Guidance for Dimensioning of Flight Geography, Contingency Volume and Ground Risk Buffer

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Change Management

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Revision in chapter	Change	Notes
7	DLOS Definition	Improvement

References

- IR (EU) 2019 / 947, August 2022
- AMC to IR 2019 / 947, August 2022

1 Table of Contents

2 Nomenclature

Abbreviation	Meaning
a	acceleration
ALOS	Attitude Line Of Sight
AMC	Acceptable Means of Compliance
baro	barometric
BVLOS	Beyond Visual Line of Sight
C_L	Lift coefficient
CD	Characteristic Dimension
CM	Contingency Maneuver
CV	Contingency Volume
C_D	Drag coefficient
DLOS	Detection Line of Sight
IR	Implementing Regulation
FG	Flight Geography
g	Gravitational acceleration
GM	Guidance Material
GPS	Global Positioning System
GRB	Ground Risk Buffer
GV	Ground Visibility
H	Height
K	Cartography error
m	UAS mass
Pos	Position
RZ	Reaction time
S	Distance
t	time
TO/LD	Take-off/Landing location
UAS	Unmanned Aircraft System
V_0	Maximum operational speed.
V_{Stall_clean}	Stall speed in clean configuration
VLOS	Visual Line of Sight
z	Vertical direction
ε	Glide angle
Φ	Roll angle
Θ	Pitch angle
Ψ	Yaw angle

3 Disclaimer

This guide assumes knowledge of the content of the “Guide on Operational Authorizations” of the LBA. Therefore, we recommend that you study that guide first. Furthermore, the structure of the application forms for operational authorizations in the specific category should be known. All documents can be found on the LBA homepage in the drones section under the tab “Operational authorization / LUC”.

4 Introduction

Applications for operational authorizations in the specific category according to IR (EU) 2019/947 require the definition of an operational volume (flight geography + contingency volume) and a ground risk buffer. For this purpose, LBA accepts geographical coordinates when the application is submitted. The coordinates become part of the operational authorization. This guide provides explanations and information on the compliant calculation and presentation of volumes and areas.

5 Definitions

Figure 1 is used to show the relation between operational volume (operational volume = flight geography + contingency volume) and the ground risk buffer. In the following, the individual volumes and areas are described in accordance with IR (EU) 2019/947 and the AMC and GM material. Further explanations are given, when necessary.

5.1 Flight Geography

The flight geography is the volume in which the operator may operate the UAS within the scope of his operational authorization, while complying with normal operating procedures. The size of the flight geography usually results from the desired flight volume of the operator or the flight route.
In special cases, the size of the flight geography may also result from the flight volume that is available within a controlled ground area.

5.2 Contingency Volume

The contingency volume is the volume immediately outside of the flight geography. The contingency volume completely surrounds the flight geography. If the UAS leaves the flight geography and enters the contingency volume, "contingency procedures" must be applied. It is assumed that the UAS is still under control in the contingency volume, but there is an abnormal situation.

The aim of the contingency procedures is to prevent the situation from escalating further. For example, the UAS can be manually flown back into the flight geography.

The size of the contingency volume results from the combination of several sources of error and the space required by the contingency procedures. Sources of error include GNSS inaccuracy, positioning error and inaccuracy of the map material. The space required for the contingency procedures depends on the individual procedure.

5.3 Ground Risk Buffer

The ground risk buffer is a defined area on the ground, which is directly adjacent to the contingency volume. If the UAS leaves the contingency volume to the outside, it is assumed that the UAS is no longer under control. The flight of the UAS must be terminated and the UAS impacts the ground. The UAS must reach the earth's surface within the ground risk buffer. Various methods are available for flight termination (e.g. turning off the rotors or deploying the parachute), which have an impact on the size of the ground risk buffer.

5.4 Adjacent Volume

The adjacent volume (also known as adjacent airspace) is the airspace that borders the contingency volume laterally and vertically from the outside. It lies vertically above the adjacent area on the ground. The UA would fly into this airspace if a "fly away" occurs, i.e. the UA cannot be terminated.

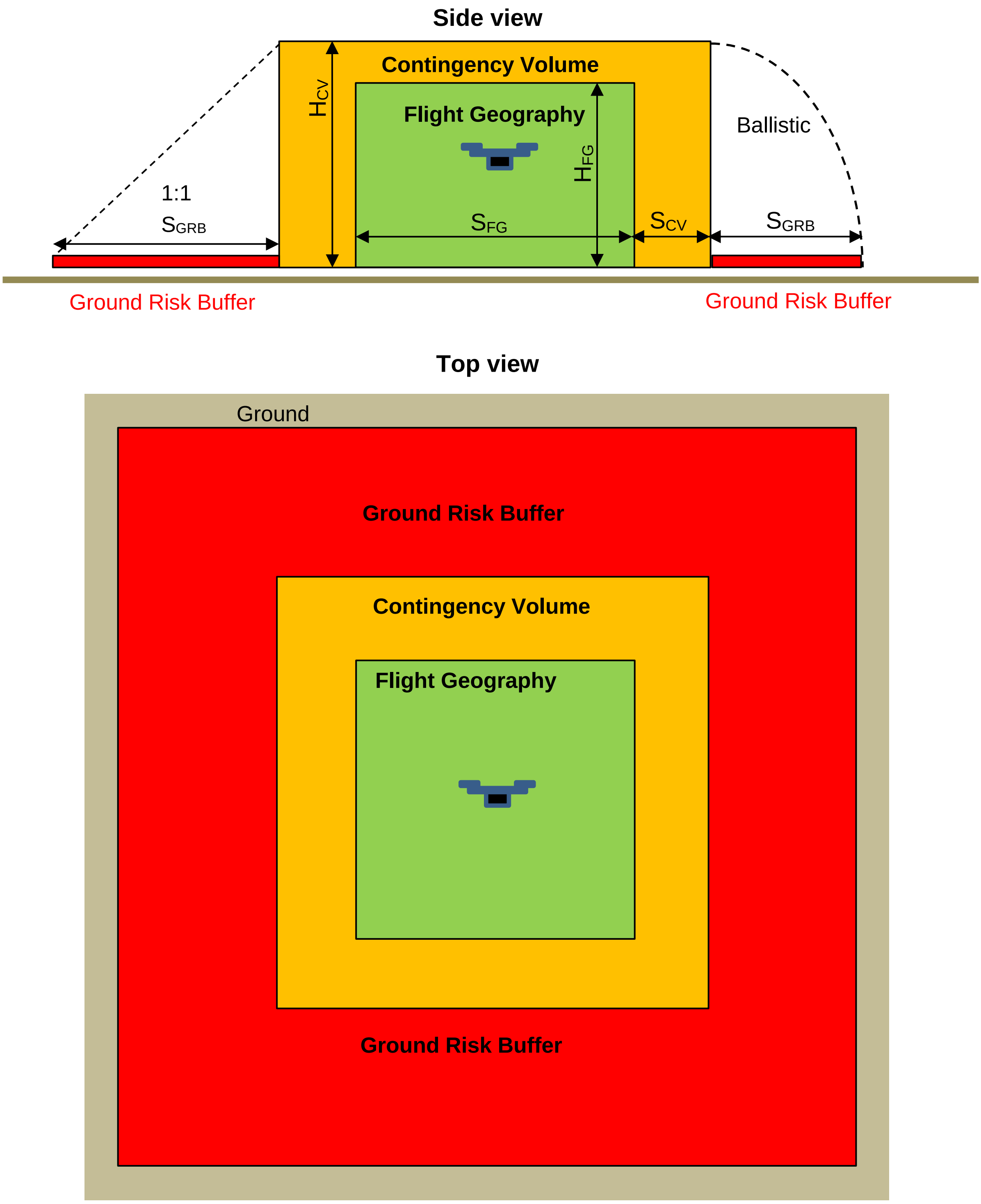


Figure 1: Simplified presentation of Flight Geography, Contingency Volumen and Ground Risk Buffer

Note:

- *Due to the simplified drawing, the example has a higher buffer at the corners*
- *To determine the ground risk class, the area of flight geography and contingency volume projected onto the ground and the area of the ground risk buffer must be considered. The highest ground risk class occurring in the entire area is assumed for the SORA. If, for example, only the ground risk buffer is in "populated area", the entire operation must be evaluated as an operation over "populated area".*

