

120334

ID01172

**SURVEY REPORT**  
on  
**ID01172**  
**Placer Prospecting Lease**

Dawson, Yukon Territory

**Stewart River**

Lease No.: IW01172 – Owner: Douglas Walker 100%

ID01172

NTS # 115P/12

Easting: 368900E Northing: 7056000N  
NAD83 UTM 8N

Dawson Mining District

WORK PERFORMED: April 21, 2015  
DATE OF REPORT: April 23, 2015





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## Summary

GroundTruth Exploration Inc. conducted an aerial UAV survey on the three mile placer prospecting lease: ID01172 owned by Douglas Walker on April 21, 2015.

The goal of the survey was to acquire high resolution Orthoimagery and topography on the full extent of the lease which serves as a detailed blueprint for targeting followup exploration activity to evaluate mining potential.

The lease is located 100km South East of Dawson on the south side of the Stewart River, directly across from the mouth of Clear Creek. (figure 1). The property was accessed by truck via the North Klondike Highway. The UAV survey was conducted using an autonomous fixed wing drone. The model is an 'EBEE' manufactured by Sensefly.

Imagery and elevation data was acquired at a ground resolution of 4cm. The drone survey was successful in creating an extremely detailed image and elevation model of the entire lease.

### 1.0 Location and Access

The prospecting lease is located 100km South East of Dawson City on the Stewart river drainage system in central Yukon Territory. The lease is centered at: 368900E 7056000N (NAD83, UTM 8N), on NTS mapsheet 115P/12 (Figure 1). The area is accessible via the North Klondike Highway. The lease itself is across the river and is accessed by boat in summer.

### 2.0 Property

Placer Prospecting lease Tenure:

Location: Stewart River, IW01172

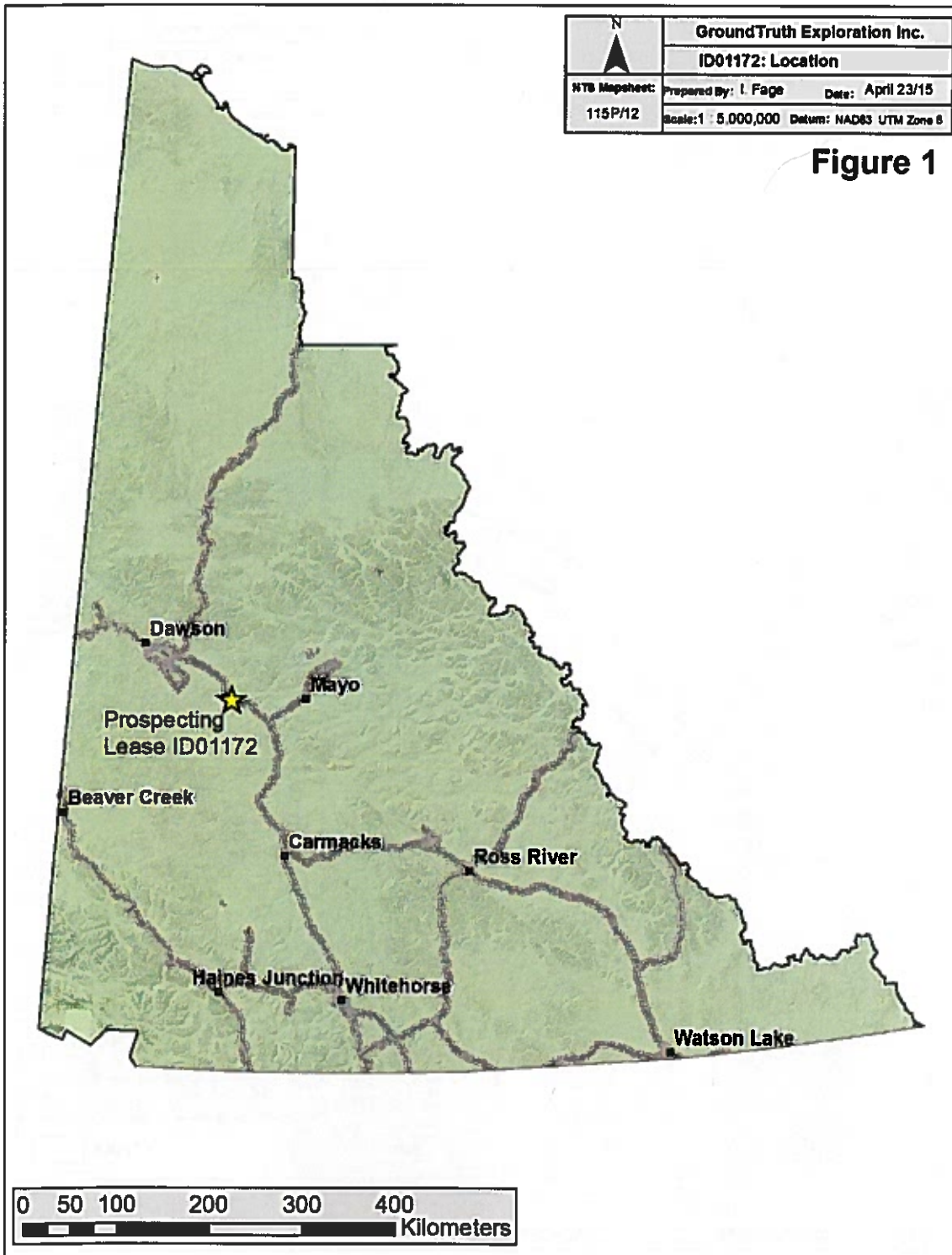
Length: 3 miles

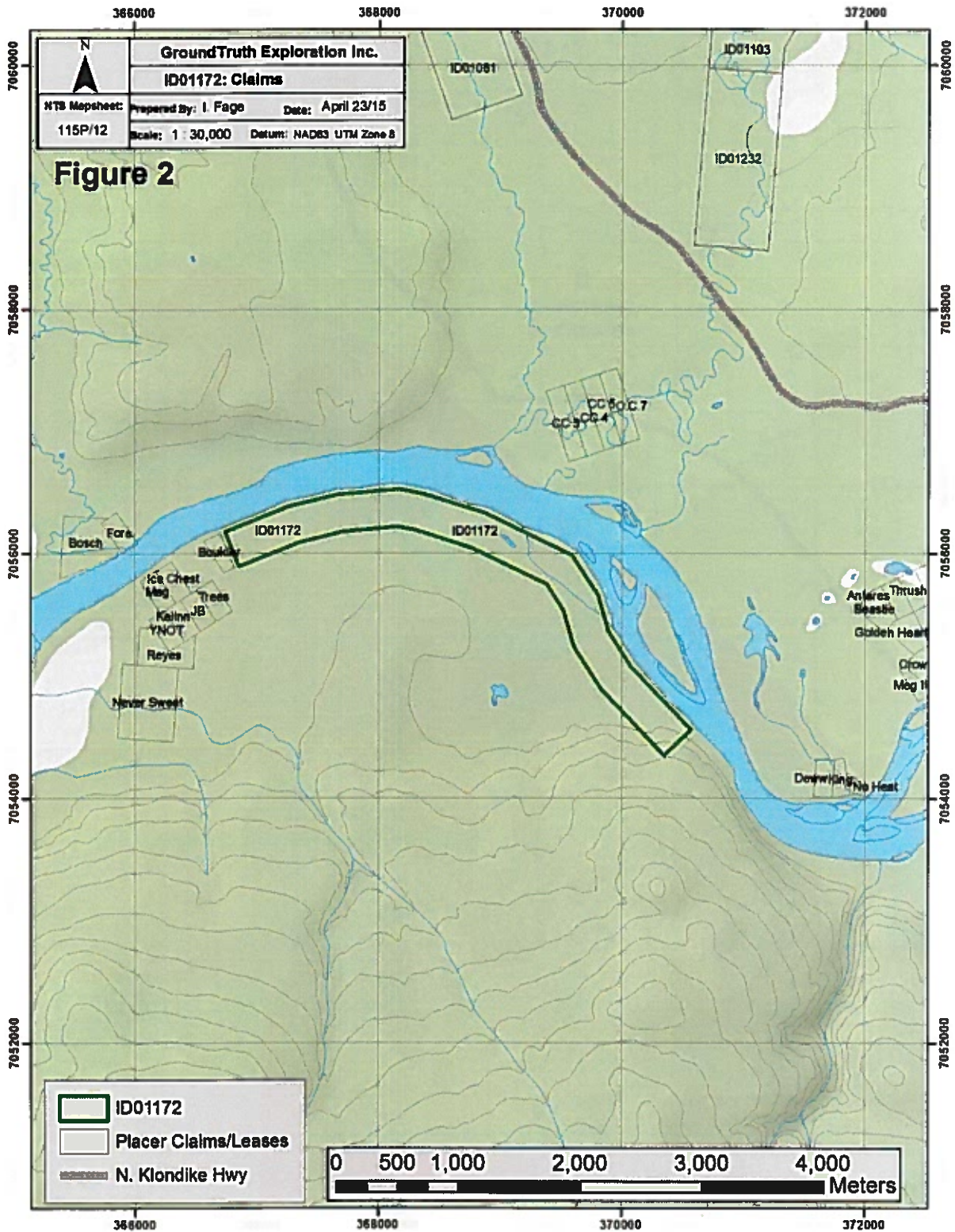
Expiry: April 23, 2015 –pending renewal

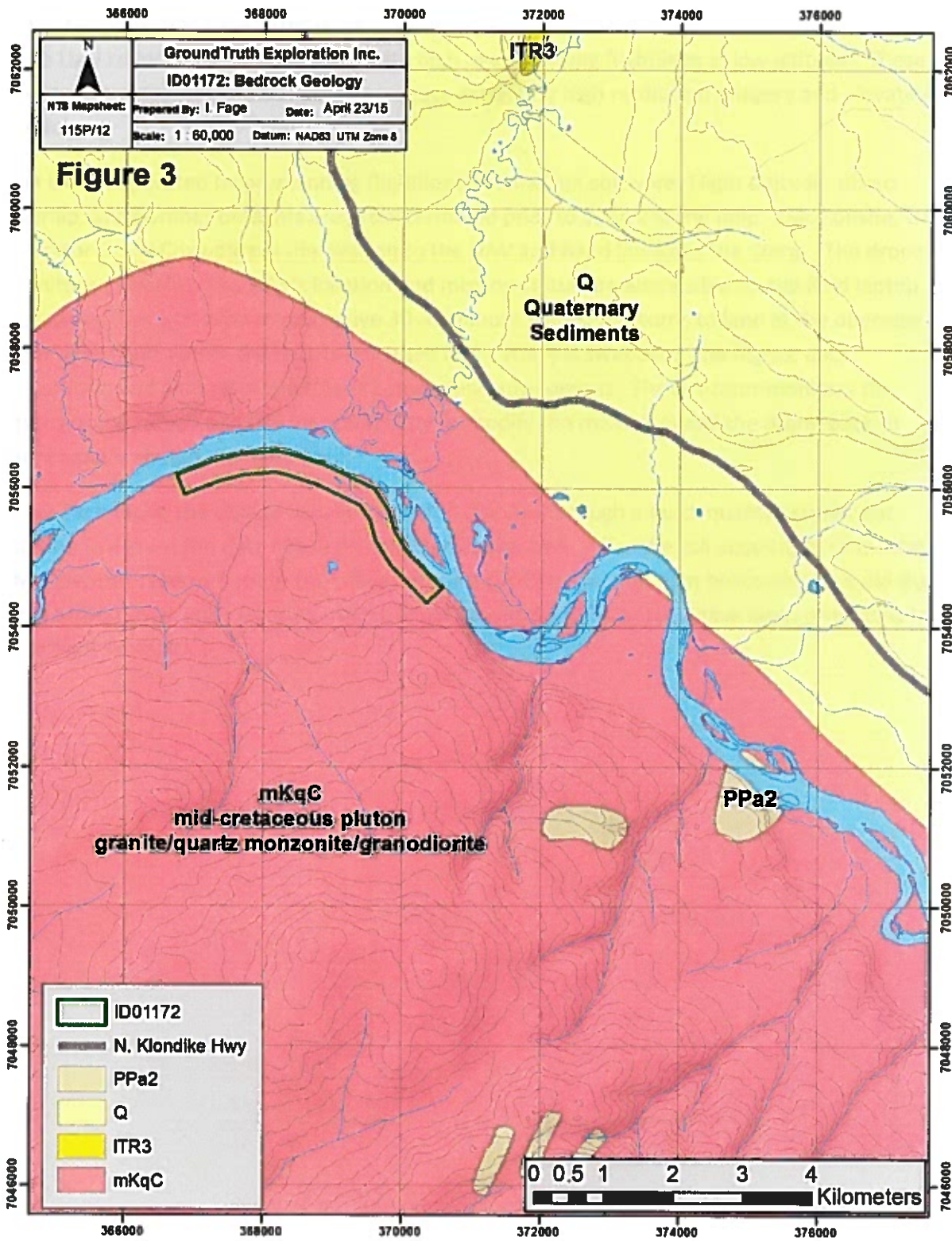
(Figure 2)

### 3.0 Physiology and Geology

Placer prospecting lease ID01172 is located within the Yukon-Tanana Terrane, in the Stewart River drainage. The landscape is composed broad valleys bordered by moderately sloped, tree covered hills ranging in elevations from 1200 to 5000 feet. The area experiences typical climatic conditions for central Yukon Territory with short, warm and dry summers and cold winters. Temperatures range from -20°C to -60°C in the winter and +10°C to +30°C in summer. The 3 mile placer lease is completely underlain by a mid cretaceous pluton. metamorphic unit. The northern side of the Stewart River Valley underlain by Quaternary Sediments. See Figure 3.







#### **4.0 UAV Survey Procedure(s)**

The UAV collects a series of photos with high overlap along flightlines at low altitude. These photos are processed in a bundle to generate extremely high resolution imagery and elevation models.

The UAV is operated by preplanning flightlines in E-motion software. Flight altitude, photo overlap, and number of flights are predetermined prior to survey in the field. Once onsite, UAV operator David Cox uploads the mission to the UAV and hand launches the drone. The drone is monitored visually. The UAV's location and mission status are also visible on the field laptop. The drone flies a mission in successive 30-40 minute flights. It returns to land at the operator after each flight where the data is uploaded and battery is swapped. The flights, data acquisition and landing of the UAV is completely autonomous. The operator monitors the status of the survey and has the capability to modify the mission or call the drone back to launch point should the need arise.

