

Scout Aerial Africa

DRONES – THE BIG PICTURE FOR GEOLOGY AND MINING



WHO ARE WE?

SCOUT AERIAL
GROUP

Scout Aerial Group is a diversified operating and investment group with market leading businesses and targeted investment in Remote Sensing and Remotely Piloted Aircraft Systems (RPAS)

OPERATOR IN
AUSTRALIA &
PIONEER



OPERATOR IN AFRICA



MANUFACTURER /
DESIGNER



DGRT GEOPHYSICS

THIRD PARTY CLIENTS
SELLS/
LEASES TO





Aerial Survey & Mapping

Remote sensing and photogrammetry

Geophysical mapping

Precision Agriculture -
vegetation cover, forestry, farm land,
plant growth or devastation



Aerial Cinematography

TV and Advertising

Corporate Videos

Outdoor Events

Real Estate



Aerial Inspections

Assets

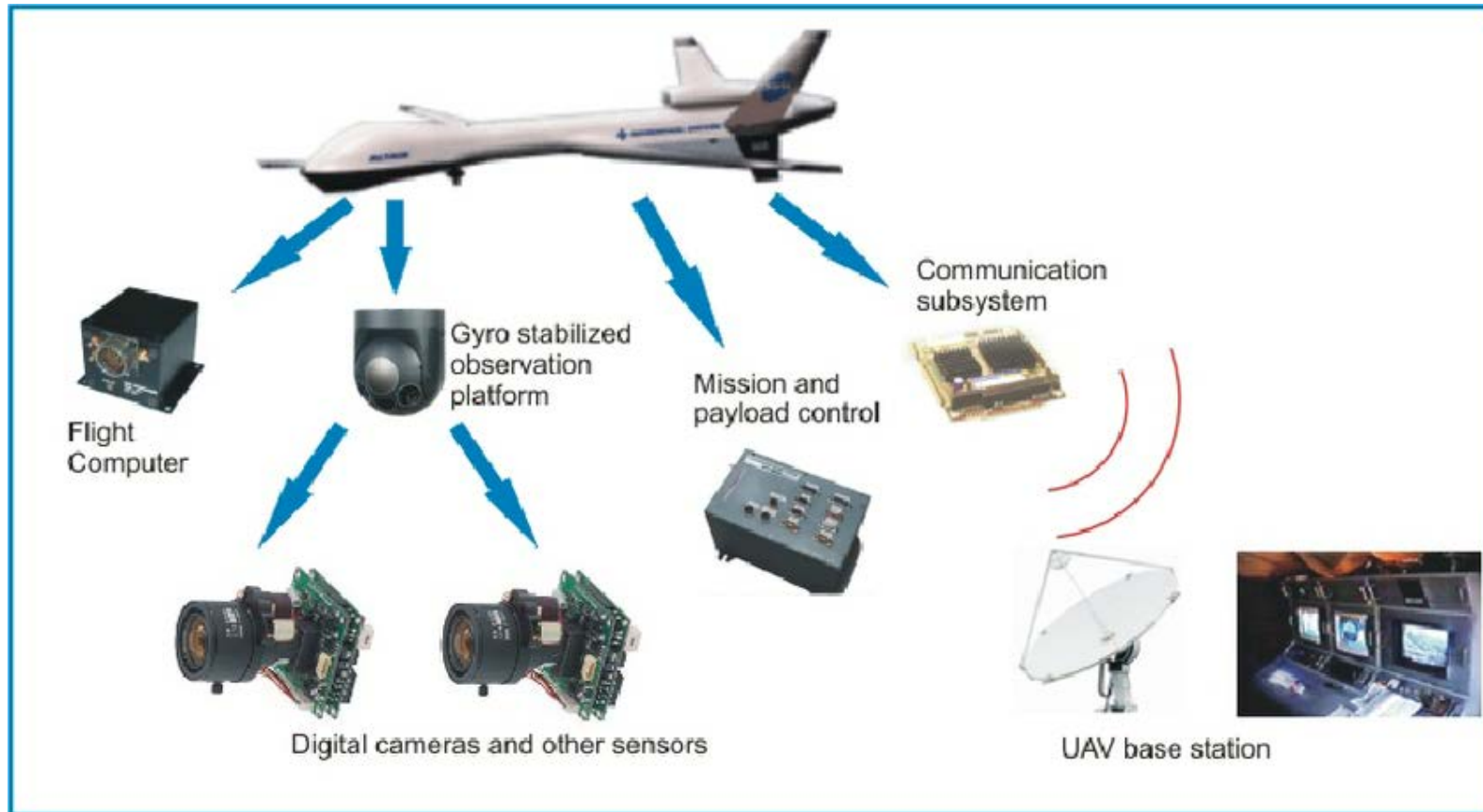
Mining

Construction



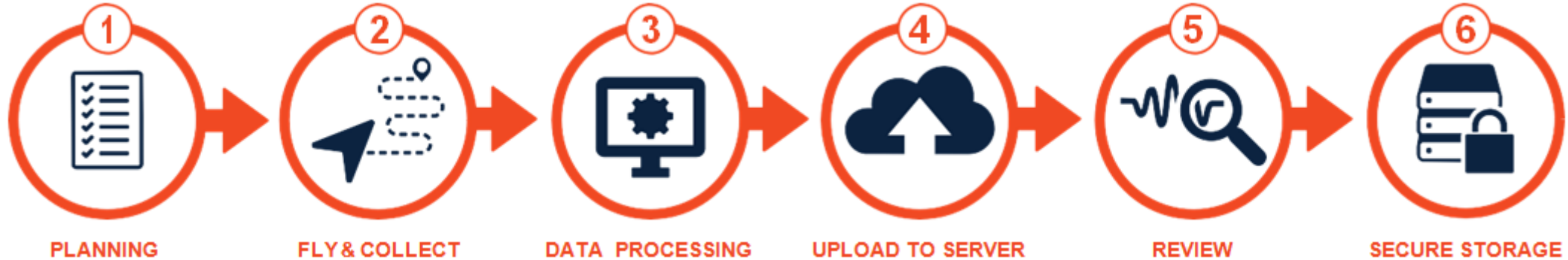
Video intro.

What is a Remotely Piloted Aircraft System (RPAS)?



Our process; how it works.

To ensure successful outcomes of every project; we've fine-tuned our process.



1. THE PLAN

We'll review your project scope and timeline to plan the most effective and efficient data collection service based on your requirements.

2. FLY & COLLECT DATA

We use a number of fit-for-purpose remotely piloted aircraft to collect a multitude of data

3. DATA PROCESSING

Our GIS team skillfully collates and processes the data to form an array of digital maps, 3D models and reports to get the information you require.

4. UPLOAD TO SERVER

