**IMUG 2022 Workshop Exercise – CHRONC Demo**

**Start with NRC Sample Problem-Point Estimates LNT**

**Save As: CHRONC Demo**

**Turn on the COMIDA2 Food Ingestion Model. Make sure appropriate COMIDA2 file is linked to the project.**

**Change the intermediate phase dose projection period to 1 year.**

**Change the compensation costs as follows:**

**Evacuation cost is $100/person-day.**

**Relocation cost is $80/person-day.**

**Removal cost is $10,000/person.**

**Change the duration of the intermediate phase to 1 year.**

**Change the long-term dose projection period to 1 year.**

**Change the long-term exposure period to 30 years.**

**Change the dose limit for the intermediate phase to 2 rem.**

**Change the dose limit for the long-term phase to 0.5 rem.**

**Increase the number of decontamination plan levels to 3 and define plans as follows:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Time to Perform Decontamination (s)** | **Dose Reduction Factor** | **Fraction of Time Worker Spends in Contaminated Area for Farmland** | **Fraction of Time Worker Spends in Contaminated Area for Nonfarmland** |
| 3.15E+07 | 2 | 0.15 | 0.15 |
| 3.15E+07 | 4 | 0.15 | 0.15 |
| 3.15E+07 | 8 | 0.15 | 0.15 |

**Change Farmland and Nonfarmland Costs according to the following table:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Decontamination Cost ($/hectare)** | **Fraction of Cost from Labor** | **Decontamination Cost ($/person)** | **Fraction of Cost from Labor** |
| **Farmland** | | **Nonfarmland** | |
| 10,000 | 0.35 | 10,000 | 0.35 |
| 20,000 | 0.35 | 20,000 | 0.35 |
| 40,000 | 0.35 | 40,000 | 0.35 |

**Change the expected rate of return on property investments to 7%.**

**Change the regional characteristics as follows:**

**Total farmland property value is $12,000 per hectare.**

**The fraction of farmland wealth from improvements is 0.2.**

**Total nonfarmland property value is $350,000 per person.**

**The fraction of nonfarmland wealth from improvements is 0.72.**

**Change the maximum food ingestion doses to**

**Maximum allowable doses from milk are 500 mrem effective and 2 rem thyroid.**

**Maximum allowable doses from everything other than milk are 500 mrem effective and 2 rem thyroid.**

**Maximum long-term doses are 500 mrem effective and 2 rem thyroid.**

**Based on running the calculation with the above revisions, answer the following questions:**

**What is the mean of total predicted excess cancer fatalities within 80.5 km of the plant?**

**What is the mean of total predicted excess cancer occurrences within 80.5 km of the plant?**

**What is the mean dose at the worst location along the site boundary at 1.4 km for a nonevacuee during the emergency phase?**

**What is the 95th percentile dose at the worst location of the site boundary for a nonevacuee during the emergency phase?**

**What fraction of the long-term population dose within 80.5 km is from the groundshine pathway?**

**What is the total average cost of the accident for the area within 80.5 km?**

**What is the single largest component of the accident cost within 80.5 km?**

**On the average, what is the distance at which decontamination is required?**

**On the average, what is the longest distance at which some type of interdiction is required? What type of interdiction is it?**

**On the average, how many square kilometers need to be decontaminated?**

**On the average, how many square kilometers need to be interdicted?**