U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

August 31, 2015

Exemption No. 12683
Regulatory Docket No. FAA−2015−2496

Mr. Lynn James French
dba FlytImagery
79970 Road 447
Broken Bow, NE 68822

Dear Mr. French:

This letter is to inform you that we have granted your request for exemption. It transmits our decision, explains its basis, and gives you the conditions and limitations of the exemption, including the date it ends.

By letter dated June 1, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of FlytImagery (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct precision agriculture, real estate surveillance, structural inspections, and aerial photography.

See Appendix A for the petition submitted to the FAA describing the proposed operations and the regulations that the petitioner seeks an exemption.

The FAA has determined that good cause exists for not publishing a summary of the petition in the Federal Register because the requested exemption would not set a precedent, and any delay in acting on this petition would be detrimental to the petitioner.

Airworthiness Certification

The UAS proposed by the petitioner are the AgEagle and DJI Phantom 3.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the

aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

You have requested to use a UAS for aerial data collection[1]. The FAA has issued grants of exemption in circumstances similar in all material respects to those presented in your petition. In Grants of Exemption Nos. 11062 to Astraeus Aerial (*see* Docket No. FAA−2014−0352), 11109 to Clayco, Inc. (*see* Docket No. FAA−2014−0507), 11112 to VDOS Global, LLC (*see* Docket No. FAA−2014−0382), and 11213 to Aeryon Labs, Inc. (*see* Docket No. FAA−2014−0642), the FAA found that the enhanced safety achieved using an unmanned aircraft (UA) with the specifications described by the petitioner and carrying no passengers or crew, rather than a manned aircraft of significantly greater proportions, carrying crew in addition to flammable fuel, gives the FAA good cause to find that the UAS operation enabled by this exemption is in the public interest.

Having reviewed your reasons for requesting an exemption, I find that—

- They are similar in all material respects to relief previously requested in Grant of Exemption Nos. 11062, 11109, 11112, and 11213;
- The reasons stated by the FAA for granting Exemption Nos. 11062, 11109, 11112, and 11213 also apply to the situation you present; and
- A grant of exemption is in the public interest.

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, FlytImagery is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

[1] Aerial data collection includes any remote sensing and measuring by an instrument(s) aboard the UA. Examples include imagery (photography, video, infrared, etc.), electronic measurement (precision surveying, RF analysis, etc.), chemical measurement (particulate measurement, etc.), or any other gathering of data by instruments aboard the UA.

Conditions and Limitations

In this grant of exemption, FlytImagery is hereafter referred to as the operator.

Failure to comply with any of the conditions and limitations of this grant of exemption will be grounds for the immediate suspension or rescission of this exemption.

1. Operations authorized by this grant of exemption are limited to the AgEagle and DJI Phantom 3 when weighing less than 55 pounds including payload. Proposed operations of any other aircraft will require a new petition or a petition to amend this exemption.

2. Operations for the purpose of closed-set motion picture and television filming are not permitted.

3. The UA may not be operated at a speed exceeding 87 knots (100 miles per hour). The exemption holder may use either groundspeed or calibrated airspeed to determine compliance with the 87 knot speed restriction. In no case will the UA be operated at airspeeds greater than the maximum UA operating airspeed recommended by the aircraft manufacturer.

4. The UA must be operated at an altitude of no more than 400 feet above ground level (AGL). Altitude must be reported in feet AGL.

5. The UA must be operated within visual line of sight (VLOS) of the PIC at all times. This requires the PIC to be able to use human vision unaided by any device other than corrective lenses, as specified on the PIC's FAA-issued airman medical certificate or U.S. driver's license.

6. All operations must utilize a visual observer (VO). The UA must be operated within the visual line of sight (VLOS) of the PIC and VO at all times. The VO may be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and PIC must be able to communicate verbally at all times; electronic messaging or texting is not permitted during flight operations. The PIC must be designated before the flight and cannot transfer his or her designation for the duration of the flight. The PIC must ensure that the VO can perform the duties required of the VO.

