BRAND-AGNOSTIC STUDY

Customer Test of AGI Passive Resistivity Cables Compared To Third-Party Cables

AGI Advanced Geosciences, Inc

CASE HISTORY

Objective: For troubleshooting purposes, a customer wanted to make an objective comparison between two brands of passive-resistivity cables—AGI and an undisclosed third party.

Survey site: A site in the Mid Atlantic, USA. This comparison was made in May 2017.

Instruments Used: SuperSting™ R8 with SwitchBox28™, fully-charged deep-cycle marine battery, stainless-steel stakes, and AGI EarthImager™ 2D software for data inversion.

Passive Cables Used:

AGI: Two-year-old FlexLite proprietary cables with 28 total electrodes spaced at 6ft/1.83m

Undisclosed Third-Party: Three-year-old passive cables with 28 total electrodes spaced at 6ft/1.83m

BACKGROUND & PROCESS:

Please note that in order to respect the customer's privacy and ongoing projects—both the AGI customer and third-party cable manufacturer will remain undisclosed.

Pre-Measurement Comparison	
AGI	**Third-Party**
Multi-stranded conductors with proprietary connectors. The take outs are sealed 100% into the jacket. This is a higher-cost build method with a longer lead time for purchase.	Uses Solid-core conductor with off-the-shelf connectors. The take outs use a molding method that is a lower cost and shorter lead time for purchase.

An AGI customer experienced data quality issues when they used Third-Party cables. They decided to replace 28 of their 56 electrodes with the AGI FlexLite Passive Electrode Cable and do a comparison test between the two brands. On the following pages, you can see the results of their comparison. All comparison inversion models used the same parameter sets with identical stop criteria and histogram data removal thresholds. Any variations in RMS, L2 or numbers of iterations are related to the amount of noise and spikes.

RESULTS:

The AGI FlexLite Cable

The customer found that **AGI FlexLite Cables measured significantly cleaner raw data with less spikes.**

Models from the AGI data also **converged faster and with lower RMS error and better L2-Norm and contained more good data in the final model.**

Significantly more data needed to be removed with the Third-Party Passive Cables to fit a good model. The two final models shared similar features, but **there were many more clear artifacts in the Third-Party Passive Cables data.**

See further details on the following pages.

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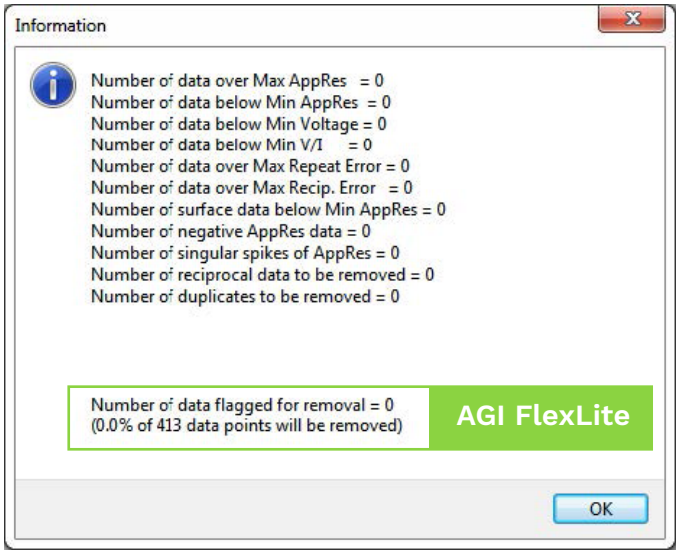
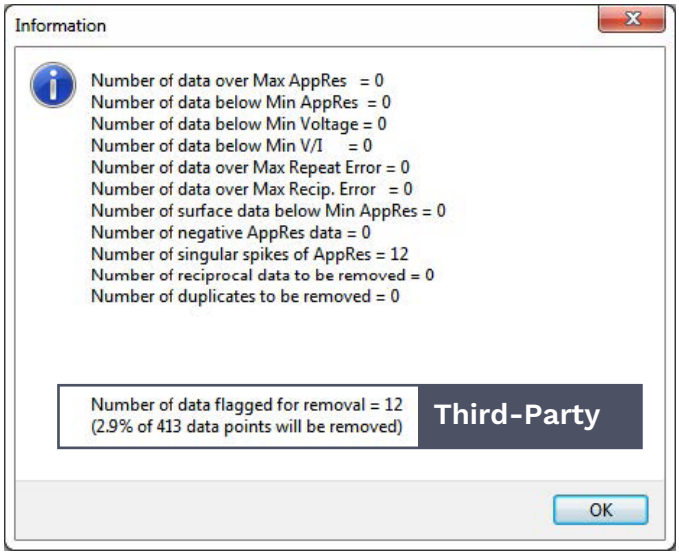
RESULTS (CONT'D):





