2/24/87

Number 220

AGS Studies Report

Date(s) 1/4 - 1/27/87 Time(s)

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Reported by K.A. Brown

Subject Latest Results from Studies of Induced Radioactivity

In Accelerator Division Technical Note No. 246 we described the relationship between measured radiation dose and beam loss. Using the approximation,

$$D = k\ \xi\ \ln(1 + T/t),$$

we calculated values of k for high energy protons in the AGS (at which D was the dose measured at a standard distance of 12 inches). Values were found for the FEB run in 1985, the FEB run in 1986, and the SEB run in 1986. This January we ran SEB and during the 1/27-28 maintenance, Health Physics did a full ring survey and we calculated values for k for this run.

In December, 1986, we began collecting beam intensity data and beam hours data more frequently. A program was written which sampled the beam current transformer every hour at different times (ICBM, 3CBM, CBM, and XCBM times) and sampled the CE010 SEC every hour. This data allows a better resolution on the amount of beam lost during the run. Also, more attention was paid to the number of hours there was beam in the machine and the number of hours there was extracted beam.

We also found a few minor errors in the calculations of k published in Accelerator Division Technical Note No. 264. Basically, the errors involved keeping the method of calculation more consistent for each point.

Figure I shows the energy dependence of k. Injection is approximately 200 MeV, transition is approximately 8 GeV, and extraction is approximately 30 GeV.

Figure II shows k for injection for the four different runs. Figure III shows k for transition for the four different runs. Figure IV shows k for extraction for the four different runs.

Figure V shows the capture efficiency over the month of January. Figure VI shows the acceleration and transition efficiencies. Figure VII shows the extraction efficiency. Note that the extraction efficiency is taken as CE010/XCBM and does not include any calibration constant.

Also included is a copy of the HP ring survey taken on January 27, 1987. Of particular concern are the unexpected high levels seen in the H11 region.

