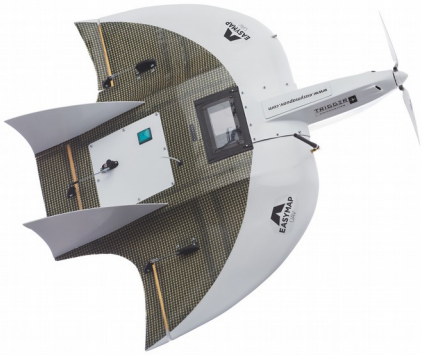
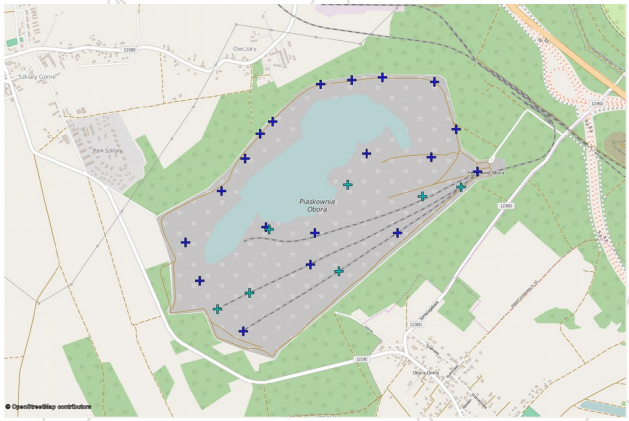
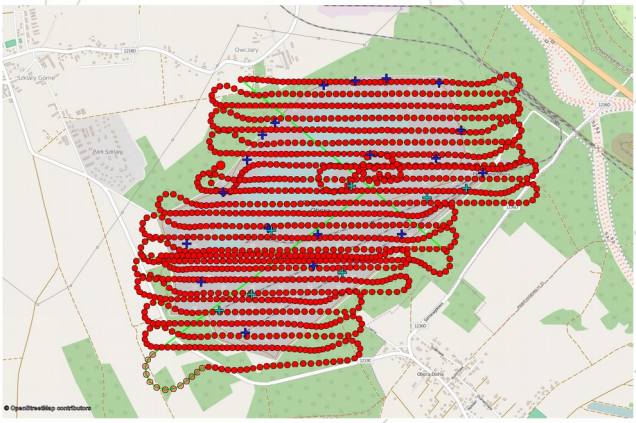
TRIGGER COMPOSITES

EASYMAP UAV



# Opencast mine mapping project

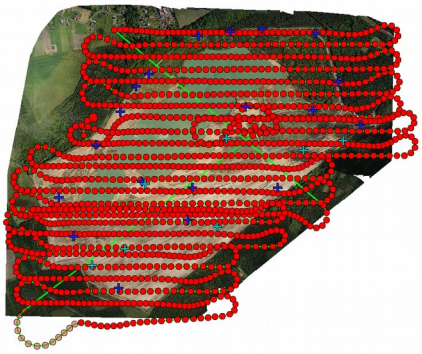




In June 2014 Geoprojekt Company had ordered a photogrammetric measurements of mine "Obora" near Lubin city in Poland. The mission had been done with EasyMap UAV, a Trigger Composites solution, which offers a very good sensor and takes hundreds of photos on square kilometer. Then a Swiss package Pix4D Mapper was used for the photogrammetric processing of the taken pictures. Thanks to this software, collected pictures gave (apart from an orthophotomap) a very detailed point cloud – similar to the one we can obtain from LIDAR. The processing used 19 photo points and 7 control points, obtaining average square errors on X and Y axes below 3 cm and on the Z axe below 13 cm. Such accuracy, with the high resolution reaching 5 cm, allows to calculate dump volume as well as the volume of pits, and when we compare these to the previous measurements also the volume of the dug output.