6 Example Computation for Contingency Volume and Ground Risk Buffer

This chapter provides examples for the calculation of the minimum dimensions of the contingency volume and the ground risk buffer. All the following calculations are to be understood as sample calculations only. A more detailed computation is possible using a flight mechanical calculation. You can use these computations for your specific operation in your operations manual. **If you submit deviating computations, please ensure that there is sufficient justification and documentation.**

6.1 Definitions

V_0, m/s	Maximum operational speed that is flown. This corresponds to the information in field 0.8 of the LBA SORA form or field 8 of the LBA PDRA form. *Note: A speed below 3 m/s for multirotor and 1.25* $*\, V_{Stall\_clean}$ *for fixed-wing aircraft is not considered realistic.*
CD, m	The "Maximum UAS characteristic dimension" or "CD" is the maximum possible length of a straight line that can be spanned from one point on the UAS geometry to another point. Propellers and rotors are part of the geometry, whereby their most unfavorable position is considered. This corresponds to the information in field 0.6 of the LBA SORA form, or field 6 of the LBA PDRA forms. *Note: Commonly used values for:* *Fixed-wing aircraft* • *Wing-span or* • *Fuselage length* *Multirotor* • *Diagonal distance from rotor tip to rotor tip, rotors in unfavorable position*
V_{Wind}, m/s	Maximum wind speed specified in the operations manual up to which the UAS may be operated.
FG	Flight Geography
CV	Contingency Volume
GRB	Ground Risk Buffer

6.2 Computation Flight Geography

Version 1:
The size of the flight geography usually results from the operator's desired flight volume.

Variant 2:
Determination of the maximum flight geography available, when operating over a controlled ground area.
For this purpose, the ground projection of flight geography, contingency volume and the ground risk buffer must be completely contained in the controlled ground area. A calculation from the outside inwards is recommended:
The outer limit of the ground risk buffer corresponds to the topology of the controlled ground area. First, the lateral extent (width) of the ground risk buffer (see Chapter 0) is subtracted from the topology of the controlled ground area. This gives the boundary between the contingency volume and the ground risk buffer. In the second step, the lateral extent (width) of the contingency volume (see Chapter 0) is then subtracted from this limit. This results in the maximum possible expansion of the flight geography as the remaining area (see the example in chapter 8.3).

Notes on the realistic definition of particularly small flight geographies:

FG lateral	
Width Flight Geography: S_{FG}	$S_{FG} \geq 3CD$
FG vertical	
Height Flight Geography: H_{FG}	$H_{FG} \geq 3CD$
Note: Smaller values than $H_{FG} = 3CD$ and $S_{FG} = 3CD$ are considered unrealistic, also for automated waypoint flights.	

6.3 Computation Contingency Volume

Notes on the realistic dimensioning of the contingency volume:

CV lateral	
GPS – Inaccuracy: S_{GPS}	$\mathrm{S_{GPS}} = 3\ \mathrm{m}$
Position holding error: S_{Pos}	$\mathrm{S_{Pos}} = 3\ \mathrm{m}$
Map error: S_{K}	$\mathrm{S_K} = 1\ \mathrm{m}$
Reaction distance: S_{RZ}	<u>Manual initiation of measures</u> Response time: *t* = 1 s, with V_0results in $S_{RZ} = V_0 \cdot 1\ \mathrm{s}$ *Note: S_{RZ} can also be smaller in fully automatic systems (e.g. geofence).*
Contingency maneuvers: S_{CM}	<u>Multirotor - stopping</u> Based on $S = \frac{1}{2}at^2 + V_0 t$ follows with a thrust to weight ratio of at least 2 $\text{Thrust to weight} \geq 2mg$ and a maximum pitch angle of less than 45 degrees $\Theta_{\max} \leq 45^{\circ}$ The minimum distance for stopping to hovering mode is: $S_{\mathrm{CM}} = \frac{1}{2} \frac{\mathrm{V_0}^2}{g \tan(\Theta)}$ <u>Fixed-wing aircraft -180° turn:</u> Assumption: roll angle $\Phi_{\max} \leq 30^{\circ}$ The radius for the turn is: $S_{\mathrm{CM}} = \frac{\mathrm{V_0}^2}{g \tan(\Phi)}$
Alternative contingency maneuver parachute: S_{CM}	Flight terminated with parachute opening directly when leaving the FG t =Time to open the parachute $S_{CM} = V_0 t$
Lateral extension contingency volume: S_{CV}	$S_{CV} = S_{GPS} + S_{Pos} + S_K + S_{RZ} + S_{CM}$
Examples	
Example multirotors: $V_0 = 10\frac{\mathrm{m}}{\mathrm{s}}$, $\Theta = 45^{\circ}$, $[\tan(45°) = 1]$	$\mathrm{S_{CV}} = 3\ \mathrm{m} + 3\ \mathrm{m} + 1\ \mathrm{m} + 10\ \mathrm{m} + \frac{1}{2} * \frac{\left(10\frac{\mathrm{m}}{\mathrm{s}}\right)^2}{9{,}81\frac{\mathrm{m}}{\mathrm{s}^2} * 1} = 22.1\ \mathrm{m}$
Example fixed-wing aircraft: $V_0 = 30\frac{\mathrm{m}}{\mathrm{s}}$,$\Phi = 30^{\circ}$	$\mathrm{S_{CV}} = 3\ \mathrm{m} + 3\ \mathrm{m} + 1\ \mathrm{m} + 30\ \mathrm{m} + \frac{\left(30\frac{\mathrm{m}}{\mathrm{s}}\right)^2}{9{,}81\frac{\mathrm{m}}{\mathrm{s}^2}\tan(30°)} = 195.9\ \mathrm{m}$

CV vertical	
Altitude measurement error: H_{baro}	$H_{\mathrm{baro}} = 1\ \mathrm{m}$ for barometric altitude measurement, or $H_{\mathrm{baro}} = 4\ \mathrm{m}$ for GPS-based altitude measurement
Response height: H_{RZ}	<u>Manual initiation of measures</u> Response time: t = 1 s, with 45° pitch angle results $H_{\mathrm{RZ}} = \mathrm{V}_0 \cdot 0.7 \cdot 1\ \mathrm{s}$ *Note: H_{RZ} can also be smaller in fully automatic systems (e.g. geofence).*
Contingency maneuvers: H_{CM}	<u>For multirotor</u> The forward kinetic energy is completely converted into potential energy. This results in the height $H_{\mathrm{CM}} = \frac{1}{2}\frac{{V_0}^2}{\mathrm{g}}$ <u>For fixed-wing aircraft</u> Exit the FG upwards with a 45° pitch angle, then fly on a constant circular path with V_0 and radius r until level flight is achieved. With $r = \frac{{V_0}^2}{g}$ results in the contingency maneuver height being approximately $H_{\mathrm{CM}} = \frac{{V_0}^2}{g} \cdot 0.3$
Alternate contingency maneuver parachute: H_{CM}	Flight terminated with parachute opening directly when leaving the FG Exit FG with 45° pitch angle t =Time to open the parachute $H_{\mathrm{CM}} = V_0 \cdot t \cdot 0.7$
Contingency volume: H_{CV}	$H_{CV} = H_{FG} + H_{baro} + H_{RZ} + H_{CM}$
Examples	
Height of Flight Geography	$H_{\mathrm{FG}} = 100\ \mathrm{m}$
Example multirotor: $V_0 = 10\,\frac{\mathrm{m}}{\mathrm{s}}$	$H_{\mathrm{CV}} = 100\ \mathrm{m} + 1\ \mathrm{m} + 7\ \mathrm{m} + \frac{1}{2}\frac{\left(10\,\frac{\mathrm{m}}{\mathrm{s}}\right)^2}{9{,}81\,\frac{\mathrm{m}}{\mathrm{s}^2}} = 113{,}1\ \mathrm{m}$
Example fixed-wing a/c: $V_0 = 30\,\frac{\mathrm{m}}{\mathrm{s}}$	$H_{\mathrm{CV}} = 100\ \mathrm{m} + 1\ \mathrm{m} + 21\ \mathrm{m} + \frac{\left(30\,\frac{\mathrm{m}}{\mathrm{s}}\right)^2}{9{,}81\,\frac{\mathrm{m}}{\mathrm{s}^2}} \cdot 0{,}3 = 149{,}52\ \mathrm{m}$