FIGURE I

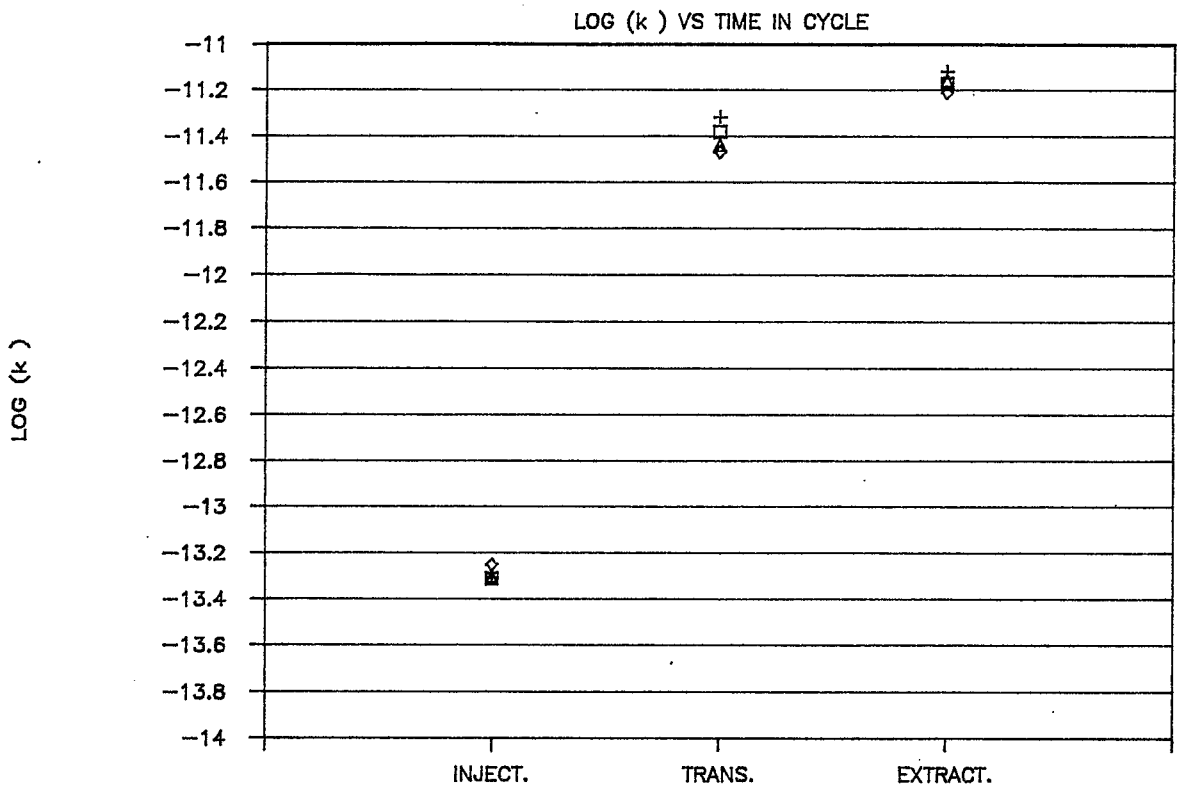


FIGURE II

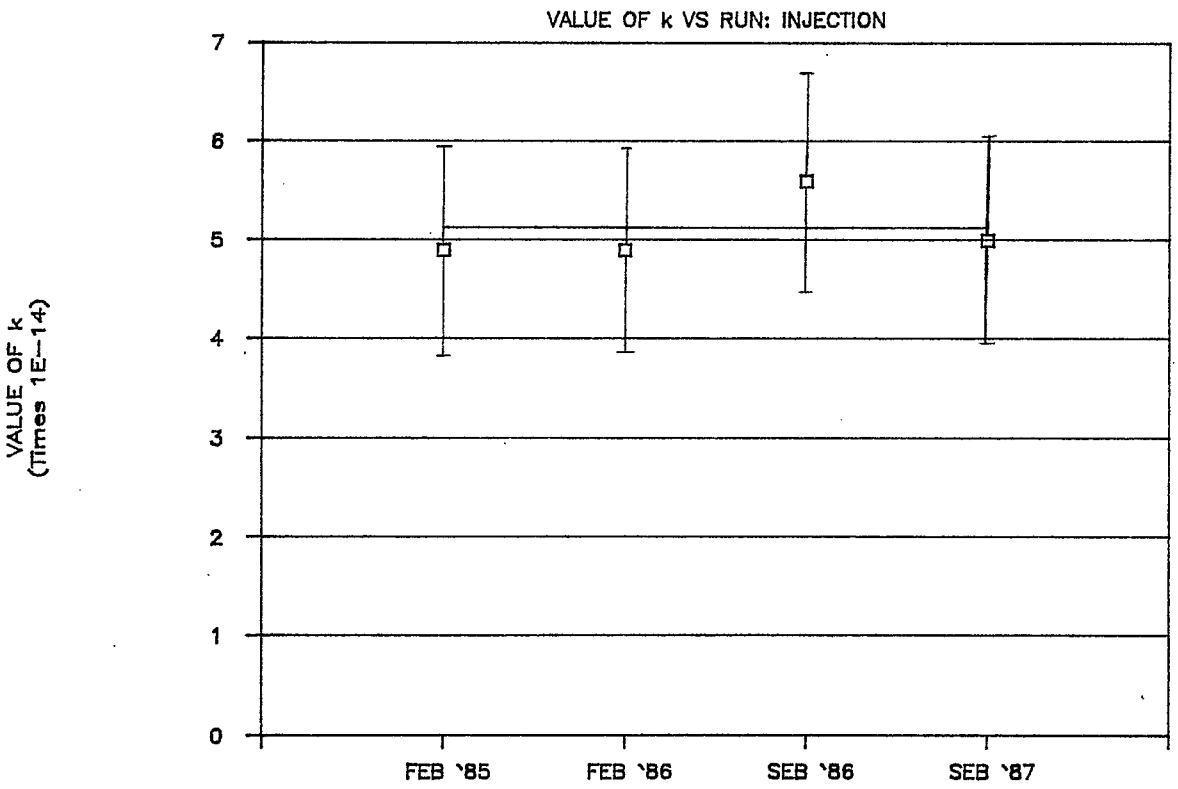


