30E-01	3.59	1
SU16-381	1.09E+00	+/-	1.26E-01	2.28E-01	2.91	1
SU16-382	6.67E-01	+/-	1.08E-01	1.70E-01	3.33	1
SU16-383	7.02E-01	+/-	1.26E-01	2.27E-01	3.30	1
SU16-384	6.94E-01	+/-	1.21E-01	1.83E-01	3.31	1
SU16-385	6.59E-01	+/-	1.12E-01	1.60E-01	3.34	1
SU16-386	9.92E-01	+/-	1.36E-01	2.55E-01	3.01	1
SU16-387	7.65E-01	+/-	1.18E-01	1.94E-01	3.24	1
SU16-388	7.02E-01	+/-	1.14E-01	1.87E-01	3.30	1
SU16-389	9.33E-01	+/-	1.42E-01	2.16E-01	3.07	1
SU16-390	8.29E-01	+/-	1.31E-01	2.56E-01	3.17	1
SU16-391	7.53E-01	+/-	1.35E-01	2.42E-01	3.25	1
SU16-392	7.15E-01	+/-	1.08E-01	2.24E-01	3.29	1
SU16-393	1.07E+00	+/-	1.38E-01	1.99E-01	2.93	1
SU16-394	7.90E-01	+/-	1.30E-01	2.12E-01	3.21	1

Mean	**0.78**	***Sign Test Statistics***	
Median	**0.75**		
Min	**0.41**	***Sum of Positive Signs***	**19**
Max	**1.09**	***Sign Test Critical Value for N = 19***	**13**
Std Dev (1 σ)	**0.16**	***Survey Unit Evaluation***	PASS

Notes: [1] If Th-232 result > DCGLw, then Sign = -1, otherwise Sign = 1

APPENDIX B

HP INSTRUMENTATION QUALITY CONTROL

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 6)

Counting Instrument:	Ludlum 2929	Detector:	Ludlum 43-10-1
Serial #:	163827	Serial #:	PR 171322
Calibration Date:	5/9/2007	12 month calibration:	OK
Detector Active Area or Area Covered by Smear (cm^2):	100		

	Efficiency (fraction)	Source Nuclide	Source Number	Original Source Activity (DPM)	Source Creation Date	$T_{1/2}$ (yr)	Source Decayed Activity	Required MDA ($DPM/100cm^2$)	Control Chart & Daily Bkg Count Time	Control Chart & Daily Source-Sample Count Time	Control Chart bkg Average α/β cpm	Control Chart bkg 1 sigma, cpm	Control Chart Source-bkg Average α/β cpm	Control Chart source 1 sigma, cpm
Alpha	0.3552	Th-230	2126-96	19,500	5/17/1996	7.54E+04	19,498	100	20	1	0.32	0.11	6925.6	77.64
Beta	0.2218	Tc-99	4003-02	21,800	6/26/2002	2.11E+04	21,796	1000	20	1	54.40	2.60	4835.5	94.63

Date	Daily Bkg Counts		Daily Check Source Counts		Daily Bkg Rate (cpm)		Net Daily Source Rate (cpm)		Bkg QC Pass/Fail		Source QC Pass/Fail				α MDA OK?	β MDA OK?	H.P. Technician	Technician Initials
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	MDA α (dpm)	MDA β (dpm)				
7/7/2007	3	1122	6857	4969	0.2	56.1	6856.9	4912.9	PASS	PASS	PASS	PASS	12.12	127	Yes	Yes		SK
7/9/2007	7	1054	6852	4781	0.4	52.7	6851.7	4728.3	PASS	PASS	PASS	PASS	14.06	124	Yes	Yes		SK
7/10/2007	2	1075	7049	4752	0.1	53.8	7048.9	4698.3	PASS	PASS	PASS	PASS	11.45	125	Yes	Yes		SK
7/11/2007	7	1052	6832	4712	0.4	52.6	6831.7	4659.4	PASS	PASS	PASS	PASS	14.06	124	Yes	Yes		SK
7/12/2007	6	1048	6866	4825	0.3	52.4	6865.7	4772.6	PASS	PASS	PASS	PASS	13.65	124	Yes	Yes		SK
7/13/2007	4	1098	6963	4693	0.2	54.9	6962.8	4638.1	PASS	PASS	PASS	*QUESTION*	12.69	126	Yes	Yes		SK
7/16/2007	7	1071	6832	4860	0.4	53.6	6831.7	4806.5	PASS	PASS	PASS	PASS	14.06	125	Yes	Yes		SK
7/17/2007	1	1102	6998	4928	0.1	55.1	6998.0	4872.9	*QUESTION*	PASS	PASS	PASS	10.57	126	Yes	Yes		SK
7/18/2007	3	1148	6910	4759	0.2	57.4	6909.9	4701.6	PASS	PASS	PASS	PASS	12.12	129	Yes	Yes		SK
7/19/2007	7	1106	7028	4702	0.4	55.3	7027.7	4646.7	PASS	PASS	PASS	PASS	14.06	127	Yes	Yes		SK
7/20/2007	6	1070	6917	4912	0.3	53.5	6916.7	4858.5	PASS	PASS	PASS	PASS	13.65	125	Yes	Yes		SK
7/23/2007	0	1087	7017	4785	0.0	54.4	7017.0	4730.7	*QUESTION*	PASS	PASS	PASS	8.45	126	Yes	Yes		SK
7/24/2007	2	1119	6824	4776	0.1	56.0	6823.9	4720.1	PASS	PASS	PASS	PASS	11.45	127	Yes	Yes		SK
7/25/2007	8	1114	7023	4804	0.4	55.7	7022.6	4748.3	PASS	PASS	PASS	PASS	14.45	127	Yes	Yes		SK
7/26/2007	4	1108	6948	4864	0.2	55.4	6947.8	4808.6	PASS	PASS	PASS	PASS	12.69	127	Yes	Yes		SK
7/27/2007	4	1132	6900	4998	0.2	56.6	6899.8	4941.4	PASS	PASS	PASS	PASS	12.69	128	Yes	Yes		SK
7/28/2007	6	1141	6950	4722	0.3	57.1	6949.7	4665.0	PASS	PASS	PASS	PASS	13.65	128	Yes	Yes		SK
7/30/2007	0	1008	6991	4690	0.0	50.4	6991.0	4639.6	*QUESTION*	PASS	PASS	*QUESTION*	8.45	121	Yes	Yes		SK
7/31/2007	4	1102	6786	4730	0.2	55.1	6785.8	4674.9	PASS	PASS	PASS	PASS	12.69	126	Yes	Yes		SK
8/1/2007	4	1143	6757	4734	0.2	57.2	6756.8	4676.9	PASS	PASS	*QUESTION*	PASS	12.69	128	Yes	Yes		SK
8/2/2007	6	1125	6787	4803	0.3	56.3	6786.7	4746.8	PASS	PASS	PASS	PASS	13.65	128	Yes	Yes		SK
8/3/2007	6	1089	6808	4767	0.3	54.5	6807.7	4712.6	PASS	PASS	PASS	PASS	13.65	126	Yes	Yes		SK
8/6/2007	5	1074	6813	4790	0.3	53.7	6812.8	4736.3	PASS	PASS	PASS	PASS	13.19	125	Yes	Yes		SK
8/7/2007	6	1114	6993	4904	0.3	55.7	6992.7	4848.3	PASS	PASS	PASS	PASS	13.65	127	Yes	Yes		SK
8/8/2007	5	1074	7060	4992	0.3	53.7	7059.8	4938.3	PASS	PASS	PASS	PASS	13.19	125	Yes	Yes		SK
8/9/2007	2	1032	6856	4620	0.1	51.6	6855.9	4568.4	PASS	PASS	PASS	*QUESTION*	11.45	123	Yes	Yes		SK
8/13/2007	4	1008	6871	4972	0.2	50.4	6870.8	4921.6	PASS	PASS	PASS	PASS	12.69	121	Yes	Yes		SK
8/14/2007	3	1058	6858	4852	0.2	52.9	6857.9	4799.1	PASS	PASS	PASS	PASS	12.12	124	Yes	Yes		SK
8/15/2007	1	1089	7104	5245	0.1	54.5	7104.0	5190.6	*QUESTION*	PASS	*QUESTION*	**FAIL**	10.57	126	Yes	Yes		SK

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 2)

Counting Instrument:			Ludlum 2929		Detector:	Ludlum 43-10-1			Cal. Date:	9/7/2007								
Serial #:			163827		Serial #:	PR171322			Cal. Due Date OK?	WARNING								
Detector Active Area or Area Covered by Smear (cm^2):						100												
	Efficiency (fraction)	Source Nuclide	Source Number	Original Source Activity (DPM)	Source Creation Date	$T_{1/2}$ (yr)	Source Decayed Activity	Required MDA ($DPM/100cm^2$)	Control Chart & Daily Bkg Count Time	Control Chart & Daily Source-Sample Count Time	Control Chart bkg Average α/β cpm	Control Chart bkg 1 sigma, cpm	Control Chart Source-bkg Average α/β cpm	Control Chart source 1 sigma, cpm				
Alpha	0.3649	Th-230	2126-96	19,500	5/17/1996	7.54E+04	19,498	100	20	1	0.23	0.11	7114.7	95.95				
Beta	0.2385	Tc-99	4003-02	21,800	6/26/2002	2.11E+04	21,796	1000	20	1	58.37	1.86	5198.7	60.95				

Date	Daily Bkg Counts		Daily Check Source Counts		Daily Bkg Rate (cpm)		Net Daily Source Rate (cpm)		Bkg QC Pass/Fail		Source QC Pass/Fail				α MDA OK?	β MDA OK?	H.P. Technician	Technician Initials
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	MDA α (dpm)	MDA β (dpm)				
9/25/2007	3	1097	7177	5185	0.2	54.9	7176.9	5130.2	PASS	PASS	PASS	PASS	11.80	117	Yes	Yes		SK
9/26/2007	1	1201	7113	5303	0.1	60.1	7113.0	5243.0	PASS	PASS	PASS	PASS	10.29	122	Yes	Yes		SK
9/27/2007	3	1169	7156	5270	0.2	58.5	7155.9	5211.6	PASS	PASS	PASS	PASS	11.80	121	Yes	Yes		SK
10/2/2007	4	1269	7039	5326	0.2	63.5	7038.8	5262.6	PASS	*QUESTION*	PASS	PASS	12.35	125	Yes	Yes		SK

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 6)

Counting Instrument:			Ludlum 2929		Detector:	Ludlum 43-10-1		Calibration Date:		9/7/2007								
Serial #:			163827		Serial #:	PR171322		12 month calibration:		OK								
Detector Active Area or Area Covered by Smear (cm^2):						100												
	Efficiency (fraction)	Source Nuclide	Source Number	Original Source Activity (DPM)	Source Creation Date	$T_{1/2}$ (yr)	Source Decayed Activity	Required MDA ($DPM/100cm^2$)	Control Chart & Daily Bkg Count Time	Control Chart & Daily Source-Sample Count Time	Control Chart bkg Average α/β cpm	Control Chart bkg 1 sigma, cpm	Control Chart Source-bkg Average α/β cpm	Control Chart source 1 sigma, cpm				
Alpha	0.3649	Th-230	2126-96	19,500	5/17/1996	7.54E+04	19,498	100	20	1	0.22	0.13	7114.7	95.89				
Beta	0.2384	Tc-99	4003-02	21,800	6/26/2002	2.11E+04	21,796	1000	20	1	61.59	3.72	5195.5	62.15				

Date	Daily Bkg Counts		Daily Check Source Counts		Daily Bkg Rate (cpm)		Net Daily Source Rate (cpm)		Bkg QC Pass/Fail		Source QC Pass/Fail				α MDA OK?	β MDA OK?	H.P. Technician	Technician Initials
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	MDA α (dpm)	MDA β (dpm)				
10/4/2007	4	1304	7068	5261	0.2	65.2	7067.8	5195.8	PASS	PASS	PASS	PASS	12.35	127	Yes	Yes		SK
10/9/2007	6	1215	7282	5243	0.3	60.8	7281.7	5182.3	PASS	PASS	PASS	PASS	13.28	123	Yes	Yes		SK
10/10/2007	7	1271	6998	5309	0.4	63.6	6997.7	5245.5	PASS	PASS	PASS	PASS	13.69	125	Yes	Yes		SK
10/11/2007	5	1291	7051	5219	0.3	64.6	7050.8	5154.5	PASS	PASS	PASS	PASS	12.84	126	Yes	Yes		SK
10/12/2007	4	1332	7066	5293	0.2	66.6	7065.8	5226.4	PASS	PASS	PASS	PASS	12.35	128	Yes	Yes		SK
10/15/2007	2	1271	6972	5107	0.1	63.6	6971.9	5043.5	PASS	PASS	PASS	*QUESTION*	11.14	125	Yes	Yes		SK
10/16/2007	3	1203	7038	5255	0.2	60.2	7037.9	5194.9	PASS	PASS	PASS	PASS	11.80	122	Yes	Yes		SK
10/17/2007	6	1228	6929	5343	0.3	61.4	6928.7	5281.6	PASS	PASS	PASS	PASS	13.28	123	Yes	Yes		SK
10/18/2007	2	1265	7047	5174	0.1	63.3	7046.9	5110.8	PASS	PASS	PASS	PASS	11.14	125	Yes	Yes		SK
10/19/2007	2	1350	7108	5340	0.1	67.5	7107.9	5272.5	PASS	PASS	PASS	PASS	11.14	129	Yes	Yes		SK
10/22/2007	4	1137	7107	5281	0.2	56.9	7106.8	5224.2	PASS	PASS	PASS	PASS	12.35	119	Yes	Yes		SK
10/23/2007	4	1200	7073	5362	0.2	60.0	7072.8	5302.0	PASS	PASS	PASS	PASS	12.35	122	Yes	Yes		SK
10/24/2007	4	1253	7037	5305	0.2	62.7	7036.8	5242.4	PASS	PASS	PASS	PASS	12.35	125	Yes	Yes		SK
10/25/2007	5	1137	7092	5357	0.3	56.9	7091.8	5300.2	PASS	PASS	PASS	PASS	12.84	119	Yes	Yes		SK
10/26/2007	3	1272	7132	5283	0.2	63.6	7131.9	5219.4	PASS	PASS	PASS	PASS	11.80	125	Yes	Yes		SK
10/29/2007	1	1168	7027	5229	0.1	58.4	7027.0	5170.6	PASS	PASS	PASS	PASS	10.29	121	Yes	Yes		SK
10/30/2007	5	1166	6986	5277	0.3	58.3	6985.8	5218.7	PASS	PASS	PASS	PASS	12.84	121	Yes	Yes		SK
10/31/2007	3	1296	7126	5285	0.2	64.8	7125.9	5220.2	PASS	PASS	PASS	PASS	11.80	126	Yes	Yes		SK
11/1/2007	4	1156	7133	5291	0.2	57.8	7132.8	5233.2	PASS	PASS	PASS	PASS	12.35	120	Yes	Yes		SK
11/2/2007	4	1155	7002	5311	0.2	57.8	7001.8	5253.3	PASS	PASS	PASS	PASS	12.35	120	Yes	Yes		SK
11/5/2007	2	1329	7105	5347	0.1	66.5	7104.9	5280.6	PASS	PASS	PASS	PASS	11.14	128	Yes	Yes		SK
11/6/2007	6	1189	7146	5331	0.3	59.5	7145.7	5271.6	PASS	PASS	PASS	PASS	13.28	122	Yes	Yes		SK
11/7/2007	3	1224	6889	5368	0.2	61.2	6888.9	5306.8	PASS	PASS	*QUESTION*	PASS	11.80	123	Yes	Yes		SK
11/8/2007	2	1202	7004	5317	0.1	60.1	7003.9	5256.9	PASS	PASS	PASS	PASS	11.14	122	Yes	Yes		SK
11/9/2007	6	1158	7001	5297	0.3	57.9	7000.7	5239.1	PASS	PASS	PASS	PASS	13.28	120	Yes	Yes		SK
11/12/2007	2	1152	7026	5238	0.1	57.6	7025.9	5180.4	PASS	PASS	PASS	PASS	11.14	120	Yes	Yes		SK
11/13/2007	5	1174	6847	5320	0.3	58.7	6846.8	5261.3	PASS	PASS	*QUESTION*	PASS	12.84	121	Yes	Yes		SK
11/14/2007	4	1235	6983	5329	0.2	61.8	6982.8	5267.3	PASS	PASS	PASS	PASS	12.35	124	Yes	Yes		SK
11/15/2007	7	1245	6915	5400	0.4	62.3	6914.7	5337.8	PASS	PASS	*QUESTION*	*QUESTION*	13.69	124	Yes	Yes		SK
11/27/2007	6	1167	7071	5222	0.3	58.4	7070.7	5163.7	PASS	PASS	PASS	PASS	13.28	121	Yes	Yes		
11/28/2007	7	1113	6986	5172	0.4	55.7	6985.7	5116.4	PASS	PASS	PASS	PASS	13.69	118	Yes	Yes		
11/29/2007	3	1137	7073	5396	0.2	56.9	7072.9	5339.2	PASS	PASS	PASS	*QUESTION*	11.80	119	Yes	Yes		
11/30/2007	4	1230	6969	5336	0.2	61.5	6968.8	5274.5	PASS	PASS	PASS	PASS	12.35	123	Yes	Yes		
12/3/2007	6	1181	7095	5154	0.3	59.1	7094.7	5095.0	PASS	PASS	PASS	PASS	13.28	121	Yes	Yes		
12/4/2007	1	1124	7107	5408	0.1	56.2	7107.0	5351.8	PASS	PASS	PASS	*QUESTION*	10.29	119	Yes	Yes		
12/5/2007	4	1217	7036	5194	0.2	60.9	7035.8	5133.2	PASS	PASS	PASS	PASS	12.35	123	Yes	Yes		
12/6/2007	5	1166	6982	5267	0.3	58.3	6981.8	5208.7	PASS	PASS	PASS	PASS	12.84	121	Yes	Yes		
12/7/2007	3	1223	7139	5217	0.2	61.2	7138.9	5155.9	PASS	PASS	PASS	PASS	11.80	123	Yes	Yes		

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 6)

Counting Instrument:			Ludlum 2929		Detector:	Ludlum 43-10-01		Calibration Date:		7/3/2007								
Serial #:			208319		Serial #:	PR215938		12 month calibration:		OK								
Detector Active Area or Area Covered by Smear (cm^2):						100												
	Efficiency (fraction)	Source Nuclide	Source Number	Original Source Activity (DPM)	Source Creation Date	$T_{1/2}$ (yr)	Source Decayed Activity	Required MDA ($DPM/100cm^2$)	Control Chart & Daily Bkg Count Time	Control Chart & Daily Source-Sample Count Time	Control Chart bkg Average α/β cpm	Control Chart bkg 1 sigma, cpm	Control Chart Source-bkg Average α/β cpm	Control Chart source 1 sigma, cpm				
Alpha	0.3476	Th-230	2126-96	19,500	5/17/1996	7.54E+04	19,498	100	20	1	0.10	0.09	6777.8	54.04				
Beta	0.2473	TC-99	4003-02	21,800	6/26/2002	2.11E+05	21,800	1000	20	1	55.17	1.80	5335.2	90.85				