We can host your data online for easy access and viewing - no need for expensive software packages.

5. REVIEW DATA

You review and approve the deliverables. If you need additional analysis, our team can help.

6. SECURE STORAGE

Never worry about losing your data - we store it securely.

Mining specific applications

Geology

- Stock pile management
- Grade control & exploration planning

Hydrology

- Drainage and water management
- Watershed, drainage basin & water flow mapping
- Thermal detection of ground water inflows
- Tailings dam management

Short-term Mine planning

- Pit & dump management
- Communication of daily/weekly mining plans
- Haul route surface optimisation
- Storm damage assessment & control

Long-term Mine planning

- Haul road, dump and pit design
- Geotechnical
- Surface stability monitoring
- Exploration
- Control for mining in void areas
- Mapping of steep inaccessible inclines

Other uses

Precision Agriculture

- Quickly Survey large areas of Land
- Obtain a birds eye view on crops, livestock or general farmland
- Detect areas of stress, monitor irrigation systems and improve outputs

Inspections

- Easily inspect large buildings and hard to reach areas.

Mapping/Survey –

- Large areas of land can be surveyed with extremely high resolution imagery
- High resolution DSM, DTM/DEM, Orthomosaic imagery to assist with planning and assessments

Minerals and Gas

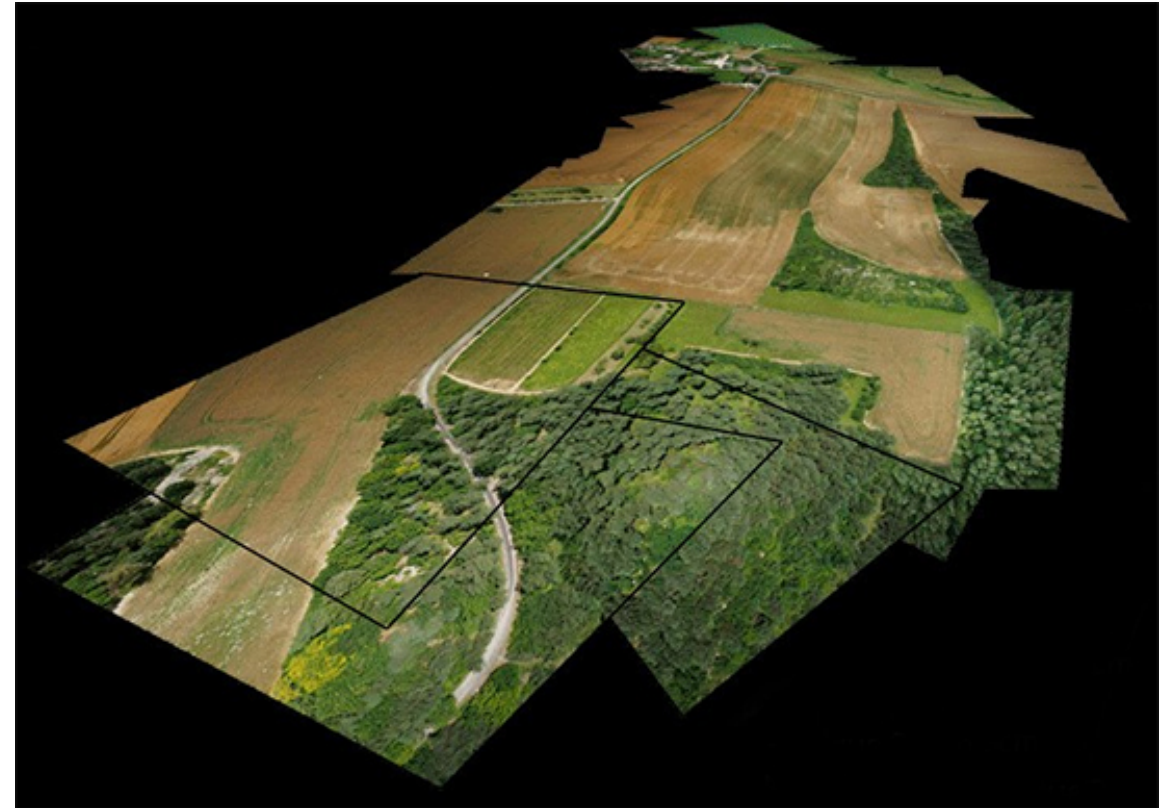
- Exploration mapping
- Blast profiling
- Plume cloud Assessment/Sampling