FIGURE III

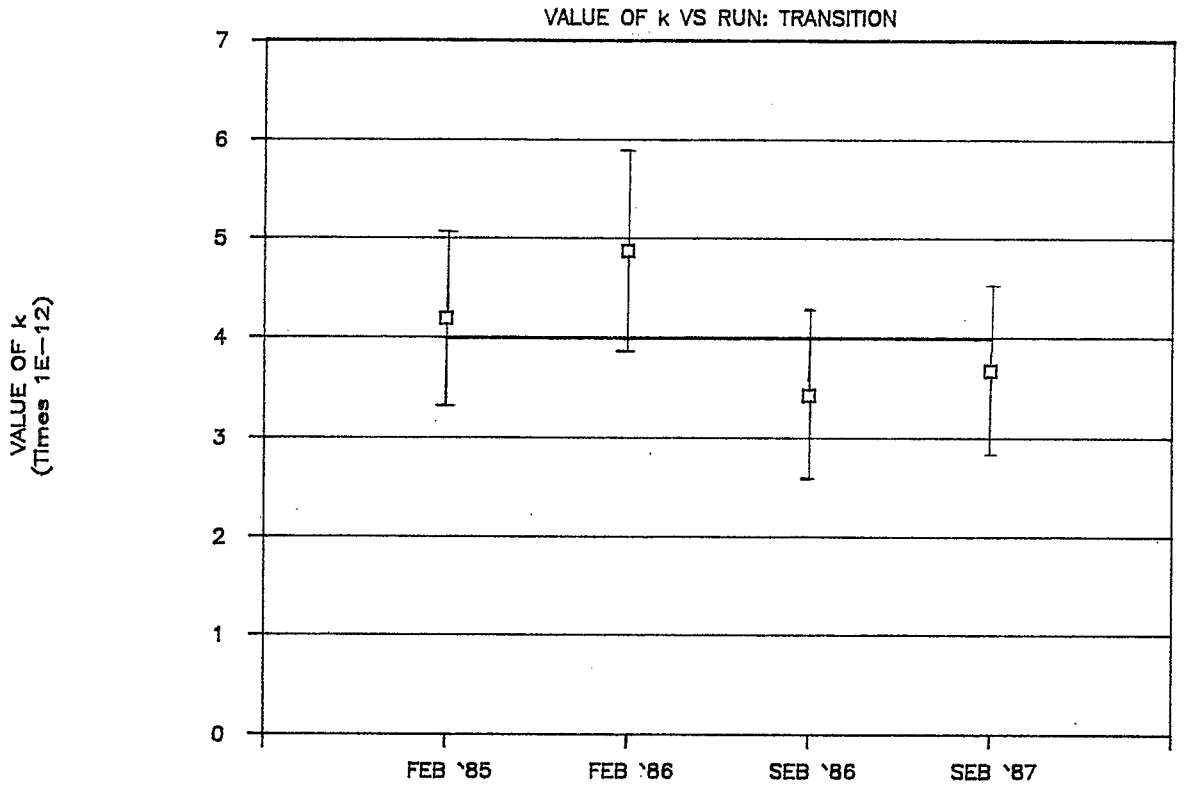


FIGURE IV

