**\*\*For the bedrock values, I would recommend using the elevation columns, since depth is dependent on the surface elevation but the elevation values have already been corrected for that\*\***

**The surface elevations should be correct, but sometimes the well locations are a little off, which would then change the surface value, so things could still be off!**

**Files in the Data folder:**

**Downhole\_BedrockPicks\_2023-01-06.csv**

This file contains all the bedrock picks from the semi-automated workflow described in the powerpoint/pdf file.

The columns in this .csv are as follows:

| **Column** | **Data Type** | **Description** |
| --- | --- | --- |
| **ID** | integer | Unique identifier for each well, starting from 0 |
| **API\_NUMBER** | integer | Unique identifier for each well, using the American Petroleum Institute (API) [naming convention](https://en.wikipedia.org/wiki/API_well_number) (this is how all water wells are uniquely identified in Illinois) |
| **TABLE\_NAME** | text | The original database table from which the data came, and a description of what the table contains. I have listed the tables in what I consider to generally be the most reliable to the least reliable, though there’s not much difference between the quality of the data from these tables, except for the DESCRIPTIONS table, which is probably much more accurate than all others:   1. DESCRIPTIONS: detailed descriptions of geologic materials from well borings (usually done by geologists) 2. FORMATION\_TOPS: Data just for getting the top and bottom of geologic units/formations. At least done in part by geologists. 3. HWYBRIDGE\_LOG: descriptions from drillers drilling Highway/Bridge boring logs (wells usually drilled by engineering agencies before building. Often these are relatively shallow) 4. WFORMATIONS: descriptions from drillers, often drilling water wells |
| **BEDROCK\_DEPTH** | float | Depth in feet to bedrock, as picked by the semi-automatic workflow |
| **FORMATION** | text | The description of the geologic formation that was picked as the uppermost bedrock formation |
| **BR\_CLASS\_TYPE** | integer (signed) | How the bedrock pick was made. Description of data is as follows:   * -2: The interval just above bedrock was not classified (bedrock could be higher/shallower) * -1: At least one interval above bedrock was not classified, but the bedrock interface was classified on both sides * 0: The first record for the well is already in bedrock. This bedrock pick is therefore likely wrong, as it likely is much deeper/lower than the actual top of bedrock * 1: At least one interval above bedrock was classified using the “Starts with” wildcard (xxx\*) * 2: All records down to and including the top of bedrock were exact matches with predefined classifications   Assuming the actual descriptions and classification process was good (which is an assumption):   * 2 and 1 are likely to have good bedrock depths * -1 is more likely than not to have a good bedrock pick * -2 may be correct, but should not be trusted * 0 is almost always incorrect |
| **LATITUDE** | float | Latitude of the well (using the [EPSG:4269](https://epsg.io/4269) coordinate reference system…probably not necessary information for your work, but just so you know) |
| **LONGITUDE** | float | Longitude of the well (using the [EPSG:4269](https://epsg.io/4269) coordinate reference system…probably not necessary information for your work, but just so you know) |
| **ELEV\_FT** | float | Surface elevation of the well, as calculated using the Latitude and Longitude (which are usually accurate, but may not be) and the Illinois statewide lidar surface elevation dataset (which is very accurate) |
| **BEDROCK\_ELEV\_FT** | float | Elevation of the bedrock pick, in feet above sea level |
| **BEDROCK\_ELEV\_M** | float | Elevation of the bedrock pick, in meters above sea level |

**wPermits\_BedrockPicks\_2023-01-06.csv**

This file contains manual bedrock picks from geologists doing detailed mapping in a certain area. These are high-quality picks, but only exist in locations in Illinois where recent, detailed geologic mapping has taken place.

| **Column** | **Data Type** | **Description** |
| --- | --- | --- |
| **ID** | integer | Unique identifier for each well, starting from 0 |
| **API\_NUMBER** | integer | Unique identifier for each well, using the American Petroleum Institute (API) [naming convention](https://en.wikipedia.org/wiki/API_well_number) (this is how all water wells are uniquely identified in Illinois) |
| **WELLTYPE** | text | The type of well the data is derived from. I have put them in a very general order of best quality to least quality, but basically, STRAT and MONIT wells (numbers 1 and 2 in the list below) should be very high quality, numbers 3-6 are all done by professional geoscientists, but with different objectives, and the rest are some variation of water well where there will be little difference in the quality of picks based on the type.   1. STRAT: Stratigraphic (described by and for geologists) 2. MONIT: Monitoring (used to monitor water levels by professional (hydro)geologists 3. TH: test hole (may have detailed information, but may not 4. OBS: observation well 5. COAL: Coal test well (probably has good descriptions, but may be lacking if it is not directly related to coal) 6. O/G: Oil and gas well (may be too deep to be of use for this) 7. BUS: Water well for business 8. COMM: Water well for commercial operation 9. FARM; Household or livestock watering well 10. INDUS: Industrial water well 11. IRRIG: Irrigation well 12. MUNICIPAL: Water well for municipal water supply 13. Nan: Unknown 14. NCPUB: Noncommunity public water well (may be for small rural community, for example) 15. NPOT: Non-potable water well 16. PRIV: Private water well 17. SEMIP: semi-private water well (may be shared between multiple houses, for example) 18. STOCK: Livestock watering well 19. SUBD: Subdivision water supply 20. WF: Water flood or repressurization well (helps maintain groundwater levels as needed) |
| **DEPTH** | float | Total depth of the well (not useful for what you are doing, probably) |
| **ISWSPNUM** | integer | Number for reference for the Illinois State Water Survey (ISWS): (not useful for what you are doing, probably) |
| **VERIFIED\_BY** | text | Initials of who verified the depth (not useful for what you are doing, probably) |
| **VERIFIED\_NOTES** | text | General notes about bedrock pick (not useful for what you are doing, probably) |
| **VERIFIED\_DATE** | date | When was the top of bedrock selected for this well |
| **BEDROCK\_DEPTH** | float | The depth to the top of bedrock, in feet, as picked manually by geologist |
| **VLQ** | integer | Verified Location Quality (in order from worst quality to highest quality):   1. Could not find 2. Within a [PLSS section](https://en.wikipedia.org/wiki/Section_(United_States_land_surveying)#:~:text=In%20U.S.%20land%20surveying%20under%20the%20Public%20Land,number%2C%20section%20number%2C%20and%20portion%20of%20a%20section.) 3. In a big parcel 4. In a lot or at a house 5. Located using GPS |
| **VLC** | integer | Verified location confidence:(in order from least confident to most confident):   1. Too big of an area or not enough information to be certain about well location 2. Not sure (iffy) 3. Ok (in a big parcel) 4. Very confident (small lot or GPS matches with other metadata known about the well (e.g., lot owner, etc)) |
| **LATITUDE** | float | Latitude of the well (using the [EPSG:4269](https://epsg.io/4269) coordinate reference system…the coordinate reference system is probably not necessary information for your work, but just so you know) |
| **LONGITUDE** | float | Longitude of the well (using the [EPSG:4269](https://epsg.io/4269) coordinate reference system…the coordinate reference system is probably not necessary information for your work, but just so you know) |
| **ELEV\_FT** | float | Surface elevation of the well, as calculated using the Latitude and Longitude (accuracy of coordinates should be in the VLQ and VLC columns) and the Illinois statewide lidar surface elevation dataset (which is very accurate) |
| **BEDROCK\_ELEV\_FT** | float | Elevation of the bedrock pick, in feet above sea level |
| **BEDROCK\_ELEV\_M** | float | Elevation of the bedrock pick, in meters above sea level |