U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO

Edge of Space Sciences, Inc. (EOSS) / Russell B. Chadwick

ADDRESS

4371 North 63rd Street / 303-530-0228 / russ4cwop@gmail.com

This certificate is issued for the operations specifically described hereinafter. No person shall conduct an operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED

Activity:	Multiple unmanned free balloon operations IAW 14 CFR, Part 101; this Certificate; and Special Provisions
Max. Height:	115,000 feet Mean Sea Level (MSL)
Location:	Two (2) potential launch sites - see special provisions and attached map of launch sites
Time/s:	Official sunrise to sunset applicable to launch site (daylight hours only)
Date/s:	02/15/2024 - 12/31/2025, not to exceed twelve (12) 14 CFR Part 101 - Subpart D non-exempt operations

COA: WSA-2403-BAL (cc: ZDV, Leidos FS)

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

14 CFR 101.35(a)(3) Equipment and marking requirements …radar reflective devices…

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached to and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Administrator of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

NOTE – This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance

SPECIAL PROVISIONS

Special Provisions Nos. 1 to 7, inclusive, are set forth on the reverse side hereof.

This certificate is effective from February 15, 2024 to December 31, 2025, inclusive, and is subject to cancellation at any time upon notice by the Administrator or his authorized representative.

BY DIRECTION OF THE ADMINISTRATOR

FAA Western Service Area
(Region)

(Signature)

February 6, 2024
(Date)

B. G. Chew, Group Manager
Operations Support Group, WSC
(Title)

FAA Form 7711-1 (7-74)

WSA-2403-BAL
SPECIAL PROVISIONS

Prepared for and applicable to:

Edge of Space Sciences, Inc. (EOSS)
(POC: Russell B. Chadwick)

1. Authority to deviate from the Code of Federal Regulations (CFR) is limited to specific regulations shown on the attached Certificate of Waiver or Authorization; compliance with all other applicable CFRs, including all subparts of Part 101, is mandatory.

2. **You must make the following notifications as listed below:** Note: The notification information listed below is necessary for Air Traffic Control (ATC) to advise known aircraft of balloon and payload location. It does not alleviate EOSS' responsibility to ensure safety to unknown aircraft, persons, or their property.

   a. **Seven days in advance of the launch:** Provide pre-launch notice to Denver Air Route Traffic Control Center (ZDV) Airspace and Procedures Office by email at 9-ANM-ZDV-Airspace@faa.gov.

   b. **Three business days prior to launch:** Provide current forecast trajectory to ZDV Airspace and Procedures Office by email at 9-ANM-ZDV-Airspace@faa.gov.

   c. **Twenty-four to 72 hours prior to conducting operations:** Contact Leidos Flight Service at 877-487-6867 and ask to issue a Notice to Airmen (NOTAM) referencing this waiver.

   d. **Twenty-four hours prior to launch,** provide current forecast trajectory to**:**

      1. ZDV Airspace and Procedures Office by email at 9-ANM-ZDV-Airspace@faa.gov.

      2. ZDV Traffic Management Unit (TMU) by email at 9-ATO-ZDV-MOS@faa.gov.

   e. **Thirty minutes to 2 hours prior to conducting operations:** Call ZDV TMU at 303-651-4252 to advise them of the forecast trajectory. Provide launch information, ADS-B squawk code **4453**, ID (i.e., N991SS or N992SS) and **the planned payload cut-down altitude**.

   f. **Fifteen minutes prior to launch:** Call Denver ARTCC TMU at 303-651-4252 to ensure the cell phone used at the site is working and able to send and receive phone calls.

   g. **As requested by ZDV:** Provide launch information, en-route position reports, and "on deck" reports.

h. Prior to issuing the cut down command: Call ZDV TMU at 303-651-4252 to coordinate the optimum time for cut down, to avoid possible conflict with high traffic volume and known aircraft. **In the event an unplanned early termination of flight occurs or balloon failure, contact ZDV TMU immediately and advise**.

i. **When operations have terminated:**

1. Advise ZDV TMU at 303-651-4252 when the balloon has landed.

2. Call Leidos Flight Service at 877-487-6867 and ask to cancel the NOTAM.

3. Provide the following information to each facility upon **initial** notification:

a. Provide/verify/confirm launch location.

b. Time of launch and duration of activity.

c. Ascent rate, direction, speed, altitude of operation, package separation information, and estimated impact location.

d. ADS-B squawk code **4453** and ID (i.e., N991SS or N992SS).

e. Means of establishing contact with launch site (cellular or satellite phone number).