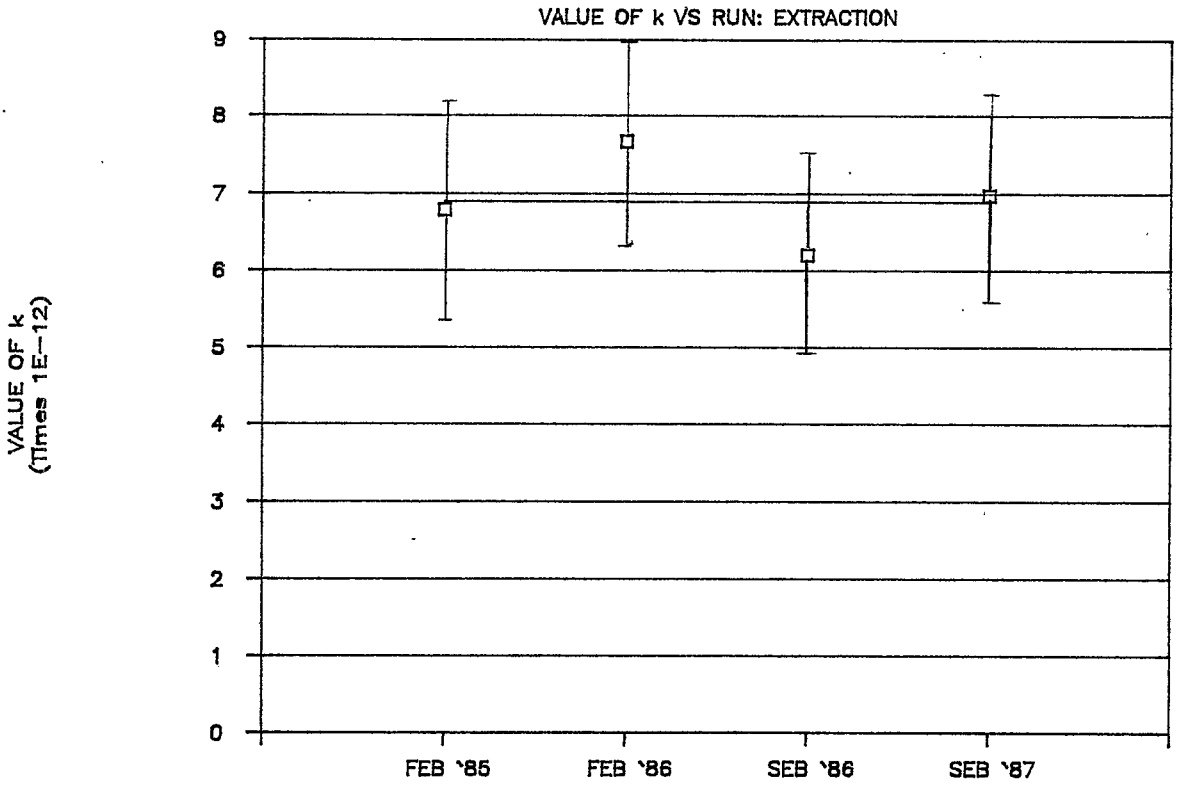


FIGURE V

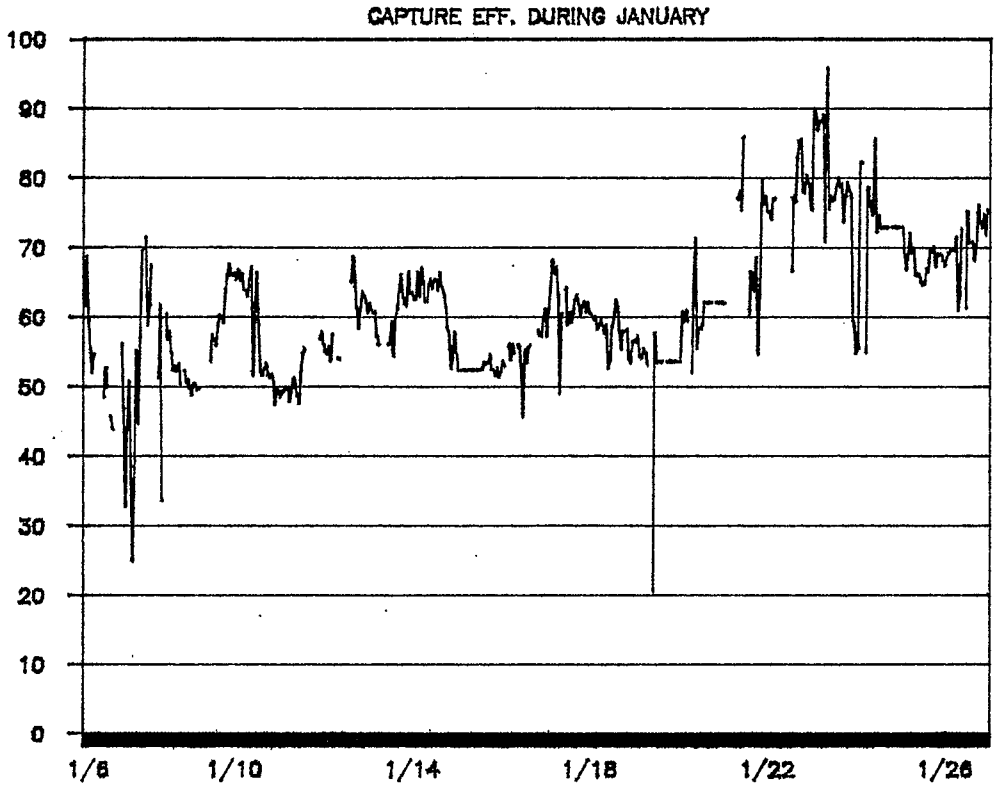


