# Gemmological Report

**Report Number**
19022029

**Date**
5 March 2019

**Item**
One faceted gemstone

**Weight**
1.38 ct

**Shape**
Modified cushion-shape

**Cut**
Modified brilliant cut

**Measurements**
8.34 x 6.54 x 4.84 mm

**Transparency**
Transparent

**Colour**
green

**Species**
Natural beryl

**Variety**
Emerald

**Origin**
Afghanistan

**Condition**
Indications of minor clarity enhancement. Natural emeralds are commonly clarity enhanced.

**Comments**
See Information Sheet(s).

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Important notes and limitations on the reverse.

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In keeping with the traditions and high standards of the Catlin Gem Lab (Catelin), each Report reflects the findings and independent opinion of Catelin. Our testing is carried out by qualified gemologists applying approved analytical methods and using approved instrumentation. The description given in the Gemological Report (henceforth called Report) is limited to a selection of identifying characteristics observed in the gemstones (herein referred to as "the stones"

The unmated original of the Report is the only valid document. Matched stones are treated only in a matching sense. Determination of the measurements of natural stones cannot, in most cases, match the precision achievable on loose stones. Weight indications for stones treated in a setting are estimates. Weight figures indicated by the client are checked by Catelin. The colour photograph printed on the Report serves merely as an aid to the gemstones. The actual appearance of the stones may differ from their photographic image. The descriptions of jewelry items may be shortened and simplified.

Origin: A professional opinion as to the probable geographic origin of a gemstone may be given whenever possible and if requested. Deductions as to geographic origins are based exclusively on the internal characteristics, physical and chemical properties observed by Catelin staff, by comparison to the properties recorded in the reference stones of known identity, the results of continuing research undertaken by Catelin, and gemological knowledge published to date. The reference stones mentioned previously are part of the Catelin gemstone reference collection and are systematically and continuously collected, classified and characterized. Catherines from different geological sources may reveal a tell-tale combination of characteristic inclusion patterns, absorption spectra and trace-element compositions that allows for the determination of their origin. Indications of origin provided by Catelin are not a warranty as to the quality or value of the gemstones. They are statements of qualified opinion, and do not guarantee the provenance of particular gemstones. Rather, such statements indicate the most probable origin, based on the data collected for the gemstones noted.

The combination of data may not, in all instances, provide the necessary basis for the determination of a single origin. When such cases arise, the Catelin Gem Lab does not comment on the origin of the gemstones. In addition, a determination of the origin of a gemstone implies the level of knowledge and expertise about the respective type of gemstone at the time of the analysis. As stated above, Catelin offers a comprehensive collection of reference and fully analyzed samples from all commercially relevant mines worldwide. This is an essential prerequisite for providing reliable and relevant origin determination services. However, new in some areas and other countries are coming on stream, and Catelin continues to solicit samples from new sources and thoroughly study its characteristics. The gemstones from such new mines can show similar gemological characteristics which may overlap with the characteristics of stones from earlier known localities. In such cases, the potential limited number must be reviewed to ensure the basis for the determination of the origin as described above.

Enhancement: Historically, many coloured gemstones have been enhanced to improve their appearance. Enhancement is a term used in the trade to describe any process additional to cutting and polishing that improves the appearance or durability of gemstones. Today, a variety of traditional and advanced enhancements (also known as treatments) are routinely applied to many natural gem materials including, but not limited to, beryl, corundum, topaz, amethyst, tourmaline, sapphire, and chrysoberyl. The clarity of gem materials is often enhanced to reduce the visibility of surface-reaching fissures. This is accomplished by filling the fissures with transparent, colorless (or, rarely, colored) organic substances, such as oil, resin, and wax, or a mixture of these. The international trade generally accepts the filling, also known as clarity enhancement of fissures in natural and other colored stones. Some opalized quartz is reported to be stable under normal conditions, whereas others are not. Oils used to enhance emeralds are less stable.

The clarity enhancement of emeralds is a reversible and repeatable process, and tests may be used to detect and determine multiple times during their "life" as gemstones. This is especially true if it is used as a filling agent, but generally, all types of filling material, including oil, wax, and resin, can be removed. Consequently, clients must be aware that an emerald could potentially be treated again after being treated in Catelin and receiving a Report. If clarity-enhancement treatments are applied to an emerald with a high density of fissures, the appearance of the stone changes dramatically. The more surface-reaching fissures that are present in a stone, the higher the potential for (additional) clarity enhancement.

Enhancement disclosure: Generally, the wording used in Catelin Reports is fully compliant with the American Gem Society (AGS), the American National Standards Institute (ANSI), and the Gemological Institute of America (GIA) standards as defined by the Laboratory Manual Harmonization Committee (LMHC). In keeping with international trade practices, Catelin does not make a separate comment about any treatment that is commonly applied to any of a wide range of gemstones and that is widely used in today's marketplace. On the front of the Report, however, enhancement disclosure will be made for emeralds that show evidence of clarity enhancement. The comment disclosing clarity enhancement in emeralds will address the present and relative amount of enhancement. If requested by the client, the type of treatment will be disclosed. In its reports, Catelin distinguishes the following groups of filling materials: traditional (of type), modern (non-type), m. mixed (of-type and non-type), and wax, catlin. Catelin applies the following terms to grade the presence and relative quantity of the fillers:

- No indications of clarity enhancement.
- Indications of insignificant clarity enhancement.
- Indications of minor clarity enhancement.
- Indications of moderate clarity enhancement.
- Indications of significant clarity enhancement.

Sometimes, fissures that are filled are very wide, or cavities are filled with a viscous substance. In addition to the amount of clarity enhancement, the quantification of filled cavities is also given. Catelin applies the following terms to grade the relative quantity of fillers in cavities:

- Minor amount of filling material in cavities (K1).
- Moderate amount of filling material in cavities (K2).
- Significant amount of filling material in cavities (K3).

For a comparison with the report wording of other LMHC members, please refer to the LMHC's website at http://www.lmhc-gemology.org. The LMHC provides a comprehensive set of guidelines for laboratories to follow. These guidelines address the use of terminology and methods for describing gemstone enhancements. The LMHC encourages laboratories to use consistent and standardized terminology to report gemstone enhancements.

The Report does not contain a guarantee for, or approval of, the gemstones described herein. Catelin assumes no responsibility for any damage or loss, or claims by third parties, which may arise from the information herein contained. This Report is not intended to be used in any manner other than as an aid to the gemstones. The client is responsible for ensuring that the gemstones are properly cared for and maintained. Catelin provides this Report as a service to the client and does not assume any responsibility for the use of the gemstones described in this Report.

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Emeralds from Panjshir, Afghanistan

The Panjshir Valley lies in the foothills of the Hindu Kush in Afghanistan, approximately 130 km north of the capital, Kabul. The mining areas are situated on the east side of the River Panjshir and cover an area of approximately 400 km². The emerald occurrences are located along the Herat Panjshir fault and are related to the Himalayan orogeny, which started some 24 million years ago.

Emeralds have been reported in Afghanistan for thousands of years. Historically, these gems have sometimes also been known as Bactrian emeralds, though this term might also refer to sources in today's Pakistan. It is only for the past four decades that commercial quantities of Afghan emeralds have been mined. Their colour and quality varies, the best being comparable to Colombia's highest quality emeralds.