After each flight, the data is visually inspected and run through a quick quality assessment routine to ensure the data has been collected as planned. After the full acquisition of the data, the Operator returns back to the office and runs full Orthorectification processing to build the final orthomosaic and elevation model. Final products for this survey have been generated in Postflight Terra 3D.

## 4.0 Placer Lease ID01172 Quality Report

### Quality Report



Generated with Postflight Terra 3D version 3.4.28

- 1** Important: Click on the different icons for:
- 2** Help to analyze the results in the Quality Report
  - 3** Additional information about the feature

**4** Click [here](#) for additional tips to analyze the Quality Report

#### Summary

Project	dwalker_2015_04_21
Processed	2015-Apr-22 16:13:39
Camera Model Name	CanonEOS127HS_4.3_4806x0456 (RGB)
Average Ground Sampling Distance (GSD)	4.9 cm / 1.93 in
Area Covered	4.534 km <sup>2</sup> / 453.404 ha / 1.120.97 acres
Image Coordinate System	WGS84
Output Coordinate System	WGS84 / UTM zone 8N
Processing Type	Full Aerial nadir
Feature Extraction Image Scale	1
Camera Model Parameter Optimization	optimize automatic and all internal
Time for Initial Processing (without report)	03h:42m:31s

#### Quality Check

<b>1</b> Images	median of 71002 keypoints per image	
<b>2</b> Dataset	908 out of 921 images calibrated (98%), all images enabled	
<b>3</b> Camera Optimization	0.9% relative difference between initial and final focal length	
<b>4</b> Matching	median of 5571.91 matches per calibrated image	
<b>5</b> Choresferencing	no 3D GCP	

#### Preview



Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before classification.

#### Calibration Details

Number of Calibrated Images	908 out of 921
Number of Geolocated Images	921 out of 921

Initial Image Positions

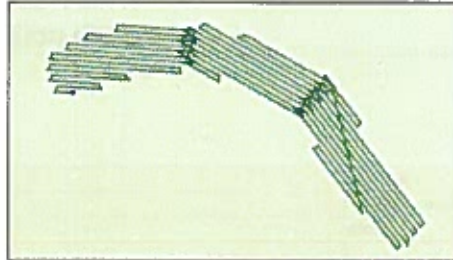


Figure 2: Top view of the initial image position. The green line follows the position of the images in time starting from the large blue dot.

Computed Image/GCPs/Manual Tie Points Positions

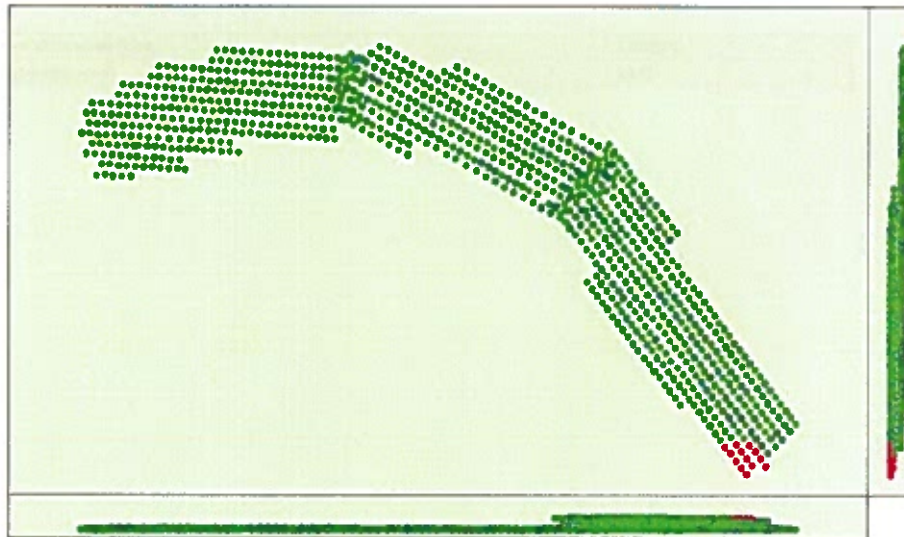


Figure 3: Offset between initial (blue dots) and computed (green dots) image positions as well as the offset between the GCPs initial positions (blue crosses) and their computed positions (green crosses) in the top-view (XY plane), front-view (XZ plane), and side-view (YZ plane). Red dots indicate disabled or uncalibrated images.

Overlap

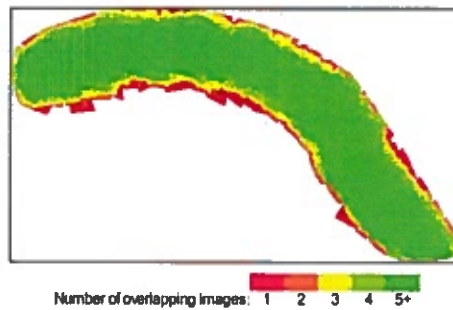


Figure 4: Number of overlapping images computed for each pixel of the orthomosaic. Red and yellow areas indicate low overlap for which poor results may be generated. Green areas indicate an overlap of over 5 images for every pixel. Good quality results will be generated as long as the number of keypoint matches is also sufficient for these areas (see Figure 5 for keypoint matches).

