**Supplementary Table 1.** Major Oxide and LOI data of the Sirbu Shale samples.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample**  **ID** | **SiO2**  (%) | **Al2O3**  (%) | **TiO2**  (%) | **Fe2O3**  (%) | **MnO**  (%) | **MgO**  (%) | **CaO**  (%) | **Na2O**  (%) | **K2O**  (%) | **P2O5**  (%) | **LOI**  (%) | **Total**  (%) |
| **BH-1** | 72.14 | 12.73 | 0.32 | 4.00 | 0.06 | 1.20 | 0.15 | 0.92 | 2.83 | 0.22 | 3.75 | 98.32 |
| **BH-2** | 73.17 | 11.46 | 0.35 | 3.70 | 0.07 | 1.19 | 0.33 | 0.90 | 2.46 | 0.22 | 3.32 | 97.17 |
| **BH-3** | 74.68 | 10.95 | 0.26 | 3.30 | 0.05 | 1.01 | 0.12 | 1.04 | 2.28 | 0.21 | 3.07 | 96.97 |
| **BH-4** | 71.82 | 12.77 | 0.34 | 3.92 | 0.06 | 1.17 | 0.21 | 0.79 | 2.86 | 0.22 | 4.09 | 98.25 |
| **BH-5** | 69.83 | 14.03 | 0.39 | 4.11 | 0.06 | 1.29 | 0.13 | 0.81 | 3.19 | 0.22 | 4.09 | 98.15 |
| **BH-6** | 62.88 | 17.89 | 0.49 | 4.84 | 0.06 | 1.62 | 0.85 | 0.58 | 4.24 | 0.48 | 5.13 | 99.06 |
| **BH-7** | 71.29 | 12.05 | 0.39 | 5.34 | 0.09 | 1.28 | 0.23 | 0.84 | 2.66 | 0.23 | 3.83 | 98.23 |
| **BH-8** | 69.00 | 13.48 | 0.45 | 5.03 | 0.07 | 1.38 | 0.20 | 0.76 | 3.10 | 0.23 | 4.02 | 97.72 |
| **BH-9** | 68.19 | 14.30 | 0.45 | 4.66 | 0.06 | 1.35 | 0.19 | 0.70 | 3.17 | 0.22 | 4.28 | 97.57 |
| **BH-10** | 74.32 | 11.24 | 0.28 | 3.14 | 0.08 | 1.01 | 0.39 | 1.01 | 1.95 | 0.23 | 3.85 | 97.50 |
| **BH-11** | 63.64 | 16.73 | 0.54 | 4.87 | 0.05 | 1.32 | 0.28 | 0.47 | 3.98 | 0.22 | 5.71 | 97.81 |
| **BH-12** | 69.58 | 13.12 | 0.47 | 4.13 | 0.05 | 1.20 | 0.23 | 0.66 | 2.97 | 0.22 | 4.22 | 96.85 |
| **BH-13** | 72.09 | 11.98 | 0.39 | 4.02 | 0.05 | 1.17 | 0.25 | 0.74 | 2.73 | 0.22 | 3.96 | 97.60 |
| **BH-14** | 68.60 | 14.23 | 0.43 | 4.27 | 0.05 | 1.20 | 0.24 | 0.63 | 3.05 | 0.22 | 4.81 | 97.73 |
| **BH-15** | 68.90 | 14.18 | 0.42 | 4.38 | 0.05 | 1.22 | 0.26 | 0.65 | 3.18 | 0.22 | 4.67 | 98.13 |
| **BH-16** | 67.79 | 14.98 | 0.45 | 4.46 | 0.05 | 1.25 | 0.28 | 0.58 | 3.52 | 0.22 | 5.18 | 98.76 |
| **BH-17** | 69.97 | 13.33 | 0.39 | 4.26 | 0.05 | 1.18 | 0.27 | 0.74 | 2.65 | 0.23 | 4.00 | 97.07 |
| **BH-18** | 64.91 | 16.06 | 0.52 | 4.84 | 0.05 | 1.35 | 0.32 | 0.50 | 3.82 | 0.23 | 5.79 | 98.39 |