7. This exemption and all documents needed to operate the UAS and conduct its operations in accordance with the conditions and limitations stated in this grant of exemption, are hereinafter referred to as the operating documents. The operating documents must be accessible during UAS operations and made available to the Administrator upon request. If a discrepancy exists between the conditions and limitations in this exemption and the procedures outlined in the operating documents,

the conditions and limitations herein take precedence and must be followed. Otherwise, the operator must follow the procedures as outlined in its operating documents. The operator may update or revise its operating documents. It is the operator's responsibility to track such revisions and present updated and revised documents to the Administrator or any law enforcement official upon request. The operator must also present updated and revised documents if it petitions for extension or amendment to this grant of exemption. If the operator determines that any update or revision would affect the basis upon which the FAA granted this exemption, then the operator must petition for an amendment to its grant of exemption. The FAA's UAS Integration Office (AFS−80) may be contacted if questions arise regarding updates or revisions to the operating documents.

8. Any UAS that has undergone maintenance or alterations that affect the UAS operation or flight characteristics, e.g., replacement of a flight critical component, must undergo a functional test flight prior to conducting further operations under this exemption. Functional test flights may only be conducted by a PIC with a VO and must remain at least 500 feet from other people. The functional test flight must be conducted in such a manner so as to not pose an undue hazard to persons and property.

9. The operator is responsible for maintaining and inspecting the UAS to ensure that it is in a condition for safe operation.

10. Prior to each flight, the PIC must conduct a pre-flight inspection and determine the UAS is in a condition for safe flight. The pre-flight inspection must account for all potential discrepancies, e.g., inoperable components, items, or equipment. If the inspection reveals a condition that affects the safe operation of the UAS, the aircraft is prohibited from operating until the necessary maintenance has been performed and the UAS is found to be in a condition for safe flight.

11. The operator must follow the UAS manufacturer's maintenance, overhaul, replacement, inspection, and life limit requirements for the aircraft and aircraft components.

12. Each UAS operated under this exemption must comply with all manufacturer safety bulletins.

13. Under this grant of exemption, a PIC must hold either an airline transport, commercial, private, recreational, or sport pilot certificate. The PIC must also hold a current FAA airman medical certificate or a valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government. The PIC must also meet the flight review requirements specified in 14 CFR § 61.56 in an aircraft in which the PIC is rated on his or her pilot certificate.

14. The operator may not permit any PIC to operate unless the PIC demonstrates the ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency must be logged in a manner consistent with 14 CFR § 61.51(b). Flights for the purposes of training the operator's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the UAS in a manner consistent with how the UAS will be operated under this exemption are permitted under the terms of this exemption. However, training operations may only be conducted during dedicated training sessions. During training, proficiency, and experience-building flights, all persons not essential for flight operations are considered nonparticipants, and the PIC must operate the UA with appropriate distance from nonparticipants in accordance with 14 CFR § 91.119.

15. UAS operations may not be conducted during night, as defined in 14 CFR § 1.1. All operations must be conducted under visual meteorological conditions (VMC). Flights under special visual flight rules (SVFR) are not authorized.

16. The UA may not operate within 5 nautical miles of an airport reference point (ARP) as denoted in the current FAA Airport/Facility Directory (AFD) or for airports not denoted with an ARP, the center of the airport symbol as denoted on the current FAA-published aeronautical chart, unless a letter of agreement with that airport's management is obtained or otherwise permitted by a COA issued to the exemption holder. The letter of agreement with the airport management must be made available to the Administrator or any law enforcement official upon request.

17. The UA may not be operated less than 500 feet below or less than 2,000 feet horizontally from a cloud or when visibility is less than 3 statute miles from the PIC.

18. If the UAS loses communications or loses its GPS signal, the UA must return to a pre-determined location within the private or controlled-access property.

19. The PIC must abort the flight in the event of unpredicted obstacles or emergencies.

20. The PIC is prohibited from beginning a flight unless (considering wind and forecast weather conditions) there is enough available power for the UA to conduct the intended operation and to operate after that for at least five minutes or with the reserve power recommended by the manufacturer if greater.