These plots show the amount of data that needed to be removed before inversion. Both criteria were the same.

The AGI FlexLite Cables produced no spikes and 100% of the raw data was retained. The Third-Party Passive Resistivity Cables showed 12 spikes, or 3% of the raw data that needed to be removed.

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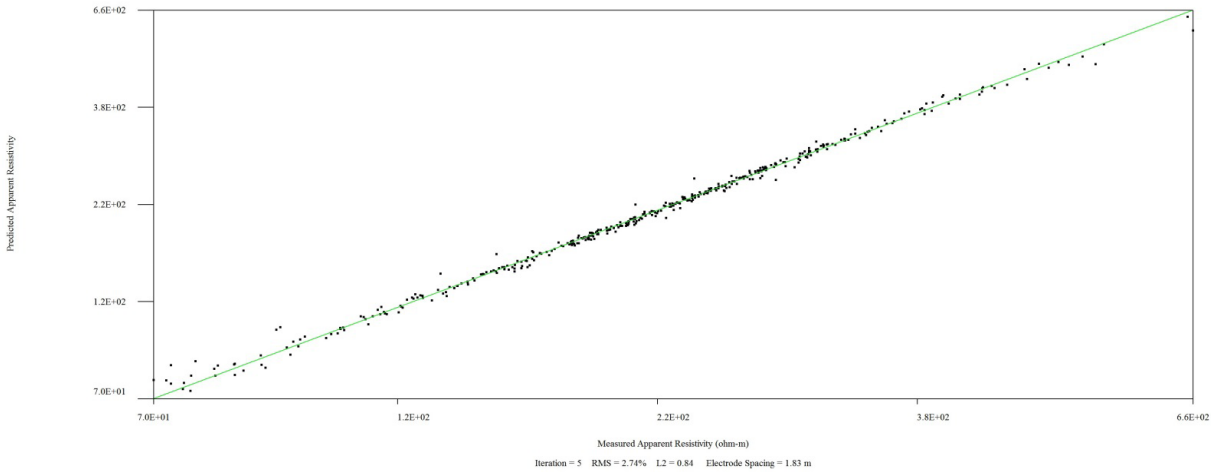
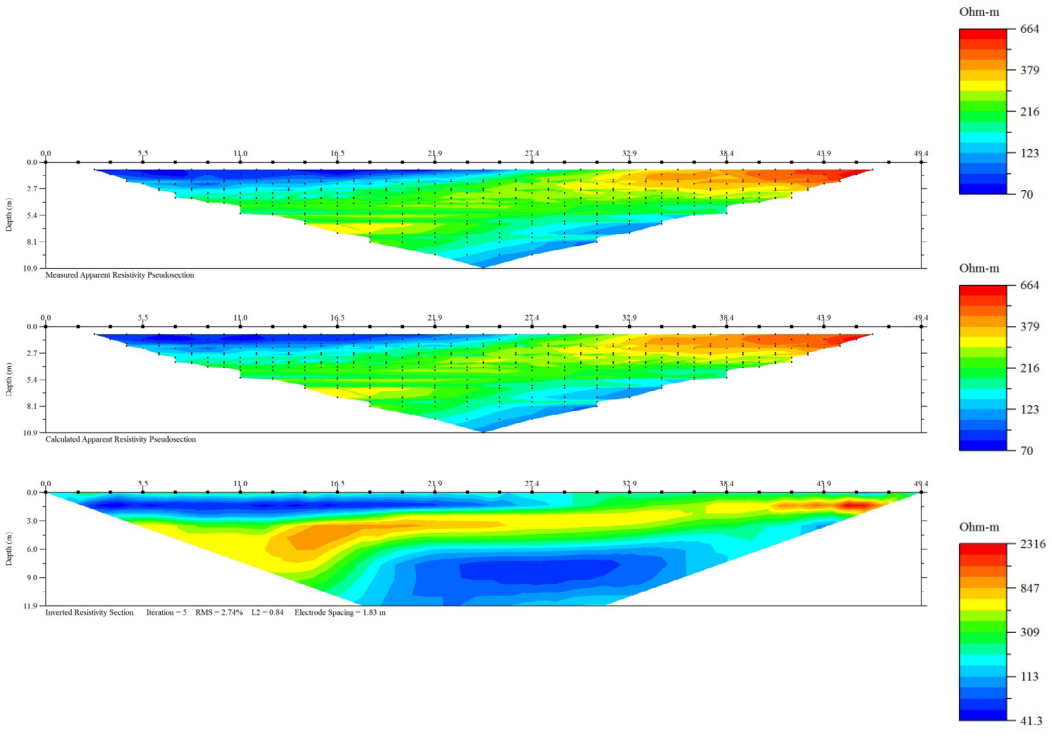
RESULTS (CONT'D):