Wildlife monitoring, road construction

Data Analysis

Data analysis and facilitation:

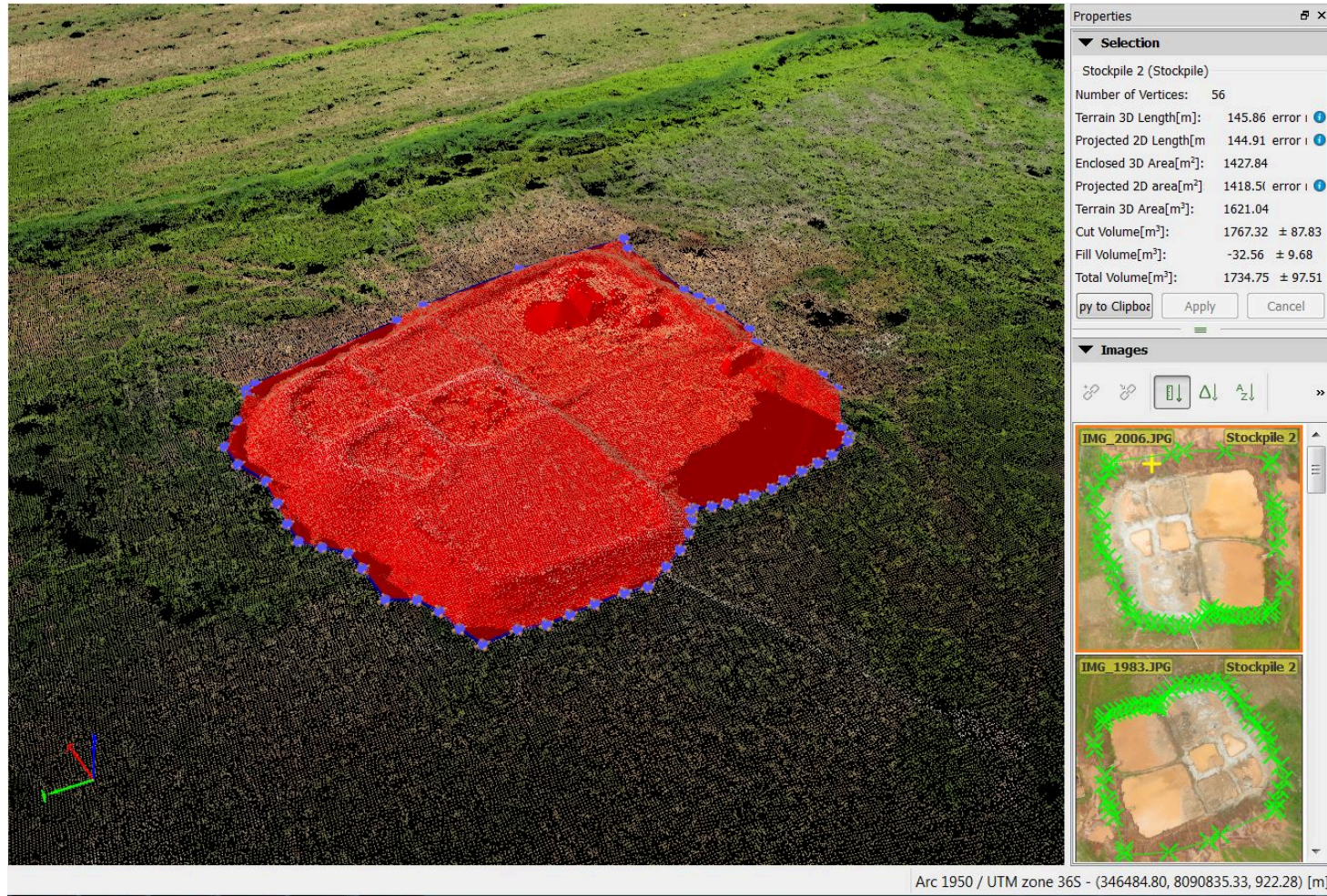
- In country Data management
- GIS integration
- Ongoing reporting
- Data analytics
- Incident Logging and geolocation
- Statistical analysis and reporting
- Breach zone identification
- Data storage and back up