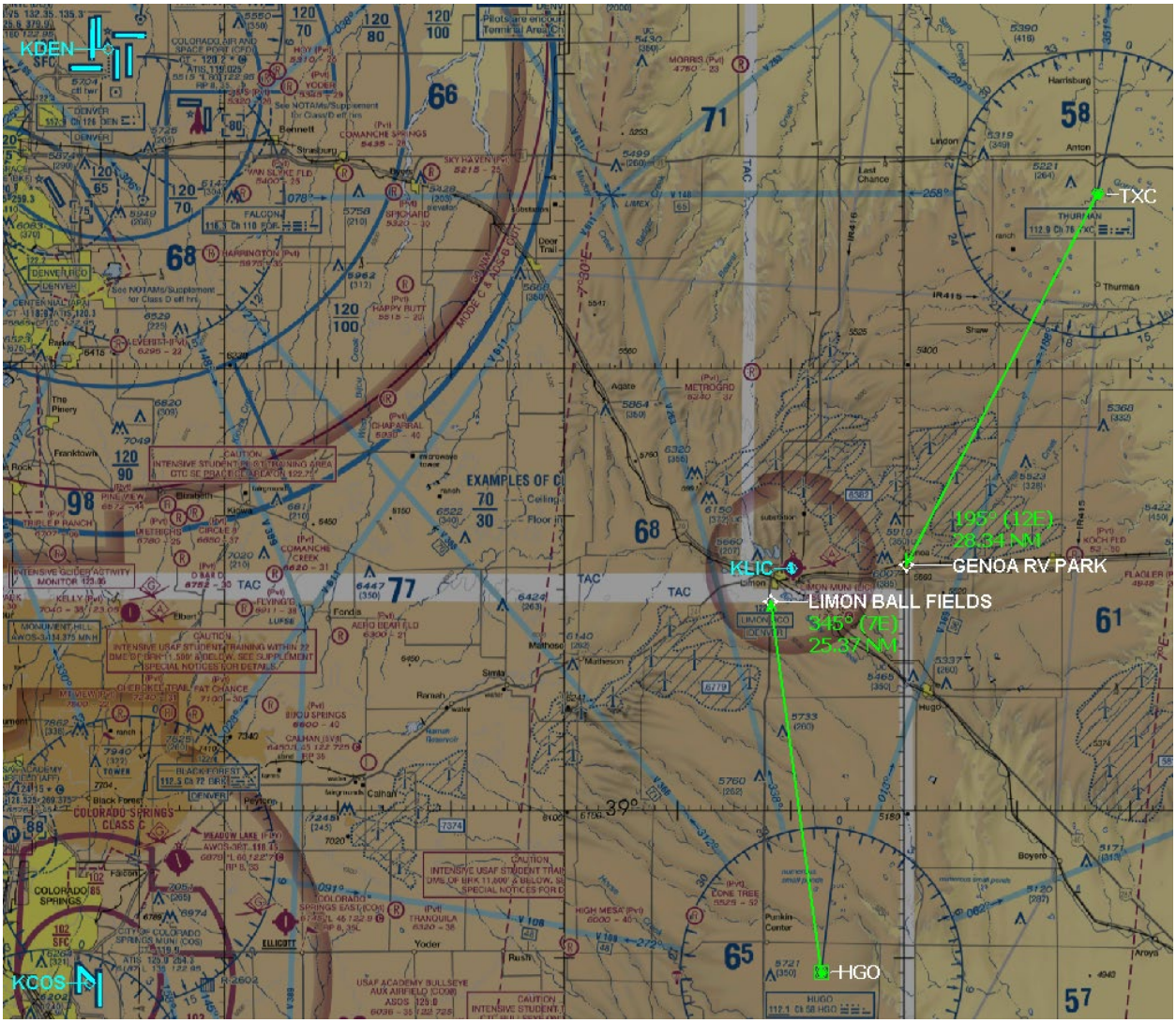
f. Capability to advise the FAA when all launched objects have returned to earth.

4. Safety spotters must scan the airspace within five (5) miles of the launch site to ascertain the area is clear of aircraft and will remain clear of aircraft during balloon package launch operation.