Images X, Y, Z represent the percentage of images with a relative geolocation error in X, Y, Z smaller than a multiple of Sigma.

## Point Cloud Densification details

### Summary

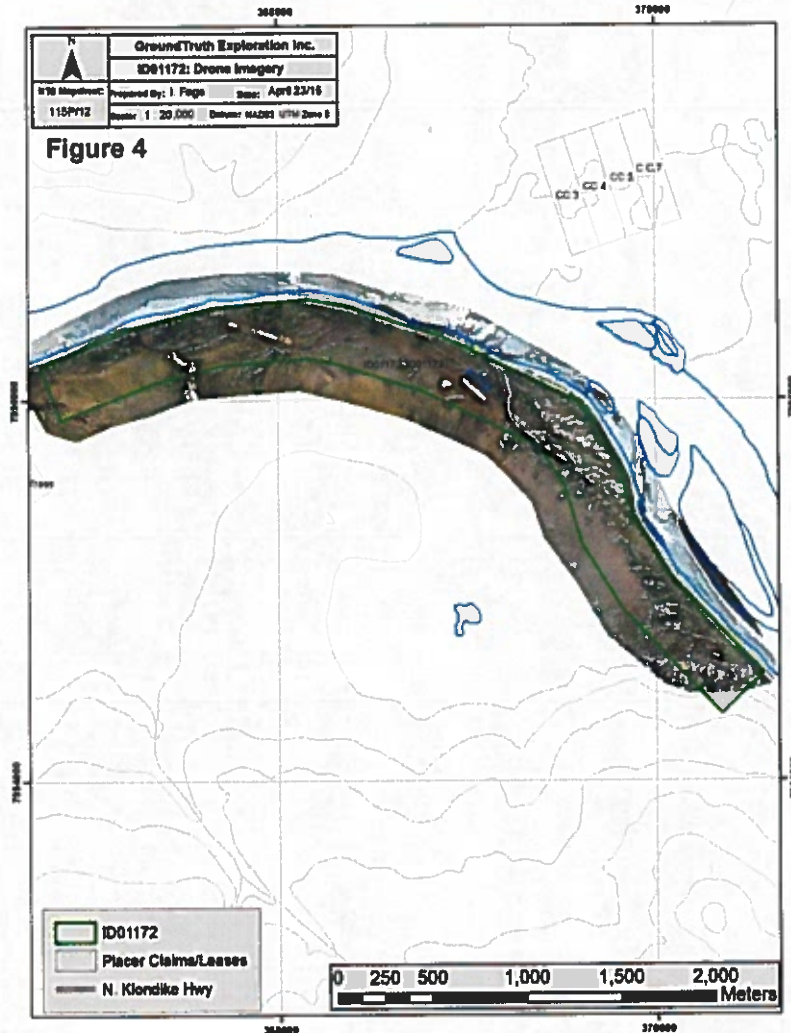
Processing Type	aerial nadir
Image Scale	1/2 (half image size, default)
Point Density	optimal
Minimum Number of Matches	3
Use Densification Area	yes
Use Annotations	yes
Time for Densification (without report and 3D textured mesh)	02h:03m 24s

