



**ASSESSMENT AND YMEP 22-042 REPORT**

describing

**AIRBORNE LiDAR SURVEY**

Survey performed on August 25, 2022

at the

**BANDITO PROPERTY**

Amigo 1-8	YC24964 – YC24971	Bandito 117-136	YD14855 – YD14874
Bandito 1-72	YC29447 - YC29518	Bandito 205-244	YE14595- YE15034
Bandito 81-96	YD14875 - YD14904	MGM8	YA90928
Bandito 116-97	YD14481 – YD14500		

NTS 095C/05

Latitude 60° 22' N; Longitude 125° 48' W

in the

Watson Lake Mining District  
Yukon Territory

prepared by

Archer, Cathro & Associates (1981) Limited

for

**ENDURANCE GOLD CORPORATION**

By

K. Willms, B.Sc., P.Geol.

January 2023

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## **INTRODUCTION**

The Bandito property is located in southeastern Yukon Territory, on the Liard Plateau in the Toobally Lakes area, and covers numerous niobium, rare earth element (REE), nickel, copper and zirconium prospects and showings, along with large REE, yttrium and niobium soil geochemical anomalies. The property is wholly owned by Endurance Gold Corporation., the property is subject to a 1% net smelter return royalty.

This report describes a LiDAR survey conducted on August 25, 2022, by LiDAR Services International Inc. on behalf of Endurance Gold. The author summarized details of the survey, a Statement of Qualifications is in Appendix I. While a Statement of Expenditures is in Appendix II.

## **PROPERTY LOCATION, CLAIM AND LAND USE DATA, AND ACCESS**

The Bandito property is comprised of 177 contiguous mineral claims covering an area of approximately 3700 ha (37 km<sup>2</sup>) in southeastern Yukon, centred at latitude 60°22' N and longitude 125°48' W (Figure 1). The claims are registered with the Watson Lake Mining Recorder in the name of Endurance Gold. Details concerning the claims are listed below, and the locations of individual claims are shown on Figure 2.

<u>Claim Name</u>	<u>Claim Number</u>	<u>Grant Number</u>	<u>Expiry Date*</u>
AMIGO	1-6	YC24964-YC24969	2028-12-31
AMIGO	7-8	YC24970-YC24971	2029-12-31
BANDITO	1-4	YC29447-YC29450	2027-12-31
BANDITO	5-10	YC29451-YC29456	2028-12-31
BANDITO	11-18	YC29457-YC29464	2029-12-31
BANDITO	19-24	YC29465-YC29470	2028-12-31
BANDITO	25-28	YC29471-YC29474	2027-12-31
BANDITO	29-36	YC29475-YC29482	2029-12-31
BANDITO	37-40	YC29483-YC29486	2028-12-31
BANDITO	41-48	YC29487-YC29494	2027-12-31
BANDITO	49-64	YC29495-YC29510	2028-12-31
BANDITO	65-72	YC29511-YC29518	2027-12-31
BANDITO	81-87	YD14875-YD14881	2027-12-31
BANDITO	88	YD14886	2027-12-31
BANDITO	89-92	YD14882-YD14885	2027-12-31
BANDITO	93-96	YD14901-YD14904	2027-12-31
BANDITO	97	YD14500	2027-12-31
BANDITO	98	YD14499	2027-12-31
BANDITO	99	YD14498	2027-12-31
BANDITO	100	YD14497	2027-12-31
BANDITO	101	YD14496	2028-12-31
BANDITO	102	YD14495	2028-12-31
BANDITO	103	YD14494	2028-12-31
BANDITO	104	YD14493	2028-12-31

