| Precipitation sampling sites**Supplementary File 2:** The precipitation and groundwater sampling sites as well as checking points (Groundwater and precipitation stations after dash line are checking points). |  | Groundwater sampling sites |
| --- | --- | --- |
| Row | Station | N | E | References |  | Row | Station | N | E | References |
| 1 | Abadeh | 52.67 | 31.18 | [1] |  | 1 | Kazeroon | 51.65 | 29.61 | [2] |
| 2 | Abolabas | 49.51 | 31.31 | [3] |  | 2 | Eghlid | 52.71 | 31.01 | [4] |
| 3 | Alvand | 45.57 | 34.51 | [5] |  | 3 | Ardekan | 51.98 | 30.26 | [6] |
| 4 | Ardekan | 51.98 | 30.26 | [1] |  | 4 | Rudball Dam | 53.19 | 29.30 | [4] |
| 5 | Arsanjan | 53.30 | 29.91 | [1] |  | 5 | Kovar | 52.62 | 29.11 | [7] |
| 6 | Bajgah | 52.59 | 29.71 | [1] |  | 6 | Firoozabad | 52.41 | 29.50 | [4] |
| 7 | Darab | 54.54 | 28.75 | [1] |  | 7 | Haji Abad | 55.90 | 28.30 | [8] |
| 8 | Dasht Arjan | 51.98 | 29.66 | [2] |  | 8 | Beheshtabad | 50.62 | 32.03 | [9] |
| 9 | Damavand | 52.06 | 35.71 | [10] |  | 9 | Khersan Dam | 50.82 | 31.50 | [11] |
| 10 | Estahban | 54.04 | 29.12 | [1] |  | 10 | Seymareh Dam | 47.00 | 33.00 | [12] |
| 11 | Fasa | 53.39 | 28.55 | [1] |  | 11 | Dareh Shahr | 47.22 | 33.08 | [13] |
| 12 | Gorgan | 54.48 | 36.83 | [14] |  | 12 | Tangeh Bijar | 46.26 | 33.38 | [15] |
| 13 | Hamadan | 48.52 | 34.80 | [16] |  | 13 | Alashtar | 48.25 | 33.87 | [17] |
| 14 | Hashtgerd | 50.60 | 35.95 | [18] |  | 14 | Pabdeh-Komaroon | 49.52 | 31.50 | [19] |
| 15 | Isfahan | 51.65 | 32.00 | [20] |  | 15 | Keyno | 49.51 | 31.31 | [21] |
| 16 | Jahrom | 53.56 | 28.50 | [1] |  | 16 | Alvand & Karkheh Basin | 45.58 | 34.50 | [22] |
| 17 | Kazeroon | 51.65 | 29.61 | [1] |  | 17 | Havasan Dam | 45.86 | 34.46 | [23] |
| 18 | Khersan | 50.82 | 31.50 | [11] |  | 18 | Dorfak-Gilan | 49.60 | 37.20 | [24] |
| 19 | Mashhad | 59.57 | 36.30 | [25] |  | 19 | Orumieh-Oshnavieh | 45.04 | 37.33 | [26] |
| 20 | Paveh | 46.36 | 35.04 | [27] |  | 20 | North-Semnan | 53.23 | 35.34 | [9] |
| 21 | Rafsanjan | 55.99 | 30.40 | [28] |  | 21 | Bastam | 54.99 | 36.48 | [29] |
| 22 | Sabalan | 47.66 | 38.40 | [30] |  | 22 | Ayneh varzan | 52.20 | 35.66 | [31] |
| 23 | Sarcheshmeh | 55.67 | 29.45 | [32] |  | 23 | Plor | 52.06 | 35.71 | [33] |
| 24 | Shahrood | 55.01 | 36.41 | [34] |  | 24 | Andarokh-Kardeh | 59.65 | 36.58 | [35] |
| 25 | Shiraz | 52.53 | 29.61 | [1] |  | 25 | Ayoub spring site | 57.32 | 37.80 | [36] |
| 26 | Shirinbahar | 49.52 | 31.50 | [19] |  | 26 | Shirvan | 57.93 | 37.00 | [9] |
| 27 | Sirjan | 55.67 | 29.45 | [37] |  | 27 | Birjand | 59.21 | 32.87 | [38] |
| 28 | Marvdasht | 52.83 | 29.80 | [1] |  | 28 | Gonabad | 58.67 | 34.35 | [39] |
| 29 | Tehran | 51.40 | 35.70 | [40] |  | 29 | Bousheher | 51.93 | 27.83 | [41] |
| 30 | Tehran-Airport | 51.43 | 35.58 | [40] |  | 30 | Sirjan | 55.67 | 29.45 | [37] |
| 31 | Zarghan | 52.43 | 29.46 | [1] |  | 31 | Sabalan | 47.66 | 38.40 | [30] |
| 32 | Zarivar | 46.17 | 35.52 | [42] |  | 32 | Tabas | 56.92 | 33.59 | [43] |
| 33 | Birjand | 59.21 | 32.87 | [38] |  | 33 | bandar lengeh | 54.88 | 26.55 | [44] |
| 34 | Dorfak-Gilan | 49.60 | 37.20 | [24] |  | 34 | Isfahan | 50.45 | 33.91 | [45] |
| 35 | Azershahr | 45.97 | 37.75 | [16] |  | 35 | Zarivar | 46.17 | 35.52 | [42] |
| 36 | Ahvaz | 48.40 | 31.32 | [46] |  | 36 | Mahalat | 46.13 | 35.53 | [47] |
| 37 | Averin | 44.95 | 38.55 | [48] |  | 37 | Taftan | 61.13 | 28.60 | [49] |
| 38 | Karaj | 50.97 | 35.82 | [16] |  | 38 | Sabalan | 47.68 | 38.39 | [9] |
| 39 | Taftan1\* | 61.13 | 28.60 | [49] |  | 39 | Tehran-Haraz | 51.99 | 35.88 | [50] |
| 40 | Tehran-Haraz | 51.99 | 35.88 | [50] |  | 40 | Damghan | 54.34 | 36.16 | [51] |

1\* In Taftan station, high elevation fresh surface water samples are used due to the lack of precipitation sampling

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