Date	Daily Bkg Counts		Daily Check Source Counts		Daily Bkg Rate (cpm)		Net Daily Source Rate (cpm)		Bkg QC Pass/Fail		Source QC Pass/Fail				α MDA OK?	β MDA OK?	H.P. Technician	Technician Initials
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	MDA α (dpm)	MDA β (dpm)				
7/10/2007	4	1014	6886	5415	0.2	50.7	6885.8	5364.3	PASS	*QUESTION*	PASS	PASS	12.97	109	Yes	Yes		SK
7/11/2007	4	1053	7116	5471	0.2	52.7	7115.8	5418.4	PASS	PASS	**FAIL**	PASS	12.97	111	Yes	Yes		SK
7/12/2007	3	1076	6852	5510	0.2	53.8	6851.9	5456.2	PASS	PASS	PASS	PASS	12.39	112	Yes	Yes		SK
7/13/2007	2	1088	6812	5300	0.1	54.4	6811.9	5245.6	PASS	PASS	PASS	PASS	11.70	113	Yes	Yes		SK
7/16/2007	5	1177	6812	5300	0.3	58.9	6811.8	5241.2	PASS	*QUESTION*	PASS	PASS	13.48	117	Yes	Yes		SK
7/17/2007	2	1079	6824	5349	0.1	54.0	6823.9	5295.1	PASS	PASS	PASS	PASS	11.70	112	Yes	Yes		SK
7/18/2007	3	1155	6704	5261	0.2	57.8	6703.9	5203.3	PASS	PASS	PASS	PASS	12.39	116	Yes	Yes		SK
7/19/2007	1	1073	6797	5376	0.1	53.7	6797.0	5322.4	PASS	PASS	PASS	PASS	10.80	112	Yes	Yes		SK
7/20/2007	1	1079	6716	5308	0.1	54.0	6716.0	5254.1	PASS	PASS	PASS	PASS	10.80	112	Yes	Yes		SK
7/23/2007	2	1170	6764	5480	0.1	58.5	6763.9	5421.5	PASS	PASS	PASS	PASS	11.70	116	Yes	Yes		SK
7/24/2007	0	1119	6705	5508	0.0	56.0	6705.0	5452.1	PASS	PASS	PASS	PASS	8.63	114	Yes	Yes		SK
7/25/2007	2	1111	6937	5425	0.1	55.6	6936.9	5369.5	PASS	PASS	*QUESTION*	PASS	11.70	114	Yes	Yes		SK
7/26/2007	5	1069	5201	5343	0.3	53.5	5200.8	5289.6	PASS	PASS	**FAIL**	PASS	13.48	112	Yes	Yes		SK
7/27/2007	3	1083	6685	5470	0.2	54.2	6684.9	5415.9	PASS	PASS	PASS	PASS	12.39	112	Yes	Yes		SK
7/30/2007	1	1038	6727	5318	0.1	51.9	6727.0	5266.1	PASS	PASS	PASS	PASS	10.80	110	Yes	Yes		SK
7/31/2007	1	1131	6842	5325	0.1	56.6	6842.0	5268.5	PASS	PASS	PASS	PASS	10.80	115	Yes	Yes		SK
8/1/2007	8	1073	6766	5172	0.4	53.7	6765.6	5118.4	**FAIL**	PASS	PASS	*QUESTION*	14.76	112	Yes	Yes		SK
8/2/2007	3	1091	6827	5347	0.2	54.6	6826.9	5292.5	PASS	PASS	PASS	PASS	12.39	113	Yes	Yes		SK
8/3/2007	4	1154	6827	5322	0.2	57.7	6826.8	5264.3	PASS	PASS	PASS	PASS	12.97	116	Yes	Yes		SK
8/6/2007	7	1063	6821	5542	0.4	53.2	6820.7	5488.9	*QUESTION*	PASS	PASS	PASS	14.37	112	Yes	Yes		SK
8/7/2007	0	1232	6631	5535	0.0	61.6	6631.0	5473.4	PASS	**FAIL**	*QUESTION*	PASS	8.63	119	Yes	Yes		SK
8/8/2007	0	1125	6648	5365	0.0	56.3	6648.0	5308.8	PASS	PASS	*QUESTION*	PASS	8.63	114	Yes	Yes		SK
8/9/2007	3	1072	6851	5378	0.2	53.6	6850.9	5324.4	PASS	PASS	PASS	PASS	12.39	112	Yes	Yes		SK
8/13/2007	2	972	6871	5362	0.1	48.6	6870.9	5313.4	PASS	**FAIL**	PASS	PASS	11.70	107	Yes	Yes		SK
8/15/2007	2	1002	6922	5232	0.1	50.1	6921.9	5181.9	PASS	*QUESTION*	*QUESTION*	PASS	11.70	109	Yes	Yes		SK

CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 6)

Counting Instrument:	Ludlum 2929	Detector:	Ludlum 43-10-1
Serial #:	208319	Serial #:	PR-215938
Detector Active Area or Area Covered by Smear (cm^2):	100		

Calibration Date: 7/3/2007
12 month calibration: OK

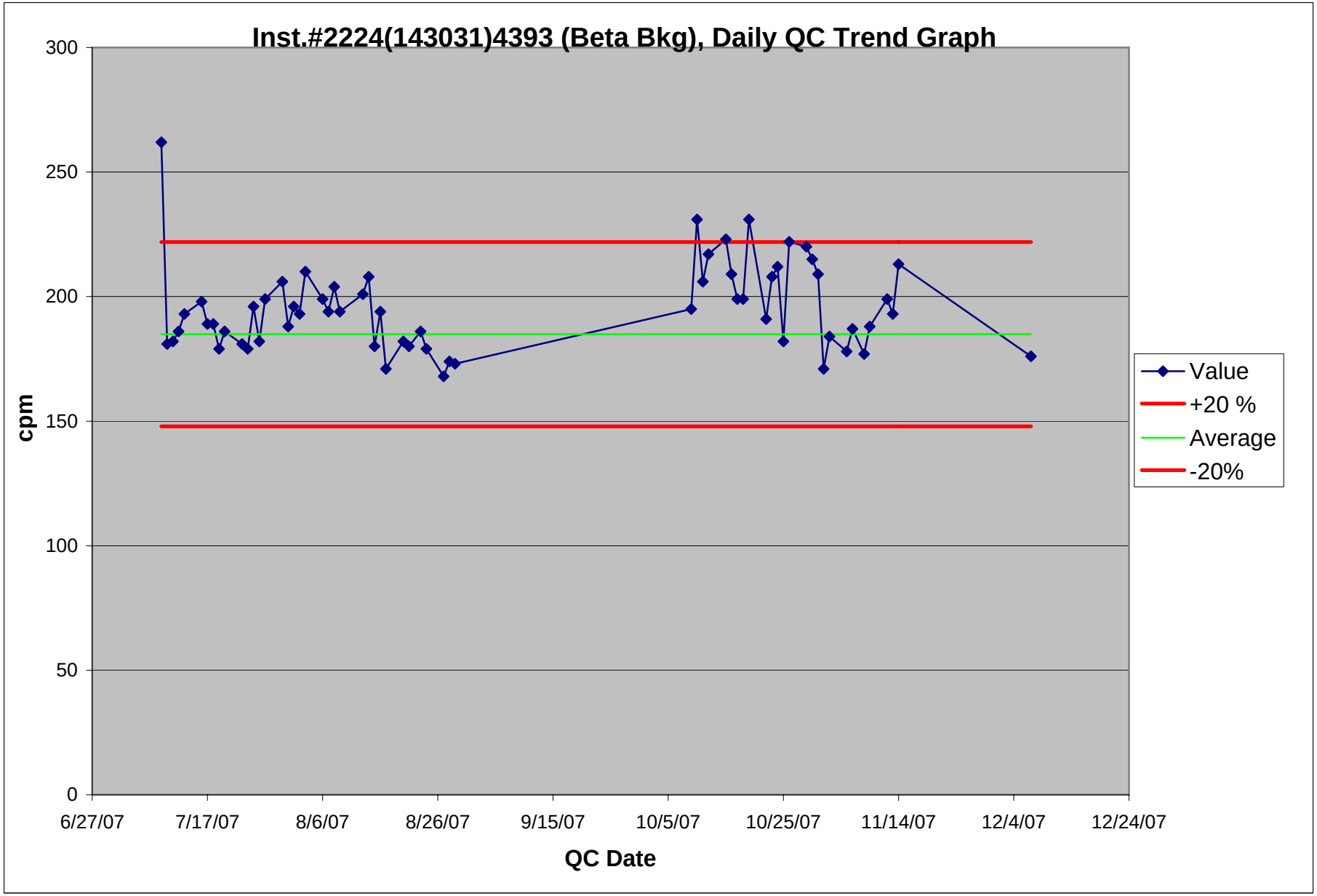
	Efficiency (fraction)	Source Nuclide	Source Number	Original Source Activity (DPM)	Source Creation Date	$T_{1/2}$ (yr)	Source Decayed Activity	Required MDA ($DPM/100cm^2$)	Control Chart & Daily Bkg Count Time	Control Chart & Daily Source-Sample Count Time	Control Chart bkg Average α/β cpm	Control Chart bkg 1 sigma, cpm	Control Chart Source-bkg Average α/β cpm	Control Chart source 1 sigma, cpm
Alpha	0.3449	Th-230	2126-96	19,500	5/17/1996	7.54E+04	19,498	100	20	1	0.07	0.06	6724.7	74.33
Beta	0.2014	Tc-99	4003-02	21,800	6/26/2002	2.11E+04	21,796	1000	20	1	43.68	1.58	4390.7	87.02

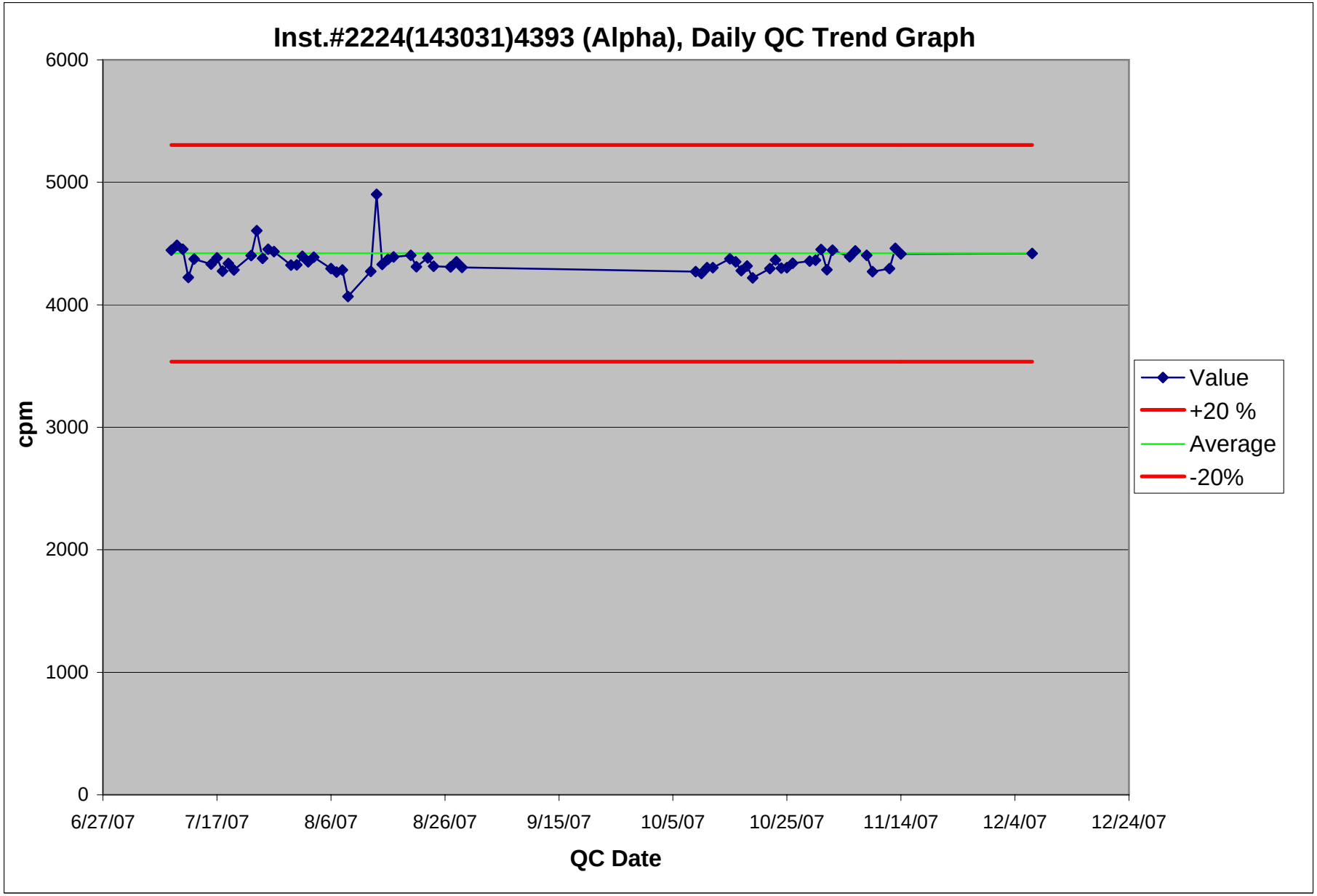
Date	Daily Bkg Counts		Daily Check Source Counts		Daily Bkg Rate (cpm)		Net Daily Source Rate (cpm)		Bkg QC Pass/Fail		Source QC Pass/Fail				α MDA OK?	β MDA OK?	H.P. Technician	Technician Initials
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	MDA α (dpm)	MDA β (dpm)				
8/20/2007	0	869	6799	4497	0.0	43.5	6799.0	4453.6	PASS	PASS	PASS	PASS	8.70	125	Yes	Yes		SK
8/21/2007	1	890	6652	4386	0.1	44.5	6652.0	4341.5	PASS	PASS	PASS	PASS	10.88	127	Yes	Yes		SK
8/22/2007	2	929	6641	4520	0.1	46.5	6640.9	4473.6	PASS	PASS	PASS	PASS	11.79	129	Yes	Yes		SK
8/23/2007	0	856	6696	4402	0.0	42.8	6696.0	4359.2	PASS	PASS	PASS	PASS	8.70	124	Yes	Yes		SK
8/24/2007	2	866	6584	4514	0.1	43.3	6583.9	4470.7	PASS	PASS	PASS	PASS	11.79	125	Yes	Yes		SK
8/27/2007	1	865	6665	4364	0.1	43.3	6665.0	4320.8	PASS	PASS	PASS	PASS	10.88	125	Yes	Yes		SK
8/28/2007	1	847	6763	4506	0.1	42.4	6763.0	4463.7	PASS	PASS	PASS	PASS	10.88	124	Yes	Yes		SK
8/29/2007	0	846	6562	4421	0.0	42.3	6562.0	4378.7	PASS	PASS	*QUESTION*	PASS	8.70	124	Yes	Yes		SK
8/30/2007	4	872	6716	4493	0.2	43.6	6715.8	4449.4	*QUESTION*	PASS	PASS	PASS	13.07	125	Yes	Yes		SK
8/31/2007	3	880	6649	4344	0.2	44.0	6648.9	4300.0	PASS	PASS	PASS	PASS	12.48	126	Yes	Yes		SK
9/5/2007	1	844	6807	4623	0.1	42.2	6807.0	4580.8	PASS	PASS	PASS	*QUESTION*	10.88	124	Yes	Yes		SK
9/6/2007	0	877	6544	4496	0.0	43.9	6544.0	4452.2	PASS	PASS	*QUESTION*	PASS	8.70	126	Yes	Yes		SK
9/7/2007	0	929	6776	4361	0.0	46.5	6776.0	4314.6	PASS	PASS	PASS	PASS	8.70	129	Yes	Yes		SK
9/8/2007	2	856	6850	4466	0.1	42.8	6849.9	4423.2	PASS	PASS	PASS	PASS	11.79	124	Yes	Yes		SK
9/10/2007	2	862	6816	4585	0.1	43.1	6815.9	4541.9	PASS	PASS	PASS	PASS	11.79	125	Yes	Yes		SK
9/11/2007	3	906	6621	4528	0.2	45.3	6620.9	4482.7	PASS	PASS	PASS	PASS	12.48	128	Yes	Yes		SK
9/12/2007	0	856	6714	4591	0.0	42.8	6714.0	4548.2	PASS	PASS	PASS	PASS	8.70	124	Yes	Yes		SK
9/13/2007	3	886	6774	4484	0.2	44.3	6773.9	4439.7	PASS	PASS	PASS	PASS	12.48	126	Yes	Yes		SK
9/14/2007	1	871	6674	4439	0.1	43.6	6674.0	4395.5	PASS	PASS	PASS	PASS	10.88	125	Yes	Yes		SK
9/15/2007	0	852	6643	4586	0.0	42.6	6643.0	4543.4	PASS	PASS	PASS	PASS	8.70	124	Yes	Yes		SK
9/17/2007	0	845	6666	4499	0.0	42.3	6666.0	4456.8	PASS	PASS	PASS	PASS	8.70	124	Yes	Yes		SK
9/18/2007	2	939	6586	4517	0.1	47.0	6585.9	4470.1	PASS	*QUESTION*	PASS	PASS	11.79	130	Yes	Yes		SK
9/19/2007	0	832	6677	4395	0.0	41.6	6677.0	4353.4	PASS	PASS	PASS	PASS	8.70	123	Yes	Yes		SK
9/20/2007	2	887	6621	4503	0.1	44.4	6620.9	4458.7	PASS	PASS	PASS	PASS	11.79	126	Yes	Yes		SK
9/21/2007	3	923	6775	4591	0.2	46.2	6774.9	4544.9	PASS	PASS	PASS	PASS	12.48	129	Yes	Yes		SK
9/24/2007	2	879	6528	4544	0.1	44.0	6527.9	4500.1	PASS	PASS	*QUESTION*	PASS	11.79	126	Yes	Yes		SK
9/25/2007	2	873	6773	4357	0.1	43.7	6772.9	4313.4	PASS	PASS	PASS	PASS	11.79	125	Yes	Yes		SK
9/26/2007	2	856	6807	4460	0.1	42.8	6806.9	4417.2	PASS	PASS	PASS	PASS	11.79	124	Yes	Yes		SK
9/27/2007	3	908	6672	4647	0.2	45.4	6671.9	4601.6	PASS	PASS	PASS	*QUESTION*	12.48	128	Yes	Yes		SK
10/2/2007	3	958	6648	4468	0.2	47.9	6647.9	4420.1	PASS	*QUESTION*	PASS	PASS	12.48	131	Yes	Yes		SK
10/3/2007	3	966	6675	4516	0.2	48.3	6674.9	4467.7	PASS	*QUESTION*	PASS	PASS	12.48	131	Yes	Yes		

