50-320

Miscellaneous Hydrology & Meteorology data from NRR files (HMB,DSE)

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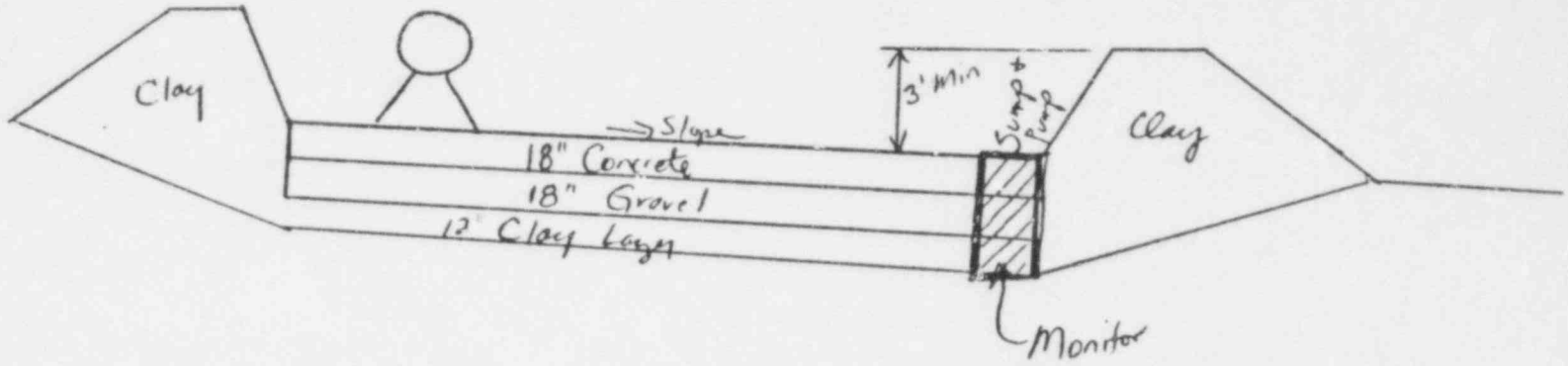
HYDROLOGIC ENGINEERING SECTION

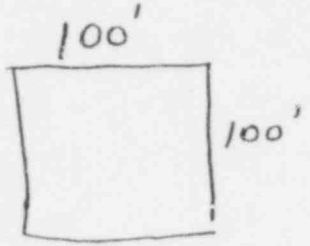
Sheet ___ of ___

Project ___ Calc by ___

Docket No. ___ Subject ___ Ck'd by ___ Date ___



Locate take area at northern end of site between Unit 2 Reactor Bldg & Unit 2 Pump House



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DOSE RATE = (CONCENTRATION RELEASED AT THE PLANT X RIVER DILUTION FACTOR) X ADULT WATER CONSUMPTION X DOSE CONVERSION FACTOR ("J"TH ISOTOPE TO "K"TH ORGAN)

(CONCENTRATION IN THE DRINKING WATER)

$$D_{J,K}\left(\frac{MREM}{}\right) = N_J\left(\frac{pCi}{\ell}\right) X \frac{\text{PLANT DISCHARGE RATE (CFS)}}{\text{RIVER FLOW RATE (CFS)}} X 1\left(\frac{\ell}{D}\right) X DCF_{J,K}\left(\frac{MREM}{pCi}\right) X \text{RELEASE (D) TIME}$$

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For Plant Release of 129 CFS, River Flow Rate of 55000 CFS and Drinking Water Consumption Rate of One Liter per Day the Equation Becomes:

$$D_{J,K}\left(\frac{MREM}{\quad}\right) = N_J\left(\frac{pCi}{\ell}\right) X \frac{129\ CFS}{55{,}000\ CFS} X\ 1.0\left(\frac{\ell}{D}\right) X\ DCF_{J,K}\ X\ RT(D)$$

OR

$$D_{J,K}\left(\frac{MREM}{\quad}\right) = N_J\left(\frac{pCi}{\ell}\right) X\ 2.35\ (10^{-3})\ X\ DCF_{J,K}\ X\ RT(D)$$

NOTE: DCF from Reg. Guide 1.109.

DOSE FACTOR (DF)

J/K	Total Body	Liver	Thyroid
H_3	2.52×10^{-10}	2.52×10^{-10}	2.52×10^{-10}
Co-58	4.00×10^{-9}	1.78×10^{-9}	No Data
Co-60	1.13×10^{-8}	5.13×10^{-9}	No Data
Sr-89	2.12×10^{-8}	No Data	No Data
Sr-90	4.46×10^{-6}	No Data	No Data
I-131	7.53×10^{-9}	1.42×10^{-8}	4.68×10^{-6}
I-132	4.56×10^{-10}	1.30×10^{-9}	4.56×10^{-8}
I-133	1.80×10^{-9}	5.92×10^{-9}	8.71×10^{-7}
Cs-136	4.44×10^{-8}	6.16×10^{-8}	No Data
Cs-137	1.71×10^{-7}	2.61×10^{-7}	No Data
Ce-144	6.28×10^{-11}	4.89×10^{-10}	No Data

Assumptions:

(1) Adult drinking water pathway with consumption rate of 1.L/day.
(2) Liquid release
(3) Susquehanna River flow of 55,000 cfs.
(4) Discharge rate of 129 cfs.

EXAMPLE: FOR $0.5\left(\frac{pCi}{\ell}\right)$ AS THE CONCENTRATION OF IODINE-131 IN THE PLANT LIQUID RELEASED FOR A ONE DAY DURATION THE DOSE TO THE THYROID WOULD BE:

DOSE (MREM) = $0.5 \times 2.35(10^{-3})\ DCF_{J,K} \times 1.0$

DOSE (MREM) = $0.5 \times DF_{J,K} \times 1.0 = 2.34\ (10^{-6})$ MREM

WHERE DF = $4.68(10^{-6})$ FROM ENCLOSED TABLE.

NOTE: DF = $2.35(10^{-3}) \times DCF_{J,K}$

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