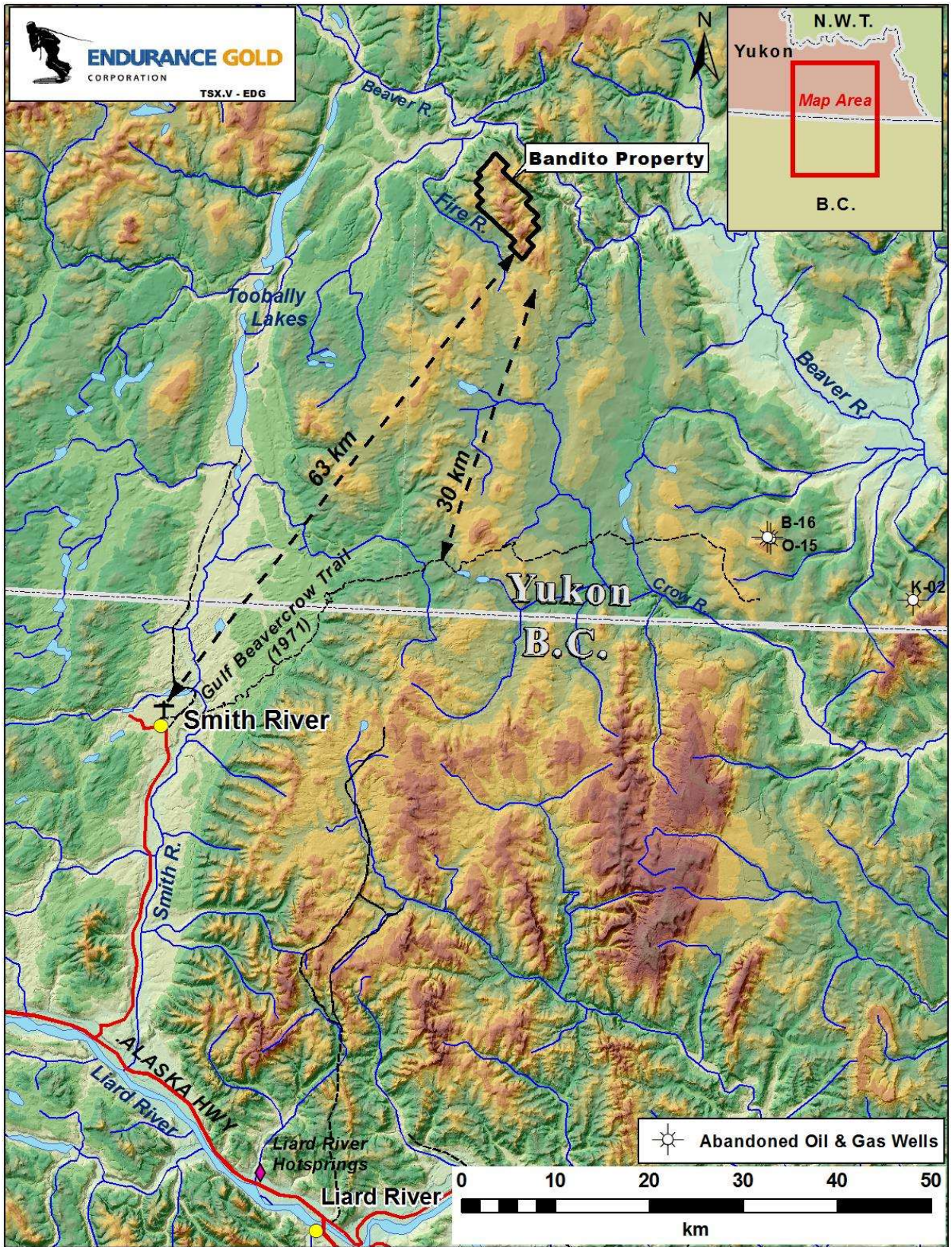