21. Air Traffic Organization (ATO) Certificate of Waiver or Authorization (COA). All operations shall be conducted in accordance with an ATO-issued COA. The exemption holder may apply for a new or amended COA if it intends to conduct operations that cannot be conducted under the terms of the attached COA.

22. All aircraft operated in accordance with this exemption must be identified by serial number, registered in accordance with 14 CFR part 47, and have identification (N−Number) markings in accordance with 14 CFR part 45, Subpart C. Markings must be as large as practicable.

23. Documents used by the operator to ensure the safe operation and flight of the UAS and any documents required under 14 CFR §§ 91.9 and 91.203 must be available to the PIC at the Ground Control Station of the UAS any time the aircraft is operating. These documents must be made available to the Administrator or any law enforcement official upon request.

24. The UA must remain clear and give way to all manned aviation operations and activities at all times.

25. The UAS may not be operated by the PIC from any moving device or vehicle.

26. All Flight operations must be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures unless:
    a. Barriers or structures are present that sufficiently protect nonparticipating persons from the UA and/or debris in the event of an accident. The operator must ensure that nonparticipating persons remain under such protection. If a situation arises where nonparticipating persons leave such protection and are within 500 feet of the UA, flight operations must cease immediately in a manner ensuring the safety of nonparticipating persons; and
    b. The owner/controller of any vessels, vehicles or structures has granted permission for operating closer to those objects and the PIC has made a safety assessment of the risk of operating closer to those objects and determined that it does not present an undue hazard.

    The PIC, VO, operator trainees or essential persons are not considered nonparticipating persons under this exemption.

27. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative. Permission from property owner/controller or authorized representative will be obtained for each flight to be conducted.

28. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries of the operational area as defined by the applicable COA must be reported to the FAA's UAS Integration Office (AFS−80) within 24 hours. Accidents must be reported to the National Transportation Safety Board (NTSB) per instructions contained on the NTSB Web site: www.ntsb.gov.

If this exemption permits operations for the purpose of closed-set motion picture and television filming and production, the following additional conditions and limitations apply.

29. The operator must have a motion picture and television operations manual (MPTOM) as documented in this grant of exemption.

30. At least 3 days before aerial filming, the operator of the UAS affected by this exemption must submit a written Plan of Activities to the local Flight Standards District Office (FSDO) with jurisdiction over the area of proposed filming. The 3-day notification may be waived with the concurrence of the FSDO. The plan of activities must include at least the following:
    a. Dates and times for all flights;
    b. Name and phone number of the operator for the UAS aerial filming conducted under this grant of exemption;
    c. Name and phone number of the person responsible for the on-scene operation of the UAS;
    d. Make, model, and serial or N−Number of UAS to be used;
    e. Name and certificate number of UAS PICs involved in the aerial filming;
    f. A statement that the operator has obtained permission from property owners and/or local officials to conduct the filming production event; the list of those who gave permission must be made available to the inspector upon request;
    g. Signature of exemption holder or representative; and
    h. A description of the flight activity, including maps or diagrams of any area, city, town, county, and/or state over which filming will be conducted and the altitudes essential to accomplish the operation.

31. Flight operations may be conducted closer than 500 feet from participating persons consenting to be involved and necessary for the filming production, as specified in the exemption holder's MPTOM.

Unless otherwise specified in this grant of exemption, the UAS, the UAS PIC, and the UAS operations must comply with all applicable parts of 14 CFR including, but not limited to, parts 45, 47, 61, and 91.

This exemption terminates on September 30, 2017, unless sooner superseded or rescinded.

Sincerely,
/s/
John S. Duncan
Director, Flight Standards Service

Enclosures

Lynn James French
dba FlytImagery
79970 Road 447
Broken Bow, NE. 68822
308-872-5423

June 1, 2015

U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
West Building Ground Floor Room W12-140
Washington, DC 20590

Re: Exemption Request Under Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations

Dear Administrators,

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the "Reform Act") and 14 C.F.R. Part 11, Lynn James French dba FlytImagery, a private pilot, agriculture entrepreneur, and sUAS owner, hereby applies for an exemption from the Federal Aviation Regulations ("FARs") listed in section 2 to allow commercial operation of the small Unmanned Aircraft Systems (sUAS) listed below within the Continental United States (CONUS) so long as operations are conducted under the limitations outlined herein or as may be established by the FAA as required by section 333.