5. All operations will be conducted in accordance with the holder's safety rules and codes.

6. The holder must be responsible for safeguarding persons and property on the ground and must ensure all persons connected with the operation are familiar with the waiver and the above special provisions.

7. The following map/image and table on the next page depicts launch sites applicable to this certificate:



Launch Site Name	LAT/LONG	FRD
Limon Ball Fields	39° 14’ 12.0” N, 103° 41’ 46.2” W	HGO345025
Genoa RV Park	39° 16’ 42.8” N, 103° 29’ 44.0” W	TXC200028

No certificate may be issued unless a completed application form has been received (14 C.F.R. 91. 101. and 105).

US Department of Transportation
Federal Aviation Administration

APPLICATION FOR CERTIFICATE OF WAIVER

Form Approved: O.M.B. No. 2120-0027

APPLICANTS - DO NOT USE THESE SPACES

Region	Date

Action
□ Approved □ Disapproved – *"Explain under "Remarks"*

Signature of authorized FAA representative

INSTRUCTIONS

Submit this application in triplicate (3) to any FAA Flight Standards district office.

Applicants requesting a Certificate of Waiver or Authorization for an aviation event must complete all the applicable items on this form and attach a properly marked 7.5 series Topographic Quadrangle Map(s), published by the U.S. Geological Survey (scale 1:24,000), of the proposed operating area. The map(s) must include scale depictions of the flightlines, showlines, race courses, and the location of the air event control point, Police dispatch, ambulance, and fire fighting equipment. The applicant may also wish to submit photographs and scale diagrams as supplemental material to assist in the FANS evaluation of a particular site. Application for a Certificate of Waiver or Authorization must be submit- ted 45 days prior to the requested date of the event.

Applicants requesting a Certificate of Waiver or Authorization for activities other than an aviation event will complete items 1 through 8 only and the certification, item 15, on the reverse.

1. Name of organization	2. Name of responsible person
Edge of Space Sciences, Inc. (EOSS)	Russell B. Chadwick, FAA Coordinator

3. Permanent mailing address	House number and street or route number	City	State and ZIP code	Telephone No.
	4371 North 63rd Street	Boulder	CO 80301	303-530-0228

4. FAR section and number to be waived

14 CFR Part 101.35(a)(3) Equipment & marking requirements; See Supplement attached

5. Detailed description of proposed operation *(Attach supplement if needed)*

This request covers unmanned free balloon flights over the Box 7 period from the indicated Box 6 launch sites or other site as coordinated with the FAA. The purpose of these flights is to verify EOSS equipment is suitable for high-altitude flight and/or to carry University of Colorado or Metro State University student-built payloads, NOAA payloads, or other scientific/educational payloads into the stratosphere for educational or research purposes. The flights are to occur during daylight hours only, launching after local sunrise and landing before local sunset.

6. Area of operation *(Location, altitudes, etc.)*

See attached supplemental information for a map of proposed launch sites. The attached table gives the location for each proposed launch site. Also, any other launch site locations as coordinated with FAA Denver Center and TRACON.

7a. Beginning *(Date and hour)*	b. Ending *(Date and hour)*
15 FEB 2024, 0000 Z	31 DEC 2025, 2300Z

8. Aircraft make and model (a)	Pilot's Name (b)	Certificate number and rating (c)	Home address (Street, City, State) (d)
N/A			

ITEMS 9 THROUGH 14 TO BE FILLED OUT FOR AIR SHOW/AIR RACE WAIVER REQUESTS ONLY.

9. The air event will be sponsored by:

N/A

10. Permanent mailing address	House number and street or route number	City	State and ZIP code	Telephone No.

11. Policing *(Describe provisions to be made for policing the event.)*

12. Emergency facilities *(Mark all that will be available at time and place of air event.)*

□ Physician □ Fire truck □ Other - Specify _____

□ Ambulance □ Crash wagon _____

13. Air Traffic control *(Describe method of controlling traffic, including provision for arrival and departure of scheduled aircraft.)*

14. Schedule of Events *(include arrival and departure of scheduled aircraft and other periods the airport maybe open.)*

Hour (a)	Date (b)	Event (c)

If sufficient space is not available, the entire schedule of events may be submitted on separate sheets, in the order and manner indicated above.

Please Read — The undersigned applicant accepts full responsibility for the strict observance of the terms of the Certificate of Waiver or Authorization, and understands that the authorization contained in such certificate will be strictly limited to the above described operation.