- *EasyMap UAV with Pix4D Mapper can significantly facilitate and accelerate work in opencast mines. We dispose of the greatest experience in performing such difficult measurements in Poland. – says Tomasz Maik, the CEO of Trigger Composites.*

- *We addressed the company Fotomapy ordering an Digital Surface Model for the sand mine „Obora" in order to evaluate the volume of the mineral mined for the sake of calculating the exploitation charge. During 3-hour measurements taken with EasyMap drone, operator collected over 1300 pictures and after a few days they delivered a point cloud and an orthophotomap.* – says Adam Karol from Geoprojekt.



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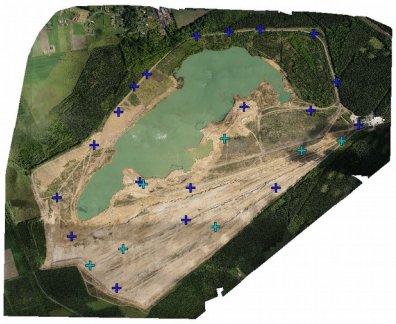
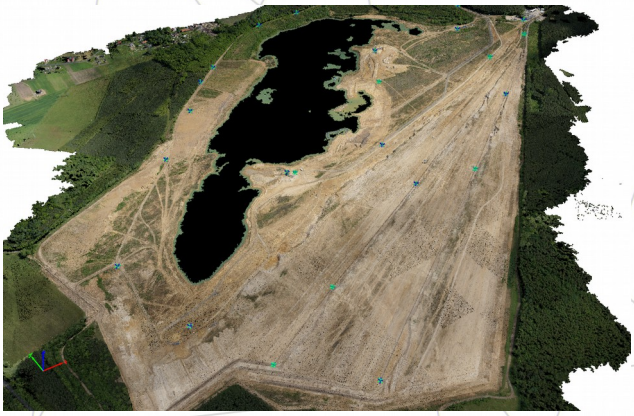
Based on the measurements ordered, the company Geoprojekt performed the sections of escarpments for the evaluation of slopes' stability, vectorised the orthophotomap and prepared a road map of the mine and, most importantly, they calculated the volume of the mineral mined in order to consecutively calculate the exploitation charge. The calculations indicated a very small difference between the commercial books and the volumes measured – below 1%. All the maps, the orthophotomap and the Digital Surface Model prepared for the customer were handed and admitted to the Central Map Stock of KGHM Polska Miedz (The biggest Polish copper mine and smelter company).

*- From our point of view, the greatest value of the measurements performed with EasyMap drones is the new quality of area mapping. The level of details of the report is impressive for customers.* – added Adam Karol from Geoprojekt.





| | |
|---|---|
| Average Ground Sampling Distance (GSD): | 5.48 cm |
| Area covered: | 6.3442 km$^2$ / 634.417 ha / 2.4508 sq. mi. |
| Image coordinate system: | WGS84 |
| Ground Control Point (GCP) coordinate system: | WGS84 |
| Output coordinate system: | WGS84 / UTM zone 33N |
| Processing type: | full (scale 1) aerial nadir |
| Time for initial processing (without report): | 07h:15m:15s |

| GCP | Tolerance XY/Z [m] | Error X [m] | Error Y [m] | Error Z [m] |
|---|---|---|---|---|
| **Mean** | | 0.000356 | -0.001181 | 0.031342 |
| **Sigma** | | 0.015976 | 0.018422 | 0.126798 |
| **RMS error** | | 0.015980 | 0.018460 | 0.130615 |
| GCP | Tolerance XY/Z [m] | Error X [m] | Error Y [m] | Error Z [m] |
| **Mean** | | -0.004937 | -0.018841 | -0.029690 |
| **Sigma** | | 0.033731 | 0.021680 | 0.122424 |
| **RMS error** | | 0.034090 | 0.028723 | 0.125973 |

For many people linking small aircrafts and huge pits can be surprising, but the possibilities of measurement given by the use of flying robots are extremely useful for the mining industry. As any new technology, the unmanned aerial photogrammetry slowly becomes more and more significant in terms of area measurement. In a short time thanks to companies such as Trigger Composites and Pix4D the use of drones such as EasyMap will constitute everyday life.

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