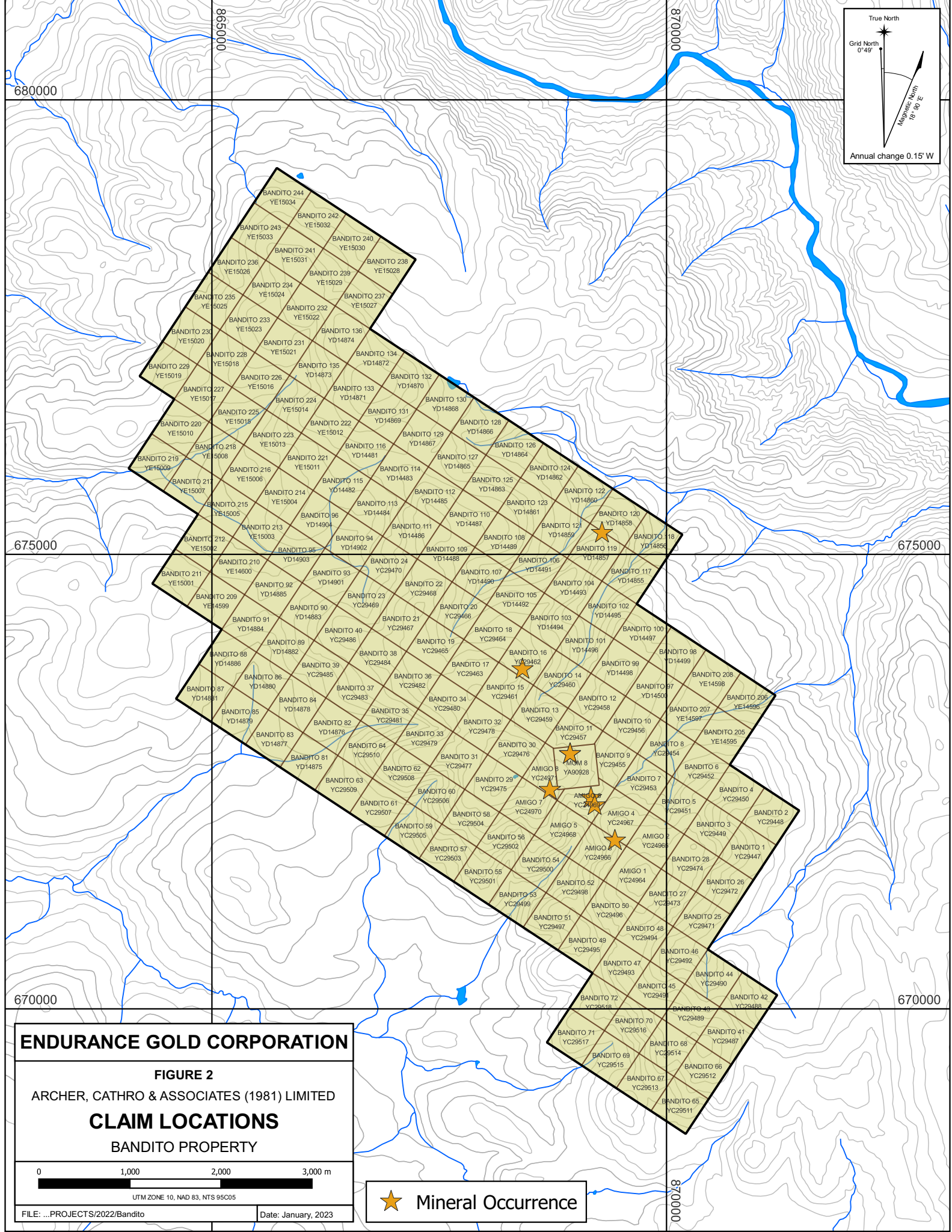


