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

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

August 26, 2015

Exemption No. 12609
Regulatory Docket No. FAA–2015-1925

Mr. Devon Humphrey
CEO
Flightline Geographics LLC
150 Sunset Ridge
Dripping Springs, TX 78620

Dear Mr. Humphrey:

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 14, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Flightline Geographics LLC (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial mapping, GIS, data collection, aerial imaging, and damage assessment.

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 RQ-265.

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 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, Flightline Geographics 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.

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

Conditions and Limitations

In this grant of exemption, Flightline Geographics 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 RQ-265 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 August 31, 2017, unless sooner superseded or rescinded.

Sincerely,

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

Enclosures

FLIGHTLINE GEOGRAPHICS
Aerial visual intelligence for GIS

May 14, 2015

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

Re: Flightline Geographics LLC Petition for Section 333 Exemption for RPA Technologies RQ-265

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, Flightline Geographics LLC (Flightline) is petitioning the Federal Aviation Administration (FAA) for an exemption from the Federal Aviation Regulations (FARs) requested below concerning small unmanned aerial systems (UAS). Section 333 of the FMRA promotes UAS integration into the national airspace by granting the FAA authority to allow for the safe operation of certain UAS within the national airspace.

Flightline specializes in aerial data collection for Geographic Information Systems (GIS). Flightline is the U.S. reseller for RPA Technologies Ltd (RPA) RQ-265 small UAS. Our team has attended factory training by RPA and continues to practice missions through the RQ-265 X-Planes Simulator plug-in, which provides a realistic mission planning and execution environment for rehearsing missions and gaining additional experience.

Flightline employs flight crews consisting of factory-trained or factory-supplied UAS pilots, FAA-licensed pilots, visual observers and post-processing GIS technicians. Flightline has participated in several government and university-run research projects under COAs in Texas since 2012, by providing aerial image capture consulting and processing. In addition, Flightline is aligned with the Lone Star UAS Center for Excellence and Innovation at Texas A&M University and plans to perform safe and controlled UAS operational testing for GIS applications under a variety of conditions and is willing to share the flight data with the FAA.

Flightline proposes to operate small UAS subject to restrictions and conditions that will ensure an equivalent level of safety and that are at least as stringent as those that FAA has found to be acceptable in its most recent grants of petitions under Section 333, including numbers 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). Further, this petition raises no national security or privacy concerns. Flightline therefore respectfully submits that prompt grant of this petition is warranted.

As a GIS data content provider, Flightline will capture Remote Sensing data in a safe and effective manner for multiple industries and governmental uses. For this reason, Flightline will use the RPA Technologies RQ-265 with off-the-shelf Digital SLR cameras and other similar lightweight sensor technologies, as they become available. This aircraft weighs less than 55 pounds and has been operated safely for several years with the approval of civil aviation authorities in several other countries including New Zealand, Australia, Canada and others. *This aircraft, due to its advanced safety features, including the MILSPEC autopilot and emergency*

parachute landing mode, has even been approved for operation over urban areas in New Zealand by their CAA. The detailed specifications of the aircraft are listed in a section below.

Flightline will use experienced pilots and visual observers (VOs) for all of its UAS operations. All pilots and VOs will receive factory UAS training and flight hours in accordance with manufacturer operational manuals before approval to fly is given.

Flightline is requesting this exemption in order to provide services for many industries, including but not limited to:

1. Mapping and GIS – High definition image data for small-scale project locations that are not currently cost-effective or safe for manned capture (environmental studies, utilities, energy exploration, emergency management, wetlands delineation, storm damage assessment, pipeline inspection, etc.)
2. Government Agencies – Federal, State and Local (Local governments with small scale project areas and limited budgets will be better able to afford UAS services, as opposed to manned flights)
3. Engineering – Site assessment, construction, documentation
4. Insurance – Damage assessment and verification
5. Agriculture – NDVI processing of aerial imagery for vegetative health and general range management

Flightline is requesting to use the UAS in rural locations only for GIS data collection for a variety of end user customers. These project locations will fall outside of heavily populated areas when plotted on VFR Sectional Aeronautical Charts and other map-based GIS sources and will not be within five (5) miles of any airport (unless FAA has approved such operations and Flightline has a written agreement with the airport manager).

Flightline's initial work will take place near its main office in Dripping Springs, TX. Projects will be pursued initially within Texas and surrounding states, and may expand to other locations that are economically suitable.

Flightline is submitting the manufacturer's Flight Operations Manual, Maintenance Manual and sample SOP Flight Ops Checklist confidentially pursuant to 14 CFR Section 11.35(b). The Manuals contain confidential, proprietary and commercially sensitive information that has not been made available to the public and that is protected under the Freedom of Information Act, 5 U.S.C. § 552, *et seq.*

Petitioner Name and Address:

Flightline Geographics LLC
150 Sunset Ridge
Dripping Springs, TX 78620
Devon Humphrey – CEO
devon@flightlinegeographics.com

Exemptions Requested:

Flightline Geographics LLC is requesting this waiver as it applies to the following FARs:

- 14 CFR Section 61.113 (a) and (b): Private pilot privileges and limitations
- 14 CFR Section 61.23 (a) and (c): Operation with a driver's license in lieu of FAA medical certificate
- 14 CFR Section 61.101 (e)(4) and (5): Allow private pilot certificate holder to operate UAS for compensation
- 14 CFR Section 61.113(a): Allow sport pilot certificate holder to operate UAS for compensation
- 14 CFR Section 61.315(a): Allowing holder of sport pilot certificate to serve as PIC of UAS
- 14 CFR Section 91.7(a): Civil aircraft airworthiness
- 14 CFR Section 91.119(c): Minimum altitude requirements
- 14 CFR Section 91.121: Altimeter requirements
- 14 CFR Section 91.151(a)(1): Fuel requirements
- 14 CFR Section 91.405(a): Maintenance requirements
- 14 CFR Section 91.407(a): Maintenance requirements
- 14 CFR Section 91.409(a)(1)(2): Inspection frequency
- 14 CFR Section 91.417(a)(b): Maintenance records

Flightline's History

Flightline has been processing and delivering GIS data in the form of aerial visual intelligence from manned and unmanned platforms since 2012. Flightline has participated on previous projects for Federal Agencies and major Public Universities under FAA COAs. Flightline's role has been as a GIS subject matter expert and data processing service provider working with UAS data for agricultural and emergency management applications. This has provided exposure to and participation in professionally-run and safe UAS flight operations since 2012. With the growth of the UAS industry and recent commercial exemptions that have been granted, Flightline is petitioning to safely and legally operate its own UAS in the National Airspace.

Flightline is the U.S. reseller for the RQ-265 UAS manufactured in New Zealand. This aircraft has been accepted by civil aviation authorities in New Zealand, Australia, Canada and many other modern countries. The aircraft can carry true color (RGB), infrared (IR) and other lightweight sensors for specialized imagery applications for GIS and mapping, including agriculture, engineering, environmental and energy transmission line right-of-way monitoring. The system is hand-launched and parachute-landed and its safety features are recognized by civil aviation authorities in the countries listed above.

The RQ-265 includes a MILSPEC DTA autopilot which incorporates many recognized safety features, including automated flight termination system by parachute under a variety of fault

conditions, maintenance of a Minimum Safe Altitude (MSA) and terrain collision avoidance measures using the world-wide SRTM elevation model. While the system is designed to be able to operate beyond line-of-sight, Flightline will not operate in this mode, always remaining within line-of-sight of the PIC and VO.

Summary of operations

1. All flights will be conducted in accordance with the manufacturer's Flight Operations Manual (FOM), following Visual Flight Rules (VFR).
2. The UAS with payload will weigh less than 55 pounds.
3. All flights will include a Pilot in Command (PIC) and Visual Observer (VO). Flights will be operated within visual line of sight of the PIC and VO. The PIC and VO will be able to communicate verbally at all times.
4. The PIC and VO will have manufacturer's training and flight hours with the RQ-265 in accordance with the manufacturer's requirements.
5. The PIC must hold at least an FAA Sport Pilot Certificate. The PIC must also hold a current valid U.S. driver's license issued by a state, the District of Columbia, Puerto Rico, a territory, a possession, or the Federal government.
6. Prior to each flight, the PIC will inspect the UAS to confirm that it meets manufacturer specifications for safe flight. The UAS ground control system software requires that all items on the pre-flight checklist be completed prior to initiating a launch.
7. After a maintenance event involving a critical component of the UAS, a test flight will be performed and logged in the aircraft maintenance logs.
8. A pre-flight briefing will be conducted describing the planned UAS mission prior to each flight. This pre-flight briefing is delivered by the PIC and is mandatory for all VOs.
9. All flights will be conducted within a defined "sterile area" containing a security perimeter for the flight operations area. These areas, along with any identified "UAS no fly zones" around tall structures or elevation features will be clearly identified on the flight ground control station computer, where the location and status of the aircraft is also monitored in real time.
10. All required permissions and notifications to federal, state and local governments, including law enforcement, fire or other appropriate governmental agencies.
11. Written or verbal permission from the property owner will be obtained.
12. In accordance to the manufacturer's FOM, both primary and alternate landing areas will be designated before any UAS flight is attempted.
13. The UAS will not be flown at night or when weather conditions may prevent a visual observation of the vehicle throughout the duration of the flight.
14. Maximum flight time will be less than 90 minutes per the manufacturer's recommendation. The UAS autopilot monitors battery charge in real time and will enter return mode and land at the pre-designated landing location with 20% battery remaining.
15. Airspeed will not exceed 87 knots
16. Flights will be operated at an altitude of 400 feet AGL or less and more than 100 feet above any building or structure to be imaged or inspected.
17. The UAS will remain clear and yield to all manned aircraft.
18. If GPS signal is lost but communications link remains, the PIC will manually return the aircraft to one of the pre-determined landing zones or perform an immediate landing as per the manufacturer's FOM.
19. In the unlikely event of a lost link/communication loss, the RQ-265 is preprogrammed to return to a pre-designated landing location within the security perimeter and to perform a safe automated landing procedure by parachute.

20. Flightline will follow all manufacturer maintenance and inspection procedures, schedules and documents for the UA and log each event in the aircraft maintenance logs in accordance with the manufacturer's FOM.

Aircraft to be Used

Flightline Geographics will be operating the RQ-265 UAS from RPA Technologies Ltd. The RQ-265 is an all-electric aircraft that provides precision 3D mapping and real- time thermal infrared and full motion video capabilities. The system is hand-launched and parachute landed. A detailed pre-flight procedure is prescribed by the manufacturer in its FOM and must be confirmed prior to any flight within the flight control software. (A launch will not be allowed by the software if any items from the pre-flight checklist are missed.) The RQ-265 is the 2015 version of the RQ-84Z, which has a proven safety record in several countries throughout the modern world, including New Zealand, Australia, Canada, Mexico, Mongolia, Turkey, among others.

The RQ-265 is landed by parachute and provides an excellent platform for aerial sensing operations. The parachute is both an emergency and automated primary landing method for the RQ-265. A skid landing is also an option, though not the preferred method. The RQ-265 is well suited for collection of larger project areas (i.e. approximately one square mile, or slightly more, per flight) due to its long endurance.

RPA RQ-265 Specifications include:

- Wing Span: 102"
- Length: 43.2"
- Weight 11 lbs with standard camera payload
- Top speed: 45 knots
- Cruise Speed: 32 knots
- Endurance: 1.5 hours

Extent of relief

Flightline seeks an exemption from several provisions of 14 CFR Part 91 as part of the UAS exemption. The following list details the exemptions requested and the mitigation procedures that will ensure an equivalent level of safety to the public and the national airspace. FAA has granted similar exemptions to those requested below in, for example, Exemption Nos. 11136, 11138, 11150 and 11153.

14 CFR Section 61.113 (a) and (b)

Section 61.113 (a & b) limits private pilots to non-commercial flight operations. Since Flightline's primary business is commercial GIS data acquisition during flight, an exemption from this section is necessary.

Equivalent Level of Safety

Because the UAS does not carry crew or persons, the equivalent level of safety can be achieved by pilots who have completed the Manufacturer's required training course and who hold a minimum of a Sport Pilot certificate. The FAA itself, in Exemption No. 11462, concluded that Sport Pilot certificate will ensure that the PIC has proper knowledge and training. Flightline agrees that the awareness of airspace restrictions, communication with ATC and situational awareness concerns to safely operate within the National Airspace are satisfied by a minimum of a Sport Pilot certificate.

The RQ-265 UAS is remotely piloted with no passengers or crew on board and the MILSPEC autopilot and parachute primary and emergency landing procedures provide an added measure of safety against human error in flying the UAS. For these reasons, Flightline is certain that an equivalent level of safety will be maintained with this exemption.

14 CFR Section 61.23(a)&(c), 61.101(e)(4)&(5), 61.315(a): Who can Operate a UAS commercially

The FAA has previously allowed operation with a federal or state-issued driver's license in lieu of an FAA-medical certificate, to allow the holder of a private pilot certificate to operate a UAS for compensation, and to allow holder of a sport pilot certificate to serve as PIC of a UAS.

Equivalent Level of Safety

It has been previously recognized that the holder of a minimum of a Sport Pilot Certificate can provide an equivalent level of safety to a Private Pilot certificate.

Flightline is requesting exemption to the above regulations as only holders of a *minimum* of a sport pilot certificate will be operating our UAS.

14 CFR Section 91.7(a): Airworthiness

Section 91.7(a) requires that no person may operate a civil aircraft unless it is in an airworthy condition. To the extent that this regulation would require an airworthiness certificate for the aircraft, Flightline requests an exemption.

Equivalent Level of Safety

All UAS operated by Flightline will be under 55 pounds, including payload, and will operate in a defined area made known to local ATC. Furthermore, the vehicles Flightline will operate do not carry personnel, explosive materials or flammable liquid fuels or other potentially hazardous materials. The vehicles to be used will be maintained to the strict tolerances of Flightline's Director of Maintenance and the guidelines set out in the operations manuals of the manufacturer 's Flight Operations Manual (FOM). The RQ-265 and its predecessor, the RQ-84Z have many thousands of successful flight hours logged. This UAS, piloted by Flightline's pilots, does not represent a risk to the national airspace or the public.

14 CFR Section 91.119(c): Minimum altitude requirements

Flightline requests an exemption from the minimum safe altitude requirements specified in 14 CFR 91.119(c). The altitude required by this section is 500 feet above the surface and persons, vehicles, etc. Flightline plans to operate the UAS at or below 400 feet AGL (but not less than 100 feet above structures, buildings, vehicles, etc.) in order to properly collect imagery data and to avoid entering the national airspace at an altitude that could possibly conflict with manned aircraft.

Equivalent Level of Safety

As explained in this document, the manufacturer's FOM, every precaution will be taken to assure that the UAS is operating safely with existing air traffic and poses no risk to ground assets and persons.

14 CFR Section 91.121: Altimeter requirements

This section requires that the pilot of the aircraft use an altimeter on board the aircraft to determine altitude. The altimeter must be set based on the barometric pressure of the departing airport and airports in route. Petitioner seeks an exemption from 14 CFR Part 91.121 as GPS is instead used by the autopilot to provide altitude measurements in feet AGL.

Equivalent Level of Safety

As part of the flight monitoring software of each UAS, the GPS altitude is displayed within the Ground Control Station display and audible feedback prompts will be given during flight when altitude approaches 400 feet. Pre-flight checks will confirm the correlation of the GPS altitude of the location of the flight compared to the flight plan to confirm the plan's accuracy and make any necessary changes (including the abort of the mission). As an additional safety measure, the manufacturer's FOM and flight control software both require a minimum of 7 GPS satellites to be in view in order to proceed with pre-flight and launch, ensuring a valid GPS location and altitude.

14 CFR Section 91.151: Fuel requirements

Petitioner requests exemption from 14 CFR Part 91.151 which 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"

The remaining section does not apply, as the UAS will not be flown at night. Since most UAS flights will be 60-90 minutes in duration, another method of determining safe flight limits must be considered.

Equivalent Level of Safety

Flightline and the flight control software will require that in order for the pilot to take off (initiate a mission), the battery charge displayed by the system must be a full charge (>97%) and the aircraft will end its mission such that the total flight time does not exceed 90 minutes, in accordance with the manufacturer's recommendation. This will ensure that the UAS lands safely at one of the designated landing areas before battery life becomes critical or unstable. The flight control software includes battery monitoring and reserve charge features, ensuring a safe return with sufficient battery to make a parachute landing. There is a separate power supply that provides power to the parachute-based Flight Termination System, even if main power is lost. Sufficient reserve battery power is always maintained as recommended by the manufacturer and is monitored by the flight control system at the Ground Control Station. Audible warnings are issued to the PIC as the lower limit of operation is reached.

14 CFR Section 91.405, 14 CFR Section 91.407, 14 CFR Section 91.409, 14 CFR Section 91.417: Maintenance Reporting and Maintenance Inspection frequency

Petitioner seeks an exemption from the above regulations and their references to 14 CFR Part 43. 14 CFR 91.405(a) states that each owner or operator of an aircraft "Shall have that aircraft inspected as prescribed in subpart E of this part and shall between required inspections, except as provided in paragraph (c) of this section, have discrepancies repaired as prescribed in part 43 of this chapter".

Since the UAS will not have an airworthiness certification, these regulations will not apply to these aircraft. Additionally, the nature of the vehicles is that of easily replaced off-the-shelf parts and a much smaller number of parts that can be replaced – making inspection schedules less fixed and field repairs possible.

Equivalent Level of Safety

Using the manufacturer's FOM and maintenance manual, an inspection and preventative maintenance schedule will be followed for the RQ-265. Because the UAS is dismantled for storage and shipment after each flight, a thorough inspection will be performed after the reassembly of the vehicle and before each flight. The maintenance will be overseen by Flightline's Director of Maintenance (DOM) who will ensure that the inspections and preventative maintenance are performed and logged and signed in the UAS log book. It is Flightline's intention to keep maintenance logs for each of its UAS, as prescribed by the manufacturer, and to make these available to FAA inspection at any time. The DOM will ensure that any PIC or VO is able to perform field repairs and replacements as necessary. All field repairs and replacements will be correctly logged and signed on site by the PIC.

Public Interest

Granting Flightline this waiver is in the public interest for several reasons. The aerial imagery and geospatial data add to the public's benefit including agricultural analysis, environmental studies, construction monitoring, safe and rapid disaster response, damage assessment, emergency response planning and a wide range of other GIS uses to be determined by the customers. Many of these applications are not cost-effectively or safely performed by manned aircraft and the lower cost and more rapid turn-around times for the data and imagery means that customers are more able to utilize this capability for projects in the public interest and on a more frequent basis.

Flightline's use of UAS will decrease the need for manned aircraft in the air and thus reduce pollution, airspace congestion, and risk to crews and others. Flightline recognizes and supports the need to establish standards for UAS operators, which will safeguard the NAS. Flightline will offer and conduct UAS operations using skilled professionals who will adhere to the required safety standards.

The UAS operated by Flightline will be under 55 pounds including payload, will operate in a defined area made known to local ATC, and will not carry personnel, explosive materials or flammable liquid fuels or other potentially hazardous materials – only cameras and related imaging sensors.

Summary to be Published in the Federal Register (if necessary)
Petitioner: Flightline Geographics LLC

Sections of 14 CFR Affected: 14 CFR Section 61.113, 14 CFR Section 91.7, 14 CFR Section 91.119, 14 CFR Section 91.121, 14 CFR Section 91.151, 14 CFR Section 91.405, 14 CFR Section 91.407, 14 CFR Section 91.409, 14 CFR Section 91.417.

Description of Relief Sought: Petitioner seeks relief from the requirements of 14 CFR Section 61.113, 14 CFR Section 91.7, 14 CFR Section 91.119, 14 CFR Section 91.121, 14 CFR Section 91.151, 14 CFR Section 91.405, 14 CFR Section 91.407, 14 CFR Section 91.409 and 14 CFR Section 91.417 in order to conduct aerial data collection missions for GIS using small unmanned aerial systems for commercial uses in the service of many business and governmental sectors.

Conclusion
Flightline Geographics LLC believes that the criteria provided in Section 333 of the FMRA regarding size, weight, speed, operating capabilities, proximity to airports and populated areas, operation within visual line of sight, and national security have been satisfied. Flightline's commitment to follow these criteria in a professional manner should justify the granting of this exemption request. Please contact Devon Humphrey at Flightline Geographics LLC with any questions or for more information.

Devon Humphrey
Flightline Geographics LLC
150 Sunset Ridge
Dripping Springs, TX 78620
512-264-3246
devon@flightlinegeographics.com

Attachments: RPA RQ-265 Flight Operations Manual (including sample SOPs, flight logs and check lists), Flight Operations Checklist and Maintenance Manual. These documents are submitted as Confidential Documents under 14 CFR 11.35(b) and exempt from disclosure under the Freedom of Information Act.