6.4 Computation Ground Risk Buffer

GRB Lateral	
Simplified approach: 1:1 rule: S_{GRB}	$S_{\mathrm{GRB}} = H_{\mathrm{CV}} + \frac{1}{2} CD$
Ballistic Approach: S_{GRB} ***Note: Only permitted for rotorcraft and multirotors!***	$S_{\mathrm{GRB}} = \mathrm{V}_0 \sqrt{\frac{2H_{\mathrm{CV}}}{g}} + \frac{1}{2} CD$
Termination with parachute: S_{GRB} *Note: Values below $V_{\mathrm{Wind}} = 3\frac{\mathrm{m}}{\mathrm{s}}$ are not considered realistic for this computation.*	$t =$ Time to open the parachute From the rate of descent with the parachute open ($\mathrm{V_z}$) and the maximum permissible wind speed for operation (V_{Wind}) results $S_{\mathrm{GRB}} = V_0 t + V_{\mathrm{Wind}} * \frac{H_{\mathrm{CV}}}{V_{\mathrm{z}}}$
Termination with fixed-wing aircraft: S_{GRB}	Power is switched off With the glide ratio $E = \frac{1}{\varepsilon} = \frac{C_L}{C_D}$ results $S_{\mathrm{GRB}} = \frac{H_{\mathrm{CV}}}{\varepsilon}$ Power is switched off and the rudder position is permanently selected in a way that no gliding is possible: The simplified approach can be chosen (1:1 rule).
Examples	
Simplified approach: Multirotor: $\mathrm{V_0} = 10\frac{\mathrm{m}}{\mathrm{s}}$, CD=1.5m, $\mathrm{H_{CV}} = 113{,}1\mathrm{m}$	$\mathrm{S_{GRB}} = 113{,}1\mathrm{m} + \frac{1}{2} \cdot 1{,}5\mathrm{m} = 113{,}85\mathrm{m}$
Ballistic Approach: Multirotor: $V_0 = 10\frac{\mathrm{m}}{\mathrm{s}}$, *CD* = 1.5 m, $H_{\mathrm{CV}} = 113{,}1\mathrm{m}$	$S_{\mathrm{GRB}} = 10\frac{\mathrm{m}}{\mathrm{s}} \sqrt{\frac{2 \cdot 113{,}1\ \mathrm{m}}{9{,}81\frac{\mathrm{m}}{\mathrm{s}^2}}} + \frac{1}{2} \cdot 1{,}5\ \mathrm{m} = 48{,}77\ \mathrm{m}$
Fixed-wing aircraft only power is switched off: $V_0 = 30\frac{\mathrm{m}}{\mathrm{s}}$, *CD* = 3 m, $H_{\mathrm{CV}} = 149{,}52\ \mathrm{m}$	$\varepsilon = \frac{1}{20}$ $S_{\mathrm{GRB}} = 149{,}52\ \mathrm{m} \cdot 20 = 2990{,}4\ \mathrm{m}$
Fixed-wing aircraft power is switched off and rudder position selected so that no gliding is possible: $V_0 = 30\frac{\mathrm{m}}{\mathrm{s}}$, *CD* = 3 m, $H_{\mathrm{CV}} = 149{,}52\ \mathrm{m}$	$S_{\mathrm{GRB}} = 149{,}52\ \mathrm{m} + \frac{1}{2} \cdot 3\ \mathrm{m} = 151{,}02\ \mathrm{m}$
GRB vertical	- not applicable -

6.5 Computation *adjacent volumes*

The adjacent volume begins at the outer limit of the contingency volume. Its width results from a two-minute flight of the UA at its operating speed V_O:

Adjacent volume horizontal	
Width of the *adjacent volume*: S_{AV}	$S_{AV} = 120\,s \cdot V_O$
Example	
$V_O = 10\,\frac{m}{s}$	$S_{AV} = 120\,s \cdot 10\,\frac{m}{s} = 1200\,m$

The height of the adjacent volume is at least 500 feet (150 m) above the operational volume.

Adjacent volume vertical	
Hight of the *adjacent volume*: H_{AV}	$H_{AV} = H_{CV} + 150\,m$
Example	
$H_{CV} = 100\,m$	$H_{AV} = 100\,m + 150\,m = 250\,\mathrm{m}$

Note: If the operating volume does not reach the floor, any airspace below the operating volume is also considered an adjacent volume.

7 Computation VLOS/BVLOS Maximum Distance

When determining the operating range for Visual Line of Sight (VLOS) operations, care must be taken to ensure that the remote pilot can actually operate the UAS within visual range.
To check whether the described UAS operation is in VLOS or Beyond Visual Line of Sight (BVLOS), the following calculations may be used.

Definitions	
VLOS limit	The maximum possible VLOS distance between remote pilot and UAS results from the **smaller value of ALOS and DLOS**. Anything beyond that is considered **BVLOS**.
ALOS	Attitude Line of Sight The Attitude Line of Sight defines the maximum distance up to which a remote pilot can detect the position and orientation of the UAS. Up to this limit, the remote pilot is able to control the flight path of the UAS, and is able to determine the attitude and position of the UAS. This distance was determined in practical tests.
DLOS	Detection Line of Sight The detection line of sight defines the distance up to which the UA could theoretically fly while at the same time other aircraft can be visually detected, and still sufficient time is available for an avoidance maneuver. The ground visibility is crucial for this.
GV	Ground Visibility The ground visibility depends on the operational area and the meteorological conditions, and must be determined at the respective time of operation. The procedure for precisely determining ground visibility should be described in the operations manual. The use of landmarks or the use of a transmissometer are possible. The maximum ground visibility to be assumed is **5 km**, analog to the visibility according to the VFR rules in airspace G.

ALOS limit	<u>For rotorcraft and multirotors</u> $\mathrm{ALOS_{max}} = 327 \cdot \mathrm{CD} + 20\ \mathrm{m}$ <u>For fixed-wing aircraft:</u> $\mathrm{ALOS_{max}} = 490 \cdot \mathrm{CD} + 30\ \mathrm{m}$
DLOS limit	$\mathrm{DLOS_{max}} = 0.3 \cdot \mathrm{GV}$ GV depends on the actual ground visibility at site and time of operation. However it always applies: $\mathrm{GV_{max}} = 5\ \mathrm{km}$

Note: If the largest possible distance between the pilot location and the outer side of the contingency volume (boundary between contingency volume and ground risk buffer) is greater than the VLOS boundary, no VLOS operation can take place. Operations must then take place in BVLOS.

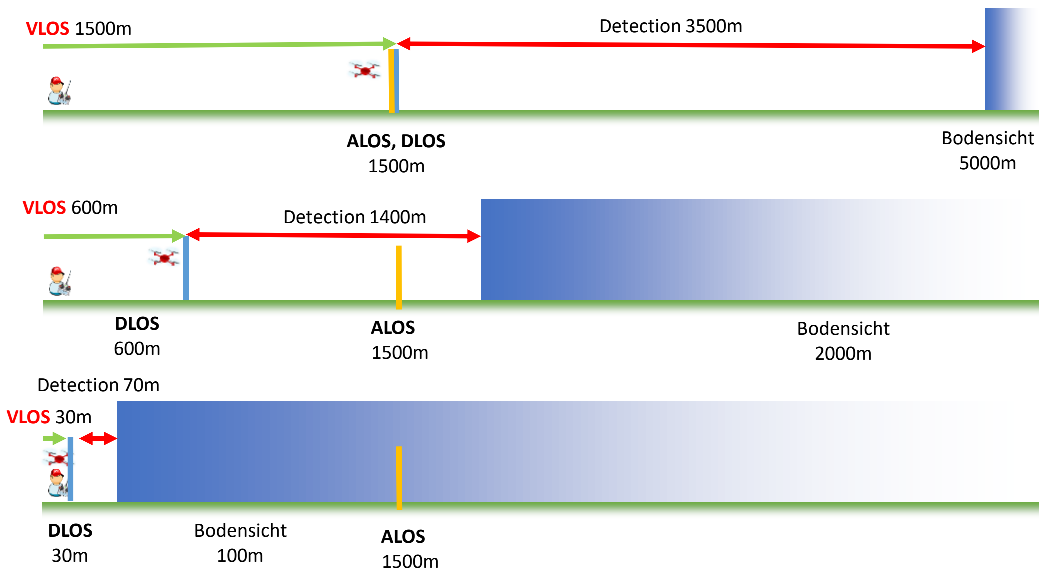
7.1 Examples for maximum VLOS distance:

The table is valid for a Ground Visibility of 5km or more.

