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

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

August 18, 2015

Exemption No. 12486
Regulatory Docket No. FAA–2015–2259

Mr. Matt Colgan
Blue River Technology Inc.
575 N. Pastoria Avenue
Sunnyvale, CA 94085

Dear Mr. Colgan:

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 26, 2015, you petitioned the Federal Aviation Administration (FAA) on behalf of Blue River Technology Inc. (hereinafter petitioner or operator) for an exemption. The petitioner requested to operate an unmanned aircraft system (UAS) to conduct aerial data for precision agricultural surveys.

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 a Vulcan Raven and DJI S1000.

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, Blue River Technology 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 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, Blue River Technology Inc. is hereafter referred to as the operator.

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

Failure to comply with any of the conditions and limitations of this grant of exemption will be grounds for the immediate suspension or rescission of this exemption.

1. Operations authorized by this grant of exemption are limited to the Vulcan Raven and DJI S1000 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

May 26, 2015

Submitted via www.regulations.gov

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

Re: Exemption Request under Section 333 of the FAA Reform Act and Part 11 of the Federal Aviation Regulations

Dear Sir or Madam:

Pursuant to Section 333 of the FAA Modernization and Reform Act of 2012, Pub. L 112-95 (the "Reform Act"), 49 U.S.C. § 44701(f) and 14 C.F.R. part 11, Blue River Technology Inc. ("Blue River" or "Petitioner") hereby petitions the Federal Aviation Administration ("FAA") for relief from 14 C.F.R. §§ 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 permit Blue River to operate small unmanned aircraft systems ("sUAS") for the collection of aerial data over rural areas in furtherance of commercial precision agricultural surveys. Based on prior FAA grants of Section 333 exemptions as described below as well as the information submitted in support of this Petition, Blue River asks that the FAA utilize its summary grant process to act on the requested relief, consistent with the FAA's recent policy initiative to streamline the processing of sUAS exemption petitions.[1]

The FAA has granted previous exemptions in accordance with Section 333 of the Reform Act under circumstances similar in all material respects to those presented in this petition, including, but not limited to, Exemption Nos. 11062 to Astreus Aerial in Docket FAA-2014-0352 (Sep. 25, 2014), 11109 to Clayco, Inc. in Docket FAA-2014-0507 (Dec. 10, 2014), 11112 to VDOS Global, LLC in Docket FAA-2014-0382 (Dec. 10, 2014), 11213 to Aeryon Labs, Inc. in Docket FAA-2014-0642 (Mar. 24, 2015), 11261 to AeroVironment in Docket FAA-2014-0715 (Apr. 1, 2015), 11262 to Avigators in Docket FAA-2014-0720 (Ap. 1, 2015), 11316 to Precision Done in Docket FAA-2014-1063 (Apr. 9, 2015). In each of these grants, the FAA found that enhanced safety achieved using a small unmanned aircraft ("sUA") and carrying no passengers or crew, rather than a manned aircraft of significantly greater proportions carrying crew in addition to flammable fuel, gave the FAA good cause to find that the sUAS operation enabled by the

[1] FAA, News Release, "FAA Summary Grants Speed Exemptions" (Apr. 9, 2015).

exemption was in the public interest. Further to its request that the FAA grant summary approval of the relief requested herein, Blue River is willing to accept all relevant conditions and limitations for commercial operations contained in Exemption 11262, supra, specifically paragraph no. 2, and nos. 4 through 28. For ease of administrative processing, these conditions and limitations are re-stated on Appendix A to this Petition.

In support of this petition, Blue River is submitting, under separate cover and with a request for confidential treatment, the following documents: Blue River Operations Manual; Vulcan Raven LD User's Manual; DJI S1000 User's Manual (collectively, the "Operating Documents").

I. STATUTORY CRITERIA

Section 333(a) of the Reform Act directs the Secretary to "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." In reaching the determination required under Section 333(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)." Section 333(b). Once the Secretary makes a determination under Section 333(b) that a particular UAS operation may be safely conducted in the national airspace system, "the Secretary shall establish requirements for the safe operation of such aircraft systems in the national airspace system." Section 333(c) (emphasis added). For the reasons set forth herein, Blue River submits that this Petition supports a determination that the Company's proposed sUAS operations may be safely conducted in the national airspace system.

