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

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

June 15, 2015

Exemption No. 11825
Regulatory Docket No. FAA–2015–0373

Mr. Christopher Vasquez
REDLine Aerospace, LLC
2807 Strathallan Avenue
Henderson, NV 89044

Dear Mr. Vasquez:

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 February 11, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of REDLine Aerospace, LLC (hereinafter petitioner or operator) for an exemption. The exemption would allow the petitioner 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 T600 Inspire 1, SteadiDrone Mavrick, and Freefly Cinestar X8.

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. 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, REDLine Aerospace, 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 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, REDLine Aerospace, 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 T600 Inspire 1, SteadiDrone Mavrick, and Freefly Cinestar X8 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.
32. All operations shall be conducted in compliance with the Air Traffic Organizations (ATO) issued certificate of Waiver or Authorization (COA) prior to conducting any operations under this grant of exemption. All operations conducted outside the U.S. 12 nm limit, must be conducted within airspace managed by the U.S. and within the U.S. Flight Information Region (FIR) boundary.
33.

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 June 30, 2017, unless sooner superseded or rescinded.

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

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

Wednesday, February 11, 2015

Re: Exemption Request Pursuant To Section 333 of the FAA Reform Act of 2012

Dear Sir Or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012 (the "Reform Act") and 14 C.F.R. Part 11, REDLine Aerospace, LLC seeks an exemption from Federal Aviation Regulations ("FARs") detailed below for the following described Unmanned Aerial System.

REDLines goal is to provide a professional unmanned solution for aerial cinema and commercial work.

1. **Concept of Operation –** REDLine Aerospace LLC (hereafter REDLine) will be conducting UAS operations in the following basic manner:

   1.1. REDLine is currently working with Direct Cinema Limited's documentary film on the diminishing Orca whale population. Participation with related scientific organizations could include: Scripps Institution of Oceanography UC San Diego. SeaWorld Parks San Diego and the Vancouver Aquarium. (Canada BC).

   1.2. A three-person team trained by REDLine under a proprietary Commercial Pilot & Safety Observer program will operate one or more of the following: Cinestar X8, Steadidrone Mavrik, and/or DJI T600 Inspire 1 unmanned aircraft. The airframe will initially utilize a lightweight Sony a7S camera as the mission payload, stock camera (such as the one included on the DJI T600), and/or professional-grade cinema cameras. The crew positions are:

      1.2.1. Pilot in Command (a qualified REDLine Pilot) in charge of all aircraft operations and maneuvers. The PIC will brief and retain all final mission and safety decision making responsibilities.

      1.2.2. Safety Observer (a qualified REDLine Pilot) will be on discrete frequency hand-held radios and/or within 'speaking' distance of the PIC at all times. The Safety Observer will provide area of operations (AOO) situational awareness to include inclement weather and/or area traffic, as well advise of any potential flight conflicts. Positive (2-way) communication will be established prior to takeoff and maintained at all times an aircraft is airborne.

      1.2.3. Payload Specialist (a REDLine qualified technician or person designated as an ASC, DP or camera-operator on an insured project) will operate a mission-specific payload, which will initially include a cinema-grade digital film camera with professional lensing and 2 or 3-axis control. The payload specialist will be within speaking distance of the PIC at all times.

      1.2.4. This separation of specific duties allows the PIC and Safety Observer to focus on flight safety while operating under pre-briefed mission parameters with sound decision making to build maximum situational awareness. Crew Resource Management (CRM) is taught, briefed and debriefed. See REDLine CRM program letter.

   1.3. REDLine missions will be primarily over open water to observe marine life. Over-land missions will take place in areas designated as an operating area by signs, placards and/or electronic notices. Sea and land operations will be scheduled not less than 72 hours in advance, and:

      1.3.1. All REDLine missions with new or significantly altered or proprietary REDLine equipment will be first conducted over an open, privately owned land area prior to any commercial

operations in accordance with FAA Advisory Circular 91-57, Model Aircraft Operating Standards.

1.3.2. All REDLine mission pilots will practice and execute normal and emergency procedures during training flights before commercial operations.

1.3.2.1. REDLine Syllabus (Attachment B) specifies Profile 1 which includes a selection of normal and other than normal flight operations.

