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Your ref:
Our ref: LTR-EHS-12-78

Cc: Marc Rosser, Gerry Couture, Elle Binns

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Subject: **Assessment of Public Dose from Liquid and Gaseous Effluents for First Half 2012**

Effluents released from plant operations are monitored to determine the quantities of radio nuclides discharged into the environment. In order to assess the radiological impacts, the accumulated activities are normally summarized on an annual basis and input into dose models developed by the NRC/EPA to estimate commitment rates from the following pathways:

- Air Effluents by Direct Inhalation
- Liquid Effluents by Ingestion of Potable Water
- Liquid Effluents by Ingestion of Fish
- Liquid Effluents by Irradiation from Shoreline Deposits

We are now providing an estimate of public dose both semi-annually and annually. Since all of our current computer codes and formulas are based on an annual assessment, we determined it would be more appropriate to use a ratio of activities to dose from 2011 applied to the measured release activities in 2012 to calculate the public dose for the first half of 2012. The annual dose calculation will be determined and reported when the data is available for the entire calendar year. There were no significant changes in our process, compounds, or release points between 2011 and the first half of 2012.

The total activities measured and /or estimated for calendar year 2011 were:

- 401.6 µCi of Uranium released as gaseous effluent resulted in a public dose of

  Whole Body 0.160 mrem/yr Bone 5.504E-03 mrem/yr , Lung 1.45 mrem/yr

- 6.9 mCi of Uranium and 14.1 mCi of Technetium released in liquid effluent resulted in a public dose of

  Whole Body 1.77-04 mrem/yr Bone 2.58E-03 mrem/yr , Lung 0 mrem/yr

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The activities measured for the first half of calendar year 2012 were:

213.7 μCi of Uranium released as gaseous effluent
1.9 mCi of Uranium released in liquid effluent
13.5 mCi of Technetium released in liquid effluent

This year's dose for whole body and lung from inhalation pathways can be calculated using the current year activities and last year's ratio of dose to activity:

(213.7÷401.6) * 0.160 = 0.085 mRem
(213.7÷401.6) * 1.45 = 0.772 mRem

The dose values are summarized in the table below resulting in a maximum whole body dose of 0.085 mRem and a lung dose of 0.772 mRem for the first half of 2012. These doses are well below both 12.5 mrem (1/2 of the 25 mrem annual dose limit) as well as the 5 mrem ALARA limit (1/2 of 10 mrem annual ALARA limit). The contribution to dose to whole body and to the bone from liquid effluent is negligible but is included for completeness. These values were estimated using the original spreadsheet for 2011 by using half year standard values and 2012 activities.

Results

Pathways	Total Body (mRem/6 months)	Organ Dose (mRem/6 months) Bone	Organ Dose (mRem/6 months) Lung
Air Effluents			
Direct inhalation*	0.085	2.93-03	0.772
Liquid Effluents			
Potable Water	2.361E-05	3.35E-04	
Aquatic Food(Fish)	1.67E-06	1.93E-05	
Shoreline Deposit	8.04E-10		
Total (mRem/6 months)	0.085	3.28E-03	0.772

* Assumes 80 % residence time

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