

SMARTER GOLD EXPLORATION

Leveraging UAV LiDAR, Magnetics, & Machine Learning for Target Generation

An ongoing gold exploration project containing five prospective areas is located 35 km east of Kirkland Lake, ON. Due to the swampland nature of Northern Ontario, cost-effective methods for subsurface exploration are increasingly valuable and abundant. Such methods can be used in combination of other data sources to gain a better understanding of the underlying geology.

2,000 line-km of drone-borne magnetic data was

acquired over an 84 km² area over a two-week period and was processed to produce a series of grids and images. The processed data – along with geology and drillhole data – was used to generate an updated geological map through both qualitative and quantitative methods. The resulting interpretation highlighted thirteen (13) priority areas that helped guide future drilling and field programs. The methods developed during this project laid the foundation for Rosor’s magnetic surveys moving forward.

Project

Larder Lake Project

Methods

Drone-borne Magnetics and Lidar

Location

Larder Lake, Ontario, Canada

Anomaly Type

Subsurface Gold Deposits

BACKGROUND

Located about 35 km east of Kirkland Lake, Ontario is the Larder Lake Project, a large-scale prospective area owned by Gatling Exploration (“Gatling”). The Larder Lake Project contains five prospective areas for further development that lie along the Larder Lake-Cadillac Deformation Zone, which is host to many high-grade gold deposits including the Kirkland Lake deposit and Kerr-Addison-Chesterville deposit. All five areas have been previously explored, with the Cheminis deposit having been actively explored since 1937. Since Gatling has owned the area in 2018, there has been additional exploration work including collected a fixed-wing Lidar survey to create a 3 m-resolution digital elevation model, a sampling project, and extensive drilling with 134 drillholes for a total of 57,556 m.

Gatling approached Rosor Exploration to produce a high-quality, high-resolution magnetic dataset to expand Gatling’s current knowledge of the Larder Lake-Cadillac Deformation Zone, more specifically the Larder Lake Break.

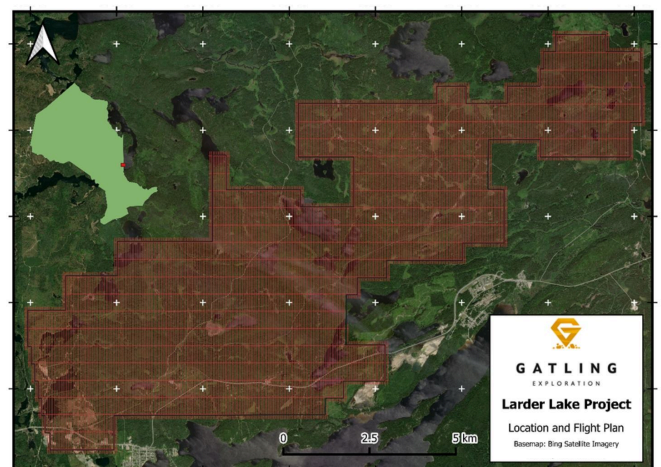


Figure 1: Location and flight plan of the Gatling Larder survey.

The Larder Lake Break is the dominant belt of volcanics and metamorphosed sediments that marks the boundary between the Abitibi Superior Province to the north, and the Timiskaming Assemblage to the south. Due to the swampland nature of Northern Ontario, outcrops are few and far between, meaning it is crucial to get subsurface data by cost-effective means.

THE ROSOR SOLUTION

The Larder Lake Project covers 84 km² over a series of mining claims. Rosor embarked on an ambitious exploration project covering the entire project, which included 2,000 line-km of drone-borne magnetic data, 1,285 line-km of high-resolution Lidar data, and a geophysical interpretation of the area (Figure 1). The drone project started on May 21, 2024, with the 2,000 line-km of magnetic data acquired over 14 days, and the Lidar data acquired over 10 days. Raw data was processed using Oasis Montaj, as well as a newly developed in-house levelling technique specific for drone-borne magnetic data which vastly improved the final magnetic grids. This levelling technique is still used and improved upon for all surveys Rosor flies. Comparison of Rosor's magnetic data and regional magnetic data from the Ontario Geological Survey can be seen in Figure 2.

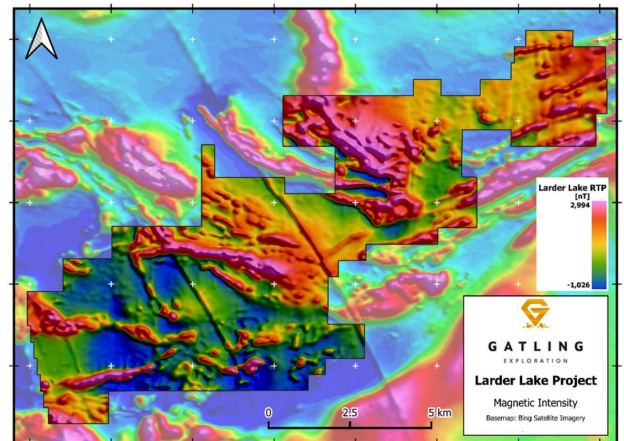


Figure 2: Magnetic intensity of the Larder Lake Project, overlaying the Abitibi Supergrid from the OGS.