1.3.2.2. Pilots are trained to identify and operate under NORMAL, EARLY RETURN and EMERGENCY conditions.

1.3.2.2.1. Simulation will be used to the maximum extent available.

1.3.2.2.2. Actual flight will be used to train and practice when feasible.

1.4. REDLine mission will recover aircraft to both safe land based areas and REDLine approved ship flight decks.

1.4.1. REDLine will log and maintain a proprietary 'flight deck' takeoff and landing currency to include manual line-of-sight flight operations in lieu of software or GPS-reliant "return-to-home" technology.

1.4.2. REDLine will track all FOD and/or report "Dropped Objects" not collected and/or accounted for.

1.4.3. REDLine will make every reasonable effort to maximize flight safety for sea and land operating areas, to include proprietary and/or aircraft-specific modifications such as:

1.4.3.1. Emergency hydro-activated flotation devices for over-water flights to preclude loss of craft and/or potential hazard to marine life.

1.4.3.2. Emergency hydro-activated independent lighting.

1.4.3.3. Emergency parachute(s) for over-land operations in the event of power or system failure for larger craft.

1.4.3.4. Alert siren or tone as a warning beforehand to alert those in the area of the impending operations as way to see and avoid a potential hazard.

1.4.3.5. Emergency siren or tone as a warning if aircraft is operating under other than normal conditions. For example, the emergency siren would sound for an early return due to a bad battery or power cell.

2. **The Unmanned Aircraft System** – REDLine will own and operate one or more of the following "off-the-shelf" proven aircraft systems, configurations and associated mobile ground stations with a mission payload not to exceed 85% of the maximum takeoff weight (MTOW):

	DJI T600 Inspire 1	SteadiDrone “Mavrik"	Freefly Cinestar X8
2.1 System	T600 User Manual Link	Mavrik User Manual Link	CineStar 8
2.2 Primary Method of Aircraft Control	Futaba-style Line of Sight Hand-Held Radio Control with GPS	Futaba-style Line of Sight Hand-Held Radio Control with GPS	Futaba-style Line of Sight Hand-Held Radio Control with GPS
2.3 Registration Number(s)	T600 Manufacturer Specifcations - Link	Mavrik Manufacturer Specifications - Link	CineStar Seller Specifications - Link
2.4 Propulsion	4 Brushless Electric Motors	4/8 MT4008 KV600 Brushless Electric Motors	8 MN4012 KV480 Brushless Electric Motors
2.5 Power Supply (approx. 18-35 minute flight)	TB48 5700 mAh 22.8V LiPo 6S 670g	8000 mAh Lipo 4S 16.8V (4.2V per cell)	10,000 mAh Lipo 6S
2.6 Nominal Weight	2,935 g / 6.47 lb	2,200 g / 4.85 lb	3050 g / 6.72 lb
2.6.1 Maximum Take Off Weight (MTOW)	3200 g / 7.06 lb (based on DJI Forum, not MFR spec)	2,800 g / 6.17 lb	5445 g / 12 lb
2.7 Width/ Length /Height	438 x 451 x 301 mm	777 x 500 x 205 mm	1,000 x 900 x 350 mm
2.8 Maximum speed	22 m/s ATTI no wind	15 m/s assumed	12 m/s assumed
2.9 Navigation capability	RF, GPS and Vision Positioning System (VPS)	RF, GPS by 3DR Systems “Pixhawk” w/ Advanced GPS features	RF, GPS by MikroKopter
2.10 Command & Control Telemetry (basic description)	Radio Controller 5.728~5.850 GHz 2.400~2.483 GHz to 2km	16 Channel Radio Controller 2.400~2.483 GHz	9 Channel Radio Controller 2.400~2.483 GHz
2.11 Camera and Gimbal	X3 FC350 on ZenMuse X3 9W / 11W in motion	Sony a7S on AlexMos gimbal by Basecam Electronics	Sony a7S on M5 gimbal by Movi
2.11.1 Camera Weight	included in T/O weight	489 g / 1.1 lb (no lens)	489 g / 1.1 lb (no lens)
2.11.2 Gimbal Weight	included in T/O weight	included in T/O weight	2,200 g + 125 g / 5.13 lb
2.11.3 Communication	Wi-Fi / RF to Ground	Wi-Fi / RF to Ground	Wi-Fi / RF to Ground
2.11.4 Integration	X3 is the DJI-supplied camera w T600 purchase	Camera size based on Manufacturer Suggestion	FreeFly systems make CineStar 8 and Movi M5
2.12 Safety Features	No fly zone feature hard-programmed in w GPS	LiPo Alarm Checker	Flight Simulation Software
2.13 Maintenance / Repair	As per Manufacturer	As per Manufacturer	As per Manufacturer
2.13.1 Software or Hardware Updates and Upgrades	REDLine will upgrade based on DJI updates and T600 User Manual Link	REDLine will maintain and upgrade based on manufacturer updates and User Manual updates	REDLine will maintain and upgrade based on manufacturer updates
2.13.2 RF Additional Information	10dBm@900m, 13dBm@5.8G, 20dBm@2.4G	n/a	n/a