### Results

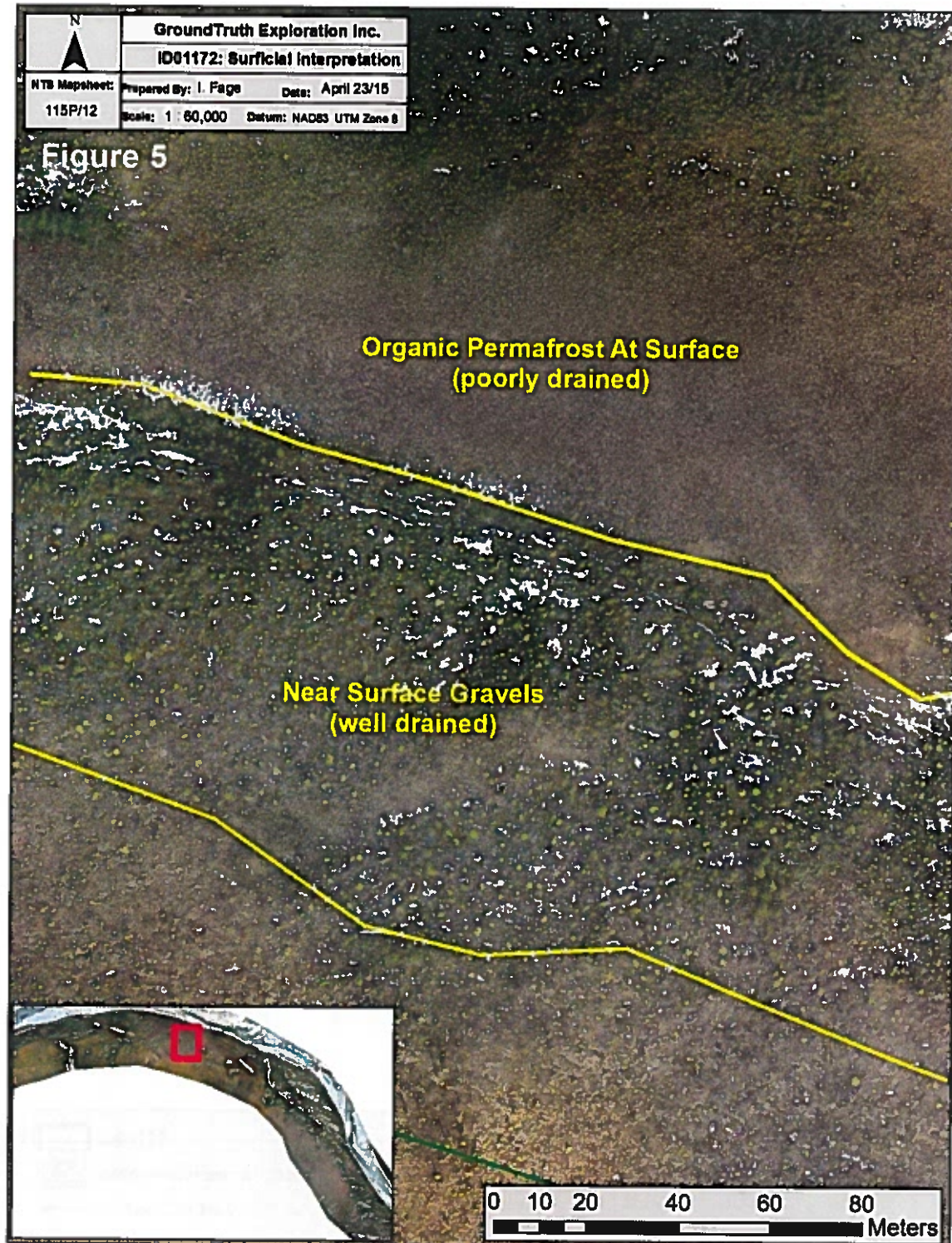
Number of 3D Densified Points	72919112
Average Density (per m <sup>2</sup> )	23.72

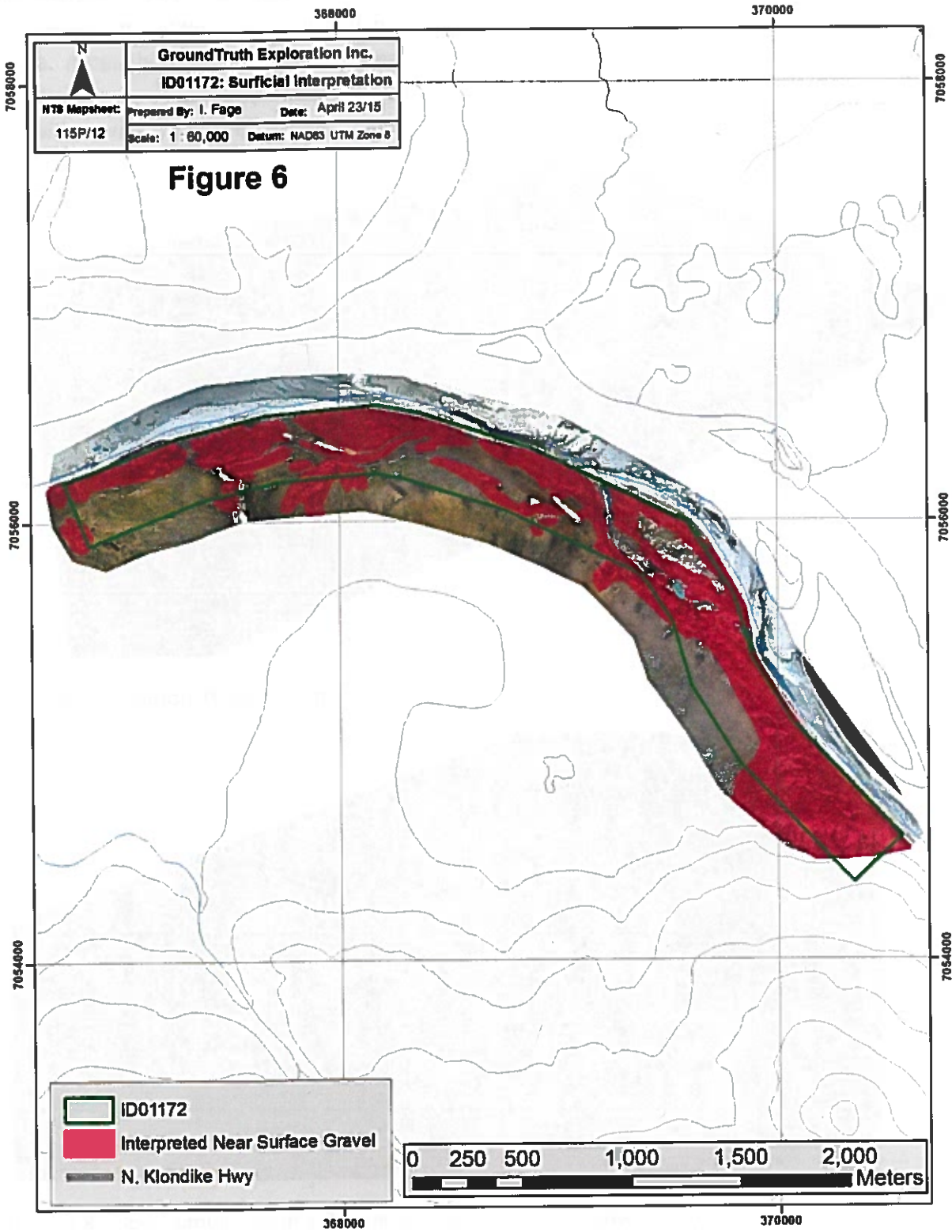
## 6.0 UAV Survey Results and Interpretation