AGI FlexLite Cables:
First/Final model using raw data

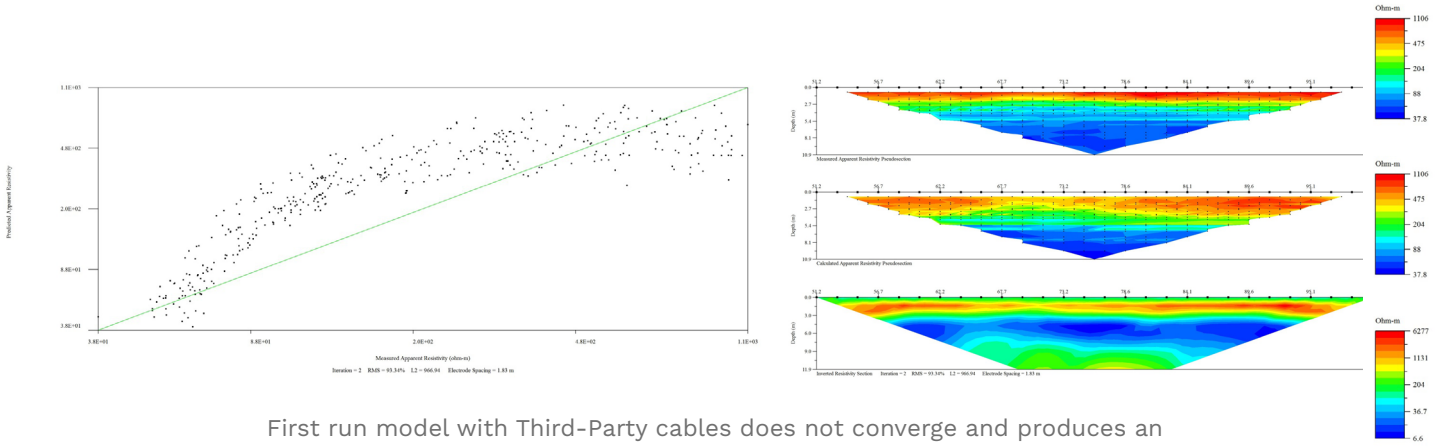




The first run model using the AGI FlexLite Cables converges to a very good solution with an RMS of 2.74% and L2=0.84. **No filtering is required.**