2.13. Lost Link – REDLine aircraft will be programmed to fly to a location designated by the Pilot in Command as a "Safe Zone" and/or uninhabited location.

2.13.1.REDLine PIC will first attempt to regain command link.

2.13.2. A "Safe Zone" is a designated landing site that has been pre-briefed and announced by the Pilot in Command to mitigate potential damage to Participants and Non-Participants alike.

2.13.3. While operating from a mobile operating location such as onboard a ship or craft, or at sea, aircraft logic will be programmed to return to the last known GPS-based coordinates and hover at low altitude until power is depleted.

2.14. Oceanic Ditching – REDLine will recover an aircraft immediately upon indication of any safety, power or maintenance issues. If it becomes imminent that a safe recovery cannot be made, the Pilot in Command, assisted by the Safety Observer, will visually clear a place to ditch the aircraft as softly as possible.

2.14.1. The Pilot in Command will announce the intention to ditch and receive an all-clear call from the Safety Observer and Payload Specialist as time and conditions permit. Once the craft sets down, every reasonable attempt will be made to safely recover the downed craft. A report shall be made and submitted to the servicing Coast Guard and/or FSS in less than 24 hours in the event a craft is lost.

2.14.2. Over land, external photographic and video systems will be used to document the landing site when possible.

3. Unmanned Aircraft PIC – REDLine will be using the highest levels of manned and unmanned pilots to accomplish our missions. REDLine has a minimum qualification of a commercial pilot rating for all pilots.

3.1. PIC qualifications (directly in control)

3.1.1. All REDLine pilots will hold a commercial multi-engine aircraft rating.

3.1.2. All REDLine pilots will be current and qualified as Pilot in Command / Primary in a military or civilian aircraft with a DoD Military Physical and/or civilian Class II medical.

3.1.3. All REDLine pilots operating RPA/UAS as Pilot in Command will have a minimum of 500 flight hours to include ***any*** the following:

3.1.3.1. DoD, CBP, DHS or NASA Remotely Piloted Aircraft - 300 Hours Minimum

3.1.3.2. DoD, CBP, DHS or NASA Manned Aircraft (Fixed Wing or Rotary) - 300 Hours Minimum

3.1.3.3. Instructor Pilot (DoD, NASA, or FAA CFI) (Manned or RPA Aircraft) - 150 Hours Minimum

3.1.4. All REDLine pilots will be qualified in both PIC and Safety Observer positions.

3.1.4.1. REDLine PIC and SO will follow a proprietary training syllabus to become qualified as Commercial PIC and SO, able to accomplish flights over land or at sea.

3.1.5. All REDLine pilots will maintain aerial platform currency in accordance with REDLine qualification guidelines:

3.1.5.1. Currency is defined as 3 sorties per month plus 9 sorties over a 3 month look-back to include:

3.1.5.1.1. One Emergency Procedures scenario taken to a logical conclusion.

3.1.5.1.2. One Emergency Procedures practice session within 30 days of the flight taking place.

3.1.5.1.2.1. Computer simulation will be used to the maximum extent possible.

3.1.5.1.2.2. Real world EP flying will not deviate from safe operating parameters.

3.1.5.1.3. One Local Area Procedures Instructional Session before each new geographic location and within 30 days of the flight taking place.