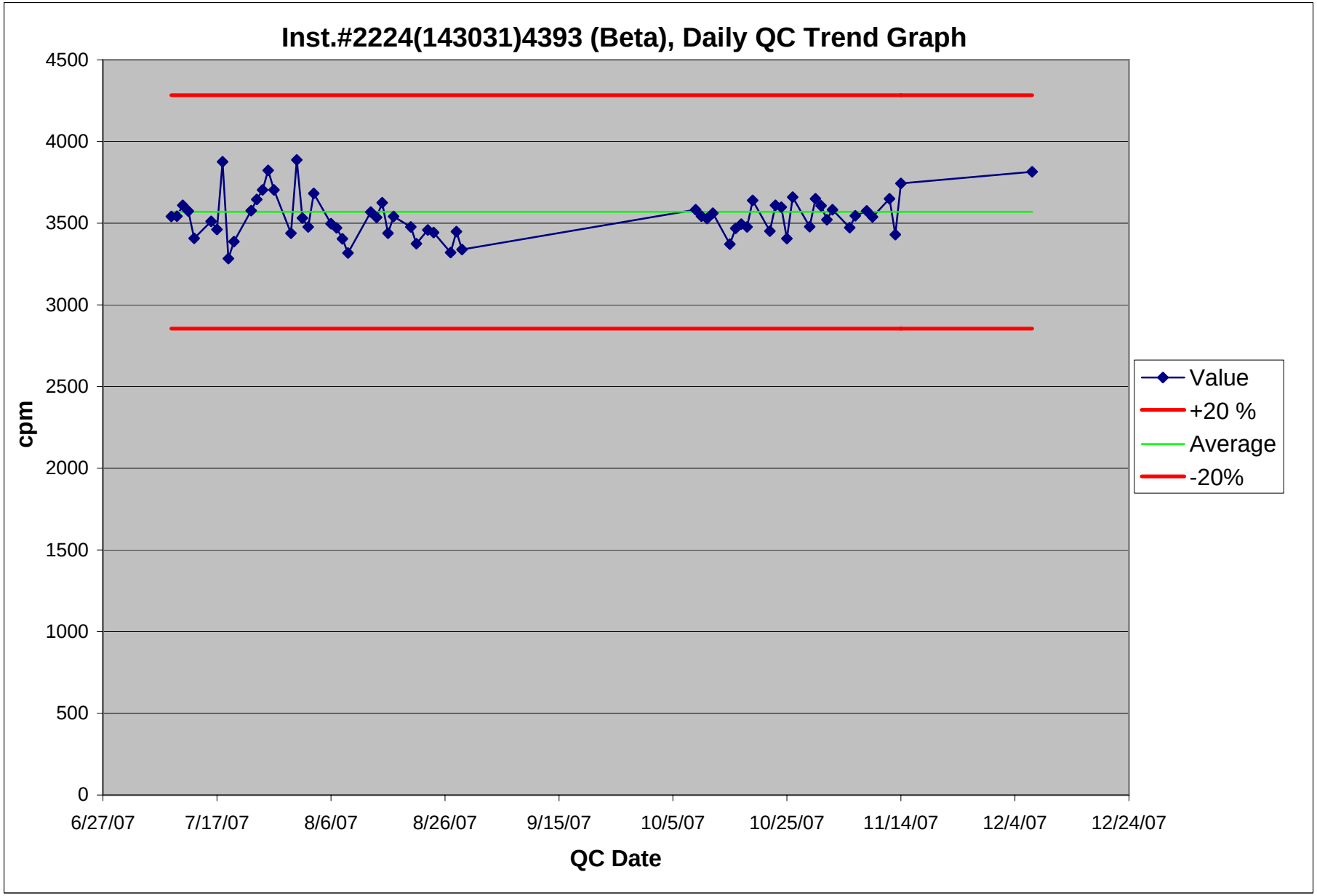
CABRERA ALPHA-BETA COUNTING INSTRUMENT (Rev 6)

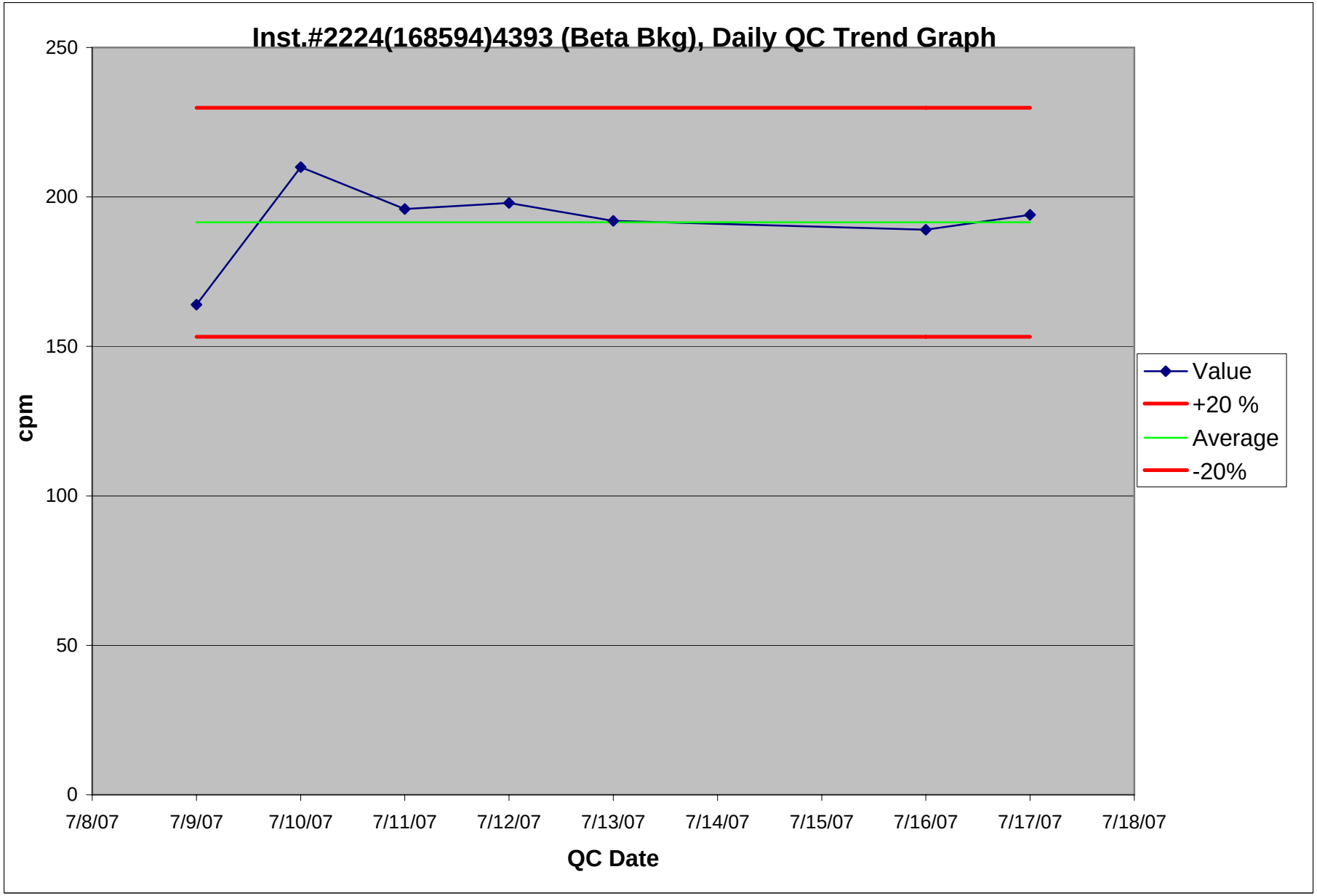
Counting Instrument:			Ludlum 2929		Detector:	Ludlum 43-10-1		Calibration Date:		7/3/2007								
Serial #:			208319		Serial #:	PR-215938		12 month calibration:		OK								
Detector Active Area or Area Covered by Smear (cm^2):						100												
	Efficiency (fraction)	Source Nuclide	Source Number	Original Source Activity (DPM)	Source Creation Date	$T_{1/2}$ (yr)	Source Decayed Activity	Required MDA ($DPM/100cm^2$)	Control Chart & Daily Bkg Count Time	Control Chart & Daily Source-Sample Count Time	Control Chart bkg Average α/β cpm	Control Chart bkg 1 sigma, cpm	Control Chart Source-bkg Average α/β cpm	Control Chart source 1 sigma, cpm				
Alpha	0.3430	Th-230	2126-96	19,500	5/17/1996	7.54E+04	19,498	100	20	1	0.12	0.10	6688.5	71.95				
Beta	0.2039	Tc-99	4003-02	21,800	6/26/2002	2.11E+04	21,796	1000	20	1	53.48	4.89	4443.2	65.26				

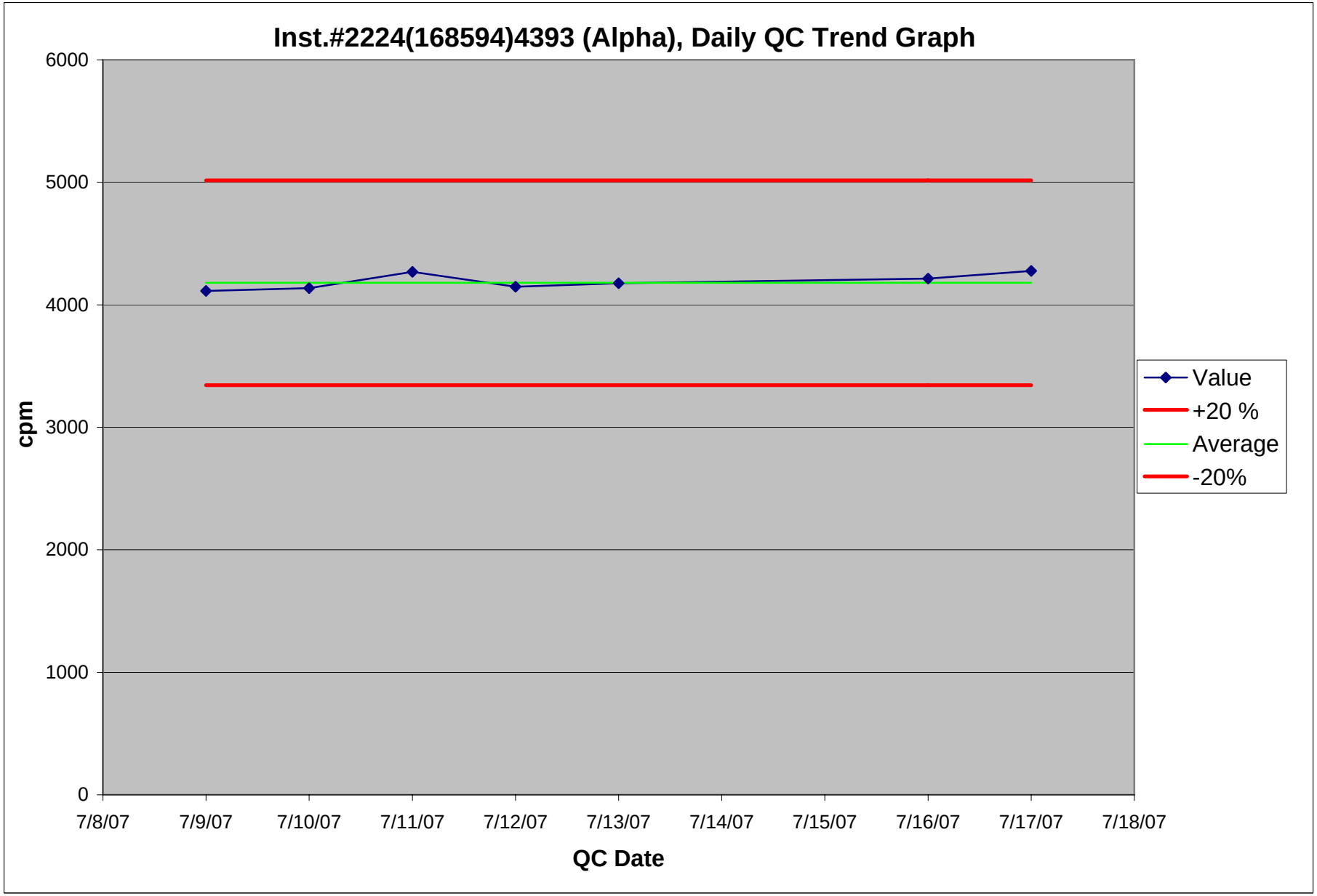
Date	Daily Bkg Counts		Daily Check Source Counts		Daily Bkg Rate (cpm)		Net Daily Source Rate (cpm)		Bkg QC Pass/Fail		Source QC Pass/Fail				α MDA OK?	β MDA OK?	H.P. Technician	Technician Initials
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	MDA α (dpm)	MDA β (dpm)				
10/5/2007	1	1136	6615	4428	0.1	56.8	6615.0	4371.2	PASS	PASS	PASS	PASS	10.94	139	Yes	Yes		SK
10/9/2007	2	982	6634	4509	0.1	49.1	6633.9	4459.9	PASS	PASS	PASS	PASS	11.85	131	Yes	Yes		SK
10/10/2007	3	1000	6678	4475	0.2	50.0	6677.9	4425.0	PASS	PASS	PASS	PASS	12.55	132	Yes	Yes		SK
10/11/2007	4	987	6617	4437	0.2	49.4	6616.8	4387.7	PASS	PASS	PASS	PASS	13.14	131	Yes	Yes		SK
10/12/2007	1	952	6743	4549	0.1	47.6	6743.0	4501.4	PASS	PASS	PASS	PASS	10.94	129	Yes	Yes		SK
10/15/2007	1	992	6589	4512	0.1	49.6	6589.0	4462.4	PASS	PASS	PASS	PASS	10.94	131	Yes	Yes		SK
10/16/2007	1	963	6684	4480	0.1	48.2	6684.0	4431.9	PASS	PASS	PASS	PASS	10.94	129	Yes	Yes		SK
10/17/2007	3	970	6686	4469	0.2	48.5	6685.9	4420.5	PASS	PASS	PASS	PASS	12.55	130	Yes	Yes		SK
10/18/2007	2	1059	6652	4440	0.1	53.0	6651.9	4387.1	PASS	PASS	PASS	PASS	11.85	135	Yes	Yes		SK
10/19/2007	3	987	6811	4682	0.2	49.4	6810.9	4632.7	PASS	PASS	PASS	*QUESTION*	12.55	131	Yes	Yes		SK
10/22/2007	3	949	6549	4465	0.2	47.5	6548.9	4417.6	PASS	PASS	PASS	PASS	12.55	129	Yes	Yes		SK
10/23/2007	1	947	6567	4429	0.1	47.4	6567.0	4381.7	PASS	PASS	PASS	PASS	10.94	129	Yes	Yes		SK
10/24/2007	5	966	6667	4588	0.3	48.3	6666.8	4539.7	PASS	PASS	PASS	PASS	13.66	130	Yes	Yes		SK
10/25/2007	2	997	6686	4615	0.1	49.9	6685.9	4565.2	PASS	PASS	PASS	PASS	11.85	131	Yes	Yes		SK
10/26/2007	0	913	6574	4529	0.0	45.7	6574.0	4483.4	PASS	PASS	PASS	PASS	8.75	126	Yes	Yes		SK
10/29/2007	3	898	6691	4450	0.2	44.9	6690.9	4405.1	PASS	PASS	PASS	PASS	12.55	126	Yes	Yes		SK
10/30/2007	3	874	6487	4541	0.2	43.7	6486.9	4497.3	PASS	PASS	*QUESTION*	PASS	12.55	124	Yes	Yes		SK
10/31/2007	1	981	6632	4514	0.1	49.1	6632.0	4465.0	PASS	PASS	PASS	PASS	10.94	131	Yes	Yes		SK
11/1/2007	1	875	6590	4430	0.1	43.8	6590.0	4386.3	PASS	PASS	PASS	PASS	10.94	124	Yes	Yes		SK
11/2/2007	1	805	6649	4503	0.1	40.3	6649.0	4462.8	PASS	*QUESTION*	PASS	PASS	10.94	120	Yes	Yes		SK
11/5/2007	6	1019	6626	4536	0.3	51.0	6625.7	4485.1	PASS	PASS	PASS	PASS	14.13	133	Yes	Yes		SK
11/6/2007	2	869	6762	4543	0.1	43.5	6761.9	4499.6	PASS	*QUESTION*	PASS	PASS	11.85	124	Yes	Yes		SK
11/7/2007	3	933	6623	4434	0.2	46.7	6622.9	4387.4	PASS	PASS	PASS	PASS	12.55	128	Yes	Yes		SK
11/8/2007	2	918	6601	4451	0.1	45.9	6600.9	4405.1	PASS	PASS	PASS	PASS	11.85	127	Yes	Yes		SK
11/9/2007	6	921	6551	4514	0.3	46.1	6550.7	4468.0	PASS	PASS	PASS	PASS	14.13	127	Yes	Yes		SK
11/12/2007	4	937	6799	4516	0.2	46.9	6798.8	4469.2	PASS	PASS	PASS	PASS	13.14	128	Yes	Yes		SK
11/13/2007	2	871	6696	4541	0.1	43.6	6695.9	4497.5	PASS	*QUESTION*	PASS	PASS	11.85	124	Yes	Yes		SK
11/14/2007	6	994	6504	4570	0.3	49.7	6503.7	4520.3	PASS	PASS	*QUESTION*	PASS	14.13	131	Yes	Yes		SK
11/15/2007	4	908	6604	4449	0.2	45.4	6603.8	4403.6	PASS	PASS	PASS	PASS	13.14	126	Yes	Yes		SK
11/27/2007	5	854	6720	4467	0.3	42.7	6719.8	4424.3	PASS	*QUESTION*	PASS	PASS	13.66	123	Yes	Yes		SK
11/28/2007	5	854	6640	4488	0.3	42.7	6639.8	4445.3	PASS	*QUESTION*	PASS	PASS	13.66	123	Yes	Yes		SK
11/29/2007	3	907	6731	4612	0.2	45.4	6730.9	4566.7	PASS	PASS	PASS	PASS	12.55	126	Yes	Yes		SK
11/30/2007	2	911	6761	4659	0.1	45.6	6760.9	4613.5	PASS	PASS	PASS	*QUESTION*	11.85	126	Yes	Yes		SK
12/3/2007	3	861	6674	4535	0.2	43.1	6673.9	4492.0	PASS	*QUESTION*	PASS	PASS	12.55	123	Yes	Yes		SK
12/4/2007	4	901	6805	4614	0.2	45.1	6804.8	4569.0	PASS	PASS	PASS	PASS	13.14	126	Yes	Yes		SK
12/5/2007	3	916	6649	4574	0.2	45.8	6648.9	4528.2	PASS	PASS	PASS	PASS	12.55	127	Yes	Yes		SK
12/6/2007	5	850	6708	4509	0.3	42.5	6707.8	4466.5	PASS	*QUESTION*	PASS	PASS	13.66	123	Yes	Yes		SK
12/7/2007	4	937	6811	4454	0.2	46.9	6810.8	4407.2	PASS	PASS	PASS	PASS	13.14	128	Yes	Yes		SK