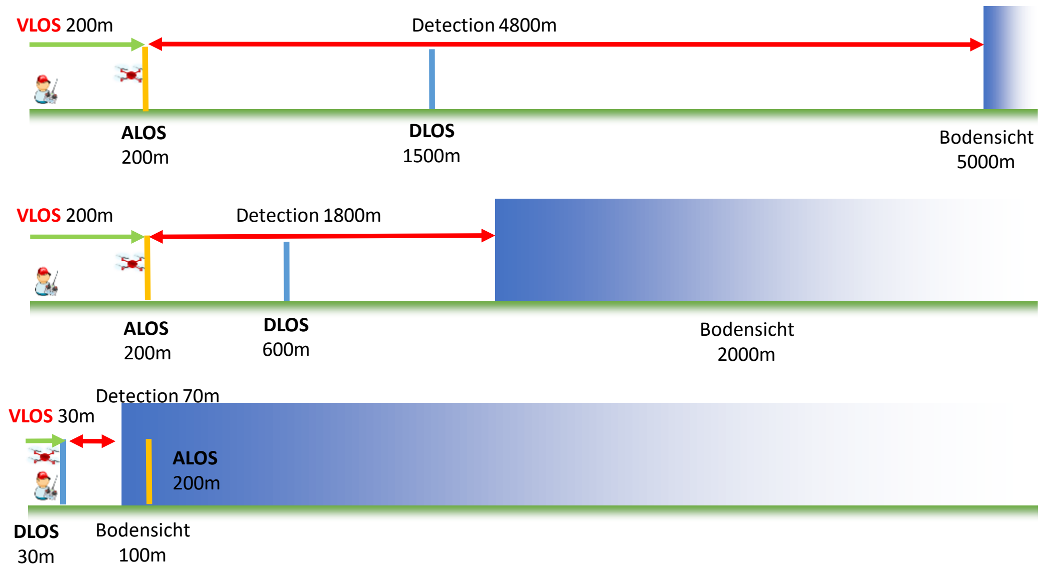
characteristic dimension (CD)	Maximum VLOS distance	
	Rotary Wing	Fixed Wing
1 m	347 m	520 m
2 m	674 m	1010 m
3 m	1000 m	1500 m
3,5 m	1164,5 m	1500 m
4 m	1328 m	1500 m
4,53 m	1500 m	1500 m
> 4,53 m	1500 m	1500 m

The following examples with varying GV is for better visualization and not to scale.

Starrflügel, CD = 3m -> ALOS = 1500m



Multirotor, CD = 0,55m -> ALOS = 200m



8 Development of *.kml files

The outer coordinates of Flight Geography, Contingency Volume and Ground Risk Buffer should be provided to LBA. For Flight Geography and Contingency Volume these are the external coordinates projected onto the ground.
The topology of flight geography, contingency volume and ground risk buffer should clearly emerge from the coordinates. The outer coordinate points are sequentially connected with straight lines.

8.1 Introduction

For easy processing, we require to define the above areas digitally with cartography software and save them as a *. kml file.
This file is attached to the application for an operational authorization. The coordinate data generated by this process in the *. kml file becomes part of the operational authorization. The *. kml file can also be opened directly with a text editor or spreadsheet program, which allows the coordinates to be displayed and exported to a geofence system.

There are several free software tools that can be used to create *. kml files.

These include, (among others):

- Google Earth browser mode
- Google Earth Pro Desktop
- QGIS
- GPS Prune
- Etc.

Depending on the software used, it may be possible to define an altitude for the generated areas. Instead, only the 2D projection of flight geography and contingency volume should be drawn on the ground, and the height must be clearly specified in the operations manual.

If several flight areas are to be saved in one *.kml file, each flight area must be saved in its own folder or layer within the *.kml file, named uniquely and according to the designation in the application or operations manual.

The following items should be in the *.kml file - the nomenclature is shown here in bold.

- **Flight Geography** - as a polygon in green
- **Contingency volume** - as a polygon in yellow
- **Ground Risk Buffer** - as a polygon in red
- **Pilot** - pilot position as location marker
- **TO/LD** - UAS take-off and landing position as location marker

It must be strictly ensured that the previously calculated minimum sizes of the contingency volume and ground risk buffer are correctly compiled in the *. kml. If the contingency volume and ground risk buffer are drawn manually in software as a polygon, exact positioning is often difficult.

Note: *Compliance with the calculated contingency volume and ground risk buffer is checked using automatic software tools. Falling short of the calculated sizes will not be tolerated.*
We therefore strongly recommend a conservative approach when drawing manually!

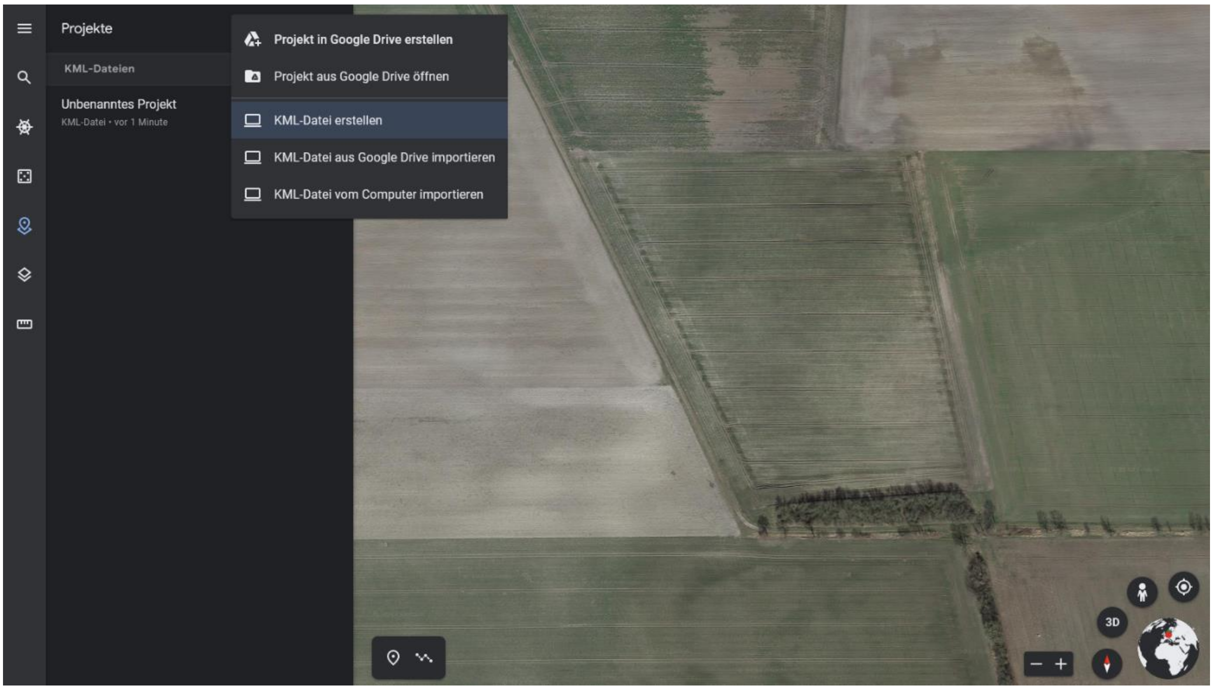
8.2 Example 1 *.kml in Google Earth

The following example explains how to use the browser version of Google Earth to create a compliant *.kml file.
In this example, an operator should fly over an agricultural field. The size of the flight geography results from the size of the field.