4. UAS Operation Parameters

4.1. REDLine is based in Nevada, and will initially fly the training syllabus (Attachment B) in uninhabited privately owned areas near Henderson, NV for initial training and equipment validation.

4.1.1. Validation is REDLine's method to ensure off-the-shelf products (specifically flight stabilization, software, video capture and transmission devices and new equipment) are working as per manufacturer specifications, and not considered experimental.

4.1.2. Training and Validation flights will be Day, VMC, and outside of any flight corridors, away from communications or power transmission lines, and outside of 5 miles from any airport.

4.2. REDLine will operate missions initially over the Pacific Ocean and coordinate with specific FSDO's for times and airspace permission if required.

4.2.1. All commercial operations will be communicated to the appropriate FSDO not less than 72 hours in advance.

4.2.2. All commercial operations will include a review of Federal or Official Advisories and/or NOTAMS which shall be formally briefed before each flight or flying window.

4.2.2.1. A Flying Window can include one or more flights within the same area provided there is not a change in PIC and Safety Officer, weather or payload mission.

4.3. Overall Risk Mitigation Plan - Every effort will be made to Preserve human life. Preserve animal life, avoid intrusion to natural surroundings and any man-made property. REDLine will do this through a combination of flight discipline, expertise and programs to mitigate risk.

4.3.1.Flight Discipline - Commercial and Private Operations will be clearly briefed, flown and de-briefed to include lessons learned, reasonable improvements, and future risk identification.

4.3.2. Expertise - All crews will fly known parameters and shall not exceed identified operating limitations set by the manufacturer. Crews will be confident and knowledgeable with the systems they are operating, to include passing a REDLine internally approved test before being checked out in the system.

4.3.2.1. Defined aircrew responsibilities are briefed and documented before a crews' first flight.

4.3.3. Programs - All REDLine aircrew will be professionally trained in each of the following areas to maximize flight safety and mitigate flight risk.

4.3.3.1. Crew Resource Management - All crew members will be educated, briefed and debriefed on CRM.

4.3.3.2. Local Area Orientation - All aircrew will be provided reference charts to study and reference before flying to determine any potential hazards to flight (e.g. location and height of obstacles, populated areas), to help mitigate potential pattern conflicts, or excessive disruption of wildlife habitats. The orientation shall include familiarization of pre-determined alternate landing sites to be used in the event of a "lost link" contingency or other degraded system operations that would preclude landing at the primary takeoff/landing site.

4.3.3.3. Weather - All Aircrew have been extensively trained in weather. REDLine further trains aircrew under a proprietary syllabus (Attachment B) to, at a basic level, identify weather trends and conditions that effect smaller RPA systems. Any aircrew member

may terminate a mission for actual or predicted weather phenomena which prevent a safe flight.

4.3.3.4. Operational Risk Management Program - An assessment of personal and mission risks will be tallied to deliver an overall GO or NO-GO for each period / day of flight. See REDLine ORM Policy letter.

4.4. REDLine will conduct all operations in accordance with 14 CFR 91.119 Minimum Safe Altitudes: General

4.5. REDLine will conduct all operations under day visual flight rules

4.5.1. Flights, with proper aircraft lighting or marking, may include civil twilight.

5. Public Interest

5.1. REDLine commercial operations are in the highest Public Interest. Initial operations are being conducted by professional aviators with extensive manned and unmanned experience.

5.2. REDLine innovations will help reduce or negate petroleum-based aviation's current impact on marine life by using smaller, lighter, more efficient and far quieter electrically-powered systems.

5.2.1.Utilization of substantially lighter, emission-free unmanned aircraft represents a significant improvement over manned observation from boats, helicopters or aircraft.

5.2.1.1. Small unmanned aircraft are less intrusive than traditional aircraft or helicopters.

5.2.1.2. Noise pollution is minimized.

5.2.1.2.1. A small drone at 1 meter emits 82-85 dB as compared to helicopter emitting 100 dB at 100'. (Source: FAS, Purdue)

5.2.1.3. Oil/fuel residuals are 'zero' for electric operations.

5.2.1.4. Small unmanned aircraft are a significantly lesser risk compared to manned operations in the unlikely event of an unplanned landing.