The final orthomosaic was generated from 906 individual photos covering 4.5km<sup>2</sup> at 4cm ground resolution. Image and Elevation model quality are excellent.



The detailed vegetation in the model provides information to interpret well drained areas with larger, dense vegetation as possessing gravels near surface. Subdued areas with small vegetation are interpreted to contain high ice permafrost at surface. Followup geophysics and drilling or test pits would be targeted in the well drained zones. The following figure shows areas interpreted to contain gravels near surface. See figure 5 and 6.





The elevation model provides useful information on the subtle topography in this low lying area. Accessibility on poor drained areas may be challenging during summer months. See figure 7. The lease is on a flood plain and the elevation model can be used to predict how a flood would occur in an area of planned mining operations. See figure 8.

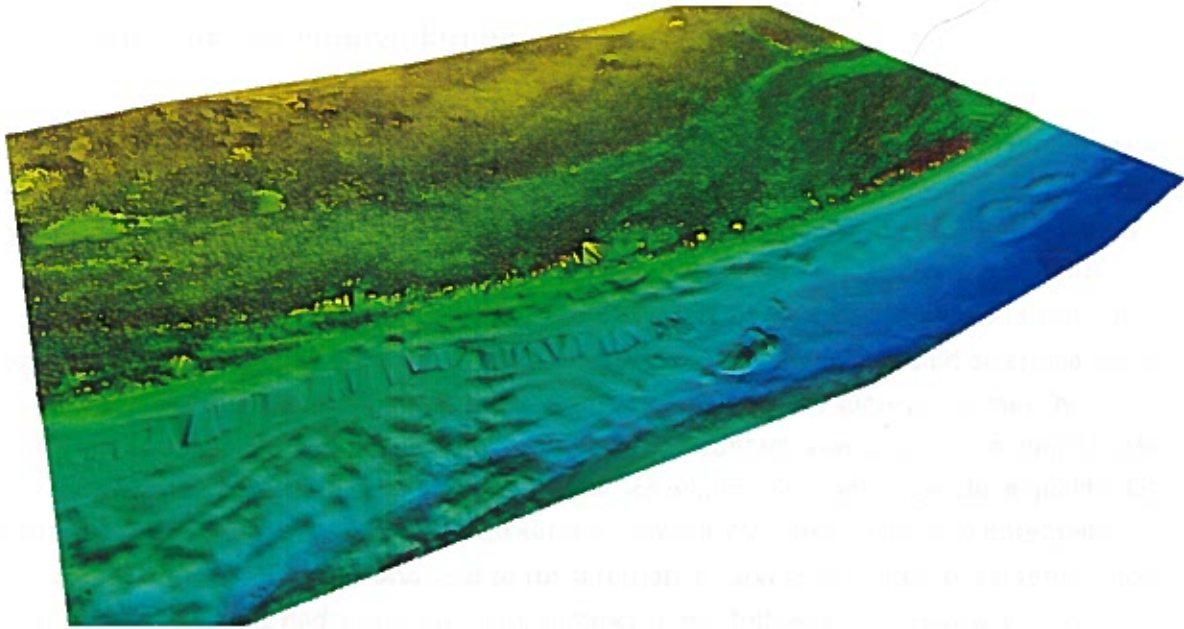


Figure 7: Elevation Model at center of lease

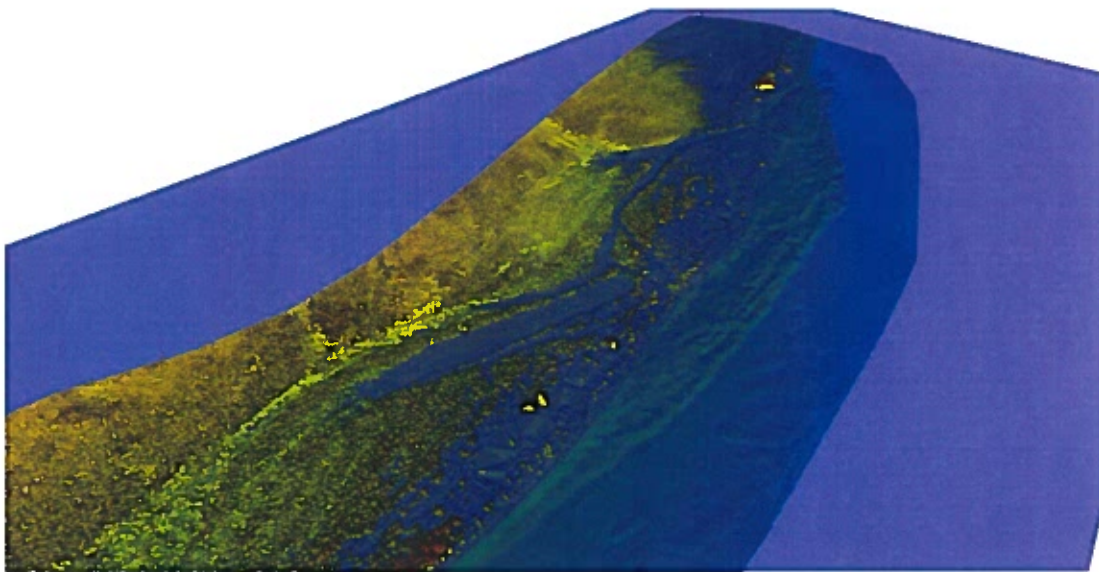


Figure 8: Flood simulation of a 2.5 meter water level rise above river ice height.

## **7.0 Conclusion/ Recommendations**

The UAV imagery is used at the 'blueprint for planning further exploration efforts on this lease. Detailed inspection of the surface vegetation types and standing water provides useful information on where near surface gravels exist for placer exploration. Poorly drained areas are interpreted to be covered by organic permafrost and denser vegetation would denote better drainage and the presence of gravel near surface. This information is a good guide for exploration targeting by geophysics, drilling or test pits. spacing (1.5m) could be employed to provide detailed evaluation on priority targets identified on the 5m surveys. Winter DC Resistivity surveys have given challenges to produce low contact resistance in challenging areas such as saturated permafrost and creek 'overflow' ice where it is tough to produce quality data. Solutions would be to run reconnaissance survey such as UAV drone to identify potentially adverse survey areas prior to survey, or to run alternative surveys in winter for targeting such as Ground Penetrating Radar and wait until summer to run followup DC Resistivity surveys. Results need to be proofed by follow-up method such as drilling.