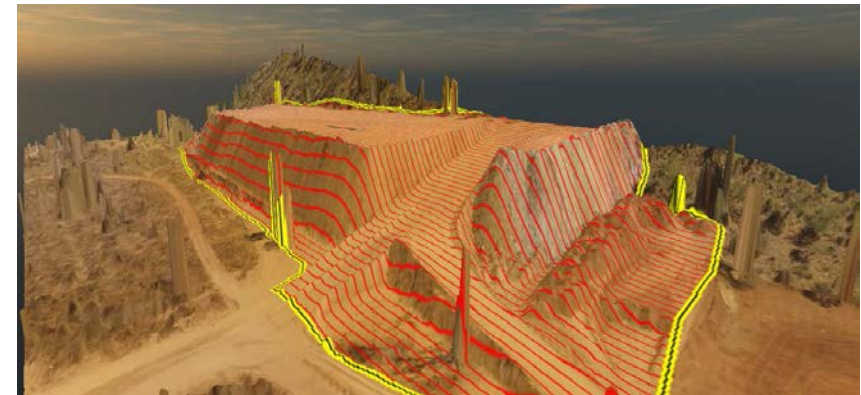
Examples – Resolution (10cm/Pixel)



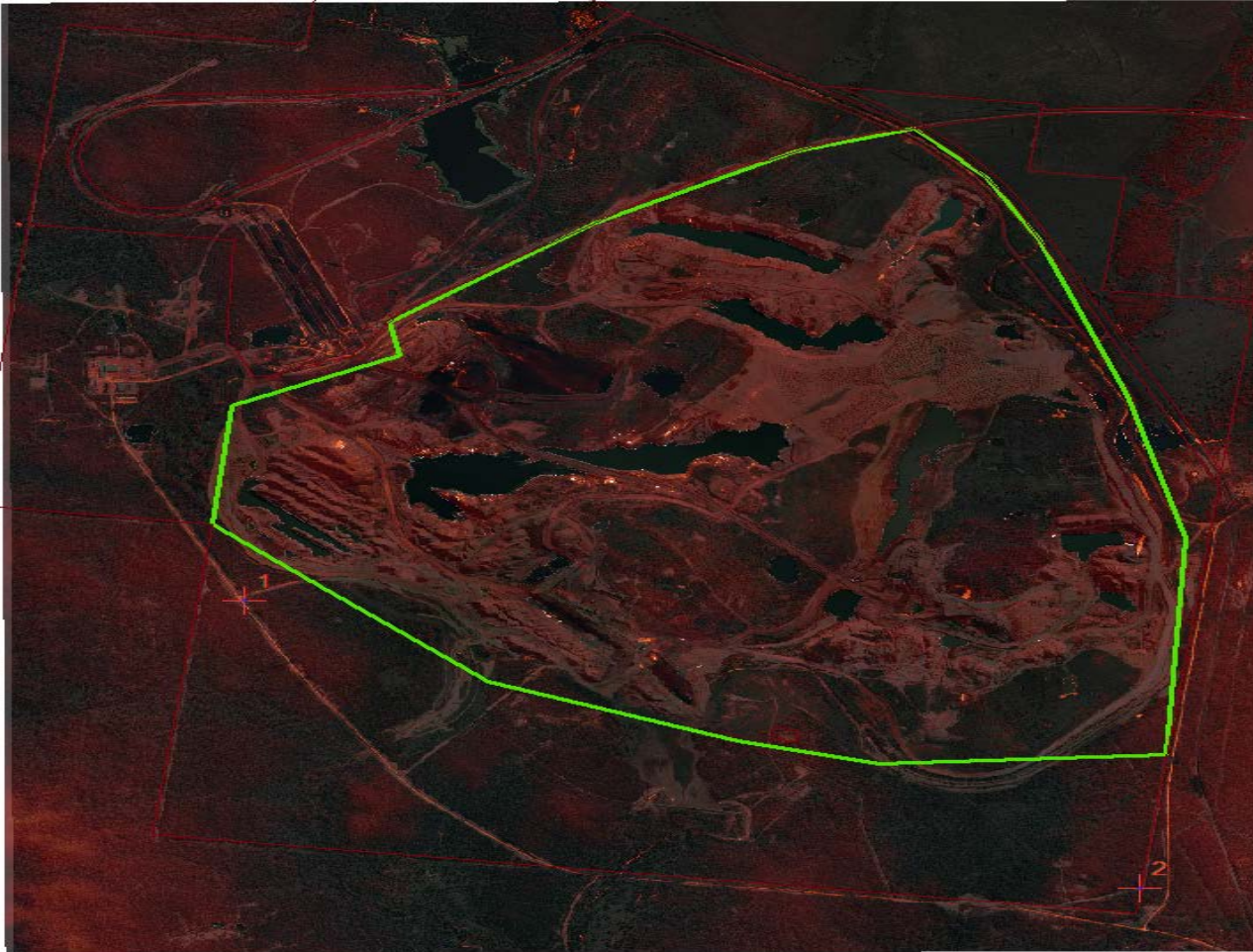
Examples – Stockpiles/Dumps



- Instant Stockpile Reports
- Volumetric assessments
- 3D Modeling
- Contour mapping
- Mine remediation
- Exploration