5.2.1.4.1. Illuminated automatic flotation devices, attached to each aircraft, reduce the potential for lost aircraft.

5.2.1.4.2. Aircraft systems are secured to prevent lost or dropped objects.

5.3. REDLine is working with leading scientific and research organizations who advise and approve of RPA aviation as a platform to aid in scientific and documentary film work.

The following is a list of specific regulations that REDLine seeks relief from and/or describes how the regulation will be satisfied through REDLine RPA aviation operations:

- Section **21.185** prescribes, in pertinent part, the procedural requirements for issuing and changing design approvals, production approvals, airworthiness certificates, and airworthiness approvals.
    - ✓ ***REDLine*** *will not be seeking certification while providing an equivalent level of safety via REDLine maintenance, operation procedures and policies.*
- Section **45.23(b)** prescribes, in pertinent part, that when marks include only the Roman capital letter "N" and the registration number is displayed on limited, restricted or light- sport category aircraft or experimental or provisionally certificated aircraft, the operator must also display on that aircraft near each entrance to the cabin, cockpit, or pilot station, in letters not less than 2 inches nor more than 6 inches high, the words "limited," "restricted," "light-sport," "experimental," or "provisional," as applicable.
    - ✓ ***REDLine*** *will is not seeking 21.185 certification and therefore also seeking exemption to aircraft marking IAW section 45.23(b)*

- Section **61.113(a)** and **(b)** prescribes that—

    (a) no person who holds a private pilot certificate may act as a pilot in command of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as pilot in command of an aircraft.

    (b) a private pilot may, for compensation or hire, act as pilot in command of an aircraft in connection with any business or employment if:

        (1) The flight is only incidental to that business or employment; and

        (2) The aircraft does not carry passengers or property for compensation or hire.

    - ✓ ***REDLine*** *pilots maintain appropriate aeronautical rating, training and experience and seek exemption to carry property in a commercial capacity for compensation or hire on board RPA*

- Section **91.7(a)** prescribes, in pertinent part, that no person may operate a civil aircraft unless it is in an airworthy condition.

    ✓ ***REDLine*** *will not be seeking certification while providing an equivalent level of safety via REDLine maintenance, operation procedures and policies.*

- Section **91.9(b)(2)** prohibits operation of U.S.-registered civil aircraft 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.

    ✓ ***REDLine*** *will ensure all relevant material be kept accessible to the PIC in compliance with*

- Section **91.103** prescribes, in pertinent part, that each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight, to include—

    (a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC;

(b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:

(1) For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein; and

(2) For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.

✓ ***REDLine*** *will comply with 91.103 (information available immediately to the PIC and Safety Observer*

- Section **91.109** prescribes, in pertinent part, that no 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.

✓ ***REDLine*** *will adhere to 91.109. Flight instruction will be on private land property to the maximum extent possible IAW with REDLine qualification policy.*

- Section **91.119** prescribes that, except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

(a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

(b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

(c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

(d) Helicopters, powered parachutes, and weight-shift-control aircraft. If the operation is conducted without hazard to persons or property on the surface—

(1)A helicopter may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section, provided each person operating the helicopter complies with any routes or altitudes specifically prescribed for helicopters by the FAA; and

(2) A powered parachute or weight-shift-control aircraft may be operated at less than the minimums prescribed in paragraph (c) of this section.

✓ ***REDLine*** *seeks exemption from 91.119 for RPA systems that are in use for commercial purposes. Commercial RPA flights will be made without undue hazard to persons or property on the surface.*

- Section **91.121** requires, in pertinent part, each person operating an aircraft to maintain cruising altitude by reference to an altimeter that is set "to the elevation of the departure airport or an appropriate altimeter setting available before departure."

✓ ***REDLine*** *will fly aircraft and follow manufactured altitude monitoring guidelines backed up by safety observer visual clearing.*

- Section **91.151(a)** prescribes that 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.