Figure 1: Location Map



True North  
 Grid North 0°49'  
 Magnetic North 10°30' E  
 Annual change 0.15' W

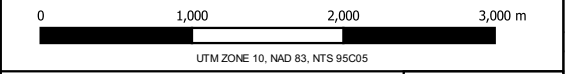
**ENDURANCE GOLD CORPORATION**

**FIGURE 2**

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

**CLAIM LOCATIONS**

BANDITO PROPERTY



FILE: ...PROJECTS/2022/Bandito Date: January, 2023

★ Mineral Occurrence

BANDITO	105	YD14492	2028-12-31
BANDITO	106	YD14491	2028-12-31
BANDITO	107	YD14490	2027-12-31
BANDITO	108	YD14489	2027-12-31
BANDITO	109	YD14488	2027-12-31
BANDITO	110	YD14487	2027-12-31
BANDITO	111	YD14486	2027-12-31
BANDITO	112	YD14485	2027-12-31
BANDITO	113	YD14484	2027-12-31
BANDITO	114	YD14483	2027-12-31
BANDITO	115	YD14482	2027-12-31
BANDITO	116	YD14481	2027-12-31
BANDITO	117-118	YD14855-YD14856	2027-12-31
BANDITO	119	YD14857	2028-12-31
BANDITO	120	YD14858	2027-12-31
BANDITO	121	YD14859	2028-12-31
BANDITO	122-136	YD14860-YD14874	2027-12-31
BANDITO	205-210	YE14595-YE14600	2028-12-31
BANDITO	211-244	YE15001-YE15034	2028-12-31
MGM	8	YA90928	2029-12-31

\*Expiry dates include 2022 work that has been filed for assessment credit but has not yet been accepted.

The Bandito property is situated approximately 155 km east of Watson Lake, Yukon, and 129 km west of Fort Liard, Northwest Territories, the nearest supply centres. The nearest major supply centre is Whitehorse, Yukon, located 504 km to the west. The property is only accessible by air. The Smith River Falls airstrip is located 63 km south-west of the property. There are small fishing and hunting lodges located on both Upper and Lower Toobally lakes, located approximately 20km and 35km from the property, which can support float planes. The nearest trail access is a historical cat trail that passes within 30 km of the property.

The property lies within the traditional territories of the Ross River Dena Council and Liard First Nation (Kaska Dena Council), which have not yet settled land claims agreements with Canada and Yukon. Land Use Planning is currently underway on the traditional territories of the Kaska Dena Council.

### **AIRBORNE LIDAR SURVEY**

LiDAR Services International Inc. conducted the survey based out of the Whitehorse Airport in a Partenavia P68C airplane owned and operated by Integrated Sensing & Surveillance Inc. of Red Deer, Alberta.

The project consisted of pre-planned flight lines flown at an average height of 850 m above ground level and a forward speed of 215 km/h. Full details from this survey can be found in Appendix III.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES (1981) LIMITED

A handwritten signature in blue ink, appearing to read 'K. Willms', is positioned above the name. The signature is fluid and cursive, with a prominent loop at the end.

K. Willms, B.Sc., P.Geo.

**APPENDIX I**  
**STATEMENT OF QUALIFICATIONS**

## STATEMENT OF QUALIFICATIONS

I, Kelson Willms, geologist, with business addresses in Vancouver and Squamish, British Columbia and Whitehorse, Yukon Territory and residential address in Whitehorse, Yukon, do hereby certify that:

1. I graduated from the University of British Columbia in 2017 with a B.Sc. in Earth and Environmental Sciences.
2. From 2015 to present, I have been actively engaged in mineral exploration in the Yukon Territory and British Columbia, Canada, and in the United States of America and Mexico.
3. I am a Professional Geoscientist (P.Ge.) with the Engineers and Geoscientists British Columbia (Member Number 56580).
4. I have personally participated in and supervised the field work reported herein and have summarized all data resulting from this work.