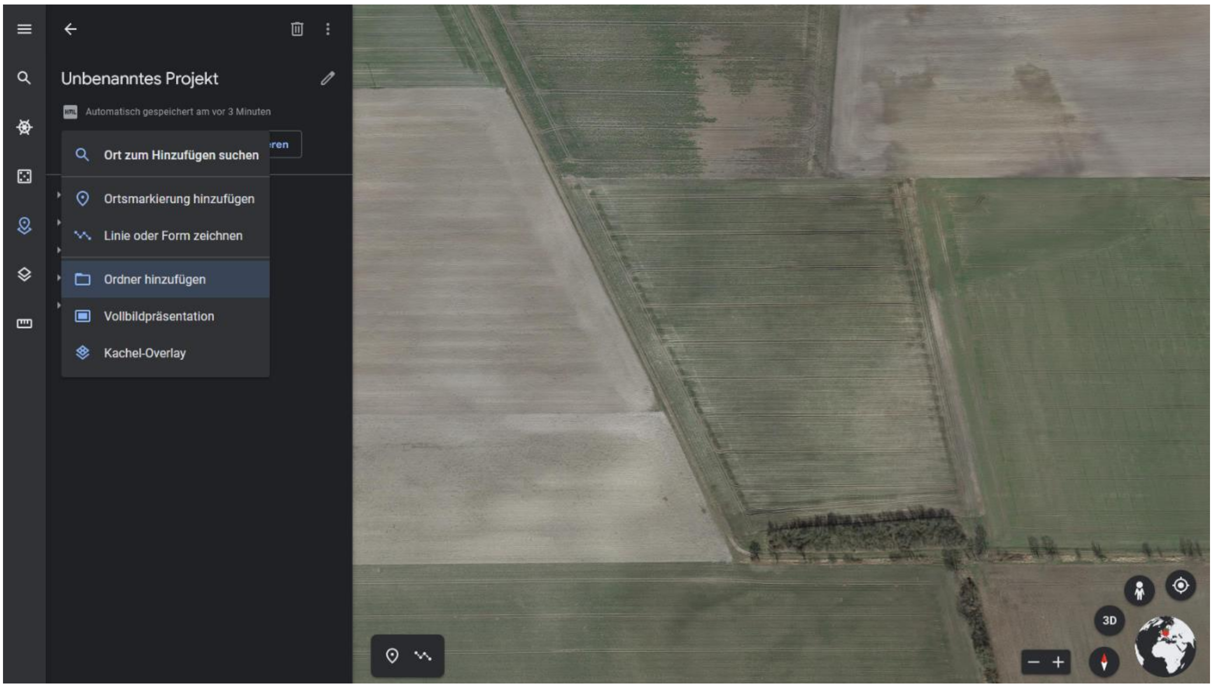
The browser version of Google Earth is available at https://www.google.com/intl/de_de/earth/
.
The example of a multicopter in Chapter 6 is used.

- $V_0 = 10\,\frac{\mathrm{m}}{\mathrm{s}}$
- $CD = 1{,}5\ \mathrm{m}$
- $H_{\mathrm{FG}} = 100\ \mathrm{m}$
- $H_{\mathrm{CV}} = 113{,}1\ \mathrm{m}$
- $S_{\mathrm{CV}} = 22{,}1\ \mathrm{m}$
- $S_{\mathrm{GRB}} = 48{,}77\ \mathrm{m}$

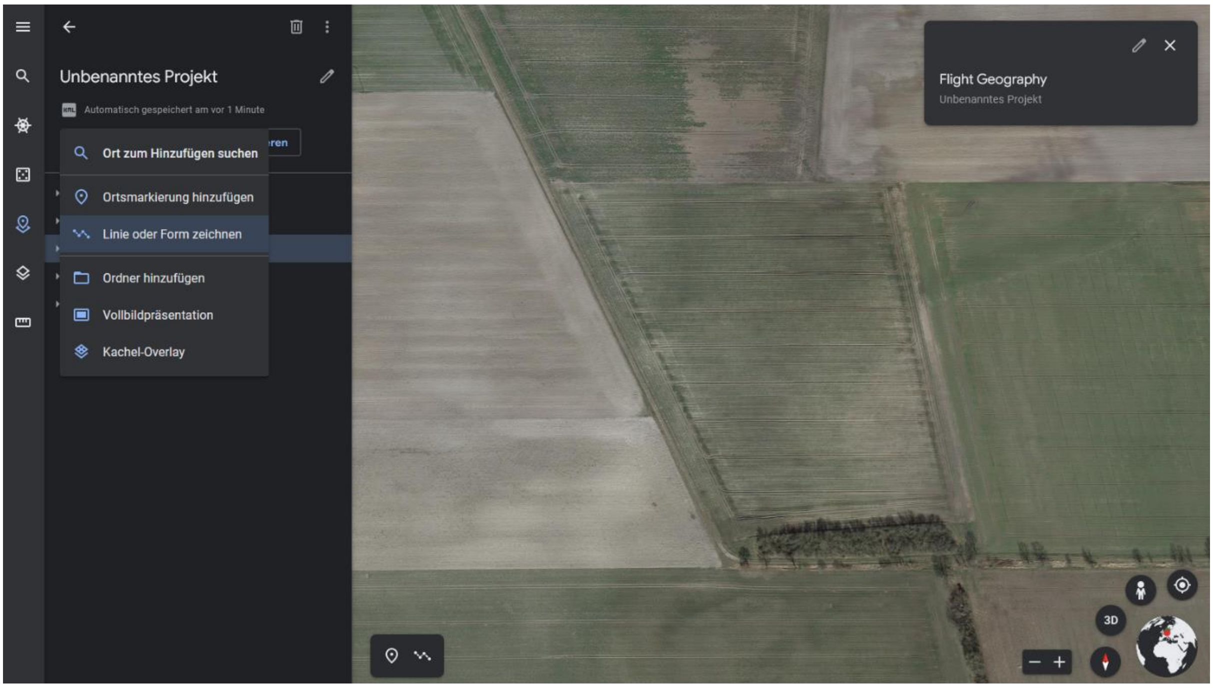
1. A new KML file is created via the *Project Details* panel.



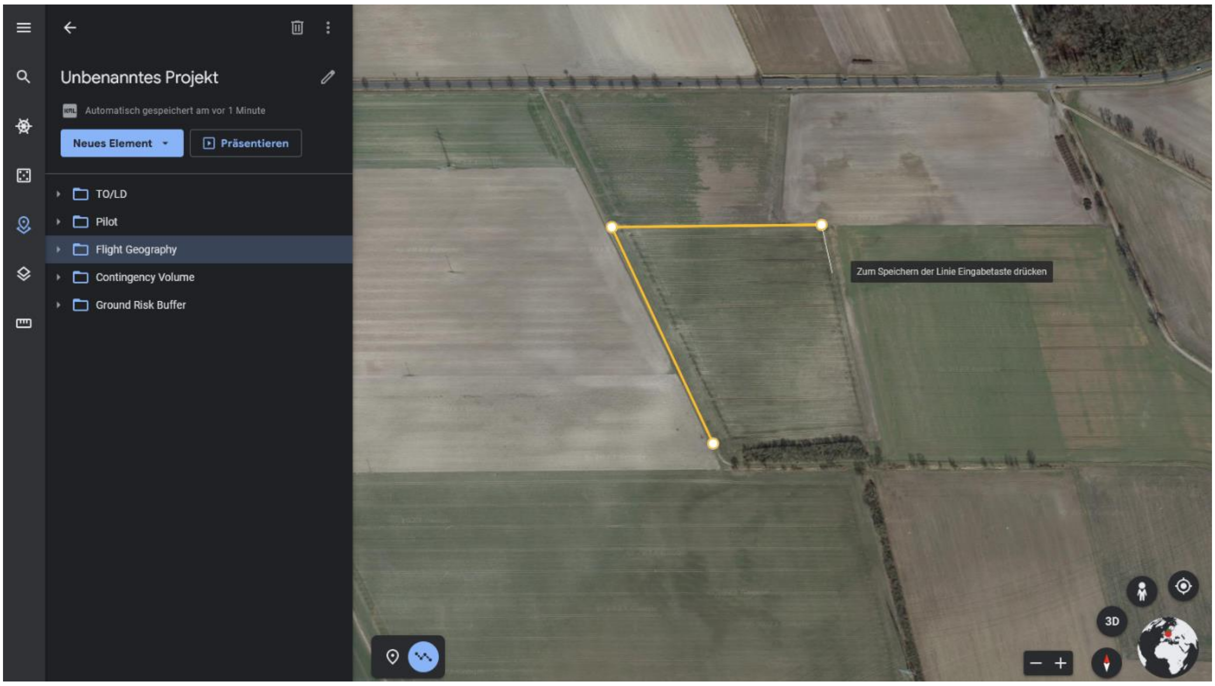
2. For each of the elements provided in chapter 8.1, an individual new folder with the respective name is created from the *New feature* menu.