The requested exemptions would authorize commercial operations for precision agriculture, real estate surveillance, structural inspections, and aerial photography that could be performed more safely within the U.S. National air space than with the use of manned aircraft. The approval of this request will, in part, allow improved predictive indicators of crop stress to assist production design, predictive crop yields, overall water use reduction, pest control, nutritional input management, repair assessment of structural systems, and beneficial usage from general photography. Operations will be performed only on owned property or with the authorization and permission of other property owners or their authorized agents.

Given the small size, weight, speed, and limited operating area of the sUAS involved, and the remote and restricted environment within which they will operate, approval of the application presents no national security issue. Due to the reduce environmental impact from several aspects and the strong level of safety surrounding the proposed operations associated with allowing sUAS for commercial operations, it can be assured that granting these requested exemptions is in the public interest (see section 4 below).

The limitations outlined in this request, provide for at least an equivalent or even higher level of safety to operations under the current regulatory structure because the proposed operations represent a safety enhancement to employees, ground personnel, or pilot and crew operations that would otherwise be conducted with conventional aircraft, and because of the very high level of safety standards outlined in the operating conditions below (see section 5 below).

Therefore, the applicant respectfully requests that FAA grant the requested exemption without delay.

Table of Contents

Operating Conditions:

Grant of the exemption would be subject to the following operating conditions and operated in the rural central Nebraska area in accordance with conditions set forth by the Academy of Model Aeronautics and by a Pilot In Command (PIC) who:

- Maintains a minimum Private Pilot certificate operating the sUAS with the knowledge of regulations as they pertain to safety and airspace restrictions afforded by this privilege.
- Has a valid driver's license.
- Completed the manufacturer provided training program.
- Maintains visual line of sight of the aircraft throughout its operation by unaided human vision other than corrective lenses as specified on the FAA airmen medical certificate.
- Ensures the flight would be discontinued if a hazard to other aircraft, people, or property existed.
- Assesses weather conditions, airspace restrictions, and location of people to lessen risks if accidental loss of control should occur. Potential landing areas in the event of an emergency would be identified.
- Ensures flight would not occur over people except those directly responsible for the flight.
- Ensures flights would be limited to 400 feet altitude.
- All flights will be operated during daytime VFR conditions.
- Ensures flights would remain out of airport flight paths and restricted airspace areas, and obey FAA Temporary Flight Restrictions (TFR's).
- Ensures no objects will be dropped from the sUAS.
- Performs pre-flight safety inspections according to the manufacturer including verification of communications links.

- Maintains the sUAS in optimal condition according to manufacturer recommendations and continual upkeep of wear or damaged components.
- Performs a functional flight test prior to conducting further operations under this exemption whenever critical flight components have been replaced that would affect the sUAS operation or flight characteristics. Flight tests would remain at least 500 feet from other persons and be conducted in such a manner so as not to impose an undue hazard to persons and property.
- Utilizes a Visual Observer (VO) in order to identify other aircraft and objects in the airspace during the flight so that the sUAS will be the first to maneuver away.
- Ensure operations conducted within five miles from an airport shall only be initiated when the following conditions are met:
    - Airport is not a medium or large airport.
    - Coordination with the airport authority, or air traffic control when a control tower is present.
    - Airport UNICOM frequency when applicable is monitored and flight intentions are communicated.
    - Flight maneuvers will be initiated to remain clear of traffic as visually observed or when communicated on the UNICOM frequency by the pilot or control tower.
- Will not operate the sUAS from any moving device or vehicle.
- The sUAS will be operated at speeds under 40 knots.
- The sUAS will not be operated in winds exceeding 25 knots and consistent with any manufacturer recommendations.
- Flight time will be limited in duration to ensure that no less than 10% battery power remains upon landing.
- Verifies that if the sUAS loses communications or loses its GPS signal, it can return to a pre- determined location and land within the private or controlled-access property.
- All operations shall comply with required permissions and permits established by territorial, state, county, or city jurisdictions; including local law enforcement, fire, or other appropriate governmental agencies.

sUAS Description:
The following sUAS aircraft are being requested for approval with this petition.

