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

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

July 23, 2015

Exemption No. 12130
Regulatory Docket No. FAA–2015-1651

Mr. Todd Warr
429 Autumn Chase Court
Purcellville, VA 20132

Dear Mr. Warr:

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 May 3, 2015, you petitioned the Federal Aviation Administration (FAA) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial imaging, videography, surveying, and inspections.

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 is a Yuneec Q500.

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, Mr. Todd Warr 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.

Conditions and Limitations

In this grant of exemption, Mr. Todd Warr is hereafter referred to as the operator.

[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.

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 Yuneec Q500 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 July 31, 2017, unless sooner superseded or rescinded.

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

Enclosures

Todd Warr
Aerial Drone Photography (ADP)
429 Autumn Chase Court
Purcellville, VA. 20132
1 (540) 338-8903
twarr3@yahoo.com

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

Subject: Exemption Request to Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations from 14 C.F.R. Part 21, 45.27(a), 45.29 (3)(c)(d)(e)(f)(g)(h), 61.113 (a) & (b), 91.103, 91.121, 91.203, 91.151

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 and 14 C.F.R. Part 11, I, Todd Warr, a licensed Private Pilot, hereby applies for an exemption from the Code of Federal Regulations (C.F.R), Federal Aviation Regulations (FARs) identified, to allow commercial operation of lightweight Unmanned Aircraft Systems (UAS) for aerial imaging and video. This exemption is made based on information outlined in this petition, to allow commercial operation of a YUNEEC Q500 UAS, so long as operations are conducted within and under the conditions outlined herein or as may be established by the Federal Aviation Administration (FAA) as required by 333.

1. Types of Operations

The requested exemption would permit the operation of small, unmanned multirotor aircraft under controlled conditions to provide the following services to the community;

a. Real Estate sales advertising
b. Aerial Survey
c. Aerial Photo/video
d. Promotional advertising material
e. Inspections

This exemption would permit operation of an ultra-light weight, unmanned (piloted by remote control) in predetermined areas away from the general public, airports, heliports, and vehicular traffic. Operations would be conducted within federal guidelines, by a FAA Licensed Private Pilot with the assistance of an Observer. Operations would be conducted after carefully reviewing, inspecting, and examining the area of aerial operation to ensure the safety of persons and property.

2. REQUESTED RELIEF

I am requesting a grant of exemption of the following sections of Title 14 of the Code of Federal Regulations:

- **14 CFR 21;**
- **14 CFR 91, et seq;**
- **14 CFR 45.23 (b);**
- **14 CFR 61.113 (a) & (b);**
- **14 CFR 407 (a)(1);**
- **14 CFR 409 (a)(2);**
- **14 CFR 417 (a) & (b).**

I am also requesting an Exemption from Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations for the following:

- **14 CFR 45.23 (b);**
- **14 CFR Part 21;**
- **14 CFR 61.113 (a) & (b);**
- **91.7 (a);**
- **91.9 (b) (2);**
- **91.103 (b);**
- **91.119;**
- **91.121;**
- **91.151 (a);**
- **91.203 (a) & (b);**
- **91.405 (a);**
- **91.407 (a) (1);**
- **91409 (a) (2);**
- **91.417 (a) & (b).**

14 C.F.R. Part 21, Subpart H: Airworthiness Certificates 91.7 (a)

14 CFR § 91.203 Given the size, weight, speed, and limited operating area associated with the UAS aircraft to be utilized, I am asking exemption from 14 CFR Part 21,Subpart H(Airworthiness Certificates) and §91.203 (a) and (b) (Certifications required), subject to certain conditions and limitations, is warranted and meets the requirements for an equivalent level of safety under14 CFR Part 11 and Section 333 of the Reform Act.

The Federal Aviation Act U.S.C. 44701 (f) and 333 of the Reform Act 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 demonstrated that the UAS operated without an airworthiness certificate, in the restricted environment and under conditions proposed, will be at least as safe, or safer, than a

conventional aircraft (fixed wing or rotorcraft) operating with an airworthiness certificate without the restrictions and conditions proposed. I request an exemption from 14 CFR 91.7 (a) Civil Aircraft Airworthiness.

14 C.F.R. 45.23(b): Marking of the Aircraft

Furthermore I request an exemption from §45.23 Marking of the aircraft because my UAS will not have a cabin, cockpit or pilot station on which to mark certain words or phrases. Additionally two -inch lettering is difficult to place on such a small aircraft with dimensions smaller than the minimal lettering requirement.

Even though the UAS will have no airworthiness certificate, an exemption may be needed. The word “Experimental” could be placed on the UAS to comply with 45.29 (f) in a size suitable for the available space. The UAS is equipted with LED lights to aid in visibility.

14 CFR 61.113 (a) & (b): Private pilot privileges and limitations: Pilot in command

Under §61.113 (a) and(b) private pilots are limited to non-commercial operations, however I can achieve an equivalent level of safety as achieved by current regulations because my UAS does not carry any pilots or passengers. I have a Private Pilots License and will ensure all operations are conducted by a person with at a minimum a Private Pilots Certificate.

14 CFR 91.9 (b) (2): Civil Aircraft Flight Manual in the Aircraft

An exemption to the part will be needed since there is nowhere to place a copy of a flight manual on board the UAS.

14 C.F.R. 91.103 (b)(1), (b)(2): Preflight Action

This requires each PIC to take certain actions before flight to insure safety of flight. There is no approved flight manual, however the PIC will take actions prior to flight by reviewing the weather, flight battery requirements, and ensuring there is a safe location to land and depart so as not to cause undue hazard to people or property on the ground. The manufactures manual will be used prior to flight to ensure safety.