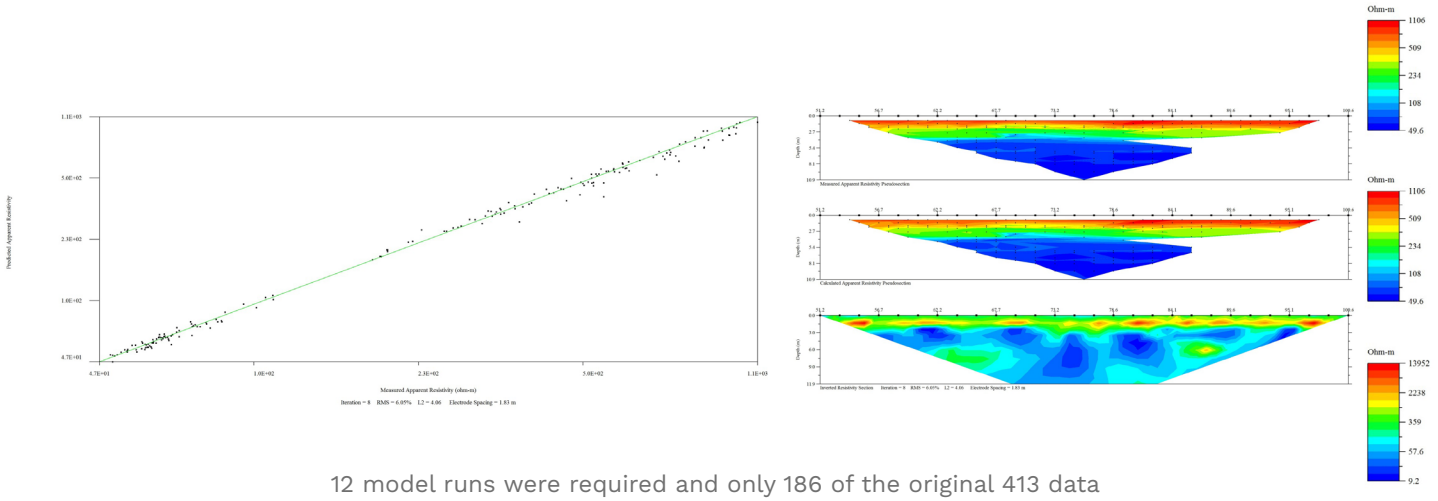
RESULTS (CONT'D):

Third-Party Cables:
First model with raw data



First run model with Third-Party cables does not converge and produces an RMS of 93.34% Error and L2 = 966.94. Extensive filtering is required.

Third-Party Cables:
Final model with after 12 model runs



12 model runs were required and only 186 of the original 413 data points are retained in the final model (a loss of 55%). Further filtering was not performed because the remaining data became too sparse.

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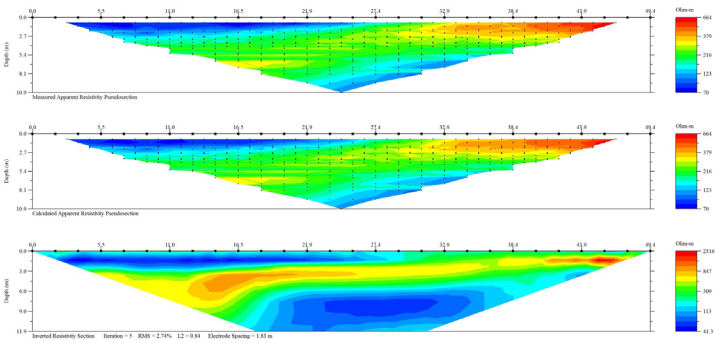
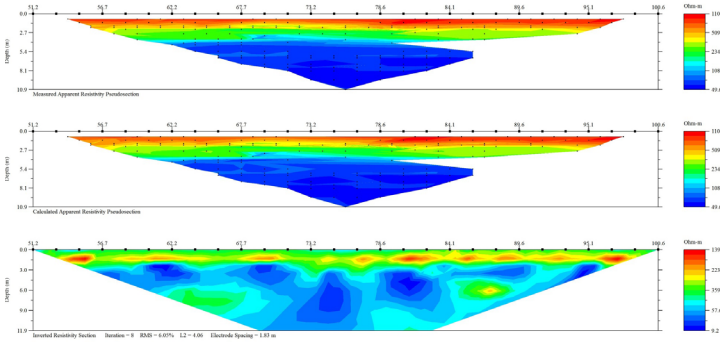
RESULTS (CONT'D):

The final inversion models had similar layering between the two cable types but more complex structures are seen in the Third-Party's model. This is probably from fitting to noise.

AGI Cables - Final Model



Third-Party Cables - Final Model



Final Model Data Comparison		
	AGI	Third-Party
Total Data Points (Final # / Starting #)	413 / 413	186 / 413
% Data Rejected Initially Due To Low-Quality Signal	0%	3%
% Raw Data Used In Final Model	100%	45%
RMS	2.74%	6.05%
L2 Norm	0.84	4.06

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