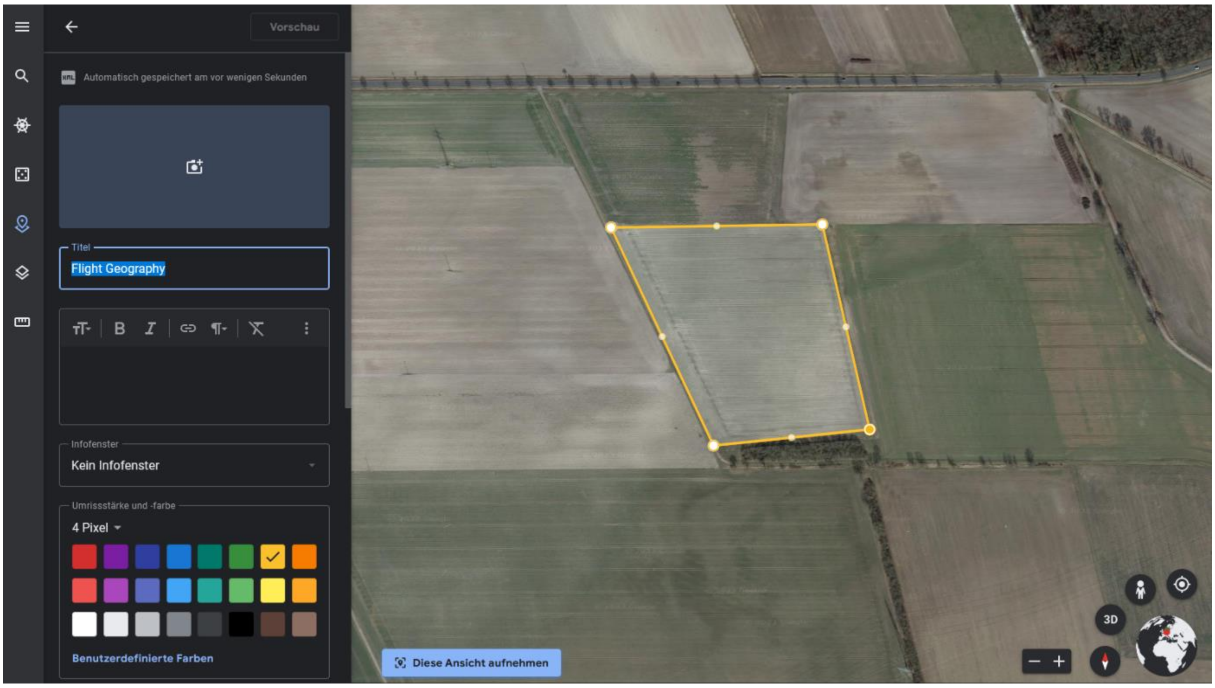
3. In the folder *Flight Geography*, line or shape is drawn from the *New feature* menu



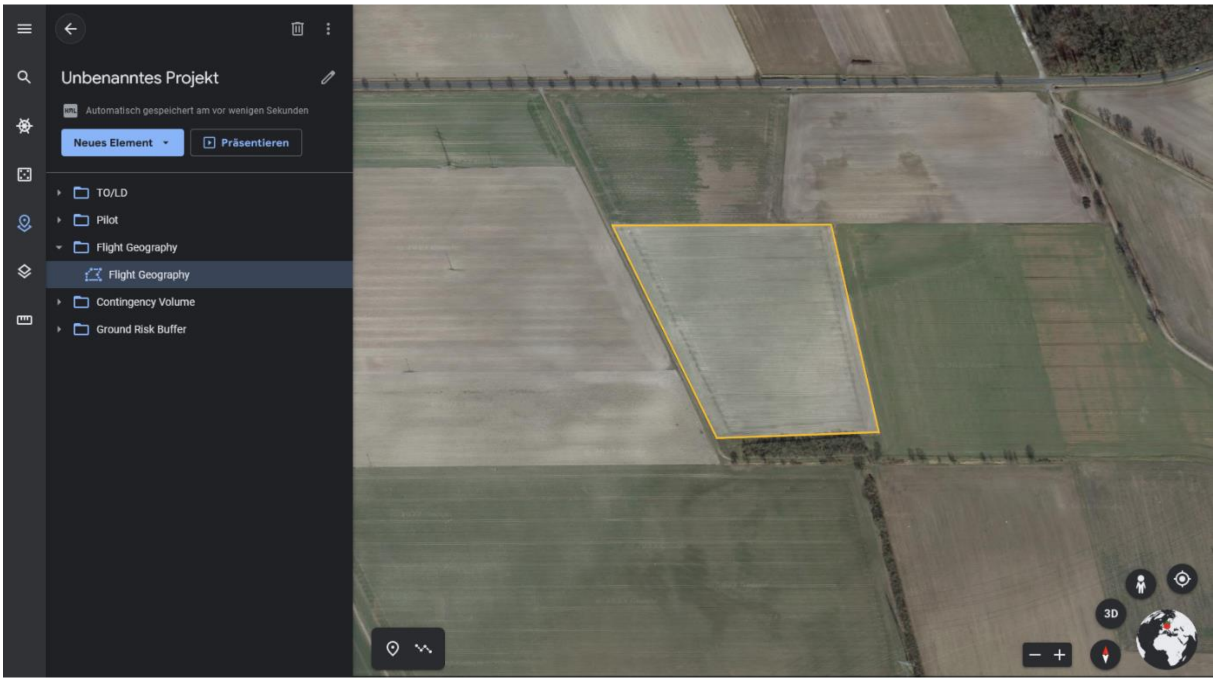
4. Lines are drawn as the outer contour of the Flight Geography. Click to create a corner point. The coordinates of these corner points (here in the picture small circles) are saved later in the *.kml file. The contour is closed by clicking on the starting point.

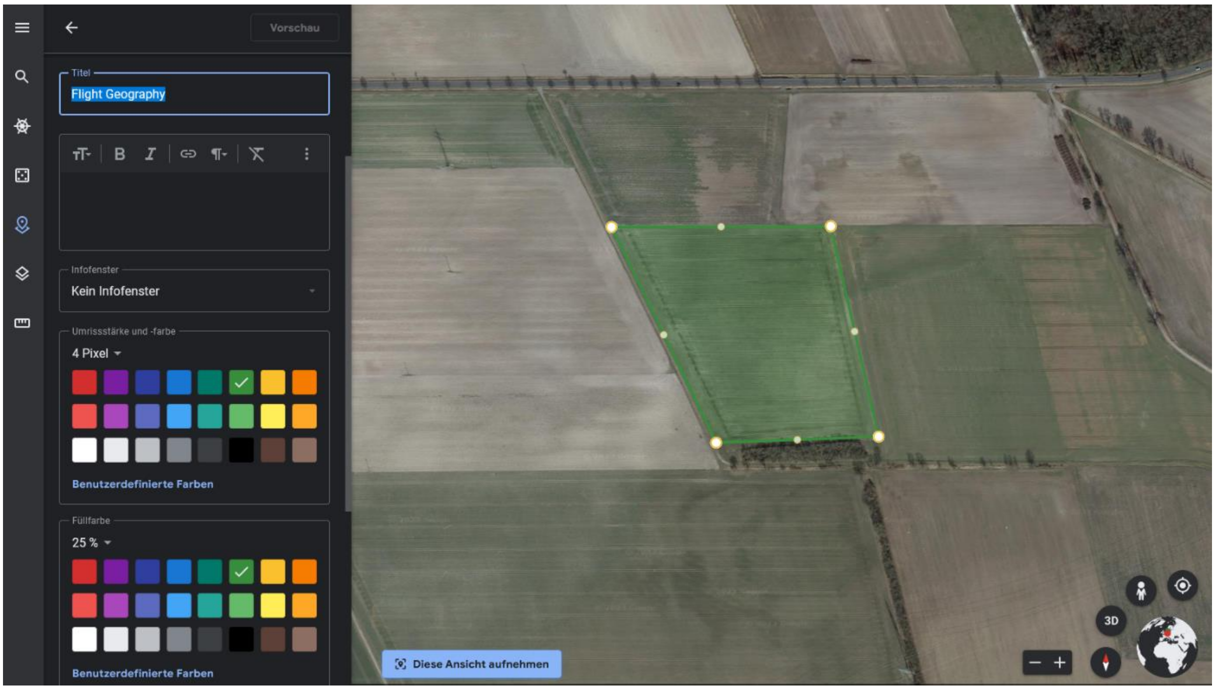


5. After closing the form, you can give it a name. The nomenclature should be clear and correspond to that in Chapter 8.1.