Examples – Thermal Scanning

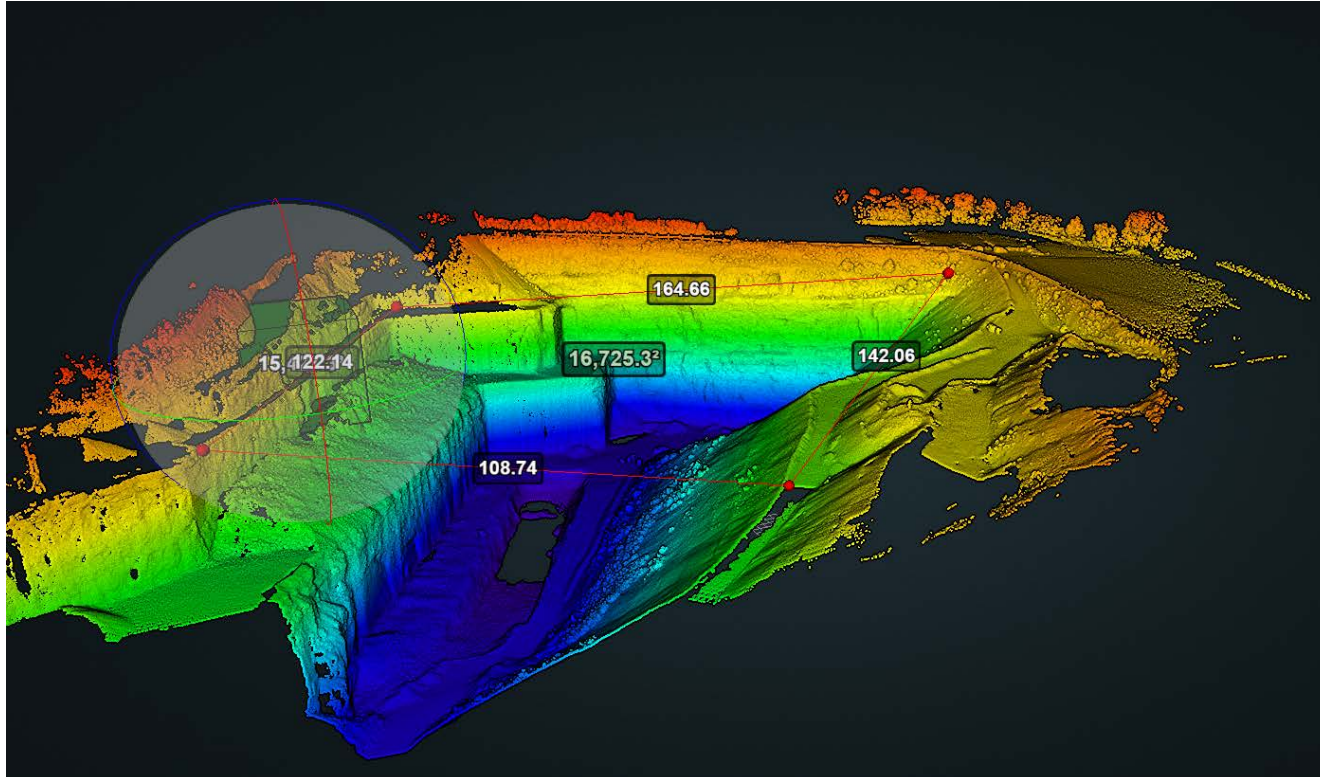


Spontaneous Combustion

Thermal Mapping to identify coal that is burning in the stockpiles

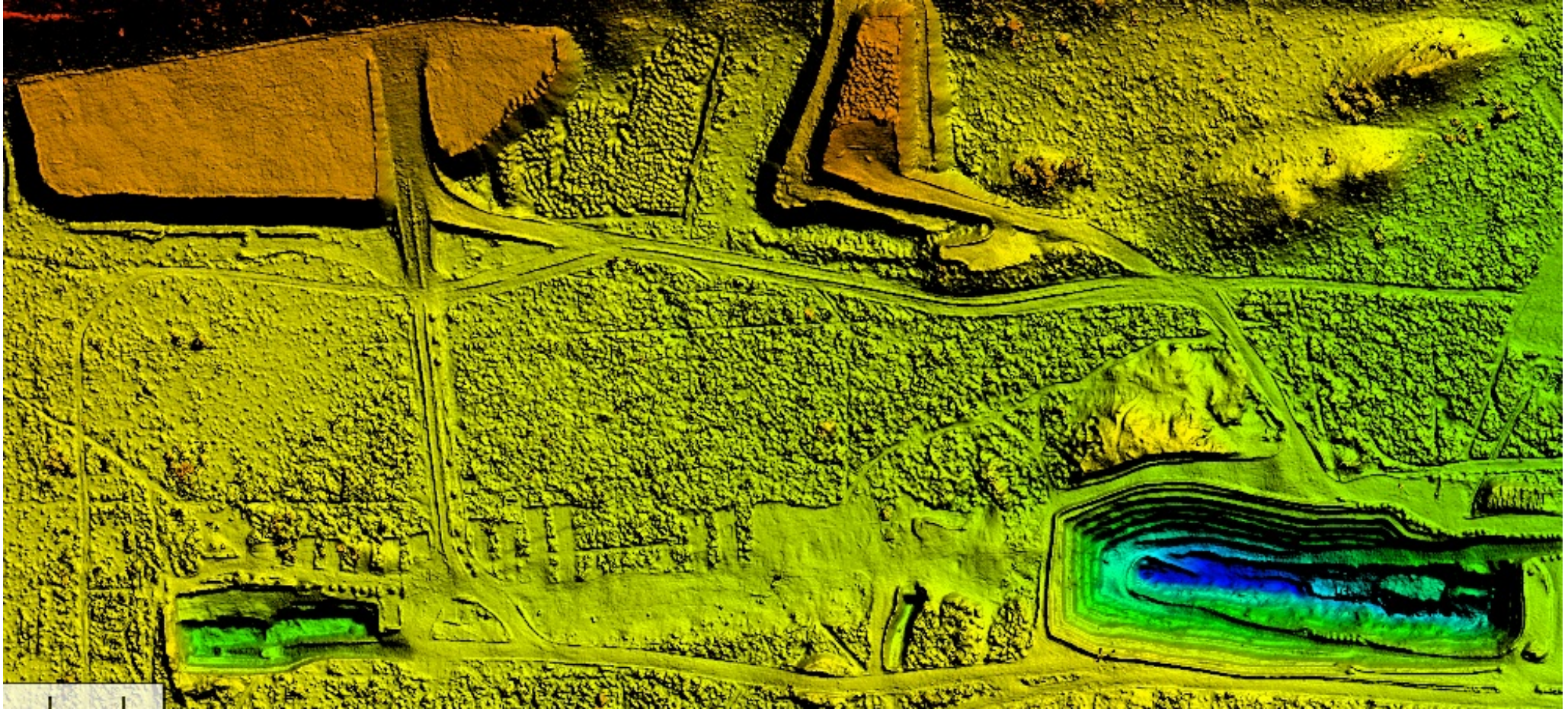
Helps to manage control/waste

Examples – 3D modelling



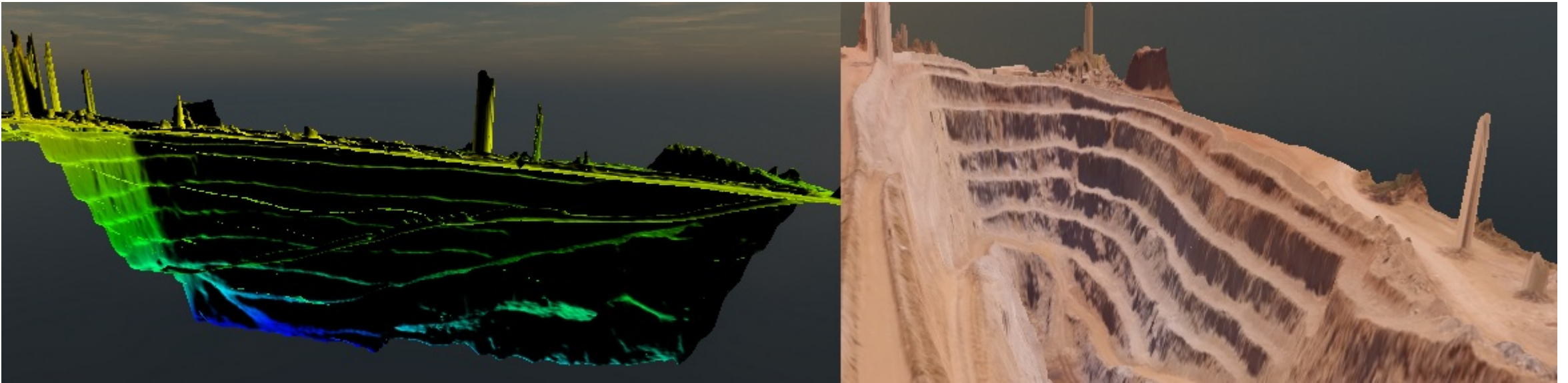
3D Modelling
Cut and fill Volumes
Planning
Water management
Vegetation Classification
Environmental modelling and
reporting

Examples



High Resolution DSM

Examples



Cross section of a large Pit with corresponding Ortho of the same pit

Benefits of RPAS

- ✓ **Lower Cost** – reduced manpower, no shutdown costs
- ✓ **Risk reduction** – dangerous monitoring/inspection is now automated
- ✓ **Improved overview** – Flying at low heights RPAs can create a very sharp image and clear overview of the mine for active monitoring and inspections
- ✓ **Survey of inaccessible areas** – RPAs can easily access previously hard to reach places
- ✓ **Improved data density and resolution** – compared to helicopters/airplanes, RPA systems can get much closer to the survey goal – improving data density, resolution and ultimately survey quality
- ✓ **Faster data acquisition** – shorter time span – less people fewer security measures

Accuracy of RPAS survey techniques?

Dependant on variables:

- 1. Height above ground level** - Lower flight = lower, more precise ground sampling distance.
 - 2. Ground Sampling distance** – is a remote sensing term used to describe the size of a pixel as measured on the ground. So 5cm/px GSD = 5cm on the ground.
- On average our aerial surveys are conducted at 120m AGL which is between 5cm-10cm GSD. Usual satellite imagery can range between 50cm/px and 30m/px GSD
- At a lower height, GSD can be 2cm-10cm allowing greater accuracy- however this requires more flights as coverage per flight is reduced.

How accurate?

-Previous testing through our parent company, Scout Aerial in Australia, has found that conducting aerial surveys with a 5-7cm/pixel GSD will yield the abovementioned results, as well as providing an efficient flight profile. This means accurate data, quickly.

