

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
**CERTIFICATE OF WAIVER**

ISSUED TO

**BNSF Railway**  
**Responsible Person: Michael Lemonie**  
**Waiver Number: 107W-2021-01756**

ADDRESS—

**2400 Western Center Blvd**  
**Fort Worth, TX 76131**

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 provisions contained in this certificate.

OPERATIONS AUTHORIZED

Small unmanned aircraft system (sUAS) operations beyond the visual line of sight of the remote pilot in command (PIC) in lieu of visual line of sight (VLOS)

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

**14 CFR § 107.31—Visual line of sight aircraft operation,**

**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 33, inclusive, are set forth on the attached pages.

This Certificate of Waiver is effective from June 7, 2021, to June 30, 2023, and is subject to cancellation at any time upon notice by the Administrator or an authorized representative.

**BY DIRECTION OF THE ADMINISTRATOR**

**General Aviation and Commercial Division, AFS-800**

## SPECIAL PROVISIONS ISSUED TO BNSF Railway

### General.

Although you submitted your request to operate beyond visual line of sight as a petition for exemption under 14 CFR part 11, you will operate a small unmanned aircraft system (sUAS), as defined at 14 CFR § 107.3.<sup>1</sup> Given the provision codified at 14 CFR § 91.1(f), the FAA's Flight Standards Service asked you to instead apply for a Waiver, in accordance with the requirements of 14 CFR § 107.200. The Administrator finds that the proposed sUAS operation can be conducted safely under the provisions of this Certificate of Waiver (Waiver) as listed below because you have established adequate mitigations for risks involved with operating your sUAS in the manner you described. Adherence to the provisions of this waiver establishes the required level of safety within the national airspace system.

This Waiver may be canceled at any time by the Administrator, the person authorized to grant the Waiver, or a representative designated to monitor a specific operation. As a general rule, this Waiver 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 any provision listed below is a violation of the terms of this Waiver and may serve as justification for cancellation.

List of Regulations Waived by Section and Title. The following regulations are waived:

14 CFR § 107.31, Visual line of sight aircraft operation, is waived to allow operation of the small unmanned aircraft (sUA) beyond the direct visual line of sight of the remote pilot in command (PIC) and any visual observer (VO) who is participating in the operation.

No part of this waiver will function as an airspace authorization under 14 CFR § 107.41. The FAA's Air Traffic Organization responds directly to requests for such authorizations.

**Common Special Provisions.** The Responsible Person is directly responsible for safety of operations conducted under this Waiver and will ensure the Remote Pilot in Command (remote PIC), manipulator of the controls, and visual observer(s) (VO)<sup>2</sup> comply with all provisions of this Waiver.

1. The Responsible Person listed on the Waiver is responsible to the FAA for the safe conduct of the operations. Prior to conducting operations that are the subject of this Waiver, the responsible person:
  - a. Must ensure the remote PIC, manipulators of the controls, and VO(s) are informed of the terms and provisions of this Waiver and strictly observe the terms and provisions herein;
  - b. Must ensure the remote PIC, manipulators of the controls, and VO(s) are informed and familiar with part 107 regulations; and
  - c. Evidence of the above (a and b) must be documented and must be presented for inspection upon request from the Administrator or an authorized representative;
2. This Waiver may not be combined with any other waiver(s), authorization(s), or exemption(s) without specific authorization from the FAA;

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<sup>1</sup> The petition for exemption (hereinafter, "request") is available on regulations.gov at Docket No. FAA-2020-0620.

<sup>2</sup> Title 14 CFR § 107.3 defines the term "visual observer." Any VO participating in operations conducted under this Waiver must meet the requirements listed in § 107.33 throughout the duration of flight operations.