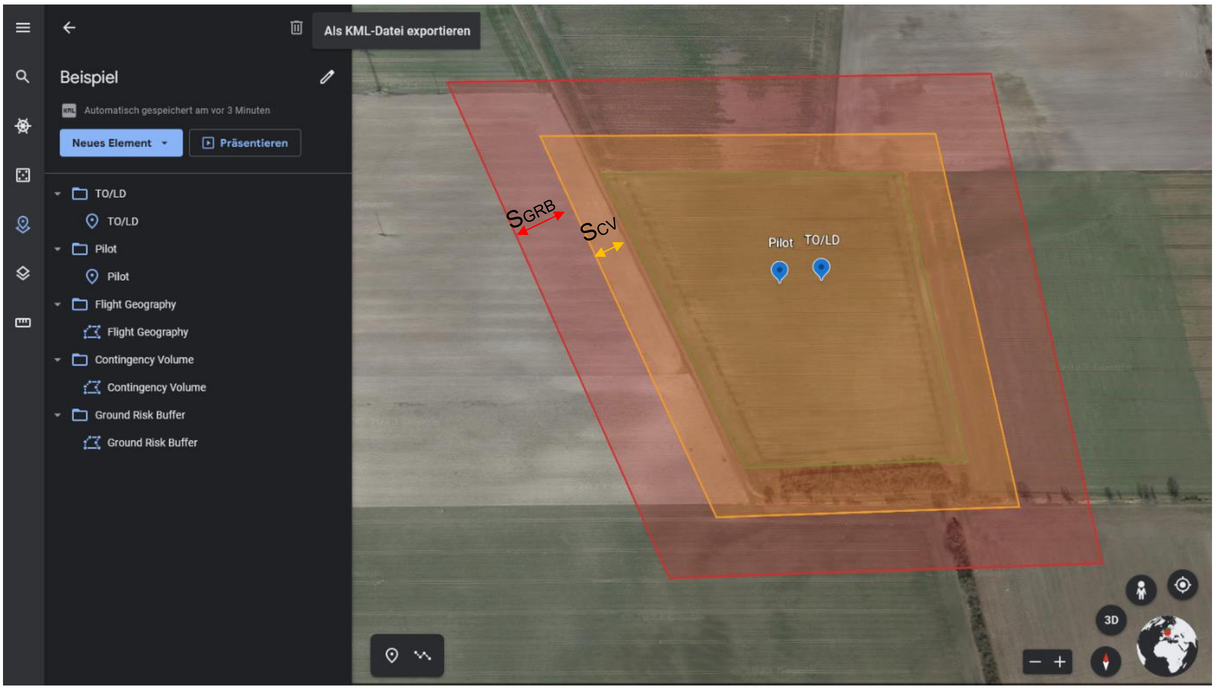
6. Using *Edit place, the* generated Flight Geography can be colored according to the specifications from Chapter 8.1.





7. The process is repeated for the contingency volume and the ground risk buffer. It is important to ensure that the previously calculated minimum distances are not violated. This is where the distance measurement tool from Google Earth (ruler icon) can help. When drawing by hand, a conservative approach is recommended.

8. The pilot's position is to be added as a placemark (*New feature*). The same process is repeated with the UAS take-off and landing position.



9. The finished representation can be exported as a *.kml file and sent to LBA.

8.3 Example 2 *.kml in Google Earth

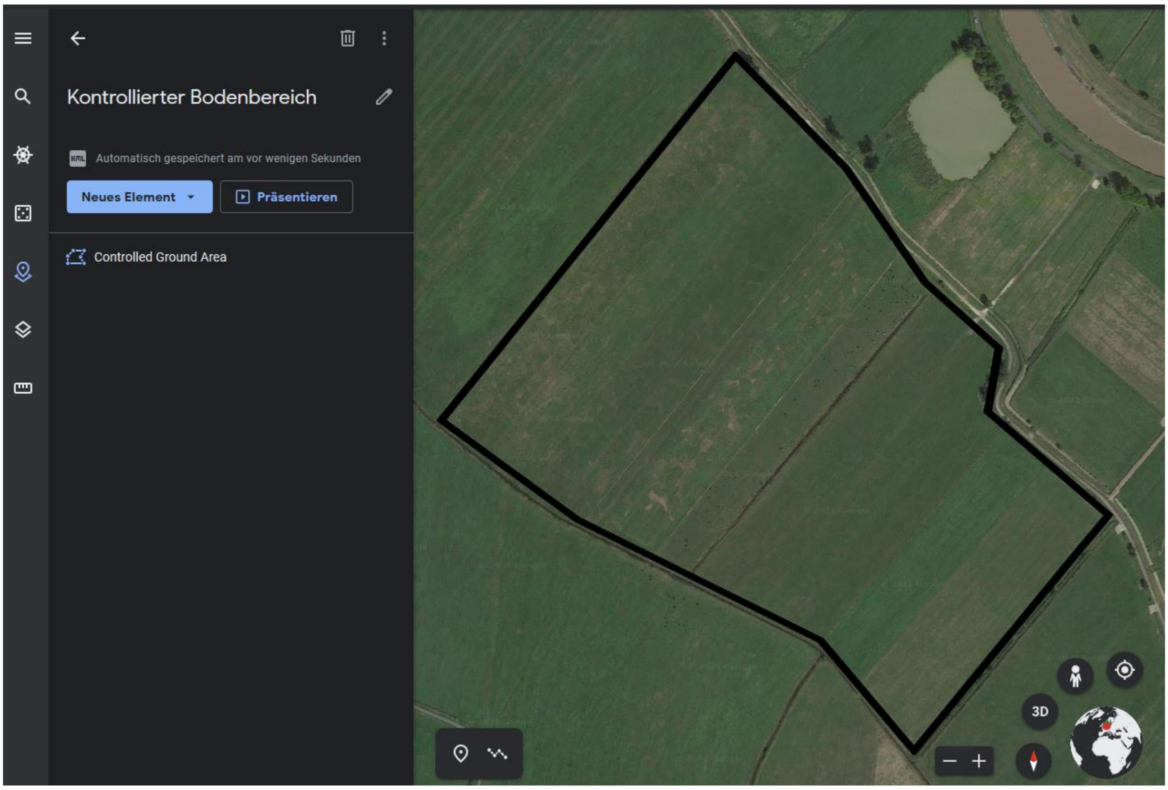
In this example, a UAS operation is to be implemented over a controlled ground area. For this purpose, Flight Geography, Contingency Volume and Ground Risk Buffer must be completely contained in the controlled ground area. We therefore recommend the calculation of the areas from the outside inwards as shown for variant 2 in chapter 0. Additionally, the procedure and naming conventions according to example 1 apply.

Again, the example of a multicopter in Chapter 6 is used.

