**Supplementary material**

**Table S1** Radium activities in surface water of the northeast and the entirety of the Daya Bay

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Region | Station | Longitude | Latitude | Salinity | 224Ra(Bq·m-3) | 223Ra(Bq·m-3) | 228Ra(Bq·m-3) |
| the northeast bay | D1 | 114.688° | 22.769° | 31.81 | 10.8±0.7 | 0.64±0.08 | 2.7±0.2 |
| D2 | 114.688° | 22.759° | 31.17 | 7.4±0.5 | 0.73±0.09 | 2.9±0.2 |
| D3 | 114.698° | 22.738° | 31.31 | 6.2±0.3 | 0.50±0.08 | 2.5±0.2 |
| D4 | 114.719° | 22.737° | 31.11 | 11.2±0.7 | 0.51±0.09 | 3.2±0.3 |
| D5 | 114.729° | 22.725° | 31.37 | 8.9±0.6 | 0.68±0.11 | 3.3±0.2 |
| D6 | 114.730° | 22.705° | 31.32 | 10.9±0.6 | 0.60±0.08 | 3.3±0.3 |
| D7 | 114.724° | 22.672° | 31.61 | 6.2±0.4 | 0.65±0.07 | 2.7±0.2 |
| D8 | 114.709° | 22.684° | 31.50 | 4.5±0.4 | 0.48±0.08 | 2.5±0.2 |
| D9 | 114.696° | 22.694° | 31.56 | 7.7±0.4 | 0.60±0.09 | 2.4±0.2 |
| D10 | 114.714° | 22.717° | 31.30 | 7.6±0.5 | 0.51±0.08 | 3.3±0.3 |
| D11 | 114.697° | 22.723° | 31.29 | 7.4±0.4 | 0.40±0.08 | 2.7±0.2 |
| D12 | 114.679° | 22.737° | 31.38 | 4.9±0.3 | 0.35±0.06 | 2.6±0.2 |
| D13 | 114.672° | 22.749° | 31.25 | 7.2±0.5 | 0.50±0.09 | 2.4±0.2 |
| D14 | 114.667° | 22.759° | 31.05 | 14.1±0.7 | 0.43±0.06 | 2.9±0.3 |
| D15 | 114.635° | 22.749° | 31.21 | 18.8±1.0 | 0.56±0.07 | 2.9±0.2 |
| D16 | 114.647° | 22.738° | 31.19 | 14.8±0.9 | 0.70±0.09 | 3.1±0.3 |
| D17 | 114.663° | 22.723° | 31.41 | 4.0±0.3 | 0.68±0.11 | 2.4±0.2 |
| D18 | 114.679° | 22.710° | 31.45 | 3.1±0.3 | 0.63±0.10 | 2.6±0.2 |
| D19 | 114.652° | 22.689° | 31.47 | 2.1±0.3 | 0.47±0.08 | 2.1±0.2 |
| D20 | 114.623° | 22.700° | 31.30 | 3.4±0.3 | 0.72±0.08 | 2.8±0.2 |
| the entire bay | W1 | 114.545° | 22.676° | 32.60 | 5.4±0.5 | 0.78±0.05 | 1.8±0.2 |
| W2 | 114.519° | 22.576° | 33.17 | 11.1±0.4 | 1.25±0.12 | 2.2±0.3 |
| W3 | 114.591° | 22.611° | 33.24 | 5.5±0.5 | 0.45±0.06 | 2.0±0.3 |
| W4 | 114.606° | 22.727° | 31.97 | 12.8±1.0 | 0.67±0.09 | 3.0±0.5 |
| W5 | 114.644° | 22.529° | 30.71 | 2.8±0.4 | 0.74±0.12 | 1.5±0.2 |
| W6 | 114.672° | 22.624° | 32.93 | 4.5±0.4 | 0.43±0.05 | 1.6±0.3 |
| W8 | 114.718° | 22.661° | 32.78 | 8.3±0.7 | 0.74±0.06 | 2.2±0.3 |
| W9 | 114.728° | 22.761° | 32.78 | 9.0±0.5 | 0.57±0.08 | 2.2±0.4 |
| W10 | 114.735° | 22.370° | 32.95 | 0.6±0.1 | 0.16±0.02 | 0.4±0.1 |
| W11 | 114.754° | 22.533° | 33.93 | 4.9±0.2 | 0.31±0.05 | 1.5±0.2 |
| W12 | 114.779° | 22.578° | 34.26 | 2.1±0.2 | 0.41±0.04 | 1.0±0.1 |

**Table S2** Radium activities for coastal pore-water samples in the Daya Bay /(Bq·m-3)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | Offshore distance(m) | Longitude | Latitude  | 224Ra | 223Ra | 228Ra | 224RaSGD-(1-RF)224Rans | 223RaSGD-(1-RF)223Rans | 228RaSGD-(1-RF)228Rans |
| the northeast bay | the entire bay | the northeast bay | the entire bay | the northeast bay | the entire bay |
| S1-1 | 1 | 114.649° | 22.771° | 104.2±4.3 | 0.42±0.06 | 9.6±1.0 | 94.2±5.8 | 96.3±6.0 | - | - | 7.0±1.0 | 7.5±1.1 |
| S1-2 | 5 | 48.0±2.0 | 0.93±0.11 | 18.0±1.6 | - | - | - | - | - | - |
| S2-1 | 2 | 114.689° | 22.792° | 43.8±3.7 | 4.50±0.55 | 6.8±0.6 | 33.8±5.3 | 36.0±5.5 | 4.0±0.6 | 3.9±0.6 | 4.2±0.6 | 4.7±0.8 |
| S2-2 | 3 | 60.3±5.0 | 0.45±0.06 | 8.4±0.6 | 50.3±6.3 | 52.5±6.5 | - | - | 5.8±0.6 | 6.3±0.8 |
| S3-1 | 0.5 | 114.745° | 22.746° | 38.2±3.4 | 0.21±0.04 | 3.2±0.6 | - | - | - | - | - | - |
| S3-2 | 2 | 44.5±3.6 | 6.20±0.63 | 5.5±0.7 | 34.3±5.3 | 36.7±5.5 | 5.7±0.6 | 5.6±0.7 | 2.9±0.7 | 3.4±0.9 |
| S3-3 | 4 | 105.5±8.0 | 1.13±0.17 | 10.7±0.9 | 95.3±8.9 | 97.7±9.0 | - | - | 8.1±0.9 | 8.6±1.1 |
| S5-1 | 7 | 114.743° | 22.678 | 17.3±1.6 | 0.28±0.04 | 2.8±0.5 | - | - | - | - | - | - |
| S5-2 | 0.5 | 31.0±2.9 | 0.51±0.07 | 3.1±0.9 | - | - | - | - | - | - |
| S6-1 | 0.5 | 114.515° | 22.594 | 37.0±3.4 | 0.61±0.07 | 7.1±1.7 | - | 29.2±5.3 | - | - | - | 5.0±1.8 |
| S6-2 | 6 | 3.0±0.4 | 0.08±0.02 | 0.9±0.5 | - | - | - | - | - | - |
| Mean |  |  |  |  |  |  | 61.5±31.0 | 58.0±31.2 | 4.8±1.2 | 4.8±1.2 | 5.6±2.1 | 5.9±1.9 |