A) AgEagle:

Features of the AgEagle include:

- Time and flight proven design in Kansas and Nebraska environmental conditions.
- Silent and reliable battery powered electric fixed wing aircraft with a wingspan of approximately 56 inches.
- Take-off weight of approximately 7.5 pounds including payload.
- Failsafe controls for emergency landings.
- Automated low battery return.
- Laser provisions in the wing allow for automated feather soft landings.
- Automated preflight system performance checks and calibrations.
- A preflight checklist for the sUAS operator.
- Limited range governed by an approximate 40 minute operational time with fly-away failsafes.
- Load carrying capacity limited to a single sensor approximate to the size of a consumer

point-and-shoot camera
- A cruising speed of approximately 35 knots governed by software failsafes.
- Multiple failsafe measures inherent to the design of the system implemented to ensure safe flight, recovery and incident mitigation.

B) DJI Phantom 3:

Features of the DJI Phantom 3 include:
- Based on the highly successful consumer grade Phantom line of DJI quadcopters.
- Battery powered quad rotor unmanned aircraft and handheld ground control station.
- Maximum diameter of less than 24 inches.
- Take-off weight of approximately 2.8 pounds.
- It has fail safe modes of operation for either loss of RC or GPS signal.
- Automatic termination of flight and landing will be initiated when the battery reaches a predetermined low state.
- Limited range governed by the battery for an approximate 25 minute operational time.
- Load carrying capacity limited to a single sensor approximate to the size of a consumer point-and-shoot camera
- Maximum speed less than 32 knots.
- Internal inertial measuring unit (IMU) with integrated barometric sensor augmented with global positioning system (GPS) to maintain geospatial orientation and position.
- Telemetry information is transmitted back to a ground control station allowing the PIC to monitor battery level, GPS signal strength, altitude (AGL), distance from PIC.
- Altitude can be limited by the onboard flight controller and maximum altitude can be preprogrammed by the PIC.

1) Name and Address of Applicant is:

Lynn James French,
dba FlytImagery
79970 Road 447
Broken Bow, NE. 68822
Phone: 308-872-5423

2) Section of 14 CFR from which and exemption is being requested:

a. Exemption of the following sections of 14 CFR are be requested.

• 14 C.F.R. 21	Certification Procedures for Products and Parts
• 14 C.F.R. 61.113(a)	Private Pilot privileges and limitations
• 14 C.F.R. 91.7(a)	Civil Aircraft Airworthiness
• 14 C.F.R. 91.119(c)	Minimum safe altitudes
• 14 C.F.R. 91.121	Altimeter settings
• 14 C.F.R. 91.151(a)(1)	Fuel requirements for VFR flight
• 14 C.F.R. 91.405(a)	Maintenance Required
• 14 C.F.R. 91.407(a)(1)	Operation after Maintenance, Rebuilding, or Altercation.
• 14 C.F.R. 91.409(a)(1)&(2)	Inspections
• 14 C.F.R. 91.417(a)&(b)	Maintenance records

3) **The extent of relief being sought and the reason for the relief:**
    a. See Appendix A

4) **How this request would benefit the public as a whole:**
    a. Utilizing sUAS in the agricultural industry for precision surveys, real estate surveillance, structural inspections, and aerial photography, is in the public interest because it provides timely access to large amounts of survey data via environmentally friendly means. This enables growers to improve the productivity of the crop by more accurately identifying and correcting crop stress factors. In many cases, crop nutrients can be reduced in areas determined to already be healthy.
    Alternatives to utilizing sUAS technology erodes the competitiveness of the US food supply simply due to its reduced efficiency, increased cost, and lack of data precision. These alternatives might include satellite imagery which is less competitive and is not often available in the instantaneous time frames needed to detect and react to crop health issues. Manned aerial survey is another alternative which employs the use of full size aircraft. While the results can be similar, the process comes at a higher cost and a more time consuming process. This process is less able to operate safely close to the ground where higher resolution detail is needed. Additionally, the proposed sUAS operate off of stored electric energy, reducing the environmental impact from engine emissions and hazards associated with stored onboard fuel in the aircraft. A third alternative includes ground scouting analysis which involves personnel visually inspecting crops for health and yield. This process is very limited by the amount of area a person can cover on foot over a period of time – again reducing the value and increasing the cost of the results as compared to sUAS technology.