## 8.0 Statement of Expenditures

### UAV Drone Aerial Survey on Placer Lease ID01172



**Overview:**

GroundTruth Exploration conducted an aerial drone survey on placer prospecting lease: ID01172 on April 21st, 2015. Imagery and elevation data was collected at a ground resolution of 4cm. Two drones were required for the survey as the target required very closed spaced flightlines and high photo overlap to get quality data. The entire lease was covered and data quality is excellent for both Imagery and DEM.

**Drone Standard Data Deliverables:**

1. Orthorectified Image (.geotiff, .ecw),
2. Digital Elevation Model (.geotiff, .grd)
3. Tiled Imagery for Google Earth™ (.kml)
4. 3D point cloud (.las)
5. Quality Report (.pdf)

**Drone Acquisition Daily Cost Breakdown:**

**Wages:**

1 UAV Drone Operator * \$500/day	\$ 500.00
1 UAV Drone Operator * \$500/day	\$ 500.00

**Survey Equipment:**

UAV Drone with Base Station * \$500/day (2 drones)	\$ 1,000.00
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**Other Equipment (dependent on logistical requirements):**

Iridium Satellite Phone @ \$35/day	\$ 35.00
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**Data Management and Processing Services**

Imagery Processing: Ortho/DEM/ QC @\$100/flight 8 flights	\$ 800.00
Interpretation and assessment report - I. Fage, GroundTruth Exploration Inc.	\$ 500.00

<b>Total Cost</b>	<b>\$3,335.00</b>
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## 9.0 Certification

I, Isaac Fage of Dawson, Yukon Territory certify that I hold an Advanced Diploma in GIS/Remote Sensing from the Centre of Geographic Sciences (COGS). I am an owner and President of GroundTruth Exploration Inc. I have been working in the Mineral Exploration continuously since 2004.

Isaac Fage



April 2015