

ADS Take Home Challenge

The objective of this exercise is to give you the opportunity to demonstrate your ability to QA/QC, analyze, and draw insights from geologic data. We are less concerned with “correct answers” than we are with seeing that you can clearly communicate your thought processes and interpretations. You should not spend more than a couple of hours on this exercise. Note: The values in this dataset are not real. We expect analysis based on the given dataset; geologic knowledge is not required.

1. Using any IDE of your choosing, create a python environment that includes libraries that allow you to manipulate tabular and geospatial datasets. We recommend using [pandas](#) and [geopandas](#), but you are free to use other libraries. During the follow-up interview, you will be asked to share information about your development environment of choice, and to spin up a python interpreter to execute code.
2. Install a recent, stable version of QGIS (open source) if you do not already have it on your computer. If you prefer to visualize spatial data using Python tools, that is also fine.
3. At KoBold Metals, we often use spatial geochemistry data to identify exploration targets. Given the CSV provided, quality check the data using Python (the environment you set up in step 1) and optionally in QGIS.
 - a. **Programmatically** remedy all errors you can find in the dataset provided. Write at least one Python function that aids in the data clean up.
 - b. Document the errors you have observed and how you remedied them. Provide **(1) your code in a .ipynb or .py file and (2) an explanation of the revisions you made to the data and (3) a final csv and geopackage of the cleaned data file.**
4. In this exercise, we’re searching for ore bodies with high concentrations of Nickel and Cobalt in particular. Using a method of your choice, plot the geochemistry data and compare the statistical distribution of these elements across two lithologies: gabbro and basalt.
 - a. Which of the two lithologies appears to be more prospective to you, and why? Include the figure(s) you created to make this decision.
5. Use either Python or QGIS to view the geochemistry data spatially. Insert the provided TMI (total magnetic intensity) raster underneath the geochemistry data. Given that a high magnetic signal generally corresponds with higher prospectivity, highlight three areas you think are most prospective. Provide maps/figures/screenshots as needed to support your decision.