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

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

August 25, 2015

Exemption No. 12586
Regulatory Docket No.FAA-2015-0323

Mr. Adam Thorngate-Gottlund
Counsel for AGERpoint, Inc.
The Royse Law Firm
1717 Embarcadero Road
Palo Alto CA 94303

Dear Mr. Thorngate-Gottlund:

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 5, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of AGERpoint, Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct data collection operations which will be used for early stage disease detection, crop inventory, and mapping.

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 FOV Skyhunter 1.8 and AGERpoint Penguin B.

The petitioner requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*. In accordance with the statutory criteria provided in Section 333 of Public Law 112−95 in reference to 49 U.S.C. § 44704, and in consideration of the size, weight, speed, and limited operating area associated with the aircraft and its operation, the Secretary of Transportation has determined that this aircraft meets the conditions of Section 333. Therefore, the FAA finds that the requested relief from 14 CFR part 21, *Certification procedures for products and parts, Subpart H—Airworthiness Certificates*, and any associated noise certification and testing requirements of part 36, is not necessary.

The Basis for Our Decision

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

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

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

Our Decision

In consideration of the foregoing, I find that a grant of exemption is in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. 106(f), 40113, and 44701, delegated to me by the Administrator, AGERpoint, Inc. is granted an exemption from 14 CFR §§ 61.23(a) and (c), 61.101(e)(4) and (5), 61.113(a), 61.315(a), 91.7(a), 91.119(c), 91.121, 91.151(a)(1), 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b), to the

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

extent necessary to allow the petitioner to operate a UAS to perform aerial data collection. This exemption is subject to the conditions and limitations listed below.

Conditions and Limitations

In this grant of exemption, AGERpoint, Inc. 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 FPV Skyhunter 1.8 and AGERPoint Penguin B 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

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
WASHINGTON, DC

Regulatory Docket No. _____

IN THE MATTER OF THE PETITION FOR EXEMPTION OF:
AGERPOINT, INC.
FOR AN EXEMPTION SEEKING RELIEF FROM THE REQUIREMENTS OF TITLE 14 OF THE CODE OF FEDERAL REGULATIONS SECTIONS 21.185, 45.23(b), 61.113 (a) & (b), 91.7(a), 91.9(b), 91.103, 91.121, 91.119, 91.203(a) & (b), 405(a), 407(a)(1), 409(a)(2), AND 417(a) & (b)
CONCERNING OPERATION OF AN UNMANNED AIRCRAFT SYSTEM IN THE NATIONAL AIRSPACE
PURSUANT TO SECTION 333 OF THE
FAA MODERNIZATION AND REFORM ACT OF 2012

Submitted on February 5, 2015

Adam Thorngate-Gottlund
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GLOSSARY OF ABBREVIATIONS

AGL	Above Ground Level
ATC	Air Traffic Control
COA	Certificate of Authorization
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation NAS
	National Airspace System
PIC	Pilot In Command
Section 333	FAA Modernization and Reform Act of 2012, Section 333
SMS	Safety Management System
UAS	Unmanned Aircraft System
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

SUMMARY

AGERpoint, Inc. seeks exemption from the requirements of 14 C.F.R. §§ 45.23(b), 61.113 (a) and (b), 91.7(a), 91.9(b), 91.103, 91.121, 91.119, 91.203(a) and (b), 405(a), 407(a)(1), 409(a)(2), 417(a) and (b), as well as the restricted category airworthiness certification standards specified in 14 C.F.R. § 21.185, including the requirement to have a certificate of airworthiness as contemplated by 14 C.F.R. Part 21. AGERpoint, Inc. (hereinafter referred to as "AGERpoint") is an agricultural consulting company that provides crop inventory and analysis to growers of permanent crops (e.g. tree, bush and vine crops). AGERpoint is in the process of acquiring a UAV Factory Penguin B Unmanned Aerial Vehicle Platform (hereinafter referred to as the "Penguin B UAV Platform"), functionally identical to Unmanned Aerial Vehicles ("UAVs") used by the United States Defense Department, as well as various research institutions, in order to provide these services. This exemption will permit AGERpoint to operate this Unmanned Aircraft System ("UAS") safely over certain rural areas of the national airspace (the "NAS"), in order to collect data which will be used for early stage disease detection, crop inventory and mapping using instruments including LiDAR, Multispectral, hyperspectral, photographic and thermal sensors which require low altitude and low speed collection of data – something the UAS is uniquely qualified to do – without complying with FAA regulations which would be impossible for a UAS or preclude the operations AGERpoint contemplates.

BACKGROUND

A. Unmanned Aircraft System: Penguin B UAV Platform

AGERpoint seeks an exemption to operate a Penguin B UAV Platform for compensation or hire within the NAS. The Penguin B UAV Platform is comprised of an unmanned aircraft and a transportable ground station. The Penguin B UAV Platform has a maximum takeoff weight of approximately 47 pounds, a wingspan of 130 inches, and a length of 89 inches. The Penguin B UAV Platform unmanned aircraft is equipped with a single propeller driven by a small gasoline powered internal combustion engine.

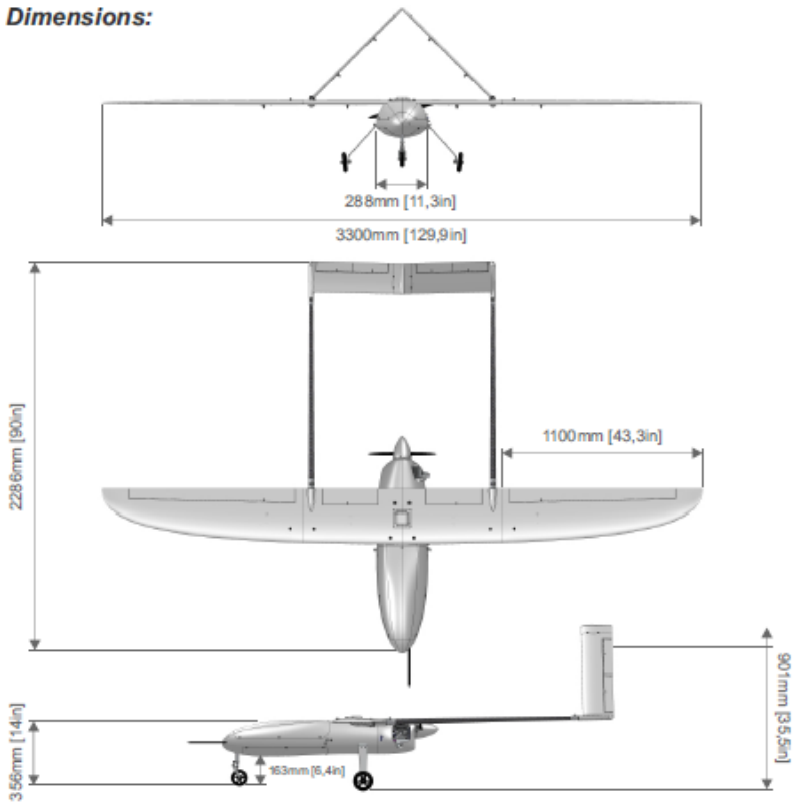

Figure 1: The Penguin B UAV Platform unmanned aircraft.

B. Safe Operational History of the Penguin B UAV Platform unmanned aircraft in the NAS

The Penguin B UAV has operated safely within the NAS as a research platform for a variety of organizations, including (but not limited to) Virginia Tech, California State University, Texas A&M, Kansas State University, the United States Naval Research Labs, and the United States Air Force. The Air Force alone has logged over 100 hours of flight time with the Penguin B UAV over three years in service, representing 66 total sorties, of which 38 took place during 2014.

BASIS FOR PETITION

Petitioner, AGERpoint, Inc., by and through undersigned counsel, pursuant to the provisions of the Federal Aviation Regulations (14 C.F.R. § 11.61) and the FAA Modernization and Reform Act of 2012, Section 333, *Special Rules for Certain Unmanned Aircraft Systems* (hereafter "Section 333"), hereby petitions the Administrator for an exemption from the requirements of 14 C.F.R. §§ 45.23(b), 61.113 (a) and (b), 91.7(a), 91.9(b), 91.103, 91.121, 91.119, 91.203(a) and (b), 405(a), 407(a)(1), 409(a)(2), and 417(a) and (b), as well as the restricted category airworthiness certification standards specified in 14 C.F.R. § 21.185, including the requirement to have a certificate of airworthiness as contemplated by 14 C.F.R. Part 21. In accordance with Federal Aviation Regulation ("FAR") Section 21.16, *Special Conditions* (14 C.F.R. § 21.16), AGERpoint further requests that, to the extent necessary, the Administrator prescribe such special conditions for the intended operation of the Penguin B UAV Platform as the Administrator finds necessary to establish a level of safety equivalent to that established by the restricted category airworthiness certification standards specified in 14 C.F.R. § 21.185, including the requirement to have a certificate of airworthiness as contemplated by 14 C.F.R. Part 21.

The FAA Modernization and Reform Act of 2012, Section 333 directs the Secretary

of Transportation to determine if certain UAS may operate safely in the NAS. AGERpoint's request for exemption may be granted pursuant to the authority of Section 333 and 14 C.F.R. Part 11. Section 333 sets forth the requirements for considering whether a UAS will create a hazard to users of the NAS or the public or pose a threat to national security; and further, provides the authority for such UAS to operate without airworthiness certification. Section 333 states the following:

> *(a) In General.--Notwithstanding any other requirement of this subtitle, and not later than 180 days after the date of enactment of this Act, the Secretary of Transportation shall determine if certain unmanned aircraft systems may operate safely in the national airspace system before completion of the plan and rulemaking required by section 332 of this Act or the guidance required by section 334 of this Act.*
>
> *(b) Assessment of Unmanned Aircraft Systems.--In making the determination under subsection (a), the Secretary shall determine, at a minimum--*
>
> *(1) which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security; and*
>
> *(2) whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph (1).*
>
> *(c) Requirements for Safe Operation.--If the Secretary determines under this section that certain unmanned aircraft systems may operate safely in the national airspace system, the Secretary shall establish requirements for the safe operation of such aircraft systems in the national airspace system.*

As discussed in detail below, under AGERpoint's program the Penguin B UAV Platform will operate safely in the NAS without creating a hazard to users of the NAS, or the public, or otherwise pose a threat to national security.

Pursuant to 14 C.F.R. § 11.81, AGERpoint provides the following information in support of its petition for exemption:

A. Name And Address Of The Petitioner.

The name and address of the Petitioner is:

AGERpoint, Inc.
P.O. Box 1810
Daytona Beach, FL 32115

The point of contact for this Petition and specific contact information is as follows:

Adam Thorngate-Gottlund, Esq.
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B. Sections Of 14 C.F.R. From Which AGERpoint Seeks Exemption, And The Extent Of The Exemption.

1. The Certification Standards Specified In Section 21.185 and Part 21.

In accordance with the FAA Modernization and Reform Act of 2012, Section 333, and 14 C.F.R. § 21.16 entitled *Special Conditions*, AGERpoint seeks to exempt the Penguin B UAV Platform from the restricted category airworthiness certification specified in 14 C.F.R. § 21.185, or the requirement to have a certificate of airworthiness issued, as contemplated by 14 C.F.R. Part 21. Section 21.185 entitled *Issue of airworthiness certificates for restricted category aircraft*, states in part:

> *(a) Aircraft manufactured under a production certificate or type certificate. An applicant for the original issue of a restricted category airworthiness certificate for an aircraft type certificated in the restricted category, that was not previously type certificated in any other category, must comply with the appropriate provisions of § 21.183.*

AGERpoint seeks relief from the airworthiness certificate requirements and proposes to commercially operate the Penguin B UAV Platform without an airworthiness certificate for the special purpose of providing crop inventory and analysis. AGERpoint seeks relief

from the airworthiness certificate requirements of 14 C.F.R. § 21.185 to the extent that the Penguin B UAV Platform, which has not yet been type certificated by the FAA, may be operated as if it were a restricted category aircraft for a single, defined, special purpose operation (*i.e.*, agricultural surveying). Operation of the Penguin B UAV Platform will not create a hazard to users of the NAS, or the public, or otherwise pose a threat to national security.

Section 333 sets forth the requirements for considering whether a UAS will create a hazard to users of the NAS or the public or pose a threat to national security. Further, Section 333 provides the authority for such UAS to operate without airworthiness certification. Specifically, Section 333 states the following, in part:

> *(b) Assessment of Unmanned Aircraft Systems.--In making the determination under subsection (a), the Secretary shall determine, at a minimum--*
>
> *(1) which types of unmanned aircraft systems, if any, as a result of their size, weight, speed, operational capability, proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security; and*
>
> *(2) whether a certificate of waiver, certificate of authorization, or airworthiness certification under section 44704 of title 49, United States Code, is required for the operation of unmanned aircraft systems identified under paragraph (1).*

As set forth further below, numerous factors, particularly the physical characteristics of the Penguin B UAV, the operational history of the Penguin B UAV Platform in the NAS, as well as the specific parameters of AGERpoint's intended operation pursuant to this exemption, demonstrate that the Penguin B UAV Platform will operate safely in the NAS without creating a hazard to other aircraft or people on the ground. Accordingly, the FAA may approve operation of the Penguin B UAV Platform, without an airworthiness certificate, by setting forth specific operating limitations to ensure a level of safety equivalent to what would be provided by airworthiness certification.

AGERpoint submits that the Penguin B UAV Platform can operate safely in the NAS, and will not create a hazard to other aircraft or people on the ground. Accordingly, the FAA may approve its use without an airworthiness certificate as demonstrated by: (i) the safe operational history and current use of the Penguin B UAV Platform in the NAS; (ii) the characteristics of the Penguin B UAV Platform; (iii) the limited area of AGERpoint's intended operation (i.e. only over private land in rural areas with the prior consent and coordinated planning of the landowner); (iv) the licensed pilot requirement; (v) the specific operating limitations; and (vi) any other conditions that the Administrator may prescribe.

i. The Penguin B UAV Platform Has A History Of Safe Operation In The NAS.

The Penguin B UAV has operated safely within the NAS as a research platform for a variety of organizations, including (but not limited to) Virginia Tech, California State University, Texas A&M, Kansas State University, the United States Naval Research Labs, and the United States Air Force. The Air Force alone has logged over 100 hours of flight time with the Penguin B UAV over three years in service, representing 66 total sorties, of which 38 took place during 2014.

ii. The Specifications Of The Penguin B UAV Platform Demonstrate Its Safe Characteristics.

The Penguin B UAV Platform does not create a hazard to users of the NAS or the public, or otherwise pose a threat to national security considering its size, weight, speed, or operational capability. The specifications of the Penguin B UAV Platform are as follows:

Unmanned Aircraft System	The Penguin B UAV is an Unmanned Aircraft System that is comprised of an unmanned aircraft and a transportable ground station.
Unmanned Aircraft Dimensions	Wingspan: 130 in. Length: 89 in.
Engine (Propulsive Unit)	<u>Engine (Propulsive Unit)</u> Manufacturer: 3W-modellmotoren http://www.3w-modellmotoren.com/katalog/motoren-einzylinder-28/3w-28i.html 28cc gas 2-stroke engine Muffler system 3.35 HP electronic spark APC 16x15 propeller Unleaded gasoline with 2-stroke oil mixture Reverse rotation to utilize tractor propellers <u>Generator</u> Manufacturer: UAV Factory 150W max Belt driven.
Fuel	Unleaded gasoline with 2-stroke oil mixture
Engine (Propulsive Unit) Limits	Maximum Power Output: 3.35 HP Maximum RPM: 8,500 RPM Maximum Motor Temperature: 250 °F (121 °C) NOTE: The motor temperature is not displayed to the operator.
Propeller and Propeller Limits	Manufacturer: APC Fixed pitch tractor 16x15 or 17x10 (Diameter x Pitch) Max RPM: 9,000
Backup Battery Command & Control	Manufacturer: various Lipo 3S 3,000 mah

Airspeed Limits	Vne (Never Exceed Speed) 68 knot (35 m/s) Vno (Maximum Structural Cruising Speed) 43 knots (22 m/s) Va (Maneuvering Speed) 43 knots (22 m/s) Landing Speed: 25 knots (13 m/s)
C.G. Range	.25 inches fore or aft from datum
Datum	Marked on aircraft
Mean Aerodynamic Chord (MAC)	13 in. long with leading edge 21.2 in. from nose
Leveling Means	Not Applicable.
Maximum Weights	Ramp 47 lbs. Takeoff 47 lbs. Landing 47 lbs.
Empty Weight	22 lbs. NOTE: Empty Weight Excludes weight of battery and payload modules.
Frequencies	902-928 MHz (ISM Band) 420-450 MHz (ISM Band) NOTE: Telemetry uplink and downlink are on the 900 Mhz band. C2 uplink and downlink are on the 400 Mhz band.
Computer Software	APM Mission Planner

Minimum Crew	(1) The Penguin B UAV Platform can be operated by a single operator.
Number of Seats	(0) Not Applicable.
Fuel Capacity	7.5 gallons maximum
Oil Capacity	Not Applicable.
Max. Operating Altitude	10,000 ft. AGL (3040 M)
Control Surface Movements	Wing Flaps Down 45 Aileron Up 30° Down 30° "V" tail elevator action Up 60° Down 60° "V" tail rudder action Up 60° Down 60° "V" tail max. combination Rudder elevator action Up 60° Down 60°
Nominal Endurance	10 hours
Ambient Outside Air Temperature (OAT)	Maximum OAT: 120 °F (49 °C) Minimum OAT At Altitude: -20 °F (-29 °C)
Wind Limitation	15 knots steady, 5 knots gusts
Maintenance	This Penguin B UAV Platform must be maintained in accordance with the Penguin B UAV Maintenance Operation Manual, or later FAA accepted revision.

iii. Flight Operations Pursuant To The Exemption Sought Would Be Limited To Rural Areas over Private Land.

AGERpoint proposes to only conduct aerial survey flight operations over privately held land in rural areas, and to undertake certain procedures if a flight near to airports, helipads, or state roads is planned. Specifically, AGERpoint's proposed flight operations are by their nature limited to rural areas that are:

1. Private land with consent having been received from the landowner and plans implemented as to any persons or structures on the ground within the flight area;

2. Not within five (5) miles of any airport or helipad, except with the prior approval of the relevant FAA and/or ATC offices;

Furthermore, all flight operations will be conducted such that the energy of the UAS as defined by a 2:1 glide slope is never directed outside the boundaries of the consenting landholder's land, and never directed over any state road.

In summary, AGERpoint seeks to operate its Penguin B UAV Platform only over rural areas, while maintaining safe distances from any populated areas, airports, helipads, or major roadways.

iv. Flight Operations Of The Penguin B UAV Platform Are Limited To The Line Of Sight Of A Certificated Pilot in Command.

AGERpoint will only utilize Pilots in Command (PIC) who have successfully taken and passed the FAA written private pilot knowledge test, who also have a valid driver's license or third class medical certificate, in order to certify their health. The pilot must have 200 takeoffs and landings, and 25 hours of flight time on the Penguin B. The PIC must meet the requirements as set forth by the Standard Operating Procedures adopted by AGERpoint for flight operations of the Penguin B UAV Platform.

v. Flights Will Be Conducted Pursuant To Specific Operating Limitations.

In seeking this exemption, AGERpoint proposes to operate the Penguin B UAV Platform, for the special purpose of conducting aerial surveys for early stage disease detection, crop inventory, and mapping, pursuant to the following specific operating limitations:

1. Flight operations are permitted only over defined areas of private land.

2. The Penguin B UAV Platform will be operated at or below 400 ft. above ground level (AGL).

3. The Penguin B UAV Platform shall be operated within two miles, and within line of sight, of the pilot in command.

4. The Penguin B UAV Platform shall be operated pursuant to Day Visual Flight Rules (VFR) in visual meteorological conditions (VMC). The Penguin B UAV Platform shall be operated only during daylight hours (*i.e.* between the end of morning civil twilight and the beginning of evening civil twilight, as published in the American Air Almanac, converted to local time).

5. The duration of each flight shall not exceed 8 hours, or 80% of the Penguin B UAV Platform's nominal endurance.

6. The Penguin B UAV Platform shall operate from on-site takeoff/landing locations directly next to the pilot in command.

7. Operations shall be conducted by certificated PICs who have completed training, checking, currency, and recency of experience requirements as approved by the FAA Administrator.

8. Operation of the Penguin B UAV Platform with any inoperative instruments or equipment shall be prohibited.

9. The Penguin B UAV Platform shall be maintained in accordance with the Manufacturer's Maintenance Manual.

10. Prior to flight operations, AGERpoint shall coordinate and establish two way communications with the nearest Air Traffic Control facility, if located within five miles of the survey area.

11. All flight operations will be conducted such that the energy of the UAV as defined

by a 2:1 glide slope is never directed outside the boundaries of the consenting landholder's land, and never directed over any state road.

vi. Additional Operating Limitations May Be Prescribed By The FAA.

In accordance with Section 333 of the FAA Modernization and Reform Act of 2012 14 C.F.R. § 21.16, the Administrator may prescribe special conditions for the intended operation of the Penguin B UAV Platform in order to establish a level of safety equivalent to that established by Section 21.185. Likewise, the Administrator may prescribe special conditions if the airworthiness regulations of 14 C.F.R. Part 21 do not contain adequate or appropriate safety standards due to the novel or unusual design features of the aircraft.

Section 21.16, entitled *Special Conditions*, states the following:

> *If the FAA finds that the airworthiness regulations of this subchapter do not contain adequate or appropriate safety standards for an aircraft, aircraft engine, or propeller because of a novel or unusual design feature of the aircraft, aircraft engine or propeller, he prescribes special conditions and amendments thereto for the product. The special conditions are issued in accordance with Part 11 of this chapter and contain such safety standards for the aircraft, aircraft engine or propeller as the FAA finds necessary to establish a level of safety equivalent to that established in the regulations.*

See 14 C.F.R. § 21.16.

AGERpoint requests that, to the extent necessary, the FAA prescribe such special conditions for AGERpoint's intended operation of the Penguin B UAV Platform as will establish a level of safety equivalent to that established by Section 21.185, and 14 C.F.R. Part 21, which will permit safe operation of the Penguin B UAV Platform for the special purpose of conducting aerial surveys without an airworthiness certificate.

2. The Display Requirements Of Section 45.23(b).

AGERpoint seeks an exemption from 14 C.F.R. § 45.23(b). Section 45.23 entitled *Display of marks; general*, subsection (b), states the following:

(b) 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.

AGERpoint requests relief from the requirement of Section 45.23(b), if applicable, that the word "Restricted" be displayed on the Penguin B UAV Platform near each entrance to the cabin, cockpit, or pilot station. As the Penguin B UAV Platform is unmanned, it has no cabin, cockpit, pilot station, or entrances thereto. Therefore, AGERpoint proposes that, if required by the Administrator, the word "Restricted" be displayed in letters two (2) inches high, horizontally on both sides of the fuselage between the leading edge of the wing and the nose section of the Penguin B UAV Platform.

This exemption would maintain the level of safety established by Section 45.23(b) because if required, displaying the word "Restricted" with two (2) inch high letters, horizontally on both sides of the fuselage between the leading edge of the wing and the nose section of the Penguin B UAV Platform, will inform all parties of the unmanned aircraft's overall operating status in compliance with size requirement of Section 45.23(b) (*i.e.*, "letters not less than 2 inches . . . high"). By placing the letters horizontally on both sides of the fuselage between the leading edge of the wing and the nose section of the Penguin B UAV Platform, will ensure that the word "Restricted" is the in most visible location, so that all parties will be informed of the unmanned aircraft's overall operating status.

The FAA has previously granted exemptions in circumstances similar, in all material respects, to those presented herein (*e.g.*, Exemption Nos. 8737, 10167, 10167A, 10700, 10810).

3. The Private Pilot Privilege and Limitations of Section 61.113 (a) and (b).

Section 61.113 (a) & (b) limit private pilots to non-commercial operations. Because the

Penguin B UAV will not carry a pilot or passengers, the proposed operations will achieve the same level of safety of current operations by requiring the PIC operating the aircraft to have passed the FAA written private pilot knowledge test. Unlike a conventional commercial aircraft, the Penguin B UAV is remotely controlled without the ability to carry humans or cargo apart from its instruments and fuel. By definition, AGERpoint's operation of the UAV will be in a controlled, restricted area and subject to flight plan restrictions as set forth in this application, supplemented by such Special Conditions as the Administrator may require. This level of safety is greater than that provided by a single individual holding either a commercial or a private pilot's certificate operating a conventional aircraft. The risks associated with the operation of the Penguin B UAV Platform are so much smaller than the level of risk associated with conventional aircraft in general, and specifically with commercial operations contemplated by Part 61 when it was drafted, that allowing operations of the Penguin B UAV with a private pilot as PIC exceeds the present safety achieved by Section 61.113 (a) & (b).

4. The Civil Aircraft Airworthiness Requirement of Section 91.7(a).

Section 91.7(a) requires that no person may operate a civil aircraft unless it is in airworthy condition. As there will be no airworthiness certificate issued for the Penguin B UAV if this exemption is granted, no FAA regulatory standard will exist for determining airworthiness. Given the size of the aircraft and the limitations on operations set out in this application and in any Special Conditions required by the FAA, an equivalent level of safety will be achieved as under the regulation.

5. The Manual Requirement Of Section 91.9(b).

AGERpoint seeks an exemption from 14 C.F.R. § 91.9(b). Section 91.9 entitled *Civil aircraft flight manual, marking, and placard requirements*, subsection (b) states the following:

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

(1) For which an Airplane or Rotorcraft Flight Manual is required by § 21.5 of this chapter unless there is available in the aircraft a current, approved Airplane or Rotorcraft Flight Manual or the manual provided for in § 121.141(b); and

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

Relief is requested because the Penguin B UAV Platform weighs approximately forty seven (47) pounds at its maximum gross weight and cannot carry the approved Airplane Flight Manual onboard. Furthermore, since the Penguin B UAV Platform is unmanned, the aircrew member is located at a ground control station. As such, AGERpoint proposes the following conditions and limitations to its request for exemption from Section 91.9(b):

> The approved Airplane Flight Manual must be kept at the ground control station, where it is immediately available for reference by the aircrew member (pilot in command) of the Penguin B UAV Platform any time the unmanned aircraft is operating.

The approved Airplane Flight Manual must be made available within 10 days to any FAA, U.S. Department of Defense, or law enforcement official upon request.

This exemption would maintain the level of safety established by Section 91.9(b) because AGERpoint will keep the approved Airplane Flight Manual at the ground control station where the pilot in command flying the Penguin B UAV Platform will have immediate access to the document.

Previous exemptions granted by the FAA concerning Section 91.9(b) establish that safety is not adversely affected when the approved Aircraft Flight Manual is kept at the ground control station of a UAS, where it can be immediately accessed by the pilot in command. Section 91.9(b) "requires aircraft to carry the flight manual so the pilot would

have ready access to the aircraft limitations while in flight." Exemption No. 8607. However, the FAA has also found that UAS will always be operated without any passengers or crew onboard, and that "requiring these special-use aircraft [UAS] to carry superfluous paper documents may present a safety hazard to the integrity of the [UAS]." *Id*.

The FAA has previously granted exemptions in circumstances similar, in all material respects, to those presented herein (*e.g.*, Exemption Nos. 8607, 8737, 8738, 9299, 9430, 9554, 9564, 9565, 10167, 10602, 10673, 10835, 10869, 10968).

6. The Preflight Action Requirement of Section 91.103.

Section 91.103 requires each PIC to take certain actions before flight to ensure the safety of the flight. As FAA approved flight manuals will not be provided for the Penguin B UAV Platform, an exemption will be necessary. An equivalent level of safety will be provided by following the preflight procedures set forth at Exhibit A hereto.

7. The Altimeter Settings Requirement of Section 91.121.

Section 91.121 requires each person operating an aircraft to maintain cruising altitude by reference to an altimeter which is set "… to the elevation of the departure airport or an appropriate altimeter setting available before departure." The Penguin B UAV will not be equipped with a barometric altimeter, but with a DGPS system nominally accurate to within 0.2 degrees of its programmed heading and about one centimeter of its programmed horizontal position which will be integrated into the Penguin B UAV Platform; therefore an exemption will be necessary. An equivalent level of safety will be achieved by the operator pursuant to the preflight procedures set forth at Exhibit A hereto.

8. The Minimum Safe Altitude Requirements of Section 91.119.

Section 91.119 establishes safe altitudes for operation of civil aircraft. Subsections (b) and (d) are, either by the terms of AGERpoint's planned operations or by the nature of the

Penguin B UAV, inapplicable here. Subsection (c) allows for operation at less than 500 feet AGL "over open water or sparsely populated areas" such as those where AGERpoint will conduct its operations, although "aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure." In order to successfully collect agricultural data, AGERpoint may need to operate the Penguin B UAV within 500 feet of people, vessels, vehicles, or structures. As set forth in this Application, AGERpoint's operations will only take place with the prior consent and cooperative planning of all people and owners of vessels, vehicles, or structures permitted onsite during operation. Coordination will be done with property owner and onsite farm manager.

The equivalent level of safety will be achieved given the size, weight, and speed of the Penguin B UAV, as well as the locations where it will be operated. No flight will be taken without the prior permission of all parties this Section aims to protect. All affected individuals will be made aware of the planned flight operation. Compared with the flight operations of conventional aircraft weighing several orders of magnitude more than the Penguin B UAV, any risk associated with AGERpoint's operations is far lower than similar operations with conventional aircraft. In addition, this exemption will permit separation between AGERpoint's operations and those of conventional aircraft.

9. The Certifications Requirements Of Sections 91.203(a) and (b).

AGERpoint seeks an exemption from 14 C.F.R. § 91.203(a) and (b). Section 91.203 entitled *Civil aircraft: Certifications required*, subsections (a) and (b) state the following:

> *(a) Except as provided in § 91.715, no person may operate a civil aircraft unless it has within it the following:*
>
> *(1) An appropriate and current airworthiness certificate. ….]*

> *(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), or a registration certification issued under the laws of a foreign country.*
>
> *(b) No person may operate a civil aircraft unless the airworthiness certificate required by paragraph (a) of this section or a special flight authorization issued under § 91.715 is displayed at the cabin or cockpit entrance so that it is legible to passengers or crew.*

The Penguin B UAV Platform is unmanned; it has no cabin, cockpit, pilot station, or entrances thereto. The aircrew member is located at a ground control station and no passengers can be carried. As such, AGERpoint proposes the following conditions and limitations to its request for exemption from Sections 91.203(a) and (b):

> The documents required by Sections 91.203(a) and (b) must be kept at the ground control station, where it is immediately available to the aircrew member (pilot in command) of the Penguin B UAV Platform any time the unmanned aircraft is operating.

The documents required by 91.203(a) and (b) must be made available within 10 days to any FAA, U.S. Department of Defense, or law enforcement official upon request.

This exemption would maintain the level of safety established by Sections 91.203(a) and (b) because AGERpoint will keep the required documents at the ground control station where the pilot in command flying the Penguin B UAV Platform will have immediate access.

Previous exemptions granted by the FAA concerning Sections 91.203(a) and (b) establish that safety is not adversely affected when the Airworthiness Certificate and U.S. registration certificate are kept at the ground control station of the UAS, where it can be immediately accessed by the pilot in command. Specifically, the FAA has held that the intent of Sections 91.203(a) and (b) is better served by having the required documents in the control of the UAS operator (pilot in command), reasoning as follows in Exemption 8607:

The original intent of the subject regulation was to display the airworthiness and registration documents so they would be easily available to FAA inspectors and passengers for inspection and verification of the airworthiness and registration of the aircraft . . . In this case, the aircraft will always be operated without any passengers or crew.

The missions for which UASs are intended will prevent the aircraft from being available for the inspections normally prescribed for civil aircraft. Further, it will be operated on strictly confined missions from a known departure and arrival point, under the constant control of a pilot-in-command. We also find that requiring these special-use aircraft to carry superfluous paper documents may present a safety hazard to the integrity of the [UAS].

FAA operating limitations and special arrangements with Air Traffic Control (ATC) for surveillance of [UAS] flights adequately compensate for the requirements for carrying airworthiness and registration documents. We find the intent of the regulation is better served by having the required documents in the control of the aircraft operator and available for inspection under the special conditions prescribed in this exemption.

The FAA has previously granted exemptions in circumstances similar, in all material respects, to those presented herein (*e.g.*, Exemption Nos. 8607, 8737, 8738, 9299, 9564, 9565, 10167, 10602, 10673, 10835, 10869, 10968).

10. The Maintenance and Inspections Requirements of Sections 405(a), 407(a)(1), 409(a)(2), and 417(a) and (b).

These Sections require than an aircraft operator or owner have the aircraft regularly inspected and maintained according to established standards, and maintain certain records of the same. Because they only apply to aircraft with airworthiness certificates, these sections will not apply to AGERpoint.

Nonetheless, equivalent levels of safety will be obtained through the small physical characteristics of the Penguin B UAV, as well as maintenance provided by the operator pursuant to rigorous recordkeeping in an Aircraft Maintenance Logbook (provided as Exhibit A). If mechanical issues arise, the UAV can land immediately. As provided in Exhibit B, the operator will ensure that the UAV is in working order prior to initiating flight and perform

required maintenance. This will best achieve the goals of these sections, since the operator will be most familiar with the UAV and best suited to maintain it in an airworthy condition.

C. Granting AGERpoint's Request Would Be In The Public Interest.

Granting the present Petition will further the public interest by allowing AGERpoint safely, efficiently, and economically to perform aerial crop inventory and analysis in support of any organization which might require it, including government entities, agriculture producers and other businesses, scientific researchers, wildlife conservationists, and forestry professionals. Additionally, use of the Penguin B UAV Platform will decrease congestion of the NAS, reduce pollution, and provide significant benefits to the economy. These benefits will be realized without implicating any privacy issues.

1. The Public Will Benefit From The Aerial Surveys And Research Performed.

AGERpoint submits this Petition to perform aerial crop inventory and analysis in support of any organization which might require it, including government entities, agriculture producers and other businesses, scientific researchers, wildlife conservationists, and forestry professionals. The data gathered will be used for early stage disease detection, crop inventory and mapping. According to the USDA Economic Research Service, agriculture and agriculture-related industries accounted for 4.8% of the U.S. GDP in 2012, totaling $775.8 billion. The Penguin B UAV Platform will provide safe, efficient, and economical means for gathering data which can help improve food production efficiency, yield, and safety, all of which are critical to the well-being of the general public.

2. AGERpoint's Operations Will Decrease Congestion Of The NAS.

The Penguin B UAV Platform serves as a safe, efficient, and economical alternative to the manned aircraft which would otherwise be necessary to gather this data. By reducing

the amount of manned aircraft needed to perform aerial surveys, an exemption allowing the use of a Penguin B UAV Platform would reduce the amount of manned aircraft in the NAS, reduce noise and air pollution, as well as increase the safety of life and property in the air and on the ground.

Furthermore, by reducing the number of manned aircraft operating in the NAS, congestion around airports caused by arriving and departing aircraft will be reduced. The Penguin B UAV Platform does not require an airport to takeoff or land. Likewise, a reduction of manned aircraft conducting aerial survey missions would result in a lower burden on air traffic control during the ground, takeoff, departure, arrival, and landing phases of flight operations.

3. The Environment Will Benefit From The Safety And Efficiency Of The Penguin B UAV Platform.

Conducting aerial surveys with the Penguin B UAV Platform instead of manned aircraft will benefit the public by reducing the levels of air and noise pollution generated during traditional flight operations. By using a small gasoline engine burning around one gallon per hour, the Penguin B UAV Platform produces substantially less air pollution than the six cylinder internal combustion twin engine aircraft that are typically utilized for aerial surveys, while burning approximately 20-30 gallons per hour of leaded aviation fuel. The Penguin B UAV Platform, while reducing the carbon footprint of aerial surveys, also limits noise pollution as its small engine is no louder than a lawn mower during the take-off phase, and during normal operations is about as loud as background conversation in an office or a restaurant.

By using the Penguin B UAV Platform to perform aerial surveys, the substantial risk to life and property in the air and on the ground which is usually associated with

traditional manned aircraft flight operations, will be substantially reduced or completely eliminated. Weighing in at approximately forty seven (47) pounds at its maximum gross weight, with a wingspan of 130 inches and a length of 89 inches, and a maximum fuel capacity of only 7.5 gallons, the Penguin B UAV Platform has less physical potential for damage to life and property than the manned aircraft that typically conduct aerial surveys, which weigh approximately 6,500 pounds with a wingspan of approximately 40 feet, a length of 34 feet, and a fuel capacity of 180 gallons.

4. Performing Aerial Survey Operations With The Penguin B UAV Platform Will Benefit The Economy.

In addition to being safe and efficient, the Penguin B UAV Platform is also an economical alternative to using manned aircraft to conduct aerial surveys. As such, operation of the Penguin B UAV Platform will allow United States based companies, like AGERpoint, to remain competitive and contribute to growth of the U.S. economy. Specifically, with the cost of aviation fuel and the Environmental Protection Agency ("EPA") regulatory actions phasing out leaded fuels, U.S. owned and operated companies must adopt new and alternative technology in order to remain competitive.

UAV technology not only allows companies greater operational flexibility compared to manned aircraft, but also drastically mitigates the high operational cost of a traditional manned aircraft. By operating the UAV platforms, companies such as AGERpoint can remain competitive and profitable, providing job stability to employees and contractors, which increases consumer spending; improves local, state, and federal tax revenues; and allows companies to invest in research and development in order to remain competitive both in the United States and abroad, ultimately contributing to the growth of the national economy.

5. There Are No Privacy Issues.

Like the manned aerial survey flight operations that have been conducted for decades, the proposed operation of the Penguin B UAV Platform will not implicate any privacy issues. By definition, the Penguin B UAV platform will only operate in rural areas, and only above land where AGERpoint has been contracted by the owner or occupant to conduct aerial survey operations. Even if carrying photographic, hyperspectral, or other similar payloads, the UAV will not be operated closer than 500' to any person, vessel, vehicle or structure without the owner's permission. Precautionary measures to mitigate risk to people on the property, including temporary relocation of non-essential personnel to a minimum distance of two times the average AGL operation of the aircraft, will be standard operating procedure. The aircraft will operate no higher than 400' AGL, except as necessary to comply with the requirements of 14 C.F.R. § 91.119. Unlike manned aerial survey flight operations, there are no people on board the Penguin B whose observations might impact privacy, and the LIDAR used to conduct AGERpoint's surveys creates not an image, but a data set called a "point cloud." With these precautions in place, and lacking any natural or virtual eyes to see, AGERpoint's operations will have no impact at all upon privacy.

D. A Summary That Can Be Published In *The Federal Register*

The Rules From Which AGERpoint Seeks Exemption:

> *AGERpoint, Inc. seeks exemption from the requirements of 14 C.F.R. §§ 21.185 and Part 21, 45.23(b), 61.113 (a) and (b), 91.7(a), 91.9(b), 91.103, 91.121, 91.119, 91.203(a) and (b), 405(a), 407(a)(1), 409(a)(2), and 417(a) and (b).*

A Brief Description Of The Nature Of The Exemption AGERpoint Seeks:

> *This exemption will permit AGERpoint, Inc. to operate an Unmanned Aircraft System over certain rural agricultural areas, while keeping the documents required by the regulations at the ground control station and immediately accessible to the pilot in command. Furthermore, the exemption will relieve AGERpoint, Inc. from the airworthiness certificate standards and the requirement to have a certificate of*

airworthiness for its Unmanned Aircraft System. This exemption will also permit any required markings concerning the operational status of the UAS to be displayed on the fuselage of the unmanned aircraft.

CONCLUSION

AGERpoint seeks an exemption pursuant to 14 C.F.R. § 11.61 and Section 333 of the FAA Modernization and Reform Act of 2012, which will permit safe operation of the Penguin B UAV Platform commercially, without an airworthiness certificate, for the special purpose of aerial agricultural surveillance, collecting data which will be used for early stage disease detection, crop inventory and mapping. By granting this Petition, the FAA Administrator will be fulfilling the Congressional mandate of the FAA Modernization and Reform Act of 2012, while also advancing the interests of the public, by allowing AGERpoint to safely, efficiently, and economically operate the Penguin B UAV Platform commercially within the NAS.

WHEREFORE, in accordance with the Federal Aviation Regulations and the FAA Modernization and Reform Act of 2012, Section 333, AGERpoint respectfully requests that the Administrator grant this Petition for an exemption from the requirements of 14 C.F.R. §§ 45.23(b), 61.113 (a) and (b), 91.7(a), 91.9(b), 91.103, 91.121, 91.119, 91.203(a) and (b), 405(a), 407(a)(1), 409(a)(2), and 417(a) and (b), as well as the restricted category airworthiness certification standards specified in 14 C.F.R. § 21.185, including the requirement to have a certificate of airworthiness issued for the Penguin B UAV Platform, as contemplated by 14 C.F.R. Part 21.

Dated: February 5, 2015

Respectfully submitted,

The Royse Law Firm

/s/ Adam Thorngate-Gottlund

_____

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cc: AGERpoint, Inc.
Attn: CEO

Exhibit A

AIRCRAFT MAINTENANCE LOGBOOK

Manufacturer: _____ Model: _____ Class: _____
Serial: _____ Registration: _____
DATE PUT INTO SERVICE: _____

DATE	TECH	REMARKS

Exhibit B

Penguin B UAV Platform Preflight Checklist

Preflight Equipment Checklist: **Page 1 of 1**

Ground Control Operator Essentials:

- ☐ Logbook
- ☐ Flight Log paperwork
- ☐ Briefed on mission
- ☐ Cloudcap Documentation

Ground Station Equipment:

- ☐ Portable (or desktop) Ground Station
- ☐ Power Cable
- ☐ GPS
- ☐ GPS Cable (if using Novatel DGPS antenna)
- ☐ External Comms Antenna (350 MHz or 900MHz as applicable)
- ☐ Laptop
- ☐ Laptop Power
- ☐ USB to Serial Adapter
- ☐ Serial Cable
- ☐ Mouse
- ☐ Reference Data (Mission Maps and DTED)
- ☐ Ethernet Cable
- ☐ External Monitor (optional)
- ☐ Headset
- ☐ Headset breakout box and power
- ☐ Futaba Controller (a.k.a. Flight Control Box, FCB)
- ☐ FCB/Headset cable spool
- ☐ Appropriate Software Versions for GCO

Aircraft Equipment (ground crew responsibility)

- ☐ Airframe
- ☐ Batteries
- ☐ Fuel
- ☐ Payload Equipment
- ☐ Piccolo Autopilot
- ☐ Launch Aparatus (if applicable)
- ☐ Starter
- ☐ Glow plugs
- ☐ Chargers
- ☐ Backup RC Radio (Alpha 60 only)

Preflight Actions Checklist: **Page 1 of 3**

Portable Ground Control Station:

- ☐ Set up GPS Antenna
  - o Physically mark location for future setups
  - o Inspect and attach GPS cable
- ☐ Verify Connections
  - o GPS
  - o UHF Comm
  - o Serial
  - o Power
- ☐ Turn on Power

GCO Laptop:

- ☐ Verify Connections
  - o Power
  - o Serial
  - o Network
  - o External Monitor
  - o Input devices
- ☐ Turn on Power
- ☐ Verify Network Connection status
  - o IP should be 192.168.1.100
  - o Check access to Terrastation NAS Drive
- ☐ Execute Piccolo Command Center (PCC) Note Software Version _____
- ☐ Open Ground Station Window: Note GCS Firmware Version _____
  - o If different from PCC, correct (Flash Firmware or exit PCC and execute correct version)
- ☐ Verify ground station voltage readings _____
- ☐ Verify Ground Station GPS readings
  - o Enable DGPS and begin averaging the Ground station location
- ☐ Open Ground Station Window and request radio settings
  - o Note Channel/Frequency
- ☐ Set Power to .1 Watt
- ☐ Verify GS VSWR (350 MHz only) should be less than 2.0 _____
- ☐ Load Map Layers
- ☐ Load DTED Layers
- ☐ Set Aircraft List to Dynamic

Preflight Actions Checklist: **Page 2 of 3**

Piccolo Initial Set Up:

- ☐ Request Piccolo Power On (ground crew)
- ☐ Verify Piccolo Shows up on list
  - o If not attach via programming cable and continue
- ☐ Set new piccolo to Active
- ☐ Verify Firmware matches GCS and PCC version numbers _____
- ☐ Run Validate (Preflight page) and reconcile any issues (especially with Gains/Limits/AC dimensions)
- ☐ Check radio settings
  - o Note Frequency/channel _____
  - o Verify VSWR (MHX 320 Radio) less than 2.0
    - ▪ If not check antenna (
  - o Set power to .1 Watt
  - o Check RSSI (GS and Piccolo should be approximately equal and close to -50)
- ☐ Verify Payload operation

At this point the RF Comms should be working, remove programming cable and connect over RF Link

- ☐ Verify Aircraft GPS reading
- ☐ Set Lost Comm Waypoint
  - o LC waypoint is 99 on mission limits
- ☐ Clear out all other waypoints (if necessary)
- ☐ Create Climb out/recovery box
- ☐ Conduct rage check (100 yards at .1 Watt)
  - o RSSI should be -80 or better
  - o Link should be 100
- ☐ Check system voltage
  - o Replace battery if necessary
- ☐ Request fast telemetry
- ☐ Confirm with Ground Crew and set new piccolo to Pilot address
  - o If flying multiple AC be sure that this is clearly communicated
- ☐ Run Autopilot Configuration Validation (and after any changes are made to the controller configuration.
- ☐ Verify Surface Trims
  - o Tethered FCB all trims set to neutral
  - o Adjust Surface tables with Shift function to set trims
- ☐ Give External Pilot go for Surfaces Check with Tethered FCB (and R/C FCB if applicable)
- ☐ Verify Correct Surface actuation using Preflight page
  - o Ailerons Left/Right
  - o Elevator Up/Down
  - o Rudder Left/Right
  - o Throttle Full/Closed

- ☐ Check Euler Angle response (observe on HUD /Map or watch Sensor readings)
  - Command to EP (“Go for Roll Pitch Yaw)
    - (Sensor Readings Positive for Roll Right, Pitch Up and Yaw Right)
  - On Sensor Configuration Page
    - Penguin PSI = 180 Others 0.
- ☐ Zero Air Data
  - Input Baro Reading from Tower or Handheld unit
  - Input Current Airfield Altitude (from DTED or GPS Reading)
  - Zero air data with pitot sensor cupped

Climb out

- ☐ Test lost comm. (turn off ground station)
  - Verify Tracking LC waypoint
- ☐ Confirm all is satisfactory
  - Payload
  - Test Manager
  - Safety observers
- ☐ Execute Mission