K. Willms, B.Sc., P.Ge.

**APPENDIX II**  
**STATEMENT OF EXPENDITURES**



<b>YMEP No: 22-042</b>		Project Name: Bandito		Applicant Name: Endurance Gold Corporation	
Expense Claim No:		Project Type: Hard Rock		Program module: Target Evaluation	
Date Submitted: January 30, 2023		Phone: 867 667 4415		email: lsmith@archercathro.com	
Address: 41 MacDonald Road, Whitehorse, YT, Y1A 4R1					
Start and end dates of fieldwork		August 25, 2022		Number of field days	
				1	
Daily Field Expenses			Number Days		Rate/Day
Number of Persons:					Total
					\$ 100.00
					\$ -
Persons		Position	Days	Rate/Day	
P4 Geologist		Sr. Geo	4	\$ 500.00	
P6 Partner		Sr. Geo	2.25	\$ 500.00	
A2 Admin		Technician	1.75	\$ 350.00	
S2 ESG Manager		Technician	1.75	\$ 350.00	
				Total Field	
				\$ 4,350.00	
Equipment		Days		Rate/Day	
				Total	
				Equipment Total	
				\$ -	
Other					
Persons/ Supplier		Position	Days	Rate/Day	
LiDar Services International, as attached				\$ 23,800.00	
Jaworski Mapping & GIS				\$ 624.25	
				Other Total	
				\$ 24,424.25	
				Total expenditures - YMEP	
				\$ 28,774.25	



**Statement of Expenditures**  
**Bandito**

**Expenses**

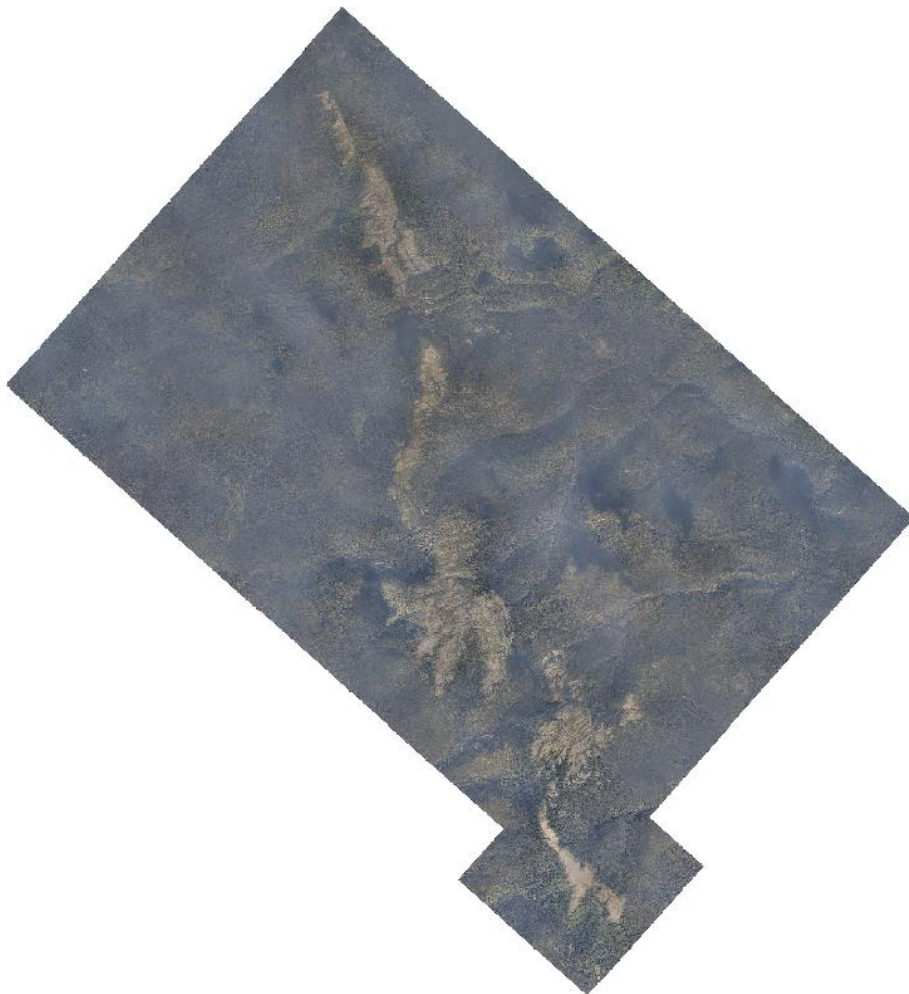
LiDAR SERVICES INTERNATIONAL INC.	\$ 23,800.00
ARCHER, CATHRO & ASSOCIATES (1981) LIMITED, project oversight, Class 1 Prep and submission, Class 3 prep	<u>\$ 2,214.00</u>
	<u>\$ 26,014.00</u>

