Problems Due Friday, Sept. 20, 1996

1.) An enrichment plant has a throughput of 32,000 kgU/day and produces 26,000 kgU as tails. What is the enrichment of the product if the feed is natural U and the tails are 0.25%?

2.) A gaseous diffusion method has been proposed to produce BF_3 enriched to 90% in B^{10}. How many kgs of BF_3 feed (natural B) are needed to produce 1 kg of enriched product with 8% tails?

3.) Calculate the natural U feed and SWU factors 1 billion years into the future. Assume tails of 0.15% and 3% enriched product;

$t_{1/2}$ (^{35}U) = 7.1 x 10^8 y,

$t_{1/2}$ (^{38}U) = 4.51 x 10^9 y.

4.) Assuming that the price per SWU is $80 and the cost of conversion is $4/kgU, what is the price of the U_3O_8 ($lb U_3O_8) beyond which it will cost less to enrich the already mined , purified, and converted (to UF_6) tails that contain 0.2% ^{35}U rather than mine new U?

(Assume the product will be 3% enriched in either case and the new tails will be 0.1%(when the old tails are enriched). Tails stored as UF_6 cost nothing.)