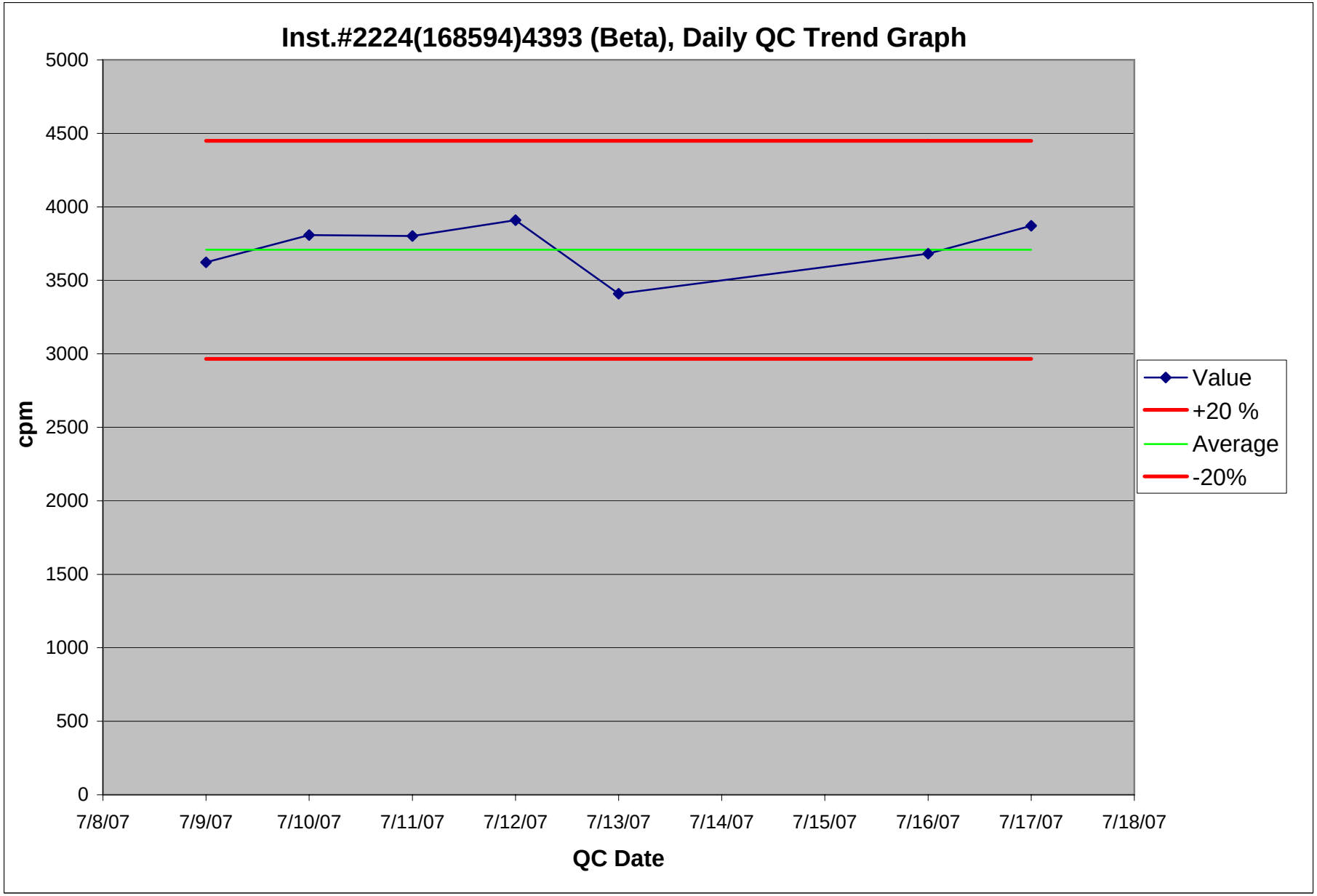

Inst.#2224(143031)4393 (Beta Bkg), Daily QC Trend Graph
300
250
200
150
100
50
0
cpm
6/27/07
7/17/07
8/6/07
8/26/07
9/15/07
10/5/07
10/25/07
11/14/07
12/4/07
12/24/07
QC Date
Value
+20 %
Average
-20%

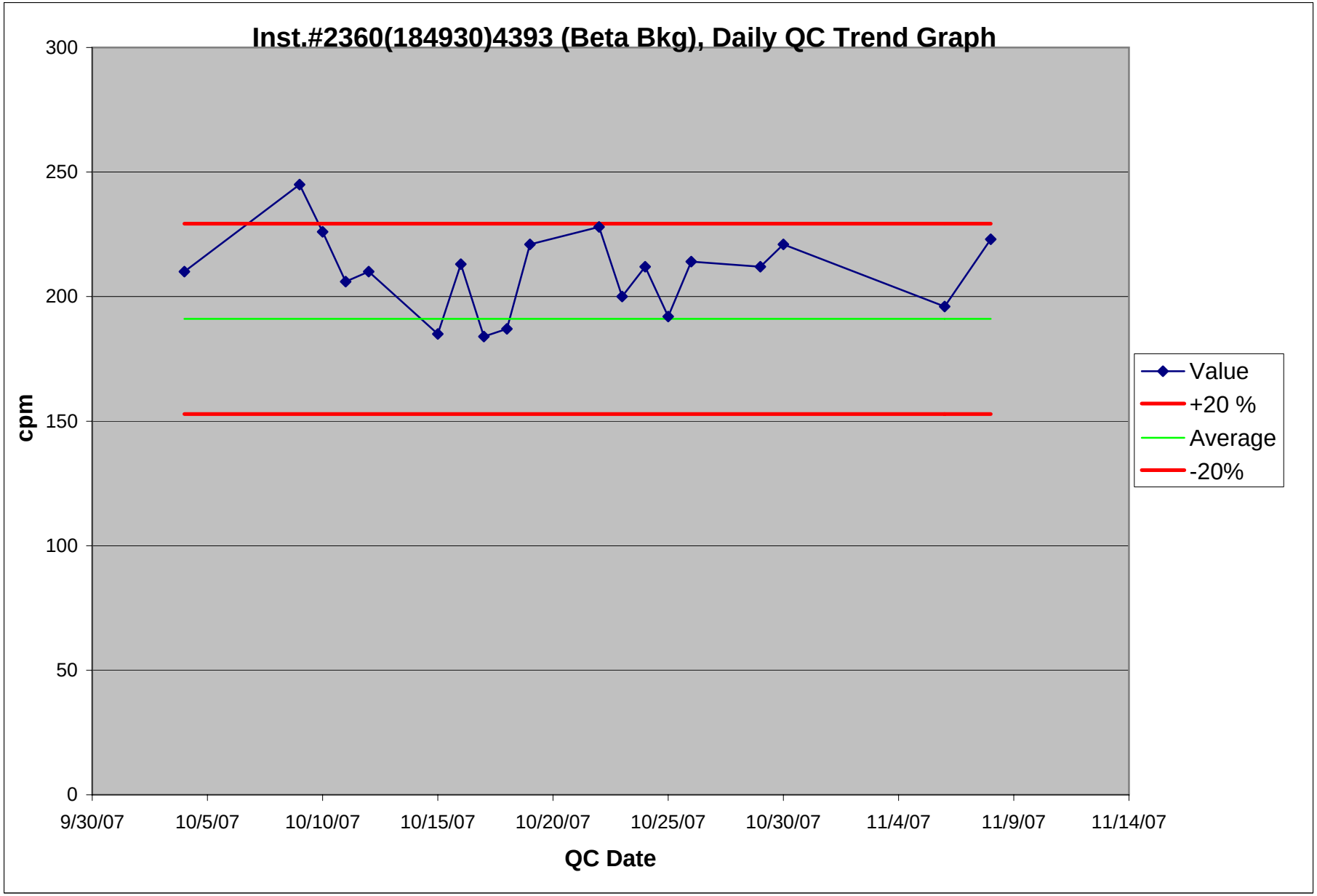

Inst.#2224(143031)4393 (Alpha), Daily QC Trend Graph
6000
5000
4000
3000
2000
1000
0
cpm
6/27/07
7/17/07
8/6/07
8/26/07
9/15/07
10/5/07
10/25/07
11/14/07
12/4/07
12/24/07
QC Date
Value
+20 %
Average
-20%

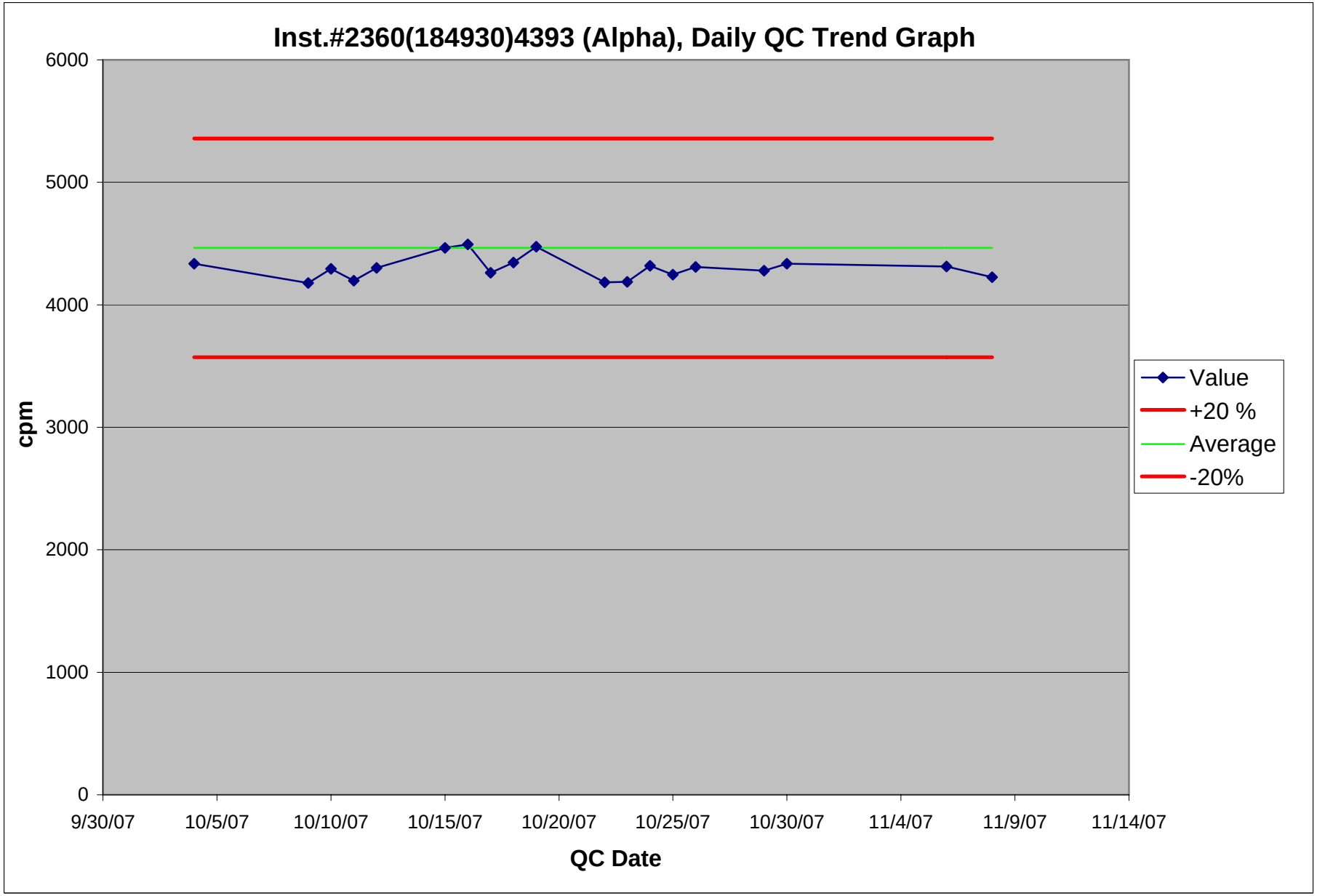

Inst.#2224(143031)4393 (Beta), Daily QC Trend Graph
4500
4000
3500
3000
2500
2000
1500
1000
500
0
cpm
6/27/07
7/17/07
8/6/07
8/26/07
9/15/07
10/5/07
10/25/07
11/14/07
12/4/07
12/24/07
QC Date
Value
+20 %
Average
-20%

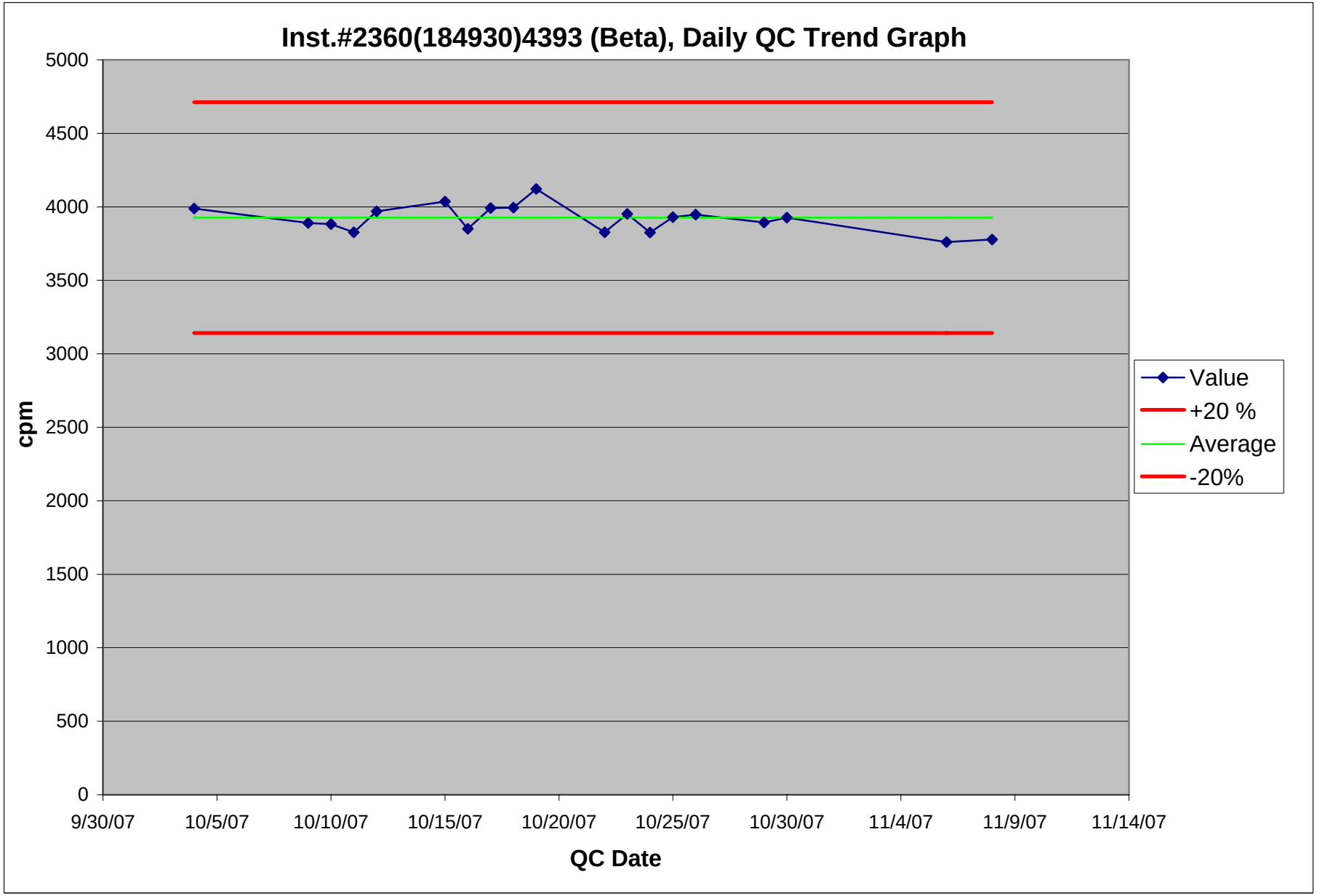

Inst.#2224(168594)4393 (Beta Bkg), Daily QC Trend Graph
250
200
150
100
50
0
cpm
7/8/07
7/9/07
7/10/07
7/11/07
7/12/07
7/13/07
7/14/07
7/15/07
7/16/07
7/17/07
7/18/07
QC Date
Value
+20 %
Average
-20%

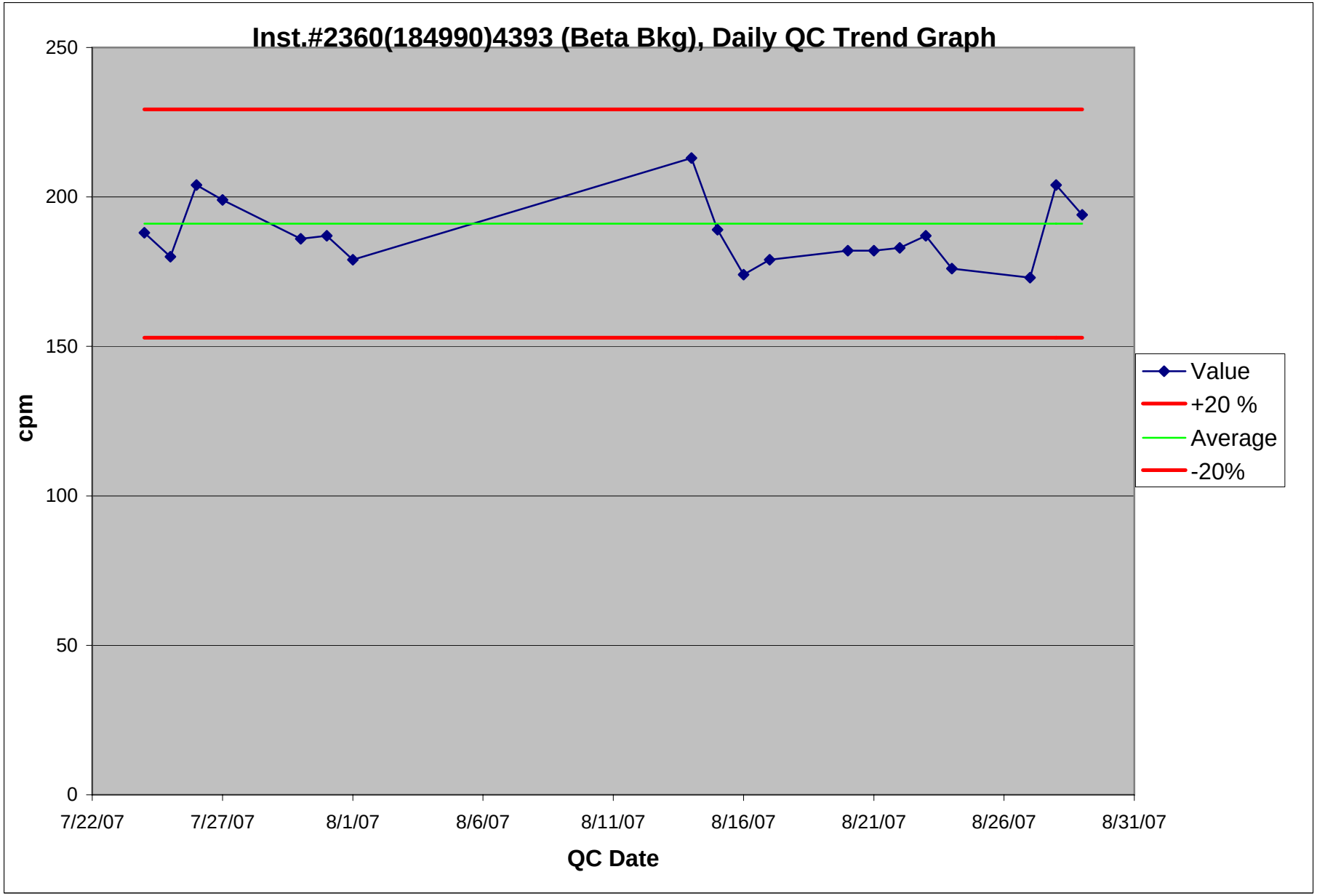

Inst.#2224(168594)4393 (Alpha), Daily QC Trend Graph
6000
5000
4000
3000
2000
1000
0
cpm
7/8/07
7/9/07
7/10/07
7/11/07
7/12/07
7/13/07
7/14/07
7/15/07
7/16/07
7/17/07
7/18/07
QC Date
Value
+20 %
Average
-20%