  ✓ ***REDLine*** *will fly aircraft within described battery limitations. Prior to flight the PIC shall determine a minimum battery level/life required for normal return and landing (i.e. a "bingo" battery level). At pre-briefed time intervals all crew members shall determine battery level/ life and verbally confirm it. On-board warnings and alerts may be used to augment crew situational awareness.*

- Section **91.203(a)** prohibits, in pertinent part, any person from operating a civil aircraft unless it has within it (1) an appropriate and current airworthiness certificate; and (2) an effective U.S. registration certificate issued to its owner or, for operation within the United States, the second copy of the Aircraft Registration Application as provided for in § 47.31(c).

  ✓ ***REDLine*** *will not be seeking certification while providing an equivalent level of safety via REDLine maintenance and operation procedures and policies. Maintenance and operational capability will be based on manufacturers and system suppliers recommendations as well as practical REDLine aviation knowledge.*

- Section **91.203(b)** prescribes, in pertinent part, that no person may operate a civil aircraft unless the airworthiness certificate 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.

  ✓ ***REDLine*** *will not be seeking certification while providing an equivalent level of safety via REDLine maintenance and operation procedures and policies.*

- Section **91.405(a)** requires, in pertinent part, that an aircraft operator or owner shall have that aircraft inspected as prescribed in subpart E of the same part and shall, between required inspections, except as provided in paragraph (c) of the same section, have discrepancies repaired as prescribed in part 43 of the chapter. Section 91.407(a)(1) prohibits, in pertinent part, any person from operating an aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless it has been approved for return to service by a person authorized under § 43.7 of the same chapter.

  ✓ ***REDLine*** *will follow manufacturer provided information and internal maintenance policy and safety.*

- Section **91.407(a)(1)** prohibits, in pertinent part, any person from operating an aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless it has been approved for return to service by a person authorized under § 43.7 of the same chapter.

  ✓ ***REDLine*** *will follow manufacturer provided information and internal maintenance policy and safety.*

- Section **91.409(a)(2)** prescribes, in pertinent part, that no person may operate an aircraft unless, within the preceding 12 calendar months, it has had an inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.

✓ ***REDLine*** *will follow manufacturer provided information and internal maintenance policy and safety.*

- Section **91.417(a)** and **(b)** prescribes, in pertinent part, that—

(a) Each registered owner or operator shall keep the following records for the periods specified in paragraph (b) of this section:

(1) Records of the maintenance, preventive maintenance, and alteration and records of the 100-hour, annual, progressive, and other required or approved inspections, as appropriate, for each aircraft (including the airframe) and each engine, propeller, rotor, and appliance of an aircraft. The records must include—

(i) A description (or reference to data acceptable to the Administrator) of the work performed; and

(ii) The date of completion of the work performed; and

(iii) The signature, and certificate number of the person approving the aircraft for return to service.

(2) Records containing the following information:

(i) The total time in service of the airframe, each engine, each propeller, and each rotor.

(ii) The current status of life-limited parts of each airframe, engine, propeller, rotor, and appliance.

(iii) The time since last overhaul of all items installed on the aircraft which are required to be overhauled on a specified time basis.

(iv) The current inspection status of the aircraft, including the time since the last inspection required by the inspection program under which the aircraft and its appliances are maintained.

(v) The current status of applicable airworthiness directives (AD) and safety directives including, for each, the method of compliance, the AD or safety directive number and revision date. If the AD or safety directive involves recurring action, the time and date when the next action is required.

(vi) Copies of the forms prescribed by § 43.9(d) of this chapter for each major alteration to the airframe and currently installed engines, rotors, propellers, and appliances.

(b) The owner or operator shall retain the following records for the periods prescribed:

(1) The records specified in paragraph (a)(1) of this section shall be retained until the work is repeated or superseded by other work or for 1 year after the work is performed.

(2) The records specified in paragraph (a)(2) of this section shall be retained and transferred with the aircraft at the time the aircraft is sold.

(3) A list of defects furnished to a registered owner or operator under § 43.11 of this chapter shall be retained until the defects are repaired and the aircraft is approved for return to service.