II. SUMMARY OF PROPOSED OPERATIONS

The proposed sUAS operations would use onboard cameras and lidar to capture high quality imagery that are mosaicked into a digital 3D reconstruction of the surveyed area. Numerous agricultural applications demand very high resolution that can only be acquired with sufficient quality at low speeds and altitudes that are challenging and, in some cases impossible, to achieve with conventional aircraft. Use of the sUAS for aerial surveys reduces the need to operate conventional aircraft for the same purpose and provides very high resolution imagery at a fraction of the cost. These savings result in enhanced efficiency and productivity for agricultural activities.

Blue River will operate sUA weighing less than 55 pounds below 200 feet AGL over rural, unpopulated agricultural areas, at a nominal airspeed of 10 knots and a maximum airspeed of 33 knots, as this is the maximum airspeed for optimal data collection. All operations will utilize a

Pilot-in-Command ("PIC") holding an FAA airman certificate and a Visual Observer ("VO"), as more fully described herein.

The sUA will possess visual characteristics so as to be highly visible and easily recognizable in the unlikely event of an encroaching general aviation manned aircraft. The sUA will under no circumstances be flown in Class A, B, C, or D airspace under the requested exemption. The sUAS operator will maintain awareness of, and separation from, any temporary flight restrictions and restricted/prohibited areas, and will comply with applicable Notice to Airmen ("NOTAM") requirements, including any requirement that NOTAMs be issued at least 24 hours prior to operating the sUAS, and that such NOTAM be cancelled upon completion of operations or if operations will not be conducted. Operations will comply with the weather minimums as prescribed under 14 C.F.R. § 91.155. Prior to and while conducting any operations under the authority requested herein, Blue River will ensure the aircraft are (i) is registered in accordance with C.F.R. part 47, (ii) is identified by serial number, and (iii) has identification (N-Number) markings as required under 14 C.F.R. part 45, Subpart C, with such markings as large as practicable.

The sUAS will possess programmable failsafe features such as lost communication and lost link procedures as well as instantaneous manual override. The PIC will utilize a Federal Communications Commission compliant VHF radio and commercially available handheld receivers to maintain 2 way communications with all operational personnel and the nearest Common Traffic Advisory Frequency ("CATF") or other necessary operating frequencies during all phases of flight. Blue River's sUAS operations personnel also will be equipped with ForeFlight Mobile software for up-to-date airspace and current weather information. This software additionally includes updated aeronautical charts for operations under visual flight rules ("VFR"), which will be relied upon to strengthen special awareness.

III. PROPOSED SYSTEMS AND OPERATIONS

a. Unmanned Aircraft System

Blue River wishes to operate two sUAS types under this petition – the Vulcan Raven LD and the DJI S1000 – which are described in detail in the attached user manuals and summarized in the tables below.

Table 1. Vulcan Raven LD technical specifications.

Parameter	Value
Configuration	X8 co-axial multirotor
Motors	8 brushless electric motors
Motor redundancy	Yes
Vehicle weight (no batteries or payload)	17.6 lbs.
Instrument payload	8.8 lbs.
Battery weight	13.5 lbs.
Typical take-off weight	39.9 lbs.

Maximum take-off weight (MTOW)	55.0 lbs.
Nominal airspeed	10 knots
Maximum airspeed	33 knots
Target altitude	35 ft AGL
Endurance	Up to 30 minutes
Diagonal length	1300 mm
Frame material	Carbon fiber, aluminum
Batteries	LiPo 8S, 11 Ah, 40C
RC control frequency	2.4 GHz
Flight controller	DJI A2
Payload	Visible/NIR cameras, lidar

Table 2. DJI S1000 technical specifications.