| **BH-19** | 64.48 | 16.71 | 0.53 | 4.87 | 0.05 | 1.31 | 0.32 | 0.48 | 4.16 | 0.22 | 5.98 | 99.11 |
| **BH-20** | 69.88 | 13.21 | 0.42 | 4.32 | 0.05 | 1.13 | 0.30 | 0.67 | 2.72 | 0.24 | 4.57 | 97.51 |
| **BH-21** | 64.82 | 16.16 | 0.54 | 4.82 | 0.05 | 1.26 | 0.29 | 0.47 | 3.88 | 0.22 | 5.97 | 98.48 |
| **BH-22** | 73.31 | 11.96 | 0.29 | 3.70 | 0.05 | 0.95 | 0.24 | 0.82 | 2.18 | 0.22 | 3.84 | 97.56 |
| **BH-23** | 65.43 | 16.60 | 0.46 | 4.61 | 0.05 | 1.18 | 0.34 | 0.45 | 3.84 | 0.22 | 6.05 | 99.23 |
| **BH-24** | 66.05 | 16.02 | 0.46 | 4.94 | 0.05 | 1.20 | 0.36 | 0.44 | 3.80 | 0.22 | 6.10 | 99.64 |
| **BH-25** | 68.50 | 14.36 | 0.41 | 4.62 | 0.05 | 1.16 | 0.29 | 0.56 | 3.05 | 0.22 | 4.78 | 98.00 |
| **BH-26** | 67.11 | 15.49 | 0.42 | 4.75 | 0.05 | 1.20 | 0.29 | 0.47 | 3.51 | 0.22 | 5.44 | 98.95 |
| **BH-27** | 63.67 | 16.96 | 0.51 | 5.05 | 0.05 | 1.30 | 0.31 | 0.40 | 3.91 | 0.22 | 5.96 | 98.34 |
| **BH-28** | 66.93 | 14.88 | 0.47 | 5.00 | 0.05 | 1.21 | 0.26 | 0.47 | 3.45 | 0.22 | 5.54 | 98.48 |
| **BH-30** | 68.06 | 18.48 | 0.50 | 1.98 | 0.05 | 0.53 | 0.17 | 0.39 | 2.84 | 0.22 | 4.99 | 98.21 |
| **BH-31** | 66.82 | 15.32 | 0.49 | 3.61 | 0.05 | 1.10 | 0.29 | 0.50 | 3.40 | 0.24 | 4.92 | 96.74 |
| **BH-32** | 66.90 | 15.04 | 0.48 | 4.60 | 0.06 | 1.16 | 0.29 | 0.47 | 3.44 | 0.22 | 5.27 | 97.93 |
| **BH-33** | 67.05 | 14.92 | 0.45 | 4.74 | 0.05 | 1.08 | 0.35 | 0.47 | 3.10 | 0.23 | 5.12 | 97.56 |
| **BH-34** | 67.80 | 14.78 | 0.46 | 4.46 | 0.05 | 1.20 | 0.33 | 0.43 | 3.38 | 0.22 | 5.49 | 98.60 |
| **BH-36** | 65.15 | 16.56 | 0.49 | 4.60 | 0.05 | 1.30 | 0.36 | 0.37 | 3.87 | 0.22 | 5.94 | 98.91 |
| **BH-37** | 64.78 | 16.07 | 0.50 | 4.81 | 0.05 | 1.22 | 0.34 | 0.42 | 3.64 | 0.22 | 5.55 | 97.60 |
| **BH-38** | 64.69 | 16.30 | 0.52 | 4.55 | 0.05 | 1.20 | 0.34 | 0.39 | 3.74 | 0.22 | 5.73 | 97.73 |
| **BH-39** | 65.15 | 16.04 | 0.52 | 4.74 | 0.05 | 1.21 | 0.32 | 0.40 | 3.72 | 0.22 | 5.73 | 98.10 |
| **BH-40** | 65.67 | 15.38 | 0.52 | 4.16 | 0.05 | 1.11 | 0.33 | 0.44 | 3.44 | 0.22 | 5.54 | 96.86 |
| **BH-41** | 65.56 | 15.55 | 0.53 | 4.68 | 0.05 | 1.12 | 0.33 | 0.44 | 3.62 | 0.22 | 5.66 | 97.76 |