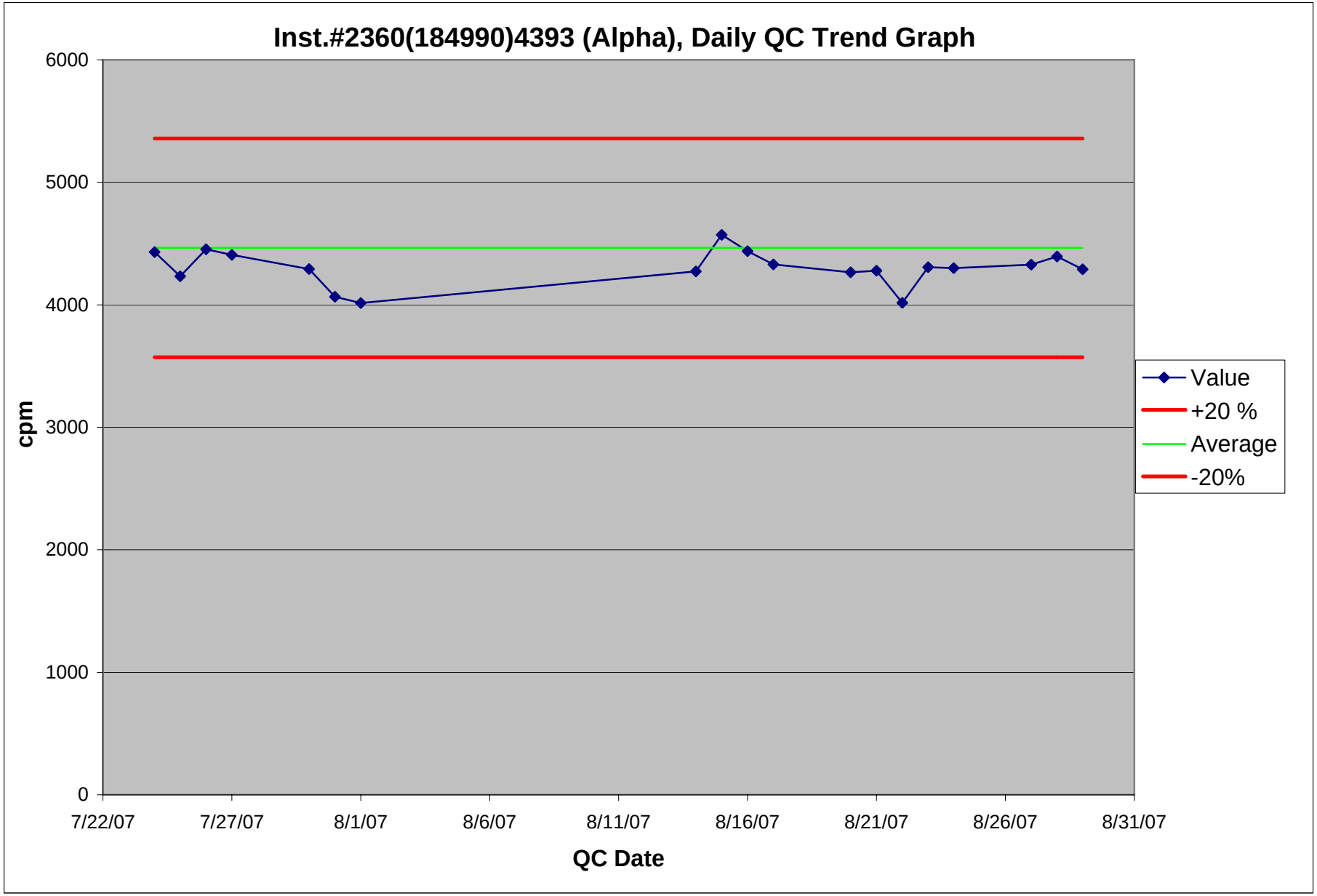

Inst.#2224(168594)4393 (Beta), Daily QC Trend Graph
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
cpm
7/8/07
7/9/07
7/10/07
7/11/07
7/12/07
7/13/07
7/14/07
7/15/07
7/16/07
7/17/07
7/18/07
QC Date
Value
+20 %
Average
-20%

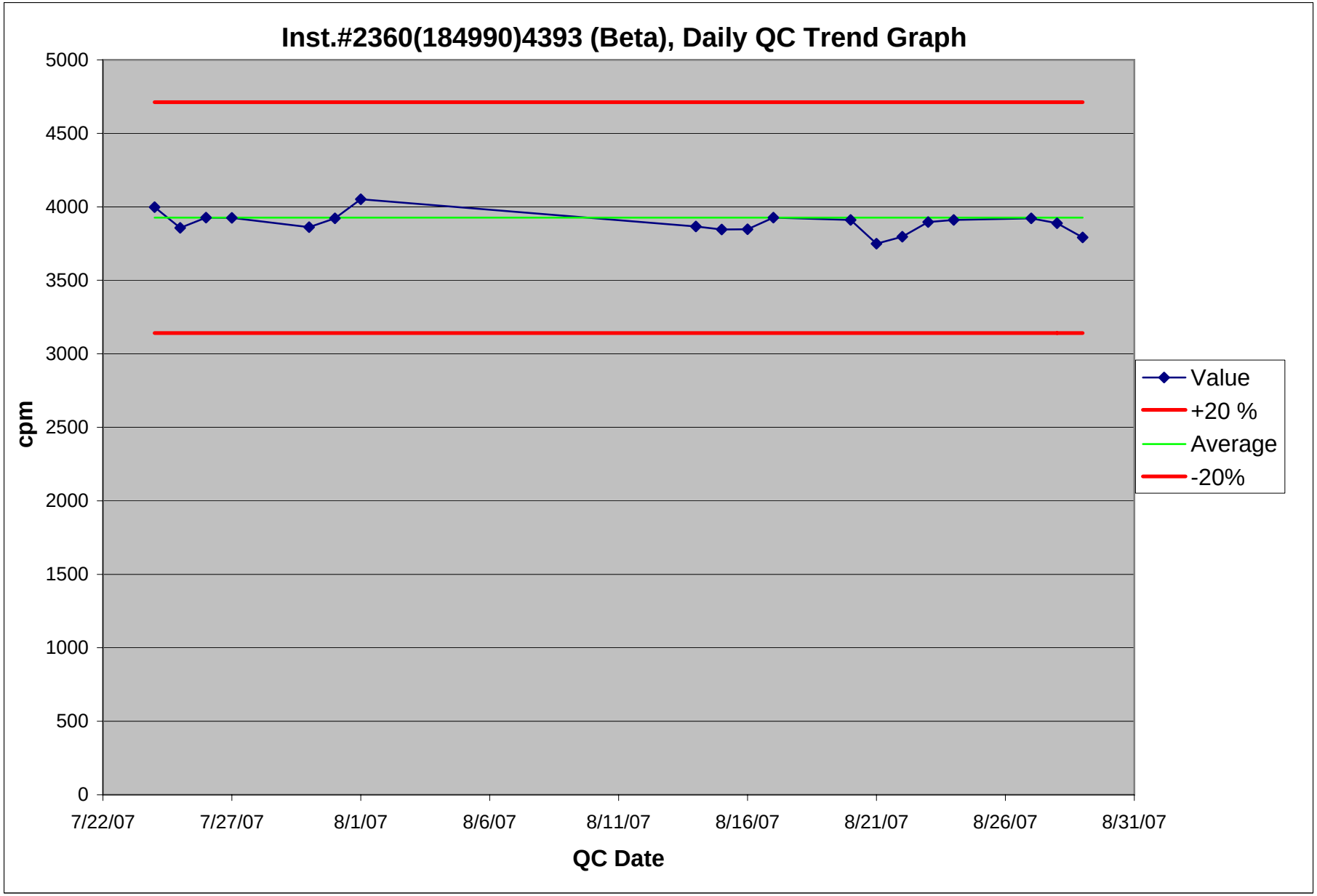

Inst.#2360(184930)4393 (Beta Bkg), Daily QC Trend Graph
300
250
200
150
100
50
0
cpm
9/30/07
10/5/07
10/10/07
10/15/07
10/20/07
10/25/07
10/30/07
11/4/07
11/9/07
11/14/07
QC Date
Value
+20 %
Average
-20%

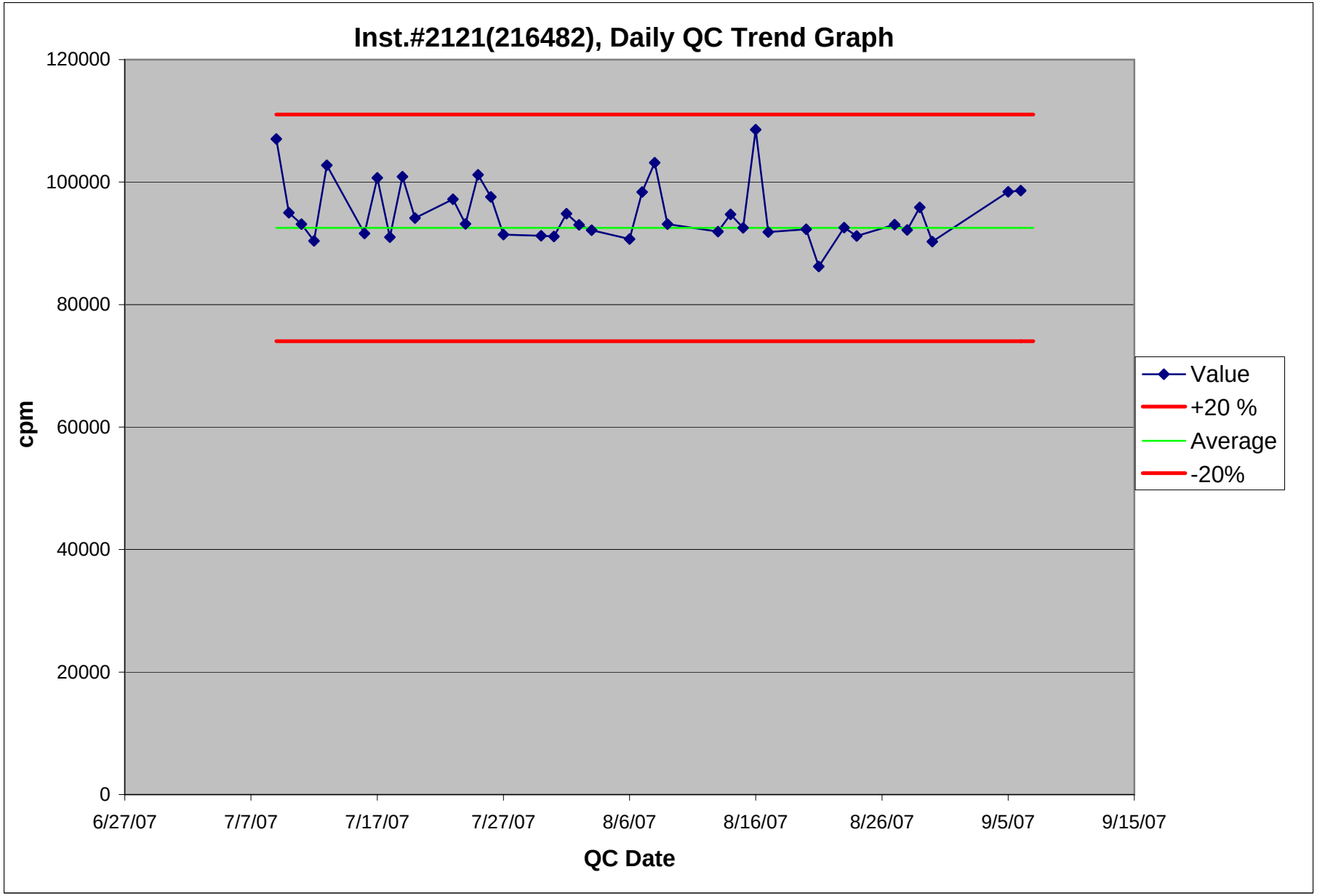

Inst.#2360(184930)4393 (Alpha), Daily QC Trend Graph
6000
5000
4000
3000
2000
1000
0
cpm
9/30/07
10/5/07
10/10/07
10/15/07
10/20/07
10/25/07
10/30/07
11/4/07
11/9/07
11/14/07
QC Date
Value
+20 %
Average
-20%


Inst.#2360(184930)4393 (Beta), Daily QC Trend Graph
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
cpm
9/30/07
10/5/07
10/10/07
10/15/07
10/20/07
10/25/07
10/30/07
11/4/07
11/9/07
11/14/07
QC Date
Value
+20 %
Average
-20%


Inst.#2360(184990)4393 (Beta Bkg), Daily QC Trend Graph
250
200
150
100
50
0
cpm
7/22/07
7/27/07
8/1/07
8/6/07
8/11/07
8/16/07
8/21/07
8/26/07
8/31/07
QC Date
Value
+20 %
Average
-20%


Inst.#2360(184990)4393 (Alpha), Daily QC Trend Graph
6000
5000
4000
3000
2000
1000
0
cpm
7/22/07
7/27/07
8/1/07
8/6/07
8/11/07
8/16/07
8/21/07
8/26/07
8/31/07
QC Date
Value
+20 %
Average
-20%


Inst.#2360(184990)4393 (Beta), Daily QC Trend Graph
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
cpm
7/22/07
7/27/07
8/1/07
8/6/07
8/11/07
8/16/07
8/21/07
8/26/07
8/31/07
QC Date
Value
+20 %
Average
-20%


