RADIONUCLIDE DATA SHEET [BISMUTH]

**Half Life:** 31.55 years  
**Radiation:** Decay Mode: Electron Capture  
**Gamma Constant:** 4.72 mR/hr per 1 mCi at 30 cm

### Major Betas

<table>
<thead>
<tr>
<th>Max E(MeV)</th>
<th>Avg E (MeV)</th>
<th># per 100 dis</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.806</td>
<td>0.383</td>
<td>0.012</td>
</tr>
</tbody>
</table>

Max. Beta Range in Air : 241.48 cm  
Max. Beta Range in Water : 0.26 cm  
Average gamma E = 0.822 MeV

### Intake Data (annual)

- Minimum Ingestion: 1000 μCi equals 5 rem TEDE (WHOLE BODY)  
- Minimum Inhalation: 200 μCi equals 5 rem TEDE (WHOLE BODY)

### Doses

- **Skin Dose:** Reported for 1 μCi over 10 cm² of skin  
  35.2 mrad/hr (gamma dose)  
- **Point Source:** 79.8 mrad/hr (beta dose)  
- **Disk Source:** 80.1 mrad/hr (beta dose)

### Shielding Information

<table>
<thead>
<tr>
<th>Maximum Range For Beta</th>
<th>Plastic</th>
<th>0.41 cm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aluminum</td>
<td>0.18 cm</td>
</tr>
<tr>
<td>Tenth Value Thickness For Average Gamma:</td>
<td>Concrete</td>
<td>0 cm</td>
</tr>
<tr>
<td></td>
<td>Lead</td>
<td>0 cm</td>
</tr>
</tbody>
</table>

### Detection information:

Usable Detectors listed with estimate efficiencies

<table>
<thead>
<tr>
<th>Ludlum 3 w/ pancake probe at 1 cm</th>
<th>%</th>
<th>Liq. Scint. Counter</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ludlum 3 w/ NaI probe near surface</td>
<td>%</td>
<td>Gamma Counter</td>
<td>%</td>
</tr>
</tbody>
</table>

### Action Quantities:

- Bench Top Quantity Must Be Less Than  
  4000 μCi  
- Containers Require Labeling When Greater Than  
  10 μCi  
- Rooms Require Posting When There Is Greater Than  
  100 μCi  
- Contamination Lasting More than 24 hrs Require NRC Notification At  
  2000 μCi