Parameter	Value
Configuration	X8 co-axial multirotor
Motors	8 brushless electric motors
Motor redundancy	Yes
Vehicle weight (no batteries or payload)	9.3 lbs.
Instrument payload	8.8 lbs.
Battery weight	5.5 lbs.
Typical take-off weight	23.6 lbs.
Maximum take-off weight (MTOW)	24.2 lbs.
Nominal airspeed	10 knots
Maximum airspeed	29 knots
Target altitude	35 ft AGL
Endurance	Up to 15 minutes
Diagonal length	1045 mm
Frame material	Carbon fiber
Batteries	LiPo 6S, 10-20 Ah, 15C
RC frequency	2.4 GHz
Flight controller	DJI A2
Payload	Visible/NIR cameras, lidar

The sUAS identified above are equipped with redundant safety mechanisms allowing them to operate safely after experiencing certain in-flight failures. If a lost-link event occurs, including the loss of ground communications and/or the loss of a GPS signal, the aircraft have the ability to perform a pre-coordinated, predictable, automated flight maneuver and return to a predetermined location for landing. The sUAS can be operated safely after the loss of an aircraft electric motor. The sUAS use a radio frequency spectrum for operation and control that complies with FCC requirements.

b. Pilot-in-Command

The PIC shall possess (i) either a private, recreational, or sport pilot's certificate and (ii) either an FAA medical certificate or a U.S. driver's license. All operations will utilize a VO and the sUAS will be operated within VLOS of the PIC and VO at all times. Consistent with previous FAA grants of exemptions under Section 333, Blue River proposes that the VO be used to satisfy the VLOS requirement as long as the PIC always maintains VLOS capability. The VO and the PIC will be able to communicate verbally at all times during operational flights.

Blue River will not permit any PIC to operate the sUAS unless the PIC demonstrates the ability to safely operate the sUAS in a manner consistent with how the sUAS must be operated under the requested exemption, including evasive and emergency maneuvers and maintaining appropriate distances from persons, vessels, vehicles and structures. PIC qualification flight hours and currency will be logged in a manner consistent with 14 C.F.R. § 61.51(b). Flights will be conducted for the purposes of training Blue River's PICs and VOs (training, proficiency, and experience-building) and determining the PIC's ability to safely operate the sUAS. Training operations will only be conducted during dedicated training sessions, and, when training flights are conducted, the PIC will operate the sUAS with appropriate distance from persons not essential for flight operations, i.e., nonparticipants, in accordance with 14 C.F.R. § 91.119.

c. Operating Parameters of Blue River's sUAS

As indicated above, the sUAS will be operated at a weight of less than 55 lbs. (including payload), speed of no more than 33 knots, and altitude of less than 200 ft AGL. The sUA will not carry a pilot, passenger, or flammable liquids. The sUA will be operated exclusively over non-congested, rural agricultural areas. All flights will be terminated with 20% remaining battery power.

Blue River will not conduct sUAS operations within five (5) nautical miles of an airport reference point unless a letter of agreement with that airport's management is obtained and the operation is conducted in accordance with a Notice to Airmen ("NOTAM"). Additionally, Petitioner will not operate the aircraft in Class A, B, C, or D airspace. Nor will Petitioner operate the aircraft less than 500 feet below a cloud or less than 2,000 feet horizontally from a cloud or when visibility is less than three (3) statute miles from the PIC. sUAS operations will not be conducted at night. All operations will be conducted under visual meteorological conditions ("VMC"). The UAS will remain clear and yield the right of way to all manned operations and activities at all times. All operations shall be conducted over private or controlled-access property with permission from the property owner/controller or authorized representative.

Any sUAS that has undergone maintenance or alterations that affect the sUAS operation or flight characteristics will 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 will be conducted in such a manner so as to not pose an undue hazard to persons and property.

Documents used by Blue River to ensure the safe operation and flight of the sUAS, including but not limited to Blue River's Operations Manual, the exemption issued by the FAA, ATO-issued COA, as well as any FAA-issued U.S. registration certificates for the aircraft, will be immediately available to the PIC at the Ground Control Station any time the aircraft is operating. These documents will be made available to the Administrator or any law enforcement official upon request.