15. Certification - I CERTIFY that the foregoing statements are true.

Date	Signature of Applicant
06 NOV 2023	Russell B. Chadwick

Remarks

EOSS will file a FAR 101.37 HiBal Prelaunch Notice one week prior to each planned launch with the following FAA facilities:

Denver ARTCC: A&P, TMU
Denver TRACON, designated POC

FSS NOTAM will be confirmed 24 hours prior to launch. Telephone communications with ARTCC and TRACON will be verified 1 hour prior to launch. Forecast trajectory information will be available to ARTCC and TRACON Operations prior to launch. Launch, enroute position reports and end-of-flight reports will be called in per controller request and will be available in real-time on the internet (www.wxqa.com/cgi-bin/balon1.cgi) and/or (www.eoss.org/cgi-bin/balon1.cgi). NOTAM will be cancelled with FSS at end-of-flight.

Form 7711-2 Supplemental Information

Box 4 & 5:

On suitable launch dates in 2024 & 2025, one to four 1000 to 3000 gram latex balloons may each carry a flight string of up to 28 lb. of EOSS, Colorado Space Grant/CU, MSU educational/scientific, NOAA and/or other payload packages to an altitude of 65k to 115k feet MSL. The flight string and attached payloads will then descend via parachute back to the surface where the equipment will be recovered. The payloads and parachute may be separated from the balloon by radio command at any time if required for flight safety.

The flight string will be equipped with GPS location telemetry beacons to support FAA position and altitude reports throughout the flight. These reports will be echoed every minute or less to an Internet web site where they will appear as VOR radial and range and MSL altitude. EOSS provided VHF RDF triangulation and barometric or dead-reckoned altitude will back-up the GPS location reporting. If necessary, internet reports will be backed-up by telephoned reports from the EOSS Ground Station at the launch site. Since the latex balloon envelope will accompany the flight string in ascent and will disintegrate on burst above FL600, radar reflective devices are not deemed necessary to flight safety. Some of the flight strings may carry ADS-B units and FAA will be informed when this is the case. So far in 2023, EOSS has conducted 15 balloon flights and 13 of them have carried an ADS-B unit. These are commercial units that have been repackaged by EOSS for use on a balloon flight string. The ADS-B units have performed as expected.

Meteorological conditions over eastern CO are difficult to forecast and may change rapidly over the course of a balloon flight. Therefore, it is not possible to ensure VFR conditions over the entire flight prior to committing to a launch. EOSS's GPS position reports have proven satisfactory for FAA flight advisories.

Box 6:

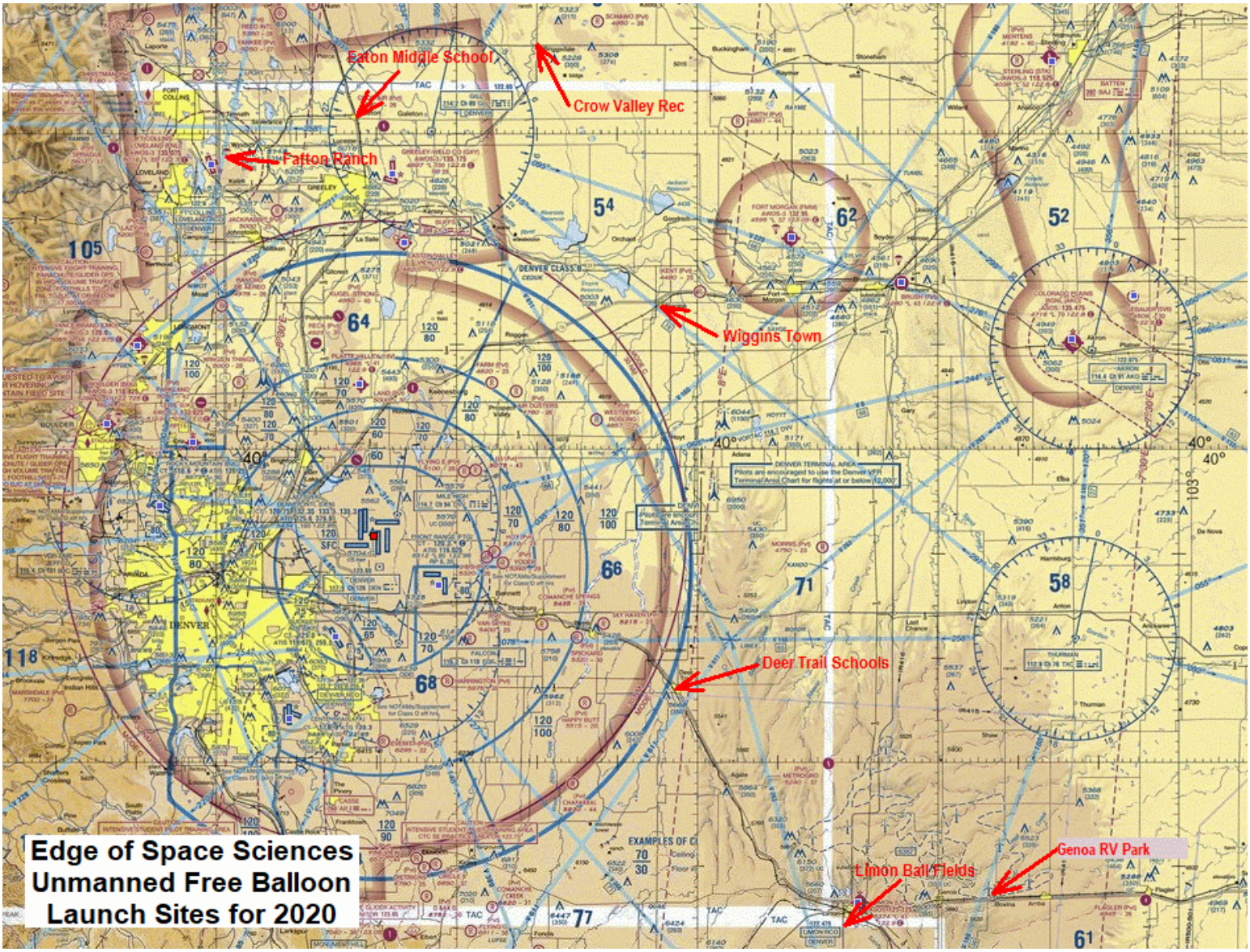
Ascent rate is expected to be approximately 1100 fpm which results in an 86 minute time from launch to burst at 100,000 feet. The flight trajectory from launch to recovery is dependent upon winds aloft, but will generally be east of the launch site. Descent rate varies directly with pressure altitude; descent time is expected to be approximately 45 minutes. Under normal conditions, flight times will be less than 2.3 hours.

The choice of launch site is based on forecast trajectory to a safe landing site, local facilities, avoidance of DEN Class B Airspace, and reliable radio communications with the tracking and recovery team. The selected launch site will be specified in the HIBAL Pre-launch Notice for each launch date.

The proposed launch site locations are shown in the map below and the site name, location (in degrees magnetic and nautical miles) relative to VOR and latitude and longitude (in deg min sec format) are given in this table:

Table of Proposed EOSS Balloon Launch Sites in Colorado for this application

Launch Site Name	VOR Referenced Location	Latitude (dms)	Longitude (dms)
Fatton Ranch	GLL256019	40° 28' 25.2" N	104° 57' 45.0" W
Deer Trail Schools	FQF092027	39° 36' 37.8" N	104° 02' 29.4" W
Eaton Middle School	GLL272008	40° 31' 36.0" N	104° 43' 24.6" W
Wiggins Town	GLL119027	40° 13' 42.1" N	104° 04' 28.2" W
Crow Valley Rec	GLL041013	40° 38' 45.0" N	104° 20' 25.2" W



Map showing seven EOSS launch sites in Colorado for 2020 & 2021 and the same launch sites will be used in 2024 & 2025. The five northernmost launch sites relate to this application. The other two launch sites are listed on a related, but separate application.

Box 7:

This Waiver Request is for up to sixteen flight days in each of 2024 & 2025. In the interest of paperwork mitigation, it was deemed appropriate to include all of these very similar flights in a single waiver request. Each balloon flight will be covered by a HIBAL Prelaunch Notice filed and revised as appropriate for each flight date. Also, a NOTAM will be filed as appropriate for each flight date.

Commitment to launch is contingent upon many largely uncontrollable variables, including suitable weather conditions at the launch site, forecast landings in unpopulated areas and flight-ready payloads. Thus, launch dates may be delayed one day on short notice until all criteria are met. In the unlikely event that conditions are unsuitable for both days of a weekend, then affected flights may be postponed to a later date; revised HIBAL Prelaunch Notices and NOTAMs will be filed in such events.