FIGURE VI

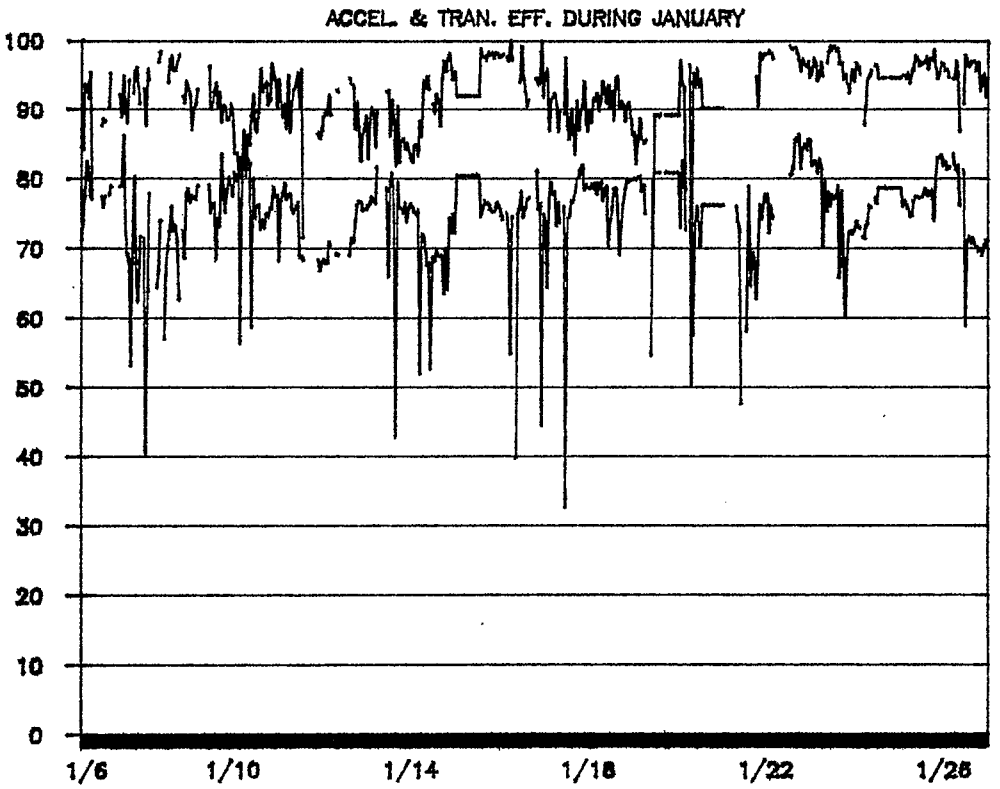
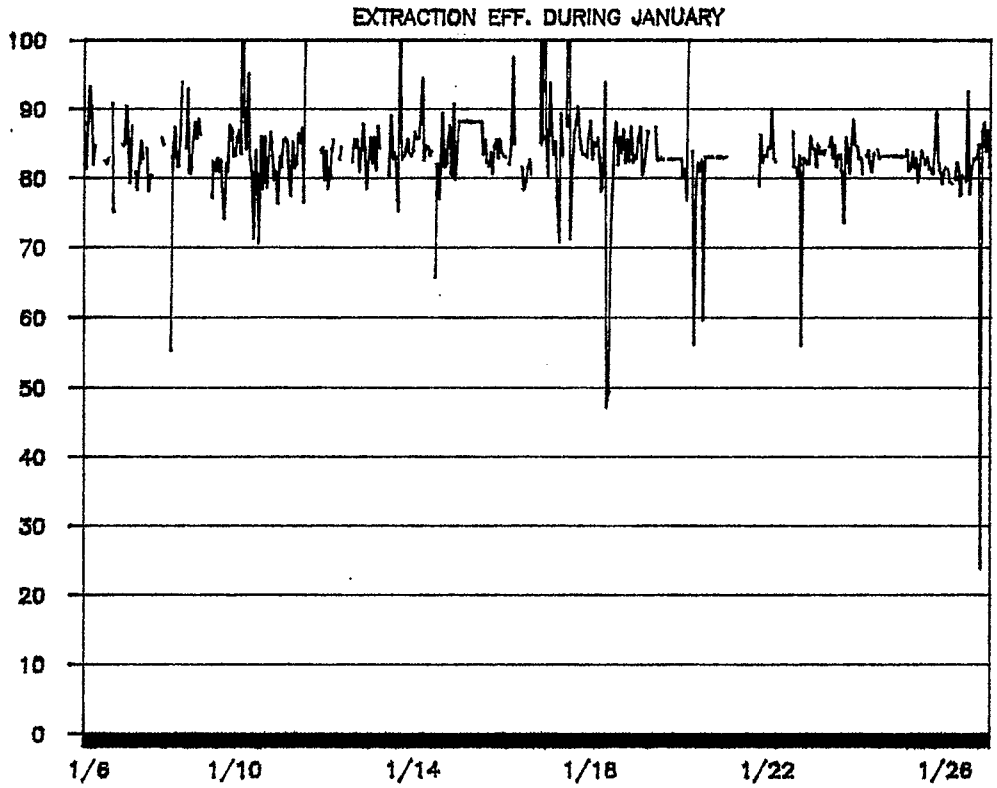