IV. INFORMATION REQUIRED UNDER 14 C.F.R. § 11.81

a. 14 C.F.R. § 11.81(a) – Name and contact information of the Petitioner

Blue River Technology Inc.
575 N. Pastoria Ave.
Sunnyvale, CA 94085
Attn: Matt Colgan, PhD, Senior Systems Engineer
Phone: (650) 804-4021
Email: matt.c@bluevrivert.com

b. 14 C.F.R. § 11.81(b) – The specific sections of 14 C.F.R. from which the Petitioner seeks an exemption

Blue River seeks an exemption from the following sections of 14 C.F.R.:

- 14 C.F.R. §§ 61.23(a) and (c)
- 14 C.F.R. §§ 61.101(e)(4) and (5)
- 14 C.F.R. § 61.113(a)
- 14 C.F.R. §§ 61.315(a)
- 14 C.F.R. § 91.7(a)
- 14 C.F.R. § 91.119(c)
- 14 C.F.R. § 91.121
- 14 C.F.R. § 91.151(a)(1)
- 14 C.F.R. § 91.405(a)
- 14 C.F.R. § 91.407(a)(1)
- 14 C.F.R. §§ 91.409(a)(1) and (2)
- 14 C.F.R. §§ 91.417(a) and (b)

c. 14 C.F.R. § 11.81(c) – The extent of and reasons for the relief sought

- 14 C.F.R. §§ 61.23(a) and (c) – Medical certificates; operations requiring a medical certificate; operations requiring either a medical certificate or U.S. driver's license. 14 C.F.R. § 61.23(a) provides, inter alia, that a person exercising the privileges of a private pilot or recreational pilot certificate must hold a third-class medical certificate. Separately, 14 C.F.R. § 61.23(c) allows persons exercising the privileges of a sport pilot certificate in a light-sport aircraft other than a glider or balloon to hold a U.S. driver's license in lieu of a medical certificate. Blue River petitions the FAA for relief from these regulations to the extent necessary to allow the proposed sUAS flights to be operated by a PIC holding (1) a private, recreational, or sport pilot certificate, and (2) a current FAA airman medical certificate or a valid U.S. driver's license. Blue River submits that an equivalent level of safety will be achieved through an FAA medical certificate or a U.S. driver's license. Additionally, grant of the requested relief is (i) appropriate given the nature of the proposed sUAS operations, which pose considerably less safety risk than operations with larger UAS, and (ii) consistent with FAA exemptions issued under circumstances similar in all material respects to those presented in this petition, including, but not limited to, Exemption No. 11261, supra. Moreover, the requested relief is entirely consistent with FAA policy announced on April 9, 2015, in which the FAA determined that sUAS operations under Section 333 may be conducted by a PIC holding a U.S. driver's license in lieu of a medical certificate. In adopting this policy, the FAA explained, "This change is consistent with the agency's approach for sport pilot certificate holders, who may flight light sport aircraft with a driver's license and no FAA medical certificate."[2]

- 14 C.F.R. §§ 61.101(e)(4) and (5) – Recreational pilot privileges and limitations; acting as a pilot in command of an aircraft for compensation or hire, or in furtherance of a business. 14 C.F.R. § 61.23(e)(4) provides that a recreational pilot may not act as a PIC of an aircraft for compensation or hire, and 14 C.F.R. § 61.23(e)(5) additionally provides that such persons may not act as a PIC of an aircraft in furtherance of a business. Blue River requests an exemption from these regulations to the extent necessary to allow its sUAS to be operated by a PIC holding a recreational pilot certificate. Given the proposed airspace operations, in particular the size, weight, speed and operational capability of the sUAS at issue, the confinement of such operations to rural areas, the aeronautical knowledge requirements necessary for the issuance of a recreational pilot certificate and the skills necessary for the safe operation of the sUAS, operations should be permitted by a PIC holding a recreational pilot certificate. Most importantly, this relief is consistent with the FAA's policy announced on April 9, 2015, in which the FAA concluded that it

[2] FAA, News Release, "FAA Summary Grants Speed Exemptions" (Apr. 9, 2015).

should "allow[ ] operations under [Section 333] exemptions by people who hold a recreational or sport pilot certificate."[3]

- 14 C.F.R. § 61.113(a) – Private pilot privileges and limitations: Pilot in command; acting as a pilot in command of an aircraft for compensation or hire. This regulation provides that no person who holds a private pilot certificate may act as [a PIC] of an aircraft that is carrying passengers or property for compensation or hire; nor may that person, for compensation or hire, act as [a PIC] of an aircraft." Blue River respectfully asks for an exemption from this regulation to the extent necessary to allow its sUAS to be operated by a PIC holding a private pilot certificate. In this regard, the Company submits that the same reasons in support of its requested relief from 14 C.F.R. §§ 61.101(e)(4) and (5), including the equivalent level of safety, apply with equal force to an exemption from 14 C.F.R. § 61.113(a).

