

CINTICHEM HEALTH PHYSICS PROCEDURES

MANUAL CONTROL CHARTING FOR STANDARD AND
BLANK COUNTS ON ENVIRONMENTAL LAB HPGe DETECTORS

	DATE
PREPARED BY <i>[Signature]</i>	9/1/92
CHECKED BY <i>[Signature]</i>	22 Sept. 90
APPROVAL <i>[Signature]</i>	9/04/92
	ISSUED
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PURPOSE:

To provide instruction for Environmental Lab Technicians on how to record data on the control charts for routine standard (P-3) and blank counts on the Environmental Lab High Purity Germanium (HPGe) gamma spectrometers. Also included are instructions on what to do when the data exceeds the control ranges set.

DISCUSSION:

In order to maintain a high confidence in the results from analytical equipment Quality Control (QC) samples, including routine standards and blanks, must be introduced into the sample stream. Limits are then set on their results and put onto a control chart to monitor any trends or abrupt deviations in system performance. In this way the results of sample analysis are kept within an acceptable accuracy range.

PROCEDURE:

1. After performing the routine P-3 and blank counts (daily), analyze the results and print them out. (Refer to HP-M-37 and HP-M-51 for these count procedures.)
2. Please note that the control charting must be performed as soon as the printed results are available to ensure that subsequent sample counts are of acceptable quality.
3. P-3's
 - a. Record, in pen, the centroid energy and peak shape for the 123.09 keV, 723.32 keV and 1274.48 keV peaks on the appropriate sheets for the detector in question. The energy must be recorded from the "Identified Peak Summary" section of the printout (see attached printout).
 - b. Record the activity for Eu-154, Eu-155 and Sb-125 on the corresponding sheet for the detector in question. Record the activity level from the "Time Corrected Activity" column of the "Summary of Nuclides" section of the printout. Make sure that the activity is decayed to September 1, 1983 at 12:00 hours (see attached printout).
 - c. If any one of these parameters exceeds the 3σ limit on the control chart, note the occurrence in the log for that system, verify that the Liquid Nitrogen filling schedule has been followed and perform two "Pole Zeros" and recount the standard.
 - d. If the parameter exceeds the 3σ control limits on the control chart a second time, take the detector out of service (put an "Out of Service" sign on the Shield), note the occurrence in the log for that system, and notify both the QC Technician and the Environmental Lab Supervisor. Do not put the system back into service without approval from both of these people.
 - e. Draw a solid line from one days results to the next. If a day has more than one result record all entries, number them in order of occurrence, and connect them with dashed lines. Near the top of the graph, on that date, record the cause. Example: For pole zero enter PZ.

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	DATE
PREPARED BY <i>[Signature]</i>	9/1/92
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f. For days with no result put an "X" on the base line of the graph, above the dates. For results off the scale, mark the sheet below the date with an arrow pointing down and run connecting lines from the previous result to the edge of the page, also with an arrow pointing down.

4. Blanks

- a. Record, in pen, the activity for Co-60, Sb-125, Cs-137, Ce-144, Bi-214, Pb-214 and Th-234 on the corresponding sheet for the detector in question. Record the activity level from the "Time of Count Activity" column of the "Summary of Nuclides" section of the printout. No back decay is required.
- b. If the following occurs, notify Senior Environmental staff or QC:
 - i. Any isotope exceed the 3σ limit twice in a row on the same detector.
 - ii. Two isotopes exceed the 3σ limit at the same time on the same detector.
 - iii. If control charts or other data indicate a trend in an unacceptable direction over a period of a week.
- c. Three or more isotopes out of control on the same detector requires that the detector be taken out of service (see 3.d.) and notification made as above.

NOTE: All control charts will be reviewed by the Quality Control Group on a weekly basis.