Inst.#2121(216482), Daily QC Trend Graph
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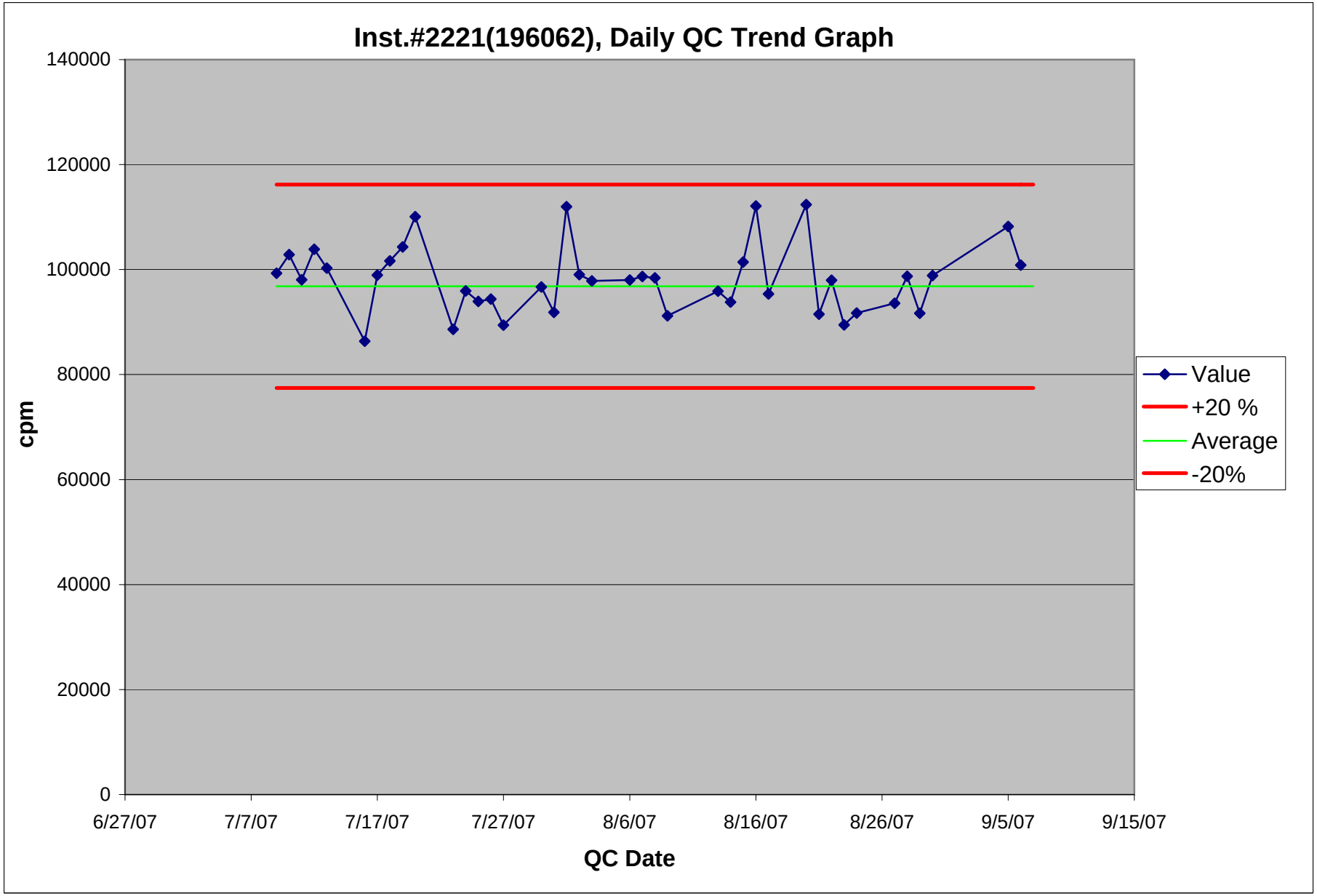
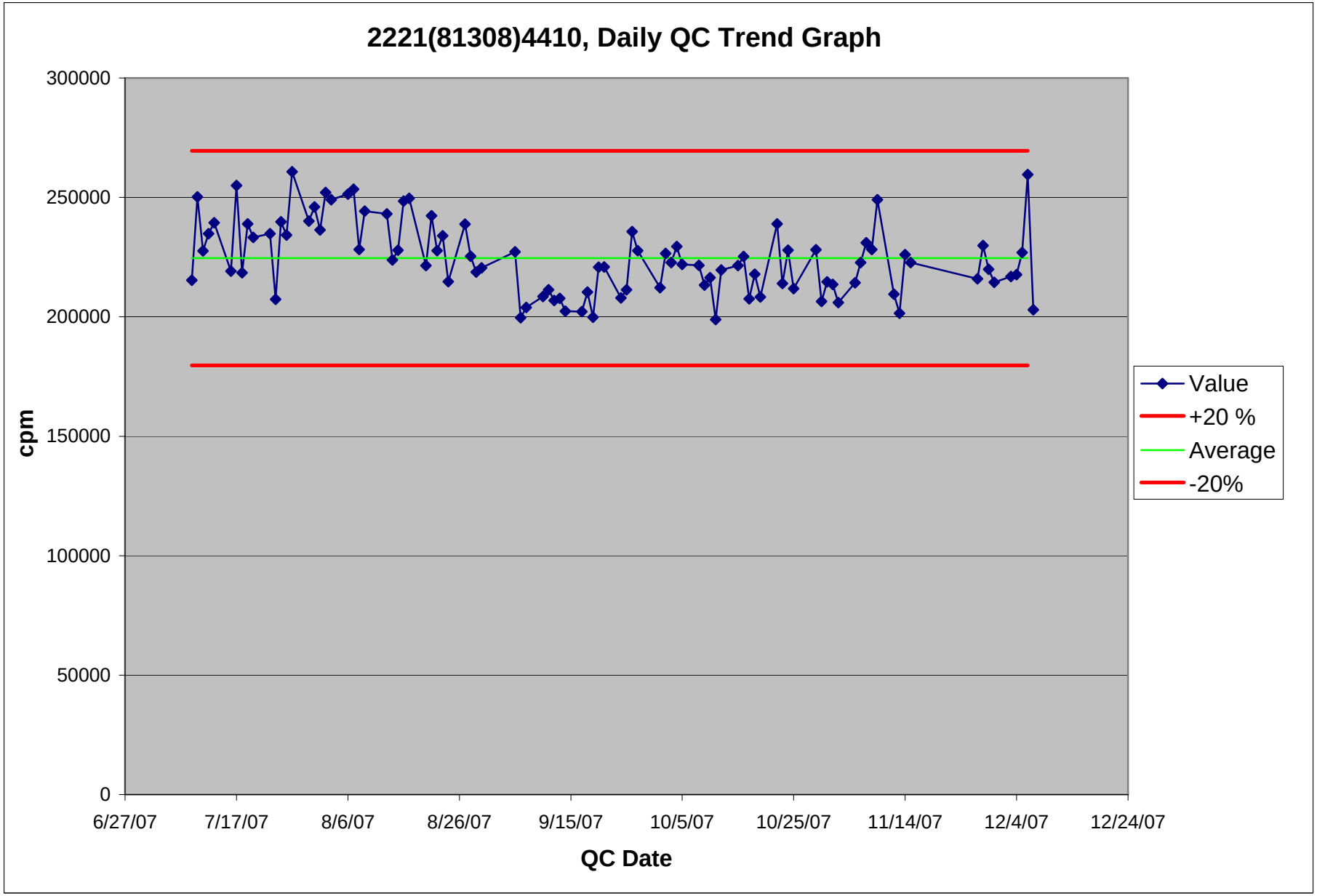
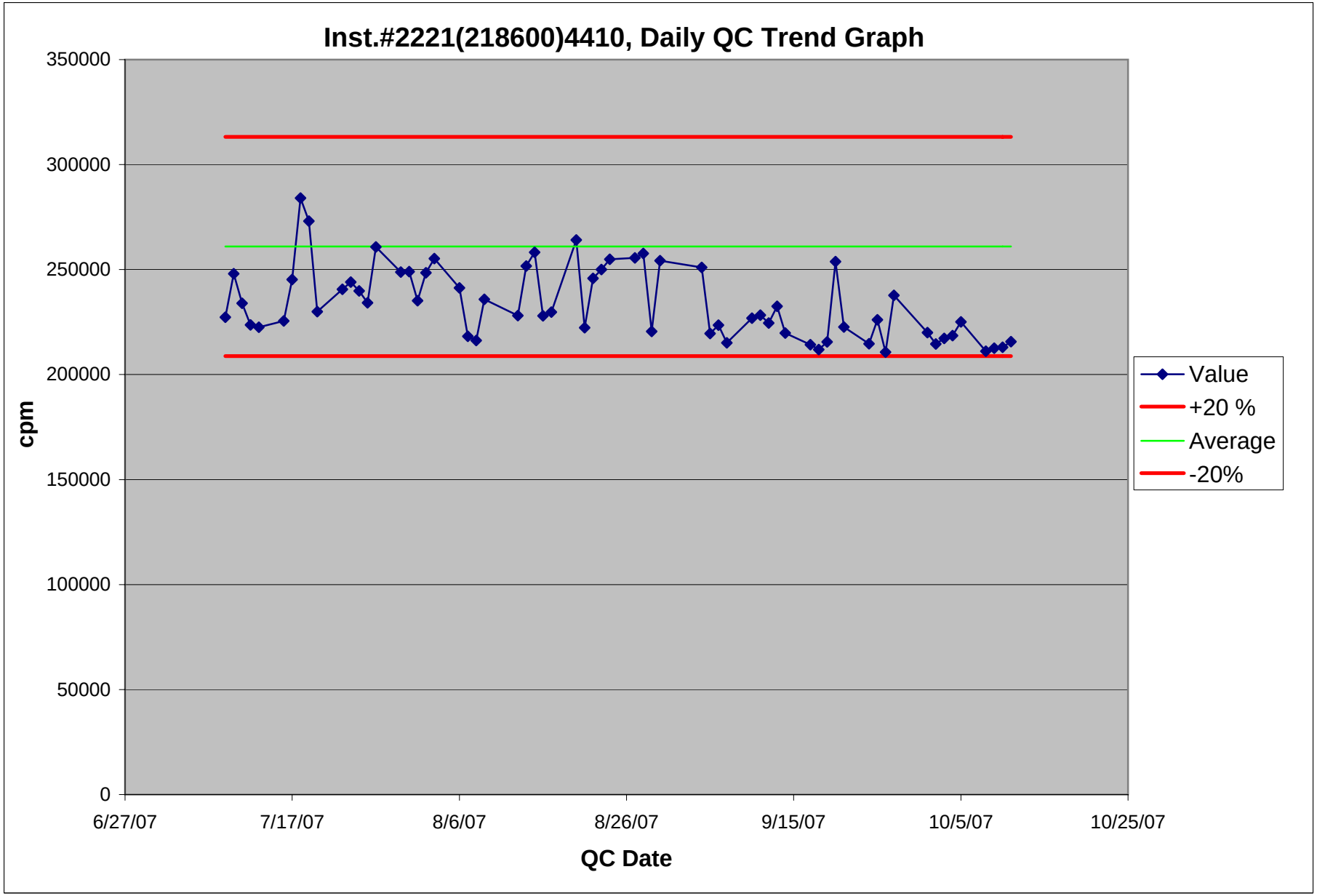
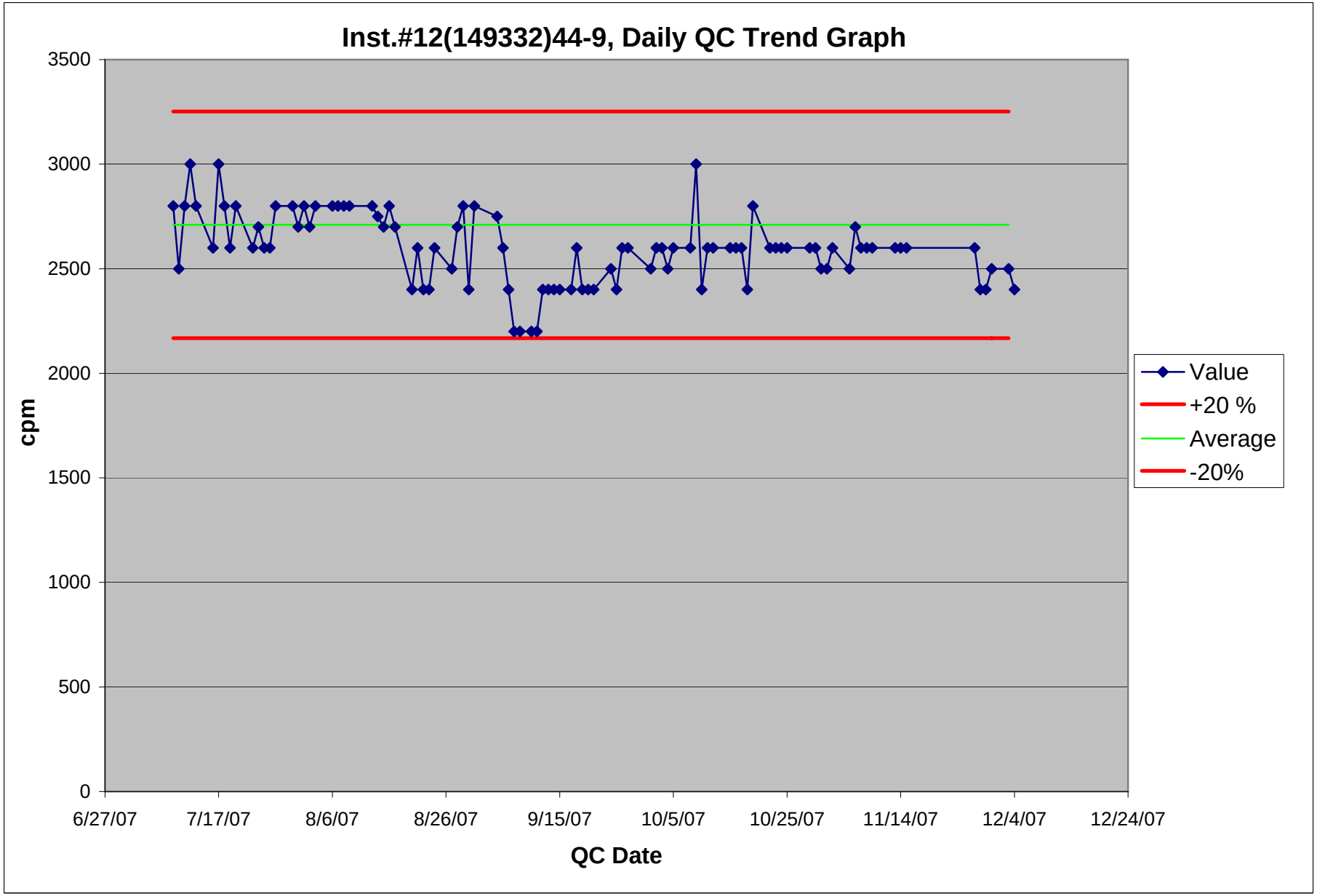
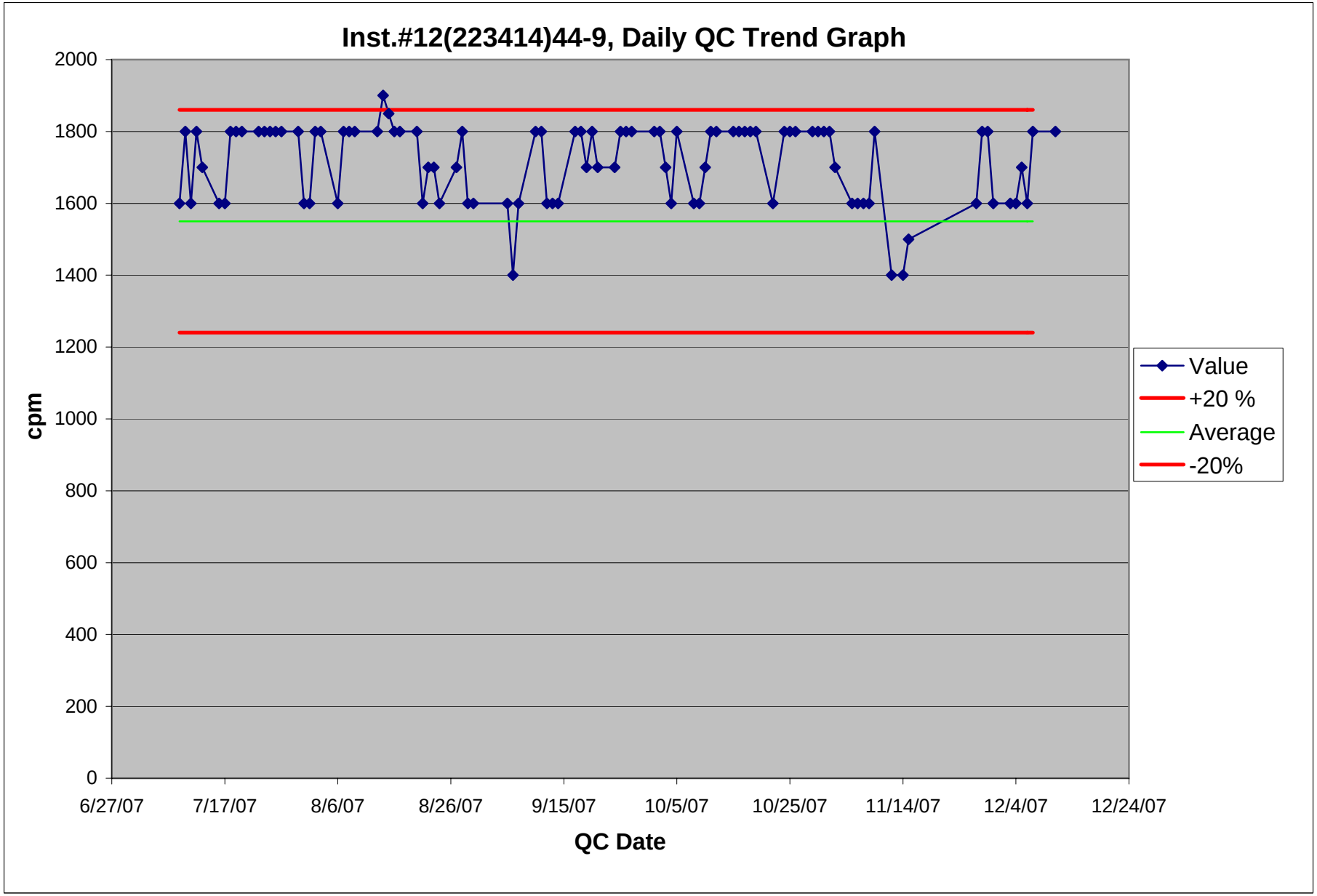
100000
80000
60000
40000
20000
0
cpm
6/27/07
7/7/07
7/17/07
7/27/07
8/6/07
8/16/07
8/26/07
9/5/07
9/15/07
QC Date
Value
+20 %
Average
-20%

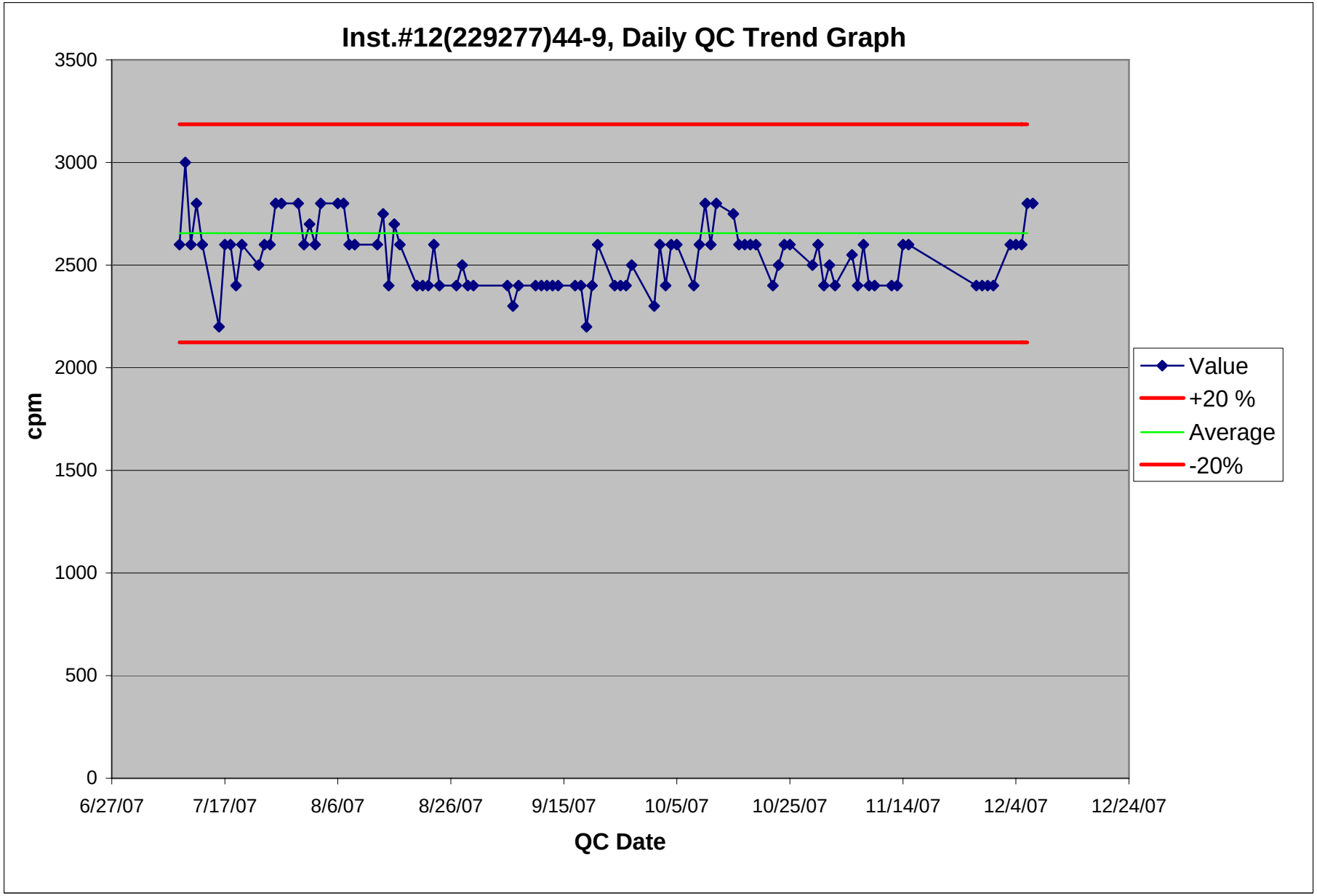

Inst.#2221(196062), Daily QC Trend Graph
140000
120000
100000
80000
60000
40000
20000
0
cpm
6/27/07
7/7/07
7/17/07
7/27/07
8/6/07
8/16/07
8/26/07
9/5/07
9/15/07
QC Date
Value
+20 %
Average
-20%


2221(81308)4410, Daily QC Trend Graph
300000
250000
200000
150000
100000
50000
0
cpm
6/27/07
7/17/07
8/6/07
8/26/07
9/15/07
10/5/07
10/25/07
11/14/07
12/4/07
12/24/07
QC Date
Value
+20 %
Average
-20%