1. The controlled ground area is drawn (here as a black line)

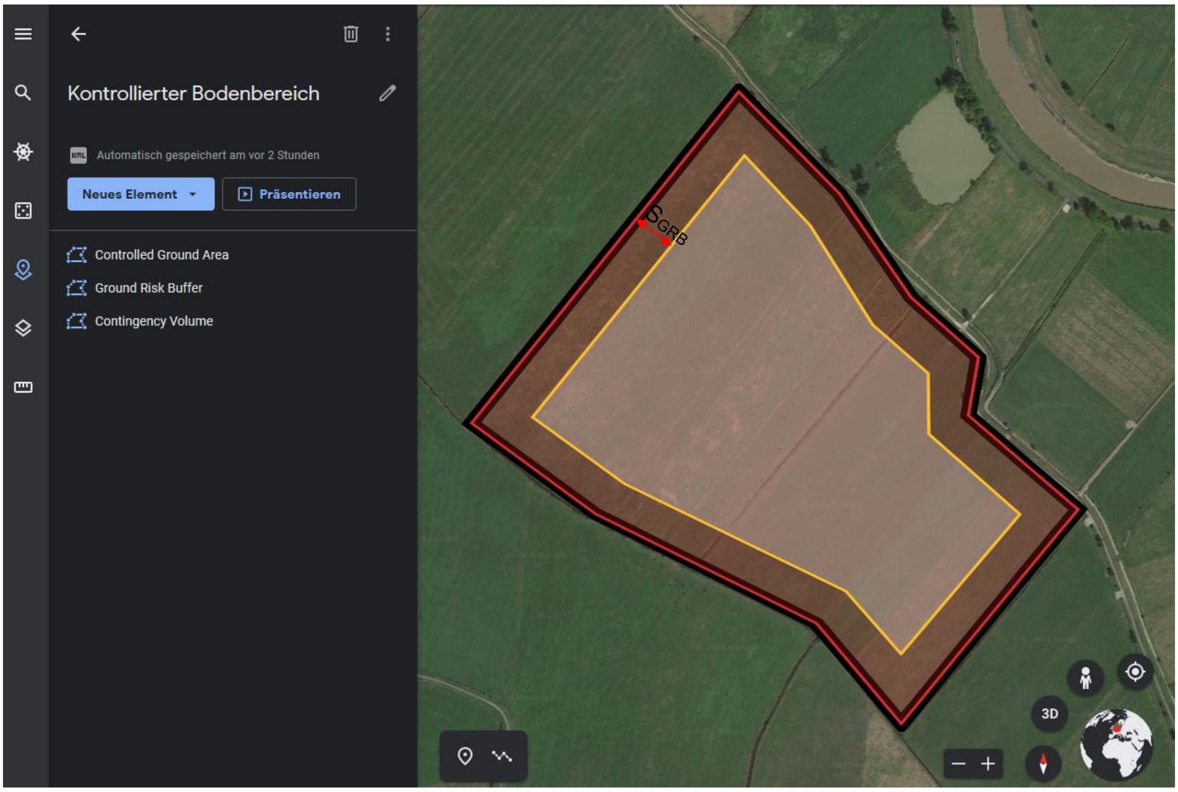
   Note:
   According to Article 2 – 21 IR (EU) 2019/947, a "controlled ground area" means the ground area where the UAS is operated and within ***which the UAS operator*** *can ensure that only involved persons are present.*

   Who can belong to the persons involved is specified under:
   GM1 Article 2(18) Definitions - IR (EU) 2019/947

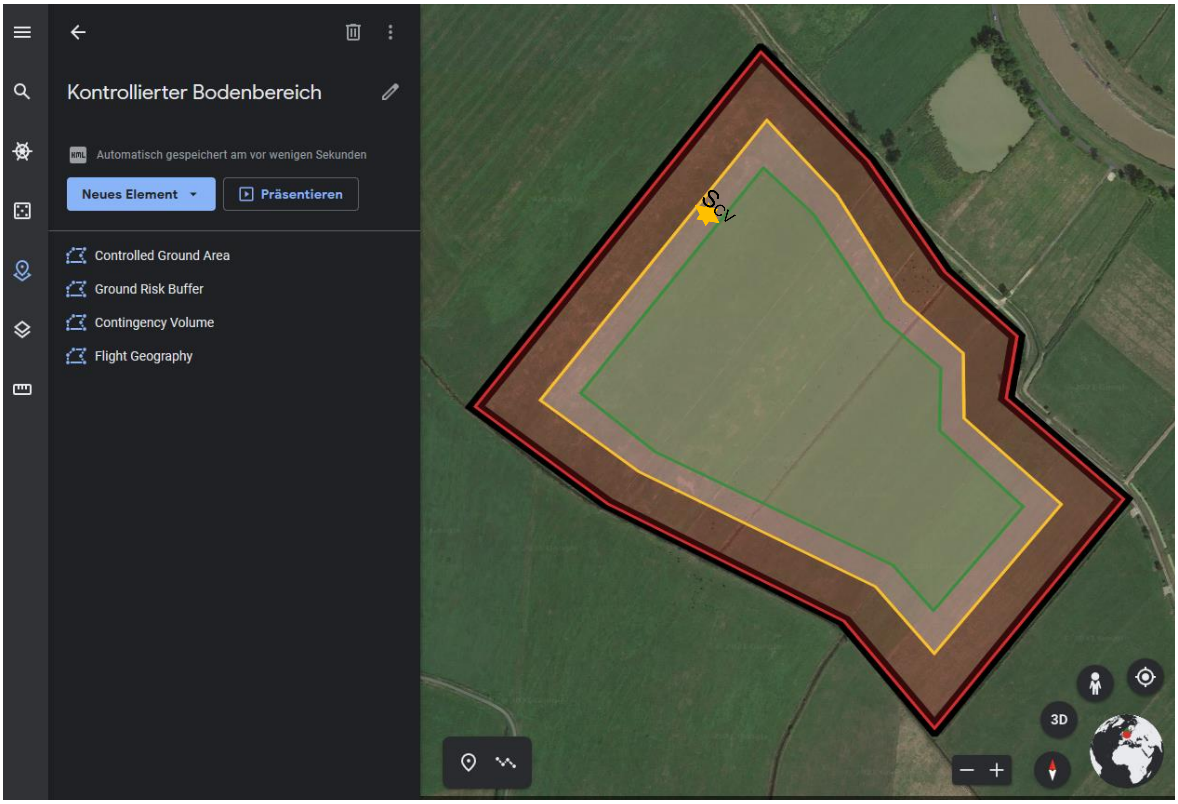


2. The outer contour of the Ground Risk Buffer corresponds to the controlled ground area.

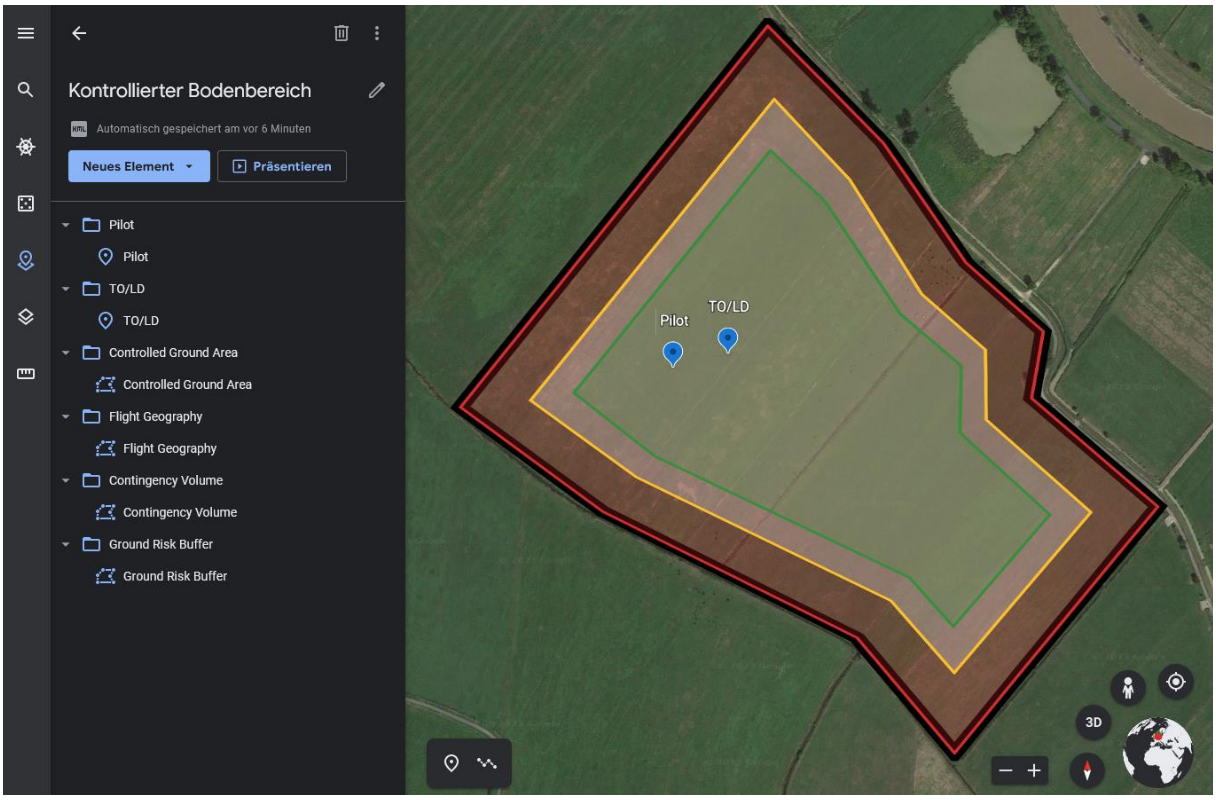
3. The contingency volume is drawn using the calculated ground risk buffer.



4. The flight geography results from the area still available after deducting the width of the contingency volume.



5. The location of the pilot and the take-off and landing point of the UAS are marked. The *.kml file can be exported.



Intentionally left bank: