Summary of Pebble Self-potential archive files

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The Pebble self-potential archive consists of folders "fieldData" and "Processed_SPvalues". The fieldData folder contains subdirectories for the two years that self-potential data were acquired (2007 and 2008), which in turn contain the raw self-potential data. The Processed_SPvalues folder contains the final self-potential values at all surveyed stations for each year. A summary of the various directories and files is described below.

PebbleSParchive/fieldData/2007

- readme.txt: notes on the 2007 data acquisition
- **220807**: folder containing data files for Aug. 22, 2007
- **230807**: folder containing data files for Aug. 23, 2007
- **240807**: folder containing data files for Aug. 24, 2007
- **polarization:** folder containing electrode polarization measurements (2 per day for each of the 3 survey days)
- text files in each of the subfolders contain notes on the data acquisition

Data file description:

Each station has a unique data file that is automatically generated by the datalogger software. Files are named according to the assigned station ID. The data file contains 20 (nominal) self-potential measurements taken at a given station. These 20 measurements are averaged to produce a single station self-potential that is stored in the Processed_SPvalues folder. The data files have 2 header lines, followed by the 20 measurements with comma-separated data. Each line contains the following information:

FIELD1: Measurement number
FIELD2: Date & Time, MM/DD/YYYY HH:MM:SS
FIELD3: measurement units = Volt
FIELD4: measured self-potential
FIELD5: range (automatically set by voltmeter), 50.00 m = 50 mV range
FIELD6: resolution (automatically set by voltmeter), 1.000 μ = 1 μ V range

PebbleSParchive/fieldData/2008

- **day#**: folders containing data files for each day(line) of acquisition
- PebbleFieldSPdata.xls: an Excel file with separate worksheets for each line of self-potential data, with worksheet names that correspond to the data folder names that contain measurements for that line.

Data file description:

Each station has a unique data file that is automatically generated by the datalogger software. Files are named according to the assigned station ID. The data file contains 15 (nominal) self-potential measurements taken at a given station. These 15 measurements are averaged to produce a single station self-potential that is stored

in the Processed_SPvalues folder. The data files have 2 header lines, followed by the 20 measurements with comma-separated data. Each line contains the following information:
FIELD1: Measurement number
FIELD2: Date, MM/DD/YYYY
FIELD3: Time, HH:MM:SS
FIELD3: measurement units = Volt
FIELD4: measured self-potential
FIELD5: range (automatically set by voltmeter), 50.00 m = 50 mV range
FIELD6: resolution (automatically set by voltmeter), 1.000 μ = 1 μ V range

Excel file description:
Each worksheet has a few lines of header information that details the survey and line details. This is followed by a table with the following columns:
LID: Line number, increasing sequentially in the order in which lines were acquired
FE: Front electrode station number. Every measurement station is assigned a unique number, and FE corresponds to the station number for the front, or roving, electrode.
RE: Rear electrode station number. Unique station number for the base electrode, which remains fixed for a line of data.
RAW_SP: File name that contains self-potential measurements for a single station, located in the directory that corresponds to the line name. The files are automatically generated by the datalogger software, and are described below.
SDEV: Standard deviation of measurements at a single station. This column is empty because it is computed automatically from the data file.
DATE: Date of the measurement. This column is empty because it is computed automatically from the data file
TIME: Time of the measurement. This column is empty because it is computed automatically from the data file
LON: Longitude of the station corresponding to the front electrode location (California State Plane Zone 2 Feet)
LAT: Latitude of the station corresponding to the front electrode location (California Sate Plane Zone 2 Feet)
ELEV: Elevation of the station corresponding to the front electrode location (feet)
trueV: Dummy field- always zero, not used.
Comments: Notes about particular measurement stations.

PebbleSParchive/Processed_SPvalues/
This folder contains one Excel file for each year of acquisition. Each file provides the coordinates (UTM WGS84 Zone5N) of every surveyed station, along with the processed self-potential value for that location (in Volts). The 2007 values are calculated by averaging the 20 measurements at each station along the single profile. Because of the more complicated survey geometry in 2008 that consists of multiple interconnected survey lines, a more sophisticated strategy was required to generate the final SP value at each location. In this case the processed self-potential value is calculated by tying

together the multiple lines of raw data according to the methods described in Minsley and others (2008).

Note that self-potential values for any given survey are calculated with respect to an arbitrary reference location, which is assigned a value of 0 Volts. Because the 2007 and 2008 surveys have different reference locations, the absolute SP values do not necessarily agree where the lines overlap, but the relative trends between the two surveys are consistent with one-another.

References

Minsley, B.J., Coles, D.A., Vichabian, Y., and Morgan, F.D., 2008, Minimization of self-potential survey mis-ties acquired with multiple reference locations: Geophysics, v. 73, no. 2, p. F71-F81.