Inst.#2221(218600)4410, Daily QC Trend Graph
350000
300000
250000
200000
150000
100000
50000
0
cpm
6/27/07
7/17/07
8/6/07
8/26/07
9/15/07
10/5/07
10/25/07
QC Date
Value
+20 %
Average
-20%


Inst.#12(149332)44-9, Daily QC Trend Graph
3500
3000
2500
2000
1500
1000
500
0
cpm
6/27/07
7/17/07
8/6/07
8/26/07
9/15/07
10/5/07
10/25/07
11/14/07
12/4/07
12/24/07
QC Date
Value
+20 %
Average
-20%


Inst.#12(223414)44-9, Daily QC Trend Graph
2000
1800
1600
1400
1200
1000
800
600
400
200
0
cpm
6/27/07
7/17/07
8/6/07
8/26/07
9/15/07
10/5/07
10/25/07
11/14/07
12/4/07
12/24/07
QC Date
Value
+20 %
Average
-20%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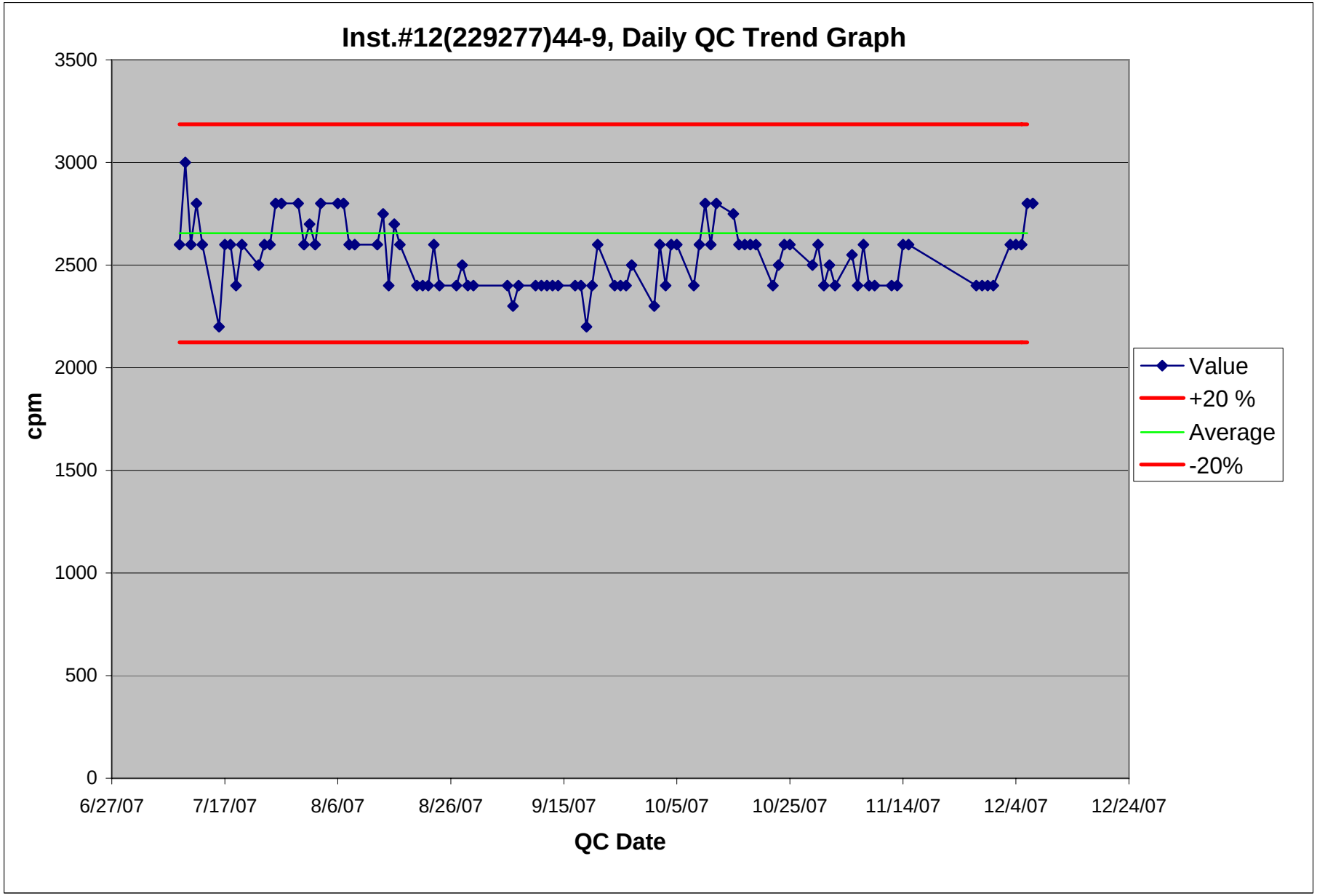
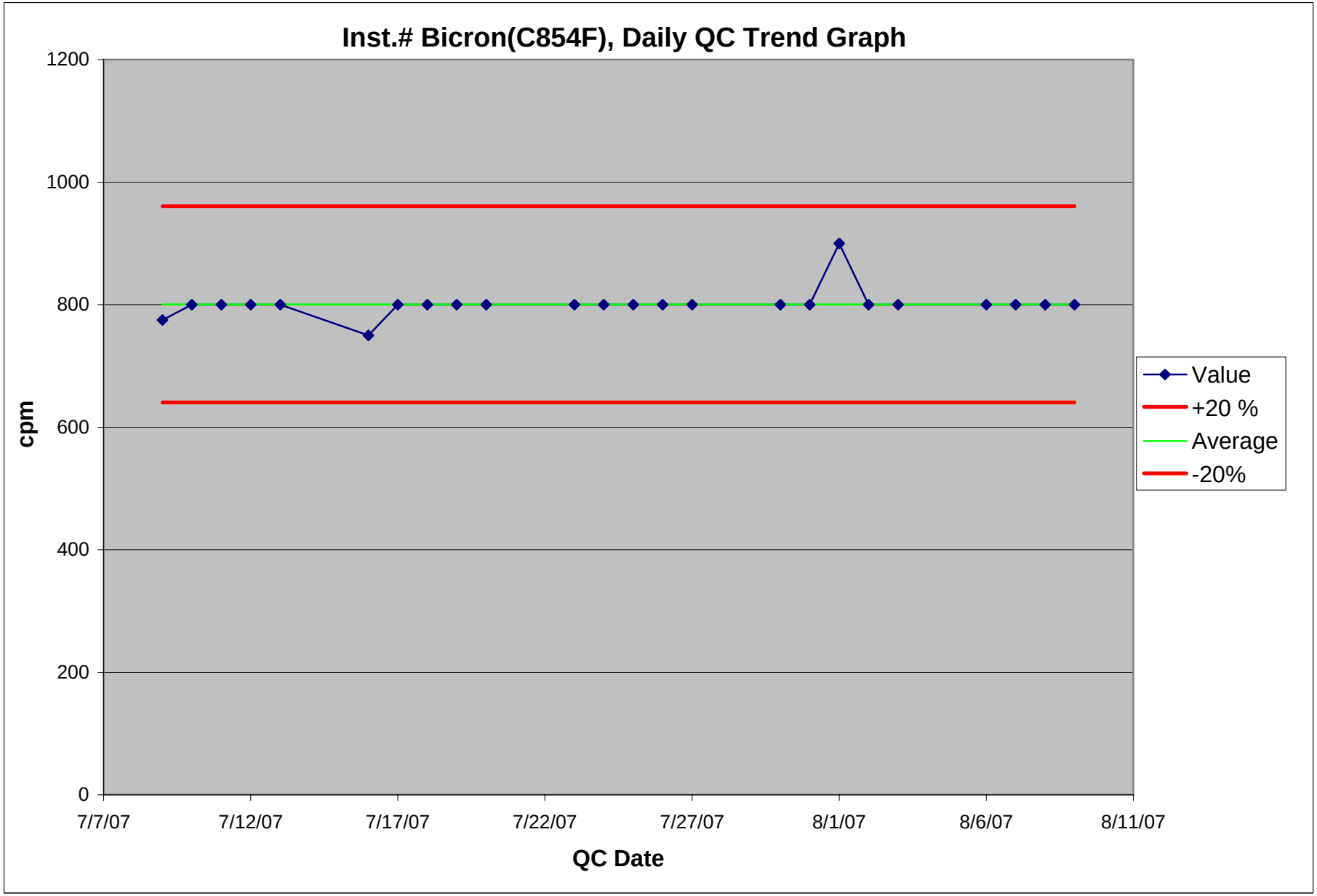
3500
3000
2500
2000
1500
1000
500
0
cpm
6/27/07
7/17/07
8/6/07
8/26/07
9/15/07
10/5/07
10/25/07
11/14/07
12/4/07
12/24/07
QC Date
Value
+20 %
Average
-20%


Inst.#12(229277)44-9, Daily QC Trend Graph
3500
3000
2500
2000
1500
1000
500
0
cpm
6/27/07
7/17/07
8/6/07
8/26/07
9/15/07
10/5/07
10/25/07
11/14/07
12/4/07
12/24/07
QC Date
Value
+20 %
Average
-20%


Inst.# Bicron(C854F), Daily QC Trend Graph
1200
1000
800
600
400
200
0
cpm
7/7/07
7/12/07
7/17/07
7/22/07
7/27/07
8/1/07
8/6/07
8/11/07
QC Date
Value
+20 %
Average
-20%

#1

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER CABRERA SERVICES ORDER NO. 276136/313051

Mfg. Ludlum Measurements, Inc. Model 2929 Serial No. 163827

Mfg. Ludlum Measurements, Inc. Model 43-10-1 Serial No. PR 171322

Cal. Date 9-May-07 Cal Due Date 9-May-08 Cal. Interval 1 Year Meterface 202-014

Check mark ☑ applies to applicable Instr. and/or detector IAW mfg. spec. T. 73 °F RH 55 % Alt 700.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Window Operation

☑ Audio ck.

☑ Meter Zeroed Alpha Sensitivity 175 mV Beta Sensitivity 4 mV Beta Window 50 mV

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 02/07/97.

Instrument Volt Set 850 V = 3.38 on High Voltage dial. High Voltage set with detector connected.

☑ HV Readout (2 points) Ref./Inst. 500 / 495 V Ref./Inst. 2000 / 1995 V

COMMENTS:

4pi Eff. for Ni63 ≈ 0.53%, Source Count= 1604 cpm, Background= 59 cpm, Source Size= 288947 dpm
4pi Eff. for Th230 ≈ 39.47%, Source Count= 7876 cpm, Background= 59 cpm, Source Size= 19800 dpm
4pi Eff. for Tc99 ≈ 29.47%, Source Count= 8548 cpm, Background= 59 cpm, Source Size= 28800 dpm
4pi Eff. for SrY90 ≈ 39.62%, Source Count= 22977 cpm, Background= 59 cpm, Source Size= 57834 dpm

Cal'd high voltage with detector connected.

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Alpha Channel Digital Readout	400K cpm	39949 (0)	39949 (0)
	40K cpm	3994	3994
	4K cpm	399	399
	400 cpm	40	40
	40 cpm	4	4

	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
Beta/Gamma Channel Digital Readout	400K cpm	40055 (0)	40055 (0)
	40K cpm	4006	4006
	4K cpm	405	405
	400 cpm	40	40
	40 cpm	4	4

*Uncertainty within ± 10% C.F. within ± 20%

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323-1978. State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: ☐ S-394/1122 ☐ 1131 ☐ 781

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ 720 ☐ 734 ☐ 1616 ☐ Neutron Am-241 Be S/N T-304

☑ Alpha S/N Th230: S/N 121495 ☑ Beta S/N Tc99 S/N 5279, Ni-63 S/N 99Ni2204017, ☑ Other SrY90 S/N 99Sr2204016

☑ m 500 S/N 190566 ☐ Oscilloscope S/N ☑ Multimeter S/N 86250390

Calibrated By: Jason Flores Date 9-May-07

Reviewed By: Rhonda Harris Date 9 May 07

AC Inst. Only ☑ Passed Dielectric (Hi-Pot) and Continuity Test ☐ Failed:

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.

FORM C25 01/24/2007

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 43-10-1 Serial No. PR 171322

Order #. 276136/313051

Customer CABRERA SERVICES

Alpha Input Sensitivity 125 mV

Counter 2929 Serial No. 163827

Beta Input Sensitivity 4 mV

Count Time 1Minute

Beta Window 50 mV

Other

Distance Source to Detector TRAY

High Voltage	Background		Isotope Th230 Size 19800 dpm		Isotope Tc 99 Size 28800 dpm		Isotope Sr Y 90 Size 57834 dpm	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
800	0	53	7846	414	14	6694	2	22195
825	0	69	7828	497	16	7679	5	22663
850	0	59	7876	602	12	8548	2	22977
875	0	82	7984	778	10	8806	4	22888

☐ Gas Proportional detector count rate decreased ≤ 10% after 15 hour static test using 39" cable.

☐ Gas proportional detector count rate decreased ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter.

Signature Jason Flores

Date 9-MAY-07

FORM C4B 04/09/2003

#1

Designer and Manufacturer of Scientific and Industrial Instruments

CERTIFICATE OF CALIBRATION

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

CUSTOMER CABRERA SERVICES ORDER NO. 282824 / 316758

Mfg. Ludlum Measurements, Inc. Model 2929 Serial No. 163827

Mfg. Ludlum Measurements, Inc. Model 43-10-1 Serial No. PR-171322

Cal. Date 7-Sep-07 Cal Due Date 7-Sep-08 Cal. Interval 1 Year Meterface 202-014

Check mark ☑ applies to applicable instr. and/or detector IAW mfg. spec. T. 75 °F RH 47 % Alt 697.8 mm Hg

☐ New Instrument Instrument Received ☑ Within Toler. +-10% ☐ 10-20% ☐ Out of Tol. ☐ Requiring Repair ☐ Other-See comments

☑ Mechanical ck. ☑ Window Operation

☑ Audio ck.

☑ Meter Zeroed Alpha Sensitivity 175 mV Beta Sensitivity 4 mV Beta Window 50 mV

☑ Calibrated in accordance with LMI SOP 14.8 rev 12/05/89. ☐ Calibrated in accordance with LMI SOP 14.9 rev 02/07/97.

Instrument Volt Set 850 V = 3.48 on High Voltage dial. High Voltage set with detector connected.

☑ HV Readout (2 points) Ref./Inst. 500 / 481 V Ref./Inst. 2000 / 2006 V

COMMENTS:

4pi Efficiencies:
Th230: Source size = 19,800 dpm, Background = 1 cpm, Source count = 8,084 cpm, Efficiency ≈ 40.82%
Tc99: Source size = 33,200 dpm, Background = 50 cpm, Source count = 9,028 cpm, Efficiency ≈ 27.04%
Ni-63: Source size = 288,285 dpm, Background = 50 cpm, Source count = 6,995 cpm, Efficiency ≈ 2.41%
SrY90: Source size = 110,836 dpm, Background = 50 cpm, Source count = 48,727 cpm, Efficiency ≈ 43.92%

Gamma Calibration: GM detectors positioned perpendicular to source except for M 44-9 in which the front of probe faces source.

Alpha Channel Digital Readout	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
	400K cpm	40071 (0)	40071 (0)
	40K cpm	4008	4008
	4K cpm	400	400
	400 cpm	40	40
	40 cpm	4	4

Beta/Gamma Channel Digital Readout	REFERENCE CAL POINT	INSTRUMENT RECEIVED	INSTRUMENT METER READING*
	400K cpm	40048 (0)	40048 (0)
	40K cpm	4004	4004
	4K cpm	400	400
	400 cpm	40	40
	40 cpm	4	4

*Uncertainty within ± 10% C.F. within ± 20%

Ludlum Measurements, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology, or to the calibration facilities of other International Standards Organization members, or have been derived from accepted values of natural physical constants or have been derived by the ratio type of calibration techniques. The calibration system conforms to the requirements of ANSI/NCSL Z540-1-1994 and ANSI N323-1978. State of Texas Calibration License No. LO-1963

Reference Instruments and/or Sources: ☐ S-394/1122 ☐ 1131 ☐ 781

Cs-137 Gamma S/N ☐ 1162 ☐ G112 ☐ M565 ☐ 5105 ☐ T1008 ☐ T879 ☐ E552 ☐ E551 ☐ 720 ☐ 734 ☐ 1616 ☐ Neutron Am-241 Be S/N T-304

☑ Alpha S/N Th230 s/n 121495 ☑ Beta S/N Tc99 s/n 5296, Ni-63 s/n 99NI2204017, SrY90 s/n 5281 ☐ Other

☑ m 500 S/N 114520 ☐ Oscilloscope S/N ☑ Multimeter S/N 78401030

Calibrated By: Sebastian Ceballos Date 07-Sep-07

Reviewed By: Rhonda Harris Date 9 Sep 07

This certificate shall not be reproduced except in full, without the written approval of Ludlum Measurements, Inc.
FORM C25 01/24/2007

AC Inst. Only ☑ Passed Dielectric (Hi-Pot) and Continuity Test ☐ Failed:

Designer and Manufacturer
of
Scientific and Industrial
Instruments

LUDLUM MEASUREMENTS, INC.
POST OFFICE BOX 810 PH. 325-235-5494
501 OAK STREET FAX NO. 325-235-4672
SWEETWATER, TEXAS 79556, U.S.A.

Bench Test Data For Detector

Detector 43-10-1 Serial No. PR-171322

Customer CABRERA SERVICES

Counter 2929 Serial No. 163827

Count Time 1Minute

Other

Order #. 282824 / 316758

Alpha Input Sensitivity 175 mV

Beta Input Sensitivity 4 mV

Beta Window 50 mV

Distance Source to Detector tray

High Voltage	Background		Isotope Th230 Size 19,800 dpm		Isotope Tc99 Size 33,200 dpm		Isotope Sr90 Size 110,836 dpm		Isotope Ni-63 Size 288,285 dpm	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
825V	0	61	8,028	726	9	8,412	11	49,593	3	4,037
* 850	1	50	8,084	890	12	9,028	46	48,727	2	6,995
875	0	69	8,039	1,122	11	9,712	129	46,530	2	10,356

☐ Gas Proportional detector count rate decreased ≤ 10% after 15 hour static test using 39" cable.

☐ Gas proportional detector count rate decreased ≤ 10% after 5 hour static test using 39" cable and alpha/beta counter.

Signature Sebastn Ceballos Date 07-Sep-07

FORM C4B-1 04/08/2005

Certificate of Calibration

2 Channel Scaler Certificate of Calibration

ERG
Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Manufacturer: Ludlum Model: 2929 Serial No.: 208319

All Ranges Calibrated Electronically; Ludlum Pulser Generator Serial No.: 97743 ☐ 201932 ☑

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 481-3 • Calibration of Radiation Detection Instruments & Devices

☑ Mechanical ck. ☐ Meter Zeroed ☐ Geotropism ck. ☐ F/S Response ck. ☑ Audio ck.

☐ THR/WIN ck. High Voltage ck. ☑ 500v ☑ 1000v ☑ 1500v ☐ Battery ck. (min 4.4 vdc)

Alpha Threshold.: 170 mV Beta Threshold.: 4 mV Beta Window.: 50 mV

Voltage setting: 550 volts = 2.26 on HV Dial (Pot.)