    In summary, approval of this exemption for commercial operations is in the best public interest by:

- Helping to keep the US food supply competitive through increased efficiency and reduced cost.
- Reduced environmental impact from the reduction in emissions that are traditionally created from manned flights performing the same task.
- Reduced environmental impact from the reduction of fertilizer requirements through precise identification of areas that may not require applications when compared to surrounding areas which do.
- Improved safety of the general public when compared to the hazards associated equivalent manned flights at low altitudes.

5) **Reasons why granting this exemption would not adversely affect safety and how the exemption would provide a level of safety at least equal to the existing rule.**
    a. The proposed operations outlined in this petition would not adversely affect safety and will provide a greater level of safety than the existing rule for the following key reasons:
        i. The sUAS would be operated by a certificated pilot with current medical who utilizes the knowledge of airspace regulations and flight safety to ensure the operation of sUAS is consistent with these requirements and the safety of fellow pilots of manned aircraft.
        ii. The operation of small battery powered sUAS, weighing less than ten pounds, flying at speeds less than 40 knots, and conducted in the strict conditions outlined in the Operating Conditions listed above, will provide a higher level of safety than existing rule utilizing manned aircraft and that of the currently proposed rules for small

unmanned aircraft systems. Conventional operations conducted with manned aircraft have elevated risks for the following reasons:

1. Operations are in large aircraft carrying large amounts of fuel and operating at extremely low altitudes while in close proximity to people, animals, and structures. The opportunity for emergency landings in event of aircraft failure are limited because of these operating conditions and therefore put the public in danger.
2. Manned aircraft equipped for the operations requested in this exemption have a flight crew on board to operate the imaging equipment. The aircraft, pilot, and crew must travel from an airport to the target area, fly multiple passes across the surveillance area, and return to the airport. These flights must pass over many property owners to achieve their objective. This exposes both flight crew and ground personnel to noise, emissions, and safety risks associated with such operations.

In summary, the sUAS proposed in this exemption are battery powered, small, lightweight, hand carried to the surveillance sight (not flown), and operated by a certificated pilot. These safety enhancements virtually eliminate the risks outlined above and provide for a level of safety better than the existing rule.

6) Federal Registry Summary

Pursuant to 14 C.F.R. § 11.81(f), the following summary is provided for publication in the Federal Register, should the FAA determine that publication is needed:

Docket No.: _____

Petitioner: Lynn James French dba FlytImagery

Sections of 14 CFR: 14 C.F.R. 21, 14 C.F.R. 61.113(a), 14 C.F.R. 91.7(a), 14 C.F.R. 91.119(c), 14 C.F.R. 91.121, 14 C.F.R. 91.151(a)(1), 14 C.F.R. 91.405(a), 14 C.F.R. 91.407(a)(1), 14 C.F.R. 91.409(a)(1)&(2), 14 C.F.R. 91.417(a)&(b)

Description of Relief Sought: Lynn James French, dba FlytImagery, is seeking an exemption pursuant to 14 CFR and Section 333 of the FAA Modernization and Reform Act of 2012. The exemption will permit safe operation of the above name sUAS commercially for the purpose of conducting precision agriculture operations, real estate surveillance, structural inspections, and aerial photography that could be performed more safely within the U.S. National air space than with the use of manned aircraft.

Based upon the foregoing, Lynn James French dba FlytImagery, requests that the FAA grant the necessary exemptions under Section 333 of the FAA Reform ACT and 49 U.S.C. §44701(f) of the Federal Aviation Act as requested herein to allow commercial operations within the continental United States.