| **BH-42** | 64.79 | 15.73 | 0.55 | 4.66 | 0.05 | 1.20 | 0.34 | 0.39 | 3.71 | 0.22 | 5.71 | 97.35 |
| **BH-43** | 71.30 | 12.66 | 0.37 | 4.18 | 0.05 | 1.05 | 0.26 | 0.69 | 2.59 | 0.23 | 4.09 | 97.47 |
| **BH-44** | 70.31 | 13.17 | 0.39 | 4.11 | 0.05 | 1.07 | 0.23 | 0.62 | 2.76 | 0.22 | 4.36 | 97.29 |
| **BH-45** | 67.41 | 14.62 | 0.49 | 4.61 | 0.05 | 1.14 | 0.27 | 0.47 | 3.32 | 0.22 | 5.29 | 97.89 |
| **BH-46** | 65.55 | 15.13 | 0.55 | 4.95 | 0.05 | 1.15 | 0.31 | 0.38 | 3.45 | 0.23 | 5.64 | 97.39 |
| **BH-47** | 64.51 | 15.77 | 0.53 | 4.51 | 0.05 | 1.16 | 0.33 | 0.42 | 3.43 | 0.22 | 5.49 | 96.41 |
| **BH-48** | 65.31 | 15.39 | 0.55 | 4.48 | 0.05 | 1.13 | 0.32 | 0.39 | 3.54 | 0.22 | 5.26 | 96.64 |

**Supplementary Table 2.** Results of trace elements concentrations (in ppm), total phosphorus concentrations (ppm), Aluminium concentration (Weight %), TOCbm maximum and minimum (Weight %), trace element ratios (Cd/Mo) and trace elements in enrichments factors (no unit) for Sirbu Shale sample are provided in this table. The enrichment factor was calculated using the Eq.1. An example of the enrichment factor calculation is given after this table.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **V** | **Cr** | **Co** | **Ni** | **Mo** | **Cd** | **U** | **P** | **Cd/Mo** | **Al** | **VEF** | **CrEF** | **CoEF** | **NiEF** | **MoEF** | **CdEF** | **UEF** | **PEF** | **TOCbm**  **maximum** | **TOCbm**  **minimum** |
| **BH-1** | 100.14 | 78.29 | 75.00 | 36.86 | 1.59 | 0.92 | 4.71 | 960.70 | 0.58 | 6.74 | 0.89 | 0.71 | 3.46 | 0.77 | 2.44 | 14.04 | 2.14 | 2.07 | 4.53 | 2.27 |
| **BH-2** | 78.06 | 60.90 | 39.58 | 26.17 | 1.07 | 1.16 | 5.07 | 960.70 | 1.08 | 6.07 | 0.77 | 0.61 | 2.03 | 0.60 | 1.82 | 19.70 | 2.56 | 2.30 | 5.87 | 2.93 |
| **BH-3** | 80.58 | 61.02 | 43.39 | 20.59 | 0.99 | 0.91 | 4.64 | 917.03 | 0.92 | 5.80 | 0.83 | 0.64 | 2.32 | 0.50 | 1.76 | 16.15 | 2.45 | 2.30 | 4.54 | 2.27 |
| **BH-4** | 104.85 | 82.46 | 34.14 | 31.46 | 1.03 | 0.99 | 5.42 | 960.70 | 0.96 | 6.76 | 0.93 | 0.75 | 1.57 | 0.65 | 1.58 | 15.17 | 2.45 | 2.07 | 4.95 | 2.47 |