✓ ***REDLine*** *will follow manufacturer or supplier provided information and internal maintenance policy and safety.*

ATTACHED DOCUMENTS:

REDLine A	Business Talking Points *
REDLine B	Commercial Pilot and Safety Observer Training Program *
REDLine C	Commercial Aircrew and Support Qualification Program *
REDLine D	Common GPS Checklist
REDLine E	Operational Risk Management Program *
REDLine F	RPA Operations Safety
REDLine G	Knowledge Test System 03
REDLine H	Proposed Fleet (Table 2.1 through 2.13.2 shown earlier in this product)

* Proprietary REDLine Aerospace LLC Information, Process or IP 2015

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
CERTIFICATE OF WAIVER OR AUTHORIZATION

ISSUED TO
REDLine Aerospace, LLC

2807 Strathallan Avenue
Henderson, NV 89044

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED
Operation of DJI T600 Inspire 1, SteadiDrone Mavrick, and Freefly Cinestar X8 Unmanned Aircraft Systems at or below 200 feet Above Ground Level (AGL) for the purpose of aerial data collection.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE
N/A

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

Note-This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions are set forth and attached.

This certificate FAA-2015-0373-333E is effective from May 9, 2015 to May 31, 2017 and is subject to cancellation at any time upon notice by the Administrator or his/her authorized representative.

BY DIRECTION OF THE ADMINISTRATOR

/S/

FAA Headquarters, AJV-115	Jacqueline R. Jackson
(Region)	(Signature)
May 7, 2015	Manager, UAS Tactical Operations Section
(Date)	(Title)

FAA Form 7711-1 (7-74)

STANDARD PROVISIONS

A. **General.**

1. The approval of this COA is effective only with an approved FAA Grant of Exemption.

2. A copy of the COA including the special limitations must be immediately available to all operational personnel at each operating location whenever UAS operations are being conducted.

3. This authorization may be canceled at any time by the Administrator, the person authorized to grant the authorization, or the representative designated to monitor a specific operation. As a general rule, this authorization may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with the authorization is cause for cancellation. The operator will receive written notice of cancellation.

B. **Safety of Flight.**

1. The operator or pilot in command (PIC) is responsible for halting or canceling activity in the COA area if, at any time, the safety of persons or property on the ground or in the air is in jeopardy, or if there is a failure to comply with the terms or conditions of this authorization.

See-and-Avoid

Unmanned aircraft have no on-board pilot to perform see-and-avoid responsibilities; therefore, when operating outside of active restricted and warning areas approved for aviation activities, provisions must be made to ensure an equivalent level of safety exists for unmanned operations consistent with 14 CFR Part 91 §91.111, §91.113 and §91.115.

a. The pilot in command (PIC) is responsible:

- To remain clear and give way to all manned aviation operations and activities at all times,
- For the safety of persons or property on the surface with respect to the UAS, and
- For compliance with CFR Parts 91.111, 91.113 and 91.115

b. UAS pilots will ensure there is a safe operating distance between aviation activities and unmanned aircraft (UA) at all times.

c. Visual observers must be used at all times and maintain instantaneous communication with the PIC.

d. The PIC is responsible to ensure visual observer(s) are:

- Able to see the UA and the surrounding airspace throughout the entire flight, and
- Able to provide the PIC with the UA's flight path, and proximity to all aviation activities and other hazards (e.g., terrain, weather, structures) sufficiently for the PIC to exercise effective control of the UA to prevent the UA from creating a collision hazard.

e. Visual observer(s) must be able to communicate clearly to the pilot any instructions required to remain clear of conflicting traffic.

2. Pilots are reminded to follow all federal regulations e.g. remain clear of all Temporary Flight Restrictions, as well as following the exemption granted for their operation.

3. The operator or delegated representative must not operate in Prohibited Areas, Special Flight Rule Areas or, the Washington National Capital Region Flight Restricted Zone. Such areas are depicted on charts available at http://www.faa.gov/air_traffic/flight_info/aeronav/. Additionally, aircraft operators should beware of and avoid other areas identified in Notices to Airmen (NOTAMS) which restricts operations in proximity to Power Plants, Electric Substations, Dams, Wind Farms, Oil Refineries, Industrial Complexes, National Parks, The Disney Resorts, Stadiums, Emergency Services, the Washington DC Metro Flight Restricted Zone, Military or other Federal Facilities.

4. All aircraft operated in accordance with this Certificate of Waiver/Authorization 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.

C. **Reporting Requirements**

1. Documentation of all operations associated with UAS activities is required regardless of the airspace in which the UAS operates. NOTE: Negative (zero flights) reports are required.