Submitted on June 1, 2015

Respectfully submitted,

Lynn James French, dba FlytImagery

APPENDIX A: The Extent of the Relief being Sought and the Reason for the Relief

Lynn James French dba FlytImagery, requests an exemption from the regulations listed in section 2 to the extent described below as well as any additional regulations that may technically apply to the operation of the aircraft:

14 C.F.R. Part 21, Subpart H: Certification Procedures for Products and Parts, Subpart H – Airworthiness Certificates

Part 21, Subpart H, entitled Airworthiness Certificates, establishes the procedural requirements for the issuance of airworthiness certificates as required by FAR § 91.203(a). Given the size of the sUAS, its weight, speed, operational capability, its proximity to airports and populated areas, and the operating conditions outlined in this petition, it is unnecessary to go through the certificate of airworthiness process under Part 21 Subpart H in order to achieve or exceed current safety levels.

Such an exemption meets the requirements of an equivalent level of safety under Part 11 and Section 333 of the Reform Act. The Federal Aviation Act and Section 333 of the Reform Act both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon the consideration described herein.

14 C.F.R. § 61.113 (a): Private Pilot Privileges and Limitations: Pilot in Command

Section 61.113(a) limits private pilots to non-commercial operations. Unlike a conventional aircraft that carries a pilot, passengers, and cargo, the sUAS in this petition are remotely controlled with no passengers or property of others on board. Section 61.133(a) requires an individual with a commercial pilot's license to be pilot in command of any aircraft for compensation or hire. While airspace knowledge and requirements remain the same for both private and commercial pilots, and while sUAS do not present the safety hazards around non-airspace issues such as on-board occupants, it is an equivalent level of safety for private pilots to serve as pilot of command of a sUAS for compensation or hire.
Additionally, the sUAS in this petition have an autonomous navigation and control system with GPS guidance along with a high degree of pre-programmed limitations to prevent the potential for operation outside of the airspace restrictions established. Automated controls enable safe, reliable operation, as well as advanced networking capabilities. As such, nearly all operations that would be traditionally handled by a commercial pilot are handled by the intelligent systems in the aircraft.

Given the fact that there are no occupants or cargo in the aircraft and the fact that the safety features of the sUAS are highly software controlled and monitored in real-time with a specific flight management systems, it is proposed that pilot in command should not be required to hold a commercial pilot certification but rather be able to utilize the privileges of a private pilot certificate for commercial purposes of operating a sUAS.

Given these conditions and the size, speed, operational capabilities, and lack of combustible fuel, the risks associated with private pilot operations are diminished such that allowing operations set forth would meet or exceed the current level of safety.

14 C.F.R. § 91.7 (a): Civil aircraft airworthiness

This regulation requires that no person may operate a civil aircraft unless it is in airworthy condition. Should the exemption be granted allowing commercial operation of the petitioned sUAS without an airworthiness certificate, no standard will exist for airworthiness of these aircraft. Given the successful track record of these aircraft combined with the fault monitoring and other provision previously mentioned herein, an equivalent level of safety will be achieved by insuring compliance with the manufacturer's manuals for maintenance, safety, and pre-flight prior to each flight.

14 CFR § 91.119 (c): Minimum Safe Altitudes: General

This regulation provides that over sparsely populated areas the aircraft cannot be operated closer than 500 feet to any person, vessel, vehicle, or structure. Because flight operations for precision agriculture, real estate surveillance, structural inspections, and aerial photography are required to be performed at relatively low altitudes (below 400 feet) an exemption from Section 91.119(c) is needed.
The equivalent level of safety will be achieved because these aircraft will only fly over private property with the permission of the landowner and will not be operated in congested or populated areas. Despite flying at lower altitudes than more conventional manned aircraft, an equivalent level of safety will be achieved given the size, weight, speed, and material with which the aircraft are built. Additionally the aircraft are not designed for transit but rather for limited flights for a specific purpose. Because of this inherent constraint, it is considered that the lowered minimum safe altitude will provide an improved or equivalent level of safety compared to large aircraft with pilot, passenger, flammable fuel, and cargo transitioning across many miles to perform its duties.

14 CFR 91.121 – Altimeter settings

This section requires that each person operating an aircraft shall maintain the cruising altitude or flight level of that aircraft, as the case may be, by reference to an altimeter that is set, when operating below 18,000 feet MSL to:

- The current reported altimeter setting of a station along the route and within 100 nautical miles of the aircraft;
- If there is no station within the area prescribed in paragraph (a)(1)(i) of this section, the current reported altimeter setting of an appropriate available station;
- In the case of an aircraft not equipped with a radio, the elevation of the departure airport or an appropriate altimeter setting available before departure.

Due to the very limited area of operation afforded by line of sight operation and the low altitudes with which these operations are targeted, the intent of this section does not affect the level of safety for sUAS operations
To provide an equivalent level of safety, ground level reference altitudes are established in part by on-board GPS during the pre-flight tests.

14 C.F.R. § 91.151 (a) (1): Fuel Requirements for Flight in VFR Conditions

The regulation provides that no person may begin a flight in an airplane under day-VFR conditions unless there is enough fuel to fly to the first point of intended landing and to fly after that for at least 30 minutes.

Given that the flights of the proposed aircraft are much shorter in duration (less than 40 minutes), have a limited area of operation, and limited size, weight, and speed, an equivalent level of safety is achieved through built in battery power monitoring provisions and the Operating Conditions outline in this petition. Those conditions coupled with the built in low battery "return to home" features and fail safe checks built into the aircraft will provide an equivalent level of safety.

14 C.F.R. § 91.405 (a): Maintenance Required

Maintenance of the petitioned sUAS is performed by the operator in accordance with the instruction materials provided by the manufacturer and as provided during training as applicable. An equivalent level of safety can be achieved in lieu of the current rule when these instructions and training are followed and because the inherent properties of the aircraft which include:

- Small size and mechanical simplicity due to small electronic motors controlled by highly refined electronic circuits as compared to conventional aircraft with large fuel propelled engines controlled by a complex series of mechanical systems and linkages requiring a high level of skill by the maintenance crew.
- Lack of cargo, crew, or passengers.
- Very limited area of remote operation dictated by line of sight.

As provided in the manuals and the operating conditions outlined in this exemption, the operator will ensure that the sUAS is in working order prior to initiating flight, perform required maintenance, and keep a log of any maintenance that is performed. It is also recognized that the trained operator is the person most familiar with the aircraft and is best suited to maintain the aircraft in an airworthy condition and to ensure and equivalent level of safety. Key elements of the aircraft are designed to be easily changed (i.e. propellers) by trained operators such that the aircraft is easily kept in an airworthy state.

14 CFR § 91.407 (a) (1): Operation after Maintenance, Preventive Maintenance, Rebuilding or Altercations

This section applies only to aircraft with an airworthiness certificate, therefore these sections would need exemption. The maintenance, preventative maintenance, rebuilding, and alterations will be performed by the operator pursuant to the manufacturer's recommendations and the operating conditions outlined in this petition. The aircraft will be discrepancy free prior to initiating flight and will be grounded if mechanical issues are discovered. The operator will consult with the manufacture regarding any unresolved discrepancies until they have been restored back to factory standards. Additionally, the simplicity of the aircraft by design facilitates limited wear parts and ability for basic field maintenance. These aircraft attributes and procedures will provide an equivalent level of safety.

14 CFR § 91.409 (a) (1) & (2): Inspections

This section applies only to aircraft with an airworthiness certificate, therefore these sections would need exemption. Pre-flight and post-flight inspections will be accomplished by the operator to the manufacturer's recommendations and as outlined in the operating conditions. Any discrepancies discovered during inspections will be resolved before further flight. An equivalent level of safety is achieved because of these inspections and the limitations of the aircraft and flight which include: flights under 400 feet, small size, limited area of operation, and lack of cargo, crew, or passengers.

14 CFR § 91.417 (a) & (b): Maintenance Records

This section applies only to aircraft with an airworthiness certificate and therefore these sections would need exemption. Maintenance will be accomplished by the operator pursuant to the manufacturer's recommendations and the operating conditions outlined in this petition. The operator will maintain records of maintenance performed. An equivalent level of safety will be achieved through the inspection and maintenance outlined above and by the records of maintenance and repair that will be kept as outlined in this section.