Geophysical interpretation of the project included full lithological and structural interpretations of the area. This comprehensive study was done using a combination of machine-learning techniques to find linear structures, and qualitative interpretation from magnetics, Lidar, geological maps, and drillhole data. The interpretation was done using in-house techniques to carry out the interpretation efficiently and effectively.

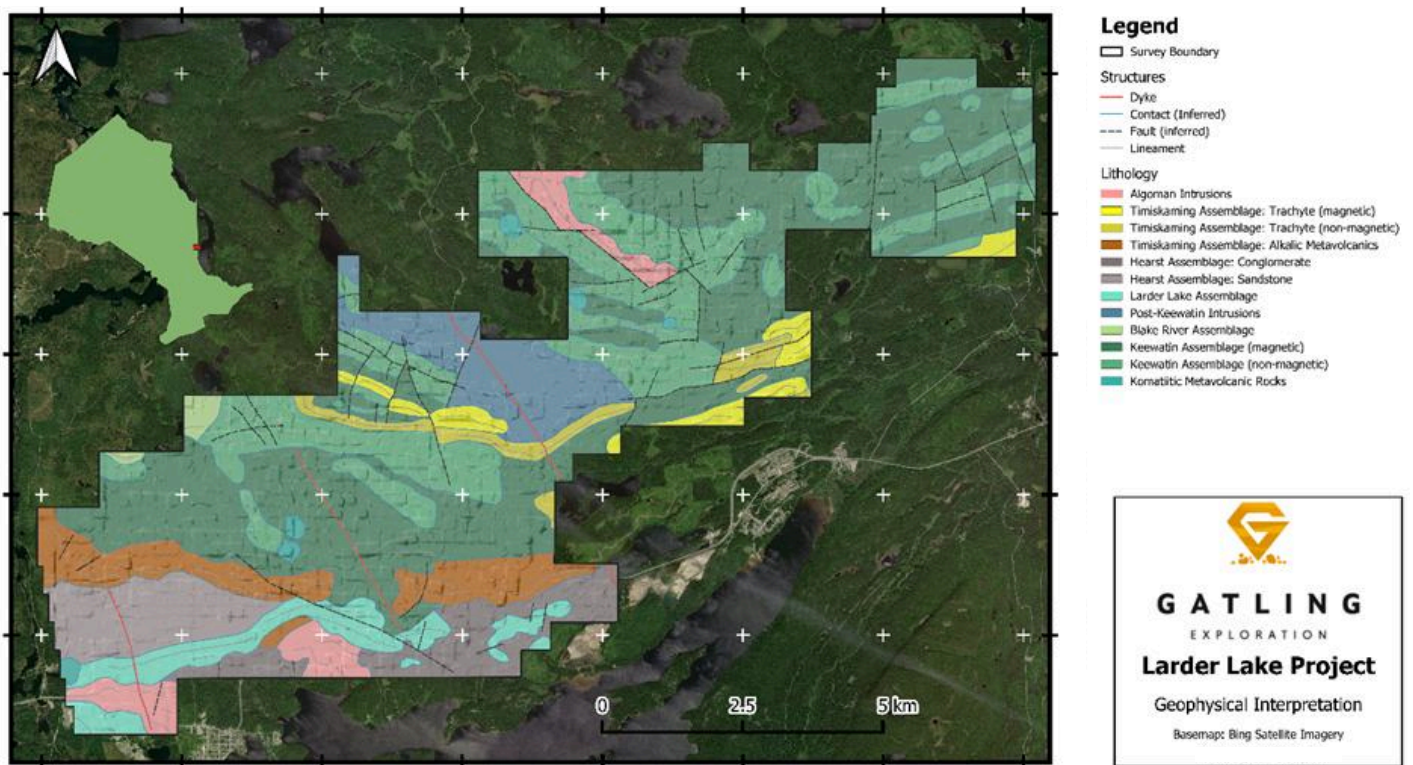


Figure 3: Geophysical Interpretation of the Larder Lake Project.

The interpretation led to 4 areas that were modelled for both magnetic susceptibility and magnetic vector inversion (MVI). The magnetic susceptibility inversion proved better at modelling structures throughout the area in the southern part of the area. Conversely, the MVI inversions proved more effective at delineating the larger magnetic bodies in the area, particularly in the North.