- 14 C.F.R. §§ 61.315(a) – Privileges and limitations of sport pilot certificates. This regulation provides that a person holding a sport pilot certificate may act as a PIC of a light-sport aircraft, except as specified in subparagraph (c), which, in turn, prohibits such operations for compensation or hire or in furtherance of a business. Blue River submits that the same justifications applicable to its requested relief from 14 C.F.R. §§ 61.101(e)(4) and (5), including the equivalent level of safety, apply in the case of its requested relief from 14 C.F.R. §§ 61.315(a). Additionally, as the FAA concluded in recently granting Exemption No. 11261 under circumstances similar in all material respects to those presented by Blue River:

  > The FAA has reviewed the knowledge and training requirements of sport, recreational, private and commercial certificates and concluded that a UAS PIC holding a minimum of a sport pilot certificate, and operating under this exemption, would not adversely affect operations in the [national airspace system] or present a hazard to persons or property on the ground.[4]

- 14 C.F.R. § 91.7(a) – Civil aircraft airworthiness; operations of civil aircraft in an airworthy condition. This regulation provides, "no person may operate a civil aircraft unless it is in an airworthy condition." No airworthiness certificate exists for the aircraft at issue. Blue River therefore seeks relief from this regulation to the extent necessary to permit the proposed sUAS operations set forth in this petition. Blue River submits that an equivalent level of safety will be achieved through reliance on the Operating Documents submitted in support of this petition, thereby ensuring the aircraft remains in an airworthy condition. In this regard, and prior to each flight, the PIC will conduct a pre-flight inspection to ensure the aircraft is in a condition for safe flight. If the inspection

[3] Ibid.
[4] Issued in Docket FAA-2014-0715 (Apr. 1, 2014), at 4.

reveals a condition that affects the safe operation of the sUAS, the aircraft will not be operated until the necessary maintenance has been performed and the sUAS is found to be in a condition for safe flight. Moreover, if the sUAS undergoes maintenance or alterations that affect the sUAS operation or flight characteristics, e.g., replacement of a flight critical component, the sUAS will undergo a functional test flight prior to conducting further operations.

- 14 C.F.R. § 91.119(c) – Minimum safe altitudes: General; operations over other than congested areas. 14 C.F.R. § 91.119(b) prohibits aircraft, when operating over congested areas, from operating at less than 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet from the aircraft. 14 C.F.R. § 91.119(c) prohibits aircraft, when operating over other than congested areas, from operating at less than 500 feet above surface except over open water or sparsely populated areas, in which case the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure. The sUAS will be operated exclusively over non-congested, rural agricultural areas, however, Blue River petitions the FAA for relief from § 91.119(c) to the extent necessary to permit the sUAS to be operated over such areas at less than 500 feet above surface. In order to ensure an equivalent level of safety, the sUAS operations will be conducted at least 500 feet from all nonparticipating persons, vessels, vehicles, and structures, unless a) nonparticipating persons are sufficiently protected by barriers or structures, 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 and determined that operating closer to those objects does not present an undue hazard.

- 14 C.F.R. § 91.121 – Altimeter settings. This regulation requires any aircraft operating within 18,000 feet of Mean Sea Level (MSL) to contain an altimeter set to one of several designated altimeter settings prior to departure. Blue River petitions for relief from this regulation because the sUAS will not have a typical barometric altimeter onboard. Instead, altitude information will be provided to the PIC of the sUAS via a digitally encoded telemetric data feed from the aircraft GPS to a ground-based on-screen display. Prior to each flight, a zero altitude initiation point will be established and confirmed by the PIC. The collection and monitoring of altitude information through these means will provide for an equivalent level of safety.

- 14 C.F.R. § 91.151(a)(1) – Fuel requirements for flight in VFR conditions; commencement of flight with sufficient fuel; flights during the day. This regulation prohibits any flight from being initiated unless there is enough fuel to fly to the first point of intended landing and to fly after that for at least 30 minutes. Consistent with other sUAS exemptions issued under Section 333, Blue River only proposes to conduct sUAS operations during daytime. Blue River requests an exemption from the regulation to the extent necessary to permit the proposed operations to be conducted by the sUAS described herein, which run on battery power. For the Vulcan Raven LD, the maximum

duration of flight from a single battery charge is 30 minutes. For the DJI S1000, the maximum duration of flight from a single battery charge is 15 minutes. To ensure an equivalent level of safety, the sUAS will never fly more than 0.5 statute miles from the point of intended landing. Additionally, the PIC (i) will ensure prior to each flight that the sUAS has sufficient battery power for the aircraft to fly at normal cruising speed to the intended landing point (considering wind and forecast weather conditions) and (ii) land the sUA with at least 20% battery power remaining.

- 14 C.F.R. § 91.405(a) – Maintenance requirements; 14 C.F.R. § 91.407(a)(1) – Operation after maintenance, preventive maintenance, rebuilding, or alteration; approval for return to service; 14 C.F.R. §§ 91.409(a)(1) and (2) – Inspections; operations and instruction; and 14 C.F.R. §§ 91.417(a) and (b) – Maintenance records; retention of records. 14 C.F.R. § 91.405(a) provides that an aircraft owner or operator must "have the aircraft inspected as prescribed in subpart E of this part and shall between required inspections . . . have discrepancies repaired as prescribed in part 43 of this chapter." 14 C.F.R. § 91.407 provides that "no person may operate any aircraft that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless [i]t has been approved for return to service by a person authorized under §43.7 of this chapter." Additionally, 14 C.F.R. §§ 91.409(a) generally prohibits aircraft operations unless, within the preceding 12 calendar months, the aircraft either has had, "An annual inspection in accordance with part 43 of this chapter and has been approved for return to service by a person authorized by §43.7 of this chapter," id. at subparagraph (1), or "An inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter." Id. at subparagraph (2). Finally, 14 C.F.R. §§ 91.417(a) requires aircraft owners and operators to retain "[r]ecords of maintenance, preventive maintenance, and alteration and records of the 100-hour, annual, progressive, and other required or approved inspections, as appropriate, for each aircraft (including the airframe) and each engine, propeller, rotor, and appliance of an aircraft," for the time periods prescribed under 14 C.F.R. § 91.417(b). 14 C.F.R. §§ 91.405(a), 91.407(a)(1), 91.409(a)(1) and (2), and 91.417(a) and (b) require, among other things, that maintenance be conducted in accordance with 14 C.F.R. part 43. By its terms, however, part 43, applies to aircraft for which an airworthiness certificate has been issued, and no such certificate has been issued for the aircraft which Blue River proposes to operate.

  Blue River requests an exemption from these regulations to the extent necessary to permit the sUAS operations to be conducted as described herein. To ensure an equivalent level of safety with respect to the maintenance and inspection requirements of these regulations, (i) Blue River will strictly comply with safety and maintenance procedures included in all applicable sUAS manufacturer's instructions and operator's manuals, (ii) the PIC will inspect the sUAS (including ground control station) prior to each flight, to ensure it is in a condition for safe flight and, where such inspections reveal a condition

affecting safe operation, no operations will be conducted pending performance of necessary maintenance and a finding that the sUAS is in a condition for safe flight, (iii) all maintenance and alterations will be documented in aircraft records, (iv) any maintenance or alterations affecting the sUAS operation or flight characteristics will undergo a functional test flight, with appropriate entries in aircraft records, (v) the pre-flight inspection section of Blue River's Operating Documents will account for all discrepancies, (vi) Blue River will follow the sUAS manufacturer's aircraft/component, maintenance, overhaul, replacement, inspection and life limit requirements, and (vii) all maintenance, inspections and record keeping will be carried out in accordance with the Operating Documents, with appropriate notations in aircraft records, including total flight hours, work accomplished and the signature of the authorized person returning sUAS to service.

In accordance with the statutory criteria provided in Section 333 of the Reform Act regarding airworthiness certification under 49 U.S.C. § 44704, Blue River believes that relief from 14 C.F.R. part 21, Subpart H, and any associated noise certification and testing requirements of 14 C.F.R. part 36 is not necessary, in consideration of the size, weight, speed and limited operating area associated with the sUAS and their operations. To the extent that the FAA believes such relief is warranted, however, Blue River asks that such relief be provided for in any exemption issued in response to this Petition.

d. 14 C.F.R. § 11.81(d) – The reasons why granting the request would be in the public interest; that is, how it would benefit the public as a whole

Grant of the relief requested herein would further the objectives of Congress under Section 333 of the Reform Act, by promoting the operation of sUAS flights to safely and efficiently gather aerial data in furtherance of precision agriculture activities. The collection of such data with sUAS is more cost-effective to customers than manned aircraft operations, as it provides remarkably high resolution imagery at a fraction of the cost. The resulting cost savings drive enhanced efficiencies and productivity gains for agricultural activities.

e. 14 C.F.R. § 11.81(e) – The reasons why granting the exemption would not adversely affect safety, or how the exemption would provide a level of safety at least equal to that provided by the rule from which you seek the exemption

These reasons are set forth in the information furnished by Blue River pursuant to 14 C.F.R. § 11.81(c), above. In order to further ensure an equivalent level of safety, Blue River is willing to accept the FAA's standard conditions and limitations ordinarily attached to exemptions issued under Section 333 in connection with agriculture operations with sUAS, including, but not limited to, those recently attached to Exemption No. 11261, supra. For ease of administrative processing, such conditions and limitations are set forth on Appendix A to this petition. The primary risk associated with Blue River's proposed operations are manned agricultural

operations under 14 C.F.R. § 137, however, given the nature of the proposed operations, in particular the very low altitude and speed at which the sUAS will be operated, as well as the conditions and limitations which Blue River is willing to accept, such risks are more than sufficiently mitigated.

f. 14 C.F.R. § 11.81(f) – Federal Register summary

Blue River submits that good cause exists for not publishing a summary of this Petition in the Federal Register, as the relief requested herein is not precedential and any delay in acting on this petition would be detrimental to Blue River. Nevertheless, in the event the FAA determines to publish such a summary, Blue River submits the following:

Petitioner:	Blue River Technology Inc.
Regulations affected:	14 C.F.R. §§ 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)
Description of relief sought:	Blue River Technology Inc. petitions for an exemption permitting the operation of small unmanned aerial systems, weighing 55 pounds or less, for commercial precision agricultural surveys over remote and rural areas of the United States.

g. 14 C.F.R. § 11.81(g) – Operations outside the United States

Blue River does not seek to exercise the privileges of the requested exemption outside the United States.

V. CONCLUSION

The enhanced safety achieved under the specific guidelines and procedures proposed by Blue River provides the FAA with good cause to find that the operations which are the subject of this Petition are in the public interest. Blue River therefore respectfully requests that the FAA grant (i) the requested exemption under Section 333 of the Reform Act and 49 U.S.C. § 44701(f), and (ii) such other or additional relief as the FAA considers consistent with this Petition and the public interest, thereby permitting Blue River to conduct sUAS operations for the purpose of commercial precision agricultural surveys, as more fully described herein.

Respectfully submitted,

Matt Colgan, PhD
Senior Systems Engineer
Blue River Technology Inc.

Enclosures

Appendix A

Blue River Technology Inc. Consents to the Attachment of the Following Conditions and Limitations on its Requested Section 333 Exemption:

1. Operations authorized by this grant of exemption are limited to the following UAS when weighing less than 55 pounds including payload: the Vulcan Raven LD; the DJI S1000. 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 UAS 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 UAS operating airspeed recommended by the aircraft manufacturer.

4. The UAS 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 UAS 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 Colombia, 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 UAS 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.