3. The FAA has the authority to cancel or delay any or all flight operations if the safety of persons or property on the ground or in the air are in jeopardy or there is a violation of the terms of this Waiver;
4. A copy of this Waiver must be accessible and available to the remote PIC at the ground control station during sUA operations that are the subject of this Waiver;
5. The Responsible Person listed on this Waiver must maintain a current list of pilots by name and remote pilot certificate number used in operations under this Waiver. This list must be presented for inspection upon request from the Administrator or an authorized representative;
6. The Responsible Person listed on this Waiver must maintain a current list of sUA by registration number(s) used in operations under this Waiver. This list must be presented for inspection upon request from the Administrator or an authorized representative;
7. For the purposes of this Waiver, direct participants are the remote PICs, persons manipulating the controls, VOs, and any persons whose involvement is necessary for safety of the sUA operation. All other persons are considered non-participants;

**Waiver Specific Special Provisions.** sUAS operations beyond the visual line of sight (BVLOS) of the remote PIC may be conducted under this waiver when the operation complies with the following provisions:

#### **OPERATIONAL PROVISIONS**

8. The remote PIC must ensure all BVLOS aircraft operations only occur within the coverage areas of the ground based detection unit coverage, minus any buffer distance necessary to provide space for the safe-state avoidance maneuver to be completed to remain well-clear of any other aircraft, as described in the waiver application;
9. The remote PIC must be located at the same operational location as the sUAS for operations under this waiver, unless sUAS operations occur in combination with the associated grant of exemption;
10. The remote PIC must ensure all hangar boxes are equipped with a weather station that displays all information necessary for the pilot to comply with the weather requirements as described in the applicants General Operations Manual (GOM);
11. The Responsible Person must ensure all operations conducted under this Waiver follow the procedures and parameters outlined in the waiver application and GOM provided by the applicant. If a discrepancy exists between the provisions in this Waiver and the procedures and parameters outlined in the waiver application or GOM, the provisions of this Waiver take precedence and must be followed;

12. The Responsible Person listed on this Waiver must ensure each remote PIC who will conduct operations under this Waiver is trained in a manner that addresses the items listed in § 107.49(a)-(e) and in a manner that is consistent with how the sUAS will be operated under this Waiver. All training and demonstration for all remote PICs and VOs must be documented and made available upon request by the Administrator or an authorized representative. Training operations may only be conducted under the standard requirements of part 107 (without waiver). The training must include:
  - a. sUA limitations,
  - b. sUA programming,
  - c. sUA operational procedures,
  - d. Abnormal procedures,
  - e. Air traffic avoidance procedures,
  - f. Crew Resource Management,
  - g. sUA flight training, and
  - h. Demonstration of sUA ground and flight skills;
13. Prior to operations under this Waiver, all direct participants must attend a safety briefing that addresses at minimum, the following items:
  - a. Designated positions, physical locations, responsibilities, and Crew Resource Management,
  - b. Planned flight operating area,
  - c. Designated launch and recovery areas,
  - d. Verification of geo-fence boundaries,
  - e. Verification of return home and land flight profile, and course,
  - f. Verification of emergency landing site(s), land profile, and course,
  - g. Procedures for avoidance of other aircraft,
  - h. Procedures for operating under this Waiver;
14. Operations subject to this waiver must cease if, at any time:
  - a. Safety of human beings or property on the ground or in the air is in jeopardy,
  - b. Any failure to comply with the provisions of this Waiver exists,
  - c. Full-duplex communications cannot be maintained between the remote PIC and any VO participating in the operation,
  - d. sUA control link is lost,
  - e. A non-participating aircraft enters the designated flight operating area,
  - f. GPS signal is lost, or
  - g. sUA GPS location information is degraded;
15. No sUA flight that occurs under this waiver may carry the property of another for compensation or hire;
16. Not less than 24 hours prior to conducting operations that are the subject of this Waiver, a Notice to Airmen (NOTAM) must be filed. The NOTAM must include location, altitude, and/or operating area, time and nature of the activity;
17. The Responsible Person must establish and maintain a Safety Management System (SMS) appropriate for the size, scope, and complexity of operations that occur under this Waiver. Guidance on establishing and maintaining an SMS is available in FAA Advisory Circular 120-92B (or current revision). This program must be made available upon request by the Administrator;

18. The Responsible Person shall keep at its principal business office or at other places approved by the Administrator, and email the Administrator at 9-afs-820-Part107Reports@faa.gov monthly, the information listed below. The Responsible Person must retain all such records for a period of 90 days after the expiration date of the Waiver.
- a. For each sUAS flight operation conducted under the terms of this waiver:
    - i. Date and location of operation
    - ii. Registration number of the sUA,
    - iii. Make and model of the sUA,
    - iv. Name and certificate number of the remote PIC,
    - v. Location of the remote PIC during the sUA flight, and
    - vi. Duration of the sUA operation;
  
