DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO
Public Agency – University of Colorado, Boulder Part 91

ADDRESS
University of Colorado, Boulder
3775 Discovery Drive
Boulder, CO 80309

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any 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
Operation of the DRAK Unmanned Aircraft System (UAS) in Class E and G airspace, excluding all Class C, D, and surface E airspace, and restricted or prohibited special use airspace at or below 2500 feet AGL within the states of North Dakota and Minnesota, under the jurisdiction of Minot AFB (MIB) Radar Approach Control (RAPCON), Grand Forks AFB (RDR) RAPCON, Bismarck (BIS) Terminal Radar Approach Control (TRACON), Fargo (FAR) TRACON, and Minneapolis Air Route Traffic Control Center (ZMP ARTCC). See Special Provisions.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE
N/A

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative 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 A thru H, inclusive, are set forth on the reverse side hereof.

This certificate is effective from **December 25, 2020** to **December 24, 2022** and is subject t cancellation at any time upon notice by the Administrator or his/her authorized representative.

BY DIRECTION OF THE ADMINISTRATOR

VONNIE L GILES
Digitally signed by VONNIE L GILES
Date: 2020.12.23 08:57:45 -06'00'

FAA Central Service Area
(Region)

Vonnie L. Giles
(Signature)

Manager, Tactical Operations Team (AJV-C23)
(Title)

FAA Form 7711-1 (7-74)

Purpose: To prescribe UAS operating requirements in the National Airspace System (NAS) for the purpose of Public Aircraft Operations. The holder of this COA will be referred herein as the "Proponent".

Public Aircraft

1. A public aircraft operation is determined by statutes, 49 USC §40102(a) (41) and §40125.
2. All public aircraft flights conducted under a COA must comply with the terms of the statute.
3. All flights must be conducted per the declarations submitted in the application, and as specified in the following Special Provisions.
4. This COA provides an alternate means of complying with 14 CFR §91.113(b) for unmanned aircraft operations.
5. All operations will be conducted in compliance with Title 14 CFR §91 and the conditions of the authorization issued herein. If the operator cannot adhere to any of these requirements, a separate FAA Form 7711-2 waiver application may be required.

SPECIAL PROVISIONS

A. General.

1. All personnel connected with the UAS operation must read and comply with the contents of this authorization and its provisions.
2. A copy of the COA including the special limitations must be immediately available to all operational personnel at each operating location whenever UAS operations are conducted.
3. This authorization may be canceled at any time by the Administrator, the person authorized to grant the authorization, or the representative designated to monitor a specific operation. As a general rule, this authorization may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with the authorization is cause for cancellation. The proponent will receive a written notice of cancellation.
4. During the time this COA is approved and active, a site safety evaluation/visit may be accomplished to ensure COA compliance, assess any adverse impact on ATC or airspace, and ensure this COA is not burdensome or ineffective. Deviations, accidents/incidents/mishaps, complaints, etc., will prompt a COA review or site visit to address the issue. Refusal to allow a site safety evaluation/visit may result in cancellation of the COA. Note: This section does not pertain to agencies that have other existing agreements in place with the FAA.

5. Radiofrequency spectrum authorization is independent of the COA process and requires the proponent to obtain Federal Communications Commission (FCC) equipment certification (47 CFR Part 2, Subpart J and 47 CFR Part 87, Subpart D) and frequency licenses (47 CFR Part 87) in the Aeronautical Radionavigation, Aeronautical Mobile (Route), or Aeronautical Mobile Services, as appropriate, for the control link, ATC radios, transponders, detect and avoid systems, and navigation systems used to support this COA. For systems operating exclusively below 400 feet, and within visual line of sight, the control link equipment may be licensed under 47 CFR Part 15 (Radio Frequency Devices). Equipment licensed under 47 CFR Part 5 (Experimental) does not provide the protection necessary for NAS operations.

B. Operations.

1. Unless otherwise authorized as a special provision, a maximum of one unmanned aircraft will be controlled:
   a. From a single control station, and
   b. By one pilot at a time.
2. When necessary, transit of airways and routes must be conducted as expeditiously as possible. The unmanned aircraft should not plan to loiter on Victor airways, jet routes, Q and T routes, IR routes, or VR routes.
3. For flights operating on an IFR clearance, the PIC must ensure positional information in reference to established National Airspace System (NAS) fixes, NAVAIDs, and/or waypoints are provided to ATC. The use of latitude/longitude positions is not authorized, except oceanic flight operations.
4. Unless installed as part of a Detect and Avoid (DAA) system, the use of a Traffic Collision Avoidance System (TCAS) in Traffic Advisory (TA) or Traffic Advisory/Resolution Advisory (TA/RA) modes while operating an unmanned aircraft is prohibited.