Total eligible expenditures submitted \$ 26,014.00

**APPENDIX II**

**LiDAR SURVEY REPORT 2022**

# **Endurance Gold Corporation Bandito Property**



## **LiDAR Survey Report**

**August 2022**



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# 1. Survey Summary

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LiDAR Services International Inc. (LSI) performed a LiDAR & Imagery survey for Endurance Gold Corporation in August 2022 of the Bandito Property near Watson Lake, YT totaling approximately 50 square kilometers. LiDAR data and Imagery were collected and delivered with the following parameters:

- MATRIX LiDAR system installed in a Partenavia P68C airplane owned and operated by Integrated Sensing & Surveillance Inc. of Red Deer, Alberta.
- Airborne data was collected in one flight on August 25, 2022, based out of the Whitehorse Airport
- LiDAR data and imagery were collected at an average flying height of 850 m above ground level and a forward speed of 215 km/h with 30% side overlap
- Riegl LMS Q780 laser pulsed at a rate of 400 kHz, resulting in an average point density of 5 points/m<sup>2</sup>
- Horizontal Datum: NAD83(CSRS) in meters
- Vertical Datum: CGVD2013 orthometric heights in meters
- Map Projection: UTM Zone 10N (Central Meridian = -123 degrees longitude)
- Deliverables included:
  - LiDAR point clouds classified to Ground, DTM Key Point, Low Vegetation (0 – 1 m) and High Vegetation (>1 m) in LAS v1.2 format.
  - Bare Earth and Full Feature gridded points at 1 m spacing in ASCII XYZ format
  - Greyscale hillshades of Bare Earth and Full Feature surfaces at 1 m pixel resolution in GeoTIFF format.
  - Ortho-mosaicked colour digital imagery with 10 cm pixel resolution in compressed ECW format
  - Index map in DWG format

## 2. MATRIX LiDAR System

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The MATRIX LiDAR system was installed in a Partenavia P68C airplane, shown in Figure 1, owned and operated by Integrated Sensing & Surveillance Inc. of Red Deer, AB.



**Figure 1: P68 with MATRIX LiDAR System**

The Riegl LMS Q780 laser scanner, inertial measurement unit, digital camera, computers and data storage devices were mounted to the floor in the rear of the aircraft. The GPS antenna was mounted on top of the fuselage and the operator controlled the MATRIX system with a laptop from the rear passenger seat. Transport Canada has approved the installation of the MATRIX LiDAR system into this survey aircraft.

Key sensors utilized in the MATRIX installation for the LiDAR survey include:

- Riegl LMS Q780 laser scanner and data recorder
- NovAtel SPAN-SE dual frequency GPS receiver
- IXSEA AIRINS 200 Hz Inertial Measurement Unit (IMU)
- Canon EOS-5DS 50 megapixel digital frame downward camera

### 3. Survey Control

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To ensure accurate absolute and relative positioning of the LiDAR data during data collection, kinematic differential GPS (DGPS) surveying techniques were used. DGPS involves having a static GPS receiver collecting data at a known ground control point in the vicinity of the project area simultaneously with the collection of the kinematic GPS from the aircraft. After the mission, during the post processing, the static and kinematic sets of raw GPS data were combined together and processed, resulting in an accurate positioning solution of the aircraft.

In support of the survey, LSI referenced the continuously operating Whitehorse CACS station using the CSRS published coordinates shown below in Table 1. The control point is in the NAD83(CSRS), UTM Zone 8 projection with orthometric heights in the CGVD2013 datum and computed using the CGG2013 geoid model.