  - b. For each sUAS flight conducted under this Waiver that includes any equipment degradation, malfunction, or failure, the Responsible Person must make a record of the degradation, malfunction, or failure by recording the date, time, and a description of the degradation, malfunction or failure and email the Administrator at 9-afs-820-Part107Reports@faa.gov monthly. sUAS equipment degradations, malfunctions, or failures include, but are not limited to, the following:
    - i. Onboard flight control system,
    - ii. Any portion of the navigation system to include GPS functionality,
    - iii. Power plant malfunction or failure,
    - iv. Battery malfunction or failure,
    - v. Electrical power system malfunction,
    - vi. Control station malfunction or failure,
    - vii. Detect system failure, malfunction or failure to detect, and
    - viii. Loss of control link within the sUAS;

## TECHNICAL PROVISIONS

19. Operations conducted under this Waiver may only occur with the make and model sUAS described in the waiver application. Proposed operations of any other manufacturer, make or model of sUAS will require a new waiver application or a request to amend this Waiver;
20. All sUAS operations conducted in accordance with this Waiver must comply with all manufacturer recommendations and limitations for the sUAS, including all recommendations and limitation of the detect system described in the waiver application;
21. The Responsible Person must maintain each sUAS and its components in accordance with manufacturer's instructions and recommendations. sUAS maintenance includes scheduled and unscheduled overhaul, repair, inspection, modification, replacement, and system software upgrades of the sUAS and its components necessary for flight. A log of all maintenance performed must be kept for each aircraft operated under this waiver. This log must be available to the remote PIC for review prior to conducting operations that are the subject of this waiver. Each sUAS maintenance log must be presented to the Administrator when requested. The log must contain the following information for each maintenance activity:
- a. A description (or reference data acceptable to the Administrator) of work performed,
  - b. The date of completion of the work performed,
  - c. The name of the person who performed the work, and
  - d. The signature of the person who performed the work;

22. Any sUAS that has undergone maintenance must undergo a functional test flight prior to conducting operations under this Waiver. A log entry must be made for each functional test flight. The log entry must contain at minimum the:
  - a. Calendar date,
  - b. sUA registration number,
  - c. Remote PIC who performed the functional test flight,
  - d. Duration of the flight, and
  - e. The result of the functional flight test;
23. A functional test flight may only be conducted under the standard requirements of part 107 (without waiver);
24. The sUA must be equipped with high visibility markings and lighting to increase the conspicuity of the sUA;
25. As described in the waiver application, sUAS ground control station must display in real time the following information: sUA altitude, sUA position, sUA direction of flight, and sUAS flight mode. This information must be available at all times to the remote PIC;
26. The sUAS must visually alert the remote PIC of degraded system performance, sUAS malfunction, or loss of Command and Control (C2) link between the ground control station and the sUA;
27. Launch or recovery areas must be pre-designated and monitored to keep any human being who is not directly participating in the operation out of the areas prior to, during, and immediately following flight operations;
28. Prior to conducting operations under this Waiver, the remote PIC must determine all control links used in the sUAS, will maintain the ability to control the sUA at the maximum planned distance for the proposed operation. At all times during operations that are the subject of this Waiver, the remote PIC must maintain the ability to direct the sUA to ensure compliance with the applicable provisions of this chapter;
29. If the remote PIC loses command or control link with the sUA, the sUA must follow a predetermined route to immediately reestablish command and control link. If command and control link is not immediately reestablished and the remote PIC no longer has the ability to direct the sUAS to ensure compliance with applicable provisions of part 107, the sUA may not continue flight;
30. ADS-B out (1090/978 MHz) may not be transmitted from the sUAS when operating pursuant to this Waiver;
31. All emitters used in sUAS must be in compliance with all applicable FCC regulations and all provisions of the FCC authorization granted for the emitter. A FCC experimental authorization may not be used for sUAS operations under this Waiver;

## **ENVIRONMENTAL PROVISIONS**

32. sUA operations must occur further than 3 nautical miles from the airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or further than 3 nautical miles of airports not denoted with an ARP, and further than the center of the airport symbol as denoted on the current FAA published aeronautical chart 3 nautical miles. or within 3 nautical miles of the approach or departure end of a usable runway at an airport published on an FAA aeronautical chart; and
33. Operations conducted under this Waiver are limited to the privately owned railways and railyards in sparsely populated areas and must not exceed 100 feet AGL.