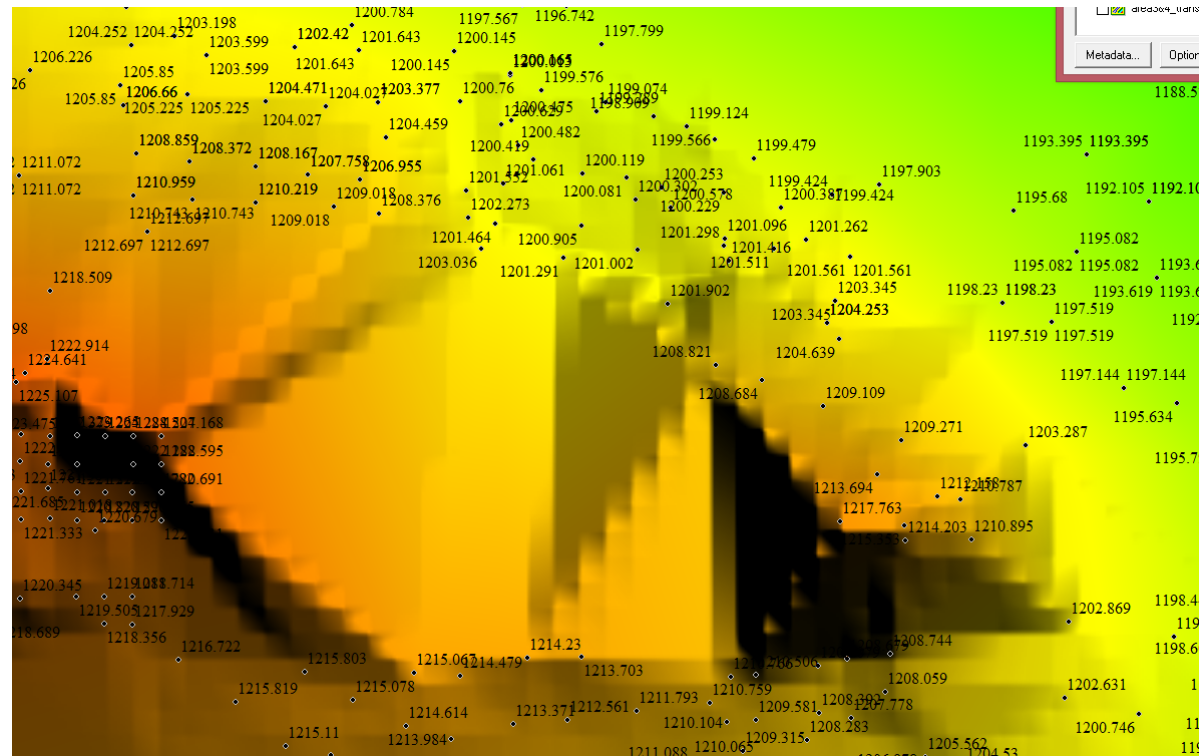
-In general accuracy equates to 2.5-3 times the GSD – so 5cm/px = 5-15cm accuracy.

3. Ground control - refers to recognisable reference points/locations on the ground where their exact geographic coordinates are known - these can be used to better improve accuracy and reference the photogrammetric model.

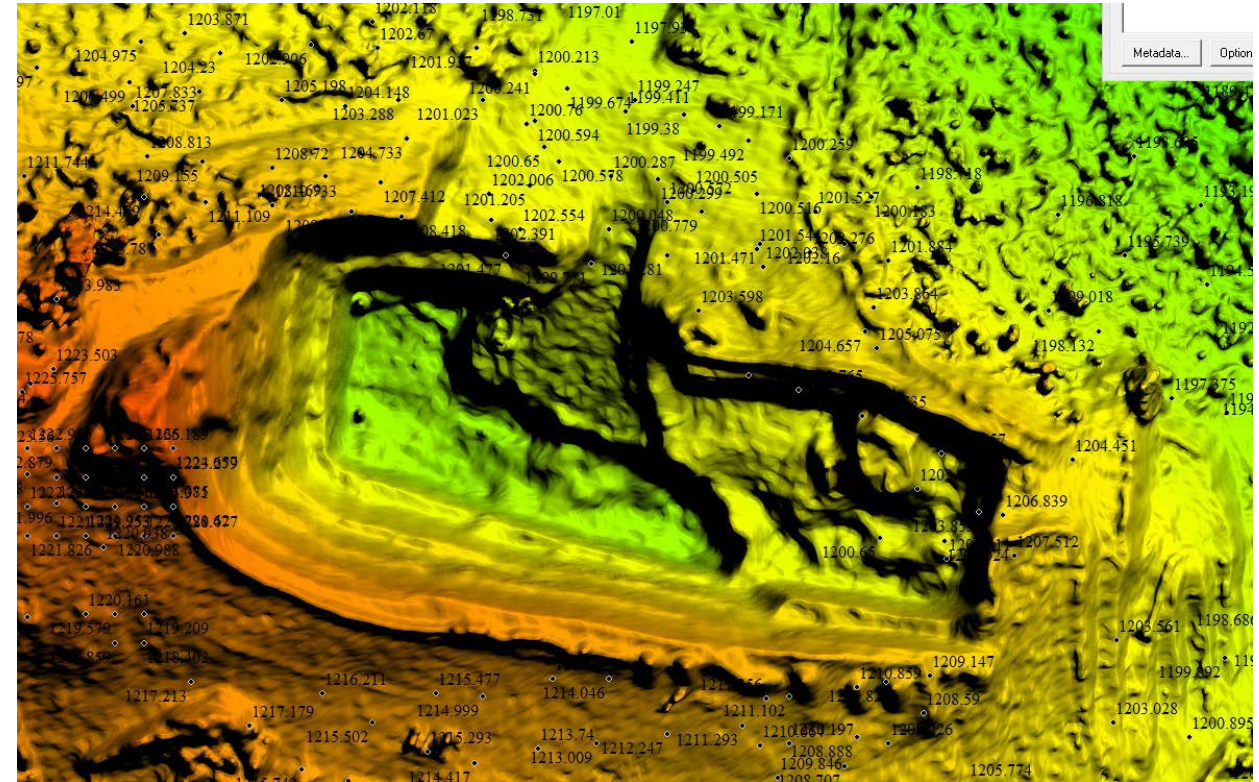
4. Accuracy of traditional survey - varies on the methods used to obtain data - what is the spacing interval between survey points and grid. Closer points mean better accuracy however; this can take many more days to complete a survey.