| **BH-5** | 114.41 | 91.06 | 48.07 | 29.49 | 1.14 | 1.13 | 5.95 | 960.70 | 0.99 | 7.43 | 0.92 | 0.75 | 2.01 | 0.56 | 1.59 | 15.67 | 2.45 | 1.88 | 5.62 | 2.81 |
| **BH-6** | 158.26 | 120.74 | 20.10 | 35.82 | 0.78 | 0.80 | 8.41 | 2096.07 | 1.02 | 9.47 | 1.00 | 0.78 | 0.66 | 0.53 | 0.85 | 8.67 | 2.71 | 3.22 | 3.72 | 1.86 |
| **BH-7** | 98.76 | 71.97 | 45.54 | 32.05 | 1.22 | 0.84 | 4.94 | 1004.37 | 0.69 | 6.38 | 0.93 | 0.69 | 2.22 | 0.70 | 1.97 | 13.57 | 2.37 | 2.29 | 4.13 | 2.07 |
| **BH-8** | 112.44 | 86.29 | 37.82 | 33.52 | 2.00 | 1.97 | 5.39 | 1004.37 | 0.98 | 7.13 | 0.94 | 0.74 | 1.65 | 0.66 | 2.90 | 28.46 | 2.31 | 2.05 | 10.16 | 5.08 |
| **BH-9** | 107.59 | 86.87 | 35.14 | 35.17 | 0.76 | 0.89 | 5.31 | 960.70 | 1.17 | 7.57 | 0.85 | 0.70 | 1.44 | 0.65 | 1.04 | 12.11 | 2.14 | 1.85 | 4.33 | 2.17 |
| **BH-10** | 62.31 | 52.12 | 66.61 | 38.21 | 1.10 | 1.46 | 4.39 | 1004.37 | 1.32 | 5.95 | 0.63 | 0.54 | 3.48 | 0.90 | 1.91 | 25.26 | 2.26 | 2.46 | 7.48 | 3.74 |
| **BH-11** | 144.28 | 111.61 | 34.53 | 45.62 | 0.38 | 0.61 | 6.52 | 960.70 | 1.59 | 8.86 | 0.97 | 0.77 | 1.21 | 0.72 | 0.44 | 7.09 | 2.25 | 1.58 | 2.75 | 1.38 |
| **BH-12** | 100.25 | 83.01 | 30.80 | 31.31 | 0.43 | 0.94 | 6.46 | 960.70 | 2.18 | 6.94 | 0.86 | 0.73 | 1.38 | 0.63 | 0.64 | 14.01 | 2.85 | 2.01 | 4.66 | 2.33 |
| **BH-13** | 91.08 | 69.82 | 38.20 | 25.18 | 0.88 | 1.13 | 5.68 | 960.70 | 1.28 | 6.34 | 0.86 | 0.67 | 1.87 | 0.56 | 1.44 | 18.43 | 2.74 | 2.20 | 5.72 | 2.86 |
| **BH-14** | 93.80 | 80.58 | 31.59 | 35.50 | 0.94 | 0.76 | 6.01 | 960.70 | 0.81 | 7.53 | 0.75 | 0.65 | 1.30 | 0.66 | 1.29 | 10.38 | 2.44 | 1.86 | 3.63 | 1.82 |
| **BH-15** | 115.39 | 82.74 | 28.91 | 32.02 | 0.94 | 0.74 | 5.30 | 960.70 | 0.79 | 7.51 | 0.92 | 0.67 | 1.20 | 0.60 | 1.30 | 10.21 | 2.16 | 1.86 | 3.55 | 1.78 |
| **BH-16** | 123.04 | 94.62 | 23.70 | 36.11 | 1.04 | 0.97 | 5.84 | 960.70 | 0.93 | 7.93 | 0.93 | 0.73 | 0.93 | 0.64 | 1.35 | 12.61 | 2.25 | 1.76 | 4.74 | 2.37 |
| **BH-17** | 89.34 | 64.74 | 28.32 | 27.19 | 0.99 | 0.69 | 4.78 | 1004.37 | 0.70 | 7.06 | 0.76 | 0.56 | 1.25 | 0.54 | 1.45 | 10.16 | 2.07 | 2.07 | 3.32 | 1.66 |
| **BH-18** | 135.38 | 103.29 | 18.23 | 41.07 | 2.23 | 0.83 | 6.09 | 1004.37 | 0.37 | 8.50 | 0.95 | 0.74 | 0.67 | 0.68 | 2.71 | 10.13 | 2.19 | 1.72 | 3.99 | 1.99 |
| **BH-19** | 147.77 | 109.64 | 19.56 | 57.26 | 1.55 | 0.89 | 6.92 | 960.70 | 0.57 | 8.84 | 1.00 | 0.76 | 0.69 | 0.91 | 1.81 | 10.36 | 2.39 | 1.58 | 4.25 | 2.13 |
| **BH-20** | 97.79 | 75.01 | 33.04 | 31.47 | 0.89 | 0.94 | 5.24 | 1048.03 | 1.05 | 6.99 | 0.84 | 0.66 | 1.47 | 0.63 | 1.32 | 13.83 | 2.29 | 2.18 | 4.63 | 2.31 |
| **BH-21** | 138.17 | 102.87 | 20.20 | 51.99 | 1.35 | 0.85 | 6.65 | 960.70 | 0.63 | 8.55 | 0.97 | 0.74 | 0.73 | 0.85 | 1.63 | 10.24 | 2.38 | 1.63 | 4.06 | 2.03 |
| **BH-22** | 74.72 | 53.14 | 31.26 | 25.70 | 0.79 | 0.72 | 4.59 | 960.70 | 0.91 | 6.33 | 0.71 | 0.51 | 1.53 | 0.57 | 1.29 | 11.77 | 2.22 | 2.21 | 3.51 | 1.76 |
| **BH-23** | 132.76 | 98.19 | 20.61 | 36.49 | 0.94 | 0.78 | 7.32 | 960.70 | 0.83 | 8.79 | 0.90 | 0.68 | 0.73 | 0.58 | 1.11 | 9.21 | 2.55 | 1.59 | 3.70 | 1.85 |
| **BH-24** | 134.20 | 100.33 | 19.46 | 53.96 | 1.05 | 0.86 | 6.51 | 960.70 | 0.82 | 8.48 | 0.95 | 0.72 | 0.71 | 0.89 | 1.27 | 10.50 | 2.35 | 1.65 | 4.14 | 2.07 |
| **BH-25** | 104.21 | 80.22 | 22.81 | 33.84 | 0.93 | 0.44 | 5.28 | 960.70 | 0.48 | 7.60 | 0.82 | 0.65 | 0.93 | 0.62 | 1.26 | 6.03 | 2.13 | 1.84 | 1.94 | 0.97 |
| **BH-26** | 130.72 | 96.47 | 47.83 | 43.78 | 0.47 | 0.38 | 5.89 | 960.70 | 0.79 | 8.20 | 0.95 | 0.72 | 1.81 | 0.75 | 0.60 | 4.73 | 2.20 | 1.70 | 1.54 | 0.77 |
| **BH-27** | 147.20 | 110.66 | 23.56 | 44.96 | 0.75 | 0.43 | 6.78 | 960.70 | 0.57 | 8.98 | 0.98 | 0.75 | 0.81 | 0.70 | 0.86 | 4.91 | 2.31 | 1.56 | 1.77 | 0.89 |
| **BH-28** | 130.33 | 99.94 | 26.39 | 47.97 | 0.66 | 0.41 | 6.38 | 960.70 | 0.63 | 7.88 | 0.99 | 0.78 | 1.04 | 0.85 | 0.86 | 5.39 | 2.48 | 1.77 | 1.75 | 0.87 |
| **BH-29** | 112.55 | 88.73 | 25.87 | 42.34 | 0.92 | 0.42 | 5.91 | 0.00 | 0.45 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | 2.24 | 1.12 |
| **BH-30** | 124.35 | 98.29 | 25.84 | 24.06 | 1.11 | 0.49 | 7.32 | 960.70 | 0.45 | 9.78 | 0.76 | 0.61 | 0.82 | 0.34 | 1.17 | 5.19 | 2.29 | 1.43 | 2.07 | 1.04 |
| **BH-31** | 127.93 | 100.23 | 35.23 | 34.68 | 0.64 | 0.53 | 6.60 | 1048.03 | 0.82 | 8.11 | 0.94 | 0.76 | 1.35 | 0.60 | 0.82 | 6.71 | 2.49 | 1.88 | 2.36 | 1.18 |