C. Safety of Flight.

1. The operator or delegated representative is responsible for halting or canceling activity in the COA area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this authorization.
   a. Any crew member responsible for performing see-and-avoid requirements for the UA must have and maintain instantaneous communication with the PIC.
   b. Visual observers must be used at all times except in Class A airspace, active restricted areas, and warning areas designated for aviation activities or as authorized in the Special Provisions. Observers may either be ground-based or airborne in a chase plane.
      (1) Visual Observers:
         (a) Must be able to communicate clearly to the pilot any instructions required to remain clear of conflicting traffic, using standard phraseology as listed in the Aeronautical Information Manual when practical.

(b) The PIC is responsible to ensure visual observers are able to see the aircraft and the surrounding airspace throughout the entire flight, and

(c) The PIC is responsible to ensure visual observers are able to provide the PIC with the UA's flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently to exercise effective control of the UA to:

- Comply with 14 CFR § 91.111, §91.113 and § 91.115, and
- Prevent the UA from creating a collision hazard, and
- Comply with all conditions of this COA.

D. Notice to Airmen (NOTAM).

1. A Distant (D) NOTAM must be issued prior to conducting UAS operations not more than 72 hours in advance, but not less than 24 hours for UAS operations prior to the operation for routine operations unless operations are contained within Class A airspace, active restricted or warning areas that are designated on the appropriate aeronautical chart or airport directory. This requirement may be accomplished:
   a. Through the operator's local base operations or (D) NOTAM issuing authority, or
   b. By contacting the NOTAM Flight Service Station at 1-877-4-US-NTMS (1-877-487- 6867). The issuing agency will require:
      (1) Name and contact information of the pilot filing the NOTAM request
      (2) Location, altitude, or operating area
      (3) Time and nature of the activity.
2. The area of operation defined in the (D) NOTAM must only be for the actual area to be flown for each day defined by a point and the minimum radius required to conduct the operation.
3. Operator must cancel (D) NOTAMs when UAS operations are completed or will not be conducted.
4. <u>For first responders only.</u> Due to the immediacy of some emergency management operations, the (D) NOTAM notification requirement may be issued as soon as practical before flight and if the issuance of a (D) NOTAM may endanger the safety of persons on the ground, it may be excluded. If the (D) NOTAM is not issued, the proponent must be prepared to provide justification to the FAA upon request.

E. Reporting Requirements.

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates.
2. The Proponent must submit the number of flights on a monthly basis through the COA Application Processing System (CAPS).

F. Special Use Airspace.

1. Coordination and de-confliction between Military Training Routes (MTR) and Special Use Airspace (SUA) is the operator's responsibility. When identifying an operational area the operator must evaluate whether an MTR or SUA will be affected. In the event the UAS operational area overlaps an MTR or SUA, the operator will contact the scheduling agency as soon as practicable in advance to coordinate and de-conflict. Approval from the scheduling agency is required for regulatory SUA, but not for MTR's and non-regulatory SUA. If no response to coordination efforts, the operator must exercise extreme caution and remain vigilant of all MTRs and/ or non-regulatory SUAs.
2. Scheduling agencies for MTRs are listed in the Area Planning AP/1B Military Planning Routes North and South America. If unable to gain access to AP/1B contact the FAA at email address mail to: 9-AJV-115-UASOrganization@faa.gov with the IR/VR routes affected and the FAA will provide the scheduling agency information. Scheduling agencies for SUAs are listed in the FAA JO 7400.10.

G. Air Traffic Control Requirements.

1. Coordination Requirements.
   a. Contact Phone Numbers: (for Lost Link Emergency/Contingency Procedures)
      - MIB RAPCON: 605-385-6198
      - RDR RAPCON: 701-747-6544 (ATCT 701-747-3815)
      - BIS TRACON: 701-223-8790
      - FAR TRACON: 701-235-8894
      - ZMP ARTCC: 651-463-5580

   b. Proponent filing and the issuance of a NOTAM prior to commencing UAS operations will serve as advance notification to ATC about UAS operations.

   c. Proponent must include direct, real-time, telephone contact information and the name of the POC in the NOTAM.

   d. Proponent must file a NOTAM for the specific operating area at least one (1) hour in advance. No more than four NOTAMs will be active at one time within in the COA operations area without prior ARTCC approval.

      (1) The NOTAM must describe the location of the operations waypoint relative to a NAVAID, with a radius of 10 nautical miles, or less, from that waypoint.

      (2) Proponent must contact the appropriate ATC facility not later than one (1) hour prior to operating with information on intended operating area and applicable NOTAM number.

      (3) Proponent must ensure NOTAMs are cancelled in a timely manner after operation(s) are complete. This action will serve as notification to ATC of completion of operations.

   e. Minneapolis ARTCC - No notification prior to each flight required. The 1-hour prior to flight NOTAM is sufficient for notification.

2. Communication Requirements.
   a. The PIC must monitor ATC radio frequency if assigned.
   b. The PIC should monitor the appropriate UNICOM/CTAF frequency when flying within 5 nautical miles of an airport with a closed tower or non-towered airport, helipad or water landing area.
3. Flight Planning Requirements.
   a. The operator is responsible for ensuring that the proposed operating area does not enter a UAS flight restricted areas as described under CFR 14 Part 99.7, Temporary Flight Restriction (TFR), Special Security Instruction (SSI). Location and contact information for the TFR SSI is depicted on the FAA website: https://udds-faa.opendata.arcgis.com. Proponent *must request permission* and receive authorization via contacts listed on the website prior to operating within a TFR SSI.
   b. It is the operator's responsibility for obtaining authorization from the appropriate authority for any operations that that may result in launching and/or landing from lands or waters administered by a Federal, State or Public agency (e.g., National Parks, State Parks, Wilderness Area, and Wildlife Refuge, etc.).
4. Procedural Requirements.
   a. ATC may require a reduction of the operating altitude during operation.
   b. ATC may delay, limit, prohibit or terminate operation when the safety of manned aircraft operations is a concern.
   c. UAS operation(s) must be contained within the area depicted in Attachment 1.
   d. Operations (including lost link procedures) must not be conducted over populated areas, heavily trafficked roads, or open-air assemblies of people.
   e. UAS Operations shall not loiter on Victor airways, Jet Routes, Q Routes, IR Routes, or VR Routes. When necessary, transit of airways and routes shall be conducted as expeditiously as possible.
   f. It is unlawful to take photos and/or video of military assets. The proponent must be familiar with and comply with 18 U.S. Code § 795 – "Photographing and sketching defense installations".

H. Lost Link Emergency/Contingency Procedures.

1. Lost Link Procedures: ATC does not need to be notified provided the UA returns to a pre-determined location within the authorized operating area and lands.
2. Loss of Sight: If a VO loses sight of the UA, the PIC must be notified immediately. If the UA is visually reacquired promptly, the mission may continue. If not, the PIC must immediately terminate the operation and the UA must return to land at home point.
3. Loss of Communication between the PIC and VO: The PIC must execute lost link procedures. If communications are reestablished, the mission may resume. If communication cannot be promptly re-established, the flight must be terminated and the UA must return to land at home point.

4. Emergency fly-away procedure: In the event of a fly-away toward an area or airport where the PIC has determined the UA may create a hazard to aviation, the PIC must immediately notify the appropriate ATC facility. The PIC must provide the following information:
    a. Approximate location
    b. Direction of flight
    c. Last known altitude
    d. Maximum remaining flight time

AUTHORIZATION

This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations not specifically stated, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the proponent to resolve the matter. This COA does not authorize flight within Temporary Flight Restrictions, Special Flight Rule Areas, regulatory Special Use Airspace or the Washington DC Federal Restricted Zone (FRZ) without pre-approval. The proponent is hereby authorized to operate the Unmanned Aircraft System in the NAS within the areas defined in the Operations Authorized section of the cover page.

Attachment 1

Operations Area: Class G/E Airspace (excluding Surface E) within a polygon defined by the following coordinates and as depicted below:

46° 25' 15.6" N 103° 7' 55.2" W	49° 00' 00.0" N 103° 9' 32.4" W
49° 00' 00.0" N 96° 59' 20.4" W	46° 18' 50.4" N 96° 14' 42.0" W

Operating Altitude: At or below 2500 feet AGL