**Table 1:** *LiDAR Control Coordinates & Positions (NAD83 (CSRS), UTM Zone 8N, CGVD2013)*

Control Point	Latitude	Longitude	Easting (m)	Northing (m)	Orthometric Height (m)
WHIT	60 45 01.833295	-135 13 19.515052	487894.132	6735018.927	1419.523

## 4. Data Collection

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### 4.1 Airborne LiDAR & Imagery Survey

LSI collected LiDAR and imagery data of the Bandito Property in one flight on August 25, 2022, based out of the Whitehorse Airport. The project consisted of pre-planned flight lines flown at an average height of 850 m above ground level and a forward speed of 215 km/h. The Riegl LMS Q780 laser pulsed at a rate of 400 kHz and the laser scanned at a rate of 134 Hz, resulting in an average point spacing of 0.45 m or 5.0 points per square meter. The Canon EOS-5DS digital camera took a photo every 3.5 seconds resulting in 60% forward overlap between consecutive photos.



**Figure 2: Project Flightlines**

## **4.2 Data Quality Control & Validation**

LiDAR calibration passes were flown near the airport during each survey flight. The calibration passes allow for the determination and verification of the roll, pitch and heading misalignment angles between the IMU measurement axis and the laser sensor. The calibration passes consisted of multiple flight lines flown at orthogonal and parallel headings at the project flying height and speed. During post processing, the flight line relative accuracies were determined and confirmed the high quality of the IMU-laser boresight alignment and the trajectory solutions.

Ground check points were also collected in the calibration area to help verify the absolute accuracy of the LiDAR data. The check points were collected on foot with a pole-mounted GPS antenna as shown in Figure 3, and post-processed in a DGPS solution referenced to the same control network as the project.



**Figure 3: Ground Check Point Collection**

The ground points of the LiDAR data over the site were used to create a triangulated surface model, which were then compared to the independently observed ground check points.

The tested fundamental vertical accuracy of the LiDAR data for the project is 10 cm at a 95% confidence interval.

## 5. Data Processing and Deliverables

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The LiDAR data and imagery for the Bandito Property were delivered to Endurance Gold with the following specifications:

- Horizontal Datum: NAD83(CSRS) in meters
- Vertical Datum: CGVD2013 orthometric heights in meters
- Mapping Projection: UTM Zone 10N (central meridian -123 degrees longitude)
- LiDAR LAS v1.2 point clouds classified to Ground, DTM Key Point, Low Vegetation (0 – 1 m above ground) and High Vegetation (greater than 1 m above ground)
- Bare Earth and Full Feature grid points at 1 meter spacing in ASCII XYZ format
- Greyscale hillshades of Bare Earth and Full Feature surfaces at 1 m pixel resolution in GeoTIFF format
- Ortho-mosaic color digital imagery with 10 cm pixel resolution in GeoTIFF and compressed ECW formats
- Index map in DWG format

## **5.1 LiDAR Point Clouds**

### **5.1.1 LiDAR Tiles**

Unclassified point clouds were generated for each individual flight line from the raw laser data, the GPS-IMU post-processed solution and the measured system calibration parameters. The point clouds were then imported into 1km x 1km tiles covering the project area using Terrasolid software. The number for each tile was derived from the southwest corner coordinate of the tile, i.e. Tile 3416702 has a southwest corner coordinate of E: 341000m, N: 6702000m.

The LAS v1.2 point clouds were delivered with the following feature codes:

- 2: Ground
- 3: Low Vegetation (0 to 1 meter above ground)
- 5: High Vegetation (greater than 1 meter above ground)
- 8: DTM Key Point

### **5.1.2 Ground Points**

An initial automatic ground classification was applied to the tiles. The automatic ground macro classified ground points using a sequence of steps that identifies the lowest LiDAR point in an area and then finds neighboring ground points based on user-specified iteration angles and tolerances. After the automatic ground classification, trained technicians inspected those points and either added or removed points from the *Ground* class that were incorrectly classified by the automatic ground macro. This was done using the Terrasolid suite of LiDAR editing tools in the MicroStation environment.