| **BH-32** | 122.00 | 96.47 | 27.78 | 37.73 | 0.94 | 0.65 | 6.05 | 960.70 | 0.70 | 7.96 | 0.92 | 0.74 | 1.08 | 0.66 | 1.21 | 8.47 | 2.32 | 1.76 | 3.04 | 1.52 |
| **BH-33** | 121.86 | 89.94 | 16.62 | 36.79 | 0.36 | 0.47 | 5.77 | 1004.37 | 1.33 | 7.90 | 0.92 | 0.70 | 0.65 | 0.65 | 0.47 | 6.19 | 2.23 | 1.85 | 2.08 | 1.04 |
| **BH-34** | 122.05 | 114.01 | 21.77 | 47.31 | 1.25 | 0.49 | 6.05 | 960.70 | 0.39 | 7.82 | 0.93 | 0.89 | 0.86 | 0.85 | 1.65 | 6.42 | 2.36 | 1.79 | 2.16 | 1.08 |
| **BH-35** | 99.65 | 102.67 | 26.43 | 46.21 | 1.95 | 0.38 | 4.59 | 0.00 | 0.19 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | 2.02 | 1.01 |
| **BH-36** | 144.68 | 138.42 | 50.22 | 78.26 | 1.40 | 0.46 | 6.06 | 960.70 | 0.33 | 8.77 | 0.99 | 0.97 | 1.78 | 1.25 | 1.64 | 5.43 | 2.11 | 1.59 | 1.96 | 0.98 |
| **BH-37** | 133.95 | 126.30 | 19.27 | 51.14 | 1.50 | 0.43 | 6.77 | 960.70 | 0.28 | 8.51 | 0.94 | 0.91 | 0.70 | 0.84 | 1.81 | 5.17 | 2.43 | 1.64 | 1.79 | 0.90 |
| **BH-38** | 133.86 | 126.25 | 19.92 | 51.28 | 0.96 | 0.42 | 6.84 | 960.70 | 0.43 | 8.63 | 0.93 | 0.90 | 0.72 | 0.83 | 1.15 | 4.98 | 2.42 | 1.62 | 1.73 | 0.87 |
| **BH-39** | 134.79 | 127.32 | 22.57 | 55.20 | 1.70 | 0.41 | 6.42 | 960.70 | 0.24 | 8.49 | 0.95 | 0.92 | 0.83 | 0.91 | 2.07 | 4.94 | 2.31 | 1.65 | 1.69 | 0.84 |
| **BH-40** | 125.39 | 118.46 | 20.81 | 48.47 | 1.15 | 0.54 | 6.33 | 960.70 | 0.47 | 8.14 | 0.92 | 0.89 | 0.79 | 0.83 | 1.46 | 6.91 | 2.38 | 1.72 | 2.45 | 1.23 |
| **BH-41** | 137.44 | 125.61 | 22.16 | 46.71 | 0.97 | 0.45 | 6.59 | 960.70 | 0.47 | 8.23 | 1.00 | 0.93 | 0.84 | 0.79 | 1.22 | 5.67 | 2.45 | 1.70 | 1.95 | 0.98 |
| **BH-42** | 134.10 | 138.12 | 23.09 | 58.38 | 1.92 | 0.46 | 5.98 | 960.70 | 0.24 | 8.33 | 0.96 | 1.01 | 0.86 | 0.98 | 2.38 | 5.69 | 2.19 | 1.68 | 1.98 | 0.99 |
| **BH-43** | 94.54 | 100.83 | 35.41 | 41.81 | 0.42 | 0.36 | 4.09 | 1004.37 | 0.86 | 6.70 | 0.84 | 0.92 | 1.64 | 0.87 | 0.64 | 5.53 | 1.86 | 2.18 | 1.54 | 0.77 |
| **BH-44** | 97.27 | 101.44 | 30.57 | 41.85 | 0.51 | 0.34 | 4.80 | 960.70 | 0.67 | 6.97 | 0.83 | 0.89 | 1.36 | 0.84 | 0.76 | 5.06 | 2.11 | 2.00 | 1.43 | 0.72 |
| **BH-45** | 120.33 | 121.49 | 51.14 | 53.07 | 0.65 | 0.39 | 5.74 | 960.70 | 0.59 | 7.74 | 0.93 | 0.96 | 2.05 | 0.96 | 0.87 | 5.16 | 2.27 | 1.81 | 1.63 | 0.81 |
| **BH-46** | 143.70 | 144.67 | 20.39 | 54.23 | 0.98 | 0.50 | 5.39 | 1004.37 | 0.52 | 8.01 | 1.07 | 1.10 | 0.79 | 0.95 | 1.26 | 6.50 | 2.06 | 1.82 | 2.24 | 1.12 |
| **BH-47** | 133.04 | 128.46 | 21.61 | 54.06 | 1.07 | 0.45 | 6.06 | 960.70 | 0.42 | 8.35 | 0.95 | 0.94 | 0.80 | 0.91 | 1.32 | 5.55 | 2.22 | 1.67 | 1.92 | 0.96 |
| **BH-48** | 128.68 | 123.64 | 21.55 | 48.61 | 0.59 | 0.45 | 6.91 | 960.70 | 0.76 | 8.15 | 0.95 | 0.93 | 0.82 | 0.84 | 0.74 | 5.66 | 2.59 | 1.72 | 1.92 | 0.96 |

The enrichment factors for the trace elements is calculated using following Eq. 1.

XEF = (X/Al)Sample/(X/Al)UCC  (Eq.1)

X and EF in Eq. 1 represent trace element and enrichment factor respectively. (X/Al)Sample and (X/Al)UCC denotes the ratio in the bulk samples of Sirbu Shale and the ratio for the average composition of UCC. Al in Eq.1 is used as a tracer for calculation the detrital fraction of trace elements. An example for CdEF calculation for the BH-1 is provided below.

CdEF (BH-1) = (0.92/6.74)/(0.08/8.257)

CdEF (BH-1) = 14.04

Average UCC composition: Al = 8.257%, Cd = 0.08 ppm

**Supplementary Table 3.** The estimated maximum and minimum values of TOCbm and respective TOCloss for the Sirbu Shale samples.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample ID** | **Scenario for maximum TOCbm value** | | | **Scenario for minimum TOCbm value** | | |
| **TOCbm** | **TOCloss** | **% loss of TOCbm** | **TOCbm** | **TOCloss** | **% loss of TOCbm** |
| BH-1 | 4.53 | 4.35 | 95.96 | 2.27 | 2.08 | 91.92 |
| BH-2 | 5.87 | 5.75 | 98.02 | 2.93 | 2.82 | 96.04 |
| BH-3 | 4.54 | 4.41 | 97.28 | 2.27 | 2.14 | 94.56 |
| BH-4 | 4.95 | 4.82 | 97.46 | 2.47 | 2.35 | 94.92 |
| BH-5 | 5.62 | 5.47 | 97.17 | 2.81 | 2.65 | 94.35 |
| BH-6 | 3.72 | 3.51 | 94.41 | 1.86 | 1.65 | 88.82 |
| BH-7 | 4.13 | 4.05 | 97.94 | 2.07 | 1.98 | 95.88 |
| BH-8 | 10.16 | 10.05 | 98.96 | 5.08 | 4.97 | 97.92 |
| BH-9 | 4.33 | 4.20 | 97.08 | 2.17 | 2.04 | 94.15 |
| BH-10 | 7.48 | 7.36 | 98.38 | 3.74 | 3.62 | 96.75 |
| BH-11 | 2.75 | 2.63 | 95.54 | 1.38 | 1.25 | 91.07 |
| BH-12 | 4.66 | 4.56 | 97.87 | 2.33 | 2.23 | 95.74 |
| BH-13 | 5.72 | 5.63 | 98.52 | 2.86 | 2.77 | 97.05 |
| BH-14 | 3.63 | 3.52 | 96.82 | 1.82 | 1.70 | 93.64 |
| BH-15 | 3.55 | 3.48 | 98.05 | 1.78 | 1.71 | 96.11 |
| BH-16 | 4.74 | 4.68 | 98.72 | 2.37 | 2.31 | 97.43 |
| BH-17 | 3.32 | 3.19 | 95.92 | 1.66 | 1.53 | 91.83 |
| BH-18 | 3.99 | 3.78 | 94.95 | 1.99 | 1.79 | 89.90 |
| BH-19 | 4.25 | 4.07 | 95.72 | 2.13 | 1.95 | 91.44 |
| BH-20 | 4.63 | 4.54 | 98.06 | 2.31 | 2.22 | 96.11 |
| BH-21 | 4.06 | 3.88 | 95.55 | 2.03 | 1.85 | 91.11 |
| BH-22 | 3.51 | 3.42 | 97.43 | 1.76 | 1.67 | 94.86 |
| BH-23 | 3.70 | 3.53 | 95.42 | 1.85 | 1.68 | 90.84 |
| BH-24 | 4.14 | 3.96 | 95.72 | 2.07 | 1.89 | 91.43 |
| BH-25 | 1.94 | 1.80 | 92.64 | 0.97 | 0.83 | 85.28 |
| BH-26 | 1.54 | 1.38 | 89.76 | 0.77 | 0.61 | 79.51 |
| BH-27 | 1.77 | 1.60 | 90.09 | 0.89 | 0.71 | 80.17 |
| BH-28 | 1.75 | 1.54 | 87.77 | 0.87 | 0.66 | 75.55 |
| BH-29 | 2.24 | 2.08 | 92.89 | 1.12 | 0.96 | 85.78 |
| BH-30 | 2.07 | 1.86 | 89.93 | 1.04 | 0.83 | 79.87 |
| BH-31 | 2.36 | 2.18 | 92.33 | 1.18 | 1.00 | 84.67 |
| BH-32 | 3.04 | 2.78 | 91.45 | 1.52 | 1.26 | 82.90 |
| BH-33 | 2.08 | 1.91 | 91.58 | 1.04 | 0.87 | 83.17 |
| BH-34 | 2.16 | 1.94 | 89.79 | 1.08 | 0.86 | 79.57 |
| BH-35 | 2.02 | 1.85 | 91.57 | 1.01 | 0.84 | 83.14 |
| BH-36 | 1.96 | 1.75 | 88.93 | 0.98 | 0.76 | 77.87 |
| BH-37 | 1.79 | 1.63 | 90.77 | 0.90 | 0.73 | 81.54 |
| BH-38 | 1.73 | 1.56 | 90.34 | 0.87 | 0.70 | 80.68 |
| BH-39 | 1.69 | 1.51 | 89.84 | 0.84 | 0.67 | 79.69 |
| BH-40 | 2.45 | 2.23 | 90.83 | 1.23 | 1.00 | 81.66 |
| BH-41 | 1.95 | 1.72 | 88.22 | 0.98 | 0.75 | 76.44 |
| BH-42 | 1.98 | 1.78 | 89.92 | 0.99 | 0.79 | 79.85 |
| BH-43 | 1.54 | 1.44 | 93.94 | 0.77 | 0.68 | 87.88 |
| BH-44 | 1.43 | 1.32 | 92.57 | 0.72 | 0.61 | 85.13 |
| BH-45 | 1.63 | 1.47 | 90.18 | 0.81 | 0.65 | 80.36 |
| BH-46 | 2.24 | 2.05 | 91.51 | 1.12 | 0.93 | 83.02 |
| BH-47 | 1.92 | 1.75 | 91.23 | 0.96 | 0.79 | 82.46 |
| BH-48 | 1.92 | 1.81 | 94.07 | 0.96 | 0.85 | 88.13 |