

SEG 100 Conference: Celebrating a Century of Discovery

S14

3D Structural Modeling Using Oriented Drill Core: A Best-Practice Case Study from the Ormaque Discovery, Val-d'Or Mining Camp, Québec

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The Ormaque deposit is located in the Val-d'Or mining camp of northwestern Québec and is the most recent discovery at Eldorado Gold Corporation's Lamaque property. The deposit sits approximately midway between the historic Sigma mine and the currently producing Triangle mine. The maiden inferred resource, published in February 2021, included 2.62 Mt at a grade of 9.53 g/t Au for 0.803 Moz of contained gold.

The geology of the deposit area is dominated by volcanic rocks of the ca. 2704 Ma Val-d'Or Formation, which is intruded by an extensive synvolcanic diorite (C-porphyry) and younger syn- to late-tectonic gabbro and diorite-tonalite stocks (~2686-2684 Ma). Gold mineralization at Ormaque occurs in gently south-dipping quartz-tourmaline-carbonate extension veins and localized breccia zones with weakly disseminated to massive tourmaline-pyrite replacement halos. The vein system occurs within the C-porphyry at the contact with volcanoclastic rocks to the north and is enveloped by an Fe-chlorite alteration footprint as defined by spectroscopy (SWIR analysis). Individual extension veins have widths ranging from several cm up to 2 m and inferred east-west strike lengths of up to 650 m and are vertically stacked from a depth of about 150 m to at least 600 m below surface. Moderately south-dipping shear or hybrid shear-extension veins locally interconnect some extension vein segments. Ductile to semibrittle, east-west-striking and steeply north-dipping shear zones anastomose through the C-porphyry and may represent preexisting and/or synmineral structures that controlled vein formation and higher-grade domains.

Interpretation of the geologic and structural framework of the Ormaque vein system involved collection of oriented drillcore measurements and modeling using Seequent's Leapfrog Geo software. Core orientation followed rigorous QA/QC monitoring prior to logging and data collection. Planar structural data were grouped and filtered by structural type and style. Orientation data were statistically analyzed to determine representative vein and shear zone orientations and to inform the construction of structural form interpolant surfaces, which allowed for 3D visualization of structural trends. Intervals containing extensional quartz-tourmaline-carbonate veins were modeled by compositing Au-bearing intercepts based on a cutoff grade (0.5 g/t Au) over the entire composite and a minimum width of 0.5 m. Composites were allowed to incorporate multiple thin veins and a maximum of 4.5 metres of dilution. Composites were grouped into 3D volumes guided by the trends established by the structural form interpolants. This compositing approach, in tandem with detailed geologic observations, oriented core measurements, and structural form interpolant visualization, allowed for the accurate and consistent modeling of vein geometry and established the geologic framework on which the initial resource estimate was made. The workflow also provides a testable and rapidly updatable model for continued exploration and resource drilling on the Lamaque property.

Ormaque Section 295720E (facing west)