Instrument found within tolerance (+/- 10%) ☑ Yes ☐ No

Reference Setting	Alpha Channel Digital Readout		Beta Channel Digital Readout	
	Instrument "As Found Reading"	Integrated Counts (1-minute count)	Instrument "As Found Reading"	Integrated Counts (1-minute count)
400 Kcpm	+/- 10%	399305	+/- 10%	399347
40 Kcpm	+/- 10%	39936	+/- 10%	39936
4 Kcpm	+/- 10%	3994	+/- 10%	3994
400 cpm	+/- 10%	400	+/- 10%	399

Calibrated By: [signature] Calibration Date: 7-3-07

Calibration Due: 7-3-08

Reviewed By: [signature] Date: 7/3/07

Certificate of Calibration

Voltage Plateau Form

ERG
Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Detector Mfg.: Ludlum Model: 43-10-1 Serial No.: PR215938

Counter Mfg.: Ludlum Model: 2929 Serial No.: 208319

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 481-3 • Calibration of Radiation Detection Instruments & Devices

Alpha Threshold: 170 mV Beta Threshold: 4 mV Beta Window: 50 mV

Geometry / Distance to source: In planchett Cable Length: ☑ 39 inch ☐ Other:

Alpha Source : ☑ Th230 @ 13,300 dpm (1/19/07) sn: 4098-03 ☐ Other:

Beta Source: ☑ Tc99 @ 17,800 dpm (1/15/07) sn: 4099-03 ☐ Other:

Count Time: 1 minute(s)

High Voltage	Alpha Source Counts		Beta Source Counts		Background Counts		Pot. Setting
	Alpha	Beta	Alpha	Beta	Alpha	Beta	
450	3634	293	4	607	2	8	1.86
500	4646	234	2	2143	1	35	2.06
550	4819	376	3	3424	1	51	2.26
600	4817	699	3	4712	0	53	2.46
650	4878	1887	7	5084	1	88	2.66

Comments: Recommended Operating High Voltage: 550 volts

Calibrated By: Calibration Date: 7-3-07

Calibration Due: 7-3-08

Reviewed By: Date: 7/3/07

#7

Certificate of Calibration

Ratemeter Certificate of Calibration

ERG
Environmental Restoration Group, Inc.
8809 Washingtion St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Manufacturer: Ludlum Model: 2224 Serial No.: 143031

All Ranges Calibrated Electronically; Ludlum Pulser Generator Serial No.: ☐ 97743 ☑ 201932

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 481-3 • Calibration of Radiation Detection Instruments & Devices

☑ Mechanical ck. ☑ Meter Zeroed ☑ Geotropism ck. ~~☐ F/S Response ck.~~ ☑ Audio ck.

~~☐ THR/WIN ck.~~ High Voltage ck. ☑ 500v ☑ 1000v ☑ 1500v ☑ Battery ck. (min 4.4 vdc)

Alpha Threshold.: 120 mV Beta Threshold.: 4 mV Beta Window.: 30 mV

~~Internal Calibration Date Reset~~ ☐ Instrument found within tolerance (+/- 10%) Yes ☑ No ☐

Reference Setting	Instrument "As Found Reading"	Instrument Meter Reading
400 Kcpm	+/- 10%	400 Kcpm
100 Kcpm	+/- 10%	100 Kcpm
40 Kcpm	+/- 10%	40 Kcpm
10 Kcpm	+/- 10%	10 Kcpm
4 Kcpm	+/- 10%	4 Kcpm
1 Kcpm	+/- 10%	1 Kcpm
400 cpm	+/- 10%	400 cpm
100 cpm	+/- 10%	100 cpm

Reference Setting	Instrument "As Found Reading"	Integrated Counts (1-minute count)
400 Kcpm	+/- 10%	399617
40 Kcpm	+/- 10%	39960
4 Kcpm	+/- 10%	3995
400 cpm	+/- 10%	400

Calibrated By: [signature] Calibration Date: 7-5-07

Calibration Due: 7-5-08

Reviewed By: [signature] Date: 7-5-07

ERG Form 1.02C

Certificate of Calibration

Voltage Plateau Form

ERG
Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Detector Mfg.: Ludlum Model: 43-93 Serial No.: PR179869

Counter Mfg.: Ludlum Model: 2224 Serial No.: 143031

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 481-3 • Calibration of Radiation Detection Instruments & Devices

Alpha Threshold: 120 mV Beta Threshold: 4 mV Beta Window: 30 mV

Detector geometry to source: ☑ Face, ☐ Side, ☐ Below, ☐ Other:

Distance to source: ☑ Contact, ☐ 6-Inches, ☐ Other:

Alpha Source : ☑ Th230 @ 13,300 dpm (1/19/07) sn: 4098-03 ☐ Other:

Beta Source: ☑ Tc99 @ 17,800 dpm (1/15/07) sn: 4099-03 ☐ Other:

Count Time: 1 Minute

High Voltage	Alpha Source Counts		Beta Source Counts		Background Counts	
	Alpha	Beta	Alpha	Beta	Alpha	Beta
700	1555	334	9	758	1	104
750	2596	511	8	2301	2	247
775	2751	578	9	2666	2	259
800	2900	677	12	3000	1	307

Comments: Recommended Operating High Voltage: 775 volts

Calibrated By: [signature] Calibration Date: 7-5-07

Calibration Due: 7-5-08

Reviewed By: [signature] Date: 7-5-07

#8

Certificate of Calibration

Ratemeter Certificate of Calibration

ERG
Environmental Restoration Group, Inc.
8809 Washingtion St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Manufacturer: Ludlum Model: 2224 Serial No.: 168594

All Ranges Calibrated Electronically; Ludlum Pulser Generator Serial No.: ☐ 97743 ☑ 201932

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 481-3 • Calibration of Radiation Detection Instruments & Devices

☑ Mechanical ck. ☑ Meter Zeroed ☑ Geotropism ck. ☐ ~~F/S Response ck.~~ ☑ Audio ck.

☐ ~~THR/WIN ck.~~ High Voltage ck. ☑ 500v ☑ 1000v ☑ 1500v ☑ Battery ck. (min 4.4 vdc)

Alpha Threshold.: 120 mV Beta Threshold.: 4 mV Beta Window.: 30 mV

~~Internal Calibration Date Reset~~ ☐ Instrument found within tolerance (+/- 10%) Yes ☑ No ☐

Reference Setting	Instrument "As Found Reading"	Instrument Meter Reading
400 Kcpm	+/- 10%	400 Kcpm
100 Kcpm	+/- 10%	100 Kcpm
40 Kcpm	+/- 10%	40 Kcpm
10 Kcpm	+/- 10%	10 Kcpm
4 Kcpm	+/- 10%	4 Kcpm
1 Kcpm	+/- 10%	1 Kcpm
400 cpm	+/- 10%	400 cpm
100 cpm	+/- 10%	100 cpm

Reference Setting	Instrument "As Found Reading"	Integrated Counts (1-minute count)
400 Kcpm	+/- 10%	399241
40 Kcpm	+/- 10%	39930
4 Kcpm	+/- 10%	3993
400 cpm	+/- 10%	399

Calibrated By: [signature] Calibration Date: 7-5-07

Calibration Due: 7-5-08

Reviewed By: [signature] Date: 07/05/07

ERG Form 1.02C

Certificate of Calibration

Voltage Plateau Form

ERG
Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Detector Mfg.: Ludlum Model: 43-93 Serial No.: PR199826

Counter Mfg.: Ludlum Model: 2224 Serial No.: 168594

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 481-3 • Calibration of Radiation Detection Instruments & Devices

Alpha Threshold: 120 mV Beta Threshold: 4 mV Beta Window: 30 mV

Detector geometry to source: ☑ Face, ☐ Side, ☐ Below, ☐ Other:

Distance to source: ☑ Contact, ☐ 6-Inches, ☐ Other:

Alpha Source : ☑ Th230 @ 13,300 dpm (1/19/07) sn: 4098-03 ☐ Other:

Beta Source: ☑ Tc99 @ 17,800 dpm (1/15/07) sn: 4099-03 ☐ Other:

Count Time: 1 Minute

High Voltage	Alpha Source Counts		Beta Source Counts		Background Counts	
	Alpha	Beta	Alpha	Beta	Alpha	Beta
650	1739	322	26	577	0	68
700	2464	367	18	1993	3	170
750	2786	675	19	3088	2	241
800	2917	1243	21	4207	4	339

Comments: Recommended Operating High Voltage: 750 volts

Calibrated By: [signature] Calibration Date: 7-5-07

Calibration Due: 7-5-08

Reviewed By: [signature] Date: ~~7~~ 7/5/07

Certificate of Calibration

Ratemeter Certificate of Calibration

ERG
Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Manufacturer: Ludlum Model: 2360 Serial No.: 184930

All Ranges Calibrated Electronically; Ludlum Pulser Generator Serial No.: ☐ 97743 ☑ 201932

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 481-3 • Calibration of Radiation Detection Instruments & Devices

☑ Mechanical ck. ☑ Meter Zeroed ☑ Geotropism ck. ☐ F/S Response ck. ☑ Audio ck.

☐ THR/WIN ck. High Voltage ck. ☑ 500v ☑ 1000v ☑ 1500v ☑ Battery ck. (min 4.4 vdc)

Alpha Threshold.: 120 mV Beta Threshold.: 4 mV Beta Window.: 30 mV

Internal Calibration Date Reset ☑ Instrument found within tolerance (+/- 10%) Yes ☑ No ☐

Reference Setting	Instrument "As Found Reading"	Instrument Meter Reading
400 Kcpm	+/- 10%	400 Kcpm
100 Kcpm	+/- 10%	100 Kcpm
40 Kcpm	+/- 10%	40 Kcpm
10 Kcpm	+/- 10%	10 Kcpm
4 Kcpm	+/- 10%	4 Kcpm
1 Kcpm	+/- 10%	1 Kcpm
400 cpm	+/- 10%	400 cpm
100 cpm	+/- 10%	100 cpm

Reference Setting	Instrument "As Found Reading"	Integrated Counts (1-minute count)
400 Kcpm	+/- 10%	399828
40 Kcpm	+/- 10%	39985
4 Kcpm	+/- 10%	3999
400 cpm	+/- 10%	400

Calibrated By: [signature] Calibration Date: 7-20-07

Calibration Due: 7-20-08

Reviewed By: [signature] Date: 7/20/07

ERG Form 1.02C

Certificate of Calibration

Voltage Plateau Form

ERG
Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Detector Mfg.: Ludlum Model: 43-93 Serial No.: PR199838

Counter Mfg.: Ludlum Model: 2360 Serial No.: 184930

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 481-3 • Calibration of Radiation Detection Instruments & Devices

Alpha Threshold: 120 mV Beta Threshold: 4 mV Beta Window: 30 mV

Detector geometry to source: ☑ Face, ☐ Side, ☐ Below, ☐ Other:

Distance to source: ☑ Contact, ☐ 6-Inches, ☐ Other:

Alpha Source : ☑ Th230 @ 13,300 dpm (1/19/07) sn: 4098-03 ☐ Other:

Beta Source: ☑ Tc99 @ 17,800 dpm (1/15/07) sn: 4099-03 ☐ Other:

Count Time: 1 Minute

High Voltage	Alpha Source Counts		Beta Source Counts		Background Counts	
	Alpha	Beta	Alpha	Beta	Alpha	Beta
600	1877	253	5	327	0	51
650	2714	332	7	1801	2	165
700	2869	584	3	3112	3	276
725	2917	908	8	3913	4	624

Comments: Recommended Operating High Voltage: 700 volts

Calibrated By: [signature] Calibration Date: 7-20-07

Calibration Due: 7-20-08

Reviewed By: [signature] Date: 7/20/07

#3

Calibration Technology
A Division of RSCS, Inc.

Calibration Certificate
ID Number: 21648211655-0

Customer: Chuck Mikaitis
Cabrera Services, Inc.
473 Silver Lane
East Hartford, CT 06118-

Instrument
Ludlum Model 2221

Serial Number
216482

Probe Model
Bicron G-1

Serial Number
C358C

Precision Check

Test 1	Test 2	Test 3	Mean	Results
9.95 Kcpm	**9.96 Kcpm**	**9.96 Kcpm**	**9.95 Kcpm**	**Satisfactory**

Accuracy Check

Range	Target Value	As Found	As Left
X1000	400 Kcpm	400.549 Kcpm #	400.549 Kcpm #
X1000	100 Kcpm	99.530 Kcpm #	99.530 Kcpm #
X100	40 Kcpm	40.016 Kcpm #	40.016 Kcpm #
X100	10 Kcpm	9.953 Kcpm #	9.953 Kcpm #
X10	4 Kcpm	4.010 Kcpm #	4.010 Kcpm #
X10	1 Kcpm	0.995 Kcpm #	0.995 Kcpm #
X1	400 cpm	400 cpm #	400 cpm #
X1	100 cpm	99 cpm #	99 cpm #

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10% of Target value
Readings with # indicate ranges were calibrated using a pulser

Probe Model & SN	Isotope	Efficiency	NIST Source ID	Geometry
G-1 C358C	Ba-133	0.1638 C/D	Ba-133 (SN: 380-39-1)	@1cm
G-1 C358C	Co-57	0.1404 C/D	Co-57 (SN: 14288)	@1cm
G-1 C358C	Cs-137	0.0427 C/D	Cs-137 (SN: 14290)	@1cm
G-1 C358C	I-129	0.0598 C/D	I-129 (SN: NES-186S)	@1cm

MTE Instrument Type	Model	CalDueDate
Pulser	Ludlum 500-4SN: 66151	01/15/2008

Outer Physical Check: *Pass*
Internal Check: *Pass*
Geotropism Check: *Pass*
Mechanical Zero: *Pass*
Tap Test: *Pass*

Electronics Checks	As Found	As Left
High Voltage	**945 Volts**	**945 Volts**
Low Level Discriminator #1	**10 mV**	**10 mV**
Window	**Out**	**Out**

Comments: Analog and digital displays reflect appropriate congruence.

Calibrated by: QA Review:

Date: 05/04/2007
Expires: 05/04/2008

Atmospheric Conditions - Temperature: 74° F Humidity: 21 % Barometric Pressure: 29.99 in/hg
This calibration was performed by RSCS using a NIST Traceable radiation source, in conformance to the following standards: ANSI N323A (1997). RSCS New Hampshire Radioactive Material License Number: 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedure 2.4.
This calibration certificate shall not be reproduced except in full without the express written consent of RSCS, inc

Radiation Safety and Control Services, Inc.
91 Portsmouth Ave. Stratham, NH 03885
1-800-525-8339 (603) 778-2871 Fax (603) 778-6879 www.radsafety.com

#4

Calibration Certificate
ID Number: 19606211654-0

Calibration Technology
A Division of RSCS, Inc.

Customer: Chuck Mikaitis
Cabrera Services, Inc.
473 Silver Lane
East Hartford, CT 06118-

Instrument
Ludlum Model 2221

Serial Number
196062

Probe Model
Bicron G-1

Serial Number
C443E

Precision Check

Test 1	Test 2	Test 3	Mean	Results
9.99 Kcpm	**9.99 Kcpm**	**9.99 Kcpm**	**9.99 Kcpm**	**Satisfactory**

Accuracy Check

Range	Target Value	As Found	As Left
X1000	400 Kcpm	399.622 Kcpm #	399.622 Kcpm #
X1000	100 Kcpm	100.139 Kcpm #	100.139 Kcpm #
X100	40 Kcpm	39.987 Kcpm #	39.987 Kcpm #
X100	10 Kcpm	9.993 Kcpm #	9.993 Kcpm #
X10	4 Kcpm	4.007 Kcpm #	4.007 Kcpm #
X10	1 Kcpm	0.999 Kcpm #	0.999 Kcpm #
X1	400 cpm	401 cpm #	401 cpm #
X1	100 cpm	100 cpm #	100 cpm #

Readings with * indicate ranges where As-Found readings are >20% of Target value. Readings with ** indicate As-left readings are >10% of Target value
Readings with # indicate ranges were calibrated using a pulser

Probe Model & SN	Isotope	Efficiency	NIST Source ID	Geometry
G-1 C443E	Ba-133	0.1736 C/D	Ba-133 (SN: 380-39-1)	@1cm
G-1 C443E	Co-57	0.1515 C/D	Co-57 (SN: 14288)	@1cm
G-1 C443E	Cs-137	0.0450 C/D	Cs-137 (SN: 14290)	@1cm
G-1 C443E	I-129	0.0684 C/D	I-129 (SN: NES-186S)	@1cm

MTE Instrument Type	Model	CalDueDate
Pulser	Ludlum 500-4SN: 66151	01/15/2008

Outer Physical Check: *Pass*
Internal Check: *Pass*
Geotropism Check: *Pass*
Mechanical Zero: *Pass*
Tap Test: *Pass*

Electronics Checks	As Found	As Left
High Voltage	880 Volts	880 Volts
Low Level Discriminator #1	3.4 mV	10 mV
Window	In	Out

Comments: Analog and digital displays reflect appropriate congruence.

Calibrated by: D. C. L.

QA Review: M. Faith

Date: 05/04/2007
Expires: 05/04/2008

Atmospheric Conditions - Temperature: 74° F Humidity: 21 % Barometric Pressure: 29.99 in/hg
This calibration was performed by RSCS using a NIST Traceable radiation source, in conformance to the following standards: ANSI N323A (1997). RSCS New Hampshire Radioactive Material License Number: 381R. RSCS calibration services are performed in accordance with the RSCS Radiation Protection Program Manual and Standard Operating Procedure 2.4.
This calibration certificate shall not be reproduced except in full without the express written consent of RSCS, Inc

Radiation Safety and Control Services, Inc.
91 Portsmouth Ave. Stratham, NH 03885
1-800-525-8339 (603) 778-2871 Fax (603) 778-6879 www.radsafety.com

#5

Certificate of Calibration

Voltage Plateau Form

ERG
Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Detector Mfg.: Ludlum Model: 44-10 Serial No.: PR144074

Counter Mfg.: Ludlum Model: 2221 Serial No.: 81308

This calibration conforms to the requirements and acceptable calibration conditions of ANSI N323A - 1997.
NMRCB Registration No. 481-3 • Calibration of Radiation Detection Instruments & Devices

Counter Threshold Setting: 10 mV Cable Length: ☐ 39 inch, ☐ 5 foot, ☑ Other:

Detector geometry to source: ☐ Face, ☑ Side, ☐ Below, ☐ Other:

Distance to source: ☐ Contact, ☑ 6-Inches, ☐ Other:

Gamma Source : ☑ Cs-137 @ 5.81μCi (3/07/07) sn: 4097-03 ☐ Other:

Count Time: 1 Minute

High Voltage	Gross Source Counts	Background Counts
700	28828	
800	53554	
900	72162	
950	75953	
1000	77991	
1050	81009	
1100	83109	
1150	83366	9826
1200	84088	

Comments: Recommended Operating High Voltage: 1150 volts

Calibrated By: [signature] Calibration Date: 7-3-07

Calibration Due: 7-3-08

Reviewed By: [signature] Date: 7/3/07