Examples - Comparison

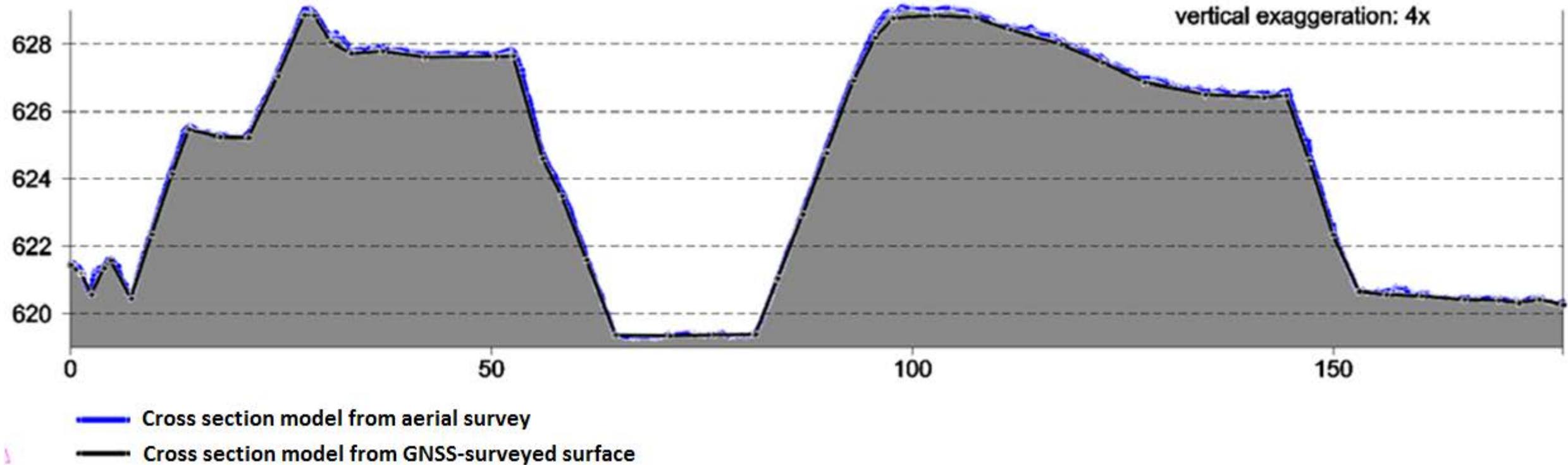
Triangulation of traditional survey points



RPAS imagery of the exact same location



Cross section comparison – RPAS vs Traditional



Accuracy – compared

Example figures

Aerial survey (m ³)	Traditional Survey (m ³)	Variance
53 642	54 018	376 or -0.7%
207 364	205 112	6252 or +3.05%
76 498	74 523	1975 or +2.7%
125 442	126 091	649 or -0.5%
21 885	21 217	668 or 3.1%
33 330	32 970	360 or -1%

- RPAS technology offers a **95% confidence interval** - 95% of points sampled lie within 15cm interval of the traditional survey points captured using GNSS techniques; corresponding to 3xGSD.

In terms of **efficiency** of use - RPAS is unmatched and provides near real time data with **equivalent accuracy** when compared with traditional surveys, however, aerial surveys can be conducted in a fraction of the time and risk of a traditional survey.

Why work with Scout Aerial Africa?

- ✓ **EFFICIENT**

RPAS can be deployed within minutes and the captured data is processed quickly

- ✓ **SAFE OPERATIONS**

we have a proven safety record and an extremely strict safety policy (Australian)

- ✓ **ENVIRO-FRIENDLY**

battery operated – zero carbon emissions

- ✓ **QUALITY & ACCURACY**

high definition imagery and exceptional mapping accuracy

A large, solid green shape that starts as a thin line on the left and expands into a wide, upward-sloping triangle on the right, located at the bottom of the slide.

Growth in Zimbabwe

We are in the process of growing within the Zimbabwean market and have worked in 5 African countries in 2016; our plan to grow to service the entire African Region.

A snapshot of our clients:



Thank-you

We are confident that we can meet the challenges ahead, and stand ready to partner with you in delivering an effective aerial surveying solution.

Contact:

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