The geological and geophysical interpretations allowed Rosor to provide 13 priority areas selected for follow-up and drilling rated from Priority One to Priority Three, with One being the highest priority. Two of the Priority One areas were already being drilled at the time unbeknownst to Rosor, confirming legitimacy to Rosor's in-house interpretation methods.

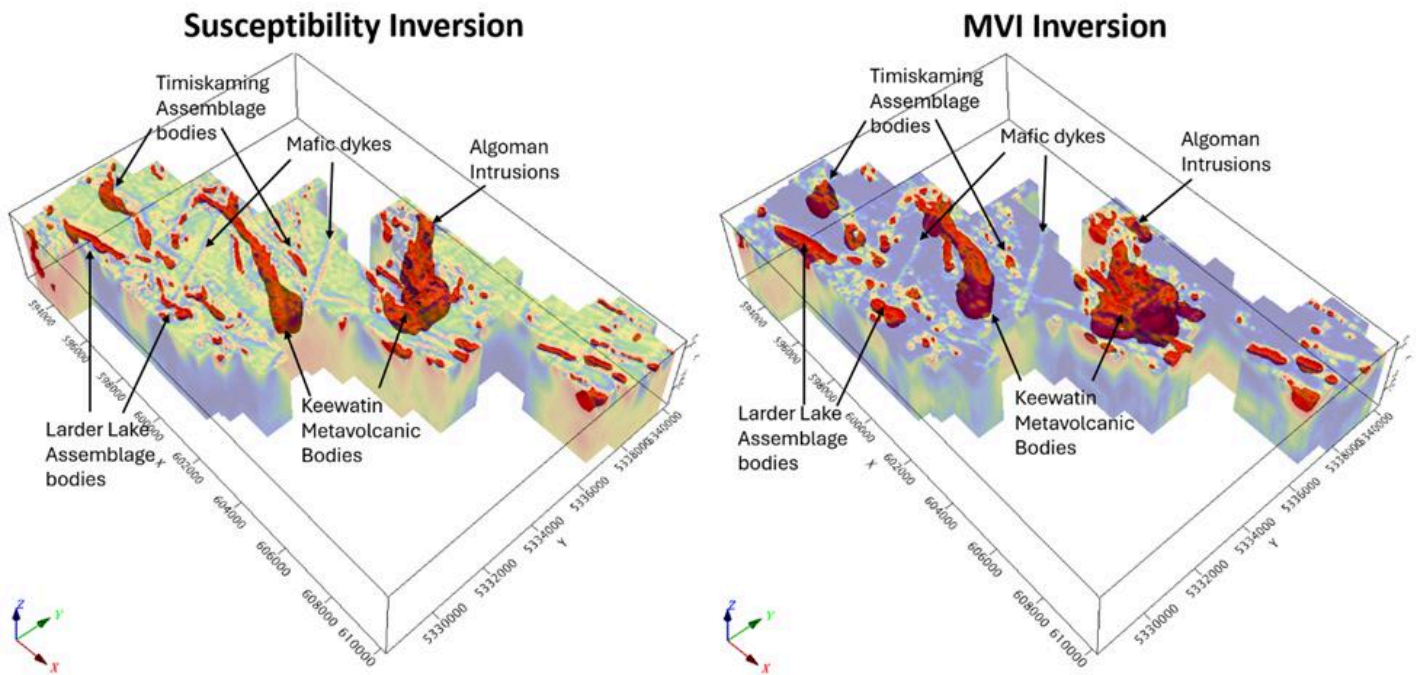


Figure 4: Susceptibility (left) and MVI (right) inversion models for the entire area.

CONCLUSIONS

Gatling approached Rosor to carry out a large-scale drone-borne LiDAR and magnetic survey. This included a full geophysical interpretation of the project to enhance their understanding and assist in further exploration. The survey significantly improved the magnetic resolution over the OGS Abitibi Supergrid (Figure 2), highlighting structures and anomalies previously not visible. The geophysical interpretation was successful in highlighting major structures and potential mineralized bodies that enhanced Gatling Exploration's understanding of the geology of the property (Figure 3), with the inversion models successfully mapping out magnetic bodies (Figure 4).

The delivered products – including the selected priority areas – provided to Gatling enhanced their drilling targets, improved site selection for the 2024 field season, and assisted in planning for future exploration projects.

Rosor has helped our exploration efforts both on the ground and with the drill bit utilizing their drone-borne surveys. They communicated effectively throughout the work program and processed the data within our tight time frame. We enjoy working with the team and look forward to using them again.

— Nathan Tribble, VP Exploration