### **5.1.3 DTM Key Points**

After completion of the manual ground editing, *DTM Key Points* were classified from the *Ground* point class. The automatic *DTM Key Point* classification selects key points from the *Ground* class and chooses neighboring *Ground* points using a horizontal tolerance of 10 m and a vertical tolerance of 10 cm. That is, the maximum horizontal distance between

*DTM Key Points* is 10 m and the maximum vertical distance is 10 cm. The points that were not selected for the *DTM Key Points* were left in the *Ground* class.

The *DTM Key Points* are a subset of the *Ground* points taken directly from the *Ground* class. The *DTM Key Point* class typically has up to 90% less points than the original *Ground* class, depending on the terrain. ***Since the DTM Key Points are taken from the Ground class, it is important that the Ground class never be used by itself. Either the DTM Key Point class can be used alone, or the DTM Key Point and Ground classes can be used together.*** The *DTM Key Point* and *Ground* classes together will produce the maximum possible terrain detail, with the largest number of points.

#### 5.1.4 Vegetation

The remaining non-ground points were then classified into two separate classes: *Low Vegetation* (0 m to 1 m above ground and *High Vegetation* (greater than 1 m above ground). The vegetation classes contain all objects and structures above the ground, including buildings, transmission lines, bridges, fences, vehicles and piles of non-earth materials.

## 5.2 Grid Points

Bare Earth grid points were created at a 1-meter interval for each tile and delivered in ASCII XYZ format. The Bare Earth grid point elevations were derived from a Triangulated Irregular Network (TIN) surface model of the *DTM Key Point* and *Ground* classes in the LiDAR point cloud tiles.

Full Feature grid points were also created at a 1-meter interval for each tile and delivered in ASCII XYZ format. The Full Feature grid point elevations were derived from the highest point in the *High Vegetation* class within each 1-meter cell. The Bare Earth grid point elevations were applied for cells having no *High Vegetation* points.

### **5.3 Hillshades**

Geo-referenced grayscale raster images with a 1 m pixel size were delivered in GeoTIFF format. The Bare Earth hillshade images were derived from the Bare Earth grid points and the Full Feature hillshade images were derived from the Full Feature grid points. The hillshades were created using a 315 degree sun azimuth and 45 degree sun angle.

### **5.4 Orthoimage Mosaics**

Geo-referenced colour digital orthoimage mosaics with 10 cm pixel size were delivered in compressed ECW and GeoTIFF formats. The mosaics were divided into tiles and trimmed to the project boundary. The compressed ECW tiles were created using a 5:1 compression ratio.

LSI greatly appreciates the opportunity to have performed the Bandito Property LiDAR survey for Endurance Gold Corporation, and is available for any questions or comments regarding the survey or the contents of this report.

LiDAR Services International Inc.  
110, 7777 – 10 St. N.E.  
Calgary, Alberta T2E 8X2

Phone: (403) 517-3130  
Fax: (403) 291-5390  
Website: [www.lidarservices.ca](http://www.lidarservices.ca)



## Data Recovery Request

Data collected and delivered by LSI will remain available on the FTP link provided for a period of one year. After this period, any request for access to the data will be subject to a fee based on the work required to complete retrieval, and any requested reprocessing. Please submit the completed form to [info@lidarservices.ca](mailto:info@lidarservices.ca).

Access is available to the hiring client only. All other requests must include a letter authorizing the release of data, or proof of transfer of ownership of the hiring client to accompany this request.

Hiring Client	Endurance Gold Corporation
Original PO#	N/A
LSI Reference Number	22-468
Date of Original Delivery	November 9, 2022

Contact Name: \_\_\_\_\_

Company: \_\_\_\_\_

Contact phone/email: \_\_\_\_\_

Date Required: \_\_\_\_\_

Data Requested: \_\_\_\_\_

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By signing below, I acknowledge that I am an authorized signatory of the company, and understand that the above information is provided to obtain a quote on retrieval of archived information.

\_\_\_\_\_  
Printed Name/Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature