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

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

September 21, 2015

Exemption No. 12944
Regulatory Docket No. FAA−2015−2565

Mr. John C. Knudsen
ALG Attorneys PLC
56 Madison Street
Suite 800
Denver, CO 80208

Dear Mr. Knudsen:

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 19, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Drone Leaf LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial photography and videography.

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 DJI S800, DJI Phantom 2 Vision, and DJI Phantom 2 Vision+.

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, Drone Leaf LLC 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

[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.

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.

Conditions and Limitations

In this grant of exemption, Drone Leaf LLC 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 DJI S800, DJI Phantom 2 Vision, and DJI Phantom 2 Vision+ 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

ALG ATTORNEYS
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June 19, 2015

VIA FED EX ONLY (TRACKING #8062 8187 2401)

U.S. Department of Transportation
Docket Management System
1200 New Jersey Ave., SE
Washington, DC 20590

Re: Petition of Drone Leaf, LLC for Exemption Pursuant to Section 333 of the *FAA Modernization and Reform Act of 2012*

Dear Sir or Madam:

Pursuant to Section 333 of the ***FAA Modernization and Reform Act of 2012*** ("**FMRA**") and 14 C.F.R. Part 11, Drone Leaf LLC ("**Drone Leaf**"), operator of Small Unmanned Aircraft Systems ("**sUASs**") equipped to conduct aerial data collection to include aerial videography and cinematography for pre-planned, controlled area, photographic and other aerial data collection services, hereby applies for an exemption from the below listed Federal Aviation Administration Regulations ("**FARs**") to allow commercial operation of its sUASs, so long as such operations are conducted within and under the conditions outlined herein, in accord with the enclosed Drone Leaf's Operations Manual ("**Flight Operations Manual**"), in compliance with the sUAS Operator's Handbook and all manufacturers' operations and/or instructions manuals ("**Operator's Handbook**")[1], and in strict compliance any and all rules, regulations, and practices as may be established by the Federal Aviation Administration ("**FAA**") for the operation of a sUAS.

LEGAL AUTHORITY AND OVERVIEW

1. Legal and Regulatory Framework

The FMRA provides that "the Secretary of Transportation shall determine if certain unmanned aircraft systems may operate safely in the national airspace system..." prior to final completion of the required Reform Act plan and the subsequent rule-making. § 333(a).

In making this determination, the Secretary of Transportation shall determine, at a minimum –

(1) Which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security; and

[1] The Flight Operations Manual and Operator's Handbook both contain confidential, trade secret and proprietary information that Drone Leaf has not and will not share with others. Petitioner submits the Flight Operations Manual and Operator's Handbook and all information contained therein as proprietary and confidential information pursuant to 14 C.F.R. § 11.35(b). The Flight Operations Manual and Operator's Handbook contain operating conditions and procedures that are not available to the public and are protected from release under the Freedom of Information Act, 5 U.S.C. § 552 *et seq.*

(2) Whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph (1).

§333(b) (1)-(2). Finally, §333 provides that "[i]f the Secretary determines under this section that certain unmanned aircraft systems may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft systems in the national airspace system." §333(c).

The FAA has promulgated guidance for UAS users that wish to obtain a Section 333 exemption. The FAA has recommended that an applicant discuss the following items:

1. The safe operation of a UAS to minimize risk to the National Airspace ("**NAS**"), including the operational characteristic for the type of UAS intended for use, operating procedures, and aircraft loading information;
2. Operational procedures, including pre-flight inspections, maintenance, and repair;
3. Radio Frequency ("**RF**") spectrum used for control of the UAS and associated equipment that is part of the UAS and whether it complies with Federal Communications Commission ("**FCC**") or other appropriate government oversight requirements;
4. A description of the Pilot in Command ("**PIC**") directly responsible for the operation of the UAS, including the level of airman certificate held, any applicable training related to the operation, and any minimum hours of flight experience required by the PIC, both total flight time and the time with the particular UAS, as well as medical standards and certification of the PIC directly responsible for the operation of the UAS;
5. The intended UAS operations, including how the operation would not adversely affect safety, or how they would provide a level of safety at least equivalent to that provided by the rule from which exemption is sought;
6. The proposed maximum operating speed and altitude, and describe the minimum flight visibility and distance from clouds for their intended operations, including any potential hazards and safety mitigations associated with these proposed conditions;
7. The characteristics of the area of intended operation and the associated potential hazards and proximity to populated areas;
8. The proximity to airports;
9. A description of how the application intends to operate the UAS within visual line-of-sight ("**VLOS**");
10. Any procedures to conduct a preflight safety risk assessment to determine that the UAS is in a condition for safe flight and that the planned operation can be completed safely;
11. To the extent the activity involves operations that have existing requirements, such as motion picture and television filming, or pipeline and powerline control, how the application intends to comply with such regulations; and
12. The applicant's intent to obtain a Certificate of Waiver of Authorization ("**COA**") from the FAA Air Traffic Organization.

Additionally, the FAA Administrator has general authority to grant exemptions from its safety regulations and minimum standards when the Administrator decides a requested exemption is in the public interest. See 49 U.S.C. § 44701(f) (permitting exemptions from §§ 44701(a), (b) and §§ 44702 –

44716, et seq.). A party requesting an exemption must explain the reasons why the exemption: (1) would benefit the public as a whole, and (2) would not adversely affect safety (or how it would provide a level of safety at least equal to the existing rules). See 14 C.F.R. § 11.81 (petitions for exemption).

2. Drone Leaf Meets and Exceeds the Legal and Regulatory Requirements

As will be shown herein, Drone Leaf meets and exceeds the stated §333 requirements as well as the guidance promulgated by the FAA. The proposed operations in this petition for exemption qualify for expedited approval under §333 of the FMRA. Each of the statutory criteria and other relevant factors are satisfied.

The proposed operations permit the use of small and relatively inexpensive UAS under controlled conditions in airspace that is: (1) limited; (2) predetermined; (3) controlled as to access; and that (4) provides an increased level of safety beyond that existing when fixed or rotor wing aircraft are used to accomplish the same purpose.

Drone Leaf's sUAS are rotorcraft, weighing 50 or fewer pounds, including payload. They operate, under normal conditions, at low speed and have the capability to hover and move in the vertical and horizontal plane. Drone Leaf's sUASs will operate in line of sight, or pursuant to the prevailing FAA regulations and guidance, and will only operate within those areas described in the enclosed Flight Operations Manual.

Given the small size of the sUASs involved and the restricted environment within which they will operate, the comprehensive safety and operational parameters used by Drone Leaf, and Drone Leaf's commitment to compliance with the FAA's regulations now and into the future, this petition exemption falls within the equivalent level of safety that Congress desired the FAA to permit commercial UAS operations by exemption pending completion of formal rulemaking. Also, due to the size of the sUASs and the restricted area in which the sUASs will operate, approval of the application presents no national security issue.

Considering the clear direction in §333 of the Reform Act, the authority contained in the Federal Aviation Act, as amended, the equivalent level of safety surrounding the proposed operations, and the significant public benefit, the grant of the requested exemptions is also in the public interest. Accordingly, Drone Leaf respectfully requests the FAA grant the requested exemption without delay.

MEET DRONE LEAF

Drone Leaf LLC is a California limited liability company that provides Geographical Information Services (GIS) services, including photography and videography for vineyards and other farming applications to help increase yields and treat insect infestations. Drone Leaf works with clients across many industries, including real estate, construction, and agriculture, to provide the client images and videos needed to support and grow their business. The Drone Leaf team has years of experience in both safely piloting sUASs and providing aerial photography.

PROPOSED OPERATIONS

The enclosed Manuals describe, in detail, the policies and procedures for Drone Leaf's proposed sUAS operations. To assist the FAA in its safety assessment of Drone Leaf's proposed sUAS operations, below is a summary of operational limitations and conditions, which will ensure an equivalent or higher level of safety to operations conducted under current regulatory guidelines:

1. The sUAS will weigh less than 50 pounds.

2. Flights will be operated within line of sight of the Operator.

3. Maximum total flight time for each operational flight will be limited to the amount of time the sUAS can be flown and still maintain a reserve battery power of no less than 25%.

4. Flights will be operated at an altitude of no more than 500 feet Above Ground Level ("**AGL**").

5. Flights will be operated at a safe lateral and vertical distance from and above any inhabited structures, buildings, vehicles, vessels, or people not associated with the operation or who have not signed a waiver in advance of the operation.

6. The sUAS Pilot with Pilot in Command responsibilities for the flight will be the designated Operator ("**Operator**").

7. The sUAS will operate only within a confined area as described in the Flight Operations Manual.

8. A briefing will be conducted in regard to the planned sUAS operations prior to each day's missions. It will be mandatory that all personnel who will be performing duties within the boundaries of the safety perimeter be present for this briefing.

9. The Operator will have been trained in operations of sUAS generally and received up-to-date information on the particular sUAS to be operated as required in the Flight Operation Manual.

10. Written and/or oral permission from the relevant property holders will be obtained.

11. All required permissions and permits will be obtained from territorial, state, county or city jurisdictions, including local law enforcement, fire or other appropriate governmental agencies.

12. If the sUAS loses transmission signal, the sUAS will have the capability to return to a pre-determined location and land.

13. Contingency plans will be in place to safely terminate flight if there is a loss of transmitter communications or a loss of GPS signal.

14. The sUAS will have the capability to abort a flight in case of unpredicted obstacles or emergencies.

REQUESTED EXEMPTIONS

The *Federal Aviation Act* expressly grants the FAA the authority to issue exemptions. This statutory authority, by its terms, includes exempting civil aircraft, as the term is defined under § 40101 of the Act, including sUASs, from its safety regulations and minimum standards when the Administrator decides a requested exemption is in the public interest.

Petitioner seeks an exemption from several interrelated provisions of 14 C.F.R. Parts 21, 45 and 91 for purposes of conducting aerial data collection to include aerial photography and videography services. Listed below are (1) the specific sections of 14 C.F.R. for which exemption is sought, and (2) the operating procedures and safeguards that Petitioner has established which will ensure a level of safety better than or equal to the rules from which exemption is sought.

A. 14 C.F.R. Part 21, Subpart H – Airworthiness Certificates and 14 C.F.R. § 91.203(a) and (b)

Petitioner seeks an exemption from 14 C.F.R. Part 21, Subpart H, which establishes the procedural requirements for the issuance of airworthiness and registration certificates as required by 14 C.F.R. Given the size and limited operating area associated with the sUAS to be utilized by the Petitioner, an exemption from Part 21, Subpart H, meets the requirements of an equivalent level of safety under Part 11 and §333 of the FMRA.

The Federal Aviation Act and §333 of the FMRA both authorize the FAA to exempt aircraft from the requirement for an airworthiness certificate, upon consideration of the size, weight, speed, operational capability, and proximity to airports and populated areas of the particular UAS. In all cases, an analysis of these criteria demonstrates that the sUAS operated without an airworthiness or registration certificate, in the restricted environment and under the conditions proposed, will be at least as safe as, or safer than, a conventional rotorcraft operating with an airworthiness certificate without restrictions and conditions of the proposed sUAS operations.

Equivalent Level of Safety

The sUAS to be operated hereunder, DJI Innovations S800 multi-rotor rotorcraft, weighs less than 55 pounds with payload, carries neither a pilot nor passenger, carries no explosive materials or flammable liquid fuels, and operates exclusively within a secured and sterile area. Unlike other civil aircraft, the proposed operations will be controlled and monitored by the Operator pursuant to the Flight Operations Manual's requirements, as attached.

These safety enhancements, which already apply to civil aircraft operated in connection with existing aerial videography operations, provide a greater degree of safety to Drone Leaf's employees, members of the public, and property owners than conventional operations conducted with airworthiness certificates issued under 14 C.F.R. Part 21, Subpart H. Lastly, application of these same criteria demonstrates that there is no credible threat to national security posed by the sUAS, due to its size, speed of operation, lack of explosive materials or flammable liquid fuels, and inability to carry a substantial external load.

B. 14 C.F.R. Part 27 Airworthiness Standards: Normal Category Rotorcraft

14 C.F.R. Part 27 sets forth the procedural requirements for airworthiness certification of normal category rotorcraft. To the extent Drone Leaf's sUASs would otherwise require certification under Part 27, Drone Leaf seeks an exemption from Part 27's airworthiness standards for the same reasons Identified in the exemption request from 14 C.F.R. Part 21, Subpart H.

C. 14 CFR § 61.113: Private Pilot Privileges And Limitations

Petitioner seeks an additional exemption from 14 CFR § 61.113, which restricts private pilot certificate holders from flying aircraft for compensation or hire, and which would also have the effect of requiring a second-class medical certificate. This provision limits private pilots to non-commercial operations.

Equivalent Level of Safety

Because the sUASs will not carry a pilot or passengers, the proposed operations can achieve the equivalent level of safety of current operations by requiring a ground crew member to have a private pilot's license rather than a commercials pilot's license to operation this sUAS. Unlike a conventional aircraft that carries the pilot and passengers, the sUAS is remotely controlled with no persons on board. The area of operation is controlled and restricted, and all flights are planned and coordinated in advance. The risks associated with the operation of the sUASs are so diminished from the level of risk associated with commercial operations contemplated by part 61 when drafted, that allowing operations as requested with a private pilot in the ground crew exceeds the present level of safety achieved by 14 C.F.R. Sec. 61.113(a) and (b).

In addition, in Grant of Exemption No. 11062 to Astraeus Aerial ("**Astraeus**"), the FAA determined that an Operator with a private pilot certificate operating the Astraeus UAS would not adversely affect operations in the NAS or present a hazard to persons or property on the ground. Additionally, as previously determined by the Secretary of Transportation, the requirement to have an airman certificate ameliorates security concerns over civil UAS operations conducted in accordance with §333.

The aerial data collection conducted by Drone Leaf will be conducted in areas where access to the public is limited and controlled. As such, the operations will have no substantial impact on any third persons not involved in the production. Drone Leaf also has a policy to conduct its operations, when possible, during times when third persons not involved in the production are expected to be limited and to the extent possible, to provide notice to affected third persons when production and operations will occur.

Because Drone Leaf will operate in controlled areas and under controlled parameters, the sUAS will be flown based on visual line-of-sight at altitudes below 500' AGL. Accordingly, Drone Leaf request that this exemption be granted.

D. 14 C.F.R. §§ 91.9(c), 45.23(b) and 45.27(a): Aircraft Marking and Identification Requirements

Petitioner seeks an exemption from the aircraft marking and identification requirements contained in 14 C.F.R. §§ 91.9(c), 45.23(b) and 45.27(a). 14 C.F.R. § 91.9(c), Civil Aircraft Flight Manual, Marking and Placard requirements, provides that "[n]o person may operate a U.S.-registered civil aircraft unless that aircraft is identified in accordance with Part 45 of this chapter."

Equivalent Level of Safety

The equivalent level of safety for exemptions to the aircraft marking and identification requirements of §§ 91.9(c), 45.23(b) and 45.27(a) will be provided by having the sUAS marked on its fuselage as required by § 45.29(f). In addition, Drone Leaf is aware of Exemption No. 11333, which required the sUAS's markings to be "as large as practicable." The FAA has previously issued the following related exemptions to the aircraft marking requirements of § 45.23(b): Exemption Nos. 10700, 10167 and 10167A.

E. 14 C.F.R. § 91.9(b)(2): Civil Aircraft Flight Manual in the Aircraft

Drone Leaf seeks an exemption from the flight manual requirements of 14 C.F.R. § 91.9(b)(2), which states:

(b) No person may operate a U.S.-registered civil aircraft –

...

(2) For which an Airplane or Rotorcraft Flight Manual is not required by § 21.5 of this chapter, unless there is available in the aircraft a current approved airplane or Rotorcraft Flight Manual, approved manual material, markings and placards, or any combination thereof.

Given the physical dimensions of the sUAS, configuration and load capacity, the sUASs have no ability to carry such a manual on the aircraft, not only because there is no pilot on board, but because there is simply no room or capacity to carry such an item on the aircraft.

Equivalent Level of Safety

The safety related purpose of this manual requirement can be equally satisfied by maintaining the sUAS flight manual at the ground control point where the Operator will have immediate access to it. Accordingly, Drone Leaf requests an exemption from 91.9(b)(2)'s flight manual requirements, on the condition that the sUAS flight manual be available at the control point during each operation.

The FAA has issued the following exemptions to this regulation: Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 32827, 10700, and 11333 ("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.")

F. 14 C.F.R. § 91.7(a): Civil Aircraft Airworthiness

Drone Leaf seeks an exemption from 14 C.F.R. § 91.7(a), which requires that a civil aircraft be in airworthy condition to be operated. Inasmuch there will be no airworthiness certificate issued for the sUAS, should this exemption be granted, no FAA regulatory standard will exist for determining airworthiness.

Equivalent Level of Safety

The DJI Innovations S800 has a stellar safety record, demonstrating that the sUAS is airworthy. Further, given the size of the sUAS and the requirements contained in the Flight Operation Manual for maintenance and pre-flight safety check lists, an equivalent level of safety will be provided.

The FAA has issued the following exemptions to this regulation: Exemption Nos. 8607, 8737, 8738, 9299, 9299A, 9565, 9565B, 10167, 10167A, 10602, 32827, 10700, and 11333.

G. 14 C.F.R. § 91.103: Preflight Action

Drone Leaf seeks an exemption from 14 C.F.R. § 91.103, which requires a PIC to become familiar with specific information before each flight, including information contained in the FAA-approved flight manual on board the aircraft. While the Operator will be familiar with all information necessary to safely conduct the flight, an exemption is requested to the extent that an FAA-approved flight manual is required on board the aircraft.

Equivalent Level of Safety

An equivalent level of safety will be provided by following the Operator's Handbook. The Operator will

take all required preflight actions - including reviewing weather, flight battery requirements, landing and takeoff distance, and aircraft performance data - before initiation of flight. The Operator's Handbook will be kept at the ground station with the operator at all times. Further, Drone Leaf will utilize all safety and manufacturer's manuals to ensure it adheres to the highest standards for safety within the industry.

H. 14 C.F.R. § 91.109(a): Flight Instruction

Drone Leaf seeks an exemption from 14 C.F.R. § 91.109(a), which provides that "[n]o person may operate a civil aircraft (except a manned free balloon) that is being used for flight instruction unless that aircraft has fully functioning dual controls." sUASs and remotely piloted aircraft, by their design, do not have functional dual controls. Instead, flight control is accomplished through the use of a box that communicates with the aircraft via radio communications.

Equivalent Level of Safety

Given the size and speed of the sUAS, an equivalent level of safe training can still be performed without dual controls because no pilot or passengers are aboard the sUAS, and all persons will be a safe distance away in the event that the sUAS experiences any difficulties during flight instruction. Flight control is accomplished through the use of a control box that communicates with the aircraft via radio communications. The FAA has approved exemptions for flight training without fully functional dual controls for a number of aircraft and for flight instruction in experimental aircraft. See, Exemption Nos. 5778K & 9862A. The equivalent level of safety is provided by the fact that neither a pilot nor passengers will be carried in the aircraft and by the size and speed of the aircraft. Enhancing this safety is the technology inherent in the remote controls utilizing digital communications that are paired to the sUAS, making it nearly impossible to unintentionally or intentionally have the control communications interrupted.

The FAA has approved exemptions for flight training without fully functional dual controls for a number of aircraft and for flight instruction in experimental aircraft. Exemptions include: Nos. 5778K and 9862A.

I. 14 C.F.R. § 91.119: Minimum Safe Altitudes

Petitioner requests an exemption from the minimum safe altitude requirements of 14 C.F.R. § 91.119. Section 91.119 prescribes the minimum safe altitudes under which aircraft may not operate, including 500 feet above the surface and away from any person, vessel, vehicle, or structure in non-congested areas. See 14 C.F.R. § 91.119(c). Section 91.119(d) allows for a helicopter to operate at less than those minimum altitudes when it can be operated "without hazard to persons or property on the surface," provided that "each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA."

To provide the intended aerial video operations, the sUAS is normally operated below 500 feet AGL. Additionally, due the nature of the proposed operations, the sUAS will maintain a safe lateral and vertical distance from inhabited structures, buildings, vehicles, and vessels, and from people not associated with the operation.

Equivalent Level of Safety

Compared to flight operations with rotorcraft weighing far more than the maximum 55 pounds proposed herein, and given the lack of flammable fuel, any risk associated with these operations is far less than those that presently exist with conventional aircraft. An equivalent level of safety will be

achieved given the size, weight, and speed of the UAS, as well as the location where it is operated. As set forth in the Flight Operation Manual, the sUAS will be operated in a confined area, where buildings and people will not be exposed to operations without their pre-obtained consent. Because of the advance notice to the property owners and participants, all affected individuals will be well aware of the planned flight operations as set forth in the Flight Operation Manual.

Furthermore, by operating at such lower altitudes, the sUAS will not interfere with other aircraft that are subject to the minimum safe altitude regulations. Finally, the successful safety record of the DJI S800 demonstrates that the sUAS can be safely used at these lower altitudes and closer operating environments.

J. 14 C.F.R. § 91.121: Altimeter Settings

This petition seeks an exemption from 14 C.F.R. § 91.121, which requires a person operating an aircraft to maintain cruising altitude or flight level by reference to an altimeter that is set to the elevation of the departure airport or barometric pressure. An exemption is required because the sUAS does not have a barometric altimeter, but rather a GPS altitude read out.

Equivalent Level of Safety

An equivalent level of safety will be achieved by following the procedures set forth in the Flight Operation Manual. As prescribed in the Flight Operation Manual, the operator will confirm the altitude of the launch site shown on the GPS altitude indicator before flight. Moreover, the Operator will use the GPS altitude indicator to constantly monitor the sUAS's height, thus ensuring operation at safe altitudes.

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

Drone Leaf requests an exemption from 14 C.F.R. § 91.151(a)'s fuel requirements for flight in VFR conditions. Section 91.151 states:

(a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed –

(1) During the day, to fly after that for at least 30 minutes; or

(2) At night, to fly after that for at least 45 minutes.

Here, the battery powering the DJI Innovations S800 provides approximately 15 minutes of powered flight. To meet the 30 minutes reserve requirement in 14 C.F.R. § 91.151, sUAS flights could not be conducted. Given the limitations on the sUAS's proposed flight area and the location of its proposed operations within a predetermined area, a safety margin based on a reserve amount of battery life is needed. Petitioner will not be conducting any sUAS flights at night.

Equivalent Level of Safety

An equivalent level of safety will be achieved because the operations will be conducted on-site without significant transit time by the sUAS. All flights will be planned to be terminated with no less than 25% reserve battery power still available. This restriction would be more than adequate to return the sUAS safely to the ground and its planned landing zone from anywhere in its limited operating area even in

the event of an unexpected occurrence. Operation of the sUAS with less than 30 minutes of reserve fuel does not include the type of risks that Section 91.151(a) was intended to alleviate given the size and speed of the small UAS, and the proximity of the flight operation to the landing zone.

This request for exemption falls within the scope of prior exemptions, including Exemption Nos. 10673, 2689F, 5745, 10673, 10808 and 11333.

L. 14 C.F.R. § 91.203(a) and (b): Carrying Civil Aircraft Certification and Registration

Drone Leaf seeks an exemption from civil aircraft certification and registration requirements of 14 C.F.R. § 91.203(a) and (b). The regulation states in pertinent part:

> (a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following:
>
> (1) An appropriate and current airworthiness certificate...
>
> (b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under § 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.

An exemption to this regulation is necessary because: (1) the sUAS's configuration, load capacity and size does not allow it to carry certification and registration documents; (2) the sUAS does not have a cabin or cockpit entrance at which documents could be displayed; and (3) there are no passengers or crew for whom the certificates need to be displayed.

Equivalent Level of Safety

To the extent these regulations are applicable to the proposed sUAS operations, an equivalent level of safety will be achieved by keeping these documents at the ground control point where the Operator will have immediate access to them.

The FAA has issued numerous exemptions to this regulation, including: Exemption Nos. 9565, 9665, 9789, 9789A, 9797, 9797A, 9816A, and 10700.

M. 14 C.F.R. § 91.405(a), 91.407(a)(1), 91.409(a)(1), 91.409(a)(2); 91.417(a) and (b): Maintenance Inspections

Drone Leaf also seeks an exemption from the maintenance inspection requirements contained in 14 C.F.R. § 91.405(a), 91.407(a)(1), 91.409(a)(1), 91.409(a)(2), 91.417(a) and (b). These regulations specify maintenance and inspection standards in reference to 14 C.F.R. Part 43. See, e.g., 14 C.F.R. § 91.405(a) (stating that each owner or operator of an aircraft "[s]hall have the aircraft inspected as prescribed in subpart E of this part and shall between required ions ...have discrepancies repaired as prescribed in part 43 of this chapter"). An exemption to these regulations is needed because Part 43 and these sections only apply to aircraft with an airworthiness certificate, which the sUAS will not have.

Equivalent Level of Safety

An equivalent level of safety will be achieved because maintenance and inspections will be performed in accordance with the Operator's Handbook as referenced in the Flight Operation Manual. As provided in the Flight Operation Manual, 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 performed. The operator is the person most familiar with the aircraft and best suited to maintain the aircraft in an airworthy condition to provide the equivalent level of safety.

If mechanical issues arise, the sUAS's size and carrying capacity, and the fact that flight operations will only take place in restricted areas for limited periods of time during daylight hours, creates less risk than that associated with conventional rotorcraft performing the same operation.

PUBLIC INTEREST

Granting Drone Leaf's exemption furthers the public interest on numerous levels. National policy set by Congress favors early integration of UAS into the national airspace in controlled, safe working environments such as those propose in this petition. In addition, maintaining industrial safety has been a priority of state and local governments for decades.

Drone Leaf also believes that the use of sUASs for aerial data collection to include aerial photography and videography serves a valuable public interest and addresses a common public concern: safety. The use of sUAS's in a controlled and safe manner, as described herein. In addition, in the event of an unforeseen incident, a sUAS causes far less disruption than traditional aircraft.

In addition, conducting aerial data collection with the sUAS, instead of manned aircraft, meets another common public concern in the noise and pollution caused by traditional aircraft. The use of a sUAS significantly reduces the levels of air and noise pollution generated during traditional aerial video production flight operations. By using battery power and electric motors, the sUAS produces no air pollution, and is the most viable environmentally conscious alternative to piston or turbine powered rotorcraft. The sUAS, while reducing the carbon footprint of aerial video productions, also eliminates noise pollution as its battery powered electric motors are barely audible during the take-off phase, and cannot be heard when operating more than 100 feet above ground level.

By using the sUAS to perform aerial videography, the substantial risk to life and property in the air and on the ground, which is usually associated with traditional manned aircraft flight operations, will be substantially reduced or completely eliminated. Aside from the lack of aircrew members located onboard the aircraft, the minimal size and weight of a sUAS creates less physical potential for collateral damage to life and property on the ground, and in the air, compared to the manned aircraft that typically conduct aerial videography. Relatedly, the sUAS contains no reactive or combustible materials on board and thus the potential for fire or explosions is greatly diminished.

In addition, granting the exception will help advance the knowledge base for conducting commercial UAS operations. This additional data will help the FAA set future rules regarding UAS flight operations, maintenance, and crew qualifications. The public also has an interest in reducing the hazards and emissions associated with alternate use of helicopters to conduct similar aerial videography operations. The UAS in question is very light weight and does not carry any flammable fuel, further reducing the risk from any potential accident.

PRIVACY

All of the proposed flights and videography will be only conducted after obtaining any individual subject matter's permission. All flights will occur over public right-of-way or private property with the property owner's prior consent and knowledge. The proposed operations will not impact privacy concerns

beyond those already implicated by manned aircraft aerial videography operations.

FEDERAL REGISTRY SUMMARY

Pursuant to 14 C.F.R. Part 11, the following summary is provided for publication in the Federal Register, should it be determined that publication is needed:

> Drone Leaf seeks an exemption from the following rules:
>
> 14 CFR Part 21, Subpart H; 14 CFR Part 27; 14 CFR 45.23(b); 45.27 (a); 14 C.F.R. 61.113; 14 CFR 91.7(a); 14 CFR 91.9(b)(2); 14 CFR 91.9(c); 14 CFR 91.103; 14 CFR 91.109(a); 14 CFR 91.119; 14 CFR 91.121; 14 CFR 91.151(a); 14 CFR 91.203 (a) & (b); 14 CFR 91.405(a); 14 CFR 91.407(a)(1); 14 CFR 91.409(a)(1)and (2); 14 CFR 91.417 (a) & (b).

Approval of these exemptions allowing commercial operations of small and lightweight unmanned aircraft ("**sUAS**") to conduct aerial videography and cinematography operations will enhance safety by reducing risk to Drone Leaf, the general public and property owners.

The DJI Innovations sUAS, weighing less than 55 pounds, with payload, and powered by batteries, eliminates virtually all of that risk given the reduced mass and lack of combustible fuel carried on board. The sUAS is transported to the designated survey area set up. It is not flown from an external location to the work-site. The sUAS will carry no passengers or crew and, therefore, will not expose them to the risks associated with manned aircraft flights.

The operation of this small UAS will provide an equivalent level of safety, supporting the grant of the exemptions requested herein, including exempting the applicant from the requirements of Part 21 and allowing commercial operations. These lightweight sUASs operate at slow speeds, close to the ground, and in a controlled environment. As a result, they are far safer than conventional aerial photography, videography, and data collection operations conducted with fixed wing aircraft or helicopters.

CONCLUSION

Satisfaction of the criteria provided in Section 333 of the Reform Act of 2012—size, weight, speed, operating capabilities, proximity to airports and populated areas and operation within visual line of sight and national security—provides more than adequate justification for the grant of the requested exemptions to permit Drone Leaf to operate sUASs in support of its aerial photography, videography, and data collection operations in accordance with the Flight Operation and Operator's Handbook appended hereto.

Granting the requested exemption will benefit the public interest as a whole in many ways, including (1) significantly improving safety and reducing risk by alleviating human exposure to danger, (2) improving aerial videography operations and decreasing operating costs, and (3) providing an environmentally conscientious way of producing aerial videography and cinematography operations.

Sincerely,

John C. Knudsen

Encls: - Flight Operations Manual (**CONFIDENTIAL- NOT FOR PUBLIC RELEASE**)

- sUAS Operator's Handbook (**CONFIDENTIAL- NOT FOR PUBLIC RELEASE**)
- Exhibit A, S800 User Manual
- Exhibit B, SPM 8800 Manual
- Exhibit C, SPM 9548 Manual
- Exhibit D, Ground Station User Manual
- Exhibit E, BTU Manual, BTU Product Release Notes
- Exhibit F, TIGER MOTOR MT2814 Manual
- Exhibit G, Operational Checklist