2. The operator must submit the following information through mailto:9-AJV-115-UASOrganization@faa.gov on a monthly basis:
   a. Name of Operator, Exemption number and Aircraft registration number
   b. UAS type and model
   c. All operating locations, to include location city/name and latitude/longitude
   d. Number of flights (per location, per aircraft)
   e. Total aircraft operational hours
   f. Takeoff or Landing damage

g. Equipment malfunctions. Reportable malfunctions include, but are not limited to the following:

(1) On-board flight control system

(2) Navigation system

(3) Powerplant failure in flight

(4) Fuel system failure

(5) Electrical system failure

(6) Control station failure

3. The number and duration of lost link events (control, performance and health monitoring, or communications) per UA per flight.

D. **Notice to Airmen (NOTAM).**

A distant (D) NOTAM must be issued when unmanned aircraft operations are being conducted. This requirement may be accomplished:

a. Through the operator's local base operations or NOTAM issuing authority, or

b. By contacting the NOTAM Flight Service Station at 1-877-4-US-NTMS (1-877-487-6867) not more than 72 hours in advance, but not less than 24 hours prior to the operation, unless otherwise authorized as a special provision. The issuing agency will require the:

(1) Name and address of the pilot filing the NOTAM request

(2) Location, altitude, or operating area

(3) Time and nature of the activity.

AIR TRAFFIC CONTROL SPECIAL PROVISIONS

A. **Coordination Requirements.**

1. Operator filing and the issuance of required distance (D) NOTAM, will serve as advance ATC facility notification of UAS operations in an area.

2. Operator must cancel NOTAMs when UAS operations are completed or will not be conducted.

3. Coordination and deconfliction between Military Training Routes (MTRs) is the operator's responsibility. When identifying an operational area the operator must evaluate whether an MTR will be affected. In the event the UAS operational area overlaps (5 miles either side of centerline) an MTR, the operator will contact the scheduling agency 24 hours in advance to coordinate and deconflict. Approval from the scheduling agency is not required. Scheduling agencies are listed in the Area Planning AP/1B Military Planning Routes North and South America, if unable to gain

access to AP/1B contact the FAA at email address mailto:9-AJV-115-UASOrganization@faa.gov with the IR/VR routes affected and the FAA will provide the scheduling agency information. If prior coordination and deconfliction does not take place 24 hours in advance, the operator must remain clear of all MTRs.

B. **Communication Requirements.**

1. When operating in the vicinity of an airport without an operating control tower, announce your operations in accordance with the FAA Aeronautical Information Manual (AIM) 4-1-9 Traffic Advisory Practices at Airports without Operating Control Towers.

C. **Flight Planning Requirements.**

This COA will allow small UAS (55 pounds or less) operations during daytime VFR conditions under the following conditions and limitations:

(1) At or below 200 feet AGL; and

(2) Beyond the following distances from the airport reference point (ARP) of a public use airport, heliport, gliderport, or seaport listed in the Airport/Facility Directory, Alaska Supplement, or Pacific Chart Supplement of the U.S. Government Flight Information Publications.

a) 5 nautical miles (NM) from an airport having an operational control tower; or

b) 3 NM from an airport having a published instrument flight procedure, but not having an operational control tower; or

c) 2 NM from an airport not having a published instrument flight procedure or an operational control tower; or

d) 2 NM from a heliport, gliderport or seaport

D. **Emergency/Contingency Procedures.**

1. Lost Link/Lost Communications Procedures:

- 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 and land.

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

2. Any incident, accident, or flight operation that transgresses the lateral or vertical boundaries defined in this COA must be reported to the FAA via email at

mailto:9-AJV-115-UASOrganization@faa.gov 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**

AUTHORIZATION

This Certificate of Waiver or Authorization does not, in itself, waive any Title 14 Code of Federal Regulations, nor any state law or local ordinance. Should the proposed operation conflict with any state law or local ordinance, or require permission of local authorities or property owners, it is the responsibility of the operator to resolve the matter. This COA does not authorize flight within Special Use airspace without approval from the scheduling agency. The operator is hereby authorized to operate the small Unmanned Aircraft System in the National Airspace System.