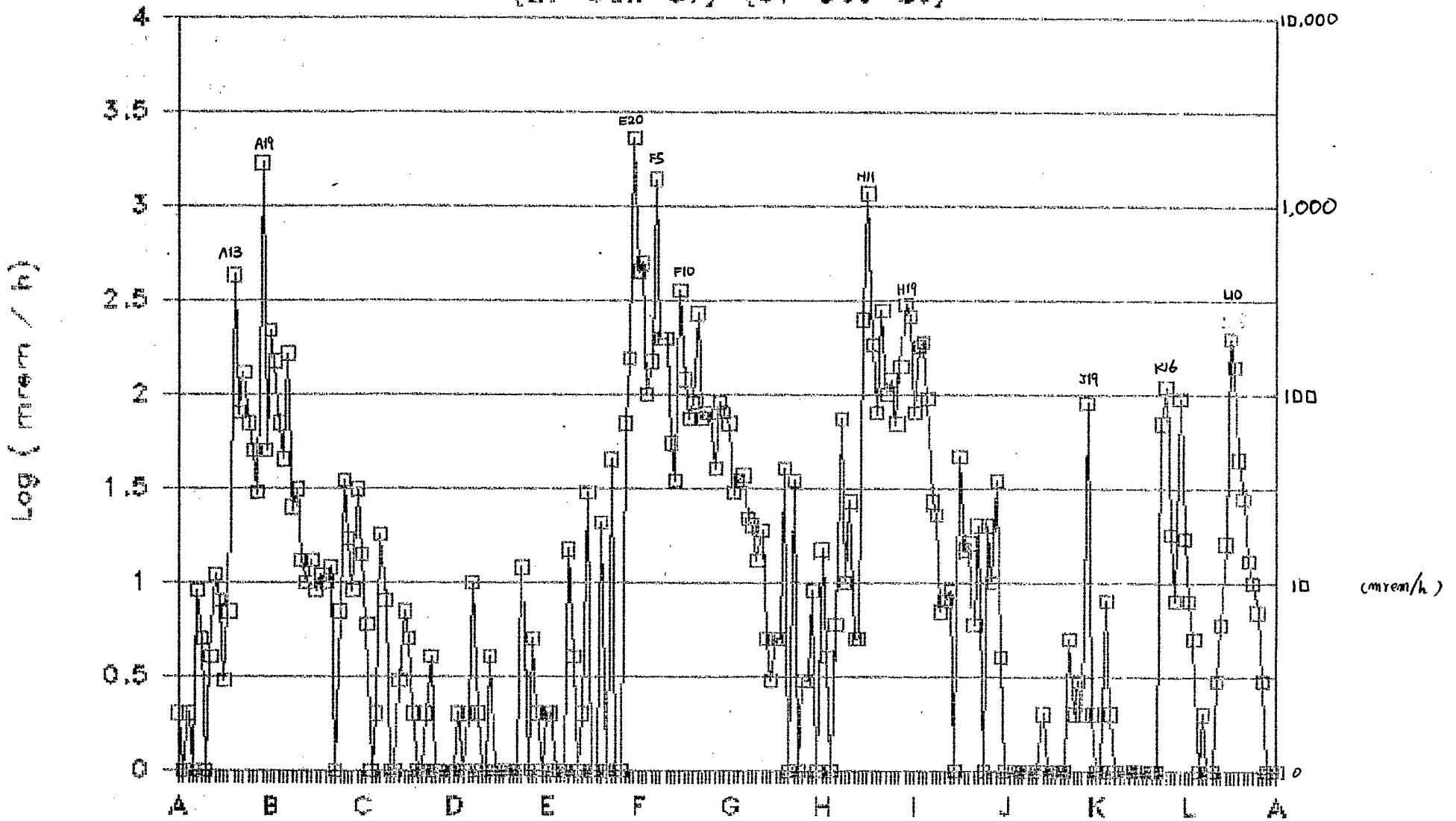
FIGURE VII


EXTRACTION EFF. DURING JANUARY
100
90
80
70
60
50
40
30
20
10
0
1/6
1/10
1/14
1/18
1/22
1/26

Sanke

HP RING_SURVEY

(27-Jan-87)-(01-Dec-86)



Superperiods A-01 to L-20

□ Out at 12"