14 CFR 91.119: Minimum Safe Altitudes

Due to the limitation that operations be conducted at or below 400 feet AGL, an exemption will be necessary to meet 91.119. The typical UAS flight will be operated as follows:

1) Operate the UAS for 10-15 minutes per flight, land my UAS according to the manufacturer’s recommended minimum level of battery power.
2) Operate my UAS only within visual line of sight (VLOS).
3) Always obtain all necessary permissions prior to operation.
4) Procedures in place to abort flights in the event of safety breaches or potential danger.

14 CFR 91.121: Altimeter Setting

The UAS is not equipped with an altimeter setting device. GPS will be used on board the UAS to determine altitude by reference to the ground (AGL).

14 CFR 91.151(a): Fuel Requirements for Flight in VFR Conditions

An exemption from 91.151 will be necessary as the normal flight time will only be 10-15 minutes. The UAS is fueled by battery power and a long duration flight is not possible. Also since all flights will be conducted Line of Sight (LOS), this requirement is not applicable.

14 CFR 91.405 (a); 407 (a) (1); 409 (a) (2); 417 (a) & (b): Maintenance Inspections

These regulations require the owner/operator to have the aircraft inspected as prescribed in subpart E of this part. An equivalent level of safety will be maintained because of the small size and limitations of this UAS. Maintenance will be accomplished by the operator pursuant to the owners manual. The operator will ensure that the UAS is in proper working order prior to each flight, perform necessary maintenance, and keep a log of maintenance. The operator is the person most familiar with the UASs operation and is best suited to maintain in an airworthy condition to provide equivalent level of safety.

3. Commercial and Public Benefits

Granting this exemption will by provide a safe (by way of a unmanned system) and efficient means to meet technical problems solvable by elevated data collection instruments. Our typical customer base is small to medium size business and individuals who would be unable to acquire this service by manned aircraft due to it being cost prohibited. By moving these functions to UAS based aircraft not only can more people benefit from this service but it will reduce aircraft noise, pollution, reduce airport congestion.

In addition, it will reduce the amount of people and property exposed to the hazards of a manned aircraft flying at low altitude with the potential for catastrophic results. There are no combustibles on-board the UAS, thus eliminating the risk of explosion and fire due to a crash. The operation of this UAS will minimize ecological damage and promote economic growth by providing information to companies in the area that would otherwise be unavailable. Additionally, this system would eliminate a distraction to air traffic controllers who must monitor an aircraft that usually wants' to take pictures in the "wrong place at the wrong time" thus reducing workload on ATC.

The use of UAS, would allow these services to be provided and thus benefit both the community and aviation by:

1. Providing a lower cost to the individual needing these services.
2. Zero emissions from the UAS.
3. Reduced noise over an aircraft.
4. Reduced hazard to people or property on the ground.

The use of a UAV will provide a level of safety at least equal to existing rules and will only be operated in a safe environment that is strictly controlled. Operations will only be conducted after a careful review of the area and weather conditions. Safety is the number one priority.

4. SUMMARY

Granting this exemption is a "win win" situation for individuals in need of this service. The community benefits from reduced pollution and noise. The economy benefits by creating jobs for small businesses. The consumer benefits from reducing the cost of this service. The FAA benefits by regulating the use of UASs so that safety and accountability can be maintained and monitored.

Approval of exemptions allowing commercial operations of UASs in the media will enhance safety by reducing risk associated with conventional aircraft operations. The operation of UASs weighting less than 55lbs by a certified pilot will enhance safety to the community increase awareness of properly flown UASs, eliminate the risk of collision with aircraft operating in the airspace and around airports and provide jobs.

Todd Warr
Aerial Drone Photography

APPENDIX A: AIRCRAFT SPECIFICATIONS

1. YUNEEC Q500: 4 Rotor, Electric Driven, Quad-Copter:

- **Flight Time** — **Up to 25 Minutes**
- **Dimension** — **16.5x16.5x9.5in**
- **Diagonal Length Without Rotor Blades** — **22.2in**
- **Propeller/Main Rotor Diameter** — **13.0in**
- **Weight Without Battery and Payload** — **40.0oz**
- **Battery** — **5400mAh 3S 11.1V LiPo (included)**
- **Transmitter** — **10 Channel 2.4GHz with 5.8 GHz video downlink**
- **Flight Modes** — **Smart Mode and Manual Mode**
- **Maximum Speed** — **12MPH**
- **Maximum Flying Height** — **Default 400ft Above Ground Level**
- **Maximum Rotation Rate** — **65^0 per second**
- **Maximum Roll Angle** — **35^0**
- **Radio Control Frequency Band** — **2.4 GHz**
- **Operating Temperature Range** — **-5^0C to 80^0 C**

2. GROUND STATION SPECIFICATIONS:

- **Operating System** — **Andriod**
- **Number of Channels** — **10**
- **Control Transmission Distance/Range (Optimum Conditions)**
  FCC Compliance Up to 800m (2624 ft) CE Compliance: Up to 400m (1312.34 ft)
  Warning You Must Follow Local Laws and Maintain Visual Line of Sight of Aircraft at All Times

- **Robust Radio Control Modulation** — **Yuneec Protocol**
- **Video link Frequency Band** — **5.8 GHz**
- **Video Transmission Distance/Range (Optimum Conditions)**
  FCC Compliance Up to 600m (1968.5 ft) CE Compliance Up to 300m (984.252 ft)
  Warning You Must Follow Local Laws and Maintain Visual Line of Sight of Aircraft at All Times
- **Flight Systems Telemetry Data On Screen Display (OSD)** — **Yes**
- **LED Backlit LCD Screen** — **Capacitive Multi-Touch 4.5"**
- **Tactile (Vibrating) and Audible Feedback** — **Yes**
- **Built-In LiPo Battery Voltage / Capacity** — **3.6V/5200mAh 18.72Wh**