

Wednesday 3 April 1996

K. Reece

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Minutes of meeting: Radiation Safety Committee

Date: Wednesday 3 April 1996

Present: L. Ahrens, H. Brown, A. Etkin, W. Glenn, E. Lessard, W. MacKay,  
A. McGeary, S. Musolino, K. Reece, E. Rodger, A. Stevens, R. Thern.

Subject: RHIC internal beam dumps - A. Stevens.

Alan Stevens presented a summary (attachment - RSC file) of several areas of concern pertaining to the two internal beam dumps in the RHIC 10 o'clock region. [These beam dumps provide a location for a fast aborted beam from the two RHIC rings.] Included in this review were dump geometry and design, skyshine, groundwater, induced activity, air activation, muons and dose rate on berm. Results for each category were obtained assuming the *present berm thickness*; which may be increased by 2 ft of additional soil. Also contained in this summary was a listing of previous references of internal beam dump related publications.

The face of each dump consists of "C-C" carbon followed by graphite; then beyond the graphite is steel. The surrounding material of the dump is marble.

BNL guidelines allow each facility to produce no more than 5 mrem/yr at the site boundary. The *present results from skyshine alone could yield 50% more than this value at the site boundary* plus a nearly negligible contribution to the site boundary dose from muons and air activation. The addition of 2 ft of soil over these locations would reduce the skyshine by a factor of  $\sim 3$ .

**Groundwater activation** estimates are a factor of 2.5 less than AGS criteria. The S&EP Division may request the addition of an "umbrella" over the dump to reduce this term even further. This committee is satisfied with the calculations however, and leaves the question of an "umbrella" to be decided by the RHIC Project and the S&EP Division. If an "umbrella" is added, the accompanying 2 ft of extra soil would also take care of the skyshine concern.

**Air activation** should be of no consequence (no monitoring required) given that the calculated annual dose at the site boundary assumed immediate release to the surrounding atmosphere and that the estimates were based on a location that is  $\sim 90$ m closer than the actual site boundary. The ventilation system is a closed system (no intentional release).

The dose rate on the berm above the dump would also benefit from the addition of 2+ ft of soil over each dump location. This would probably reduce the dose per dump to less than 100mrem/dump. However, the only constraints to limit the number of dumps per hour are the minimum cycle time of the RHIC accelerator (injection to full energy and back to injection) and administrative controls. The classifications and access controls for these areas over the beam dumps must be defined, based on the possible *dose rate per hour* and *dose per pulse*.

**Committee Recommendations:**

1. Assuming the calculation for skyshine, the addition of 2+ ft of soil over the dump would reduce this term by a factor of 3 - 5.

**Action Items:**

1. The minimum cycle time of the RHIC rings from injection to full energy and back to injection must be defined (best estimate). This will define the maximum possible number of full energy beam aborts into the beam dumps per hour. [W. MacKay]
2. (Comment from chair) The addition of an interlocking chipmunk over each dump location *that latches* and prohibits beam from being injected for ~ 45 minutes could be accounted for when considering the area classification over these beam dumps. [Reece]
3. Area classifications and access controls have not yet been defined. [Reece, Lessard]

cc: RSC (w/o attachments)  
RSC file (w/attachments)